VISHAY INTERTECHNOLOGY, INC.

INTERACTIVE
data book

RECTIFIERS

VISHAY GENERAL SEMICONDUCTOR

VSE-DB0001-1102

Notes:

1. To navigate:
   a) Click on the Vishay logo on any datasheet to go to the Contents page for that section. Click on the Vishay logo on any Contents page to go to the main Table of Contents page.
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VISHAY INTERTECHNOLOGY, INC.

RECTIFIERS

VISHAY GENERAL SEMICONDUCTOR

Schottky Rectifiers

TMBS® Trench MOS Barrier Schottky Rectifiers

Ultrafast Recovery Rectifiers

Fast Recovery Rectifiers

Standard Rectifiers

ESD Capability Rectifiers

Bridge Rectifiers

www.vishay.com

SEMICONDUCTORS

RECTIFIERS
- Schottky (single, dual)
- Standard, Fast, and Ultra-Fast Recovery (single, dual)
- Bridge
- Superectifier®
- Sinterglass Avalanche Diodes

HIGH-POWER DIODES AND THYRISTORS
- High-Power Fast-Recovery Diodes
- Phase-Control Thyristors
- Fast Thyristors

SMALL-SIGNAL DIODES
- Schottky and Switching (single, dual)
- Tuner/Capacitance (single, dual)
- Bandswitching
- PIN

ZENER AND SUPPRESSOR DIODES
- Zener (single, dual)
- TVS (TRANSZORB®, Automotive, ESD, Arrays)

FETs
- Low-Voltage TrenchFET® Power MOSFETs
- High-Voltage TrenchFET® Power MOSFETs
- High-Voltage Planar MOSFETs
- JFETs

OPTOELECTRONICS
- IR Emitters and Detectors, and IR Receiver Modules
- Optocouplers and Solid-State Relays
- Optical Sensors
- LEDs and 7-Segment Displays
- Infrared Data Transceiver Modules
- Custom Products

ICs
- Power ICs
- Analog Switches
- RF Transmitter and Receiver Modules
- ICs for Optoelectronics

MODULES
- Power Modules (contain power diodes, thyristors, MOSFETs, IGBTs)
- DC/DC Converters

PASSIVE COMPONENTS

RESISTIVE PRODUCTS
- Foil Resistors
- Film Resistors
  - Metal Film Resistors
  - Thin Film Resistors
  - Thick Film Resistors
  - Metal Oxide Film Resistors
  - Carbon Film Resistors
- Wirewound Resistors
- Power Metal Strip® Resistors
- Chip Fuses
- Variable Resistors
  - Cermet Variable Resistors
  - Wirewound Variable Resistors
  - Conductive Plastic Variable Resistors
- Networks/Arrays
- Non-linear Resistors
  - NTC Thermistors
  - PTC Thermistors
  - Varistors

MAGNETICS
- Inductors
- Transformers

CAPACITORS
- Tantalum Capacitors
  - Molded Chip Tantalum Capacitors
  - Coated Chip Tantalum Capacitors
  - Solid Through-Hole Tantalum Capacitors
  - Wet Tantalum Capacitors
- Ceramic Capacitors
  - Multilayer Chip Capacitors
  - Disc Capacitors
- Film Capacitors
- Power Capacitors
- Heavy-Current Capacitors
- Aluminum Capacitors
- Silicon RF Capacitors

STRAIN GAGE TRANSDUCERS AND STRESS ANALYSIS SYSTEMS
- PhotoStress®
- Strain Gages
- Load Cells
- Force Transducers
- Instruments
- Weighing Systems
- Specialized Strain Gage Systems

Rectifiers

Vishay General Semiconductor

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Table of Contents

Vishay General Semiconductor

Rectifiers

Introduction

Vishay Intertechnology, Inc., a Fortune 1000 Company listed on the NYSE, is one of the world's largest manufacturer of discrete semiconductors (diodes, rectifiers, transistors, optoelectronics and power ICs) and passive electronic components (resistors, capacitors, inductors and transducers). With the acquisition of General Semiconductor, Vishay becomes the world's largest manufacturer of rectifiers. General Semiconductor is now Vishay Power Diodes Division, carrying the new combined corporate brand values and same product excellence in its Vishay General Semiconductor product brand.

Vishay General Semiconductor's innovative package and chip technology products are used throughout the industry within the consumer electronics, telecommunications, electronic lighting ballast, computer, and automotive markets.

Vishay General Semiconductor's strengths are the high performance and quality of its' products, its' strong worldwide sales and distribution channels, and the value-added manufacturing of its' worldwide operations which enable Vishay General Semiconductor to effectively compete globally in all major end markets.

The information contained in this product catalog is intended to provide the necessary technical support data to assist the design engineer. It is our policy to maintain high standards of product design and manufacture. These high standards of quality assure reliable product performance for our customers. Vishay General Semiconductor worldwide manufacturing facilities are ISO 9001 and ISO/TS16469 approved. Not every application problem can be solved using a standard device; in this case we often develop special products to meet the customer's requirements. For further information, call your local sales office.

Additional information can be found on the Vishay General Semiconductor website at **www.vishay.com**.

How to Find the Products You Are Looking For

The book is divided into chapters that cover specific functional types of rectifiers. These include Schottky, with industry first TMBS® Products, Ultrafast Recovery, Fast Recovery, Standard Recovery, ESD Protection and Bridge Rectifiers. Within each chapter the products are arranged by increasing forward-current ratings. Within a specific current rating they are arranged in alphanumeric order. At the beginning of each chapter there is an explanation of the part numbering system to aid in the search for the desired part.

If the desired functional type, package and/or specifications are known, the selector guides in this book can aid in finding the desired part number and datasheet. As with the chapters, these selector guides are arranged by functional type. These selector guides list the part numbers, major specifications (e.g., V_{BR}, $I_{F(AV)}$, V_F, t_{rr}), technology (e.g., SUPERECTIFIER®, glass, plastic), package type and the datasheet's page number. For those rectifier products with datasheets contained in other books, the book is given instead of a page number.

If the product type is not known, but the part number is known there is an alphanumeric index to help locate the part.

There is also a thru-hole/surface-mount cross-reference.

For the most current information, including latest new product information, visit us on the web at **www.vishay.com**.

Rectifiers

Thru-hole to Surface Mount Rectifier Cross Reference

Vishay General Semiconductor

AXIAL LEAD THRU-HOLE PART	SURFACE MOUNT PART						
	MicroSMP	SMP	GF1	SMA	SMB	SMC	SMPC
1N3611GP ~ 1N3957GP			GF1D ~ GF1M				
1N4001 ~ 1N4007		S1PB ~ S1PM		S1A ~ S1M			
1N4001GP ~ 1N4007GP			GF1A ~ GF1M				
1N4245 ~ 1N4249			GF1D ~ GF1M				
1N4245GP ~ 1N4249GP			GF1D ~ GF1M				
1N4383GP ~ 1N4385GP			GF1D ~ GF1J				
1N4585GP, 1N4586GP			GF1K, GF1M				
1N4933 ~ 1N4937		RS1PB ~ RS1PJ		RS1A ~ RS1J			
1N4933GP ~ 1N4937GP			RGF1A ~ RGF1J				
1N4942 ~ 1N4948			RGF1D ~ RGF1M				
1N4942GP ~ 1N4948GP			RGF1D ~ RGF1M				
1N5059GP ~ 1N5062GP			RGF1D ~ RGF1K				
1N5391 ~ 1N5399					S2A ~ S2M		
1N5391GP ~ 1N5399GP					S2A ~ S2M		
1N5400 ~ 1N5408						S3A ~ S3M	
1N5614GP ~ 1N5622GP			GF1D ~ GF1M				
1N5615GP ~ 1N5623GP			RGF1D ~ RGF1M				
1N5817 ~ 1N5819				SS12 ~ SS14			
1N5820 ~ 1N5822						SS32 ~ SS34	
BA157GP			RGF1G				
BA158GP			RGF1J				
EGP20A ~ EGP20G					ES2A ~ ES2G		
EGP30A ~ EGP30G						ES3A ~ ES3G	
FGP10B ~ FGP10D		ESH1PB ~ ESH1PD	EGF1B ~ EGF1D	ESH1B ~ ESH1D			
GI500 ~ GI510						S3A ~ S3M	
GI850 ~ GI858						RS3A ~ RS3K	
GI910 ~ GI917						RS3A ~ RS3K	
GP10A ~ GP10M			GF1A ~ GF1M				
GP15A ~ GP15M					S2A ~ S2M		
GP20A ~ GP20J					S2A ~ S2J		
GP30A ~ GP30M						S3A ~ S3M	
MPG06A ~ MPG06M	MSE1PB ~ MSE1PJ	S1PB ~ S1PM		S1A ~ S1M			
MUR120					MURS120		

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Thru-hole to Surface Mount Rectifier Cross Reference

Vishay General Semiconductor

AXIAL LEAD THRU-HOLE PART	SURFACE MOUNT PART						
	MicroSMP	SMP	GF1	SMA	SMB	SMC	SMPC
MUR140 & MUR160					MURS140 & MURS160		
MUR420						MURS320	
MUR440 ~ MUR460						MURS340 ~ MURS360	
P300A ~ P300M						S3A ~ S3M	
RGP10A ~ RGP10M			RGF1A ~ RGF1M				
RGP15A ~ RGP15M					RS2A ~ RS2K		
RGP20A ~ RGP20J					RS2A ~ RS2K		
RGP25A ~ RGP25M						RS3A ~ RS3K	
RGP30A ~ RGP30M						RS3A ~ RS3K	
SB020	MSS1P2L	SS1P2L		SL12, SS12			
SB030	MSS1P3, MSS1P3L	SS1P3, SS1P3L		SL13, SS13			
SB040	MSS1P4	SS1P4		SS14			
SB120 ~ SB160		SS1P3L & SS1P4L SS1P5L & SS1P6L		SS12 ~ SS16			
SB120A ~ SB160A		SS1P3 & SS1P4					
SB220 ~ SB260				SSA23L & SSA24, B230LA & B240A			
SB220S ~ SB260S		SS2P5 & SS2P6		SS22S ~ SS24S			
SB1H90 & SB1H100		SS2PH9 & SS2PH10		SS1H9 & SS1H10			
SB2H90 & SB2H100					SS2H9 ~ SS2H10		
SB320 ~ SB360				B330LA & B340A, SSA33L & SSA34		SS32 ~ SS36	SS3P3L & SS3P4L SS3P5L & SS3P6L
SB320A ~ SB360A				B360A			
SB320S ~ SB360S							
SB3H90 & SB3H100						SS3H9 & SS3H10	
SB520A ~ SB560A						SSC53L & SSC54	SS5P3 & SS5P4 SS5P5 & SS5P6
SB5H90 ~ SB5H100							SS5P9 & SS5P10
SRP100A ~ SRP100K				RS1A ~ RS1K			
SRP300A ~ SRP300K						RS3A ~ RS3K	
UF4001 ~ UF4007				US1A ~ US1M			
UG06A ~ UG06D		ES1PD ~ ES1PD ESH1PB ~ ESH1PD		ES1A ~ ES1D ESH1B ~ ESH1D U1B ~ U1D			
UG1A ~ UG1D		ES1PD ~ ES1PD ESH1PB ~ ESH1PD		ES1A ~ ES1D ESH1B ~ ESH1D U1B ~ U1D			
UG2A ~ UG2D		ESH2PB ~ ESH2PD			ES2A ~ ES2D, ESH2B ~ ESH2D		
UG2F & UG2G					ES2F & ES2G		

Thru-hole to Surface Mount Rectifier Cross Reference

Vishay General Semiconductor

POWER PACK THRU-HOLE PART	SURFACE MOUNT PART	
	SMPC	TO-263AB (D^2PAK)
BY229-200 ~ BY299-800		BY229B-200 ~ BY299B-800
BYQ28E Series		BYG28EB Series
BYS459-1500		BYS459B-1500
BYS459-1500S		BYS459B-1500S
BYT28 Series		BYT28B Series
BYV32-50 ~ BYV32-200		BYVB32-50 ~ BYVB32-200
BYW29-50 Series		BYW29B Series
DTV32		DTV32B
DTV56		DTV56B
FEP16AT ~ FEP16JT		FEPB16AT ~ FEPB16JT
FEP6AT ~ FEP6DT		FEPB6AT ~ FEPB6DT
FES16AT ~ FES16JT		FESB16AT ~ FESB16JT
FES8AT ~ FES8JT		FESB8AT ~ FESB8JT
GI1401 ~ GI1404		GIB1401 ~ GIB1404
GI2401 ~ GI2404		GIB2401 ~ GIB2404
GUR5H60		GURB5H60
MBR1035 ~ MBR1060	SS10P4 ~ SS10P6	MBRB1035 ~ MBRB1060
MBR1090 & MBR10100	V10P10	MBRB1090 & MBRB10100
MBR1090CT ~ MBR10100CT		MBRB1090CT ~ MBRB10100CT
MBR10H35 ~ MBR10H60	SS10PH45	MBRB10H35 ~ MBRB10H60
MBR10H90 ~ MBR10H100	SS10PH9, 10PH10, V10P10	MBRB10H90 ~ MBR10H100
MBR10H90CT ~ MBR10H100CT		MBRB10H90CT ~ MBRB10H100CT
MBR1535CT ~ MBR1560CT		MBRB1535CT ~ MBRB1560CT
MBR15H35CT ~ MBR15H60CT		MBRB15H35CT ~ MBRB15H60CT
MBR1635 ~ MBR1660		MBRB1635 ~ MBRB1660
MBR16H35 ~ MBR16H60		MBRB16H35 ~ MBRB16H60
MBR2035CT ~ MBR2060CT		MBRB2035CT ~ MBRB2060CT
MBR2090CT & MBR20100CT		MBRB2090CT & MBRB20100CT
MBR20H35CT ~ MBR20H60CT		MBRB20H35CT ~ MBRB20H60CT
MBR20H90CT ~ MBR20H100CT, V20100C		MBRB20H90CT ~ MBRB20H100CT, VB20100C
MBR2535CT ~ MBR2560CT		MBRB2535CT ~ MBRB2560CT
MBR25H35CT ~ MBR25H60CT		MBRB25H35CT ~ MBRB25H60CT
MBR3035CT ~ MBR3045CT		MBRB3035CT ~ MBRB3045CT
MBR30H35CT ~ MBR30H60CT		MBRB30H35CT ~ MBRB30H60CT
MBR30H90CT ~ MBR30H100CT, V30100C		MBRB30H90CT ~ MBRB30H100CT, VB30100C
MBR735 ~ MBR760		MBRB735 ~ MBRB760
MBR7H35 ~ MBR7H60		MBRB7H35 ~ MBRB7H60
NS8AT ~ NS8MT		NSB8AT ~ NSB8MT
SBL1030 ~ SBL1040	SS10P3 & SS10P4	SBLB1030 ~ SBLB1040
SBL1030CT ~ SBL1040CT	SS12P3CL	SBLB1030CT ~ SBLB1040CT
SBL10L25	SS10P2L	SBLB10L25
SBL10L30	SS10P3L	SBLB10L30
SBL1630CT ~ SBL1640CT		SBLB1630CT ~ SBLB1640CT
SBL2030CT ~ SBL2040CT		SBLB2030CT ~ SBL2040CT
SBL25L20CT ~ SBL25L30CT		SBLB25L20CT ~ SBLB25L30CT
SBL8L40		SBLB8L40
U10BCT ~ U10DCT		UB10BCT ~ UB10DCT
U16BCT ~ U16DCT		UB16BCT ~ UB16DCT

For technical questions within your region, please contact:
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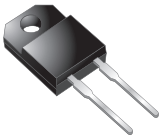
POWER PACK THRU-HOLE PART	SURFACE MOUNT PART	
	SMPC	TO-263AB (D^2PAK)
U20BCT ~ U20DCT		UB20BCT ~ UB20DCT
U30BCT ~ U30DCT		UB30BCT ~ UB30DCT
U8BT ~ U8DT		UB8BT ~ UB8DT
UG10BCT ~ UG10DCT, U10BCT ~ U10DCT		UGB10BCT ~ UGB10DCT, UB10BCT ~ UB10DCT
UG10FCT ~ UG10GCT		UGB10FCT ~ UGB10GCT
UG12HT ~ UG12JT		UGB12HT ~ UGB12JT
UG15HT ~ UG15JT		UGB15HT ~ UGB15JT
UG18ACT ~ UG18DCT		UGB18ACT ~ UGB18DCT
UG5HT ~ UG5JT		UGB5HT ~ UGB5JT
UG8AT ~ UG8DT, U8BT ~ U8DT		UGB8AT ~ UGB8DT, UB8BT ~ UB8DT
UG8FT ~ UG8GT		UGB8FT ~ UGB8GT
UG8HCT ~ UG8JCT		UGB8HCT ~ UGB8JCT
UG8HT ~ UG8JT		UGB8HT ~ UGB8JT
UH10FT		UHB10FT
UH20FCT		UHB20FCT
V10150C		VB10150C
V10150S		VB10150S
V20100S		VB20100S
V20120C		VB20120C
V20120S		VB20120S
V20120SG		VB20120SG
V20150C		VB20150C
V20150S		VB20150S
V20150SG		VB20150SG
V30100S		VB30100S
V30100SG		VB30100SG
V30120C		VB30120C
V30120S		VB30120S
V30120SG		VB30120SG
V30150C		VB30150C
V30200C		VB30200C
V40100C		VB40100C
V40100G		VB40100G
V40120C		VB40120C
V40150C		VB40150C
V60100C		VB60100C
V60120C		VB60120C

"DUAL IN-LINE BRIDGE" THRU-HOLE PART	SURFACE MOUNT PART	
	MBS	DFS
B2M ~ B6M	B2S ~ B6S	
MB2M ~ MB6M	MB2M ~ MB6M	
DF005M ~ DF10M		DF005S ~ DF10S
DF005MA ~ DF10MA		DF005SA ~ DF10S A
EDF1AM ~ EDF1DM		EDF1AS ~ EDF1DS

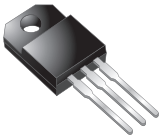
Industry's First Commercial TMBS® - Trench MOS Barrier Schottky Rectifier Series

TO-277A (SMPC)



ITO-220AC

TO-263AB



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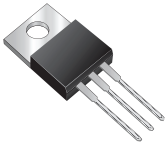
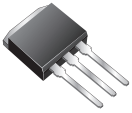


TO-220AB

TO-220AC



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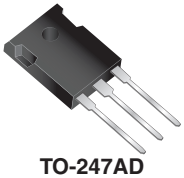

TO-247AD

The TMBS® series is Vishay General Semiconductor's patented new Trench MOS Barrier Schottky rectifier product series. TMBS® products are optimized with power ratings selections from 100 V, 120 V, 150 V up to 200 V for different system requirements and in numerous popular packages.

This is a rapid growing new product line with wide range of product portfolios for various application needs, please refer to the TMBS® data sheets section for more part numbers and specification information, or contact one of our VGS regional marketing colleagues for the most updated new parts information.

TMBS offers several advantages over planar Schottky rectifiers. As operating voltages move to 100 V and above, planar Schottky rectifiers tend to lose their advantage of high switching speed and low forward voltage drop to a substantial degree. The patented TMBS structure, however, diminishes minority carrier injections to the drift region, minimizing stored charges and improving switching speed.

FEATURES

- Patented Trench structures, voltage ratings: 200 V, 150 V, 120 V, 100 V
- Improved efficiency in AC/DC SMPS and DC/DC convertors
- High power density and low forward voltage
- Multiple package options

APPLICATIONS

- Adaptors for LCD monitors/TV, Mini PC
- PC/Server power supplies
- AC/DC SMPS
- DC/DC convertors
- Telecom and server OR-ing diodes

For technical questions within your region, please contact:
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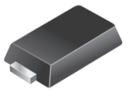
Document Number: 89098
Revision: 30-Jun-08

New eSMP™ Surface Mount Package Series with Unique Wide Bottom Plate Designs and Space-Saving Footprints

SMP



Rectifiers

TVS

(3.8 x 2 x 1) mm

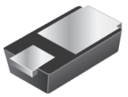
SMPC

Rectifiers

TVS

(6.7 x 4.8 x 1.1) mm

MicroSMP



Rectifiers

TVS

(2.5 x 1.3 x 0.68) mm

	$R_{\theta JL}$
MicroSMP	30 °C/W
SMP	15 °C/W
SMPC	3 °C/W

Vishay General Semiconductor developed the new eSMP™ high current density power efficiency surface mount package series with unique designs for better thermal performance and reliability.

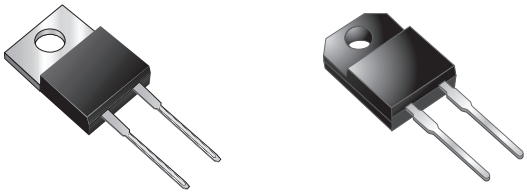
FEATURES

- Space saving miniature packages:
  SMP (3.8 x 2 x 1) mm
  SMPC (6.7 x 4.8 x 1.1) mm
  MicroSMP (2.5 x 1.3 x 0.65) mm
- Special wide bottom plate design:
  Greater heat dissipation than other packages of similar sizes
- Low device height
- Low thermal resistance
- AEC-Q101 qualified
- Available for Schottky, ultrafast and standard rectifiers

APPLICATIONS

Efficient and space saving package choice for telecom, automotive, computer, industrial and mobile consumer electronic applications

New 8 A, 600 V Ultrafast Rectifiers Offer 25 ns Reverse Recovery and 150 ns Forward Recovery Times



The new 8 A, 600 V UH8JT and UHF8JT single high voltage ultrafast rectifiers deliver a reverse recovery time of 25 ns. This improved switching performance combines with a forward recovery time of 150 ns under LEM test conditions (I_F = 8 A, dI/dt = 64 A/µs, V_F = 1.1 x $V_{F\ max.}$), and a low forward voltage drop rating of 1.85 V at 125 °C, to enable better thermal performance and better system efficiency.

Built using a planar chip junction technology, the UH8JT and UHF8JT will be used for a range of power supply applications, including high voltage continuous-current-mode power factor correction (CCM PFC) systems in consumer and computer products; high voltage output switchmode power supplies; secondary dc-to-dc rectification applications; and freewheeling diode applications.

The UH8JT (TO-220AC) and UHF8JT (ITO-220AC) feature a maximum junction temperature of 175 °C and are compliant with RoHS 2002/95/EC and WEEE 2002/96/EC.

PART NUMBER	DESCRIPTION	PACKAGE	V_F AT I_F, T_J
UH8JT	8 A, 600 V, 25 ns ultrafast recovery rectifier	TO-220AC	1.8 V at 8 A, 125 °C
UHF8JT		ITO-220AC	

New PowerBridge™ Series - Enhanced Power Bridge Rectifiers 25 A, 20 A, 15 A, 12 A, and 10 A

New space saving enhanced high current density bridge (BU) package for switch mode power supplies, home appliances and audio/video equipments, efficient performance comparable to larger size bridge products in market. Low thermal resistance $R_{\theta JC(L/A)}$, reduces heat-sink size with bridge rectifiers in system (less heat generated by power supply compared to larger size market bridge products of similar power performances).

Compatible package, lead pitch and pin layout to conventional GBU package saves design time when changing bridge rectifiers with increased system power demand (not necessary to change P.C.B. layout and heat sink when system power increased). 260 °C, 40 s of solder dipping process enables high reliability in manual soldering.

APPLICATIONS INCLUDE

- Primary rectification circuit of switch mode power supplies and adaptors for desktop PCs, servers, notebook PCs, plasma display panel (PDP) TVs, LCD TVs, and monitors.
- Primary rectification circuit of inverter type home appliance as in refrigerator, washing machine, air conditioner and induction heater systems.
- Primary rectification circuit of switch mode power supplies in telecommunication systems

PART NUMBER	DESCRIPTION	PACKAGE	V_F AT I_F PER CHIP, T_J
BU25	600 thru 1000 V 25 A single phase bridge rectifier	BU	0.87 V typical at 12.5 A, 125 °C
BU20	600 thru 1000 V 20 A single phase bridge rectifier	BU	0.85 V typical at 10 A, 125 °C
BU15	600 thru 1000 V 15 A single phase bridge rectifier	BU	0.87 V typical at 7.5 A, 125 °C
BU12	600 thru 1000 V 12 A single phase bridge rectifier	BU	0.88 V typical at 6 A, 125 °C
BU10	600 thru 1000 V 10 A single phase bridge rectifier	BU	0.88 V typical at 5 A, 125 °C

INDEX OF SYMBOLS

C_J ..... Junction capacitance
I_F ..... DC forward current
$I_{F(AV)}$ ..... Average forward rectified current
I_D ..... Stand-off reverse leakage current
I_{FSM} ..... Peak forward surge current
I_O ..... Main forward current
I_R ..... Reverse leakage current
I_{PPM} ..... Maximum peak impulse current
$I_{RM(REC)}$ .... Maximum peak reverse recovery current
I_{RSM} ..... Maximum non-repetitive reverse peak current
I_T ..... On-state test current
I^2t ..... Rating for fusing
$P_{M(AV)}$ ..... Maximum steady state power dissipation
P_{PM} ..... Peak pulse power dissipation
P_{tot}, P_D ..... Total power dissipation
Q_{rr} ..... Recovered charge
$R_{\theta JA}$ ..... Thermal resistance (junction to ambient)
$R_{\theta JC}$ ..... Thermal resistance (junction to case)
$R_{\theta JL}$ ..... Thermal resistance (junction to lead)
$R_{\theta JM}$ ..... Thermal resistance (junction to mount)
S ..... Softness factor
T_A ..... Ambient temperature
T_C ..... Case temperature
t_d ..... Time duration
t_{fr} ..... Forward recovery time
T_J ..... Junction temperature
T_L ..... Lead temperature
T_M ..... Mount temperature
t_{rr} ..... Reverse recovery time
T_S, T_{STG} .. Storage temperature
V_{BR} ..... Reverse breakdown voltage
V_F ..... Instantaneous forward voltage
V_{FP} ..... Peak forward voltage
V_{DC}, V_R ... DC reverse voltage
V_{RMS} ..... RMS input voltage
V_{RRM} ..... Peak repetitive reverse voltage
V_{RWM} ..... Working peak reverse voltage

DRAWINGS

All dimensions are in inches and (millimeters) unless noted otherwise. Figures not necessarily drawn to scale.

PRO ELECTRON TYPE DESIGNATION CODES

Two letters + alphanumeric sequence number (commercial application)
Three letters + alphanumeric sequence number (professional application)

The **first letter** gives information about the material used for the active part of the device, where “B” indicates silicon.

The **second letter** indicates the primary function of the device, where “A” is for low-power signal diodes, “Y” is for rectifying diodes, “Z” for voltage reference or regulator diodes (TVS if “W” follows “Z”), “C” is for low power bipolar transistors and “S” is for low power MOS transistors.

The **serial number** follows the first two letters. It may either be a number from 100 to 999 or a letter (e.g. W after Z indicates TVS) followed by a number from 10 to 99.

A **suffix** may be added to show V_{RRM} for a rectifier or V_{WM} for a TVS (Note: within the suffix a “V” is used instead of a decimal point). Examples: BZW04-8V5, BYW29-200, BYV29-400.

JEDEC TYPE DESIGNATION CODES

The first number (which is followed by the letter “N”) indicates the number of leads minus 1. This is followed by the serial number. Example: 1N5817, 3N254

CHARACTERISTICS AND MAXIMUM RATINGS

The electrical performance of a semiconductor device is usually expressed in terms of its characteristics and maximum ratings.

Characteristics are those which can be measured by use of suitable measuring instruments and circuits, and provide information on the performance of the device under specified operating conditions (at a given bias, for example). Depending on requirements, they are quoted either as typical (typ.) values or quaranteed (min., max.) values.

Typical values are expressed as numbers or as one or more curves, and are subject to spread.

Maximum ratings give the values which cannot be exceeded without risk of damage to the device. Changes in supply voltage and in the tolerances of other components in the circuit must also be taken into consideration. No single maximum rating should ever be exceeded, even when the device is operated well within the other maximum ratings.

Selector Guides

Schottky Rectifiers

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TMBS® (Trench MOS Barrier Schottky) Rectifiers

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$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (5)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY (3)	TYPE		(V)	(A)	
0.6	SB020 thru SB060	G	Plastic Axial	MPG06	20 to 60	0.55/0.70	0.6	40
1.0	1N5817 thru 1N5819	G	Plastic Axial	DO-204AL (DO-41)	20 to 40	0.45 to 0.60	1.0	43
	BYM13-20 thru BYM13-60	G	Plastic SMD	DO-213AB (MELF)	20 to 60	0.50 to 0.70	1.0	46
	MSS1P2L & MSS1P3L	G	Plastic SMD	MicroSMP	20 to 30	0.50	1.0	49
	MSS1P3 & MSS1P4	G	Plastic SMD	MicroSMP	30 to 40	0.55	1.0	52
	MSS1P5 & MSS1P6	G	Plastic SMD	MicroSMP	50 to 60	0.68	1.0	55
	SB120 thru SB160	G	Plastic Axial	DO-204AL (DO-41)	20 to 60	0.48 to 0.65	1.0	58
	SB120A thru SB160A	G	Plastic Axial	DO-204AL (DO-41)	20 to 60	0.50 to 0.70	1.0	61
	SB1H90 & SB1H100	G	Plastic Axial	DO-204AL (DO-41)	90 to 100	0.77	1.0	64
	SGL41-20 thru SGL41-60	G	Plastic SMD	DO-213AB (MELF)	20 to 60	0.50 to 0.70	1.0	46
	SS12 thru SS16	G	Plastic SMD	DO-214AC (SMA)	20 to 60	0.50 to 0.75	1.0	67
	B120 thru B160	G	Plastic SMD	DO-214AC (SMA)	20 to 60	0.52 to 0.75	1.0	70
	SS1H9 & SS1H10	G	Plastic SMD	DO-214AC (SMA)	90 to 100	0.77	1.0	73
	SS1P3L & SS1P4L	G	Plastic SMD	DO-220AA (SMP)	30 to 40	0.45 to 0.48	1.0	76
	SS1P3 & SS1P4	G	Plastic SMD	DO-220AA (SMP)	30 to 40	0.50 to 0.53	1.0	79
	SS1P5L & SS1P6L	G	Plastic SMD	DO-220AA (SMP)	50 to 60	0.59	1.0	83
1.5	BYS10-25 thru BYS10-45	G	Plastic SMD	DO-214AC (SMA)	25 to 45	0.50	1.0	86
	BYS11-90	G	Plastic SMD	DO-214AC (SMA)	90	0.75	1.0	89
	BYS12-90	G	Plastic SMD	DO-214AC (SMA)	90	0.36/0.75	0.1/1.0	92
	SL12 & SL13	G	Plastic SMD	DO-214AC (SMA)	20 to 30	0.36/0.445	0.1/1.0	95
	SS29 & SS210	G	Plastic SMD	DO-214AA (SMB)	90 to 100	0.75/0.95	1.0/3.0	98
2.0	**SB220 thru SB260**	G	Plastic Axial	DO-204AC (DO-15)	20 to 60	0.5/0.68	2.0	101
	SB220S thru SB260S	G	Plastic Axial	DO-204AL (DO-41)	20 to 60	0.55/070	2.0	104
	SB2H90 & SB2H100	G	Plastic Axial	DO-204AC (DO-15)	90 to 100	0.79	2.0	107
	MSS2P2 & MSS2P3	G	Plastic SMD	MicroSMP	20 to 30	0.60	2.0	110
	B230LA & B240A	G	Plastic SMD	DO-214AC (SMA)	30 to 40	0.50 to 0.55	02.0	113
	SL22 & SL23	G	Plastic SMD	DO-214AA (SMB)	20 to 30	0.395/0.44	1.0/2.0	116
	SS22 thru SS26	G	Plastic SMD	DO-214AA (SMB)	20 to 60	0.50 to 0.70	2.0	119
	SS22S, SS23S & SS24S	G	Plastic SMD	DO-214AC (SMA)	20 to 40	0.55	2.0	122
	SS25S & SS26S	G	Plastic SMD	DO-214AC (SMA)	50 to 60	0.75	2.0	125
	SS2H9 & SS2H10	G	Plastic SMD	DO-214AA (SMB)	90 to 100	0.79	2.0	128
	SS2P2, SS2P3 & SS2P4	G	Plastic SMD	DO-220AA (SMP)	20 to 40	0.55	2.0	131
	SS2P2L & SS2P3L	G	Plastic SMD	DO-220AA (SMP)	20 to 30	0.50	2.0	134
	SS2P5 & SS2P6	G	Plastic SMD	DO-220AA (SMP)	50 to 60	0.70	2.0	137
	SS2PH9 & SS2PH10	G	Plastic SMD	DO-220AA (SMP)	90 to 100	0.80	2.0	140
	SSA23L & SSA24	G	Plastic SMD	DO-214AC (SMA)	30 to 40	0.45 to 0.49	2.0	143
3.0	**B330LA & B340A**	G	Plastic SMD	DO-214AC (SMA)	30 to 40	0.50 to 0.55	3.0	146
	B340LB	G	Plastic SMD	DO-214AA (SMB)	40	0.45	3.0	149
	B350A & B360A	G	Plastic SMD	DO-214AC (SMA)	50 to 60	0.72	3.0	152
	1N5820 thru 1N5822	G	Plastic Axial	DO-201AD	20 to 40	0.475 to 0.525	3.0	155
	SB320 thru SB360	G	Plastic Axial	DO-201AD	20 to 60	0.49 to 0.68	3.0	158
	SB320A thru SB360A	G	Plastic Axial	DO-201AD	20 to 60	0.50 to 0.70	3.0	161
	SB320S thru SB360S	G	Plastic Axial	DO-204AC (DO-15)	20 to 60	0.50 to 0.70	3.0	164
	SB3H90 & SB3H100	G	Plastic Axial	DO-201AD	90 to 100	0.80	3.0	167
	SS32 thru SS36	G	Plastic SMD	DO-214AB (SMC)	20 to 60	0.50 to 0.75	3.0	170
	SS3H9 & SS3H10	G	Plastic SMD	DO-214AB (SMC)	90 to 100	0.80	3.0	173
	SS3P3	G	Plastic SMD	DO-220AA (SMP)	30	0.58	3.0	176
	SS3P4	G	Plastic SMD	DO-220AA (SMP)	40	0.60	3.0	179
	SS3P5 & SS3P6	G	Plastic SMD	DO-220AA (SMP)	50 to 60	0.78	3.0	182
	SSA33L & SSA34	G	Plastic SMD	DO-214AC (SMA)	30 to 40	0.45 to 0.49	3.0	185
	SS3P3L & SS3P4L	G	Plastic SMD	TO-277A (SMPC)	30 to 40	0.47	3.0	188

SCHOTTKY RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (5)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY (3)	TYPE		(V)	(A)	
3.0 cont'd	**SS3P5L & SS3P6L**	G	Plastic SMD	TO-277A (SMPC)	50 to 60	0.60	3.0	192
	SS32S, SS33S & SS34S	G	Plastic SMD	DO-214AC (SMA)	20 to 40	0.65	3.0	196
4.0	SL42 & SL43	G	Plastic SMD	DO-214AB (SMC)	20 to 30	0.42/0.47	4.0/8.0	199
	SL44	G	Plastic SMD	DO-214AB (SMC)	40	0.44/0.50	4.0/8.0	199
	SSB43L & SSB44	G	Plastic SMD	DO-214AA (SMB)	30 to 40	0.45 to 0.49	4.0	202
5.0	SB520 thru SB560	G	Plastic Axial	DO-201AD	20 to 60	0.48 to 0.65	5.0	205
	SB520A thru SB560A	G	Plastic Axial	DO-201AD	20 to 60	0.50 to 0.70	5.0	208
	SB5H90 & SB5H100	G	Plastic Axial	DO-201AD	90 to 100	0.80	5.0	211
	SSC53L & SSC54	G	Plastic SMD	DO-214AB (SMC)	30 to 40	0.45 to 0.49	5.0	214
	SS5P3 & SS5P4	G	Plastic SMD	TO-277A (SMPC)	50 to 60	0.52	5.0	217
	SS5P5 & SS5P6	G	Plastic SMD	TO-277A (SMPC)	50 to 60	0.69	5.0	221
	SS5P9 & SS5P10	G	Plastic SMD	TO-277A (SMPC)	90 to 100	0.88	5.0	225
7.5	MBR735 thru MBR760	G	Plastic PowerPAK	TO-220AC	35 to 60	0.84/0.75 (4)	15/7.5	229
	MBRB735 thru MBRB760	G	PowerPAK SMD	TO-263AB (D^2PAK)	35 to 60	0.84/0.75 (4)	15/7.5	229
	MBRF735 thru MBRF760	G	Isolated PowerPAK	ITO-220AC	35 to 60	0.84/0.75 (4)	15/7.5	229
	MBR7H35 thru MBR7H60	G	Plastic PowerPAK	TO-220AC	35 to 60	0.63/0.73 (4)	7.5	233
	MBRB7H35 thru MBRB7H60	G	PowerPAK SMD	TO-263AB (D^2PAK)	35 to 60	0.63/0.73 (4)	7.5	233
	MBRF7H35 thru MBRF7H60	G	Isolated PowerPAK	ITO-220AC	35 to 60	0.63/0.73 (4)	7.5	233
8.0	**SS8P2L & SS8P3L**	G	Plastic SMD	TO-277A (SMPC)	20 to 30	0.57	8.0	237
	SS8PH9 & SS8PH10	G	Plastic SMD	TO-277A (SMPC)	90 to 100	0.90	8.0	241
	SS8P2CL & SS8P3CL	G	Plastic SMD (2)	TO-277A (SMPC)	20 to 30	0.54	4.0	245
	SS8P3C & SS8P4C	G	Plastic SMD (2)	TO-277A (SMPC)	30 to 40	0.58	4.0	249
	SS8P5C & SS8P6C	G	Plastic SMD (2)	TO-277A (SMPC)	50 to 60	0.70	4.0	253
10	MBR1035 thru MBR1060	G	Plastic PowerPAK	TO-220AC	35 to 60	0.84/0.80 (4)	20/10.0	257
	MBRB1035 thru MBRB1060	G	PowerPAK SMD	TO-263AB (D^2PAK)	35 to 60	0.84/0.80 (4)	20/10.0	257
	MBRF1035 thru MBRF1060	G	Isolated PowerPAK	ITO-220AC	35 to 60	0.84/0.80 (4)	20/10.0	257
	MBR10H35 thru MBR10H60	G	Plastic PowerPAK	TO-220AC	35 to 60	0.63/0.71 (4)	10	261
	MBRB10H35 thru MBRB10H60	G	PowerPAK SMD	TO-263AB (D^2PAK)	35 to 60	0.63/0.71 (4)	10	261
	MBRF10H35 thru MBRF10H60	G	Isolated PowerPAK	ITO-220AC	35 to 60	0.63/0.71 (4)	10	261
	MBR1090CT & MBR10100CT	G	Plastic PowerPAK (2)	TO-220AB	90 to 100	0.85	5.0	265
	MBRF1090CT & MBRF10100CT	G	Isolated PowerPAK (2)	ITO-220AB	90 to 100	0.85	5.0	268
	MBR10H90 & MBR10H100	G	Plastic PowerPAK	TO-220AC	90 to 100	0.77	10	271
	MBRB10H90 & MBR10H100	G	PowerPAK SMD	TO-263AB (D^2PAK)	90 to 100	0.77	10	271
	MBRF10H90 & MBR10H100	G	Isolated PowerPAK	ITO-220AC	90 to 100	0.77	10	271
	MBR10H90CT & MBR10H100CT	G	Plastic PowerPAK (2)	TO-220AB	90 to 100	0.76	5.0	275
	MBRB10H90CT & MBRB10H100CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	90 to 100	0.76	5.0	275
	MBRF10H90CT & MBRF10H100CT	G	Isolated PowerPAK (2)	ITO-220AB	90 to 100	0.76	5.0	275
	MBR10H150CT	G	Plastic PowerPAK (2)	TO-220AB	150	0.88	5.0	279
	SB10H150CT-1	G	Plastic PowerPAK (2)	TO-262AA	150	0.88	5.0	279
	MBRF10H150CT	G	Isolated PowerPAK (2)	ITO-220AB	150	0.88	5.0	279
	SBL1030 & SBL1040	G	Plastic PowerPAK	TO-220AC	30 to 40	0.60	10	283
	SBLB1030 & SBLB1040	G	PowerPAK SMD	TO-263AB (D^2PAK)	30 to 40	0.60	10	283
	SBLF1030 & SBLF1040	G	Isolated PowerPAK	ITO-220AC	30 to 40	0.60	10	283
	SBL1030CT & SBL1040CT	G	Plastic PowerPAK (2)	TO-220AB	30 to 40	0.55	5.0	287
	SBLB1030CT & SBLB1040CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	30 to 40	0.55	5.0	287
	SBLF1030CT & SBLF1040CT	G	Isolated PowerPAK (2)	ITO-220AB	30 to 40	0.55	5.0	287
	SBL10L25	G	Plastic PowerPAK	TO-220AC	25	0.46	10	291
	SBLB10L25	G	PowerPAK SMD	TO-263AB (D^2PAK)	25	0.46	10	291
	SBLF10L25	G	Isolated PowerPAK	ITO-220AC	25	0.46	10	291
	SBL10L30	G	Plastic PowerPAK	TO-220AC	30	0.52	10	295
	SBLB10L30	G	PowerPAK SMD	TO-263AB (D^2PAK)	30	0.52	10	295

SCHOTTKY RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (5)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY (3)	TYPE		(V)	(A)	
10 cont'd	SBLF10L30	G	Isolated PowerPAK	ITO-220AC	30	0.52	10	295
	SS10P2CL & SS10P3CL	G	Plastic SMD (2)	TO-277A (SMPC)	20 to 30	0.52	5.0	299
	SS10P3C & SS10P4C	G	Plastic SMD (2)	TO-277A (SMPC)	30 to 40	0.53	5.0	303
	SS10P3 & SS10P4	G	Plastic SMD	TO-277A (SMPC)	30 to 40	0.56	10	307
	SS10P5 & SS10P6	G	Plastic SMD	TO-277A (SMPC)	50 to 60	0.67	10	311
	SS10PH45	G	Plastic SMD	TO-277A (SMPC)	45	0.72	10	315
	SS10PH9 & SS10PH10	G	Plastic SMD	TO-277A (SMPC)	90 to 100	0.88	10	319
12	**SS12P2L & SS12P3L**	G	Plastic SMD	TO-277A (SMPC)	20 to 30	0.56	12	323
15	**SB15H45**	G	Plastic Axial	P600	45	0.64	15	327
	MBR1535CT thru MBR1560CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.84/0.75 (4)	15/7.5	330
	MBRB1535CT thru MBRB1560CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 60	0.84/0.75 (4)	15/7.5	330
	MBRF1535CT thru MBRF1560CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 60	0.84/0.75 (4)	15/7.5	330
	MBR15H35CT thru MBR15H60CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.63/0.73 (4)	7.5	334
	MBRB15H35CT thru MBRB15H60CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 60	0.63/0.73 (4)	7.5	334
	MBRF15H35CT thru MBRF15H60CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 60	0.63/0.73 (4)	7.5	334
16	MBR1635 thru MBR1660	G	Plastic PowerPAK	TO-220AC	35 to 60	0.63/0.75 (4)	16	338
	MBRB1635 thru MBRB1660	G	PowerPAK SMD	TO-263AB (D^2PAK)	35 to 60	0.63/0.75 (4)	16	338
	MBRF1635 thru MBRF1660	G	Isolated PowerPAK	ITO-220AC	35 to 60	0.63/0.75 (4)	16	338
	MBR16H35 thru MBR16H60	G	Plastic PowerPAK	TO-220AC	35 to 60	0.66/0.73 (4)	16	342
	MBRB16H35 thru MBRB16H60	G	PowerPAK SMD	TO-263AB (D^2PAK)	35 to 60	0.66/0.73 (4)	16	342
	MBRF16H35 thruMBRF16H60	G	Isolated PowerPAK	ITO-220AC	35 to 60	0.66/0.73 (4)	16	342
	SBL1630CT & SBL1640CT	G	Plastic PowerPAK (2)	TO-220AB	30 to 40	0.55	8.0	346
	SBLB1630CT & SBLB1640CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	30 to 40	0.55	8.0	346
	SBLF1630CT & SBLF1640CT	G	Isolated PowerPAK (2)	ITO-220AB	30 to 40	0.55	8.0	346
20	MBR2035CT thru MBR2060CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.84/0.80 (4)	20/10	350
	MBRB2035CT thru MBRB2060CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 60	0.84/0.80 (4)	20/10	350
	MBRF2035CT thru MBRF2060CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 60	0.84/0.80 (4)	20/10	350
	MBR20H35CT thru MBR20H60CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.63/0.71 (4)	10	354
	MBRB20H35CT thru MBRB20H60CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 60	0.63/0.71 (4)	10	354
	MBRF20H35CT thru MBRF20H60CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 60	0.63/0.71 (4)	10	354
	MBR20H90CT & MBR20H100CT	G	Plastic PowerPAK (2)	TO-220AB	90 to 100	0.77	10	358
	MBRB20H90CT & MBRB20H100CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	90 to 100	0.77	10	358
	MBRF20H90CT & MBRF20H100CT	G	Isolated PowerPAK (2)	ITO-220AB	90 to 100	0.77	10	358
	MBR20H90CTG & MBR20H100CTG	G	Plastic PowerPAK (2)	TO-220AB	90 to 100	0.85	10	362
	MBR20H150CT	G	Plastic PowerPAK (2)	TO-220AB	150	0.90	10	365
	SB20H150CT-1	G	Plastic PowerPAK (2)	TO-262AA	150	0.90	10	365
	MBRF20H150CT	G	Isolated PowerPAK (2)	ITO-220AB	150	0.90	10	365
	MBR20H200CT	G	Plastic PowerPAK (2)	TO-220AB	200	0.88	10	369
	SB20H200CT-1	G	PowerPAK SMD (2)	TO-262AA	200	0.88	10	369
	MBRF20H200CT	G	Isolated PowerPAK (2)	ITO-220AB	200	0.88	10	369
	M2035S & M2045S	G	Plastic PowerPAK	TO-220AB	35 to 45	0.70	20	373
	MI2050C & MI2060C	G	Plastic PowerPAK (2)	TO-262AA	50 to 60	0.74	10	376
	SBL2030CT & SBL2040CT	G	Plastic PowerPAK (2)	TO-220AB	30 to 40	0.60	10	379
	SBLB2030CT & SBL2040CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	30 to 40	0.60	10	379
	SBLF2030CT & SBL2040CT	G	Isolated PowerPAK (2)	ITO-220AB	30 to 40	0.60	10	379
	SBL2030PT & SBL2040PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	30 to 40	0.60	10	383
25	SBL25L20CT & SBL25L30CT	G	Plastic PowerPAK (2)	TO-220AB	20 to 30	0.49	12.5	386
	SBLB25L20CT & SBLB25L30CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	20 to 30	0.49	12.5	386
	SBLF25L20CT & SBLF25L30CT	G	Isolated PowerPAK (2)	ITO-220AB	20 to 30	0.49	12.5	386
30	MBR2535CT thru MBR2560CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.82/0.75 (4)	30/15	390
	MBRB2535CT thru MBRB2560CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 60	0.82/0.75 (4)	30/15	390

SCHOTTKY RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (5)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY (3)	TYPE		(V)	(A)	
30 cont'd	MBRF2535CT thru MBRF2560CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 60	0.82/0.75 (4)	30/15	390
	MBR25H35CT thru MBR25H60CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.64/0.70 (4)	15	394
	MBRB25H35CT thru MBRB25H60CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 60	0.64/0.70 (4)	15	394
	MBRF25H35CT thru MBRF25H60CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 60	0.64/0.70 (4)	15	394
	MBR3035CT & MBR3045CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 45	0.76	30	398
	MBRB3035CT & MBRB3045CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 45	0.76	30	398
	MBRF3035CT & MBRF3045CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 45	0.76	30	398
	MBR30H35CT thru MBR30H60CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.62/0.68 (4)	15	402
	MBRB30H35CT thru MBRB30H60CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	35 to 60	0.62/0.68 (4)	15	402
	MBRF30H35CT thru MBRF30H60CT	G	Isolated PowerPAK (2)	ITO-220AB	35 to 60	0.62/0.68 (4)	15	402
	MBR3035PT thru MBR3060PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	35 to 60	0.76/0.75 (4)	30/20	406
	MBR30H35PT thru MBR30H60PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	35 to 60	0.66/0.74 (4)	20	409
	MBR30H90CT & MBR30H100CT	G	Plastic PowerPAK (2)	TO-220AB	90 to 100	0.82	15	412
	MBRF30H90CT & MBRF30H100CT	G	Isolated PowerPAK (2)	ITO-220AB	90 to 100	0.82	15	412
	MBRB30H90CT & MBRB30H100CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	90 to 100	0.82	15	412
	MBR30H90PT & MBR30H100PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	90 to 100	0.82	15	416
	MBR30H150CT	G	Plastic PowerPAK (2)	TO-220AB	150	0.90	15	419
	SB30H150CT-1	G	Plastic PowerPAK (2)	TO-262AA	150	0.90	15	419
	MBRF30H150CT	G	Isolated PowerPAK (2)	ITO-220AB	150	0.90	15	419
	M3035S & M3045S	G	Plastic PowerPAK	TO-220AB	35 to 45	0.70	30	423
	MI3035S & MI3045S	G	Plastic PowerPAK	TO-262AA	35 to 45	0.70	30	423
	M3060C	G	Plastic PowerPAK (2)	TO-220AB	60	0.72	15	426
	MI3060C	G	Plastic PowerPAK (2)	TO-262AA	60	0.72	15	426
	MF3060C	G	Isolated PowerPAK (2)	ITO-220AB	60	0.72	15	426
	M30L40C	G	Plastic PowerPAK (2)	TO-220AB	40	0.55	15	430
	M30L45C	G	Plastic PowerPAK (2)	TO-220AB	45	0.60	15	433
	SBL3030PT & SBL3040PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	30 to 40	0.55	15	436
	SD241P	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	45	0.47/0.60	10/20 (125 °C)	439
40	MBR4035PT thru MBR4060PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	35 to 60	0.70/0.72 (4)	20	442
	MBR40H35CT thru MBR40H60CT	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.64/0.68 (4)	20	445
	MBR40H35PT thru MBR40H60PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	35 to 60	0.63/0.69 (4)	20	448
	SBL4030PT & SBL4040PT	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	30 to 40	0.58	20	451
60	**MBR60100CT**	G	Plastic PowerPAK (2)	TO-220AB	100	0.82/1.00	30/60	454
	M6035C thru M6060C	G	Plastic PowerPAK (2)	TO-220AB	35 to 60	0.61/0.65 (4)	30	457
	M6035P thru M6060P	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	35 to 60	0.60/0.64 (4)	30	460

Notes:

(1) **Bold text = new products**

(2) Dual center-tapped device (V_F limit at I_F is per diode)

(3) All Schottky die are planar with oxide passivation

(4) 35 V to 45 V product/50 V to 60 V product

(5) Source: G = formerly General Semiconductor

TMBS® (TRENCH MOS BARRIER SCHOTTKY) RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (3)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
8	V8P10	G	Plastic SMD	TO-277A (SMPC)	100	0.68	8	468
10	V10P10	G	Plastic SMD	TO-277A (SMPC)	100	0.68	10	472
	MBR1090 & MBR10100	G	Plastic PowerPAK	TO-220AC	90 to 100	0.80	10	476
	MBRF1090 & MBRF10100	G	Isolated PowerPAK	ITO-220AC	90 to 100	0.80	10	476
	MBRB1090 & MBRB10100	G	PowerPAK SMD	TO-263AB (D^2PAK)	90 to 100	0.80	10	476
	V10150C	G	Plastic PowerPAK (2)	TO-220AB	150	1.41	5	480
	VF10150C	G	Isolated PowerPAK (2)	ITO-220AB	150	1.41	5	480
	VB10150C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	150	1.41	5	480
	VI10150C	G	Plastic PowerPAK (2)	TO-262AA	150	1.41	5	480
	V10150S	G	Plastic PowerPAK	TO-220AB	150	1.20	10	484
	VF10150S	G	Isolated PowerPAK	ITO-220AB	150	1.20	10	484
	VB10150S	G	PowerPAK SMD	TO-263AB (D^2PAK)	150	1.20	10	484
	VI10150S	G	Plastic PowerPAK	TO-262AA	150	1.20	10	484
12	V12P10	G	Plastic SMD	TO-277A (SMPC)	100	0.70	12	488
	V12P12	G	Plastic SMD	TO-277A (SMPC)	120	0.80	12	492
20	MBR2090CT & MBR20100CT	G	Plastic PowerPAK (2)	TO-220AB	100	0.80	10	496
	MBRF2090CT & MBRF20100CT	G	Isolated PowerPAK (2)	ITO-220AB	100	0.80	10	496
	MBRB2090CT & MBRB20100CT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	100	0.80	10	496
	V20100C	G	Plastic PowerPAK (2)	TO-220AB	100	0.79	10	500
	VF20100C	G	Isolated PowerPAK (2)	ITO-220AB	100	0.79	10	500
	VB20100C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	100	0.79	10	500
	VI20100C	G	Plastic PowerPAK (2)	TO-262AA	100	0.79	10	500
	V20100R	G	Plastic PowerPAK (2)	TO-220AB	100	0.90	10	504
	VF20100R	G	Isolated PowerPAK (2)	ITO-220AB	100	0.90	10	504
	V20100S	G	Plastic PowerPAK	TO-220AB	100	0.90	20	508
	VB20100S	G	PowerPAK SMD	TO-263AB (D^2PAK)	100	0.90	20	508
	VF20100S	G	Isolated PowerPAK	ITO-220AB	100	0.90	20	508
	VI20100S	G	Plastic PowerPAK	TO-262AA	100	0.90	20	508
	V20100SG	G	Plastic PowerPAK	TO-220AB	100	1.07	20	512
	VF20100SG	G	Isolated PowerPAK	ITO-220AB	100	1.07	20	512
	VI20100SG	G	Plastic PowerPAK	TO-262AA	100	1.07	20	512
	V20120C	G	Plastic PowerPAK (2)	TO-220AB	120	0.90	10	516
	VF20120C	G	Isolated PowerPAK (2)	ITO-220AB	120	0.90	10	516
	VB20120C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	120	0.90	10	516
	VI20120C	G	Plastic PowerPAK (2)	TO-262AA	120	0.90	10	516
	V20120S	G	Plastic PowerPAK	TO-220AB	120	1.12	20	520
	VF20120S	G	Isolated PowerPAK	ITO-220AB	120	1.12	20	520
	VB20120S	G	PowerPAK SMD	TO-263AB (D^2PAK)	120	1.12	20	520
	VI20120S	G	Plastic PowerPAK	TO-262AA	120	1.12	20	520
	V20120SG	G	Plastic PowerPAK	TO-220AB	120	1.33	20	524
	VF20120SG	G	Isolated PowerPAK	ITO-220AB	120	1.33	20	524
	VB20120SG	G	PowerPAK SMD	TO-263AB (D^2PAK)	120	1.33	20	524
	VI20120SG	G	Plastic PowerPAK	TO-262AA	120	1.33	20	524
	V20150C	G	Plastic PowerPAK (2)	TO-220AB	150	1.20	10	528
	VF20150C	G	Isolated PowerPAK (2)	ITO-220AB	150	1.20	10	528
	VB20150C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	150	1.20	10	528
	VI20150C	G	Plastic PowerPAK (2)	TO-262AA	150	1.20	10	528
	V20150S	G	Plastic PowerPAK	TO-220AB	150	1.43	20	532
	VF20150S	G	Isolated PowerPAK	ITO-220AB	150	1.43	20	532
	VB20150S	G	PowerPAK SMD	TO-263AB (D^2PAK)	150	1.43	20	532
	VI20150S	G	Plastic PowerPAK	TO-262AA	150	1.43	20	532

TMBS® (TRENCH MOS BARRIER SCHOTTKY) RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (3)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
20 cont'd	V20150SG	G	Plastic PowerPAK	TO-220AB	150	1.60	20	536
	VF20150SG	G	Isolated PowerPAK	ITO-220AB	150	1.60	20	536
	VB20150SG	G	PowerPAK SMD	TO-263AB (D^2PAK)	150	1.60	20	536
	VI20150SG	G	Plastic PowerPAK	TO-262AA	150	1.60	20	536
	V20200C	G	Plastic PowerPAK (2)	TO-220AB	200	1.60	10	540
	VF20200C	G	Isolated PowerPAK (2)	ITO-220AB	200	1.60	10	540
	VB20200C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	200	1.60	10	540
	VI20200C	G	Plastic PowerPAK (2)	TO-262AA	200	1.60	10	540
30	V30100C	G	Plastic PowerPAK (2)	TO-220AB	100	0.80	15	544
	VF30100C	G	Isolated PowerPAK (2)	ITO-220AB	100	0.80	15	544
	VB30100C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	100	0.80	15	544
	VI30100C	G	Plastic PowerPAK (2)	TO-262AA	100	0.80	15	544
	V30100S	G	Plastic PowerPAK	TO-220AB	100	0.91	30	548
	VF30100S	G	Isolated PowerPAK	ITO-220AB	100	0.91	30	548
	VB30100S	G	PowerPAK SMD	TO-263AB (D^2PAK)	100	0.91	30	548
	VI30100S	G	Plastic PowerPAK	TO-262AA	100	0.91	30	548
	V30100SG	G	Plastic PowerPAK	TO-220AB	100	1.00	30	552
	VF30100SG	G	Isolated PowerPAK	ITO-220AB	100	1.00	30	552
	VB30100SG	G	PowerPAK SMD	TO-263AB (D^2PAK)	100	1.00	30	552
	VI30100SG	G	Plastic PowerPAK	TO-262AA	100	1.00	30	552
	V30120C	G	Plastic PowerPAK (2)	TO-220AB	120	0.97	15	556
	VF30120C	G	Isolated PowerPAK (2)	ITO-220AB	120	0.97	15	556
	VB30120C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	120	0.97	15	556
	VI30120C	G	Plastic PowerPAK (2)	TO-262AA	120	0.97	15	556
	V30120S	G	Plastic PowerPAK	TO-220AB	120	1.10	30	560
	VF30120S	G	Isolated PowerPAK	ITO-220AB	120	1.10	30	560
	VB30120S	G	PowerPAK SMD	TO-263AB (D^2PAK)	120	1.10	30	560
	VI30120S	G	Plastic PowerPAK	TO-262AA	120	1.10	30	560
	V30120SG	G	Plastic PowerPAK	TO-220AB	120	1.28	30	564
	VF30120SG	G	Isolated PowerPAK	ITO-220AB	120	1.28	30	564
	VB30120SG	G	PowerPAK SMD	TO-263AB (D^2PAK)	120	1.28	30	564
	VI30120SG	G	Plastic PowerPAK	TO-262AA	120	1.28	30	564
	V30150C	G	Plastic PowerPAK (2)	TO-220AB	150	1.36	15	568
	VF30150C	G	Isolated PowerPAK (2)	ITO-220AB	150	1.36	15	568
	VB30150C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	150	1.36	15	568
	VI30150C	G	Plastic PowerPAK (2)	TO-262AA	150	1.36	15	568
	V30200C	G	Plastic PowerPAK (2)	TO-220AB	200	1.10	15	572
	VB30200C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	200	1.10	15	572
	VI30200C	G	Plastic PowerPAK (2)	TO-262AA	200	1.10	15	572
	V30100P	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	100	0.85	15	576
40	V40100C	G	Plastic PowerPAK (2)	TO-220AB	100	0.73	20	579
	VF40100C	G	Isolated PowerPAK (2)	ITO-220AB	100	0.73	20	579
	VB40100C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	100	0.73	20	579
	VI40100C	G	Plastic PowerPAK (2)	TO-262AA	100	0.73	20	579
	V40100G	G	Plastic PowerPAK (2)	TO-220AB	100	0.81	20	583
	VF40100G	G	Isolated PowerPAK (2)	ITO-220AB	100	0.81	20	583
	VB40100G	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	100	0.81	20	583
	VI40100G	G	Plastic PowerPAK (2)	TO-262AA	100	0.81	20	583
	V40120C	G	Plastic PowerPAK (2)	TO-220AB	120	0.88	20	587
	VF40120C	G	Isolated PowerPAK (2)	ITO-220AB	120	0.88	20	587
	VB40120C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	120	0.88	20	587

TMBS® (TRENCH MOS BARRIER SCHOTTKY) RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (3)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
40 cont'd	**VI40120C**	G	Plastic PowerPAK (2)	TO-262AA	120	0.88	20	587
	V40150C	G	Plastic PowerPAK (2)	TO-220AB	150	1.43	20	591
	VF40150C	G	Isolated PowerPAK (2)	ITO-220AB	150	1.43	20	591
	VB40150C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	150	1.43	20	591
	VI40150C	G	Plastic PowerPAK (2)	TO-262AA	150	1.43	20	591
	V40100P	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	100	0.73	20	595
	V40100PG	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	100	0.81	20	598
50	**V50100P**	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	100	0.78	25	602
60	**V60100C**	G	Plastic PowerPAK (2)	TO-220AB	100	0.79	30	605
	VB60100C	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	100	0.79	30	605
	V60120C	G	Plastic PowerPAK (2)	TO-220AB	120	0.95	30	609
	V60100P	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	100	0.79	30	613
	V60200PG	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	200	1.48	30	617
80	**V80100P**	G	Plastic PowerPAK (2)	TO-247AD (TO-3P)	100	0.78	40	620

Notes:

(1) **Bold text = new products**

(2) Dual center-tapped device (V_F limit at I_F is per diode)

(3) Source: G = formerly General Semiconductor

ULTRAFAST RECOVERY RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (5)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		t_{rr} (ns)	PAGE
			FAMILY	TYPE		(V)	(A)		
0.5	BYM07-50 thru BYM07-400	G	SUPERECTIFIER® SMD	DO-213AA (MiniMELF)	50 to 400	1.25/1.35	0.5	50	628
	EGL34A thru EGL34G	G	SUPERECTIFIER® SMD	DO-213AA (MiniMELF)	50 to 400	1.25/1.35	0.5	50	628
0.6	UG06A thru UG06D	G	Plastic Axial (2)	MPG06	50 to 200	0.95	0.6	15	631
1.0	BYM12-50 thru BYM12-400	G	SUPERECTIFIER® SMD	DO-213AB (MELF)	50 to 400	1.00/1.25	1.0	50	634
	EGL41A thru EGL41G	G	SUPERECTIFIER® SMD	DO-213AB (MELF)	50 to 400	1.00/1.25	1.0	50	634
	BYV26DGP & BYV26EGP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	800 to 1000	2.50	1.0	75	637
	EGF1A thru EGF1D	G	SUPERECTIFIER® SMD	DO-214BA (GF1)	50 to 200	1.00	1.0	50	641
	EGF1T	G	SUPERECTIFIER® SMD	DO-214BA (GF1)	1300	3.00	1.0	75	644
	EGP10A thru EGP10G	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	50 to 400	0.95/1.25	1.0	50	647
	ES1A thru ES1D	G	Plastic SMD (2)	DO-214AC (SMA)	50 to 200	0.92	1.0	15	650
	ES1PB, ES1PC & ES1PD	G	Plastic SMD (2)	DO-220AA (SMP)	50 to 200	0.865/0.92	0.6/1.0	15	653
	ESH1B, ESH1C & ESH1D	G	Plastic SMD (2)	DO-214AC (SMA)	100 to 200	0.87/0.90	0.7/1.0	25	656
	FGP10B thru FGP10D	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	100 to 200	0.95	1.0	35	659
	ESH1PB, ESH1PC & ESH1PD	G	Plastic SMD (2)	DO-220AA (SMP)	100 to 200	0.86/0.90	0.7/1.0	25	662
	MUR120	G	Plastic Axial (2)	DO-204AC (DO-15)	200	0.88	1.0	25	665
	MUR140 & MUR160	G	Plastic Axial (2)	DO-204AC (DO-15)	400 to 600	1.25	1.0	50	668
	MURS120	G	Plastic SMD (2)	DO-214AA (SMB)	200	0.88	1.0	25	671
	MURS140 & MURS160	G	Plastic SMD (2)	DO-214AA (SMB)	400 to 600	1.25	1.0	50	674
	SBYV26C	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	600	2.50	1.0	30	677
	U1B, U1C & U1D	G	Plastic SMD (4)	DO-214AC (SMA)	100 to 200	0.92	1.0	15	681
	UF4001 thru UF4007	G	Plastic Axial (2)	DO-204AL (DO-41)	50 to 1000	1.00/1.70	1.0	50/75	684
	UG1A thru UG1D	G	Plastic Axial (2)	DO-204AL (DO-41)	50 to 200	0.95	1.0	15	688
	US1A thru US1M	G	Plastic SMD (2)	DO-214AC (SMA)	50 to 1000	1.00/1.70	1.0	50/75	691
1.5	BYG20D thru BYG20J	G	Plastic SMD (2)	DO-214AC (SMA)	200 to 600	1.30	1.0	75	695
	BYG23M	G	Plastic SMD (2)	DO-214AC (SMA)	1000	1.70	1.0	75	699
	SUF15G & SUF15J	G	Plastic Axial (2)	GP20	400 & 600	1.80	1.5	35	702
2.0	BYG22A thru BYG22D	G	Plastic SMD (2)	DO-214AC (SMA)	50 to 200	1.10	2.0	25	705
	EGP20A thru EGP20G	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	50 to 400	0.95/1.25	2.0	50	709
	ES2A thru ES2D	G	Plastic SMD (2)	DO-214AA (SMB)	50 to 200	0.90	2.0	20	713
	ES2F & ES2G	G	Plastic SMD (2)	DO-214AA (SMB)	300 to 400	1.10	2.0	35	716
	ESH2B, ESH2C & ESH2D	G	Plastic SMD (2)	DO-214AA (SMB)	100 to 200	0.93	2.0	25	719
	ESH2PB, ESH2PC & ESH2PD	G	Plastic SMD (2)	DO-220AA (SMP)	100 to 200	0.98	2.0	25	722
	MURS240 & MURS260	G	Plastic SMD (2)	DO-214AA (SMB)	400 to 600	1.45	2.0	50	725
	USB260	G	Plastic SMD (2)	DO-214AA (SMB)	600	1.60	2.0	30	728
	FGP20B thru FGP20D	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	100 to 200	0.95	2.0	35	732
	SBYV27-50 thru SBYV27-200	G	Plastic Axial (2)	DO-204AC (DO-15)	50 to 200	1.07	3.0	15	735
	UG2A thru UG2D	G	Plastic Axial (2)	DO-204AC (DO-15)	50 to 200	0.95	2.0	15	738
	UG2F & UG2G	G	Plastic Axial (2)	DO-204AC (DO-15)	300 to 400	1.10	2.0	35	741
3.0	31GF4	G	Plastic Axial (2)	DO-201AD	400	1.25	3.0	30	744
	31GF6	G	Plastic Axial (2)	DO-201AD	600	1.60	3.0	30	747
	EGP30A thru EGP30G	G	SUPERECTIFIER® Axial	GP20	50 to 400	0.95/1.25	3.0	50	750
	ES3A thru ES3D	G	Plastic SMD (2)	DO-214AB (SMC)	50 to 200	0.90	3.0	20	753
	ES3F & ES3G	G	Plastic SMD (2)	DO-214AB (SMC)	300 to 400	1.10	3.0	35	756
	ESH3B, ESH3C & ESH3D	G	Plastic SMD (2)	DO-214AB (SMC)	100 to 200	0.90	3.0	25	760
	FGP30B thru FGP30D	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	100 to 200	0.95	3.0	35	763
	MURS320	G	Plastic SMD (2)	DO-214AB (SMC)	200	0.88	3.0	25	766
	MURS340 & MURS360	G	Plastic SMD (2)	DO-214AB (SMC)	400 & 600	1.25/1.28	3.0/4.0	50	769
	SUF30G & SUF30J	G	Plastic Axial (2)	P600	400 & 600	1.80/2.00	3.0	35	772
	UF5400 thru UF5408	G	Plastic Axial (2)	DO-201AD	50 to 1000	1.00/1.70	3.0	50/75	775
3.5	SBYV28-50 thru SBYV28-200	G	Plastic Axial (2)	DO-201AD	50 to 200	1.10	3.5	20	778
4.0	MUR420	G	Plastic Axial (2)	DO-201AD	200	0.89	4.0	25	781

ULTRAFAST RECOVERY RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (5)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		t_{rr} (ns)	PAGE
			FAMILY	TYPE		(V)	(A)		
4.0 cont'd	MUR440 & MUR460	G	Plastic Axial (2)	DO-201AD	400 to 600	1.28	4.0	50	784
	UH4PBC, UH4PCC & UH4PDC	G	Plastic SMD (3)(4)	TO-277A (SMPC)	100 to 200	1.05	2.0	25	787
	UG4A thru UG4D	G	Plastic Axial (2)	DO-201AD	50 to 200	0.95	4.0	20	791
5.0	EGP50A thru EGP50G	G	SUPERECTIFIER® Axial	GP20	50 to 400	0.95/1.25	5.0	50	794
	FGP50B thru FGP50D	G	SUPERECTIFIER® Axial	GP20	100 to 200	0.95	5.0	35	797
	GUR5H60	G	Plastic PowerPAK (2)	TO-220AC	600	1.80	5.0	30	800
	GURB5H60	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	600	1.80	5.0	30	800
	GURF5H60	G	Isolated PowerPAK (2)	ITO-220AC	600	1.80	5.0	30	800
	UG5HT & UG5JT	G	Plastic PowerPAK (2)	TO-220AC	500 to 600	1.75	5.0	25	804
	UGB5HT & UGB5JT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	500 to 600	1.75	5.0	25	804
	UGF5HT & UGF5JT	G	Isolated PowerPAK (2)	ITO-220AC	500 to 600	1.75	5.0	25	804
	UH5JT	G	Plastic PowerPAK (4)	TO-220AC	600	3.00	5.0	25	808
	UHF5JT	G	Plastic PowerPAK (4)	ITO-220AC	600	3.00	5.0	25	808
6.0	FEP6AT thru FEP6DT	G	Plastic PowerPAK (2)(3)	TO-220AB	50 to 200	0.98	3.0	35	811
	FEPB6AT thru FEPB6DT	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	50 to 200	0.98	3.0	35	811
	FEPF6AT thru FEPF6DT	G	Isolated PowerPAK (2)(3)	ITO-220AB	50 to 200	0.98	3.0	35	811
	UH6PJ	G	Plastic SMD (4)	TO-277A (SMPC)	600	3.00	6.0	25	815
8.0	BYV29-300 & BYV29-400	G	Plastic PowerPAK (2)	TO-220AC	300 to 400	1.25	8.0	35	819
	BYV29B-300 & BYV29B-400	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	300 to 400	1.25	8.0	35	819
	BYV29F-300 & BYV29F-400	G	Isolated PowerPAK (2)	ITO-220AC	300 to 400	1.25	8.0	35	819
	BYW29-50 thru BYW29-200	G	Plastic PowerPAK (2)	TO-220AC	50 to 200	1.30	20	25	823
	BYWB29-50 thru BYWB29-200	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	50 to 200	1.30	20	25	823
	BYWF29-50 thru BYWF29-200	G	Isolated PowerPAK (2)	ITO-220AC	50 to 200	1.30	20	25	823
	FES8AT thru FES8JT	G	Plastic PowerPAK (2)	TO-220AC	50 to 600	0.95/1.30/1.50	8.0	35/50	827
	FESB8AT thru FESB8JT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	50 to 600	0.95/1.30/1.50	8.0	35/50	827
	FESF8AT thru FESF8JT	G	Isolated PowerPAK (2)	ITO-220AC	50 to 600	0.95/1.30/1.50	8.0	35/50	827
	U8BT thru U8DT	G	Plastic PowerPAK (4)	TO-220AC	100 to 200	1.02	8.0	20	831
	UF8BT thru UF8DT	G	Isolated PowerPAK (4)	ITO-220AC	100 to 200	1.02	8.0	20	831
	UB8BT thru UB8DT	G	PowerPAK SMD (4)	TO-263AB (D^2PAK)	100 to 200	1.02	8.0	20	831
	GI1401 thru GI1404	G	Plastic PowerPAK (2)	TO-220AC	50 to 200	0.98	8.0	35	835
	GIB1401 thru GIB1404	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	50 to 200	0.98	8.0	35	838
	UG8AT thru UG8DT	G	Plastic PowerPAK (2)	TO-220AC	50 to 200	1.00	8.0	20	841
	UGB8AT thru UGB8DT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	50 to 200	1.00	8.0	20	841
	UGF8AT thru UGF8DT	G	Isolated PowerPAK (2)	ITO-220AC	50 to 200	1.00	8.0	20	841
	UG8FT & UG8GT	G	Plastic PowerPAK (2)	TO-220AC	300 to 400	1.25	8.0	35	819
	UGB8FT & UGB8GT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	300 to 400	1.25	8.0	35	819
	UGF8FT & UGF8GT	G	Isolated PowerPAK (2)	ITO-220AC	300 to 400	1.25	8.0	35	819
	UG8HT & UG8JT	G	Plastic PowerPAK (2)	TO-220AC	500 to 600	1.75	8.0	25	845
	UGB8HT & UGB8JT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	500 to 600	1.75	8.0	25	845
	UGF8HT & UGF8JT	G	Isolated PowerPAK (2)	ITO-220AC	500 to 600	1.75	8.0	25	845
	UG8HCT & UG8JCT	G	Plastic PowerPAK (2)(3)	TO-220AB	500 to 600	1.75	4.0	25	849
	UGB8HCT & UGB8JCT	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	500 to 600	1.75	4.0	25	849
	UGF8HCT & UGF8JCT	G	Isolated PowerPAK (2)(3)	ITO-220AB	500 to 600	1.75	4.0	25	849
	UH8JT	G	Plastic PowerPAK (4)	TO-220AC	600	3.00	8.0	25	853
	UHF8JT	G	Isolated PowerPAK (4)	ITO-220AC	600	3.00	8.0	25	853
10	BYQ28E-100 thru BYQ28E-200	G	PowerPAK SMD (2)(3)	TO-220AB	100 to 200	1.10	5.0	20	857
	BYQ28EB-100 thru BYQ28EB-200	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	100 to 200	1.10	5.0	20	857
	BYQ28EF-100 thru BYQ28EF-200	G	Isolated PowerPAK (2)(3)	ITO-220AB	100 to 200	1.10	5.0	20	857
	BYT28-300 & BYT28-400	G	Plastic PowerPAK (2)(3)	TO-220AB	300 to 400	1.30	5.0	35	861
	BYT28B-300 & BYT28B-400	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	300 to 400	1.30	5.0	35	861
	BYT28F-300 & BYT28F-400	G	Isolated PowerPAK (2)(3)	ITO-220AB	300 to 400	1.30	5.0	35	861

ULTRAFAST RECOVERY RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (5)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		t_{rr} (ns)	PAGE
			FAMILY	TYPE		(V)	(A)		
10 cont'd	UG10BCT thru UG10DCT	G	Plastic PowerPAK (2)(3)	TO-220AB	100 to 200	1.10	5.0	20	857
	UGB10BCT thru UGB10DCT	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	100 to 200	1.10	5.0	20	857
	UGF10BCT thru UGF10DCT	G	Isolated PowerPAK (2)(3)	ITO-220AB	100 to 200	1.10	5.0	20	857
	UG10FCT & UG10GCT	G	Plastic PowerPAK (2)(3)	TO-220AB	300 to 400	1.30	5.0	35	861
	UGB10FCT & UGB10GCT	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	300 to 400	1.30	5.0	35	861
	UGF10FCT & UGF10GCT	G	Isolated PowerPAK (2)(3)	ITO-220AB	300 to 400	1.30	5.0	35	861
	UH10JT	G	Plastic PowerPAK (4)	TO-220AC	600	3.00	10	25	865
	UHF10JT	G	Isolated PowerPAK (4)	ITO-220AC	600	3.00	10	25	865
	UH10FT	G	Plastic PowerPAK (4)	TO-220AC	300	1.20	10	25	869
	UHB10FT	G	PowerPAK SMD (4)	TO-263AB (D^2PAK)	300	1.20	10	25	869
	U10BCT thru U10DCT	G	Plastic PowerPAK (3)(4)	TO-220AB	100 to 200	1.10	5.0	20	873
	UF10BCT thru UF10DCT	G	Isolated PowerPAK (3)(4)	ITO-220AB	100 to 200	1.10	5.0	20	873
	UB10BCT thru UB10DCT	G	PowerPAK SMD (3)(4)	TO-263AB (D^2PAK)	100 to 200	1.10	5.0	20	873
12	UG12HT & UG12JT	G	Plastic PowerPAK (2)	TO-220AC	500 to 600	1.75	12	30	877
	UGB12HT & UGB12JT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	500 to 600	1.75	12	30	877
	UGF12HT & UGF12JT	G	Isolated PowerPAK (2)	ITO-220AC	500 to 600	1.75	12	30	877
15	UG15HT & UG15JT	G	Plastic PowerPAK (2)	TO-220AC	500 to 600	1.75	15	35	881
	UGB15HT & UGB15JT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	500 to 600	1.75	15	35	881
	UGF15HT & UGF15JT	G	Isolated PowerPAK (2)	ITO-220AC	500 to 600	1.75	15	35	881
16	FEP16AT thru FEP16JT	G	Plastic PowerPAK (2)(3)	TO-220AB	50 to 600	0.95/1.30/1.50	8.0	35/50	885
	FEPB16AT thru FEPB16JT	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	50 to 600	0.95/1.30/1.50	8.0	35/50	885
	FEPF16AT thru FEPF16JT	G	Isolated PowerPAK (2)(3)	ITO-220AB	50 to 600	0.95/1.30/1.50	8.0	35/50	885
	FES16AT thru FES16JT	G	Plastic PowerPAK (2)	TO-220AC	50 to 600	0.98/1.30/1.50	16	35/50	889
	FESB16AT thru FESB16JT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	50 to 600	0.98/1.30/1.50	16	35/50	889
	FESF16AT thru FESF16JT	G	Isolated PowerPAK (2)	ITO-220AC	50 to 600	0.98/1.30/1.50	16	35/50	889
	GI2401 thru GI2404	G	Plastic PowerPAK (2)(3)	TO-220AB	50 to 200	0.98	8.0	35	893
	GIB2401 thru GIB2404	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	50 to 200	0.98	8.0	35	896
	U16BCT thru U16DCT	G	Plastic PowerPAK (3)(4)	TO-220AB	100 to 200	1.10	8.0	35	899
	UB16BCT thru UB16DCT	G	PowerPAK SMD (3)(4)	TO-263AB (D^2PAK)	100 to 200	1.10	8.0	35	899
18	BYV32-50 thru BYV32-200	G	Plastic PowerPAK (2)(3)	TO-220AB	50 to 200	1.15	20	25	903
	BYVB32-50 thru BYVB32-200	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	50 to 200	1.15	20	25	903
	BYVF32-50 thru BYVF32-200	G	Isolated PowerPAK (2)(3)	ITO-220AB	50 to 200	1.15	20	25	903
	UG18ACT thru UG18DCT	G	Plastic PowerPAK (2)(3)	TO-220AB	50 to 200	1.10	9.0	20	907
	UGB18ACT thru UGB18DCT	G	PowerPAK SMD (2)(3)	TO-263AB (D^2PAK)	50 to 200	1.10	9.0	20	907
	UGF18ACT thru UGF18DCT	G	Isolated PowerPAK (2)(3)	ITO-220AB	50 to 200	1.10	9.0	20	907
20	**U20BCT thru U20DCT**	G	Plastic PowerPAK (3)(4)	TO-220AB	100 to 200	1.00	10	35	911
	UB20BCT thru UB20DCT	G	PowerPAK SMD (3)(4)	TO-263AB (D^2PAK)	100 to 200	1.00	10	35	911
	UH20FCT	G	Plastic PowerPAK (3)(4)	TO-220AB	300	1.20	10	25	915
	UHB20FCT	G	PowerPAK SMD (3)(4)	TO-263AB (D^2PAK)	300	1.20	10	25	915
	UHF20FCT	G	Isolated PowerPAK (3)(4)	ITO-220AB	300	1.20	10	25	919
30	FEP30AP thru FEP30JP	G	Plastic PowerPAK (2)(3)	TO-247AD	50 to 600	0.95/1.30/1.50	15	35/50	922
	U30BCT thru U30DCT	G	Plastic PowerPAK (3)(4)	TO-220AB	100 to 200	1.05	15	25	925
	UB30BCT thru UB30DCT	G	PowerPAK SMD (3)(4)	TO-263AB (D^2PAK)	100 to 200	1.05	15	25	925
	UG30APT thru UG30DPT	G	Plastic PowerPAK (2)(3)	TO-247AD	50 to 200	1.00	15	25	929

Notes:

(1) **Bold text = new products**

(2) Glass passivated die

(3) Dual center-tapped device (V_F limit at I_F is per diode)

(4) Oxide planar die

(5) Source: G = formerly General Semiconductor

FAST RECOVERY RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (3)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		t_{rr} (ns)	PAGE
			FAMILY	TYPE		(V)	(A)		
0.5	GHR16	G	Plastic Axial	R-1 (Photoflash diode)	1600	1.50	0.5	300	936
	RGL34A thru RGL34K	G	SUPERECTIFIER® SMD	DO-213AA (MiniMELF)	50 to 600	1.30	0.5	150 to 250	939
	RGP02-12E thru RGP02-20E	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	1200 to 2000	1.80	0.1	300	942
1.0	1N4933 thru 1N4937	G	Plastic Axial	DO-204AL (DO-41)	50 to 600	1.20	1.0	200	945
	1N4933GP thru 1N4937GP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	50 to 600	1.20	1.0	200	948
	1N4942GP thru 1N4948GP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	200 to 1000	1.30	1.0	150 to 500	951
	1N5615GP thru 1N5623GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	200 to 1000	1.20	1.0	150 to 500	954
	BA157 thru BA159	G	Plastic Axial	DO-204AL (DO-41)	400 to 1000	1.30	1.0	150 to 500	957
	BA157GP thru BA159GP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	400 to 1000	1.30	1.0	150 to 500	960
	BYD33DGP thru BYD33MGP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	200 to 1000	1.30	1.0	150 to 300	963
	BYM11-50 thru BYM11-1000	G	SUPERECTIFIER® SMD	DO-213AB (MELF)	50 to 1000	1.30	1.0	150 to 500	966
	GI810 thru GI818	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	50 to 1000	1.20	1.0	750	970
	RGF1A thru RGF1M	G	SUPERECTIFIER® SMD	DO-214BA (GF1)	50 to 1000	1.30	1.0	150 to 500	973
	RGL41A thru RGL41M	G	SUPERECTIFIER® SMD	DO-213AB (MELF)	50 to 1000	1.30	1.0	150 to 500	966
	RGP10A thru RGP10M	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	50 to 1000	1.30	1.0	150 to 500	976
	RMPG06A thru RMPG06K	G	Plastic Axial (2)	MPG06	50 to 800	1.30	1.0	150 to 250	979
	RS1A thru RS1K	G	Plastic SMD (2)	DO-214AC (SMA)	50 to 800	1.30	1.0	150 to 500	982
	RS1PB thru RS1PJ	G	Plastic SMD (2)	DO-220AA (SMP)	100 to 600	1.30	1.0	150 to 250	985
	SRP100A thru SRP100K	G	Plastic Axial	DO-204AL (DO-41)	50 to 800	1.30	1.0	100 to 200	988
1.5	BYG21K & BYG21M	G	Plastic SMD (2)	DO-214AC (SMA)	800 to 1000	1.50/1.60	1.0/1.5	120	991
	BYG24D thru BYG24J	G	Plastic SMD (2)	DO-214AC (SMA)	200 to 600	1.15/1.25	1.0/1.5	140	995
	RGP15A thru RGP15M	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	50 to 1000	1.30	1.5	150 to 500	998
	RS2A thru RS2K	G	Plastic SMD (2)	DO-214AA (SMB)	50 to 800	1.30	1.5	150 to 500	1001
2.0	BY296P thru BY299P	G	Plastic Axial	DO-201AD	100 to 800	1.30	3.0	500	1004
	RGP20A thru RGP20J	G	SUPERECTIFIER® Axial	GP20	50 to 600	1.30	2.0	150 to 500	1007
2.5	RGP25A thru RGP25M	G	SUPERECTIFIER® Axial	DO-201AD	50 to 1000	1.30	2.5	150 to 500	1010
3.0	BY396P thru BY399P	G	Plastic Axial	DO-201AD	100 to 800	1.25	3.0	500	1013
	GI850 thru GI858	G	Plastic Axial	DO-201AD	50 to 600	1.25	3.0	200	1016
	GI910 thru GI917	G	Plastic Axial	DO-201AD	50 to 800	1.25	3.0	750	1019
	RGP30A thru RGP30M	G	SUPERECTIFIER® Axial	DO-201AD	50 to 1000	1.30	3.0	150 to 500	1022
	RS3A thru RS3K	G	Plastic SMD (2)	DO-214AB (SMC)	50 to 800	1.30	2.5	150 to 500	1025
	SRP300A thru SRP300K	G	Plastic Axial	DO-201AD	50 to 800	1.30	3.0	100 to 200	1028
5.0	BY500-100 thru BY500-800	G	Plastic Axial	DO-201AD	100 to 800	1.35	5.0	200	1031
	GI820 thru GI828	G	Plastic Axial	P600	50 to 800	1.10	5.0	200	1034
6.0	SRP600A thru SRP600K	G	Plastic Axial	P600	50 to 800	1.30	6.0	100 to 200	1037
6.5	BYS459-1500	G	Plastic PowerPAK (2)	TO-220AC	1500	1.30	6.5	350	1040
	BYS459B-1500	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	1500	1.30	6.5	350	1040
	BYS459F-1500	G	Isolated PowerPAK (2)	ITO-220AC	1500	1.30	6.5	350	1040
8.0	BY229-200 thru BY229-800	G	Plastic PowerPAK (2)	TO-220AC	200 to 800	1.85	20	145	1044
	BY229X-200 thru BY229X-800	G	Isolated PowerPAK (2)	ITO-220AC	200 to 800	1.85	20	145	1044
	BY229B-200 thru BY229B-800	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	200 to 800	1.85	20	145	1044

FAST RECOVERY RECTIFIERS									
$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (3)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		t_{rr} (ns)	PAGE
			FAMILY	TYPE		(V)	(A)		
10	BYS459-1500S	G	Plastic PowerPAK (2)	TO-220AC	1500	1.35	6.5	220	1048
	BYS459B-1500S	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	1500	1.35	6.5	220	1048
	BYS459F-1500S	G	Isolated PowerPAK (2)	ITO-220AC	1500	1.35	6.5	220	1048
	DTV32	G	Plastic PowerPAK (2)	TO-220AC	1500	1.50	6.0	175	1052
	DTV32B	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	1500	1.50	6.0	175	1052
	DTV32F	G	Isolated PowerPAK (2)	ITO-220AC	1500	1.50	6.0	175	1052
	DTV56	G	Plastic PowerPAK (2)	TO-220AC	1500	1.80	6.0	135	1056
	DTV56B	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	1500	1.80	6.0	135	1056
	DTV56F	G	Isolated PowerPAK (2)	ITO-220AC	1500	1.80	6.0	135	1056

Notes:

(1) **Bold text = new products**

(2) Glass passivated die

(3) Source: G = formerly General Semiconductor

STANDARD RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (3)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
0.25	GI250-1 thru GI250-4	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	1000 to 4000	3.50	0.25	1064
	GP02-20 thru GP02-40	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	2000 to 4000	3.00	1.0	1067
0.5	GL34A thru GL34J	G	SUPERECTIFIER® SMD	DO-213AA (MiniMELF)	50 to 600	1.20/1.30	0.5	1070
0.8	GP08A thru GP08J	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	50 to 600	1.30	0.8	1073
1.0	1N3611GP thru 1N3614GP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	200 to 800	1.00	1.0	1076
	1N3957GP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	1000	1.00	1.0	1076
	1N4001 thru 1N4007	G	Plastic Axial	DO-204AL (DO-41)	50 to 1000	1.10	1.0	1079
	1N4001GP thru 1N4007GP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	50 to 1000	1.10	1.0	1083
	1N4245GP thru 1N4249GP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	200 to 1000	1.20	1.0	1086
	1N4383GP thru 1N4385GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	200 to 600	1.00	1.0	1089
	1N4585GP & 1N4586GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	800 to 1000	1.00	1.0	1089
	1N5059GP thru 1N5062GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	200 to 800	1.20	1.0	1092
	1N5614GP thru 1N5622GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	200 to 1000	1.20	1.0	1095
	1N6478 thru 1N6484	G	SUPERECTIFIER® SMD	DO-213AB (MELF)	50 to 1000	1.10	1.0	1098
	BYD13DGP thru BYD13MGP	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	200 to 1000	1.30	1.0	1101
	BYM10-50 thru BYM10-1000	G	SUPERECTIFIER® SMD	DO-213AB (MELF)	50 to 1000	1.10/1.20	1.0	1104
	GF1A thru GF1M	G	SUPERECTIFIER® SMD	DO-214BA (GF1)	50 to 1000	1.10/1.20	1.0	1108
	GI1-1200GP thru GI1-1600GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	1200 to 1600	1.10	1.0	1111
	GL41A thru GL41Y	G	SUPERECTIFIER® SMD	DO-213AB (MELF)	50 to 1600	1.10/1.20	1.0	1104
	GP10A thru GP10Y	G	SUPERECTIFIER® Axial	DO-204AL (DO-41)	50 to 1600	1.10/1.20/1.30	1.0	1114
	GPP10A thru GPP10M	G	Plastic Axial (2)	DO-204AL (DO-41)	50 to 1000	1.10	1.0	1117
	M100A thru M100M	G	Plastic Axial	DO-204AL (DO-41)	50 to 1000	1.00/1.10	1.0	1120
	MPG06A thru MPG06M	G	Plastic Axial (2)	MPG06	50 to 1000	1.10	1.0	1123
	S1A thru S1M	G	Plastic SMD (2)	DO-214AC (SMA)	50 to 1000	1.10	1.0	1126
	S1BA thur S1MA	G	Plastic SMD (2)	DO-214AC (SMA)	100 to 1000	1.10	1.0	1129
	S1PB thru S1PM	G	Plastic SMD (2)	DO-220AA (SMP)	100 to 1000	1.10	1.0	1133
1.5	1N5391 thru 1N5399	G	Plastic Axial	DO-204AC (DO-15)	50 to 1000	1.40	1.5	1137
	1N5391GP thru 1N5399GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	50 to 1000	1.40	1.5	1140
	AGP15-400 thru AGP15-800	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	400 to 800	1.10	1.5	1143
	BY448GP	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	1650	1.60	3.0	1146
	BYG10D thru BYG10Y	G	Plastic SMD (2)	DO-214AC (SMA)	200 to 1600	1.10/1.15	1.0/1.5	1149
	CGP15	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	1400	1.10	1.0	1153
	DGP15	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	1500	1.10	1.0	1153
	GP15A thru GP15M	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	50 to 1000	1.10	1.5	1156
	GPP15A thru GPP15M	G	Plastic Axial (2)	DO-204AC (DO-15)	50 to 1000	1.10	1.5	1159
	S2A thru S2M	G	Plastic SMD (2)	DO-214AA (SMB)	50 to 1000	1.15	1.5	1162
2.0	**SA2B thru SA2M**	G	Plastic SMD (2)	DO-214AC (SMA)	100 to 1000	1.10	2.0	1165
	CGP20	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	1400	1.10	2.0	1168
	DGP20	G	SUPERECTIFIER® Axial	DO-204AC (DO-15)	1500	1.10	2.0	1168
	GP20A thru GP20J	G	SUPERECTIFIER® Axial	GP20	50 to 600	1.10/1.20	2.0	1171
	GPP20A thru GPP20M	G	Plastic Axial (2)	DO-204AC (DO-15)	50 to 1000	1.10	2.0	1174
2.5	BY228GP	G	SUPERECTIFIER® Axial	DO-201AD	1500	1.60	2.5	1177

STANDARD RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (3)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
3.0	1N5400 thru 1N5408	G	Plastic Axial	DO-201AD	50 to 1000	1.20	3.0	1180
	1N5624GP thru 1N5627GP	G	SUPERECTIFIER® Axial	DO-201AD	200 to 800	1.00	3.0	1183
	BY251GP thru BY255GP	G	SUPERECTIFIER® Axial	DO-201AD	200 to 1300	1.10	3.0	1186
	BY251P thru BY255P	G	Plastic Axial	DO-201AD	200 to 1300	1.10	3.0	1189
	CGP30	G	SUPERECTIFIER® Axial	DO-201AD	1400	1.20	3.0	1192
	DGP30	G	SUPERECTIFIER® Axial	DO-201AD	1500	1.20	3.0	1192
	GP30A thru GP30M	G	SUPERECTIFIER® Axial	DO-201AD	50 to 1000	1.10/1.20	3.0	1195
	GI500 thru GI510	G	Plastic Axial	DO-201AD	50 to 1000	1.10	9.4	1198
	P300A thru P300M	G	Plastic Axial	DO-201AD	50 to 1000	1.20	3.0	1201
	S3A thru S3M	G	Plastic SMD (2)	DO-214AB (SMC)	50 to 1000	1.15	2.5	1204
4.0	**S4PB thru S4PM**	G	Plastic SMD (2)	TO-277A (SMPC)	100 to 1000	1.10	4.0	1207
5.0	S5A thru S5M	G	Plastic SMD (2)	DO-214AB (SMC)	50 to 1000	1.15	5.0	1211
6.0	GI750 thru GI758	G	Plastic Axial	P600	50 to 800	0.90/0.95	6.0	1214
	GPP60A thru GPP60G	G	Plastic Axial (2)	P600	50 to 400	1.10	6.0	1217
	P600A thru P600M	G	Plastic Axial	P600	50 to 1000	0.90/1.00	6.0	1220
8.0	NS8AT thru NS8MT	G	Plastic PowerPAK (2)	TO-220AC	50 to 1000	1.10	8.0	1223
	NSB8AT thru NSB8MT	G	PowerPAK SMD (2)	TO-263AB (D^2PAK)	50 to 1000	1.10	8.0	1223
	NSF8AT thru NSF8MT	G	Isolated PowerPAK (2)	ITO-220AC	50 to 1000	1.10	8.0	1223

Notes:

(1) **Bold text = new products**

(2) Glass passivated die

(3) Source: G = formerly General Semiconductor

ESD CAPABILITY RECTIFIERS								
$I_{F(AV)}$ (A)	DEVICE [1]	SOURCE [3]	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
0.7	**SE07PB thru SE07PJ**	G	Plastic SMD [2]	DO-220AA (SMP)	100 to 600	1.05	0.7	1230
1.0	**SE10PB thru SE10PJ**	G	Plastic SMD [2]	DO-220AA (SMP)	100 to 600	1.05	1.0	1233
	MSE1PB thru MSE1PJ	G	Plastic SMD [2]	MicroSMP	100 to 600	1.10	1.0	1236
1.5	**SE15PB thru SE15PJ**	G	Plastic SMD [2]	DO-220AA (SMP)	100 to 600	1.05	1.5	1239

Notes:

(1) **Bold text = new products**

(2) Oxide planar die

(3) Source: G = formerly General Semiconductor

BRIDGE RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (6)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F (5) AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
0.5	MB2M, MB4M & MB6M	G	Mini-bridge	MBM	200 to 600	1.00	0.4	1247
	B2M, B4M & B6M	G	Mini-bridge	MBM	200 to 600	1.00	0.5	1250
	MB2S, MB4S & MB6S	G	Mini-bridge (SMD)	MBS (TO-269AA)	200 to 600	1.00	0.4	1253
	B2S, B4S & B6S	G	Mini-bridge (SMD)	MBS (TO-269AA)	200 to 600	1.00	0.5	1256
	RMB2S & RMB4S	G	Recovery mini-bridge (SMD)	MBS (TO-269AA)	200 to 400	1.25	0.4	1259
0.9	B40C800DM thru B380C800DM	G	Dual in-line	DFM	65 to 600	1.00	0.9	1262
	B40C800G thru B380C800G	G	WOG	WG	65 to 600	1.00	0.9	1265
1.0	B40C1000G thru B380C1000G	G	WOG	WG	65 to 600	1.00	1.0	1268
	DF005M thru DF10M	G	Dual in-line	DFM	50 to 1000	1.10	1.0	1271
	DF005MA thru DF10MA	G	Dual in-line	DFM	50 to 1000	1.10	1.0	1274
	DF005S thru DF10S	G	Dual in-line (SMD)	DFS	50 to 1000	1.10	1.0	1277
	DF005SA thru DF10SA	G	Dual in-line (SMD)	DFS	50 to 1000	1.10	1.0	1280
	EDF1AM thru EDF1DM	G	Ultrafast dual in-line (3)	DFM	50 to 200	1.05	1.0	1283
	EDF1AS thru EDF1DS	G	Ultrafast dual in-line (SMD) (3)	DFS	50 to 200	1.05	1.0	1286
1.5	3N246 thru 3N252	G	Single in-line	KBPM	50 to 1000	1.00/1.30	1.0/1.57	1289
	B40C1500G thru B380C1500G	G	WOG	WG	65 to 600	1.00	1.5	1292
	DF15005S thru DF1510S	G	Dual-in-line (SMD)	DFS	50 to 1000	1.10	1.5	1295
	DFL15005S thru DFL1514S	G	Low-profile DIL (SMD)	L-DFS	50 to 1400	1.10	1.5	1298
	G2SB20, G2SB60 & G2SB80	G	Single in-line (4)	GBL	200 to 800	1.00	0.75	1301
	G2SBA20, G2SBA60 & G2SBA80	G	Single in-line (4)	GBL	200 to 800	1.00	0.75	1304
	KBP005M thru KBP10M	G	Single in-line	KBPM	50 to 1000	1.00/1.30	1.0/1.57	1289
	W005G thru W10G	G	WOG	WG	50 to 1000	1.00	1.0	1307
2.0	2KBP005M thru 2KBP10M	G	Single in-line	KBPM	50 to 1000	1.10	3.14	1310
	2W005G thru 2W10G	G	WOG	WG	50 to 1000	1.10	2.0	1313
	3N253 thru 3N259	G	Single in-line	KBPM	50 to 1000	1.10	3.14	1310
3.0	GBPC1005 thru GBPC110	G	GBPC with wire leads	GBPC1	50 to 1000	1.00	1.5	1316
	3KBP005M thru 3KBP08M	G	Single in-line	KBPM	50 to 800	1.05	3.0	1319
4.0	G3SBA20, G3SBA60 & G3SBA80	G	Single in-line with mounting hole (4)	GBU	200 to 800	1.00	2.0	1322
	GBL005 thru GBL10	G	Single in-line	GBL	50 to 1000	1.00	4.0	1325
	GBLA005 thru GBLA10	G	Single in-line	GBL	50 to 1000	1.00	4.0	1328
	GBU4A thru GBU4M	G	Single in-line with mounting hole	GBU	50 to 1000	1.00	4.0	1331
	GSIB420 thru GSIB480	G	Single in-line with mounting hole	GSIB-3G	200 to 800	0.95	2.0	1334
	GSIB4A20 thru GSIB4A80	G	Single in-line with mounting hole	GSIB-3G	200 to 800	1.00	2.0	1337
	KBL005 thru KBL10	G	Single in-line*	KBL	50 to 1000	1.10	4.0	1340
	KBU4A thru KBU4M	G	Single in-line with mounting hole*	KBU	50 to 1000	1.00	4.0	1343
6.0	GBPC6005 thru GBPC610	G	GBPC with wire leads	GBPC6	50 to 1000	1.00	3.0	1346
	GBU6A thru GBU6M	G	Single in-line with mounting hole	GBU	50 to 1000	1.00	6.0	1349
	G5SBA20; G5SBA60 & G5SBA80	G	Single in-line with mounting hole (4)	GBU	200 to 800	1.05	3.0	1352
	GSIB620 thru GSIB680	G	Single in-line with mounting hole	GSIB-5S	200 to 800	0.95	3.0	1355
	GSIB6A20 thru GSIB6A80	G	Single in-line with mounting hole	GSIB-5S	200 to 800	1.00	3.0	1358
	KBU6A thru KBU6M	G	Single in-line with mounting hole*	KBU	50 to 1000	1.00	6.0	1361
	VSIB620 thru VSIB680	G	Single in-line with mounting hole	GSIB-5S	200 to 800	0.95	3.0	1364
	VSIB6A20 thru VSIB6A80	G	Single in-line with mounting hole	GSIB-5S	200 to 800	1.00	3.0	1367
8.0	GBU8A thru GBU8M	G	Single in-line with mounting hole	GBU	50 to 1000	1.00	8.0	1370
	KBU8A thrz KBU8M	G	Single in-line with mounting hole*	KBU	50 to 1000	1.00	8.0	1373
10	**BU1006 thru BU1010**	G	Single in-line with mounting hole	BU	600 to 1000	1.05	5.0	1376
	BU1006A thru BU1010A	G	Single in-line with mounting hole	BU	600 to 1000	1.10	5.0	1381
	VSIB10A20 thru VSIB10A80	G	Single in-line with mounting hole	GSIB-5S	200 to 800	1.00	5.0	1386

BRIDGE RECTIFIERS

$I_{F(AV)}$ (A)	DEVICE (1)	SOURCE (6)	PACKAGE		V_{BR} RANGE (V)	MAXIMUM V_F (5) AT I_F		PAGE
			FAMILY	TYPE		(V)	(A)	
12	**BU1206 thru BU1210**	G	Single in-line with mounting hole	BU	600 to 1000	1.05	6.0	1389
	GBPC12005 thru GBPC1210	G	GBPC with fast-on lugs	GBPC12-35	50 to 1000	1.10	6.0	1394
	GBPC12005W thru GBPC1210W	G	GBPC with wire leads	GBPC12-35W	50 to 1000	1.10	6.0	1394
15	**BU1506 thru BU1510**	G	Single in-line with mounting hole	BU	600 to 1000	1.05	7.5	1398
	GBPC15005 thru GBPC1510	G	GBPC with fast-on lugs	GBPC12-35	50 to 1000	1.10	7.5	1394
	GBPC15005W thru GBPC1510W	G	GBPC with wire leads	GBPC12-35W	50 to 1000	1.10	7.5	1394
	GSIB1520 thru GSIB1580	G	Single in-line with mounting hole (4)	GSIB-5S	200 to 800	0.95	7.5	1403
	GSIB15A20 thru GSIB15A80	G	Single in-line with mounting hole (4)	GSIB-5S	200 to 800	1.00	7.5	1406
	VSIB1520 thru VSIB1580	G	Single in-line with mounting hole (4)	GSIB-5S	200 to 800	0.95	7.5	1409
	VSIB15A20 thru VSIB15A80	G	Single in-line with mounting hole (4)	GSIB-5S	200 to 800	1.00	7.5	1412
20	**BU2006 thru BU2010**	G	Single in-line with mounting hole	BU	600 to 1000	1.05	10	1415
	GSIB2020 thru GSIB2080	G	Single-in-line	GSIB-5S	200 to 800	1.00	10	1420
	VSIB2020 thru VSIB2080	G	Single in-line with mounting hole (4)	GSIB-5S	200 to 800	1.00	10	1423
25	**BU2506 thru BU2510**	G	Single in-line with mounting hole	BU	600 to 1000	1.05	12.5	1426
	GBPC25005 thru GBPC2510	G	GBPC with fast-on lugs	GBPC12-35	50 to 1000	1.10	12.5	1394
	GBPC25005W thru GBPC2510W	G	GBPC with wire leads	GBPC12-35W	50 to 1000	1.10	12.5	1394
	GSIB2520 thru GSIB2580	G	Single-in-line	GSIB-5S	200 to 800	1.00	12.5	1431
	VSIB2520 thru VSIB2580	G	Single in-line with mounting hole (4)	GSIB-5S	200 to 800	1.00	12.5	1434
35	GBPC35005 thru GBPC3510	G	GBPC with fast-on lugs	GBPC12-35	50 to 1000	1.10	17.5	1394
	GBPC35005W thru GBPC3510W	G	GBPC with wire leads	GBPC12-35W	50 to 1000	1.10	17.5	1394

Notes:

(1) **Bold text = new products**

(2) Glass passivated die, unless designated with "*"

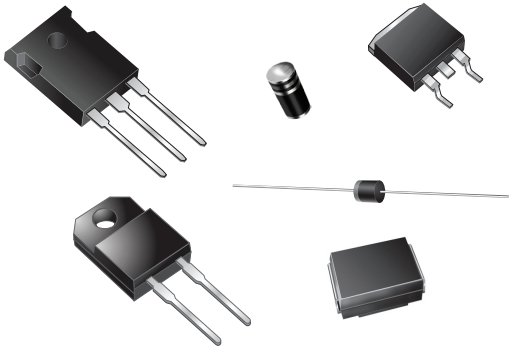
(3) t_{rr} = 50 ns maximum for EDF1 types

(4) Japanese electrical specifications

(5) V_F limits are per diode

(6) Source: G = formerly General Semiconductor

Schottky Rectifiers



Contents

(for full listing please see Selector Guide on page 20)

Introduction to Schottky Rectifiers

Vishay General Semiconductor

Vishay's Schottky rectifier is the ideal product for high speed and low power loss applications. Their metal-silicon junction and majority carrier condition results in extremely fast recovery times (less than 10 ns) and very low forward voltage drops. Vishay's unique sputtered metalization process and ion implanted guardring technology results in a highly reliable Schottky product. The sputtering technique provides a very uniform Schottky junction, yielding a well controlled barrier height distribution. Ion implantation provides consistency to the PN junction guardring, resulting in unsurpassed reverse energy handling capability. We offer a unique opportunity to our customers by providing flexibility of different barrier heights to best suit their end applications.

Lower barrier heights result in lower forward voltage drop and improved power dissipation. This is at the expense of high temperature leakage current due to the physics of the Schottky barrier junction. Conversely, high barrier heights result in improved high temperature leakage at the expense of higher forward voltage drop.

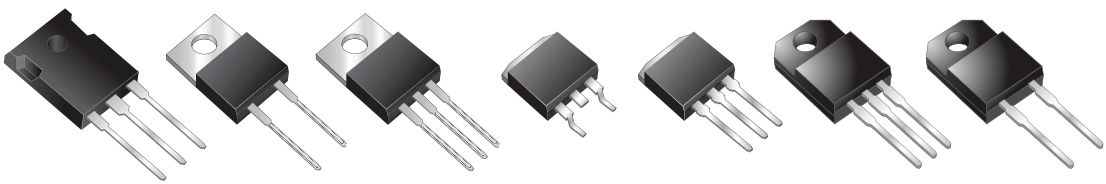
For additional information to choose the barrier height to best meet your particular application, please refer to the application note titled "Design Guidelines for Schottky Rectifiers".

In summary, some of the features of our Schottky rectifiers are as follows:

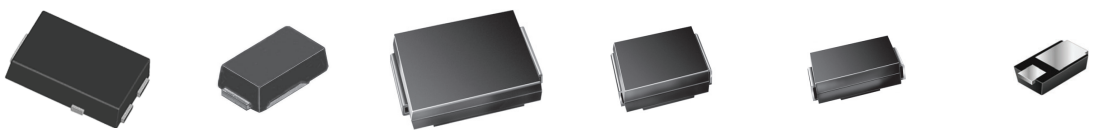
- Metal to silicon rectifier, majority carrier conduction
- Low power loss, high efficiency
- High current capability, low V_F
- Epitaxial construction
- Guardring for reverse transient protection

We offer these devices in a variety of packages for your convenience.

MPG06 | **DO-201AD** | **DO-204AL (DO-41)** | **DO-204AC (DO-15)** | **P600**



TO-247AD | **TO-220AC** | **TO-220AB** | **TO-263AB** | **TO-262AA** | **ITO-220AB** | **ITO-220AC**



TO-277A (SMPC) | **DO-220AA (SMP)** | **DO-214AB (SMC)** | **DO-214AA (SMB)** | **DO-214AC (SMA)** | **MicroSMP**

For technical questions within your region, please contact:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89087
Revision: 16-Jul-08

Schottky Rectifiers Part Numbering System

1. SURFACE MOUNT

a) SMD

MSSzxxPyyCL

M = MicroSMP
SS = Surface mount Schottky
z = Package style
A = SMA (DO-214AC)
B = SMB (DO-214AA)
C = SMC (DO-214AB)
x = Forward current (in A)
(For high barrier height, "x" is followed by "H")
P = SMP, SMPC or MicroSMP
y = Reverse voltage (in V)

2 = 20 V	6 = 60 V
3 = 30 V	9 = 90 V
4 = 40 V	10 = 100 V
5 = 50 V	

C = Dual chip
L = Low forward voltage (V_F)
"S" suffix = High current density with smaller package

Bxyyz

B = Schottky barrier rectifier
x = Forward current (in A)
y = Reverse voltage (in V)
z = Package style
A = SMA (DO-214AC)
B = SMB (DO-214AA)
C = SMC (DO-214AB)

b) LOW-V_F SMD

SLxy

SL = Surface mount low V_F
x = Forward current (in A)
1 = 1.5 A
2 = 2.0 A
4 = 4.0 A
y = Reverse voltage (in V)
2 = 20 V
3 = 30 V
4 = 40 V

2. AXIAL

SBxxHyy

SB = Schottky barrier
xx = Forward current (in A)
H = High barrier height
yy = Reverse voltage (in V)
"A" suffix = With lower forward surge current
"S" suffix = High current density with smaller package

3. POWER PACKAGES

aaacxxyypp

aaa = Barrier height classification
SBL = Schottky barrier low
M or MBR = Medium to high barrier rectifier
c = Package classification
B = TO-263
"blank" = TO-220
F = ITO-220
I = TO-262
xx = Forward current (in A)

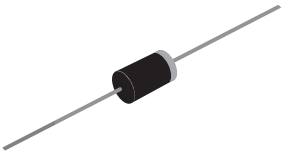
7 = 7.5 A	25 = 25 A
8 = 8 A	30 = 30 A
10 = 10 A	40 = 40 A
15 = 15 A	50 = 50 A
16 = 16 A	60 = 60 A
20 = 20 A	

(For high barrier height, "x" is followed by "H")
yy = Reverse voltage (in V)
pp = Package type
"blank" = TO-220AC, ITO-220AC or TO-263AB (single)
C, CT or S = TO-220AB, ITO-220AB, TO-263AB or TO-262AA (dual center tap)
P or PT = TO-247AD (dual center tap)
(Note: S indicates single diode)

Notes:

- Part numbering system for all parts, excluding JEDEC, ProElectron and industry standard part numbers
- For JEDEC and ProElectron part numbers, please see part number explanations on page 18

Miniature Schottky Barrier Rectifier



Case Style MPG06

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.6 A
V_{RRM}	20 V to 60 V
I_{FSM}	20 A
V_F	0.55 V, 0.70 V
T_J max.	125 °C, 150 °C

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: MPG06

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB020	SB030	SB040	SB050	SB060	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	0.6					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	20					A
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	SB020	SB030	SB040	SB050	SB060	UNIT
Maximum instantaneous forward voltage (1)	0.6 A	V_F	0.55			0.70		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)	T_A = 25 °C	I_R	0.5					mA
	T_A = 100 °C		10			5.0		

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
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Document Number: 88714
Revision: 25-Apr-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	SB020	SB030	SB040	SB050	SB060	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	80 20					°C/W

Note:

(1) Thermal resistance junction to lead P.C.B. mounted 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SB040-E3/54	0.203	54	5500	13" diameter paper tape and reel
SB040-E3/73	0.203	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

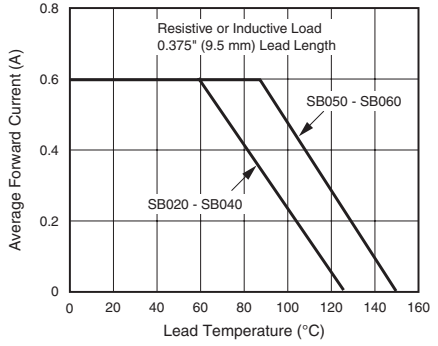


Figure 1. Forward Current Derating Curve

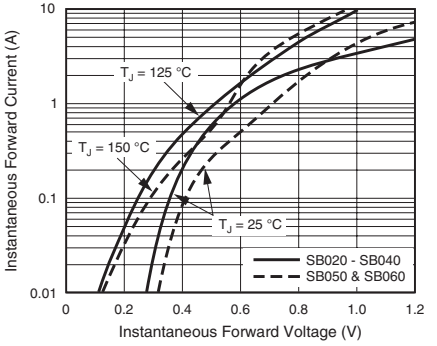


Figure 3. Typical Instantaneous Forward Characteristics

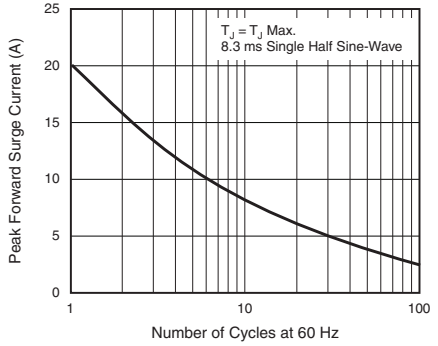


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

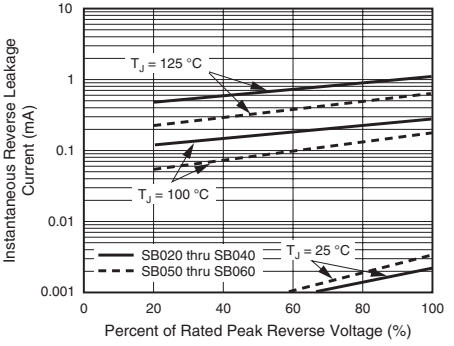


Figure 4. Typical Reverse Leakage Characteristics

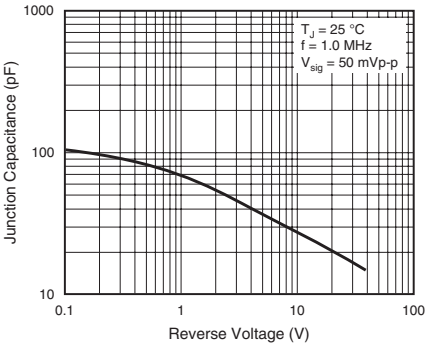


Figure 5. Typical Junction Capacitance

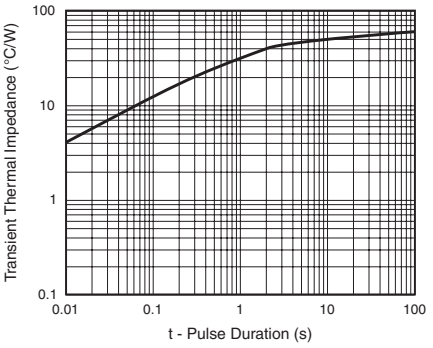
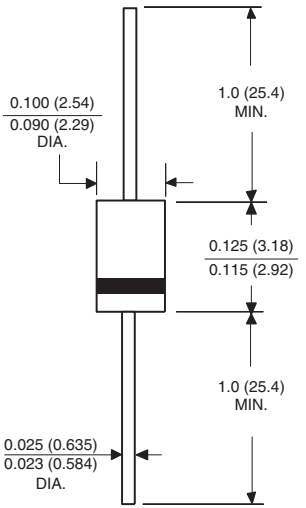


Figure 6. Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style MPG06



For technical questions within your region, please contact one of the following:
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Document Number: 88714
Revision: 25-Apr-08

Schottky Barrier Rectifiers

DO-204AL (DO-41)

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-204AL (DO-41)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	20 V, 30 V, 40 V
I_{FSM}	25 A
V_F	0.45 V, 0.55 V, 0.60 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N5817	1N5818	1N5819	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum RMS voltage	V_{RMS}	14	21	28	V
Maximum DC blocking voltage	V_{DC}	20	30	40	V
Maximum non-repetitive peak reverse voltage	V_{RSM}	24	36	48	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_L = 90 °C	$I_{F(AV)}$	1.0			A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	25			A
Voltage rate of change (rated V_R)	dV/dt	10 000			V/µs
Storage temperature range	T_J, T_{STG}	- 65 to + 125			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	1N5817	1N5818	1N5819	UNIT
Maximum instantaneous forward voltage (1)	1.0		V_F	0.450	0.550	0.600	V
Maximum instantaneous forward voltage (1)	3.1		V_F	0.750	0.875	0.900	V
Maximum average reverse current at rated DC blocking voltage (1)		T_A = 25 °C T_A = 100 °C	I_R	1.0 10			mA
Typical junction capacitance	4.0 V, 1.0 MHz		C_J	125	110		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**1N5817**	**1N5818**	**1N5819**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 15			°C/W

Note:
(1) Thermal resistance from junction to lead vertical P.C.B. mounted, 0.375" (9.5 mm) lead length with 1.5 x 1.5" (38 x 38 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N5819-E3/54	0.332	54	5500	13" diameter paper tape and reel
1N5819-E3/73	0.332	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

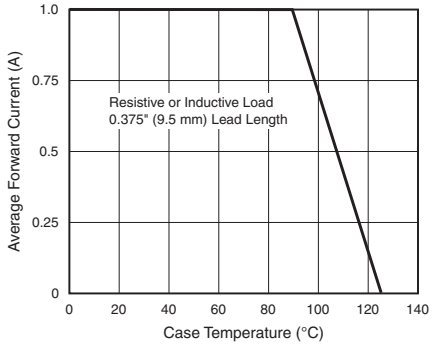


Figure 1. Forward Current Derating Curve

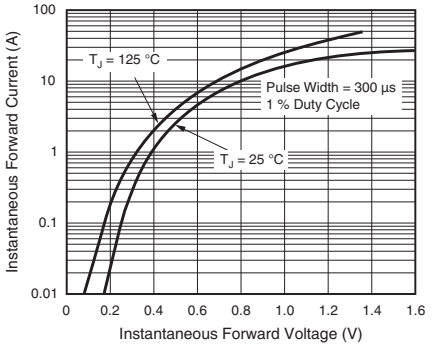


Figure 3. Typical Instantaneous Forward Characteristics

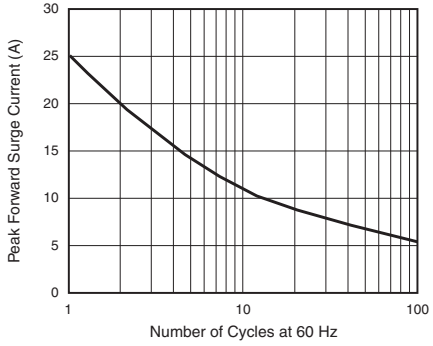


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

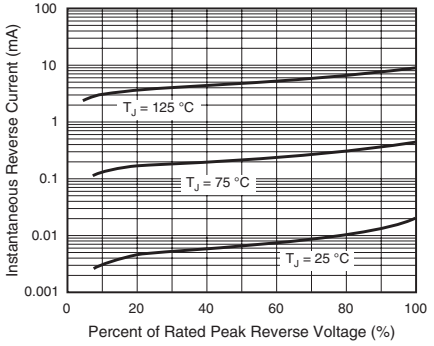


Figure 4. Typical Reverse Characteristics

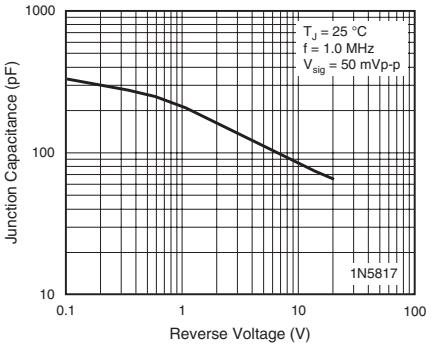


Figure 5. Typical Junction Capacitance

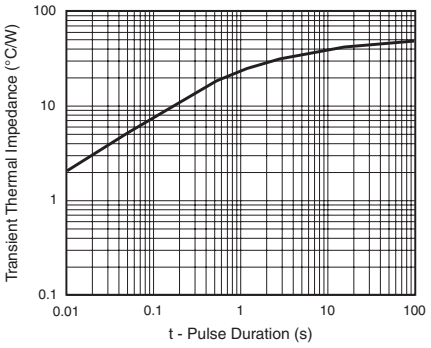


Figure 7. Typical Transient Thermal Impedance

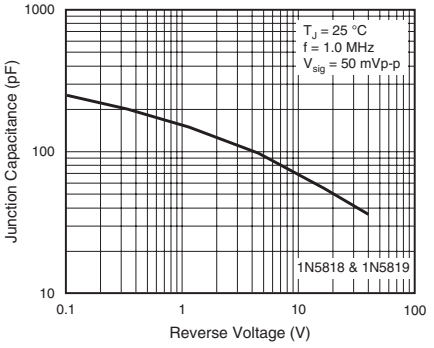
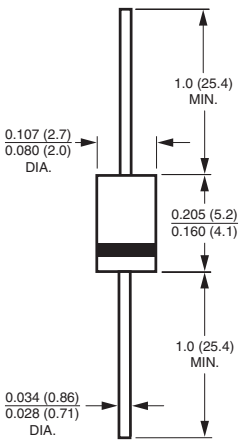


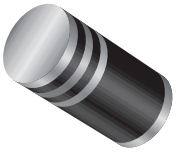
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Surface Mount Schottky Barrier Rectifier



DO-213AB

FEATURES

- MELF Schottky rectifier
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	30 A
V_F	0.50 V, 0.70 V
T_J max.	125 °C, 150 °C

MECHANICAL DATA

Case: DO-213AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end 1st band denotes device type 2nd band denotes voltage type

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYM13-20	BYM13-30	BYM13-40	BYM13-50	BYM13-60	UNIT
Denotes Schottky devices: 1st band is orange		SGL41-20	SGL41-30	SGL41-40	SGL41-50	SGL41-60	
Polarity color bands (2nd band) voltage type		Gray	Red	Orange	Yellow	Green	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30					A
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 55 to + 125			- 55 to + 150		°C
Storage temperature range	T_{STG}	- 55 to + 150					°C

For technical questions within your region, please contact one of the following:
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Document Number: 88548
Revision: 29-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYM13-20** / **SGL41-20**	**BYM13-30** / **SGL41-30**	**BYM13-40** / **SGL41-40**	**BYM13-50** / **SGL41-50**	**BYM13-60** / **SGL41-60**	**UNIT**
Maximum instantaneous forward voltage (1)	1.0 A		V_F	0.50			0.70		V
Maximum reverse current at rated DC blocking voltage (1)		T_A = 25 °C	I_R	0.5					mA
		T_A = 100 °C		10			5.0		
Typical junction capacitance	4.0 V, 1.0 MHz		C_J	110			80		pF

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**BYM13-20** / **SGL41-20**	**BYM13-30** / **SGL41-30**	**BYM13-40** / **SGL41-40**	**BYM13-50** / **SGL41-50**	**BYM13-60** / **SGL41-60**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JT}$	75 30					°C/W

Note:
(1) Thermal resistance junction to terminal, 0.24 x 0.24" (6.0 x 6.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SGL41-40-E3/96	0.137	96	1500	7" diameter plastic tape and reel
SGL41-40-E3/97	0.137	97	5000	13" diameter plastic tape and reel
BYM13-40-E3/96	0.137	96	1500	7" diameter plastic tape and reel
BYM13-40-E3/97	0.137	97	5000	13" diameter plastic tape and reel
SGL41-40HE3/96 (1)	0.137	96	1500	7" diameter plastic tape and reel
SGL41-40HE3/97 (1)	0.137	97	5000	13" diameter plastic tape and reel
BYM13-40HE3/96 (1)	0.137	96	1500	7" diameter plastic tape and reel
BYM13-40HE3/97 (1)	0.137	97	5000	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

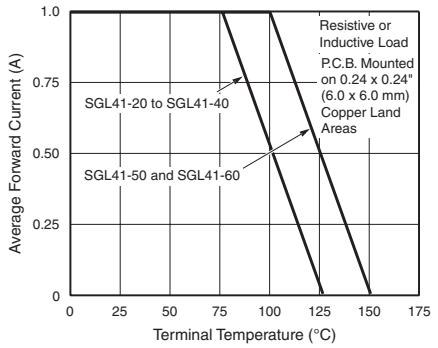


Figure 1. Forward Current Derating Curve

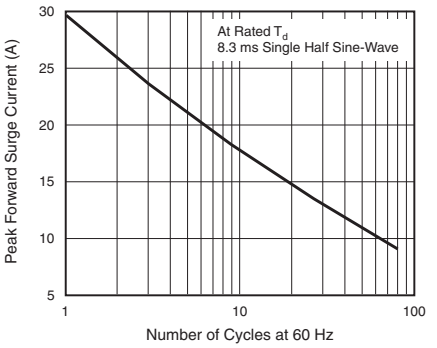


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

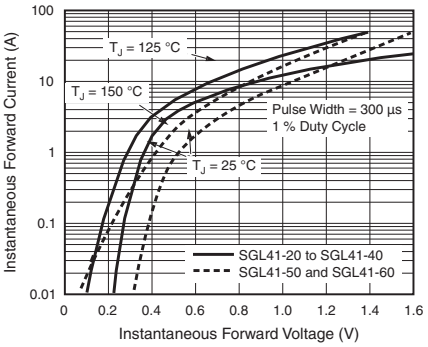


Figure 3. Typical Instantaneous Forward Characteristics

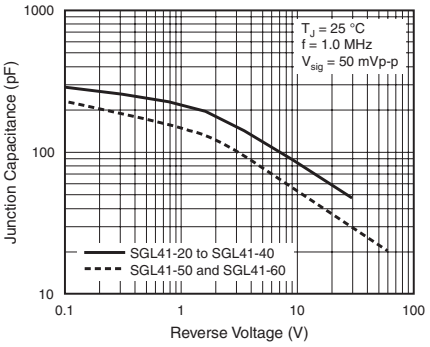


Figure 5. Typical Junction Capacitance

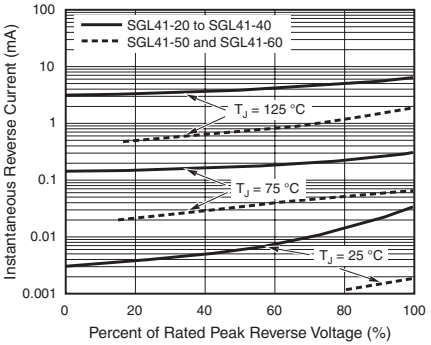
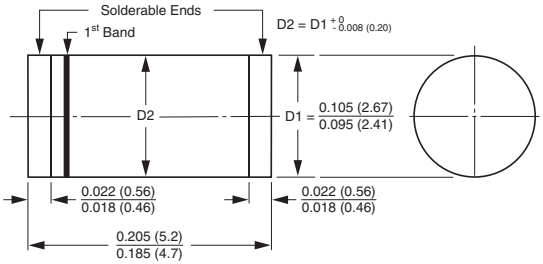


Figure 4. Typical Reverse Characteristics

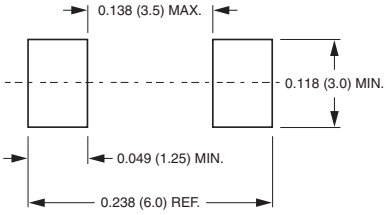
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AB



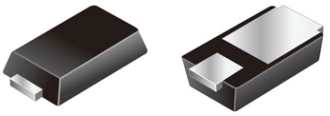
1st band denotes type and positive end (cathode)

Mounting Pad Layout



Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



Top View Bottom View

MicroSMP

FEATURES

- Very low profile - typical height of 0.68 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	20 V, 30 V
I_{FSM}	25 A
V_F at I_F = 1.0 A	0.35 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MSS1P2L	MSS1P3L	UNIT
Device marking code		12L	13L	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	25		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 0.5 A I_F = 1.0 A	T_J = 25 °C	V_F	0.39 0.44	- 0.50	V
	I_F = 0.5 A I_F = 1.0 A	T_J = 125 °C		0.28 0.35	- 0.40	
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	15 6.0	250 20	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	65	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MSS1P2L**	**MSS1P3L**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	125 30 40		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MSS1P3L-E3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSS1P3L-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

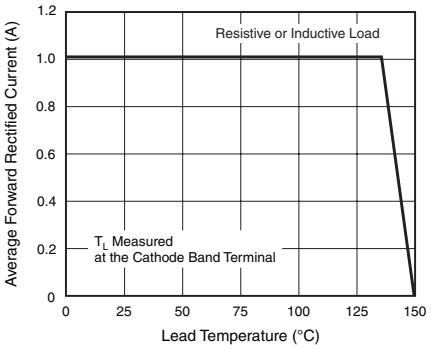


Figure 1. Maximum Forward Current Derating Curve

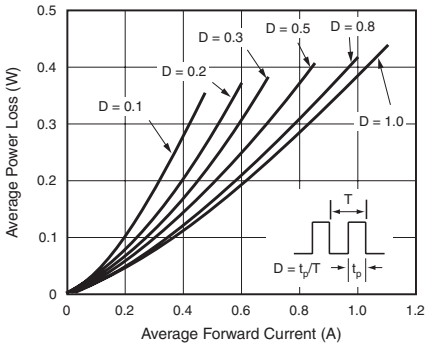


Figure 2. Forward Power Loss Characteristics

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

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Revision: 04-Aug-08

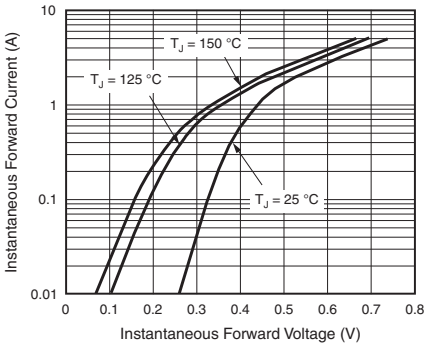


Figure 3. Typical Instantaneous Forward Characteristics

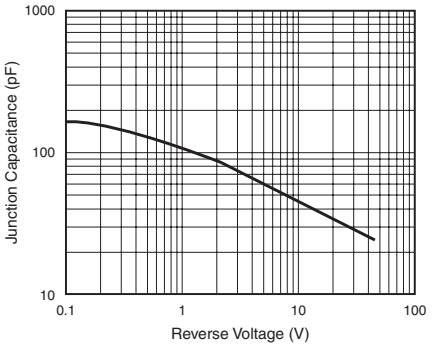


Figure 5. Typical Junction Capacitance

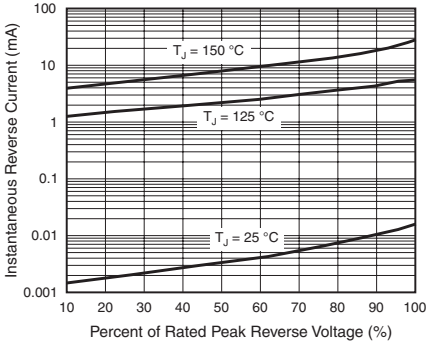


Figure 4. Typical Reverse Characteristics

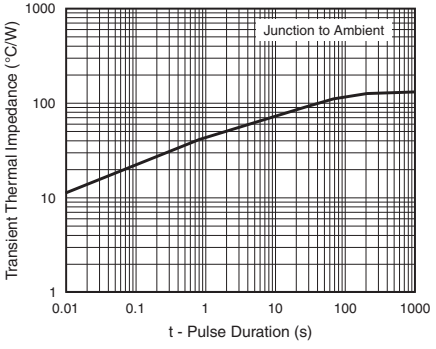
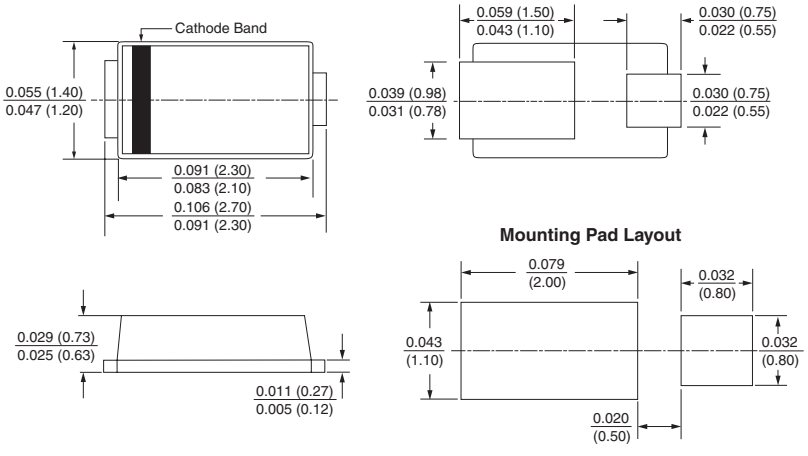


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

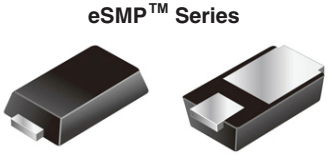
MicroSMP



MSS1P3 & MSS1P4

Vishay General Semiconductor

Surface Mount Schottky Barrier Rectifiers



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	25 A
V_F at I_F = 1.0 A	0.41 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

FEATURES

- Very low profile - typical height of 0.68 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MSS1P3	MSS1P4	UNIT
Device marking code		13	14	
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	25		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89019
Revision: 04-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 0.5 A I_F = 1.0 A	T_J = 25 °C	V_F	0.41 0.48	- 0.55	V
	I_F = 0.5 A I_F = 1.0 A	T_J = 125 °C		0.32 0.41	- 0.46	
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	8.5 4.5	200 15	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	50	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MSS1P3**	**MSS1P4**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	125 30 40		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MSS1P4-E3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSS1P4-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

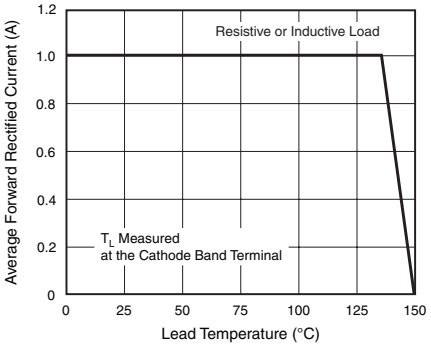


Figure 1. Maximum Forward Current Derating Curve

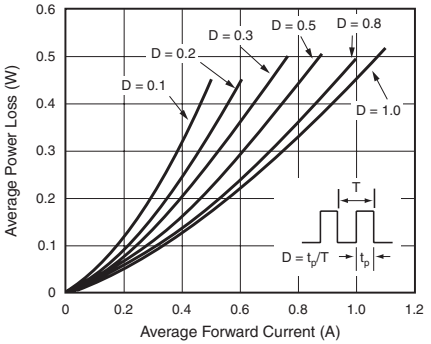


Figure 2. Forward Power Loss Characteristics

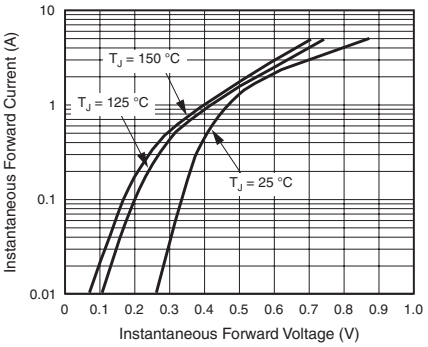


Figure 3. Typical Instantaneous Forward Characteristics

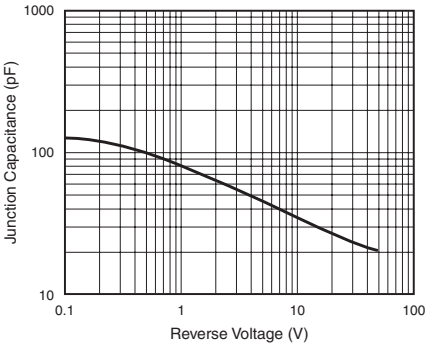


Figure 5. Typical Junction Capacitance

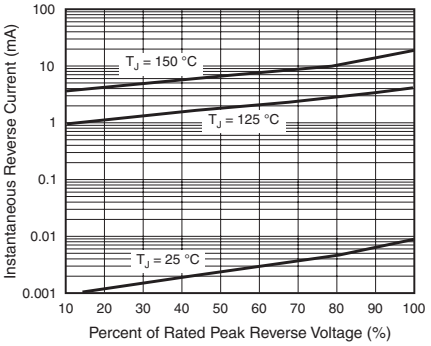


Figure 4. Typical Reverse Characteristics

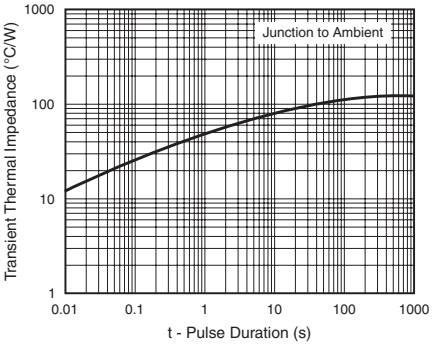
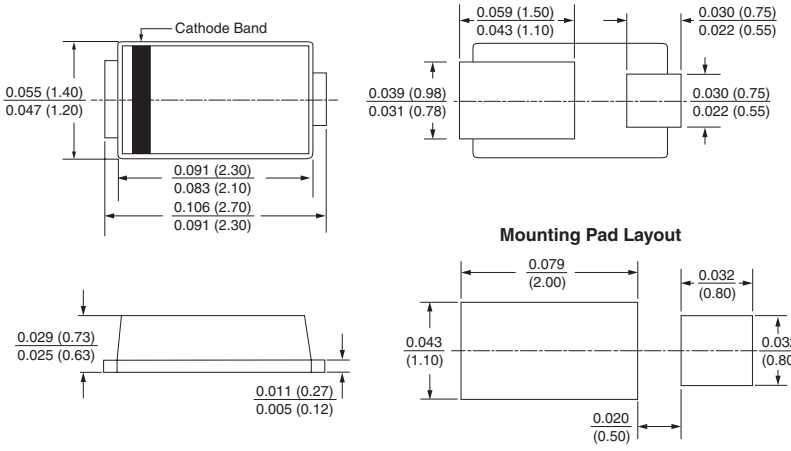


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP



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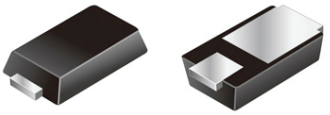
Document Number: 89019
Revision: 04-Aug-08

Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



Top View Bottom View

MicroSMP

FEATURES

- Very low profile - typical height of 0.68 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	25 A
V_F at I_F = 1.0 A	0.52 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MSS1P5	MSS1P6	UNIT
Device marking code		15	16	
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	25		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 0.5 A I_F = 1.0 A	T_J = 25 °C	V_F	0.45 0.56	- 0.68	V
	I_F = 0.5 A I_F = 1.0 A	T_J = 125 °C		0.40 0.52	- 0.60	
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	20 7.0	150 12	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	40	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MSS1P5**	**MSS1P6**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	125 30 40		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MSS1P6-E3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSS1P6-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

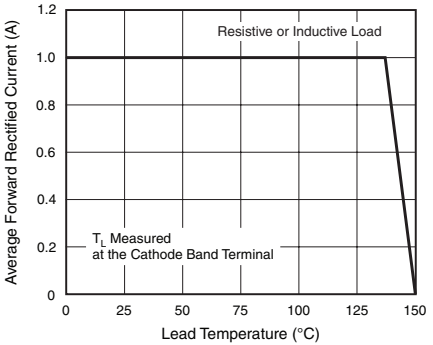


Figure 1. Maximum Forward Current Derating Curve

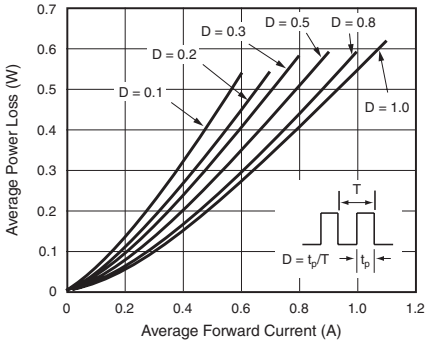


Figure 2. Forward Power Loss Characteristics

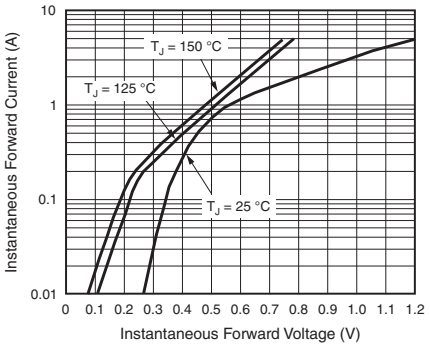


Figure 3. Typical Instantaneous Forward Characteristics

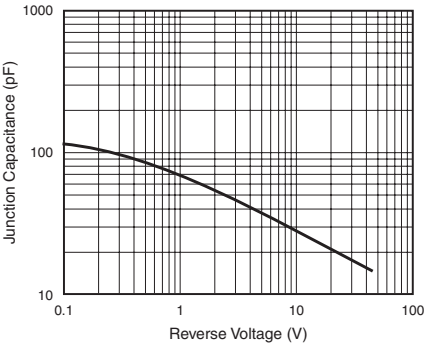


Figure 5. Typical Junction Capacitance

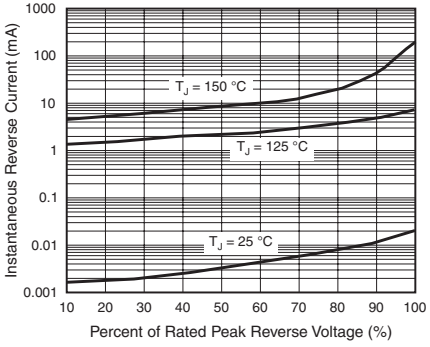


Figure 4. Typical Reverse Characteristics

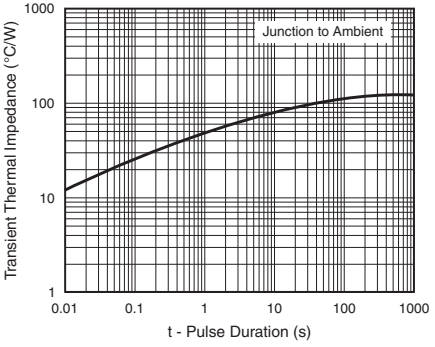
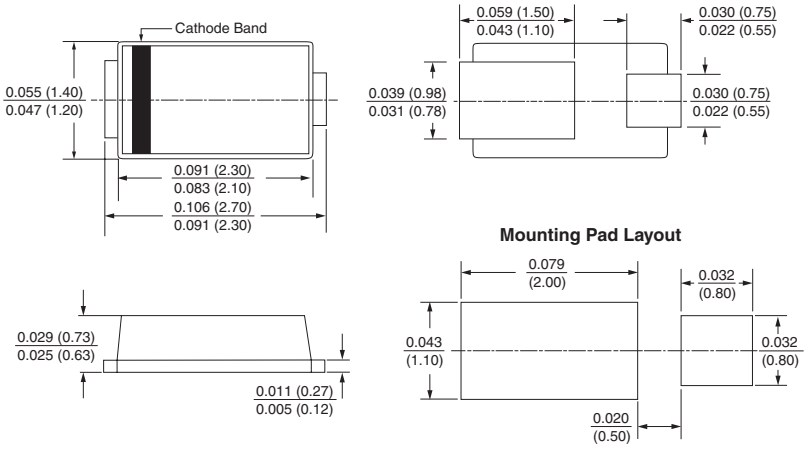


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP



Schottky Barrier Rectifier

DO-204AL (DO-41)

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-204AL (DO-41)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	50 A
V_F	0.48 V, 0.65 V
T_J max.	125 °C, 150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB120	SB130	SB140	SB150	SB160	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50					A
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SB120	SB130	SB140	SB150	SB160	UNIT
Maximum instantaneous forward voltage (1)	1.0 A		V_F	0.48			0.65		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_A = 25 °C	I_R	0.50					mA
		T_A = 100 °C		10			5.0		

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88715
Revision: 20-Aug-07

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB120**	**SB130**	**SB140**	**SB150**	**SB160**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 15					°C/W

Note:

(1) Thermal resistance junction to lead P.C.B. mounted 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB140-E3/54	0.35	54	5500	13" diameter paper tape and reel
SB140-E3/73	0.35	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

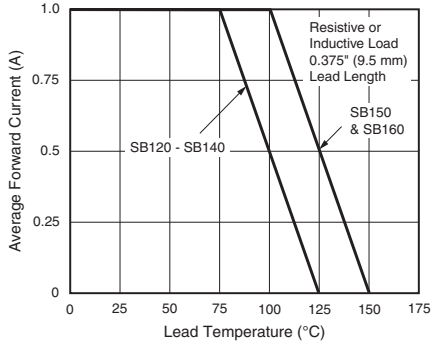


Figure 1. Forward Current Derating Curve

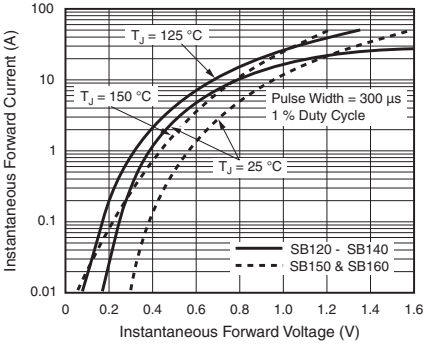


Figure 3. Typical Instantaneous Forward Characteristics

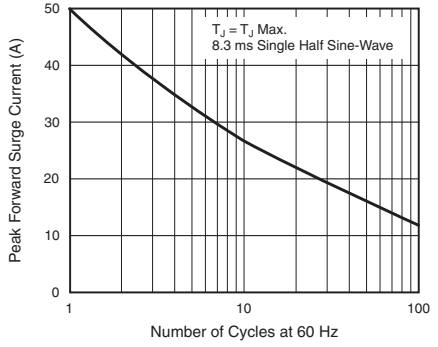


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

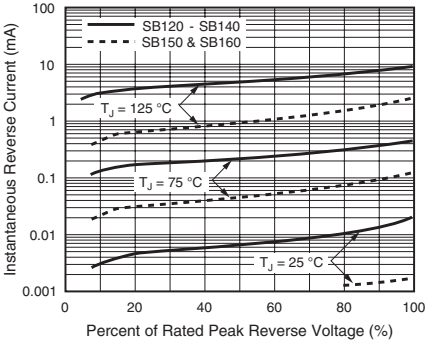


Figure 4. Typical Reverse Characteristics

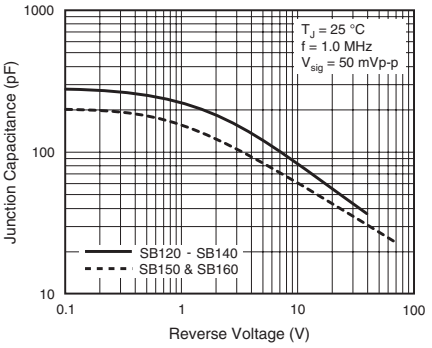


Figure 5. Typical Junction Capacitance

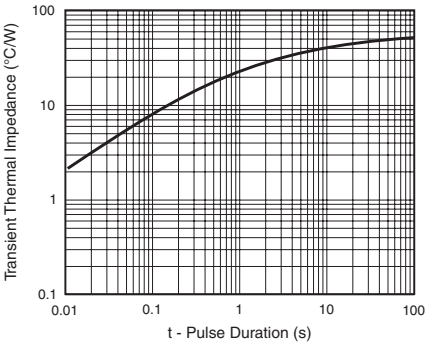
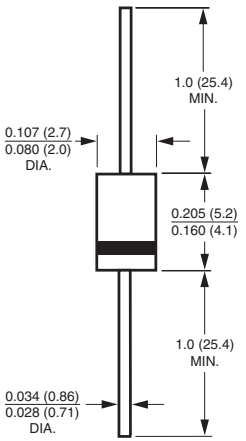


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88715
Revision: 20-Aug-07

Schottky Barrier Rectifier

DO-204AL (DO-41)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	35 A
V_F	0.50 V, 0.70 V
T_J max.	125 °C, 150 °C

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-204AL (DO-41)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB120A	SB130A	SB140A	SB150A	SB160A	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	35					A
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SB120A	SB130A	SB140A	SB150A	SB160A	UNIT
Maximum instantaneous forward voltage (1)	1.0 A		V_F	0.5			0.7		V
Maximum reverse current at rated V_R (2)		T_A = 25 °C	I_R	0.5					mA
		T_A = 100 °C		10			5.0		

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB120A**	**SB130A**	**SB140A**	**SB150A**	**SB160A**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	100 30					°C/W

Note:

(1) Thermal resistance junction to lead P.C.B. mounted 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB140A-E3/54	0.34	54	5500	13" diameter paper tape and reel
SB140A-E3/73	0.34	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

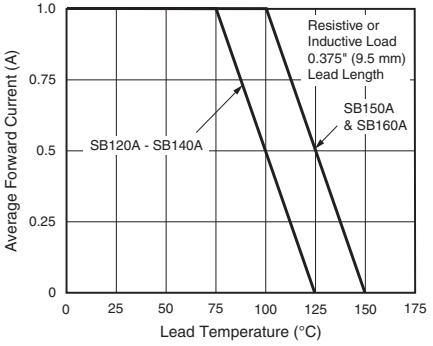


Figure 1. Forward Current Derating Curve

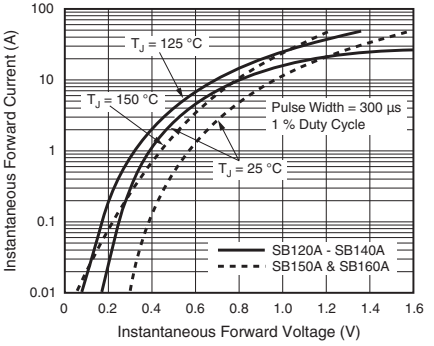


Figure 3. Typical Instantaneous Forward Characteristics

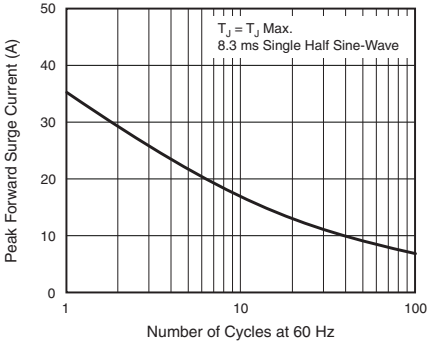


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

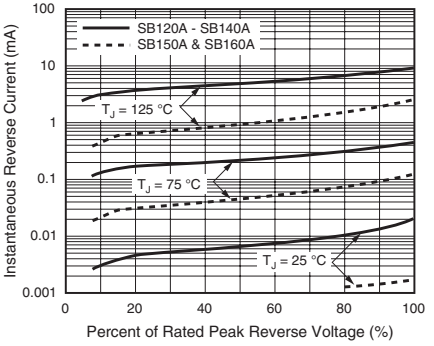
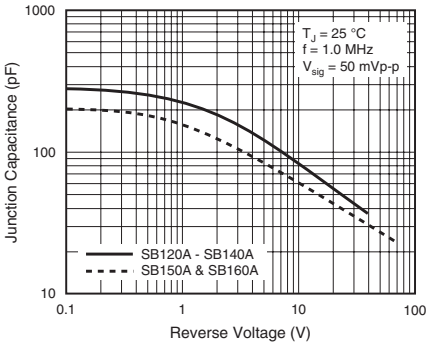


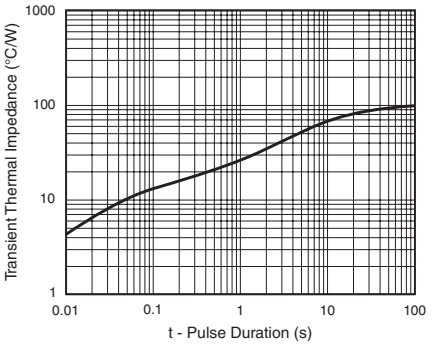
Figure 4. Typical Reverse Characteristics

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88862
Revision: 19-May-08



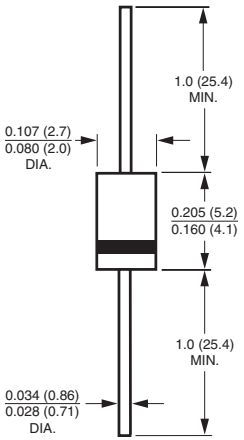
Typical Junction Capacitance



Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance

DO-204AL (DO-41)

FEATURES

- High barrier technology for improved high T_J
- Guardring for overvoltage protection
- Low power losses and high efficiency
- Low forward voltage drop
- Very low leakage current
- High forward surge capability
- High frequency operation
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in middle voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	50 A
V_F	0.62 V
I_R	1.0 µA
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AL (DO-41)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB1H90	SB1H100	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Maximum RMS voltage	V_{RMS}	63	70	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current	$I_{F(AV)}$	1.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Maximum operating junction temperature	T_J	175		°C
Storage temperature range	T_{STG}	- 55 to + 175		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88716
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SB1H90**	**SB1H100**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 1.0 A I_F = 2.0 A I_F = 2.0 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.77 0.62 0.86 0.70		V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	1.0 0.5		µA mA

Notes:

(1) Pulse test: 300 ms pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SB1H90**	**SB1H100**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	57 15		°C/W

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB1H100-E3/54	0.34	54	5500	13" diameter paper tape and reel
SB1H100-E3/73	0.34	73	3000	Ammo pack packaging
SB1H100HE3/54 (1)	0.34	54	5500	13" diameter paper tape and reel
SB1H100HE3/73 (1)	0.34	73	3000	Ammo pack packaging

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

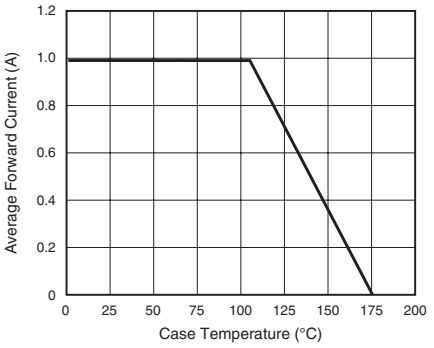


Figure 1. Forward Current Derating Curve

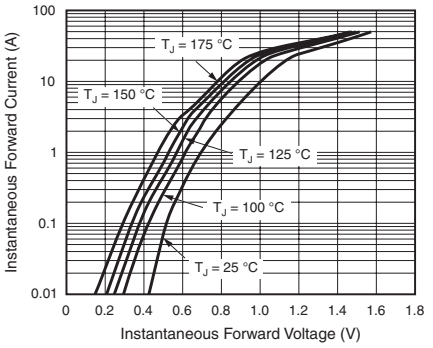


Figure 2. Typical Instantaneous Forward Characteristics

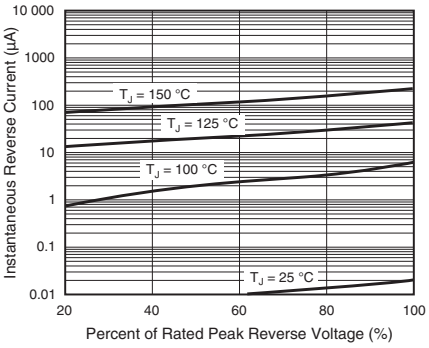


Figure 3. Typical Reverse Characteristics

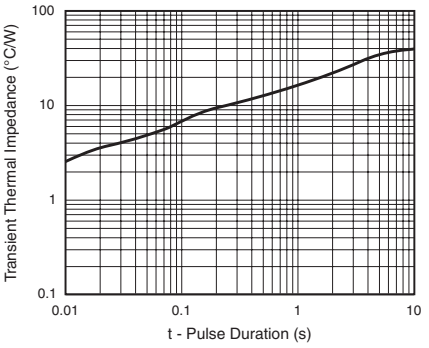


Figure 5. Typical Transient Thermal Impedance

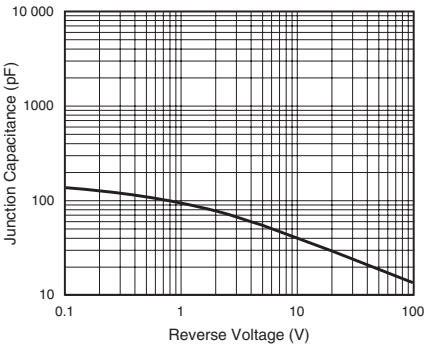
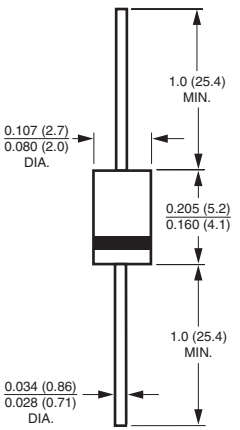


Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88716
Revision: 19-May-08

Surface Mount Schottky Barrier Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	40 A
V_F	0.50 V, 0.75 V
T_J max.	125 °C, 150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS12	SS13	SS14	SS15	SS16	UNIT
Device marking code		S2	S3	S4	S5	S6	V
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40					A
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**SS12**	**SS13**	**SS14**	**SS15**	**SS16**	**UNIT**
Maximum instantaneous forward voltage (1)	1.0 A	V_F	0.50			0.75		V
Maximum DC reverse current at rated DC blocking voltage (1)	T_A = 25 °C	I_R	0.2					mA
	T_A = 100 °C		6.0			5.0		

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SS12**	**SS13**	**SS14**	**SS15**	**SS16**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	88					°C/W
	$R_{\theta JL}$	28					

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS14-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SS14-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
SS14HE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
SS14HE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

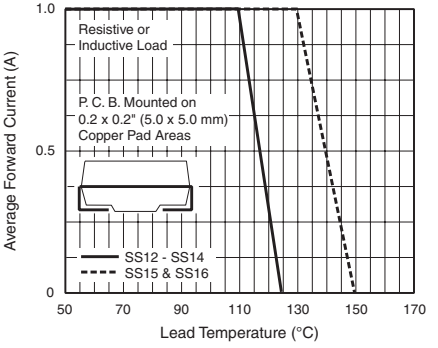


Figure 1. Forward Current Derating Curve

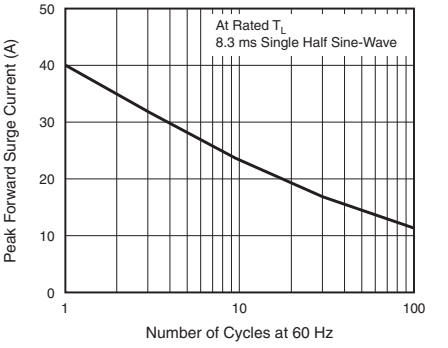


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

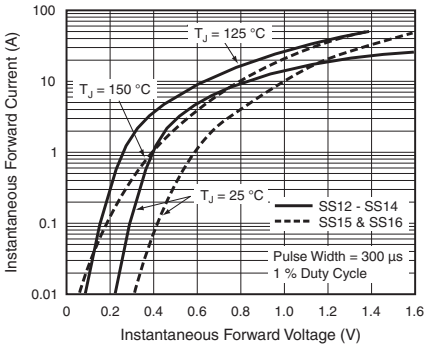


Figure 3. Typical Instantaneous Forward Characteristics

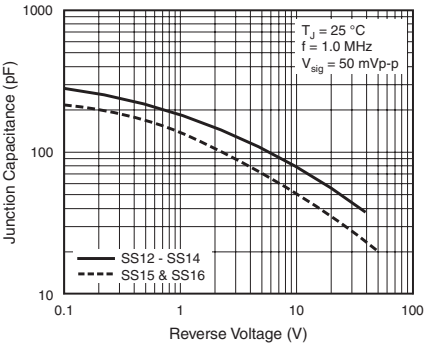


Figure 5. Typical Junction Capacitance

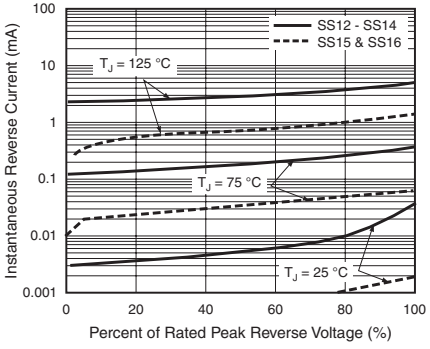
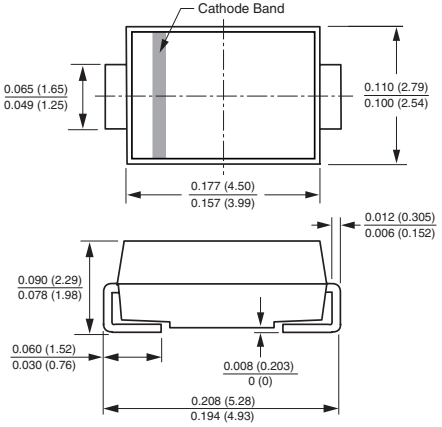


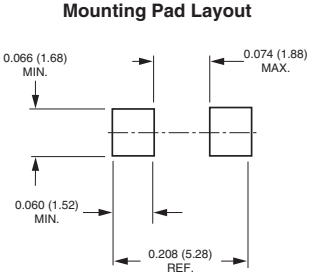
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



B120 thru B160

Vishay General Semiconductor

Surface Mount Schottky Barrier Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	30 A
V_F	0.52 V, 0.75 V
T_J max.	125 °C, 150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	B120	B130	B140	B150	B160	UNIT
Device marking code		B12	B13	B14	B15	B16	V
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30					A
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	B120	B130	B140	B150	B160	UNIT
Maximum instantaneous forward voltage (1)	1.0 A		V_F	0.52			0.75		V
Maximum reverse current at rated V_R (2)		T_A = 25 °C	I_R	0.2					mA
		T_A = 100 °C		6.0			5.0		

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88946
Revision: 19-May-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**B120**	**B130**	**B140**	**B150**	**B160**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$			95 30			°C/W

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B140-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
B140-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

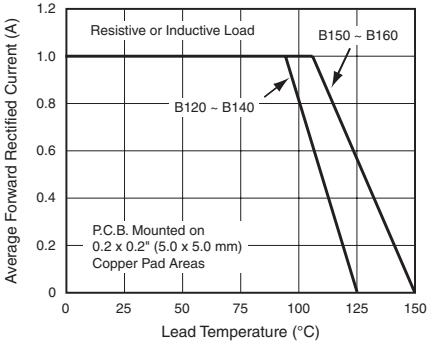


Figure 1. Maximum Forward Current Derating Curve

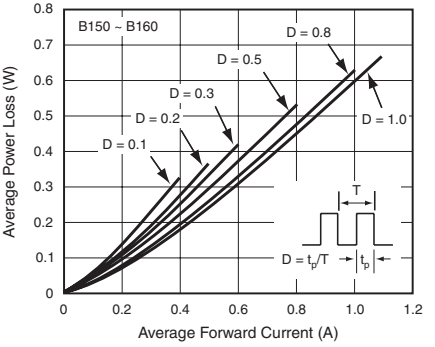


Figure 3. Forward Power Loss Characteristics

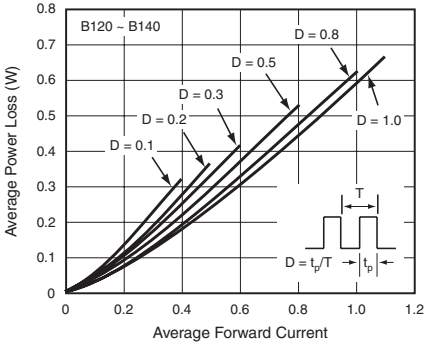


Figure 2. Forward Power Loss Characteristics

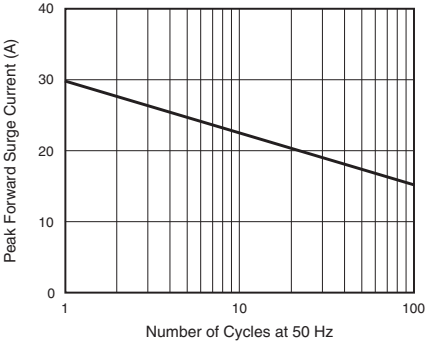


Figure 4. Typical Instantaneous Forward Characteristics

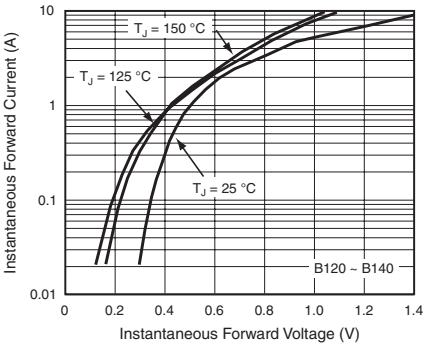


Figure 5. Typical Instantaneous Forward Characteristics

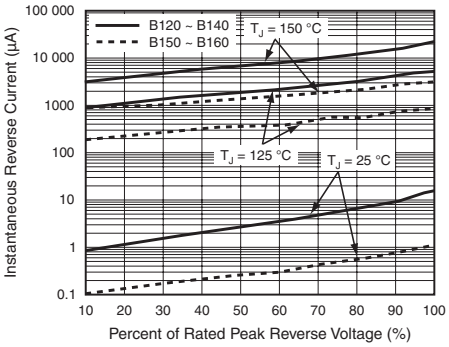


Figure 7. Typical Reverse Leakage Characteristics

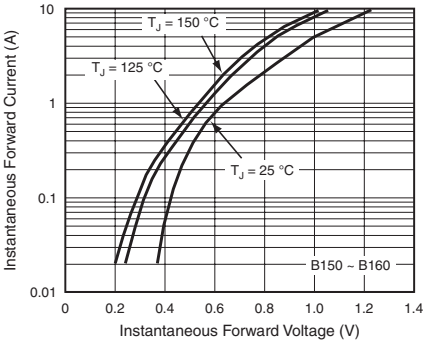


Figure 6. Typical Instantaneous Forward Characteristics

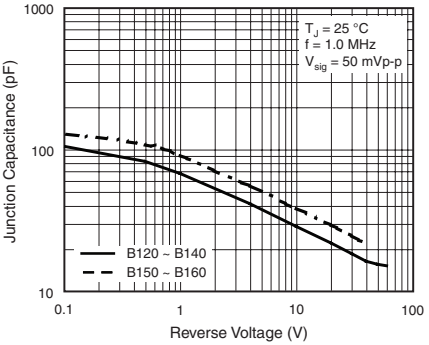
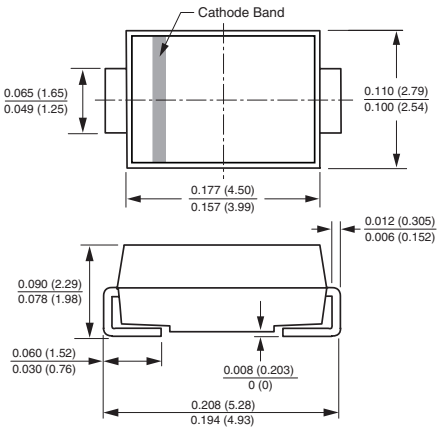


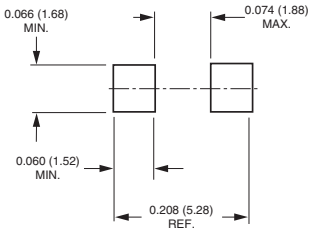
Figure 8. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

High Voltage Surface Mount Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	90 V to 100 V
I_{FSM}	50 A
V_F	0.62 V
I_R	1.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS1H9	SS1H10	UNIT
Device marking code		S9	S10	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Storage temperature range	T_{STG}	- 65 to + 175		°C
Maximum operating temperature	T_J	175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SS1H9**	**SS1H10**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 1.0 A I_F = 2.0 A I_F = 2.0 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.77 0.62 0.86 0.70		V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	1.0 0.5		µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS1H9**	**SS1H10**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	88 30		°C/W

Note:
(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS1H10-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SS1H10-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
SS1H10HE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
SS1H10HE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

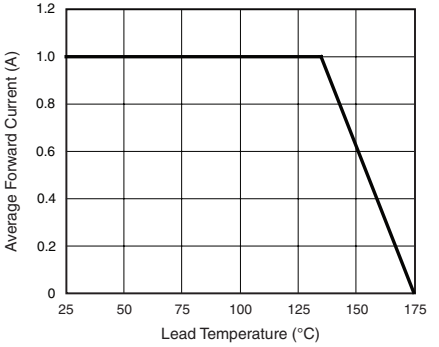


Figure 1. Forward Current Derating Curve

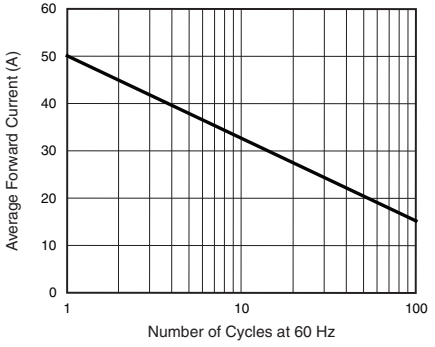


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

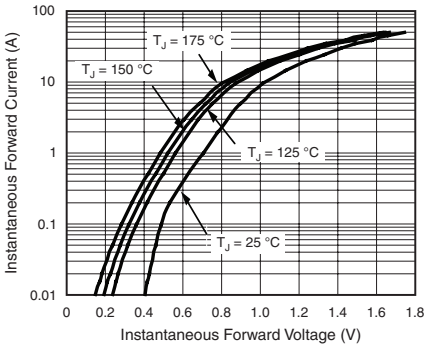


Figure 3. Typical Instantaneous Forward Characteristics

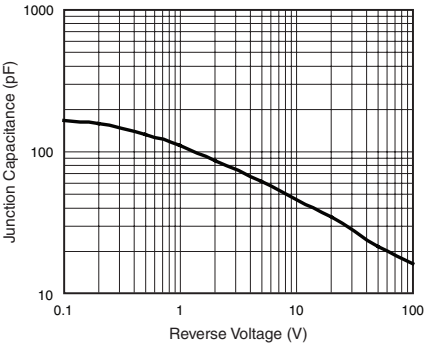


Figure 5. Typical Junction Capacitance

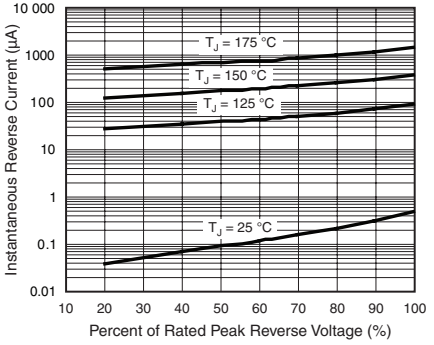


Figure 4. Typical Reverse Characteristics

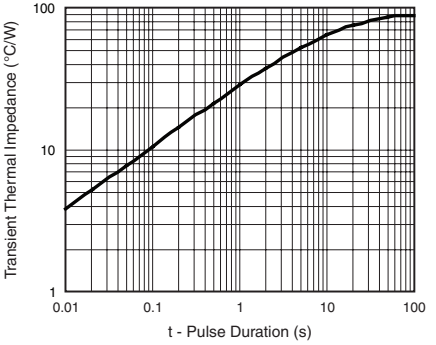
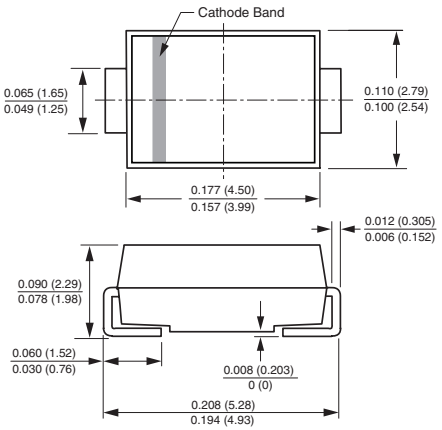


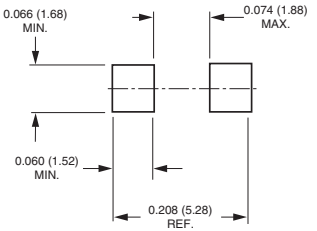
Figure 6. Typical Transient Thermal

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Low V_F High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F	0.35 V, 0.38 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS1P3L**	**SS1P4L**	**UNIT**
Device marking code		13L	14L	
Maximum repetive peak reverse voltage	V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1) T_L = 140 °C T_L = 135 °C	$I_{F(AV)}$	1.0 1.5		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Non-repetitive avalanche energy at I_{AS} = 1.5 A, L = 10 mH, T_J = 25 °C	E_{AS}	11.25		mJ
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
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Document Number: 88915
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SS1P3L**	**SS1P4L**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 1.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.45 0.35	0.48 0.38	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	200 20	150 15	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	110	130	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS1P3L**	**SS1P4L**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 15 20		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS1P3L-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS1P3L-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS1P3LHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS1P3LHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

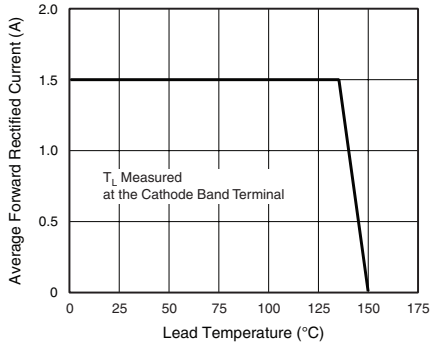


Figure 1. Maximum Forward Current Derating Curve

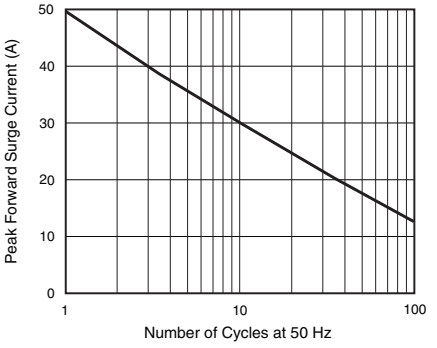


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

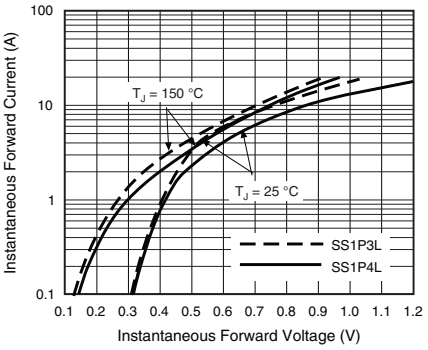


Figure 3. Typical Instantaneous Forward Characteristics

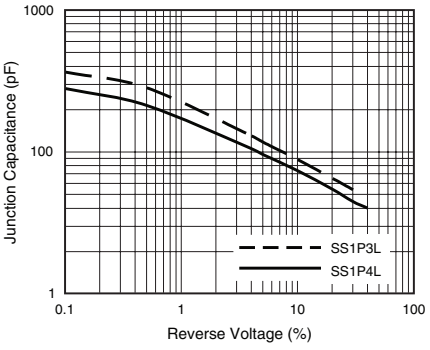


Figure 5. Typical Junction Capacitance

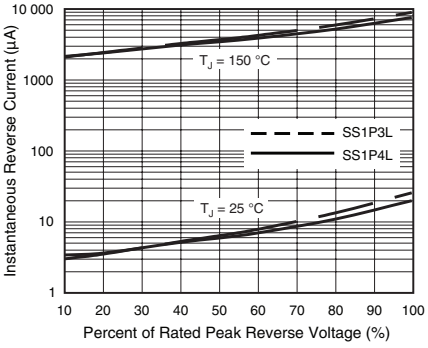


Figure 4. Typical Reverse Leakage Characteristics

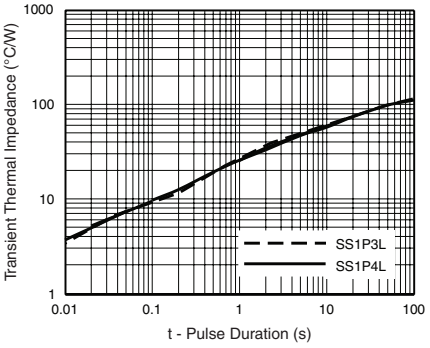
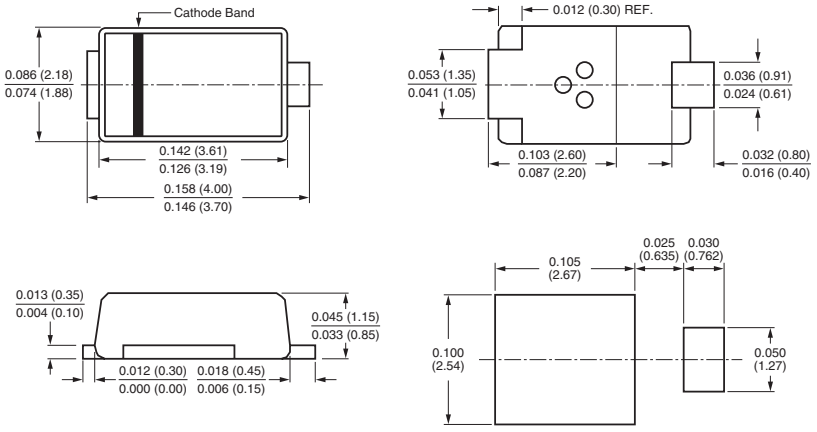


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	30 A
E_{AS}	10 mJ
V_F	0.40 V, 0.45 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS1P3	SS1P4	UNIT
Device marking code		13	14	
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30		A
Non-repetitive avalanche energy at I_{AS} = 1.5 A, L = 10 mH, T_J = 25 °C	E_{AS}	10		mJ
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SS1P3	SS1P4	UNIT
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 1.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.50 0.40	0.53 0.45	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	150 15		µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	70		pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS1P3**	**SS1P4**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 15 25		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS1P3-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS1P3-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

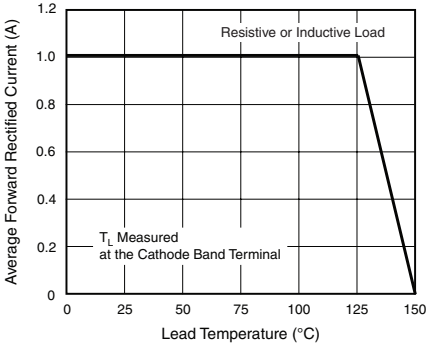


Figure 1. Maximum Forward Current Derating Curve

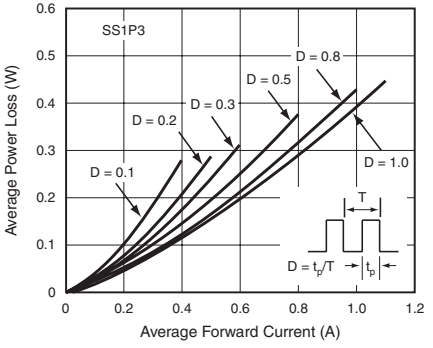


Figure 2. Forward Power Loss Characteristics

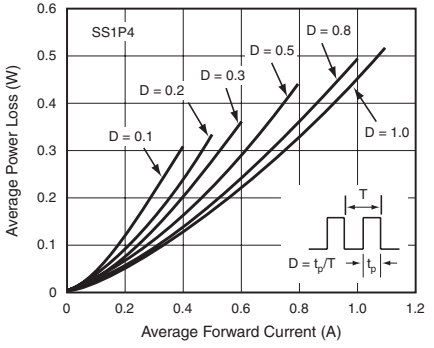


Figure 3. Forward Power Loss Characteristics

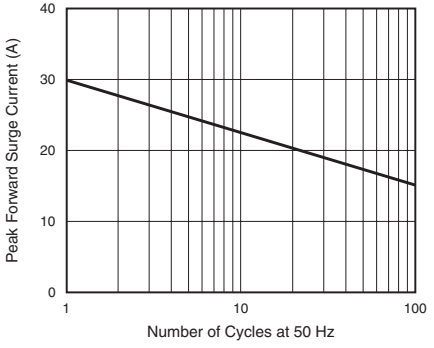


Figure 4. Typical Instantaneous Forward Characteristics

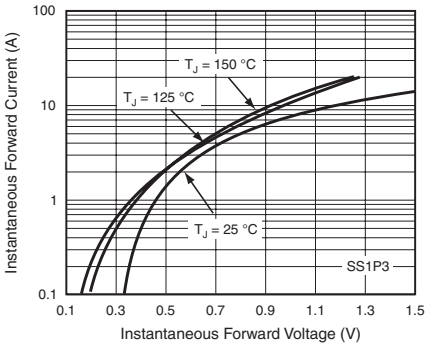


Figure 5. Typical Instantaneous Forward Characteristics

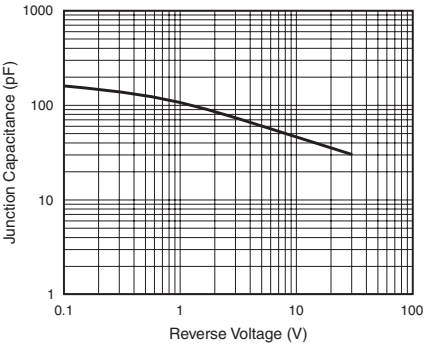


Figure 8. Typical Junction Capacitance

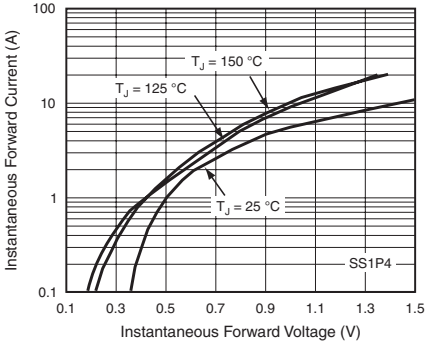


Figure 6. Typical Instantaneous Forward Characteristics

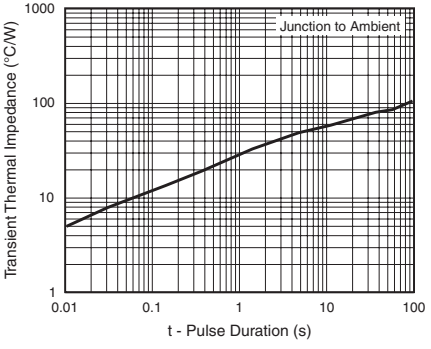


Figure 9. Typical Transient Thermal Impedatnce

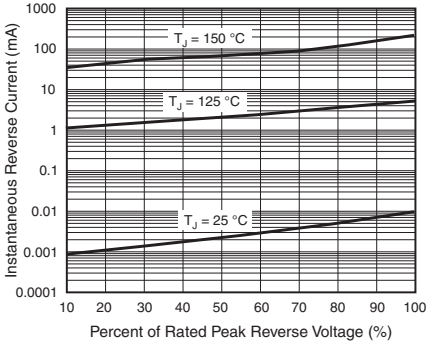
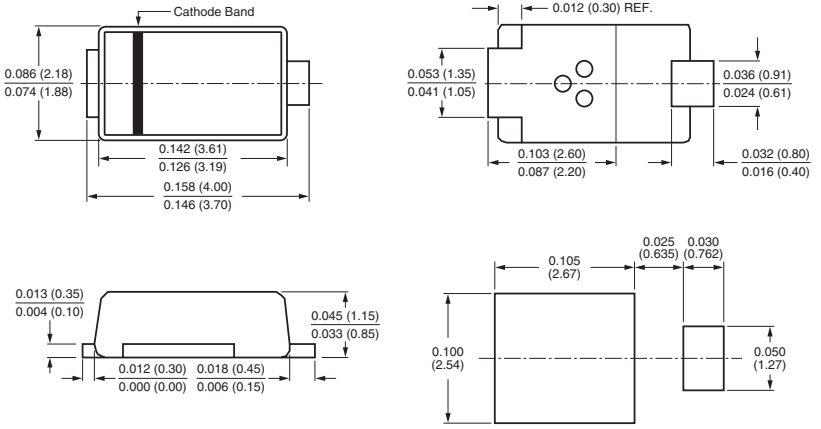


Figure 7. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



High Current Density Surface Mount Schottky Barrier Rectifier

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F at I_F = 1.0 A	0.43 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS1P5L**	**SS1P6L**	**UNIT**
Device marking code		15L	16L	
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Non-repetitive avalanche energy at I_{AS} = 1.5 A, T_A = 25 °C	E_{AS}	11.25		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 1.0 A I_F = 1.0 A	T_A = 25 °C T_A = 125 °C	V_F	0.52 0.43	0.59 0.52	V
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 1.6	100 10	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	80	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise specified)				
PARAMETER	**SYMBOL**	**SS1P5L**	**SS1P6L**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	125 25		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band.

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS1P6L-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS1P6L-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS1P6LHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS1P6LHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

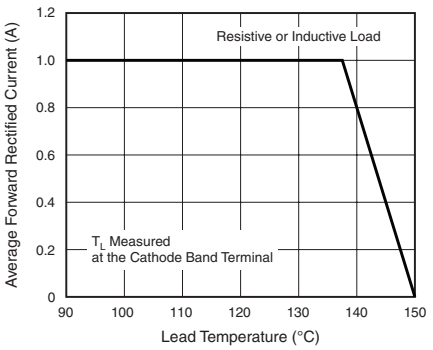


Figure 1. Maximum Forward Current Derating Curve

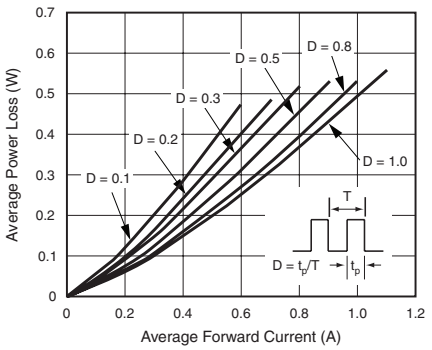


Figure 2. Forward Power Loss Characteristics

For technical questions within your region, please contact one of the following:
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Revision: 26-May-08

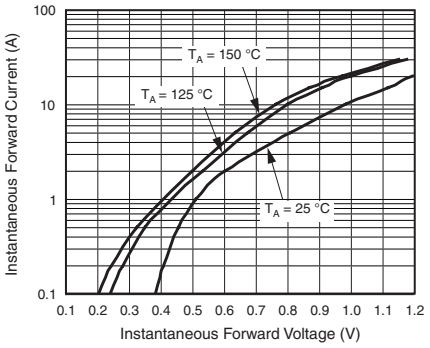


Figure 3. Typical Instantaneous Forward Characteristics

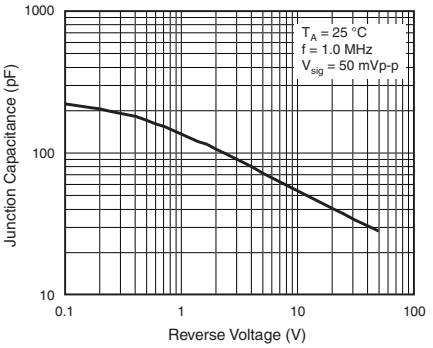


Figure 5. Typical Junction Capacitance

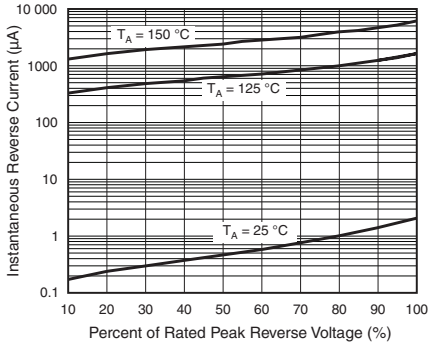


Figure 4. Typical Reverse Leakage Characteristics

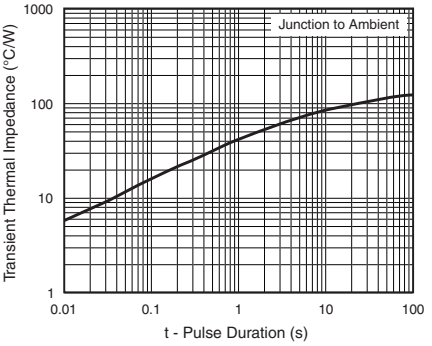
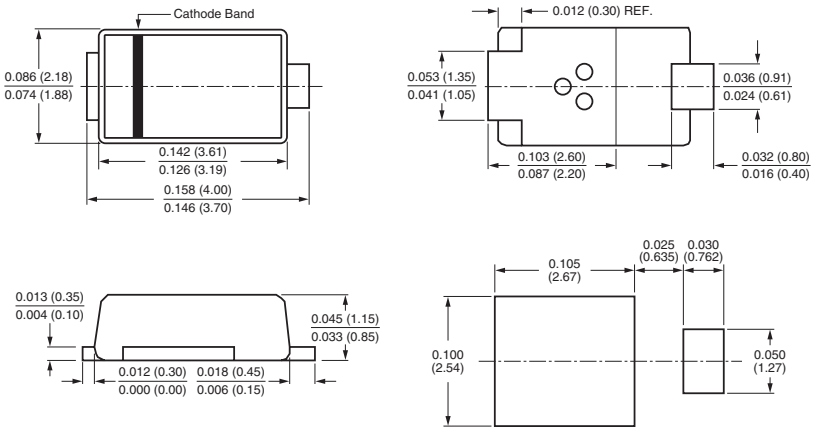


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



Surface Mount Schottky Barrier Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low switching losses
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	25 V to 45 V
I_{FSM}	40 A
V_F	0.50 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	BYS10-25	BYS10-35	BYS10-45	UNIT
Device marking code			BYS 025	BYS 035	BYS 045	
Maximum repetitive peak reverse voltage		V_{RRM}	25	35	45	V
Maximum average forward rectified current		$I_{F(AV)}$	1.5			A
Peak forward surge current single half sine-wave superimposed on rated load	8.3 ms 10 ms	I_{FSM}	40 30			A
Junction and storage temperature range		T_J, T_{STG}	- 65 to + 150			°C

For technical questions within your region, please contact one of the following:
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Revision: 21-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYS10-25**	**BYS10-35**	**BYS10-45**	**UNIT**
Maximum instantaneous forward voltage (1)	1.0 A		V_F	500			mV
Maximum DC reverse current (1)	V_{RRM}	T_J = 25 °C T_J = 100 °C	I_R	500 10			µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**BYS10-25**	**BYS10-35**	**BYS10-45**	**UNIT**
Maximum thermal resistance, junction to lead	$R_{\theta JL}$	25			°C/W
Maximum thermal resistance, junction to ambient	$R_{\theta JA}$	150 (1) 125 (2) 100 (3)			°C/W

Notes:

(1) Mounted on epoxy-glass hard tissue

(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu

(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYS10-45-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYS10-45-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYS10-45HE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYS10-45HE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

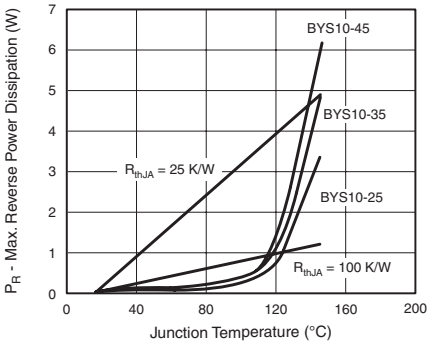


Figure 1. Max. Reverse Power Dissipation vs. Junction Temperature

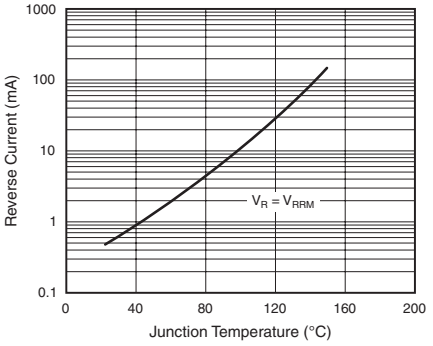


Figure 2. Max. Reverse Current vs. Junction Temperature

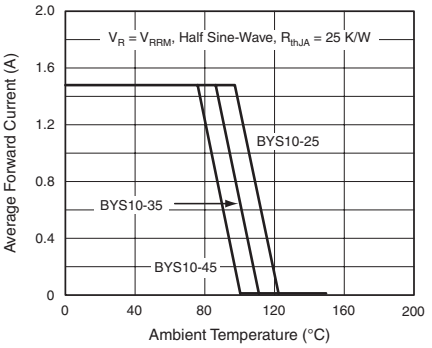


Figure 3. Max. Average Forward Current vs. Ambient Temperature

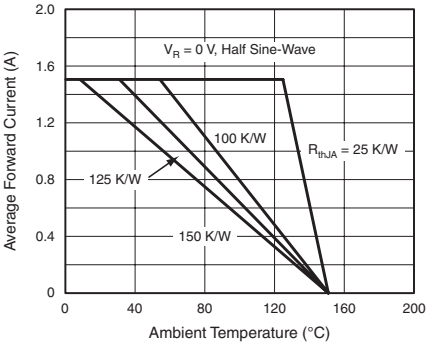


Figure 4. Max. Average Forward Current vs. Ambient Temperature

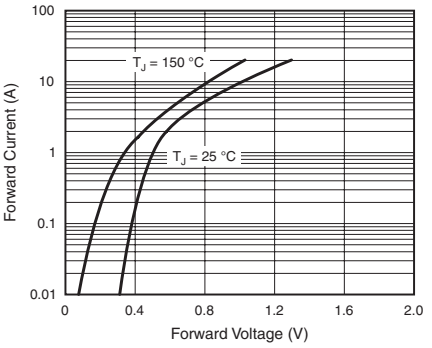


Figure 5. Max. Forward Current vs. Forward Voltage

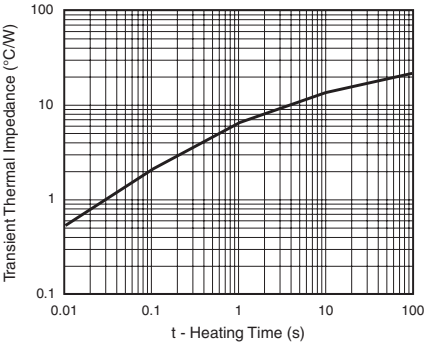
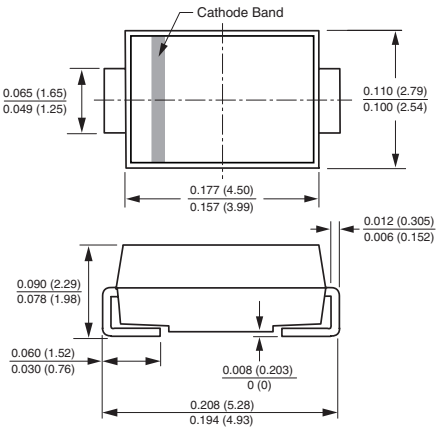


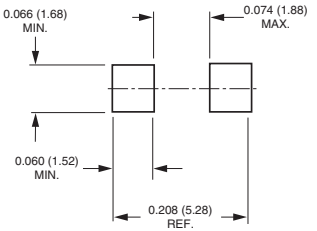
Figure 6. Diode Capacitance vs. Reverse Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



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Surface Mount Schottky Barrier Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low switching losses
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, oring diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	90 V
I_{FSM}	40 A
V_F	0.75 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**BYS11-90**	**UNIT**
Device marking code			BYS 109	
Maximum repetitive peak reverse voltage		V_{RRM}	90	V
Maximum average forward rectified current		$I_{F(AV)}$	1.5	A
Peak forward surge current single half sine-wave superimposed on rated load	8.3 ms 10 ms	I_{FSM}	40 30	A
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Junction and storage temperature range		T_J, T_{STG}	- 55 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYS11-90**	**UNIT**
Maximum instantaneous forward voltage (1)	1.0 A		V_F	750	mV
Maximum DC reverse current (1)	V_{RRM}	T_J = 25 °C T_J = 100 °C	I_R	100 1	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**BYS11-90**	**UNIT**
Maximum thermal resistance, junction to lead	$R_{\theta JL}$	25	°C/W
Maximum thermal resistance, junction to ambient	$R_{\theta JA}$	150 (1) 125 (2) 100 (3)	°C/W

Notes:

(1) Mounted on epoxy-glass hard tissue

(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu

(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYS11-90-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYS11-90-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYS11-90HE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYS11-90HE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

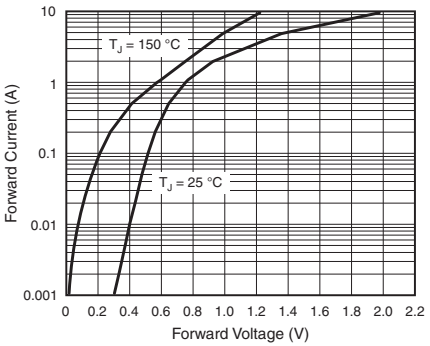

Figure 1. Forward Current vs. Forward Voltage

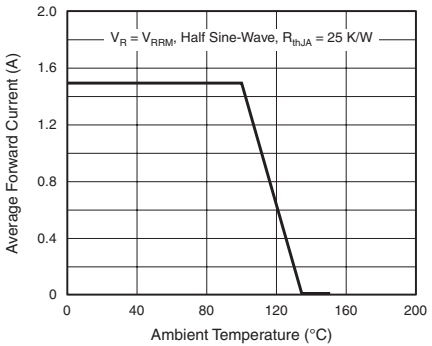

Figure 2. Max. Average Forward Current vs. Ambient Temperature

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Document Number: 86014
Revision: 21-Jan-08

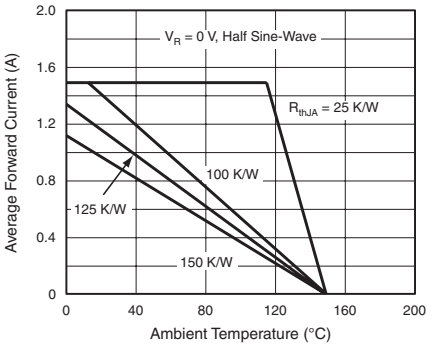


Figure 3. Max. Average Forward Currentvs. Ambient Temperature

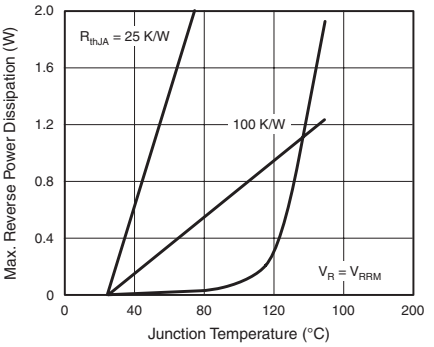


Figure 5. Max Reverse Power Dissipation vs. Junction Temperature

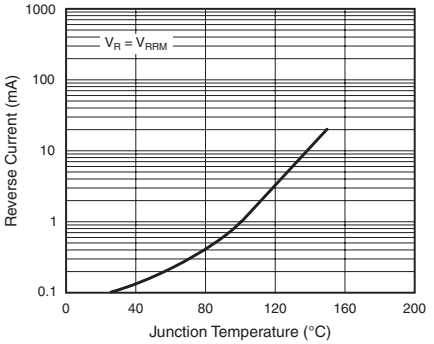


Figure 4. Reverse Current vs. Junction Temperature

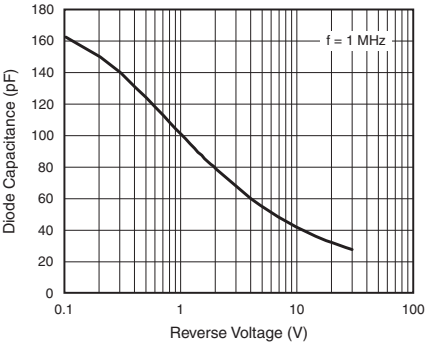
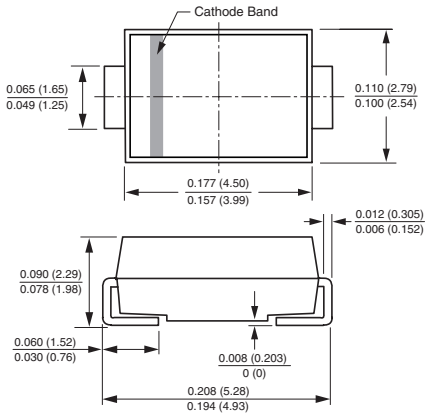


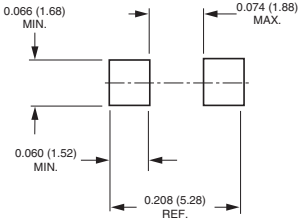
Figure 6. Diode Capacitance vs. Reverse Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Surface Mount Schottky Barrier Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low switching losses
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	90 V
I_{FSM}	40 A
V_F	0.75 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**BYS12-90**	**UNIT**
Device marking code			BYS 209	
Maximum repetitive peak reverse voltage		V_{RRM}	90	V
Maximum average forward rectified current		$I_{F(AV)}$	1.5	A
Peak forward surge current single half sine-wave superimposed on rated load	8.3 ms 10 ms	I_{FSM}	40 30	A
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Junction and storage temperature range		T_J, T_{STG}	- 55 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88950
Revision: 24-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYS12-90**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 15 mA	T_J = 25 °C	V_F	750 360	mV
Maximum DC reverse current (1)	V_{RRM}	T_J = 25 °C T_J = 100 °C	I_R	100 1	µA mA

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**BYS12-90**	**UNIT**
Maximum thermal resistance, junction to lead	$R_{\theta JL}$	25	°C/W
Maximum thermal resistance, junction to ambient	$R_{\theta JA}$	150 (1) 125 (2) 100 (3)	°C/W

Notes:
(1) Mounted on epoxy-glass hard tissue
(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu
(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYS12-90-E3/TR	0.064	61T	1800	7" diameter plastic tape and reel
BYS12-90-E3/TR3	0.064	5AT	7500	13" diameter plastic tape and reel
BYS12-90HE3/TR (1)	0.064	61T	1800	7" diameter plastic tape and reel
BYS12-90HE3/TR3 (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

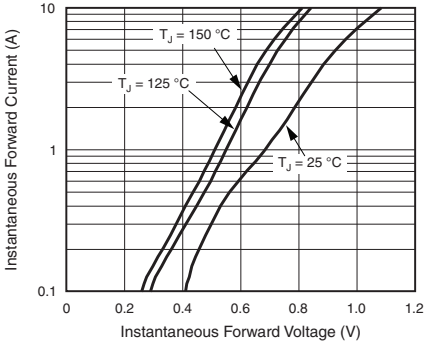


Figure 1. Forward Current vs. Forward Voltage

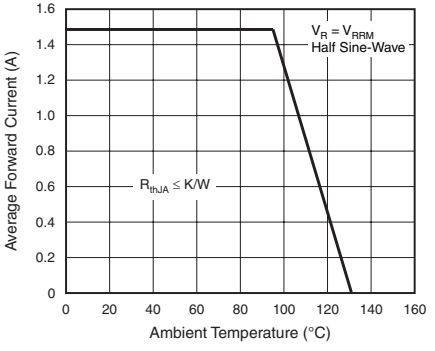


Figure 2. Max. Average Forward Current vs. Ambient Temperature

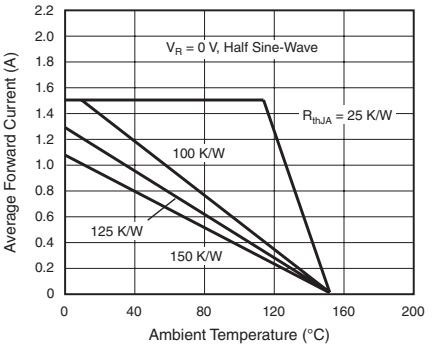


Figure 3. Max. Average Forward Current vs. Ambient Temperature

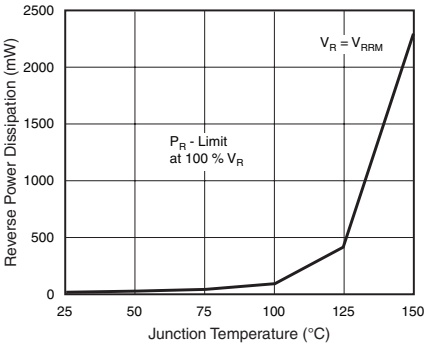


Figure 5. Max. Reverse Power Dissipation vs. Junction Temperature

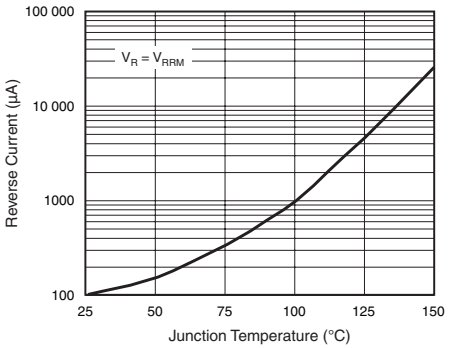


Figure 4. Reverse Current vs. Junction Temperature

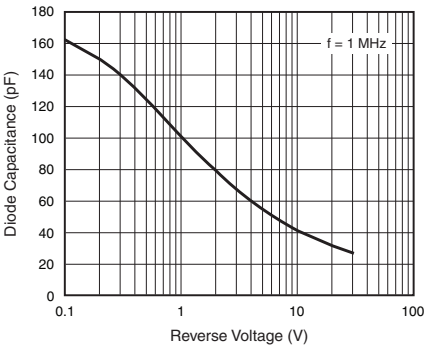
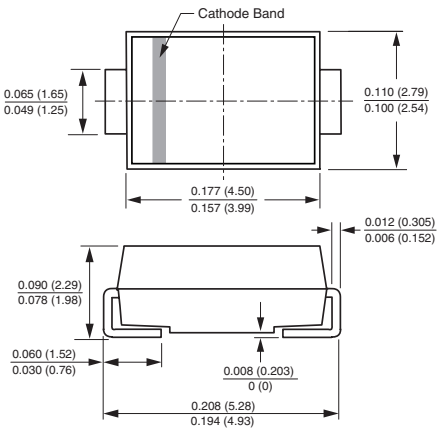


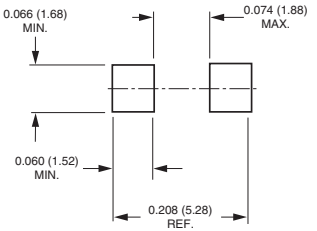
Figure 6. Diode Capacitance vs. Reverse Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Low V_F Surface Mount Schottky Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	20 V, 30 V
I_{FSM}	50 A
V_F	0.34 V
T_J max.	125 °C

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SL12	SL13	UNIT
Device marking code		SL2	SL3	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	V
Maximum RMS voltage	V_{RMS}	14	21	V
Maximum DC blocking voltage	V_{DC}	20	30	V
Maximum average forward rectified current at T_L = 105 °C (Fig. 1)	$I_{F(AV)}$	1.5		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 55 to + 125		°C
Storage temperature range	T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SL12**	**SL13**	**UNIT**
Maximum instantaneous forward voltage at (1)	I_F = 0.1 A I_F = 0.1 A I_F = 1.0 A I_F = 1.0 A	T_A = 125 °C T_A = 25 °C T_A = 125 °C T_A = 25 °C	V_F	0.230 0.360 0.340 0.445		V
Maximum DC reverse current at rated DC blocking voltage (1)		T_A = 25 °C T_A = 100 °C	I_R	0.2 6.0		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SL12**	**SL13**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	88 28		°C/W

Note:

(1) P.C.B. mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SL13-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SL13-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
SL13HE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
SL13HE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

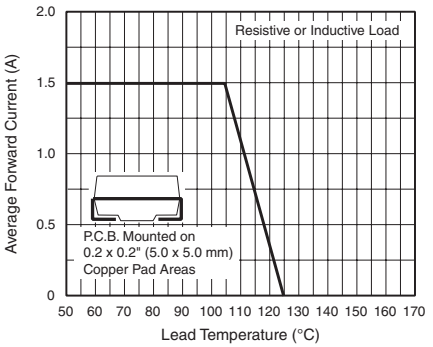


Figure 1. Forward Current Derating Curve

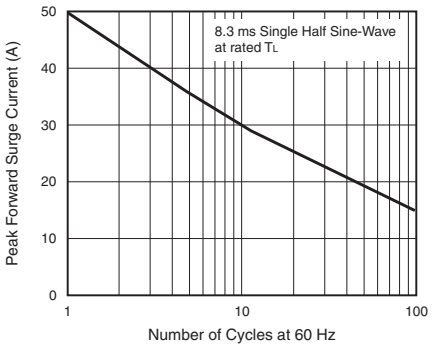


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88740
Revision: 22-Jan-08

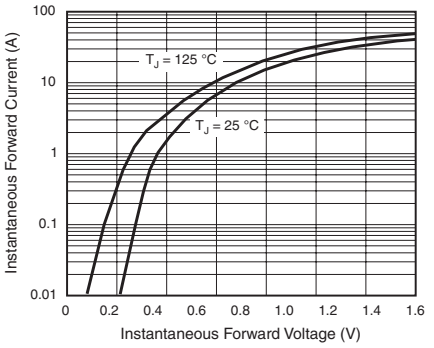


Figure 3. Typical Instantaneous Forward Characteristics

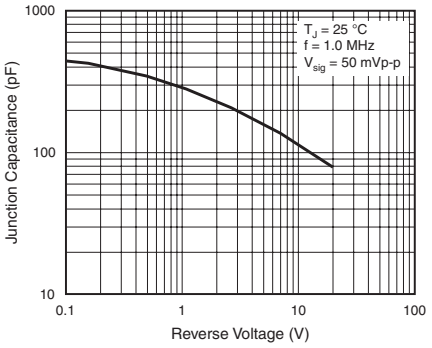


Figure 5. Typical Junction Capacitance

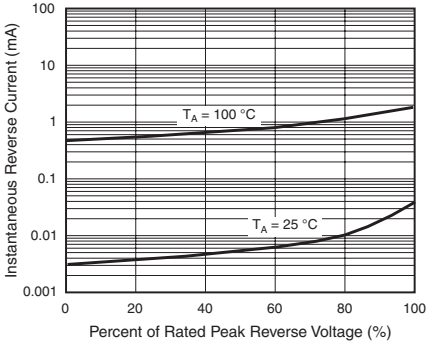
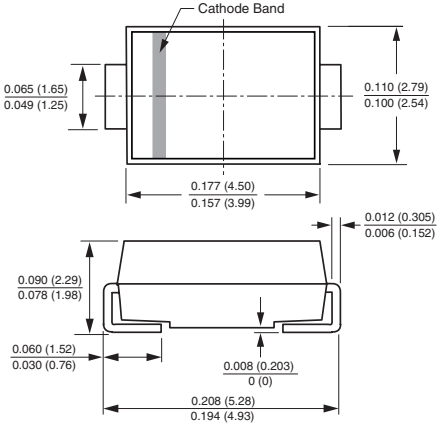


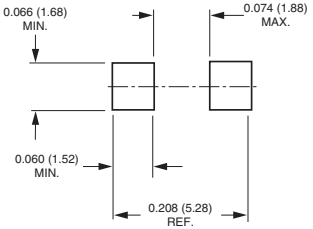
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

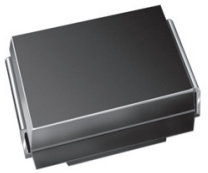
DO-214AC (SMA)



Mounting Pad Layout



High Voltage Surface Mount Schottky Rectifier



DO-214AA (SMB)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	90 V, 100 V
I_{FSM}	75 A
V_F	0.71 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS29**	**SS210**	**UNIT**
Device marking code		S9	S10	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Maximum RMS voltage	V_{RMS}	63	70	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.5		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	75		A
Peak repetitive reverse surge current at t_p = 2 µs, 1 kHz	I_{RRM}	1.0		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88749
Revision: 07-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SS29**	**SS210**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 0.1 A I_F = 1.0 A I_F = 3.0 A I_F = 1.5 A I_F = 3.0 A	T_A = 25 °C T_A = 25 °C T_A = 25 °C T_A = 100 °C T_A = 100 °C	V_F	0.43 0.75 0.95 0.71 0.85		V
Maximum DC reverse current at rated V_R (1)		T_A = 25 °C T_A = 100 °C	I_R	30 5		µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS29**	**SS210**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	85 25		°C/W

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS210-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
SS210-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
SS210HE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
SS210HE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

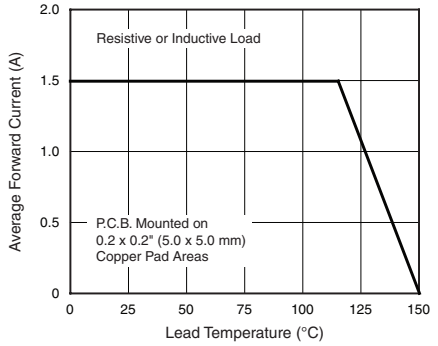


Figure 1. Forward Current Derating Curve

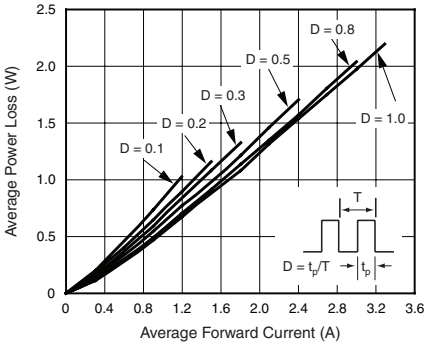


Figure 2. Forward Power Loss Characteristics

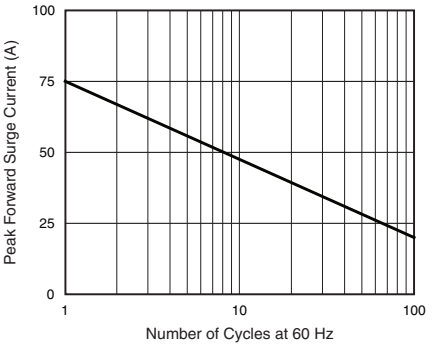


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

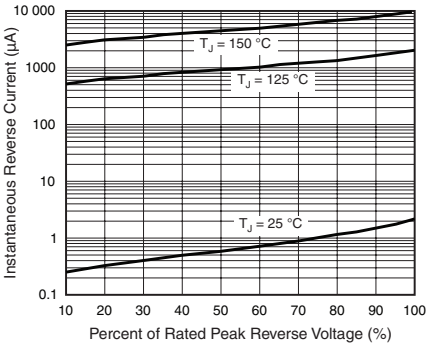


Figure 5. Typical Reverse Leakage Characteristics

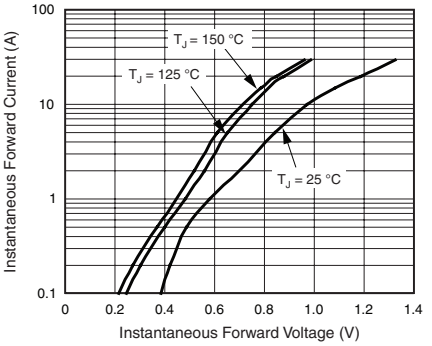


Figure 4. Typical Instantaneous Forward Characteristics

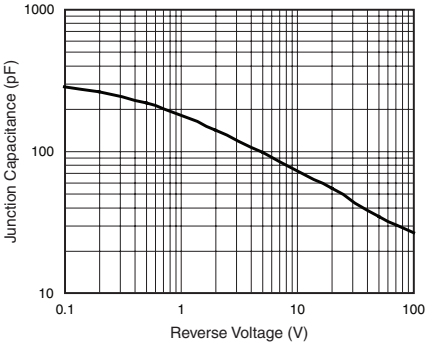
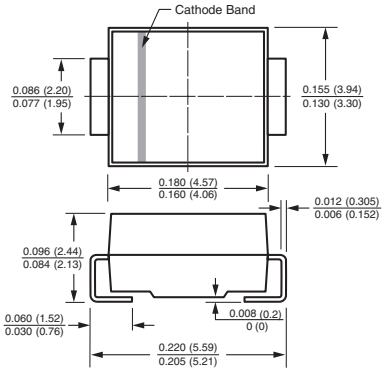


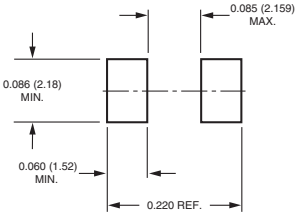
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



Mounting Pad Layout



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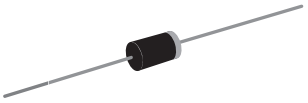
Schottky Barrier Rectifiers



DO-204AC (DO-15)

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	60 A
V_F	0.50 V, 0.68 V
T_J max.	125 °C, 150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB220	SB230	SB240	SB250	SB260	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	2.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	60					A
Maximum full load reverse current, full cycle average at T_A = 75 °C	$I_{R(AV)}$	30					mA
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SB220**	**SB230**	**SB240**	**SB250**	**SB260**	**UNIT**
Maximum instantaneous forward voltage (1)	2.0 A		V_F	0.50			0.68		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_A = 25 °C	I_R	0.50					mA
		T_A = 100 °C		15			8.0		
Typical junction capacitance			C_J	170					pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB220**	**SB230**	**SB240**	**SB250**	**SB260**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	45 14					°C/W

Note:

(1) Thermal resistance junction to lead P.C.B. mounted 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB240-E3/54	0.398	54	4000	13" diameter paper tape and reel
SB240-E3/73	0.398	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

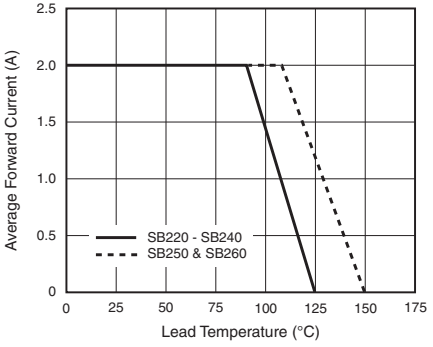


Figure 1. Forward Current Derating Curve

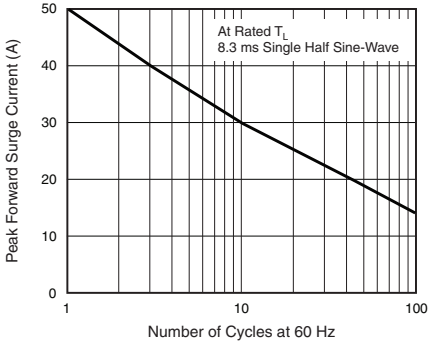


Figure 2. Maximum Non-Repetitive Surge Current

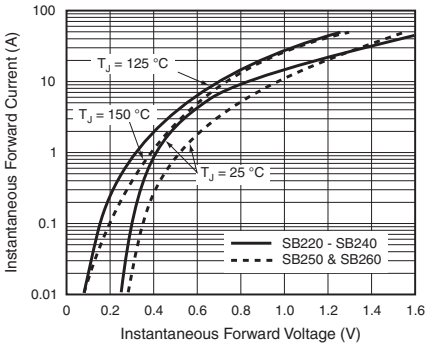


Figure 3. Typical Instantaneous Forward Characteristics

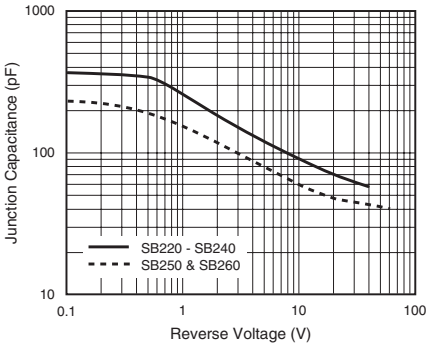


Figure 5. Typical Junction Capacitance

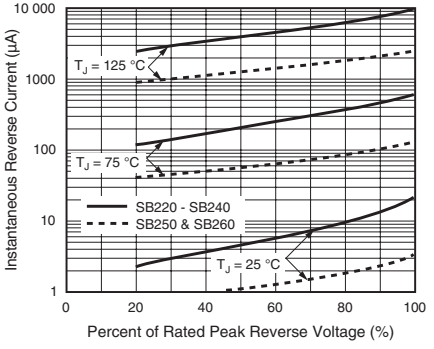


Figure 4. Typical Reverse Characteristics

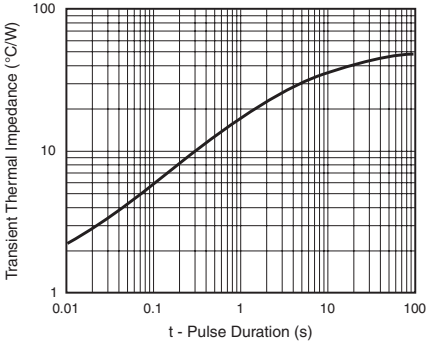
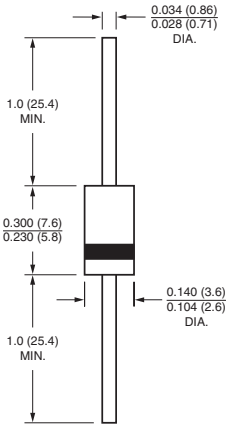


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

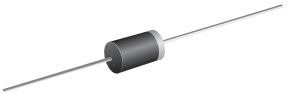
DO-204AC (DO-15)



SB220S thru SB260S

Vishay General Semiconductor

Schottky Barrier Rectifier



DO-204AL (DO-41)

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-204AL (DO-41)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	50 A
V_F	0.55 V, 0.70 V
T_J max.	125 °C, 150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB220S	SB230S	SB240S	SB250S	SB260S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	2.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50					A
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SB220S	SB230S	SB240S	SB250S	SB260S	UNIT
Maximum instantaneous forward voltage (1)	2.0 A		V_F	0.55			0.70		V
Maximum reverse current at rated V_R (2)		T_J = 25 °C	I_R	0.50					mA
		T_J = 125 °C		25			15		

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

For technical questions within your region, please contact one of the following:
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Document Number: 88951
Revision: 19-May-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB220S**	**SB230S**	**SB240S**	**SB250S**	**SB260S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	75 25					°C/W

Note:

(1) Thermal resistance junction to lead P.C.B. mounted 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB240S-E3/54	0.346	54	5500	13" diameter paper tape and reel
SB240S-E3/73	0.346	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

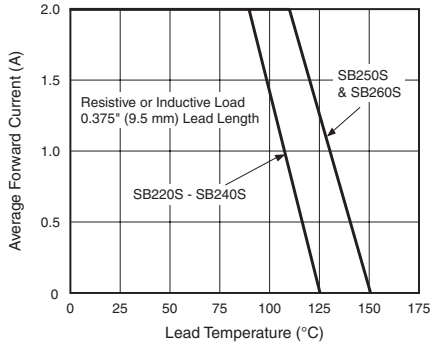


Figure 1. Forward Current Derating Curve

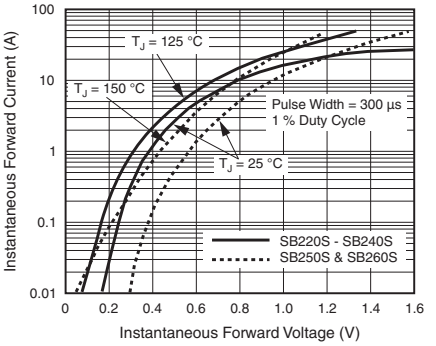


Figure 3. Typical Instantaneous Forward Characteristics

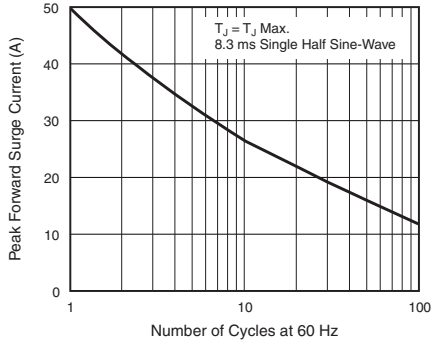


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

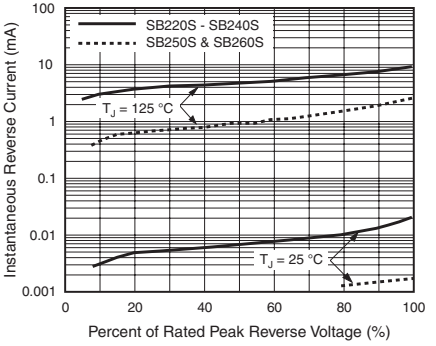


Figure 4. Typical Reverse Characteristics

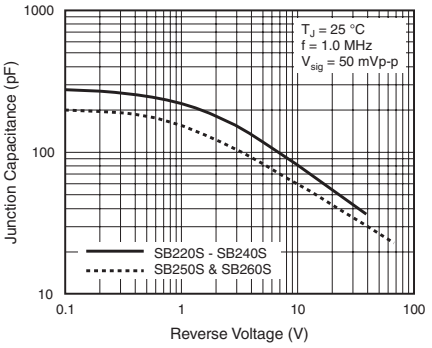
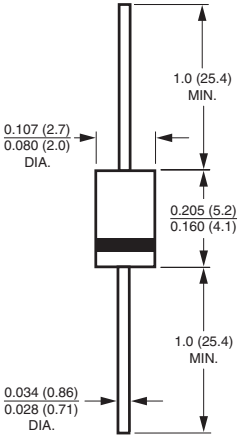


Figure 5. Typical Junction Capacitance

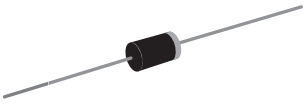
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



DO-204AC (DO-15)

FEATURES

- Guardring for overvoltage protection
- Low power losses and high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in middle voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	75 A
V_F	0.65 V
I_R	10 µA
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB2H90	SB2H100	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at T_A = 25 °C	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	75		A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Critical rate of rise of reverse voltage	dV/dt	10 000		V/µs
Storage temperature range	T_{STG}	- 55 to + 175		°C
Maximum operating junction temperature	T_J	175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SB2H90**	**SB2H100**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2.0 A I_F = 2.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.79 0.65		V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	10 4.0		µA mA

Notes:

(1) Pulse test: 300 ms pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SB2H90**	**SB2H100**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	45 14		°C/W

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB2H100-E3/54	0.398	54	4000	13" diameter paper tape and reel
SB2H100-E3/73	0.398	73	2000	Ammo pack packaging
SB2H100HE3/54 (1)	0.398	54	4000	13" diameter paper tape and reel
SB2H100HE3/73 (1)	0.398	73	2000	Ammo pack packaging

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

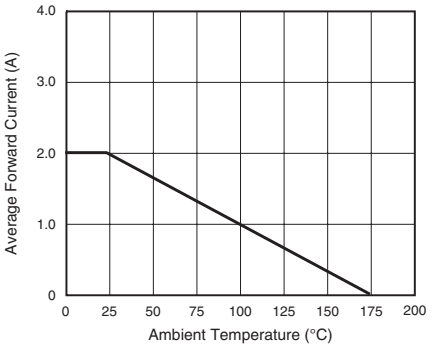


Figure 1. Forward Current Derating Curve

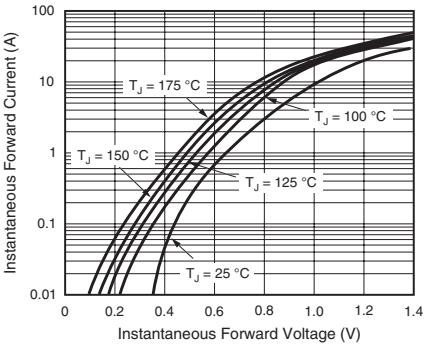


Figure 2. Typical Instantaneous Forward Characteristics

For technical questions within your region, please contact one of the following:
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Document Number: 88718
Revision: 19-May-08

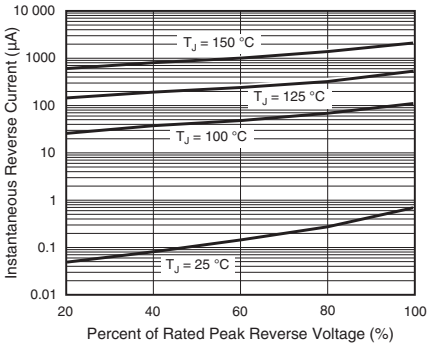


Figure 3. Typical Reverse Characteristics

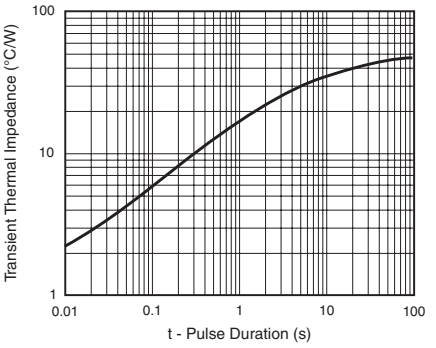


Figure 5. Typical Transient Thermal Impedance

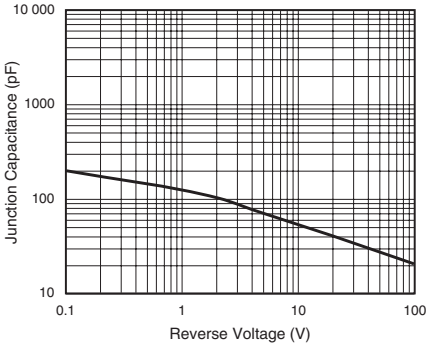
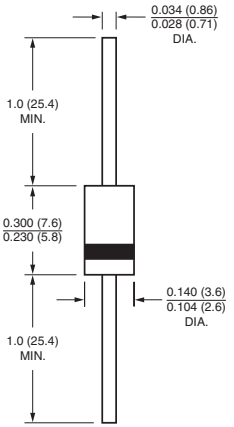


Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

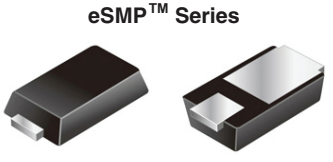
DO-204AC (DO-15)



MSS2P2 & MSS2P3

Vishay General Semiconductor

Surface Mount Schottky Barrier Rectifiers



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V, 30 V
I_{FSM}	30 A
V_F at I_F = 2.0 A	0.47 V
T_J max.	150 °C

FEATURES

- Very low profile - typical height of 0.68 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MSS2P2	MSS2P3	UNIT
Device marking code		22	23	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
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Document Number: 89054
Revision: 04-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 2.0 A	T_A = 25 °C	V_F	0.44 0.52	- 0.60	V
	I_F = 1.0 A I_F = 2.0 A	T_A = 125 °C		0.36 0.47	- 0.55	
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	15 6.0	250 20	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	65	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MSS2P2**	**MSS2P3**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 15 20		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MSS2P3-E3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSS2P3-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

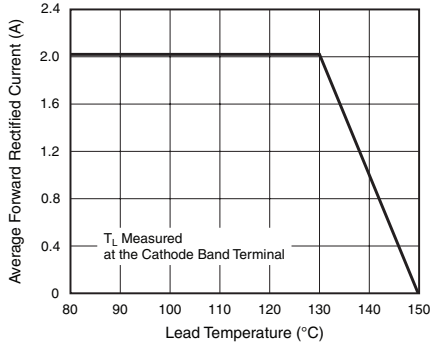


Figure 1. Forward Current Derating Curve

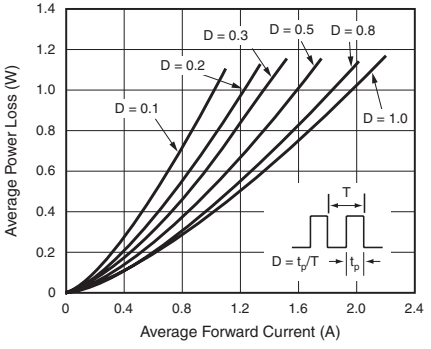


Figure 2. Forward Power Loss Characteristics

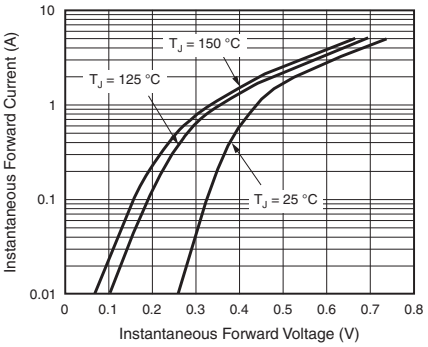


Figure 3. Typical Instantaneous Forward Characteristics

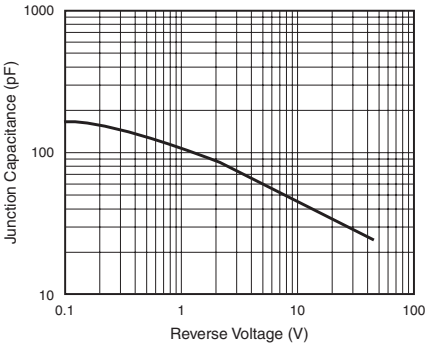


Figure 5. Typical Junction Capacitance

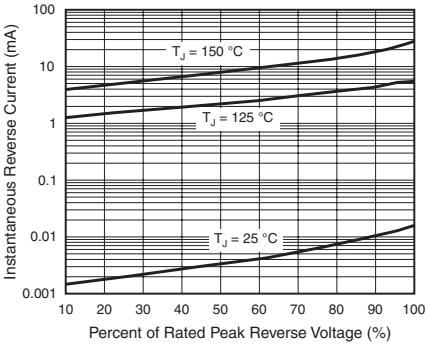


Figure 4. Typical Reverse Characteristics

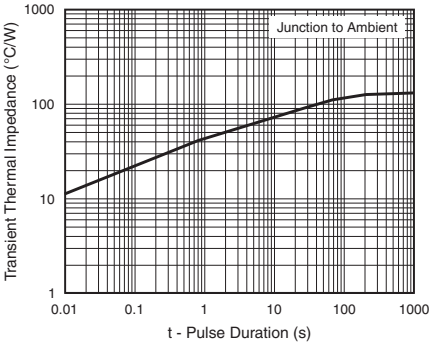
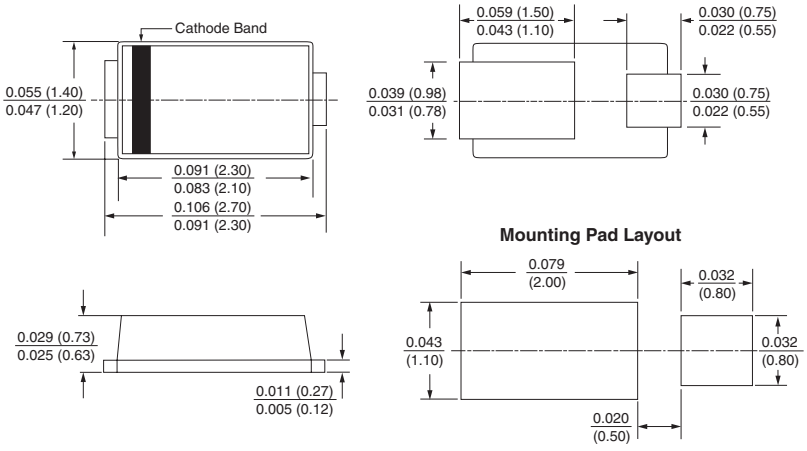


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP



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Document Number: 89054
Revision: 04-Aug-08

High Current Density Surface Mount Schottky Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	50 A
V_F	0.50 V, 0.55 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	B230LA	B240A	UNIT
Device marking code		B23	B24	V
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RMS}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified currentat T_L (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single halfsine-wave superimposed on rated load	I_{FSM}	50		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MAX.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	2.0 A	T_J = 25 °C	V_F	0.5	0.55	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C	I_R	0.5	0.5	mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**B230LA**	**B240A**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	110 28		°C/W

Note:

(1) Aluminum substrate mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B230LA-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
B230LA-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

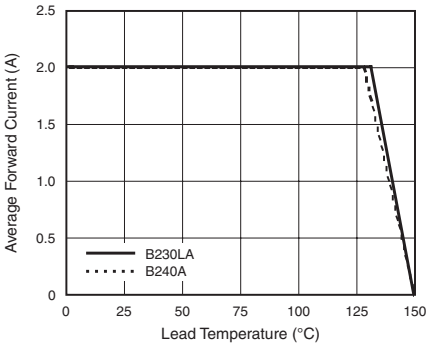


Figure 1. Forward Current Derating Curve

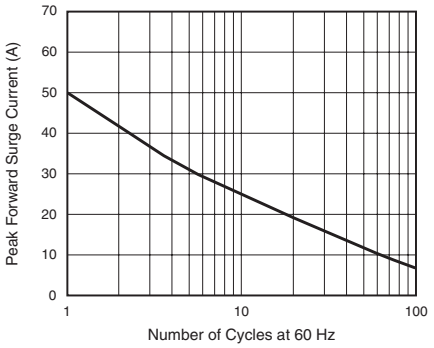


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

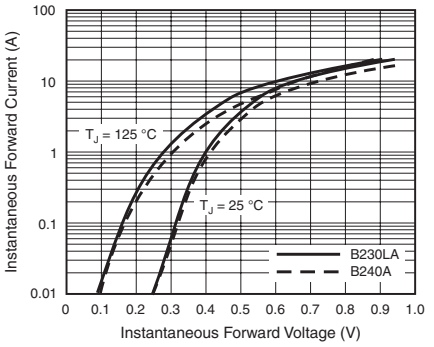


Figure 3. Typical Instantaneous Forward Characteristics

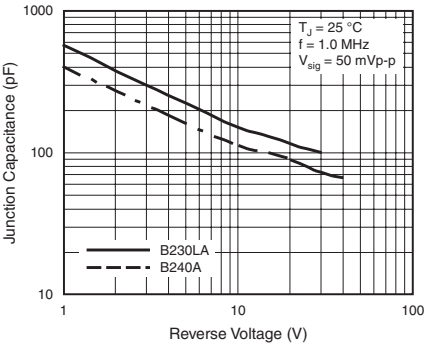


Figure 5. Typical Junction Capacitance

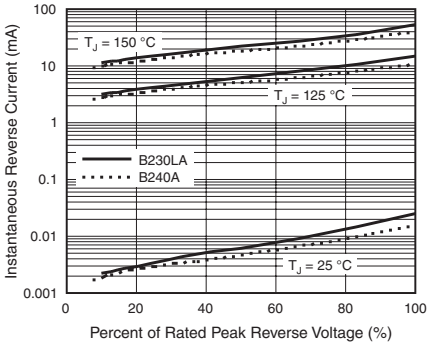
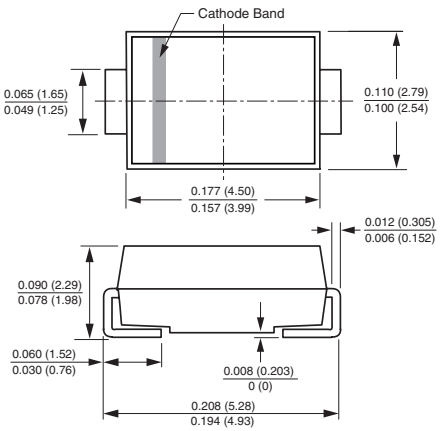


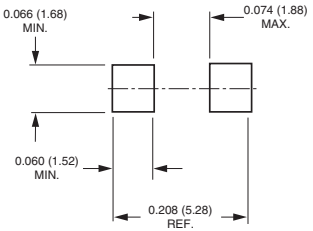
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

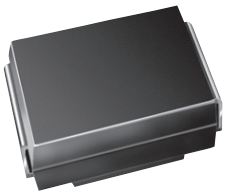
DO-214AC (SMA)



Mounting Pad Layout



Surface Mount Schottky Barrier Rectifier



DO-214AA (SMB)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V to 30 V
I_{FSM}	100 A
V_F	0.32 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SL22**	**SL23**	**UNIT**
Device marking code		SL2	SL3	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	V
Maximum RMS voltage	V_{RMS}	14	21	V
Maximum DC blocking voltage	V_{DC}	20	30	V
Maximum average forward rectified current at T_L (Fig.1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 55 to + 125		°C
Storage temperature range	T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88741
Revision: 22-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SL22**	**SL23**	**UNIT**
Maximum instantaneous forward voltage at (1)	I_F = 1.0 A I_F = 1.0 A I_F = 2.0 A I_F = 2.0 A	T_A = 125 °C T_A = 25 °C T_A = 125 °C T_A = 25 °C	V_F	0.280 0.395 0.320 0.440		V
Maximum DC reverse current at rated DC blocking voltage (1)		T_A = 25 °C T_A = 100 °C	I_R	0.4 10		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SL22**	**SL23**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	75 17		°C/W

Note:

(1) P.C.B. mounted 0.55 x 0.55" (14 x 14 mm) copper pad areas, T_L = 90 °C

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SL23-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
SL23-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
SL23HE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
SL23HE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

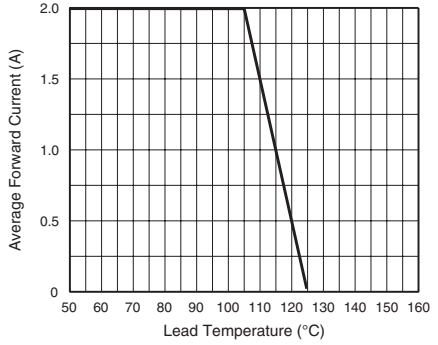


Figure 1. Forward Derating Curve

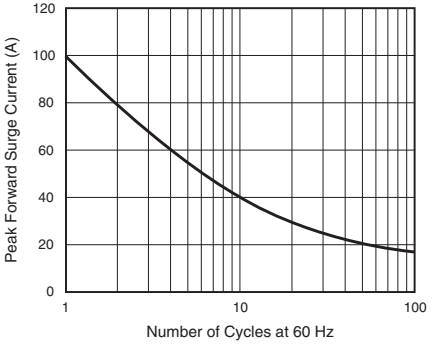


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

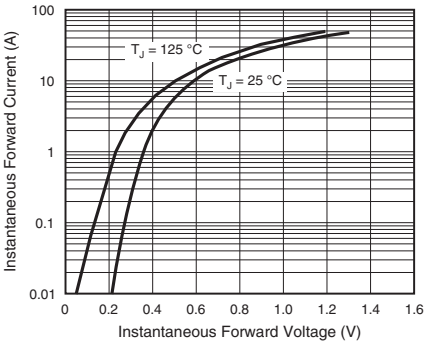


Figure 3. Typical Instantaneous Forward Characteristics

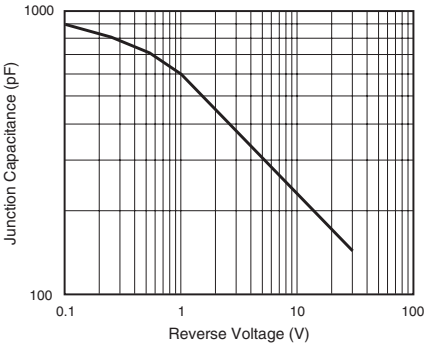


Figure 5. Typical Junction Capacitance

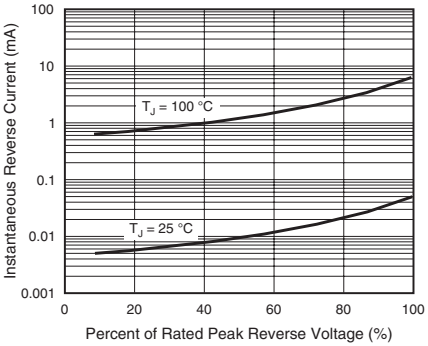
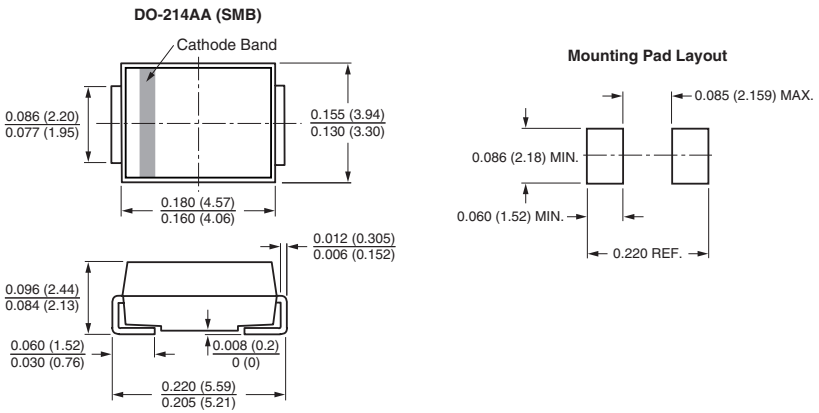


Figure 4. Typical Reverse Current Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



For technical questions within your region, please contact one of the following:
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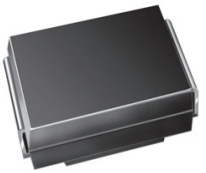
Document Number: 88741
Revision: 22-Jan-08

Surface Mount Schottky Barrier Rectifier



DO-214AA (SMB)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	75 A
V_F	0.50 V, 0.70 V
T_J max.	125 °C, 150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS22	SS23	SS24	SS25	SS26	UNIT
Device marking code		S2	S3	S4	S5	S6	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Max. average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	2.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	75					A
Non-repetitive avalanche energy at T_A = 25 °C, I_{AS} = 2.0 A, L = 10 mH	E_{AS}	20					mJ
Electrostatic discharge capacitor voltage Human body model: C = 100 pF, R = 1.5 kΩ	VC	8.0					KV
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS	SYMBOL	SS22	SS23	SS24	SS25	SS26	UNIT
Maximum instantaneous forward voltage (1)	2.0 A	V_F	0.5			0.7		V
Maximum DC reverse current at rated DC blocking voltage (1)	T_A = 25 °C T_A = 100 °C	I_R	0.4 10					mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	SS22	SS23	SS24	SS25	SS26	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	75 17					°C/W

Note:

(1) P.C.B. mounted with 0.55 x 0.55" (14 x 14 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SS24-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
SS24-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
SS24HE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
SS24HE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

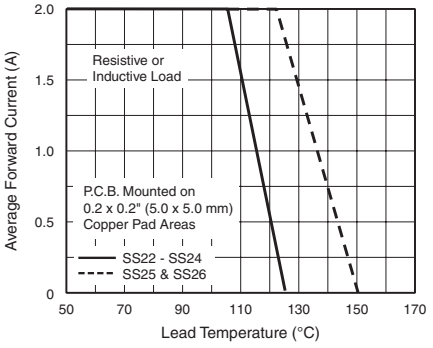


Figure 1. Forward Current Derating Curve

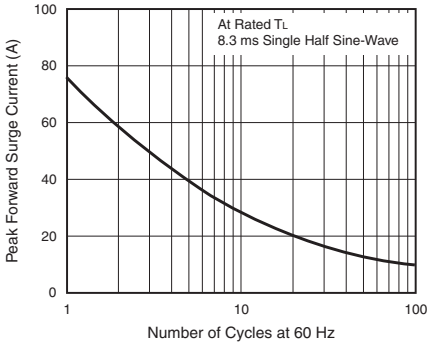


Figure 2. Maximum Non-Repetitive Surge Current

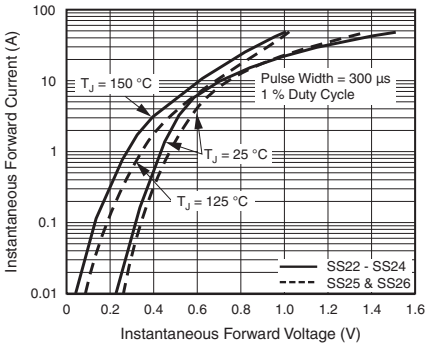


Figure 3. Typical Instantaneous Forward Characteristics

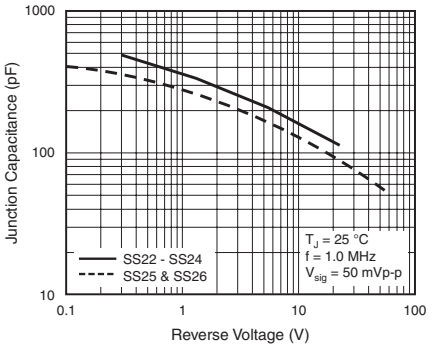


Figure 5. Typical Junction Capacitance

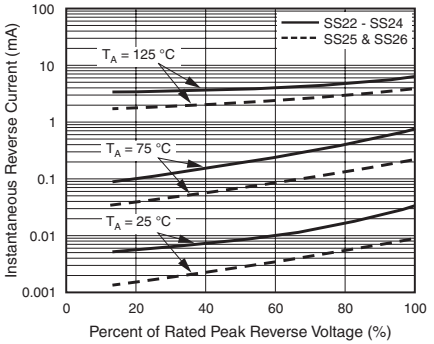
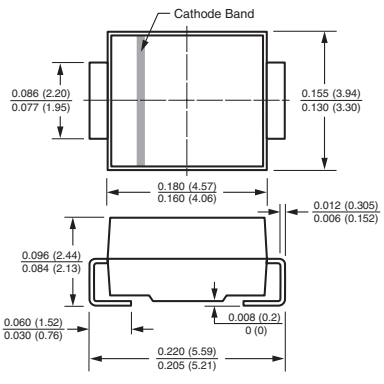


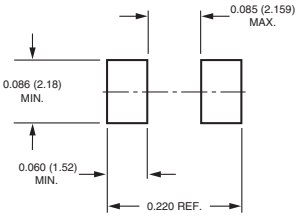
Figure 4. Typical Reverse Current Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



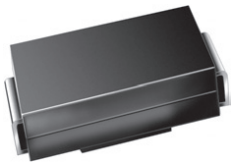
Mounting Pad Layout



SS22S, SS23S & SS24S

Vishay General Semiconductor

Surface Mount Schottky Barrier Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V, 30 V, 40 V
I_{FSM}	40 A
V_F at I_F = 2.0 A	0.517 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS22S	SS23S	SS24S	UNIT
Device marking code		22S	23S	24S	V
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	40			A
Voltage rate of change (rated V_R)	dV/dt	10 000			V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

For technical questions within your region, please contact one of the following:
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Document Number: 89008
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 1 A, I_F = 2 A,	T_J = 25 °C	V_F	0.436 0.517	- 0.55	V
Reverse current (2)	rated V_R	T_J = 25 °C T_J = 100 °C	I_R	13 1.65	200 8	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	130	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SS22S**	**SS23S**	**SS24S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	75 25			°C/W

Note:

(1) P.C.B. mounted with 0.4 x 0.4" (10 x 10 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS24S-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SS24S-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

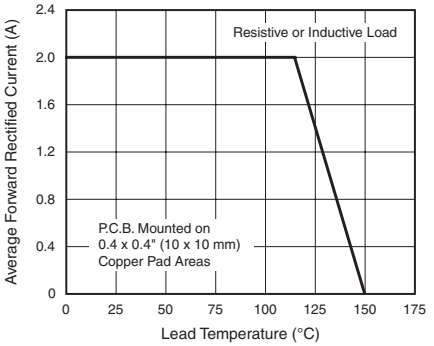


Figure 1. Forward Current Derating Curve

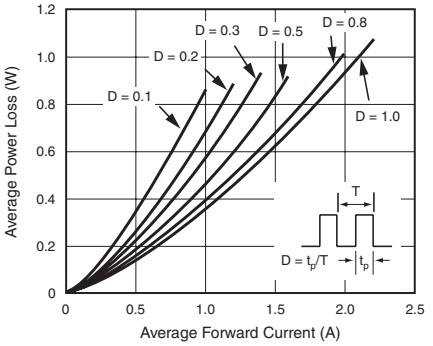


Figure 2. Forward Power Loss Characteristics

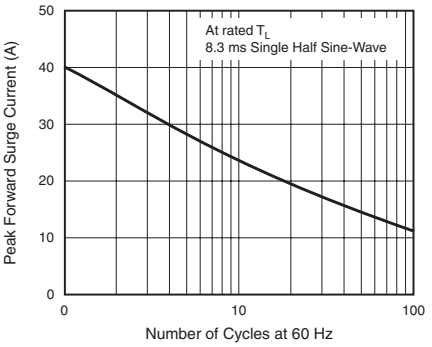


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

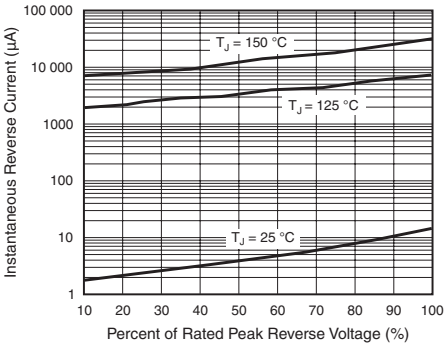


Figure 5. Typical Reverse Leakage Characteristics

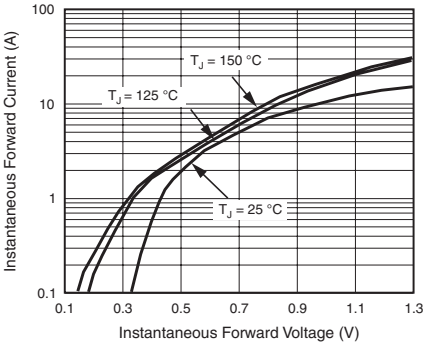


Figure 4. Typical Instantaneous Forward Characteristics

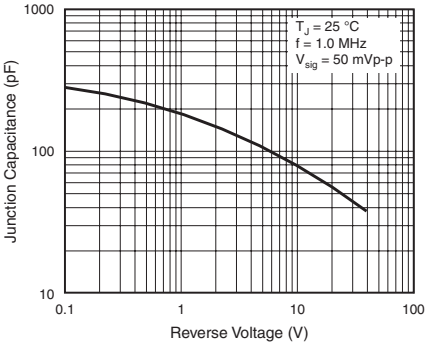
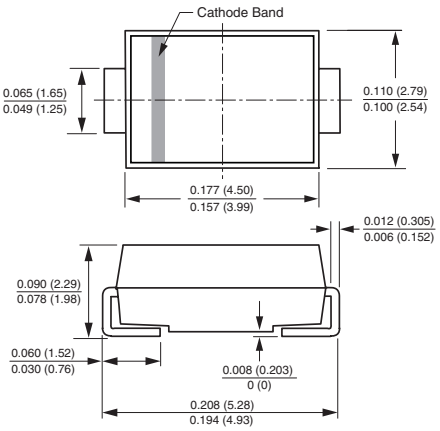


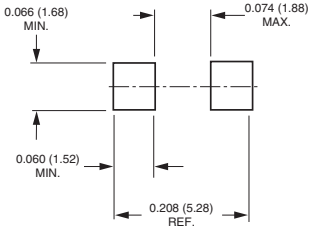
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Surface Mount Schottky Barrier Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	40 A
V_F at I_F = 2.0 A	0.53 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS25S**	**SS26S**	**UNIT**
Device marking code		25S	26S	
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40		A
Operating junction temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 2.0 A	T_A = 25 °C	V_F	0.51 0.60	- 0.75	V
	I_F = 1.0 A I_F = 2.0 A	T_A = 125 °C		0.43 0.53	- 0.62	
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 1.5	200 10	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS25S**	**SS26S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	100 28		°C/W

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS26S-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SS26S-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

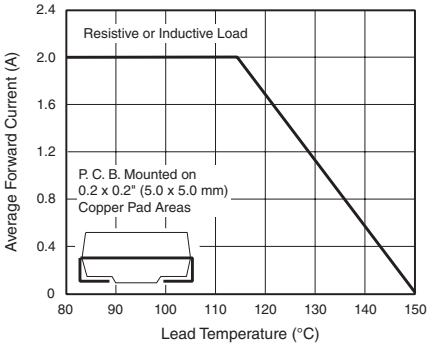


Figure 1. Forward Current Derating Curve

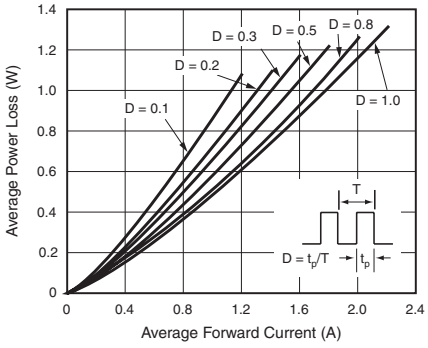


Figure 2. Forward Power Loss Characteristics

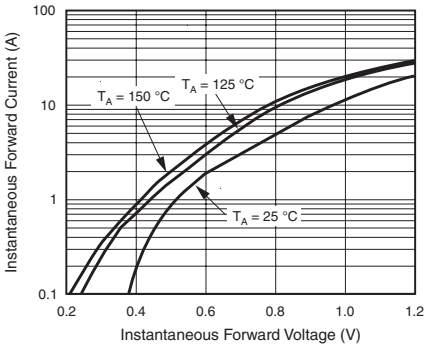


Figure 3. Typical Instantaneous Forward Characteristics

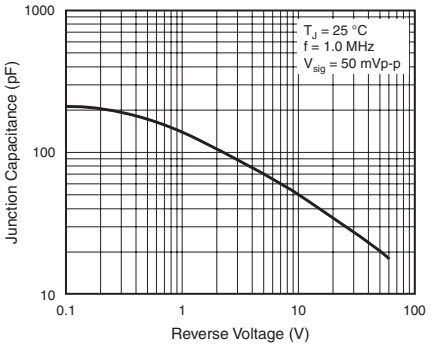


Figure 5. Typical Junction Capacitance

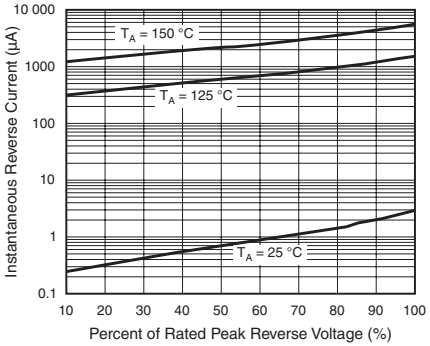
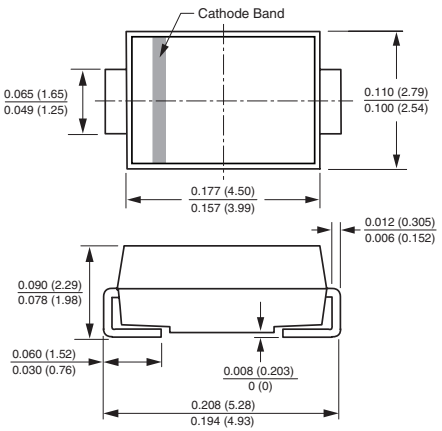


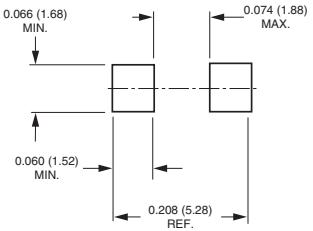
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)

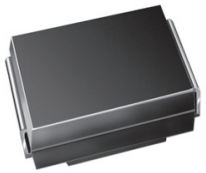


Mounting Pad Layout



High Voltage Surface Mount Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



DO-214AA (SMB)

FEATURES

- Low profile package
- Guardring for overvoltage protection
- Ideal for automated placement
- Low power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	75 A
V_F	0.65 V
I_R	10 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS2H9	SS2H10	UNIT
Device marking code		MS9	MS10	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at: T_L = 130 °C	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	75		A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88750
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SS2H9**	**SS2H10**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2.0 A I_F = 2.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.79 0.65		V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	10 4		µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS2H9**	**SS2H10**	**UNIT**
Maximum thermal resistance junction to lead T_L = 25 °C (1)	$R_{\theta JA}$ $R_{\theta JL}$	80 25		°C/W

Note:

(1) Units mounted on P.C.B. with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS2H9-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
SS2H9-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
SS2H9HE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
SS2H9HE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

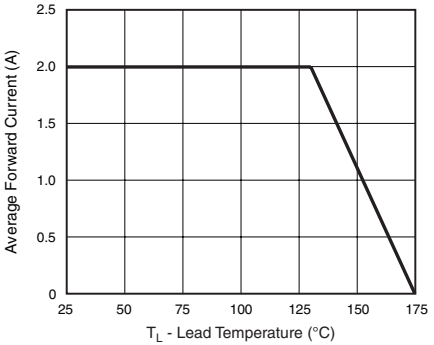


Figure 1. Forward Current Derating Curve

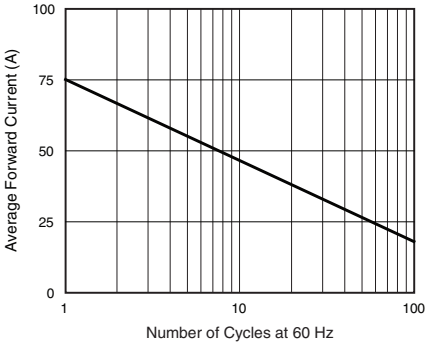


Figure 2. Max Non-Repetitive Peak Forward Surge Current

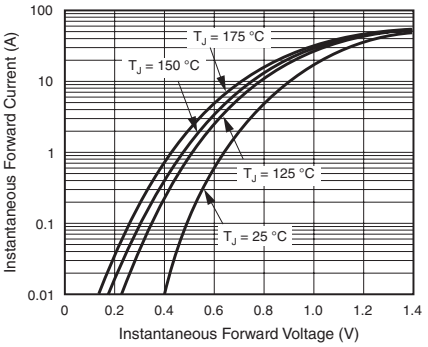


Figure 3. Typical Instanteous Forward Characteristics

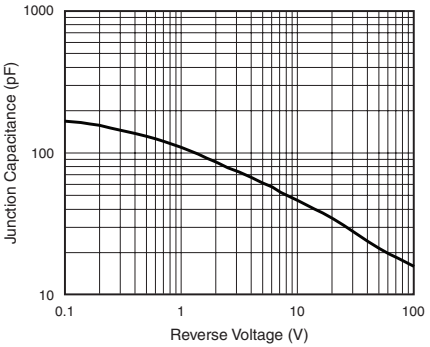


Figure 5. Typical Junction Capacitance

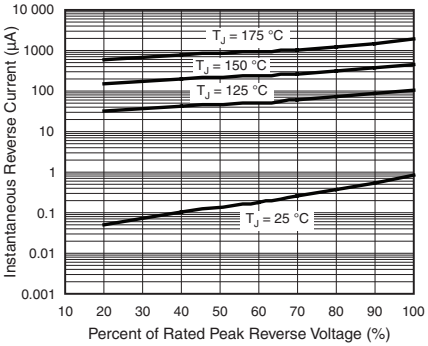


Figure 4. Typical Reverse Characteristics

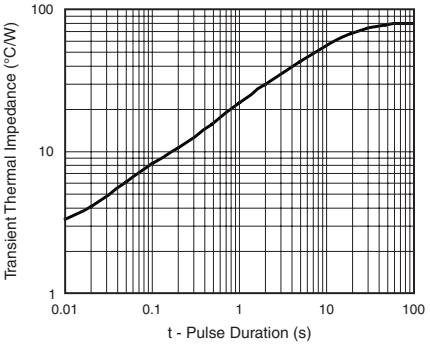
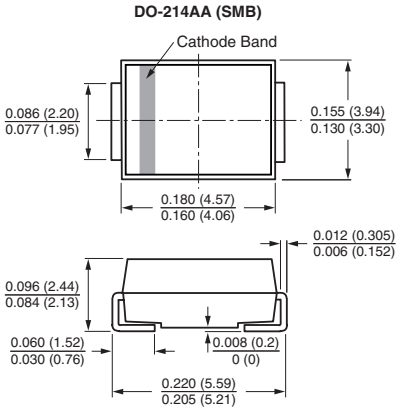
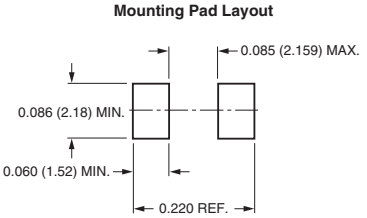


Figure 6. Typical Transient Thermal Impedance Per Leg

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series

DO-220AA (SMP)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V, 30 V, 40 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F	0.50 V
T_J max.	150 °C

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheelling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS2P2	SS2P3	SS2P4	UNIT
Device marking code		22	23	24	
Maximum repetive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50			A
Non-repetitive avalanche energy at I_{AS} = 1.5 A, L = 10 mH, T_J = 25 °C	E_{AS}	11.25			mJ
Voltage rate of change (rated V_R)	dV/dt	10 000			V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 2 A I_F = 2 A	T_J = 25 °C T_J = 125 °C	V_F	0.50 0.43	0.55 0.50	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 8	150 15	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	110		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SS2P2**	**SS2P3**	**SS2P4**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	115 15 20			°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS2P4-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS2P4-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS2P4HE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS2P4HE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

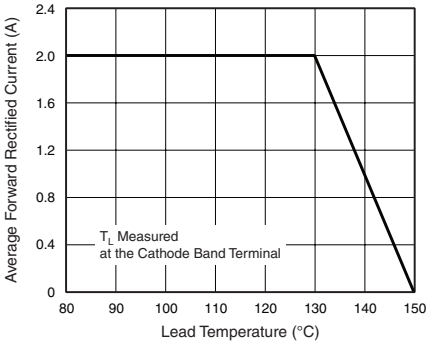


Figure 1. Forward Current Derating Curve

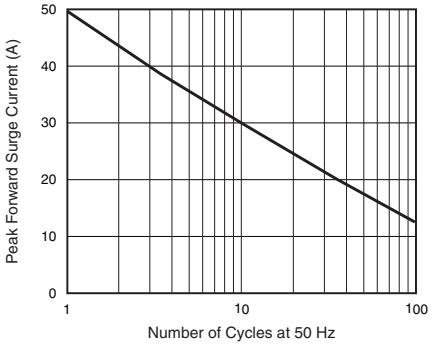


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

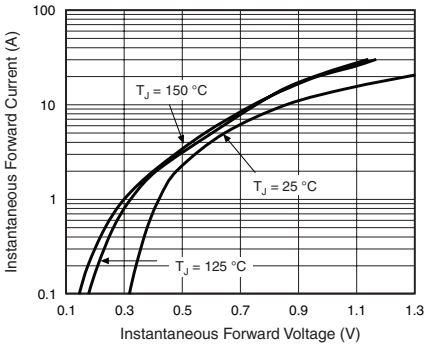


Figure 3. Typical Instantaneous Forward Characteristics

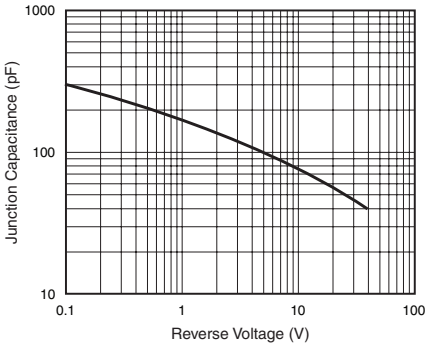


Figure 5. Typical Junction Capacitance

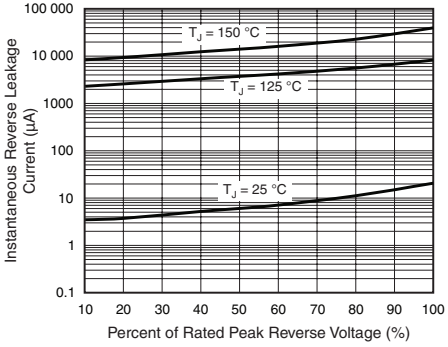


Figure 4. Typical Reverse Leakage Characteristics

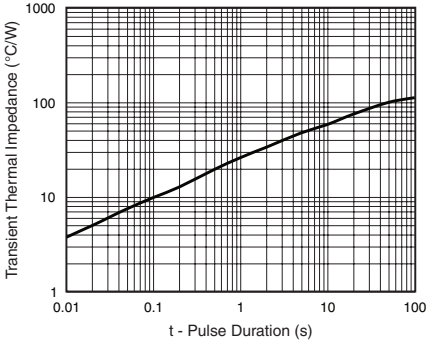
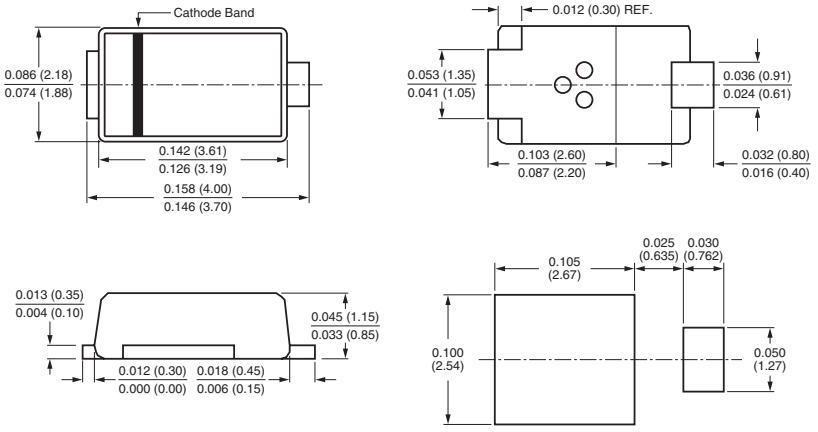


Figure 6. Typical Transient Thermal impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



Low V_F High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheelling, dc-to-dc converters, and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	20 V, 30 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F	0.45 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS2P2L	SS2P3L	UNIT
Device marking code		22L	23L	
Maximum repetive peak reverse voltage	V_{RRM}	20	30	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Non-repetitive avalanche energy at I_{AS} = 1.5 A, L = 10 mH, T_J = 25 °C	E_{AS}	11.25		mJ
Voltage rate of change (rated V_R)	dV/dt	10 000		V/us
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2 A I_F = 2 A	T_J = 25 °C T_J = 125 °C	V_F	0.45 0.38	0.50 0.45	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 9.0	200 20	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	130		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS2P2L**	**SS2P3L**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	115 15 20		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS2P3L-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS2P3L-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS2P3LHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS2P3LHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

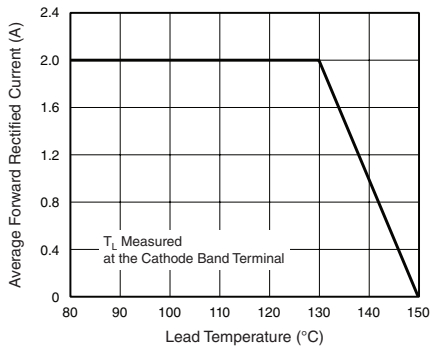


Figure 1. Forward Current Derating Curve

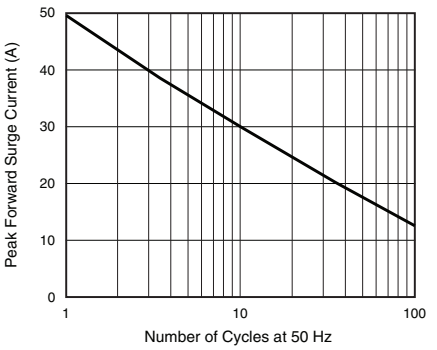


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

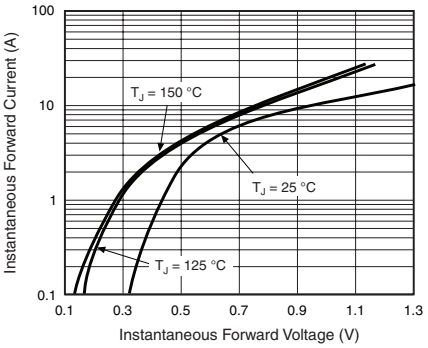


Figure 3. Typical Instantaneous Forward Characteristics

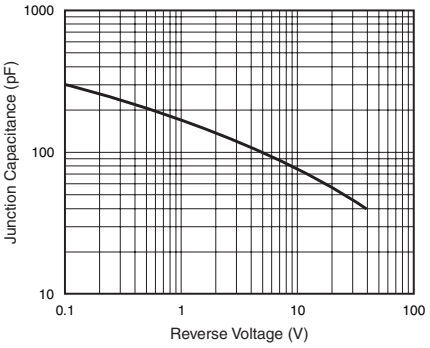


Figure 5. Typical Junction Capacitance

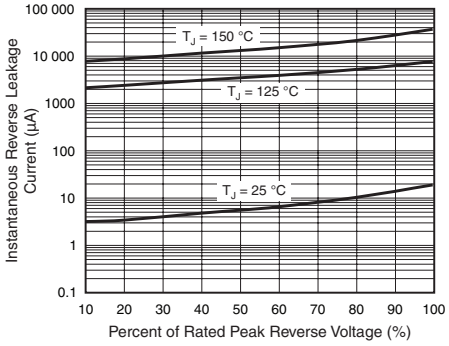


Figure 4. Typical Reverse Leakage Characteristics

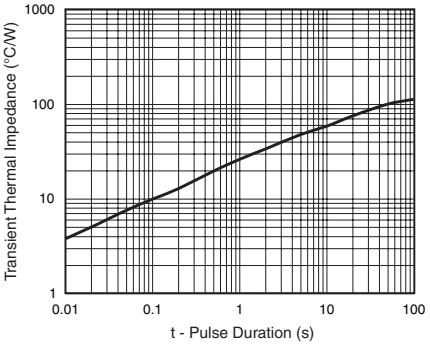
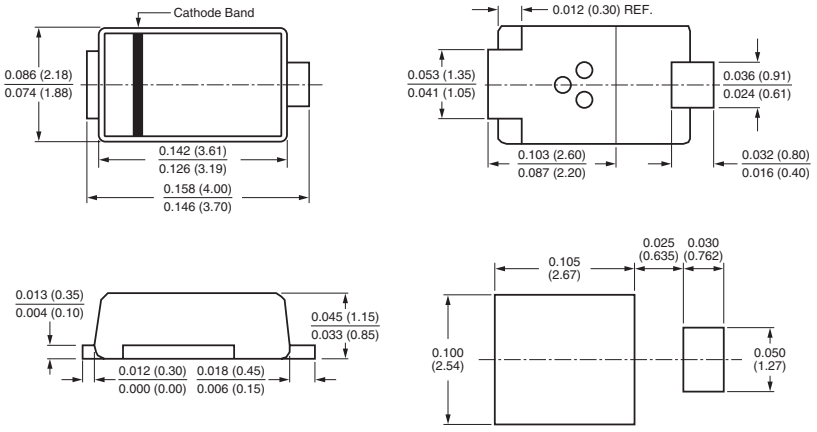


Figure 6. Typical Transient Thermal impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



High Current Density Surface Mount Schottky Rectifier

eSMP™ Series

DO-220AA (SMP)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F	0.54 V
T_J max.	150 °C

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS2P5**	**SS2P6**	**UNIT**
Device marking code		25	26	
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Non-repetitive avalanche energy at I_{AS} = 1.5 A, L = 10 mH, T_J = 25 °C	E_{AS}	11.25		mJ
Voltage rate of change (rated V_R)	dV/dt	10 000		V/us
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2 A I_F = 2 A	T_J = 25 °C T_J = 125 °C	V_F	0.62 0.54	0.70 0.60	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 1.6	100 10	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	80		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise specified)				
PARAMETER	**SYMBOL**	**SS2P5**	**SS2P6**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	115 15 20		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS2P5-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS2P5-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS2P5HE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS2P5HE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

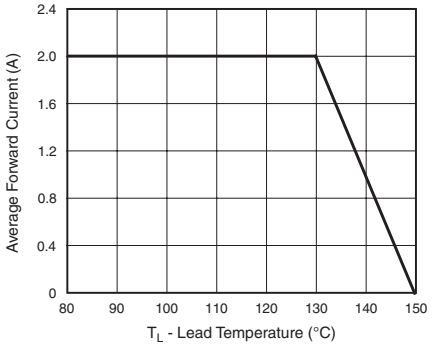


Figure 1. Forward Current Derating Curve

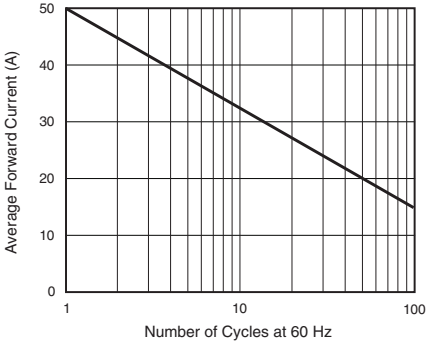


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

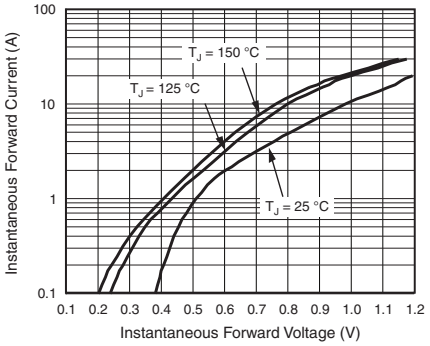


Figure 3. Typical Instantaneous Forward Characteristics

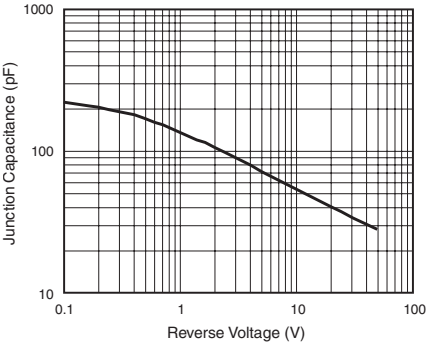


Figure 5. Typical Junction Capacitance

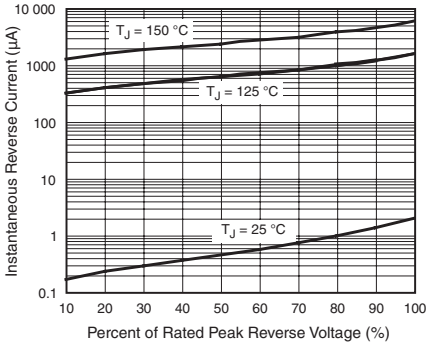


Figure 4. Typical Reverse Leakage Characteristics

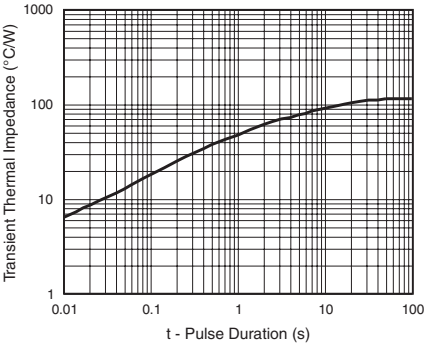
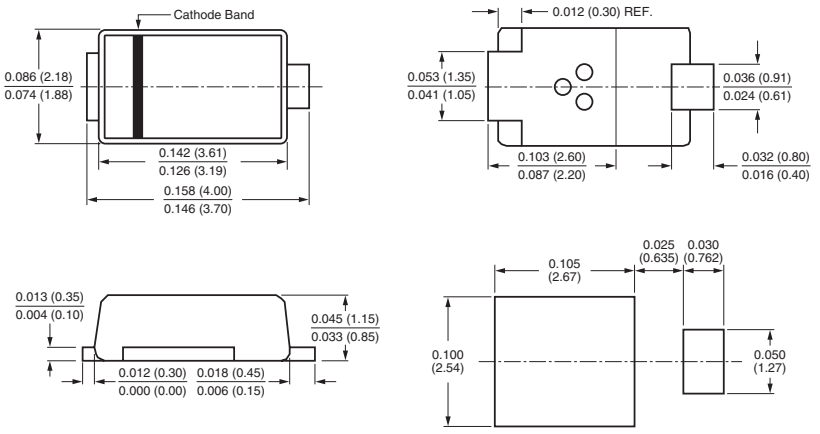


Figure 6. Typical Transient Thermal impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



SS2PH9 & SS2PH10

Vishay General Semiconductor

High Voltage Surface Mount Schottky Barrier Rectifiers

High Barrier Technology for Improved High Temperature Performance

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F at I_F = 1.0 A	0.62 V
I_R max.	1.0 µA
T_J max.	175 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS2PH9	SS2PH10	UNIT
Device marking code		29	210	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Non-repetitive avalanche energy at T_J = 25 °C, I_{AS} = 1.5 A, L = 10 mH	E_{AS}	11.25		mJ
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84682
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2.0 A I_F = 2.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.77 0.62	0.80 0.66	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	0.1 60	1.0 500	µA
Typical junction capacitance	4.0 V, 1 MHz		C_J	65	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS2PH9**	**SS2PH10**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	110 15 25		°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 15 x 15 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS2PH9-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS2PH9-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS2PH9HE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS2PH9HE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

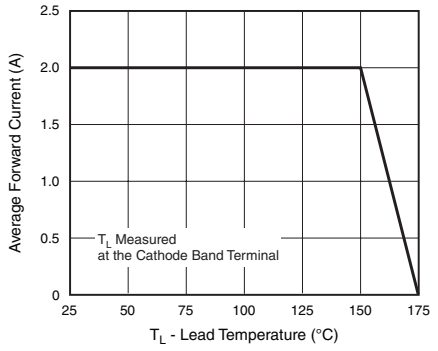


Figure 1. Forward Current Derating Curve

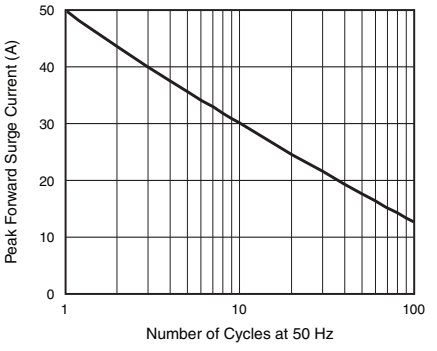


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

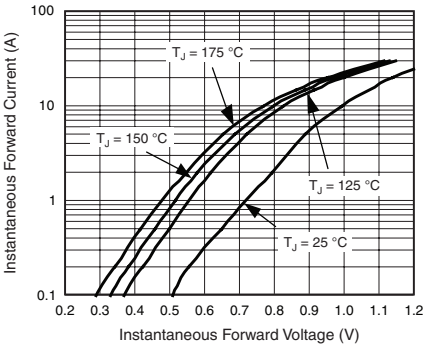


Figure 3. Typical Instantaneous Forward Characteristics

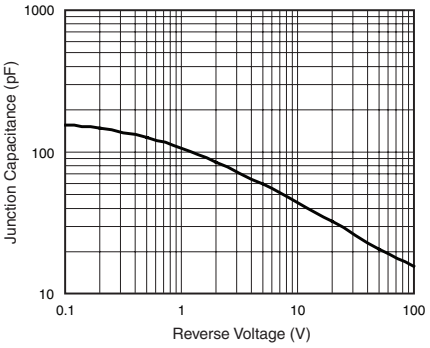


Figure 5. Typical Junction Capacitance

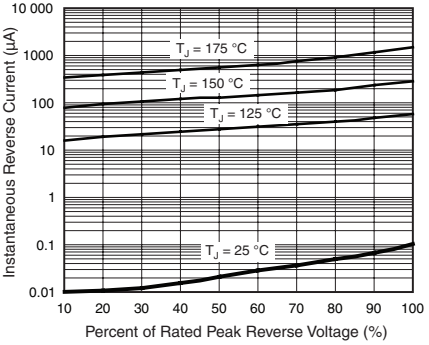


Figure 4. Typical Reverse Leakage Characteristics

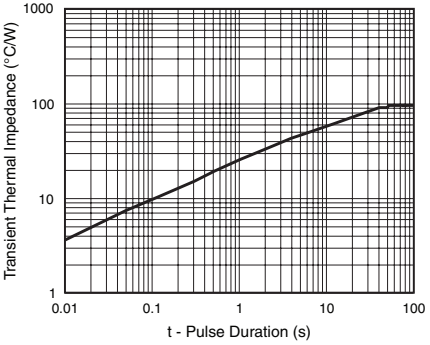
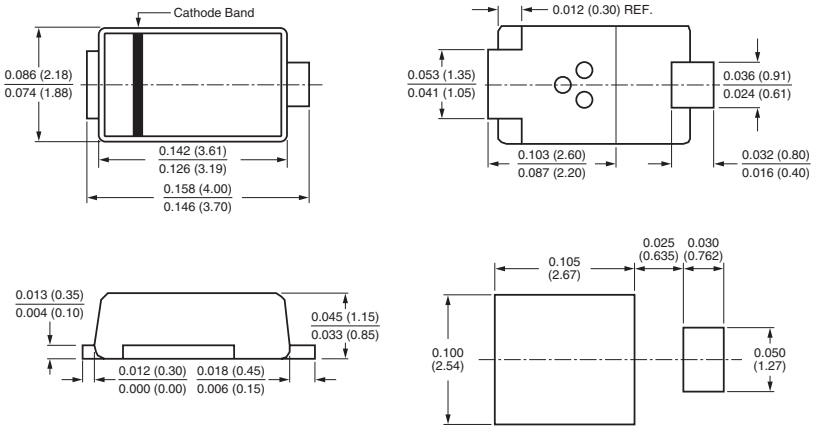


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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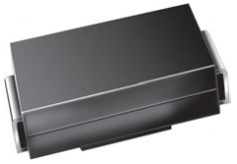
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84682
Revision: 19-May-08

High Current Density Surface Mount Schottky Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	60 A
E_{AS}	11.25 mJ
V_F	0.38 V, 0.42 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SSA23L**	**SSA24**	**UNIT**
Device marking code		23L	S24	V
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RMS}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified currentat T_L (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single halfsine-wave superimposed on rated load	I_{FSM}	60		A
Non-repetitive avalanche energy at T_A = 25 °C, I_{AS} = 1.5 A, L = 10 mH	E_{AS}	11.25		mJ
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SSA23L**		**SSA24**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage (1)	2.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.43 0.32	0.45 0.38	0.45 0.36	0.49 0.42	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 15	0.5 25	- 12	0.2 20	mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SSA23L**	**SSA24**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	110 28		°C/W

Note:
(1) Aluminum substrate mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SSA23L-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SSA23L-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
SSA23LHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
SSA23LHE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

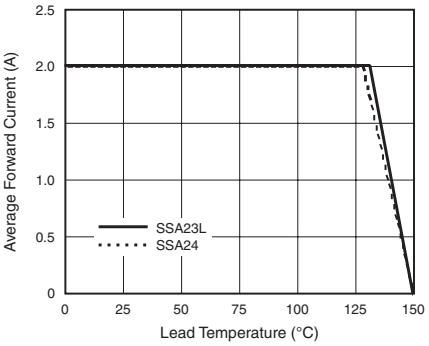


Figure 1. Forward Current Derating Curve

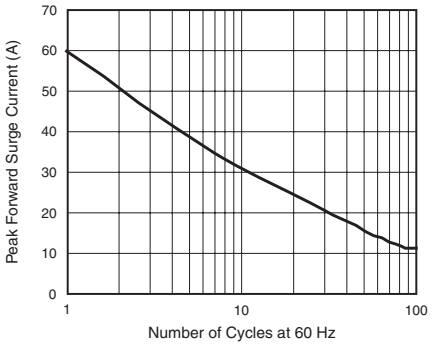


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

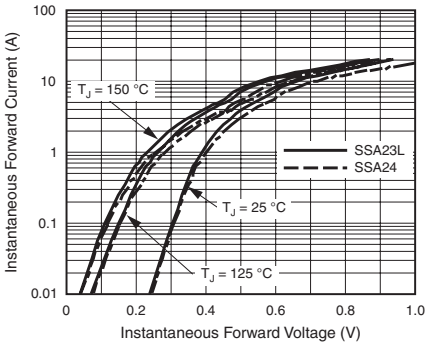


Figure 3. Typical Instantaneous Forward Characteristics

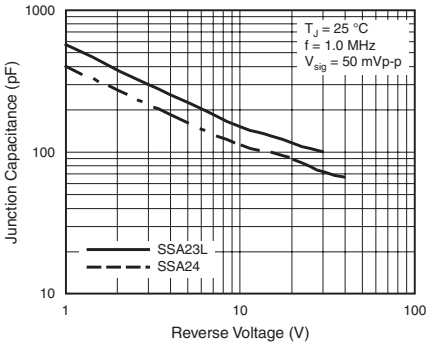


Figure 5. Typical Junction Capacitance

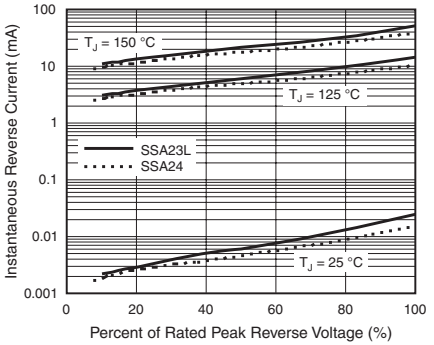
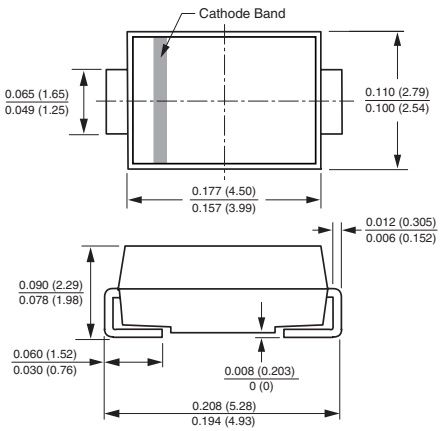


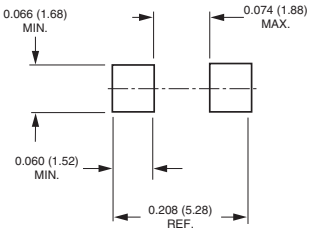
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



B330LA & B340A

Vishay General Semiconductor

High Current Density Surface Mount Schottky Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.
(Note: These devices are not Q101 qualified.)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	65 A
V_F	0.50 V, 0.55 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**B330LA**	**B340A**	**UNIT**
Device marking code		B33	B34	V
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RMS}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	65		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88896
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MAX.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A	T_J = 25 °C	V_F	0.5	0.55	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C	I_R	0.5	0.5	mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**B330LA**	**B340A**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	110 28		°C/W

Note:
(1) Aluminum substrate mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B330LA-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
B330LA-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

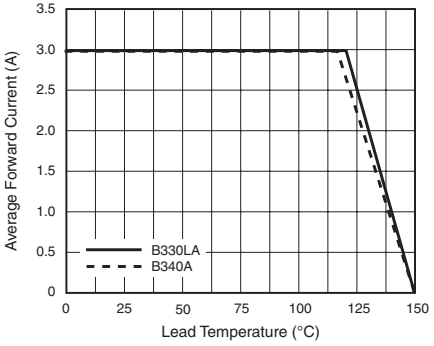


Figure 1. Forward Currenrt Derating Curve

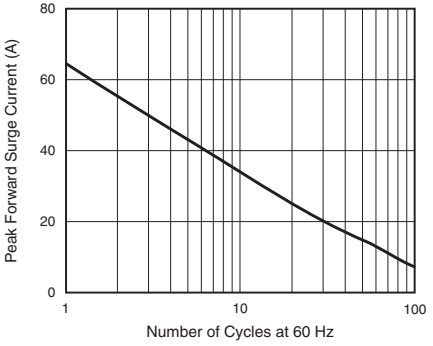


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

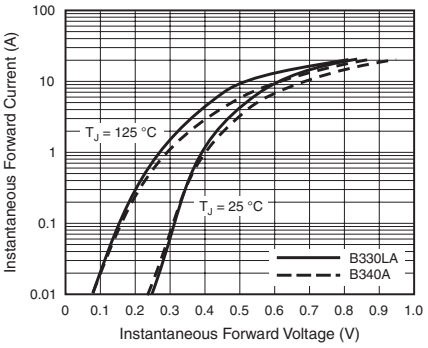


Figure 3. Typical Instantaneous Forward Characteristics

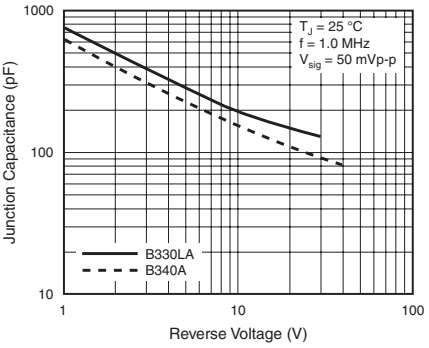


Figure 5. Typical Junction Capacitance

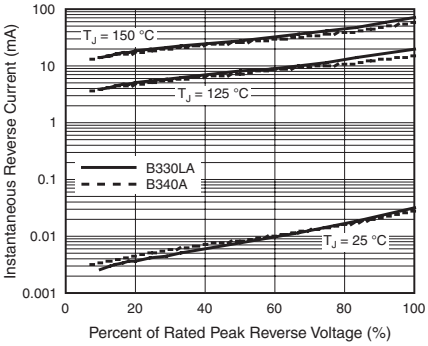
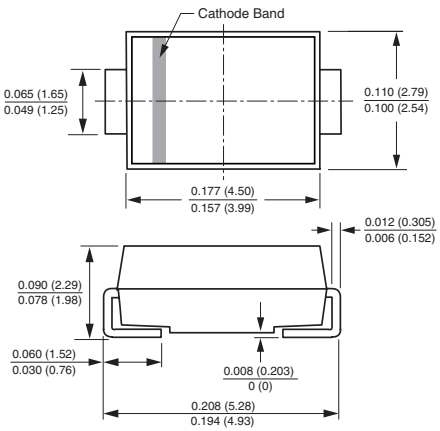


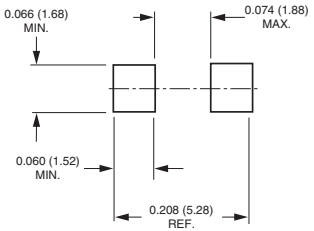
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

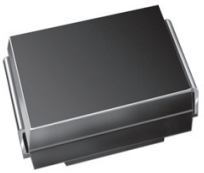
DO-214AC (SMA)



Mounting Pad Layout



High Current Density Surface Mount Schottky Rectifier



DO-214AA (SMB)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	40 V
I_{FSM}	100 A
V_F at I_F = 3.0 A	0.34 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**B340LB**	**UNIT**
Device marking code		B34	
Maximum repetitive peak reverse voltage	V_{RRM}	40	V
Maximum RMS voltage	V_{RMS}	28	V
Maximum DC blocking voltage	V_{DC}	40	V
Max. average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	3.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100	A
Voltage rate of change (rated V_R)	dV/dt	10 000	V/µs
Operating junction temperature range	T_J	- 65 to + 150	°C
Storage temperature range	T_{STG}	- 65 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.43 0.34	0.45 0.38	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 26	0.4 40	mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**B340LB**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	70 25	°C/W

Note:

(1) Aluminum substrate mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B340LB-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
B340LB-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

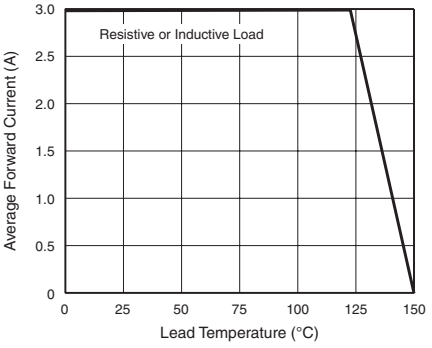


Figure 1. Forward Current Derating Curve

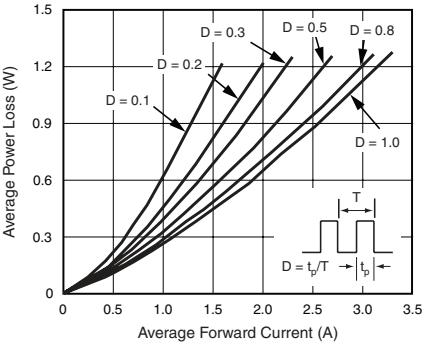


Figure 2. Forward Power Loss Characteristics

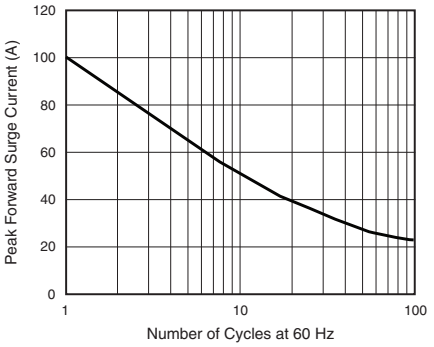


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

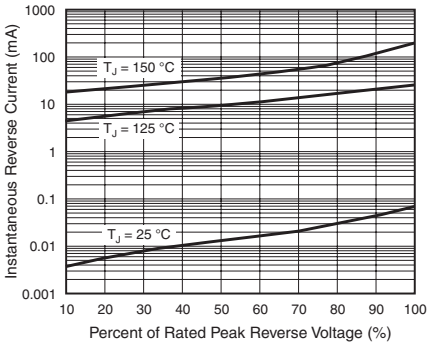


Figure 5. Typical Reverse Characteristics

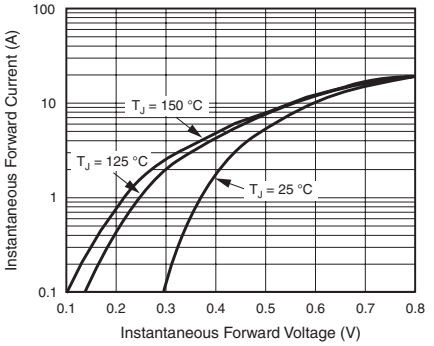


Figure 4. Typical Instantaneous Forward Characteristics

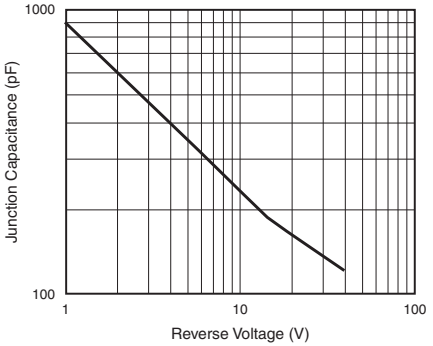
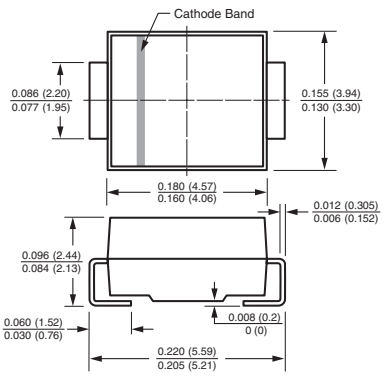


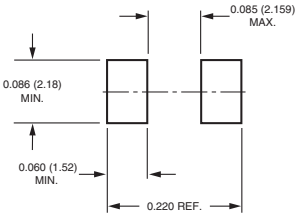
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



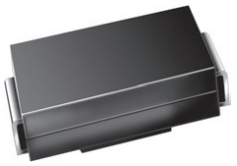
Mounting Pad Layout



B350A & B360A

Vishay General Semiconductor

Surface Mount Schottky Barrier Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	50 A
V_F at I_F = 3.0 A	0.55 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	B350A	B360A	UNIT
Device marking code		B35	B36	V
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J, T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89071
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 3.0 A	T_A = 25 °C T_A = 125 °C	V_F	0.64 0.55	0.72 0.62	V
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 2.9	200 10	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	145	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**B350A**	**B360A**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	72 12		°C/W

Note:

(1) P.C.B. mounted with 0.32 x 0.32" (8 x 8 mm) copper pad areas. T_L measure at lead terminal mount.

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B360A-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
B360A-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

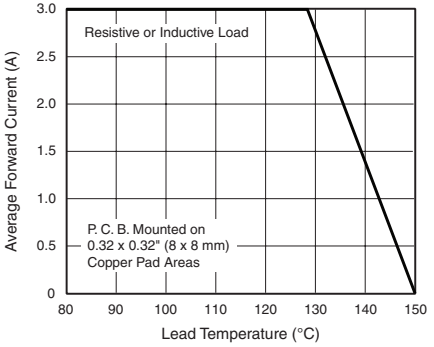


Figure 1. Forward Current Derating Curve

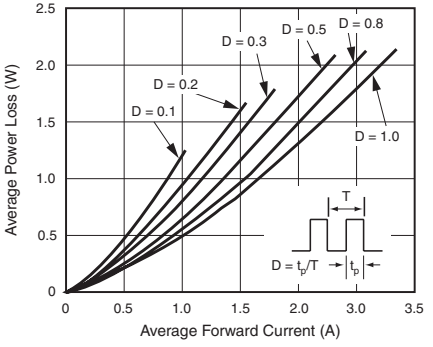


Figure 2. Forward Power Loss Characteristics

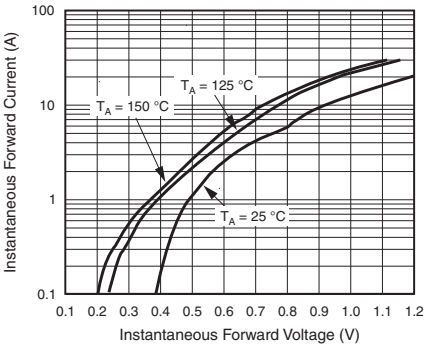


Figure 3. Typical Instantaneous Forward Characteristics

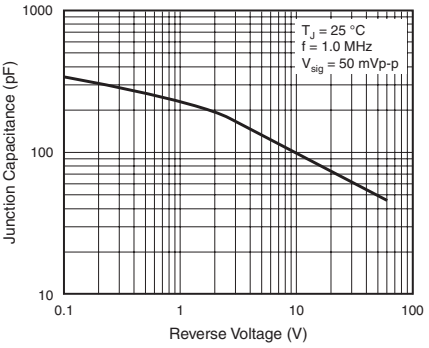


Figure 5. Typical Junction Capacitance

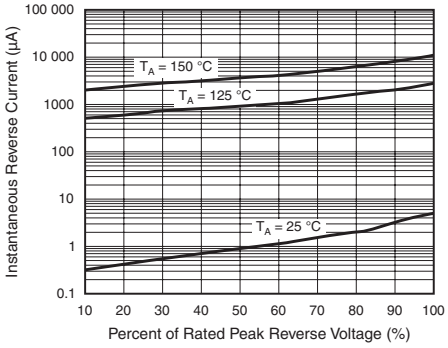
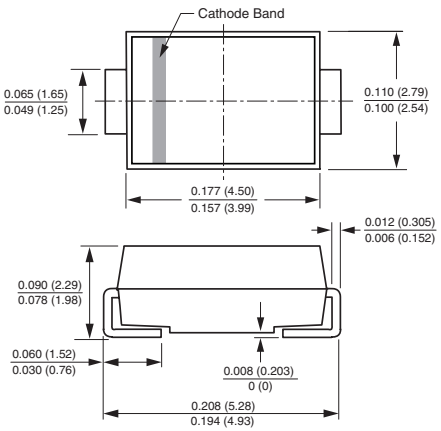


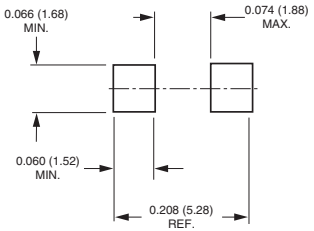
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)

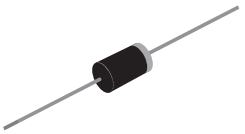


Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Schottky Barrier Rectifier



DO-201AD

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	20 V, 30 V, 40 V
I_{FSM}	80 A
V_F	0.475 V, 0.500 V, 0.525 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N5820	1N5821	1N5822	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum RMS voltage	V_{RMS}	14	21	28	V
Maximum DC blocking voltage	V_{DC}	20	30	40	V
Non-repetitive peak reverse voltage	V_{RSM}	24	36	48	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_L = 95 °C	$I_{F(AV)}$	3.0			A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80			A
Storage temperature range	T_J, T_{STG}	- 65 to + 125			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	1N5820	1N5821	1N5822	UNIT
Maximum instantaneous forward voltage (1)	3.0	V_F	0.475	0.500	0.525	V
Maximum instantaneous forward voltage (1)	9.4	V_F	0.850	0.900	0.950	V
Maximum average reverse current at rated DC blocking voltage (1)	T_A = 25 °C T_A = 100 °C	I_R	2.0 20			mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**1N5820**	**1N5821**	**1N5822**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 10			°C/W

Note:

(1) Thermal resistance from junction to lead vertical P.C.B. mounted, 0.500" (12.7 mm) lead length with 2.5 x 2.5" (63.5 x 63.5 mm) copper pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N5820-E3/54	1.08	54	1400	13" diameter paper tape and reel
1N5820-E3/73	1.08	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

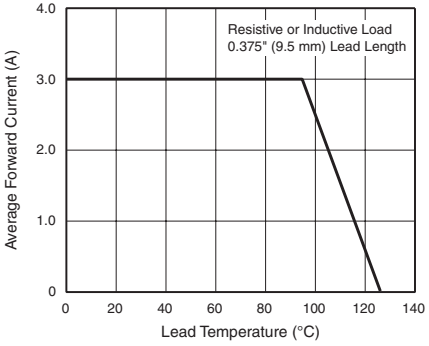


Figure 1. Forward Current Derating Curve

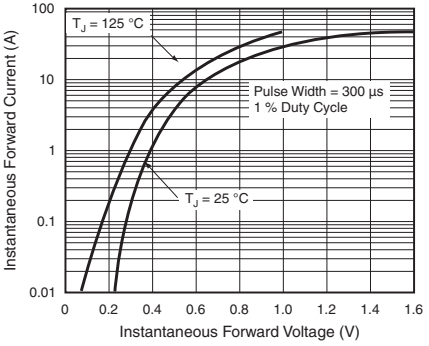


Figure 3. Typical Instantaneous Forward Characteristics

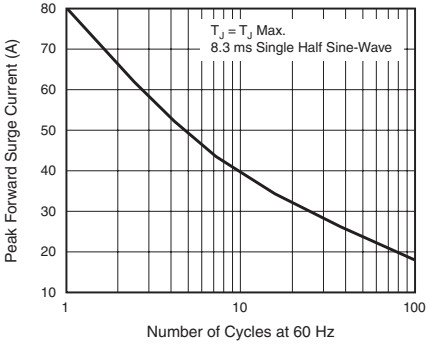


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

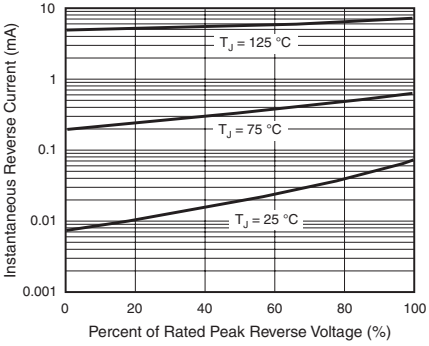


Figure 4. Typical Reverse Characteristics

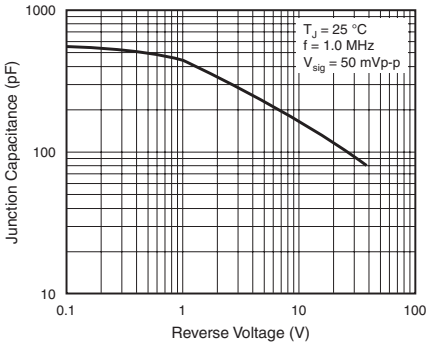


Figure 5. Typical Junction Capacitance

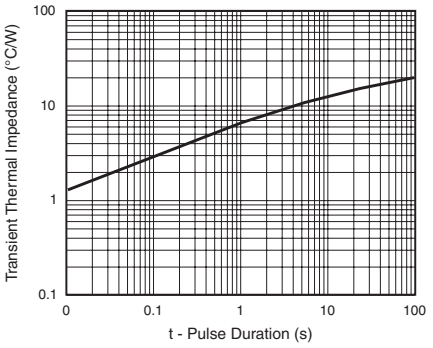
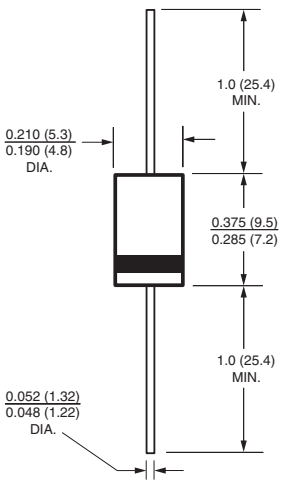


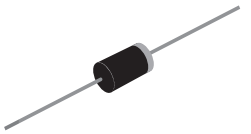
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



Schottky Barrier Rectifier



DO-201AD

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	120 A
V_F	0.49 V, 0.68 V
T_J max.	125 °C, 150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB320	SB330	SB340	SB350	SB360	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	3.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	120					A
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	SB320	SB330	SB340	SB350	SB360	UNIT
Maximum instantaneous forward voltage (1)	3.0 A	V_F	0.49			0.68		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)	T_A = 25 °C	I_R	0.5					mA
	T_A = 100 °C		20			10		

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
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Document Number: 88719
Revision: 20-Aug-07

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB320**	**SB330**	**SB340**	**SB350**	**SB360**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	30 10					°C/W

Note:

(1) Thermal resistance from junction to lead vertical P.C.B. mounting, 0.500" (12.7 mm) lead length with 2.5 x 2.5" (63.5 x 63.5 mm) copper pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB340-E3/54	1.08	54	1400	13" diameter paper tape and reel
SB340-E3/73	1.08	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

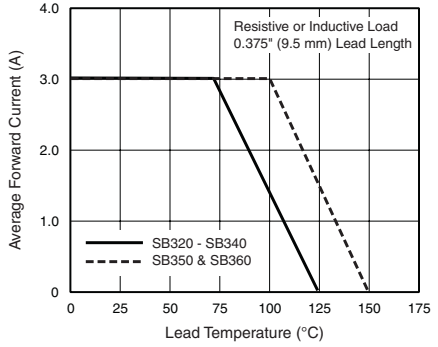


Figure 1. Forward Current Derating Curve

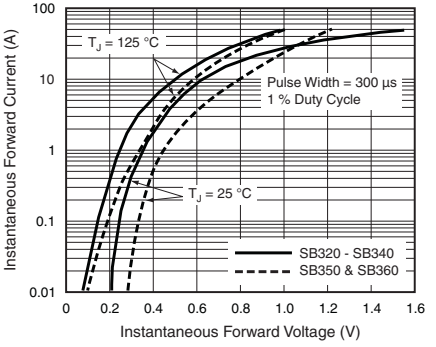


Figure 3. Typical Instantaneous Forward Characteristics

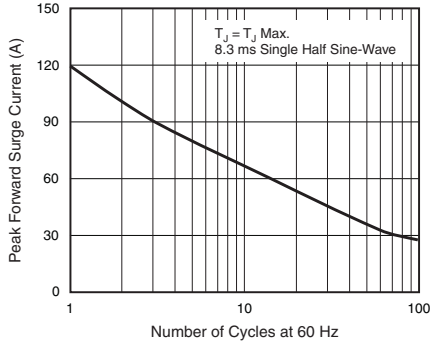


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

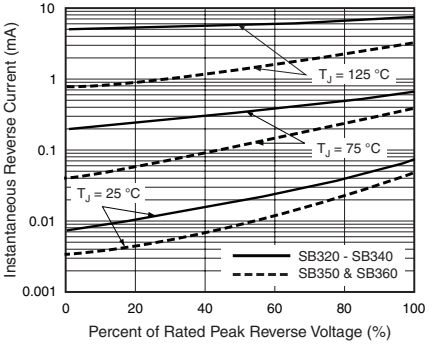


Figure 4. Typical Reverse Characteristics

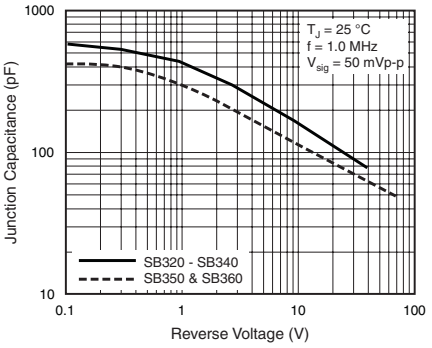


Figure 5. Typical Junction Capacitance

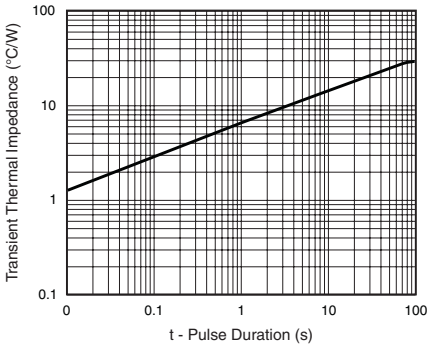
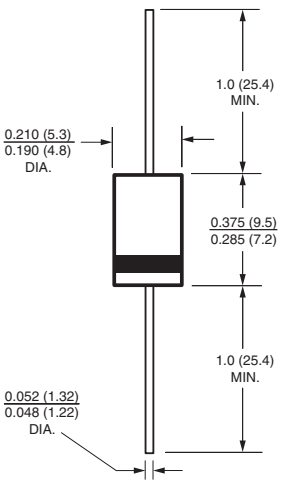


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



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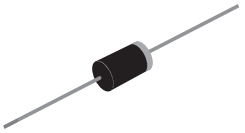
Document Number: 88719
Revision: 20-Aug-07

Schottky Barrier Rectifier



DO-201AD

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High frequency operation
- 20 kV ESD capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	80 A
V_F	0.50 V, 0.70 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB320A	SB330A	SB340A	SB350A	SB360A	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	3.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80					A
Electrostatic discharge capacitor voltage Human body model air discharge: C = 100 pF, R = 1.5 kΩ	V_C	20					kV
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SB320A**	**SB330A**	**SB340A**	**SB350A**	**SB360A**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A		V_F	0.50			0.70		V
Maximum reverse current at rated V_R (2)		T_A = 25 °C	I_R	0.5					mA
		T_A = 100 °C		20			10		

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB320A**	**SB330A**	**SB340A**	**SB350A**	**SB360A**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 12					°C/W

Note:
(1) Thermal resistance from junction to lead vertical P.C.B. mounting, 0.500" (12.7 mm) lead length with 2.5 x 2.5" (63.5 x 63.5 mm) copper pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB340A-E3/54	1.077	54	1400	13" diameter paper tape and reel
SB340A-E3/73	1.077	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

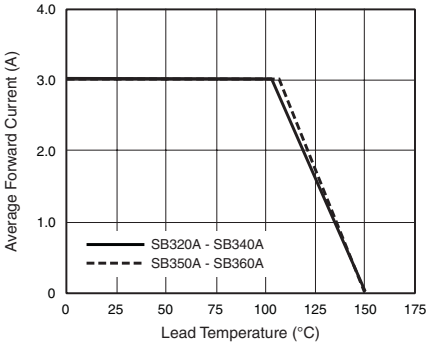


Figure 1. Forward Current Derating Curve

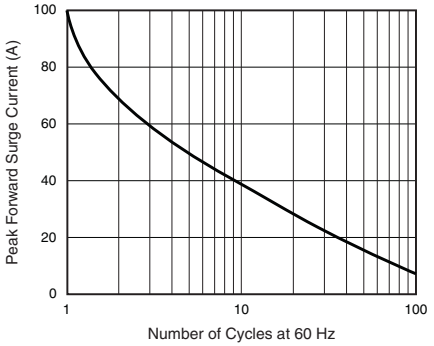


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

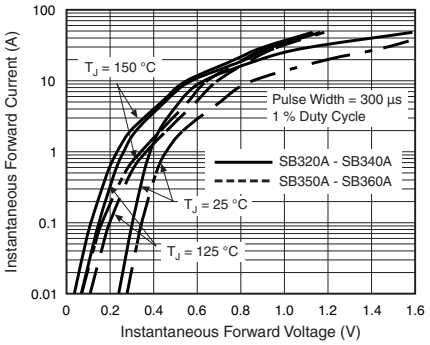


Figure 3. Typical Instantaneous Forward Characteristics

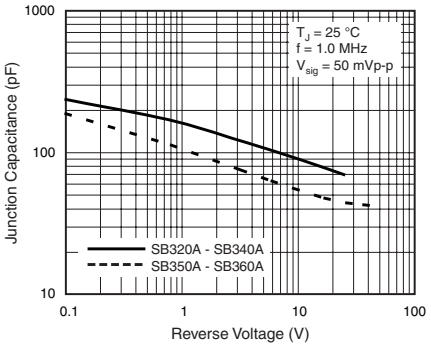


Figure 5. Typical Junction Capacitance

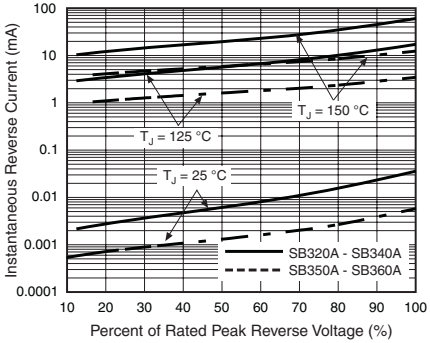


Figure 4. Typical Reverse Characteristics

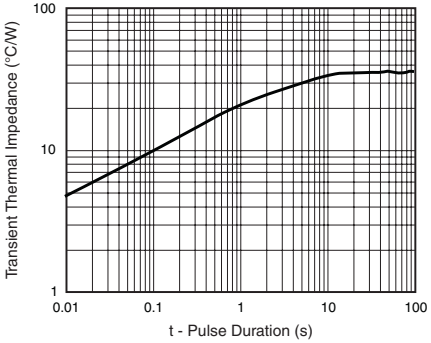
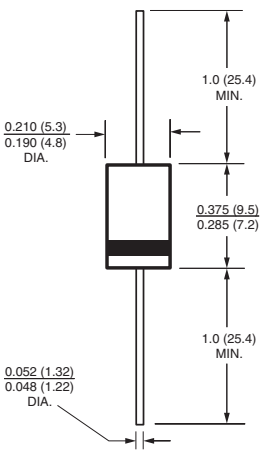


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

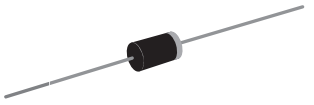
DO-201AD



SB320S thru SB360S

Vishay General Semiconductor

Schottky Barrier Rectifier



DO-204AC (DO-15)

FEATURES

- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High frequency operation
- 20 kV ESD capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	100 A
V_F	0.50 V, 0.70 V
T_J max.	125 °C, 150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB320S	SB330S	SB340S	SB350S	SB360S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	3.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100					A
Electrostatic discharge capacitor voltage Human body model air discharge: C = 100 pF, R = 1.5 kΩ	V_C	20					kV
Voltage rate of change (rated V_R)	dV/dt	10 000					V/µs
Operating junction temperature range	T_J	- 65 to + 125			- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

For technical questions within your region, please contact one of the following:
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Document Number: 88819
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SB320S**	**SB330S**	**SB340S**	**SB350S**	**SB360S**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A		V_F	0.50			0.70		V
Maximum reverse current at rated V_R (2)		T_A = 25 °C	I_R	0.50					mA
		T_A = 100 °C		20			10		

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB320S**	**SB330S**	**SB340S**	**SB350S**	**SB360S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 12					°C/W

Note:

(1) Thermal resistance from junction to lead vertical P.C.B. mounting, 0.500" (12.7 mm) lead length with 2.5 x 2.5" (63.5 x 63.5 mm) copper pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB360S-E3/54	0.40	54	4000	13" diameter paper tape and reel
SB360S-E3/73	0.40	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

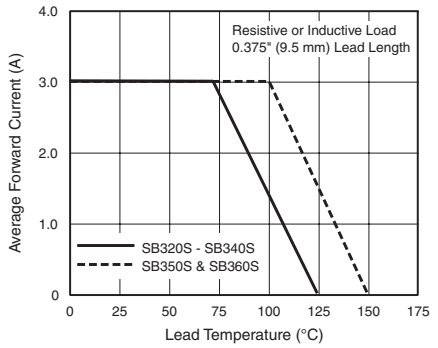


Figure 1. Forward Current Derating Curve

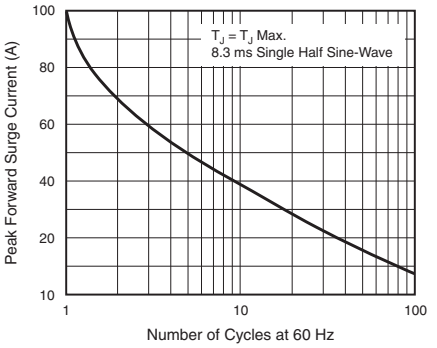


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

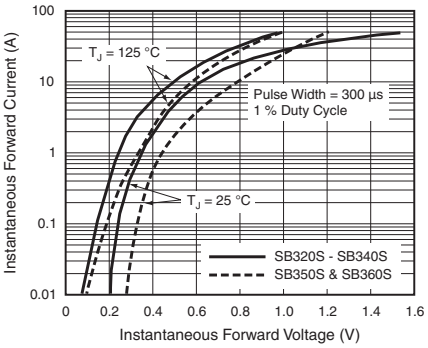


Figure 3. Typical Instantaneous Forward Characteristics

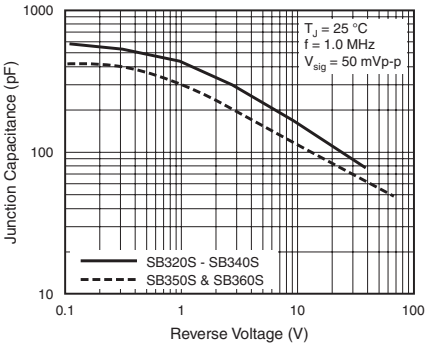


Figure 5. Typical Junction Capacitance

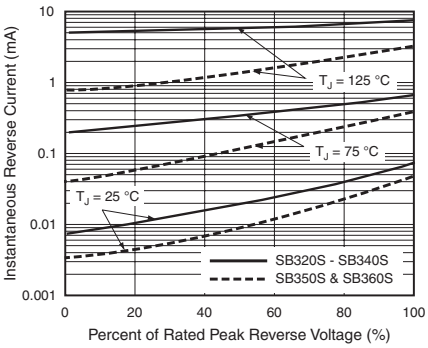


Figure 4. Typical Reverse Characteristics

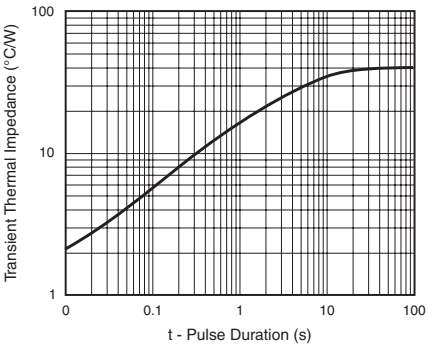
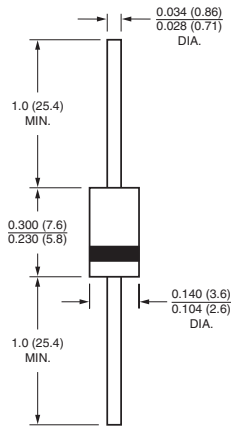


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)

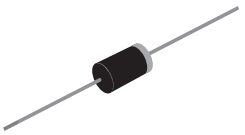


For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88819
Revision: 19-May-08

High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



DO-201AD

FEATURES

- Guardring for overvoltage protection
- Low power losses and high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in middle voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	100 A
V_F	0.65 V
I_R	20 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB3H90	SB3H100	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Maximum working reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at T_L = 90 °C	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100		A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Critical rate of rise of reverse voltage	dV/dt	10 000		V/µs
Storage temperature range	T_{STG}	- 55 to + 175		°C
Maximum operating junction temperature	T_J	175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SB3H90	SB3H100	UNIT
Maximum instantaneous forward voltage (1)	I_F = 3.0 A I_F = 3.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.80 0.65		V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	20 4.0		µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SB3H90**	**SB3H100**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 20		°C/W

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB3H100-E3/54	1.09	54	1400	13" diameter paper tape and reel
SB3H100-E3/73	1.09	73	1000	Ammo pack packaging
SB3H100HE3/54 (1)	1.09	54	1400	13" diameter paper tape and reel
SB3H100HE3/73 (1)	1.09	73	1000	Ammo pack packaging

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

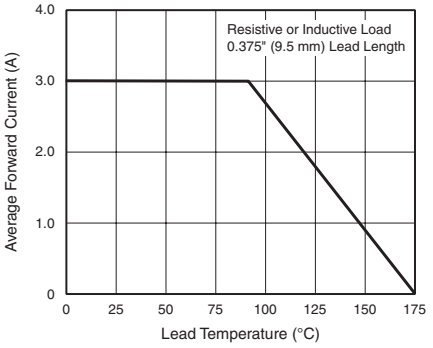


Figure 1. Forward Current Derating Curve

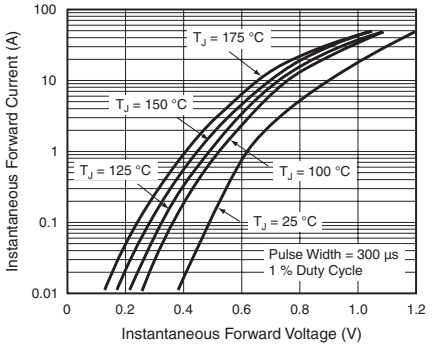


Figure 3. Typical Instantaneous Forward Characteristics

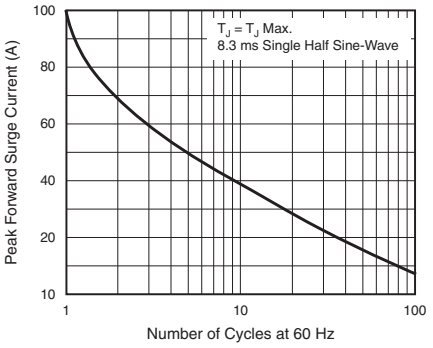


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

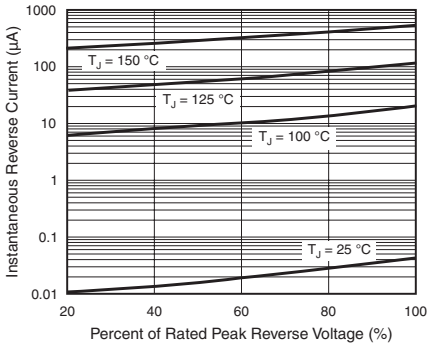


Figure 4. Typical Reverse Characteristics

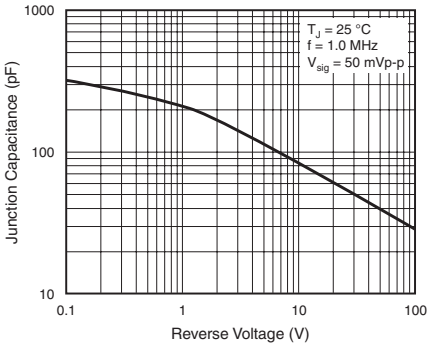


Figure 5. Typical Junction Capacitance

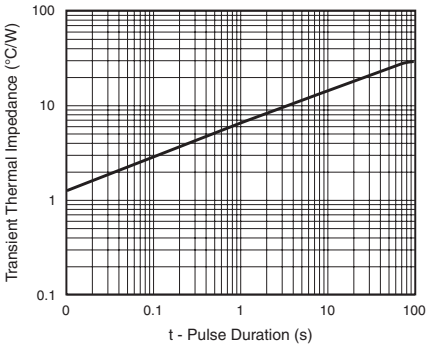
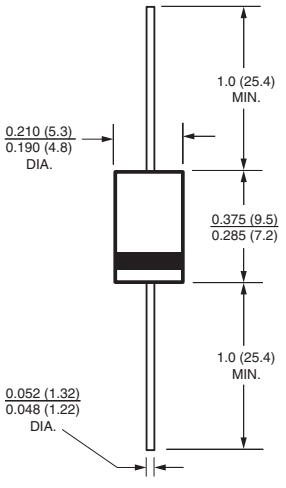


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



Surface Mount Schottky Barrier Rectifier

DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	100 A
E_{AS}	20 mJ
V_F	0.5 V, 0.75 V
T_J max.	125 °C, 150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS32	SS33	SS34	SS35	SS36	UNIT
Device marking code		S2	S3	S4	S5	S6	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	3.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100					A
Non-repetitive avalanche energy at T_A = 25 °C, I_{AS} = 2.0 A, L = 10 mH	E_{AS}	20					mJ
Voltage rate of change (rated V_R)	dv/dt	10 000					V/µs
Operating junction temperature range	T_J	- 55 to + 125			- 55 to + 150		°C
Storage temperature range	T_{STG}	- 55 to + 150					°C

For technical questions within your region, please contact one of the following:
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Document Number: 88751
Revision: 23-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	SS32	SS33	SS34	SS35	SS36	UNIT
Maximum instantaneous forward voltage (1)	3.0 A		V_F	0.5			0.75		V
Maximum DC reverse current at rated DC blocking voltage (1)		T_A = 25 °C	I_R	0.5					mA
		T_A = 100 °C		20			10		

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	SS32	SS33	SS34	SS35	SS36	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	55 17					°C/W

Note:

(1) P.C.B. mounted 0.55 x 0.55" (14 x 14 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SS34-E3/57T	0.235	57T	850	7" diameter plastic tape and reel
SS34-E3/9AT	0.235	9AT	3500	13" diameter plastic tape and reel
SS34HE3/57T (1)	0.235	57T	850	7" diameter plastic tape and reel
SS34HE3/9AT (1)	0.235	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

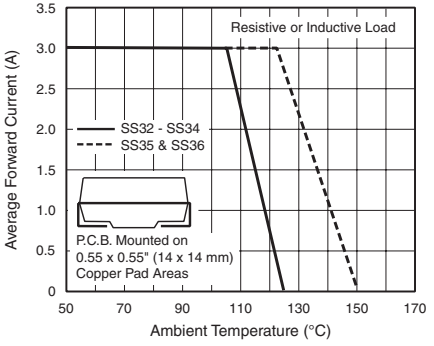


Figure 1. Forward Current Derating Curve

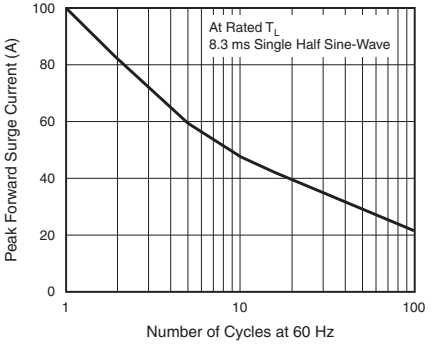


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

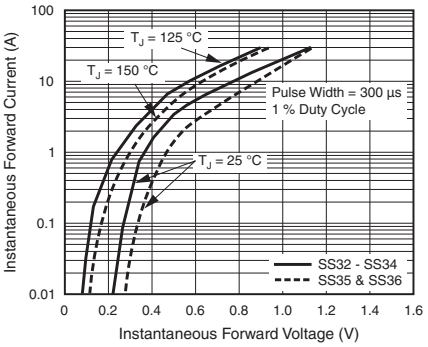


Figure 3. Typical Instantaneous Forward Characteristics

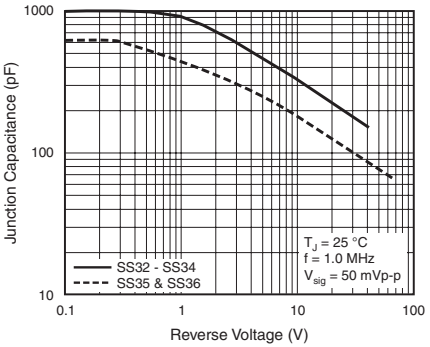


Figure 5. Typical Junction Capacitance

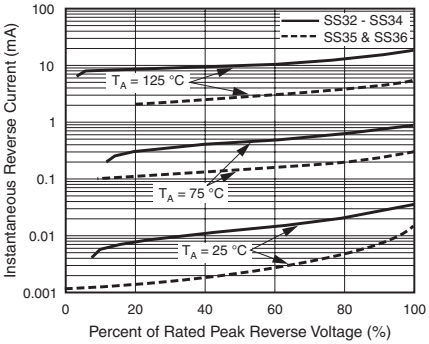


Figure 4. Typical Reverse Current Characteristics

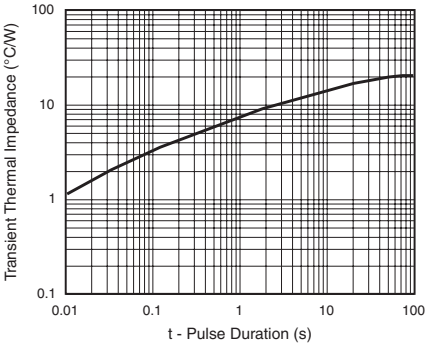
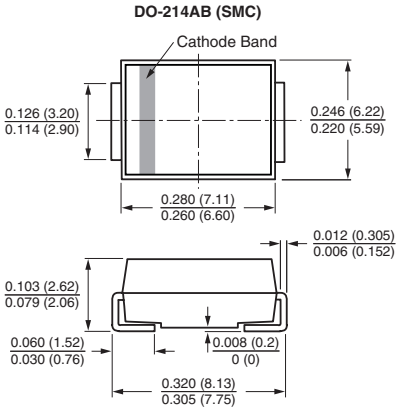
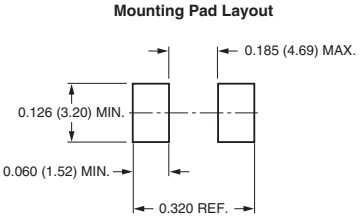


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





High Voltage Surface Mount Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance

DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	100 A
V_F	0.65 V
I_R	20 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS3H9	SS3H10	UNIT
Device marking code		MS9	MS10	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at: T_L = 115 °C	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100		A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Critical rate of rise of reverse voltage	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SS3H9**	**SS3H10**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 3.0 A I_F = 3.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.8 0.65		V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	20 4		µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS3H9**	**SS3H10**	**UNIT**
Typical thermal resistance, junction to lead at T_L = 25 °C	$R_{\theta JL}$	20		°C/W
Typical thermal resistance, junction to ambient (1)	$R_{\theta JA}$	50		

Note:

(1) Units mounted on P.C.B. with 0.55 x 0.55" (14 x 14 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS3H9-E3/57T	0.235	57T	850	7" diameter plastic tape and reel
SS3H9-E3/9AT	0.235	9AT	3500	13" diameter plastic tape and reel
SS3H9HE3/57T (1)	0.235	57T	850	7" diameter plastic tape and reel
SS3H9HE3/9AT (1)	0.235	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

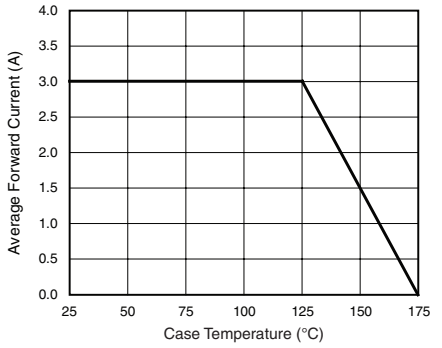


Figure 1. Forward Current Derating Curve

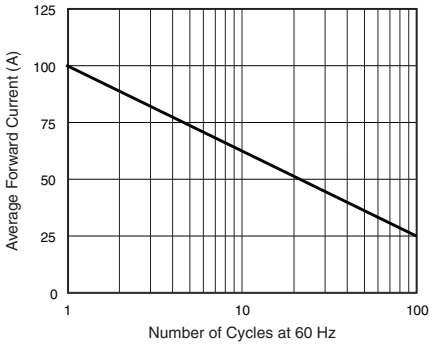


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

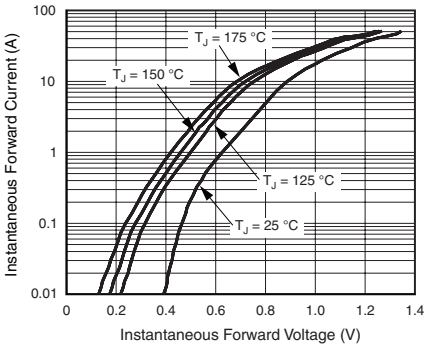


Figure 3. Typical Instantaneous Forward Characteristics

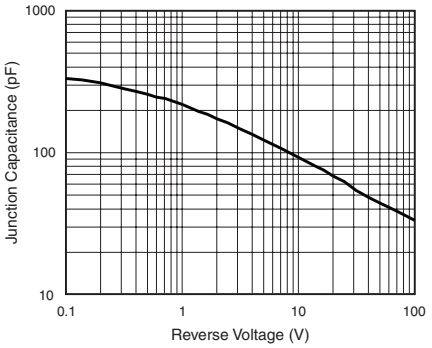


Figure 5. Typical Junction Capacitance

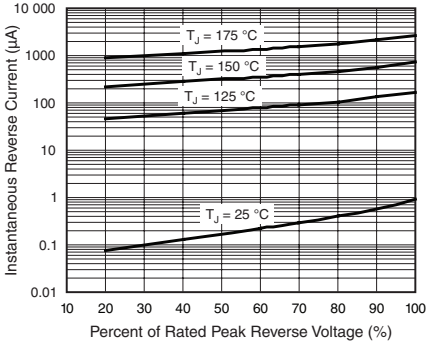


Figure 4. Typical Reverse Characteristics

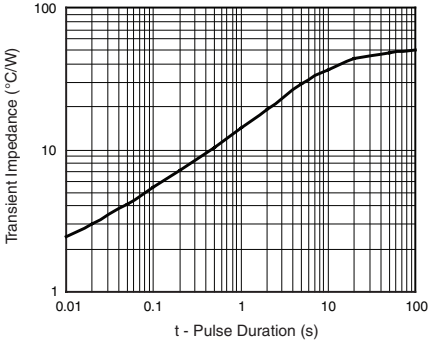
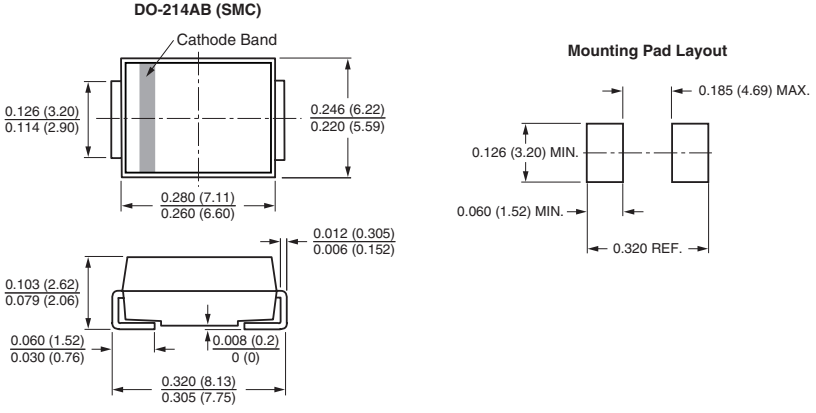


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



SS3P3

Vishay General Semiconductor

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	30 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F	0.43 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS3P3	UNIT
Device marking code		33	
Maximum repetitive peak reverse voltage	V_{RRM}	30	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50	A
Non-repetitive avalanche energy at T_J = 25 °C, I_{AS} = 1.5 A, L = 10 mH	E_{AS}	11.25	mJ
Voltage rate of change (rated V_R)	dV/dt	10 000	V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 3 A I_F = 3 A	T_J = 25 °C T_J = 125 °C	V_F	0.52 0.43	0.58 0.48	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 9.0	200 20	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	130		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88944
Revision: 19-May-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SS3P3**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ R_{eJC}	95 15 20	°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 15 x 15 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS3P3-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS3P3-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS3P3HE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS3P3HE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

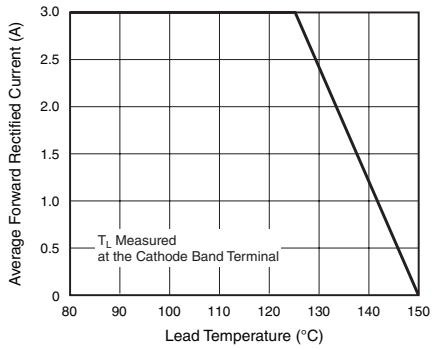


Figure 1. Forward Current Derating Curve

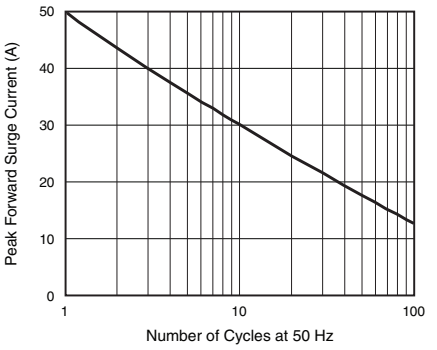


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

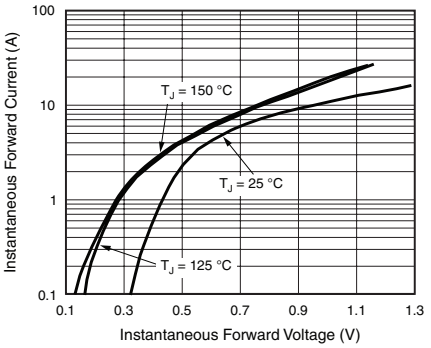


Figure 3. Typical Instantaneous Forward Characteristics

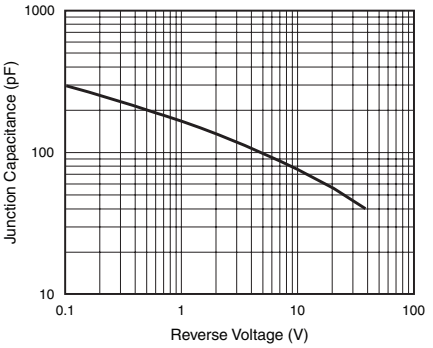


Figure 5. Typical Junction Capacitance

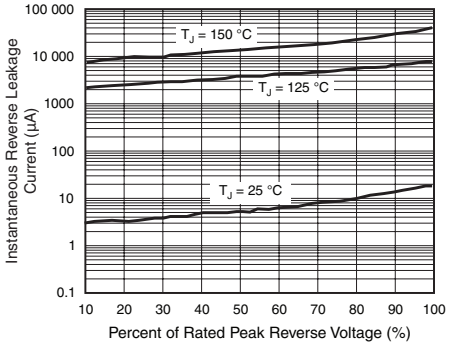


Figure 4. Typical Reverse Leakage Characteristics

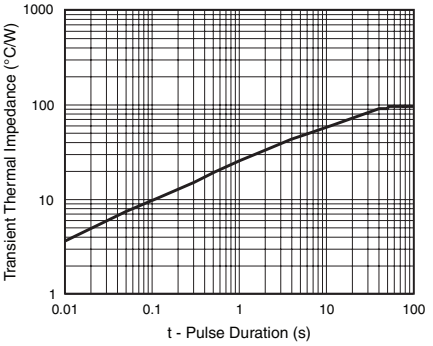
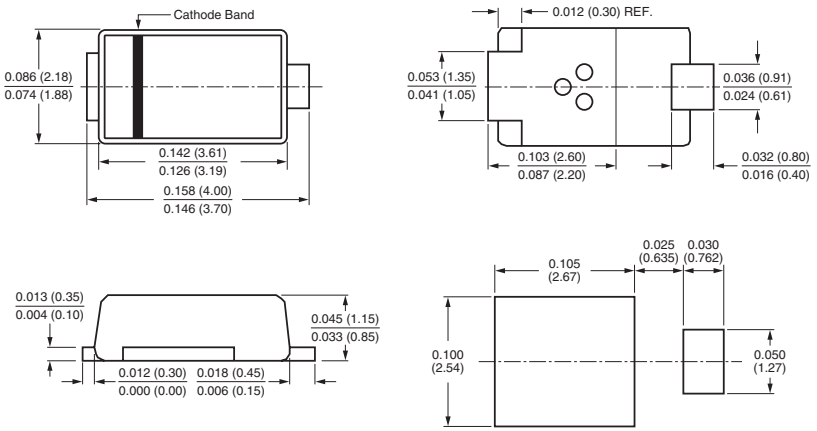


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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Document Number: 88944
Revision: 19-May-08

High Current Density Surface Mount Schottky Rectifier

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	40 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F	0.50 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS3P4	UNIT
Device marking code		34	
Maximum repetitive peak reverse voltage	V_{RRM}	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50	A
Non-repetitive avalanche energy at T_J = 25 °C, I_{AS} = 1.5 A, L = 10 mH	E_{AS}	11.25	mJ
Voltage rate of change (rated V_R)	dV/dt	10 000	V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 3 A	T_J = 25 °C T_J = 125 °C	V_F	0.55 0.50	0.60 0.55	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 7.5	150 15	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	105		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SS3P4**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ R_{eJC}	85 15 20	°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 15 x 15 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS3P4-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS3P4-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS3P4HE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS3P4HE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

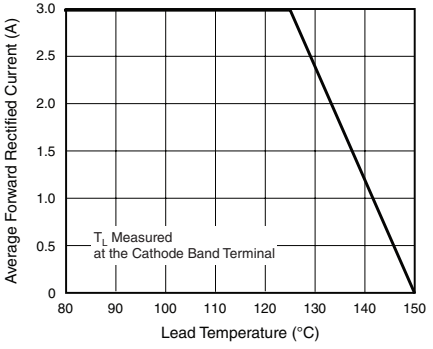


Figure 1. Forward Current Derating Curve

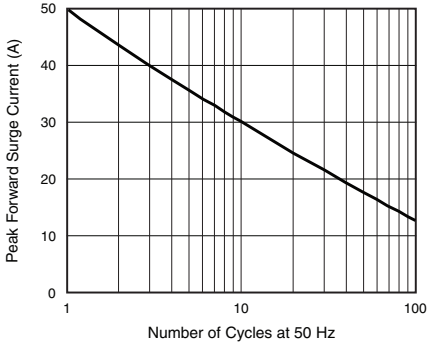


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

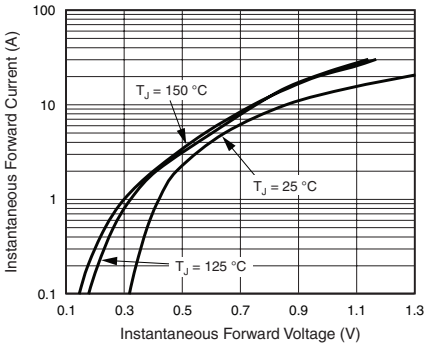


Figure 3. Typical Instantaneous Forward Characteristics

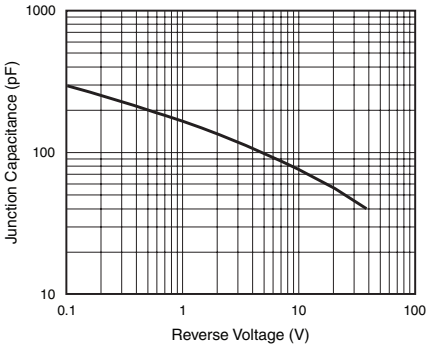


Figure 5. Typical Junction Capacitance

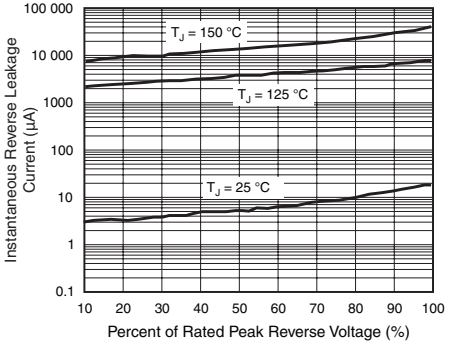


Figure 4. Typical Reverse Leakage Characteristics

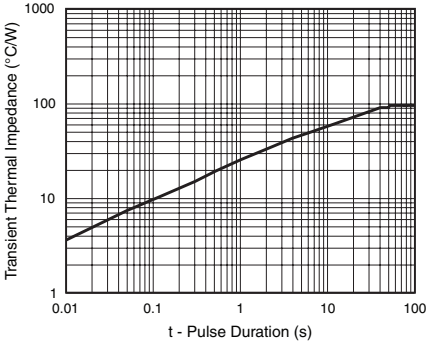
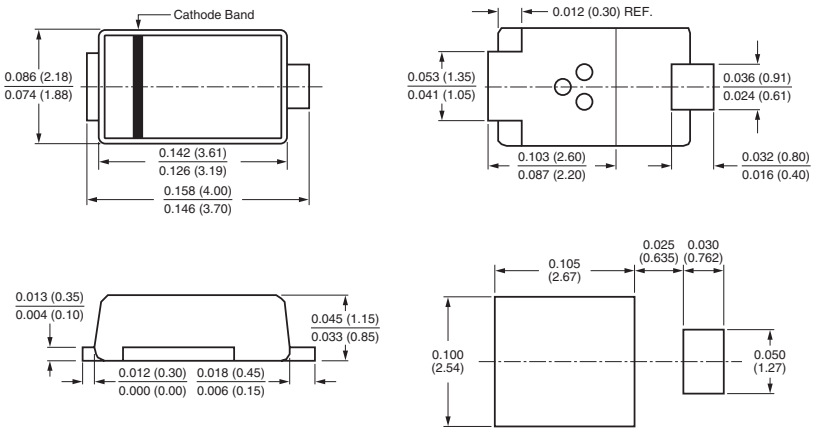


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



SS3P5 & SS3P6

Vishay General Semiconductor

High Current Density Surface Mount Schottky Rectifier

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	45 A
E_{AS}	11.25 mJ
V_F at I_F = 3.0 A	0.61 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS3P5	SS3P6	UNIT
Device marking code		35	36	
Maximum repetive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	45		A
Non-repetitive avalanche energy at I_{AS} = 1.5 A, L = 10 mH, T_J = 25 °C	E_{AS}	11.25		mJ
Voltage rate of change (rated V_R)	dV/dt	10 000		V/us
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 3 A	T_J = 25 °C T_J = 125 °C	V_F	0.71 0.61	0.78 0.65	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 2.0	100 10	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	80		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

For technical questions within your region, please contact one of the following:
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Document Number: 88997
Revision: 19-May-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS3P5**	**SS3P6**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	115 15 20		°C/W

Note:
(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 15 x 15 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS3P6-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS3P6-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS3P6HE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
SS3P6HE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

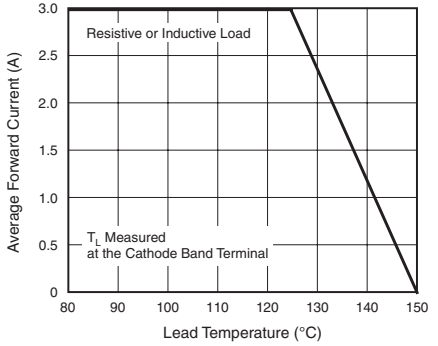


Figure 1. Forward Current Derating Curve

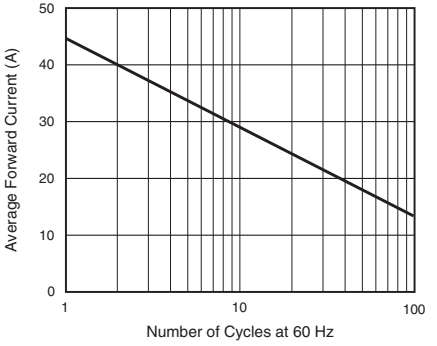


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

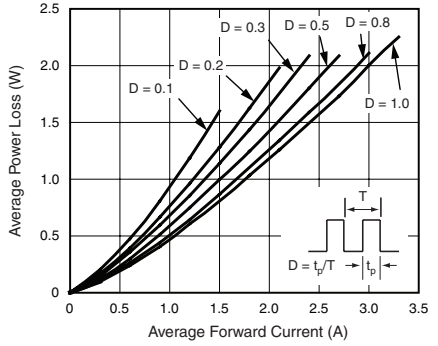


Figure 2. Forward Power Loss Characteristics

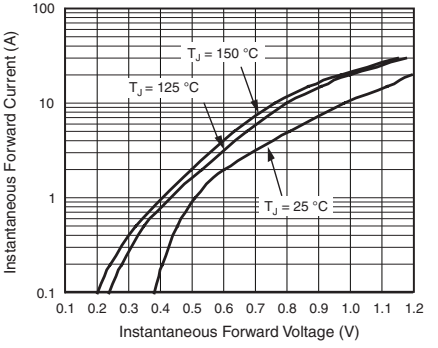


Figure 4. Typical Instantaneous Forward Characteristics

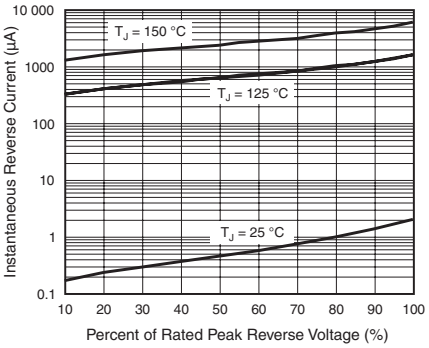


Figure 5. Typical Reverse Leakage Characteristics

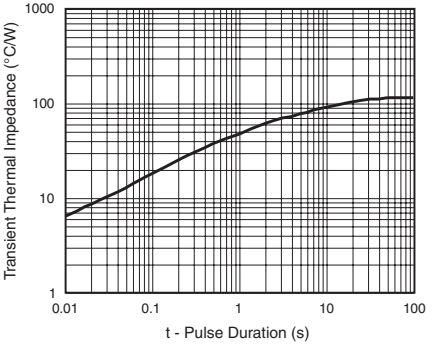


Figure 7. Typical Transient Thermal impedance

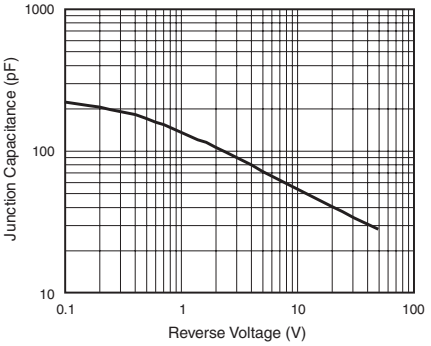
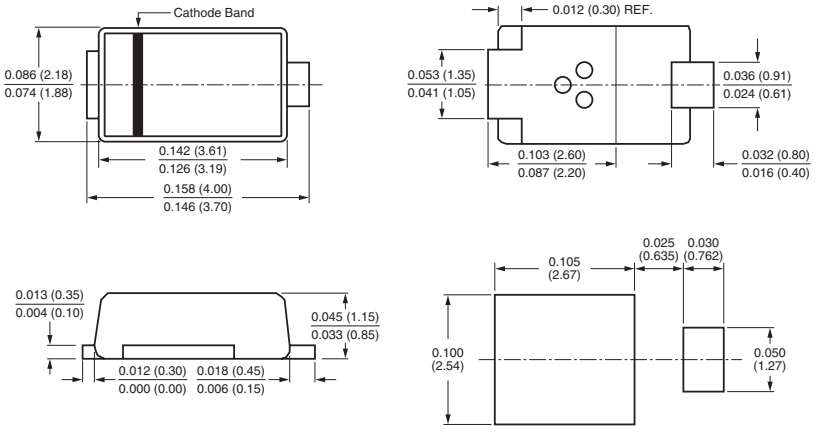


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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High Current Density Surface Mount Schottky Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	75 A
V_F	0.38 V, 0.42 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SSA33L**	**SSA34**	**UNIT**
Device marking code		33L	S34	V
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RMS}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	75		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SSA33L**		**SSA34**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage (1)	3.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.43 0.34	0.45 0.38	0.46 0.38	0.49 0.42	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 20	0.5 35	- 17	0.2 30	mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SSA33L**	**SSA34**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	110 28		°C/W

Note:
(1) Aluminum substrate mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SSA33L-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SSA33L-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
SSA33LHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
SSA33LHE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

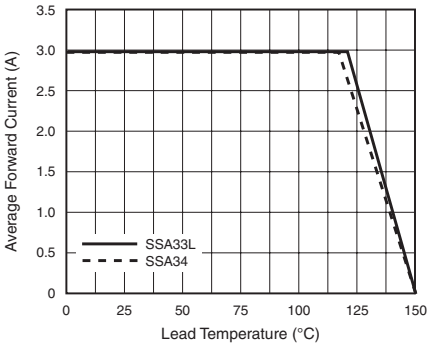


Figure 1. Forward Current Derating Curve

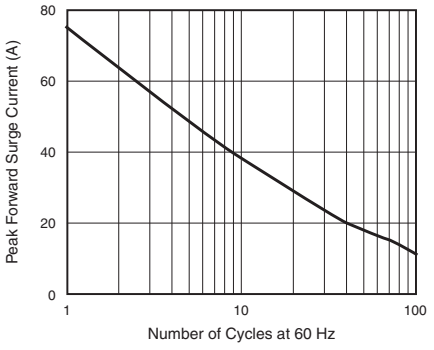


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

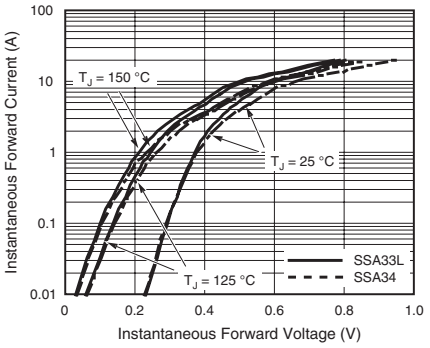


Figure 3. Typical Instantaneous Forward Characteristics

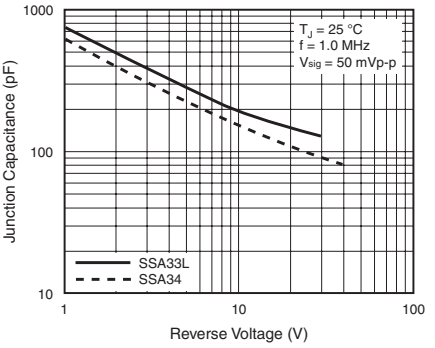


Figure 5. Typical Junction Capacitance

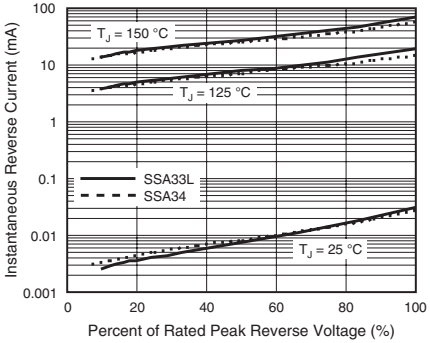
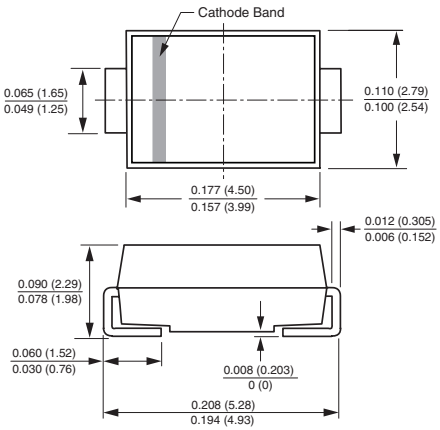


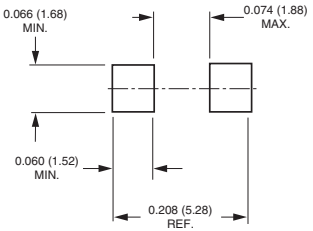
Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)

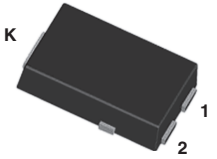


Mounting Pad Layout

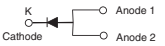


High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	150 A
E_{AS}	20 mJ
V_F at I_F = 3.0 A	0.335 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS3P3L	SS3P4L	UNIT
Device marking code		S33	S34	
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.5 A I_F = 3.0 A	T_A = 25 °C	V_F	0.384 0.427	- 0.47	V
	I_F = 1.5 A I_F = 3.0 A	T_A = 125 °C		0.268 0.335	- 0.38	
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	61.8 26.7	250 40	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	280	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS3P3L**	**SS3P4L**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS3P4L-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS3P4L-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS3P4LHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS3P4LHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS3P4L-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS3P4L-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS3P4LHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS3P4LHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

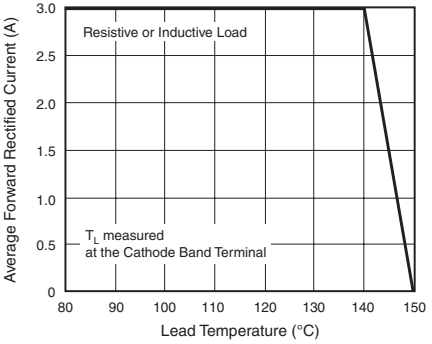


Figure 1. Forward Current Derating Curve

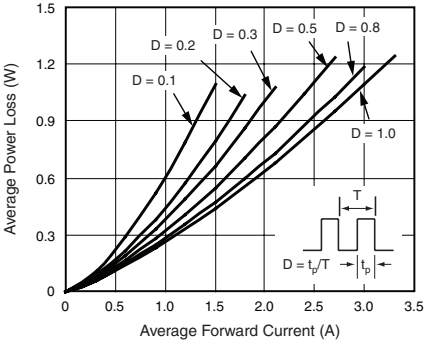


Figure 2. Forward Power Loss Characteristics

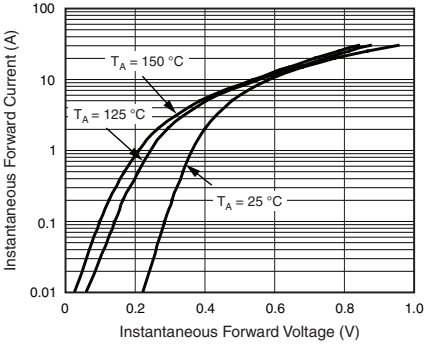


Figure 3. Typical Instantaneous Forward Characteristics

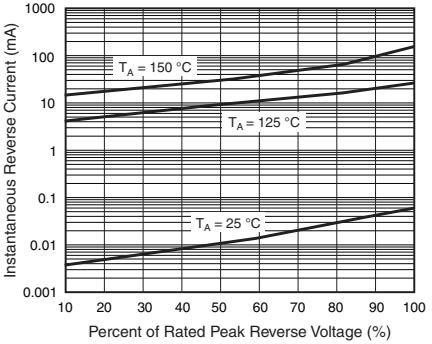


Figure 4. Typical Reverse Leakage Characteristics

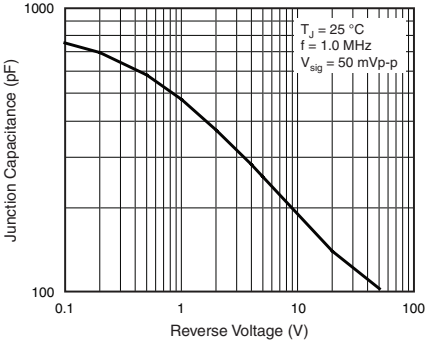


Figure 5. Typical Junction Capacitance

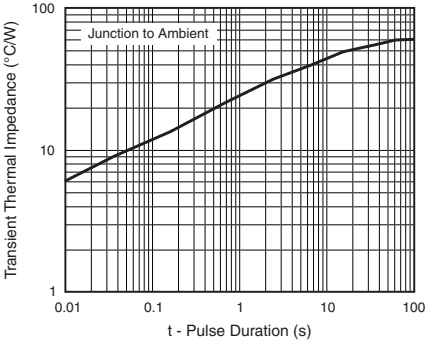
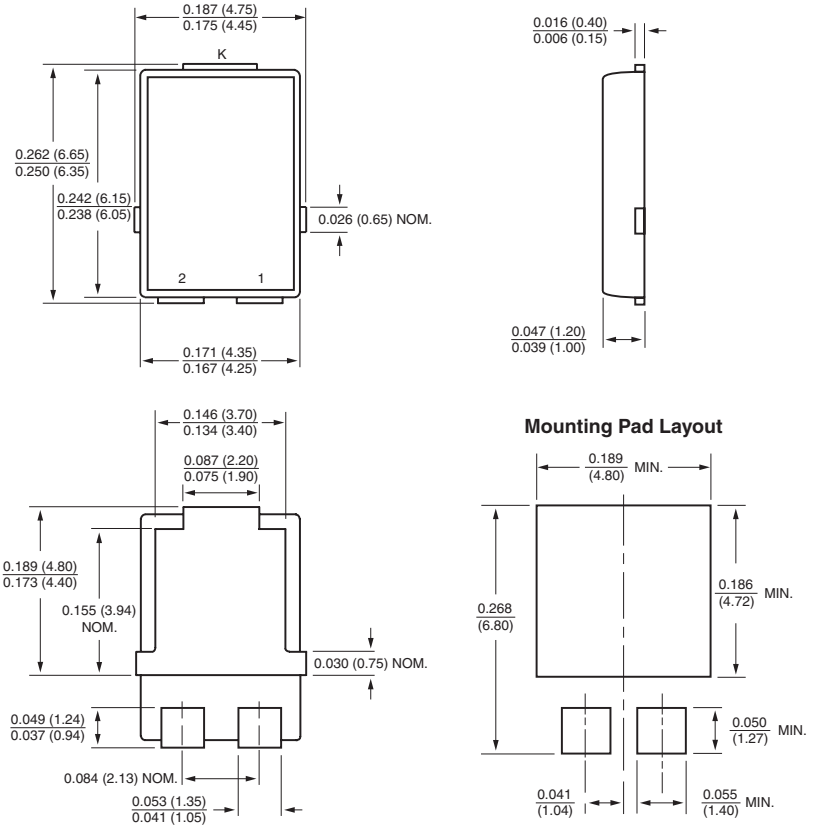


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



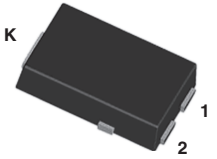
Conform to JEDEC TO-277A

SS3P5L & SS3P6L

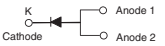
Vishay General Semiconductor

Low V_F High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	150 A
E_{AS}	20 mJ
V_F at I_F = 3.0 A	0.478 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS3P5L	SS3P6L	UNIT
Device marking code		S35	S36	
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88987
Revision: 30-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.5 A I_F = 3.0 A	T_A = 25 °C	V_F	0.464 0.542	- 0.60	V
	I_F = 1.5 A I_F = 3.0 A	T_A = 125 °C		0.379 0.478	- 0.54	
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	8.4 3.4	150 15	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	200	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS3P5L**	**SS3P6L**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	65 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS3P5L-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS3P5L-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS3P5LHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS3P5LHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS3P5L-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS3P5L-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS3P5LHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS3P5LHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

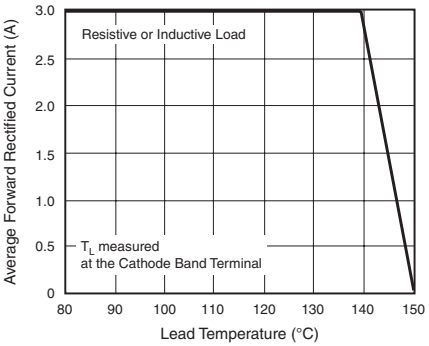


Figure 1. Maximum Forward Current Derating Curve

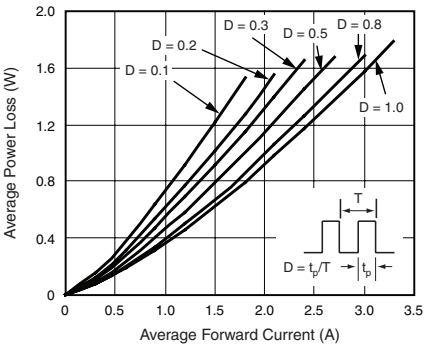


Figure 2. Forward Power Loss Characteristics

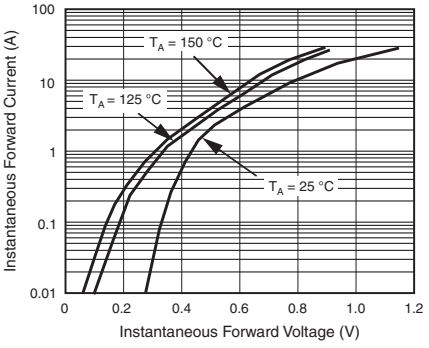


Figure 3. Typical Instantaneous Forward Characteristics

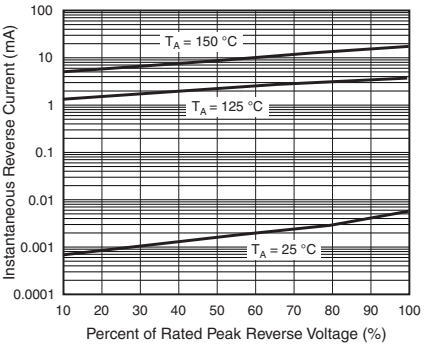


Figure 4. Typical Reverse Characteristics

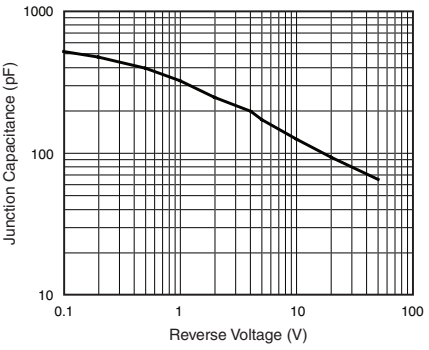


Figure 5. Typical Junction Capacitance

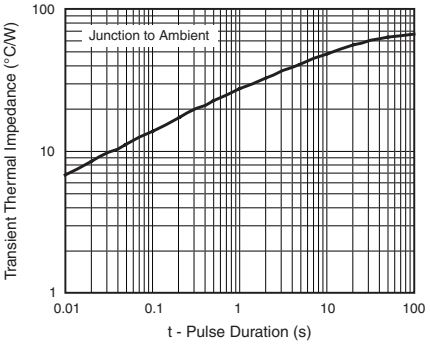
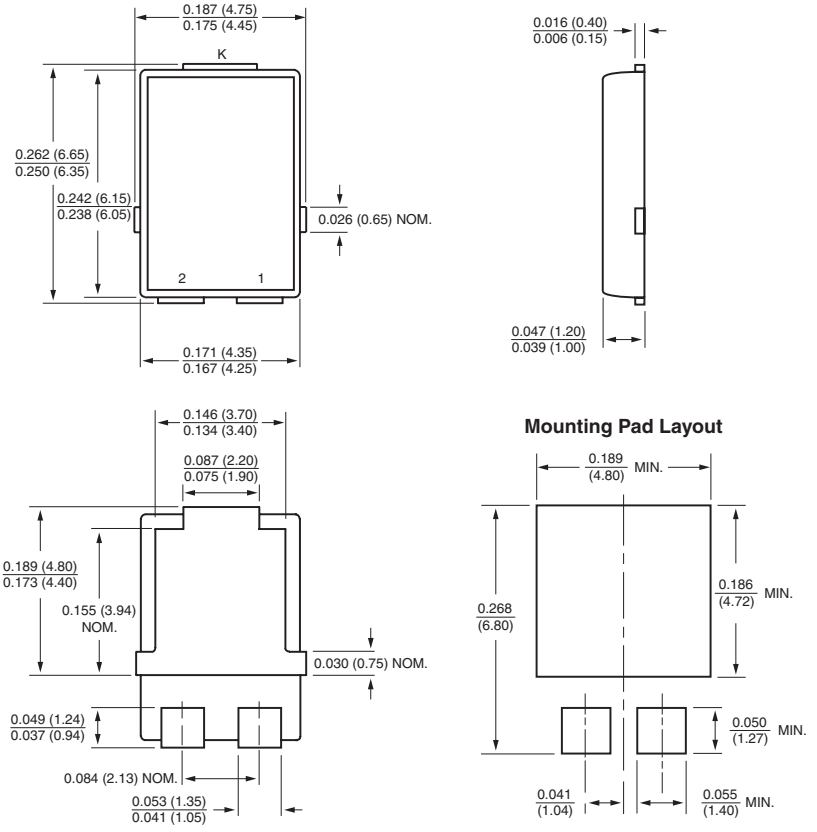


Figure 6. Typical Transient Thermal Impedance

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)

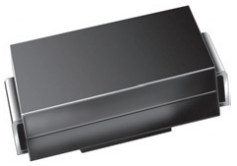


Conform to JEDEC TO-277A

SS32S, SS33S & SS34S

Vishay General Semiconductor

Surface Mount Schottky Barrier Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	20 V, 30 V, 40 V
I_{FSM}	35 A
V_F at I_F = 3.0 A	0.61 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS32S	SS33S	SS34S	UNIT
Device marking code		32S	33S	34S	V
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	35			A
Voltage rate of change (rated V_R)	dV/dt	10 000			V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89070
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 3 A	T_A = 25 °C	V_F	0.61	0.65	V
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 100 °C	I_R	13 1.65	200 8	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	130	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SS32S**	**SS33S**	**SS34S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	72 9			°C/W

Note:

(1) P.C.B. mounted with 0.4 x 0.4" (10 x 10 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS34S-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SS34S-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

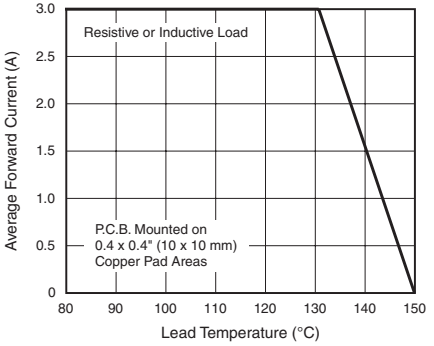


Figure 1. Forward Current Derating Curve

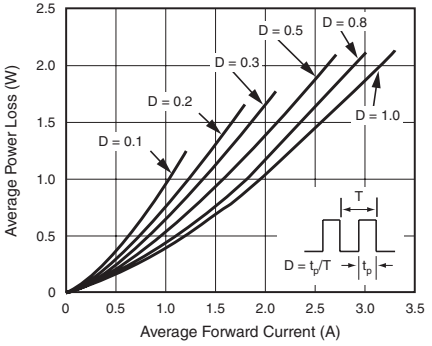


Figure 2. Forward Power Loss Characteristics

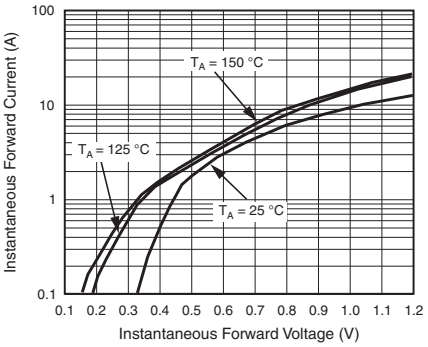


Figure 3. Typical Instantaneous Forward Characteristics

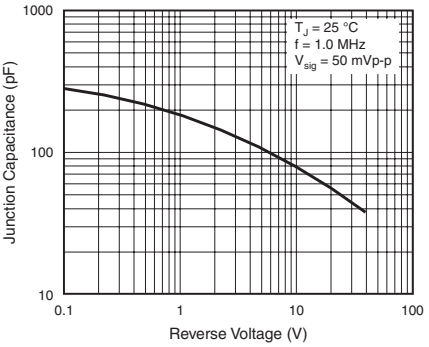


Figure 5. Typical Junction Capacitance

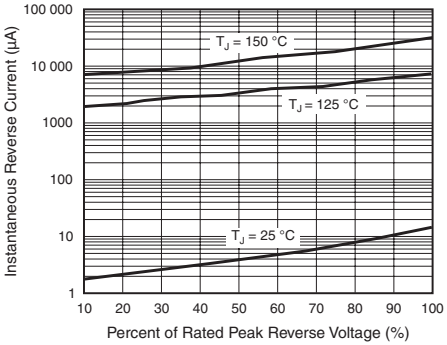
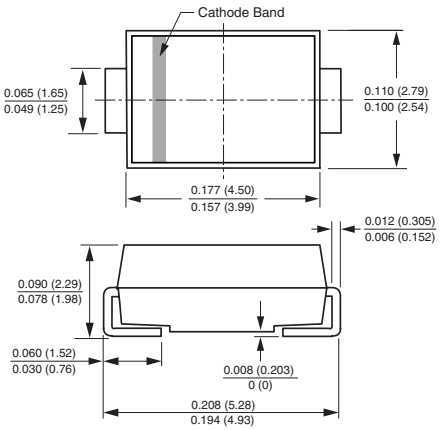


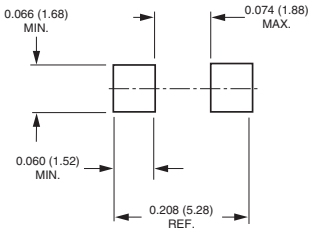
Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Surface Mount Schottky Barrier Rectifier

DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	20 V to 40 V
I_{FSM}	150 A
V_F	0.31 V, 0.35 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SL42	SL43	SL44	UNIT
Device marking code		SL2	SL3	SL4	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum RMS voltage	V_{RMS}	14	21	28	V
Maximum DC blocking voltage	V_{DC}	20	30	40	V
Maximum average forward rectified current (1) at T_L (Fig. 1)	$I_{F(AV)}$	4.0 8.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150			A
Operating junction temperature range	T_J	- 55 to + 125			°C
Storage temperature range	T_{STG}	- 55 to + 150			°C

Note:

(1) P.C.B. mounted 0.55 x 0.55" (14 x 14 mm) copper pad areas, T_L = 90 °C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SL42**	**SL43**	**SL44**	**UNIT**
Maximum instantaneous forward voltage at (1)	I_F = 4.0 A I_F = 4.0 A I_F = 8.0 A I_F = 8.0 A	T_A = 125 °C T_A = 25 °C T_A = 125 °C T_A = 25 °C	V_F	0.31 0.42 0.37 0.47		0.35 0.44 0.41 0.50	V
Maximum DC reverse current at rated DC blocking voltage (1)		T_A = 25 °C T_A = 100 °C	I_R	0.5 35			mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SL42**	**SL43**	**SL44**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 14			°C/W

Note:

(1) P.C.B. mounted 0.55 x 0.55" (14 x 14 mm) copper pad areas, T_L = 90 °C

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SL43-E3/57T	0.235	57T	850	7" diameter plastic tape and reel
SL43-E3/9AT	0.235	9AT	3500	13" diameter plastic tape and reel
SL43HE3/57T (1)	0.235	57T	850	7" diameter plastic tape and reel
SL43HE3/9AT (1)	0.235	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

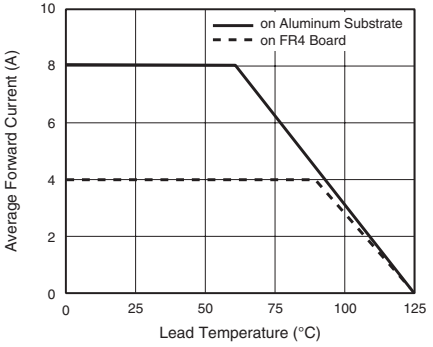


Figure 1. Forward Current Derating Curve

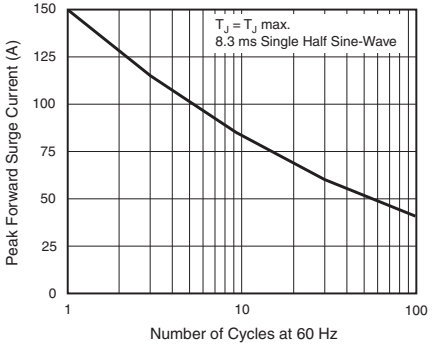


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

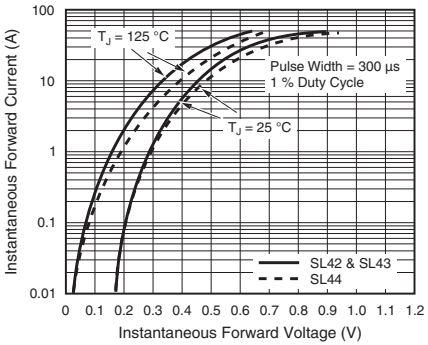


Figure 3. Typical Instantaneous Forward Characteristics

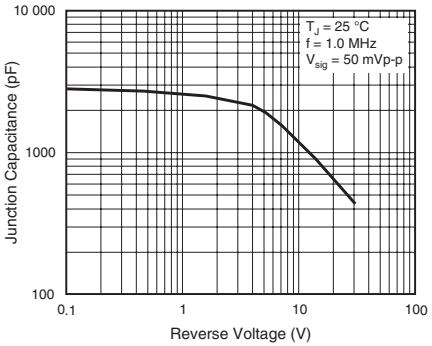


Figure 5. Typical Junction Capacitance

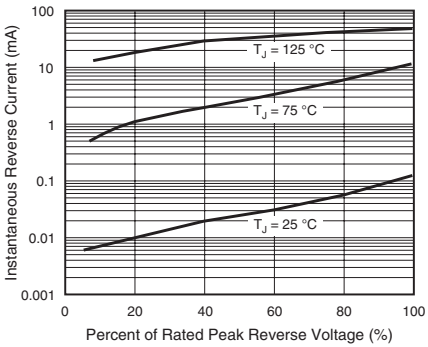
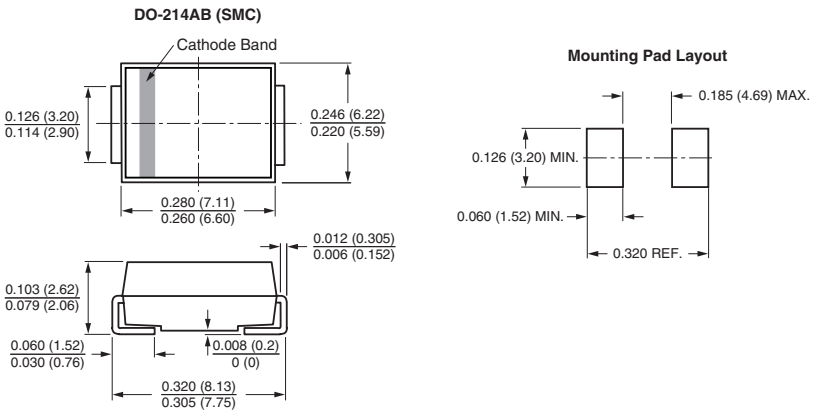
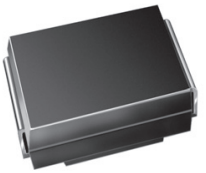


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



High Current Density Surface Mount Schottky Rectifier



DO-214AA (SMB)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	100 A
V_F	0.38 V, 0.42 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SSB43L	SSB44	UNIT
Device marking code		43L	S44	
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RMS}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Max. average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	4.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150		C

For technical questions within your region, please contact one of the following:
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Document Number: 88884
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SSB43L**		**SSB44**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage (1)	4.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.43 0.33	0.45 0.38	0.45 0.37	0.49 0.42	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 35	0.6 45	- 25	0.4 40	mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SSB43L**	**SSB44**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	70 23		°C/W

Note:
(1) Aluminum substrate mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SSB43L-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
SSB43L-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
SSB43LHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
SSB43LHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

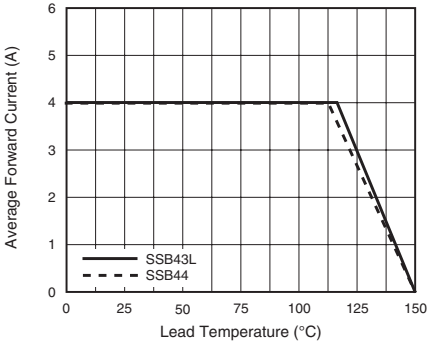


Figure 1. Forward Current Derating Curve

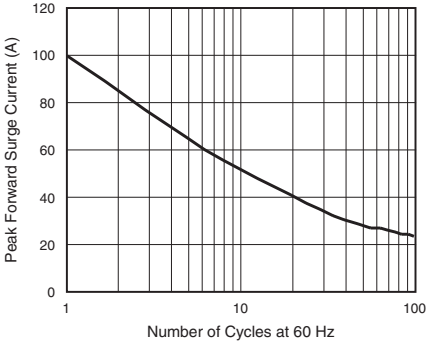


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

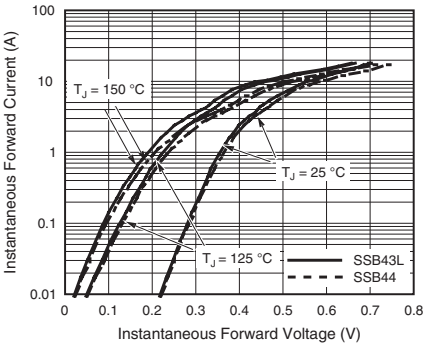


Figure 3. Typical Instantaneous Forward Characteristics

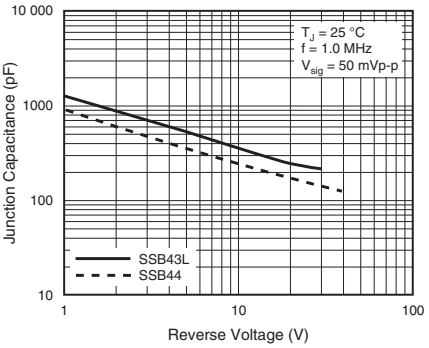


Figure 5. Typical Junction Capacitance

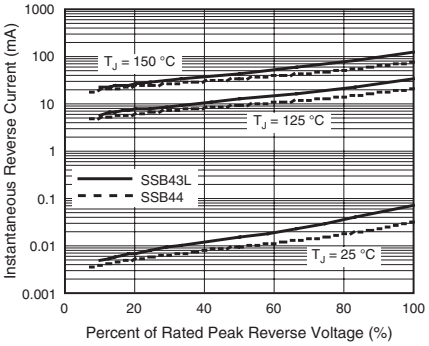
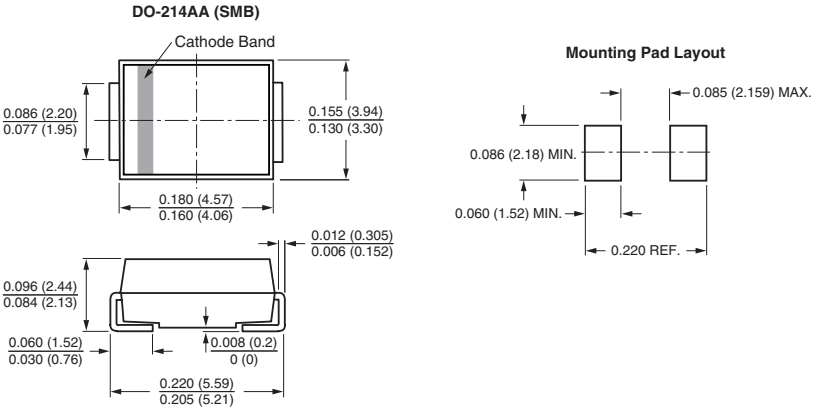


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



For technical questions within your region, please contact one of the following:
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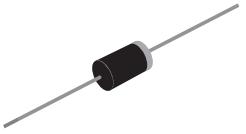
Document Number: 88884
Revision: 19-May-08

Schottky Barrier Rectifier



DO-201AD

FEATURES

- Guardring for overvoltage protection
- Extremely fast switching
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	220 A
V_F	0.48 V, 0.65 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB520	SB530	SB540	SB550	SB560	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	5.0					A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	220					A
Operating junction temperature range	T_J	- 65 to + 150					°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SB520	SB530	SB540	SB550	SB560	UNIT
Maximum instantaneous forward voltage (1)	5.0 A		V_F	0.48			0.65		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_A = 25 °C	I_R	0.5					mA
		T_A = 100 °C		50			25		

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB520**	**SB530**	**SB540**	**SB550**	**SB560**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	25 8					°C/W

Note:

(1) Thermal resistance from junction to lead vertical P.C.B. mounting, 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB540-E3/54	1.09	54	1400	13" diameter paper tape and reel
SB540-E3/73	1.09	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

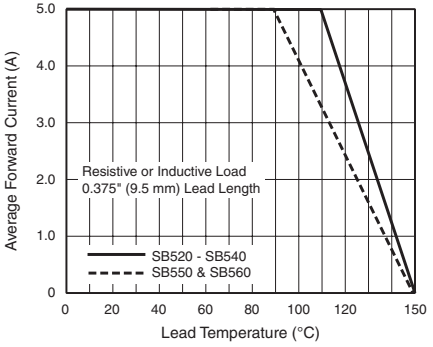


Figure 1. Forward Current Derating Curve

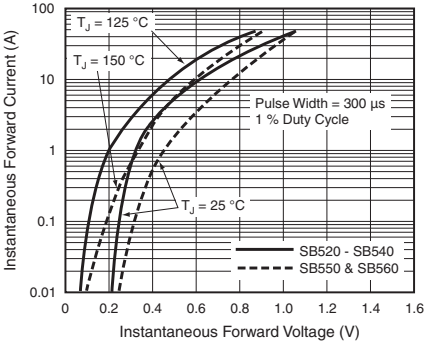


Figure 3. Typical Instantaneous Forward Characteristics

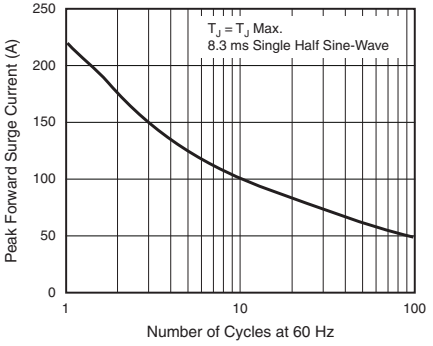


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

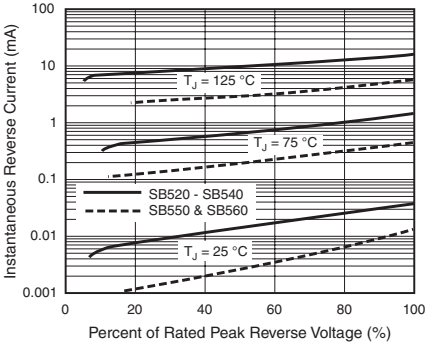


Figure 4. Typical Reverse Characteristics

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Document Number: 88721
Revision: 18-Jun-07

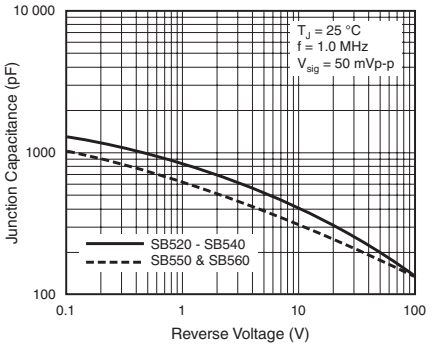


Figure 5. Typical Junction Capacitance

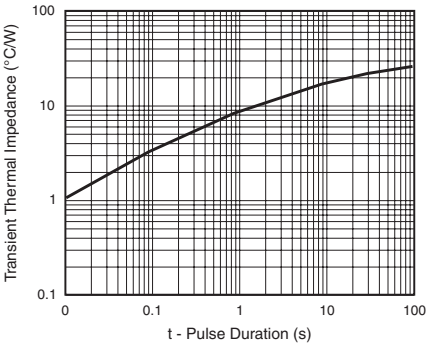
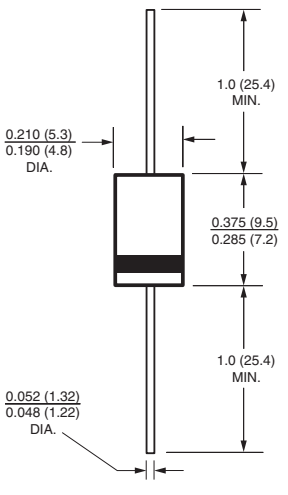


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

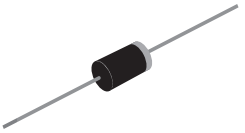
DO-201AD



SB520A thru SB560A

Vishay General Semiconductor

Schottky Barrier Rectifier



DO-201AD

FEATURES

- Guardring for overvoltage protection
- Very small conduction losses
- Extremely fast switching
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	20 V to 60 V
I_{FSM}	150 A
V_F	0.50 V, 0.70 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB520A	SB530A	SB540A	SB550A	SB560A	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	50	60	V
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	V
Maximum DC blocking voltage	V_{DC}	20	30	40	50	60	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	5.0					A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150					A
Operating junction temperature range	T_J	- 65 to + 150					°C
Storage temperature range	T_{STG}	- 65 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SB520A	SB530A	SB540A	SB550A	SB560A	UNIT
Maximum instantaneous forward voltage (1)	5.0 A		V_F	0.50			0.70		V
Maximum reverse current at rated V_R (2)		T_A = 25 °C	I_R	0.5					mA
		T_A = 100 °C		50			25		

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

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Document Number: 88903
Revision: 19-May-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**SB520A**	**SB530A**	**SB540A**	**SB550A**	**SB560A**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JC}$ $R_{\theta JL}$	25 10 8					°C/W

Note:

(1) Thermal resistance from junction to lead vertical P.C.B. mounting, 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB540A-E3/54	1.08	54	1400	13" diameter paper tape and reel
SB540A-E3/73	1.08	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

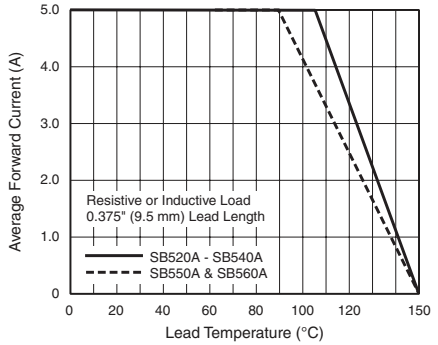


Figure 1. Forward Current Derating Curve

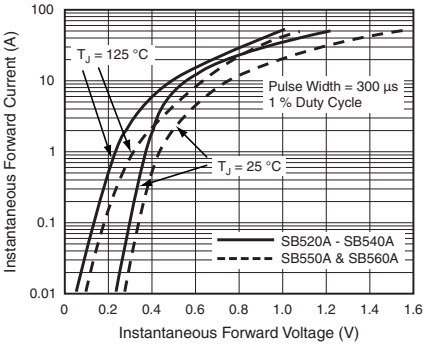


Figure 3. Typical Instantaneous Forward Characteristics

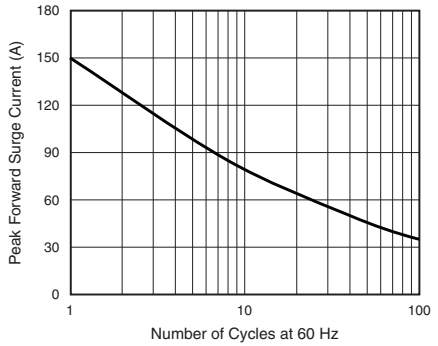


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

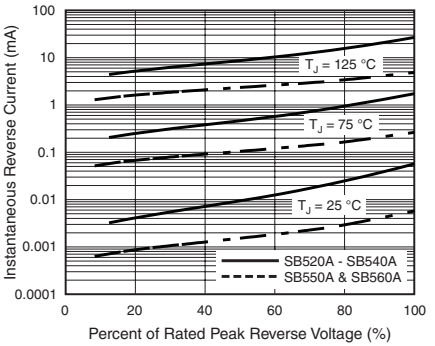


Figure 4. Typical Reverse Characteristics

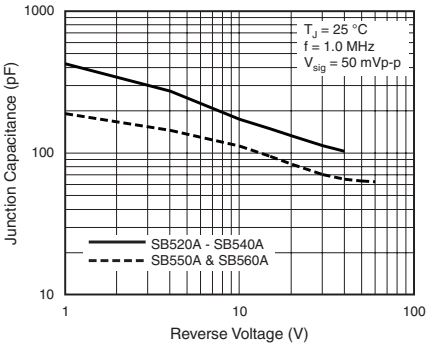


Figure 5. Typical Junction Capacitance

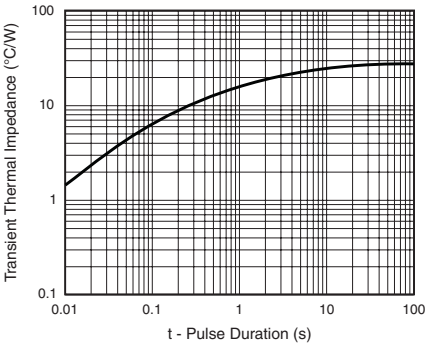
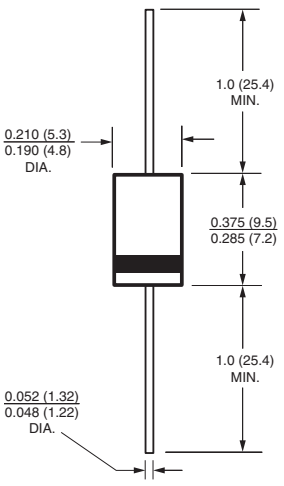


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

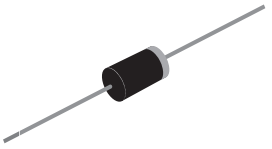
DO-201AD



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



DO-201AD

FEATURES

- Guardring for overvoltage protection
- Low power losses and high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	200 A
V_F	0.70 V
I_R	200 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in middle voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SB5H90	SB5H100	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 80 °C	$I_{F(AV)}$	5.0		A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200		A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Storage temperature range	T_{STG}	- 55 to + 175		°C
Maximum operating junction temperature	T_J	175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SB5H90**	**SB5H100**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 5.0 A I_F = 5.0 A	T_A = 25 °C T_A = 125 °C	V_F	0.80 0.70		V
Maximum reverse current at rated V_R (2)		T_A = 25 °C T_A = 125 °C	I_R	200 10		µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SB5H90**	**SB5H100**	**UNIT**
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	25 8		°C/W

Note:
(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB5H100-E3/54	1.1	54	1400	13" diameter paper tape and reel
SB5H100-E3/73	1.1	73	1000	Ammo pack packaging
SB5H100HE3/54 (1)	1.1	54	1400	13" diameter paper tape and reel
SB5H100HE3/73 (1)	1.1	73	1000	Ammo pack packaging

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

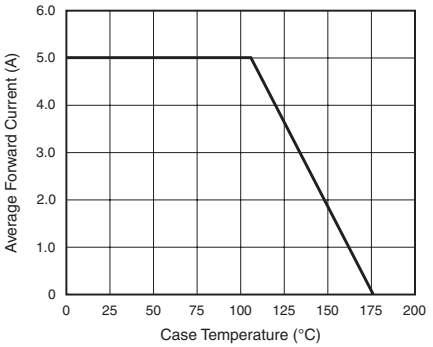


Figure 1. Forward Current Derating Curve

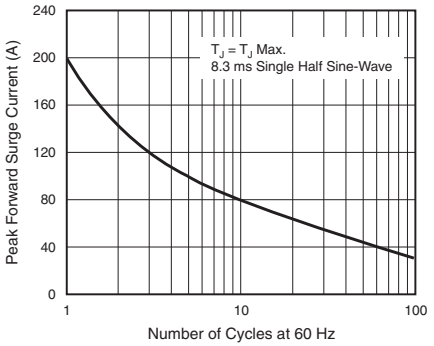


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

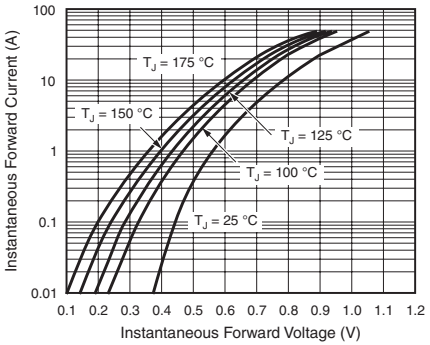


Figure 3. Typical Instantaneous Forward Characteristics

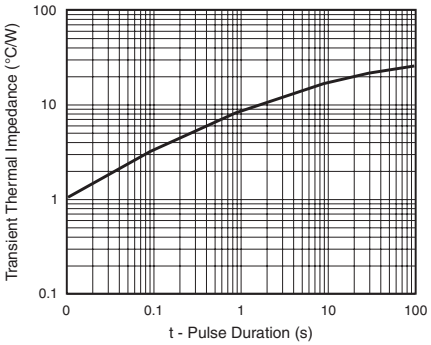


Figure 5. Typical Transient Thermal Impedance

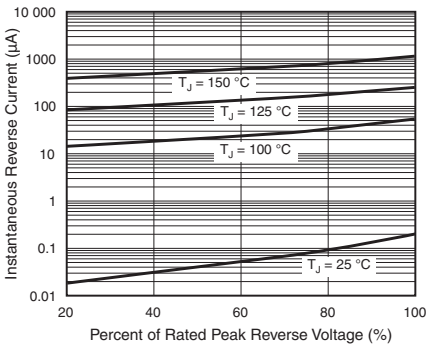


Figure 4. Typical Reverse Characteristics

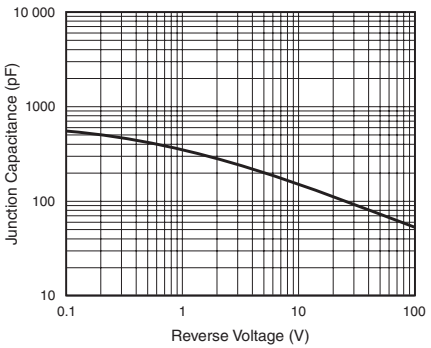
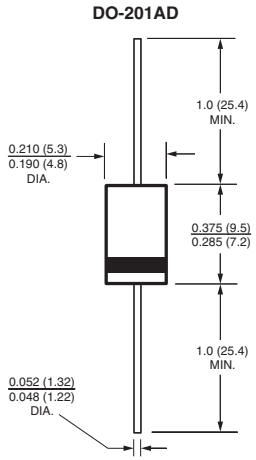


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



SSC53L & SSC54

Vishay General Semiconductor

High Current Density Surface Mount Schottky Rectifier

DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low forward voltage drop
- High surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	175 A
V_F	0.38 V, 0.42 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SSC53L	SSC54	UNIT
Device marking code		53L	S54	
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RMS}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_L (Fig. 1)	$I_{F(AV)}$	5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	175		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88885
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SSC53L**		**SSC54**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage (1)	5.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.42 0.33	0.45 0.38	0.45 0.36	0.49 0.42	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 45	0.7 65	- 40	0.5 60	mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SSC53L**	**SSC54**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	60 20		°C/W

Note:
(1) Aluminum substrate mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SSC53L-E3/57T	0.235	57T	850	7" diameter plastic tape and reel
SSC53L-E3/9AT	0.235	9AT	3500	13" diameter plastic tape and reel
SSC53LHE3/57T (1)	0.235	57T	850	7" diameter plastic tape and reel
SSC53LHE3/9AT (1)	0.235	9AT	3500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

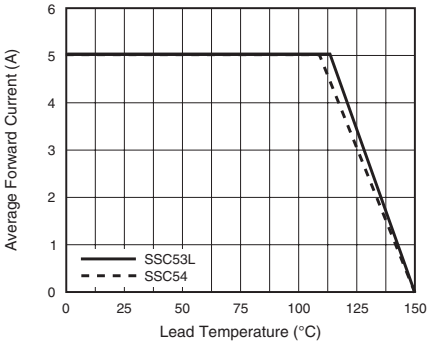


Figure 1. Forward Current Derating Curve

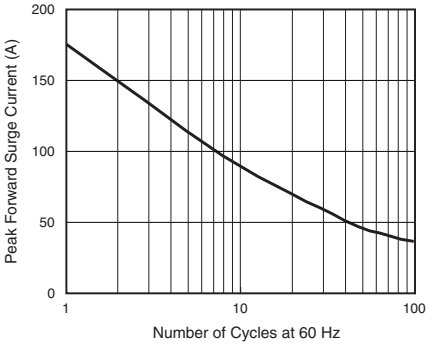


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

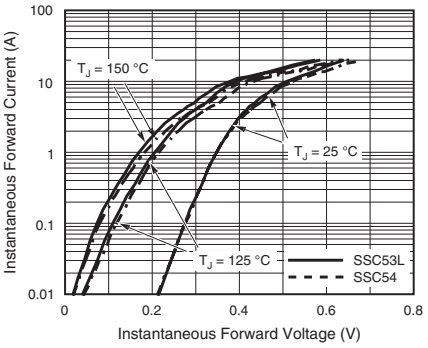


Figure 3. Typical Instantaneous Forward Characteristics

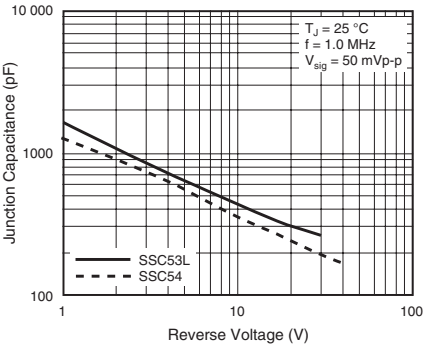


Figure 5. Typical Junction Capacitance

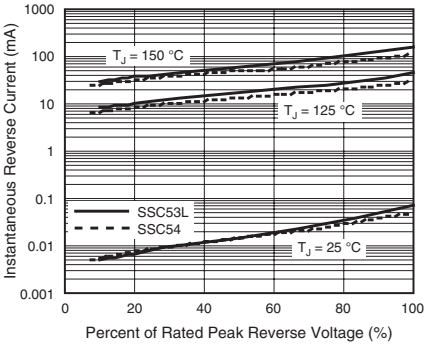
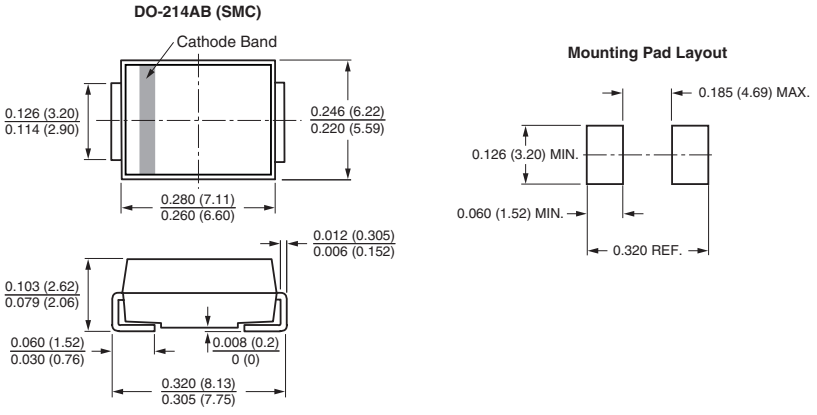
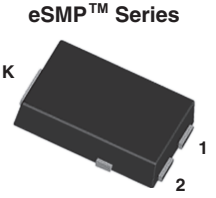


Figure 4. Typical Reverse Characteristics

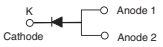
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



High Current Density Surface Mount Schottky Barrier Rectifiers



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	150 A
E_{AS}	20 mJ
V_F at I_F = 5.0 A	0.403 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS5P3**	**SS5P4**	**UNIT**
Device marking code		S53	S54	
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	5.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2.5 A I_F = 5.0 A	T_A = 25 °C	V_F	0.416 0.476	- 0.52	V
	I_F = 2.5 A I_F = 5.0 A	T_A = 125 °C		0.312 0.403	- 0.45	
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	61.8 26.7	250 40	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	280	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS5P3**	**SS5P4**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS5P4-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS5P4-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS5P4HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS5P4HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS5P4-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS5P4-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS5P4HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS5P4HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

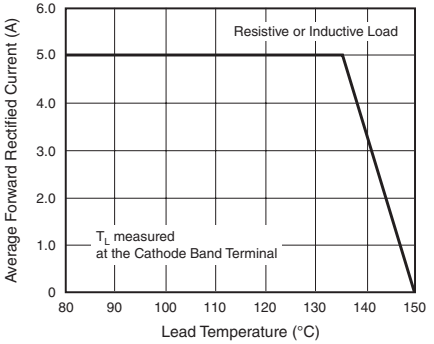


Figure 1. Maximum Forward Current Derating Curve

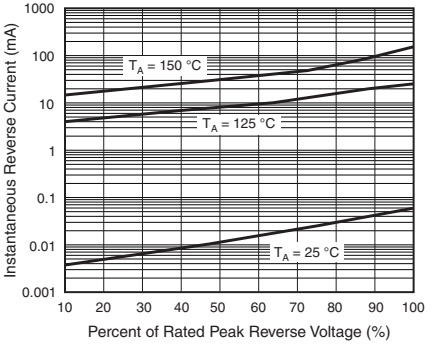


Figure 4. Typical Reverse Leakage Characteristics

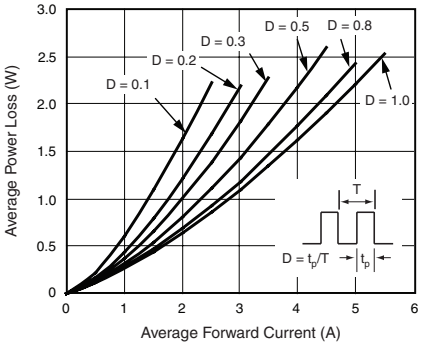


Figure 2. Forward Power Loss Characteristics

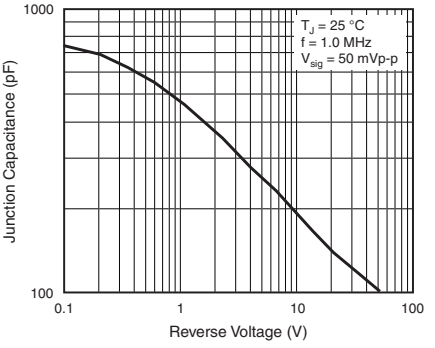


Figure 5. Typical Junction Capacitance

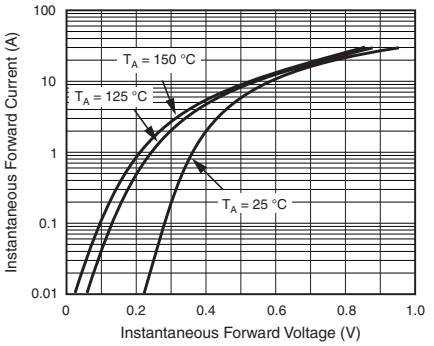


Figure 3. Typical Instantaneous Forward Characteristics

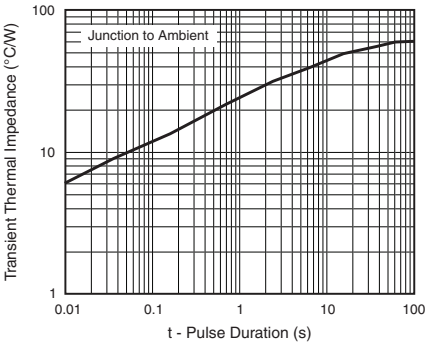
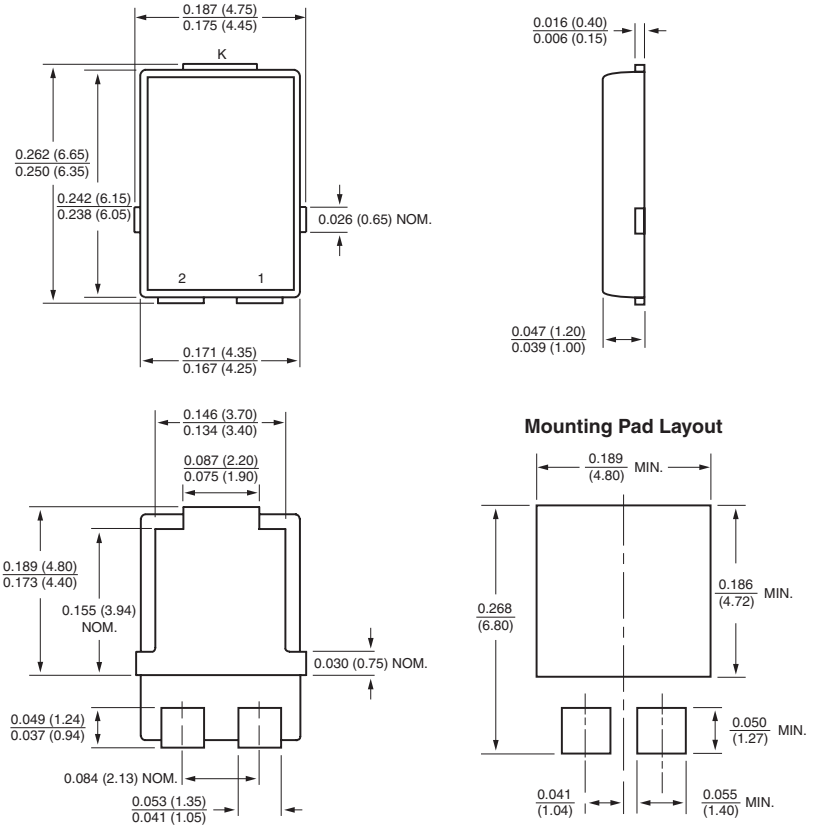


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

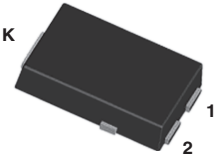
TO-277A (SMPC)



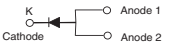
Conform to JEDEC TO-277A

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	150 A
E_{AS}	20 mJ
V_F at I_F = 5.0 A	0.560 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS5P5	SS5P6	UNIT
Device marking code		S55	S56	
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	5.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2.5 A I_F = 5.0 A	T_A = 25 °C	V_F	0.518 0.631	- 0.69	V
	I_F = 2.5 A I_F = 5.0 A	T_A = 125 °C		0.451 0.560	- 0.62	
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	8.4 3.4	150 15	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	200	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS5P5**	**SS5P6**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	65 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS5P5-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS5P5-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS5P5HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS5P5HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS5P5-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS5P5-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS5P5HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS5P5HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

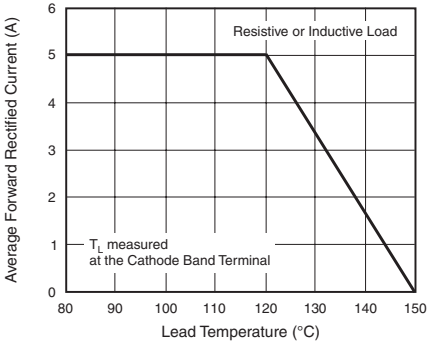


Figure 1. Maximum Forward Current Derating Curve

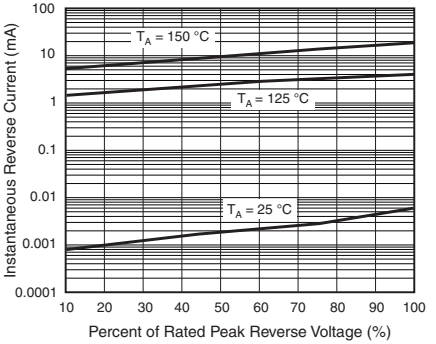


Figure 4. Typical Reverse Characteristics

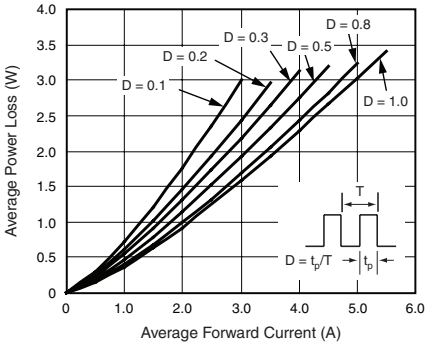


Figure 2. Forward Power Loss Characteristics

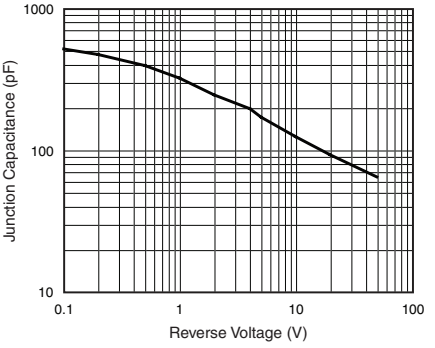


Figure 5. Typical Junction Capacitance

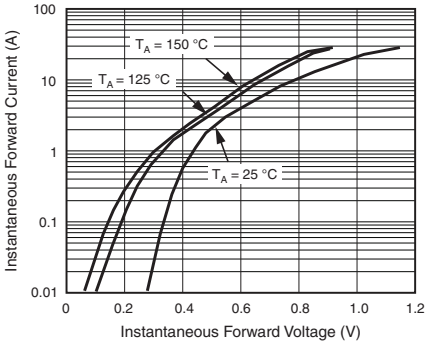


Figure 3. Typical Instantaneous Forward Characteristics

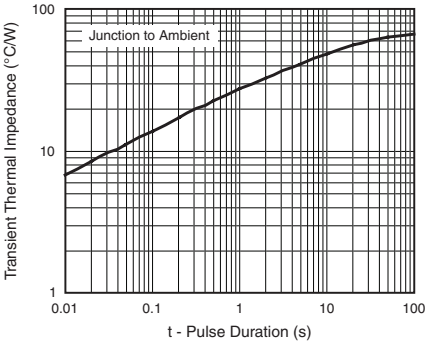
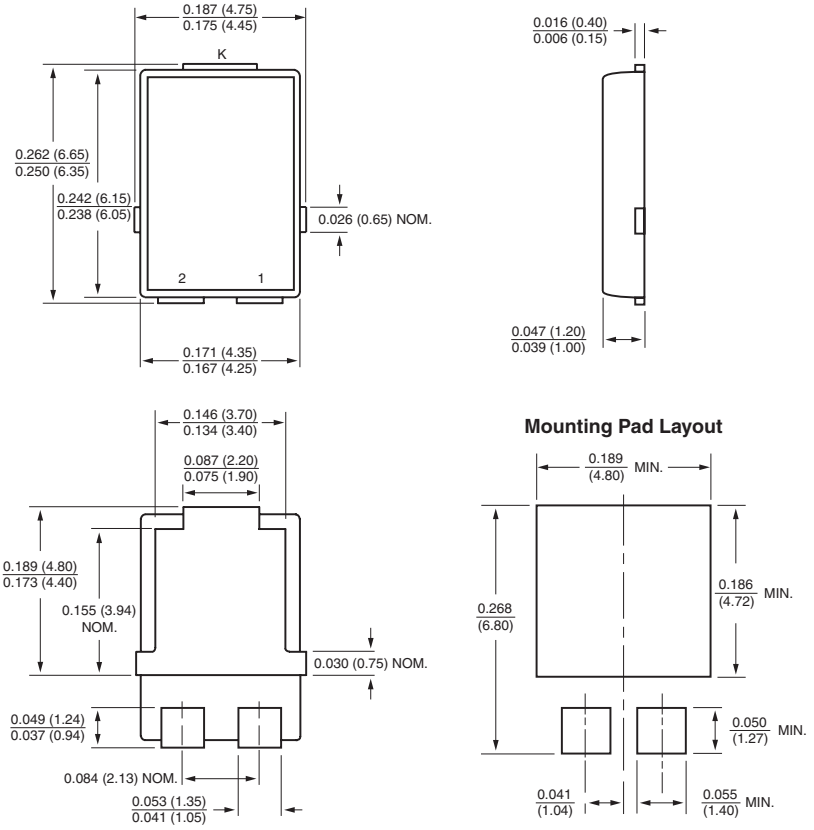


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

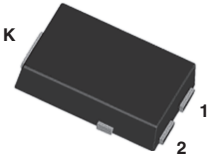
TO-277A (SMPC)



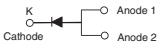
Conform to JEDEC TO-277A

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	150 A
V_F at I_F = 5.0 A	0.649 V
I_R	4.5 µA
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS5P9**	**SS5P10**	**UNIT**
Device marking code		S59	S510	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	5.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 2.5 A I_F = 5.0 A	T_A = 25 °C	V_F	0.708 0.832	- 0.88	V
	I_F = 2.5 A I_F = 5.0 A	T_A = 125 °C		0.571 0.649	- 0.68	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	4.5 2.7	15 5	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	130	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS5P9**	**SS5P10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	65 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS5P10-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS5P10-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS5P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS5P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

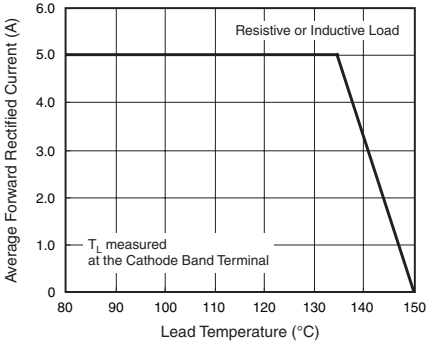


Figure 1. Maximum Forward Current Derating Curve

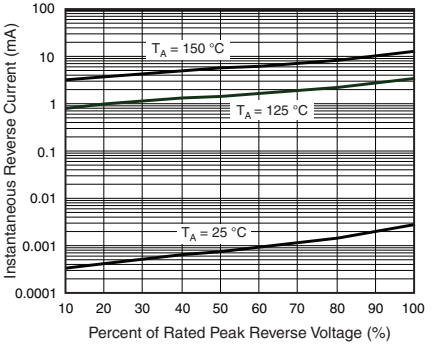


Figure 4. Typical Reverse Characteristics

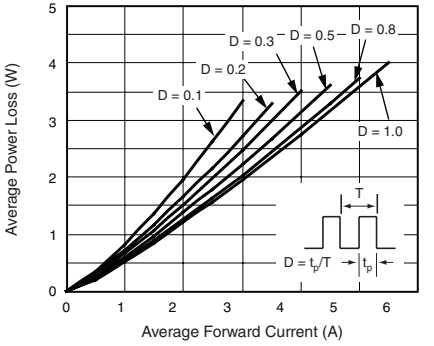


Figure 2. Forward Power Loss Characteristics

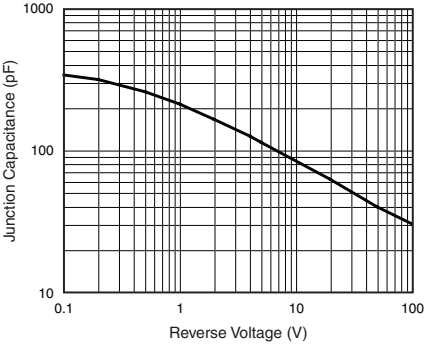


Figure 5. Typical Junction Capacitance

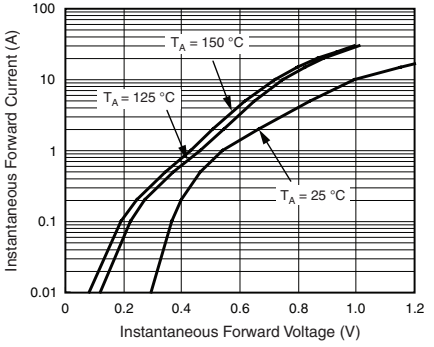


Figure 3. Typical Instantaneous Forward Characteristics

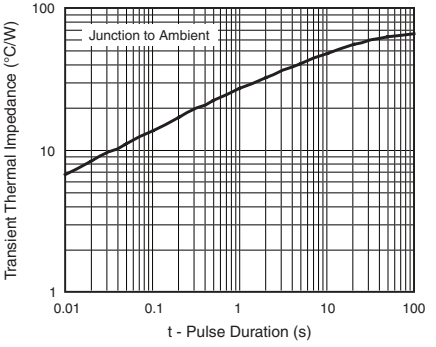
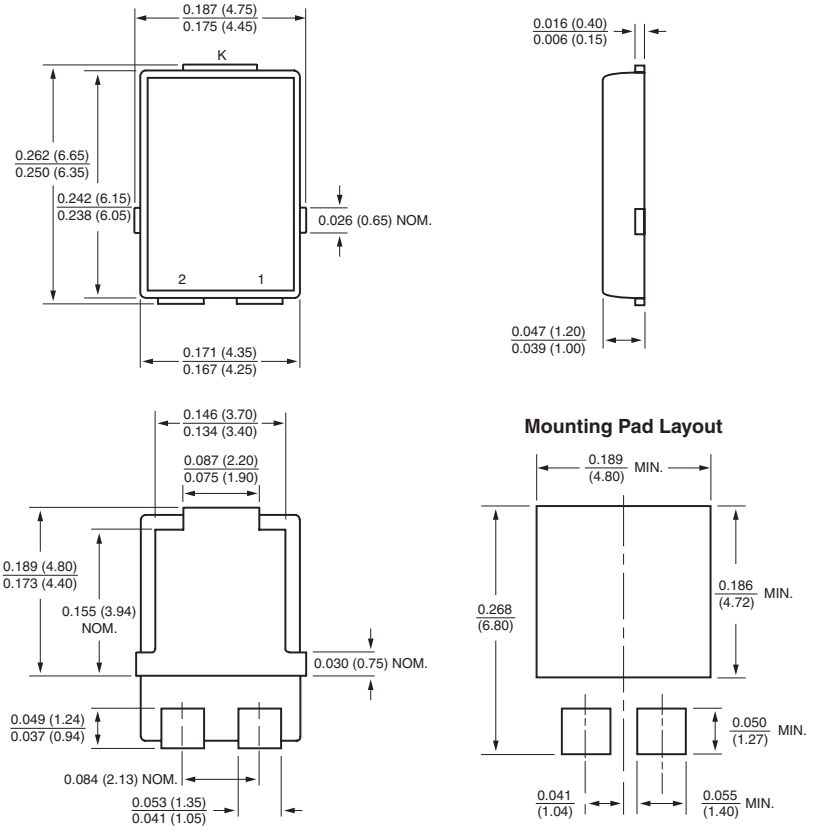


Figure 6. Typical Transient Thermal Impedance

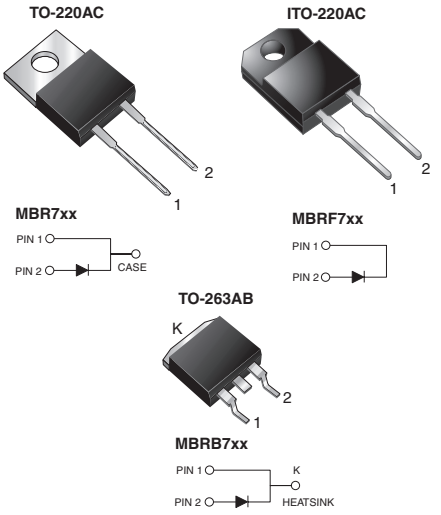
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

Schottky Barrier Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	7.5 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.65 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR735	MBR745	MBR750	MBR760	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	7.5				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Peak repetitive reverse current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 150				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR735**	**MBR745**	**MBR750**	**MBR760**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 7.5 A I_F = 7.5 A I_F = 15 A I_F = 15 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	-	0.57 0.84 0.72	0.75 0.65 -	-	V
Maximum reverse current at DC blocking voltage		T_C = 25 °C T_C = 125 °C	I_R	0.1 15		0.5 50		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Thermal resistance from junction to case	$R_{\theta JC}$	3.0	5.0	3.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR745-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF745-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB745-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB745-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR745HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF745HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB745HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB745HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

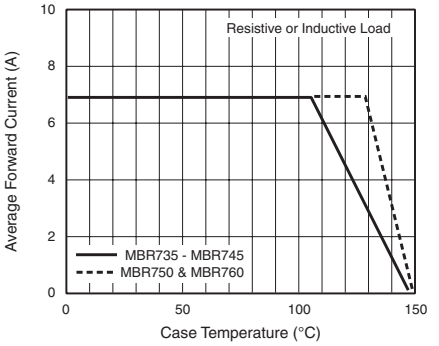


Figure 1. Forward Current Derating Curve

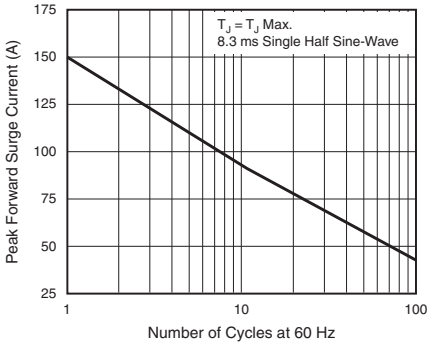


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

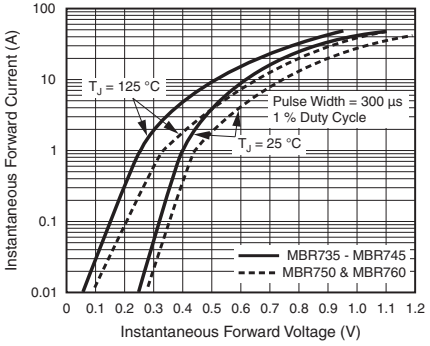


Figure 3. Typical Instantaneous Forward Characteristics

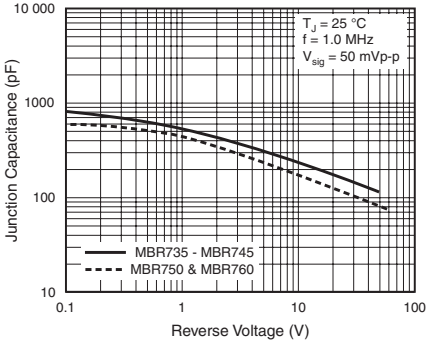


Figure 5. Typical Junction Capacitance

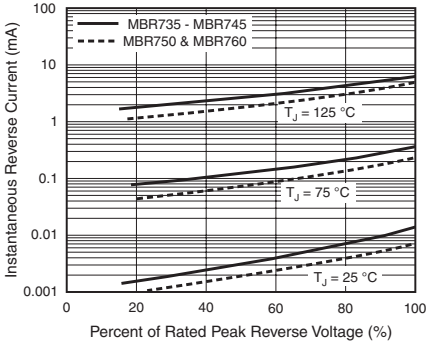


Figure 4. Typical Reverse Characteristics

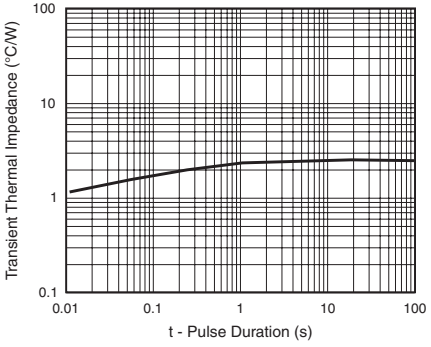
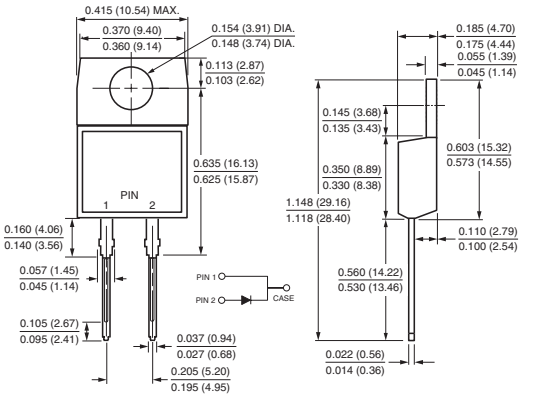


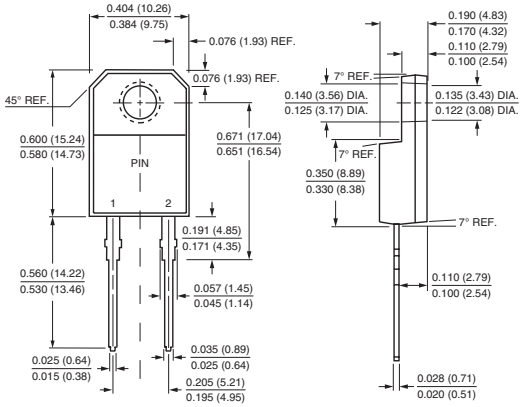
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

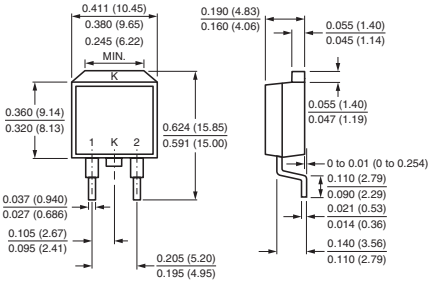
TO-220AC



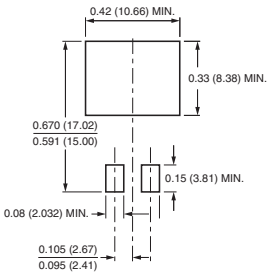
ITO-220AC



TO-263AB

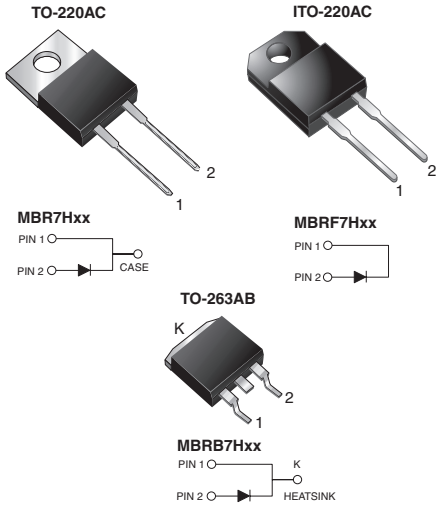


Mounting Pad Layout



Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	7.5 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	50 µA
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR7H35	MBR7H45	MBR7H50	MBR7H60	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Max. average forward rectified current (Fig. 1)	$I_{F(AV)}$	7.5				A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	20		10		mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR7H35**	**MBR7H45**	**MBR7H50**	**MBR7H60**	**UNIT**
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR7H35 MBR7H45**		**MBR7H50 MBR7H60**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage (1)	I_F = 7.5 A I_F = 7.5 A I_F = 15 A I_F = 15 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	- 0.50 - 0.61	0.63 0.55 0.75 0.66	- 0.58 - 0.68	0.73 0.61 0.87 0.72	V
Maximum reverse current at rated V_R (2)		T_C = 25 °C T_C = 125 °C	I_R	- 3.0	50 10	- 2.0	50 10	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Thermal resistance, junction to case	$R_{\theta JC}$	3.0	5.0	3.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR7H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF7H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB7H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB7H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR7H45HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF7H45HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB7H45HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB7H45HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88796
Revision: 19-May-08

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

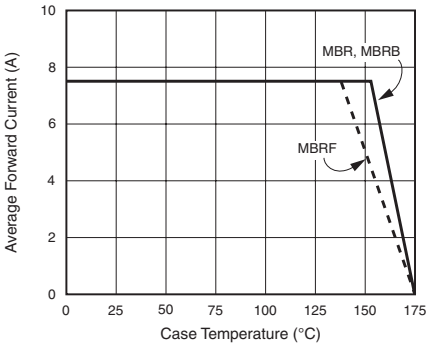


Figure 1. Forward Current Derating Curve

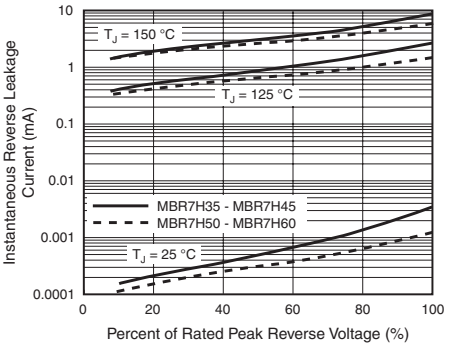


Figure 4. Typical Reverse Characteristics Per Leg

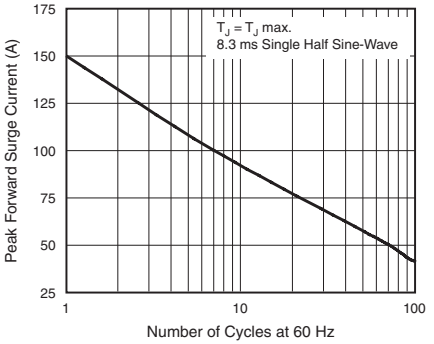


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Leg

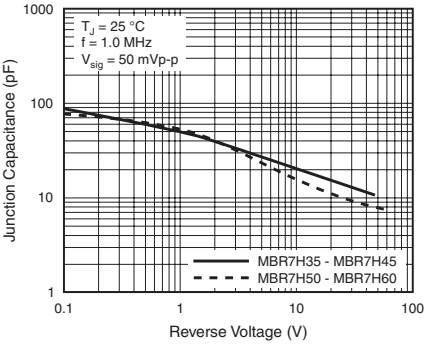


Figure 5. Typical Junction Capacitance Per Leg

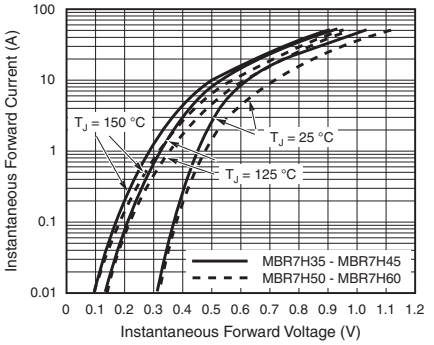


Figure 3. Typical Instantaneous Forward Characteristics Per Leg

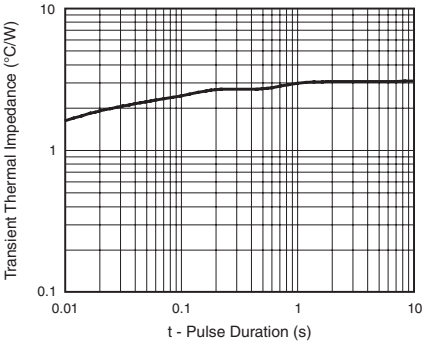
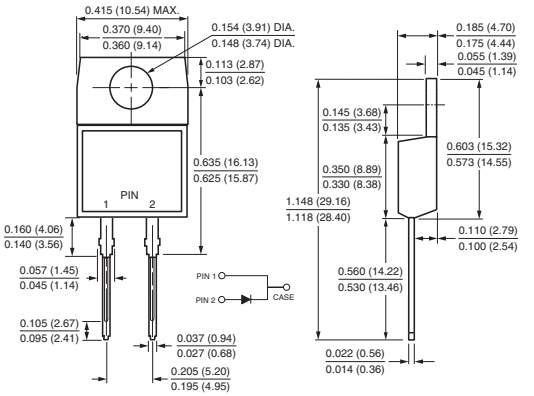


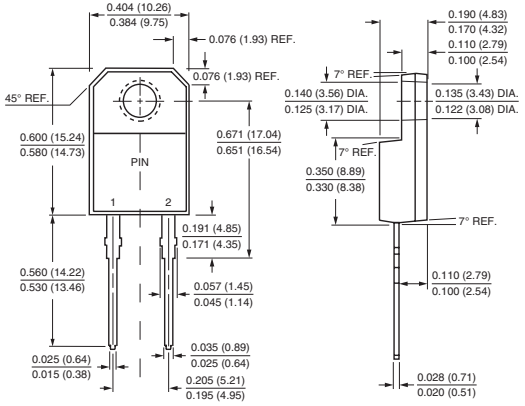
Figure 6. Typical Transient Thermal Impedance Per Leg

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

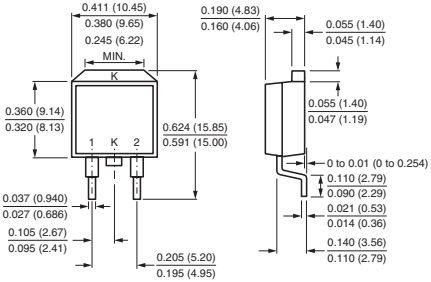
TO-220AC



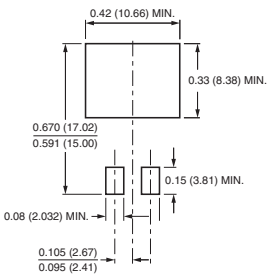
ITO-220AC



TO-263AB



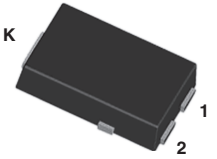
Mounting Pad Layout



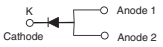
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88796
Revision: 19-May-08

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	20 V, 30 V
I_{FSM}	150 A
E_{AS}	20 mJ
V_F at I_F = 8.0 A	0.472 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS8P2L	SS8P3L	UNIT
Device marking code		S82	S83	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	8.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 4.0 A I_F = 8.0 A	T_A = 25 °C	V_F	0.447 0.533	- 0.57	V
	I_F = 4.0 A I_F = 8.0 A	T_A = 125 °C		0.357 0.472	- 0.49	
Maximum reverse current (2)	V_R = 30 V	T_A = 25 °C T_A = 125 °C	I_R	55 24	200 35	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	330	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS8P2L**	**SS8P3L**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3.5		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS8P3L-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3L-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P3LHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3LHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS8P3L-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3L-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P3LHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3LHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

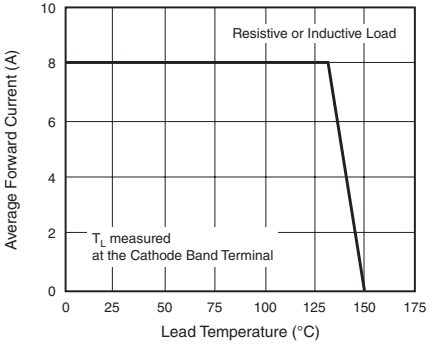


Figure 1. Maximum Forward Current Derating Curve

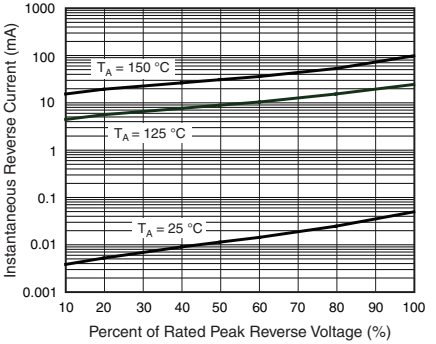


Figure 4. Typical Reverse Leakage Characteristics

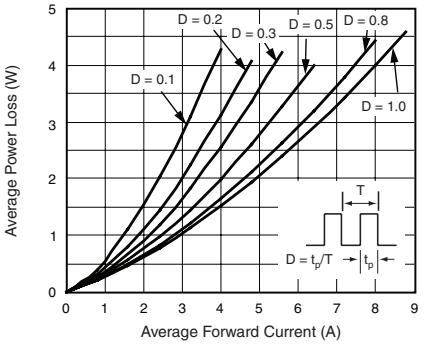


Figure 2. Forward Power Loss Characteristics

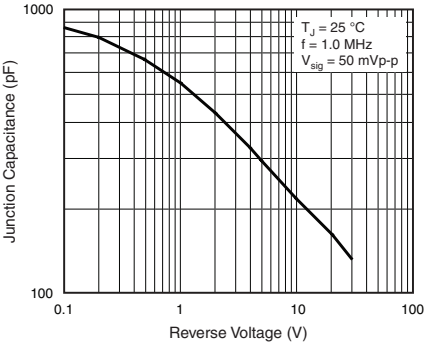


Figure 5. Typical Junction Capacitance

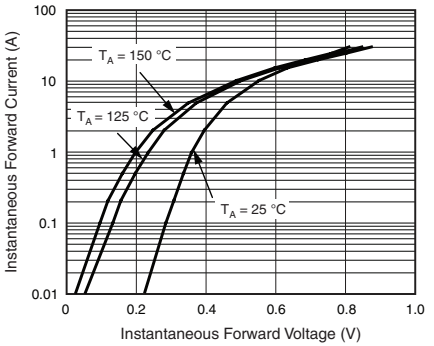


Figure 3. Typical Instantaneous Forward Characteristics

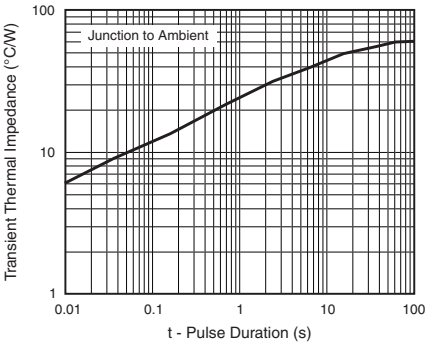
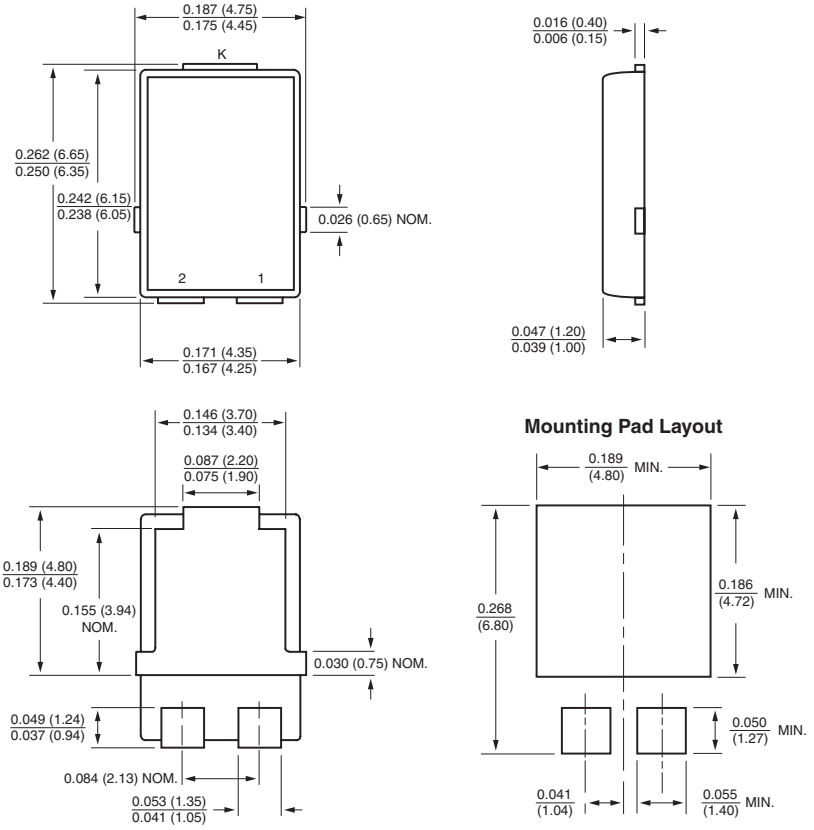


Figure 6. Typical Transient Thermal Impedance

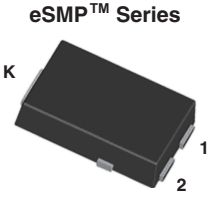
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)

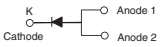


Conform to JEDEC TO-277A

High Current Density Surface Mount High Voltage Schottky Rectifier



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- High barrier technology, T_J = 175 °C maximum
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	150 A
E_{AS}	20 mJ
V_F at I_F = 8 A	0.720 V
I_R	0.18 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS8PH9	SS8PH10	UNIT
Device marking code		8H9	8H10	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	8.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 4.0 A I_F = 8.0 A	T_A = 25 °C	V_F	0.769 0.850	- 0.90	V
	I_F = 4.0 A I_F = 8.0 A	T_A = 125 °C		0.634 0.720	- 0.76	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	0.18 110	2.0 300	µA
Typical junction capacitance	4.0 V, 1 MHz		C_J	140	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS8PH9**	**SS8PH10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	65 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS8PH10-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8PH10-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8PH10HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8PH10HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS8PH10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8PH10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8PH10HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8PH10HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

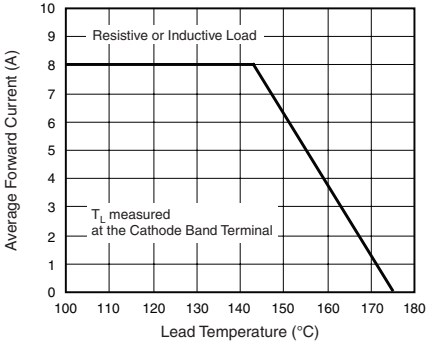


Figure 1. Maximum Forward Current Derating Curve

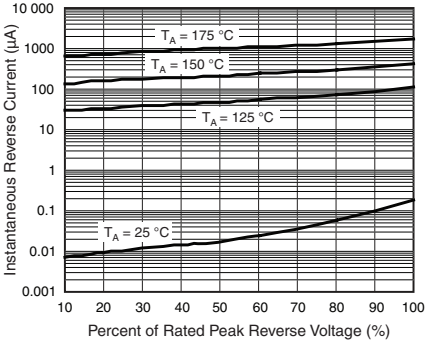


Figure 4. Typical Reverse Characteristics

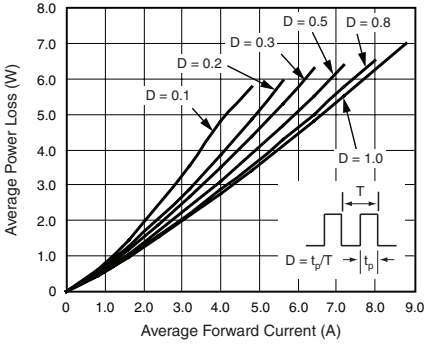


Figure 2. Forward Power Loss Characteristics

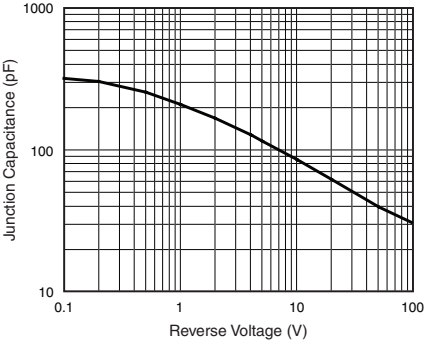


Figure 5. Typical Junction Capacitance

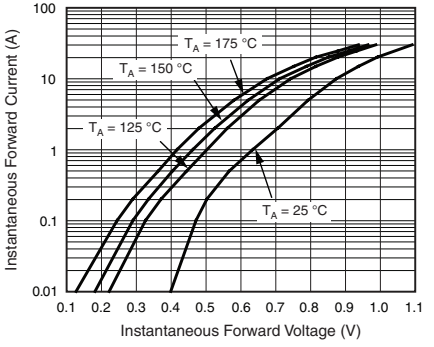


Figure 3. Typical Instantaneous Forward Characteristics

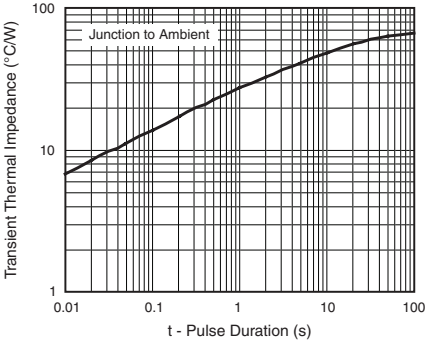
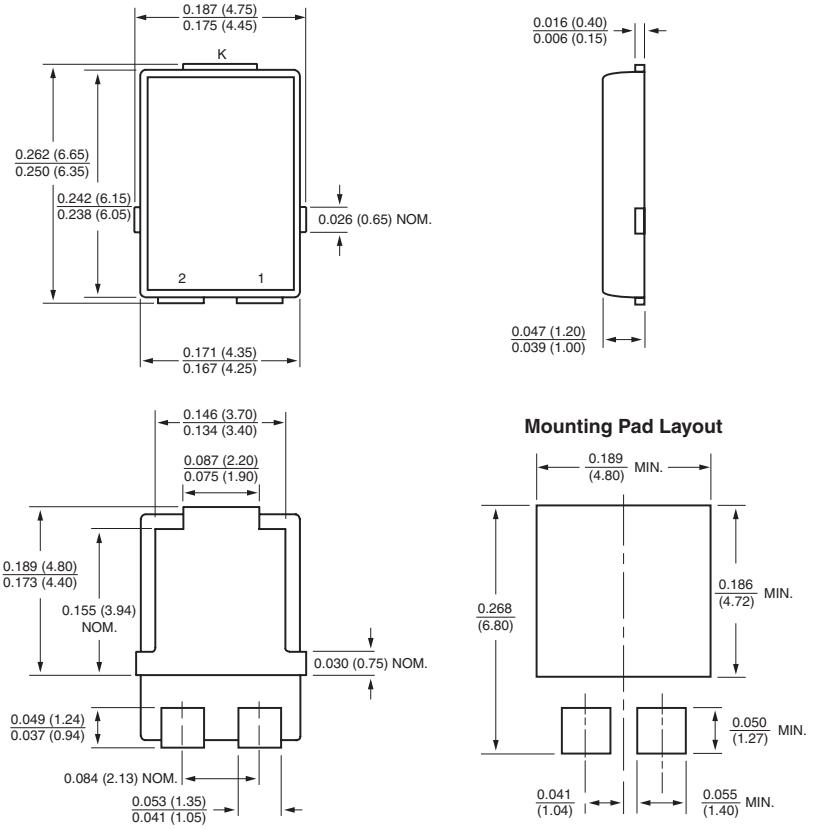


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)

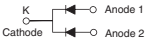


Conform to JEDEC TO-277A

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series

TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 4.0 A
V_{RRM}	20 V, 30 V
I_{FSM}	120 A
E_{AS}	20 mJ
V_F at I_F = 4 A	0.41 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	SS8P2CL	SS8P3CL	UNIT
Device marking code			S82CL	S83CL	
Maximum repetitive peak reverse voltage		V_{RRM}	20	30	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	8.0 4.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	120		A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 2 A per diode		E_{AS}	20		mJ
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 2.0 A I_F = 4.0 A	T_A = 25 °C	V_F	0.42 0.50	- 0.54	V
	I_F = 2.0 A I_F = 4.0 A	T_A = 125 °C		0.32 0.41	- 0.45	
Reverse current per diode (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	48 19	300 30	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	250	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS8P2CL**	**SS8P3CL**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS8P3CL-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3CL-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P3CLHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3CLHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS8P3CL-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3CL-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P3CLHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P3CLHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

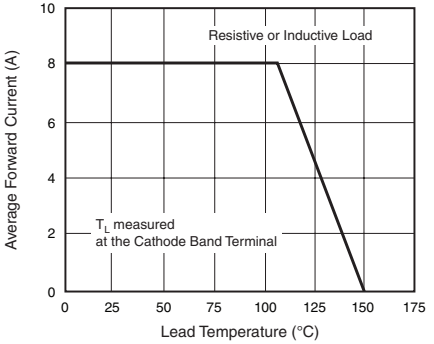


Figure 1. Maximum Forward Current Derating Curve

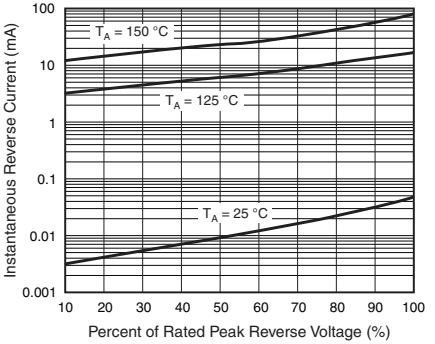


Figure 4. Typical Reverse Leakage Characteristics Per Diode

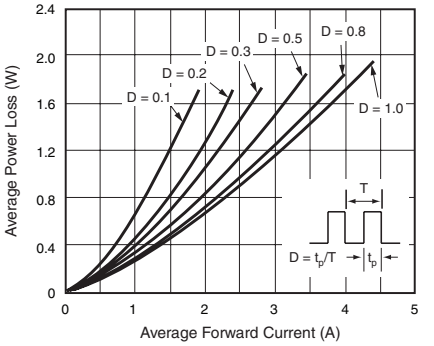


Figure 2. Forward Power Loss Characteristics Per Diode

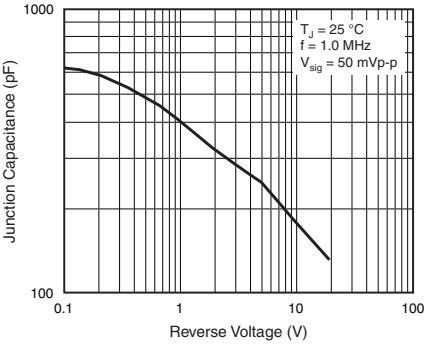


Figure 5. Typical Junction Capacitance Per Diode

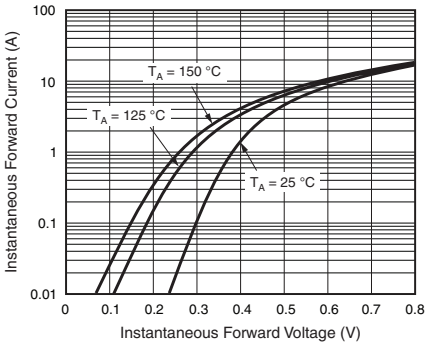


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

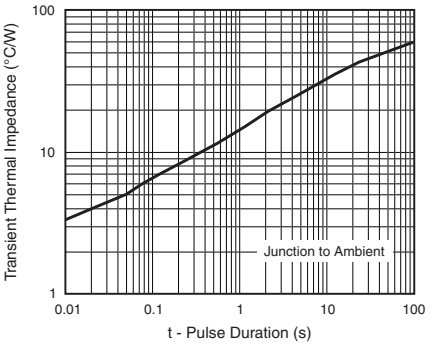
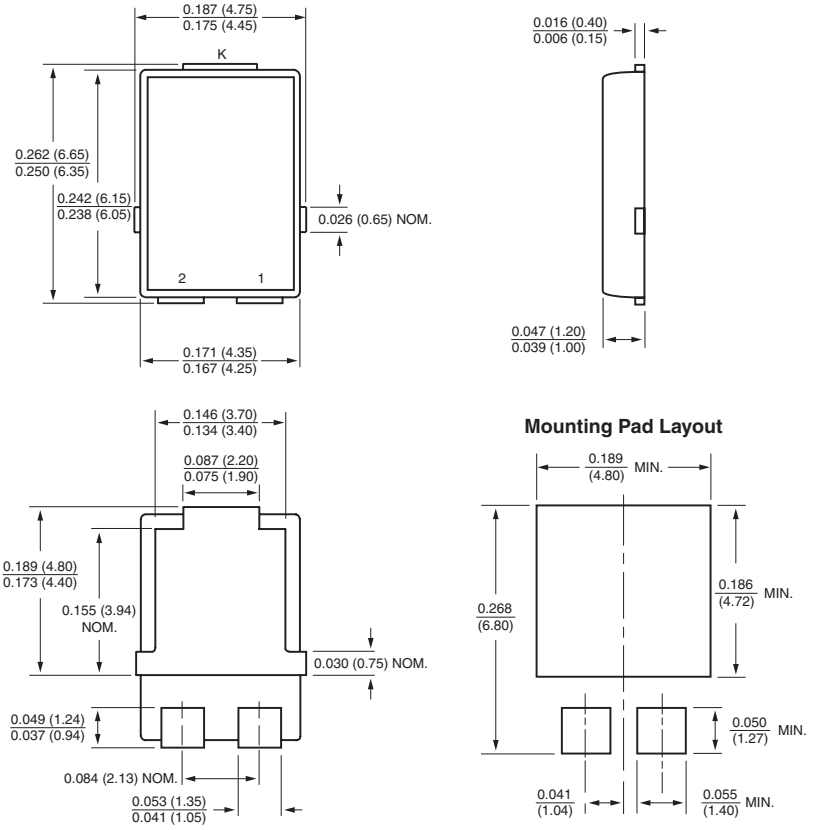


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

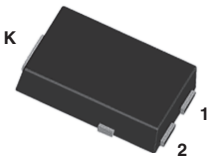
TO-277A (SMPC)



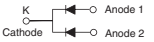
Conform to JEDEC TO-277A

High Current Density Surface Mount Dual Common-Cathode Schottky Rectifier

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 4.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	120 A
E_{AS}	20 mJ
V_F at I_F = 4 A	0.42 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	SS8P3C	SS8P4C	UNIT
Device marking code			S83C	S84C	
Maximum repetitive peak reverse voltage		V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	8.0 4.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	120		A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 2 A per diode		E_{AS}	20		mJ
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 2.0 A I_F = 4.0 A	T_A = 25 °C	V_F	0.42 0.48	- 0.58	V
	I_F = 2.0 A I_F = 4.0 A	T_A = 125 °C		0.32 0.42	- 0.48	
Reverse current per diode (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	130 26	300 35	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	230	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS8P3C**	**SS8P4C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS8P4C-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P4C-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P4CHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P4CHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS8P4C-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P4C-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P4CHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P4CHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

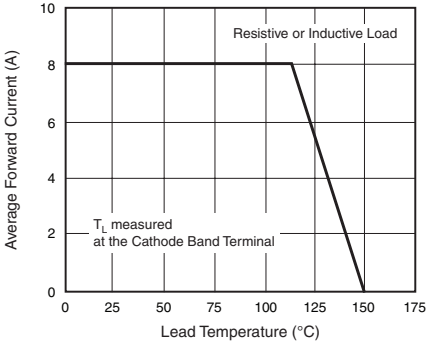


Figure 1. Maximum Forward Current Derating Curve

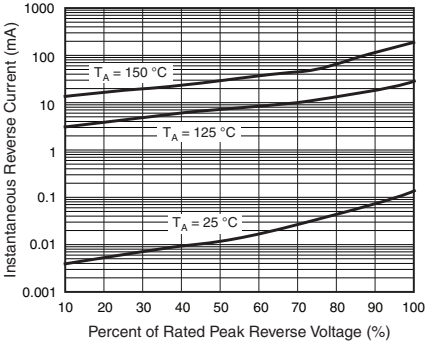


Figure 4. Typical Reverse Leakage Characteristics Per Diode

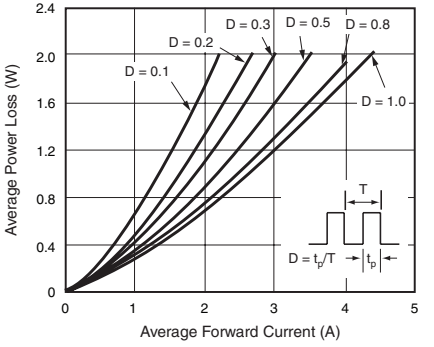


Figure 2. Forward Power Loss Characteristics Per Diode

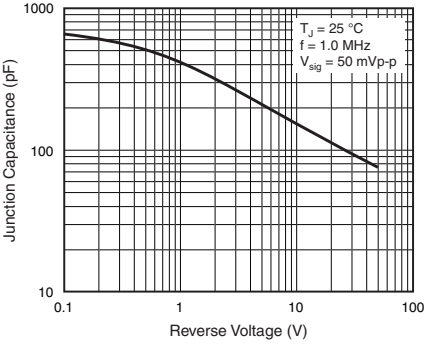


Figure 5. Typical Junction Capacitance Per Diode

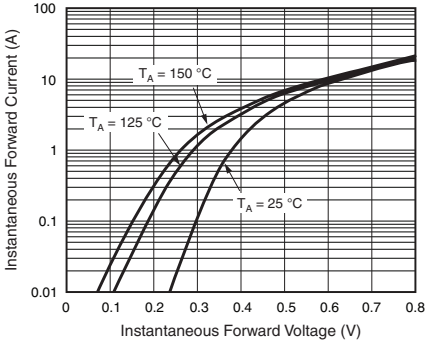


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

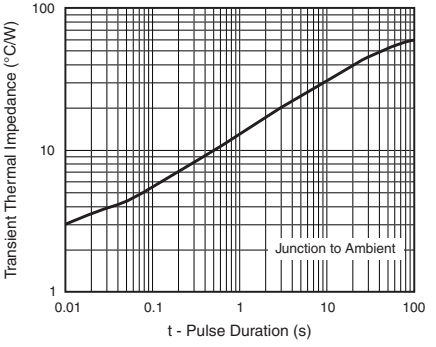
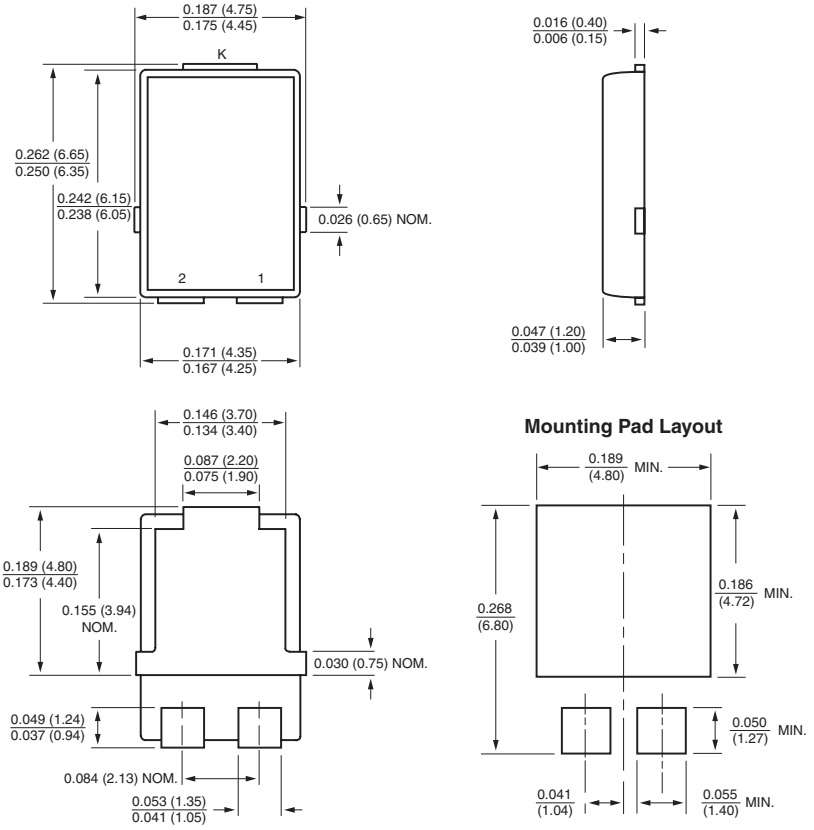


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

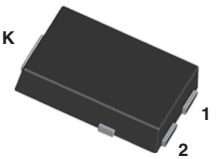
TO-277A (SMPC)



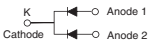
Conform to JEDEC TO-277A

High Current Density Surface Mount Dual Common-Cathode Schottky Rectifier

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 4.0 A
V_{RRM}	50 V, 60 V
I_{FSM}	120 A
E_{AS}	20 mJ
V_F at I_F = 4 A	0.56 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	SS8P5C	SS8P6C	UNIT
Device marking code			S85C	S86C	
Maximum repetitive peak reverse voltage		V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	8.0 4.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	120		A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 2 A per diode		E_{AS}	20		mJ
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 2.0 A I_F = 4.0 A	T_A = 25 °C	V_F	0.55 0.65	- 0.70	V
	I_F = 2.0 A I_F = 4.0 A	T_A = 125 °C		0.48 0.56	- 0.60	
Reverse current per diode (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	2.5 1.6	50 10	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	160	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS8P5C**	**SS8P6C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS8P6C-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P6C-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P6CHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P6CHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS8P6C-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS8P6C-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS8P6CHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS8P6CHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

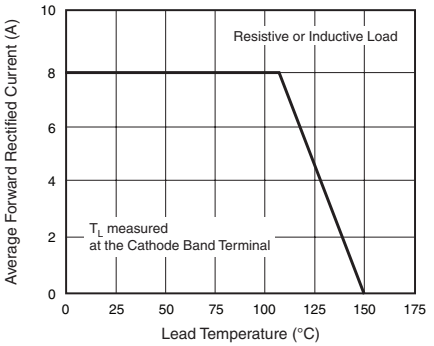


Figure 1. Maximum Forward Current Derating Curve

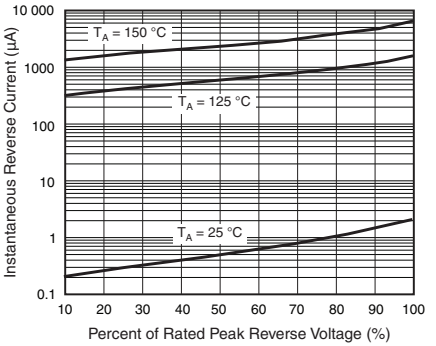


Figure 4. Typical Reverse Leakage Characteristics Per Diode

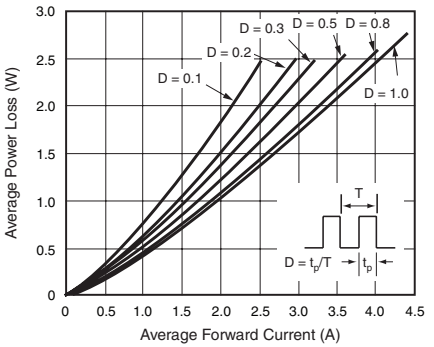


Figure 2. Forward Power Loss Characteristics Per Diode

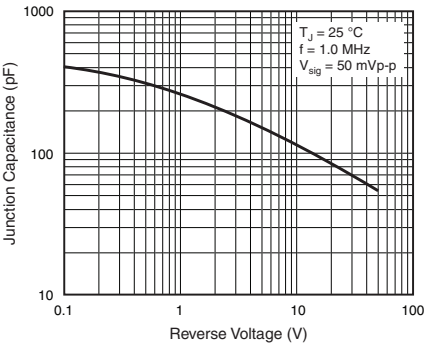


Figure 5. Typical Junction Capacitance Per Diode

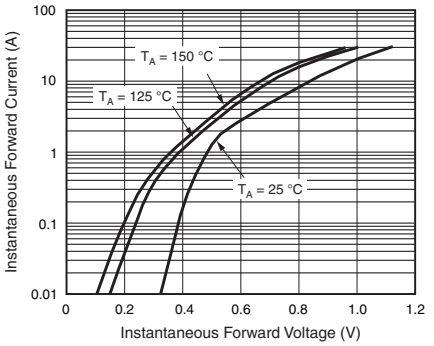


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

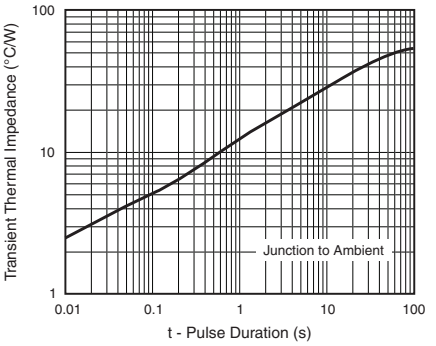
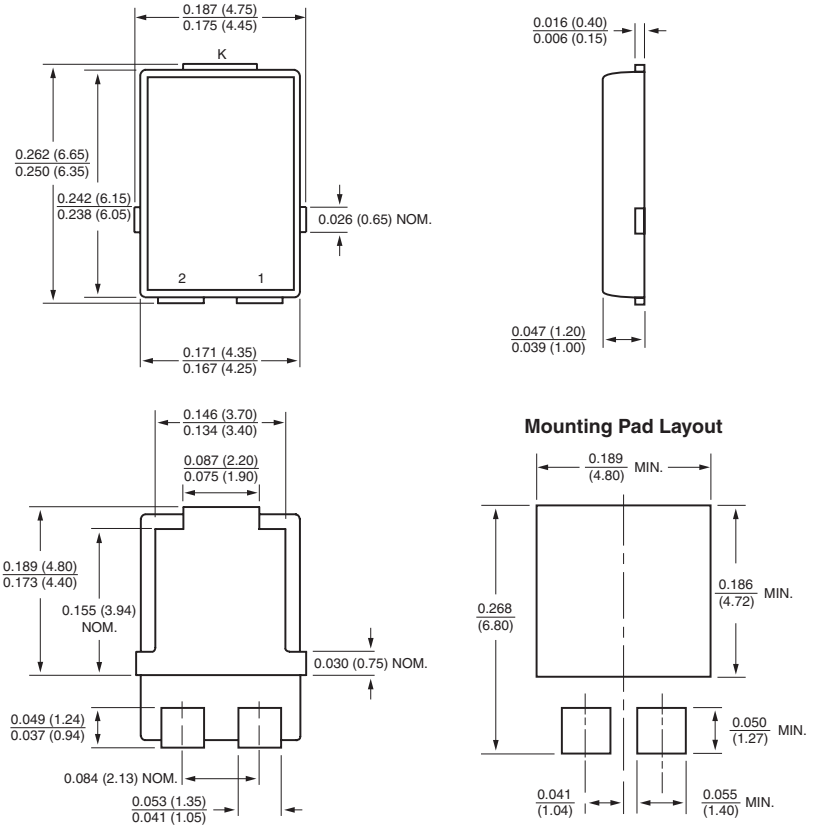


Figure 6. Typical Transient Thermal Impedance Per Diode

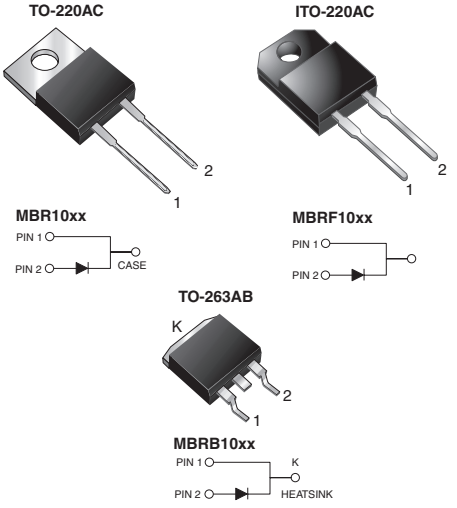
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

Schottky Barrier Rectifier



FEATURES

- Low power loss, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.70 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR1035	MBR1045	MBR1050	MBR1060	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Peak repetitive reverse current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 150				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR1035**	**MBR1045**	**MBR1050**	**MBR1060**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	- 0.57 0.84 0.72		0.80 0.70 0.95 0.85		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	0.10 15				mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Maximum thermal resistance from junction to case	$R_{\theta JC}$	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR1045-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF1045-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB1045-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB1045-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR1045HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF1045HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB1045HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB1045HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

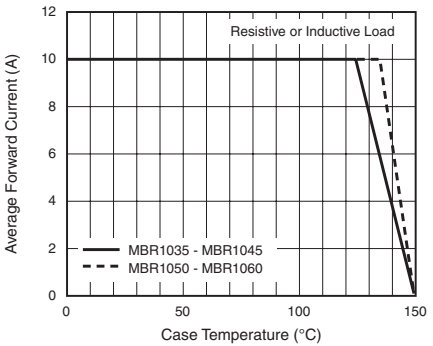


Figure 1. Forward Current Derating Curve

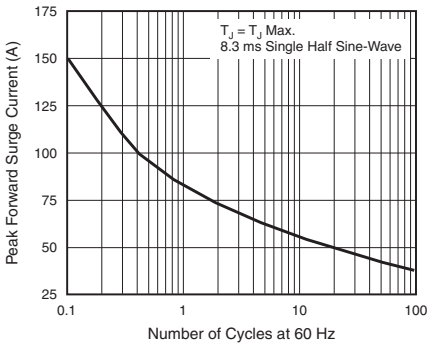


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

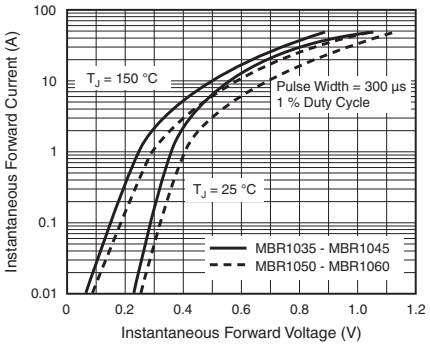


Figure 3. Typical Instantaneous Forward Characteristics

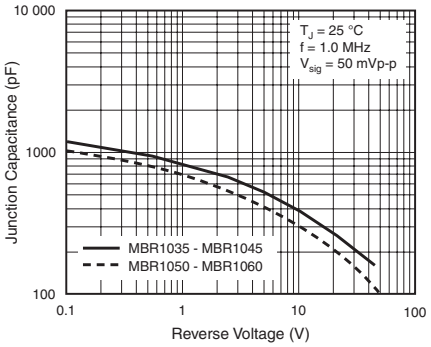


Figure 5. Typical Junction Capacitance

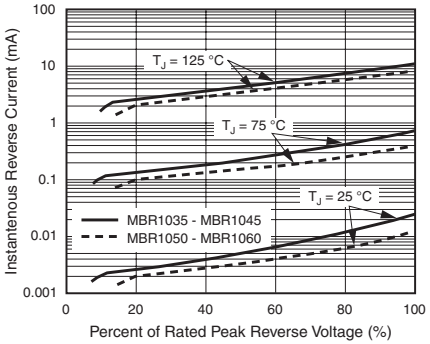


Figure 4. Typical Reverse Characteristics

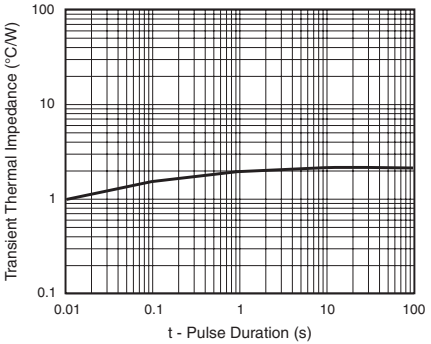
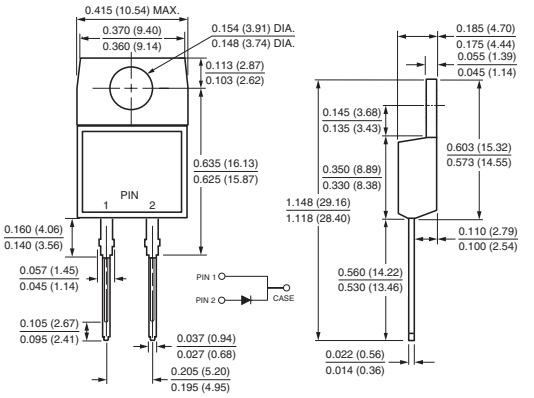


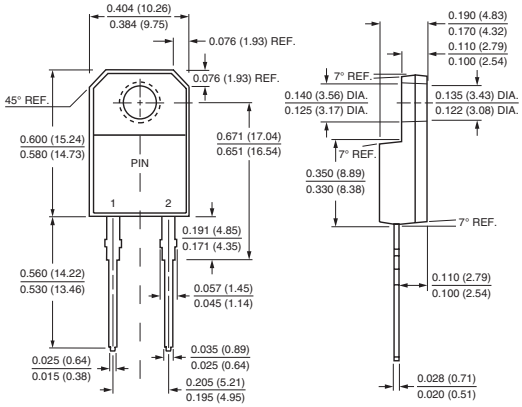
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

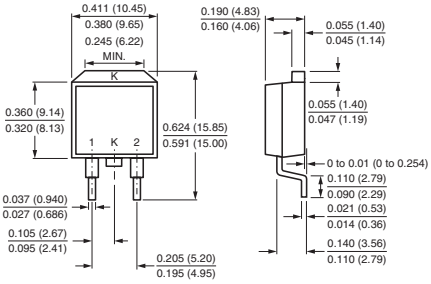
TO-220AC



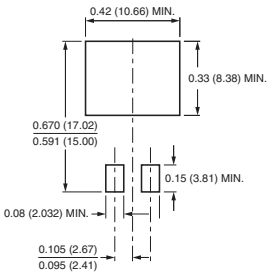
ITO-220AC



TO-263AB

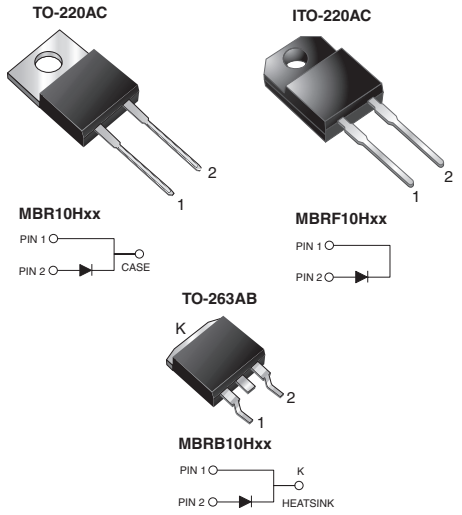


Mounting Pad Layout



Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	100 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR10H35	MBR10H45	MBR10H50	MBR10H60	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10				A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Peak repetitive reverse current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	20		10		mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR10H35**	**MBR10H45**	**MBR10H50**	**MBR10H60**	**UNIT**
Operating junction temperature range	T_J	- 65 to + 175				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR10H35 MBR10H45**		**MBR10H50 MBR10H60**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	- 0.49 - 0.62	0.63 0.55 0.75 0.68	- 0.57 - 0.68	0.71 0.61 0.85 0.71	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 4.0	100 12	- 2.0	100 12	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Maximum thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR10H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB10H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB10H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR10H45HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H45HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB10H45HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB10H45HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

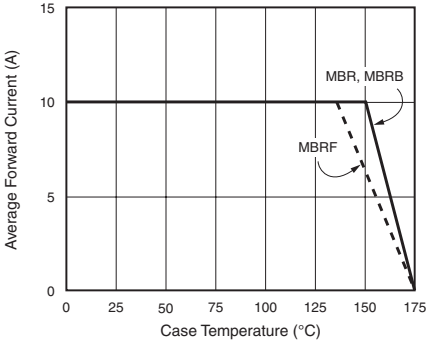


Figure 1. Forward Current Derating Curve

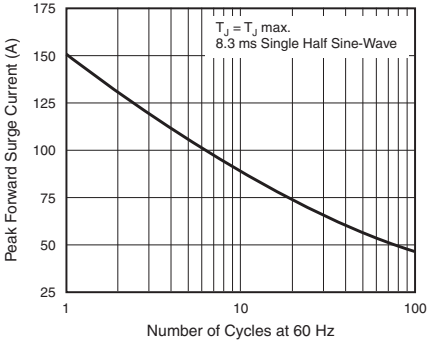


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

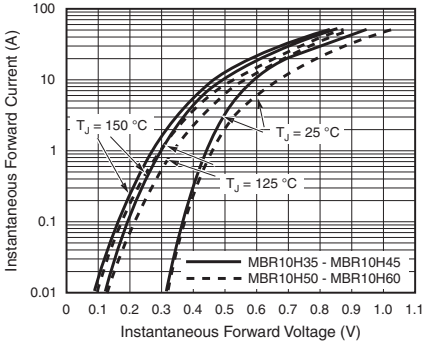


Figure 3. Typical Instantaneous Forward Characteristics

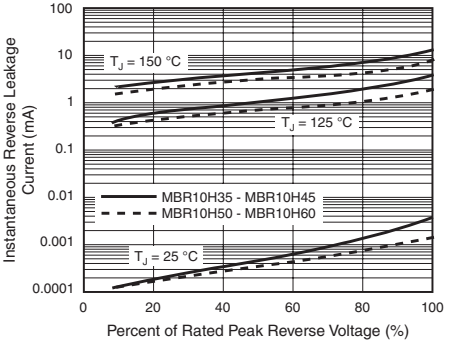


Figure 4. Typical Reverse Characteristics

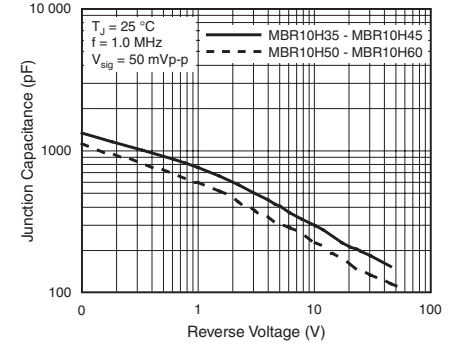


Figure 5. Typical Junction Capacitance

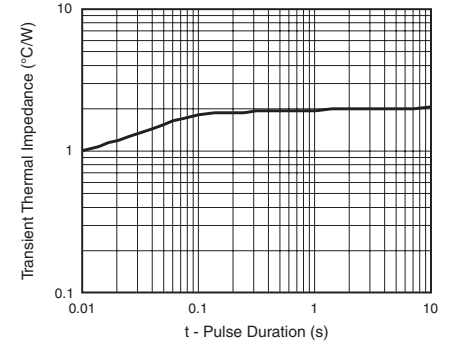
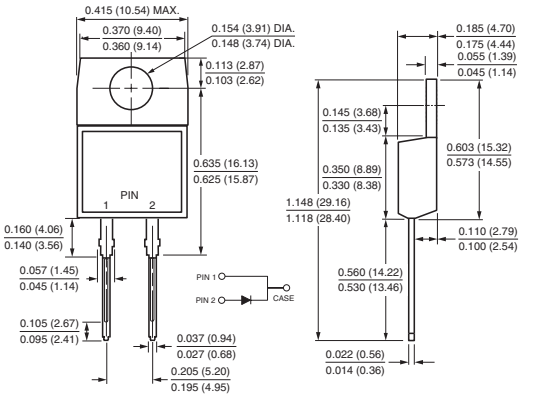


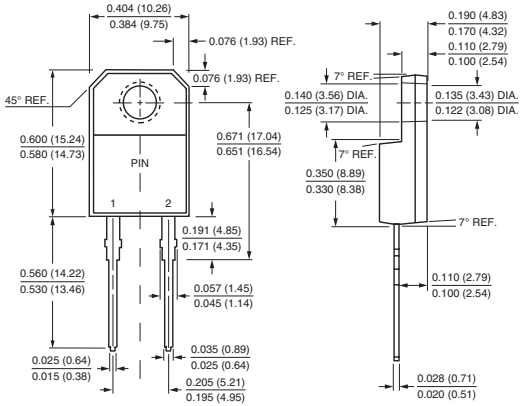
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

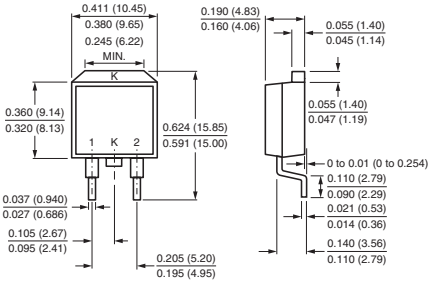
TO-220AC



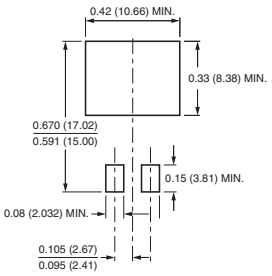
ITO-220AC



TO-263AB

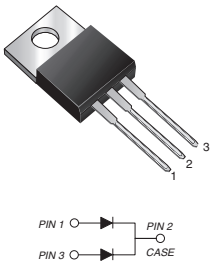


Mounting Pad Layout



Dual Common-Cathode High Voltage Schottky Rectifier

TO-220AB



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	120 A
V_F	0.75 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR1090CT	MBR10100CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 105 °C total device / per diode	$I_{F(AV)}$	10 5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	120		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz	I_{RRM}	0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR1090CT**	**MBR10100CT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 5.0 A	T_C = 125 °C T_C = 25 °C	V_F	0.75 0.85		V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 100 °C	I_R	100 6.0		µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MBR1090CT**	**MBR10100CT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	4.4		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR10100CT-E3/45	1.85	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

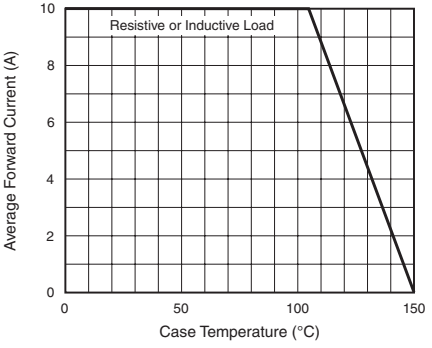


Figure 1. Forward Current Derating Curve

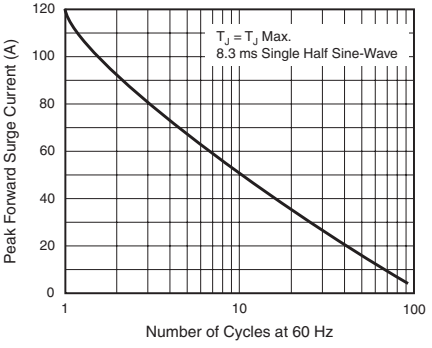


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

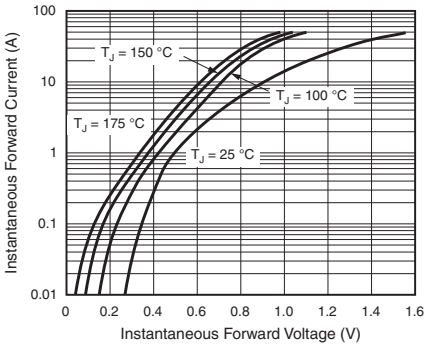


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

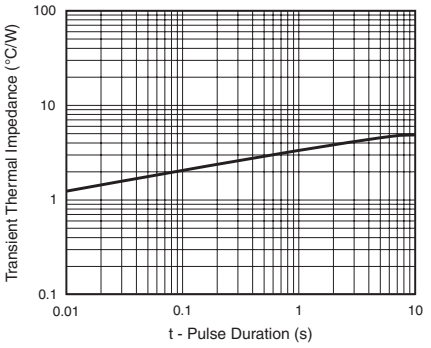


Figure 5. Typical Transient Thermal Impedance Per Diode

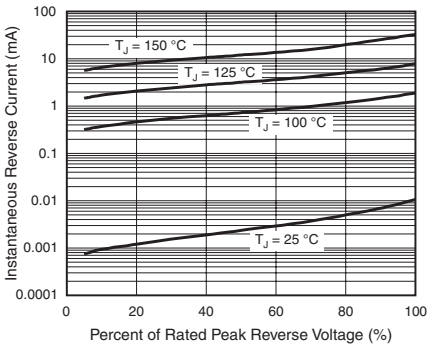


Figure 4. Typical Reverse Characteristics Per Diode

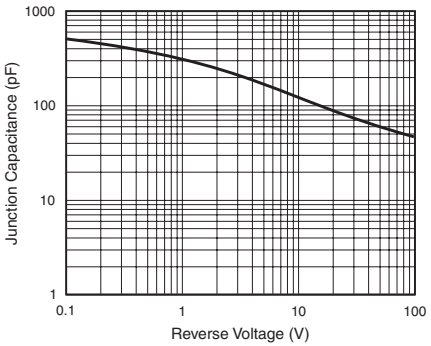
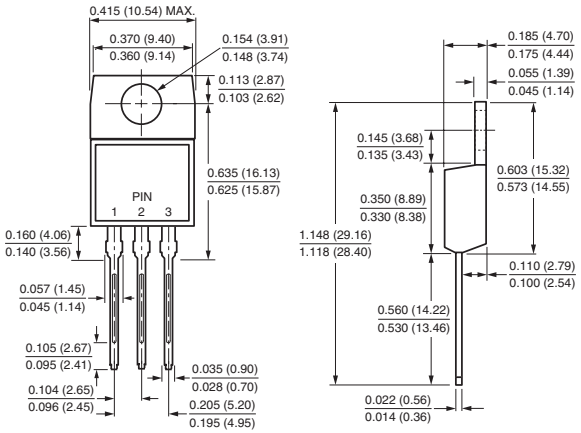


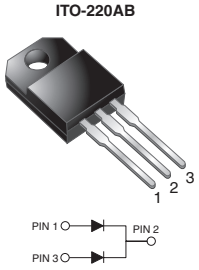
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



Dual Common-Cathode High Voltage Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	120 A
V_F	0.75 V
T_J max.	150 °C

MECHANICAL DATA

Case: ITO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBRF1090CT	MBRF10100CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	90	100	V
Working peak reverse voltage		V_{RWM}	90	100	V
Maximum DC blocking voltage		V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 105 °C	total device per diode	$I_{F(AV)}$	10 5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	120		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	0.5		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 150		°C
Isolation voltage from terminal to heatsink with t = 1 min		V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	MBRF1090CT	MBRF10100CT	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 5.0 A	T_C = 125 °C T_C = 25 °C	V_F	0.75 0.85		V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 100 °C	I_R	100 6.0		µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

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Revision: 08-Nov-07

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MBRF1090CT**	**MBRF10100CT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	6.8		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ITO-220AB	MBRF10100CT-E3/45	1.99	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

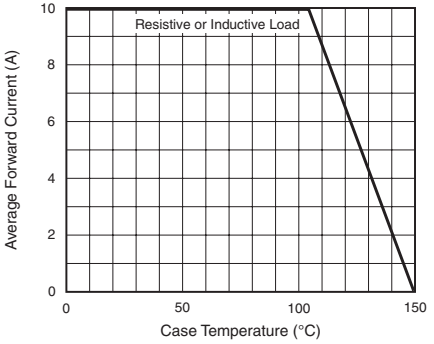


Figure 1. Forward Current Derating Curve

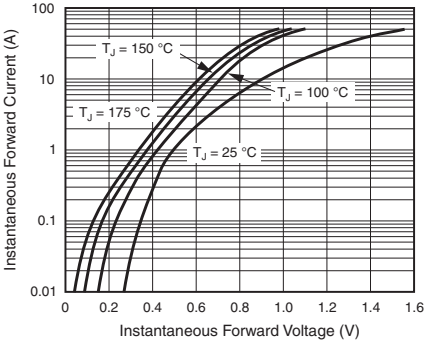


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

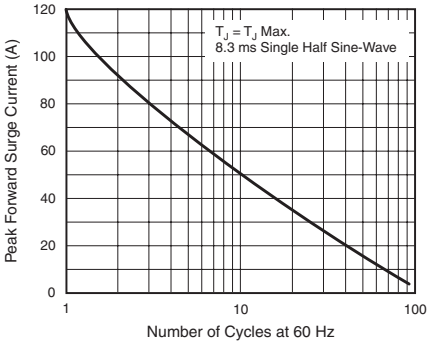


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

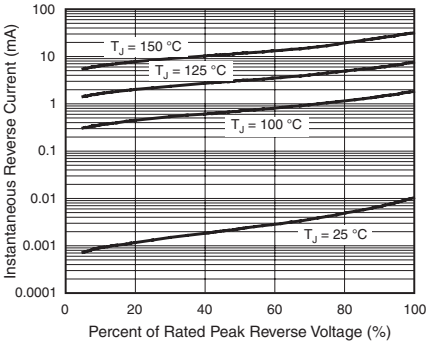


Figure 4. Typical Reverse Characteristics Per Diode

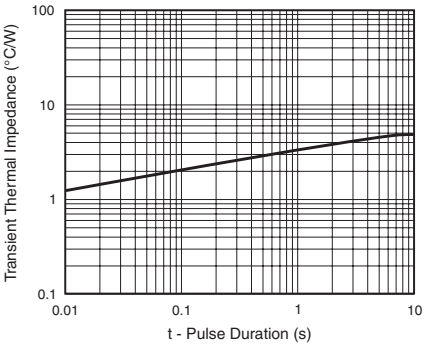


Figure 5. Typical Transient Thermal Impedance Per Diode

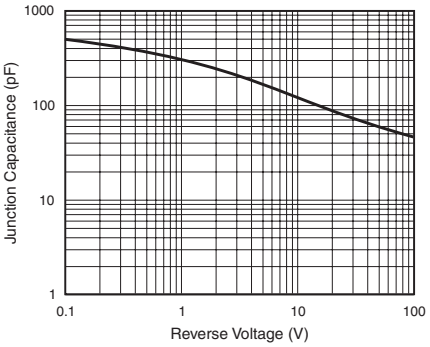
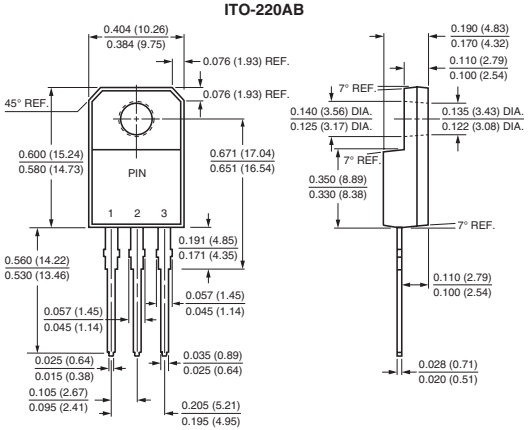


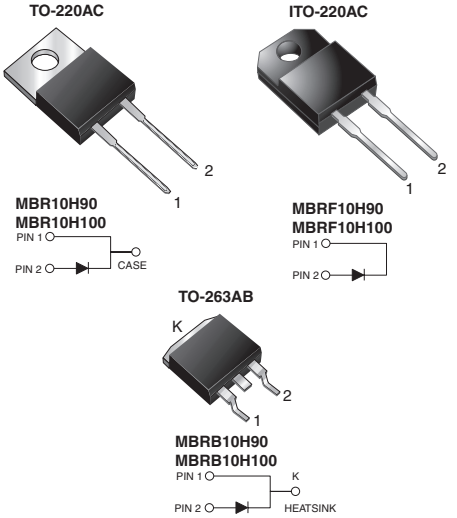
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	90 V, 100 V
I_{FSM}	250 A
V_F	0.64 V
I_R	4.5 µA
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MBR10H90**	**MBR10H100**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current	$I_{F(AV)}$	10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	250		A
Peak repetitive reverse current at tp = 2 µs, 1 kHz	I_{RRM}	0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	0.77 0.64 0.88 0.73	V
Maximum reverse current at working peak reverse voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	4.5 6.0	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.7	5.8	2.7	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR10H100-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H100-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB10H100-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB10H100-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR10H100HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H100HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB10H100HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB10H100HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

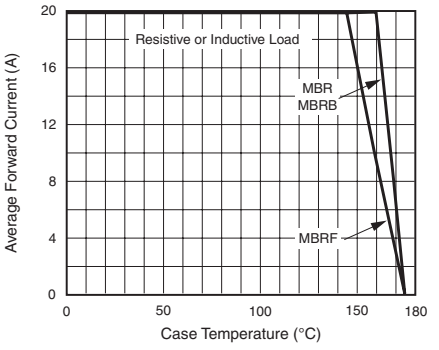


Figure 1. Forward Current Derating Curve

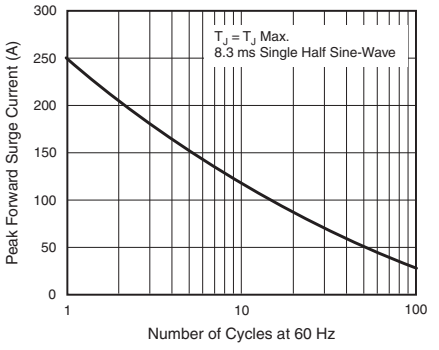


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

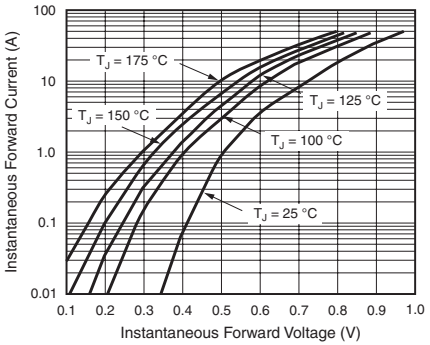


Figure 3. Typical Instantaneous Forward Characteristics

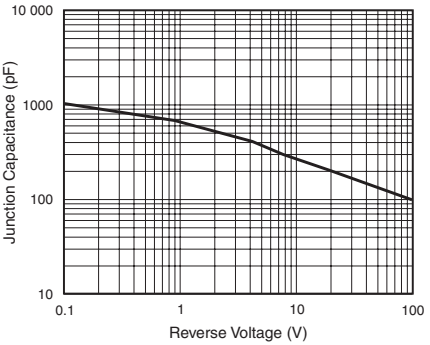


Figure 5. Typical Junction Capacitance

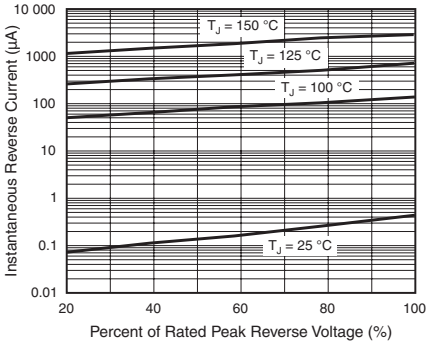


Figure 4. Typical Reverse Characteristics

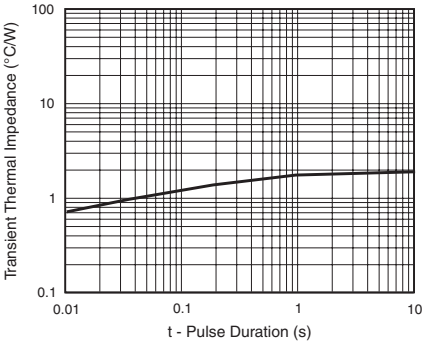
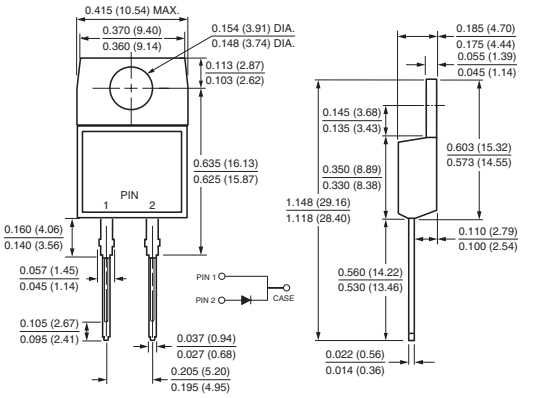


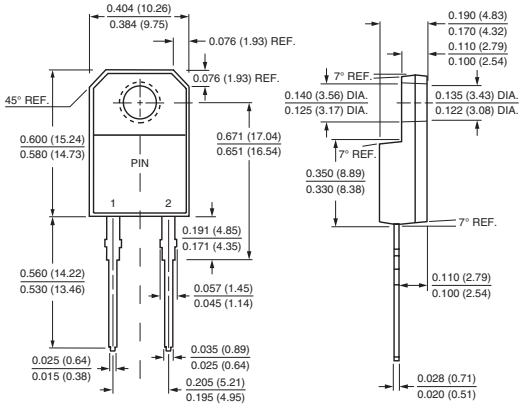
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

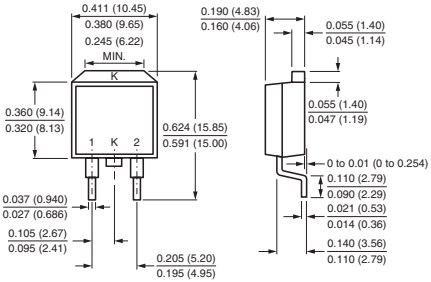
TO-220AC



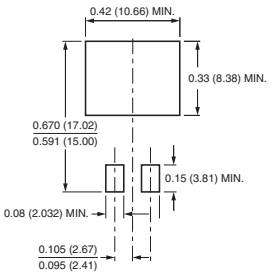
ITO-220AC



TO-263AB

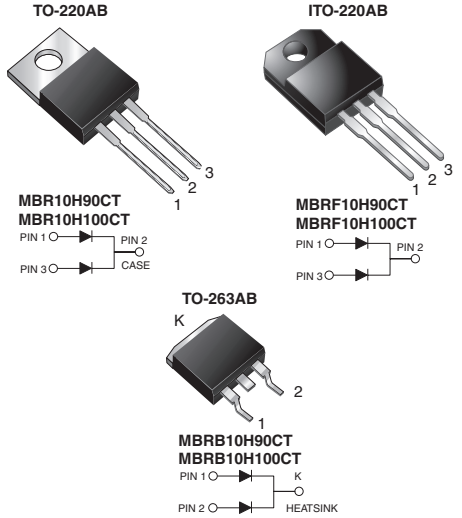


Mounting Pad Layout



Dual Common-Cathode High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	90 V, 100 V
I_{FSM}	150 A
V_F	0.61 V
I_R	3.5 µA
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR10H90CT	MBR10H100CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	90	100	V
Working peak reverse voltage		V_{RWM}	90	100	V
Maximum DC blocking voltage		V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 105 °C	total device per diode	$I_{F(AV)}$	10 5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	150		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	0.5		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175		°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min		V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 5.0 A I_F = 10 A I_F = 10 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.76 0.61 0.85 0.71	V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 100 °C	I_R	3.5 4.5	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.2	5.2	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR10H100CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF10H100CT-E3/45	1.79	45	50/tube	Tube
TO-263AB	MBRB10H100CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB10H100CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR10H100CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF10H100CTHE3/45 (1)	1.79	45	50/tube	Tube
TO-263AB	MBRB10H100CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB10H100CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

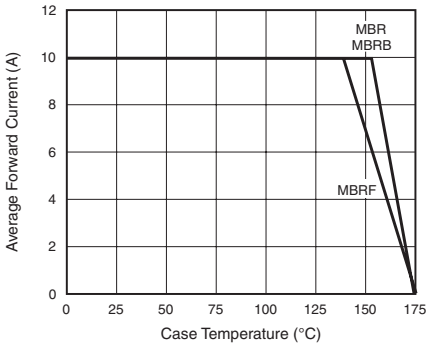


Figure 1. Forward Derating Curve Per Diode

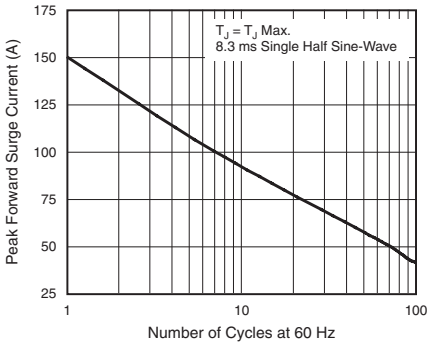


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

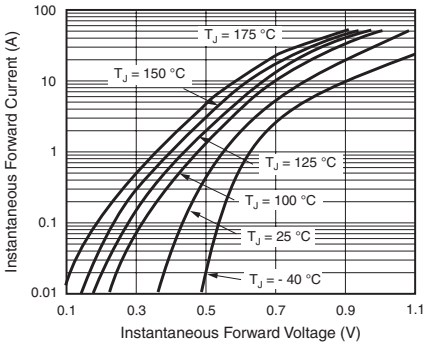


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

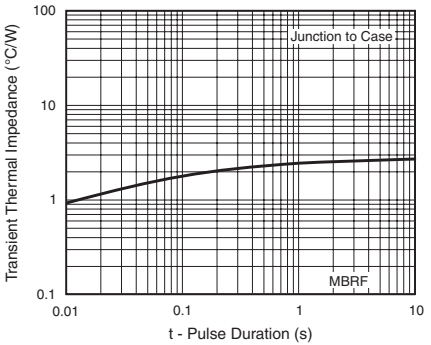


Figure 6. Typical Transient Thermal Impedance Per Diode

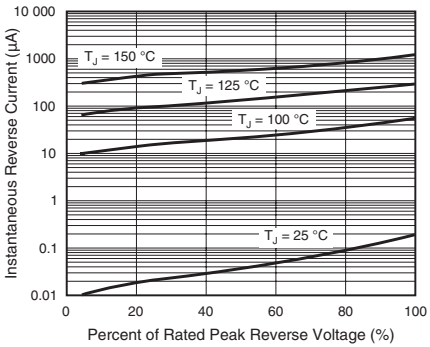


Figure 4. Typical Reverse Characteristics Per Diode

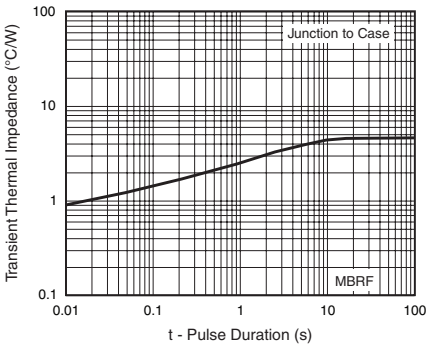


Figure 7. Typical Transient Thermal Impedance Per Diode

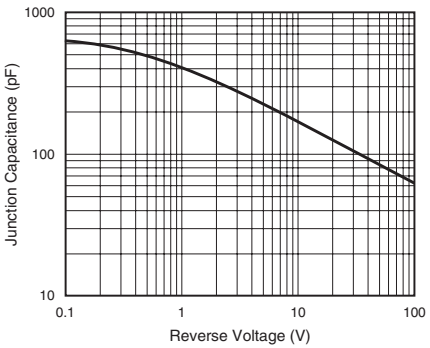
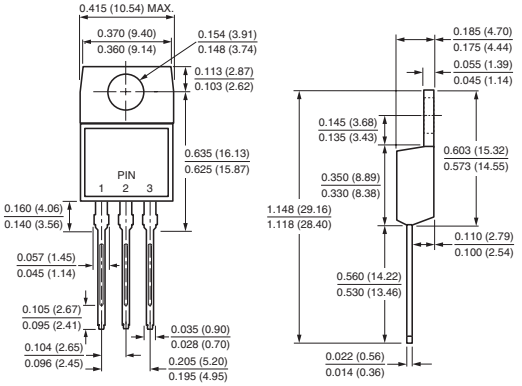


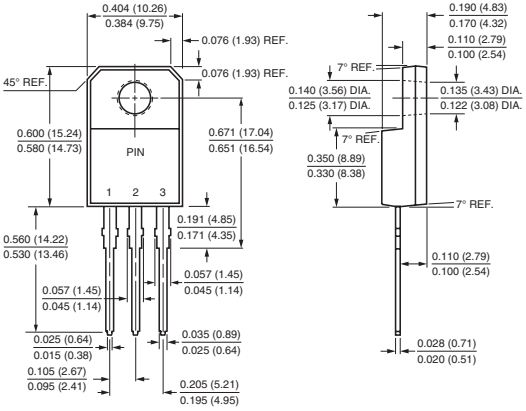
Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

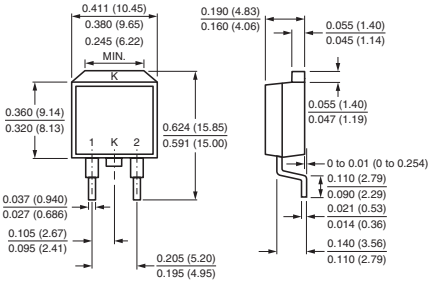
TO-220AB



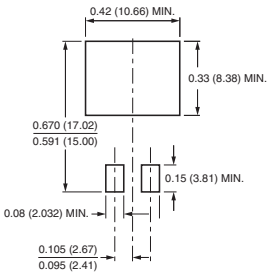
ITO-220AB



TO-263AB



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

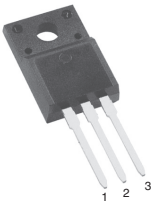
Dual Common-Cathode High Voltage Schottky Rectifier

Low Leakage Current 5.0 µA

TO-220AB

MBR10H150CT

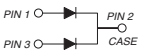
ITO-220AB



MBRF10H150CT

TO-262AA

SB10H150CT-1



FEATURES

- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling and polarity protection applications.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Mounting Torque: 10 in-lbs maximum

Polarity: As marked

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	150 V
I_{FSM}	160 A
V_F	0.72 V
T_J	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER		SYMBOL	MBR10H150CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	150	V
Working peak reverse voltage		V_{RWM}	150	V
Maximum DC blocking voltage		V_{DC}	150	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	10 5.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	160	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Peak non-repetitive reverse surge energy per diode (8/20 µs waveform)		E_{RSM}	10	mJ
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 1.5 A, L = 10 mH		E_{AS}	11.25	mJ
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175	°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min		V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 5.0 A I_F = 10 A I_F = 10 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.88 0.72 0.96 0.80	V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	5.0 1.0	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	2.4	4.5	2.4	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	MBR10H150CT-E3/45	2.06	45	50/tube	Tube
ITO-220AB	MBRF10H150CT-E3/45	2.20	45	50/tube	Tube
TO-262AA	SB10H150CT-1E3/45	1.58	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

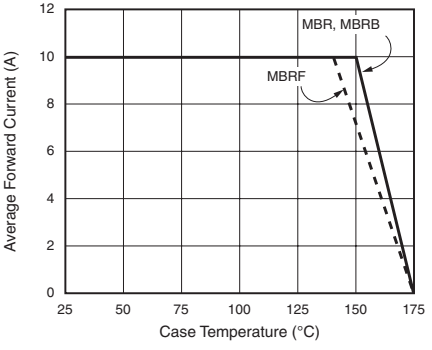


Figure 1. Forward Derating Curve (Total)

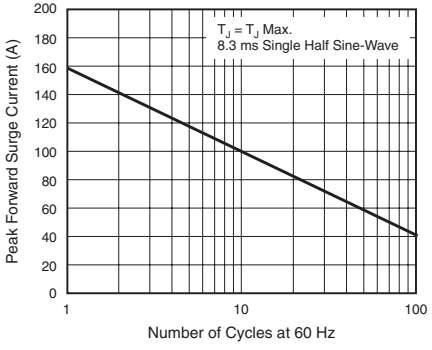


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

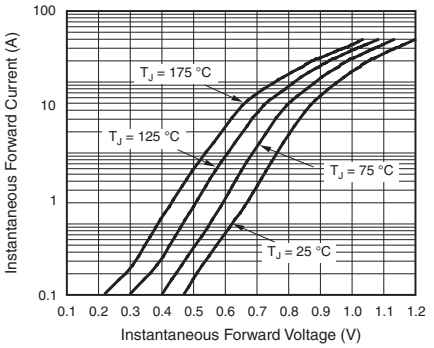


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

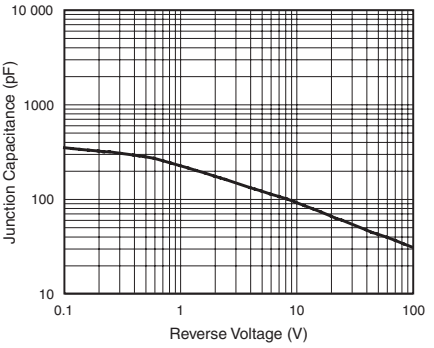


Figure 5. Typical Junction Capacitance Per Diode

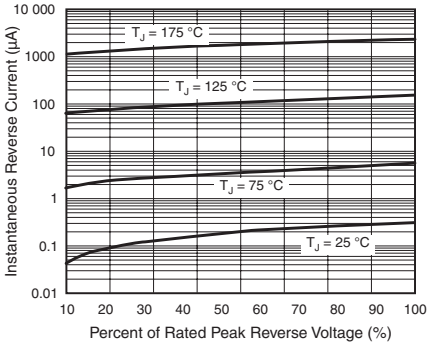


Figure 4. Typical Reverse Characteristics Per Diode

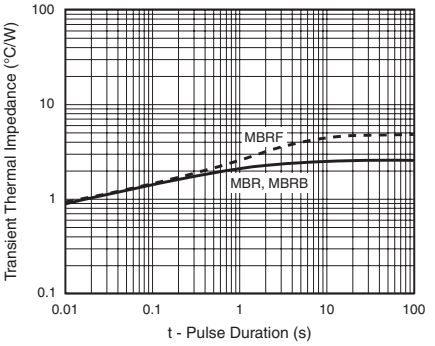
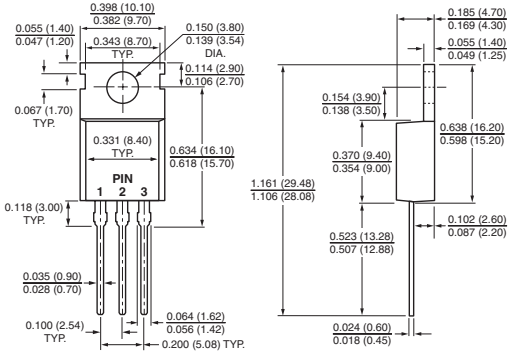


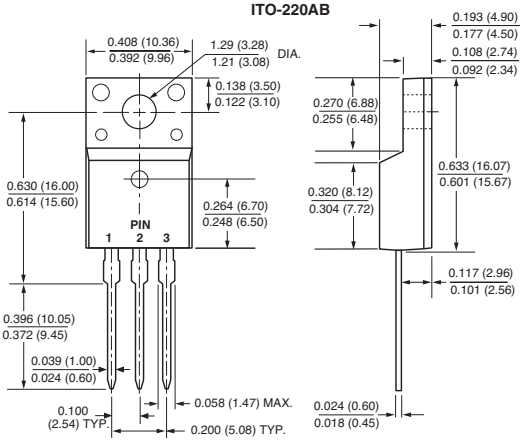
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

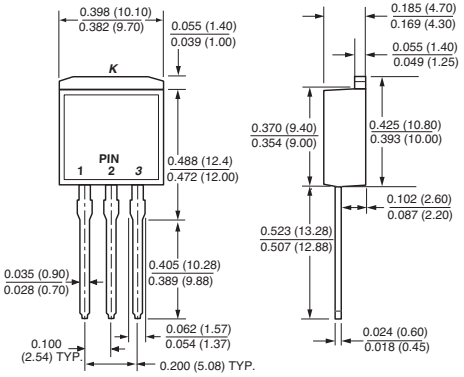
TO-220AB



ITO-220AB

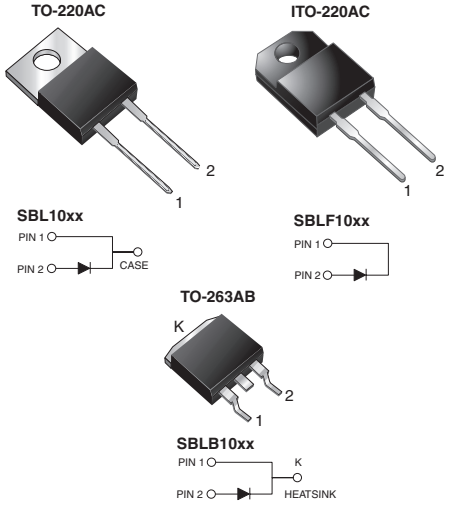


TO-262AA



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Schottky Barrier Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	30 V, 40 V
I_{FSM}	250 A
V_F	0.60 V
T_J max.	125 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	SBL1030	SBL1040	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Working peak reverse voltage	V_{RWM}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_C = 110 °C	$I_{F(AV)}$	10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	250		A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 125		°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	10 A		V_F	0.6	V
Maximum instantaneous reverse current at DC blocking voltage (1)		T_C = 25 °C T_C = 100 °C	I_R	1.0 50	mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SBL**	**SBLF**	**SBLB**	**UNIT**
Typical thermal resistance from junction to case per leg	$R_{\theta JC}$	2.0	5.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	SBL1030-E3/45	1.80	45	50/tube	Tube
ITO-220AC	SBLF1030-E3/45	1.94	45	50/tube	Tube
TO-263AB	SBLB1030-E3/45	1.33	45	50/tube	Tube
TO-263AB	SBLB1030-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	SBL1030HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	SBLF1030HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	SBLB1030HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	SBLB1030HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

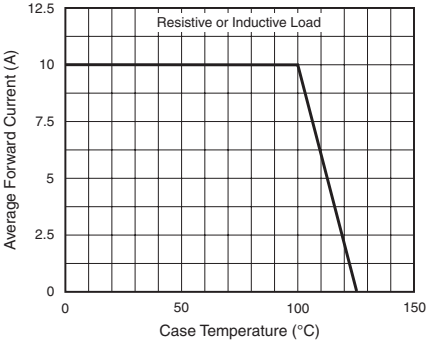


Figure 1. Forward Current Derating Curve

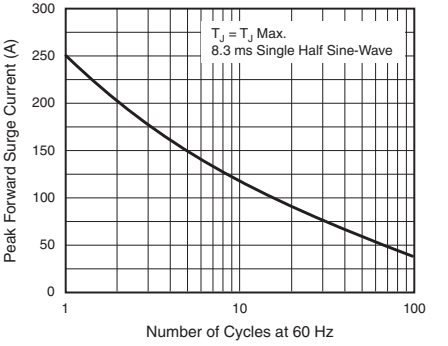


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

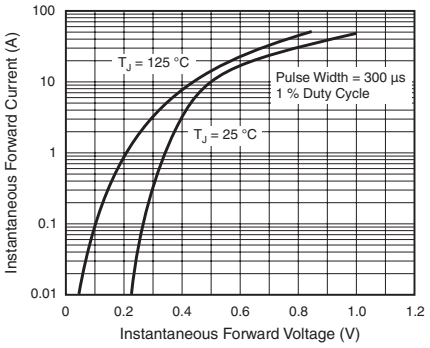


Figure 3. Typical Instantaneous Forward Characteristics

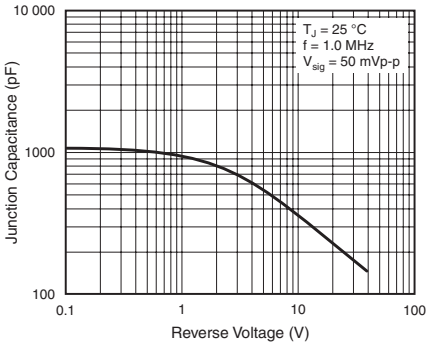


Figure 5. Typical Junction Capacitance

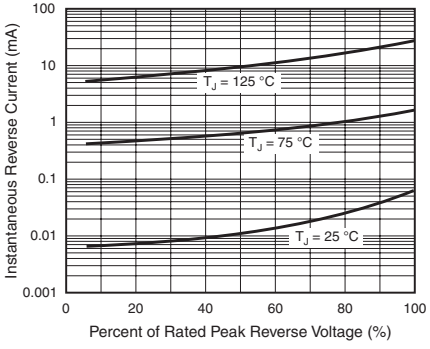


Figure 4. Typical Reverse Characteristics

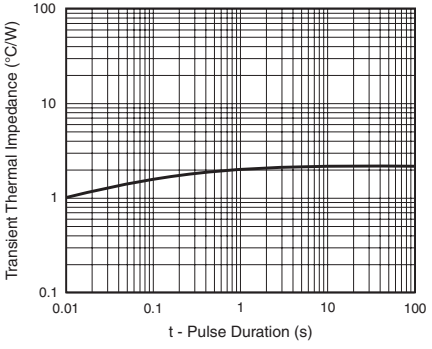
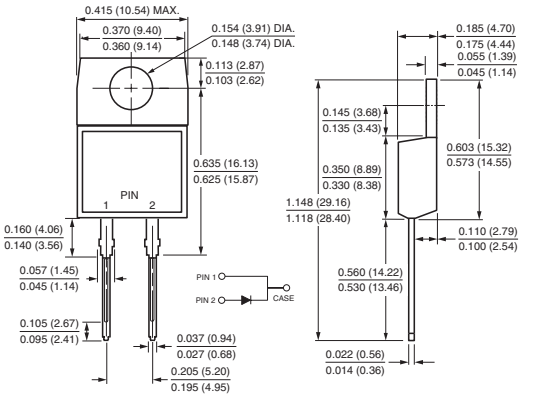


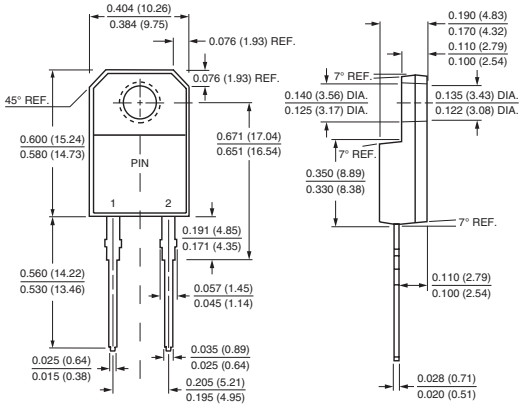
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

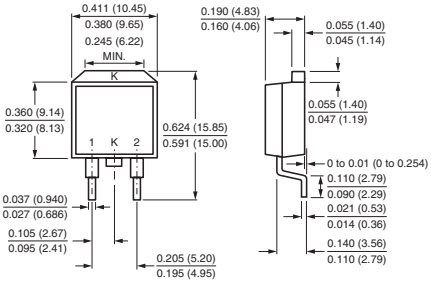
TO-220AC



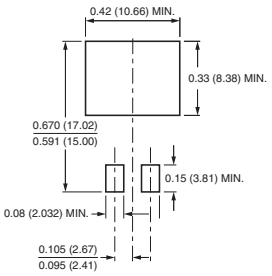
ITO-220AC



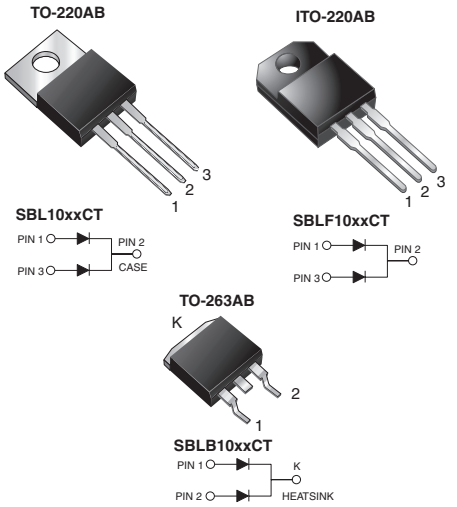
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	175 A
V_F	0.55 V
T_J max.	125 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBL1030CT	SBL1040CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Working peak reverse voltage	V_{RWM}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_C = 107 °C — total device per diode	$I_{F(AV)}$	10 5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	175		A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 125		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	5.0 A		V_F	0.55	V
Maximum instantaneous reverse current per diode at rated DC blocking voltage (1)		T_C = 25 °C T_C = 100 °C	I_R	0.5 50	mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SBL**	**SBLF**	**SBLB**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	3.0	5.0	3.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	SBL1030CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	SBLF1030CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	SBLB1030CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	SBLB1030CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	SBL1030CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	SBLF1030CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	SBLB1030CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	SBLB1030CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

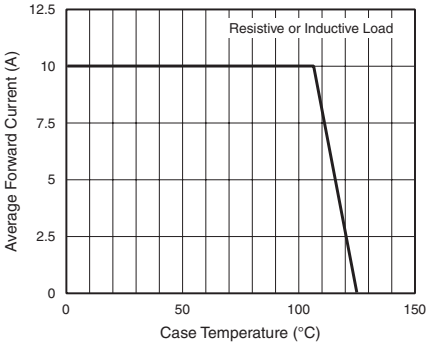


Figure 1. Forward Current Derating Curve

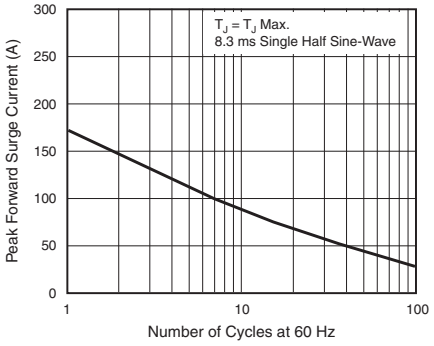


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

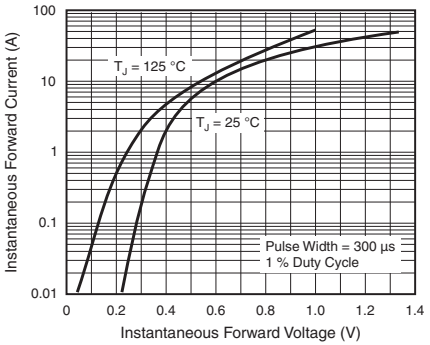


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

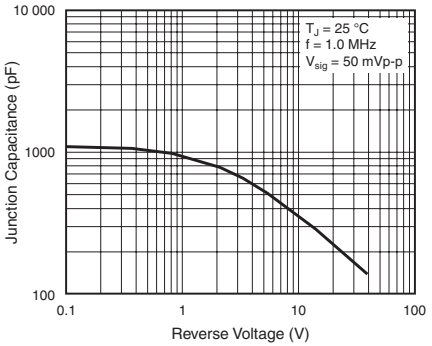


Figure 5. Typical Junction Capacitance Per Diode

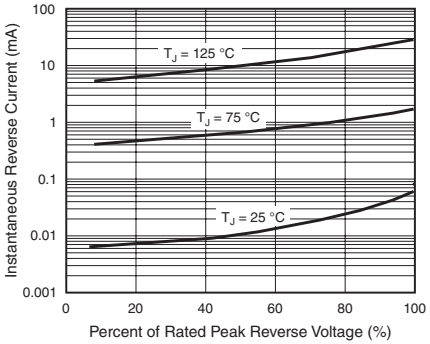


Figure 4. Typical Reverse Characteristics Per Diode

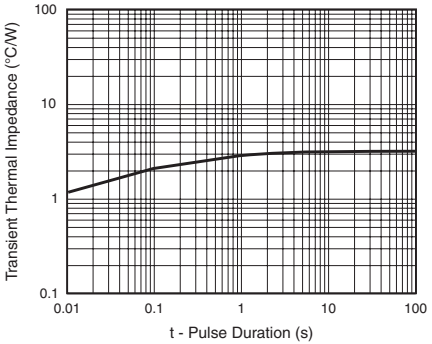
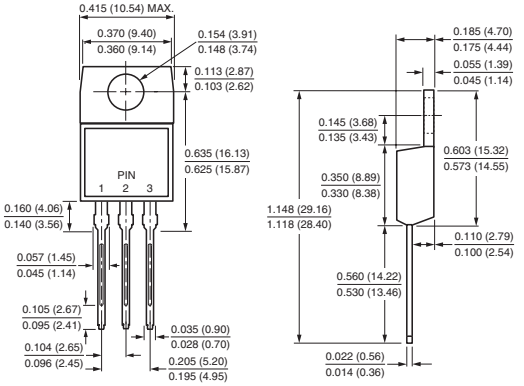


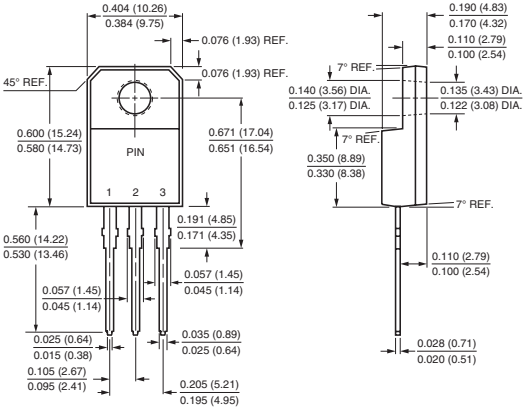
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

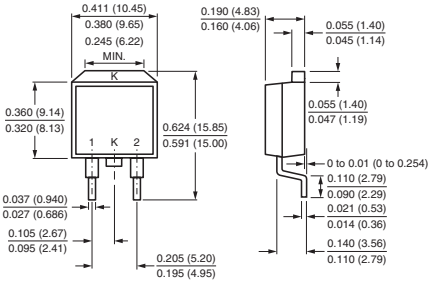
TO-220AB



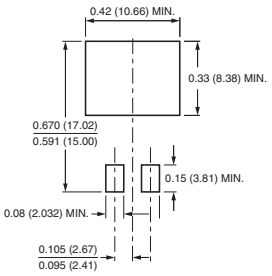
ITO-220AB



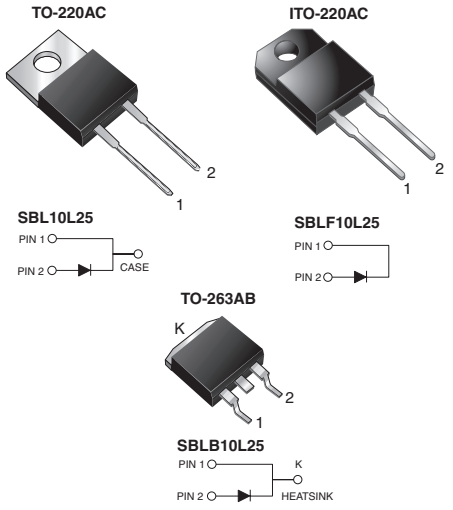
TO-263AB



Mounting Pad Layout



Low V_F Schottky Barrier Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Very low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	25 V
I_{FSM}	240 A
V_F	0.35 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SBL10L25**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	25	V
Working peak reverse voltage	V_{RWM}	18	V
Maximum DC blocking voltage	V_{DC}	25	V
Maximum average forward rectified current at T_C = 135 °C	$I_{F(AV)}$	10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	240	A
Peak repetitive reverse current at t_p = 2 µs, 1 kHz	I_{RRM}	1.0	A
Voltage rate of change (rated V_R)	dV/dt	10 000	V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150	°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.46 0.35 0.55 0.48	V
Maximum instantaneous reverse current at DC blocking voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	0.80 260	mA

Note:

(1) Pulse test: 300 µs pulse width, 2 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SBL**	**SBLF**	**SBLB**	**UNIT**
Typical thermal resistance from junction to case per leg	$R_{\theta JC}$	1.5	4.0	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	SBL10L25-E3/45	1.80	45	50/tube	Tube
ITO-220AC	SBLF10L25-E3/45	1.94	45	50/tube	Tube
TO-263AB	SBLB10L25-E3/45	1.33	45	50/tube	Tube
TO-263AB	SBLB10L25-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	SBL10L25HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	SBLF10L25HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	SBLB10L25HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	SBLB10L25HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

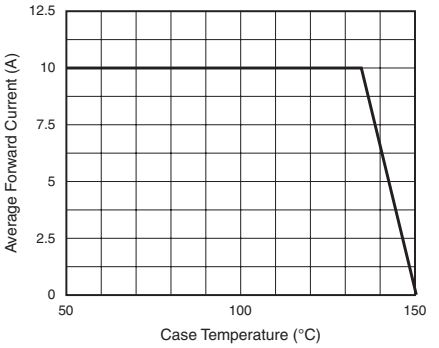


Figure 1. Forward Current Derating Curve

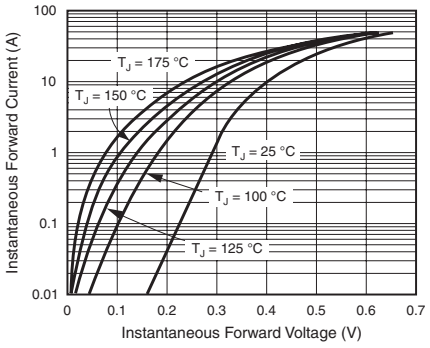


Figure 2. Typical Instantaneous Forward Characteristics

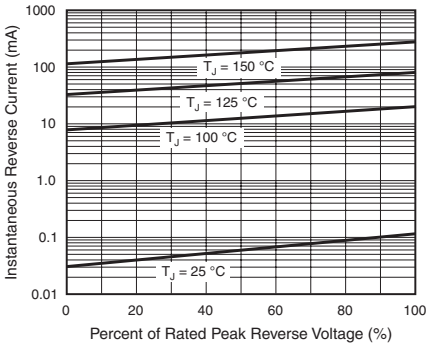


Figure 3. Typical Reverse Characteristics

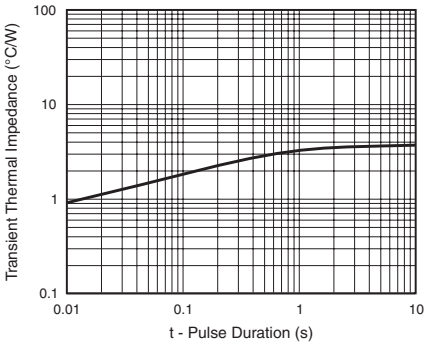


Figure 5. Typical Transient Thermal Impedance

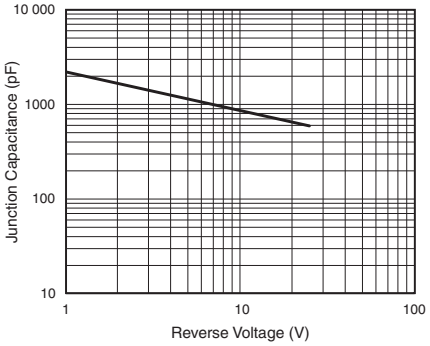
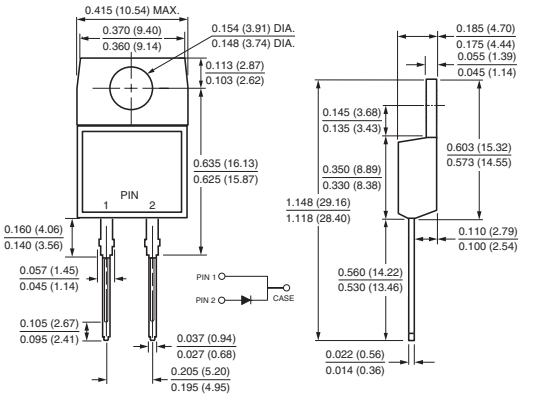


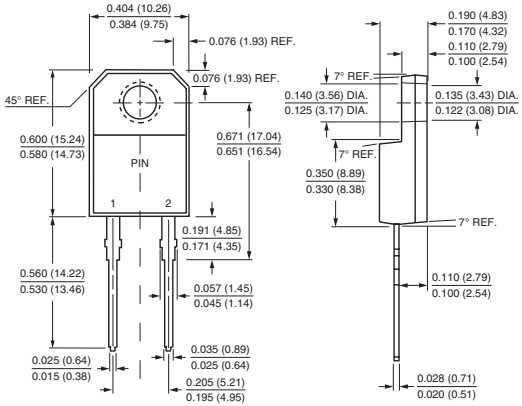
Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

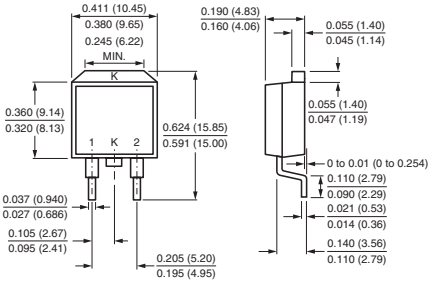
TO-220AC



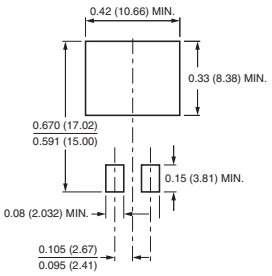
ITO-220AC



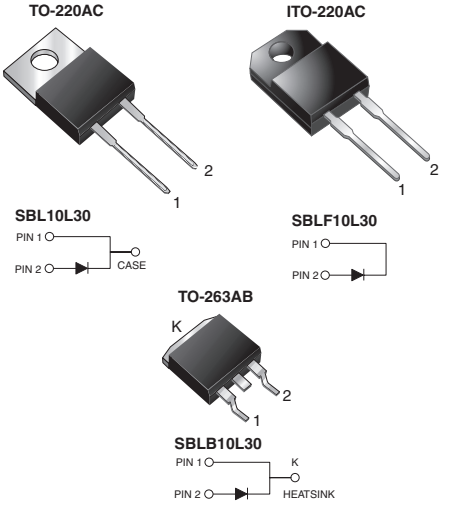
TO-263AB



Mounting Pad Layout



Low V_F Schottky Barrier Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Very low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, OR-ing diode, freewheeling diodes, dc-to-dc converters and polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	30 V
I_{FSM}	200 A
V_F	0.43 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	30	V
Working peak reverse voltage	V_{RWM}	21	V
Maximum DC blocking voltage	V_{DC}	30	V
Maximum average forward rectified current at T_C = 140 °C	$I_{F(AV)}$	10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Peak repetitive reverse current at t_p = 2 µs, 1 kHz	I_{RRM}	1.0	A
Voltage rate of change (rated V_R)	dV/dt	10 000	V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150	°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 10 A I_F = 10 A	T_J = 25 °C T_J = 125 °C	V_F	0.52 0.43	V
Maximum instantaneous reverse current at DC blocking voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	1.0 100	mA

Note:

(1) Pulse test: 300 µs pulse width, 2 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SBL**	**SBLF**	**SBLB**	**UNIT**
Typical thermal resistance from junction to case per leg	$R_{\theta JC}$	4.3	4.8	4.3	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	SBL10L30-E3/45	1.80	45	50/tube	Tube
ITO-220AC	SBLF10L30-E3/45	1.94	45	50/tube	Tube
TO-263AB	SBLB10L30-E3/45	1.33	45	50/tube	Tube
TO-263AB	SBLB10L30-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	SBL10L30HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	SBLF10L30HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	SBLB10L30HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	SBLB10L30HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

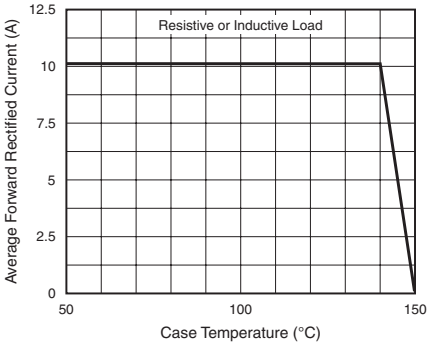


Figure 1. Forward Current Derating Curve

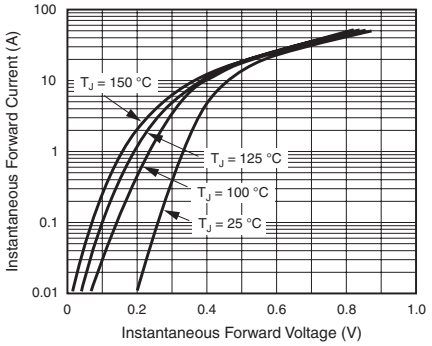


Figure 2. Typical Instantaneous Forward Characteristics

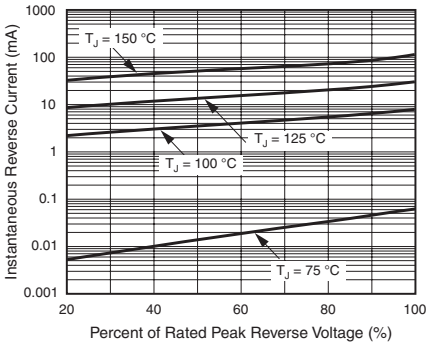


Figure 3. Typical Reverse Characteristics

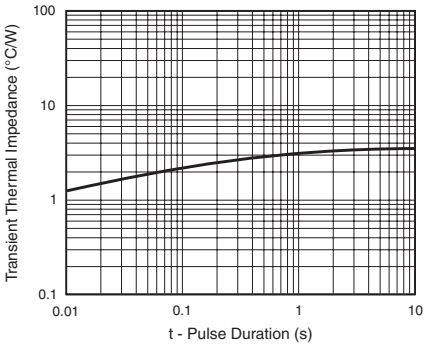


Figure 5. Typical Transient Thermal Impedance

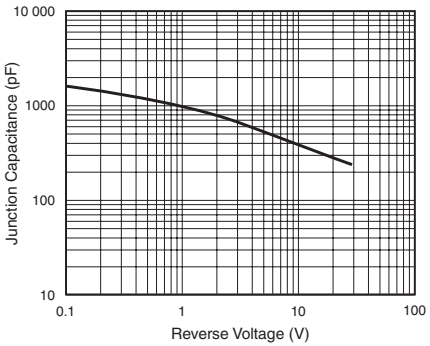
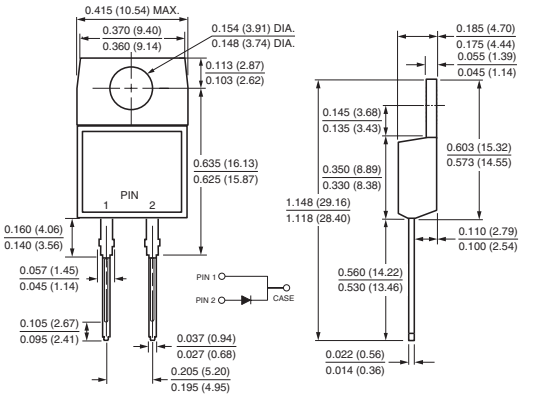


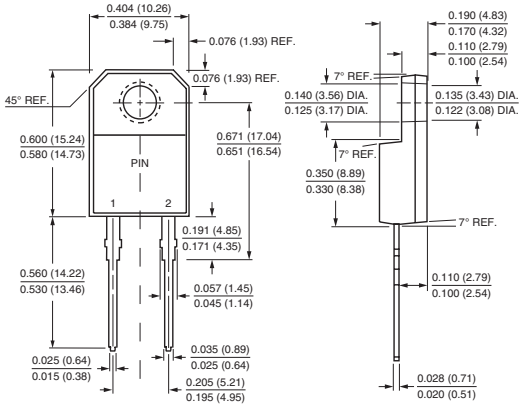
Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

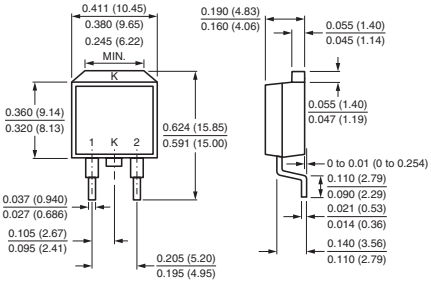
TO-220AC



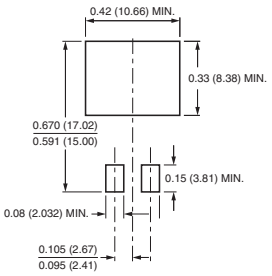
ITO-220AC



TO-263AB



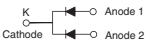
Mounting Pad Layout



High Current Density Surface Mount Dual Common-Cathode Schottky Rectifiers

eSMP™ Series

TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	20 V, 30 V
I_{FSM}	200 A
E_{AS}	20 mJ
V_F at I_F = 5 A	0.338 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	SS10P2CL	SS10P3CL	UNIT
Device marking code			S102CL	S103CL	
Maximum repetitive peak reverse voltage		V_{RRM}	20	30	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	10 5.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	200		A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 2 A per diode		E_{AS}	20		mJ
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 2.5 A I_F = 5.0 A	T_A = 25 °C	V_F	0.391 0.440	- 0.52	V
	I_F = 2.5 A I_F = 5.0 A	T_A = 125 °C		0.272 0.338	- 0.42	
Reverse current per diode (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	95 37	850 55	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	560	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS10P2CL**	**SS10P3CL**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS10P3CL-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P3CL-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P3CLHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P3CLHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS10P3CL-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P3CL-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P3CLHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P3CLHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

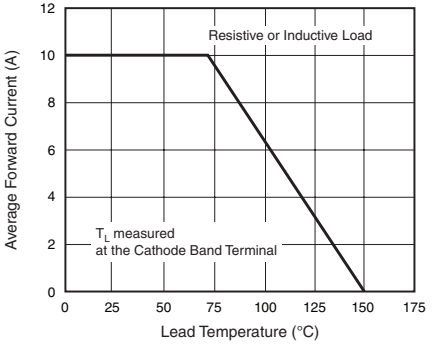


Figure 1. Maximum Forward Current Derating Curve

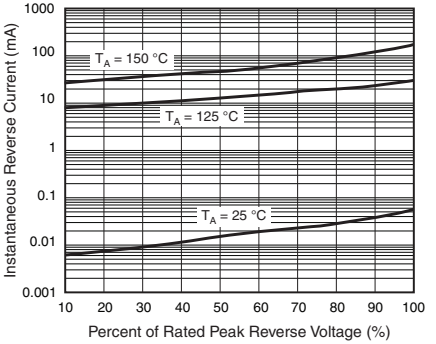


Figure 4. Typical Reverse Leakage Characteristics Per Diode

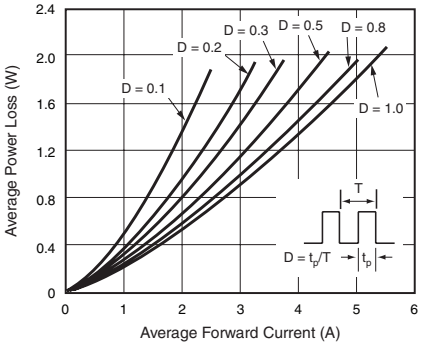


Figure 2. Forward Power Loss Characteristics Per Diode

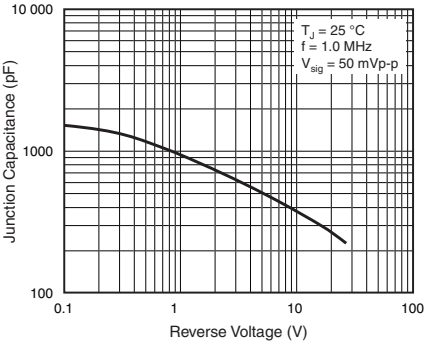


Figure 5. Typical Junction Capacitance Per Diode

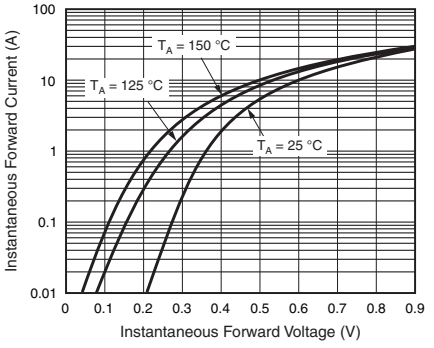


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

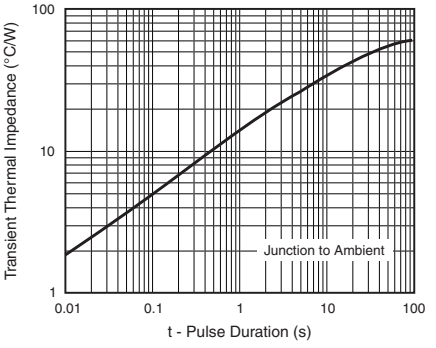
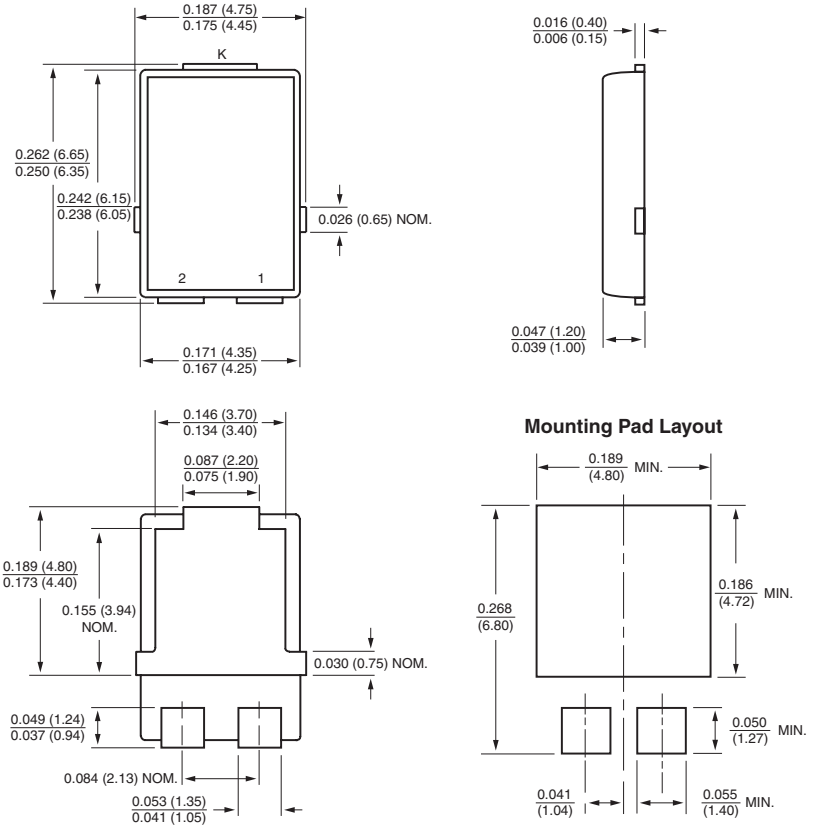


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)

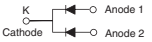


Conform to JEDEC TO-277A

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series

TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	200 A
E_{AS}	20 mJ
V_F at I_F = 5 A	0.37 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	SS10P3C	SS10P4C	UNIT
Device marking code			S103C	S104C	
Maximum repetitive peak reverse voltage		V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	10 5.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	200		A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 2 A per diode		E_{AS}	20		mJ
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 2.5 A I_F = 5.0 A	T_A = 25 °C	V_F	0.40 0.45	- 0.53	V
	I_F = 2.5 A I_F = 5.0 A	T_A = 125 °C		0.29 0.37	- 0.44	
Reverse current per diode (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	56 28	550 45	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	430	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS10P3C**	**SS10P4C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS10P4C-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4C-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P4CHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4CHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS10P4C-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4C-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P4CHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4CHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

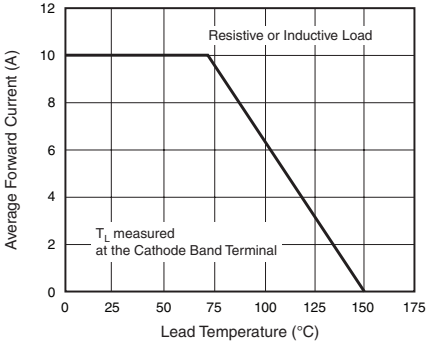


Figure 1. Maximum Forward Current Derating Curve

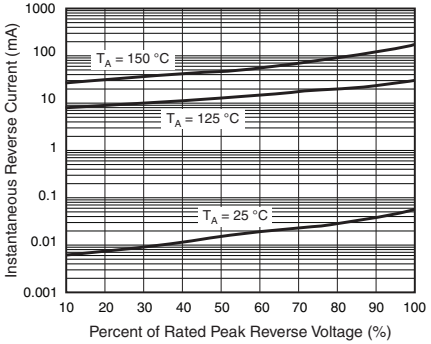


Figure 4. Typical Reverse Leakage Characteristics Per Diode

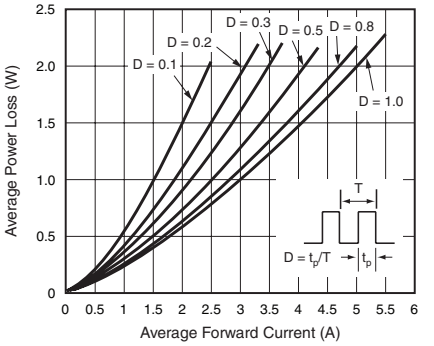


Figure 2. Forward Power Loss Characteristics Per Diode

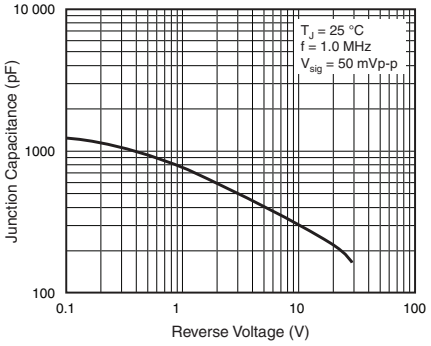


Figure 5. Typical Junction Capacitance Per Diode

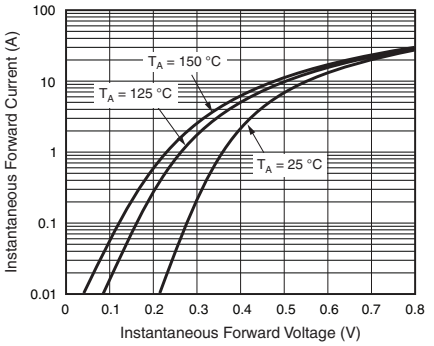


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

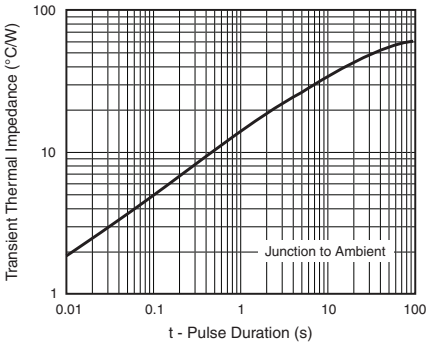
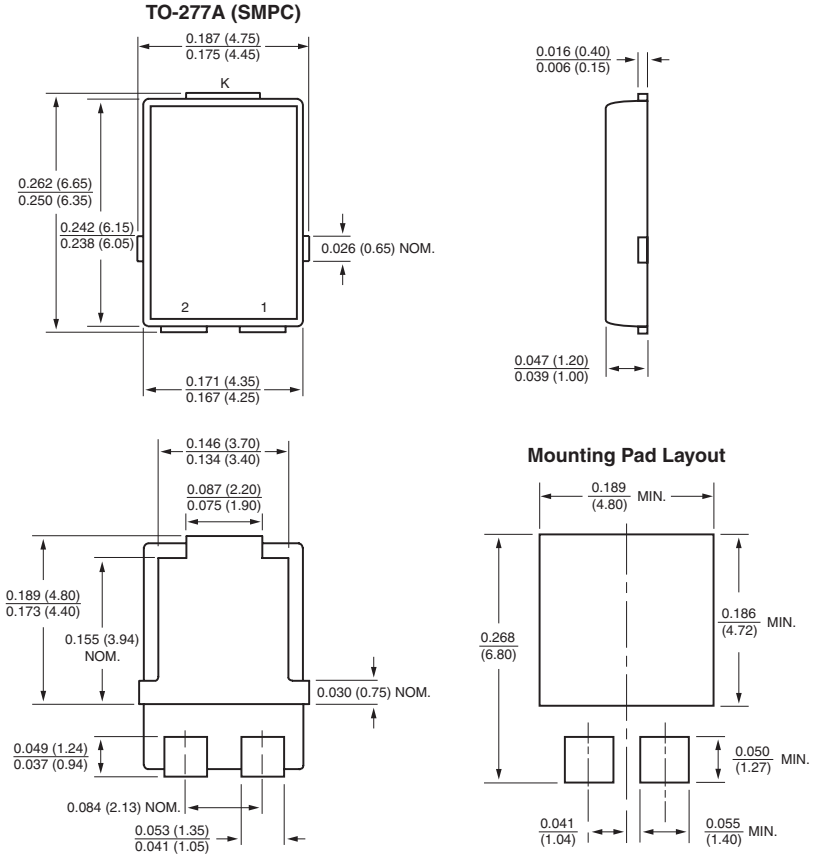


Figure 6. Typical Transient Thermal Impedance Per Diode

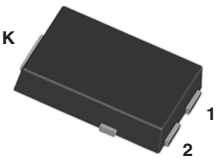
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



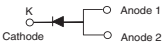
Conform to JEDEC TO-277A

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	30 V, 40 V
I_{FSM}	280 A
E_{AS}	20 mJ
V_F at I_F = 10 A	0.41 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS10P3	SS10P4	UNIT
Device marking code		S103	S104	
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	280		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.41 0.48	- 0.56	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.31 0.41	- 0.49	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	100 50	800 100	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	750	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS10P3**	**SS10P4**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS10P4-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P4HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS10P4-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P4HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P4HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

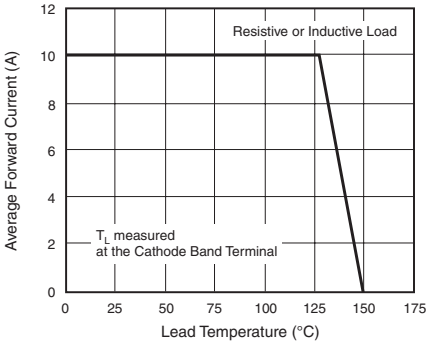


Figure 1. Maximum Forward Current Derating Curve

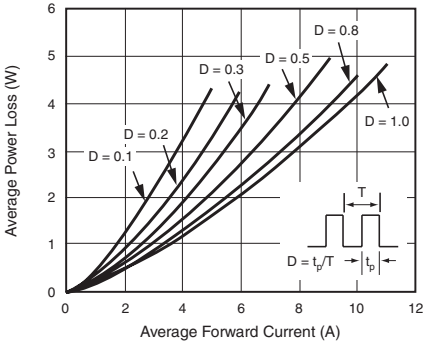


Figure 2. Forward Power Loss Characteristics

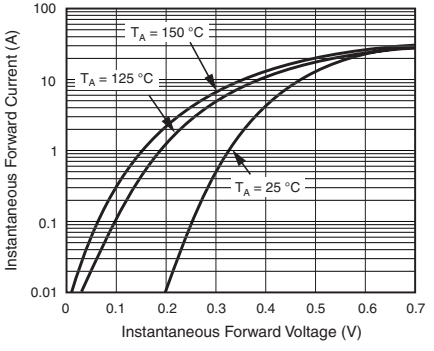


Figure 3. Typical Instantaneous Forward Characteristics

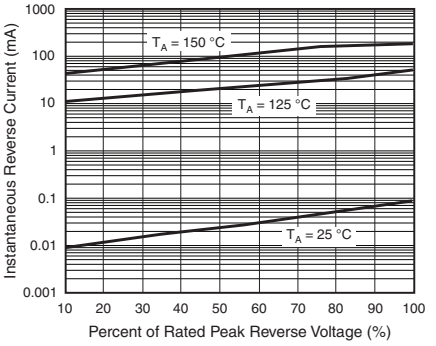


Figure 4. Typical Reverse Leakage Characteristics

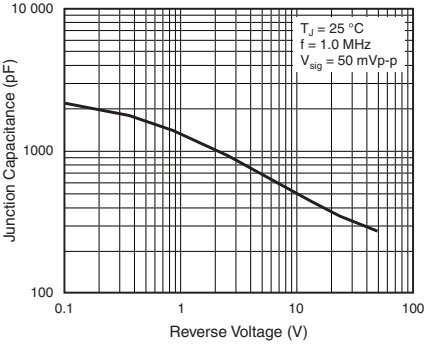


Figure 5. Typical Junction Capacitance

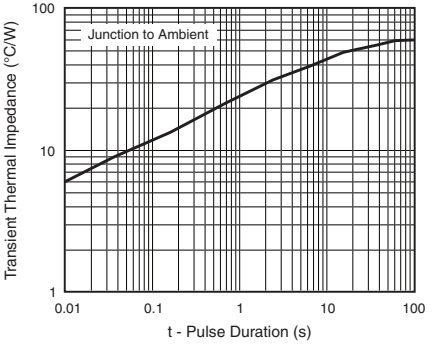
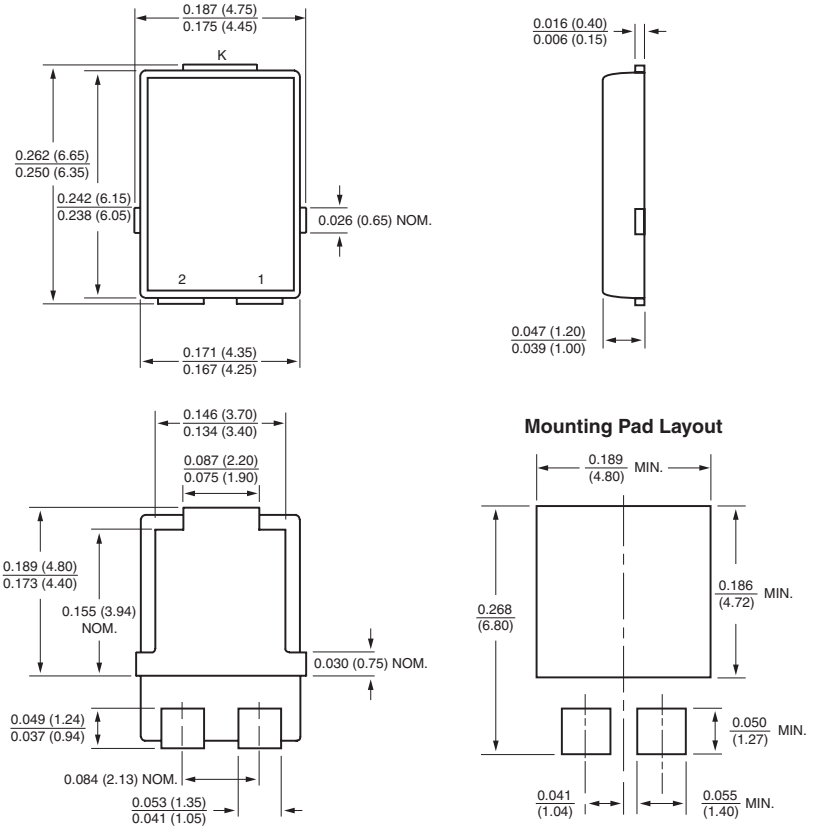


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



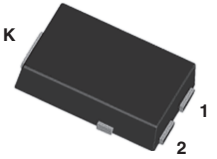
Conform to JEDEC TO-277A

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

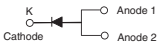
Document Number: 88983
Revision: 30-Jul-08

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	50 V, 60 V
I_{FSM}	280 A
E_{AS}	20 mJ
V_F at I_F = 10 A	0.55 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS10P5	SS10P6	UNIT
Device marking code		S105	S106	
Maximum repetitive peak reverse voltage	V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10 (1) 7 (2)		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	280		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

Notes:

(1) Units mounted on infinite heatsink

(2) Units mounted on 5 cm x 5 cm, 2 oz. copper pad

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 5 A I_F = 7 A I_F = 10 A	T_A = 25 °C	V_F	0.51 0.55 0.59	- - 0.67	V
	I_F = 5 A I_F = 7 A I_F = 10 A	T_A = 125 °C		0.42 0.47 0.55	- - 0.63	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	7.8 5.9	150 15	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	560	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS10P5**	**SS10P6**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS10P6-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P6-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P6HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P6HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS10P6-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P6-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P6HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10P6HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

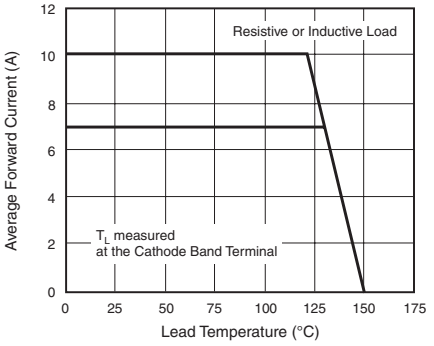


Figure 1. Maximum Forward Current Derating Curve

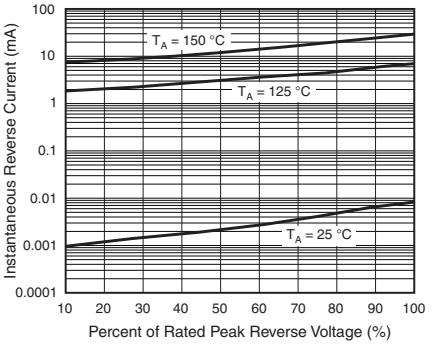


Figure 4. Typical Reverse Leakage Characteristics

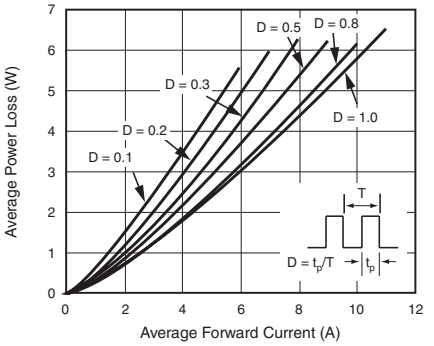


Figure 2. Forward Power Loss Characteristics

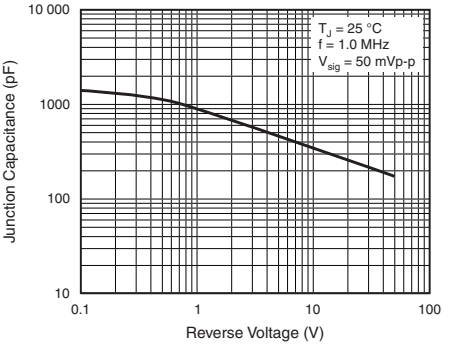


Figure 5. Typical Junction Capacitance

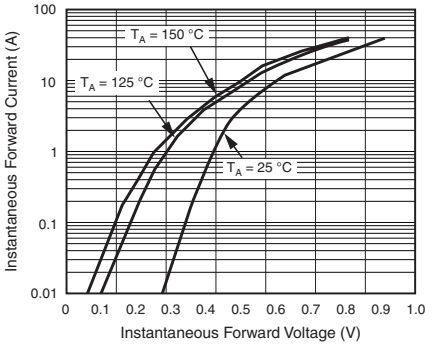


Figure 3. Typical Instantaneous Forward Characteristics

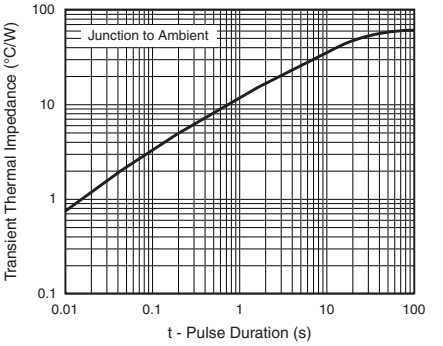
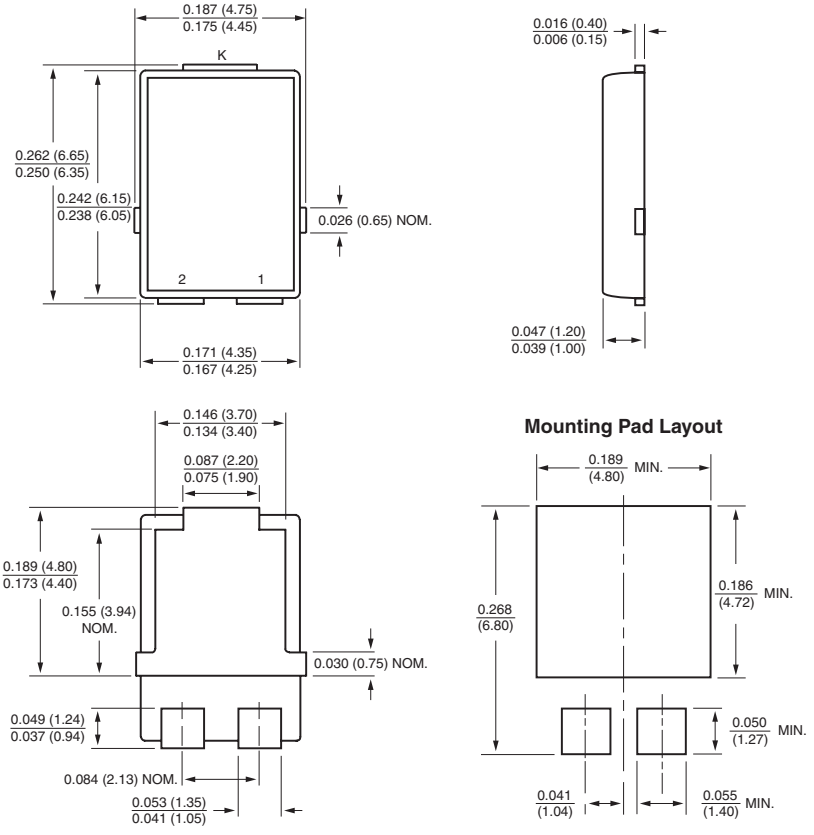


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

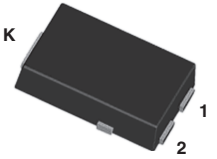
TO-277A (SMPC)



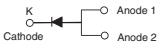
Conform to JEDEC TO-277A

High Current Density Surface Mount Schottky Rectifier

eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	45 V
I_{FSM}	200 A
E_{AS}	20 mJ
V_F at I_F = 10 A	0.56 V
I_R	5.5 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- High barrier technology, T_J = 175 °C maximum
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SS10PH45**	**UNIT**
Device marking code		10H45	
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.54 0.64	- 0.72	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.45 0.56	- 0.64	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	5.5 3.9	80 10	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	400	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SS10PH45**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3	°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS10PH45-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH45-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH45HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH45HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH45-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH45-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH45HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH45HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

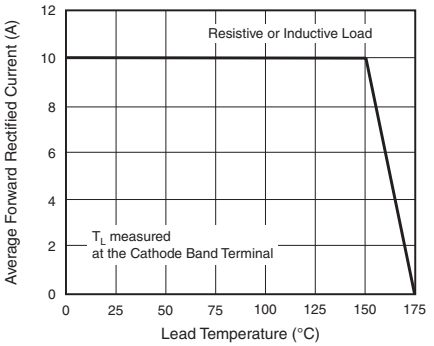


Figure 1. Maximum Forward Current Derating Curve

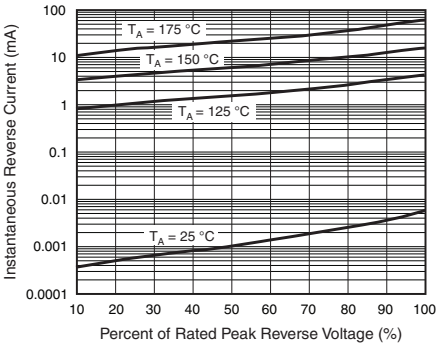


Figure 4. Typical Reverse Characteristics

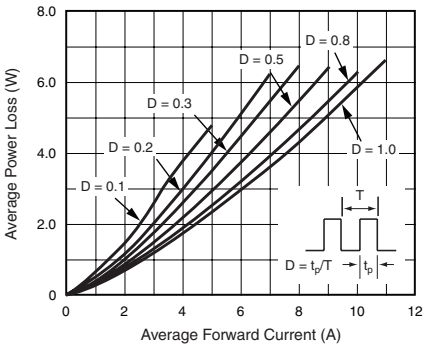


Figure 2. Forward Power Loss Characteristics

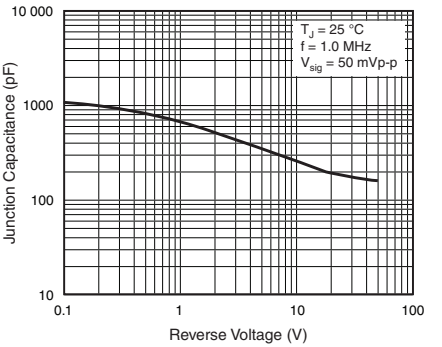


Figure 5. Typical Junction Capacitance

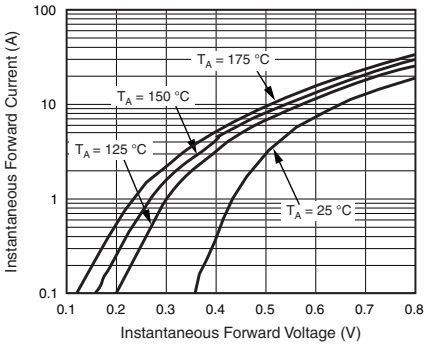


Figure 3. Typical Instantaneous Forward Characteristics

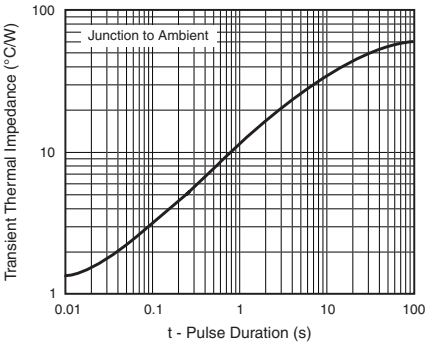
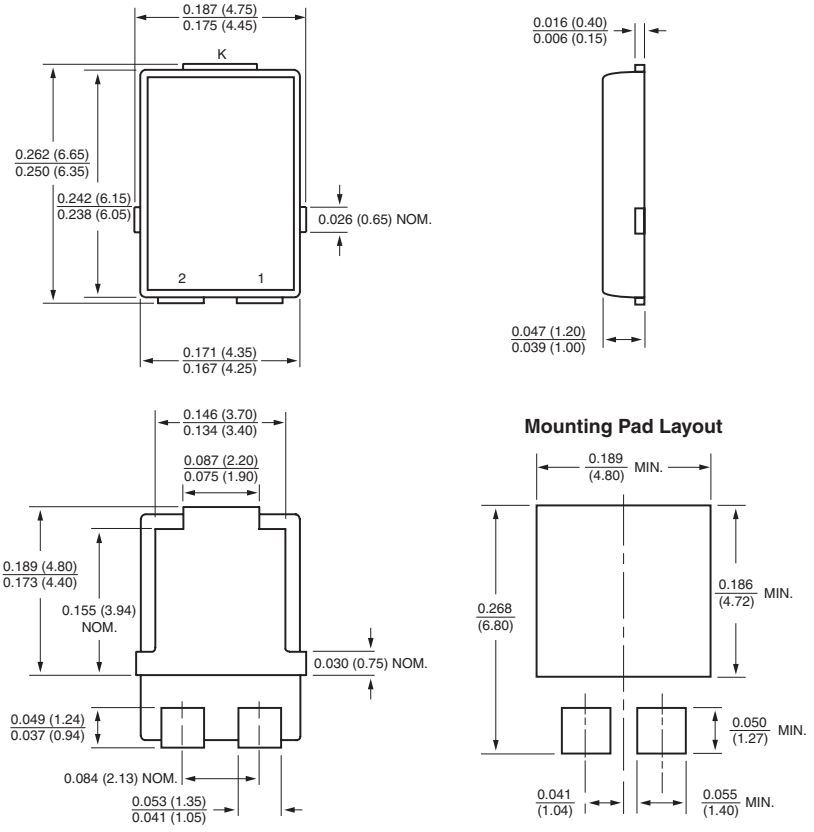


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

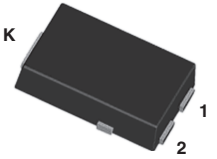
TO-277A (SMPC)



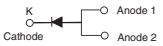
Conform to JEDEC TO-277A

High Current Density Surface Mount High Voltage Schottky Rectifier

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- High barrier technology, T_J = 175 °C maximum
- Low leakage current
- Meets MSL level 1, per J-STD-020
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	90 V, 100 V
I_{FSM}	200 A
E_{AS}	20 mJ
V_F at I_F = 10 A	0.661 V
I_R	0.3 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS10PH9	SS10PH10	UNIT
Device marking code		10H9	10H10	
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	200		A
Non-repetitive avalanche energy at I_{AS} = 2 A, L = 10 mH, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.725 0.800	- 0.88	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.581 0.661	- 0.74	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	0.3 0.3	10 3	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	270	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS10PH9**	**SS10PH10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS10PH10-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH10-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH10HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH10HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH10HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH10HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

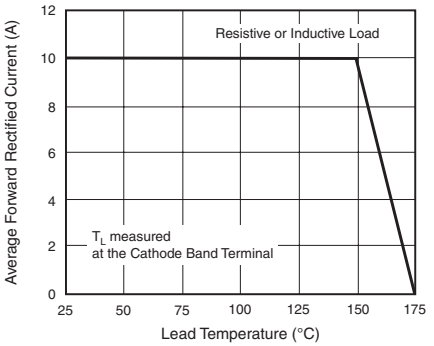


Figure 1. Maximum Forward Current Derating Curve

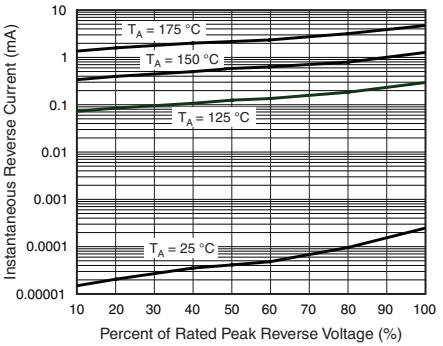


Figure 4. Typical Reverse Characteristics

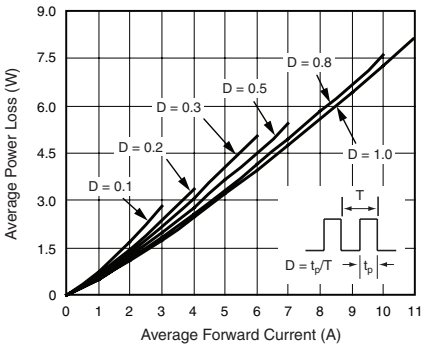


Figure 2. Forward Power Loss Characteristics

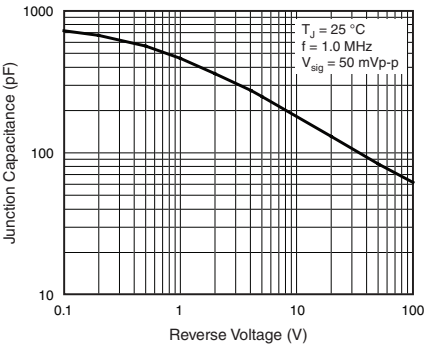


Figure 5. Typical Junction Capacitance

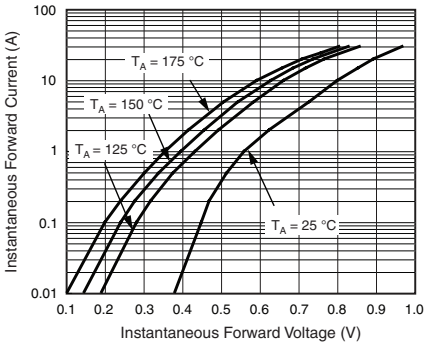


Figure 3. Typical Instantaneous Forward Characteristics

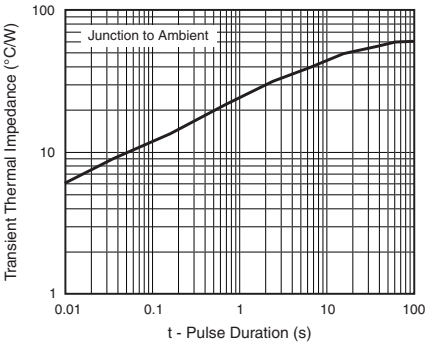
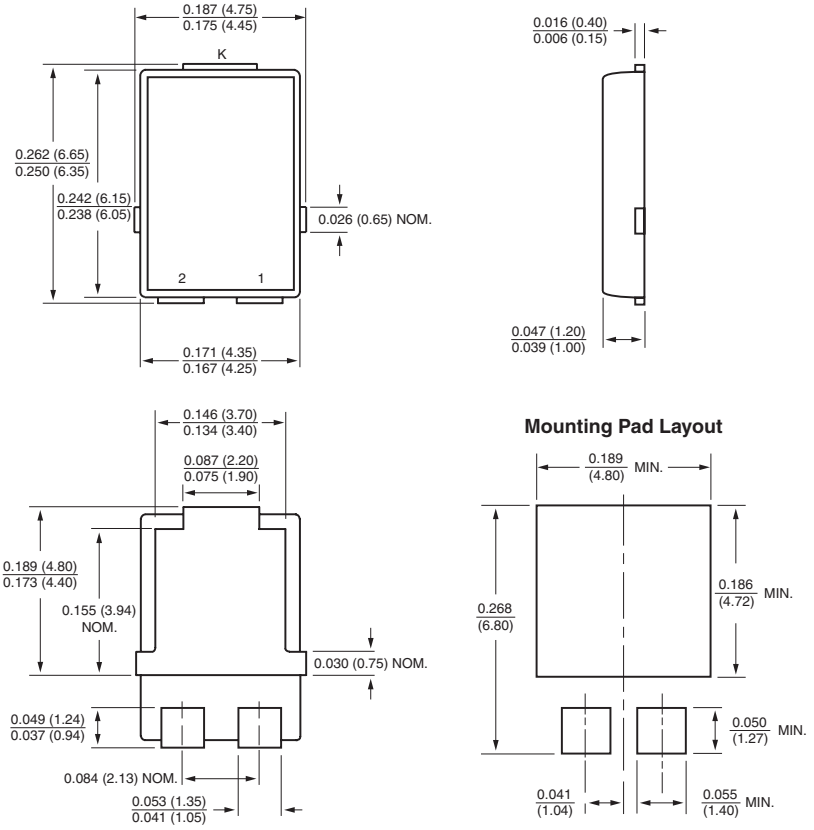


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

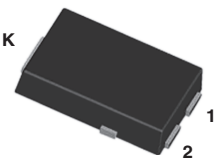
TO-277A (SMPC)



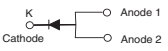
Conform to JEDEC TO-277A

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	20 V, 30 V
I_{FSM}	280 A
E_{AS}	20 mJ
V_F at I_F = 12 A	0.38 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SS12P2L	SS12P3L	UNIT
Device marking code		S122	S123	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	12		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	280		A
Non-repetitive avalanche energy at I_{AS} = 2 A, T_J = 25 °C	E_{AS}	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 6 A I_F = 12 A	T_A = 25 °C	V_F	0.41 0.48	- 0.56	V
	I_F = 6 A I_F = 12 A	T_A = 125 °C		0.30 0.38	- 0.46	
Maximum reverse current (2)	V_R = 30 V	T_A = 25 °C T_A = 125 °C	I_R	150 59	1000 120	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	930	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SS12P2L**	**SS12P3L**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3		°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS12P3L-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS12P3L-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS12P3LHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS12P3LHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
SS12P3L-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS12P3L-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS12P3LHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
SS12P3LHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

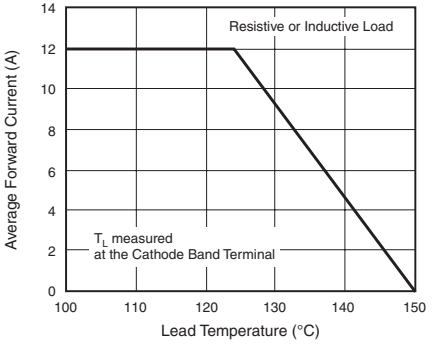


Figure 1. Maximum Forward Current Derating Curve

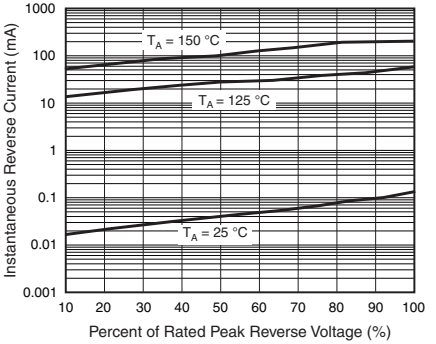


Figure 4. Typical Reverse Leakage Characteristics

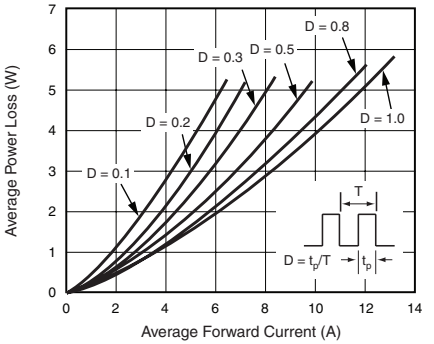


Figure 2. Forward Power Loss Characteristics

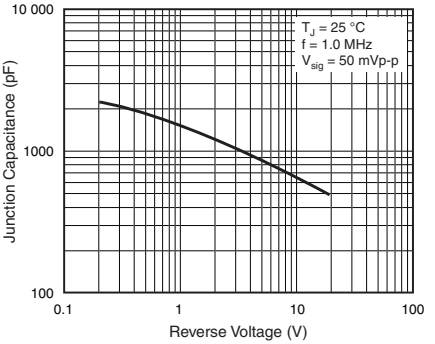


Figure 5. Typical Junction Capacitance

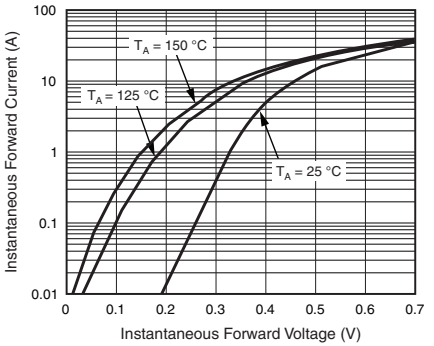


Figure 3. Typical Instantaneous Forward Characteristics

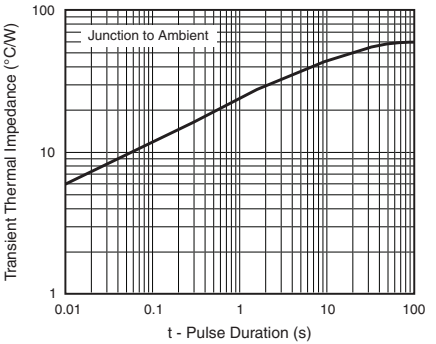
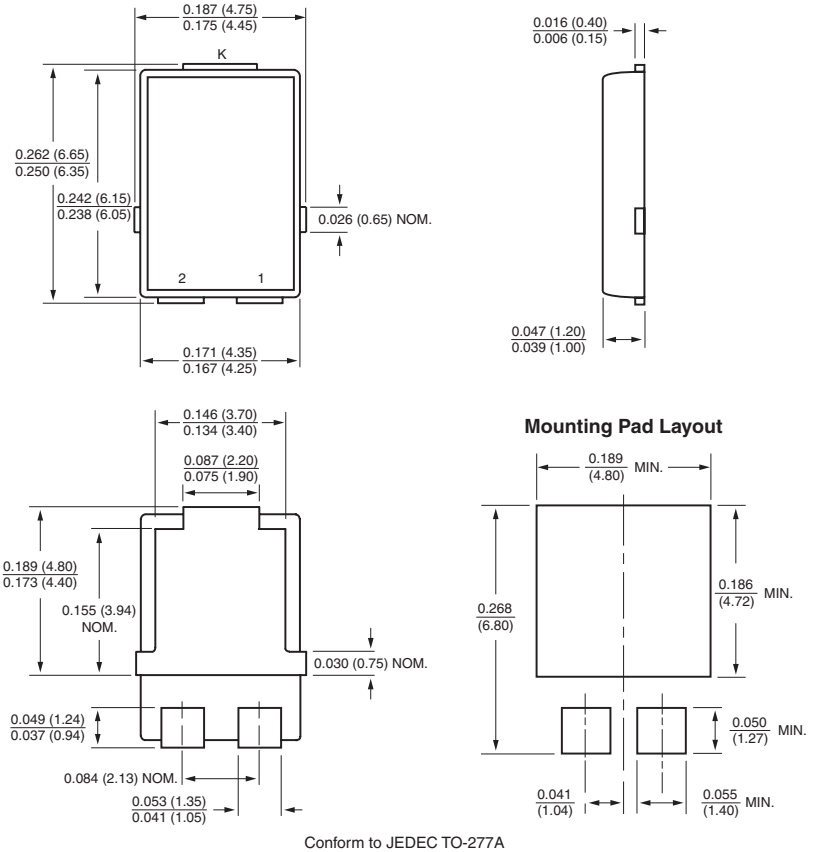


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

Photovoltaic Solarcell Protection Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance

This datasheet reflects specifications of product in actual application.

Case Style P600

FEATURES

- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency operation
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in solar cell junction box as a bypass diode for protection, using DC forward current without reverse bias.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	45 V
I_{FSM}	300 A
V_F at I_F = 15 A	0.46 V
T_{OP} max.	175 °C

MECHANICAL DATA

Case: P600, molded epoxy over passivated junction

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SB15H45**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	15 (1) 7 (2)	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	300	A
Operating junction and storage temperature range	T_{OP}, T_{STG}	- 55 to + 175	°C
Junction temperature in DC forward current without reverse bias, t ≤ 1 h (Fig. 1) (3)	T_J	≤ 200	°C

Notes:

(1) With heatsink, T_L = 25 °C

(2) Without heatsink, free air

(3) Exceeds requirements of IEC 61215 Ed. 2 bypass diode thermal test

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 25 °C	V_F	0.48 0.50 0.56	- - 0.64	V
	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 125 °C		0.35 0.39 0.46	- - 0.54	
Reverse current (2)	V_R = 45 V	T_A = 25 °C T_A = 125 °C	I_R	10 8	300 20	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	1020	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: 10 ms pulse width

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SB15H45**	**UNIT**
Thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	66 14	°C/W
Typical thermal resistance (2)	$R_{\theta JL}$	3.5	

Note:

(1) Without heatsink, free air

(2) T_A = 75 °C, T_L = 125 °C, T_J = 175 °C, infinite mass at 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SB15H45-E3/54	1.756	54	800	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

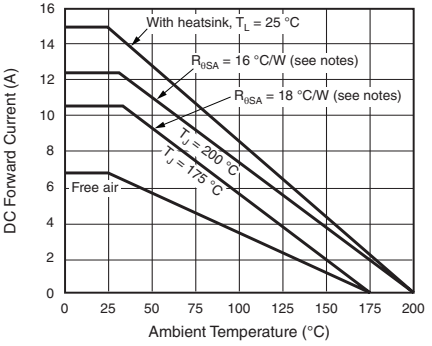


Figure 1. Forward Current Derating Curve

Notes:

Mounted on junction box

Using DC forward current

Junction box SA (sink to ambient)

Assumes $R_{\theta LS}$ (lead to sink) of 5 °C/W

Thermal resistance $R_{\theta SA}$ (sink to ambient):

$$R_{\theta SA} = \frac{(T_J - T_A)}{P_D} - (R_{\theta JL} + R_{\theta LS})$$

P_D: Power dissipation $P_D = V_F \times I_F$

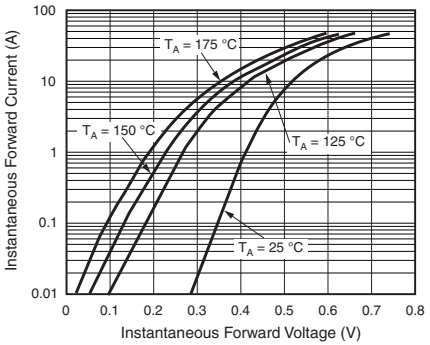


Figure 2. Typical Instantaneous Forward Characteristics

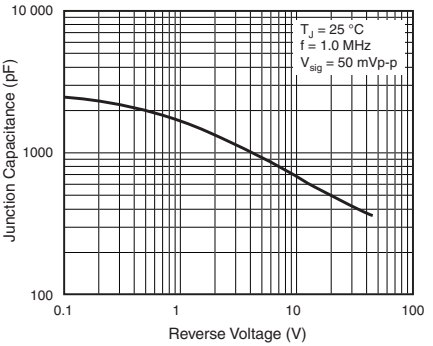


Figure 4. Typical Junction Capacitance

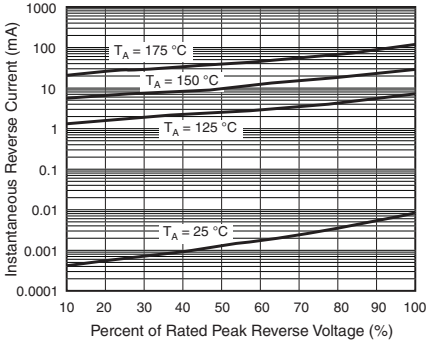
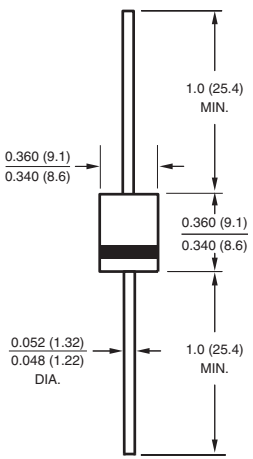


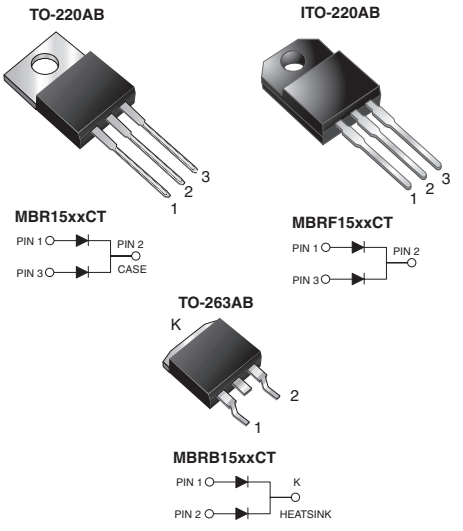
Figure 3. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style P600



Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 7.5 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.65 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR1535CT	MBR1545CT	MBR1550CT	MBR1560CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	35	45	50	60	V
Working peak reverse voltage		V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage		V_{DC}	35	45	50	60	V
Maximum average forward rectified current at T_C = 105 °C	total device	$I_{F(AV)}$	15				A
	per diode		7.5				
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	150				A
Peak repetitive reverse surge current per diode at t_p = 2.0 µs, 1 kHz		I_{RRM}	1.0		0.5		A
Voltage rate of change (rated V_R)		dV/dt	10 000				V/µs
Operating junction temperature range		T_J	- 65 to + 150				°C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR1535CT**	**MBR1545CT**	**MBR1550CT**	**MBR1560CT**	**UNIT**
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR1535CT**	**MBR1545CT**	**MBR1550CT**	**MBR1560CT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 7.5 A I_F = 7.5 A I_F = 15 A I_F = 15 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	-	0.57 0.84 0.72	0.75 0.65 -	-	V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 125 °C	I_R	0.1 15		1.0 50		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Maximum thermal resistance per diode	$R_{\theta JA}$ $R_{\theta JC}$	60 3.0	- 5.0	60 3.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR1545CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF1545CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB1545CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB1545CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR1545CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF1545CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB1545CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB1545CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

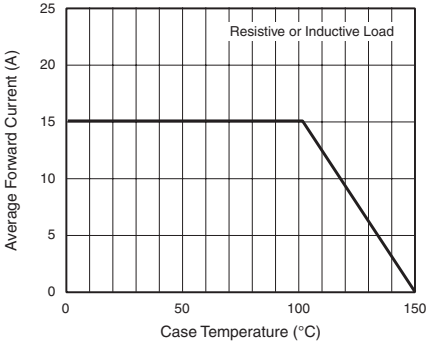


Figure 1. Forward Current Derating Curve

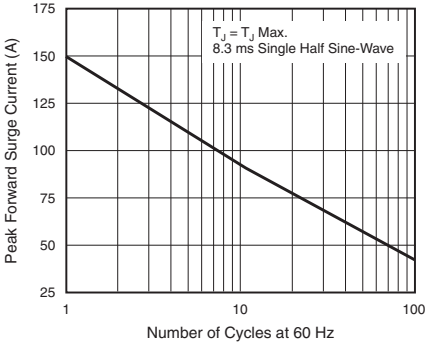


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

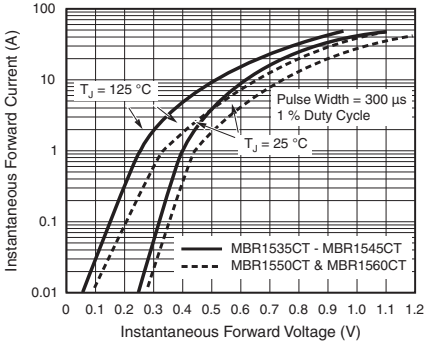


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

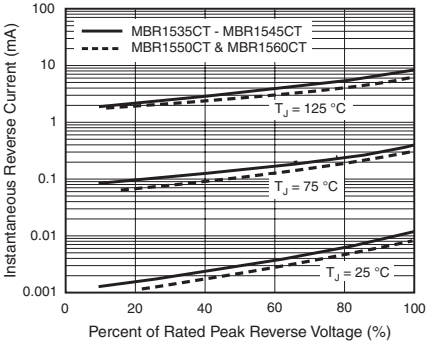


Figure 4. Typical Reverse Characteristics Per Diode

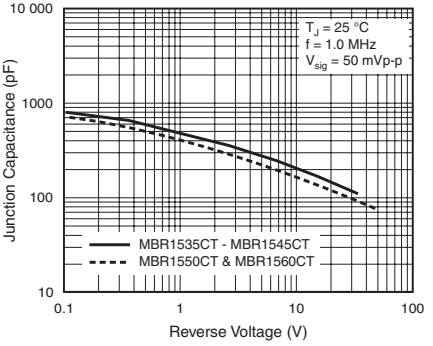


Figure 5. Typical Junction Capacitance Per Diode

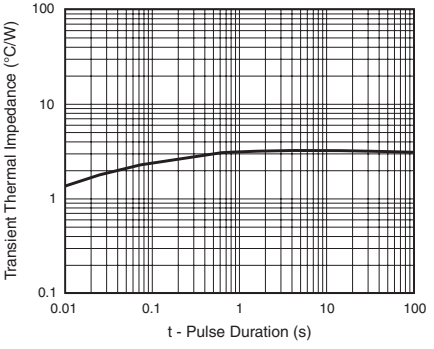
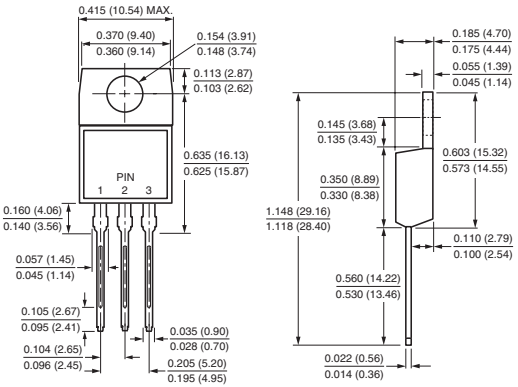


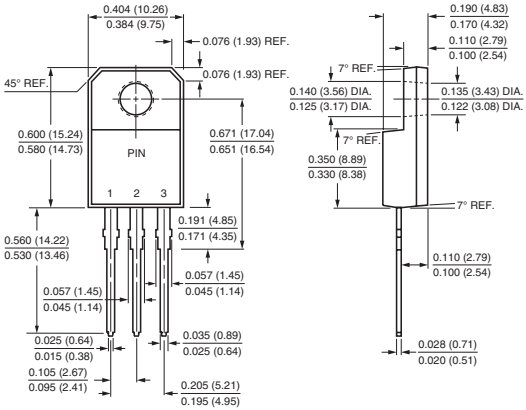
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

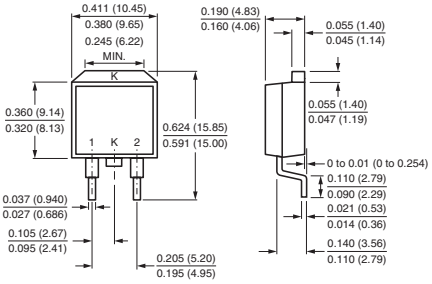
TO-220AB



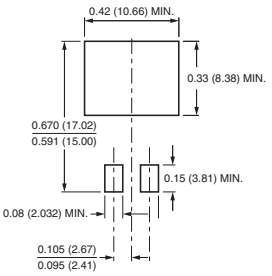
ITO-220AB



TO-263AB



Mounting Pad Layout

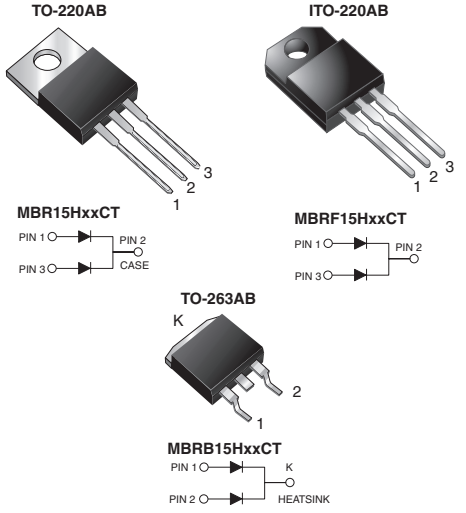


MBR(F,B)15H35CT thru MBR(F,B)15H60CT

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 7.5 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	50 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR15H35CT	MBR15H45CT	MBR15H50CT	MBR15H60CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Max. average forward rectified current (Fig. 1) total device / per diode	$I_{F(AV)}$	15 / 7.5				A
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Peak repetitive reverse surge current per diode at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	20		10		mJ

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88782
Revision: 19-May-08

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR15H35CT**	**MBR15H45CT**	**MBR15H50CT**	**MBR15H60CT**	**UNIT**
Electrostatic discharge capacitor voltage human body model: C = 100 F, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 175				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR15H35CT MBR15H45CT**		**MBR15H50CT MBR15H60CT**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage per diode (1)	I_F = 7.5 A I_F = 7.5 A I_F = 15 A I_F = 15 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	- 0.50 - 0.61	0.63 0.55 0.75 0.66	- 0.58 - 0.68	0.73 0.61 0.87 0.72	V
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C T_J = 125 °C	I_R	- 3.0	50 10	- 2.0	50 10	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Maximum thermal resistance per diode	$R_{\theta JC}$	3.0	5.0	3.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR15H45CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF15H45CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB15H45CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB15H45CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR15H45CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF15H45CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB15H45CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB15H45CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

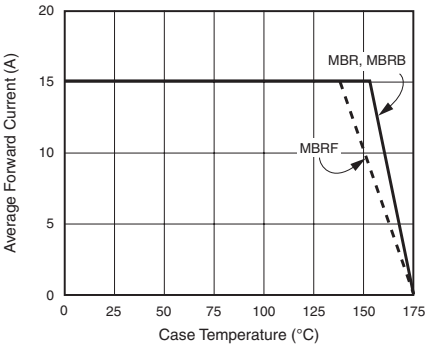


Figure 1. Forward Derating Curve Per Diode

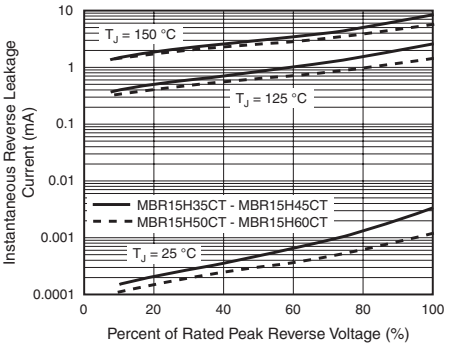


Figure 4. Typical Reverse Characteristics Per Diode

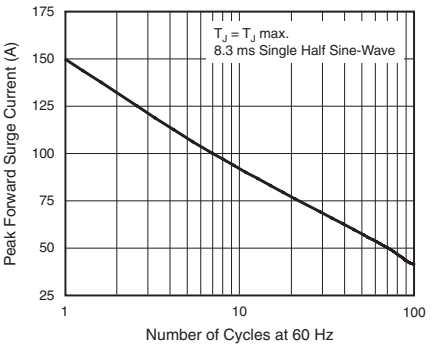


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

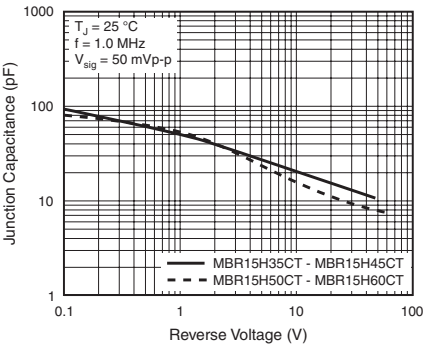


Figure 5. Typical Junction Capacitance Per Diode

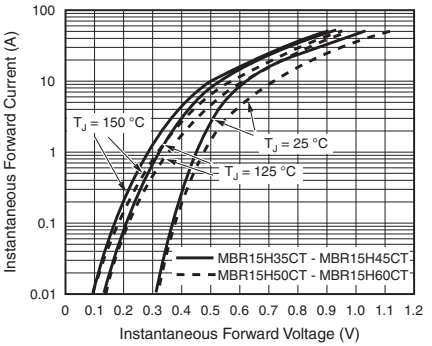


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

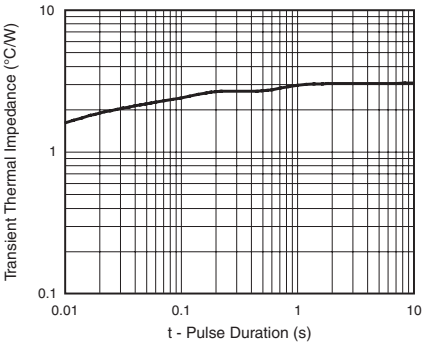
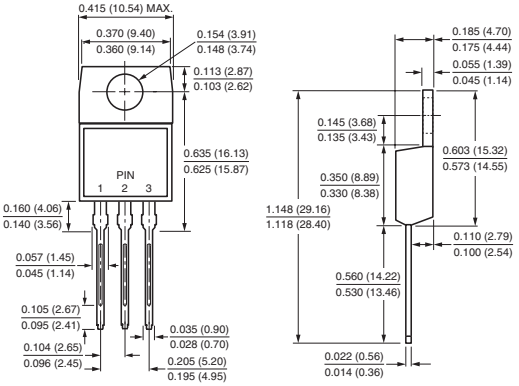


Figure 6. Typical Transient Thermal Impedance Per Diode

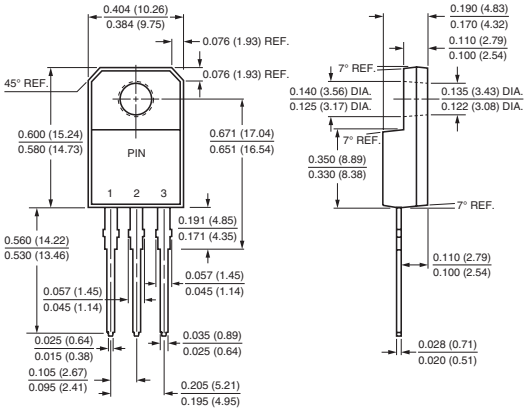
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

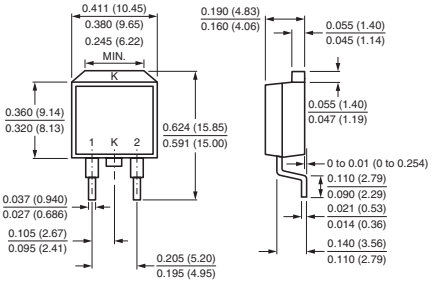
TO-220AB



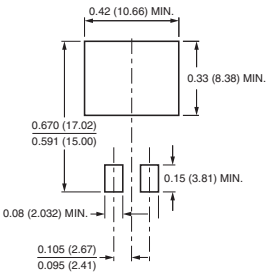
ITO-220AB



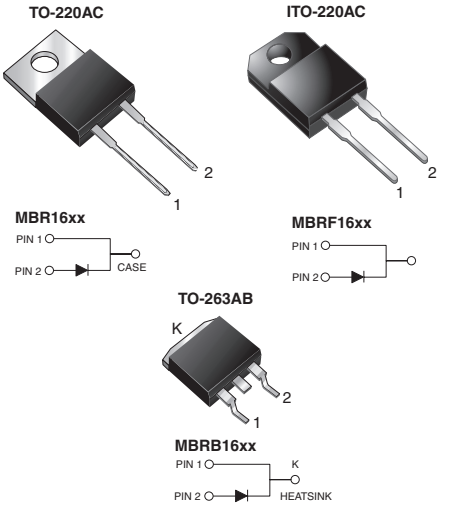
TO-263AB



Mounting Pad Layout



Schottky Barrier Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	16 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.65 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR1635	MBR1645	MBR1650	MBR1660	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current at T_C = 125 °C	$I_{F(AV)}$	16				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Peak repetitive reverse current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 150				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR1635**	**MBR1645**	**MBR1650**	**MBR1660**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 16 A I_F = 16 A	T_C = 25 °C T_C = 125 °C	V_F	0.63 0.57		0.75 0.65		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_C = 25 °C T_C = 125 °C	I_R	0.2 40		1.0 50		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	1.5	3.0	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR1645-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF1645-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB1645-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB1645-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR1645HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF1645HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB1645HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB1645HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

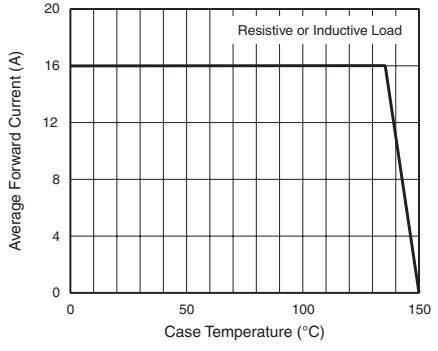


Figure 1. Forward Current Derating Curve

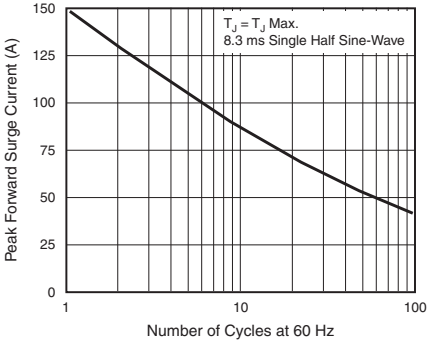


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

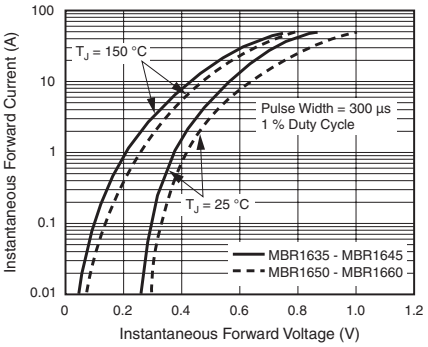


Figure 3. Typical Instantaneous Forward Characteristics

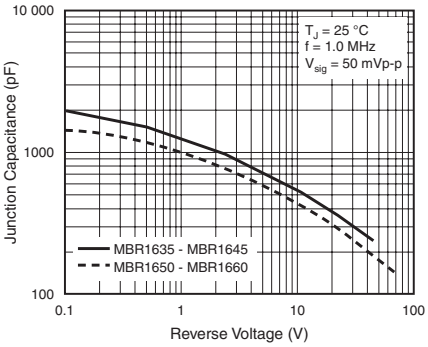


Figure 5. Typical Junction Capacitance

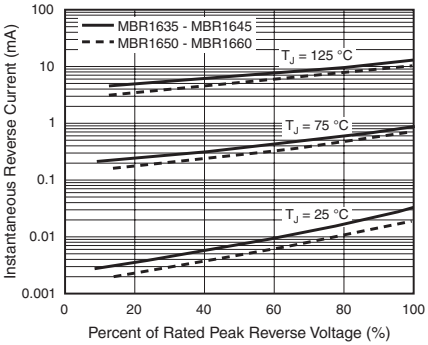


Figure 4. Typical Reverse Characteristics

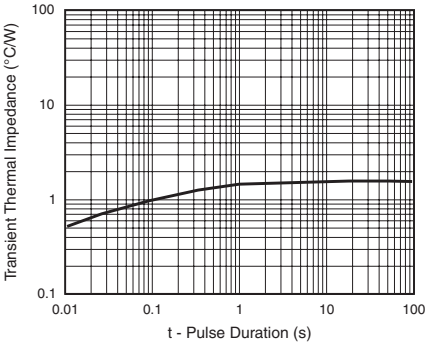
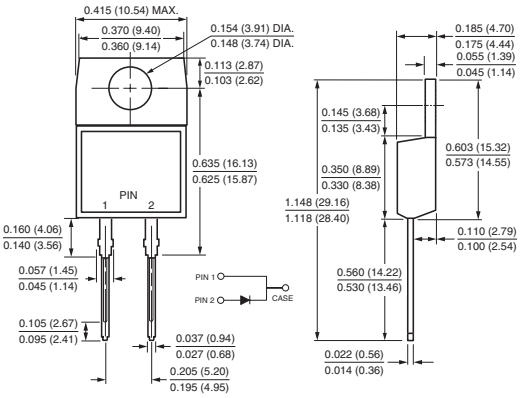


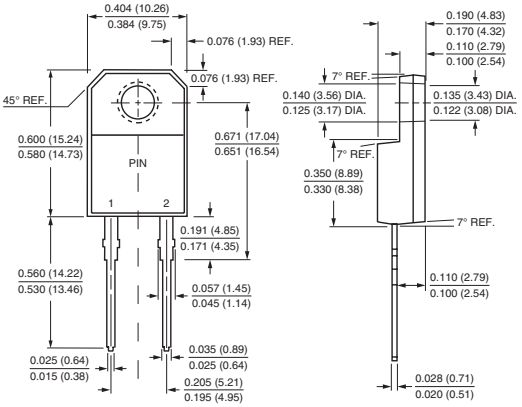
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

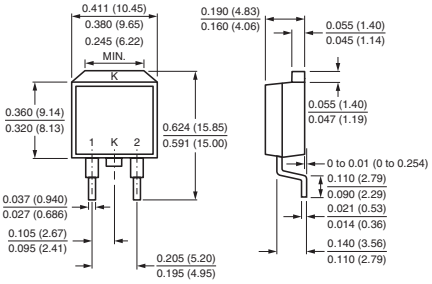
TO-220AC



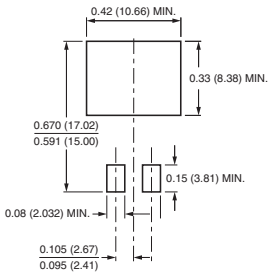
ITO-220AC



TO-263AB

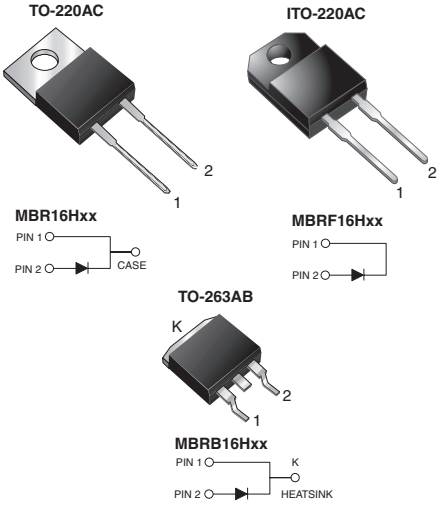


Mounting Pad Layout



Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	16 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.56 V, 0.62 V
I_R	100 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR16H35	MBR16H45	MBR16H50	MBR16H60	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Max. average forward rectified current (Fig. 1)	$I_{F(AV)}$	16				A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Peak repetitive reverse surge current at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	20				mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR16H35**	**MBR16H45**	**MBR16H50**	**MBR16H60**	**UNIT**
Operating junction temperature range	T_J	- 65 to + 175				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR16H35 MBR16H45**		**MBR16H50 MBR16H60**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage (1)	I_F = 16 A I_F = 16 A	T_J = 25 °C T_J = 125 °C	V_F	- 0.52	0.66 0.56	- 0.58	0.73 0.62	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	- 6.0	100 20	- 4.0	100 20	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Thermal resistance, junction to case	$R_{\theta JC}$	1.5	3.0	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR16H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF16H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB16H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB16H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR16H45HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF16H45HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB16H45HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB16H45HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

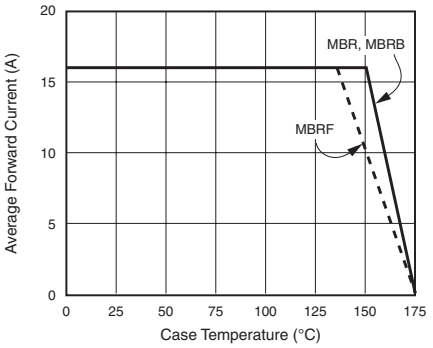


Figure 1. Forward Current Derating Curve

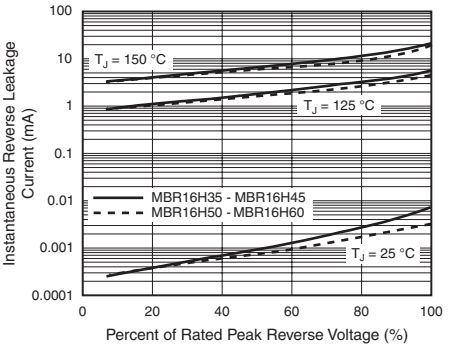


Figure 4. Typical Reverse Characteristics

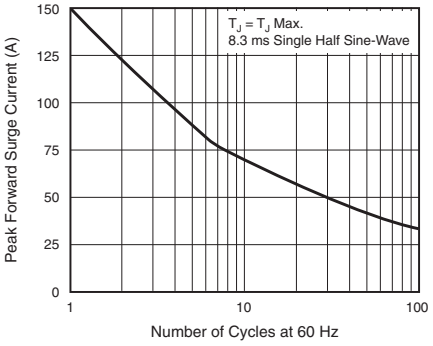


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

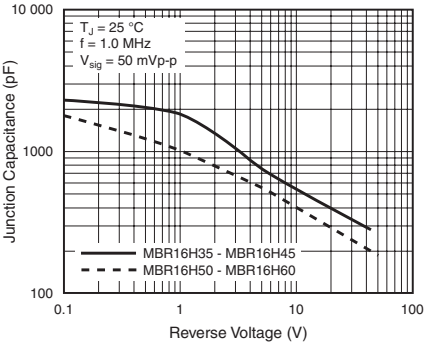


Figure 5. Typical Junction Capacitance

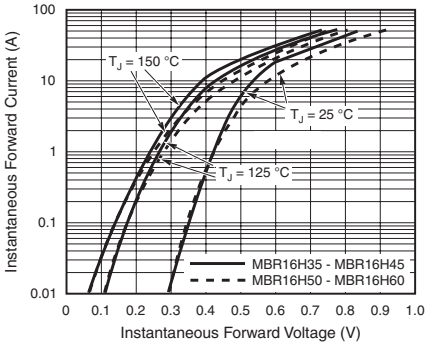


Figure 3. Typical Instantaneous Forward Characteristics

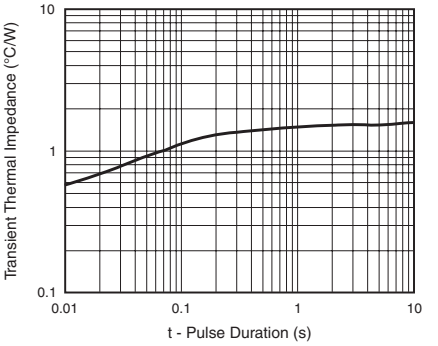
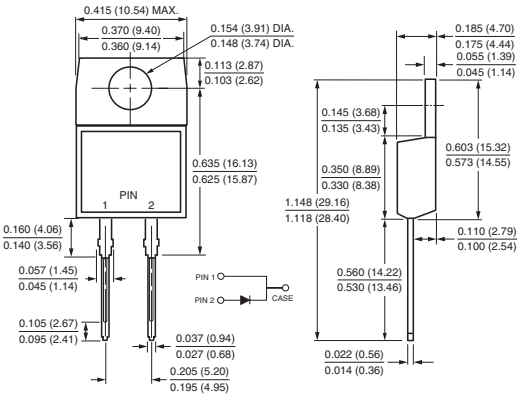


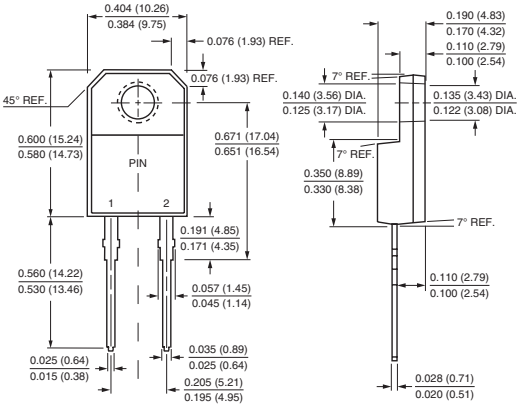
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

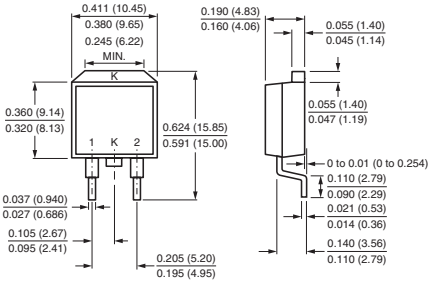
TO-220AC



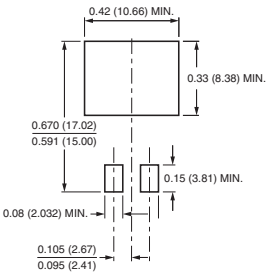
ITO-220AC



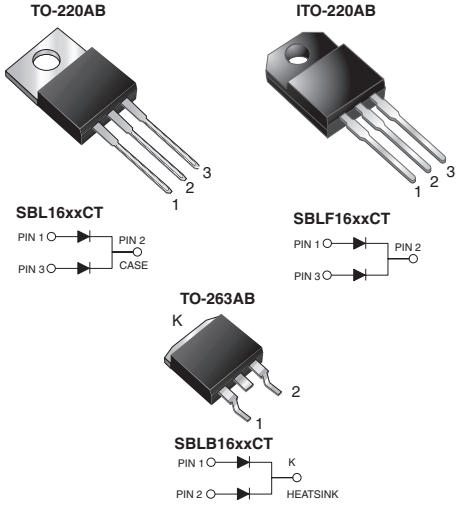
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 8.0 A
V_{RRM}	30 V, 40 V
I_{FSM}	250 A
V_F	0.55 V
T_J max.	125 °C

MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	SBL1630CT	SBL1640CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Working peak reverse voltage	V_{RWM}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_C = 95 °C total device / per diode	$I_{F(AV)}$	16 / 8.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	250		A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 125		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88727
Revision: 07-May-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	8.0 A		V_F	0.55	V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 100 °C	I_R	0.5 50	mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SBL**	**SBLF**	**SBLB**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	SBL1630CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	SBLF1630CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	SBLB1630CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	SBLB1630CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	SBL1630CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	SBLF1630CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	SBLB1630CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	SBLB1630CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

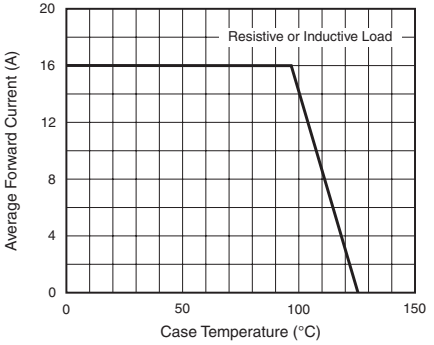


Figure 1. Forward Current Derating Curve

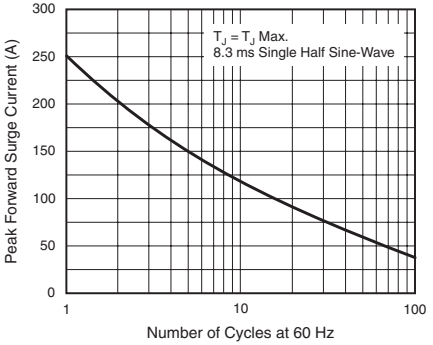


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

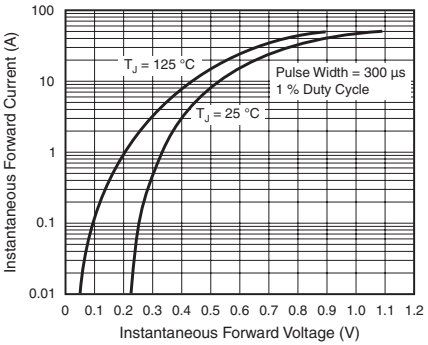


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

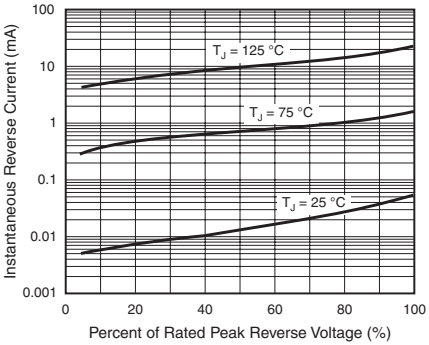


Figure 4. Typical Reverse Characteristics Per Diode

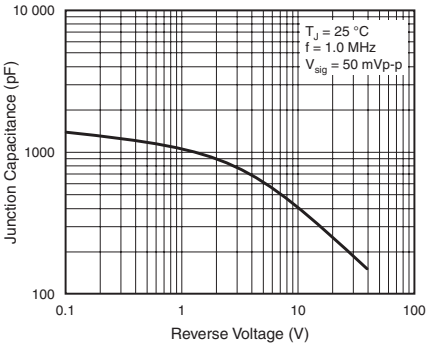


Figure 5. Typical Junction Capacitance Per Diode

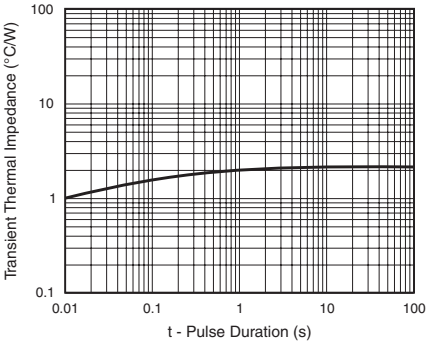
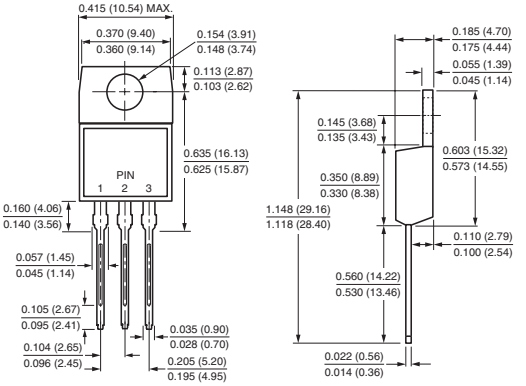


Figure 6. Typical Transient Thermal Impedance Per Diode

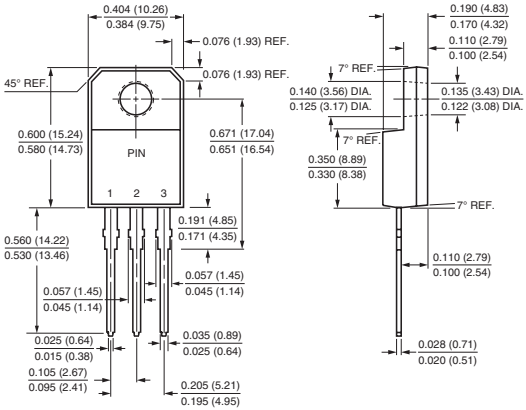
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

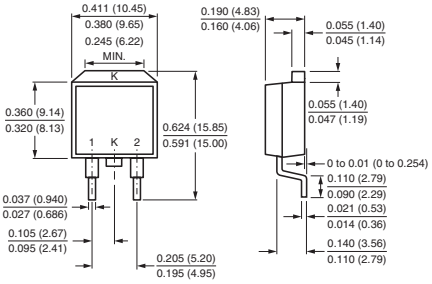
TO-220AB



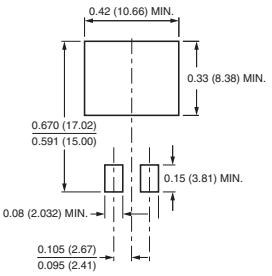
ITO-220AB



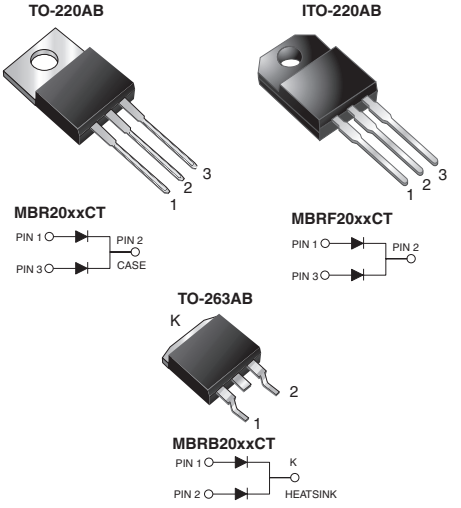
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.70 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR2035CT	MBR2045CT	MBR2050CT	MBR2060CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current at T_C = 135 °C — total device	$I_{F(AV)}$	20				A
Maximum average forward rectified current at T_C = 135 °C — per diode	$I_{F(AV)}$	10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Peak repetitive reverse surge current per diode at t_p = 2 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 150				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR2035CT**	**MBR2045CT**	**MBR2050CT**	**MBR2060CT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	0.65 0.57 0.84 0.72		0.80 0.70 0.95 0.85		V
Maximum reverse current per diode at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 125 °C	I_R	0.1 15		0.15 15		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical resistance from junction to case per diode	$R_{\theta JC}$	2.0	5.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR2045CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF2045CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB2045CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB2045CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR2045CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF2045CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB2045CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB2045CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

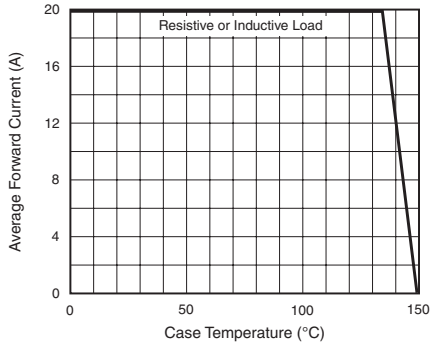


Figure 1. Forward Derating Curve (Total)

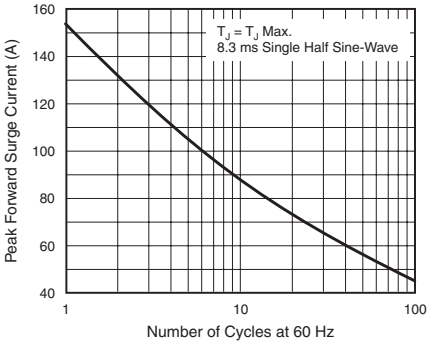


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

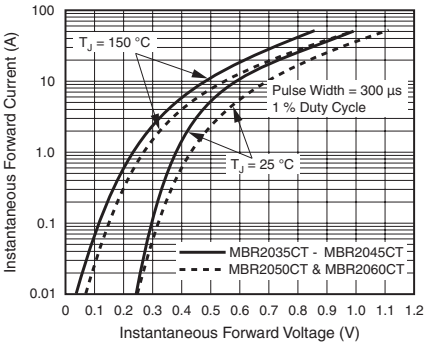


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

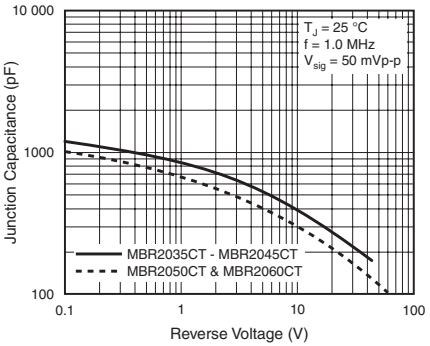


Figure 5. Typical Junction Capacitance Per Diode

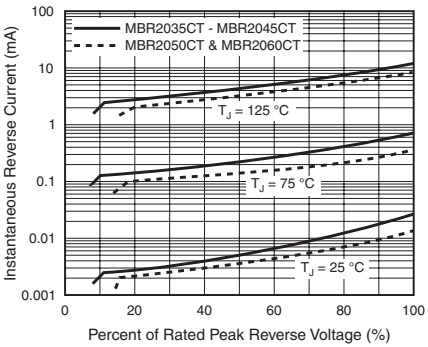


Figure 4. Typical Reverse Characteristics Per Diode

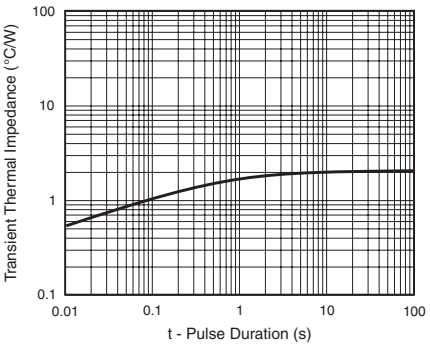
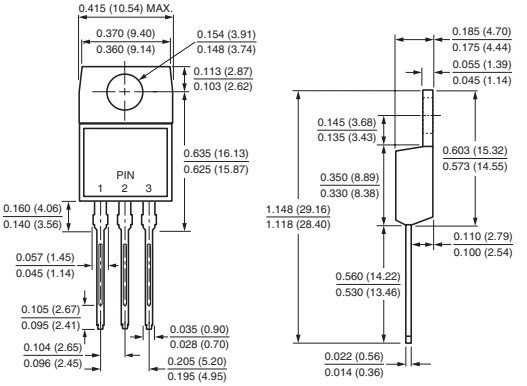


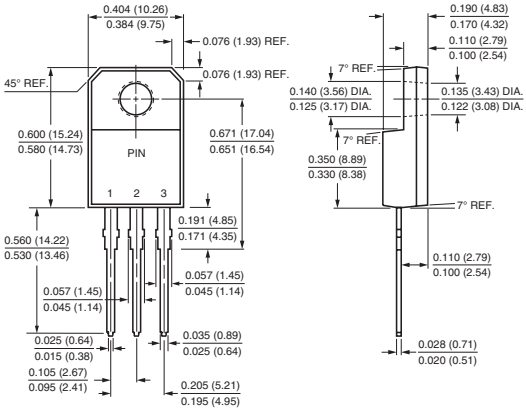
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

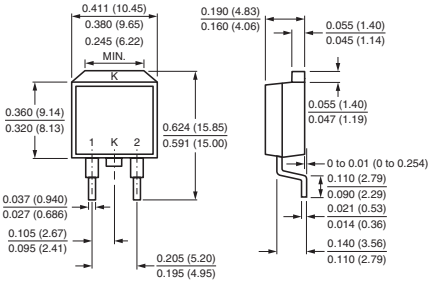
TO-220AB



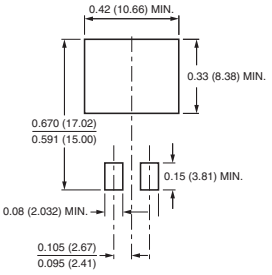
ITO-220AB



TO-263AB



Mounting Pad Layout

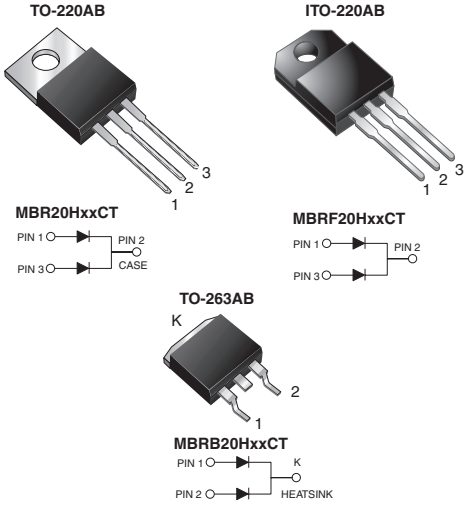


MBR(F,B)20H35CT thru MBR(F,B)20H60CT

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	100 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR20H35CT	MBR20H45CT	MBR20H50CT	MBR20H60CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Max. average forward rectified current (Fig. 1) total device / per diode	$I_{F(AV)}$	20 / 10				A
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Peak repetitive reverse surge current per diode at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	20		10		mJ

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88787
Revision: 19-May-08

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR20H35CT**	**MBR20H45CT**	**MBR20H50CT**	**MBR20H60CT**	**UNIT**
Electrostatic discharge capacitor voltage Human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR20H35CT MBR20H45CT**		**MBR20H50CT MBR20H60CT**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	- 0.49 - 0.62	0.63 0.55 0.75 0.68	- 0.57 - 0.68	0.71 0.61 0.85 0.71	V
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C T_J = 125 °C	I_R	- 4.0	100 12	- 2.0	100 12	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Thermal resistance, junction to case per diode	$R_{\theta JC}$	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR20H45CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF20H45CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB20H45CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB20H45CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR20H45CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF20H45CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB20H45CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB20H45CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

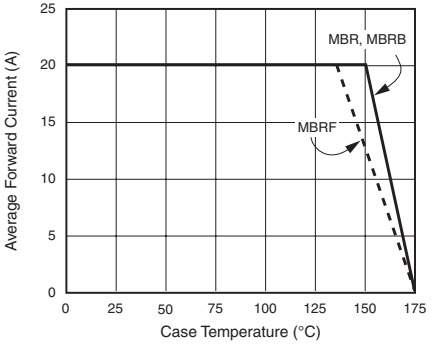


Figure 1. Forward Derating Curve (Total)

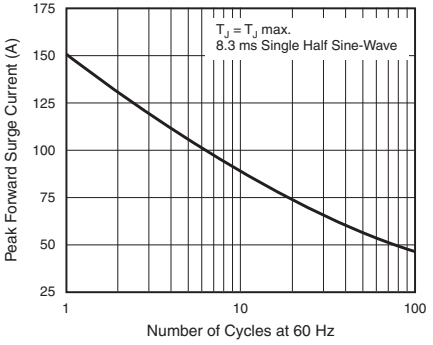


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

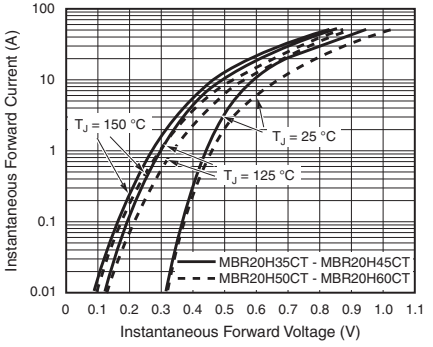


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

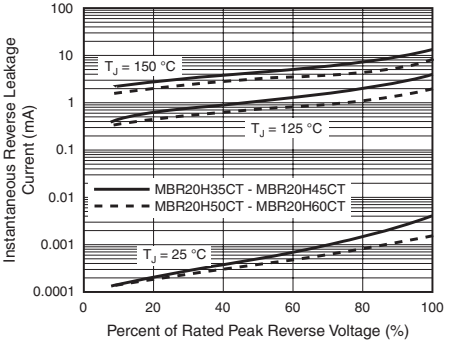


Figure 4. Typical Reverse Characteristics Per Diode

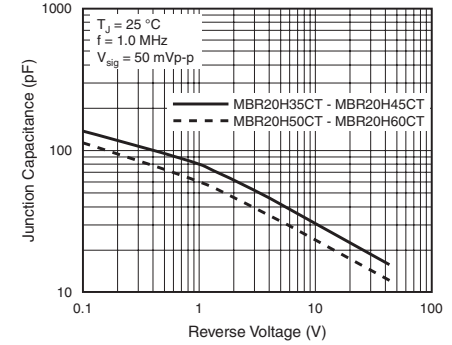


Figure 5. Typical Junction Capacitance Per Diode

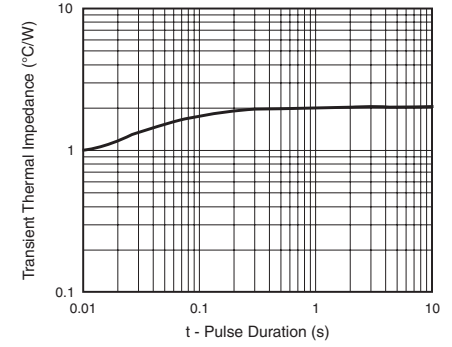
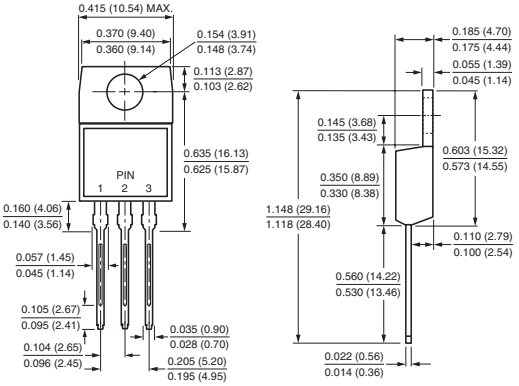


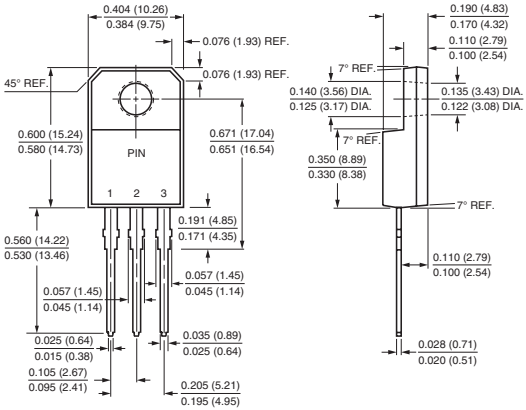
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

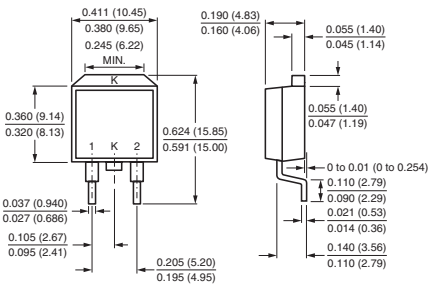
TO-220AB



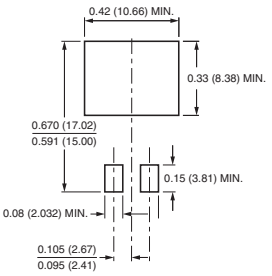
ITO-220AB



TO-263AB

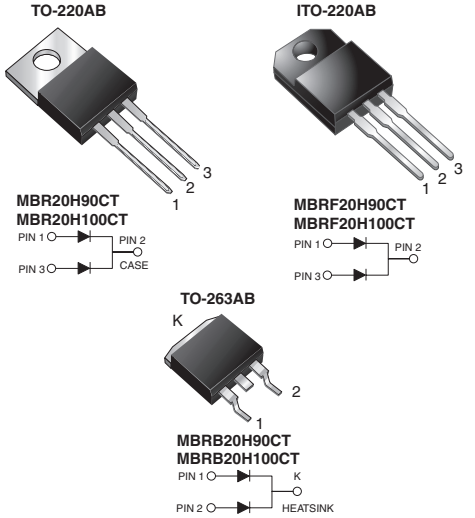


Mounting Pad Layout



Dual Common-Cathode High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	90 V, 100 V
I_{FSM}	250 A
I_R	4.5 µA
V_F	0.64 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR20H90CT	MBR20H100CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	90	100	V
Working peak reverse voltage		V_{RWM}	90	100	V
Maximum DC blocking voltage		V_{DC}	90	100	V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	20 10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	250		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500		V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88673
Revision: 08-Nov-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	0.77 0.64 0.88 0.73	V
Maximum reverse current per diode at working peak reverse voltage		T_J = 25 °C T_J = 125 °C	I_R	4.5 6.0	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	5.8	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR20H100CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF20H100CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB20H100CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB20H100CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR20H100CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF20H100CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB20H100CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB20H100CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

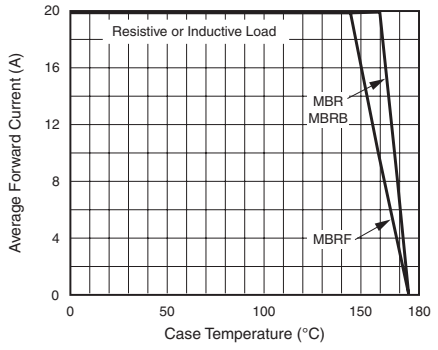


Figure 1. Forward Current Derating Curve

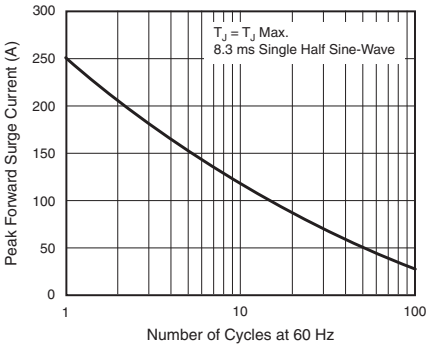


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

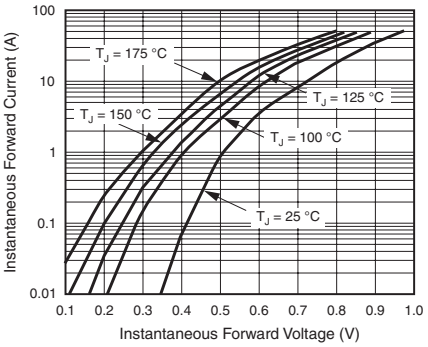


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

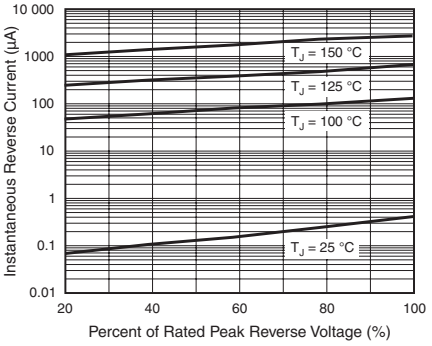


Figure 4. Typical Reverse Characteristics Per Diode

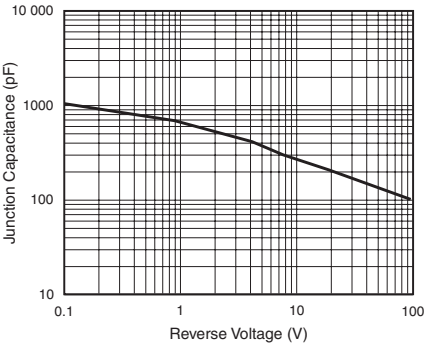


Figure 5. Typical Junction Capacitance Per Diode

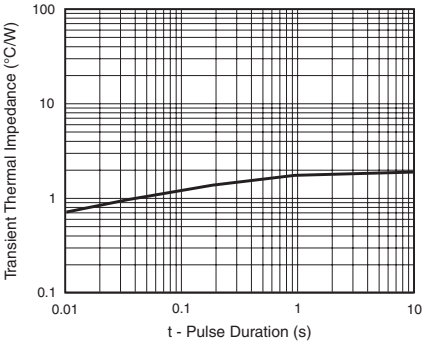
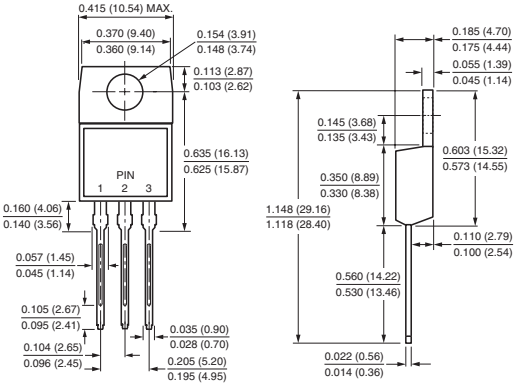


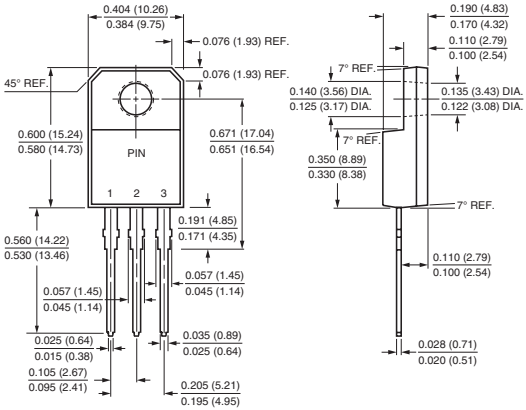
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

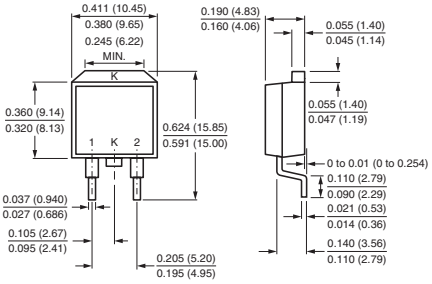
TO-220AB



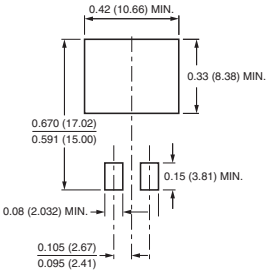
ITO-220AB



TO-263AB

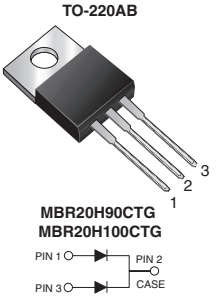


Mounting Pad Layout



Dual Common-Cathode High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	90 V, 100 V
I_{FSM}	150 A
V_F	0.70 V
I_R	3.5 µA
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR20H90CTG	MBR20H100CTG	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	90	100	V
Working peak reverse voltage		V_{RWM}	90	100	V
Maximum DC blocking voltage		V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 155 °C	total device	$I_{F(AV)}$	20		A
	per diode		10		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	150		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	0.5		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175		°C

For technical questions within your region, please contact one of the following:
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Document Number: 88856
Revision: 25-Mar-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.80 0.64 0.87 0.74	0.85 0.70 0.93 0.80	V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	- -	3.5 4.5	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**MBR**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (G)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR20H100CTG-E3/45	1.85	45	50/tube	Tube
TO-220AB	MBR20H100CTGHE3/45 (1)	1.85	45	50/tube	Tube

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

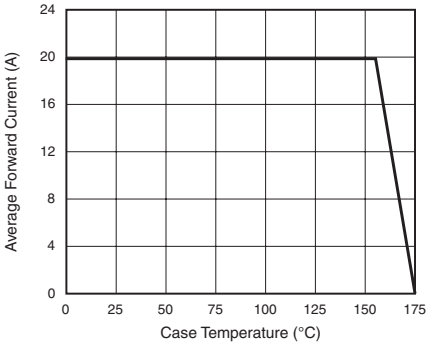


Figure 1. Forward Derating Curve

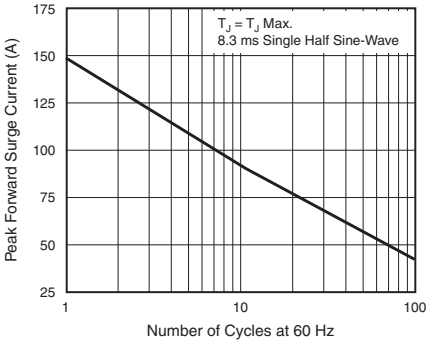


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

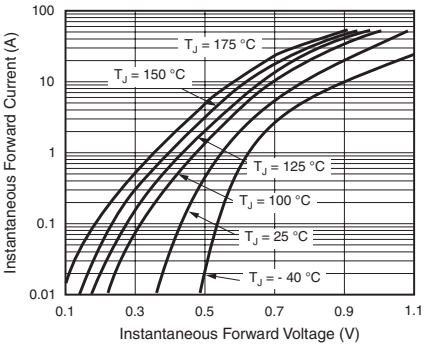


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

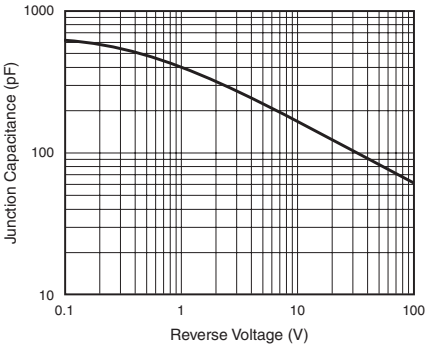


Figure 5. Typical Junction Capacitance Per Diode

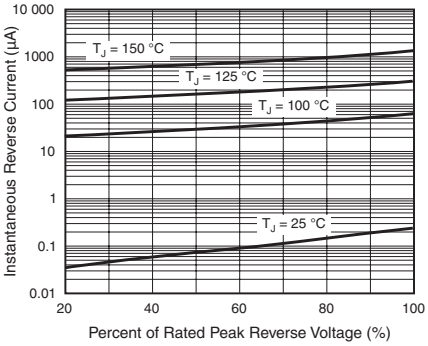


Figure 4. Typical Reverse Characteristics Per Diode

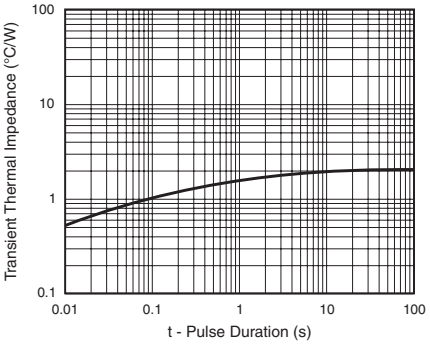
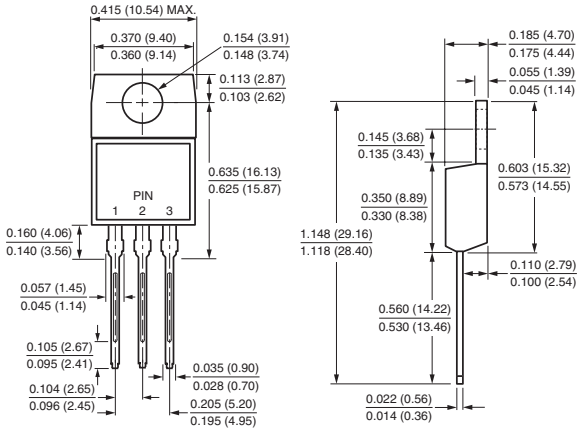


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



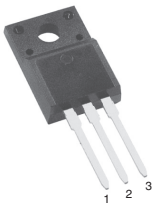
Dual Common-Cathode High Voltage Schottky Rectifier

Low Leakage Current 5.0 µA

TO-220AB

MBR20H150CT

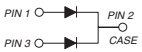
ITO-220AB



MBRF20H150CT

TO-262AA

SB20H150CT-1



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	150 V
I_{FSM}	200 A
V_F	0.75 V
T_J	175 °C

FEATURES

- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling and polarity protection applications.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Mounting Torque: 10 in-lbs maximum

Polarity: As marked

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**MBR20H150CT**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	150	V
Working peak reverse voltage		V_{RWM}	150	V
Maximum DC blocking voltage		V_{DC}	150	V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	20 10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	200	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Peak non-repetitive reverse surge energy per diode (8/20 µs waveform)		E_{RSM}	10	mJ
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 1.5 A, L = 10 mH		E_{AS}	11.25	mJ
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175	°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min		V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	0.90 0.75 0.99 0.86	V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	5.0 1.0	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	2.2	4.2	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	MBR20H150CT-E3/45	2.06	45	50/tube	Tube
ITO-220AB	MBRF20H150CT-E3/45	2.20	45	50/tube	Tube
TO-262AA	SB20H150CT-1E3/45	1.58	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

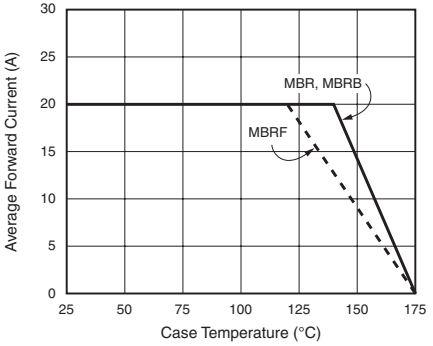


Figure 1. Forward Derating Curve (Total)

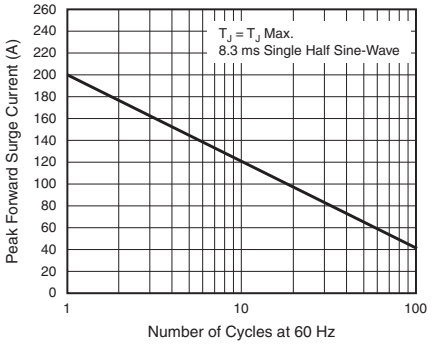


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

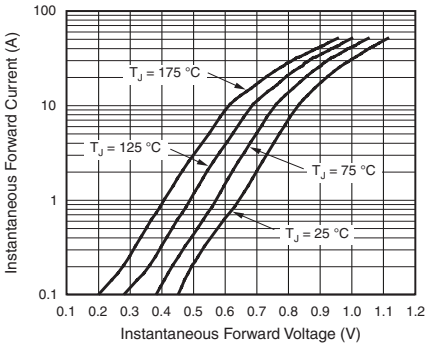


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

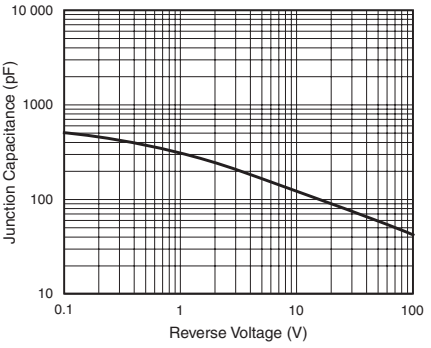


Figure 5. Typical Junction Capacitance Per Diode

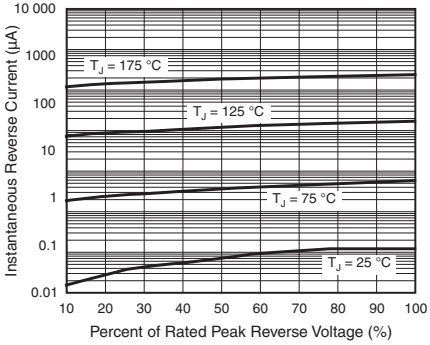


Figure 4. Typical Reverse Characteristics Per Diode

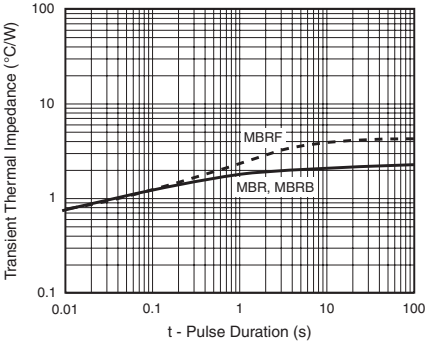
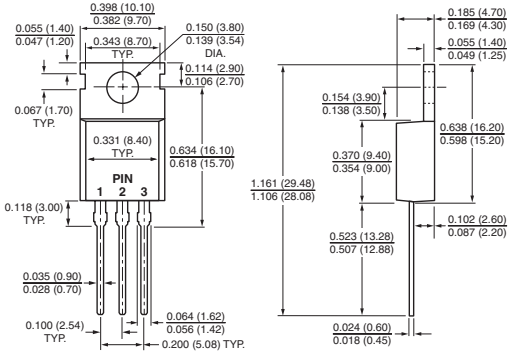


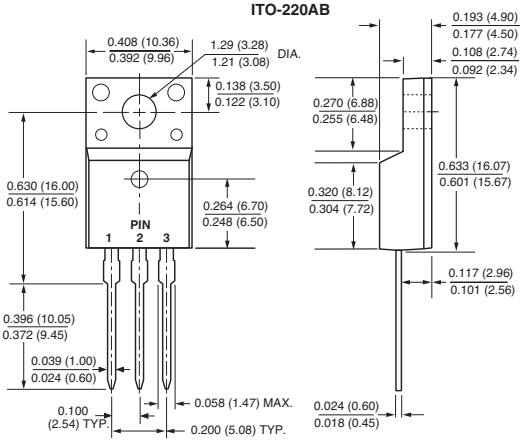
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

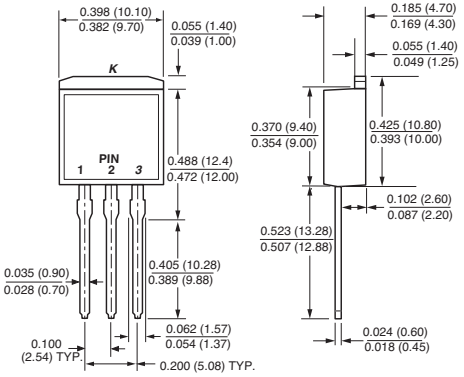
TO-220AB



ITO-220AB



TO-262AA



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PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

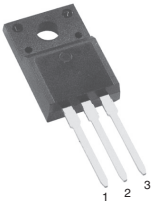
Dual Common-Cathode High Voltage Schottky Rectifier

Low Leakage Current 5.0 µA

TO-220AB

MBR20H200CT

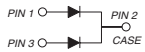
ITO-220AB



MBRF20H200CT

TO-262AA

SB20H200CT-1



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	200 V
I_{FSM}	290 A
V_F	0.75 V
T_J	175 °C

FEATURES

- Guarding for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling and polarity protection applications.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Mounting Torque: 10 in-lbs maximum

Polarity: As marked

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR20H200CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	200	V
Working peak reverse voltage		V_{RWM}	200	V
Maximum DC blocking voltage		V_{DC}	200	V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	20 10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	290	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Peak non-repetitive reverse surge energy per diode (8/20 µs waveform)		E_{RSM}	20	mJ
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 2.0 A, L = 10 mH		E_{AS}	20	mJ
Electrostatic discharge capacitor voltage human body model air discharge: C = 100 pF, R 0 1.5 kΩ		V_C	25	kV
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175	°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min		V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 10 A I_F = 20 A I_F = 20 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	0.81 0.65 0.87 0.74	0.88 0.75 0.97 0.85	V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	5.0 1.0		µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	250		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**SB**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR20H200CT-E3/45	2.06	45	50/tube	Tube
ITO-220AB	MBRF20H200CT-E3/45	2.20	45	50/tube	Tube
TO-262AA	SB20H200CT-1E3/45	1.58	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

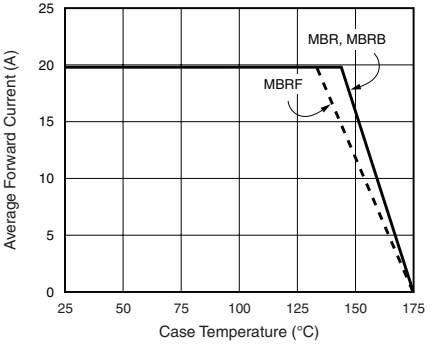


Figure 1. Forward Derating Curve (Total)

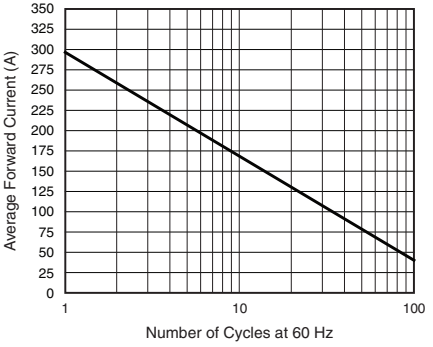


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

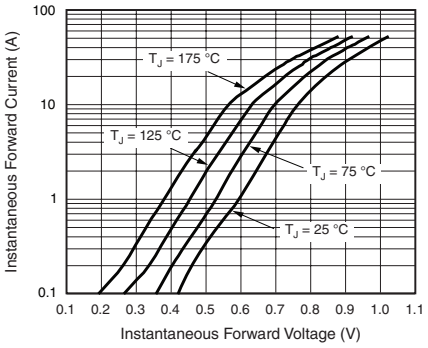


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

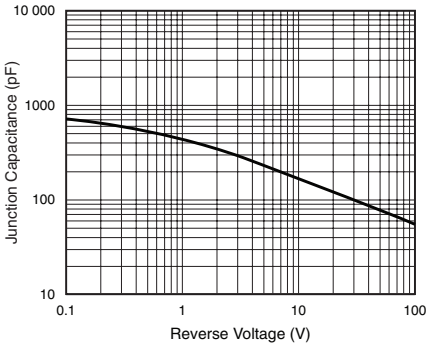


Figure 5. Typical Junction Capacitance Per Diode

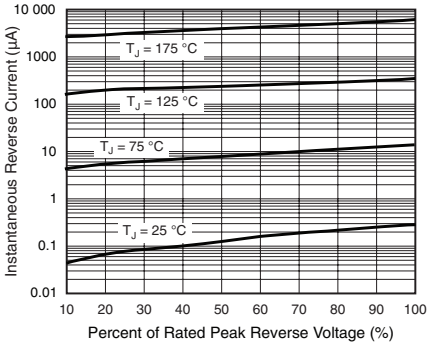


Figure 4. Typical Reverse Characteristics Per Diode

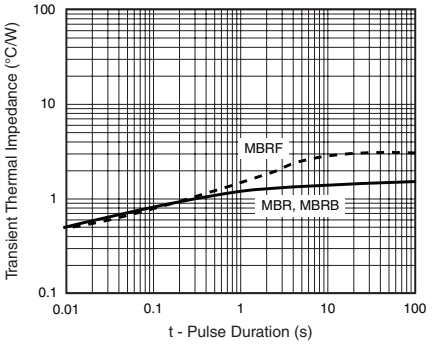
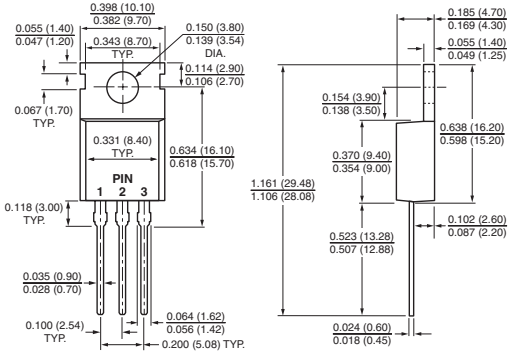


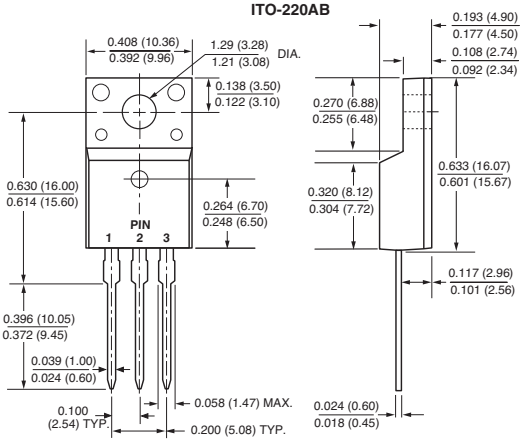
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

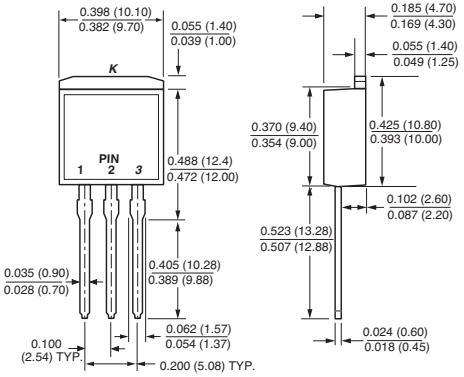
TO-220AB



ITO-220AB



TO-262AA



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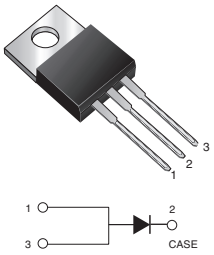
High Voltage Trench MOS Barrier Schottky Rectifier

TO-220AB



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	35 V, 45 V
I_{FSM}	200 A
V_F at I_F = 20 A	0.55 V
T_J max.	150 °C

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection applications.

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	M2035S	M2045S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200		A
Peak repetitive reverse current per leg at t_p = 2 µs, 1 kHz	I_{RRM}	2.0		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 10 A I_F = 20 A	T_J = 25 °C	V_F	0.52 0.62	- 0.70	V
	I_F = 10 A I_F = 20 A	T_J = 125 °C		0.42 0.55	- 0.61	
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	80 24	200 35	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	700		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**M2035S**	**M2045S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0		°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (G)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
M2045S-E3/4W	1.877	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

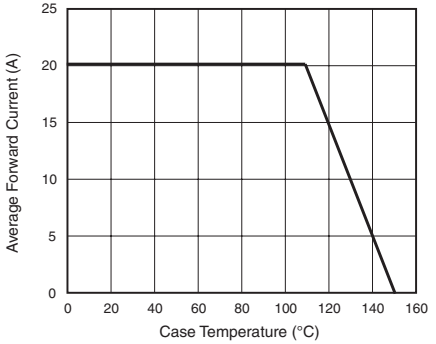


Figure 1. Forward Current Derating Curve

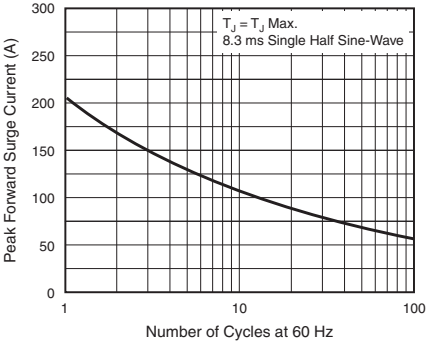


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

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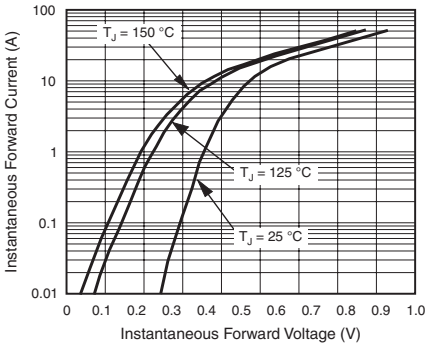


Figure 3. Typical Instantaneous Forward Characteristics

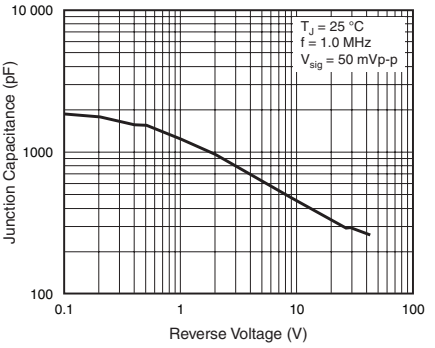


Figure 5. Typical Junction Capacitance

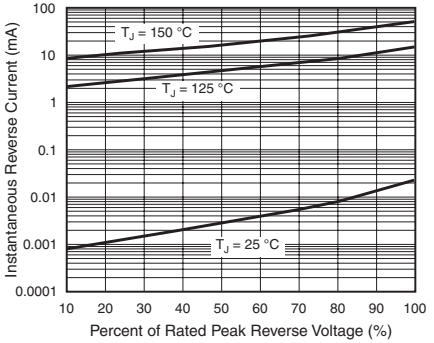
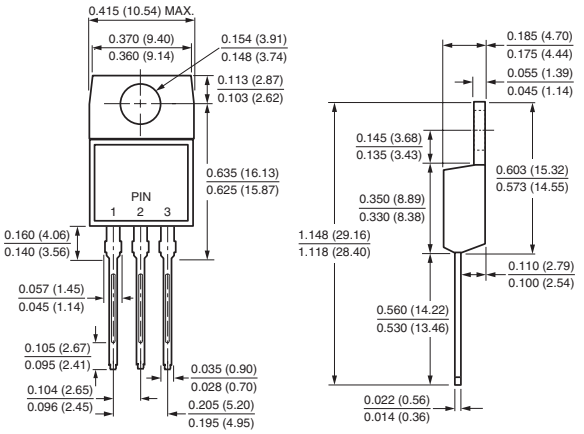


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

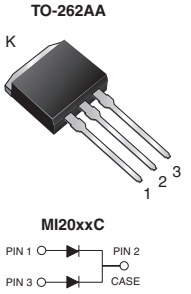
TO-220AB



MI2050C & MI2060C

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, OR-ing diodes, dc-to-dc converters or polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	50 V, 60 V
I_{FSM}	150 A
V_F at I_F = 10 A	0.570 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MI2050C	MI2060C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	50	60	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	20 10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	150		A
Peak repetitive reverse current per leg at t_p = 2 µs, 1 kHz	per diode	I_{RRM}	0.5		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/µs
Operating junction temperature range		T_J	- 65 to + 150		°C
Storage temperature range		T_{STG}	- 65 to + 175		°C

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Document Number: 89007
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A	T_J = 25 °C	V_F	0.554 0.649	- 0.74	V
	I_F = 5 A I_F = 10 A	T_J = 125 °C		0.484 0.570	- 0.62	
Reverse current per diode (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	15 10.8	150 25	μA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	300	-	pF

Notes:

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MI2050C**	**MI2060C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-262AA	MI2060C-E3/4W	1.456	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

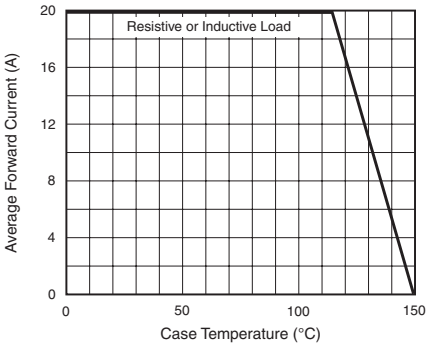


Figure 1. Forward Derating Curve (Total)

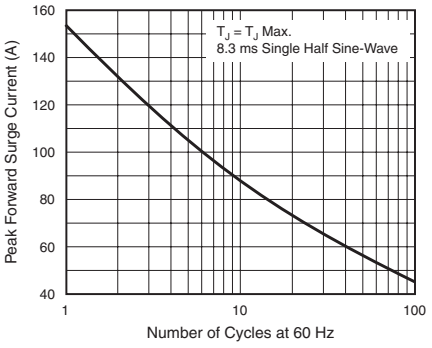


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

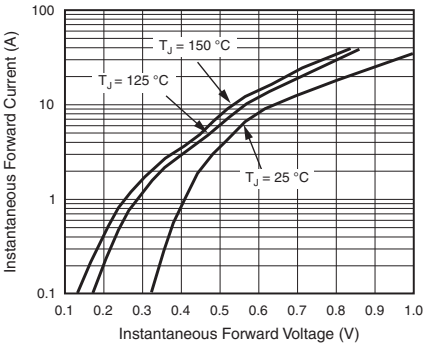


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

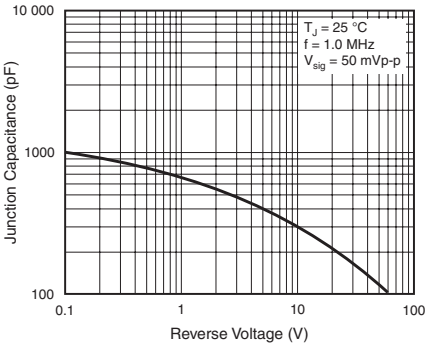


Figure 5. Typical Junction Capacitance Per Diode

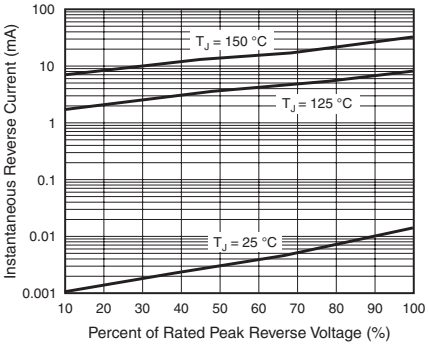


Figure 4. Typical Reverse Characteristics Per Diode

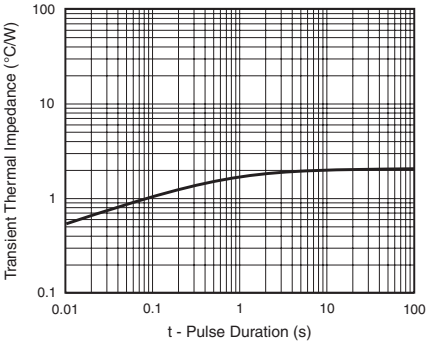
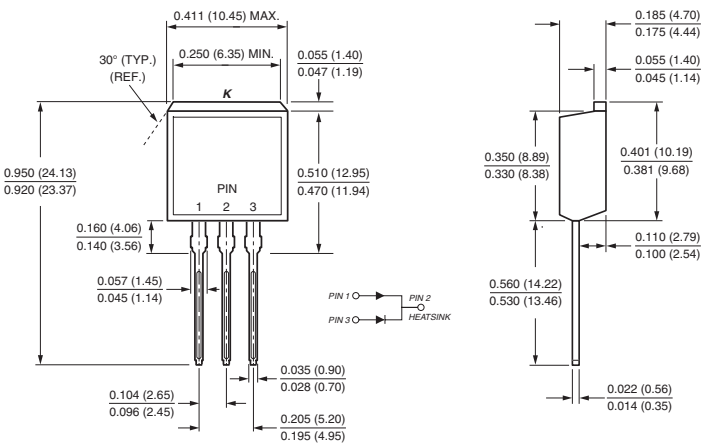


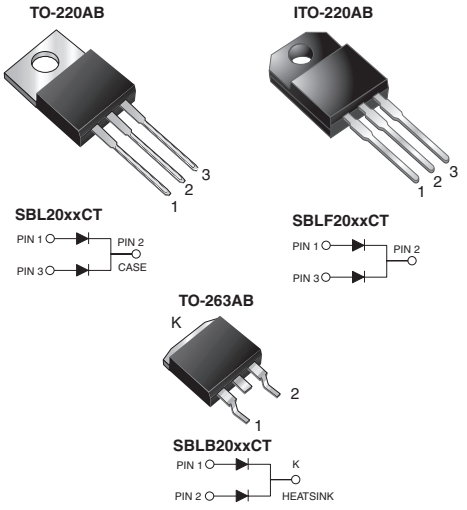
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-262AA



Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	30 V, 40 V
I_{FSM}	250 A
V_F	0.60 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBL2030CT	SBL2040CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Working peak reverse voltage	V_{RWM}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_C = 105 °C total device / per diode	$I_{F(AV)}$	20 / 10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	250		A
Peak repetitive reverse surge current per diode at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	10 A		V_F	0.6	V
Maximum instantaneous current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 100 °C	I_R	1.0 50	mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SBL**	**SBLF**	**SBLB**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	SBL2030CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	SBLF2030CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	SBLB2030CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	SBLB2030CT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AB	SBL2030CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	SBLF2030CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	SBLB2030CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	SBLB2030CTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

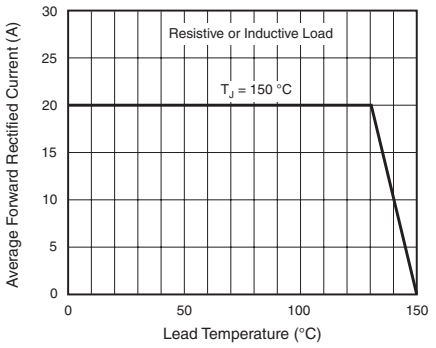


Figure 1. Forward Current Derating Curve

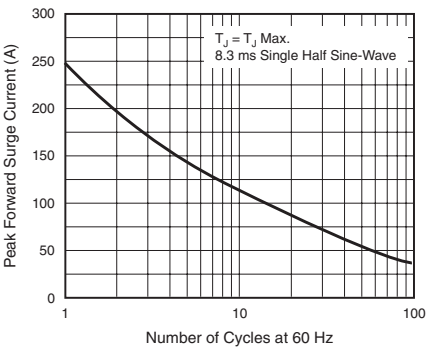


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

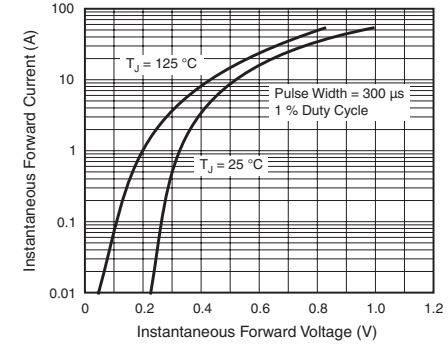


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

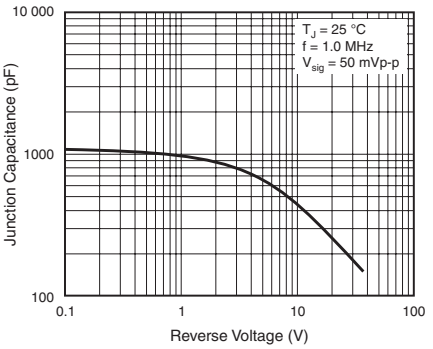


Figure 5. Typical Junction Capacitance Per Diode

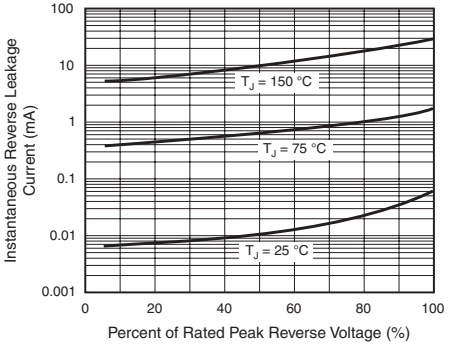


Figure 4. Typical Reverse Characteristics Per Diode

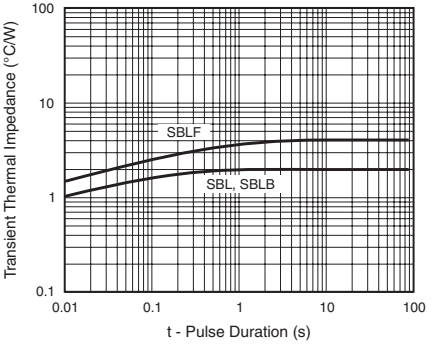
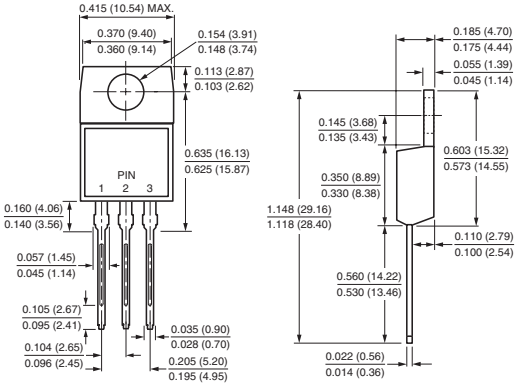


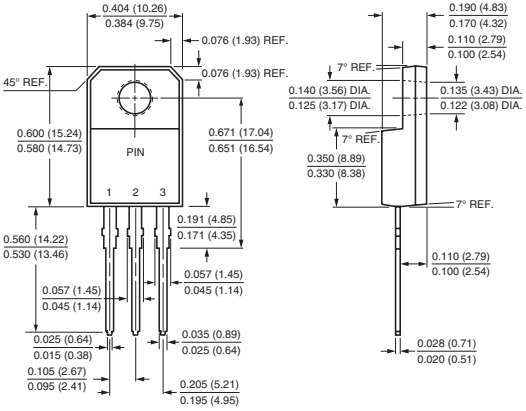
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

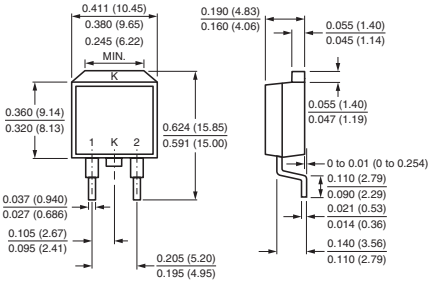
TO-220AB



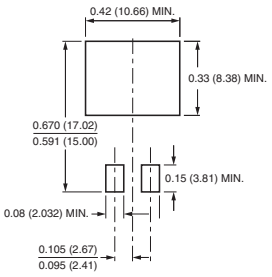
ITO-220AB



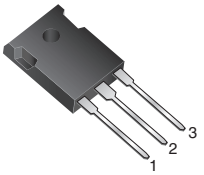
TO-263AB



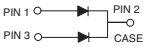
Mounting Pad Layout



Dual Common-Cathode Schottky Rectifier



TO-247AD (TO-3P)



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	30 V, 40 V
I_{FSM}	250 A
V_F	0.60 V
T_J max.	125 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBL2030PT	SBL2040PT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RWM}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20		A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	250		A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 125		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SBL2030PT	SBL2040PT	UNIT
Maximum instantaneous forward voltage per diode (1)	10 A		V_F	0.6		V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 100 °C	I_R	1.0 50		mA

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SBL2030PT**	**SBL2040PT**	**UNIT**
Thermal resistance from junction to case per diode	$R_{\theta JC}$	1.5		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD	SBL2030PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

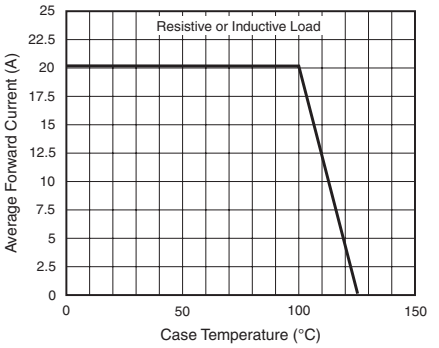


Figure 1. Forward Current Derating Curve

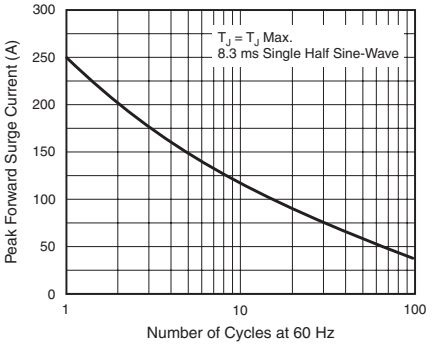


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

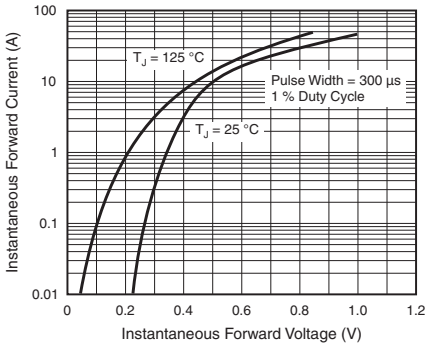


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

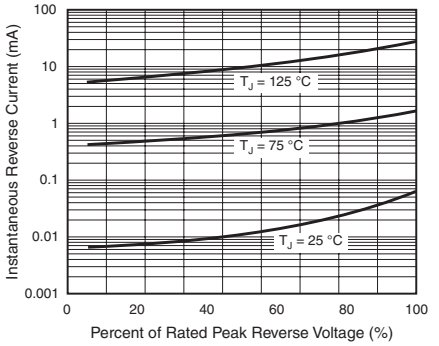


Figure 4. Typical Reverse Characteristics Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

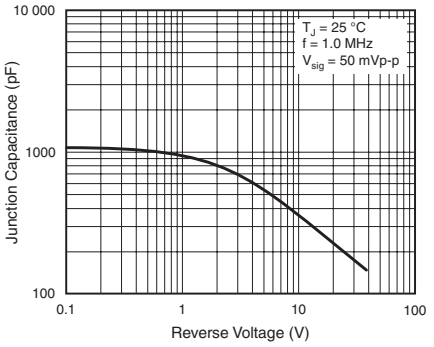


Figure 5. Typical Junction Capacitance Per Diode

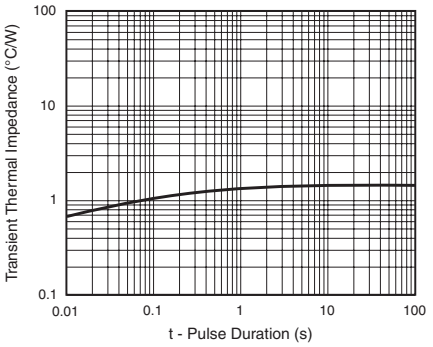
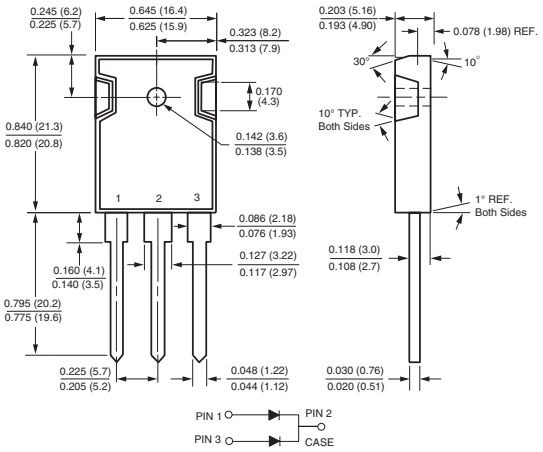


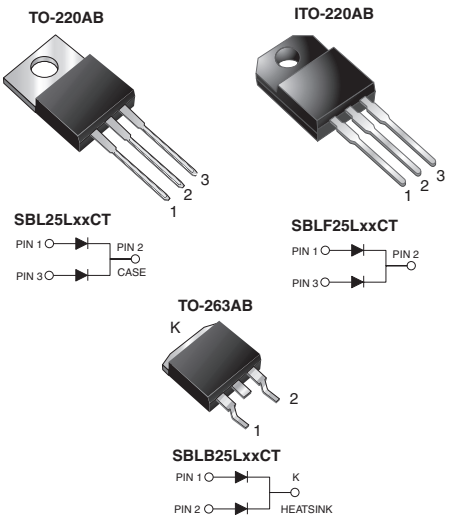
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



Dual Low V_F Common Cathode Schottky Rectifier



FEATURES

- Low power loss, high efficiency
- Very low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, switching mode power supplies, freewheeling diodes, OR-ing diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 12.5 A
V_{RRM}	20 V to 30 V
I_{FSM}	180 A
V_F	0.39 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBL25L20CT	SBL25L25CT	SBL25L30CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	25	30	V
Maximum average forward rectified current at T_C = 95 °C — total device	$I_{F(AV)}$		25		A
Maximum average forward rectified current at T_C = 95 °C — per diode	$I_{F(AV)}$		12.5		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}		180		A
Operating junction and storage temperature range	T_J, T_{STG}		- 55 to + 150		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}		1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	12.5 A	T_J = 125 °C T_J = 25 °C	V_F	0.39 0.49	V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_J = 25 °C T_J = 100 °C T_J = 125 °C	I_R	0.90 50 100	mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**SBL**	**SBLF**	**SBLB**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	1.5	4.0	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	SBL25L20CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	SBLF25L20CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	SBLB25L20CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	SBLB25L20CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	SBL25L20CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	SBLF25L20CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	SBLB25L20CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	SBLB25L20CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

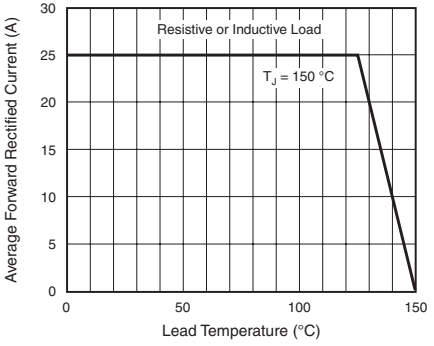


Figure 1. Forward Current Derating Curve

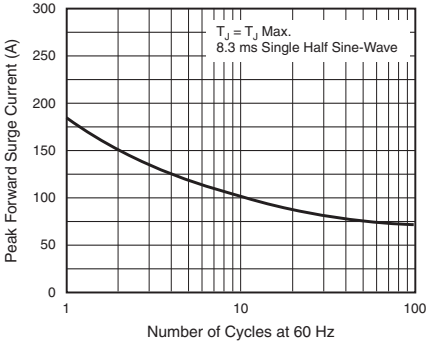


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

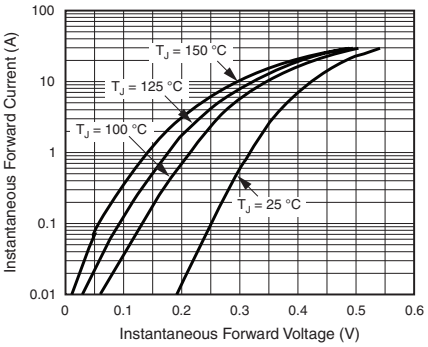


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

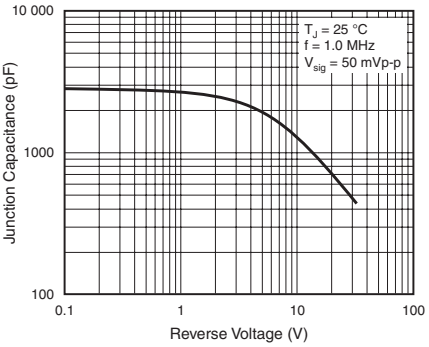


Figure 5. Typical Junction Capacitance Per Diode

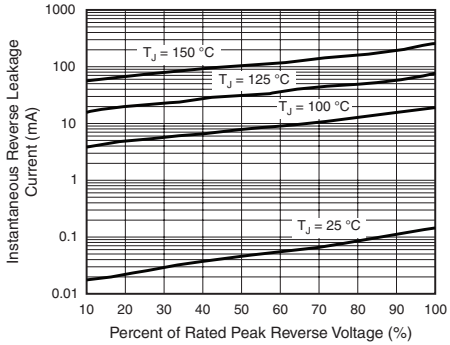


Figure 4. Typical Reverse Characteristics Per Diode

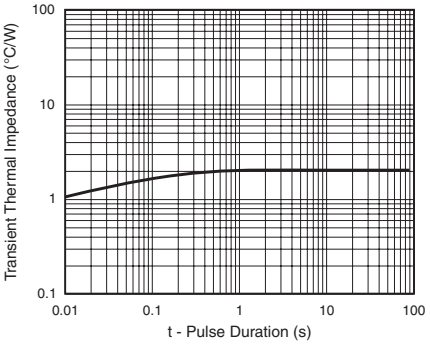
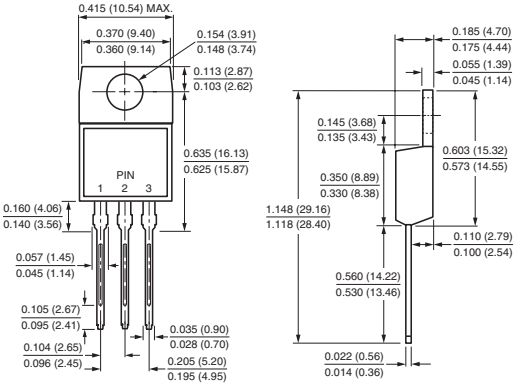


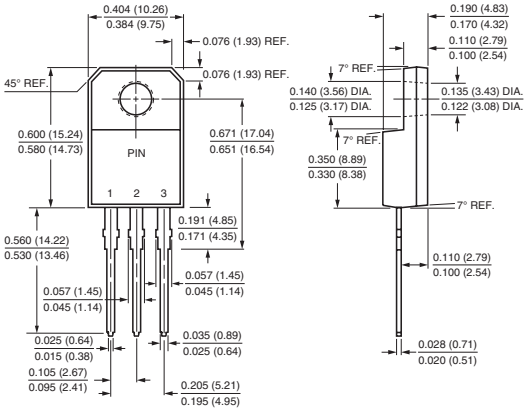
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

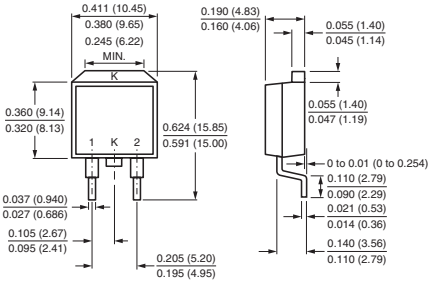
TO-220AB



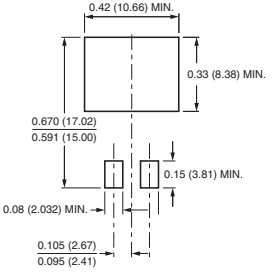
ITO-220AB



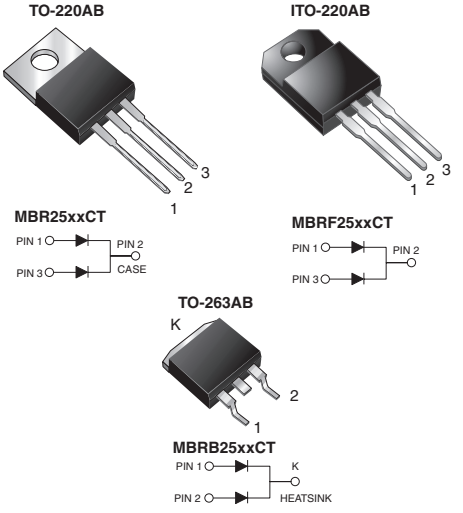
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.73 V at 30 A, 0.65 V at 15 A
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR2535CT	MBR2545CT	MBR2550CT	MBR2560CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current at T_C = 130 °C — total device	$I_{F(AV)}$	30				A
Maximum average forward rectified current at T_C = 130 °C — per diode	$I_{F(AV)}$	15				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Peak repetitive reverse surge current per diode at t_p = 2 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 µs waveform) per diode	E_{RSM}	25				mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR2535CT**	**MBR2545CT**	**MBR2550CT**	**MBR2560CT**	**UNIT**
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 150				°C
Storage temperature range	T_{STG}	- 65 to + 175				
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR2535CT**	**MBR2545CT**	**MBR2550CT**	**MBR2560CT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 15 A I_F = 15 A I_F = 30 A I_F = 30 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	- - 0.82 0.73		0.75 0.65 - -		V
Maximum instantaneous reverse current at blocking voltage per diode (1)		T_C = 25 °C T_C = 125 °C	I_R	0.2 40		1.0 50		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	1.5	4.5	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR2545CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF2545CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB2545CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB2545CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR2545CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF2545CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB2545CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB2545CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

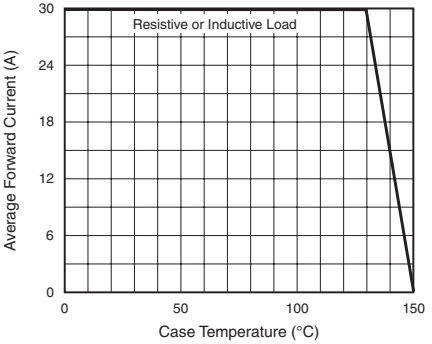


Figure 1. Forward Current Derating Curve

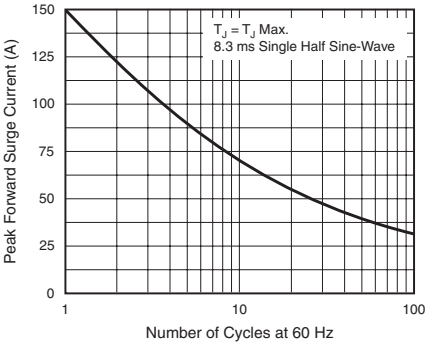


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

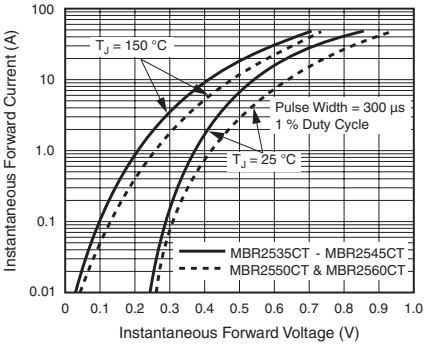


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

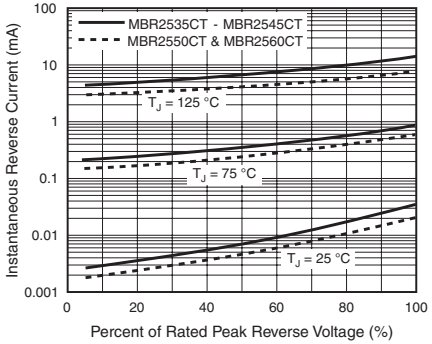


Figure 4. Typical Reverse Characteristics Per Diode

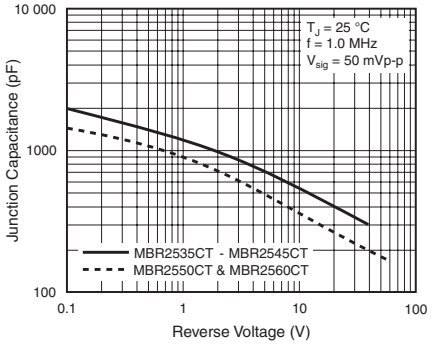


Figure 5. Typical Junction Capacitance Per Diode

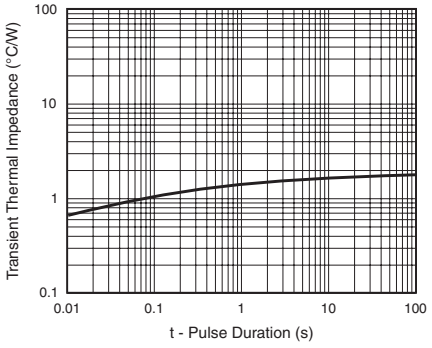
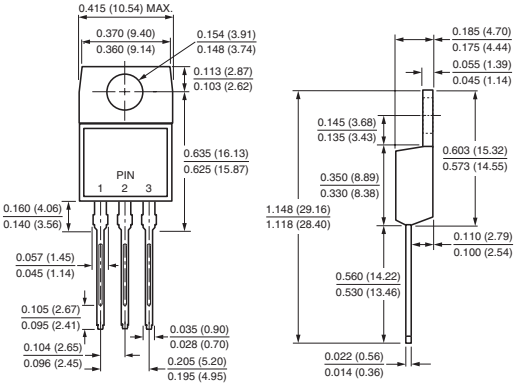


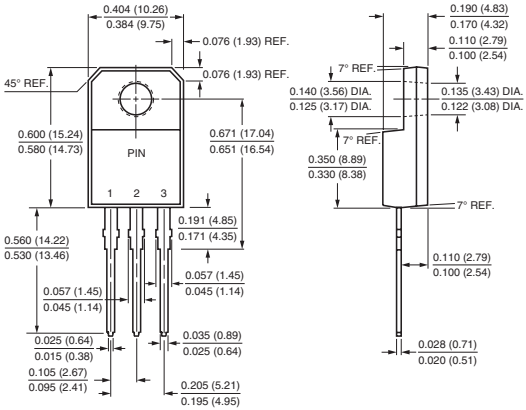
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

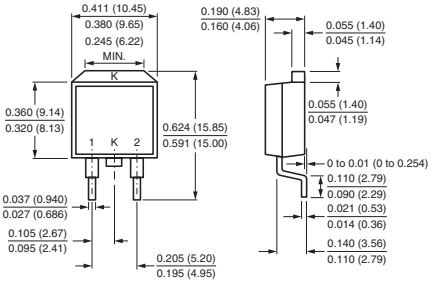
TO-220AB



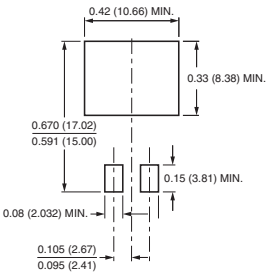
ITO-220AB



TO-263AB

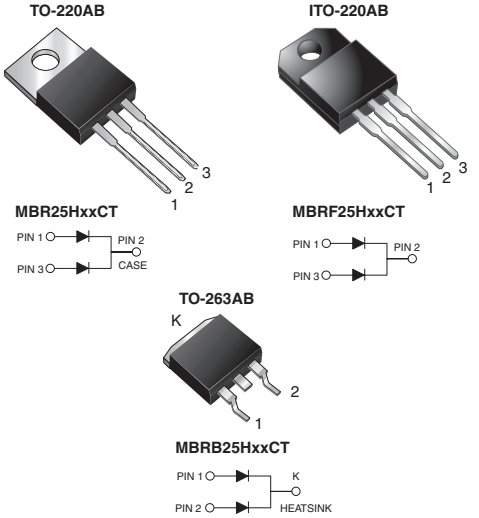


Mounting Pad Layout



Dual Common-Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.54 V, 0.60 V
I_R	100 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR25H35CT	MBR25H45CT	MBR25H50CT	MBR25H60CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Max. average forward rectified current (Fig. 1) total device / per diode	$I_{F(AV)}$	30 / 15				A
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Peak repetitive reverse surge current per diode at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88789
Revision: 19-May-08

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR25H35CT**	**MBR25H45CT**	**MBR25H50CT**	**MBR25H60CT**	**UNIT**
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	25		20		mJ
Electrostatic discharge capacitor voltage Human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 175				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR25H35CT MBR25H45CT**		**MBR25H50CT MBR25H60CT**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage per diode (1)	I_F = 15 A	T_J = 25 °C	V_F	-	0.64	-	0.70	V
	I_F = 15 A	T_J = 125 °C		0.50	0.54	0.56	0.60	
	I_F = 30 A	T_J = 25 °C		-	0.74	-	0.85	
	I_F = 30 A	T_J = 125 °C		0.63	0.67	0.68	0.72	
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C	I_R	-	100	-	100	µA
		T_J = 125 °C		6.0	20	4.0	20	mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Thermal resistance, junction to case per diode	$R_{\theta JC}$	1.5	4.5	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR25H45CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBR25H45CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB25H45CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB25H45CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR25H45CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBR25H45CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB25H45CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB25H45CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

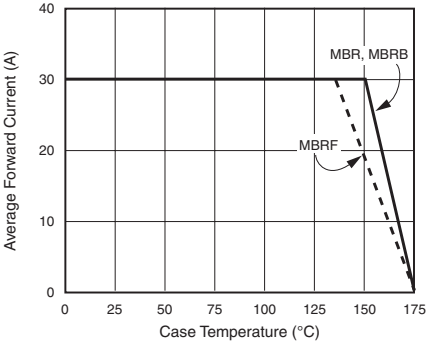


Figure 1. Forward Derating Curve (Total)

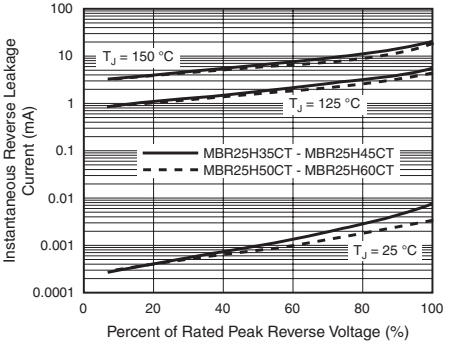


Figure 4. Typical Reverse Characteristics Per Diode

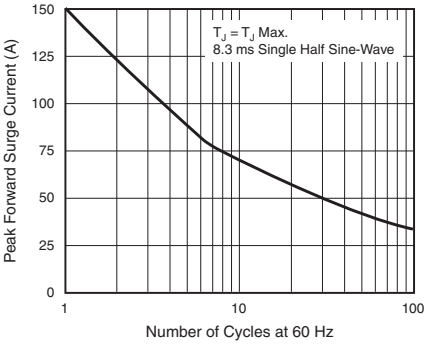


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

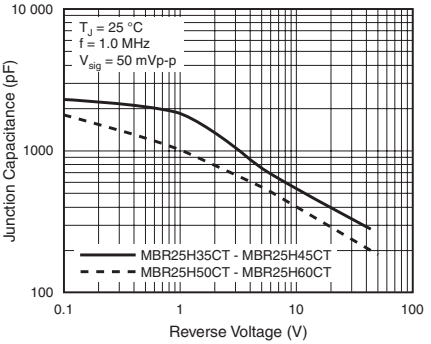


Figure 5. Typical Junction Capacitance Per Diode

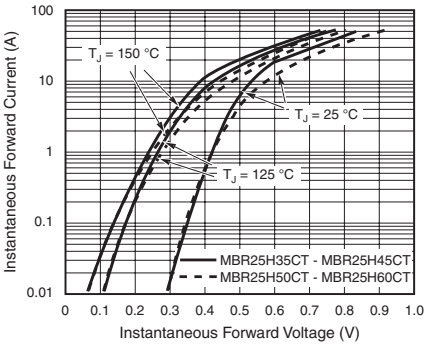


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

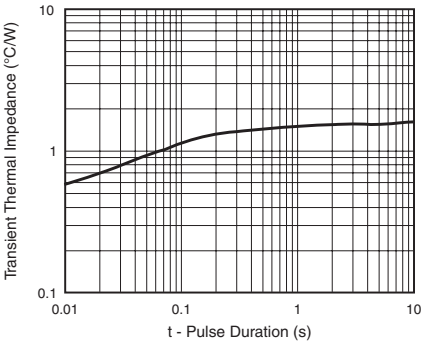
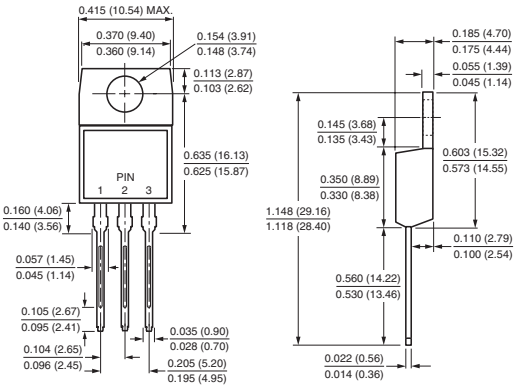


Figure 6. Typical Transient Thermal Impedance Per Diode

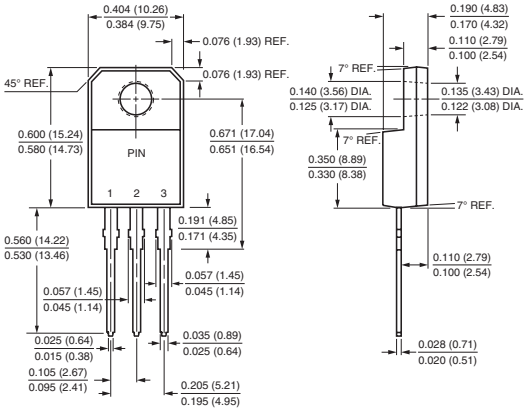
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

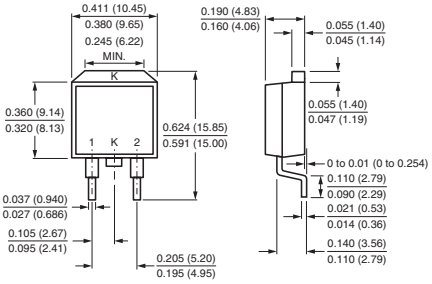
TO-220AB



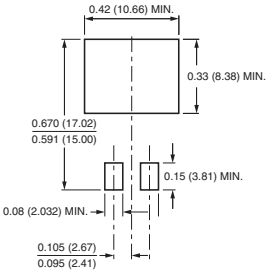
ITO-220AB



TO-263AB



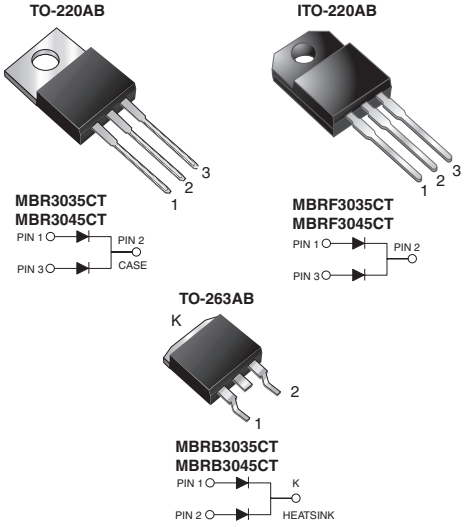
Mounting Pad Layout



MBR(F,B)3035CT & MBR(F,B)3045CT

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	35 V, 45 V
I_{FSM}	200 A
V_F	0.60 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR3035CT	MBR3045CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	35	45	V
Working peak reverse voltage		V_{RWM}	35	45	V
Maximum DC blocking voltage		V_{DC}	35	45	V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	30 15		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	200		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	2.0		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/µs
Operating junction temperature range		T_J	- 65 to + 150		°C
Storage temperature range		T_{STG}	- 65 to + 175		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500		V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88677
Revision: 08-Nov-07

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A I_F = 30 A I_F = 30 A	T_C = 125°C T_C = 25 °C T_C = 125 °C	V_F	0.60 0.76 0.72	V
Maximum instantaneous reverse current per diode at rated DC blocking voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	1.0 60	mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.5	4.5	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR3045CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF3045CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB3045CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB3045CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR3045CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF3045CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB3045CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB3045CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

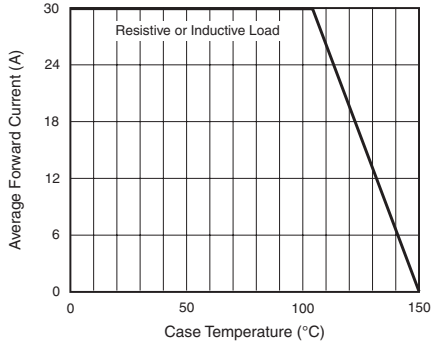


Figure 1. Forward Current Derating Curve

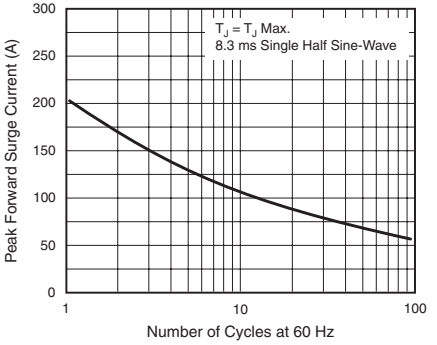


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

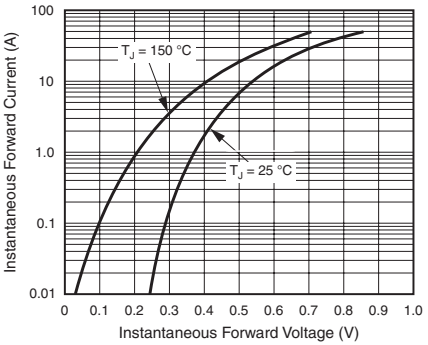


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

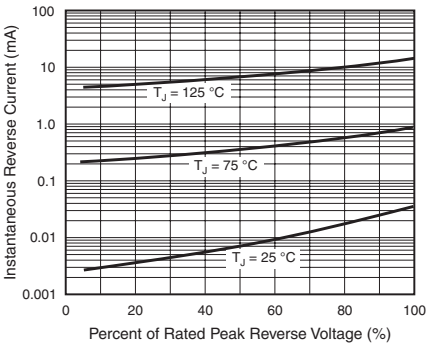


Figure 4. Typical Reverse Characteristics Per Diode

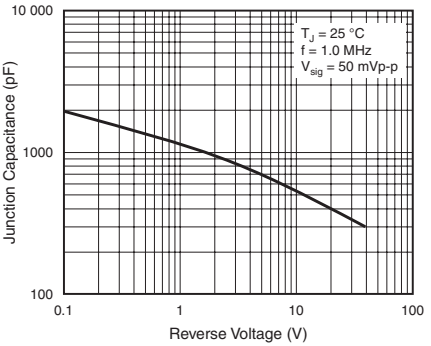


Figure 5. Typical Transient Thermal Impedance Per Diode

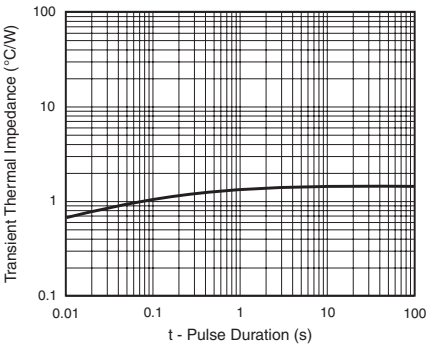


Figure 6. Typical Transient Thermal Impedance Per Diode

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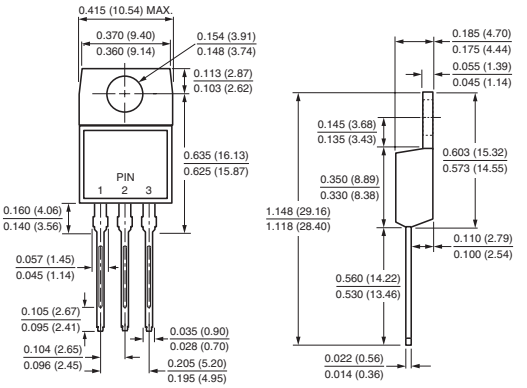
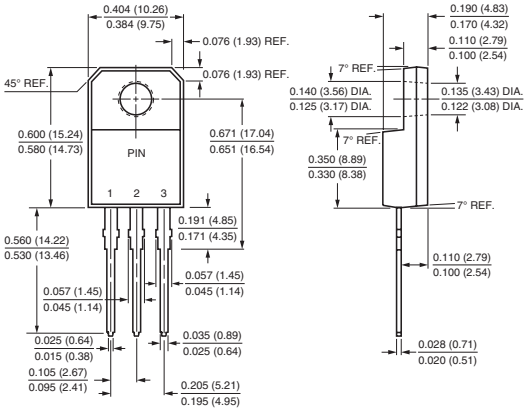
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

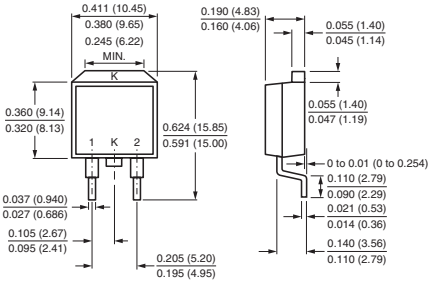
TO-220AB



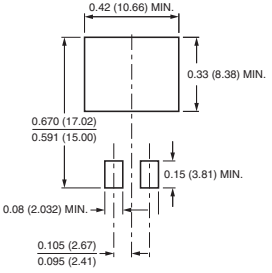
ITO-220AB



TO-263AB



Mounting Pad Layout

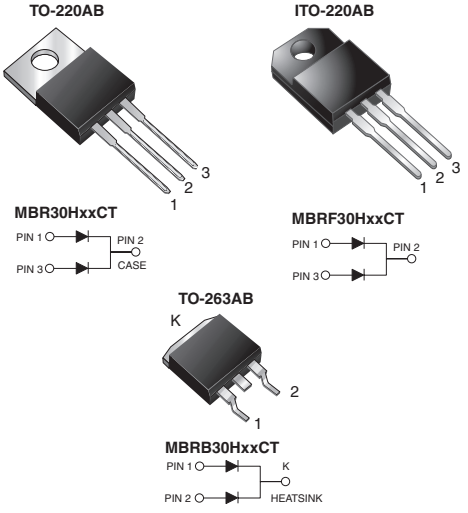


MBR(F,B)30H35CT thru MBR(F,B)30H60CT

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.56 V, 0.59 V
I_R	80 µA, 60 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR30H35CT	MBR30H45CT	MBR30H50CT	MBR30H60CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Max. average forward rectified current (Fig. 1) total device / per diode	$I_{F(AV)}$	30 / 15				A
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Peak repetitive reverse surge current per diode at t_p = 2.0 µs, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	25		20		mJ

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88866
Revision: 31-Jul-08

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR30H35CT**	**MBR30H45CT**	**MBR30H50CT**	**MBR30H60CT**	**UNIT**
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 175				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR30H35CT MBR30H45CT**		**MBR30H50CT MBR30H60CT**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage per diode (1)	I_F = 15 A I_F = 15 A I_F = 30 A I_F = 30 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	- 0.49 - 0.62	0.62 0.56 0.73 0.67	- 0.55 - 0.68	0.68 0.59 0.83 0.71	V
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C T_J = 125 °C	I_R	- 5.0	80 15	- 4.0	60 15	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Thermal resistance, junction to case per diode	$R_{\theta JC}$	1.5	4.5	1.5	°C/W

ORDERING INFORMATION					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR30H45CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF30H45CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB30H45CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB30H45CT-E3/81	1.35	81	800/teel	Tape and reel
TO-220AB	MBR30H45CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF30H45CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB30H45CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB30H45CTHE3/81 (1)	1.35	81	800/teel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

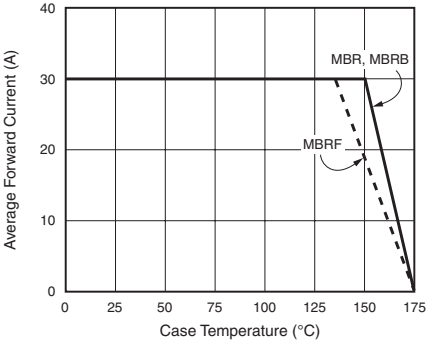


Figure 1. Forward Derating Curve

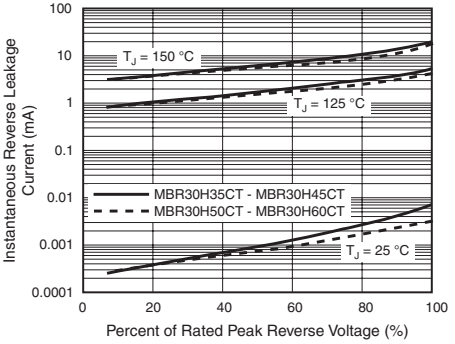


Figure 4. Typical Reverse Characteristics Per Diode

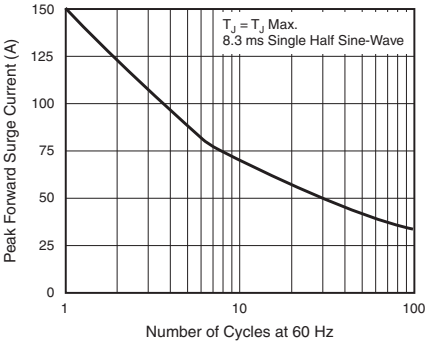


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

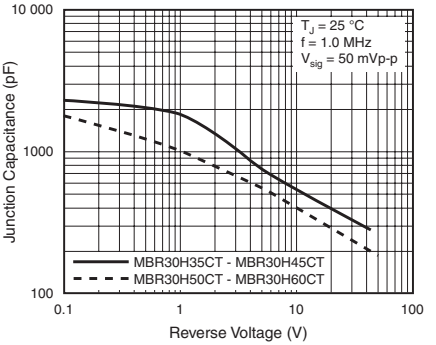


Figure 5. Typical Junction Capacitance Per Diode

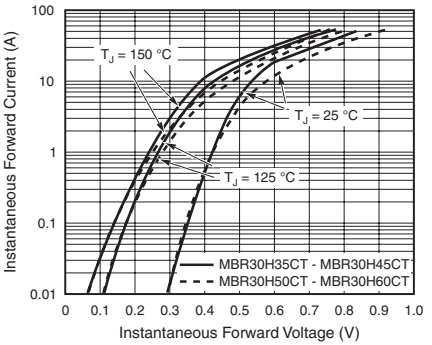


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

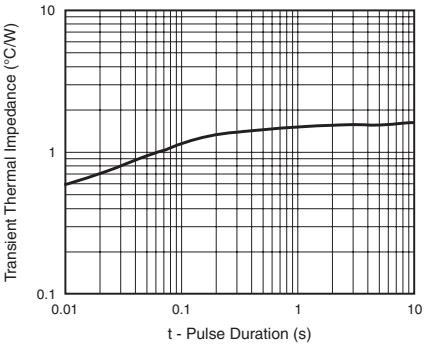


Figure 6. Typical Transient Thermal Impedance Per Diode

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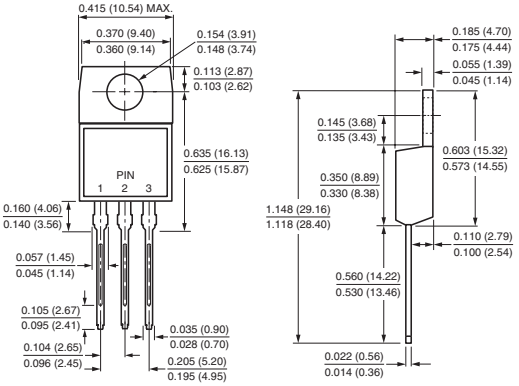
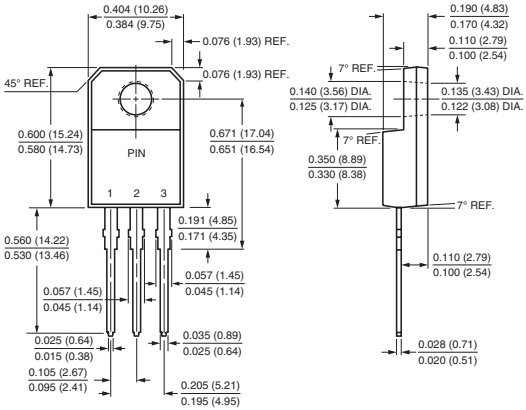
Document Number: 88866
Revision: 31-Jul-08

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

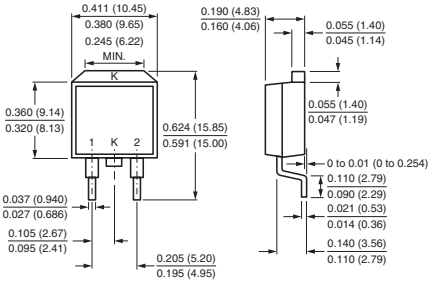
TO-220AB



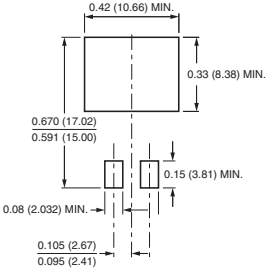
ITO-220AB



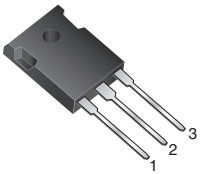
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Schottky Rectifier



TO-247AD (TO-3P)

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	35 V to 60 V
I_{FSM}	200 A
V_F	0.60 V, 0.65 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR3035PT	MBR3045PT	MBR3050PT	MBR3060PT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Maximum working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	200				A
Peak repetitive reverse surge current per diode (1)	I_{RRM}	2.0		1.0		A
Voltage rate of change at (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 150				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C

Note:

(1) 2.0 µs pulse width, f = 1.0 kHz

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88676
Revision: 07-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	MBR3035PT	MBR3045PT	MBR3050PT	MBR3060PT	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A I_F = 20 A I_F = 30 A I_F = 30 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	-	0.60	0.76	0.72	0.75 0.65 - -	V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 125 °C	I_R	1.0	60	5.0	100		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR3035PT	MBR3045PT	MBR3050PT	MBR3060PT	UNIT
Thermal resistance from junction to case per diode	$R_{\theta JC}$	1.4				°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-247AD	MBR3045PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise specified)

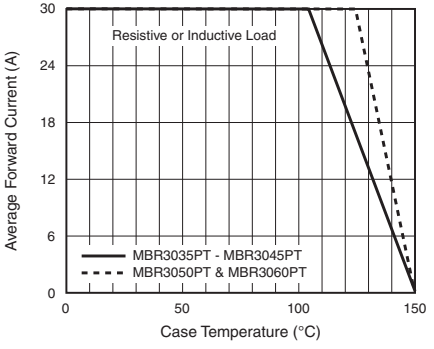


Figure 1. Forward Current Derating Curve

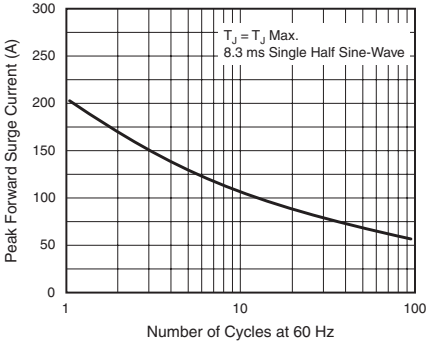


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

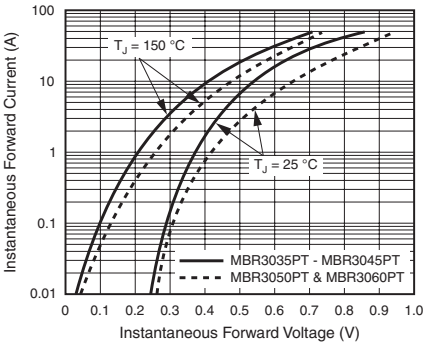


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

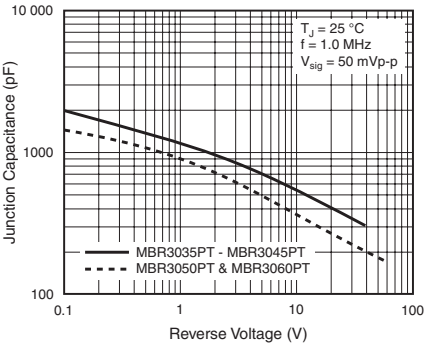


Figure 5. Typical Junction Capacitance Per Diode

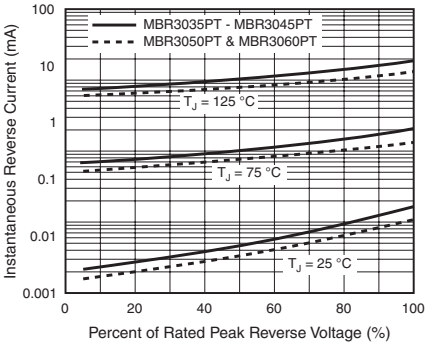


Figure 4. Typical Reverse Characteristics Per Diode

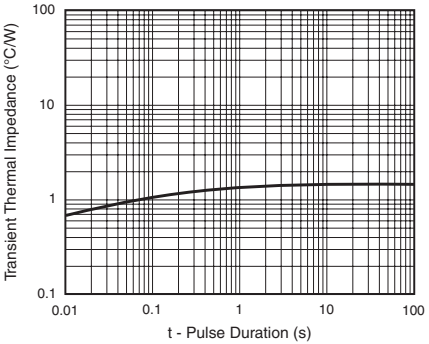
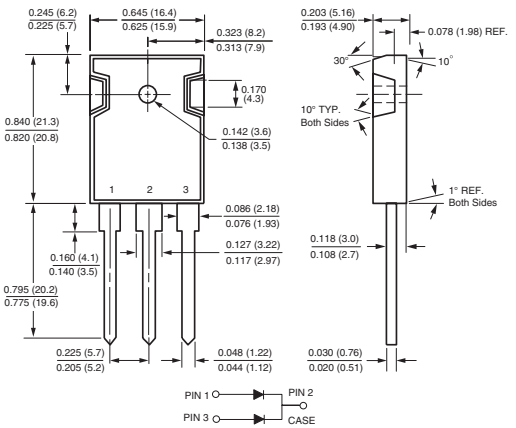


Figure 6. Typical Transient Thermal Impedance Per Diode

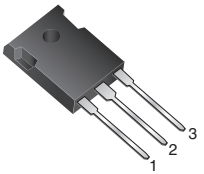
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



Dual Common-Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



TO-247AD (TO-3P)

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	35 V to 60 V
I_{FSM}	200 A
V_F	0.58 V, 0.63 V
I_R	150 µA
T_J max.	175 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR30H35PT	MBR30H45PT	MBR30H50PT	MBR30H60PT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Maximum working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30				A
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	200				A
Peak repetitive reverse surge current per diode (1)	I_{RRM}	2.0		1.0		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	30		20		mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change at rated V_R	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 175				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C

Note:

(1) 2.0 µs pulse width, f = 1.0 kHz

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR30H35PT MBR30H45PT**		**MBR30H50PT MBR30H60PT**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A I_F = 20 A I_F = 30 A I_F = 30 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J =125 °C	V_F	- 0.54 - 0.62	0.66 0.58 0.73 0.66	- 0.60 - 0.66	0.74 0.63 0.83 0.70	V
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C T_J = 125 °C	I_R	- 6.0	150 25	- 4.0	150 25	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR30H35PT**	**MBR30H45PT**	**MBR30H50PT**	**MBR30H60PT**	**UNIT**
Thermal resistance, junction to case per diode	$R_{\theta JC}$	1.4				°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD	MBR30H45PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise specified)

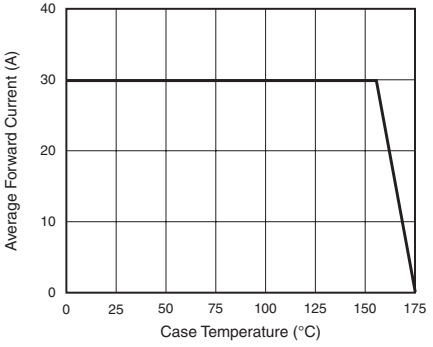


Figure 1. Forward Current Derating Curve

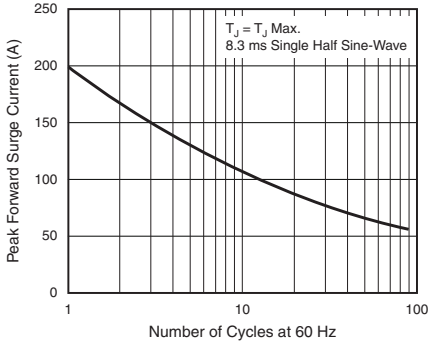


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

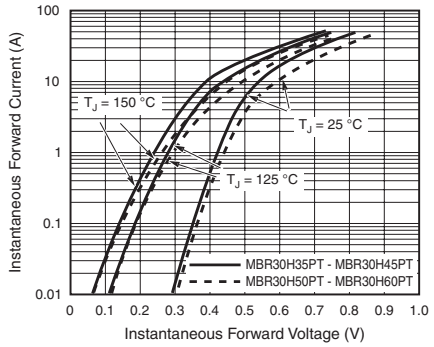


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

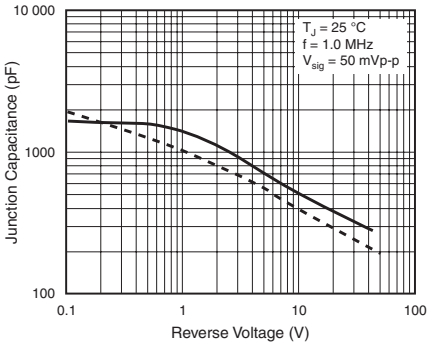


Figure 5. Typical Junction Capacitance Per Diode

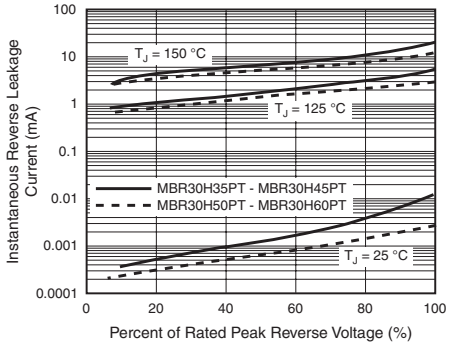


Figure 4. Typical Reverse Characteristics Per Diode

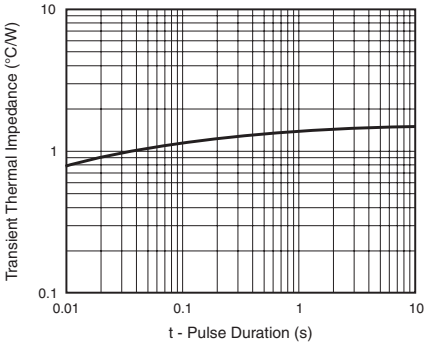
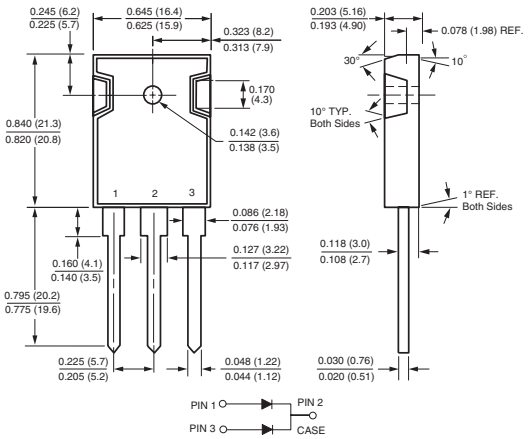


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)

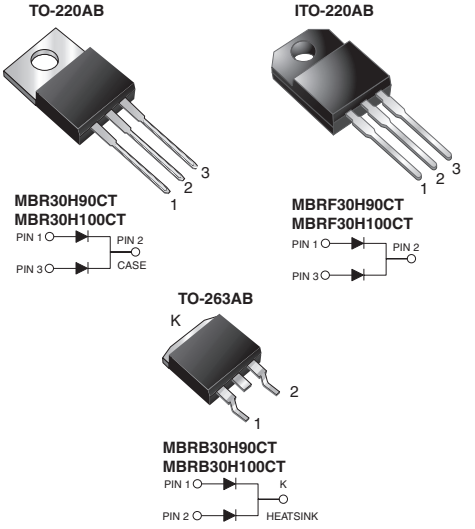


MBR(F,B)30H90CT & MBR(F,B)30H100CT

Vishay General Semiconductor

Dual Common-Cathode High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	90 V, 100 V
I_{FSM}	275 A
V_F	0.67 V
I_R	5.0 µA
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR30H90CT	MBR30H100CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	90	100	V
Working peak reverse voltage		V_{RWM}	90	100	V
Maximum DC blocking voltage		V_{DC}	90	100	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	30 15		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	275		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500		V

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Document Number: 88791
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 15 A I_F = 15 A I_F = 30 A I_F = 30 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.82 0.67 0.93 0.80	V
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C T_J = 125 °C	I_R	5.0 6.0	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.9	4.6	1.9	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR30H100CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF30H100CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB30H100CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB30H100CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR30H100CTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	MBRF30H100CTHE3/45 (1)	1.99	45	50/tube	Tube
TO-263AB	MBRB30H100CTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	MBRB30H100CTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

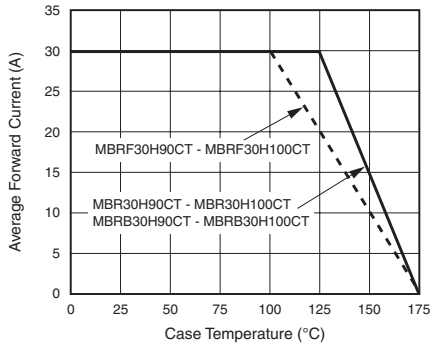


Figure 1. Forward Derating Curve Per Diode

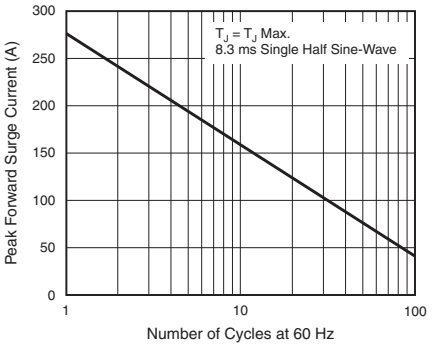


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

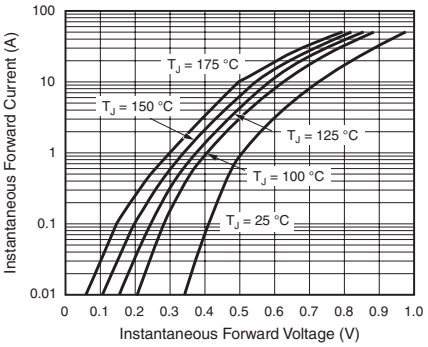


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

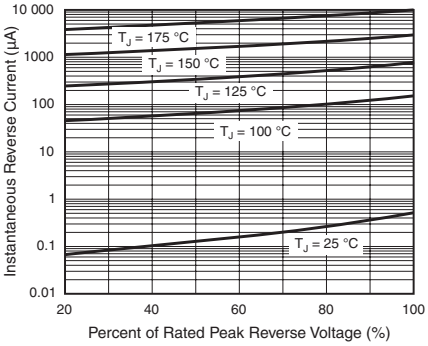


Figure 4. Typical Reverse Characteristics Per Diode

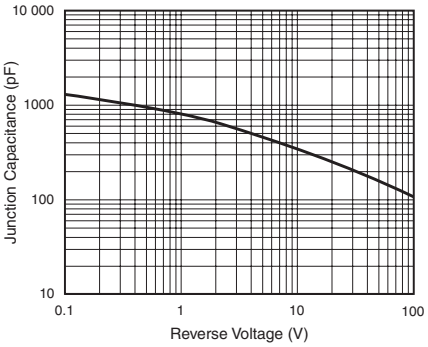


Figure 5. Typical Junction Capacitance Per Diode

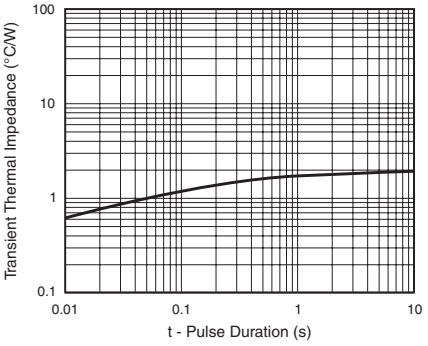
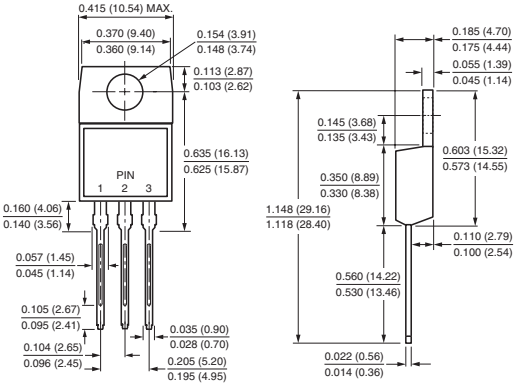


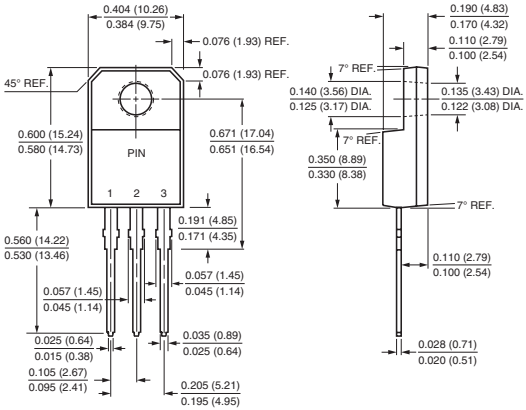
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

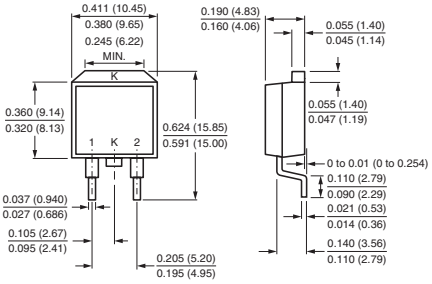
TO-220AB



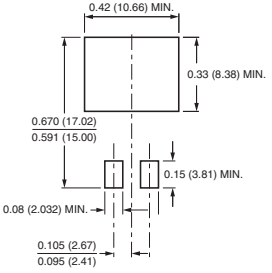
ITO-220AB



TO-263AB

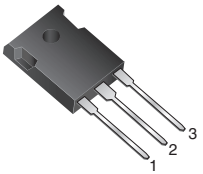


Mounting Pad Layout



Dual Common-Cathode High Voltage Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



TO-247AD (TO-3P)

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	90 V, 100 V
I_{FSM}	265 A
V_F	0.67 V
I_R	5.0 µA
T_J max.	175 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR30H90PT	MBR30H100PT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	90	100	V
Maximum working peak reverse voltage		V_{RWM}	90	100	V
Maximum DC blocking voltage		V_{DC}	90	100	V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	30 15		A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	265		A
Peak repetitive reverse surge current at t_p = 2 µs, f = 1 kHz per diode		I_{RRM}	1.0		A
Non-repetitive avalanche energy (I_{AS} = 0.5 A, L = 60 mH) per diode		E_{AS}	7.5		mJ
Voltage rate of change at (rated V_R)		dV/dt	10 000		V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175		°C

For technical questions within your region, please contact one of the following:
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Document Number: 88678
Revision: 25-Mar-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR30H90PT**	**MBR30H100PT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 15 A I_F = 15 A I_F = 30 A I_F = 30 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.82 0.67 0.93 0.80		V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_J = 25 °C T_J = 125 °C	I_R	5.0 6.0		µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MBR30H90PT**	**MBR30H100PT**	**UNIT**
Thermal resistance from junction to case per diode	$R_{\theta JC}$	1.6		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD	MBR30H100PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

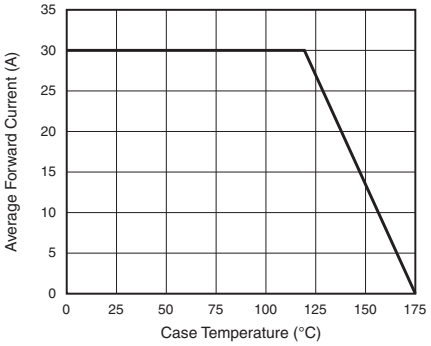


Figure 1. Forward Derating Curve

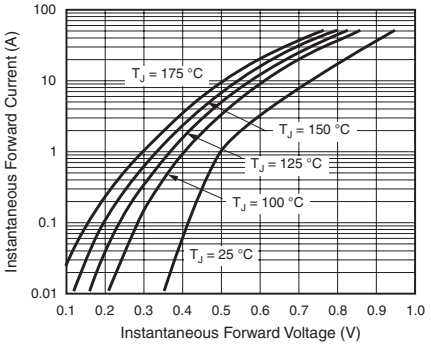


Figure 2. Typical Instantaneous Forward Characteristics Per Diode

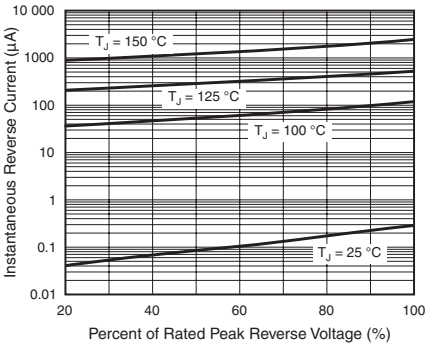


Figure 3. Typical Reverse Characteristics Per Diode

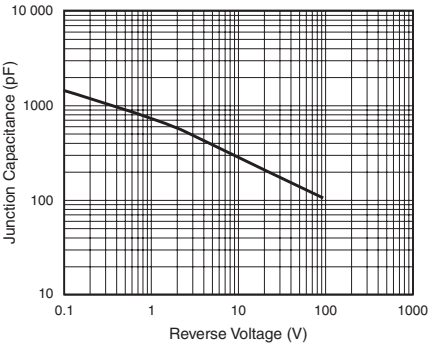
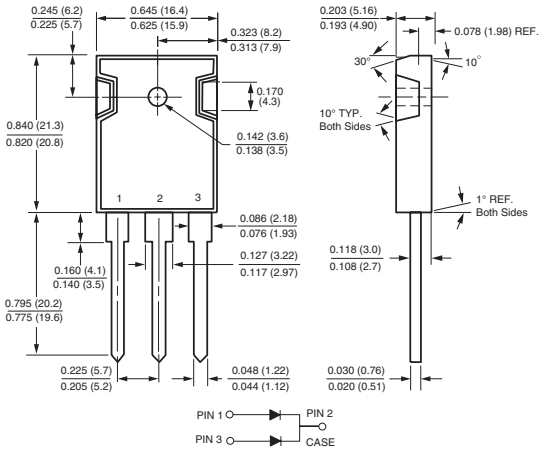


Figure 4. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



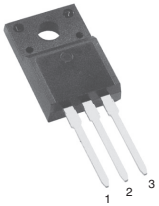
Dual Common-Cathode High Voltage Schottky Rectifier

Low Leakage Current 5.0 µA

TO-220AB

MBR30H150CT

ITO-220AB



MBRF30H150CT

TO-262AA

SB30H150CT-1

FEATURES

- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling and polarity protection applications.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Mounting Torque: 10 in-lbs maximum

Polarity: As marked

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	150 V
I_{FSM}	260 A
V_F	0.75 V
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR30H150CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	150	V
Working peak reverse voltage		V_{RWM}	150	V
Maximum DC blocking voltage		V_{DC}	150	V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	30 15	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	260	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Peak non-repetitive reverse surge energy per diode (8/20 µs waveform)		E_{RSM}	10	mJ
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 2.0 A, L = 10 mH		E_{AS}	20	mJ
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175	°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min		V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 15 A I_F = 15 A I_F = 30 A I_F = 30 A	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	0.90 0.75 0.99 0.86	V
Maximum reverse current per diode at working peak reverse voltage (1)		T_J = 25 °C T_J = 125 °C	I_R	5.0 1.0	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	1.7	4.0	1.7	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	MBR30H150CT-E3/45	2.06	45	50/tube	Tube
ITO-220AB	MBRF30H150CT-E3/45	2.20	45	50/tube	Tube
TO-262AA	SB30H150CT-1E3/45	1.58	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

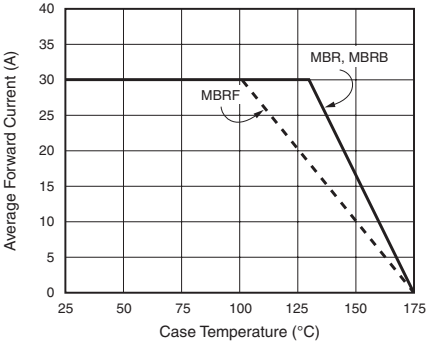


Figure 1. Forward Derating Curve (Total)

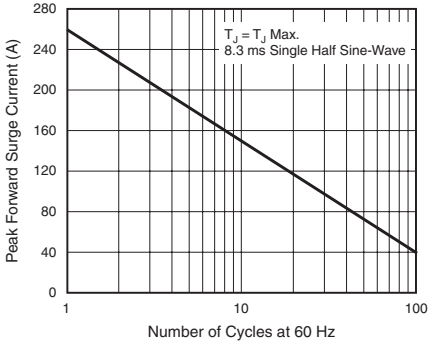


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

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PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

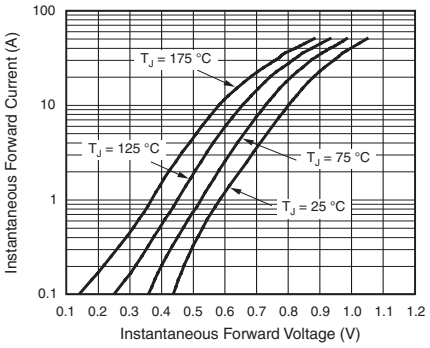


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

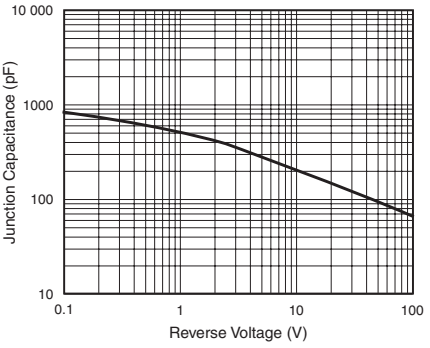


Figure 5. Typical Junction Capacitance Per Diode

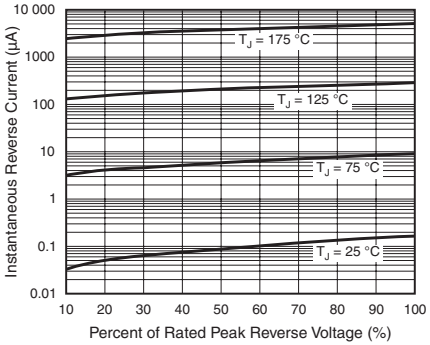


Figure 4. Typical Reverse Characteristics Per Diode

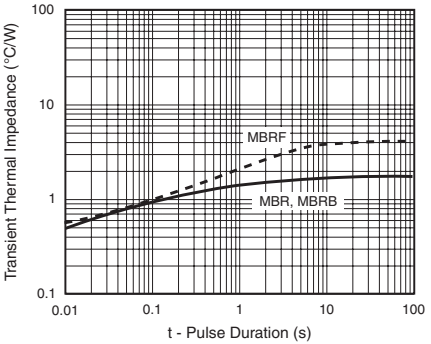
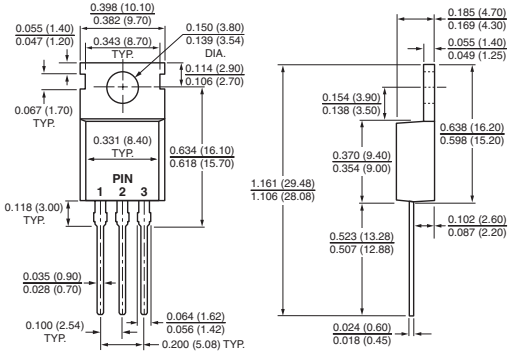


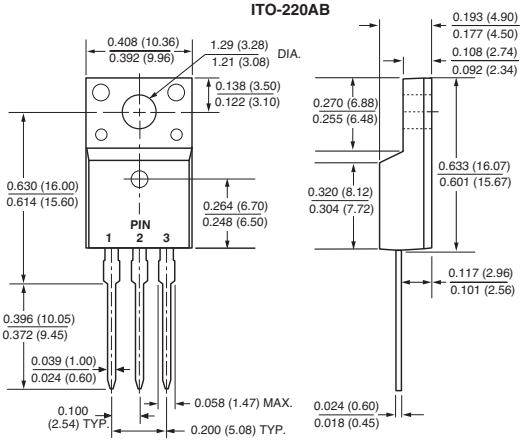
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

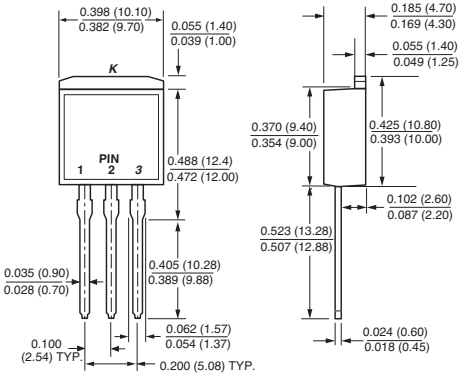
TO-220AB



ITO-220AB



TO-262AA



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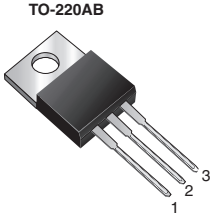
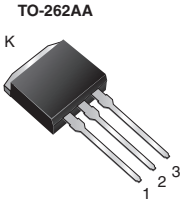
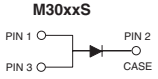
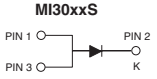
Schottky Barrier Rectifier









FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	35 V, 45 V
I_{FSM}	200 A
V_F at I_F = 30 A	0.61 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	M(I)3035S	M(I)3045S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	200		A
Peak repetitive reverse current per leg at t_p = 2 µs, 1 kHz	I_{RRM}	2.0		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction temperature range	T_J	- 65 to + 150		°C
Storage temperature range	T_{STG}	- 65 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 15 A I_F = 30 A	T_J = 25 °C	V_F	0.54 0.65	- 0.70	V
	I_F = 15 A I_F = 30 A	T_J = 125 °C		0.46 0.61	- 0.66	
Maximum instantaneous reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	40 26	200 55	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	980		pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**M30xxS**	**MI30xxS**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	M3045S-E3/4W	1.878	4W	50/tube	Tube
TO-262AA	MI3045S-E3/4W	1.454	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

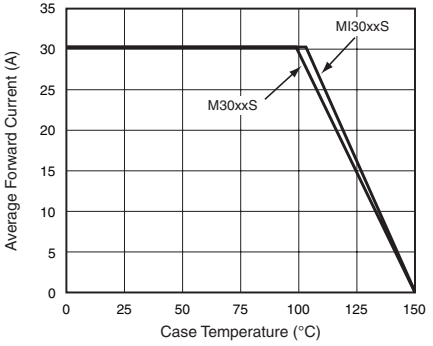


Figure 1. Forward Current Derating Curve

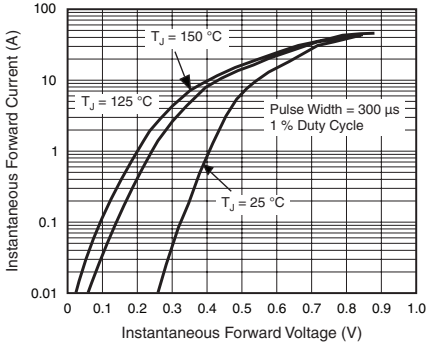


Figure 3. Typical Instantaneous Forward Characteristics

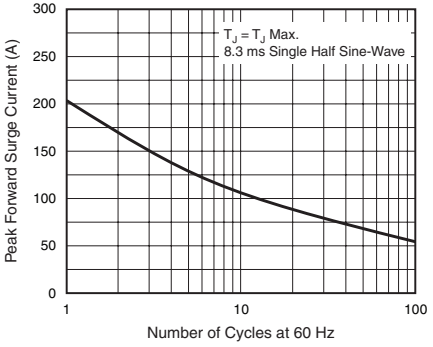


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

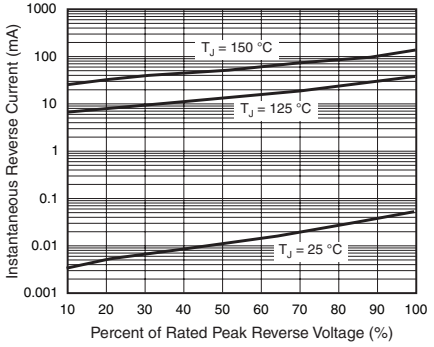


Figure 4. Typical Reverse Characteristics

For technical questions within your region, please contact one of the following:
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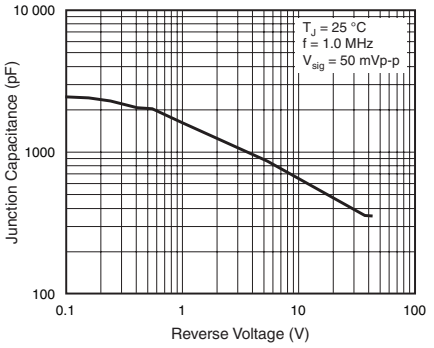


Figure 5. Typical Junction Capacitance

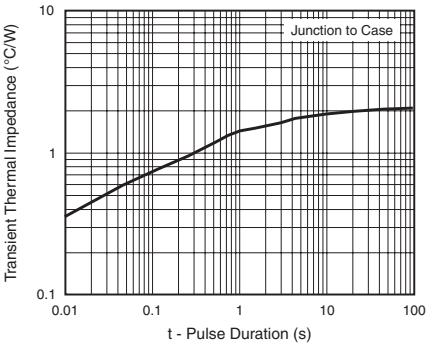
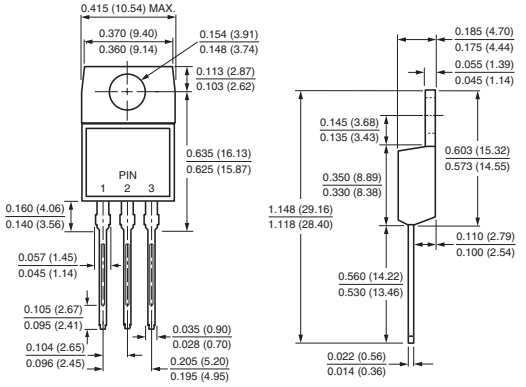


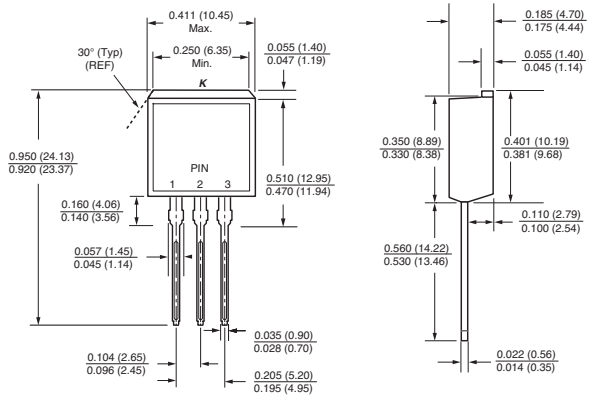
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



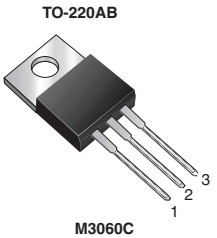
TO-262AA

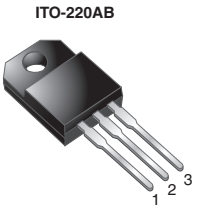


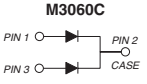
M3060C, MF3060C & MI3060C

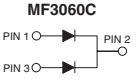
Vishay General Semiconductor

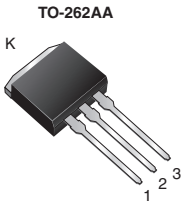
Dual Common-Cathode Schottky Rectifier

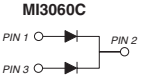












PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	60 V
I_{FSM}	160 A
V_F at I_F = 15 A	0.547 V
T_J max.	150 °C

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	M3060C	MF3060C	MI3060C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	60			V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	30 15			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	160			A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	0.5			A
Voltage rate of change (rated V_R)		dV/dt	10 000			V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 150			°C
Isolation voltage from terminal to heatsink with t = 1 min		V_{AC}	1500			V

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Document Number: 89009
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 7.5 A I_F = 15 A	T_J = 25 °C	V_F	0.482 0.520 0.614	- - 0.72	V
	I_F = 5.0 A I_F = 7.5 A I_F = 15 A	T_J = 125 °C		0.387 0.443 0.547	- - 0.62	
Reverse current per diode (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	50 23	350 45	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz	T_J = 25 °C	C_J	540	-	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**M3060C**	**MF3060C**	**MI3060C**	**UNIT**
Thermal resistance per diode	$R_{\theta JC}$	2.0	5.5	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	M3060C-E3/4W	1.85	4W	50/tube	Tube
ITO-220AB	MF3060C-E3/4W	1.75	4W	50/tube	Tube
TO-262AA	MI3060C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

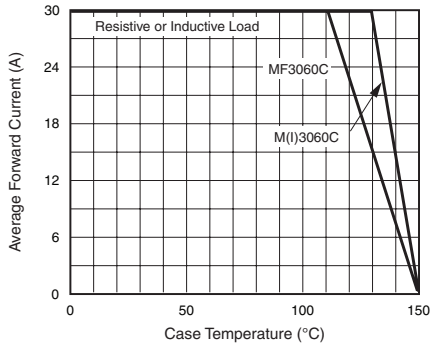


Figure 1. Forward Current Derating Curve

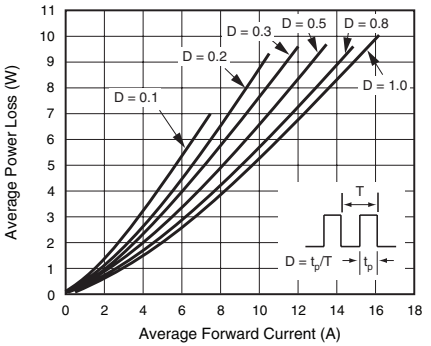


Figure 2. Forward Power Loss Characteristics Per Diode

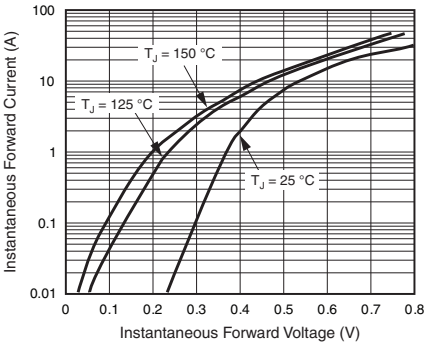


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

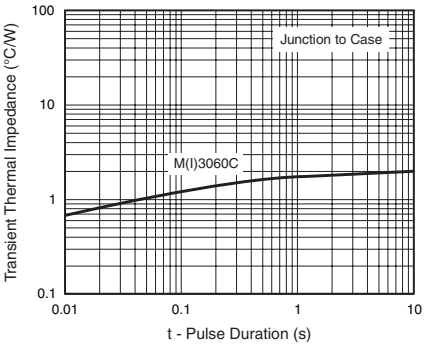


Figure 6. Typical Transient Thermal Impedance Per Diode

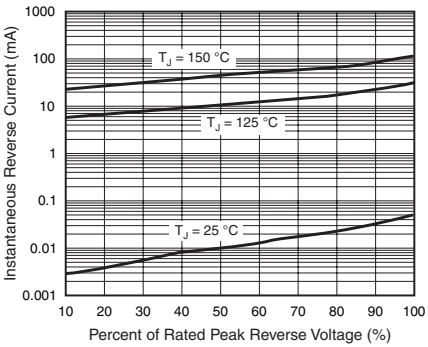


Figure 4. Typical Reverse Characteristics Per Diode

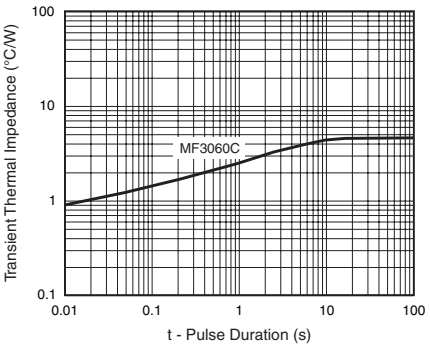


Figure 7. Typical Transient Thermal Impedance Per Diode

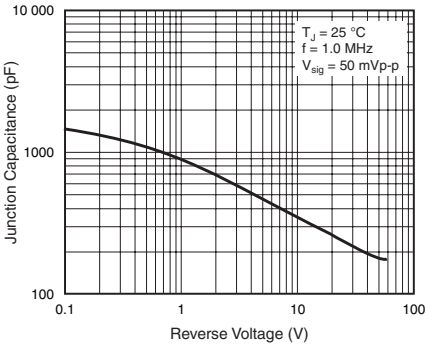
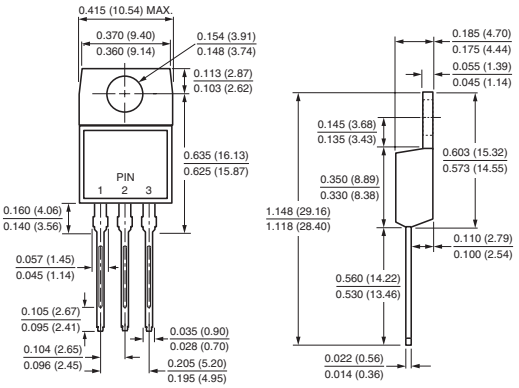


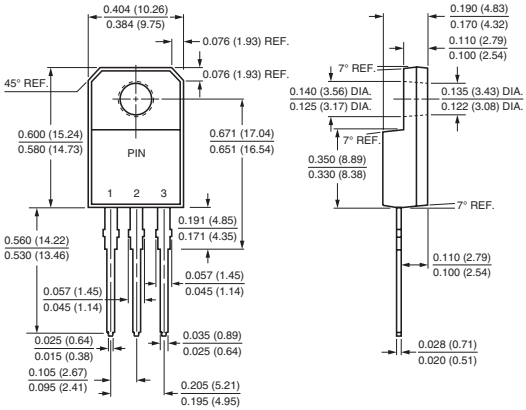
Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

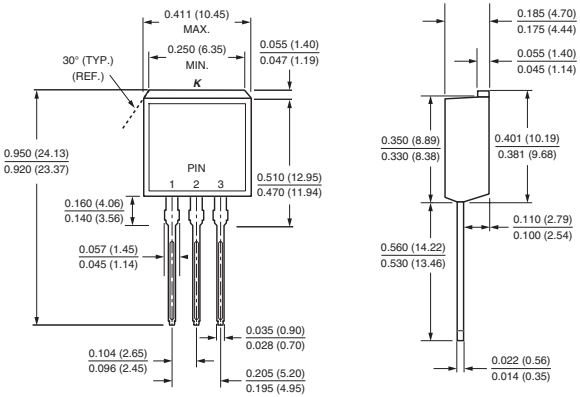
TO-220AB



ITO-220AB



TO-262AA

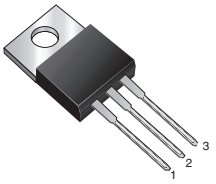


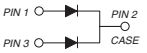
M30L40C

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier

TO-220AB





FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	40 V
E_{AS}	20 mJ
I_{FSM}	280 A
V_F at I_F = 15 A	0.413 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**M30L40C**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	40	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	30 15	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	280	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 2 A, L = 10 mH	per diode	E_{AS}	20	mJ
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 150	°C

For technical questions within your region, please contact one of the following:
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Document Number: 89012
Revision: 27-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 8 A I_F = 15 A I_F = 30 A	T_J = 25 °C	V_F	0.430 0.490 0.595	- 0.55 -	V
	I_F = 8 A I_F = 15 A I_F = 30 A	T_J = 125 °C		0.331 0.413 0.572	- 0.48 -	
Reverse current per diode (2)	V_R = 40 V	T_J = 25 °C T_J = 100 °C	I_R	88 12	360 45	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	750	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**M30L40C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
M30L40C-E3/4W	2.068	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

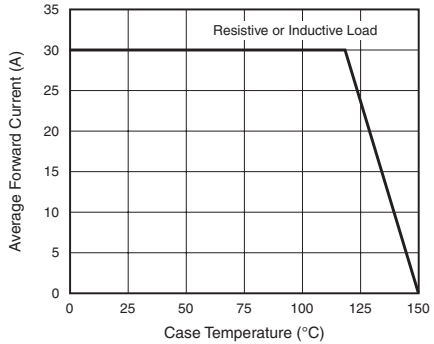


Figure 1. Forward Current Derating Curve

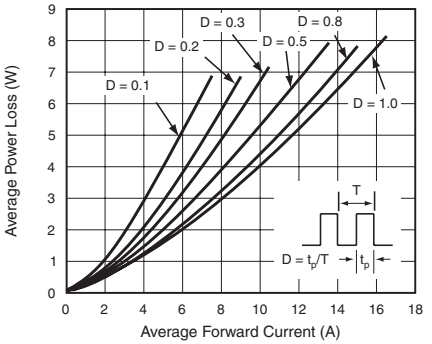


Figure 2. Forward Power Loss Characteristics Per Diode

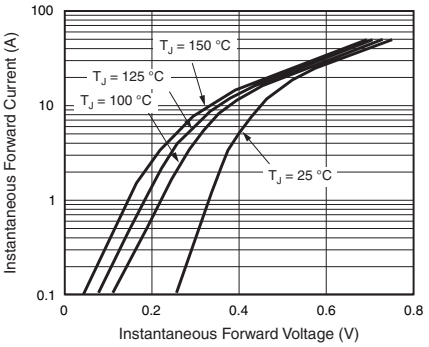


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

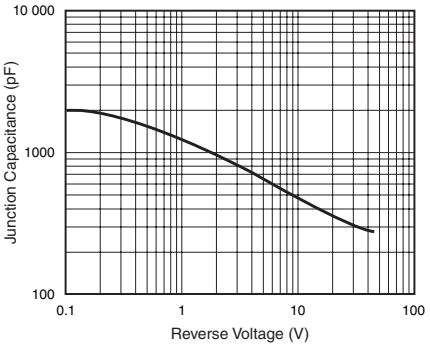


Figure 5. Typical Junction Capacitance Per Diode

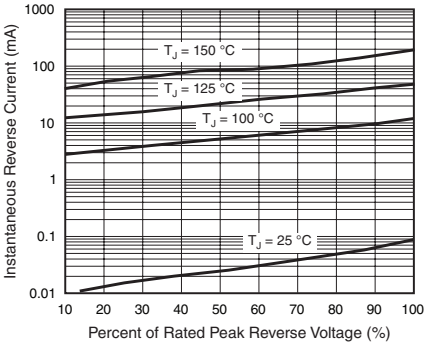


Figure 4. Typical Reverse Characteristics Per Diode

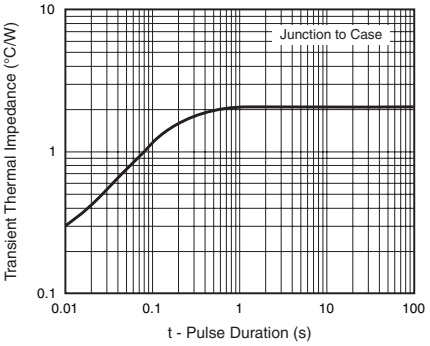
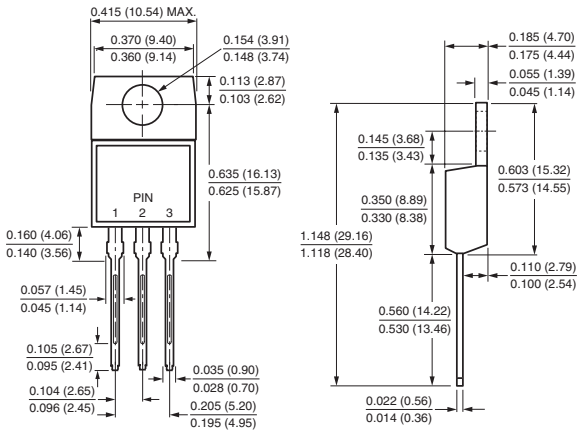


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



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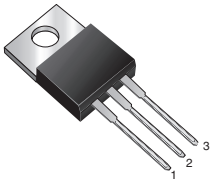
Document Number: 89012
Revision: 27-Aug-08

Dual Common-Cathode Schottky Rectifier

TO-220AB



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	45 V
E_{AS}	20 mJ
I_{FSM}	280 A
V_F at I_F = 15 A	0.46 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	M30L45C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	45	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	30 15	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	280	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Non-repetitive avalanche energy at 25 °C, I_{AS} = 2 A	per diode	E_{AS}	20	mJ
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 8 A I_F = 15 A I_F = 30 A	T_A = 25 °C	V_F	0.45 0.52 0.67	- 0.60 -	V
	I_F = 8 A I_F = 15 A I_F = 30 A	T_A = 125 °C		0.36 0.46 0.63	- 0.50 -	
Reverse current per diode (2)	V_R = 45 V	T_A = 25 °C T_A = 125 °C	I_R	210 60	1000 120	µA mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	750	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**M30L45C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
M30L45C-E3/4W	2.07	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

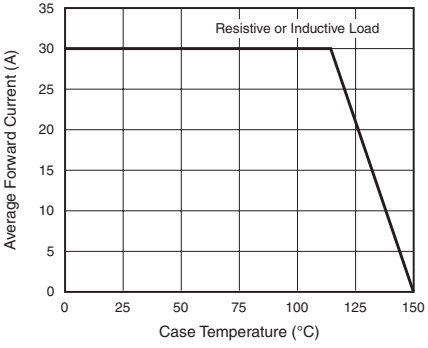


Figure 1. Forward Current Derating Curve

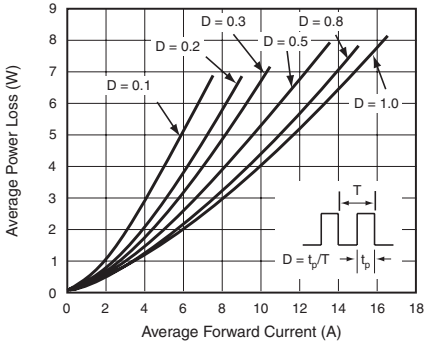


Figure 2. Forward Power Loss Characteristics Per Diode

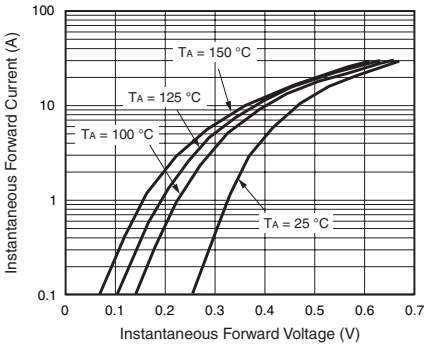


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

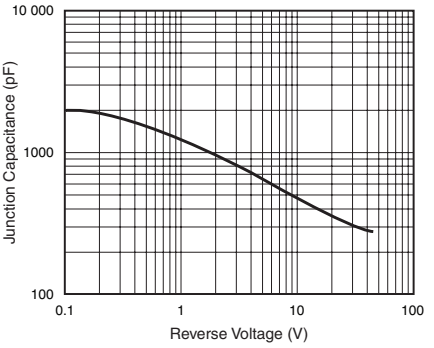


Figure 5. Typical Junction Capacitance Per Diode

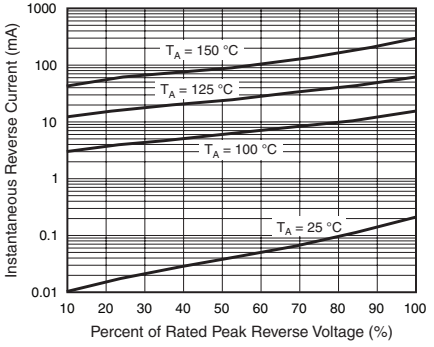


Figure 4. Typical Reverse Characteristics Per Diode

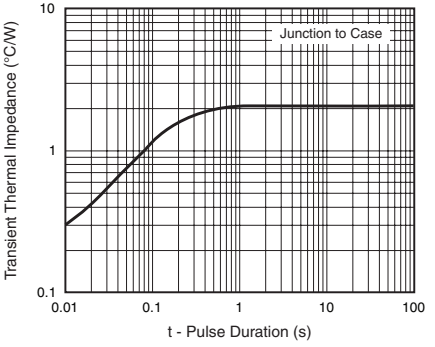
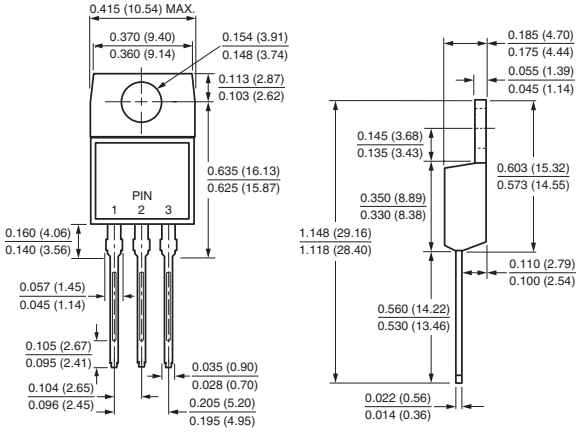


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

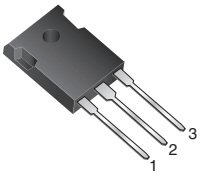
TO-220AB



SBL3030PT & SBL3040PT

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier



TO-247AD (TO-3P)

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	30 V, 40 V
I_{FSM}	275 A
V_F	0.55 V
T_J max.	125 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBL3030PT	SBL3040PT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum RMS voltage	V_{RWM}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30		A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	275		A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 125		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SBL3030PT	SBL3040PT	UNIT
Maximum instantaneous forward voltage per diode (1)	15 A		V_F	0.55		V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 100 °C	I_R	1.0 75		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
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Document Number: 88732
Revision: 25-Mar-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**SBL3030PT**	**SBL3040PT**	**UNIT**
Thermal resistance from junction to case per diode	$R_{\theta JC}$	1.5		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD	SBL3030PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

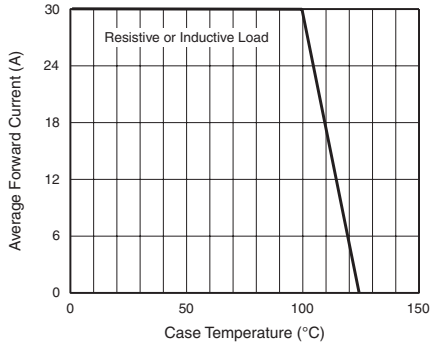


Figure 1. Forward Current Derating Curve

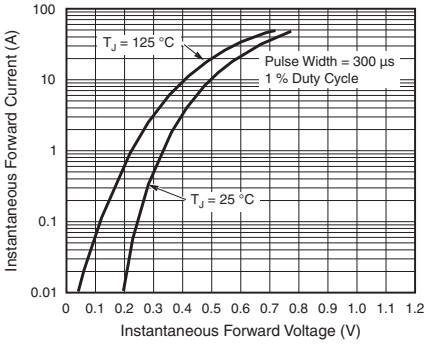


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

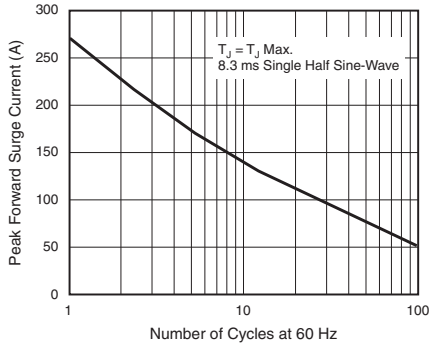


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

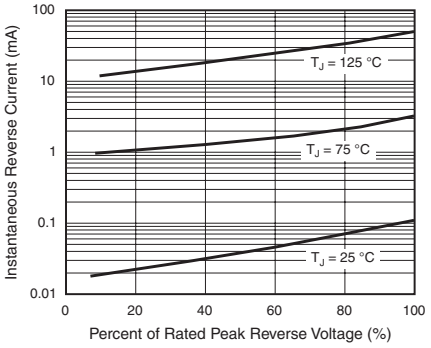


Figure 4. Typical Reverse Characteristics Per Diode

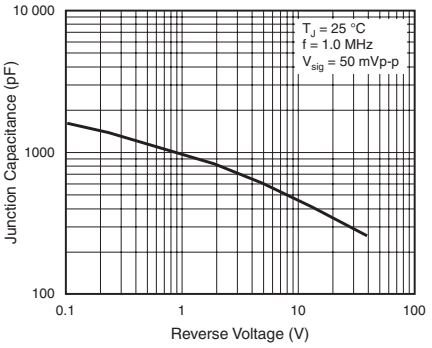


Figure 5. Typical Junction Capacitance Per Diode

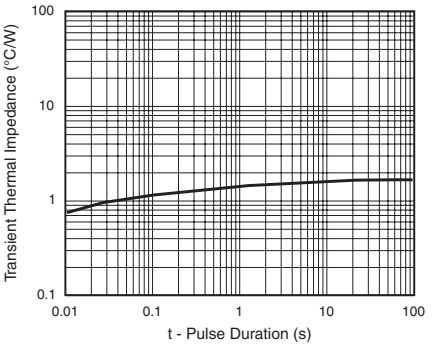
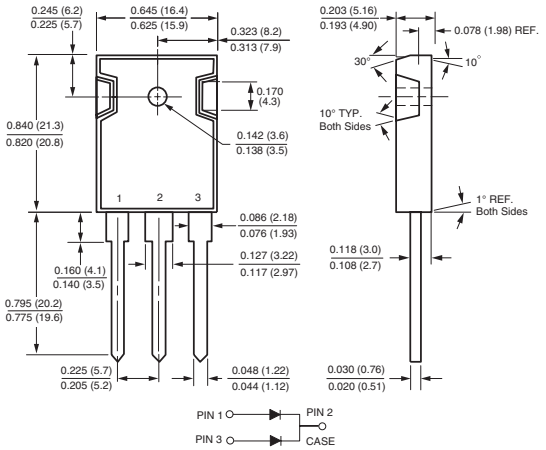


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



For technical questions within your region, please contact one of the following:
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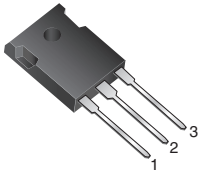
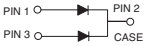
Dual Common-Cathode Schottky Rectifier



TO-247AD (TO-3P)



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	45 V
I_{FSM}	400 A
V_F	0.47 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SD241P	UNIT
Maximum repetitive peak reverse voltage at T_C = 25 °C	V_{RRM}	45	V
Maximum blocking voltage at T_C = 25 °C	V_{DC}	45	V
Maximum working peak reverse voltage	V_{RWM}	35	V
Maximum average forward rectified current at T_C = 105 °C	$I_{F(AV)}$	30	A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	400	A
Peak repetitive reverse surge current per diode (1)	I_{RSM}	2.0	A
Voltage rate of change at V_R = 35 V	dV/dt	10 000	V/µs
Operating junction temperature range	T_J	- 65 to + 150	°C
Storage temperature range	T_{STG}	- 65 to + 175	°C

Note:
(1) 2.0 µs pulse width, f = 1.0 kHz

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SD241P	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 20 A	T_C = 125 °C T_C = 125 °C	V_F	0.47 0.60	V
Maximum instantaneous reverse current reverse voltage per diode (1)	V_R = 35 V	T_C = 25 °C T_C = 125 °C	I_R	1.0 100	mA

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**SD241P**	**UNIT**
Maximum thermal resistance from junction of case per diode	$R_{\theta JC}$	1.4	°C

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD	SD241P-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

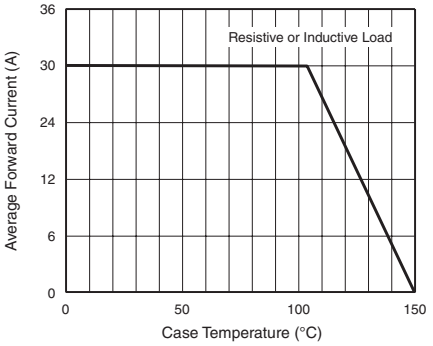


Figure 1. Forward Current Derating Curve

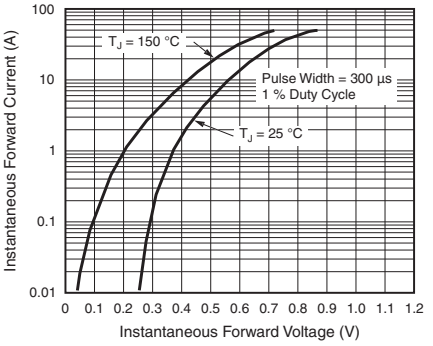


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

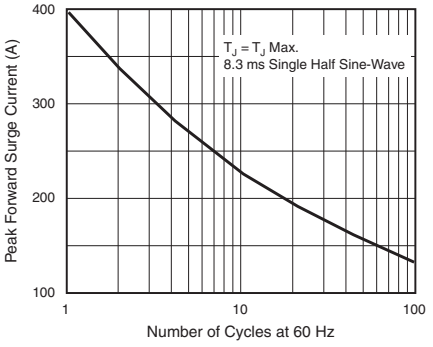


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

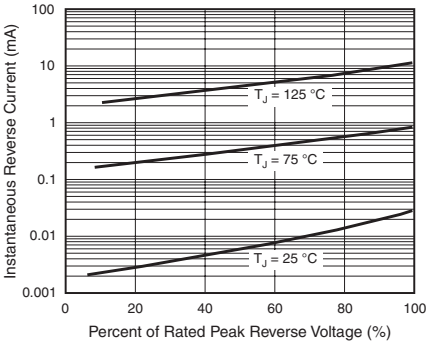


Figure 4. Typical Reverse Characteristics Per Diode

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Document Number: 88738
Revision: 07-May-08

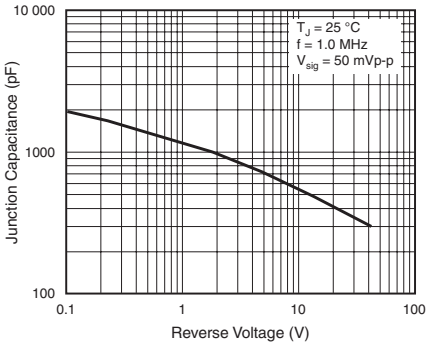


Figure 5. Typical Junction Capacitance Per Diode

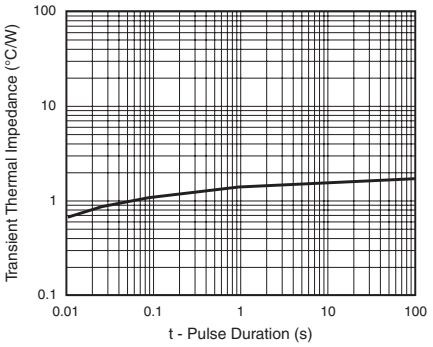
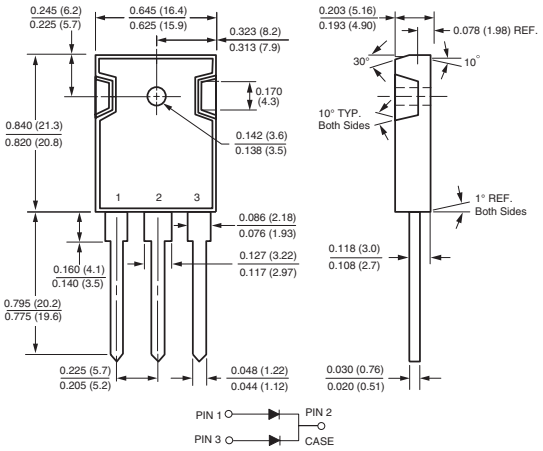


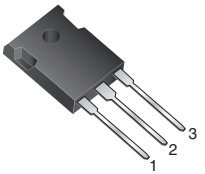
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



Dual Common-Cathode Schottky Rectifier



TO-247AD (TO-3P)

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
V_{RRM}	35 V to 60 V
I_{FSM}	400 A
V_F	0.60 V, 0.62 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR4035PT	MBR4045PT	MBR4050PT	MBR4060PT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Maximum working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current at T_C = 125 °C	$I_{F(AV)}$	40				A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	400				A
Peak repetitive reverse surge current per diode (1)	I_{RRM}	2.0		1.0		A
Voltage rate of change at (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 150				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C

Note:

(1) 2.0 µs pulse width, f = 1.0 kHz

For technical questions within your region, please contact one of the following:
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Document Number: 88679
Revision: 25-Mar-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	MBR4035PT	MBR4045PT	MBR4050PT	MBR4060PT	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A, I_F = 20 A, I_F = 40 A, I_F = 40 A,	T_C = 25 °C T_C = 125 °C T_C = 25 °C T_C = 125 °C	V_F	0.70 0.60 0.80 0.75		0.72 0.62 - -		V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 125 °C	I_R	1.0 100				mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR4035PT	MBR4045PT	MBR4050PT	MBR4060PT	UNIT
Maximum thermal resistance from junction to case per diode	$R_{\theta JC}$	1.2				°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-247AD	MBR4045PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

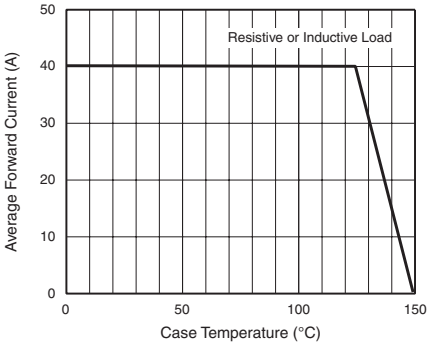


Figure 1. Forward Current Derating Curve

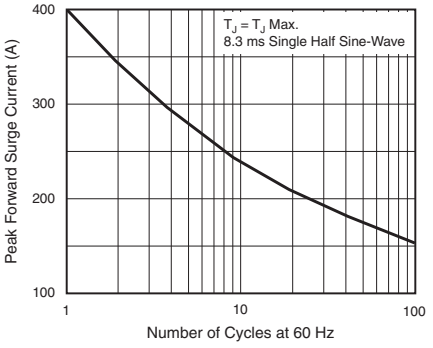


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

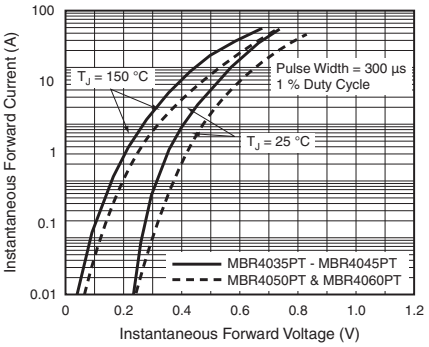


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

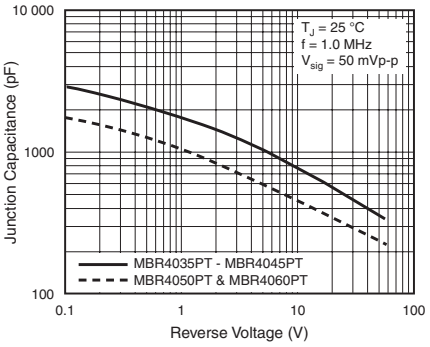


Figure 5. Typical Junction Capacitance Per Diode

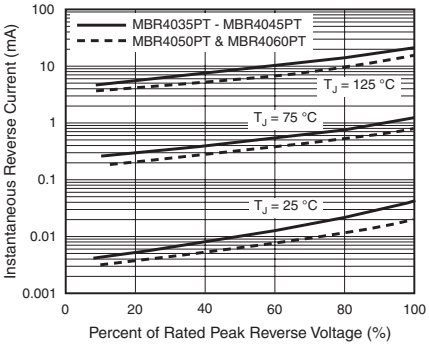


Figure 4. Typical Reverse Characteristics Per Diode

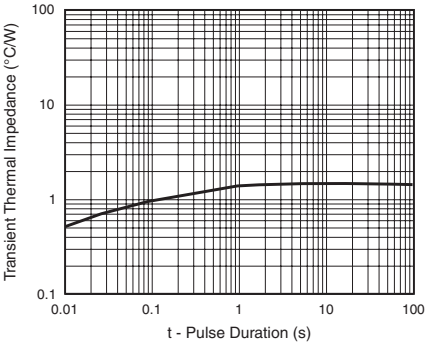
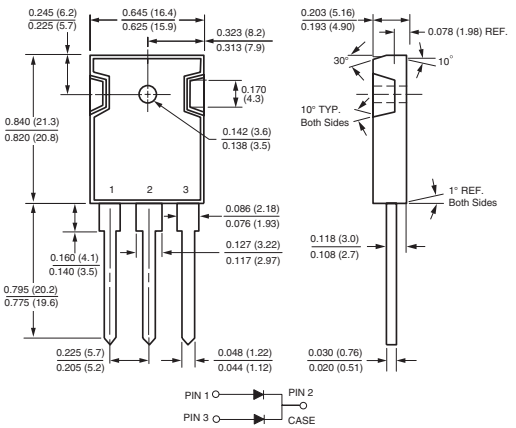


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

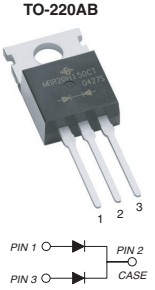
TO-247AD (TO-3P)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual Common-Cathode Schottky Rectifiers

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	35 V to 60 V
I_{FSM}	350 A, 320 A
V_F at I_F = 20 A	0.55 V, 0.60 V
I_R	100 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Mounting Torque: 10 in-lbs maximum

Polarity: As marked

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR40H35CT	MBR40H45CT	MBR40H50CT	MBR40H60CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	40 20				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	per diode	I_{FSM}	350		320		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0				A
Peak non-repetitive reverse surge energy (8/20 µs waveform)	per diode	E_{RSM}	20				mJ
Non-repetitive avalanche energy at 25 °C, I_{AS} = 3.0 A, L = 5 mH	per diode	E_{AS}	22.5				mJ
Voltage rate of change (rated V_R)		dV/dt	10 000				V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175				°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR40H35CT**	**MBR40H45CT**	**MBR40H50CT**	**MBR40H60CT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A I_F = 20 A I_F = 40 A I_F = 40 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.64 0.55 0.76 0.70		0.68 0.60 0.83 0.73		V
Maximum instantaneous reverse current per diode (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	100 15				µA mA
Typical junction capacitance	4.0 V, 1 MHz per diode		C_J	1200		920		pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR40H35CT**	**MBR40H45CT**	**MBR40H50CT**	**MBR40H60CT**	**UNIT**
Thermal resistance, junction to case per diode	$R_{\theta JC}$	1.8				°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR40H45CT-E3/45	1.58	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES
(T_A = 25 °C unless otherwise specified)

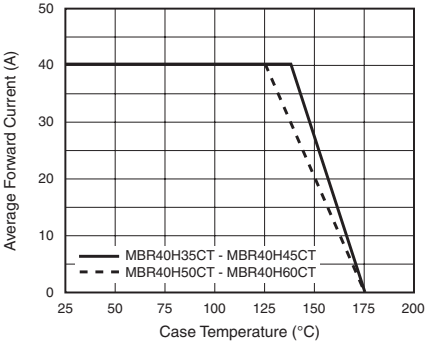


Figure 1. Forward Derating Curve Per Diode

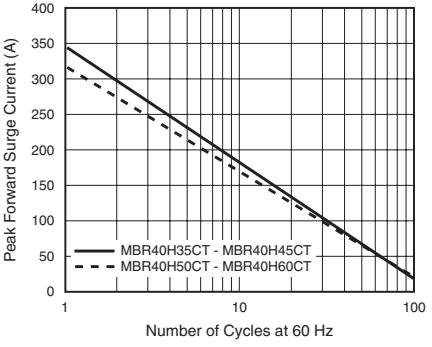


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

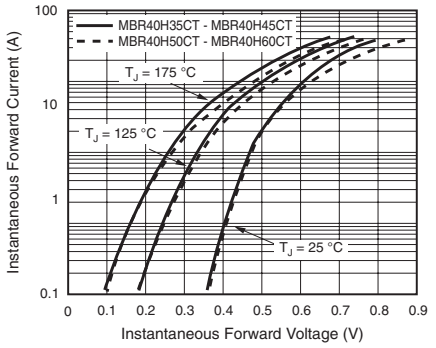


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

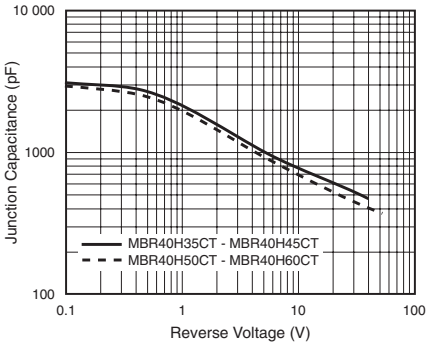


Figure 5. Typical Junction Capacitance Per Diode

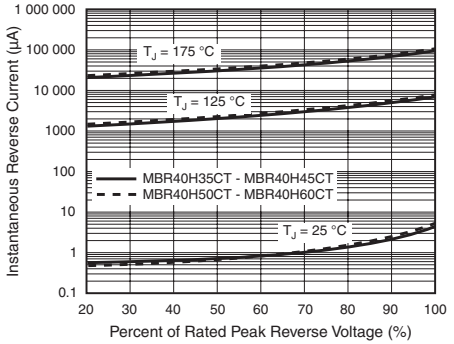


Figure 4. Typical Reverse Characteristics Per Diode

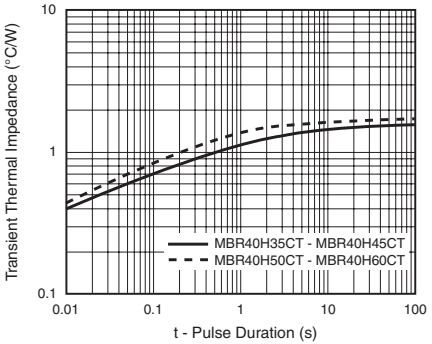
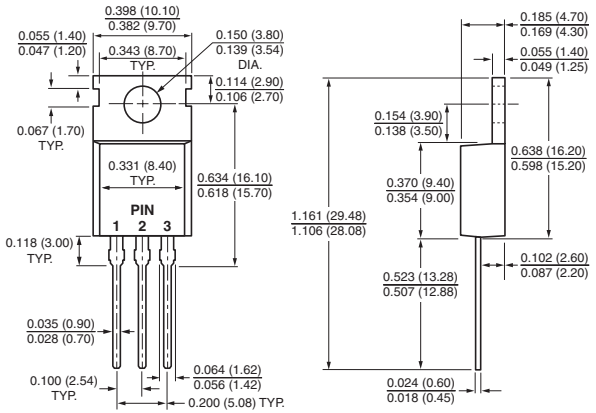


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

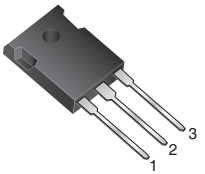


MBR40H35PT thru MBR40H60PT

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



TO-247AD (TO-3P)

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
V_{RRM}	35 V to 60 V
I_{FSM}	400 A
V_F	0.55 V, 0.60 V
T_J max.	175 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR40H35PT	MBR40H45PT	MBR40H50PT	MBR40H60PT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Maximum working peak reverse voltage	V_{RWM}	35	45	50	60	V
Maximum DC blocking voltage	V_{DC}	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	40				A
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 4 A, L = 10 mH	E_{AS}	80				mJ
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	400				A
Peak repetitive reverse surge current per diode (1)	I_{RRM}	2.0		1.0		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	30		25		mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change at (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	- 65 to + 175				°C
Storage temperature range	T_{STG}	- 65 to + 175				°C

Note:

(1) 2.0 µs pulse width, f = 1.0 kHz

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88794
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR40H35PT MBR40H45PT**		**MBR40H50PT MBR40H60PT**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A I_F = 20 A I_F = 40 A I_F = 40 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J =125 °C	V_F	- 0.49 - 0.62	0.63 0.55 0.73 0.66	- 0.56 - 0.68	0.69 0.60 0.83 0.72	V
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C T_J = 125 °C	I_R	- 9.0	150 25	- 6.0	150 25	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**MBR40H35PT**	**MBR40H45PT**	**MBR40H50PT**	**MBR40H60PT**	**UNIT**
Thermal resistance, junction to case per diode	$R_{\theta JC}$	1.2				°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD	MBR40H45PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

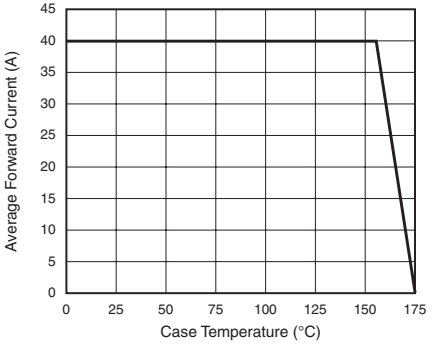


Figure 1. Forward Current Derating Curve

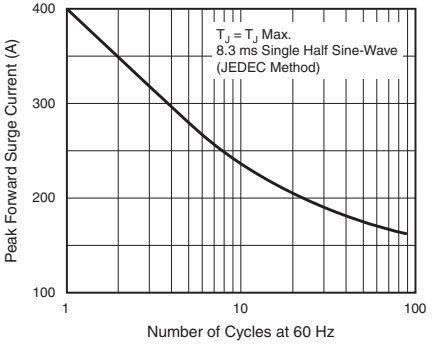


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

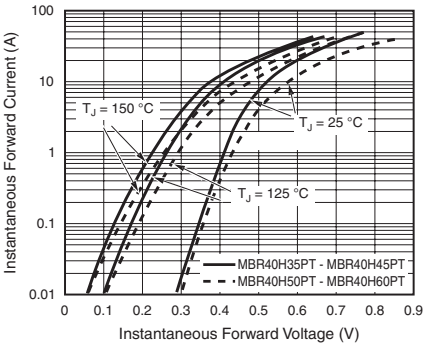


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

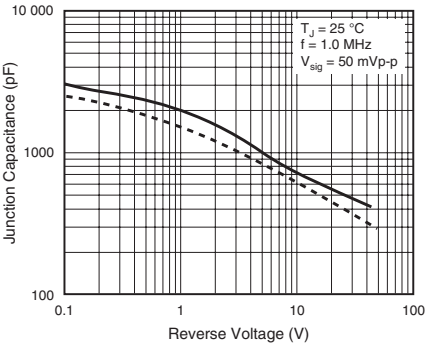


Figure 5. Typical Junction Capacitance Per Diode

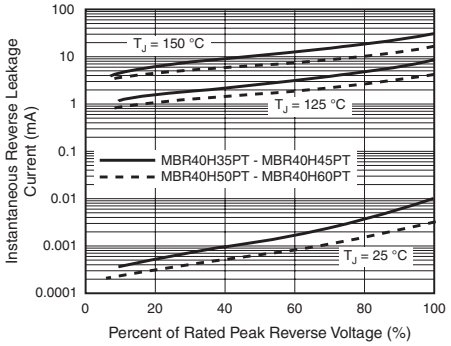


Figure 4. Typical Reverse Characteristics Per Diode

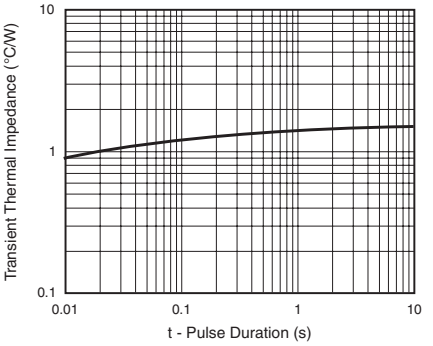
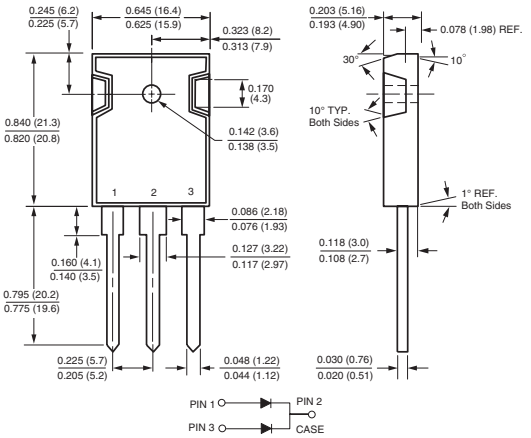


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



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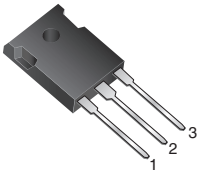
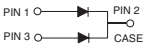
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88794
Revision: 19-May-08

Dual Common-Cathode Schottky Rectifier



TO-247AD (TO-3P)



FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
V_{RRM}	30 V, 40 V
I_{FSM}	400 A
V_F	0.50 V
T_J max.	125 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBL4030PT	SBL4040PT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	30	40	V
Maximum working peak reverse voltage	V_{RWM}	21	28	V
Maximum DC blocking voltage	V_{DC}	30	40	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	40		A
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	400		A
Peak repetitive reverse surge current per diode (1)	I_{RRM}	2.0		A
Voltage rate of change at (rated V_R)	dV/dt	1000		V/µs
Operating junction storage temperature range	T_J, T_{STG}	- 40 to + 125		°C

Note:

(1) 2.0 µs pulse width, f = 1.0 kHz

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	SBL4030PT	SBL4040PT	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A, I_F = 20 A,	T_C = 25 °C T_C = 100 °C	V_F	0.58 0.50		V
Maximum instantaneous reverse current at rated DC blocking voltage per diode (1)		T_C = 25 °C T_C = 100 °C	I_R	10 100		mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	SBL4030PT	SBL4040PT	UNIT
Thermal resistance from junction to case per diode	$R_{\theta JC}$	1.2		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-247AD	SBL4030PT-E3/45	6.13	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

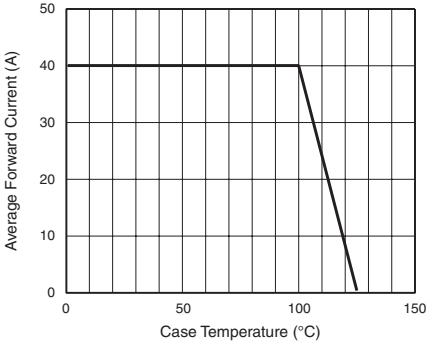


Figure 1. Forward Current Derating Curve

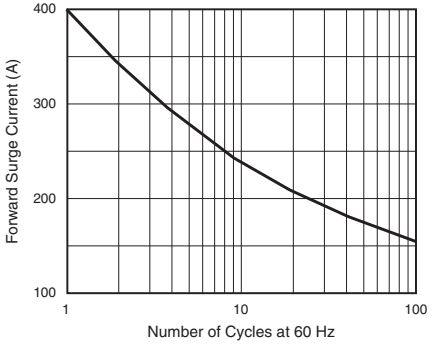


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

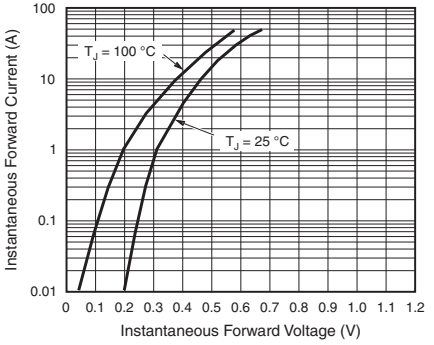


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

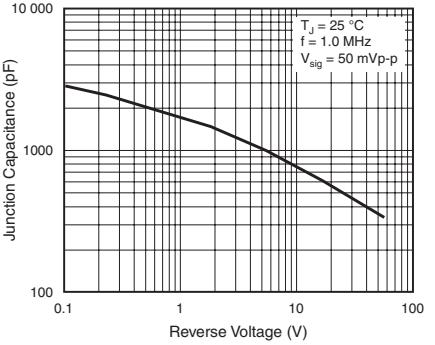


Figure 5. Typical Junction Capacitance Per Diode

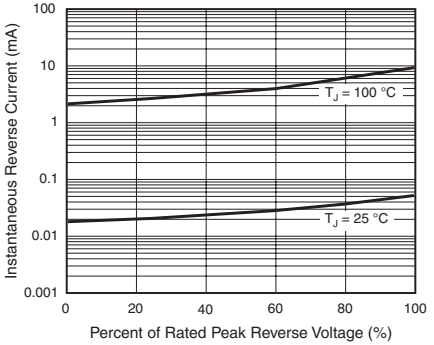


Figure 4. Typical Reverse Characteristics Per Diode

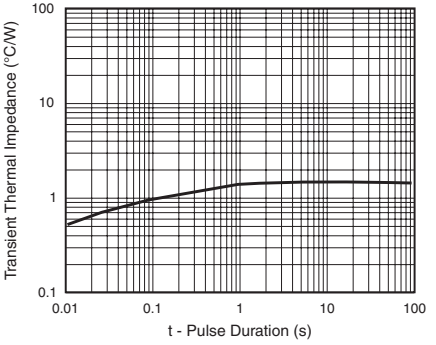
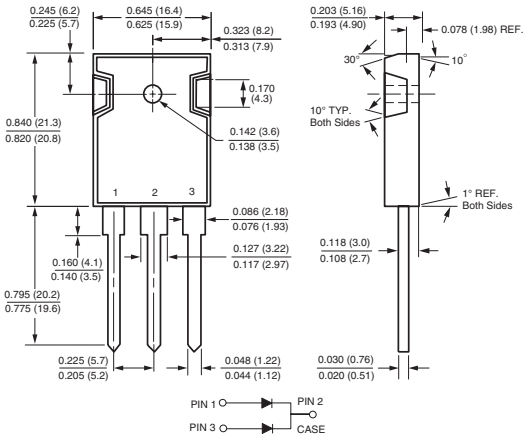


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

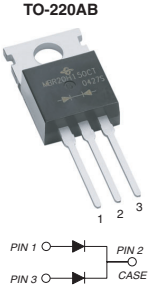
TO-247AD (TO-3P)



MBR60100CT

Vishay General Semiconductor

Dual Common-Cathode High Voltage Schottky Rectifier



FEATURES

- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	100 V
I_{FSM}	350 A
V_F at I_F = 30 A	0.64 V
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MBR60100CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Working peak reverse voltage		V_{RWM}	100	V
Maximum DC blocking voltage		V_{DC}	100	V
Maximum average forward rectified current	total device per diode	$I_{F(AV)}$	60 30	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	350	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Peak non-repetitive reverse surge energy per diode (8/20 µs waveform)		E_{RSM}	25	mJ
Non-repetitive avalanche energy per diode at 25 °C, I_{AS} = 1.0 A, L = 40 mH		E_{AS}	20	mJ
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88892
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 30 A I_F = 60 A	T_J = 25 °C	V_F	0.78 0.92	0.82 1.0	V
	I_F = 30 A I_F = 60 A	T_J = 125 °C		0.64 0.78	0.69 0.83	
Reverse current per diode (2)	V_R = 100 V	T_J = 25 °C T_J = 125 °C	I_R	8.0 8.5	100 20	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**MBR60100CT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	0.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR60100CT-E3/45	2.068	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

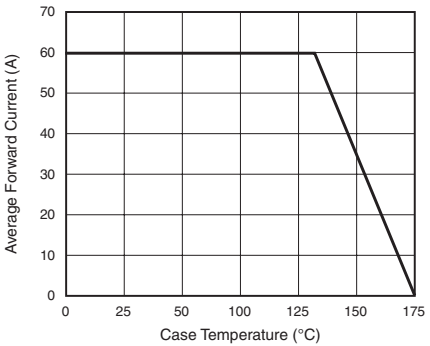


Figure 1. Forward Derating Curve

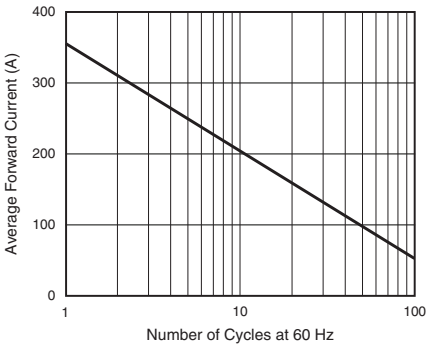


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

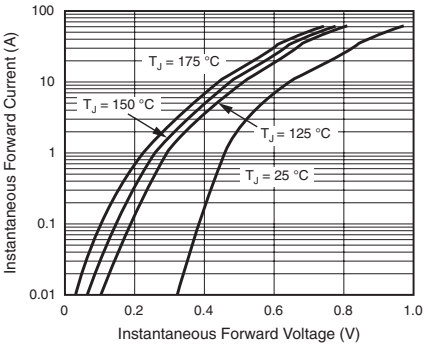


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

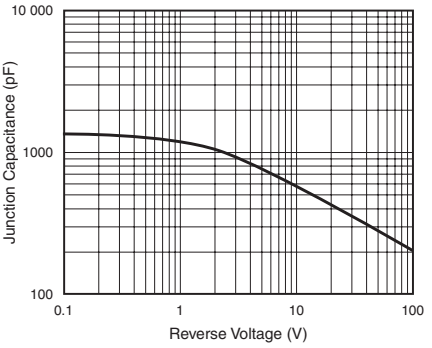


Figure 5. Typical Junction Capacitance Per Diode

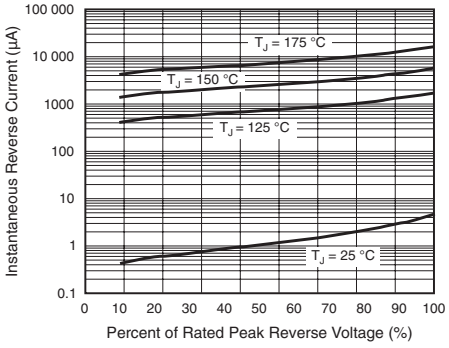


Figure 4. Typical Reverse Characteristics Per Diode

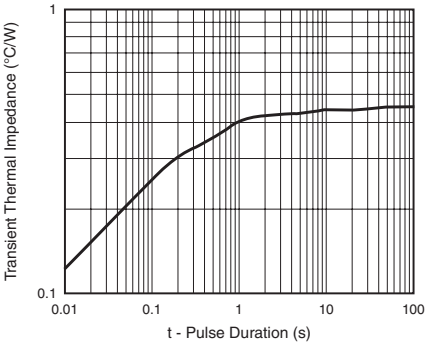
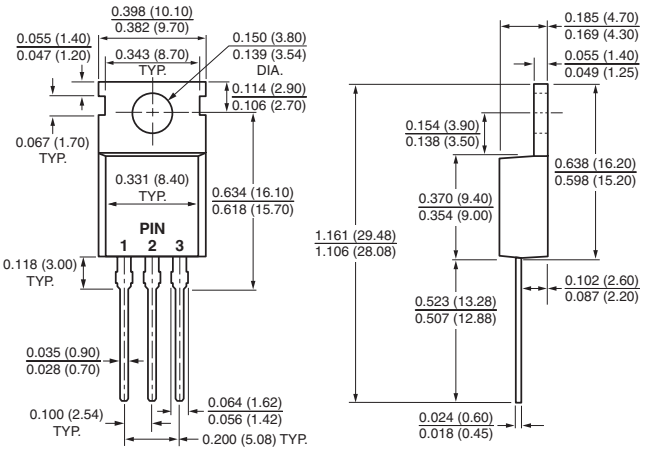


Figure 6. Typical Transient Thermal Impedance Per Diode

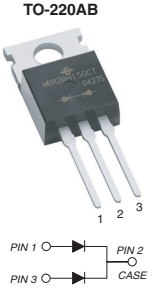
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual Common-Cathode Schottky Rectifier



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	35 V to 60 V
I_{FSM}	320 A
V_F	0.51 V, 0.56 V
T_J max.	150 °C

FEATURES

- Guarding for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, oring diodes, dc-to-dc converters or polarity protection applications.

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	M6035C	M6045C	M6060C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	35	45	60	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	60 30			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	320			A
Peak repetitive reverse current at t_p = 2.0 µs, 1 kHz per diode		I_{RRM}	1.0			A
Voltage rate of change (rated V_R)		dV/dt	10 000			V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITION		SYMBOL	M6035C	M6045C	M6060C		UNIT
				TYP.	MAX.	TYP.	MAX.	
Instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 20 A I_F = 30 A	T_J = 25 °C	V_F	0.42 0.49 0.55	- - 0.61	0.43 0.52 0.59	- - 0.65	V
	I_F = 10 A I_F = 20 A I_F = 30 A	T_J = 125 °C		0.31 0.42 0.51	- - 0.56	0.33 0.47 0.56	- - 0.61	
Reverse current per diode (2)	V_R	T_J = 25 °C T_J = 125 °C	I_R	140 106	700 175	180 140	700 175	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	1170	-	970	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**M6035C**	**M6045C**	**M6060C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0			°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
M6045C-E3/45	2.068	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

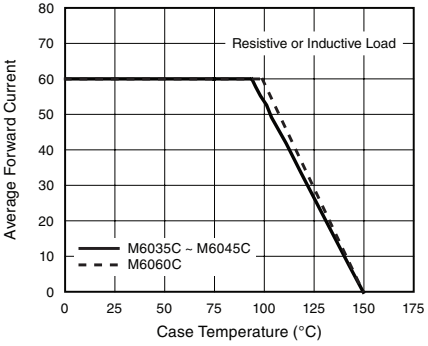


Figure 1. Maximum Forward Current Derating Curve

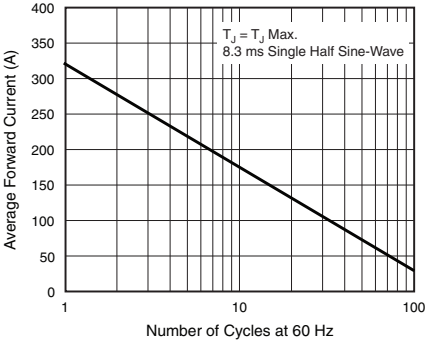


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

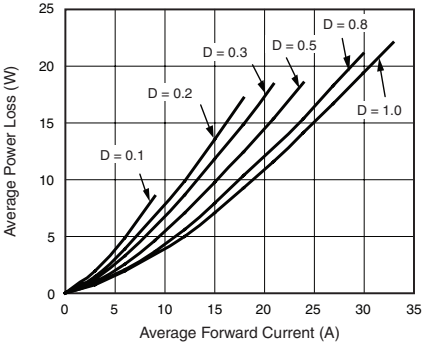


Figure 2. Forward Power Loss Characteristics Per Diode

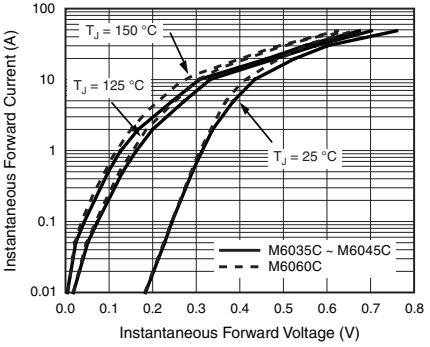


Figure 4. Typical Instantaneous Forward Characteristics Per Diode

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PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

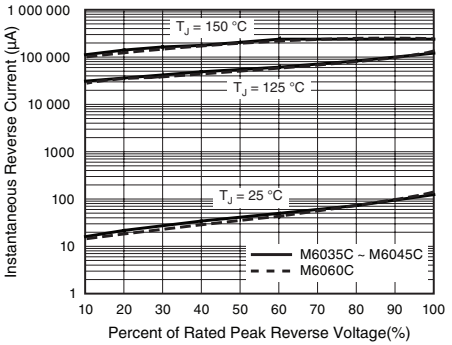


Figure 5. Typical Reverse Characteristics Per Diode

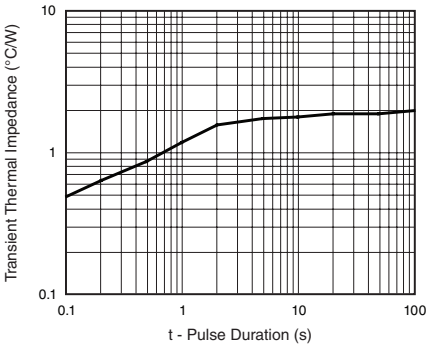


Figure 7. Typical Transient Thermal Impedance Per Diode

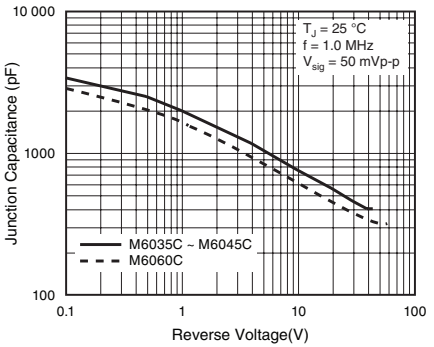
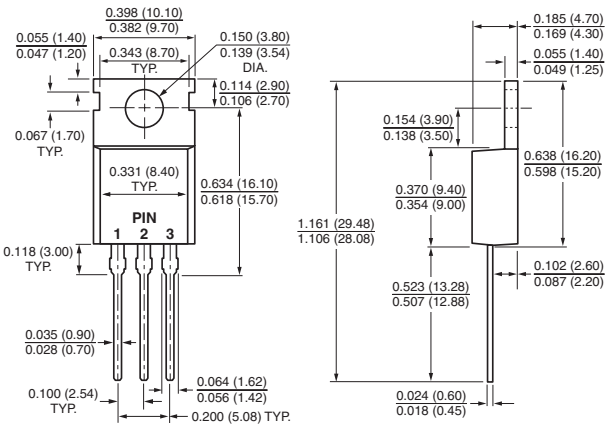


Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

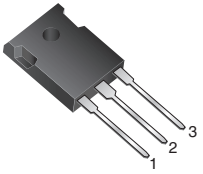
TO-220AB



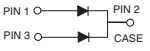
M6035P thru M6060P

Vishay General Semiconductor

Dual Common-Cathode Schottky Rectifier



TO-247AD (TO-3P)



FEATURES

- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	35 V, 45 V, 60 V
I_{FSM}	350 A
V_F at I_F = 30 A	0.50 V, 0.56 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	M6035P	M6045P	M6060P	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	60	V
Maximum average forward rectified current (Fig. 1) total device per diode	$I_{F(AV)}$	60 30			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	350			A
Peak repetitive reverse current at t_p = 2 µs, 1 kHz per diode	I_{RRM}	2.0			A
Voltage rate of change (rated V_R)	dV/dt	10 000			V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150			°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88980
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**M6035P**	**M6045P**	**M6060P**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 20 A I_F = 30 A	T_J = 25 °C	V_F	0.42 0.49 0.54	- - 0.60	0.43 0.52 0.59	- - 0.64	V
	I_F = 10 A I_F = 20 A I_F = 30 A	T_J = 125 °C		0.31 0.42 0.50	- - 0.55	0.33 0.47 0.56	- - 0.60	
Reverse current per diode (2)	V_R	T_J = 25 °C T_J = 125 °C	I_R	135 110	600 160	240 140	600 160	µA mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	1150	-	1090	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**M6035P**	**M6045P**	**M6060P**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0			°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
M6045P-E3/45	6.14	45	30/tube	Tube
M6060P-E3/45	6.14	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

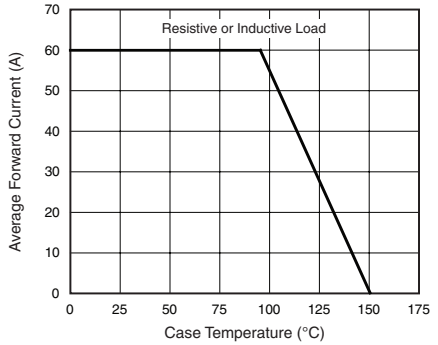


Figure 1. Forward Current Derating Curve

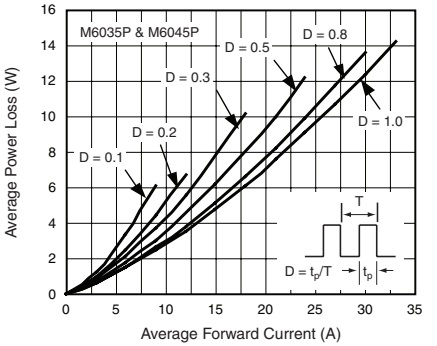


Figure 2. Forward Power Loss Characteristics Per Diode

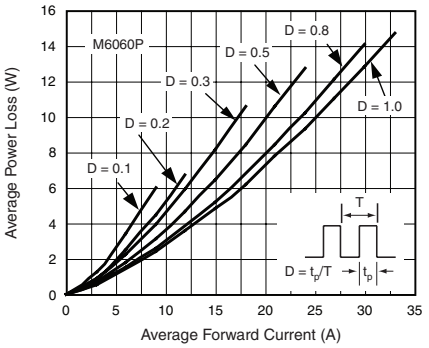


Figure 3. Forward Power Loss Characteristics Per Diode

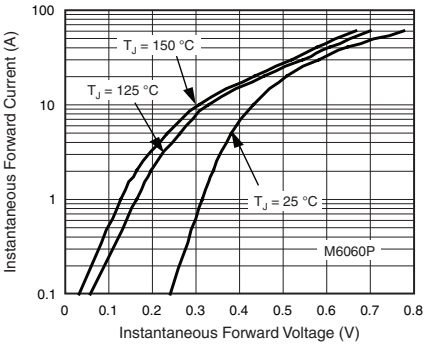


Figure 6. Typical Instantaneous Forward Characteristics Per Diode

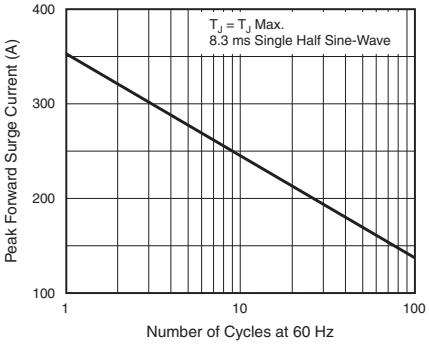


Figure 4. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

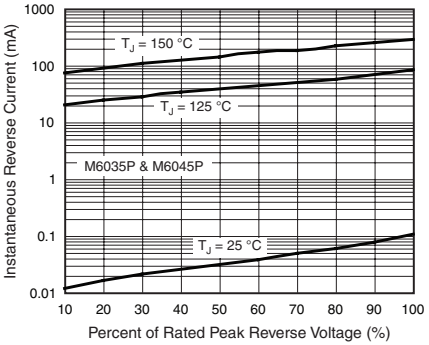


Figure 7. Typical Reverse Characteristics Per Diode

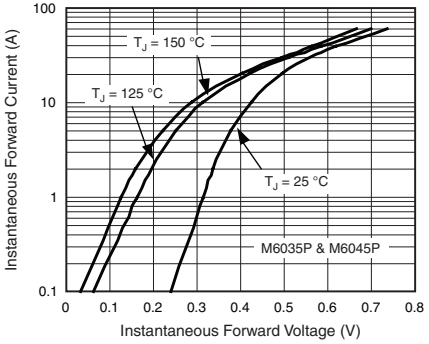


Figure 5. Typical Instantaneous Forward Characteristics Per Diode

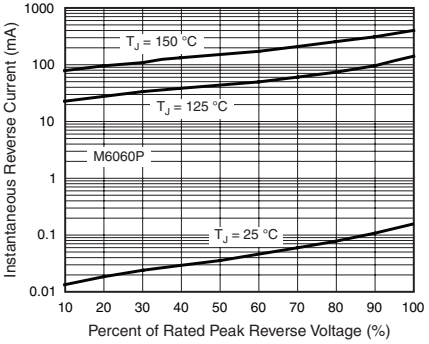


Figure 8. Typical Reverse Characteristics Per Diode

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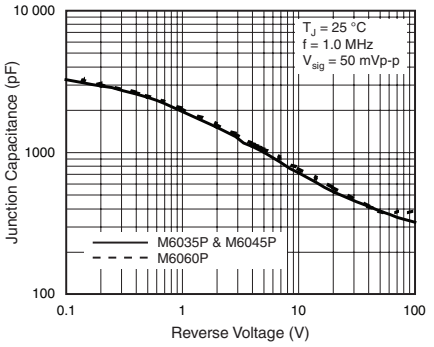


Figure 9. Typical Junction Capacitance Per Diode

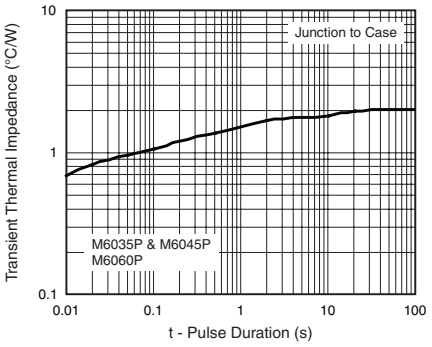
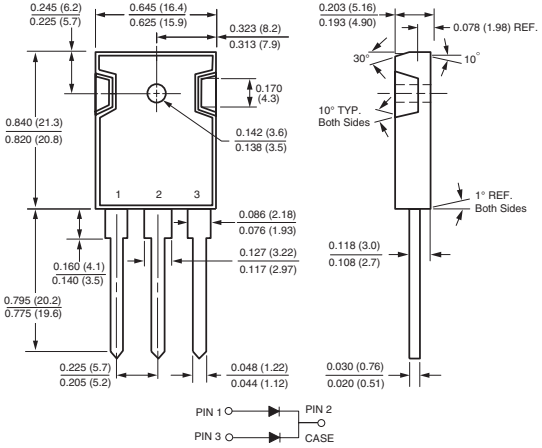


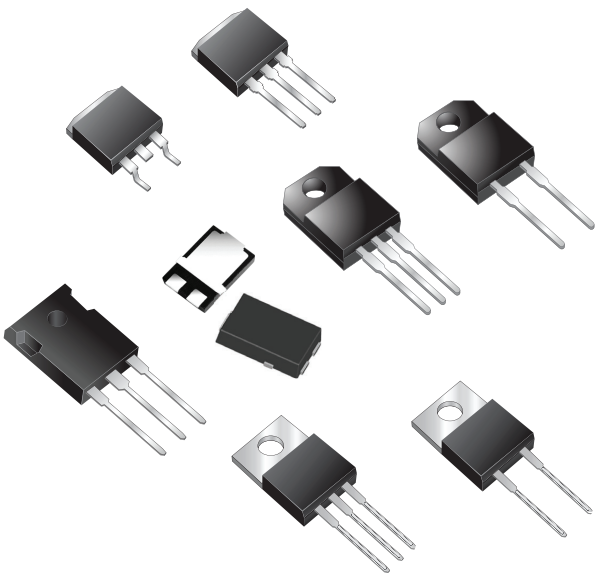
Figure 10. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



TMBS® (Trench MOS Barrier Schottky) Rectifiers



Contents

(for full listing please see Selector Guide on page 24)

Introduction to TMBS® Rectifiers

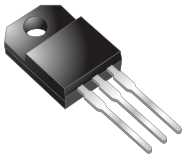
Vishay General Semiconductor

The TMBS® series is Vishay General Semiconductor's patented new Trench MOS Barrier Schottky rectifier product series. TMBS® products are optimized with power ratings selections from 100 V, 120 V, 150 V up to 200 V for different power conversion system requirements.

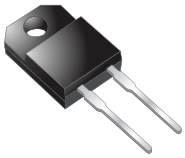
With extremely low V_F and superior switching performance, TMBS® series reduce power loss and improve the efficiency of switch-mode power supplies and OR-ing diodes. To lower costs by reducing the component count and saving board space, the rectifiers can be used as alternatives to synchronous rectification solutions while matching their efficiency and thermal performance.

The TMBS® series is offered in TO-220AB, ITO-220AB, TO-263AB, SMPC, TO-262AA, ITO-220AC, TO-247AD packages.

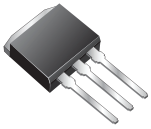
The devices are optimized for consumer and computer applications, including high-power, high-efficiency telecom base station power supplies; OR-ing diodes for redundant switch-mode power supplies in servers and industrial PCs; secondary rectification circuits for switch-mode power supply adaptors in desktop PCs, servers, and notebook PCs; and adaptors for high-power plasma display panels (PDP) TVs, LCD TVs, and LCD monitors.



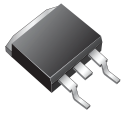
ITO-220AB



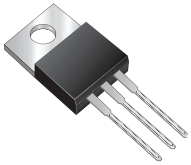
ITO-220AC



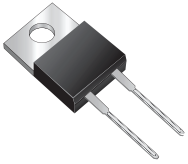
TO-262AA



TO-263AB

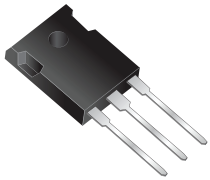


TO-220AB



TO-220AC

TO-277A (SMPC)



TO-247AD

For technical questions within your region, please contact:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89088
Revision: 30-Jun-08

Trench MOS Schottky Rectifiers Part Numbering System

1. SURFACE MOUNT

SMD

VxxPyy

V = Vishay Trench MOS Schottky
xx = Forward current (in A)
P = SMPC
yy = Reverse voltage (in V)
10 = 100 V
12 = 120 V

2. POWER PACKAGES

Vaxxyyypp

V = Vishay Trench MOS Schottky
a = Package classification
B = TO-263
"blank" = TO-220
F = ITO-220
I = TO-262
xx = Forward current (in A)
yyy = Reverse voltage (in V)
pp = Package type
C or G = Center tap TO-220AB, ITO-220AB, TO-263AB and TO-262AA (dual dice)
S or SG = Center tap TO-220AB, ITO-220AB, TO-263AB or TO-262AA (single die)
P or PG = Center tap TO-247AD

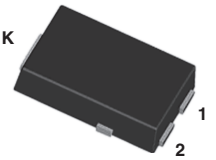
V8P10

Vishay General Semiconductor

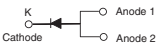
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.466 V at I_F = 4 A

TMBS® eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	100 V
I_{FSM}	150 A
E_{AS}	100 mJ
V_F at I_F = 8 A	0.582 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V8P10**	**UNIT**
Device marking code		V810	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	8.0	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150	A
Non-repetitive avalanche energy at I_{AS} = 2.0 A, T_J = 25 °C	E_{AS}	100	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89005
Revision: 30-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 4 A I_F = 8 A	T_A = 25 °C	V_F	0.522 0.643	- 0.68	V
	I_F = 4 A I_F = 8 A	T_A = 125 °C		0.466 0.582	- 0.62	
Reverse current (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	4.7 3.0	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		14.5 7.0	70 15	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V8P10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3	°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V8P10-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V8P10-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V8P10HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V8P10HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
V8P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V8P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V8P10HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V8P10HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

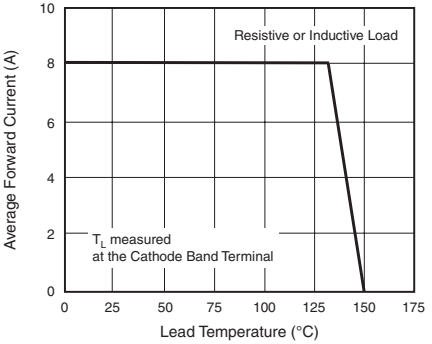


Figure 1. Maximum Forward Current Derating Curve

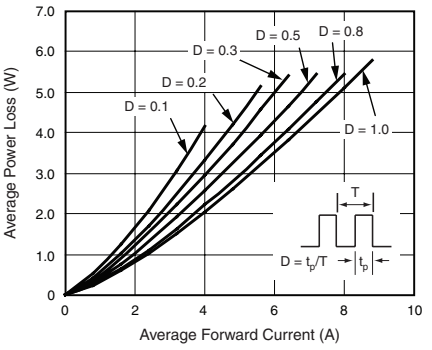


Figure 2. Forward Power Loss Characteristics

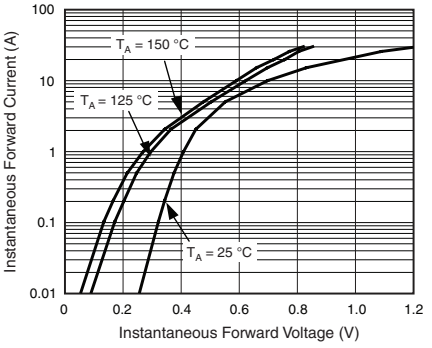


Figure 3. Typical Instantaneous Forward Characteristics

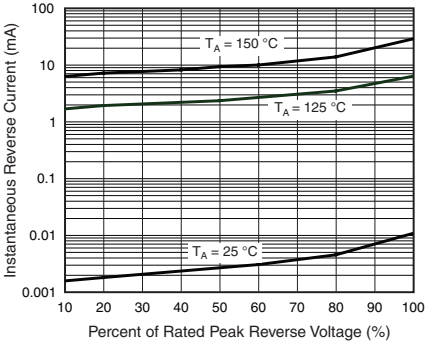


Figure 4. Typical Reverse Characteristics

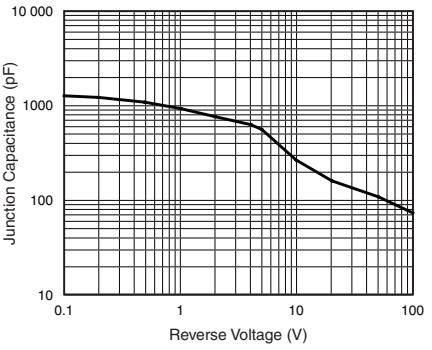


Figure 5. Typical Junction Capacitance

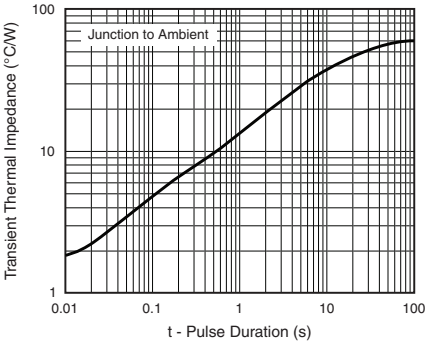
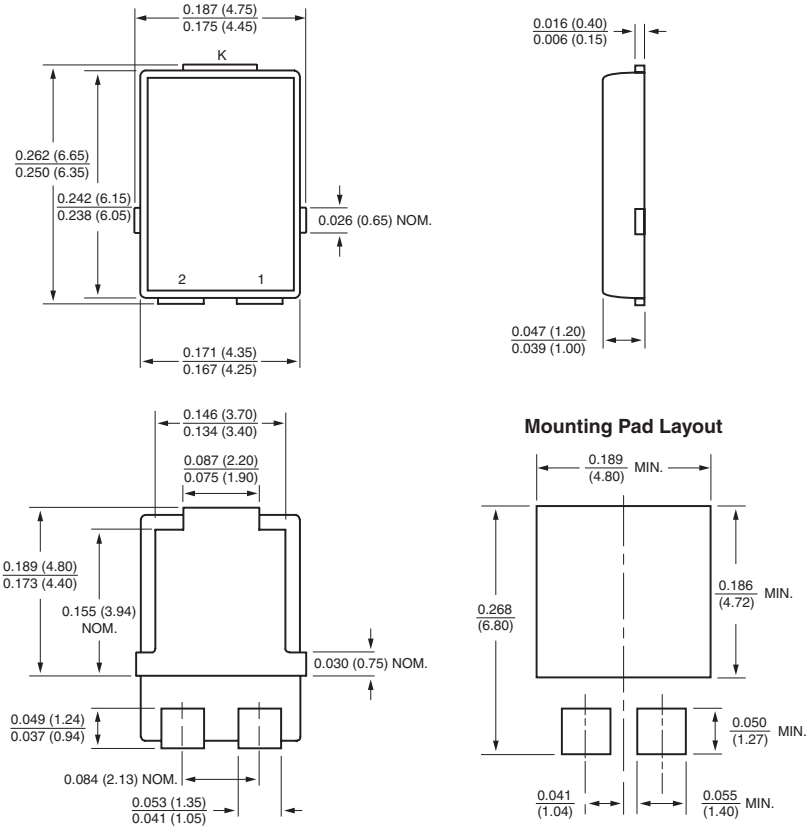


Figure 6. Typical Transient Thermal Impedance

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

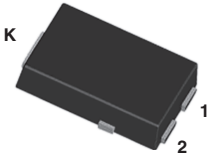
V10P10

Vishay General Semiconductor

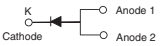
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.453 V at I_F = 5 A

TMBS® eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	100 V
I_{FSM}	180 A
E_{AS}	100 mJ
V_F at I_F = 10 A	0.574 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V10P10**	**UNIT**
Device marking code		V1010	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	180	A
Non-repetitive avalanche energy at I_{AS} = 2.0 A, T_J = 25 °C	E_{AS}	100	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89006
Revision: 30-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.512 0.625	- 0.68	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.453 0.574	- 0.62	
Reverse current (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	7.1 4.5	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		30.4 10.4	150 20	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V10P10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3	°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V10P10-E3/86A	0.10	86A	1500	7" diameter nplastic tape and reel
V10P10-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V10P10HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V10P10HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
V10P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V10P10HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V10P10HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

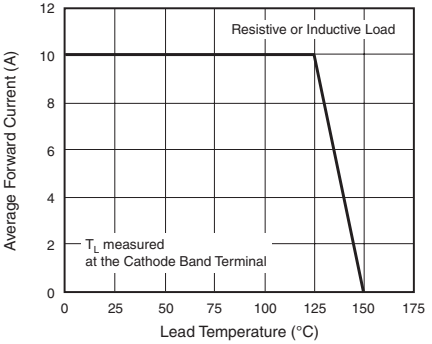


Figure 1. Maximum Forward Current Derating Curve

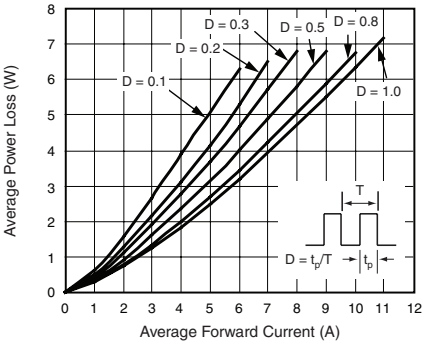


Figure 2. Forward Power Loss Characteristics

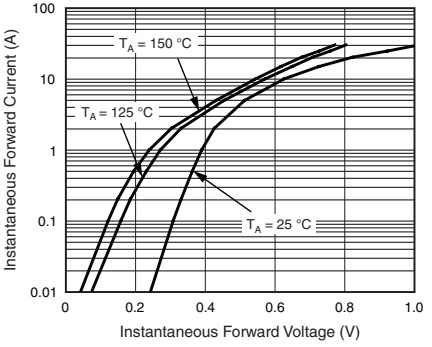


Figure 3. Typical Instantaneous Forward Characteristics

Figure 1. Maximum Forward Current Derating Curve

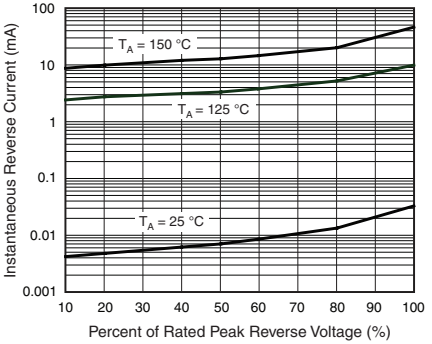


Figure 4. Typical Reverse Characteristics

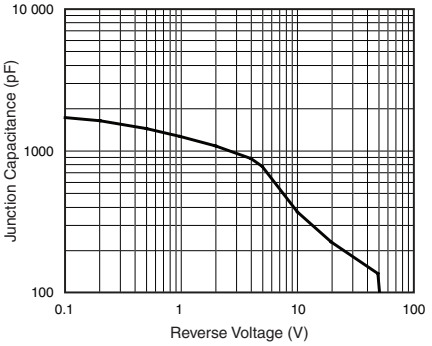


Figure 5. Typical Junction Capacitance

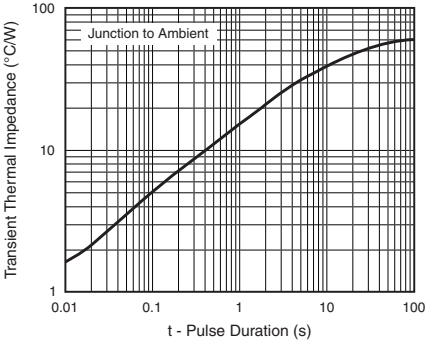
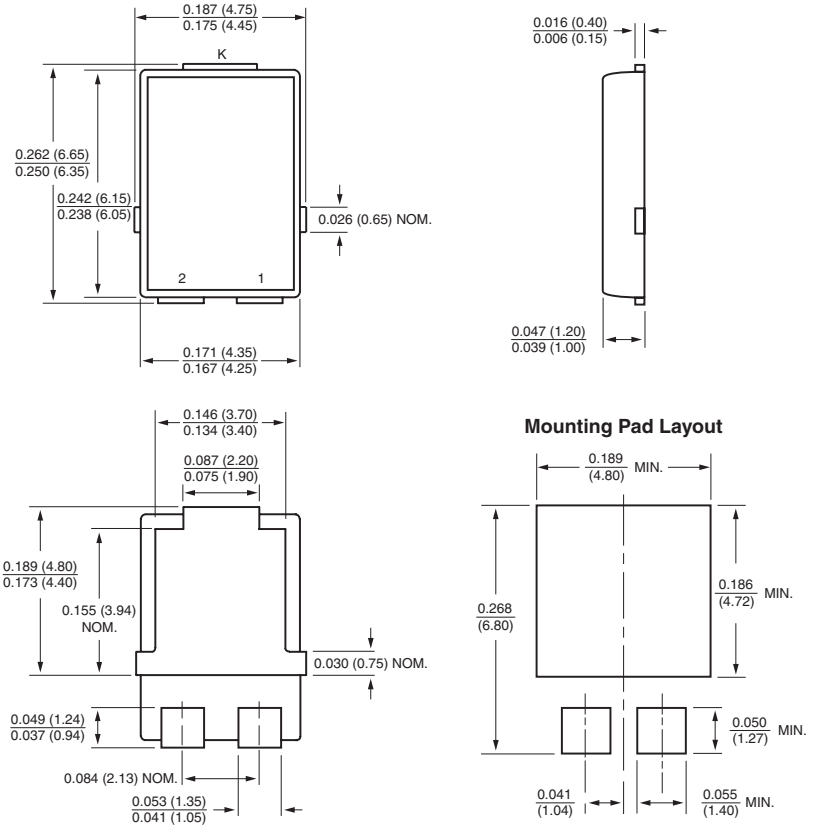


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (milliüdmeters)

TO-277A (SMPC)

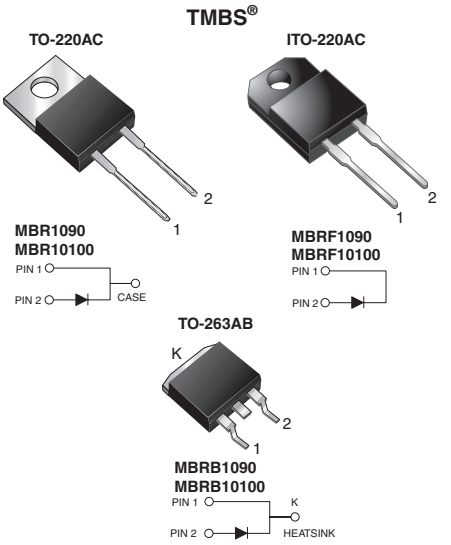


Conform to JEDEC TO-277A

MBR(F,B)1090 & MBR(F,B)10100

Vishay General Semiconductor

High-Voltage Schottky Rectifier



FEATURES

- Trench MOS Schottky technology
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	90 V, 100 V
I_{FSM}	150 A
V_F	0.65 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MBR1090**	**MBR10100**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 133 °C	$I_{F(AV)}$	10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150		A
Peak repetitive reverse current at t_p = 2 µs, 1 kHz	I_{RRM}	0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150		°C
Isolation voltage (ITO-220AC only) From terminal to heatsink t = 1 min	V_{AC}	1500		V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89034
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 10 A I_F = 10 A I_F = 20 A	T_C = 25 °C T_C = 125 °C T_C = 125 °C	V_F	0.80 0.65 0.75	V
Maximum reverse current at working peak reverse voltage (2)		T_J = 25 °C T_J = 100 °C	I_R	100 6.0	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	60 2.0	- 3.5	60 2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR10100-E3/4W	1.845	4W	50/tube	Tube
ITO-220AC	MBRF10100-E3/4W	1.661	4W	50/tube	Tube
TO-263AB	MBRB10100-E3/4W	1.384	4W	50/tube	Tube
TO-263AB	MBRB10100-E3/8W	1.384	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

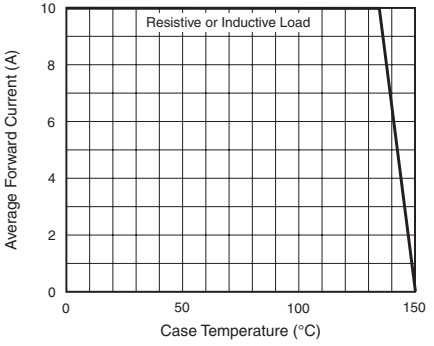


Figure 1. Forward Current Derating Curve

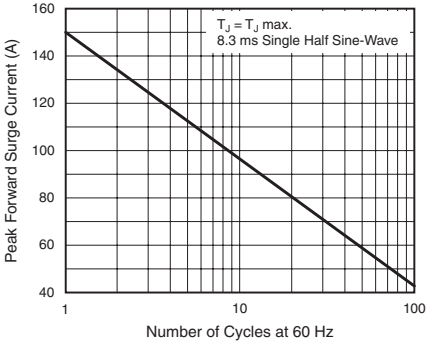


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

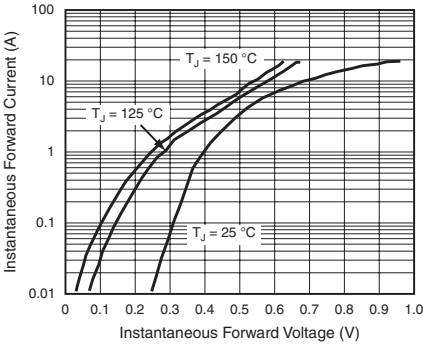


Figure 3. Typical Instantaneous Forward Characteristics

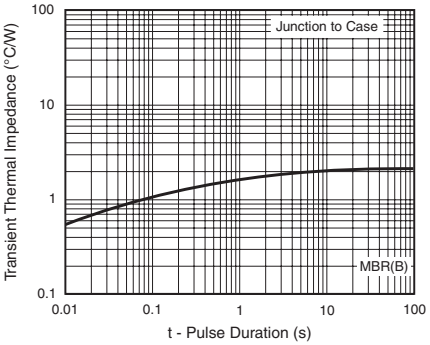


Figure 6. Typical Transient Thermal Impedance

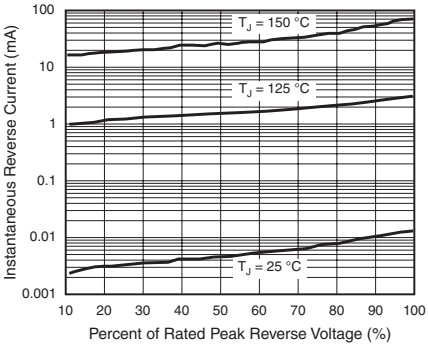


Figure 4. Typical Reverse Characteristics

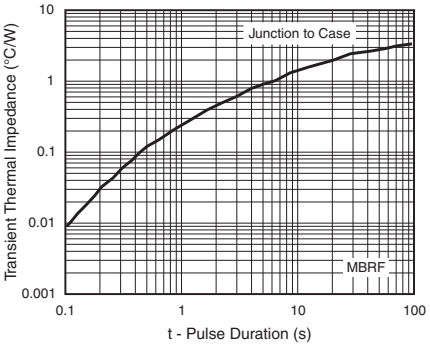


Figure 7. Typical Transient Thermal Impedance

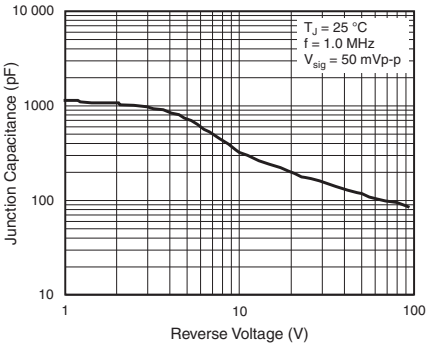
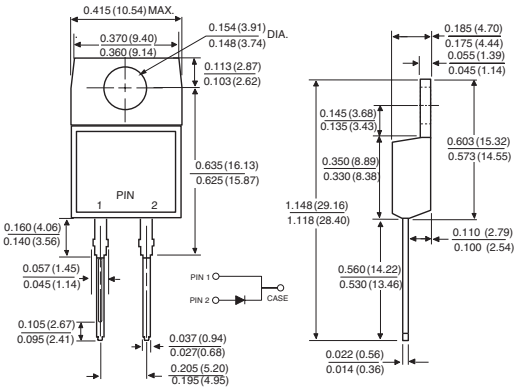


Figure 5. Typical Junction Capacitance

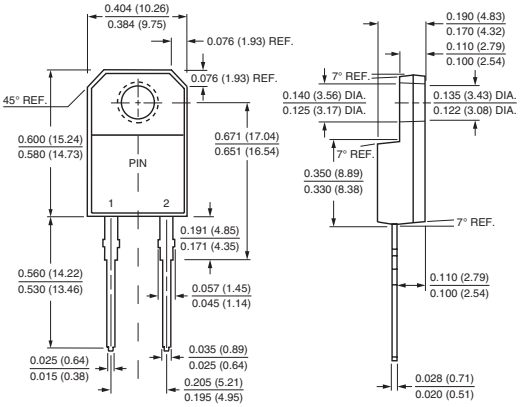
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

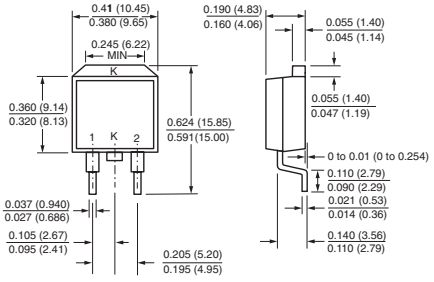
TO-220AC



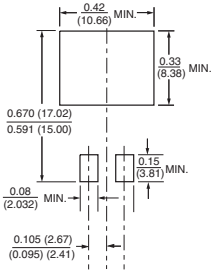
ITO-220AC



TO-263AB



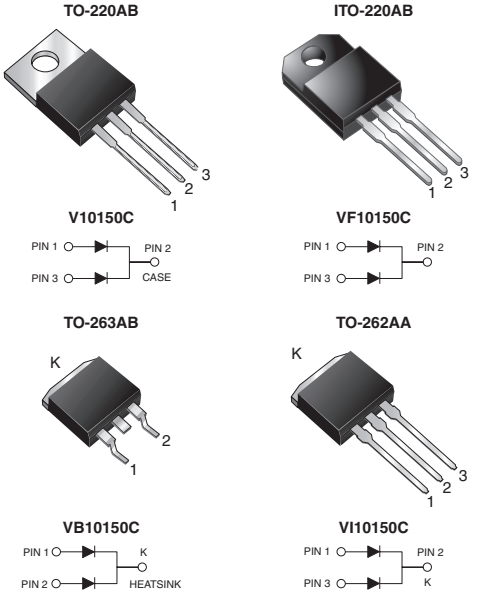
Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.63 V at I_F = 3 A

TMBS®



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	150 V
I_{FSM}	60 A
V_F at I_F = 5 A	0.69 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V10150C**	**VF10150C**	**VB10150C**	**VI10150C**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	150				V
Maximum average forward rectified current (Fig. 1) per device per diode	$I_{F(AV)}$	10 5.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	60				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89068
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	150 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 3 A I_F = 5 A	T_A = 25 °C	V_F	0.82 0.99	- 1.41	V
	I_F = 3 A I_F = 5 A	T_A = 125 °C		0.63 0.69	- 0.75	
Reverse current per diode (2)	V_R = 100 V	T_A = 25 °C T_A = 125 °C	I_R	0.5 0.5	- -	µA mA
	V_R = 150 V	T_A = 25 °C T_A = 125 °C		- 1.0	100 10	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V10150C**	**VF10150C**	**VB10150C**	**VI10150C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	4.0	6.5	4.0	4.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V10150C-E3/4W	1.87	4W	50/tube	Tube
ITO-220AB	VF10150C-E3/4W	1.74	4W	50/tube	Tube
TO-263AB	VB10150C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB10150C-E3/8W	1.38	8W	800/reel	Tape and reel
TO-262AA	VI10150C-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

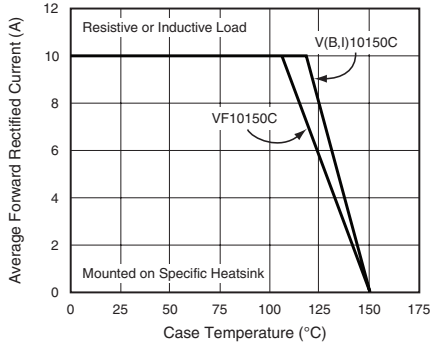


Figure 1. Maximum Forward Current Derating Curve

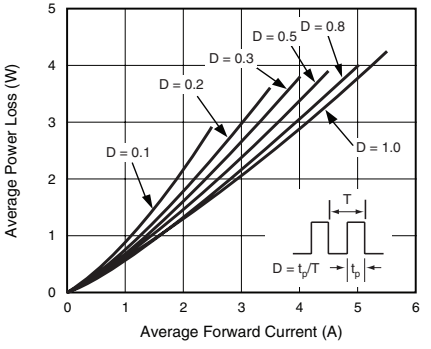


Figure 2. Forward Power Loss Characteristics Per Diode

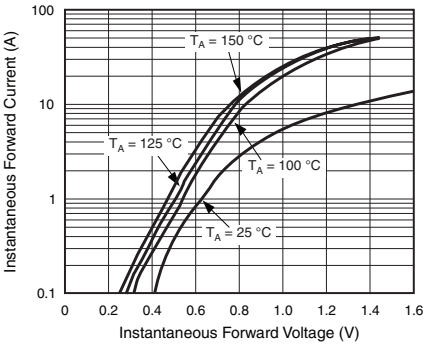


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

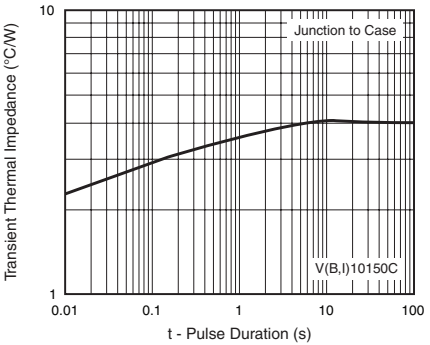


Figure 6. Typical Transient Thermal Impedance Per Diode

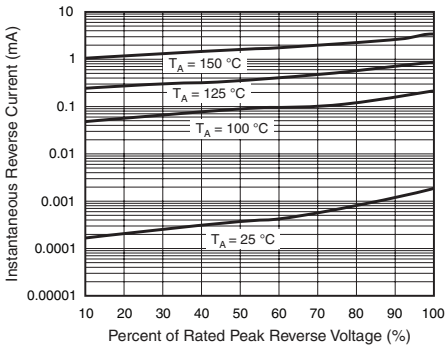


Figure 4. Typical Reverse Characteristics Per Diode

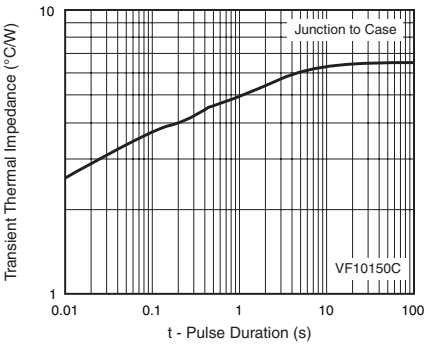


Figure 7. Typical Transient Thermal Impedance Per Diode

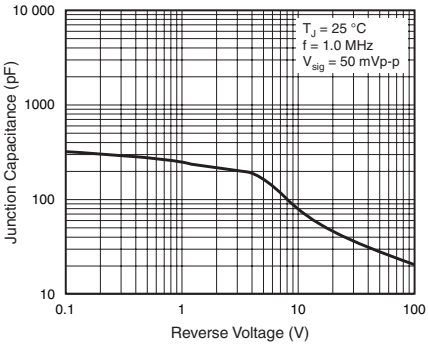
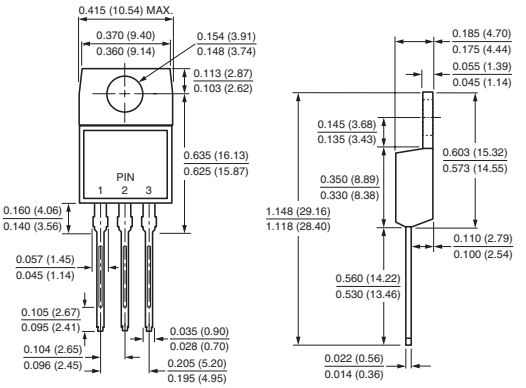


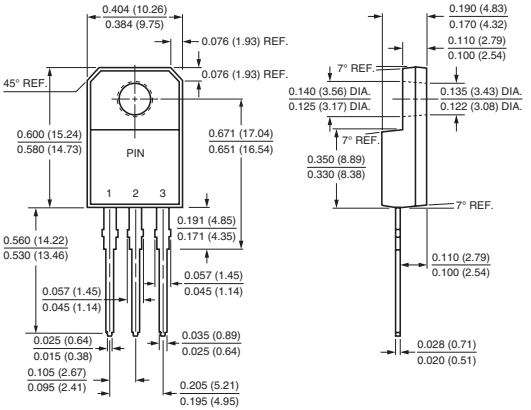
Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

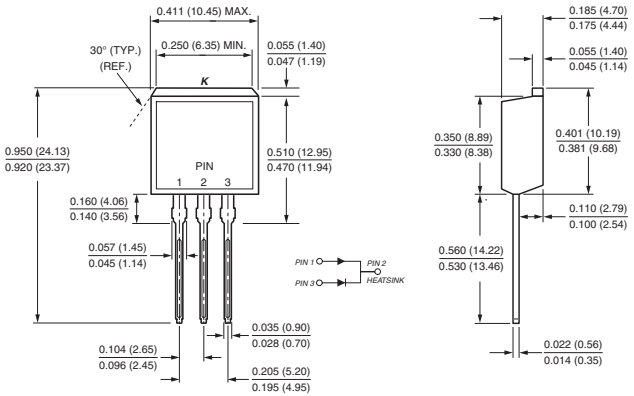
TO-220AB



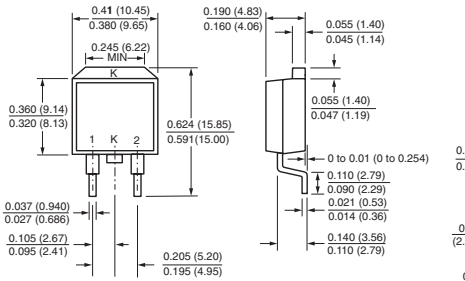
ITO-220AB



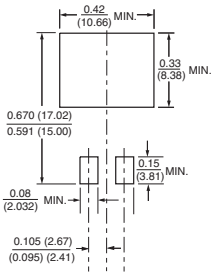
TO-262AA



TO-263AB



Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.59 V at I_F = 5 A

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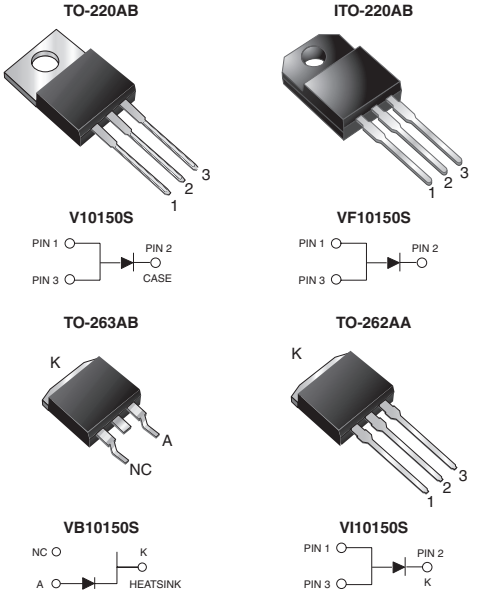


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	150 V
I_{FSM}	120 A
V_F at I_F = 10 A	0.69 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V10150S**	**VF10150S**	**VB10150S**	**VI10150S**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	150				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	120				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89058
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	150 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.79 1.05	- 1.20	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.59 0.69	- 0.75	
Reverse current (2)	V_R = 100 V	T_A = 25 °C T_A = 125 °C	I_R	1.3 1.2	- -	µA mA
	V_R = 150 V	T_A = 25 °C T_A = 125 °C		- 3	150 15	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V10150S**	**VF10150S**	**VB10150S**	**VI10150S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V10150S-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF10150S-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB10150S-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	VB10150S-E3/8W	1.37	8W	800/reel	Tape and reel
TO-262AA	VI10150S-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

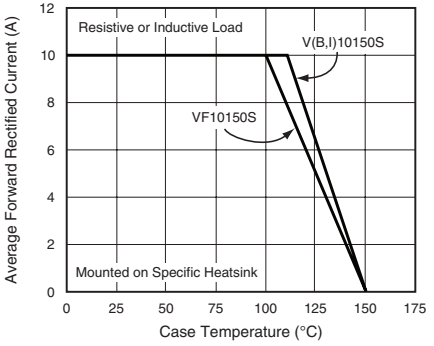


Figure 1. Maximum Forward Current Derating Curve

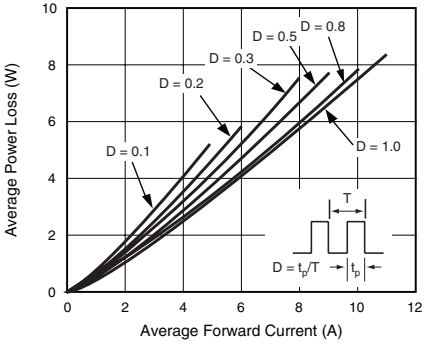


Figure 2. Forward Power Loss Characteristics

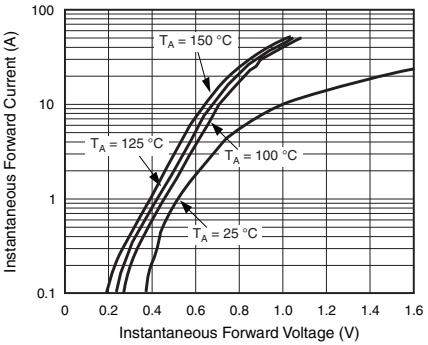


Figure 3. Typical Instantaneous Forward Characteristics

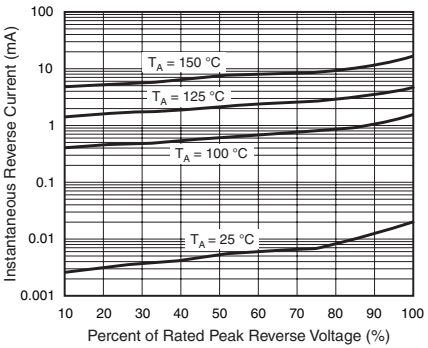


Figure 4. Typical Reverse Characteristics

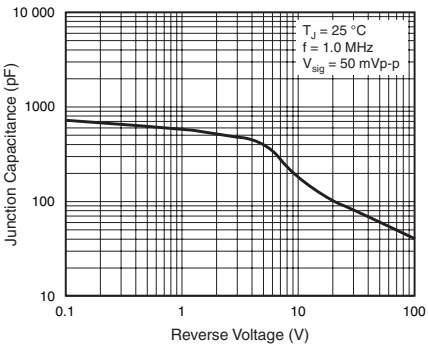


Figure 5. Typical Junction Capacitance

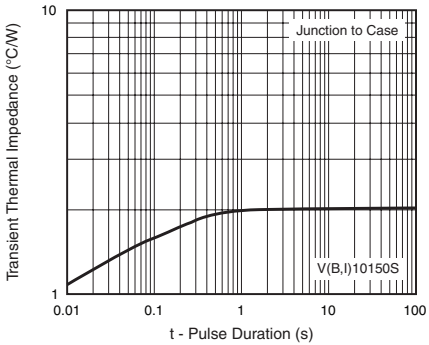


Figure 6. Typical Transient Thermal Impedance

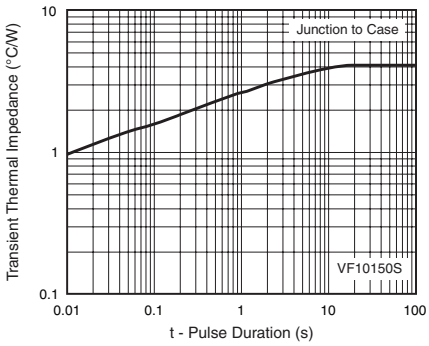
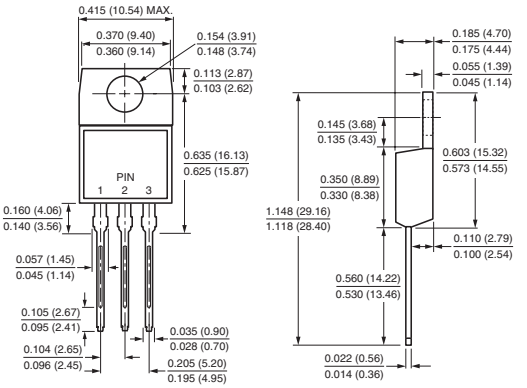


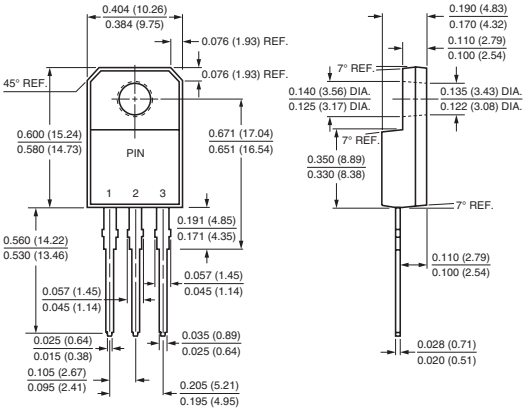
Figure 7. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

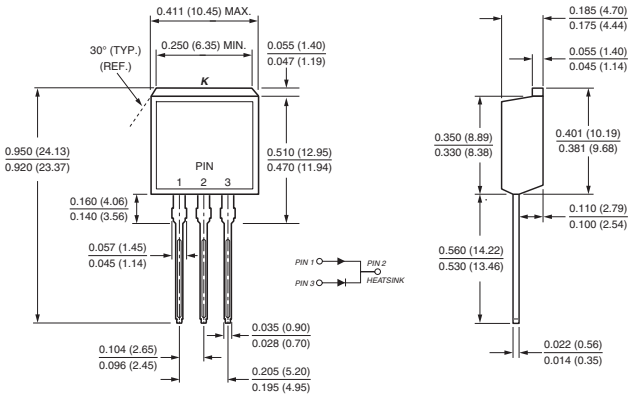
TO-220AB



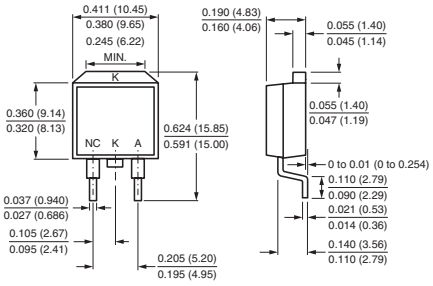
ITO-220AB



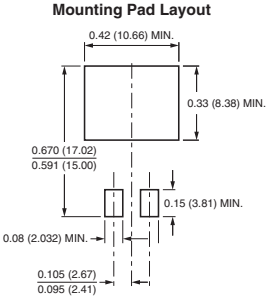
TO-262AA



TO-263AB



Mounting Pad Layout



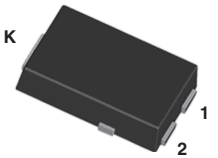
V12P10

Vishay General Semiconductor

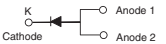
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.43 V at I_F = 5 A

TMBS® eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	100 V
I_{FSM}	200 A
E_{AS}	100 mJ
V_F at I_F = 12 A	0.58 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V12P10**	**UNIT**
Device marking code		V1210	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	12	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Non-repetitive avalanche energy at I_{AS} = 2.0 A, T_J = 25 °C	E_{AS}	100	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88981
Revision: 30-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 12 A	T_A = 25 °C	V_F	0.50 0.65	- 0.70	V
	I_F = 5 A I_F = 12 A	T_A = 125 °C		0.43 0.58	- 0.64	
Reverse current (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	7.0 4.4	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		21.3 11.8	250 20	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V12P10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 3	°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V12P10-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V12P10-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V12P10HE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V12P10HE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
V12P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V12P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V12P10HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V12P10HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

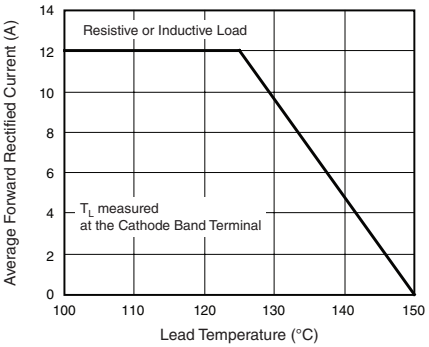


Figure 1. Maximum Forward Current Derating Curve

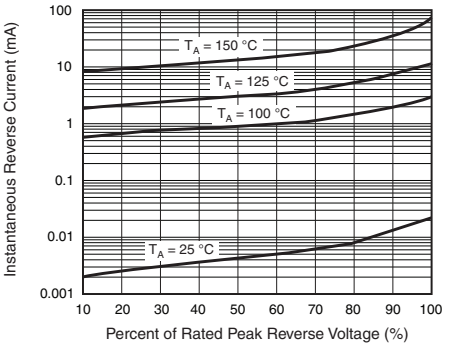


Figure 4. Typical Reverse Characteristics

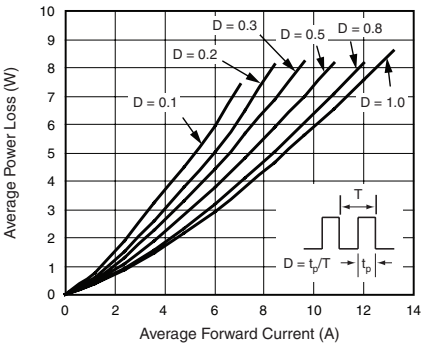


Figure 2. Forward Power Loss Characteristics

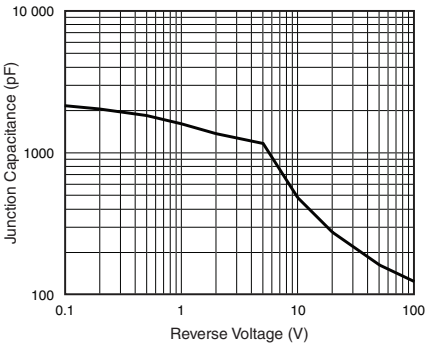


Figure 5. Typical Junction Capacitance

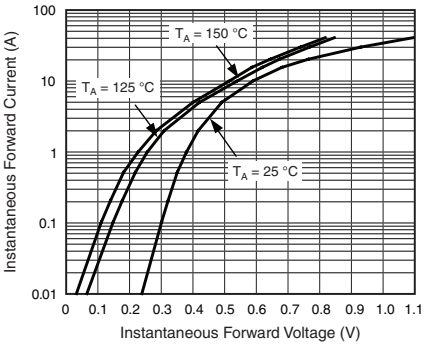


Figure 3. Typical Instantaneous Forward Characteristics

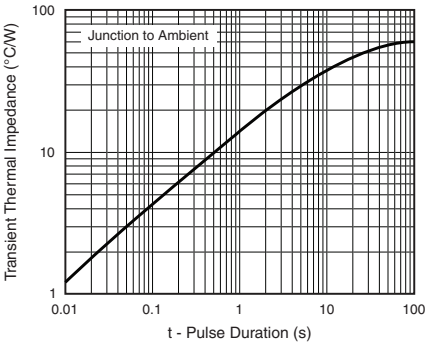


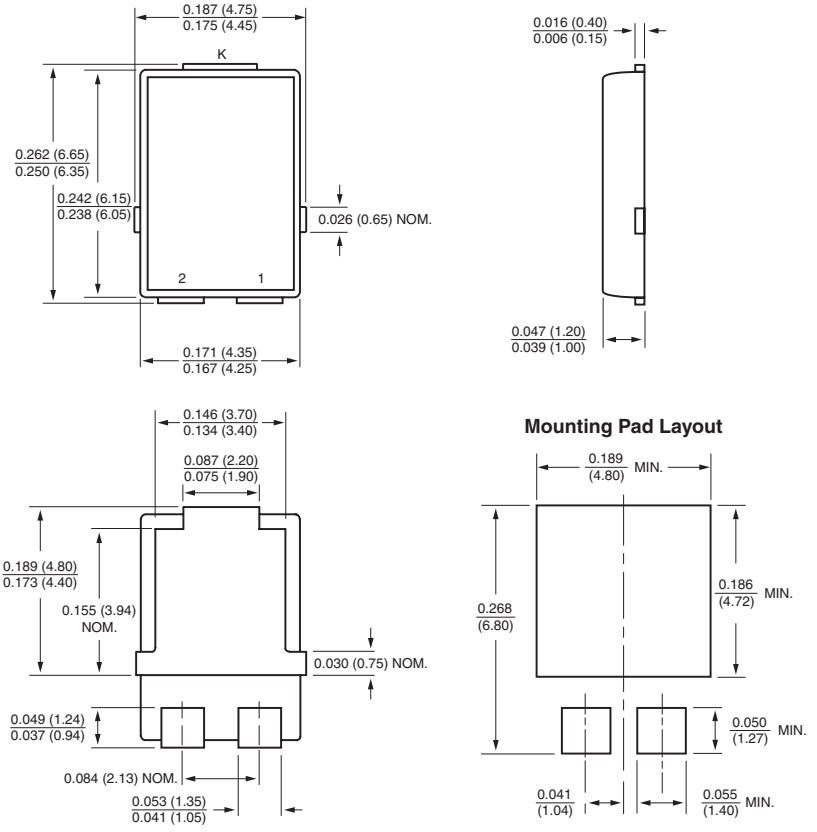
Figure 6. Typical Junction Capacitance

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88981
Revision: 30-Jul-08

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

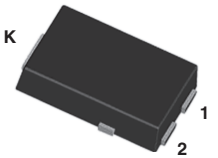
V12P12

Vishay General Semiconductor

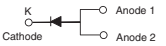
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.51 V at I_F = 6 A

TMBS® eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	120 V
I_{FSM}	150 A
E_{AS}	100 mJ
V_F at I_F = 12 A	0.63 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT
HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V12P12**	**UNIT**
Device marking code		V1212	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	12	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150	A
Non-repetitive avalanche energy at I_{AS} = 2.0 A, L = 50 mH, T_J = 25 °C	E_{AS}	100	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89094
Revision: 29-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 6 A I_F = 12 A	T_A = 25 °C	V_F	0.57 0.72	- 0.80	V
	I_F = 6 A I_F = 12 A	T_A = 125 °C		0.51 0.63	- 0.70	
Reverse current (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	13 7	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		50 16	500 50	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V12P12**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 4	°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V12P12-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V12P12-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V12P12-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V12P12-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

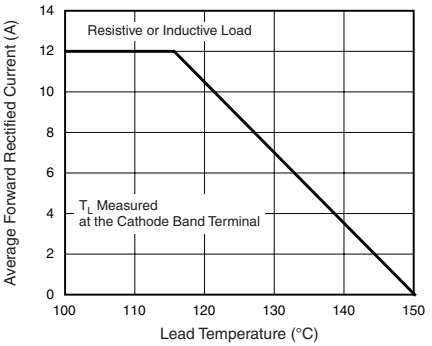


Figure 1. Maximum Forward Current Derating Curve

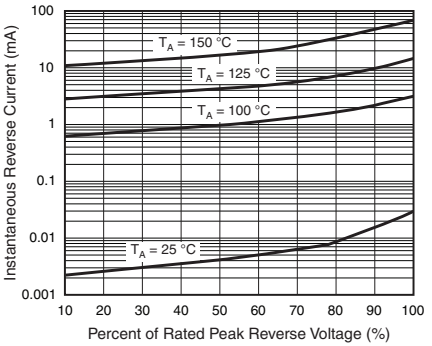


Figure 4. Typical Reverse Characteristics

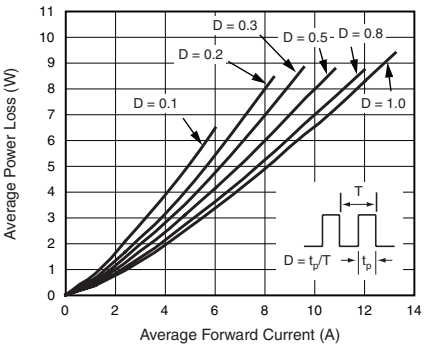


Figure 2. Forward Power Loss Characteristics

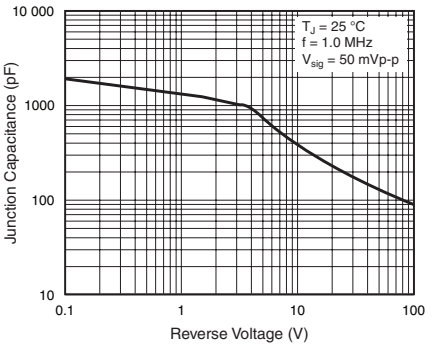


Figure 5. Typical Junction Capacitance

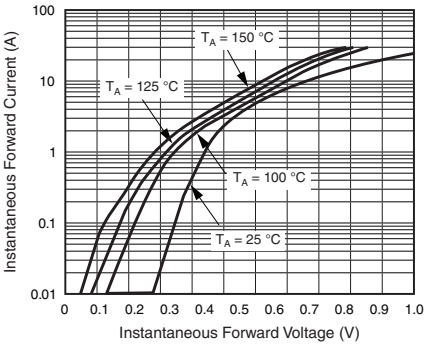


Figure 3. Typical Instantaneous Forward Characteristics

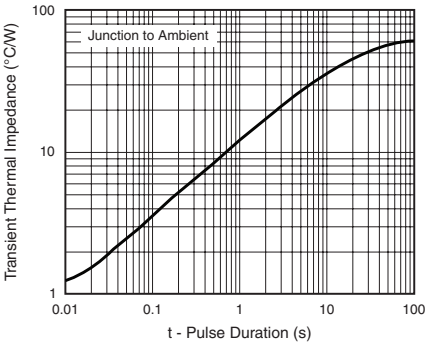


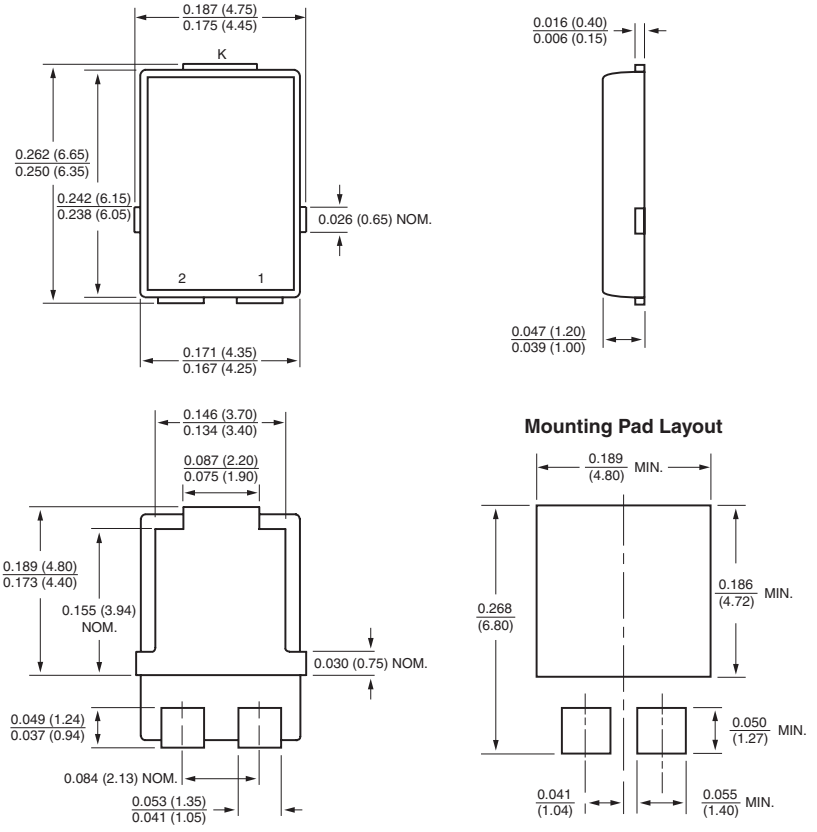
Figure 6. Typical Junction Capacitance

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89094
Revision: 29-Jul-08

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)

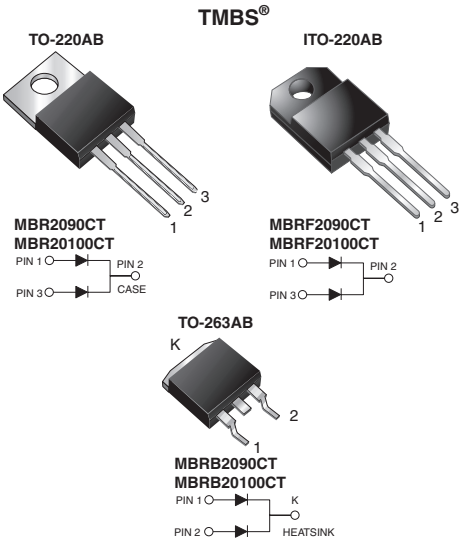


Conform to JEDEC TO-277A

MBR(F,B)2090CT & MBR(F,B)20100CT

Vishay General Semiconductor

Dual Common-Cathode High-Voltage Schottky Rectifier



FEATURES

- Trench MOS Schottky technology
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	90 V, 100 V
I_{FSM}	150 A
V_F	0.65 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR2090CT	MBR20100CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	90	100	V
Working peak reverse voltage	V_{RWM}	90	100	V
Maximum DC blocking voltage	V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 133 °C total device / per diode	$I_{F(AV)}$	20 / 10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150		A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz	I_{RRM}	0.5		A
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150		°C
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 min	V_{AC}	1500		V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89033
Revision: 26-May-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 10 A I_F = 20 A	T_C = 25 °C T_C = 125 °C T_C = 125 °C	V_F	0.80 0.65 0.75	V
Maximum reverse current per diode at working peak reverse voltage (2)		T_J = 25 °C T_J = 100 °C	I_R	100 6.0	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MBR**	**MBRF**	**MBRB**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ $R_{\theta JC}$	60 2.0	- 3.5	60 2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	MBR20100CT-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	MBRF20100CT-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	MBRB20100CT-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	MBRB20100CT-E3/8W	1.38	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

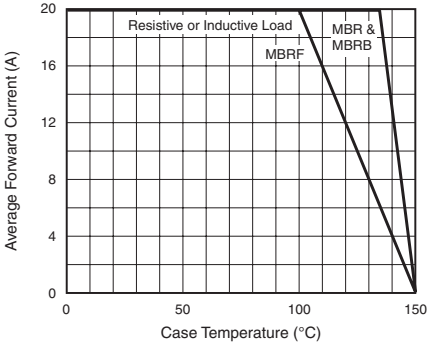


Figure 1. Forward Current Derating Curve

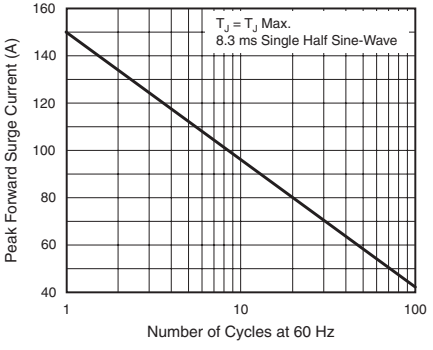


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

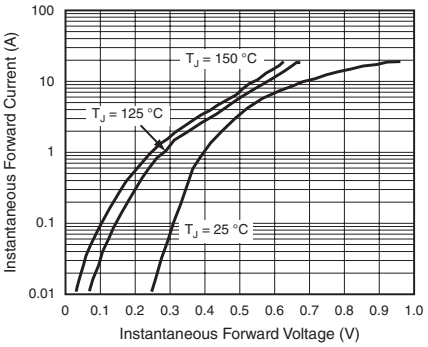


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

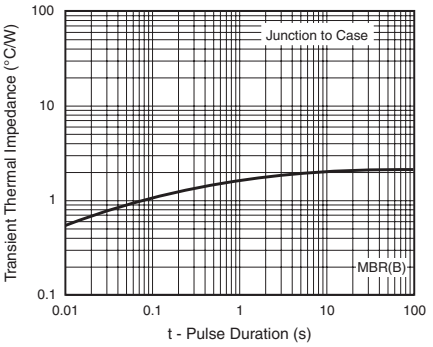


Figure 6. Typical Transient Thermal Impedance Per Diode

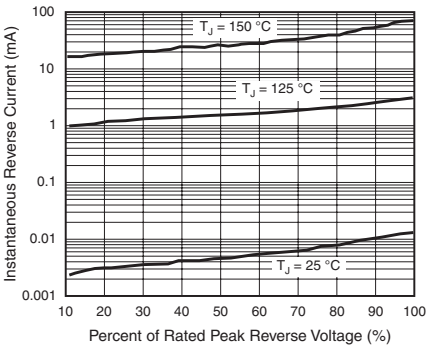


Figure 4. Typical Reverse Characteristics Per Diode

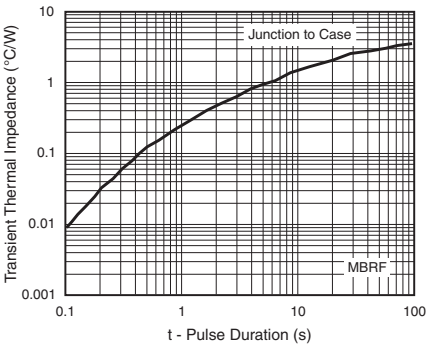


Figure 7. Typical Transient Thermal Impedance Per Diode

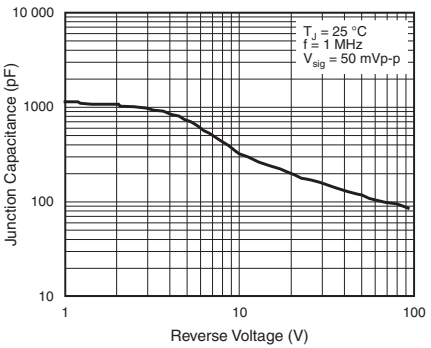


Figure 5. Typical Junction Capacitance Per Diode

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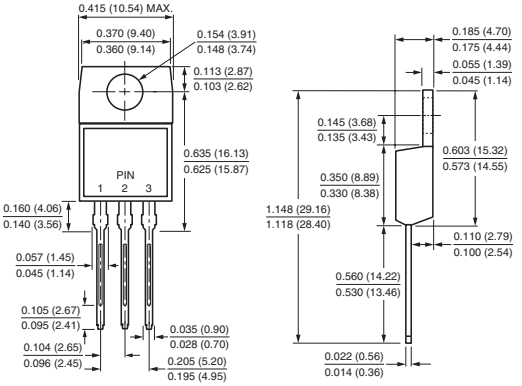
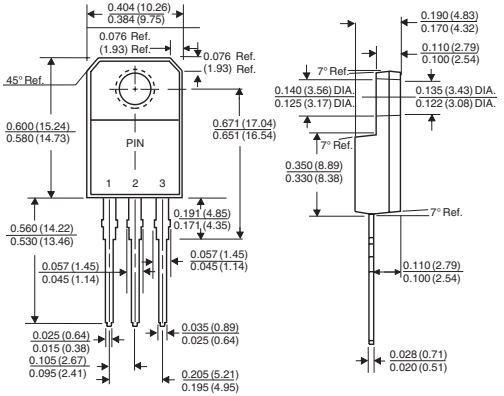
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

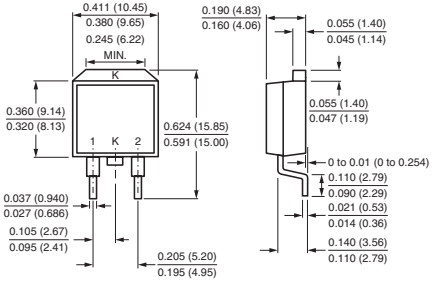
TO-220AB



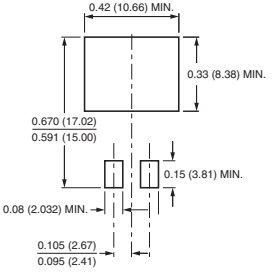
ITO-220AB



TO-263AB



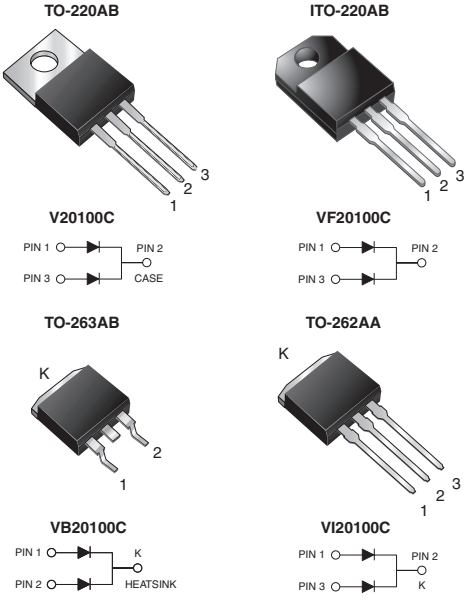
Mounting Pad Layout



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.50 V at I_F = 5 A

TMBS®



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	100 V
I_{FSM}	150 A
V_F at I_F = 10 A	0.58 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V20100C	VF20100C	VB20100C	VI20100C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100				V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	20 10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	per diode	I_{FSM}	150				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500				V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
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Document Number: 88977
Revision: 31-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage per diode	I_R = 10 mA	T_A = 25 °C	V_{BR}	105 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.55 0.65	- 0.79	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.50 0.58	- 0.68	
Reverse current per diode (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	17 5.3	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		- 12	800 25	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20100C**	**VF20100C**	**VB20100C**	**VI20100C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.8	5.5	2.8	2.8	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20100C-E3/4W	1.881	4W	50/tube	Tube
ITO-220AB	VF20100C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20100C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB20100C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI20100C-E3/4W	1.452	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

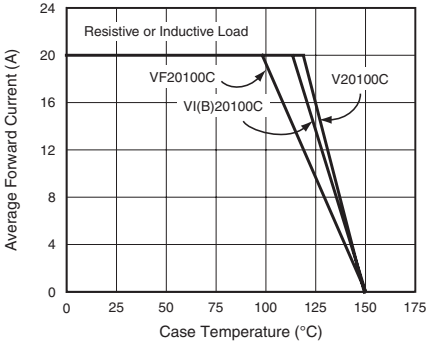

Figure 1. Maximum Forward Current Derating Curve

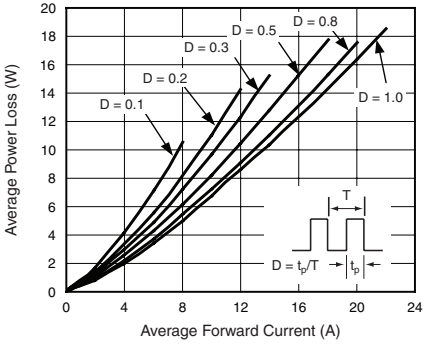

Figure 2. Forward Power Loss Characteristics Per Diode

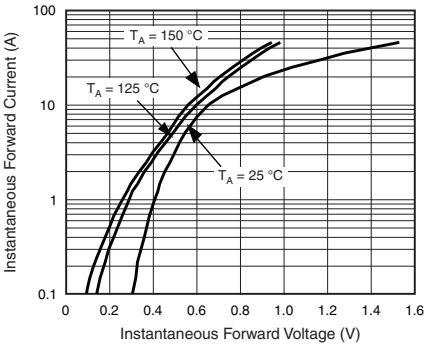

Figure 3. Typical Instantaneous Forward Characteristics Per Diode

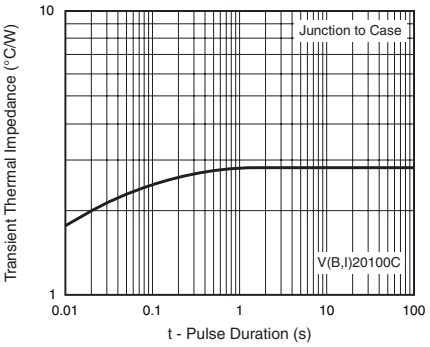

Figure 6. Typical Transient Thermal Impedance Per Diode

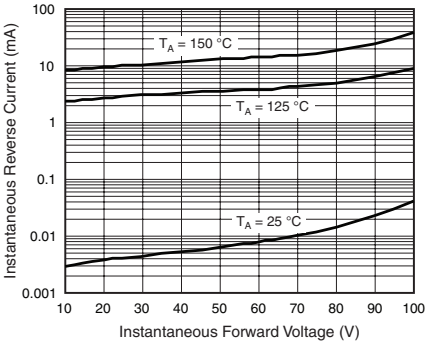

Figure 4. Typical Reverse Characteristics Per Diode

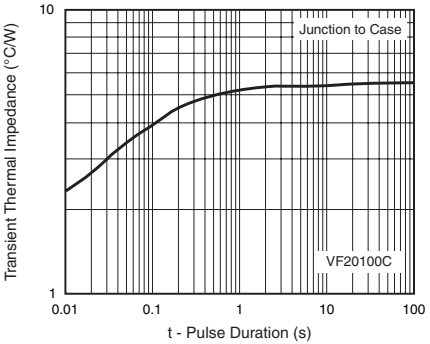

Figure 7. Typical Transient Thermal Impedance Per Diode

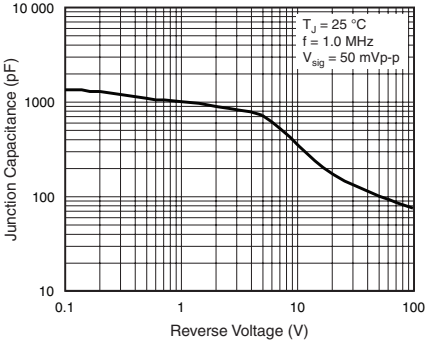

Figure 5. Typical Junction Capacitance Per Diode

For technical questions within your region, please contact one of the following:
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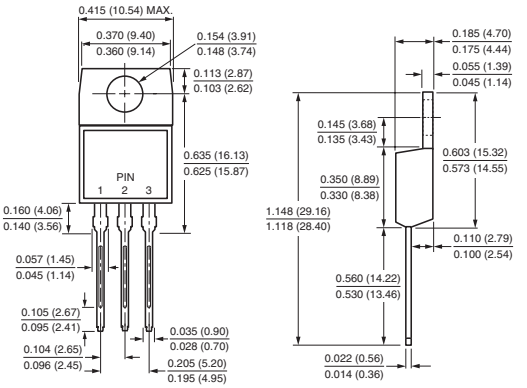
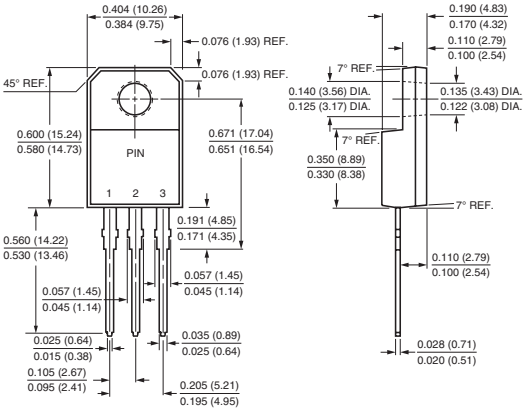
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

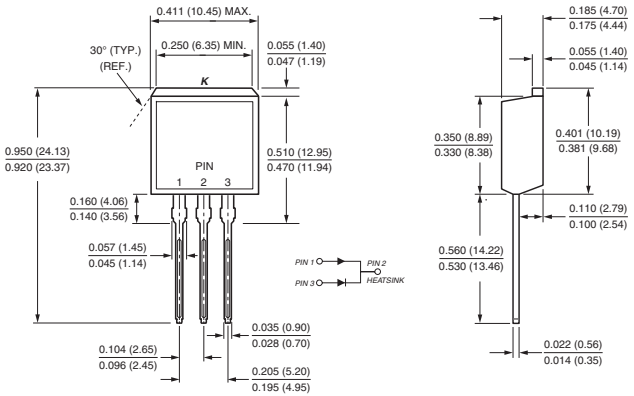
TO-220AB



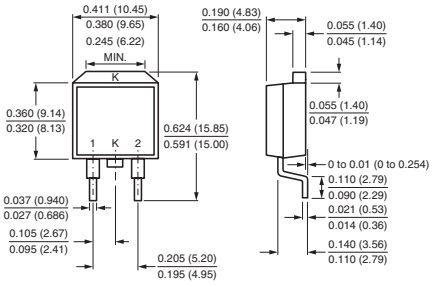
ITO-220AB



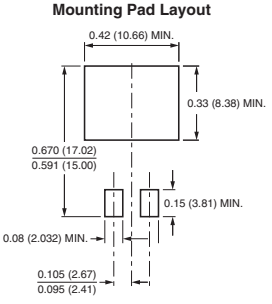
TO-262AA



TO-263AB

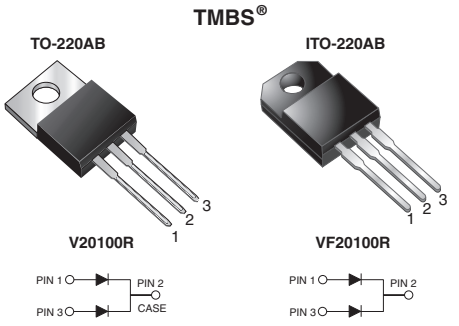


Mounting Pad Layout



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.54 V at I_F = 5 A



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	100 V
I_{FSM}	120 A
V_F at I_F = 10 A	0.65 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB and ITO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V20100R	VF20100R	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100		V
Maximum average forward rectified current (Fig. 1)	per device	$I_{F(AV)}$	20		A
	per diode		10		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	120		A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500		V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150		°C

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Document Number: 89062
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.62 0.81	- 0.90	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.54 0.65	- 0.72	
Reverse current per diode (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	4 4	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		- 5.6	150 15	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**V20100R**	**VF20100R**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.8	5.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20100R-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20100R-E3/4W	1.75	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

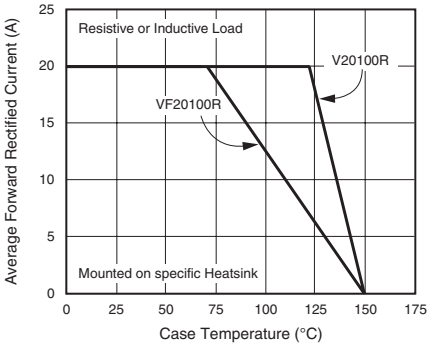

Figure 1. Maximum Forward Current Derating Curve

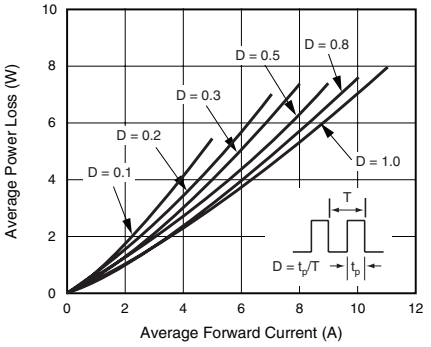

Figure 2. Forward Power Loss Characteristics Per Diode

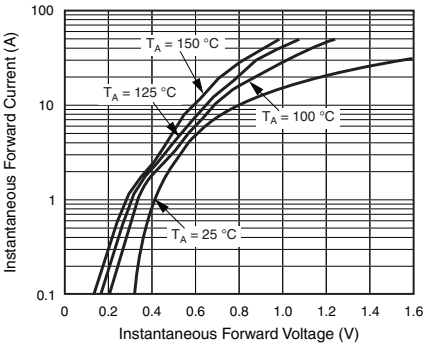

Figure 3. Typical Instantaneous Forward Characteristics Per Diode

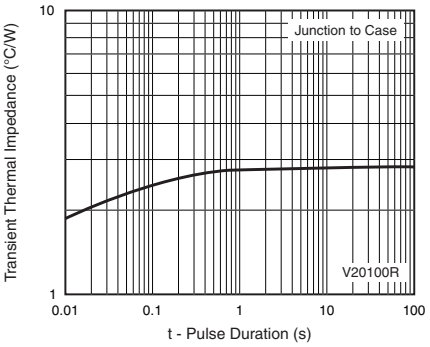

Figure 6. Typical Transient Thermal Impedance Per Diode

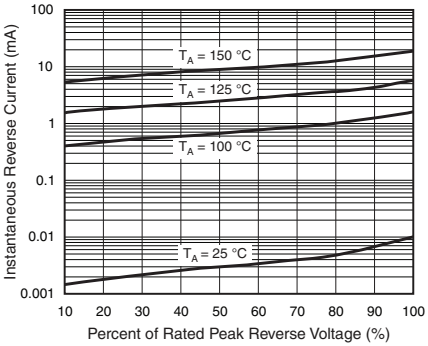

Figure 4. Typical Reverse Characteristics Per Diode

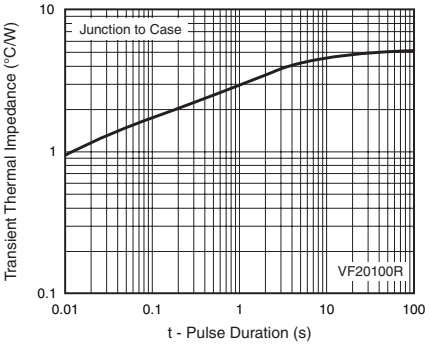

Figure 7. Typical Transient Thermal Impedance Per Diode

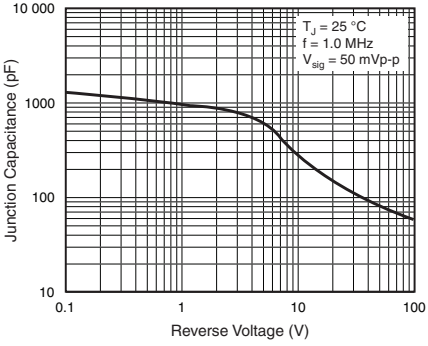

Figure 5. Typical Junction Capacitance Per Diode

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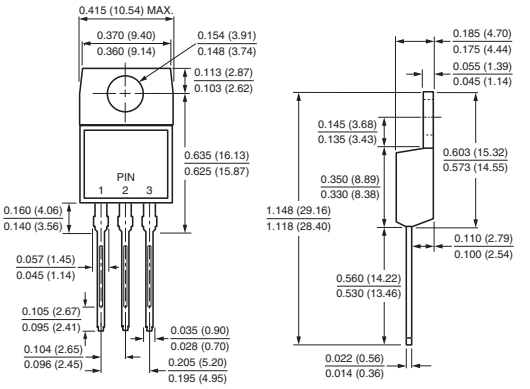
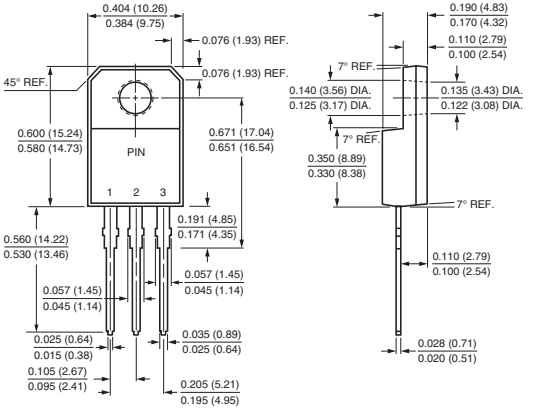
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



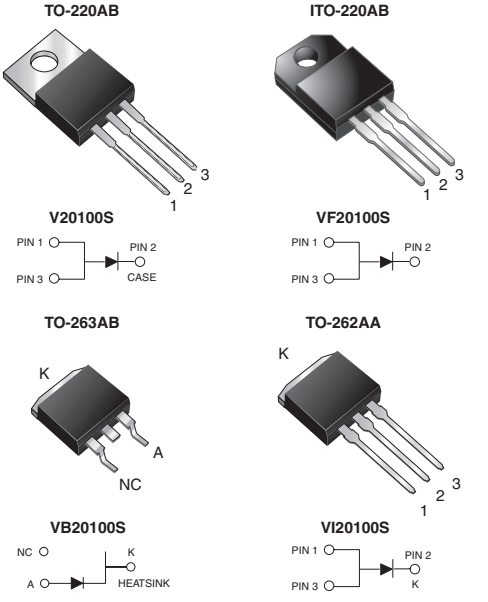
ITO-220AB



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.446 V at I_F = 5 A

TMBS®



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at I_F = 20 A	0.69 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V20100S	VF20100S	VB20100S	VI20100S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	250				A
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

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Document Number: 88975
Revision: 31-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 10 mA	T_A = 25 °C	V_{BR}	105 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.51 0.60 0.79	- - 0.90	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.45 0.53 0.69	- - 0.76	
Reverse current (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	17 7	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		70 14	500 30	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20100S**	**VF20100S**	**VB20100S**	**VI20100S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20100S-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20100S-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20100S-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	VB20100S-E3/8W	1.37	8W	800/reel	Tape and reel
TO-262AA	VI20100S-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

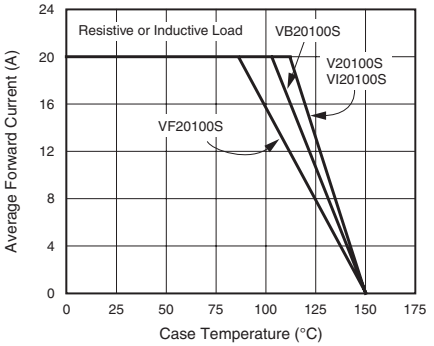


Figure 1. Maximum Forward Current Derating Curve

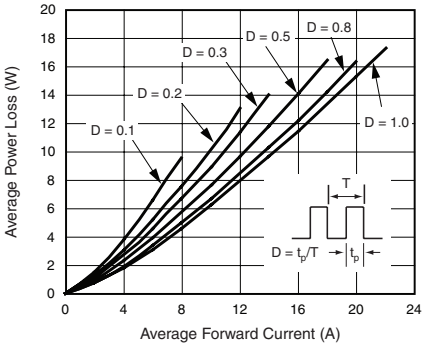


Figure 2. Forward Power Loss Characteristics

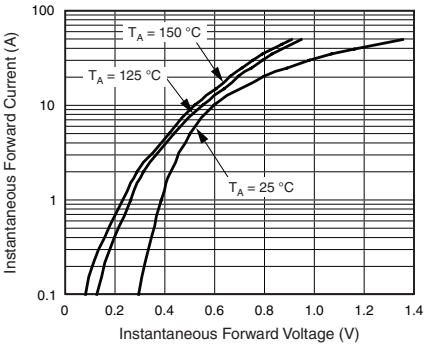


Figure 3. Typical Instantaneous Forward Characteristics

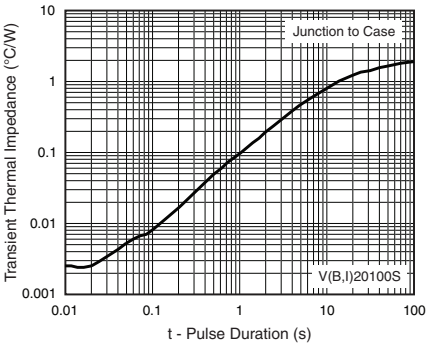


Figure 6. Typical Transient Thermal Impedance

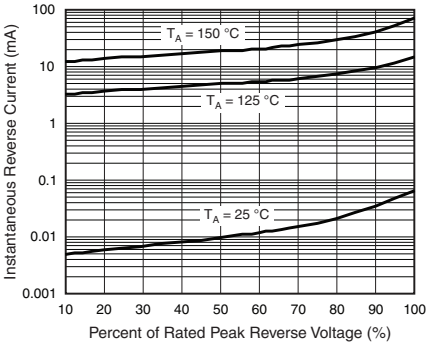


Figure 4. Typical Reverse Characteristics

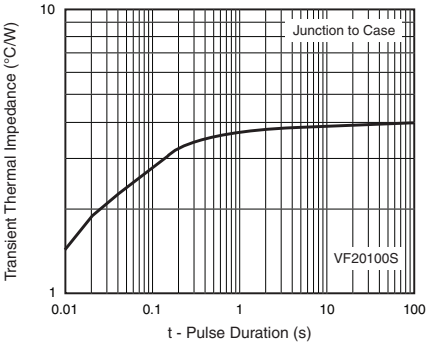


Figure 7. Typical Transient Thermal Impedance

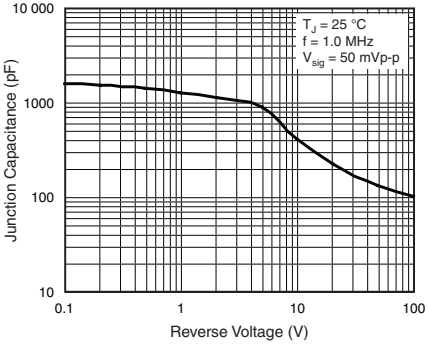
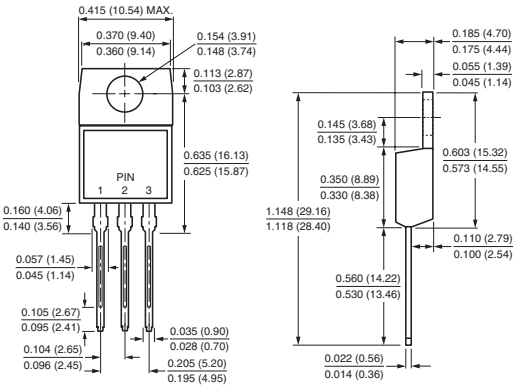


Figure 5. Typical Junction Capacitance

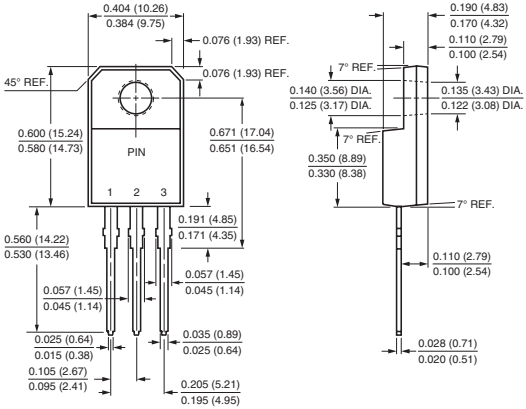
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

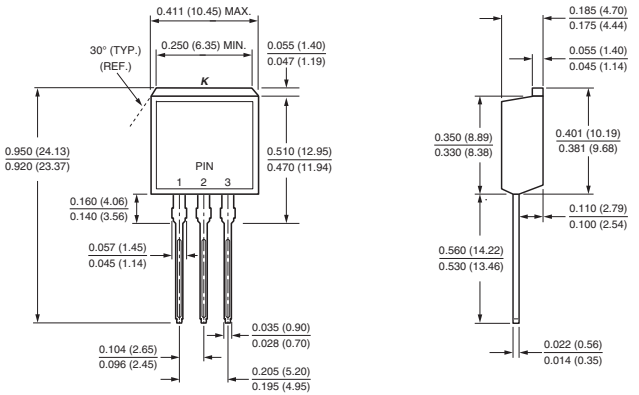
TO-220AB



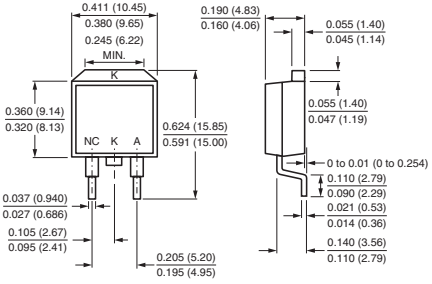
ITO-220AB



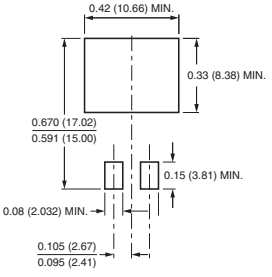
TO-262AA



TO-263AB



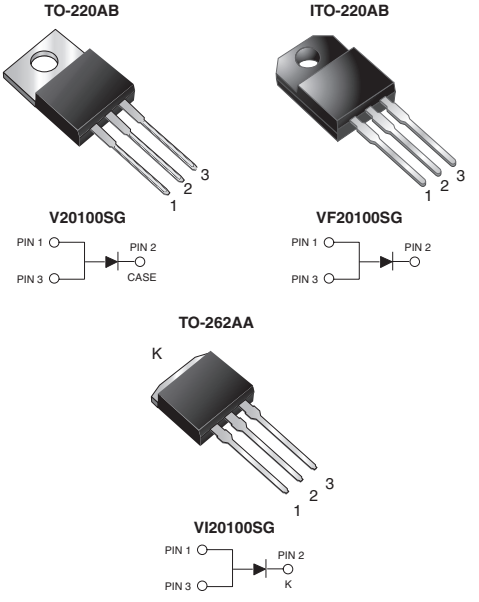
Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.50 V at I_F = 5 A

TMBS®



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	100 V
I_{FSM}	150 A
V_F at I_F = 20 A	0.75 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V20100SG	VF20100SG	VI20100SG	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100			V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150			A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500			V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150			°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88966
Revision: 31-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 10 mA	T_A = 25 °C	V_{BR}	105 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.55 0.66 0.91	- - 1.07	
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.50 0.59 0.75	- - 0.82	
Reverse current (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	15 6	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		60 13	350 25	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**V20100SG**	**VF20100SG**	**VI20100SG**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.2	4.0	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20100SG-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20100SG-E3/4W	1.74	4W	50/tube	Tube
TO-262AA	VI20100SG-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES
(T_A = 25 °C unless otherwise noted)

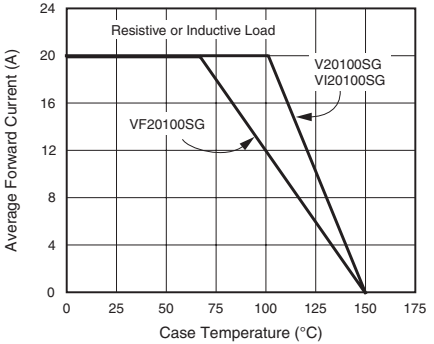


Figure 1. Maximum Forward Current Derating Curve

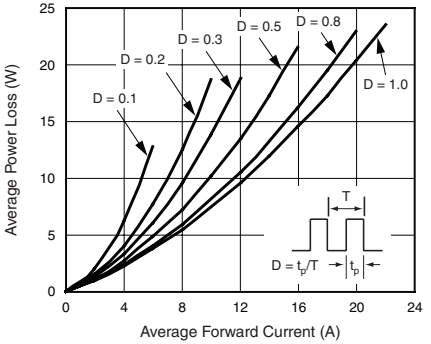


Figure 2. Forward Power Loss Characteristics

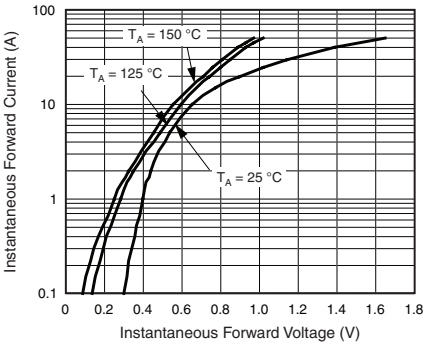


Figure 3. Typical Instantaneous Forward Characteristics

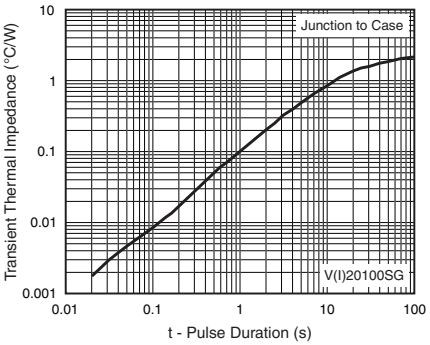


Figure 6. Typical Transient Thermal Impedance

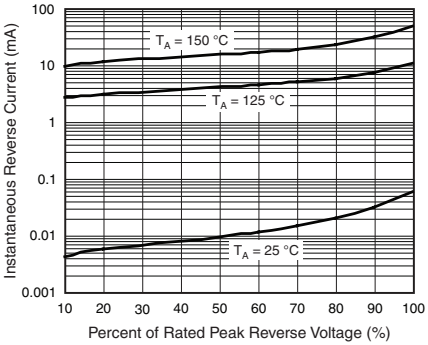


Figure 4. Typical Reverse Characteristics

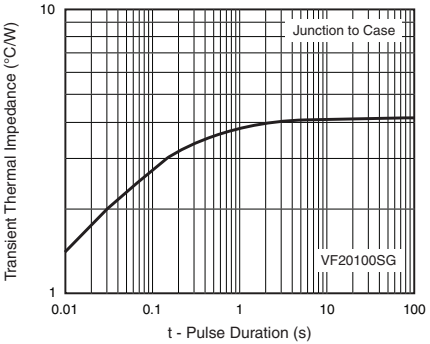


Figure 7. Typical Transient Thermal Impedance

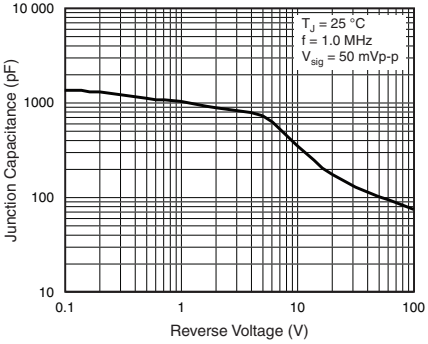
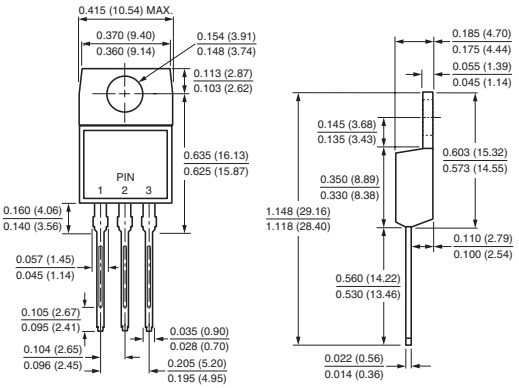


Figure 5. Typical Junction Capacitance

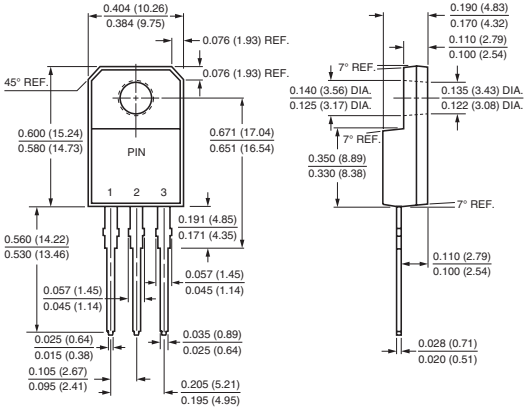
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

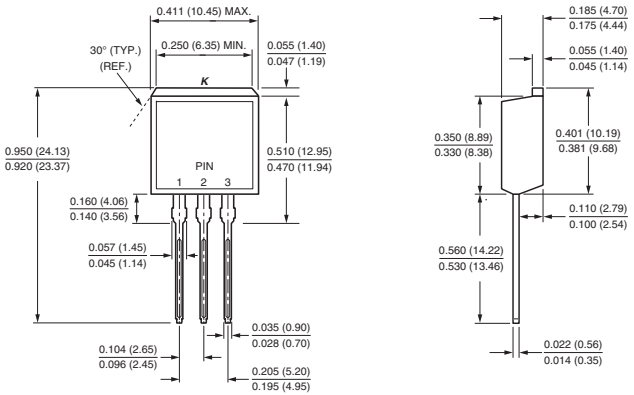
TO-220AB



ITO-220AB



TO-262AA



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.54 V at I_F = 5 A

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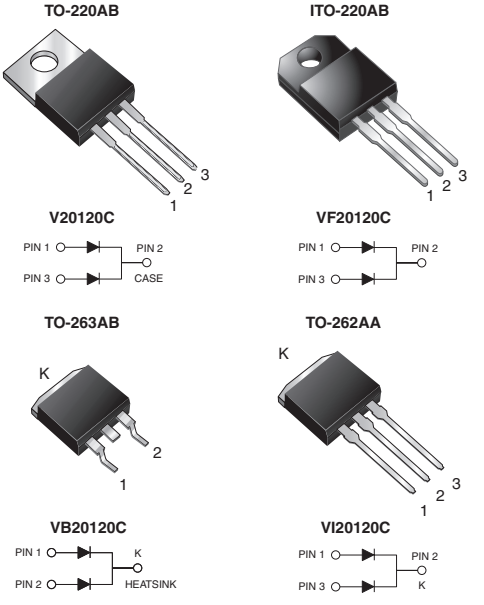


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	120 V
I_{FSM}	120 A
V_F at I_F = 10 A	0.64 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V20120C	VF20120C	VB20120C	VI20120C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	120				V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	20 10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	120				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500				V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89040
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.62 0.81	- 0.90	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.54 0.64	- 0.72	
Reverse current per diode (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	8 6	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 14	700 45	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20120C**	**VF20120C**	**VB20120C**	**VI20120C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.8	5.0	2.8	2.8	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20120C-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20120C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20120C-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	VB20120C-E3/8W	1.37	8W	800/reel	Tape and reel
TO-262AA	VI20120C-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

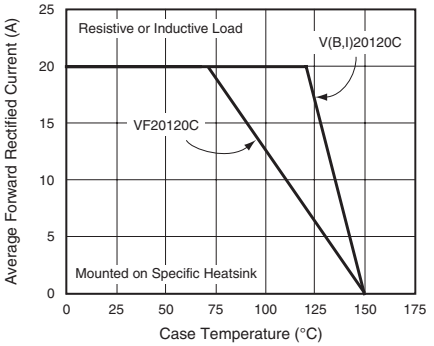


Figure 1. Maximum Forward Current Derating Curve

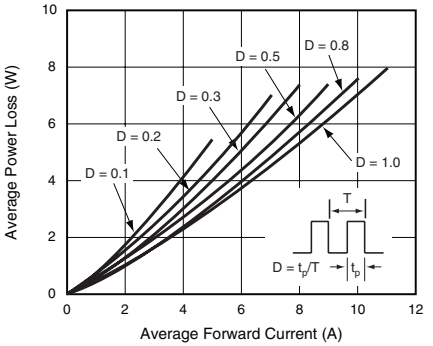


Figure 2. Forward Power Loss Characteristics Per Diode

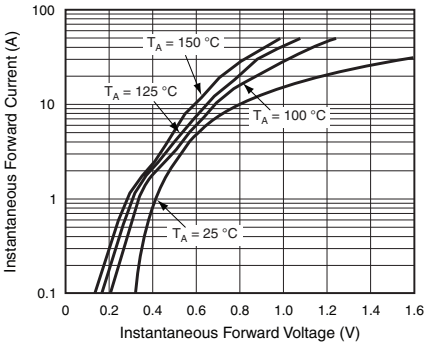


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

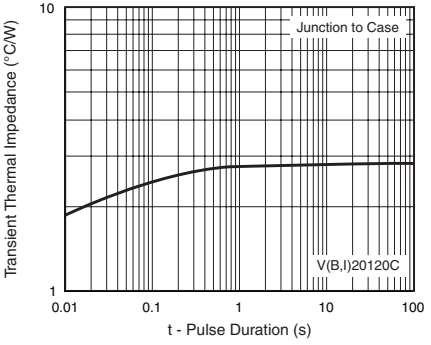


Figure 6. Typical Transient Thermal Impedance Per Diode

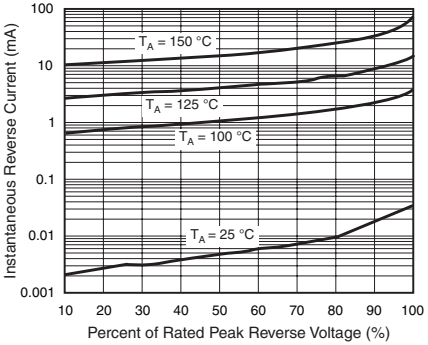


Figure 4. Typical Reverse Characteristics Per Diode

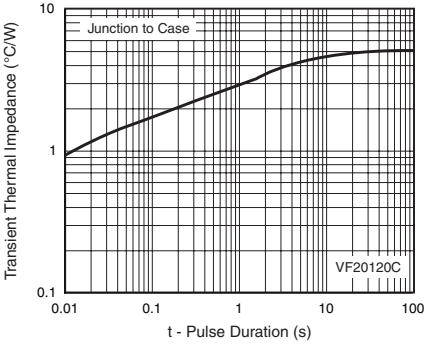


Figure 7. Typical Transient Thermal Impedance Per Diode

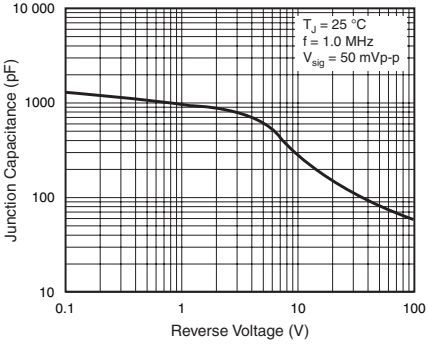
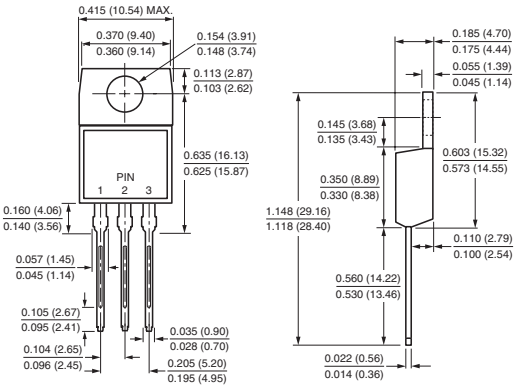


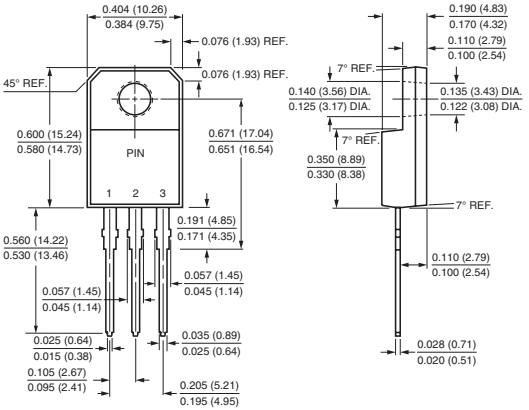
Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

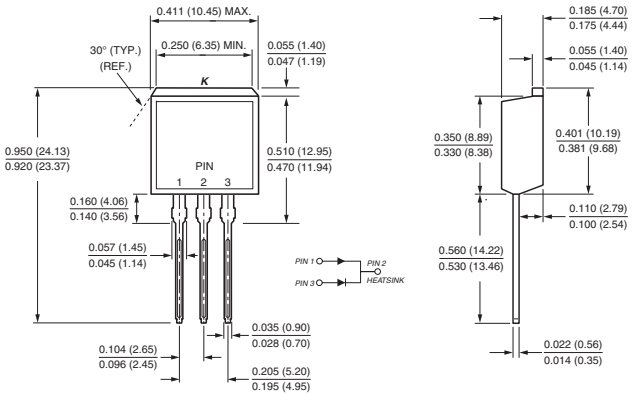
TO-220AB



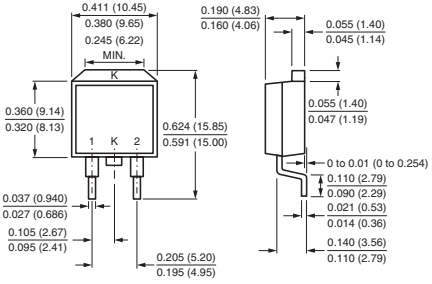
ITO-220AB



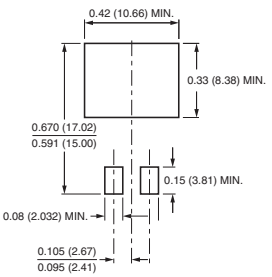
TO-262AA



TO-263AB



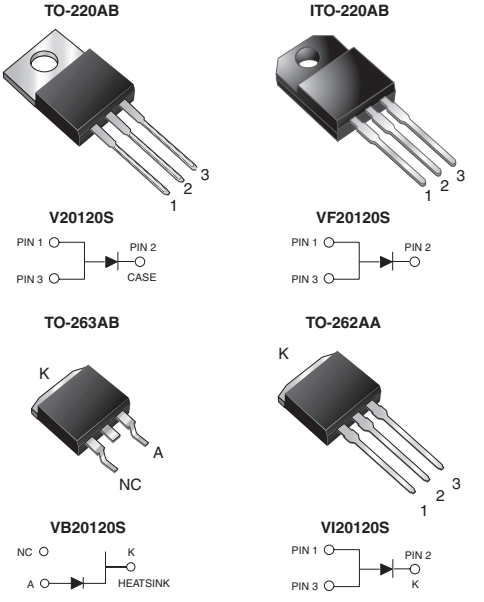
Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.50 V at I_F = 5 A

TMBS®



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	120 V
I_{FSM}	200 A
V_F at I_F = 20 A	0.73 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V20120S	VF20120S	VB20120S	VI20120S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200				A
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction ans storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88993
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.57 0.71 0.99	- - 1.12	
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.50 0.61 0.73	- - 0.81	
Reverse current (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	10 6	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 14	300 30	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20120S**	**VF20120S**	**VB20120S**	**VI20120S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2	4	2	2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20120S-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20120S-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20120S-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB20120S-E3/8W	1.38	8W	800/reel	Tape and reel
TO-262AA	VI20120S-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

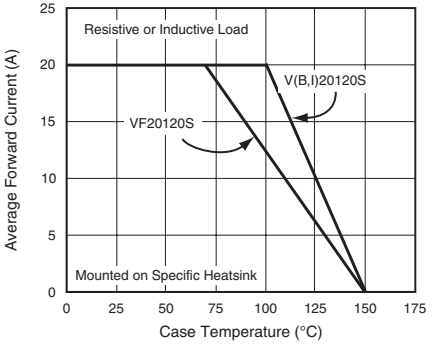


Figure 1. Maximum Forward Current Derating Curve

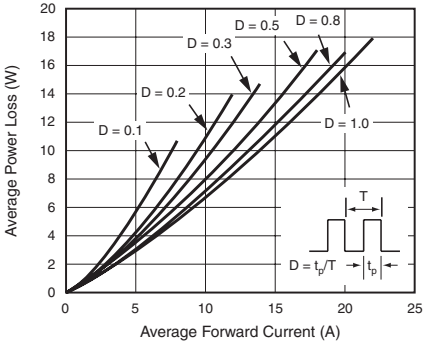


Figure 2. Forward Power Loss Characteristics

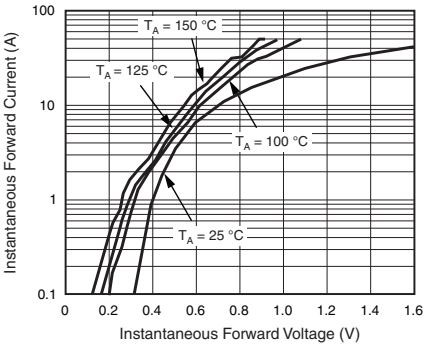


Figure 3. Typical Instantaneous Forward Characteristics

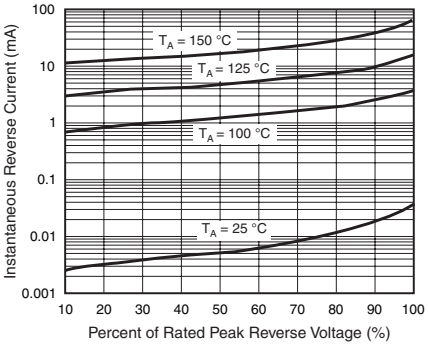


Figure 4. Typical Reverse Characteristics

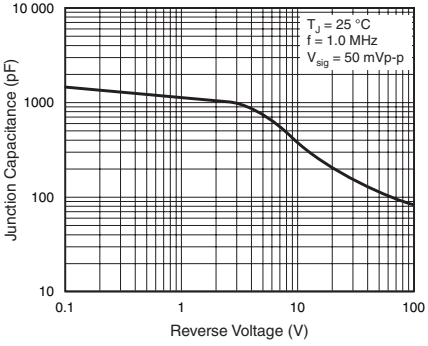


Figure 5. Typical Junction Capacitance

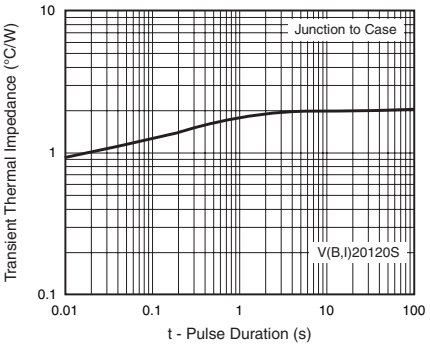


Figure 6. Typical Transient Thermal Impedance

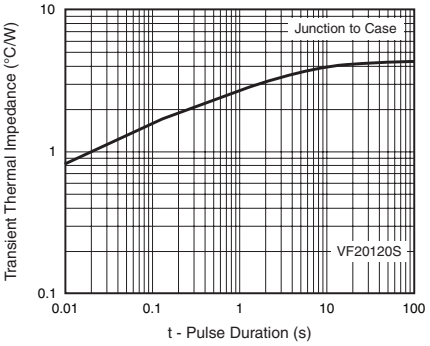
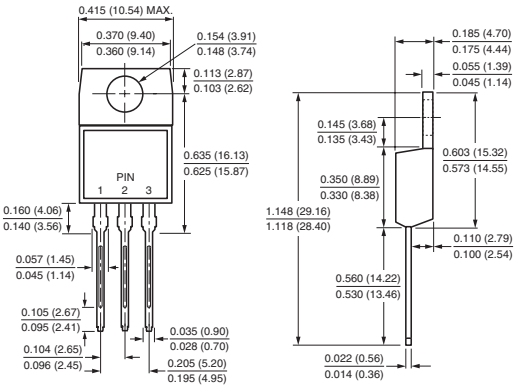


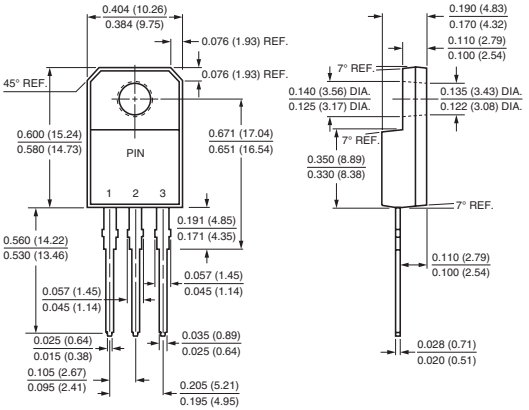
Figure 7. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

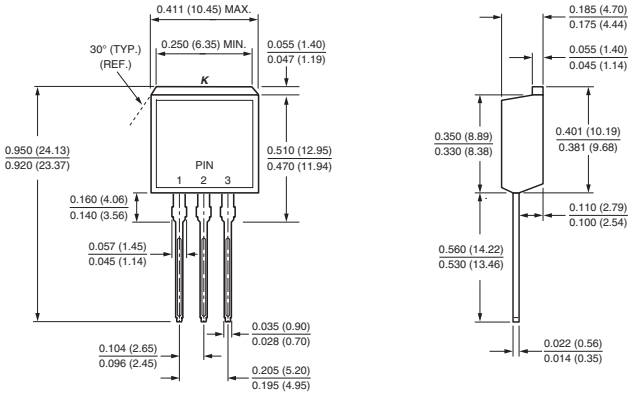
TO-220AB



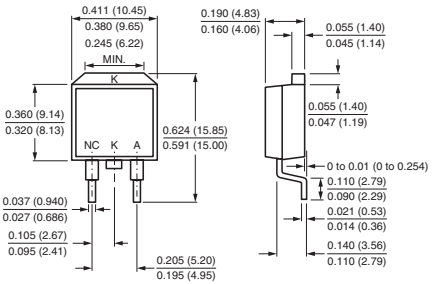
ITO-220AB



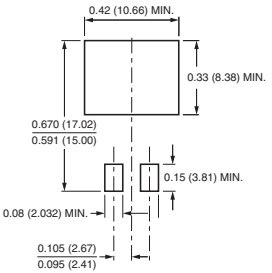
TO-262AA



TO-263AB



Mounting Pad Layout

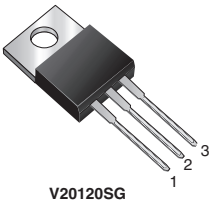


High-Voltage Trench MOS Barrier Schottky Rectifier

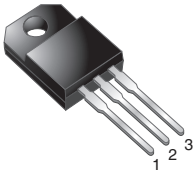
Ultra Low V_F = 0.54 V at I_F = 5 A

TMBS®

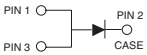
TO-220AB



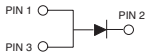
ITO-220AB



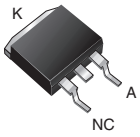
V20120SG



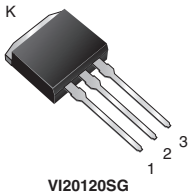
VF20120SG



TO-263AB

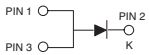


TO-262AA



VB20120SG

VI20120SG



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	120 V
I_{FSM}	150 A
V_F at I_F = 20 A	0.78 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20120SG**	**VF20120SG**	**VB20120SG**	**VI20120SG**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	120				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88994
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.62 0.81 1.20	- - 1.33	
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.54 0.65 0.78	- - 0.88	
Reverse current (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	10 7	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 12	250 25	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20120SG**	**VF20120SG**	**VB20120SG**	**VI20120SG**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.2	4.2	2.2	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20120SG-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20120SG-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20120SG-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB20120SG-E3/8W	1.38	8W	800/reel	Tape and reel
TO-262AA	VI20120SG-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

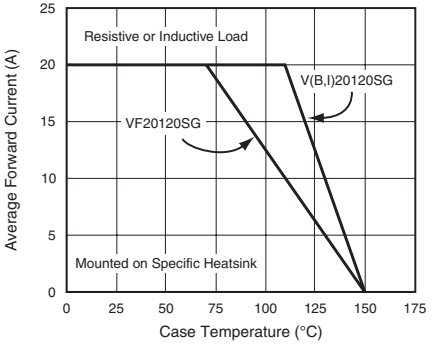


Figure 1. Forward Current Derating Curve

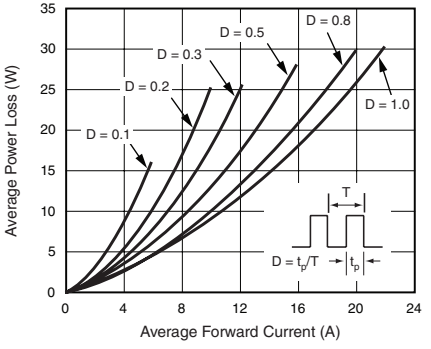


Figure 2. Forward Power Loss Characteristics

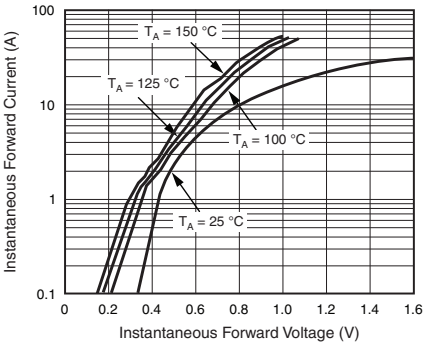


Figure 3. Typical Instantaneous Forward Characteristics

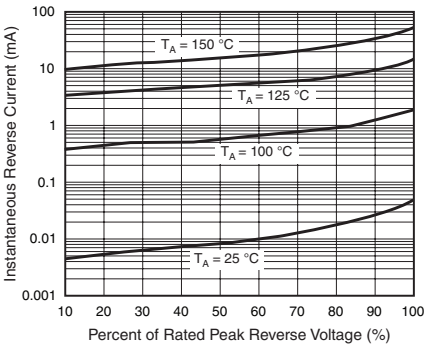


Figure 4. Typical Reverse Characteristics

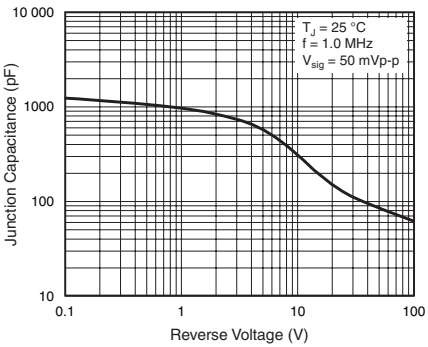


Figure 5. Typical Junction Capacitance

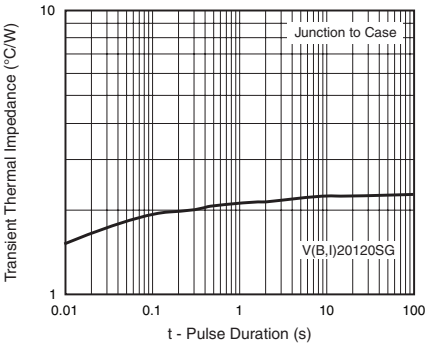


Figure 6. Typical Transient Thermal Impedance

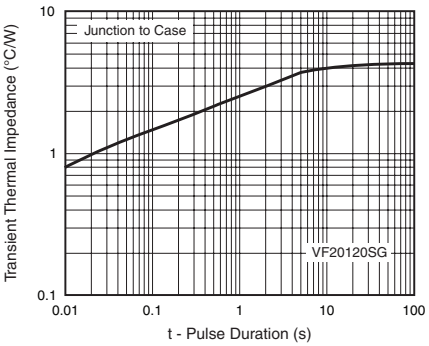
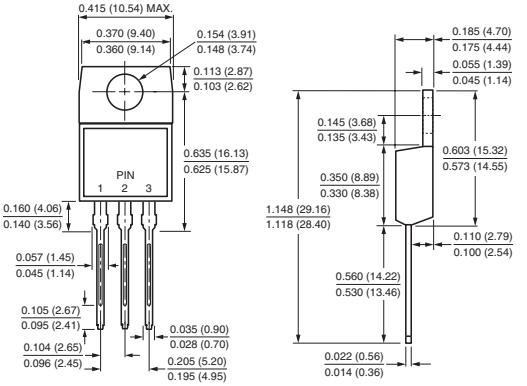


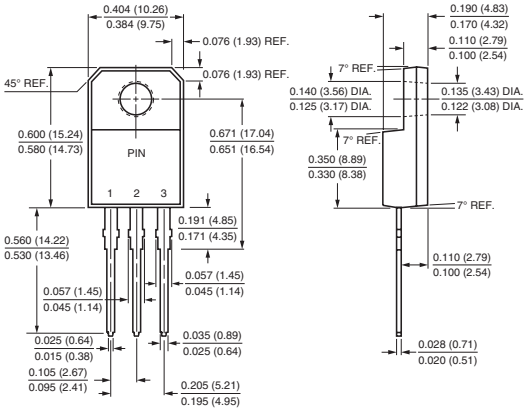
Figure 7. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

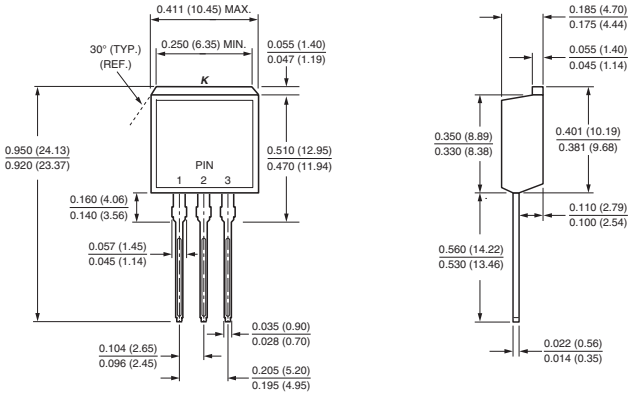
TO-220AB



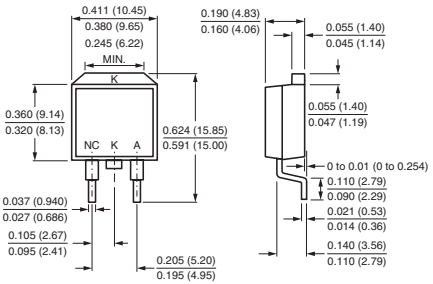
ITO-220AB



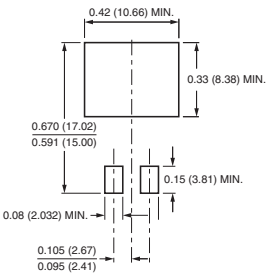
TO-262AA



TO-263AB



Mounting Pad Layout



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.59 V at I_F = 5 A

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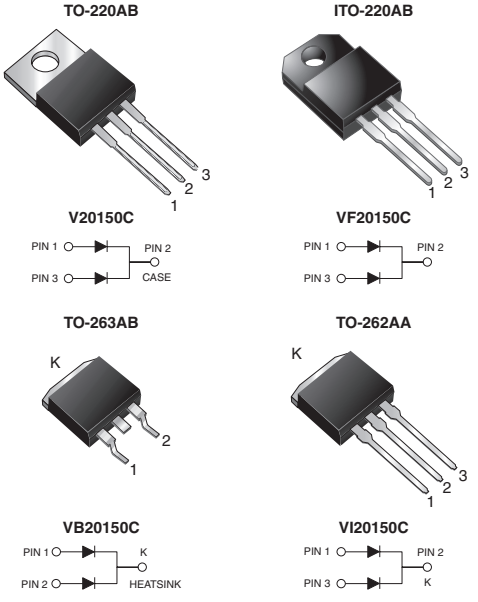


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	150 V
I_{FSM}	120 A
V_F at I_F = 10 A	0.69 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V20150C	VF20150C	VB20150C	VI20150C	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	150				V
Maximum average forward rectified current (Fig. 1) per device per diode	$I_{F(AV)}$	20 10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	120				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89046
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	150 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.79 1.05	- 1.20	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.59 0.69	- 0.75	
Reverse current per diode (2)	V_R = 100 V	T_A = 25 °C T_A = 125 °C	I_R	1.3 1.2	- -	µA mA
	V_R = 150 V	T_A = 25 °C T_A = 125 °C		- 3	150 15	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20150C**	**VF20150C**	**VB20150C**	**VI20150C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.8	5.0	2.8	2.8	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20150C-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20150C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20150C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB20150C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI20150C-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES
(T_A = 25 °C unless otherwise noted)

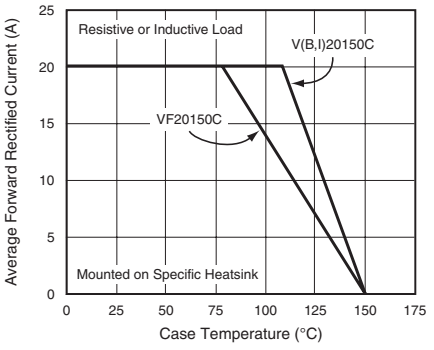


Figure 1. Maximum Forward Current Derating Curve

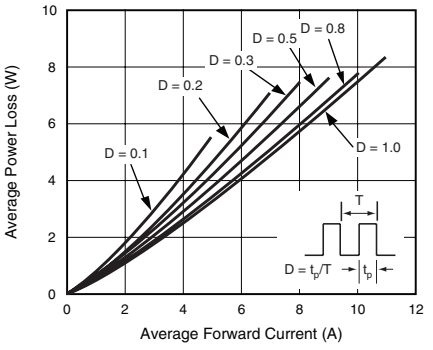


Figure 2. Forward Power Loss Characteristics Per Diode

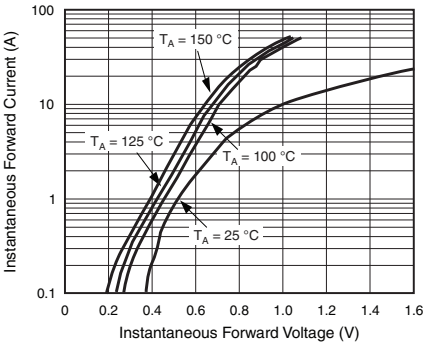


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

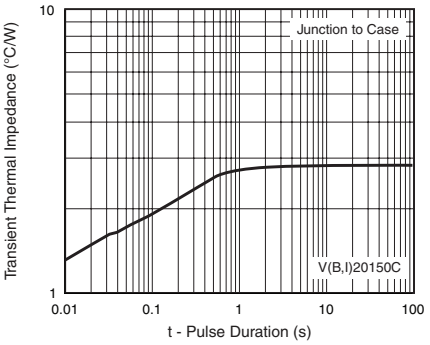


Figure 6. Typical Transient Thermal Impedance Per Diode

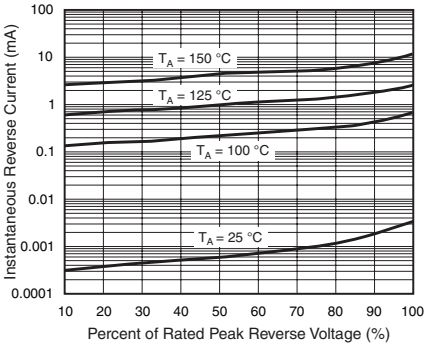


Figure 4. Typical Reverse Characteristics Per Diode

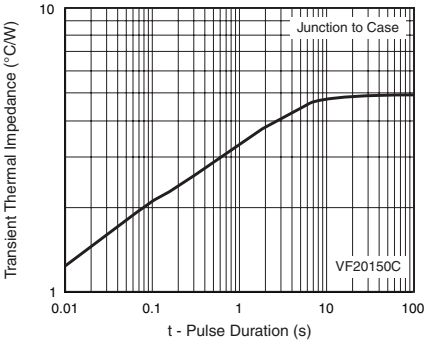


Figure 7. Typical Transient Thermal Impedance Per Diode

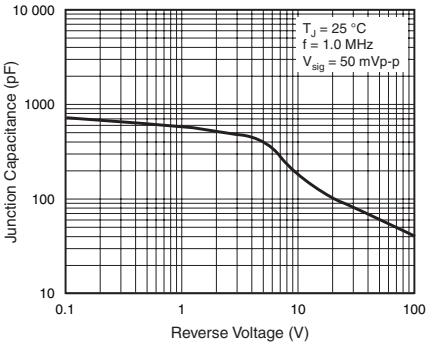
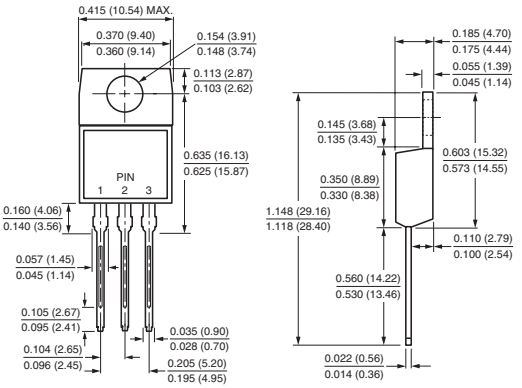


Figure 5. Typical Junction Capacitance

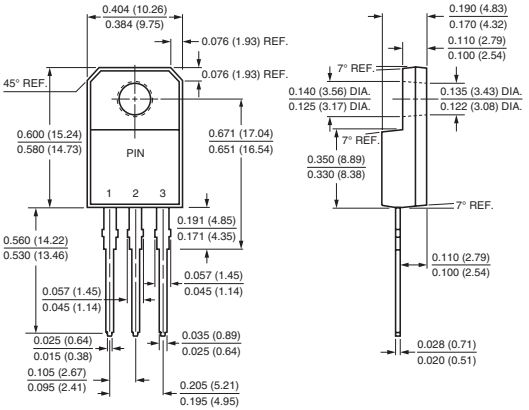
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

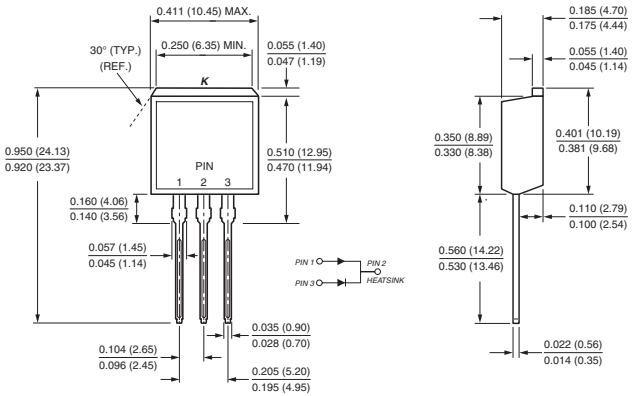
TO-220AB



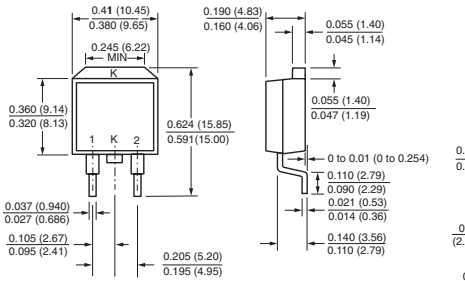
ITO-220AB



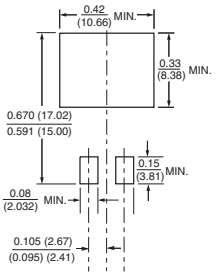
TO-262AA



TO-263AB



Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.55 V at I_F = 5 A

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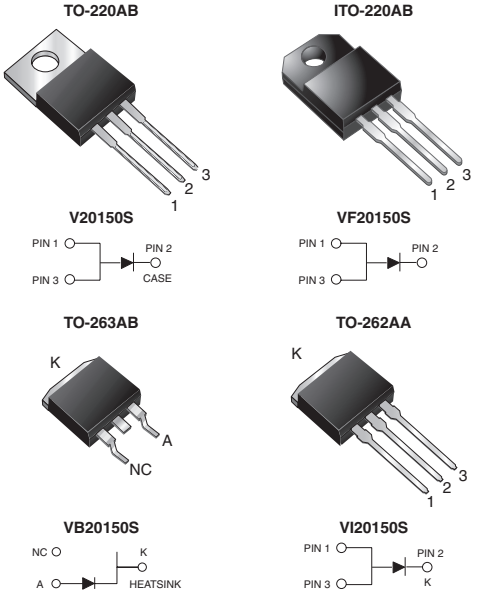

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	150 V
I_{FSM}	160 A
V_F at I_F = 20 A	0.75 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V20150S	VF20150S	VB20150S	VI20150S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	150				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	160				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
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Document Number: 89059
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	150 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.69 0.84 1.15	- - 1.43	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.55 0.64 0.75	- - 0.82	
Reverse current (2)	V_R = 100 V	T_A = 25 °C T_A = 125 °C	I_R	2 2.5	- -	µA mA
	V_R = 150 V	T_A = 25 °C T_A = 125 °C		- 5	250 25	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20150S**	**VF20150S**	**VB20150S**	**VI20150S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20150S-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20150S-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20150S-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB20150S-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI20150S-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

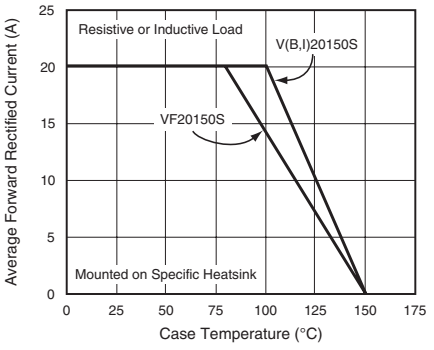


Figure 1. Maximum Forward Current Derating Curve

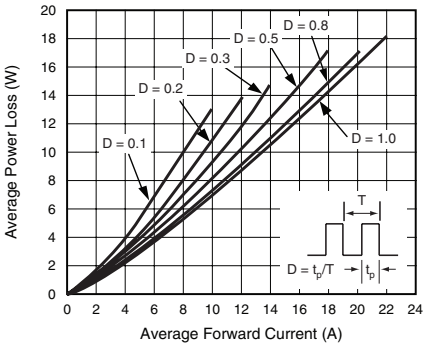


Figure 2. Forward Power Loss Characteristics

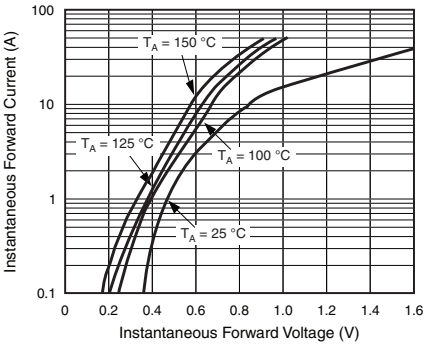


Figure 3. Typical Instantaneous Forward Characteristics

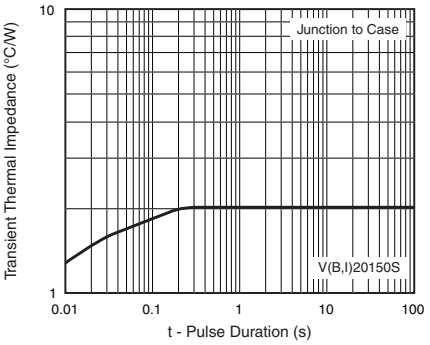


Figure 6. Typical Transient Thermal Impedance

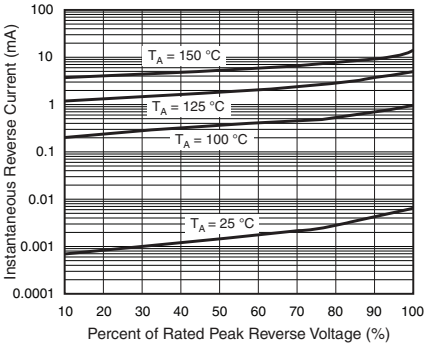


Figure 4. Typical Reverse Characteristics

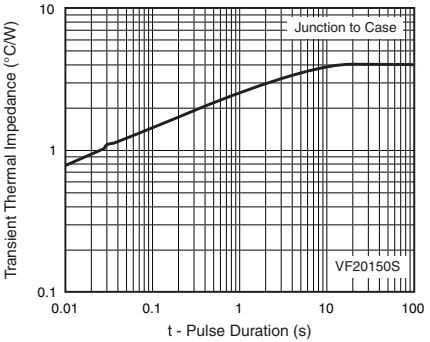


Figure 7. Typical Transient Thermal Impedance

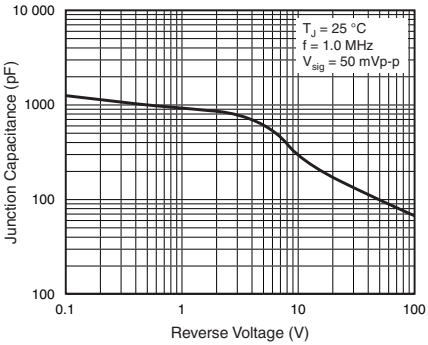
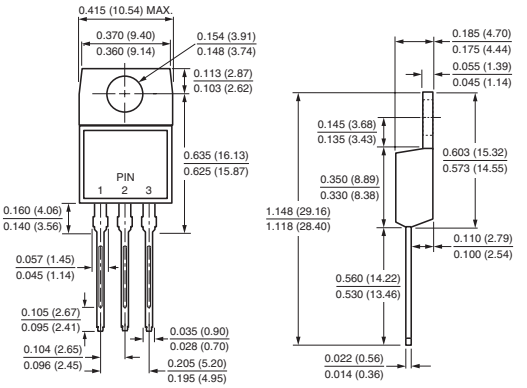


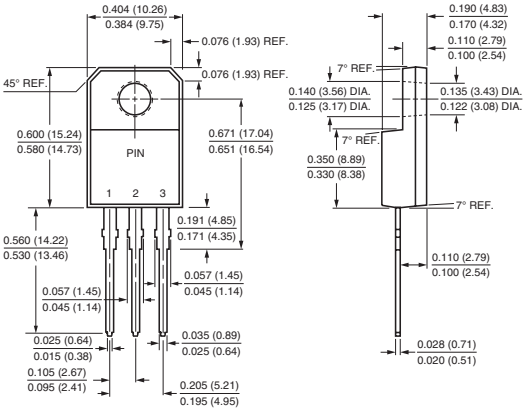
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

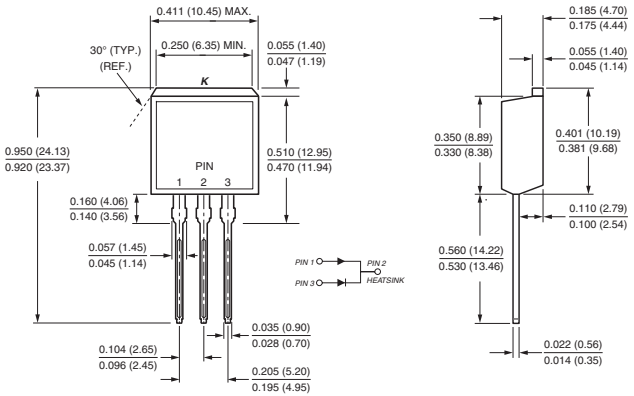
TO-220AB



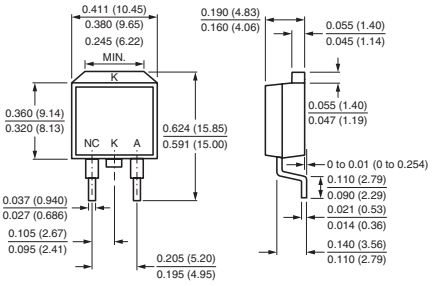
ITO-220AB



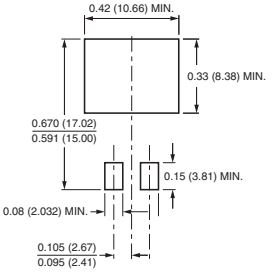
TO-262AA



TO-263AB



Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.57 V at I_F = 5 A

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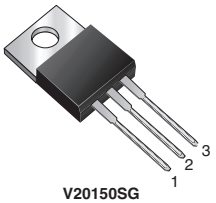
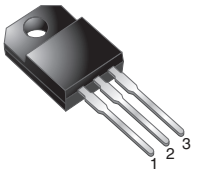
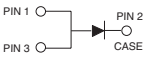
TO-220AB



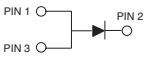
ITO-220AB



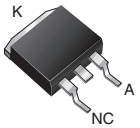
V20150SG



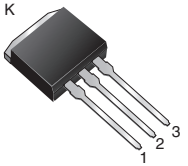
VF20150SG



TO-263AB

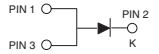


TO-262AA



VB20150SG

VI20150SG



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	150 V
I_{FSM}	140 A
V_F at I_F = 20 A	0.77 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20150SG**	**VF20150SG**	**VB20150SG**	**VI20150SG**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	150				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	20				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	140				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
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Document Number: 89060
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	150 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.72 0.87 1.24	- - 1.60	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.57 0.65 0.77	- - 0.84	
Reverse current (2)	V_R = 100 V	T_A = 25 °C T_A = 125 °C	I_R	1.5 2	- -	µA mA
	V_R = 150 V	T_A = 25 °C T_A = 125 °C		- 4	200 20	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20150SG**	**VF20150SG**	**VB20150SG**	**VI20150SG**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20150SG-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20150SG-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20150SG-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB20150SG-E3/8W	1.38	8W	800/reel	Tape and reel
TO-262AA	VI20150SG-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

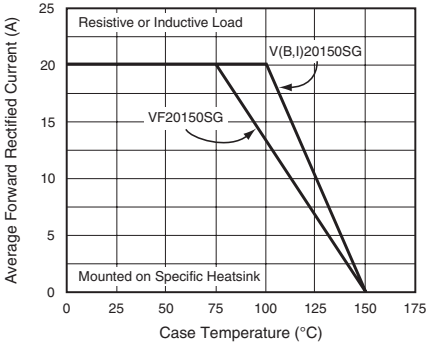

Figure 1. Maximum Forward Current Derating Curve

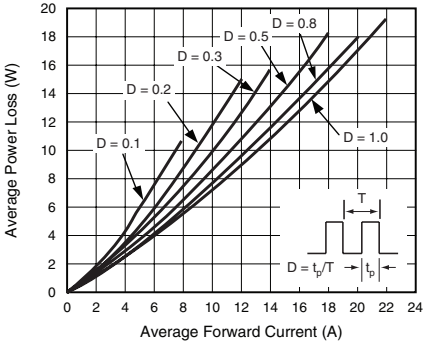

Figure 2. Forward Power Loss Characteristics

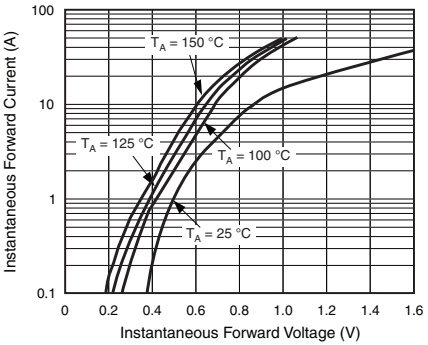

Figure 3. Typical Instantaneous Forward Characteristics

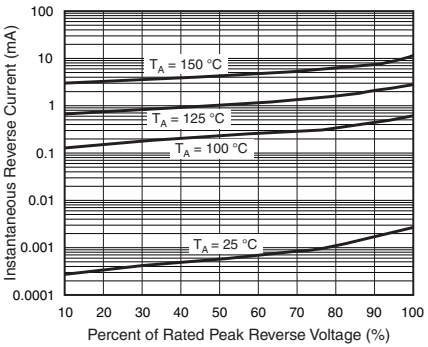

Figure 4. Typical Reverse Characteristics

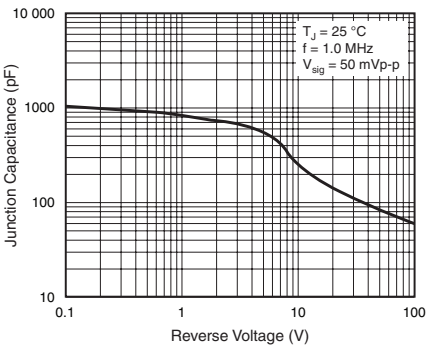

Figure 5. Typical Junction Capacitance

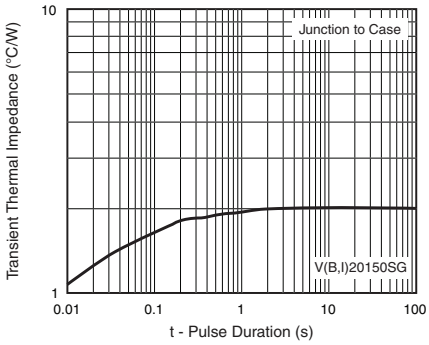

Figure 6. Typical Transient Thermal Impedance

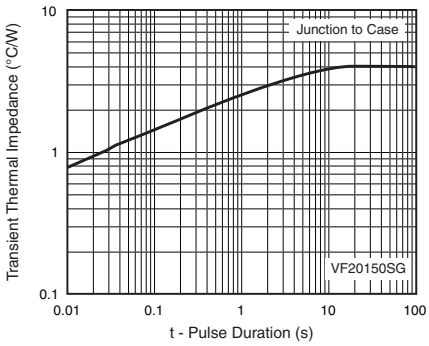

Figure 7. Typical Transient Thermal Impedance

For technical questions within your region, please contact one of the following:
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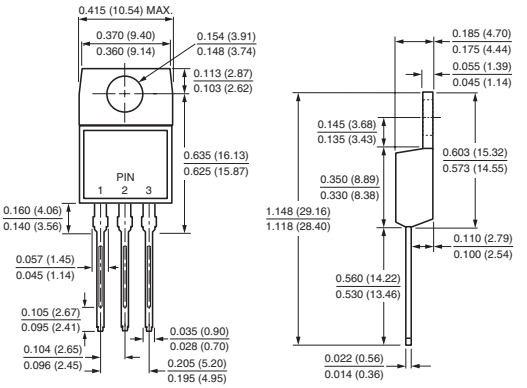
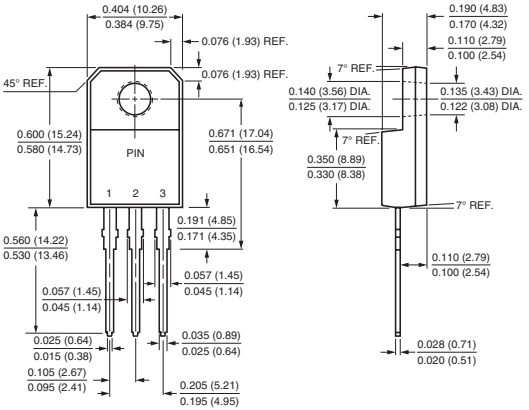
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

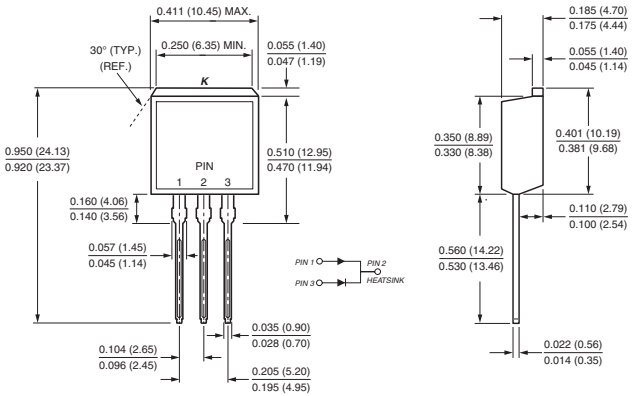
TO-220AB



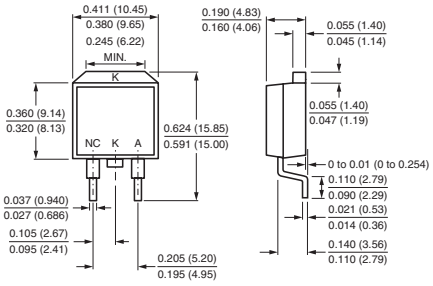
ITO-220AB



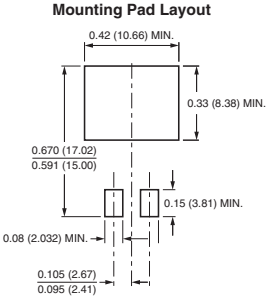
TO-262AA



TO-263AB



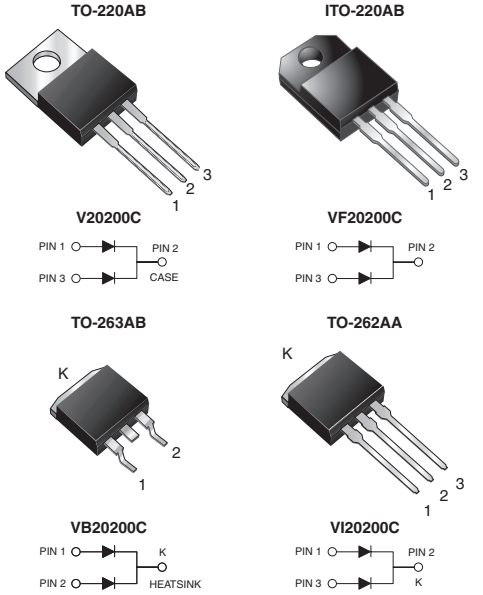
Mounting Pad Layout



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.60 V at I_F = 5 A

TMBS®



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	200 V
I_{FSM}	120 A
V_F at I_F = 10 A	0.68 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V20200C	VF20200C	VB20200C	VI20200C	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200				V
Maximum average forward rectified current (Fig. 1) per device per diode	$I_{F(AV)}$	20 10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	120				A
Peak repetitive reverse current at t_p = 2 µs, 1 kHz per diode	I_{RRM}	0.5				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	200 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	0.85 1.21	- 1.60	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		0.60 0.68	- 0.76	
Reverse current per diode (2)	V_R = 180 V	T_A = 25 °C T_A = 125 °C	I_R	6 3.6	- -	µA mA
	V_R = 200 V	T_A = 25 °C T_A = 125 °C		- 5.6	150 18	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V20200C**	**VF20200C**	**VB20200C**	**VI20200C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.8	5.0	2.8	2.8	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V20200C-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF20200C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB20200C-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	VB20200C-E3/8W	1.37	8W	800/reel	Tape and reel
TO-262AA	VI20200C-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

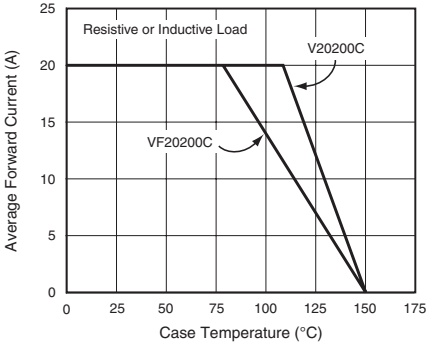


Figure 1. Maximum Forward Current Derating Curve

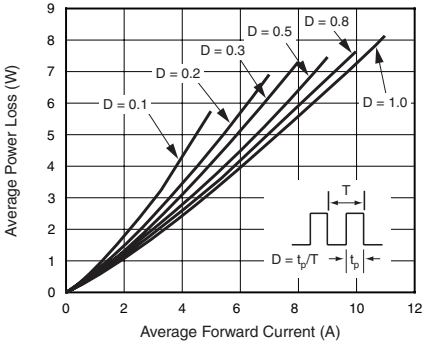


Figure 2. Forward Power Loss Characteristics Per Diode

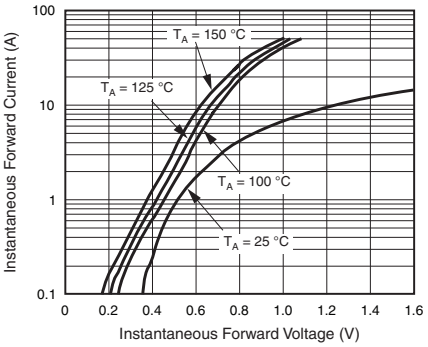


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

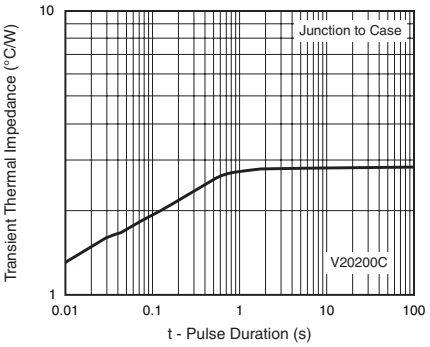


Figure 6. Typical Transient Thermal Impedance Per Diode

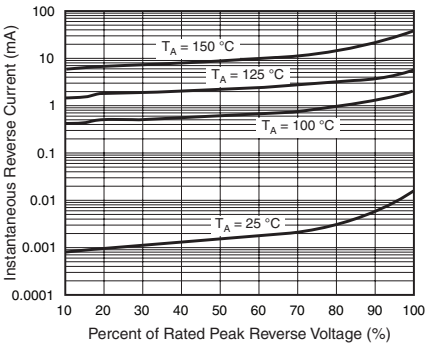


Figure 4. Typical Reverse Characteristics Per Diode

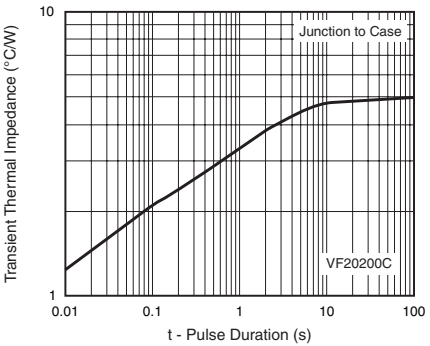


Figure 7. Typical Transient Thermal Impedance Per Diode

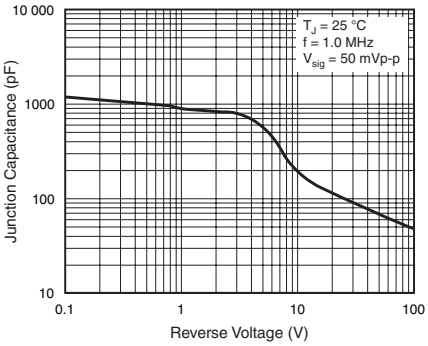
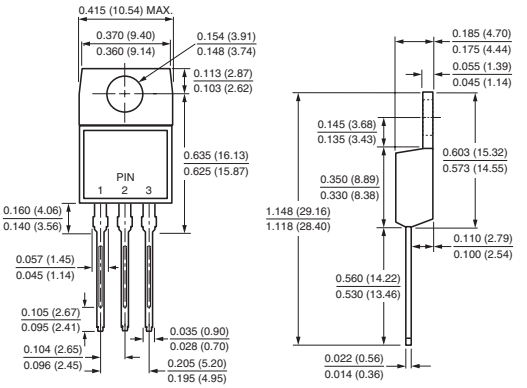


Figure 5. Typical Junction Capacitance Per Diode

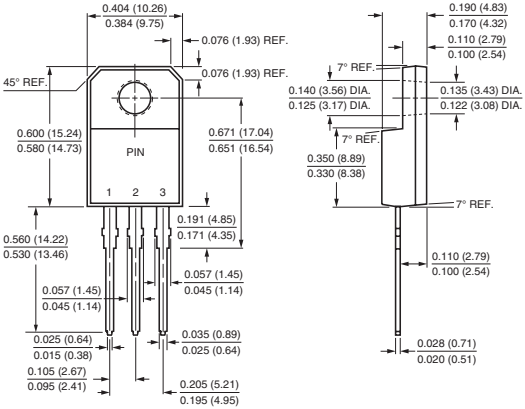
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

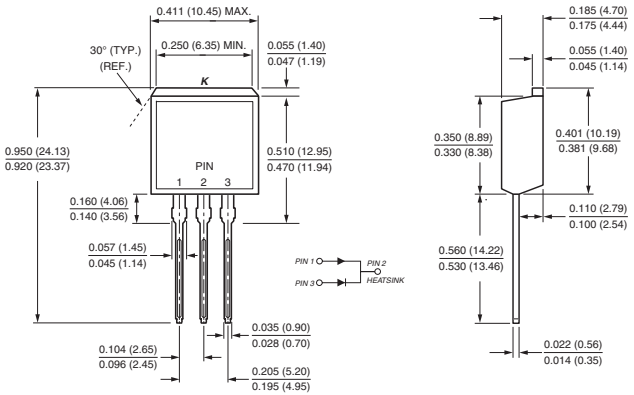
TO-220AB



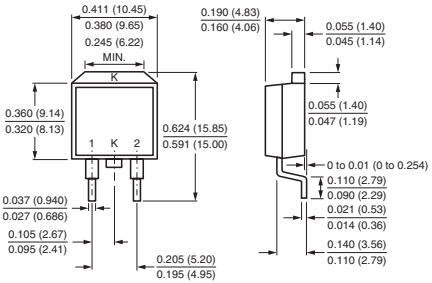
ITO-220AB



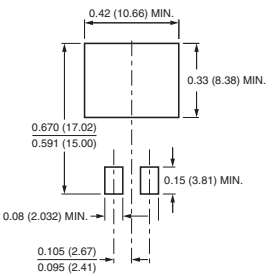
TO-262AA



TO-263AB



Mounting Pad Layout



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.455 V at I_F = 5 A

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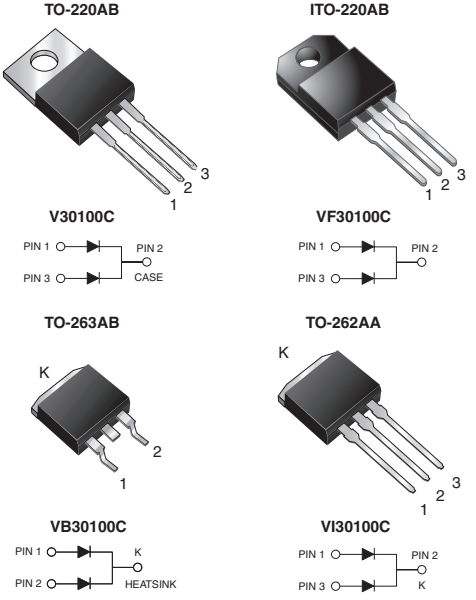


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	100 V
I_{FSM}	160 A
V_F at I_F = 15 A	0.63 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V30100C	VF30100C	VB30100C	VI30100C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100				V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	30 15				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	per diode	I_{FSM}	160				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500				V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89010
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 25 °C	V_F	0.516 0.576 0.734	- - 0.80	
	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 125 °C		0.455 0.522 0.627	- - 0.68	
Reverse current per diode (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	7.2 8.0	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		65 20	500 35	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30100C**	**VF30100C**	**VB30100C**	**VI30100C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.5	5.5	2.5	2.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30100C-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF30100C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB30100C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30100C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI30100C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

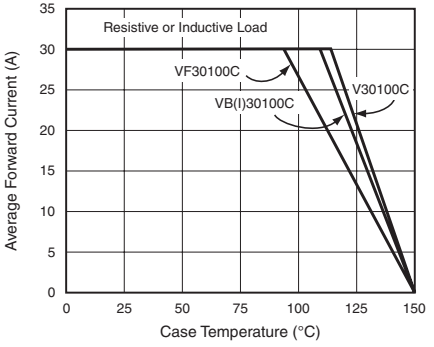


Figure 1. Forward Current Derating Curve

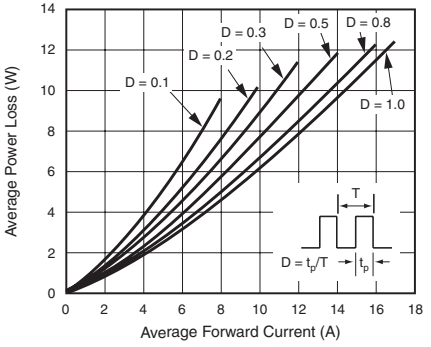


Figure 2. Forward Power Loss Characteristics Per Diode

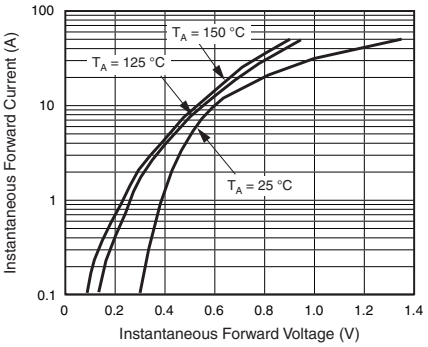


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

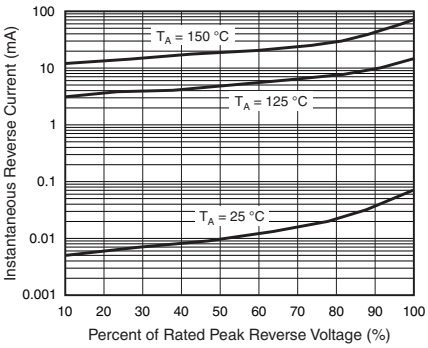


Figure 4. Typical Reverse Characteristics Per Diode

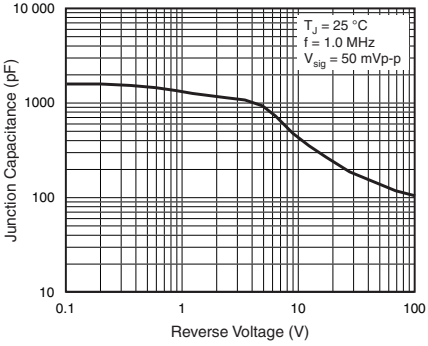


Figure 5. Typical Junction Capacitance

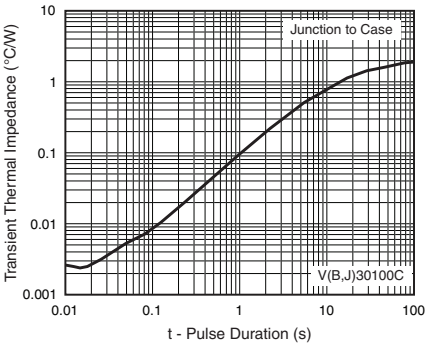


Figure 6. Typical Transient Thermal Impedance Per Diode

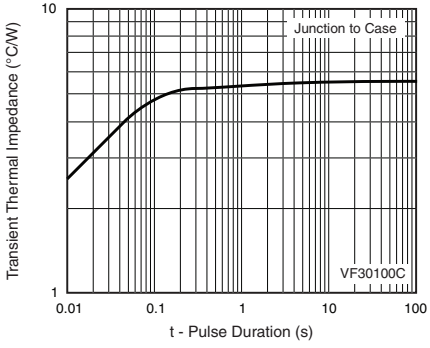
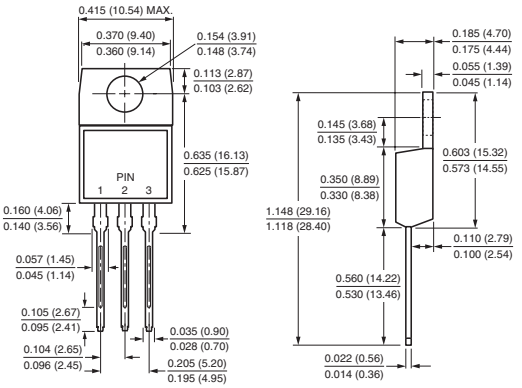


Figure 7. Typical Transient Thermal Impedance Per Diode

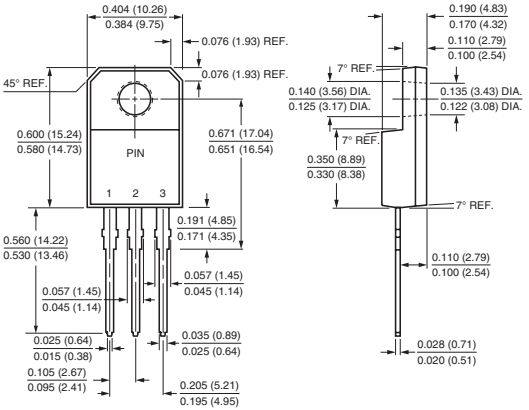
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

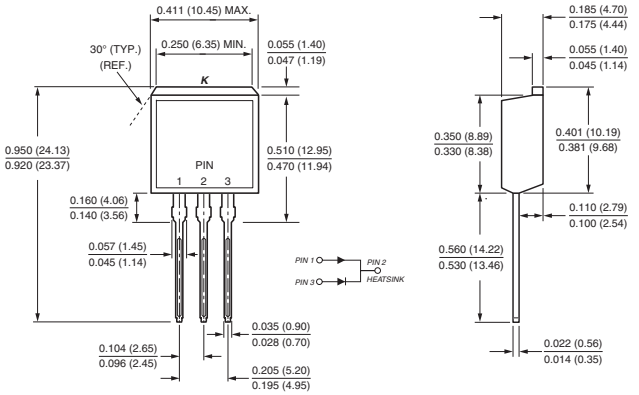
TO-220AB



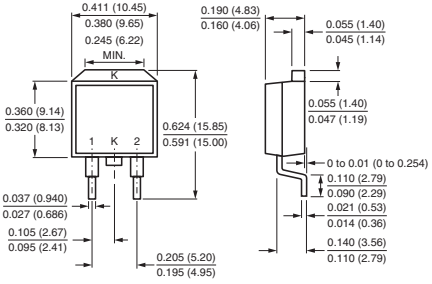
ITO-220AB



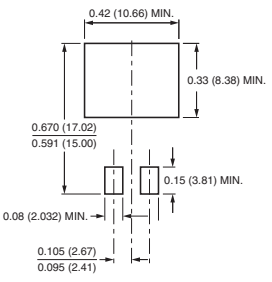
TO-262AA



TO-263AB



Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.39 V at I_F = 5 A

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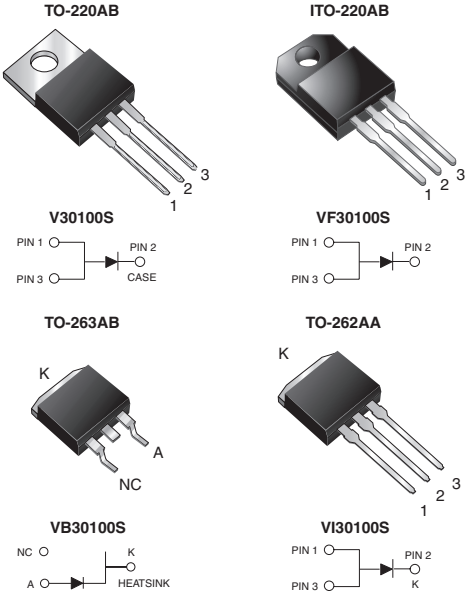


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB, and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at I_F = 30 A	0.69 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30100S	VF30100S	VB30100S	VI30100S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	250				A
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88941
Revision: 31-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 10 mA	T_A = 25 °C	V_{BR}	105 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 30 A	T_A = 25 °C	V_F	0.47 0.55 0.80	- - 0.91	V
	I_F = 5 A I_F = 10 A I_F = 30 A	T_A = 125 °C		0.39 0.49 0.69	- - 0.78	
Reverse current (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	27 11	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		70 23	1000 45	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30100S**	**VF30100S**	**VB30100S**	**VI30100S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0	4.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30100S-E3/45	1.875	45	50/tube	Tube
ITO-220AB	VF30100S-E3/45	1.805	45	50/tube	Tube
TO-263AB	VB30100S-E3/4W	1.380	4W	50/tube	Tube
TO-263AB	VB30100S-E3/8W	1.380	8W	800/reel	Tape and reel
TO-262AA	VI30100S-E3/4W	1.455	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

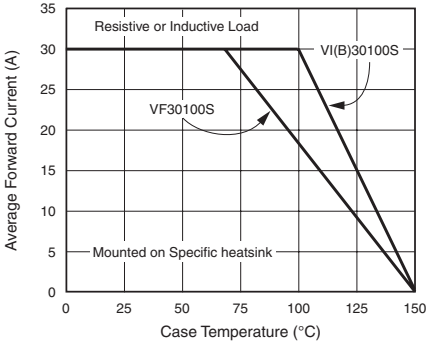


Figure 1. Forward Current Derating Curve

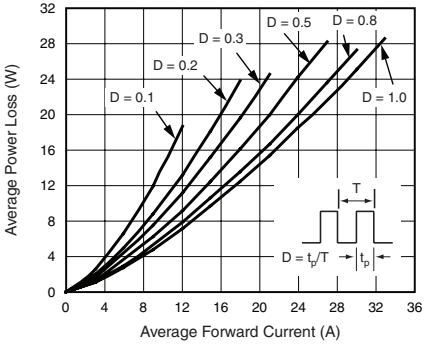


Figure 2. Forward Power Loss Characteristics

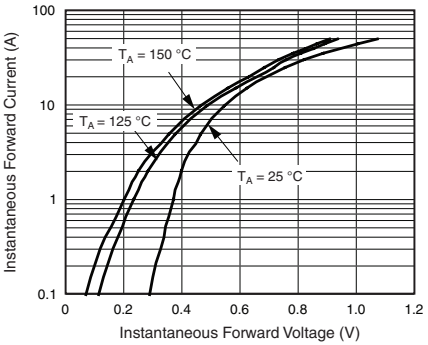


Figure 3. Typical Instantaneous Forward Characteristics

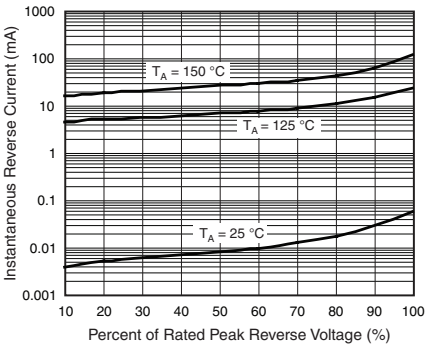


Figure 4. Typical Reverse Characteristics

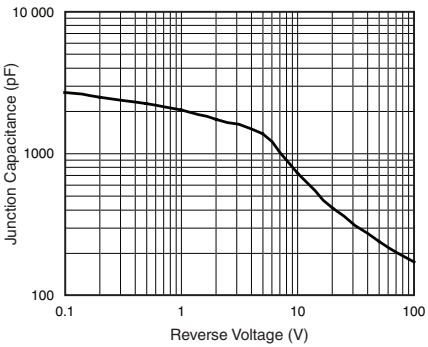


Figure 5. Typical Junction Capacitance

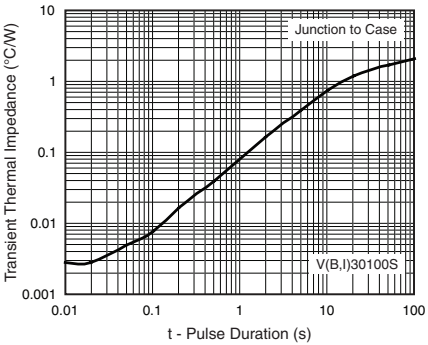


Figure 6. Typical Transient Thermal Impedance

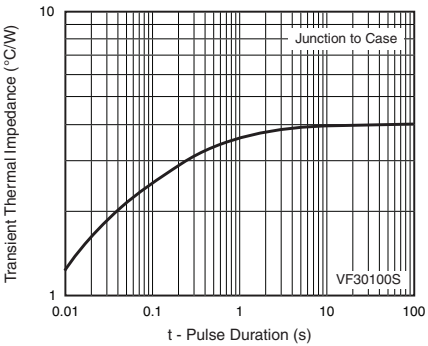
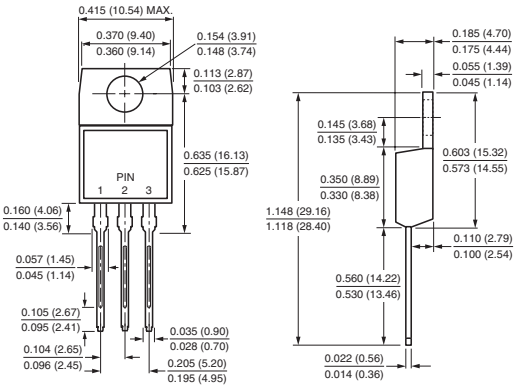


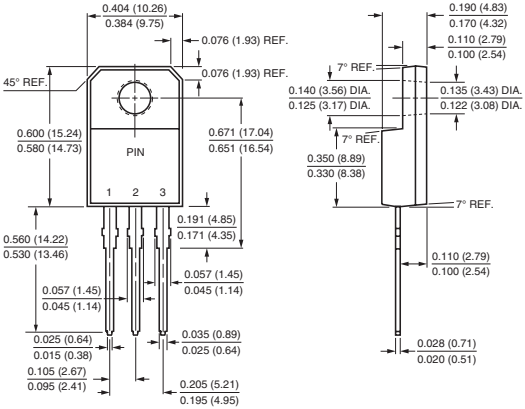
Figure 7. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

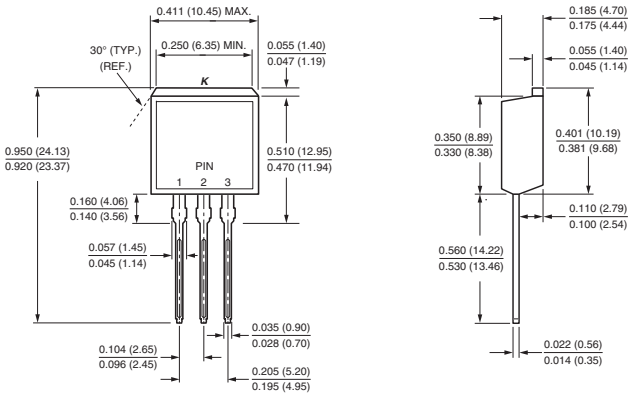
TO-220AB



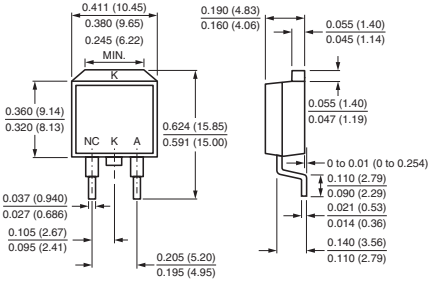
ITO-220AB



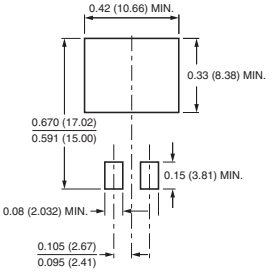
TO-262AA



TO-263AB



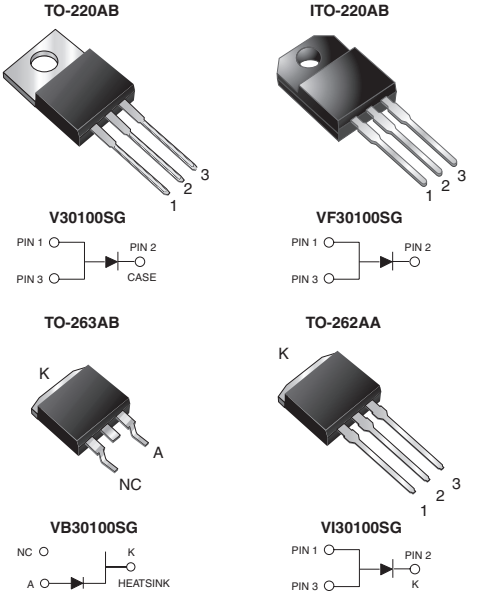
Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.437 V at I_F = 5 A

TMBS®



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at I_F = 30 A	0.76 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30100SG	VF30100SG	VB30100SG	VI30100SG	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	250				A
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 10 mA	T_A = 25 °C	V_{BR}	105 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A I_F = 30 A	T_A = 25 °C	V_F	0.50 0.60 0.92	- - 1.00	V
	I_F = 5 A I_F = 10 A I_F = 30 A	T_A = 125 °C		0.44 0.55 0.76	- - 0.83	
Reverse current (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	8.8 6.5	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		43 18	350 35	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30100SG**	**VF30100SG**	**VB30100SG**	**VI30100SG**	**UNIT**
Typical thermal resistance per leg	$R_{\theta JC}$	2.0	3.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30100SG-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF30100SG-E3/4W	1.74	4W	50/tube	Tube
TO-263AB	VB30100SG-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	VB30100SG-E3/8W	1.37	8W	800/reel	Tape and reel
TO-262AA	VI30100SG-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES
(T_A = 25 °C unless otherwise noted)

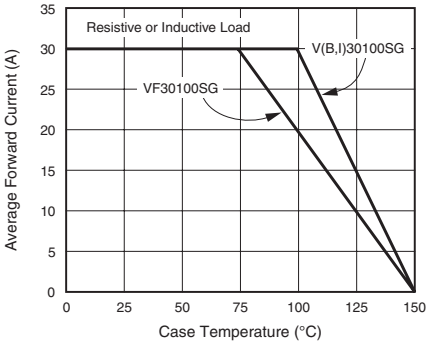


Figure 1. Forward Current Derating Curve

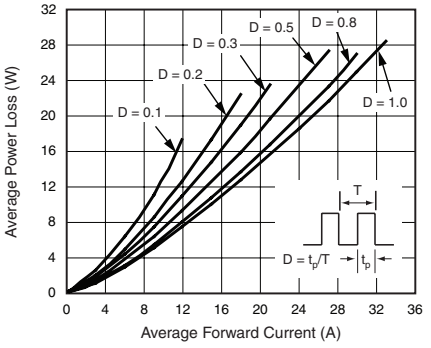


Figure 2. Forward Power Loss Characteristics

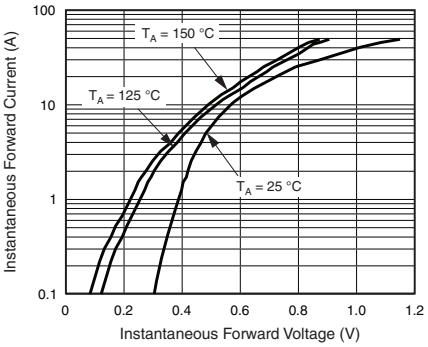


Figure 3. Typical Instantaneous Forward Characteristics

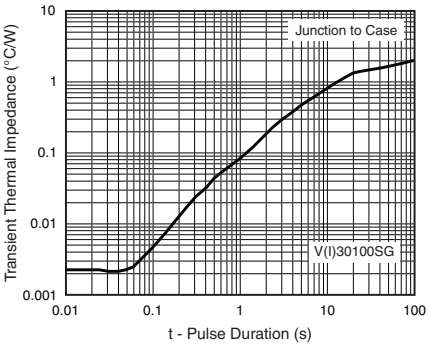


Figure 6. Typical Transient Thermal Impedance

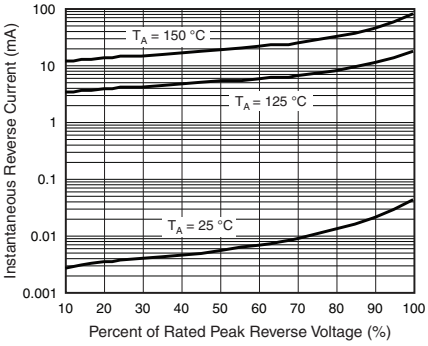


Figure 4. Typical Reverse Characteristics

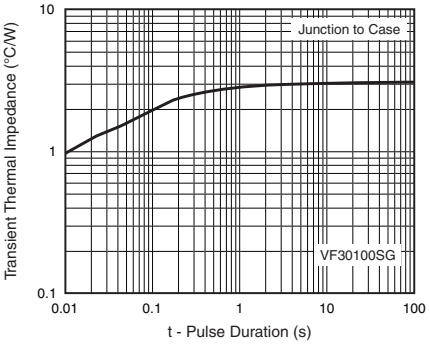


Figure 7. Typical Transient Thermal Impedance

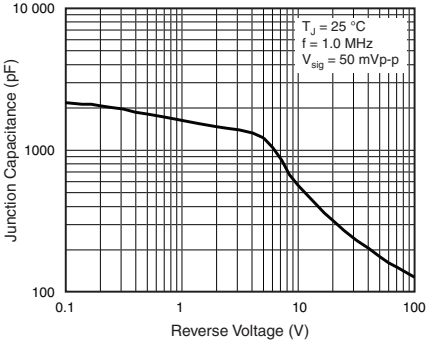
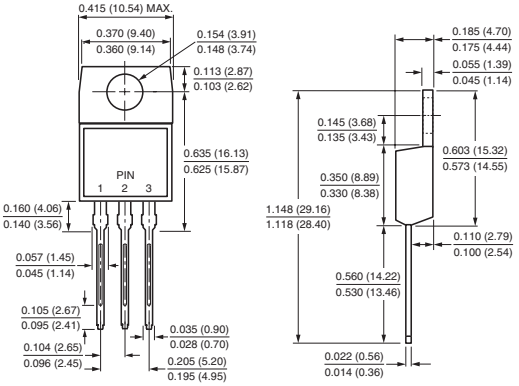


Figure 5. Typical Junction Capacitance

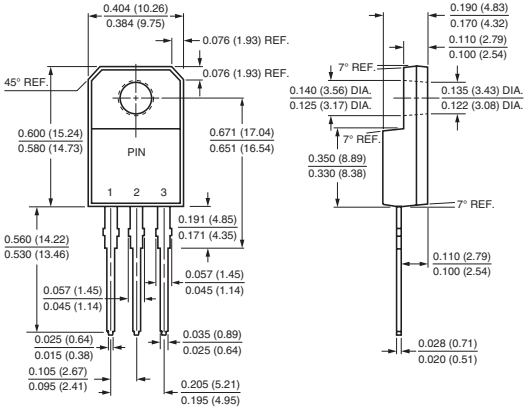
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

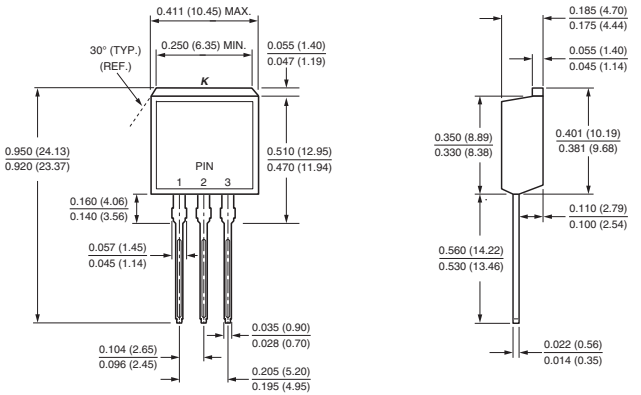
TO-220AB



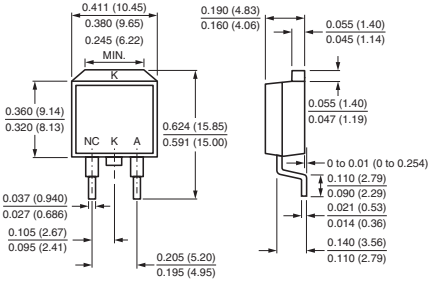
ITO-220AB



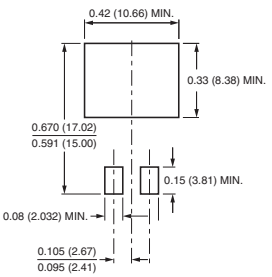
TO-262AA



TO-263AB



Mounting Pad Layout



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.50 V at I_F = 5 A

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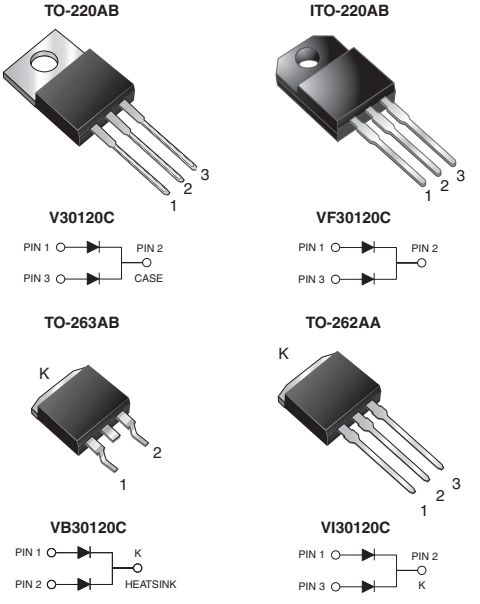


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	120 V
I_{FSM}	150 A
V_F at I_F = 15 A	0.68 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V30120C	VF30120C	VB30120C	VI30120C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	120				V
Maximum average forward rectified current (Fig. 1)	per device	$I_{F(AV)}$	30				A
	per diode		15				
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	150				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500				V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89041
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 25 °C	V_F	0.56 0.71 0.86	- - 0.97	V
	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 125 °C		0.50 0.60 0.68	- - 0.76	
Reverse current per diode (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	11 8	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 17	800 50	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30120C**	**VF30120C**	**VB30120C**	**VI30120C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.2	4.5	2.2	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30120C-E3/4W	1.89	4W	50/tube	Tube
ITO-220AB	VF30120C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB30120C-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB30120C-E3/8W	1.38	8W	800/reel	Tape and reel
TO-262AA	VI30120C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

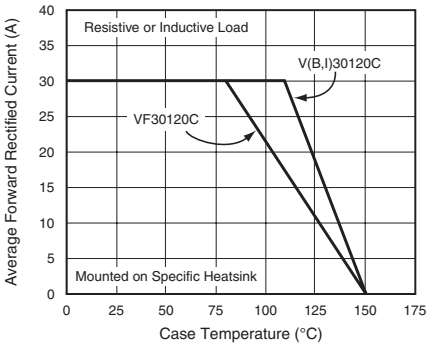


Figure 1. Maximum Forward Current Derating Curve

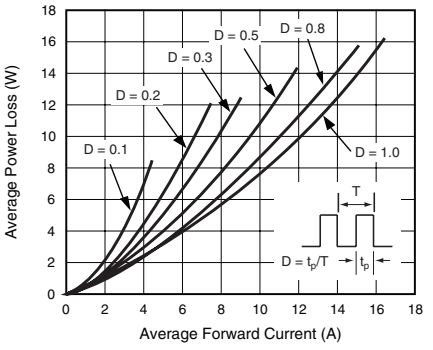


Figure 2. Forward Power Loss Characteristics Per Diode

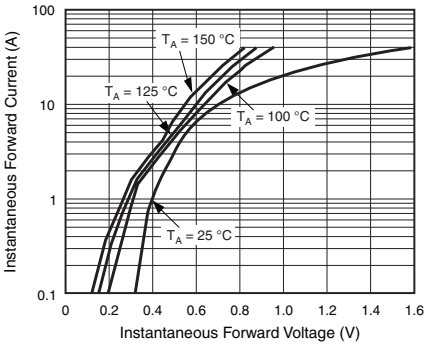


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

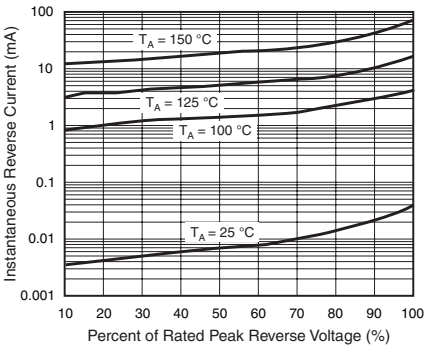


Figure 4. Typical Reverse Characteristics Per Diode

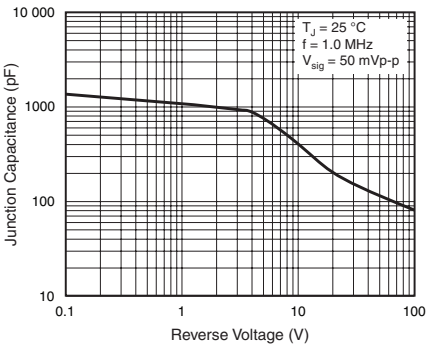


Figure 5. Typical Junction Capacitance Per Diode

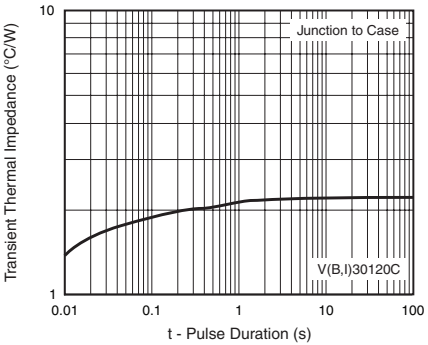


Figure 6. Typical Transient Thermal Impedance Per Diode

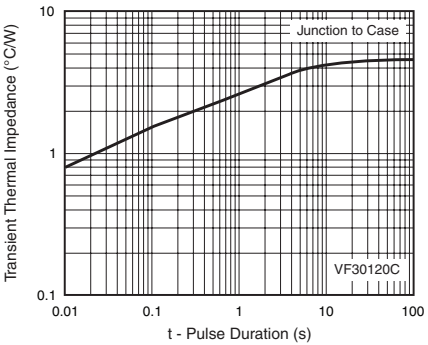
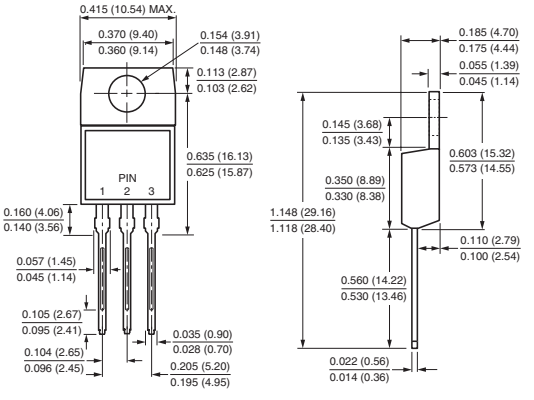


Figure 7. Typical Transient Thermal Impedance Per Diode

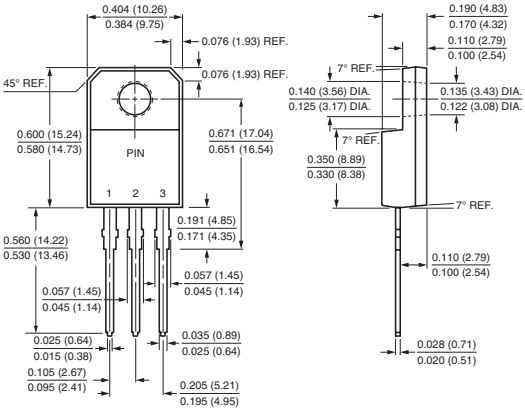
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

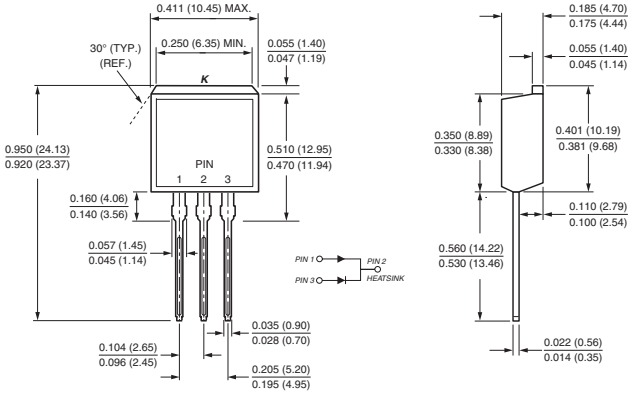
TO-220AB



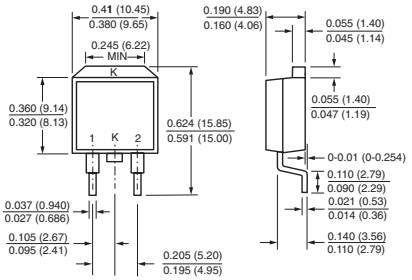
ITO-220AB



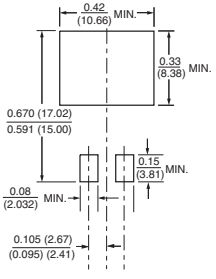
TO-262AA



TO-263AB



Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.43 V at I_F = 5 A

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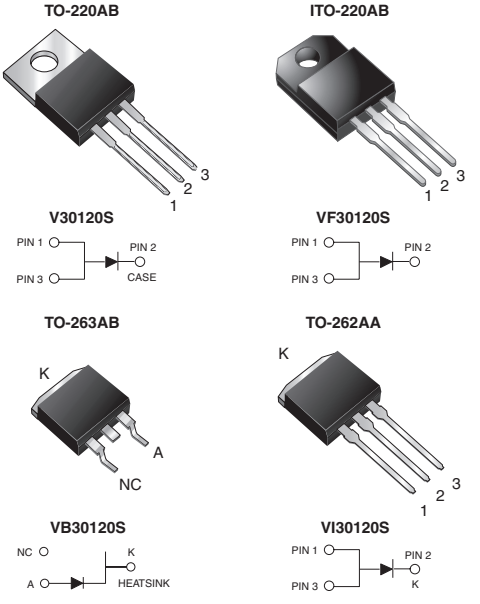


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	120 V
I_{FSM}	300 A
V_F at I_F = 30 A	0.74 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30120S	VF30120S	VB30120S	VI30120S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	300				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 25 °C	V_F	0.50 0.70 0.99	- - 1.10	V
	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 125 °C		0.43 0.60 0.74	- - 0.82	
Reverse current (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	18 12	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 22	500 35	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30120S**	**VF30120S**	**VB30120S**	**VI30120S**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.6	4	1.6	1.6	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30120S-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF30120S-E3/4W	1.76	4W	50/tube	Tube
TO-263AB	VB30120S-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30120S-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI30120S-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

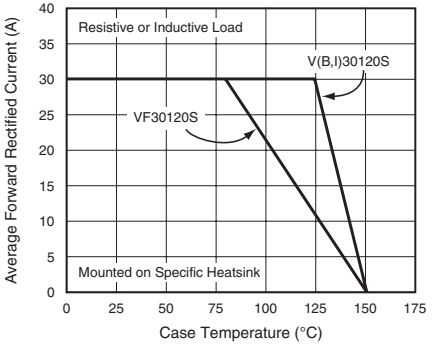


Figure 1. Forward Current Derating Curve

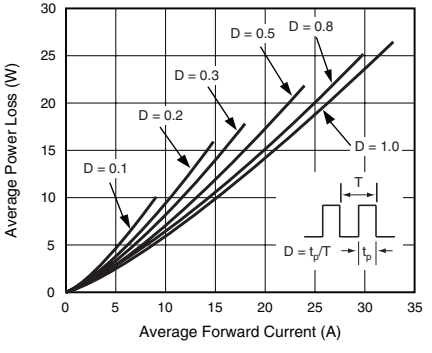


Figure 2. Forward Power Loss Characteristics Per Diode

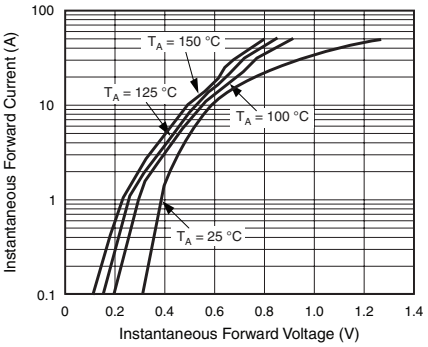


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

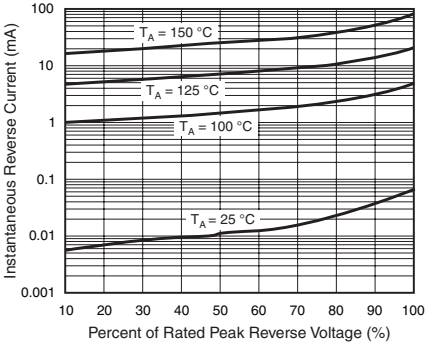


Figure 4. Typical Reverse Characteristics Per Diode

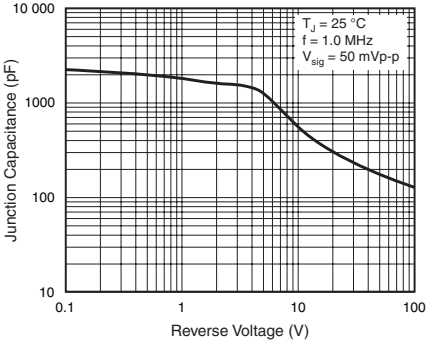


Figure 5. Typical Junction Capacitance Per Diode

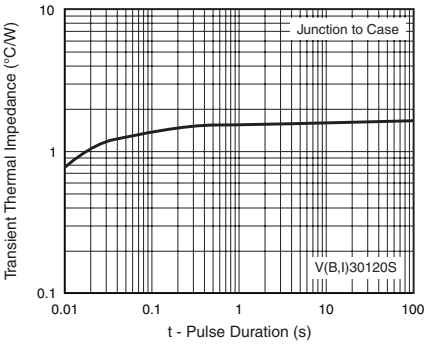


Figure 6. Typical Transient Thermal Impedance Per Diode

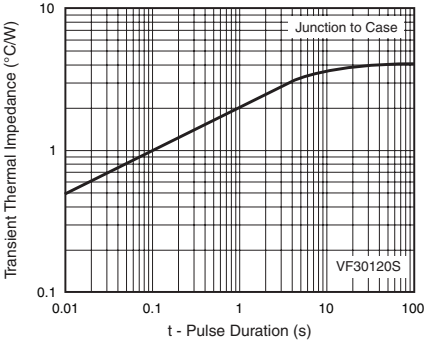
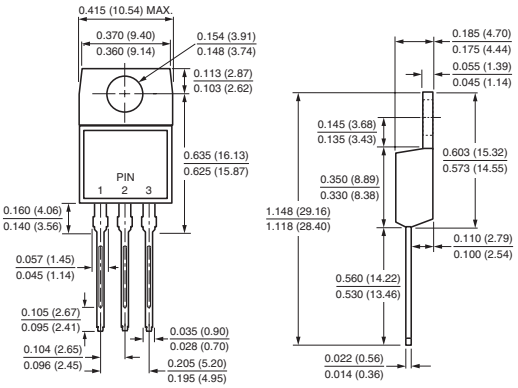


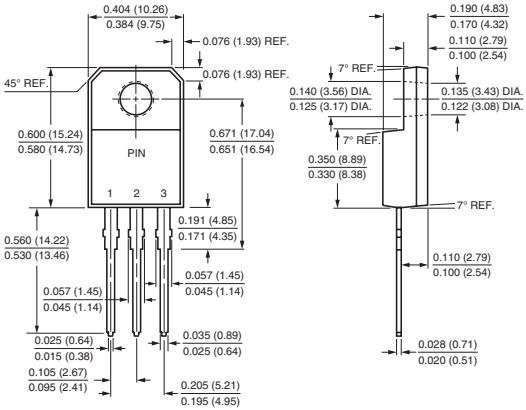
Figure 7. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

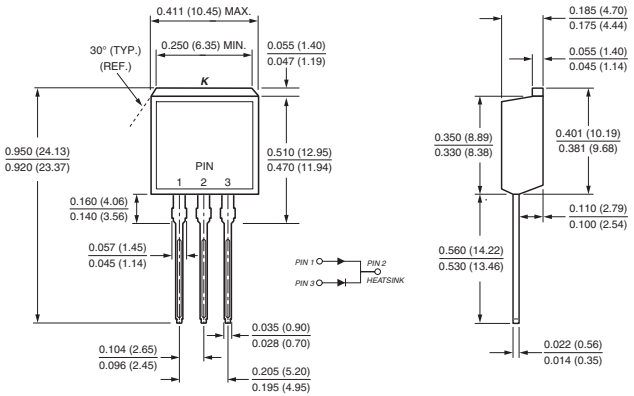
TO-220AB



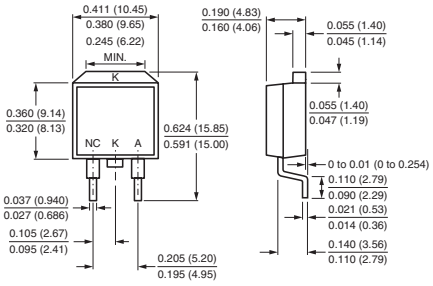
ITO-220AB



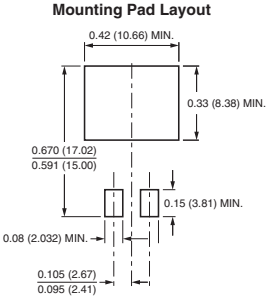
TO-262AA



TO-263AB



Mounting Pad Layout



High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.47 V at I_F = 5 A

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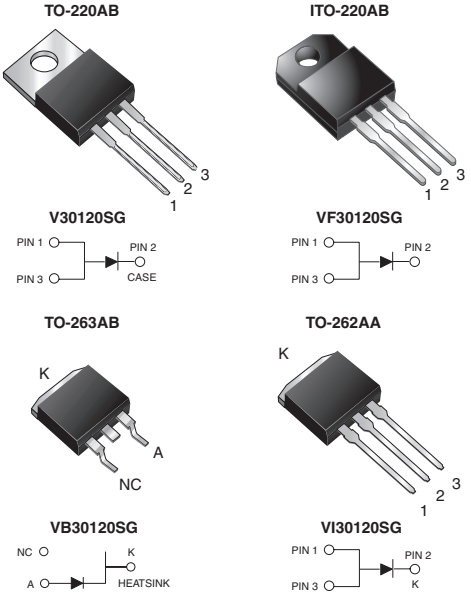


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	120 V
I_{FSM}	220 A
V_F at I_F = 30 A	0.81 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30120SG	VF30120SG	VB30120SG	VI30120SG	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	120				V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	220				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage (1)	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 25 °C	V_F	0.54 0.80 1.16	- - 1.28	V
	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 125 °C		0.47 0.66 0.81	- - 0.90	
Reverse current (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	13 13	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 23	500 55	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30120SG**	**VF30120SG**	**VB30120SG**	**VI30120SG**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	1.6	4.0	1.6	1.6	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30120SG-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF30120SG-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB30120SG-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30120SG-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI30120SG-E3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

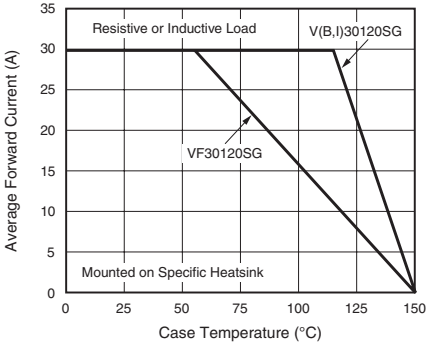


Figure 1. Forward Current Derating Curve

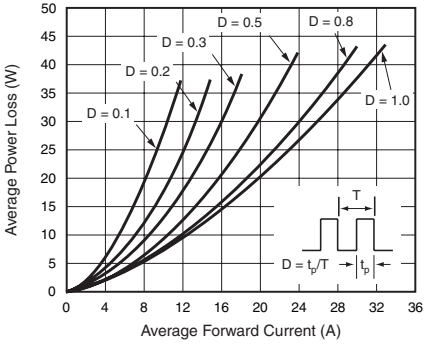


Figure 2. Forward Power Loss Characteristics

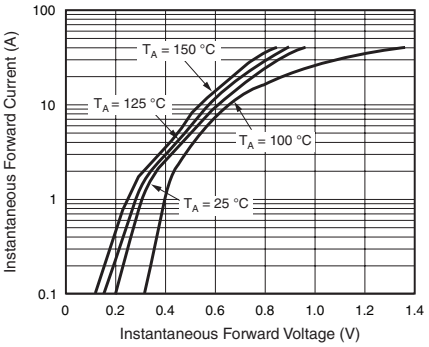


Figure 3. Typical Instantaneous Forward Characteristics

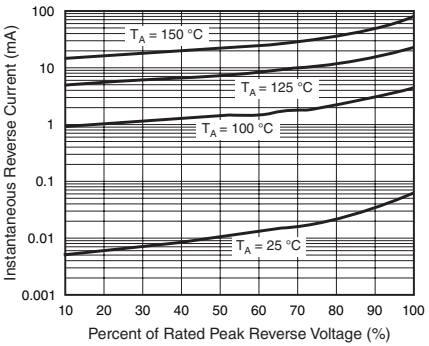


Figure 4. Typical Reverse Characteristics

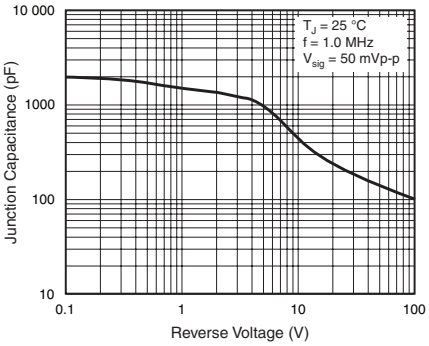


Figure 5. Typical Junction Capacitance

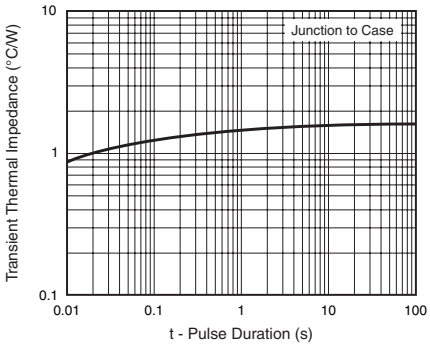


Figure 6. Typical Transient Thermal Impedance

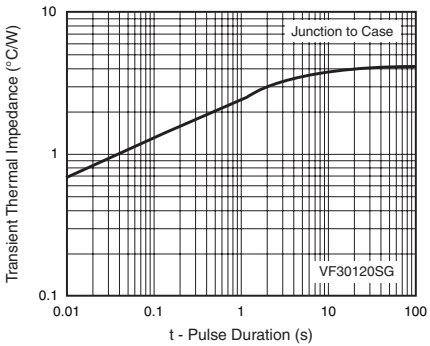
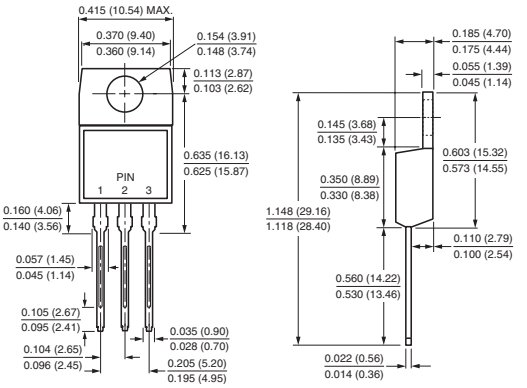


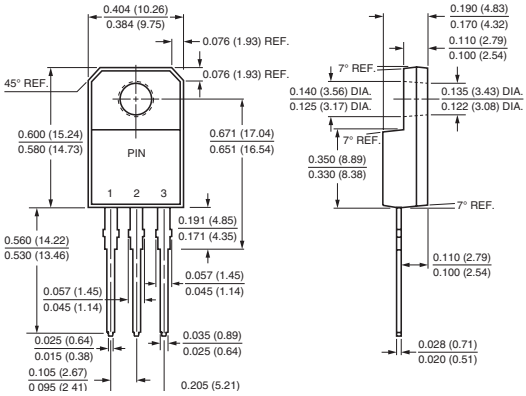
Figure 7. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

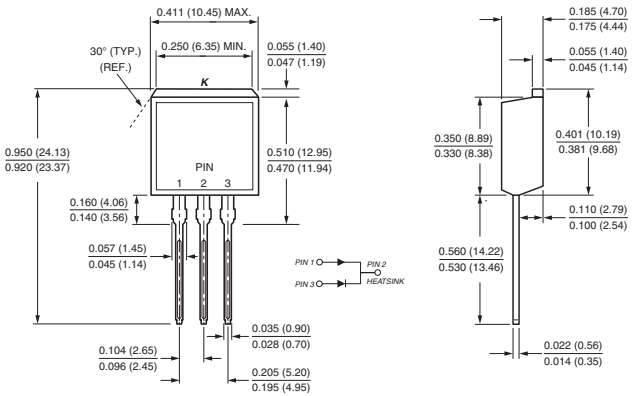
TO-220AB



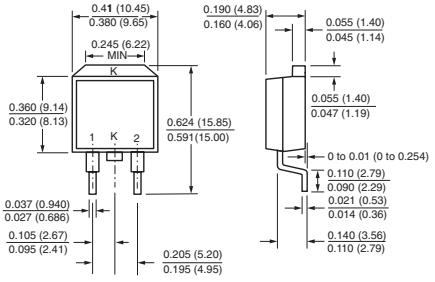
ITO-220AB



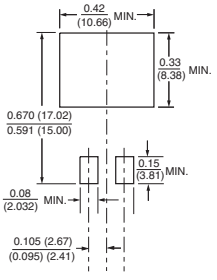
TO-262AA



TO-263AB



Mounting Pad Layout



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.56 V at I_F = 5 A

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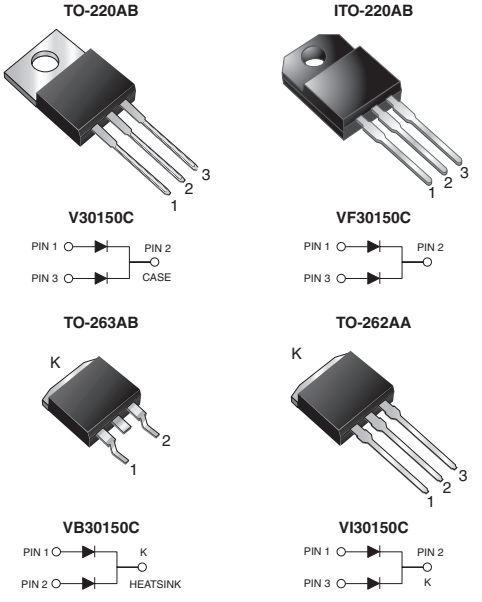


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	150 V
I_{FSM}	140 A
V_F at I_F = 15 A	0.71 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30150C	VF30150C	VB30150C	VI30150C	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	150				V
Maximum average forward rectified current (Fig. 1) per device per diode	$I_{F(AV)}$	30 15				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	140				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89047
Revision: 19-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	150 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 25 °C	V_F	0.72 0.81 1.11	- - 1.36	V
	I_F = 5 A I_F = 7.5 A I_F = 15 A	T_A = 125 °C		0.56 0.61 0.71	- - 0.79	
Reverse current per diode (2)	V_R = 100 V	T_A = 25 °C T_A = 125 °C	I_R	1.5 2	- -	µA mA
	V_R = 150 V	T_A = 25 °C T_A = 125 °C		- 4	200 20	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30150C**	**VF30150C**	**VI30150C**	**VI30150C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.2	4.5	2.2	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30150C-E3/4W	1.89	4W	50/tube	Tube
ITO-220AB	VF30150C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB30150C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30150C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI30150C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

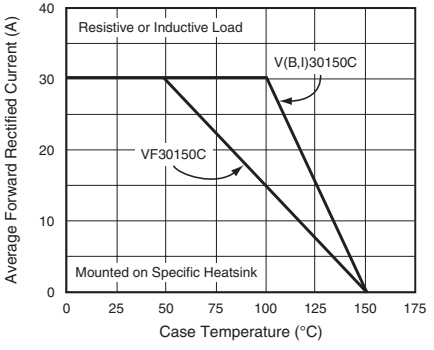


Figure 1. Maximum Forward Current Derating Curve

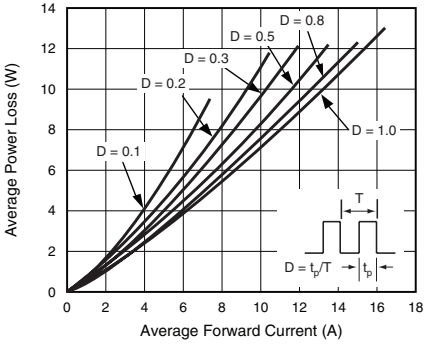


Figure 2. Forward Power Loss Characteristics Per Diode

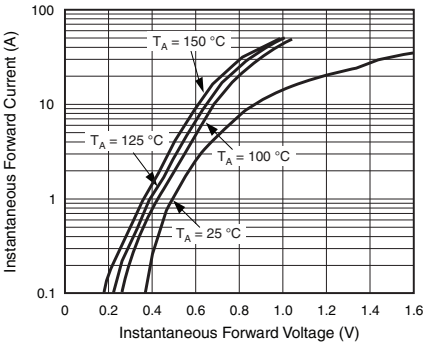


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

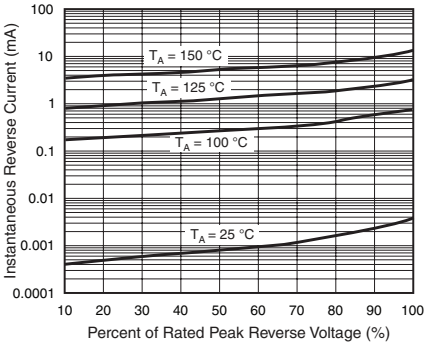


Figure 4. Typical Reverse Characteristics Per Diode

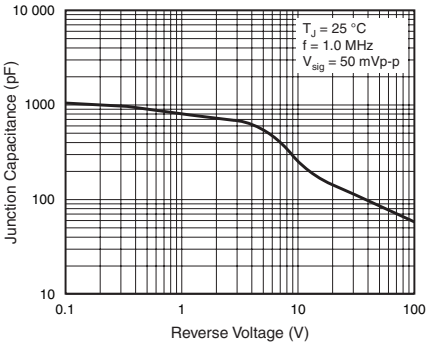


Figure 5. Typical Junction Capacitance

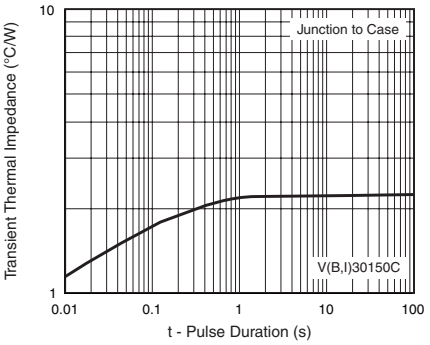


Figure 6. Typical Transient Thermal Impedance Per Diode

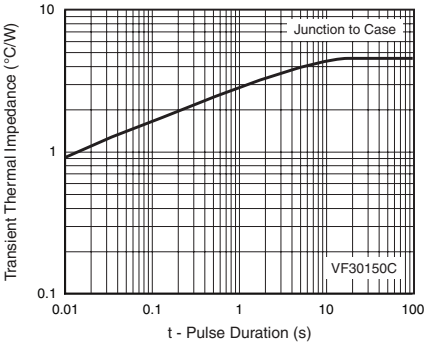
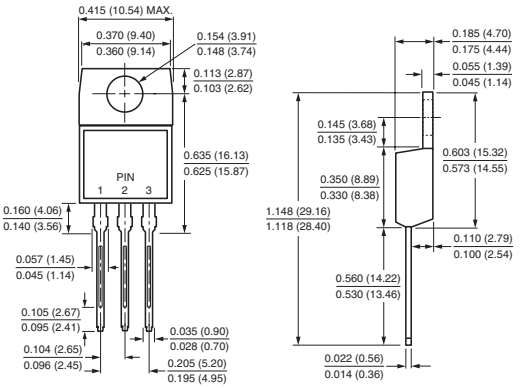


Figure 7. Typical Transient Thermal Impedance Per Diode

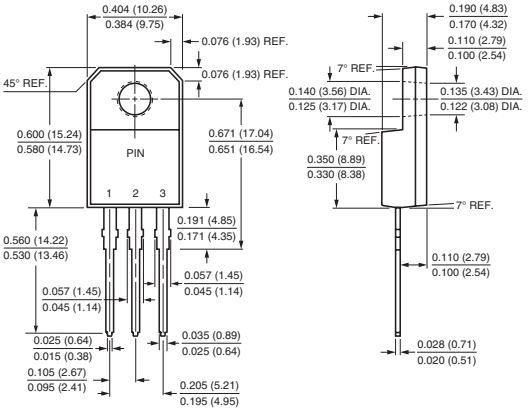
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

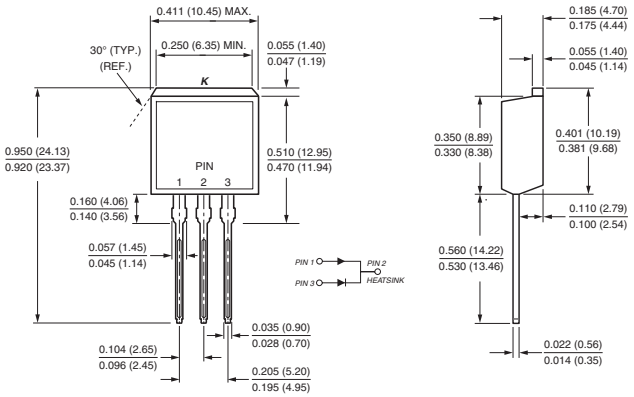
TO-220AB



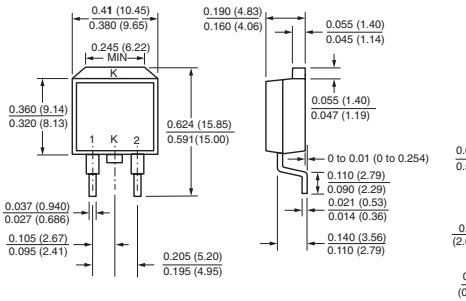
ITO-220AB



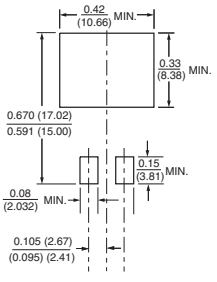
TO-262AA



TO-263AB



Mounting Pad Layout



V30200C, VB30200C & VI30200C

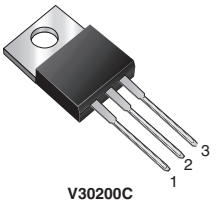
Vishay General Semiconductor

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

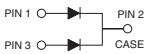
Ultra Low V_F = 0.526 V at I_F = 5 A

TMBS®

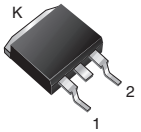
TO-220AB



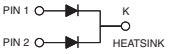
V30200C



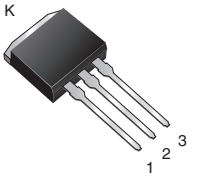
TO-263AB



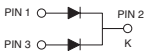
VB30200C



TO-262AA



VI30200C



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	200 V
I_{FSM}	250 A
V_F at I_F = 15 A	0.648 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V30200C	VB30200C	VI30200C	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200			V
Maximum average forward rectified current (Fig. 1) per device per diode	$I_{F(AV)}$	30 15			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	250			A
Non-repetitive avalanche energy at I_{AS} = 2.0 A, T_J = 25 °C	E_{AS}	100			mJ
Peak repetitive reverse current at t_p = 2 µs, 1 kHz per diode	I_{RRM}	1.0			A
Voltage rate of change (rated V_R)	dV/dt	10 000			V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150			°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89014
Revision: 31-Jul-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 10 mA	T_J = 25 °C	V_{BR}	205 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 15 A	T_J = 25 °C	V_F	0.691 0.770 0.841	- - 1.10	V
	I_F = 5 A I_F = 10 A I_F = 15 A	T_J = 125 °C		0.526 0.594 0.648	- - 0.72	
Reverse current per diode (2)	V_R = 180 V	T_J = 25 °C T_J = 125 °C	I_R	2.4 3.8	- -	µA mA
	V_R = 200 V	T_J = 25 °C T_J = 125 °C		5.3 6.0	160 12	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V30200C**	**VB30200C**	**VI30200C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0			°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V30200C-E3/4W	2.248	4W	50/tube	Tube
TO-263AB	VB30200C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB30200C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI30200C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

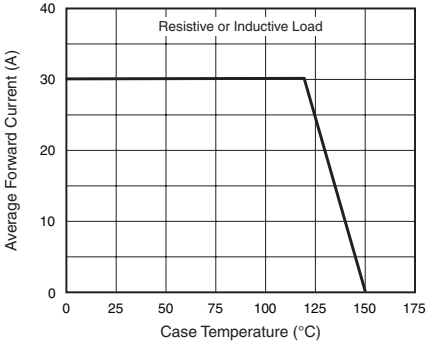


Figure 1. Forward Derating Curve

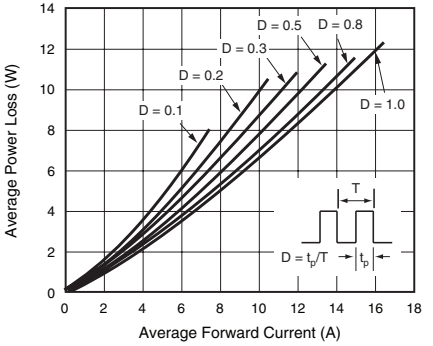


Figure 2. Forward Power Loss Characteristics Per Diode

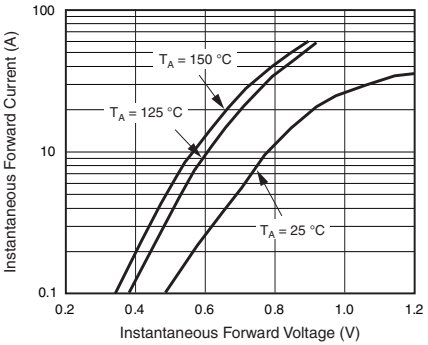


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

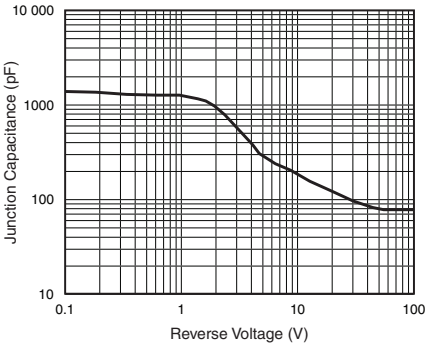


Figure 5. Typical Junction Capacitance Per Diode

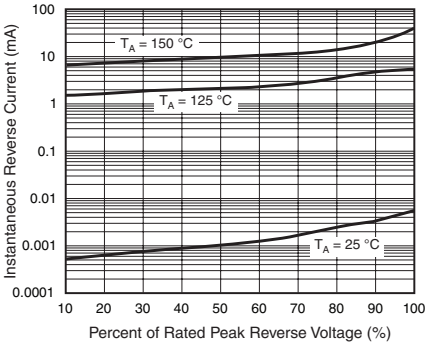


Figure 4. Typical Reverse Characteristics Per Diode

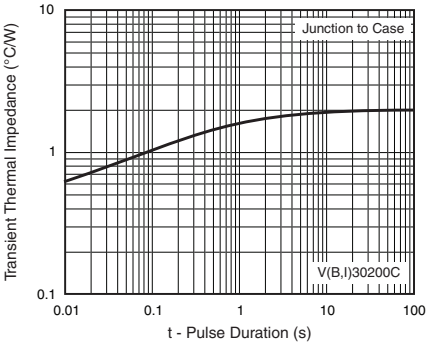
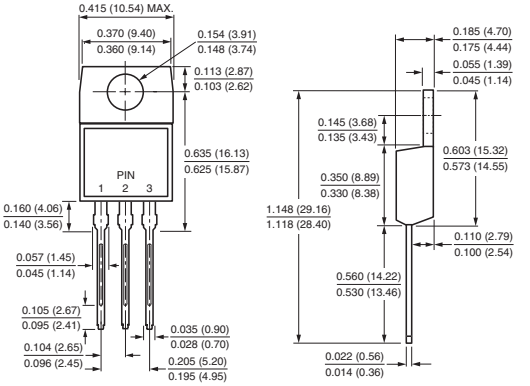


Figure 6. Typical Transient Thermal Impedance Per Diode

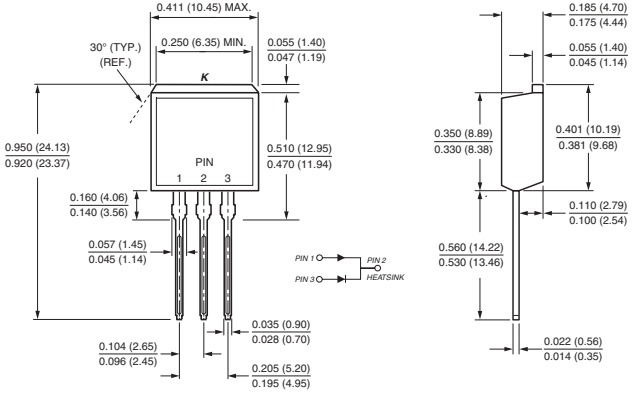
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

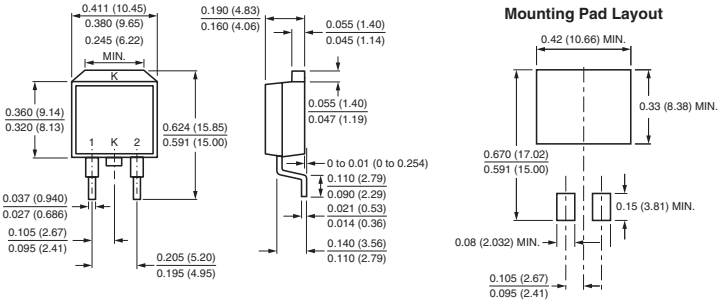
TO-220AB



TO-262AA

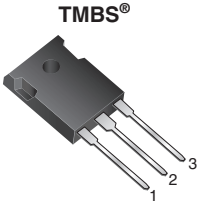


TO-263AB

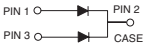


Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.57 V at I_F = 8 A



TO-247AD (TO-3P)



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	100 V
I_{FSM}	120 A
V_F at I_F = 15 A	0.65 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs Maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V30100P**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified (Fig. 1)	per device per diode	$I_{F(AV)}$	30 15	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	120	A
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88973
Revision: 26-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_J = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 8 A I_F = 15 A	T_J = 25 °C	V_F	0.64 0.78	- 0.85	V
	I_F = 8 A I_F = 15 A	T_J = 125 °C		0.57 0.65	- 0.71	
Reverse current per diode (2)	V_R = 70 V	T_J = 25 °C T_J = 125 °C	I_R	3.30 3.25	- -	µA mA
	V_R = 100 V	T_J = 25 °C T_J = 125 °C		13.7 7.2	300 20	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V30100P**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V30100P-E3/45	6.12	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

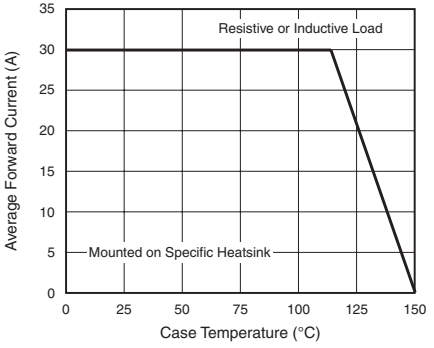


Figure 1. Forward Current Derating Curve

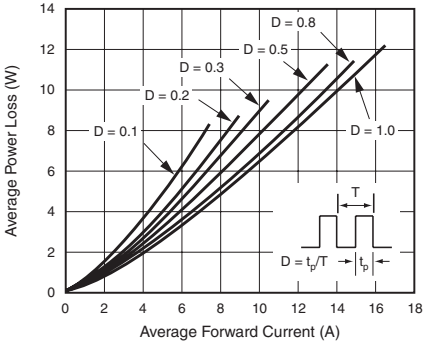


Figure 2. Forward Power Loss Characteristics Per Diode

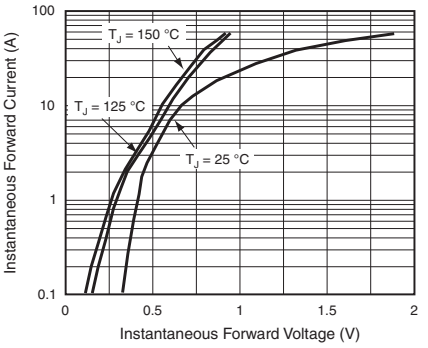


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

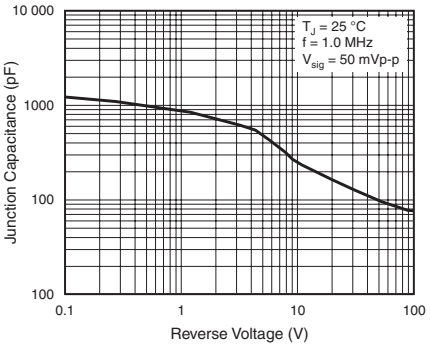


Figure 5. Typical Junction Capacitance Per Diode

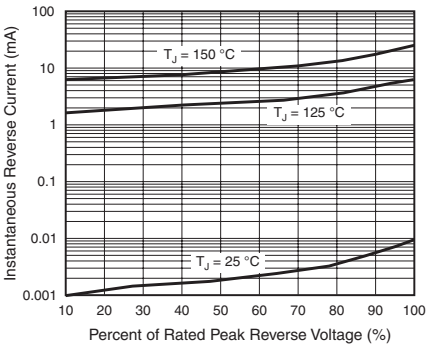


Figure 4. Typical Reverse Characteristics Per Diode

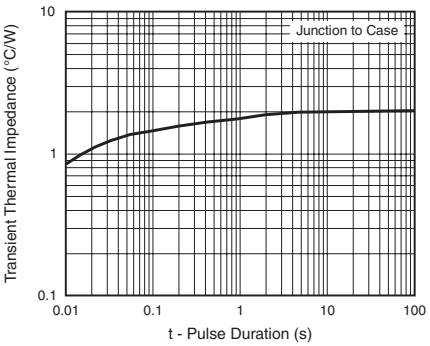
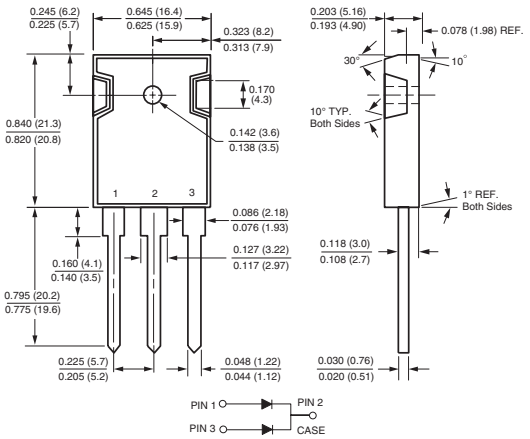


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



For technical questions within your region, please contact one of the following:
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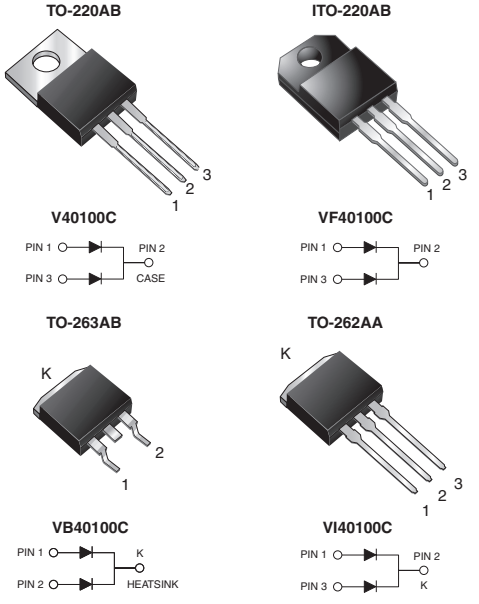
Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.38 V at I_F = 5 A

TMBS®



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at I_F = 20 A	0.61 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V40100C	VF40100C	VB40100C	VI40100C	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100				V
Maximum average forward rectified current per device (Fig. 1) per diode	$I_{F(AV)}$	40 20				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	250				A
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 min	V_{AC}	1500				V
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage (2)	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
	I_R = 10 mA			105 (minimum)	-	
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.47 0.54 0.67	- - 0.73	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.38 0.45 0.61	- - 0.67	
Reverse current at rated V_R per diode (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	9 10	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		- 21	1000 45	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V40100C**	**VF40100C**	**VB40100C**	**VI40100C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	4.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V40100C-E3/4W	1.85	4W	50/tube	Tube
ITO-220AB	VF40100C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB40100C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB40100C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI40100C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES
(T_A = 25 °C unless otherwise noted)

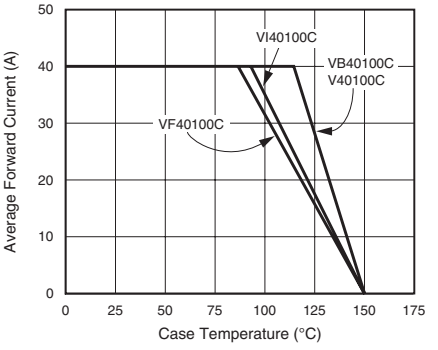


Figure 1. Forward Current Derating Curve

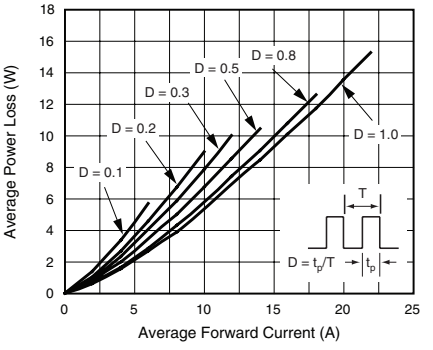


Figure 2. Forward Power Loss Characteristics Per Diode

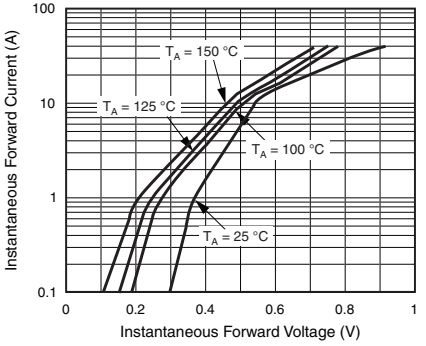


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

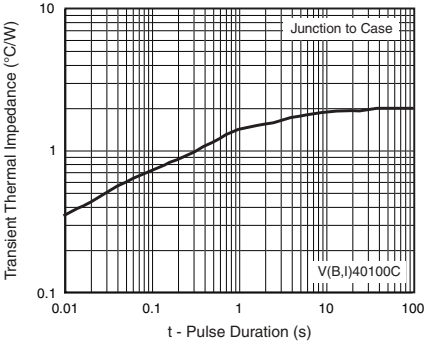


Figure 6. Typical Transient Thermal Impedance Per Diode

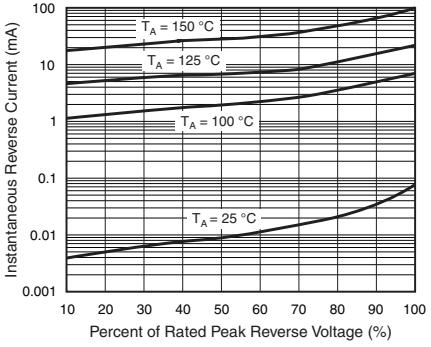


Figure 4. Typical Reverse Characteristics Per Diode

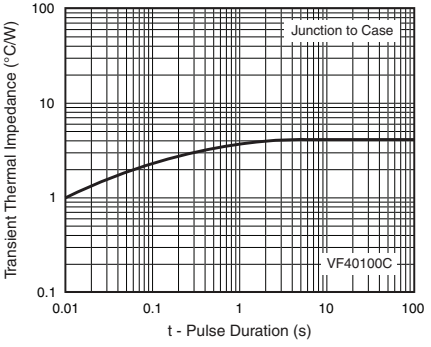


Figure 7. Typical Transient Thermal Impedance Per Diode

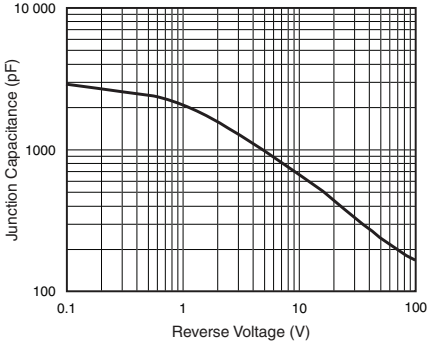
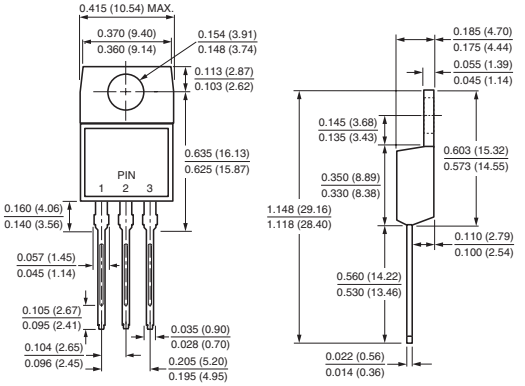


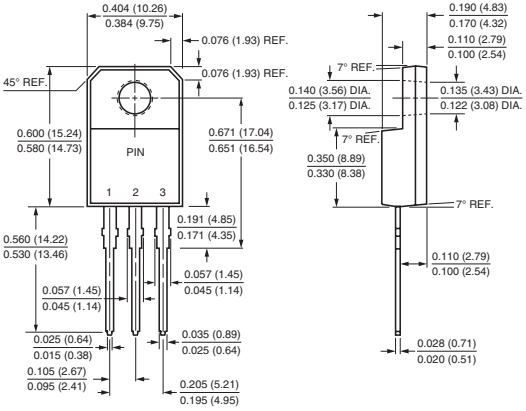
Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

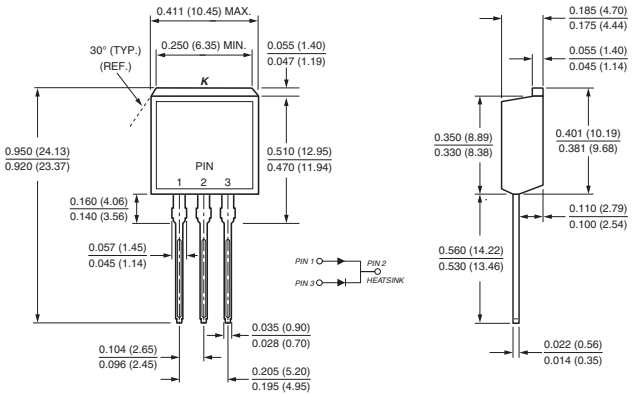
TO-220AB



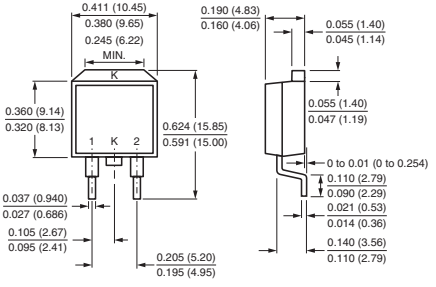
ITO-220AB



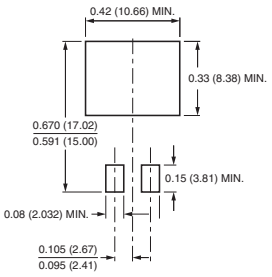
TO-262AA



TO-263AB



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89042
Revision: 26-May-08

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.42 V at I_F = 5 A

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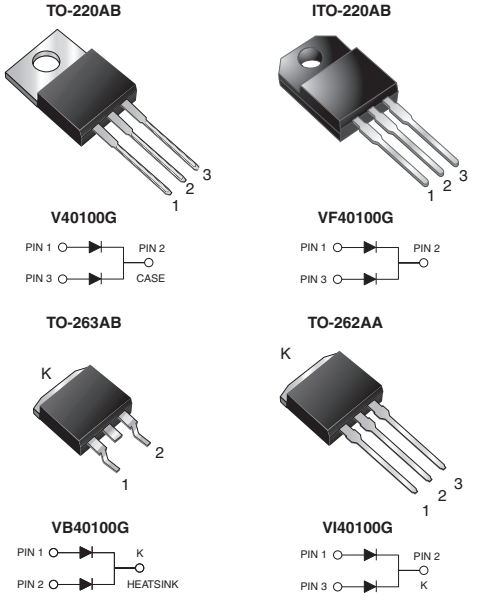


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	100 V
I_{FSM}	200 A
V_F at I_F = 20 A	0.67 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V40100G	VF40100G	VB40100G	VI40100G	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100				V
Maximum average forward rectified current (Fig. 1)	per device	$I_{F(AV)}$	40				A
	per diode		20				
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	200				A
Isolation voltage (ITO-220AB only) From terminal to heatsink t = 1 min		V_{AC}	1500				V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown Voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.49 0.59 0.75	- - 0.81	
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.42 0.54 0.67	- - 0.73	
Reverse current per diode (2)	V_R = 70 V	T_A = 25 °C T_A = 125 °C	I_R	12 8	- -	µA mA
	V_R = 100 V	T_A = 25 °C T_A = 125 °C		55 21	500 35	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V40100G**	**VF40100G**	**VB40100G**	**VI40100G**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	5.0	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V40100G-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF40100G-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB40100G-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB40100G-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI40100G-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES
(T_A = 25 °C unless otherwise noted)

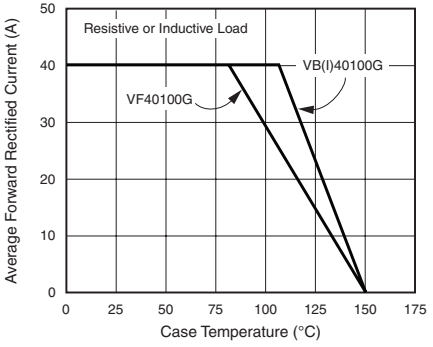


Figure 1. Maximum Forward Current Derating Curve

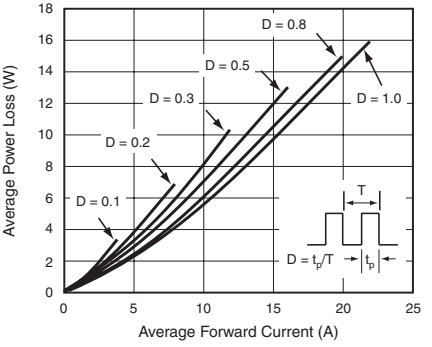


Figure 2. Forward Power Loss Characteristics

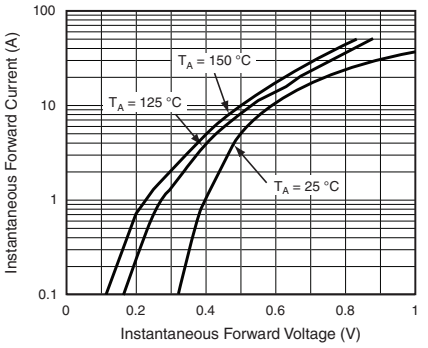


Figure 3. Typical Instantaneous Forward Characteristics

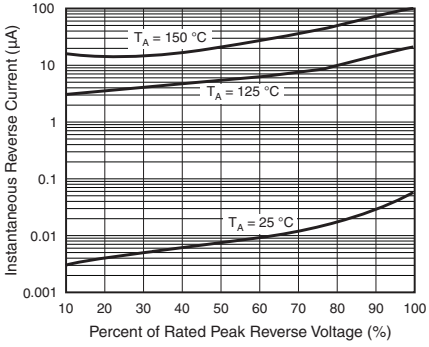


Figure 4. Typical Reverse Characteristics

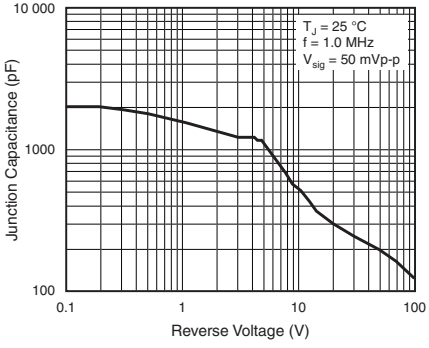


Figure 5. Typical Junction Capacitance

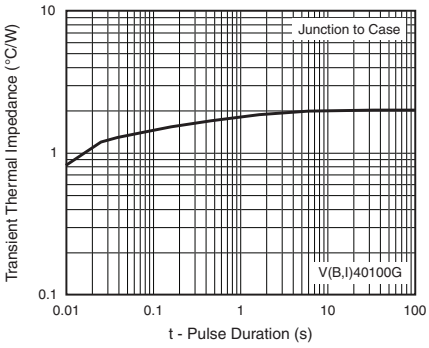


Figure 6. Typical Transient Thermal Impedance

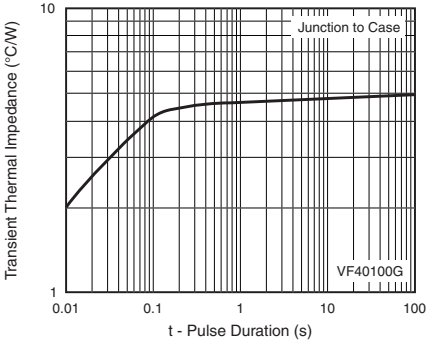
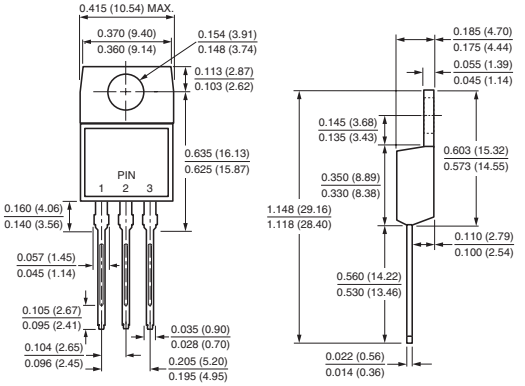


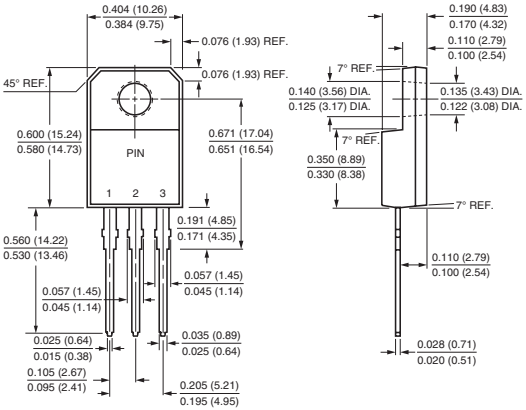
Figure 7. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

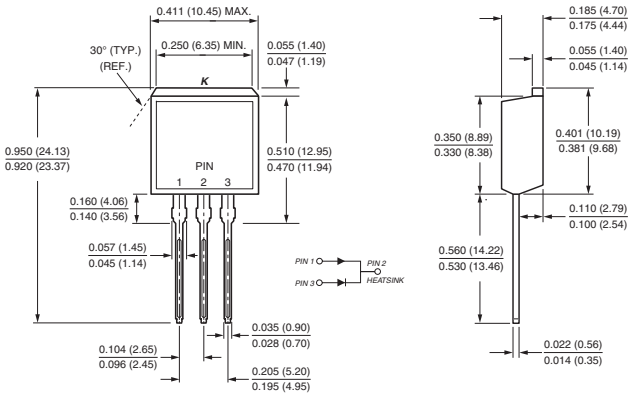
TO-220AB



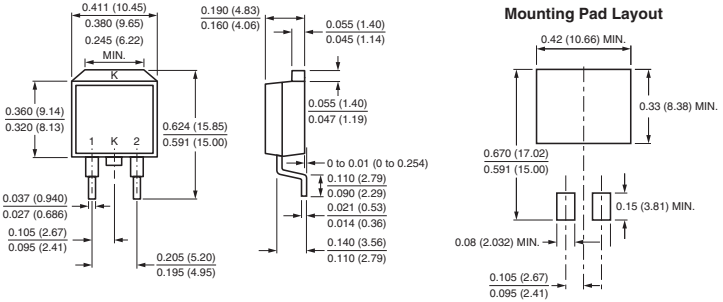
ITO-220AB



TO-262AA



TO-263AB



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88970
Revision: 19-May-08

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.43 V at I_F = 5 A

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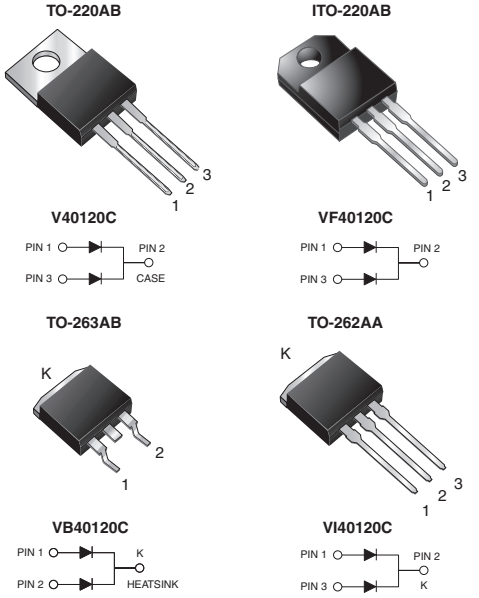


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	120 V
I_{FSM}	250 A
V_F at I_F = 20 A	0.63 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V40120C	VF40120C	VB40120C	VI40120C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	120				V
Maximum average forward rectified current (Fig. 1)	per device	$I_{F(AV)}$	40				A
	per diode		20				
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	250				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500				V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.50 0.60 0.78	- - 0.88	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.43 0.53 0.63	- - 0.71	
Reverse current per diode (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	19 10	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		- 22	500 45	µA mA

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V40120C**	**VF40120C**	**VB40120C**	**VI40120C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.8	4.0	1.8	1.8	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V40120C-E3/4W	1.88	4W	50/tube	Tube
ITO-220AB	VF40120C-E3/4W	1.76	4W	50/tube	Tube
TO-263AB	VB40120C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB40120C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI40120C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES
(T_A = 25 °C unless otherwise noted)

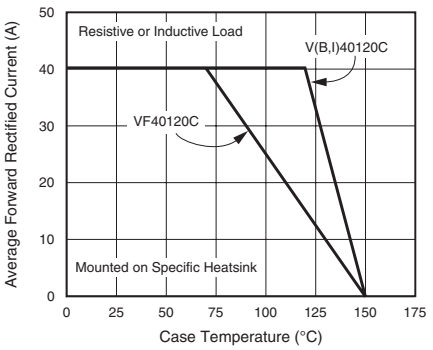


Figure 1. Maximum Forward Current Derating Curve

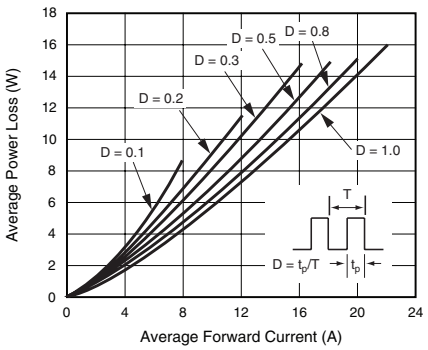


Figure 2. Forward Power Loss Characteristics Per Diode

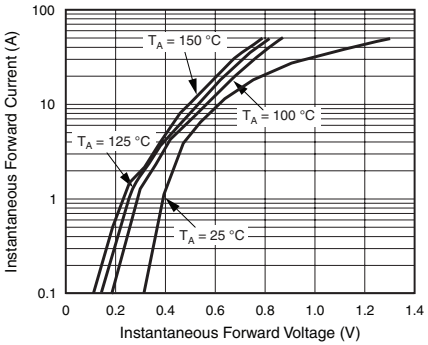


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

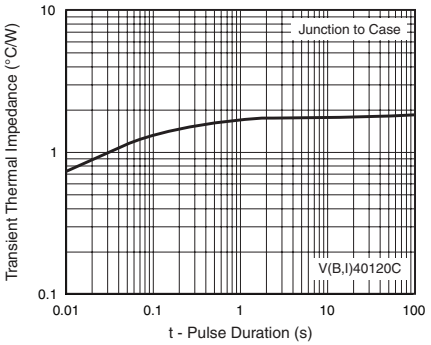


Figure 6. Typical Transient Thermal Impedance Per Diode

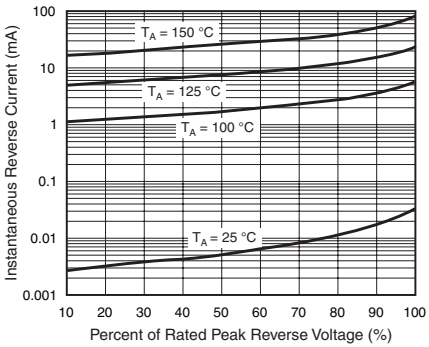


Figure 4. Typical Reverse Characteristics Per Diode

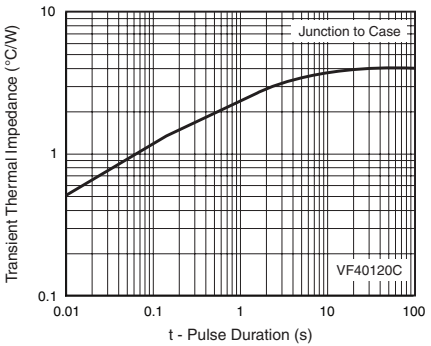


Figure 7. Typical Transient Thermal Impedance Per Diode

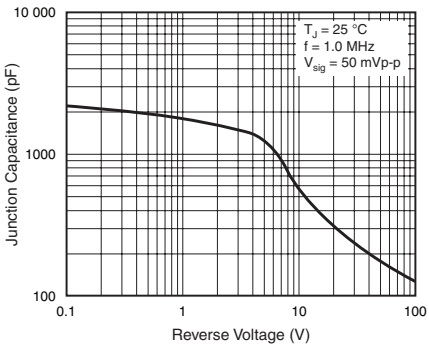
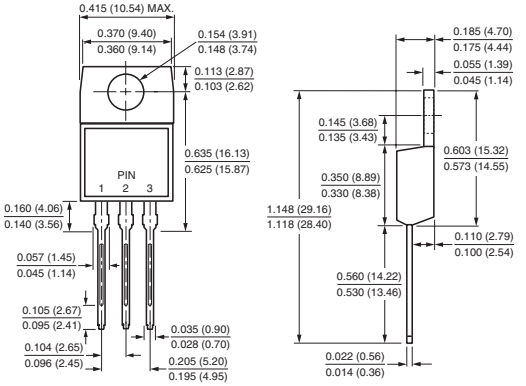


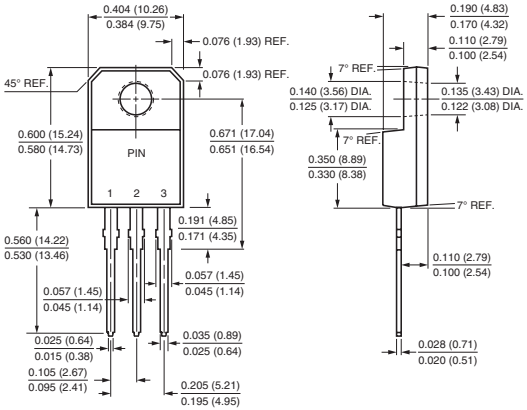
Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

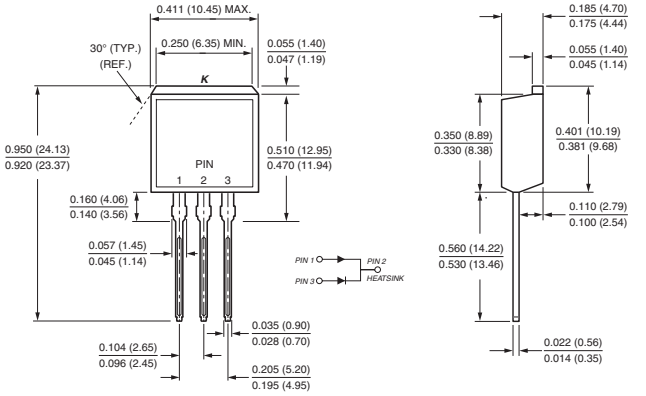
TO-220AB



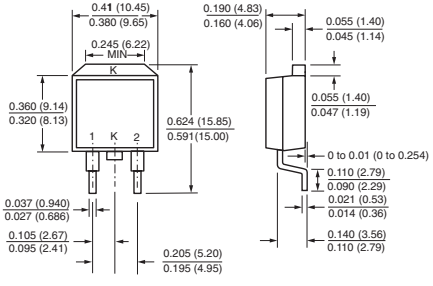
ITO-220AB



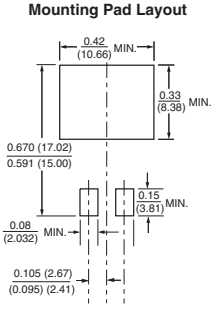
TO-262AA



TO-263AB



Mounting Pad Layout

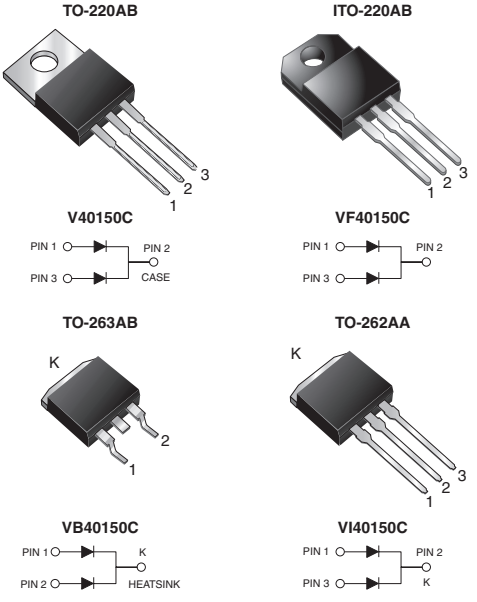


For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88937
Revision: 19-May-08

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.55 V at I_F = 5 A

TMBS®



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	150 V
I_{FSM}	160 A
V_F at I_F = 20 A	0.75 V
T_J max.	150 °C

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V40150C	VF40150C	VB40150C	VI40150C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	150				V
Maximum average forward rectified current (Fig. 1)	per device	$I_{F(AV)}$	40				A
	per diode		20				
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	160				A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500				V
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	150 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 25 °C	V_F	0.69 0.84 1.15	- - 1.43	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_A = 125 °C		0.55 0.64 0.75	- - 0.82	
Reverse current per diode (2)	V_R = 100 V	T_A = 25 °C T_A = 125 °C	I_R	2 2.5	- -	µA mA
	V_R = 150 V	T_A = 25 °C T_A = 125 °C		- 5	250 25	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**V40150C**	**VF40150C**	**VB40150C**	**VI40150C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.8	4	1.8	1.8	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V40150C-E3/4W	1.89	4W	50/tube	Tube
ITO-220AB	VF40150C-E3/4W	1.75	4W	50/tube	Tube
TO-263AB	VB40150C-E3/4W	1.39	4W	50/tube	Tube
TO-263AB	VB40150C-E3/8W	1.39	8W	800/reel	Tape and reel
TO-262AA	VI40150C-E3/4W	1.46	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

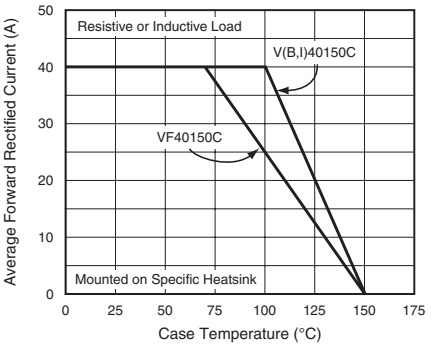


Figure 1. Maximum Forward Current Derating Curve

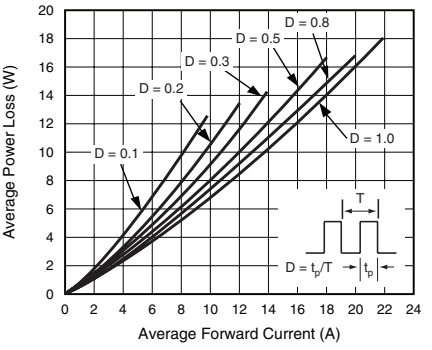


Figure 2. Forward Power Loss Characteristics Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89048
Revision: 19-May-08

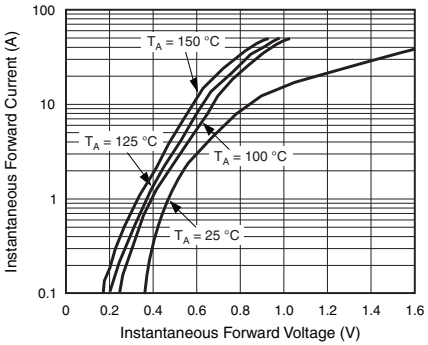


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

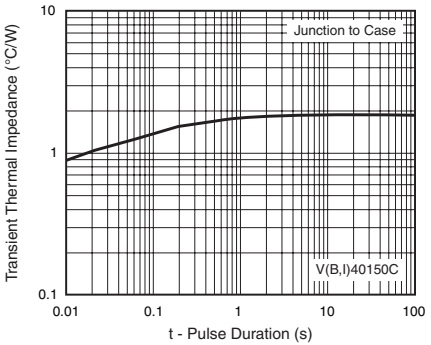


Figure 6. Typical Transient Thermal Impedance Per Diode

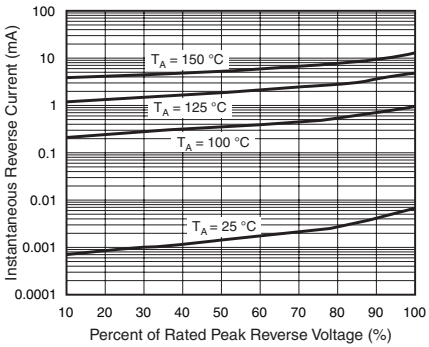


Figure 4. Typical Reverse Characteristics Per Diode

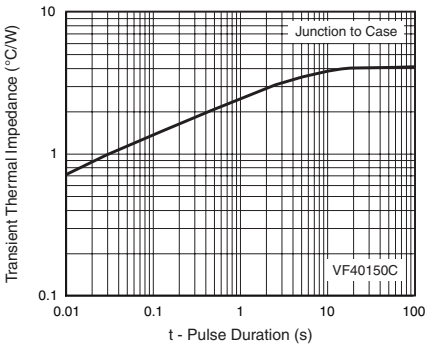


Figure 7. Typical Transient Thermal Impedance Per Diode

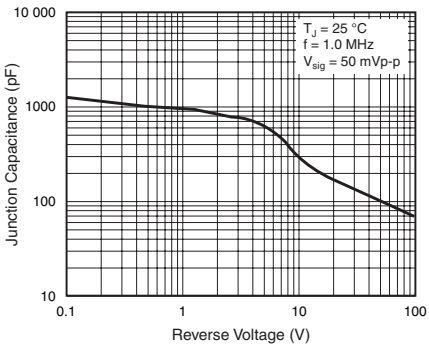
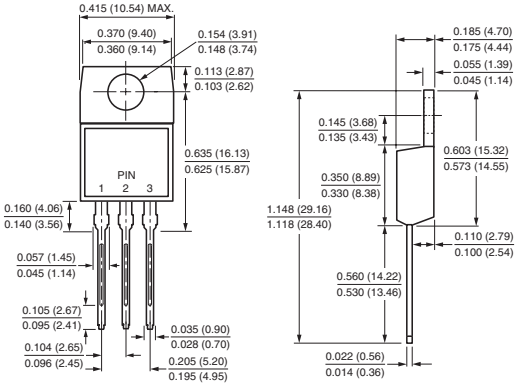


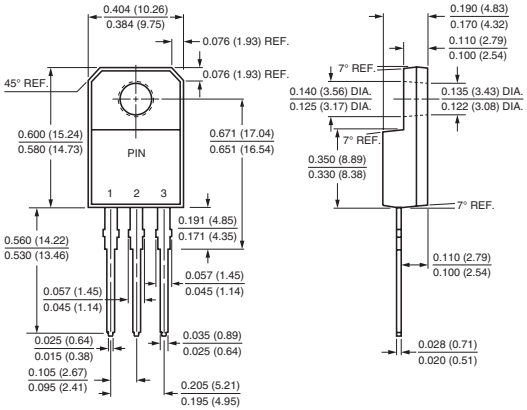
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

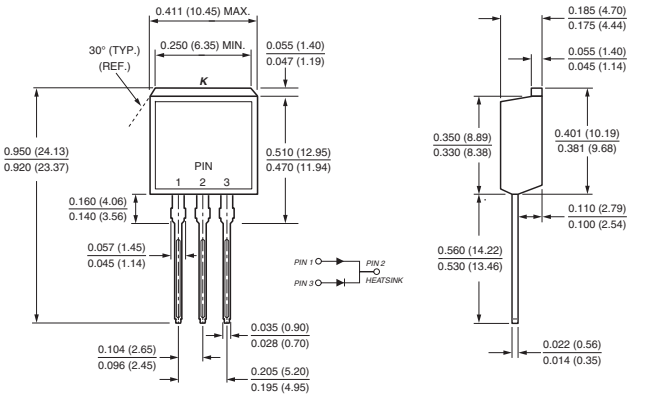
TO-220AB



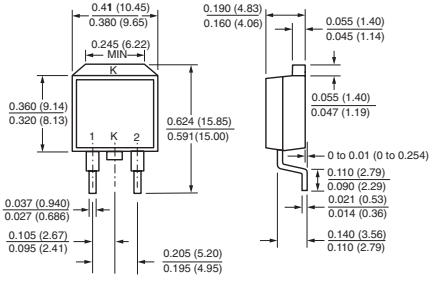
ITO-220AB



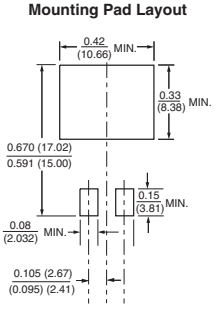
TO-262AA



TO-263AB



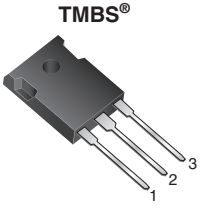
Mounting Pad Layout



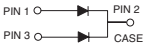
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89048
Revision: 19-May-08

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.372 V at I_F = 5 A



TO-247AD (TO-3P)



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	100 V
I_{FSM}	300 A
V_F at I_F = 20 A	0.60 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V40100P**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	40 20	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	per diode	I_{FSM}	300	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Voltage rate of change (rated V_R)		dV/dt	10 000	V
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_J = 25 °C	V_{BR}	100	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_J = 25 °C	V_F	0.461 0.525 0.652	- - 0.73	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_J = 125 °C		0.372 0.443 0.595	- - 0.67	
Reverse current per diode (2)	V_R = 70 V	T_J = 25 °C T_J = 125 °C	I_R	11.5 8.0	500 15	µA mA
	V_R = 100 V	T_J = 25 °C T_J = 125 °C		60.6 20.2	1000 45	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V40100P**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.5	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V40100P-E3/45	6.056	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

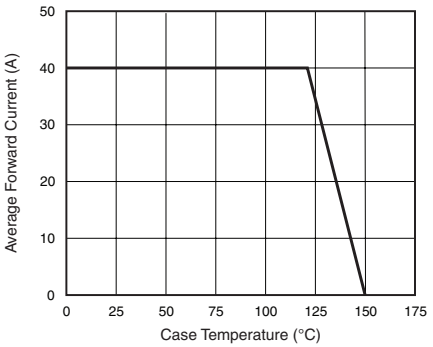


Figure 1. Forward Current Derating Curve

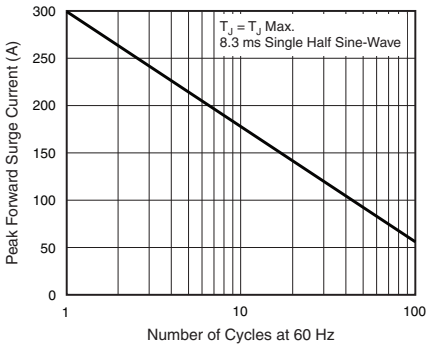


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88939
Revision: 27-May-08

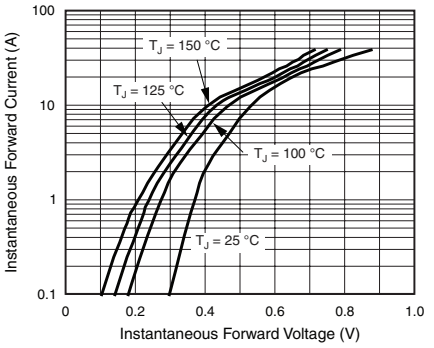


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

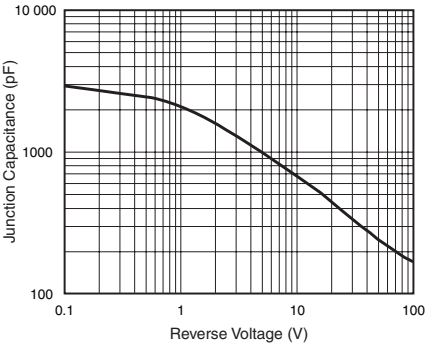


Figure 5. Typical Junction Capacitance Per Diode

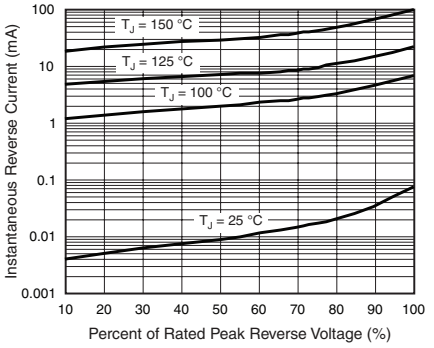


Figure 4. Typical Reverse Characteristics Per Diode

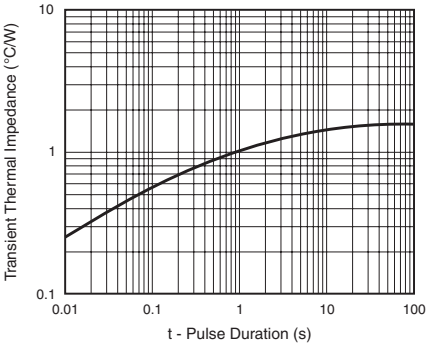
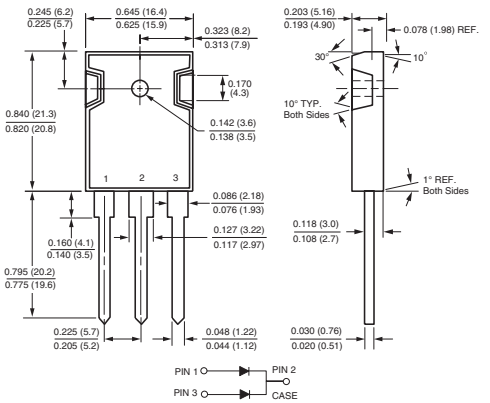


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

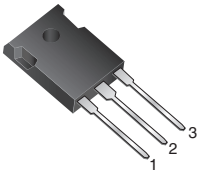
TO-247AD (TO-3P)



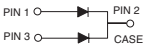
Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.420 V at I_F = 5 A

TMBS®



TO-247AD (TO-3P)



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 20 A
V_{RRM}	100 V
I_{FSM}	250 A
V_F at I_F = 20 A	0.67 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs Maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V40100PG**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified (Fig. 1)	per device per diode	$I_{F(AV)}$	40 20	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	250	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_J = 25 °C	V_{BR}	100	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 20 A	T_J = 25 °C	V_F	0.490 0.572 0.731	- - 0.81	V
	I_F = 5 A I_F = 10 A I_F = 20 A	T_J = 125 °C		0.42 0.50 0.67	- - 0.73	
Reverse current at rated V_R per diode (2)	V_R = 70 V	T_J = 25 °C T_J = 125 °C	I_R	8.4 7.4	300 15	µA mA
	V_R = 100 V	T_J = 25 °C T_J = 125 °C		40.5 18.2	500 35	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V40100PG**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	°C/W

ORDERING INFORMATION				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V40100PG-E3/45	6.109	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

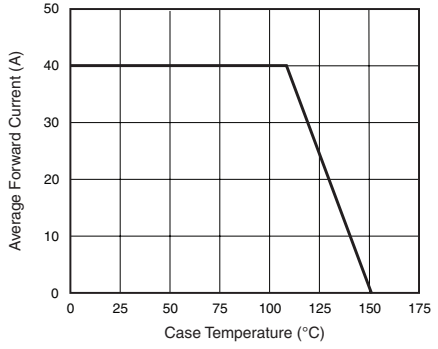


Figure 1. Forward Current Derating Curve

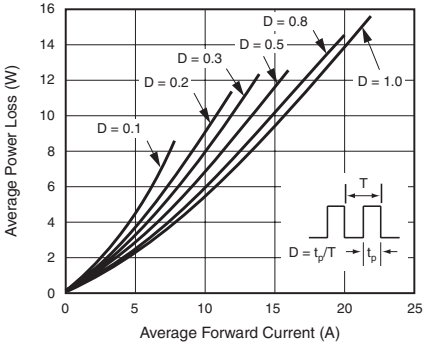


Figure 2. Forward Power Loss Characteristics Per Diode

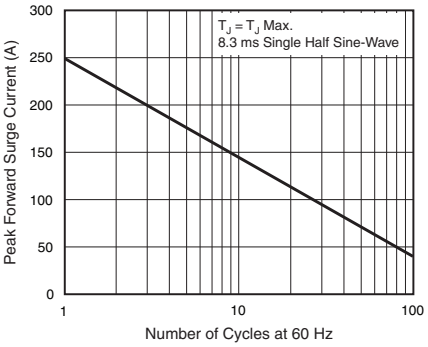


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

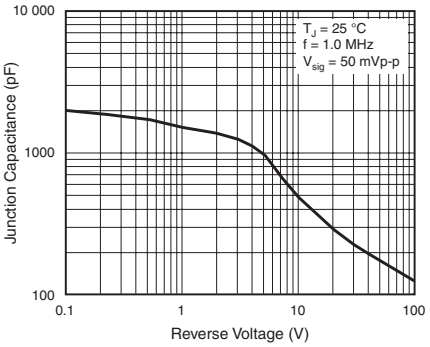


Figure 6. Typical Junction Capacitance Per Diode

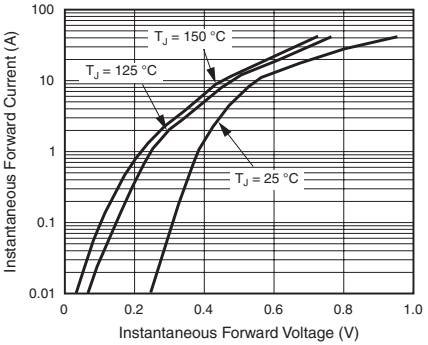


Figure 4. Typical Instantaneous Forward Characteristics Per Diode

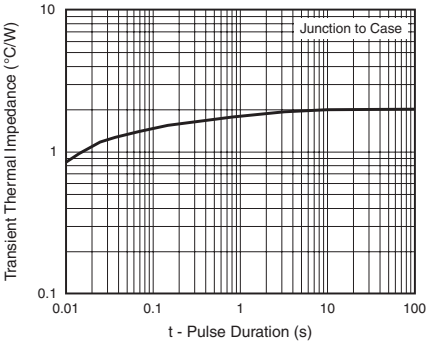


Figure 7. Typical Transient Thermal Impedance Per Diode

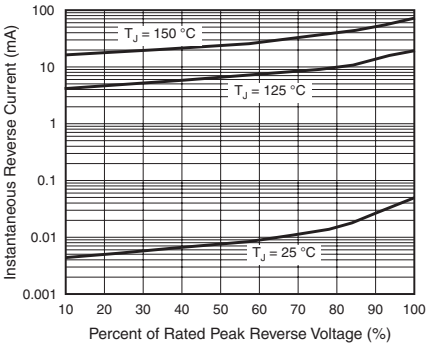
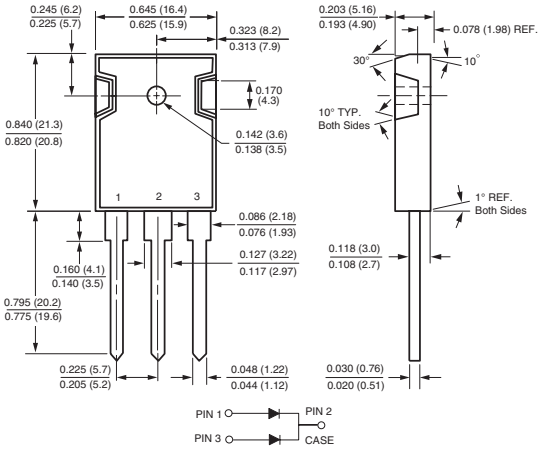


Figure 5. Typical Reverse Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.375 V at I_F = 5 A

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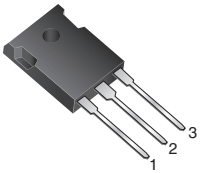
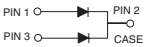


TO-247AD (TO-3P)



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 25 A
V_{RRM}	100 V
I_{FSM}	350 A
V_F at I_F = 25 A	0.64 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs Maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V50100P**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	50 25	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	per diode	I_{FSM}	350	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88929
Revision: 26-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_J = 25 °C	V_{BR}	100	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 10 A I_F = 20 A I_F = 25 A	T_J = 25 °C	V_F	0.463 0.535 0.664 0.700	- - - 0.78	V
	I_F = 5 A I_F = 10 A I_F = 20 A I_F = 25 A	T_J = 125 °C		0.375 0.445 0.605 0.635	- - - 0.70	
Reverse current per diode (2)	V_R = 70 V	T_J = 25 °C T_J = 125 °C	I_R	13.7 8.4	500 15	µA mA
	V_R = 100 V	T_J = 25 °C T_J = 125 °C		69.6 22.5	1000 45	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V50100P**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.5	°C/W

ORDERING INFORMATION				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V50100P-E3/45	6.056	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

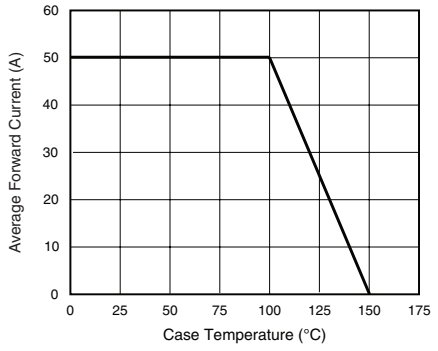


Figure 1. Forward Current Derating Curve

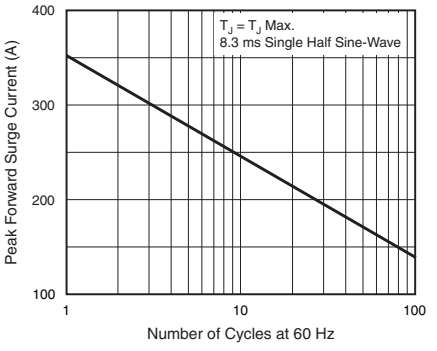


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

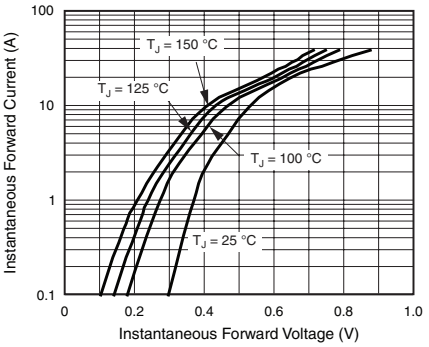


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

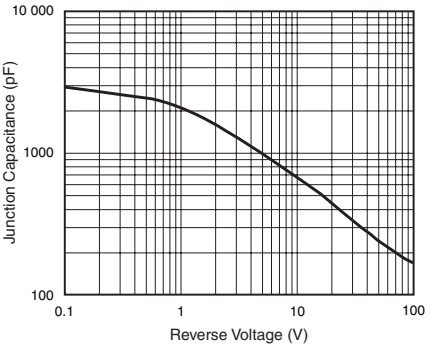


Figure 5. Typical Junction Capacitance Per Diode

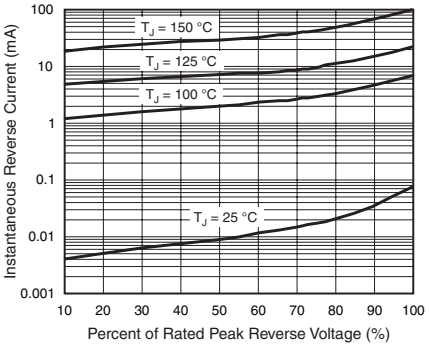


Figure 4. Typical Reverse Characteristics Per Diode

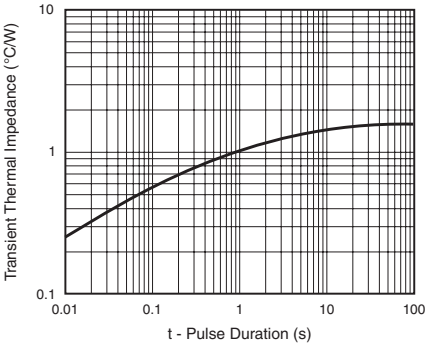
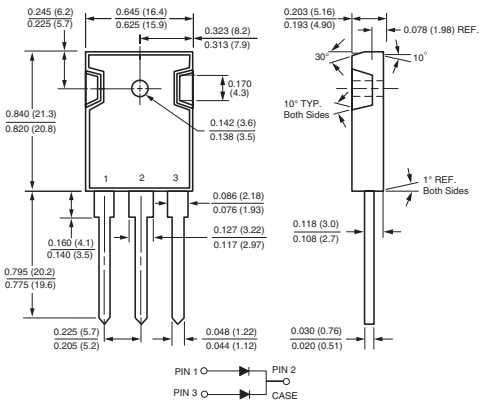


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.36 V at I_F = 5 A

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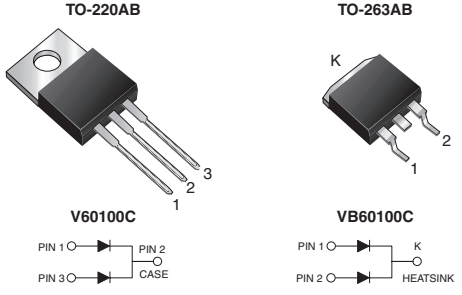


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	100 V
I_{FSM}	320 A
V_F at I_F = 30 A	0.66 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB and TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V60100C	VB60100C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100		V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	60 30		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	per diode	I_{FSM}	320		A
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A	T_A = 25 °C	V_F	0.45	-	V
	I_F = 10 A			0.52	-	
	I_F = 15 A			0.58	0.63	
	I_F = 20 A			0.63	-	
	I_F = 30 A			0.73	0.79	
	I_F = 5 A	T_A = 125 °C		0.36	-	
	I_F = 10 A			0.45	-	
	I_F = 15 A			0.53	0.58	
	I_F = 20 A			0.58	-	
	I_F = 30 A			0.66	0.70	
Reverse current at rated V_R per diode (2)	V_R = 80 V	T_A = 25 °C	I_R	24	500	µA
		T_A = 125 °C		13	20	mA
	V_R = 100 V	T_A = 25 °C		65	1000	µA
		T_A = 125 °C		30	-	mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**V60100C**	**VB60100C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.5	2.5	°C/W

ORDERING INFORMATION					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V60100C-E3/4W	1.89	4W	50/tube	Tube
TO-263AB	VB60100C-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	VB60100C-E3/8W	1.38	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

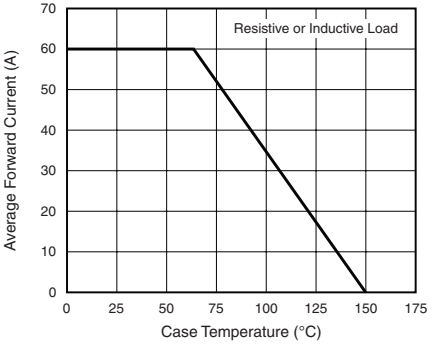


Figure 1. Forward Current Derating Curve

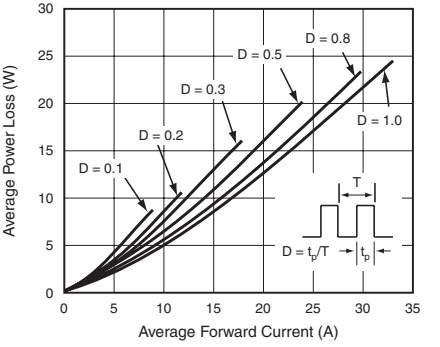


Figure 2. Forward Power Loss Characteristics Per Diode

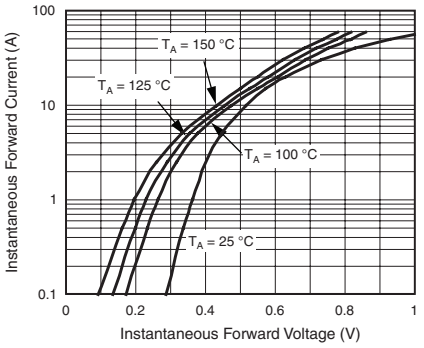


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

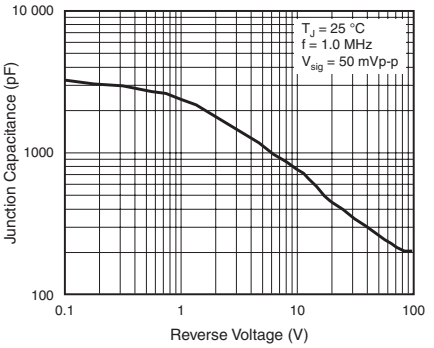


Figure 5. Typical Junction Capacitance Per Diode

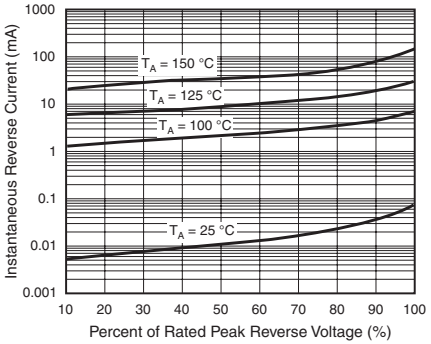


Figure 4. Typical Reverse Characteristics Per Diode

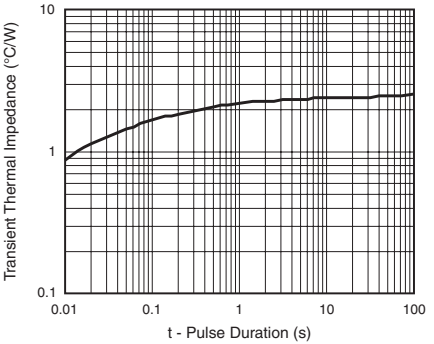
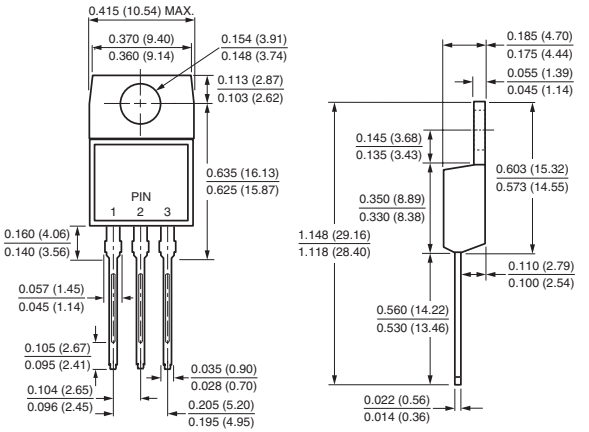


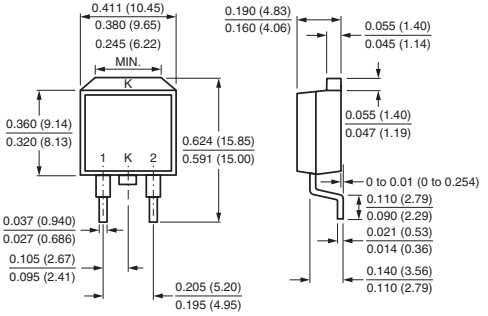
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

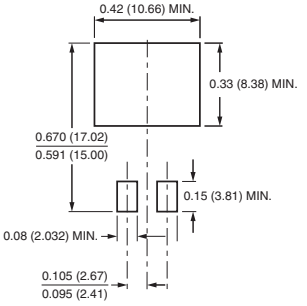
TO-220AB



TO-263AB



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.41 V at I_F = 5 A

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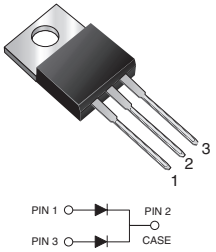
TO-220AB



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	120 V
I_{FSM}	300 A
V_F at I_F = 30 A	0.71 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V60120C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	120	V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	60 30	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	300	
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	120 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 25 °C	V_F	0.48 0.66 0.88	- - 0.95	
	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 125 °C		0.41 0.58 0.71	- - 0.75	
Reverse current at rated V_R per diode (2)	V_R = 90 V	T_A = 25 °C T_A = 125 °C	I_R	14 11	- -	µA mA
	V_R = 120 V	T_A = 25 °C T_A = 125 °C		40 15	500 45	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V60120C**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	V60120C-E3/4W	1.89	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

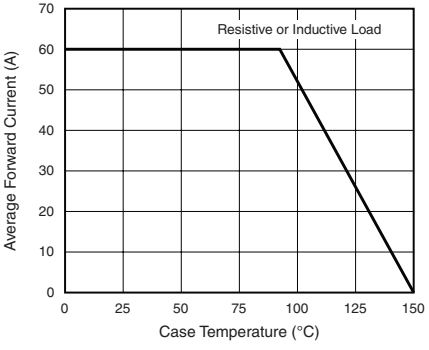


Figure 1. Forward Current Derating Curve

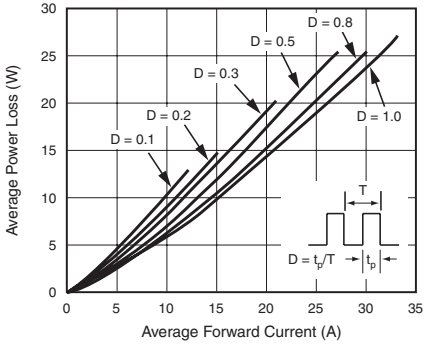


Figure 2. Forward Power Loss Characteristics Per Diode

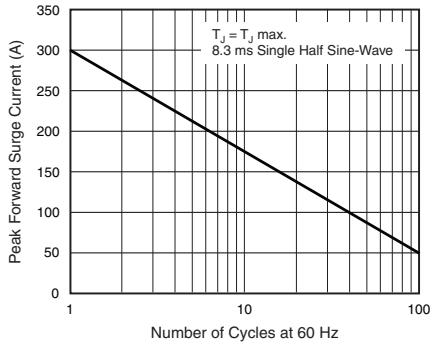


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

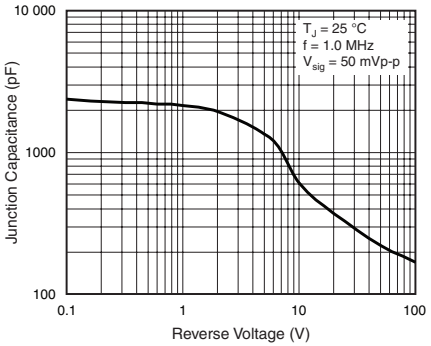


Figure 6. Typical Junction Capacitance Per Diode

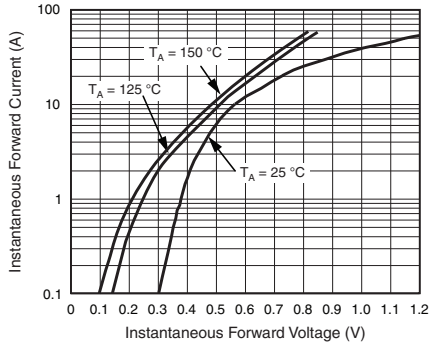


Figure 4. Typical Instantaneous Forward Characteristics Per Diode

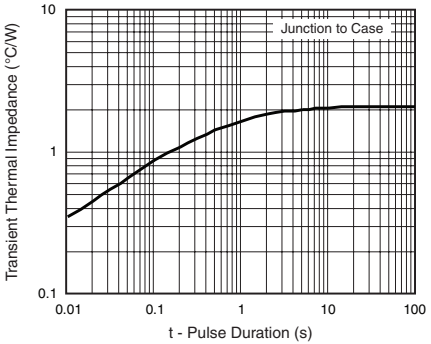


Figure 7. Typical Transient Thermal Impedance Per Diode

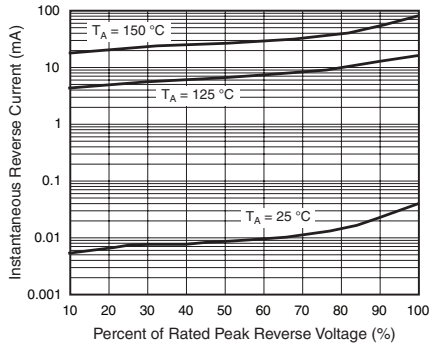
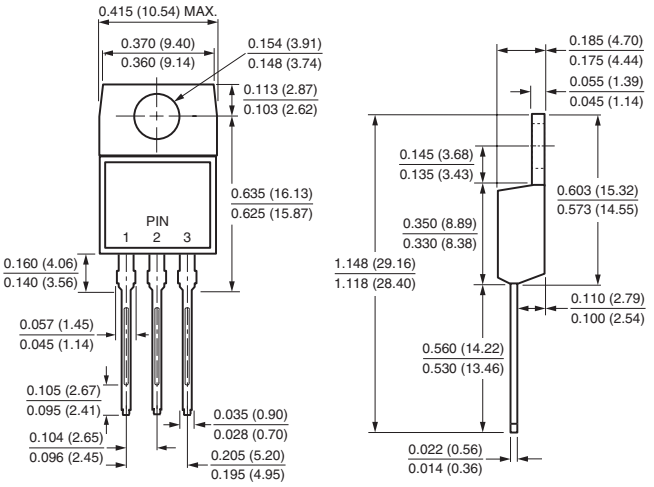


Figure 5. Typical Reverse Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

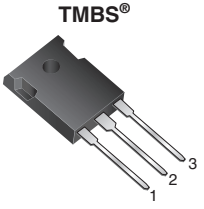
TO-220AB



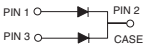
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.456 V at I_F = 10 A



TO-247AD (TO-3P)



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	100 V
I_{FSM}	350 A
V_F at I_F = 30 A	0.657 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V60100P**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	60 30	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	350	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_J = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 15 A I_F = 30 A	T_J = 25 °C	V_F	0.518 0.576 0.730	- - 0.79	V
	I_F = 10 A I_F = 15 A I_F = 30 A	T_J = 125 °C		0.456 0.531 0.657	- - 0.70	
Reverse current per diode (2)	V_R = 80 V	T_J = 25 °C T_J = 125 °C	I_R	34.6 9.5	- -	µA mA
	V_R = 100 V	T_J = 25 °C T_J = 125 °C		82.0 19.2	800 45	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V60100P**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.5	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V60100P-E3/45	6.12	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

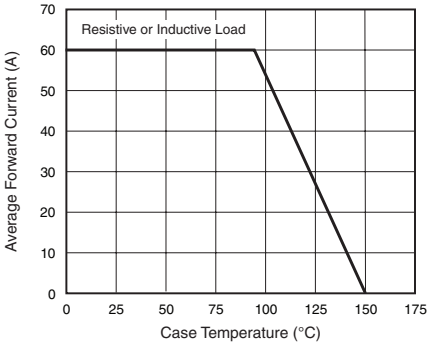


Figure 1. Forward Current Derating Curve

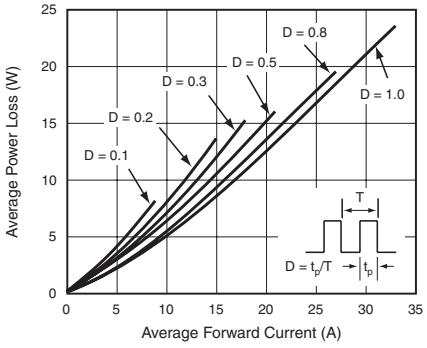


Figure 2. Forward Power Loss Characteristics Per Diode

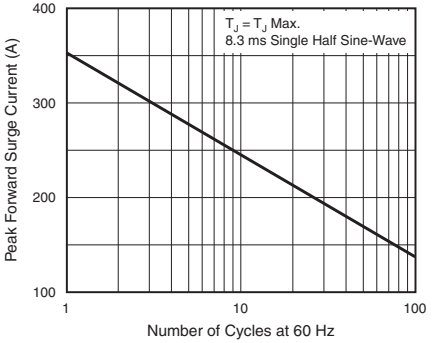


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

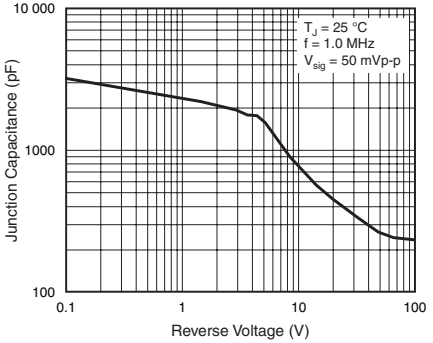


Figure 6. Typical Junction Capacitance Per Diode

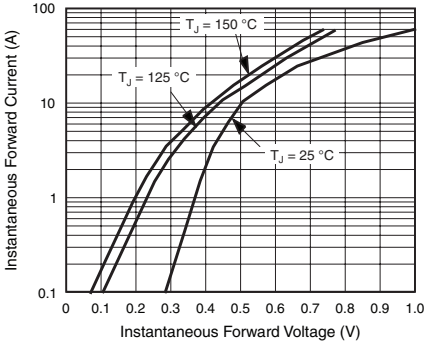


Figure 4. Typical Instantaneous Forward Characteristics Per Diode

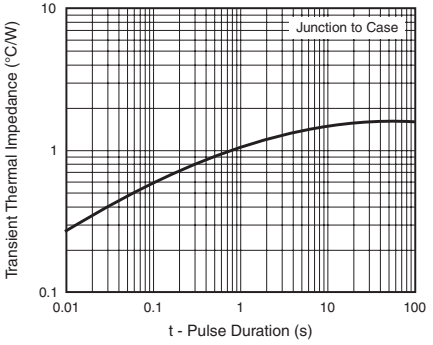


Figure 7. Typical Transient Thermal Impedance Per Diode

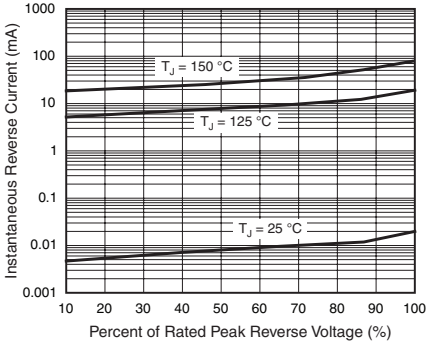
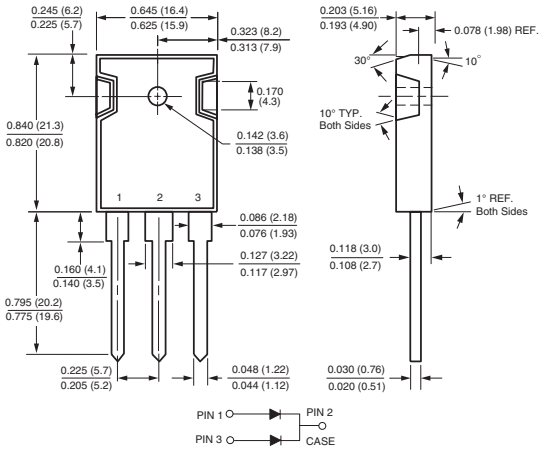


Figure 5. Typical Reverse Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



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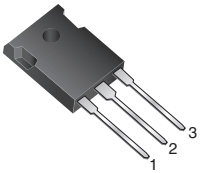
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

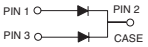
Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.52 V at I_F = 5 A

TMBS®



TO-247AD (TO-3P)



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	200 V
I_{FSM}	300 A
V_F at I_F = 30 A	0.73 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V60200PG**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	200	V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	60 30	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	300	A
Operating junction and storage temperature range		T_J, T_{STG}	- 20 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	200 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 25 °C	V_F	0.69 0.90 1.28	- - 1.48	V
	I_F = 5 A I_F = 15 A I_F = 30 A	T_A = 125 °C		0.52 0.63 0.73	- - 0.81	
Reverse current per diode (2)	V_R = 180 V	T_A = 25 °C T_A = 125 °C	I_R	3.4 4.6	- -	µA mA
	V_R = 200 V	T_A = 25 °C T_A = 125 °C		- 7.5	200 20	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V60200PG**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.5	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V60200PG-E3/45	6.06	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

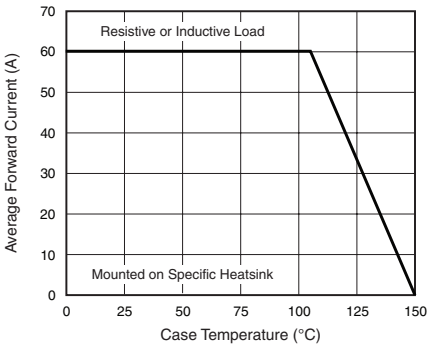


Figure 1. Forward Derating Curve

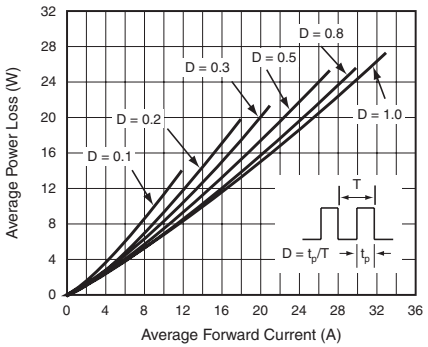


Figure 2. Forward Power Loss Characteristics Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

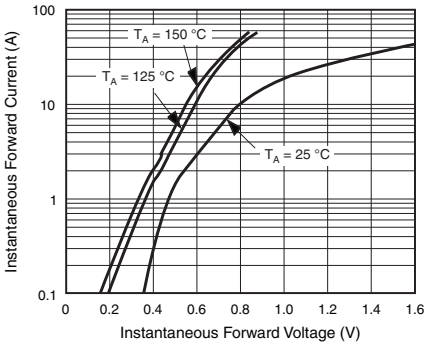


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

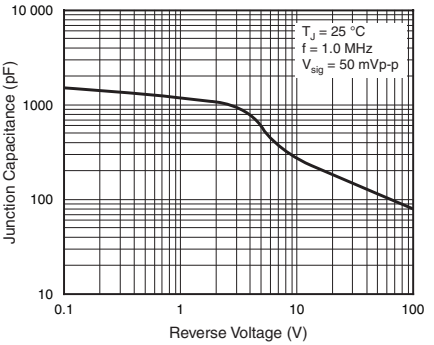


Figure 5. Typical Junction Capacitance Per Diode

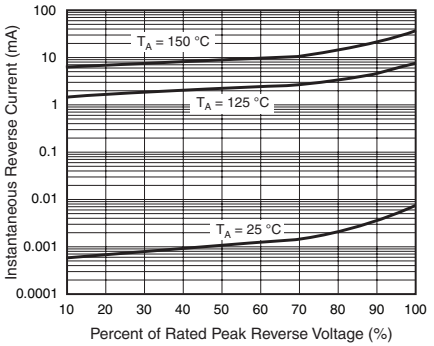


Figure 4. Typical Reverse Characteristics Per Diode

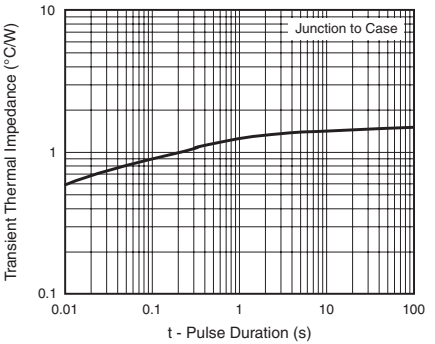
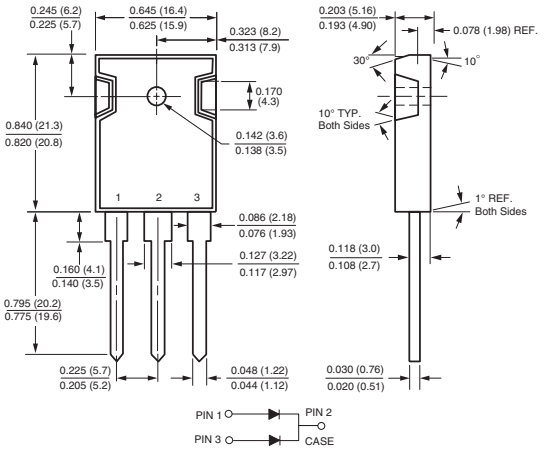


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)

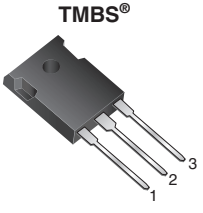


V80100P

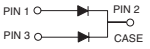
Vishay General Semiconductor

Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.425 V at I_F = 10 A



TO-247AD (TO-3P)



FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	80 A
V_{RRM}	100 V
I_{FSM}	500 A
V_F at I_F = 40 A	0.667 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V80100P**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	per device per diode	$I_{F(AV)}$	80 40	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	500	A
Peak repetitive reverse current per diode at t_p = 2 µs, 1 kHz		I_{RRM}	1.0	A
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	- 40 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88979
Revision: 26-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_J = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 20 A I_F = 40 A	T_J = 25 °C	V_F	0.492 0.580 0.736	- - 0.78	V
	I_F = 10 A I_F = 20 A I_F = 40 A	T_J = 125 °C		0.425 0.541 0.667	- - 0.72	
Reverse current per diode (2)	V_R = 80 V	T_J = 25 °C T_J = 125 °C	I_R	38 10	- -	µA mA
	V_R = 100 V	T_J = 25 °C T_J = 125 °C		85 20	800 45	µA mA

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V80100P**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	1.5	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V80100P-E3/45	6.14	45	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

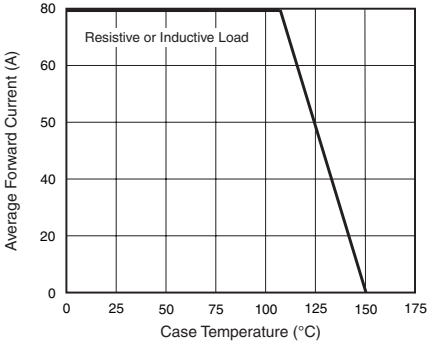


Figure 1. Forward Current Derating Curve

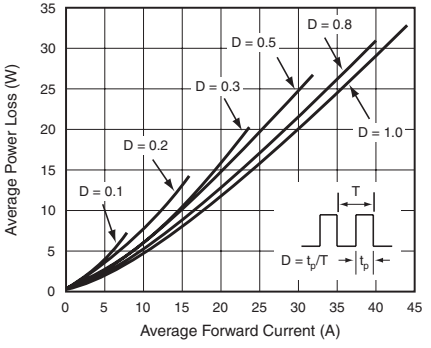


Figure 2. Forward Power Loss Characteristics Per Diode

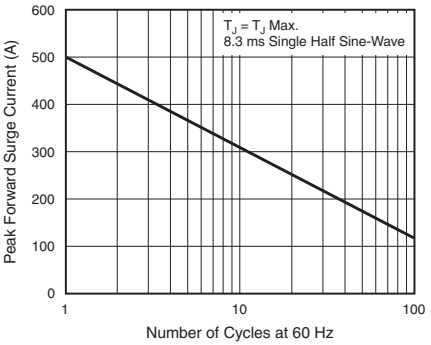


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

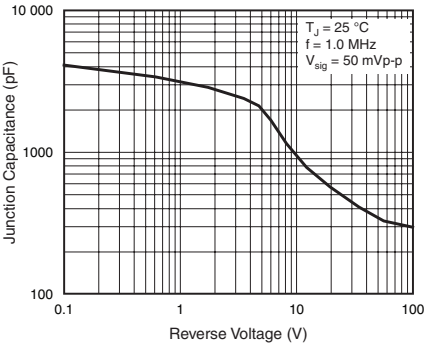


Figure 6. Typical Junction Capacitance Per Diode

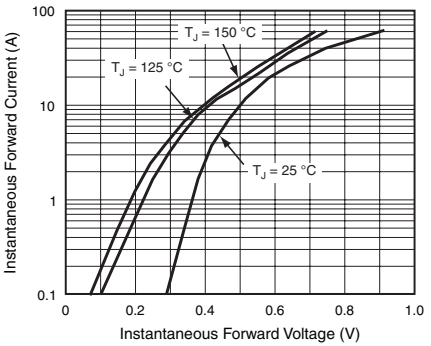


Figure 4. Typical Instantaneous Forward Characteristics Per Diode

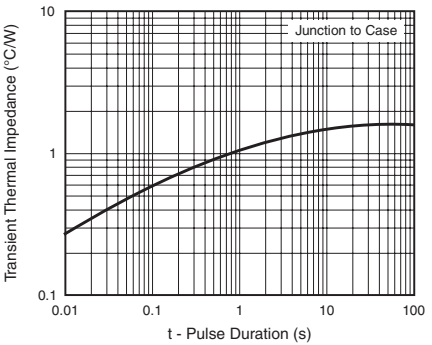


Figure 7. Typical Transient Thermal Impedance Per Diode

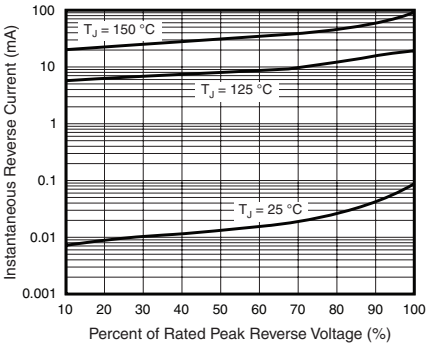
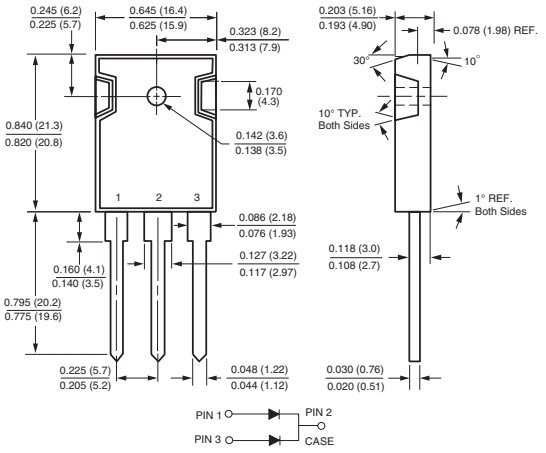


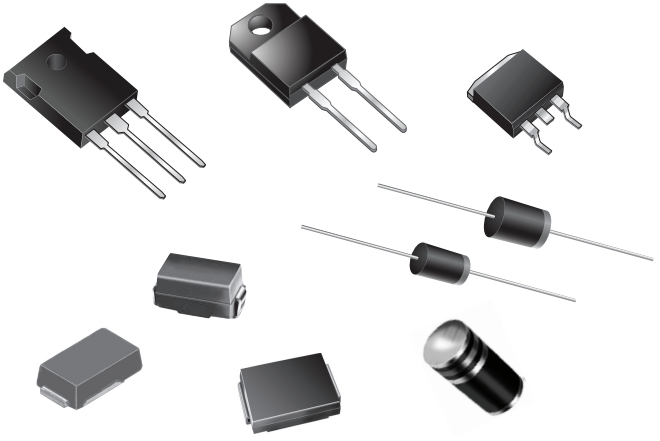
Figure 5. Typical Reverse Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



Ultrafast Recovery Rectifiers



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Introduction to Ultrafast Recovery Rectifiers

Vishay General Semiconductor

Vishay's Ultrafast rectifiers offer very fast reverse recovery times (as low as 15 nanoseconds) and voltage levels up to 1000 V in a wide variety of packages and forward current ratings. These products are ideally suited for very high frequency switching power supplies, inverters and freewheeling diodes. Vishay utilizes various passivation/packaging technologies including Superectifier, die-level glass passivation and solid glass encapsulated devices. Ultrafast rectifiers are offered in axial, surface mount and power packages.

The "Fast Efficient" chip technology (designated by FE, FES, FEP, EG, UF and US prefixes) has switching times from 25 to 75 ns (depending on voltage) and excellent high temperature leakage current. The "Ultrafast Gold" chip technology (designated by UG and ES prefixes) has switching times from 15 to 35 ns (depending on voltage), soft recovery characteristics and excellent reverse recovery temperature stability.

We offer these devices in a variety of packages for your convenience.

MPG06

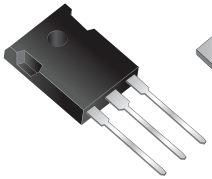
DO-201AD

DO-204AL (DO-41)

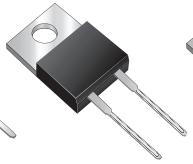
GP20

DO-204AC (DO-15)

P600



TO-247AD



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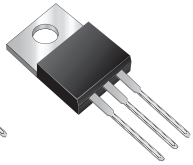
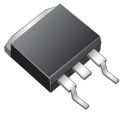
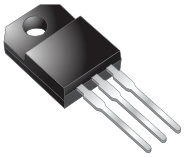


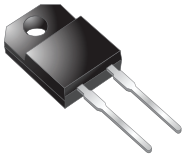
TO-220AB



TO-263AB



ITO-220AB



ITO-220AC

TO-277A (SMPC)

DO-220AA (SMP)

DO-214AB (SMC)

DO-214AA (SMB)

DO-214AC (SMA)

DO-214BA (GF1)

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Ultrafast Recovery Rectifiers Part Numbering System

1. SURFACE MOUNT

a) Flat Pack (SUPERECTIFIER®)

EGF1y
E = Enhanced
GF = Glass flat-pack (DO-214BA)
1 = 1.0 A
y = Reverse voltage (in V)
A = 50 V D = 200 V
B = 100 V T = 1300 V
C = 150 V

b) SMD

ESxPy ESHxPy USxPy UHxPyC
E = Enhanced
U = Ultrafast
S = Surface Mount
H = High junction temperature
x = Forward current (in A)
1 = 1.0 A 4 = 4.0 A
2 = 2.0 A 6 = 6.0 A
3 = 3.0 A
P = SMP, SMPC or MicroSMP
y = Reverse voltage (in V)
A = 50 V G = 400 V
B = 100 V H = 500 V
C = 150 V J = 600 V
D = 200 V K = 800 V
F = 300 V M = 1000 V
"C" suffix = Dual chip (for SMPC)

2. AXIAL

aaaxxy

aaa = Type designator
FE = Fast efficient (glass)
EGP = Enhanced glass plastic (SUPERECTIFIER®)
FGP = Fast efficient glass plastic (SUPERECTIFIER®)
UF = Ultrafast (plastic, glass passivated die)
UG = Ultrafast (plastic, glass passivated die)
SUF = Soft recovery ultrafast (plastic, glass passivated die)
xx = Forward current (in A)
(for EGP, divide # by 10 to get current in A)
y = Reverse voltage (in V)
A = 50 V F = 300 V
B = 100 V G = 400 V
C = 150 V J = 600 V
D = 200 V
"E" suffix denotes lead diameter in 24 mils

3. POWER PACKAGES

aaacxxypp

aaa = Type designator
FES = Fast efficient single
FEP = Fast efficient positive center tap
UG = Ultrafast glass passivated
H = High junction temperature (planar structure)
U = Ultrafast (planar structure)
c = Package classification
B = TO-263
"blank" = TO-220
F = ITO-220
I = TO-262
xx = Forward current (in A)
y = Reverse voltage (in V)
A = 50 V F = 300 V
B = 100 V G = 400 V
C = 150 V H = 500 V
D = 200 V J = 600 V
pp = Package type (for FES, FEP, U, UG or UH series)
T = TO-220AC, ITO-220AC or TO-263AB (single)
CT = TO-220AB, ITO-220AB or TO-263AB (dual center tap)
P or PT = TO-247AD (dual center tap)

Notes:
- Part numbering system for all parts, excluding JEDEC, ProElectron and industry standard part numbers
- For JEDEC and ProElectron part numbers, please see part number explanations on page 18

Surface Mount Glass Passivated Ultrafast Rectifier

DO-213AA (GL34)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	50 V to 400 V
I_{FSM}	10 A
t_{rr}	50 ns
V_F	1.25 V, 1.35 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-213AA, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYM07-50	BYM07-100	BYM07-150	BYM07-200	BYM07-300	BYM07-400	UNIT
Fast efficient device: 1st band is green		EGL34A	EGL34B	EGL34C	EGL34D	EGL34F	EGL34G	
Polarity color bands (2nd band)		Gray	Red	Pink	Orange	Brown	Yellow	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	V
Maximum average forward rectified current at T_T = 75 °C	$I_{F(AV)}$	0.5						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	10						A
Maximum full load reverse current, full cycle average at T_A = 55 °C	$I_{R(AV)}$	50						µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175						°C

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS	SYMBOL	BYM07-50 EGL34A	BYM07-100 EGL34B	BYM07-150 EGL34C	BYM07-200 EGL34D	BYM07-300 EGL34F	BYM07-400 EGL34G	UNIT
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C	I_R (1)	5.0						µA
	T_A = 125 °C		50						
Maximum instantaneous forward voltage	0.5 A	V_F (1)	1.25				1.35		V
Max. reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	50						ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	7.0						pF

Note

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	BYM07-50 EGL34A	BYM07-100 EGL34B	BYM07-150 EGL34C	BYM07-200 EGL34D	BYM07-300 EGL34F	BYM07-400 EGL34G	UNIT
Maximum thermal resistance	$R_{\theta JA}$ (1)	150						°C/W
	$R_{\theta JT}$ (2)	70						

Notes

(1) Thermal resistance from junction to ambient, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to terminal, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
EGL34D-E3/98	0.036	98	2500	7" diameter plastic tape and reel
EGL34D-E3/83	0.036	83	9000	13" diameter plastic tape and reel
EGL34DHE3/98 (1)	0.036	98	2500	7" diameter plastic tape and reel
EGL34DHE3/83 (1)	0.036	83	9000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

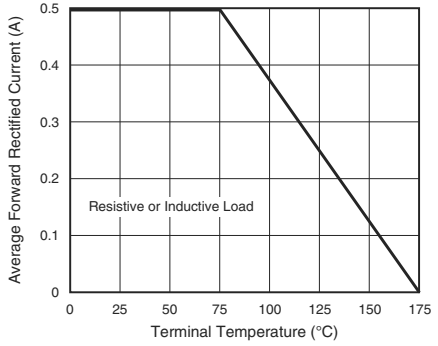


Fig. 1 - Forward Current Derating Curve

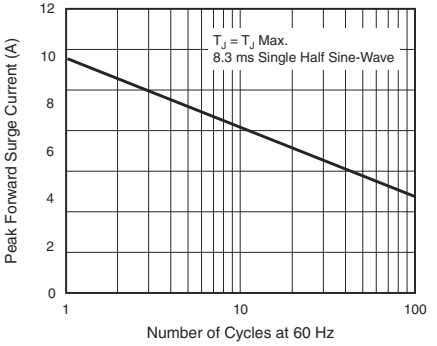


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

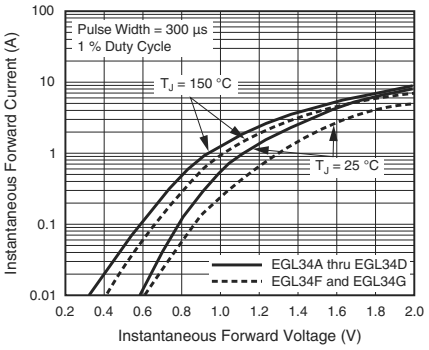


Fig. 3 - Typical Instantaneous Forward Characteristics

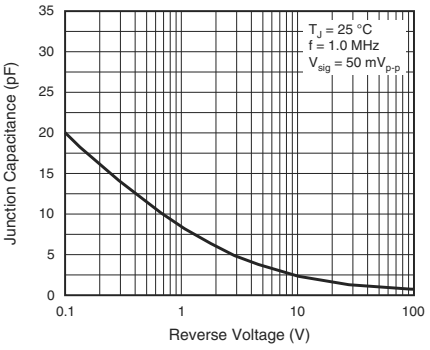


Fig. 5 - Typical Junction Capacitance

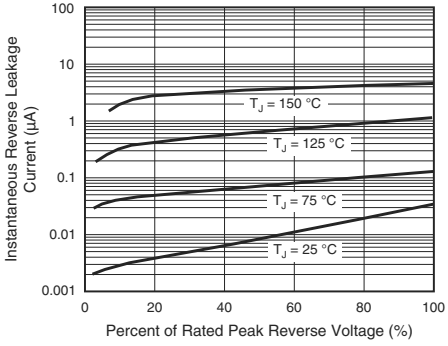


Fig. 4 - Typical Reverse Characteristics

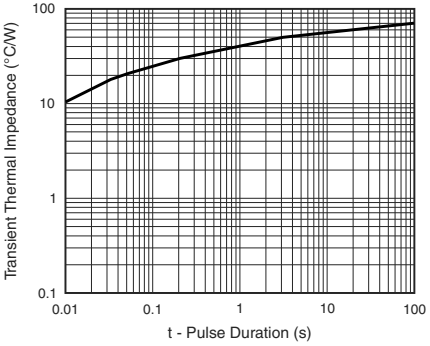
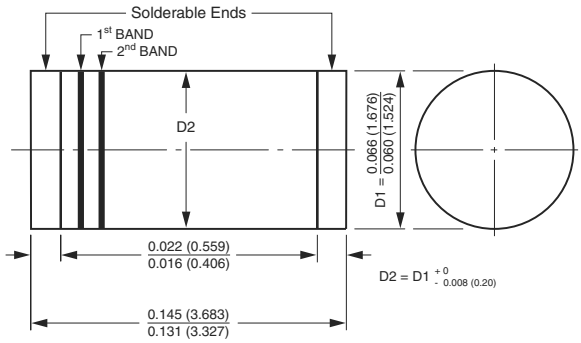


Fig. 6 - Typical Transient Thermal Impedance

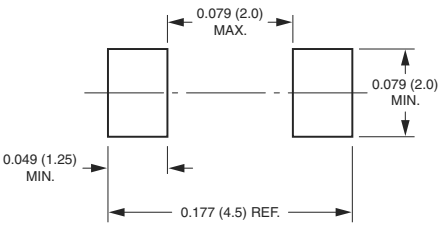
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AA (GL34)



1st band denotes type and polarity
2nd band denotes voltage type

Mounting Pad Layout



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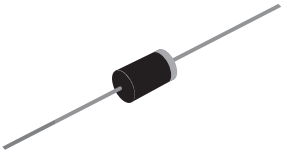
Revision: 01-Feb-11

Miniature Ultrafast Plastic Rectifier



Case Style MPG06

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Soft recovery characteristics
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.6 A
V_{RRM}	50 V to 200 V
I_{FSM}	40 A
t_{rr}	15 ns
V_F	0.95 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: MPG06

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG06A	UG06B	UG06C	UG06D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	0.6				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 0.6 A		V_F	0.95	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 100	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	15	ns
Maximum reverse recovery time	I_F = 0.6 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	25 35	ns
Maximum stored charge	I_F = 0.6 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 C	Q_{rr}	8.0 20	nC
Typical junction capacitance	4 V, 1 MHz		C_J	9.0	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**UG06A**	**UG06B**	**UG06C**	**UG06D**	**UNITS**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	97 28				°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead at 0.375" (9.5 mm) lead length P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UG06D-E3/54	0.181	54	5500	13" diameter paper tape and reel
UG06D-E3/73	0.181	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

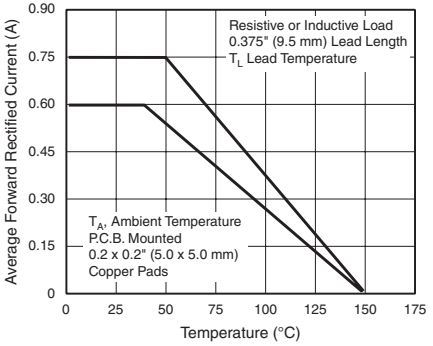


Figure 1. Maximum Forward Current Derating Curves

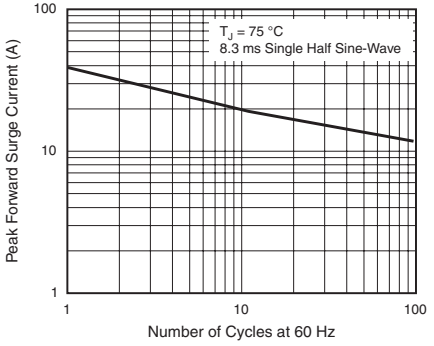


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

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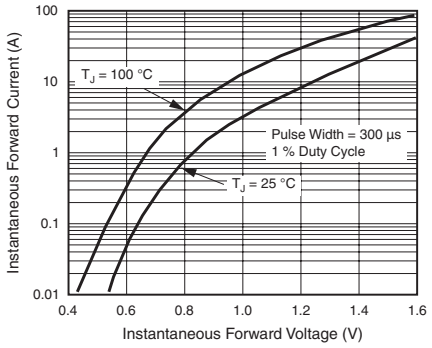


Figure 3. Typical Instantaneous Forward Characteristics

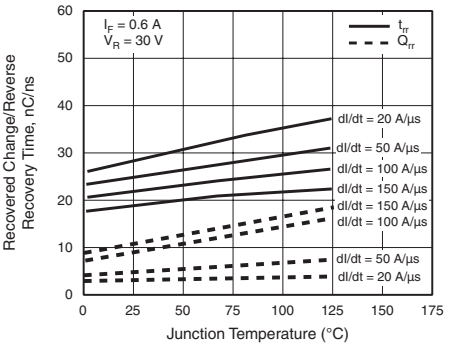


Figure 5. Reverse Switching Charateristics

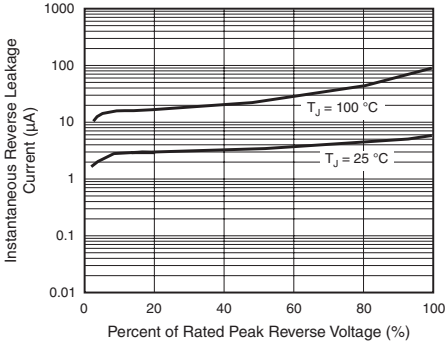


Figure 4. Typical Reverse Leakage Characteristics

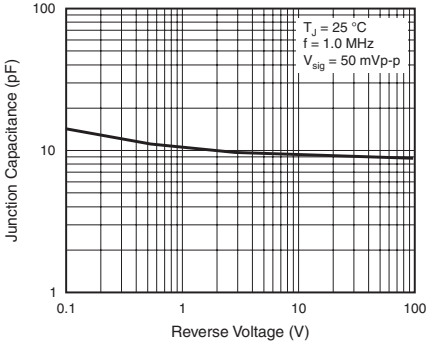
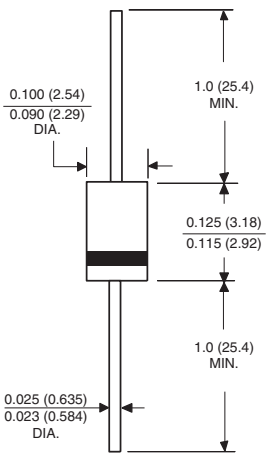


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style MPG06



Surface Mount Glass Passivated Ultrafast Rectifier

DO-213AB (GL41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 400 V
I_{FSM}	30 A
t_{rr}	50 ns
V_F	1.0 V, 1.25 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-213AB, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYM12-50	BYM12-100	BYM12-150	BYM12-200	BYM12-300	BYM12-400	UNIT
FAST EFFICIENT DEVICE: 1ST BAND IS GREEN		EGL41A	EGL41B	EGL41C	EGL41D	EGL41F	EGL41G	
Polarity color bands (2nd band)		Gray	Red	Pink	Orange	Brown	Yellow	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	V
Maximum average forward rectified current at T_T = 75 °C	$I_{F(AV)}$	1.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30						A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175						°C

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS	SYMBOL	BYM12-50 EGL41A	BYM12-100 EGL41B	BYM12-150 EGL41C	BYM12-200 EGL41D	BYM12-300 EGL41F	BYM12-400 EGL41G	UNIT
Max. instantaneous forward voltage	1.0 A	V_F (1)	1.0				1.25		V
Max. DC reverse current at rated DC blocking voltage	T_A = 25 °C	I_R (1)	5.0						µA
	T_A = 125 °C		50						
Max. reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	50						ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	20				14		pF

Note

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	BYM12-50 EGL41A	BYM12-100 EGL41B	BYM12-150 EGL41C	BYM12-200 EGL41D	BYM12-300 EGL41F	BYM12-400 EGL41G	UNIT
Maximum thermal resistance	$R_{\theta JA}$ (1)	60						°C/W
	$R_{\theta JT}$ (2)	30						

Notes

(1) Thermal resistance from junction to ambient, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to terminal, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
EGL41D-E3/96	0.114	96	1500	7" diameter plastic tape and reel
EGL41D-E3/97	0.114	97	5000	13" diameter plastic tape and reel
EGL41DHE3/96 (1)	0.114	96	1500	7" diameter plastic tape and reel
EGL41DHE3/97 (1)	0.114	97	5000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

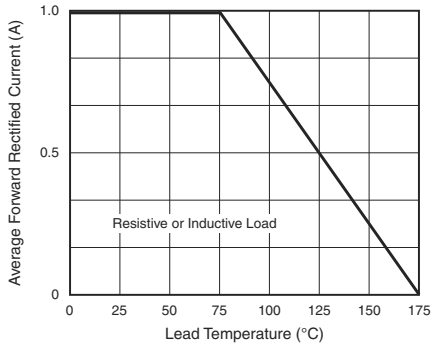


Fig. 1 - Maximum Forward Current Derating Curve

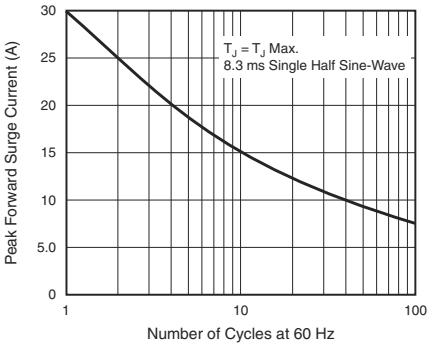


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

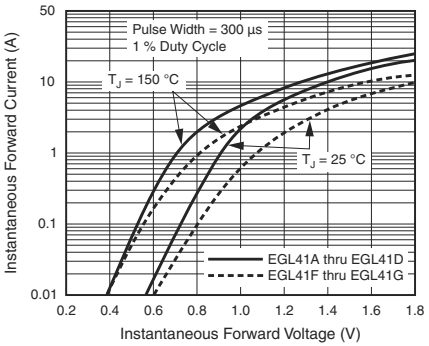


Fig. 3 - Typical Instantaneous Forward Characteristics

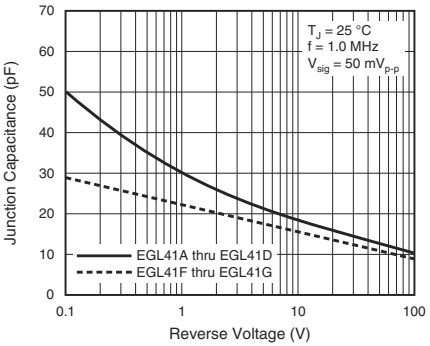


Fig. 5 - Typical Junction Capacitance

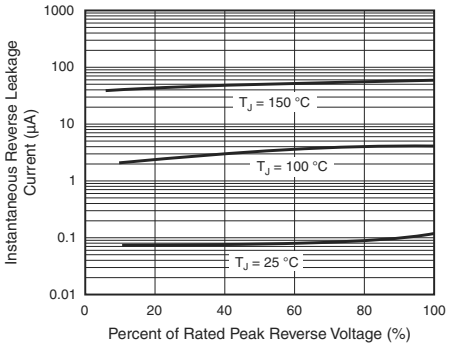


Fig. 4 - Typical Reverse Leakage Characteristics

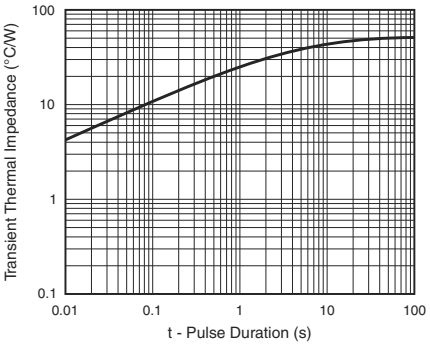
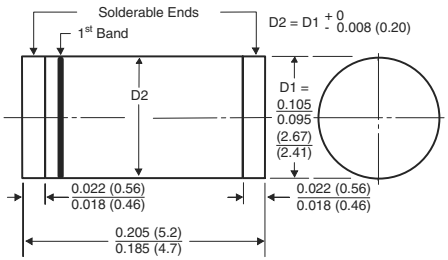


Fig. 6 - Typical Transient Thermal Impedance

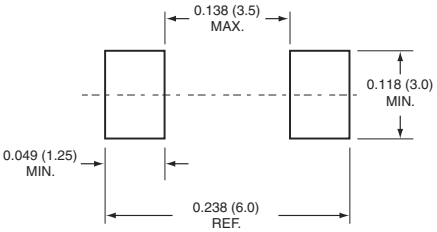
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AB (GL41)



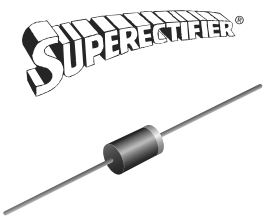
1st Band Denotes Type and Positive End (Cathode)

Mounting Pad Layout



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Glass Passivated Ultrafast Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	800 V, 1000 V
I_{FSM}	30 A
t_{rr}	75 ns
V_F	1.3 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYV26DGP	BYV26EGP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	800	1000	V
Maximum RMS voltage	V_{RMS}	560	700	V
Maximum DC blocking voltage	V_{DC}	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30		A
Non repetitive peak reverse energy	E_{RSM} (1)	10		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

Note

(1) Peak reverse energy measured at I_R = 400 mA, $T_J = T_J$ max. on inductive load, t = 20 µs

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYV26DGP**	**BYV26EGP**	**UNIT**
Minimum avalanche breakdown voltage	100 µA		V_{BR}	900	1100	V
Maximum instantaneous forward voltage	1.0 A	T_J = 25 °C	V_F	2.5		V
		T_J = 175 °C		1.3		
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0		µA
		T_A = 165 °C		150		
Max. reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	75		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**BYV26DGP**	**BYV26EGP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	70		°C/W
	$R_{\theta JL}$ (2)	16		

Notes

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, mounted on PCB with 0.5" x 0.5" (12 mm x 12 mm) copper pads

(2) Thermal resistance from junction to lead at 0.375" (9.5 mm) lead length with both leads attached to heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYV26EGP-E3/54	0.428	54	4000	13" diameter paper tape and reel
BYV26EGP-E3/73	0.428	73	2000	Ammo pack packaging
BYV26EGPHE3/54 (1)	0.428	54	4000	13" diameter paper tape and reel
BYV26EGPHE3/73 (1)	0.428	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

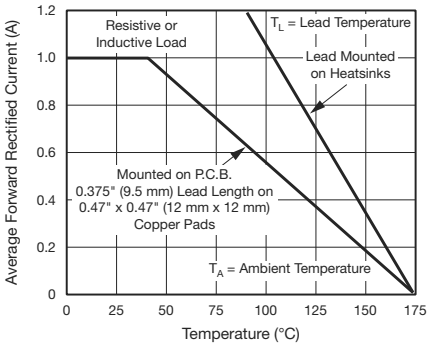


Fig. 1 - Maximum Forward Current Derating Curve

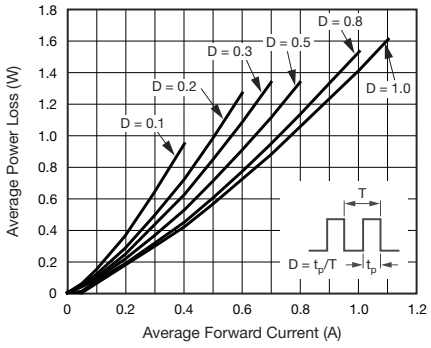


Fig. 2 - Forward Power Loss Characteristics

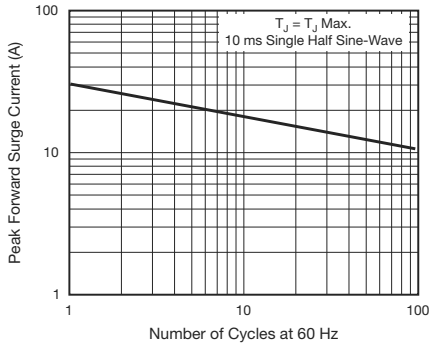


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

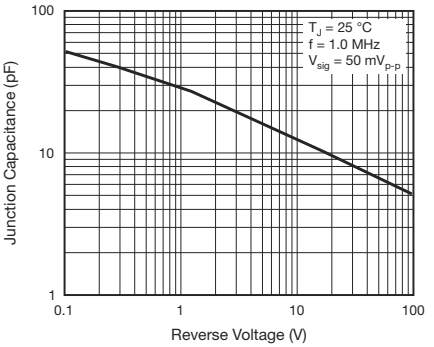


Fig. 6 - Typical Junction Capacitance

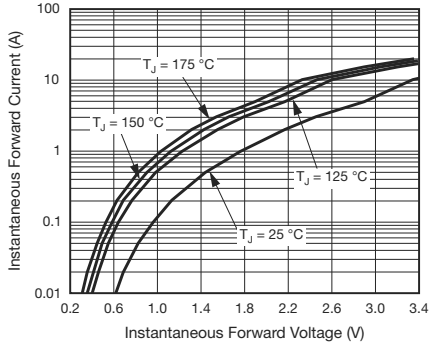


Fig. 4 - Typical Instantaneous Forward Voltage Characteristics

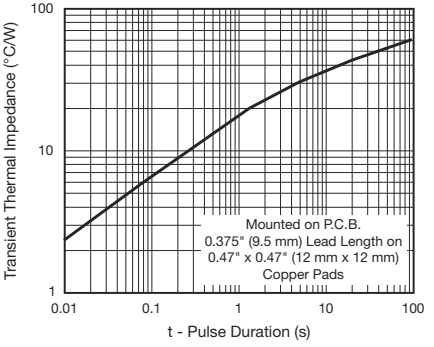


Fig. 7 - Typical Transient Thermal Impedance

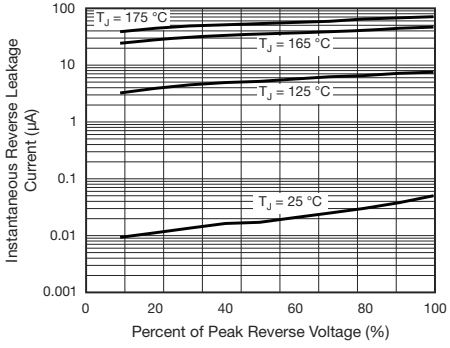
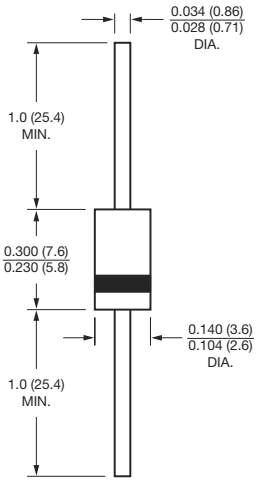


Fig. 5 - Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88554
Revision: 01-Feb-11

Surface Mount Glass Passivated Ultrafast Rectifier

DO-214BA (GF1)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	30 A
t_{rr}	50 ns
V_F	1.0 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214BA, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EGF1A	EGF1B	EGF1C	EGF1D	UNIT
Device marking code		EA	EB	EC	ED	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_L = 125 °C	$I_{F(AV)}$	1.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30				A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**EGF1A**	**EGF1B**	**EGF1C**	**EGF1D**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F (1)	1.0				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R (1)	5.0				μA
		T_A = 125 °C		50				
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50				ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15				pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**EGF1A**	**EGF1B**	**EGF1C**	**EGF1D**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	85				°C/W
	$R_{\theta JL}$ (1)	30				

Note

(1) Thermal resistance from junction to ambient and from junction to lead, PCB mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
EGF1D-E3/67A	0.104	67A	1500	7" diameter plastic tape and reel
EGF1D-E3/5CA	0.104	5CA	6500	13" diameter plastic tape and reel
EGF1DHE3/67A (1)	0.104	67A	1500	7" diameter plastic tape and reel
EGF1DHE3/5CA (1)	0.104	5CA	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise specified)

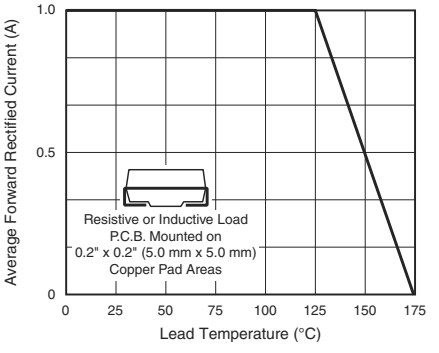


Fig. 1 - Maximum Forward Current Derating Curve

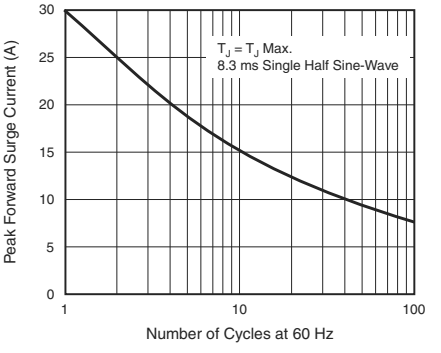


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

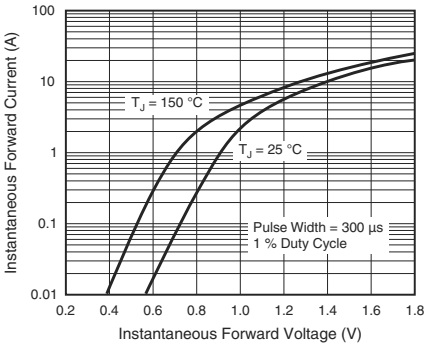


Fig. 3 - Typical Instantaneous Forward Characteristics

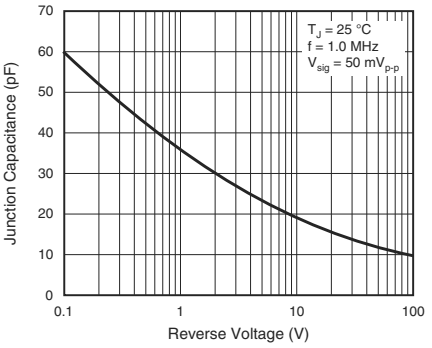


Fig. 5 - Typical Junction Capacitance

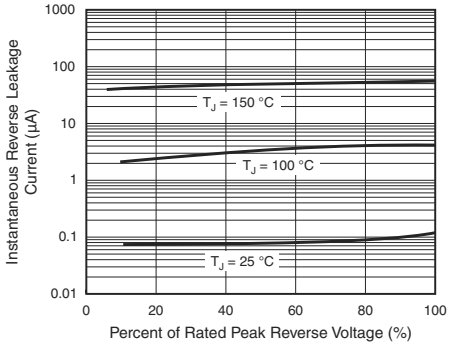


Fig. 4 - Typical Reverse Leakage Characteristics

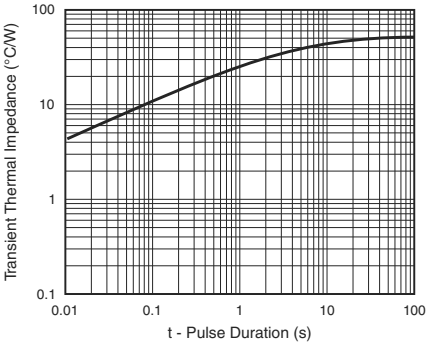
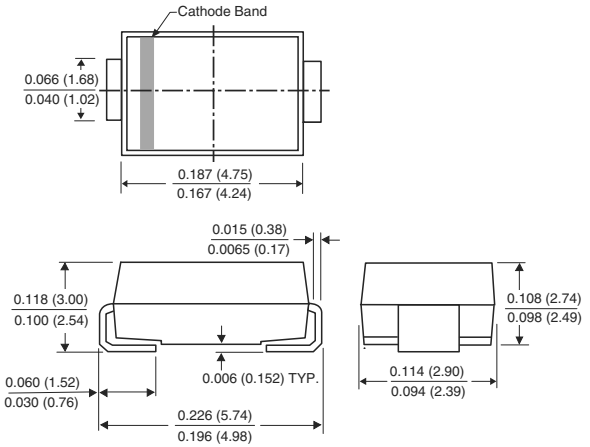


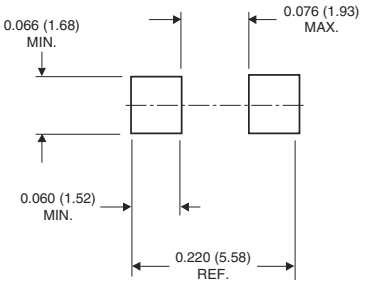
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214BA (GF1)



Mounting Pad Layout



EGF1T

Vishay General Semiconductor

Surface Mount Glass Passivated Ultrafast Rectifier

DO-214BA (GF1)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- Avalanche surge energy capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	1300 V
I_{FSM}	20 A
t_{rr}	75 ns
E_{AS}	15 mJ
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high voltage rectification of photoflash application.

MECHANICAL DATA

Case: DO-214BA, molded plastic over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EGF1T	UNIT
Device marking code		ET	
Maximum repetitive peak reverse voltage	V_{RRM}	1300	V
Maximum RMS voltage	V_{RMS}	910	V
Maximum DC blocking	V_{DC}	1300	V
Maximum average forward rectified current	$I_{F(AV)}$	1.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	20	A
Non-repetitive avalanche energy at T_A = 25 °C, I_{AS} = 1 A, L = 30 mH	E_{AS}	15	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88904
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	EGF1T	UNIT
Maximum instantaneous forward voltage	1.0 A	T_J = 25 °C	V_F (1)	3.0	V
Maximum DC reverse current	V_{RM}	T_J = 25 °C	I_R (2)	5.0	μA
		T_J = 125 °C		50	
Typical reverse recovery time	I_F = 0.5 A, I_R =1.0 A, I_{rr} = 0.25 A		t_{rr}	75	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.0	pF

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	EGF1T	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	50	°C/W
	$R_{\theta JL}$ (1)	20	

Note

(1) Thermal resistance from junction to ambient and from junction to lead, PCB mounted on 0.95" x 0.95" (24 mm x 24 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
EGF1T-E3/67A	0.104	67A	1500	7" diameter plastic tape and reel
EGF1T-E3/5CA	0.104	5CA	6500	13" diameter plastic tape and reel
EGF1THE3/67A (1)	0.104	67A	1500	7" diameter plastic tape and reel
EGF1THE3/5CA (1)	0.104	5CA	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

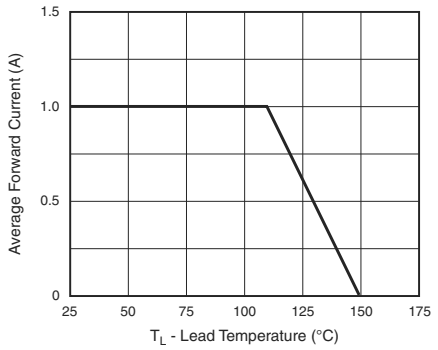


Fig. 1 - Maximum Forward Current Derating Curve

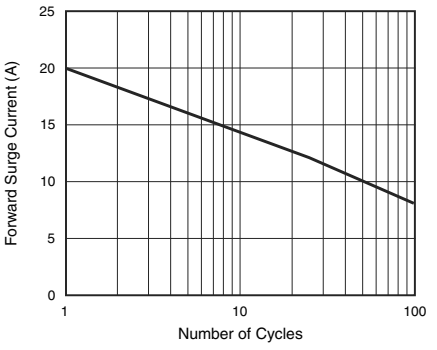


Fig. 2 - Maximum Non-Repetitive Forward Surge Current

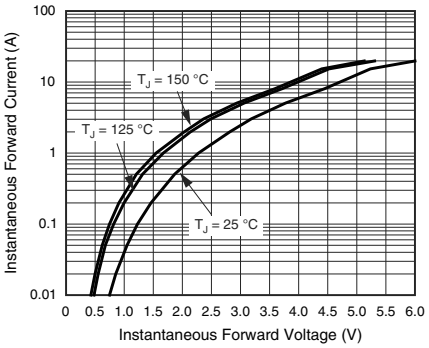


Fig. 3 - Typical Instantaneous Forward Characteristics

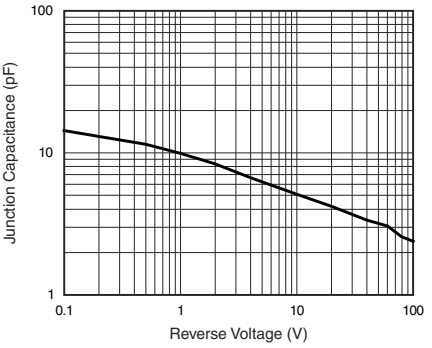


Fig. 5 - Typical Junction Capacitance Per Leg

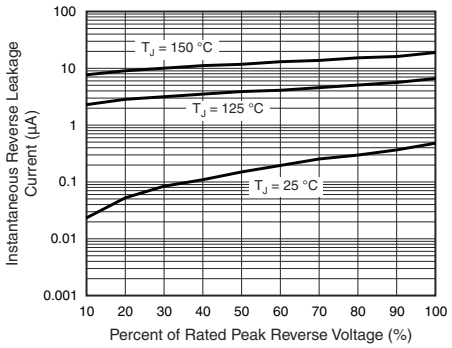


Fig. 4 - Typical Reverse Leakage Characteristics

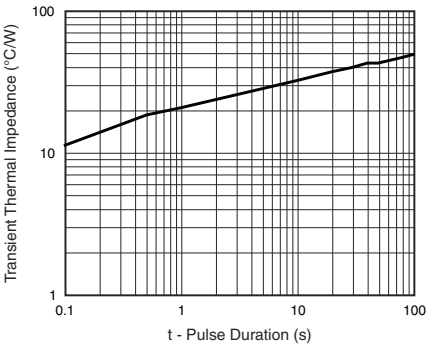
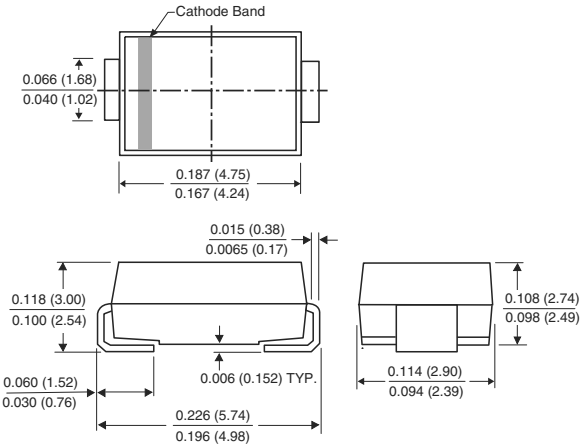


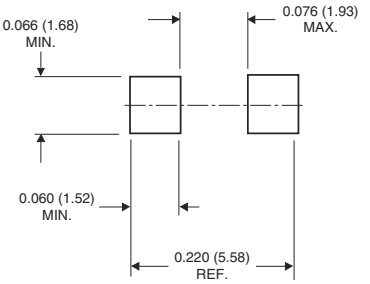
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214BA (GF1)

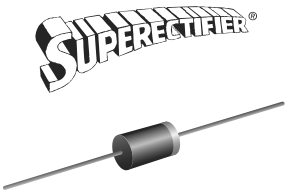


Mounting Pad Layout



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Glass Passivated Ultrafast Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb

e3

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 400 V
I_{FSM}	30 A
t_{rr}	50 ns
V_F	0.95 V, 1.25 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EGP10A	EGP10B	EGP10C	EGP10D	EGP10F	EGP10G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30						A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**EGP10A**	**EGP10B**	**EGP10C**	**EGP10D**	**EGP10F**	**EGP10G**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	0.95				1.25		V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0						μA
		T_A = 125 °C		100						
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50						ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	22				15		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**EGP10A**	**EGP10B**	**EGP10C**	**EGP10D**	**EGP10F**	**EGP10G**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	50						°C/W

Note

(1) Thermal resistance from junction to ambient, and from junction to lead at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
EGP10D-E3/54	0.337	54	5500	13" diameter paper tape and reel
EGP10D-E3/73	0.337	73	3000	Ammo pack packaging
EGP10DHE3/54 (1)	0.337	54	5500	13" diameter paper tape and reel
EGP10DHE3/73 (1)	0.337	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

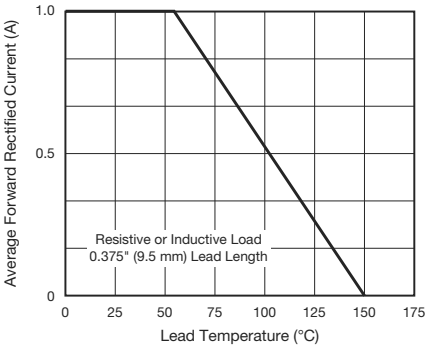


Fig. 1 - Maximum Forward Current Derating Curve

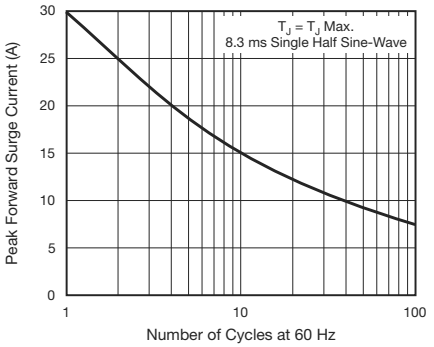


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

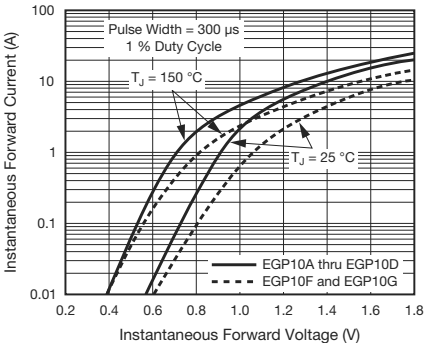


Fig. 3 - Typical Instantaneous Forward Characteristics

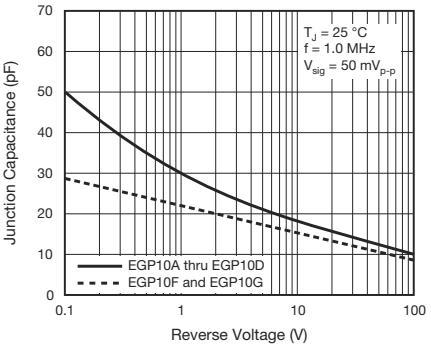


Fig. 5 - Typical Junction Capacitance

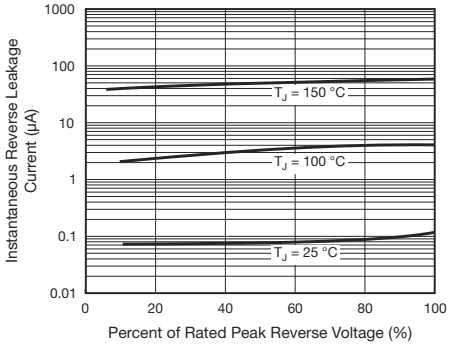


Fig. 4 - Typical Reverse Leakage Characteristics

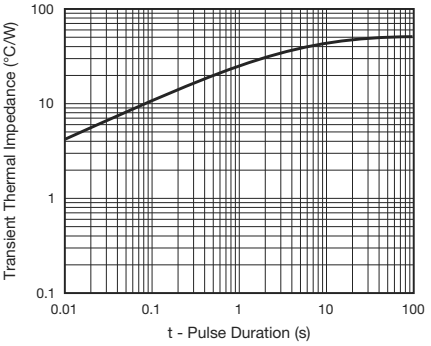
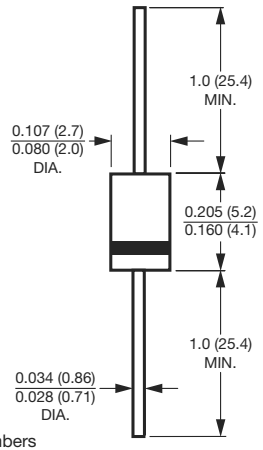


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

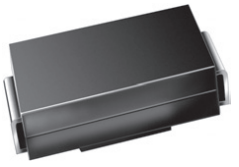
DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

Surface Mount Ultrafast Plastic Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	30 A
t_{rr}	15 ns
V_F	0.92 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES1A	ES1B	ES1C	ES1D	UNIT
Device marking code		EA	EB	EC	ED	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88586
Revision: 27-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage	I_F = 0.6 A (1) I_F = 1.0 A		V_F	0.865 0.920	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 100	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	15	ns
Maximum reverse recovery time	I_F = 0.6 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	25 35	ns
Maximum stored charge	I_F = 0.6 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	10 25	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	10	pF

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**ES1A**	**ES1B**	**ES1C**	**ES1D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	85 35				°C/W

Note:
(1) Units mounted on P.C.B. 5.0 x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ES1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
ES1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
ES1DHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
ES1DHE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

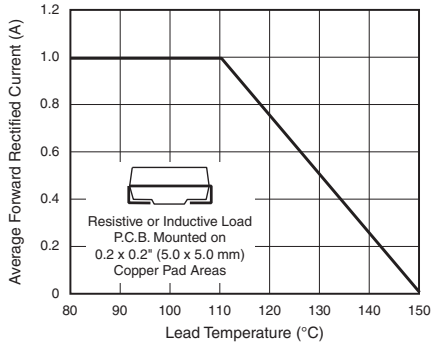


Figure 1. Maximum Forward Current Derating Curve

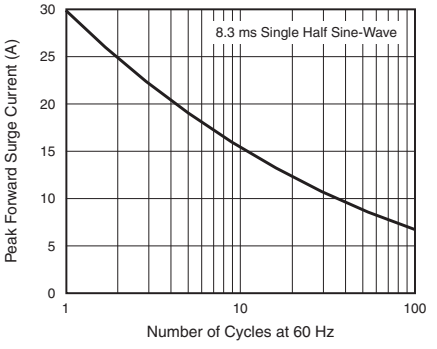


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

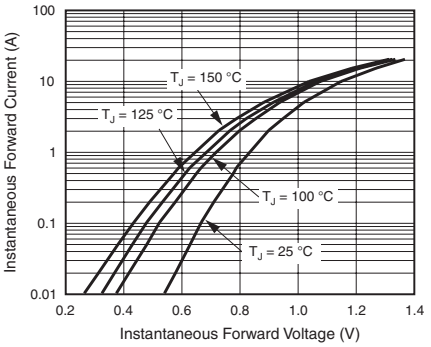


Figure 3. Typical Instantaneous Forward Characteristics

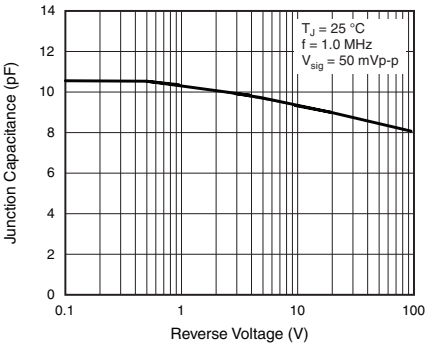


Figure 5. Typical Junction Capacitance

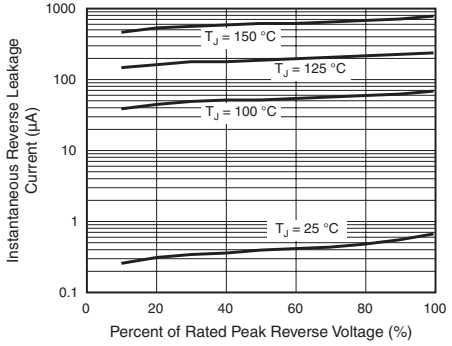


Figure 4. Typical Reverse Leakage Characteristics

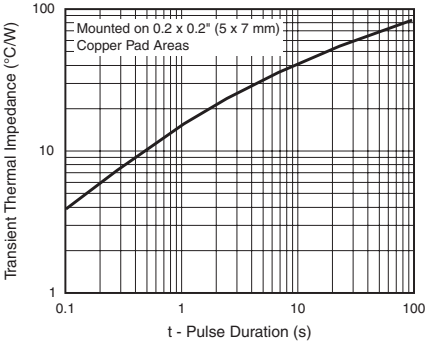
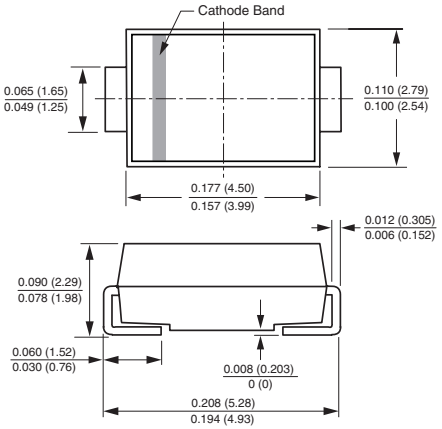


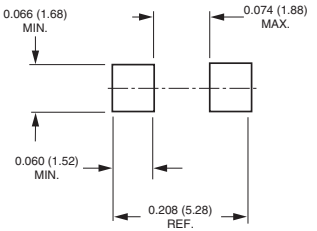
Figure 6. Typical Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



High Current Density Surface Mount Ultrafast Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- Low thermal resistance
- Meets MSL level 1 per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds of ac-to-dc and dc-to-dc converters for both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	15 ns
V_F	0.92 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES1PB	ES1PC	ES1PD	UNIT
Device marking code		EB	EC	ED	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage (1)	I_F = 0.6 A I_F = 1 A	T_J = 25 °C	V_F	0.865 0.920	V
Maximum reverse current at rated V_R (2)		T_J = 25 °C T_J = 125 °C	I_R	5.0 500	µA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		t_{rr}	15	ns
Typical reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	25 30	ns
Typical reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	8 10	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	10	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ES1PB**	**ES1PC**	**ES1PD**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 15 20			°C/W

Note:
(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ES1PB-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
ES1PB-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
ES1PBHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
ES1PBHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

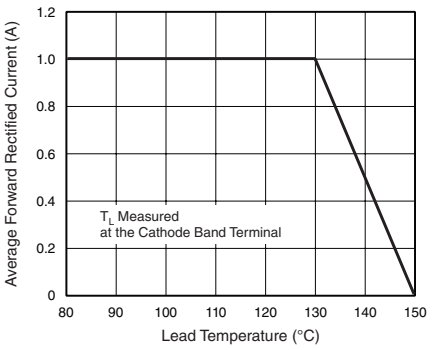


Figure 1. Maximum Forward Current Derating Curve

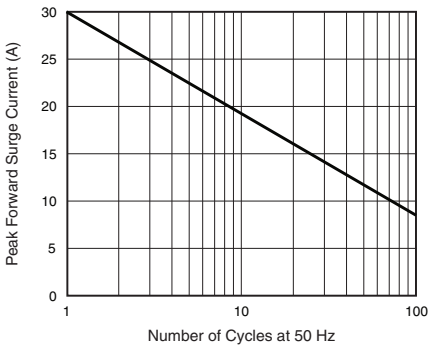


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

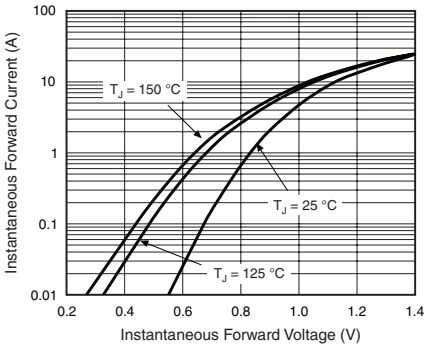


Figure 3. Typical Instantaneous Forward Characteristics

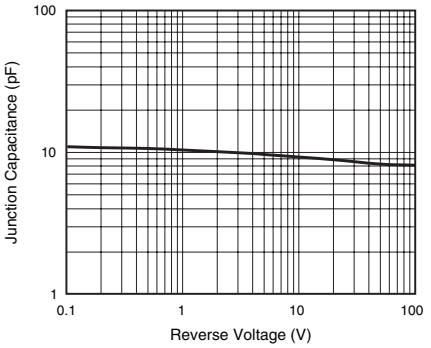


Figure 5. Typical Junction Capacitance

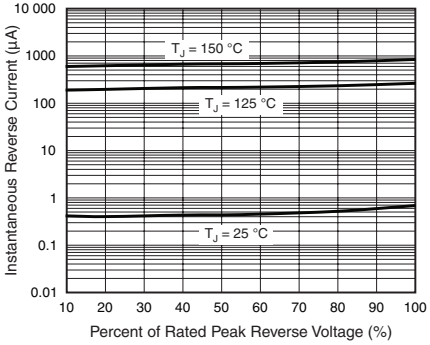


Figure 4. Typical Reverse Leakage Characteristics

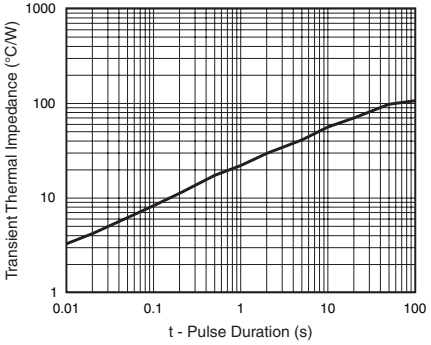
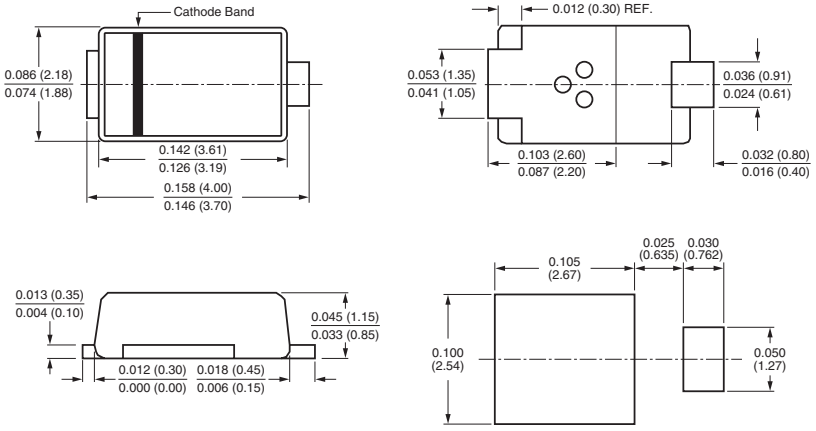


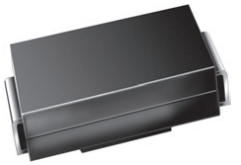
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



Surface Mount Ultrafast Plastic Rectifiers



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power loss
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds ac-to-ac and dc-to-dc converters in high temperature conditions for both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	25 ns
V_F	0.90 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ESH1B	ESH1C	ESH1D	UNIT
Device marking code		EHB	EHC	EHD	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current at T_L = 150 °C	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load (JEDEC method)	I_{FSM}	50			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175			°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88890
Revision: 27-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage	I_F = 0.7 A (1) I_F = 1 A		V_F	0.87 0.90	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 125 °C	I_R	1.0 25	µA
Maximum reverse current	V_R = 20 V, T_J = 150 °C		I_R	50	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Typical reverse recovery time	I_F = 0.6 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	25 35	ns
Typical stored charge	I_F = 0.6 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	10 15	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	25	pF

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH1B**	**ESH1C**	**ESH1D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	85 30			°C/W

Note:
(1) Units mounted on P.C.B. with 5.0 x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ESH1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
ESH1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
ESH1DHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
ESH1DHE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

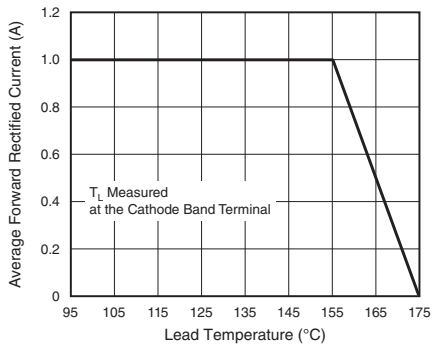


Figure 1. Maximum Forward Current Derating Curve

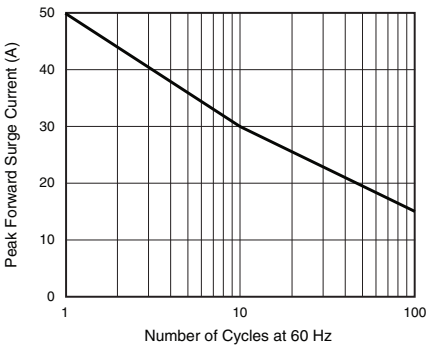


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

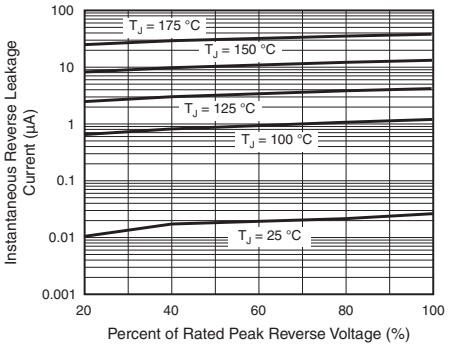


Figure 3. Typical Reverse Leakage Characteristics

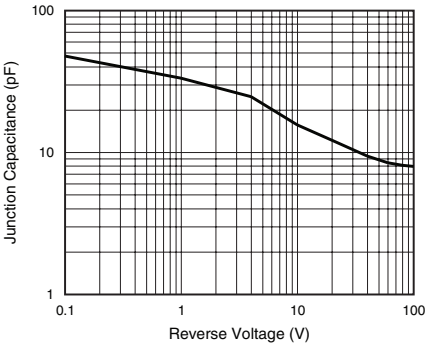


Figure 5. Typical Junction Capacitance

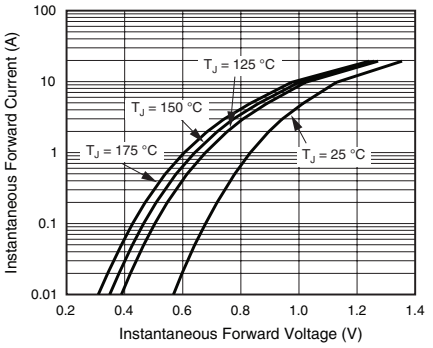


Figure 4. Typical Instantaneous Forward Characteristics

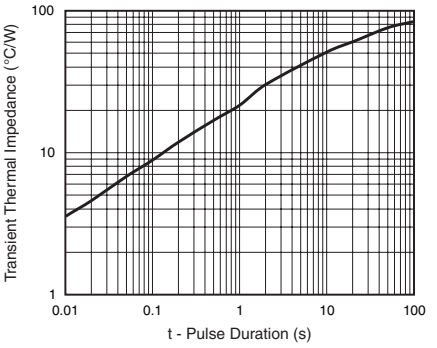
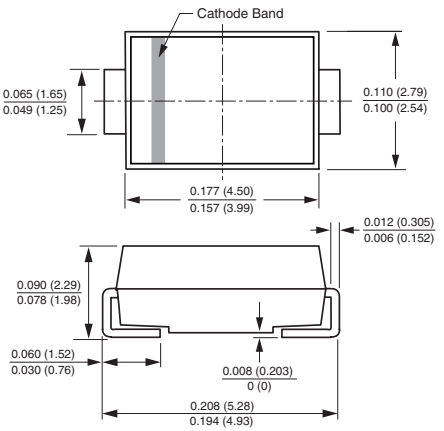


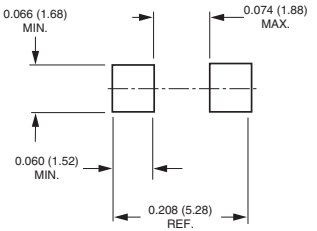
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



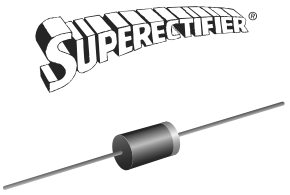
Mounting Pad Layout



FGP10B thru FGP10D

Vishay General Semiconductor

Glass Passivated Ultrafast Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V to 200 V
I_{FSM}	30 A
t_{rr}	35 ns
V_F	0.95 V
I_R	2.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FGP10B	FGP10C	FGP10D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175			°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

FGP10B thru FGP10D

Vishay General Semiconductor

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	FGP10B	FGP10C	FGP10D	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F (1)	0.95			V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R (1)	2.0			μA
		T_A = 100 °C		50			
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35			ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	25			pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	FGP10B	FGP10C	FGP10D	UNIT
Maximum thermal resistance	$R_{\theta JA}$ (1)	70			°C/W
	$R_{\theta JL}$ (1)	20			

Note

(1) Units mounted on PCB 10 mm x 10 mm copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
FGP10D-E3/54	0.30	54	5500	13" diameter paper tape and reel
FGP10D-E3/73	0.30	73	3000	Ammo pack packaging
FGP10DHE3/54 (1)	0.30	54	5500	13" diameter paper tape and reel
FGP10DHE3/73 (1)	0.30	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

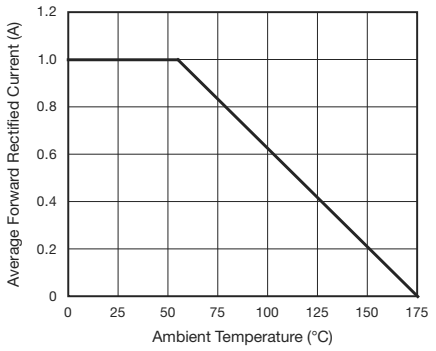


Fig. 1 - Maximum Forward Current Derating Curve

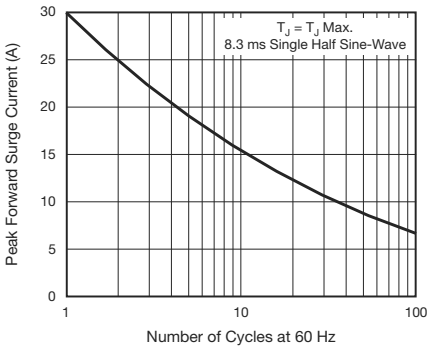


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
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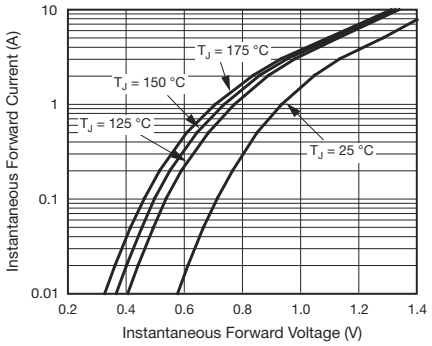


Fig. 3 - Typical Instantaneous Forward Characteristics

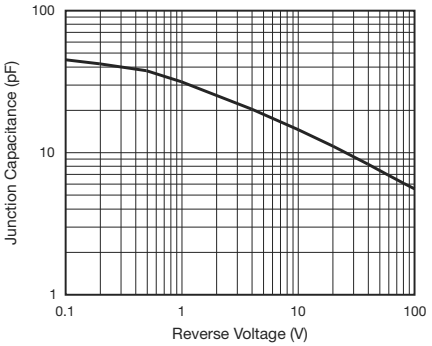


Fig. 5 - Typical Junction Capacitance

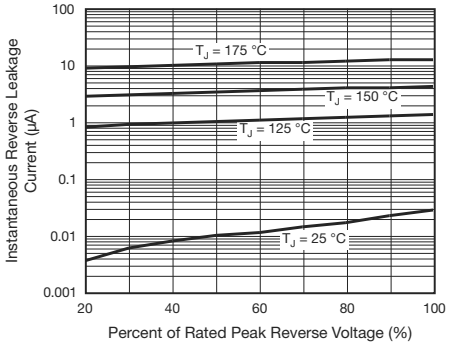


Fig. 4 - Typical Reverse Leakage Characteristics

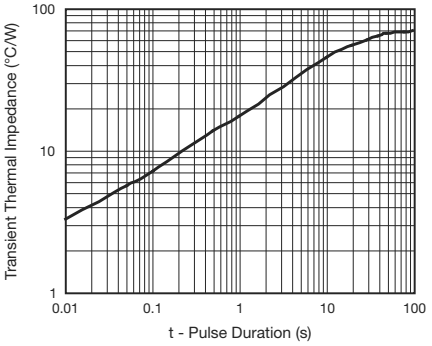
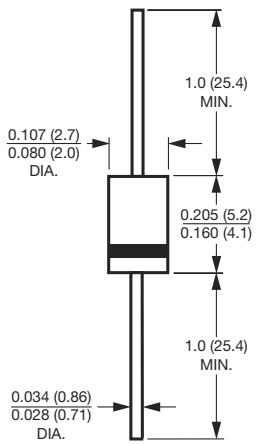


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



ESH1PB, ESH1PC & ESH1PD

Vishay General Semiconductor

High Current Density Surface Mount Ultrafast Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- Low thermal resistance
- Meets MSL level 1 per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds of ac-to-ac and dc-to-dc converters in high temperature conditions for both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	25 ns
V_F	0.90 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL-94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ESH1PB	ESH1PC	ESH1PD	UNIT
Device marking code		PB	PC	PD	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage (1)	I_F = 0.7 A I_F = 1 A	T_J = 25 °C	V_F	0.86 0.90	V
Maximum reverse current at rated V_R voltage (2)		T_J = 25 °C T_J = 125 °C	I_R	1.0 25	µA
Maximum reverse current	V_R = 20 V	T_J = 150 °C	I_R	50	µA

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88895
Revision: 13-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Typical reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	25 35	ns
Typical reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	10 15	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	25	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH1PB**	**ESH1PC**	**ESH1PD**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 15 20			°C/W

Note:
(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ESH1PB-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
ESH1PB-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
ESH1PBHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
ESH1PBHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

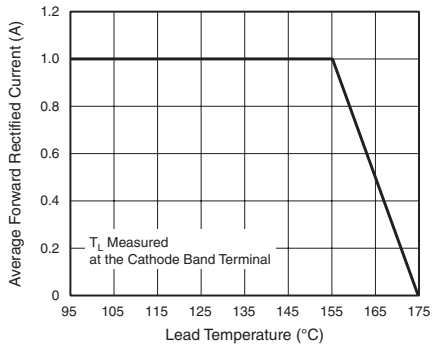


Figure 1. Forward Current Derating Curve

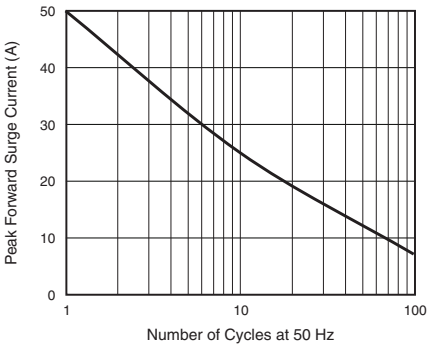


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

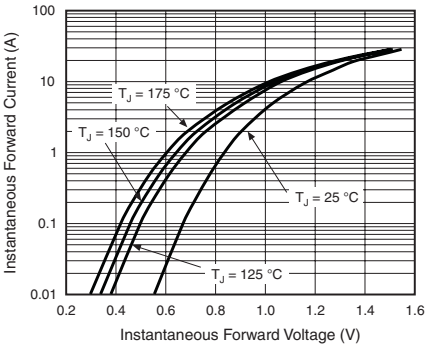


Figure 3. Typical Instantaneous Forward Characteristics

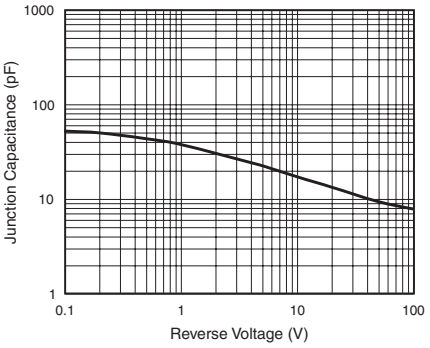


Figure 5. Typical Junction Capacitance

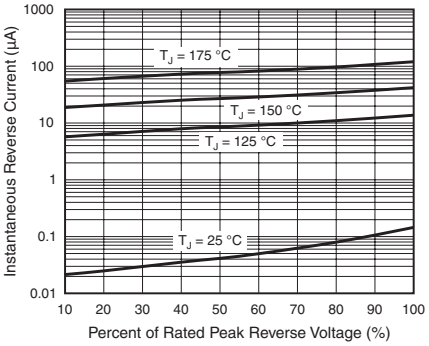


Figure 4. Typical Reverse Leakage Characteristics

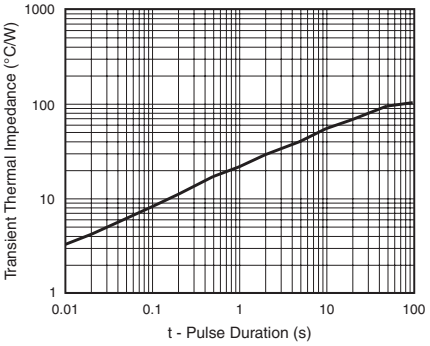
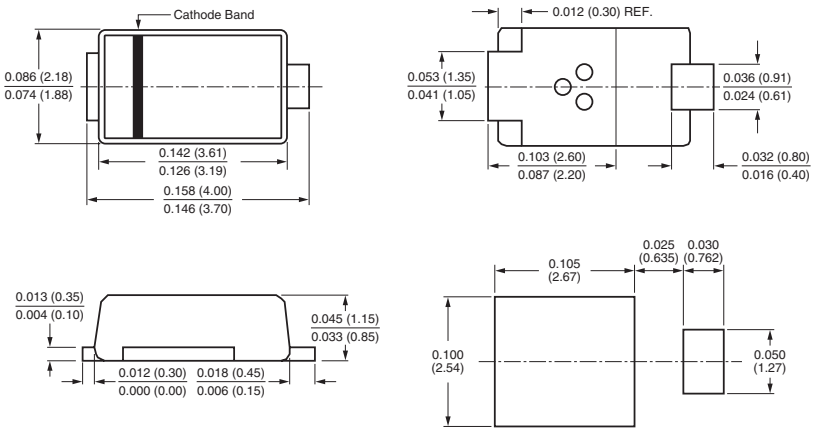


Figure 6. Typical Transient Thermal impedance

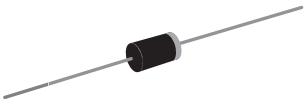
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88895
Revision: 13-May-08

Ultrafast Plastic Rectifier



DO-204AC (DO-15)

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V
I_{FSM}	35 A
t_{rr}	25 ns
V_F	0.710 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MUR120	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	V
Working peak reverse voltage	V_{RWM}	200	V
Maximum DC blocking voltage	V_{DC}	200	V
Maximum average forward rectified current at T_A = 130 °C	$I_{F(AV)}$	1.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	35	A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MUR120**	**UNIT**
Maximum instantaneous forward voltage (1)	1.0 A	T_J = 25 °C T_J = 150 °C	V_F	0.875 0.710	V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	2.0 50	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	35	ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, I_{rec} to 1.0 V		t_{fr}	25	ns

Note:

(1) Pulse test: t_p = 300 µs pulse, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**MUR120**	**UNIT**
Typical thermal resistance junction to ambient (1)	$R_{\theta JA}$	27	°C/W

Note:

(1) Lead length = 3/8" on P.C. Board with 1.5" x 1.5" copper surface

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MUR120-E3/54	0.41	54	4000	13" diameter paper tape and reel
MUR120-E3/73	0.41	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

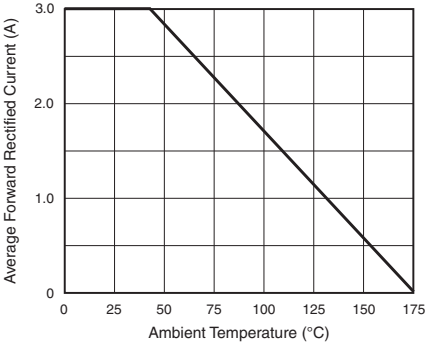


Figure 1. Forward Current Derating Curve

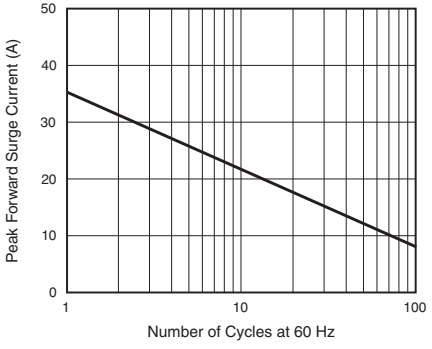


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
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Document Number: 88683
Revision: 20-Aug-07

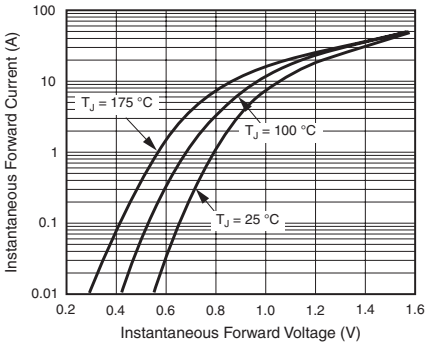


Figure 3. Typical Instantaneous Forward Characteristics

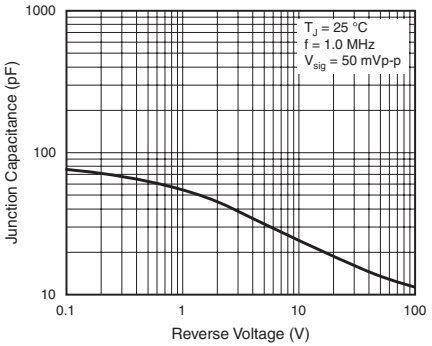


Figure 5. Typical Junction Capacitance

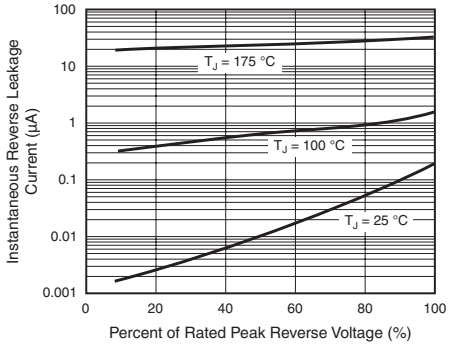
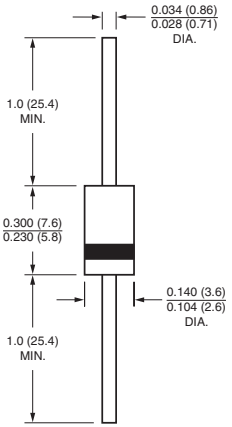


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

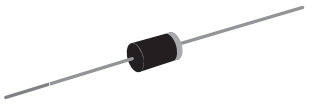
DO-204AC (DO-15)



MUR140 & MUR160

Vishay General Semiconductor

Ultrafast Plastic Rectifier



DO-204AC (DO-15)

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	400 V, 600 V
I_{FSM}	35 A
t_{rr}	50 ns
V_F	1.05 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MUR140	MUR160	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Working peak reverse voltage	V_{RWM}	400	600	V
Maximum DC blocking voltage	V_{DC}	400	600	V
Maximum average forward rectified current at T_A = 120 °C	$I_{F(AV)}$	1.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	35		A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175 °C		°C

For technical questions within your region, please contact one of the following:
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Document Number: 88684
Revision: 20-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MUR140**	**MUR160**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A	T_J = 25 °C T_J = 150 °C	V_F	1.25 1.05		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	5.0 150		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	75		ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	50		ns

Note:

(1) Pulse test: 300 µs pulse width, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MUR140**	**MUR160**	**UNIT**
Typical thermal resistance junction to ambient (1)	$R_{\theta JA}$	50		°C/W

Note:

(1) Lead length = 3/8" on P.C. Board with 1.5" x 1.5" copper surface

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MUR160-E3/54	0.41	54	4000	13" diameter paper tape and reel
MUR160-E3/73	0.41	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

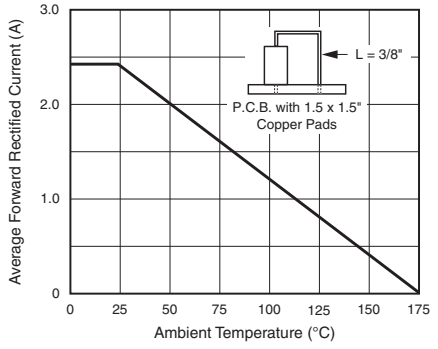


Figure 1. Forward Current Derating Curve

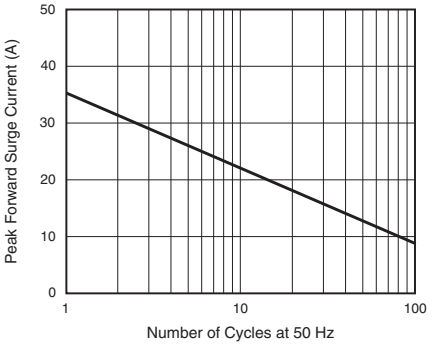


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

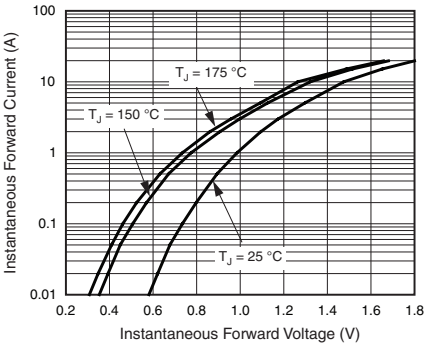


Figure 3. Typical Instantaneous Forward Characteristics

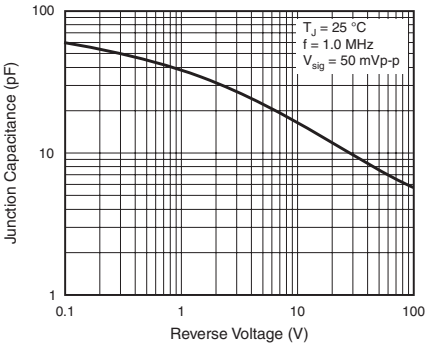


Figure 5. Typical Junction Capacitance

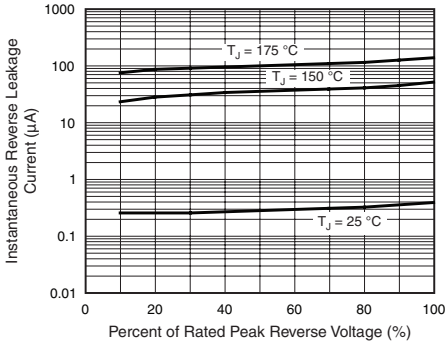
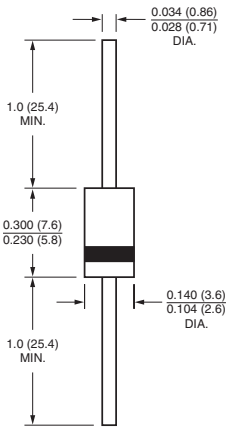


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



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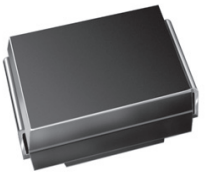
Document Number: 88684
Revision: 20-Aug-07

Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V
I_{FSM}	40 A
t_{rr}	25 ns
V_F	0.71 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Device marking code			MD	
Maximum repetitive peak reverse voltage		V_{RRM}	200	V
Working peak reverse voltage		V_{RWM}	200	V
Maximum DC blocking voltage		V_{DC}	200	V
Maximum average forward rectified current at (Fig. 1)	T_L = 155 °C T_L = 145 °C	$I_{F(AV)}$	1.0 2.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I_{FSM}	40	A
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A	T_J = 25 °C T_J = 150 °C	V_F	0.875 0.71	V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	2.0 50	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	35	ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	25	ns

Note:

(1) Pulse test: t_p = 300 µs, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Typical thermal resistance, junction to ambient	$R_{\theta JL}$	13	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MURS120-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
MURS120-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
MURS120HE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
MURS120HE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

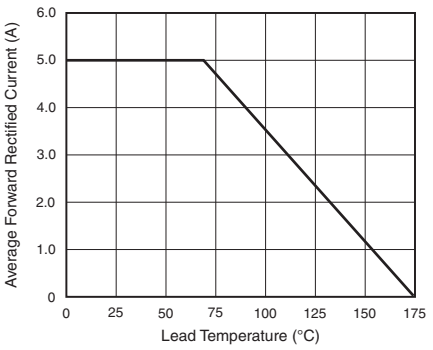


Figure 1. Forward Current Derating Curve

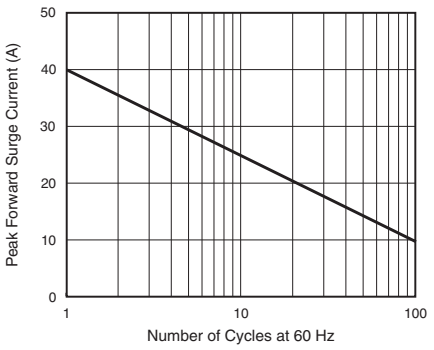


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
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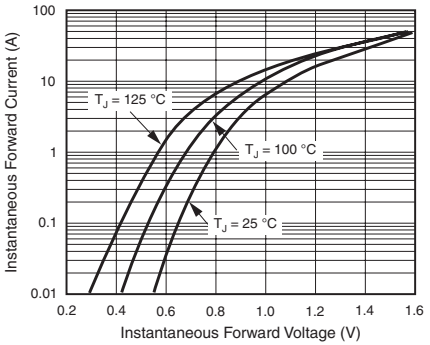


Figure 3. Typical Instantaneous Forward Characteristics

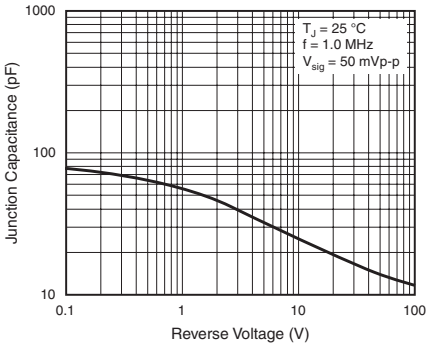


Figure 5. Typical Junction Capacitance

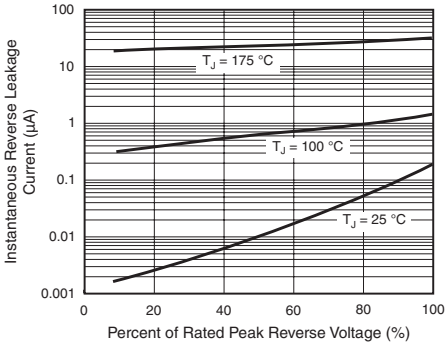
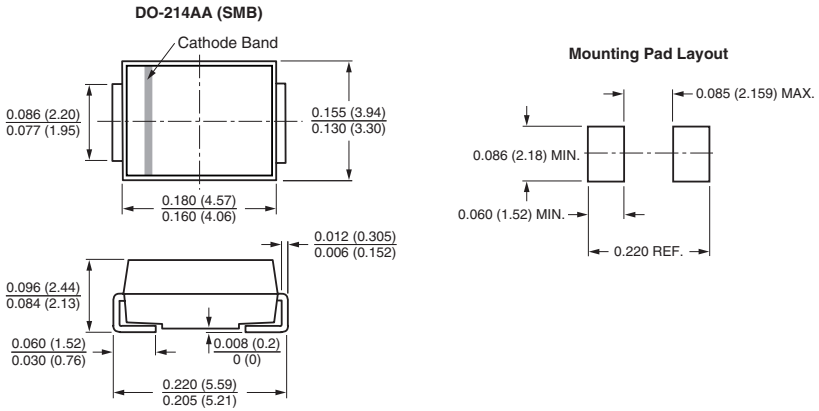
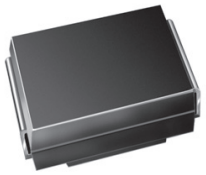


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	400 V, 600 V
I_{FSM}	35 A
t_{rr}	50 ns
V_F	1.05 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MURS140	MURS160	UNIT
Device marking code		MG	MJ	
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Working peak reverse voltage	V_{RWM}	400	600	V
Maximum DC blocking voltage	V_{DC}	400	600	V
Maximum average forward rectified current at (Fig. 1) T_L = 150 °C T_L = 125 °C	$I_{F(AV)}$	1.0 2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	35		A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

For technical questions within your region, please contact one of the following:
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Document Number: 88688
Revision: 27-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	MURS140	MURS160	UNIT
Maximum instantaneous forward voltage (1)	I_F = 1.0 A	T_J = 25 °C T_J = 150 °C	V_F	1.25 1.05		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	5.0 150		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	75		ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	50		ns

Note:

(1) Pulse test: t_p = 300 µs pulse, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	MURS140	MURS160	UNIT
Typical thermal resistance, junction to ambient	$R_{\theta JL}$	13		C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
MURS160-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
MURS160-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
MURS160HE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
MURS160HE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

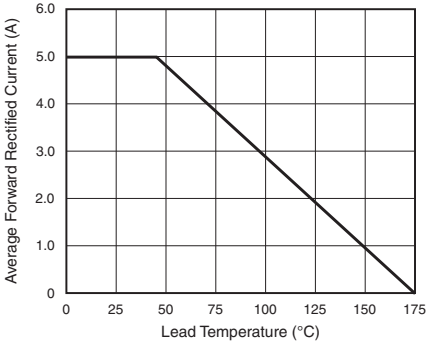


Figure 1. Forward Current Derating Curve

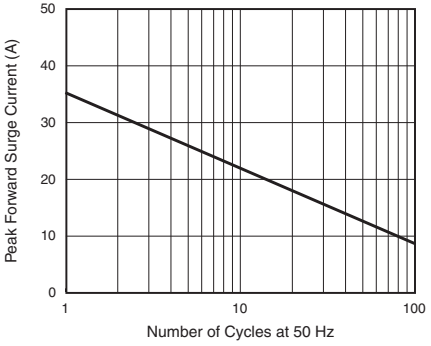


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

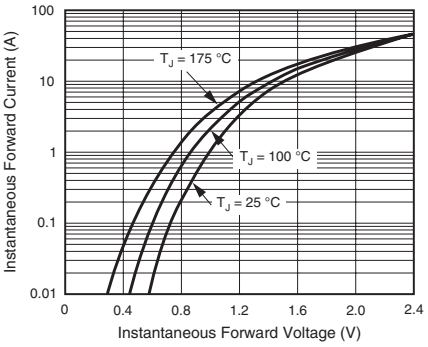


Figure 3. Typical Instantaneous Forward Characteristics

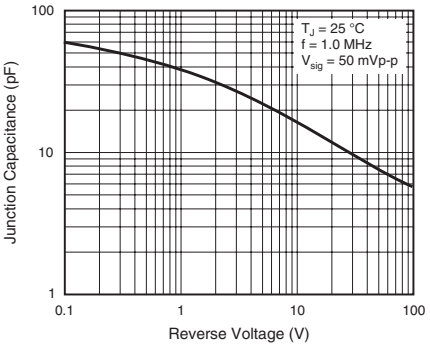


Figure 5. Typical Junction Capacitance

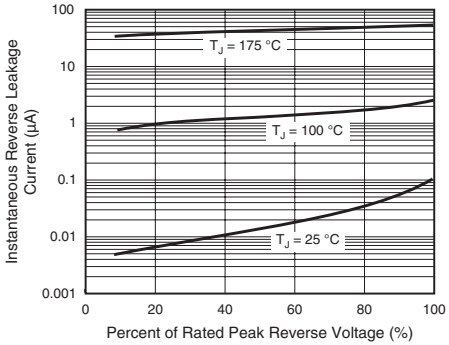
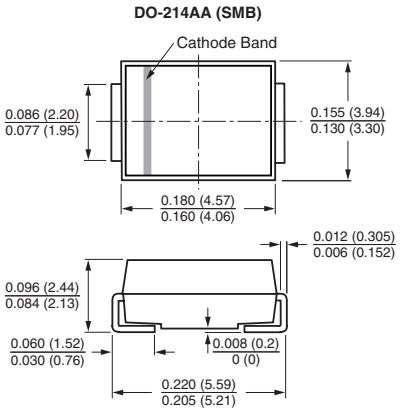
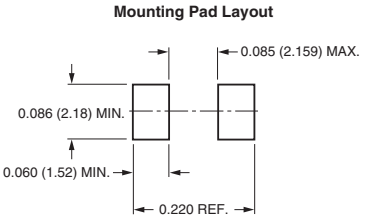


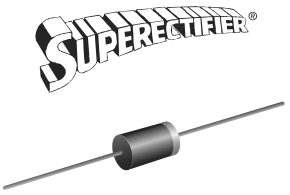
Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Glass Passivated Ultrafast Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ideal for printed circuit boards
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	600 V
I_{FSM}	30 A
t_{rr}	30 ns
V_F	1.3 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AL, molded plastic over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	600	V
Maximum RMS voltage	V_{RMS}	420	V
Maximum DC blocking voltage	V_{DC}	600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_L = 85 °C (fig. 1)	$I_{F(AV)}$	1.0	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30	A
Non repetitive peak reverse energy	E_{RSM} (1)	5.0	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175	°C

Note

(1) Peak reverse energy measured with 8/20 µs surge

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Minimum avalanche breakdown voltage	100 µA		V_{BR}	600	V
Maximum instantaneous forward voltage	1.0 A	T_J = 25 °C	V_F	2.5	V
		T_J = 175 °C		1.3	
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0	µA
		T_A = 165 °C		150	
Max. reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	30	ns
Maximum junction capacitance	4.0 V, 1 MHz		C_J	45	pF
Maximum reverse recovery current slope	I_F = 1 A, V_R = 30 V, dI_f/dt = - 1 A/µs		dI_r/dt	7.0	A/µs

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	70	°C/W
	$R_{\theta JL}$ (2)	16	

Notes

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, mounted on PCB with 0.5" x 0.5" (12 mm x 12 mm) copper pads

(2) Thermal resistance from junction to lead at 0.375" (9.5 mm) lead length with both leads attached to heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SBYV26C-E3/54	0.339	54	5500	13" diameter paper tape and reel
SBYV26C-E3/73	0.339	73	3000	Ammo pack packaging
SBYV26CHE3/54 (1)	0.339	54	5500	13" diameter paper tape and reel
SBYV26CHE3/73 (1)	0.339	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

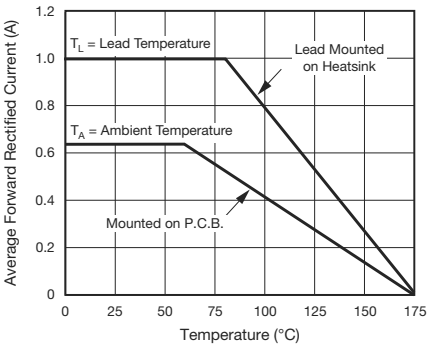


Fig. 1 - Maximum Forward Current Derating Curve

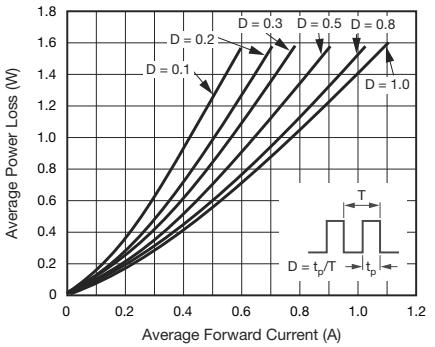


Fig. 2 - Forward Power Loss Characteristics

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

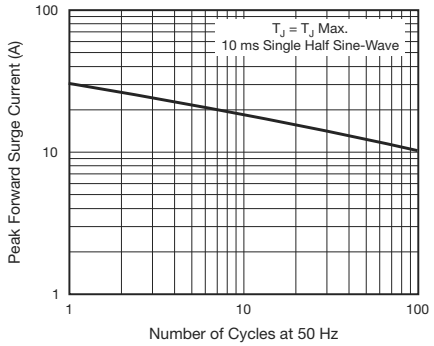


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

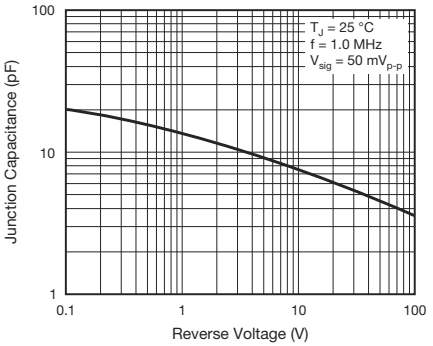


Fig. 6 - Typical Junction Capacitance

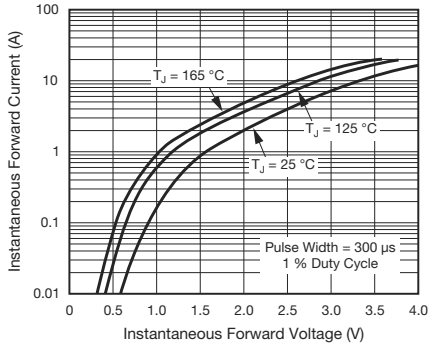


Fig. 4 - Typical Instantaneous Forward Characteristics

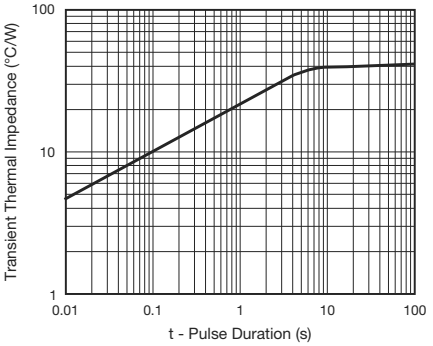


Fig. 7 - Typical Transient Thermal Impedance

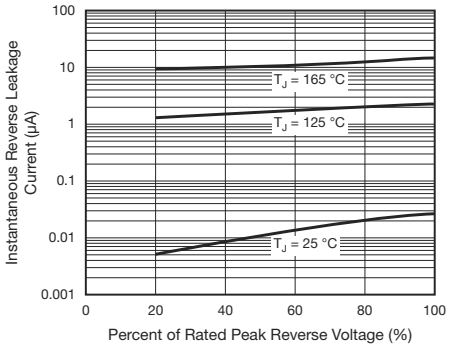
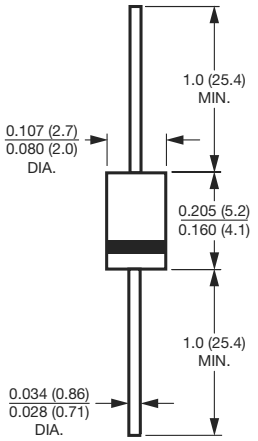


Fig. 5 - Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88735
Revision: 01-Feb-11

Surface Mount Ultrafast Plastic Rectifier

DO-214AC (SMA)

FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	30 A
t_{rr}	15 ns
V_F at I_F = 1.0 A	0.76 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**U1B**	**U1C**	**U1D**	**UNIT**
Device marking code		U1B	U1C	U1D	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 0.6 A I_F = 1.0 A	T_A = 25 °C	V_F	0.82 0.87	0.87 0.92	V
	I_F = 0.6 A I_F = 1.0 A	T_A = 100 °C		0.71 0.76	0.78 0.84	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 100 °C	I_R	- 55	5.0 100	µA
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	T_A = 25 °C	t_{rr}	-	15	ns
	I_F = 0.6 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}	T_A = 25 °C T_A = 100 °C	t_{rr}	24 29	- -	ns
Storage charge	I_F = 0.6 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}	T_A = 25 °C T_A = 100 °C	Q_{rr}	7 13	- -	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	6.8	-	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**U1B**	**U1C**	**U1D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JM}$	115 22			°C/W

Note:
(1) Free air, mounted on recommended copper pad area

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
U1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
U1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

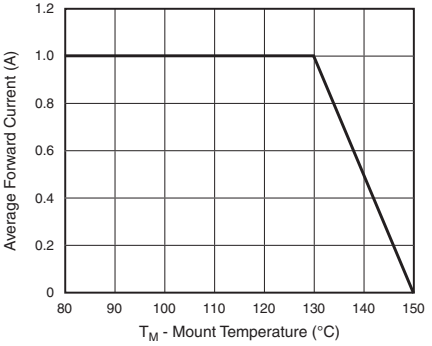


Figure 1. Forward Derating Curve

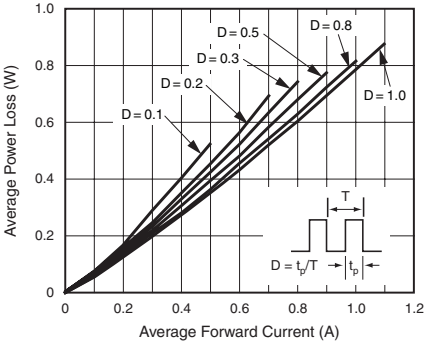


Figure 2. Forward Power Loss Characteristics

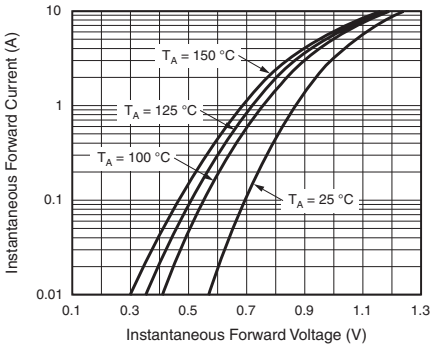


Figure 3. Typical Instantaneous Forward Characteristics

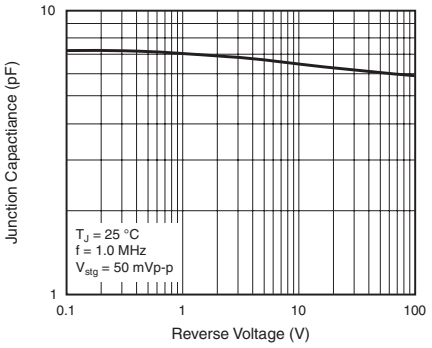


Figure 5. Typical Junction Capacitance

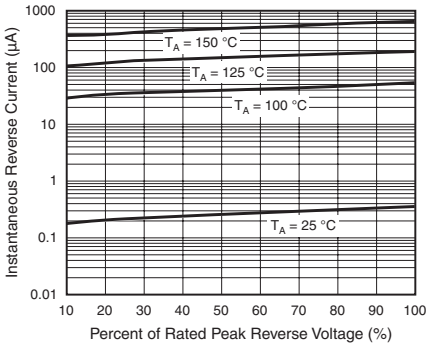


Figure 4. Typical Reverse Characteristics

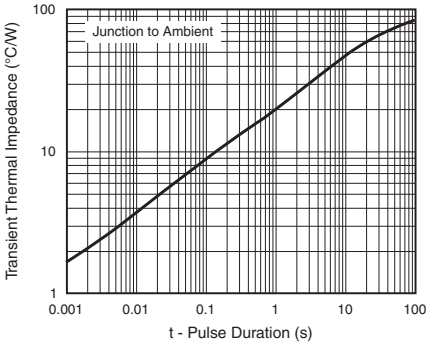
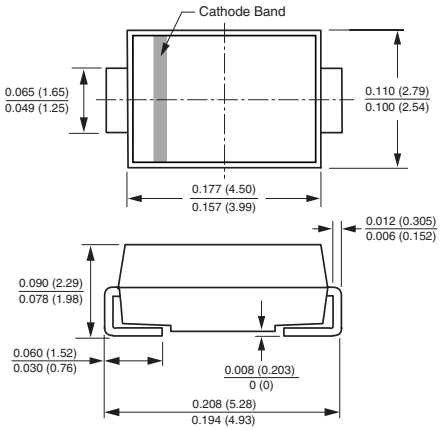


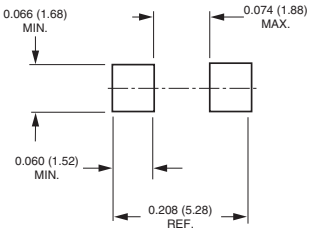
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Ultrafast Plastic Rectifier

DO-204AL (DO-41)

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
t_{rr}	50 ns, 75 ns
V_F	1.0 V, 1.7 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-204AL (DO-41)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UF4001	UF4002	UF4003	UF4004	UF4005	UF4006	UF4007	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88755
Revision: 20-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS	SYMBOL	UF4001	UF4002	UF4003	UF4004	UF4005	UF4006	UF4007	UNIT
Maximum instantaneous forward voltage (1)	1.0 A	V_F	1.0				1.7			V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C T_A = 100 °C	I_R	10 50							µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	50				75			ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	17							pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	UF4001	UF4002	UF4003	UF4004	UF4005	UF4006	UF4007	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	60 15							°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UF4007-E3/54	0.33	54	5500	13" diameter paper tape and reel
UF4007-E3/73	0.34	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

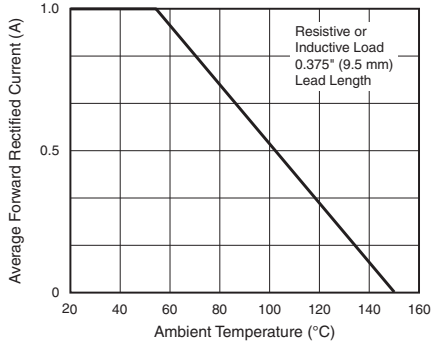


Figure 1. Maximum Forward Current Derating Curve

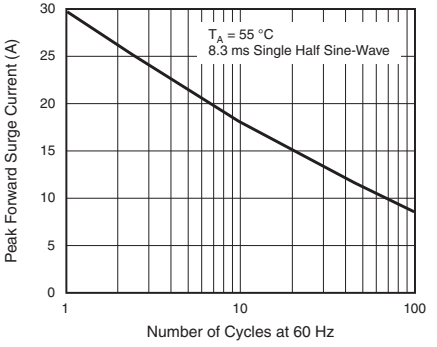


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

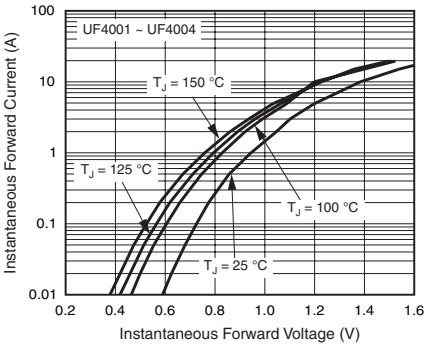


Figure 3. Typical Instantaneous Forward Characteristics

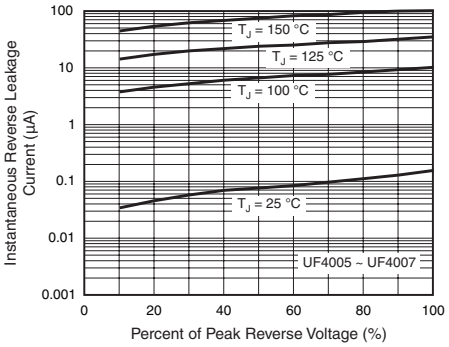


Figure 6. Typical Reverse Leakage Characteristics

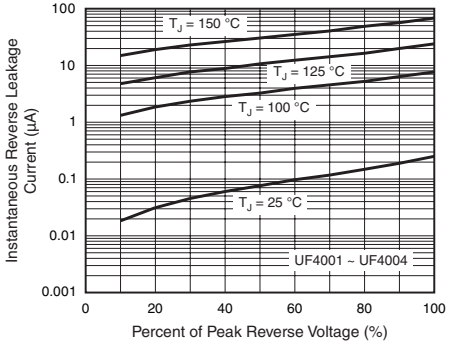


Figure 4. Typical Reverse Leakage Characteristics

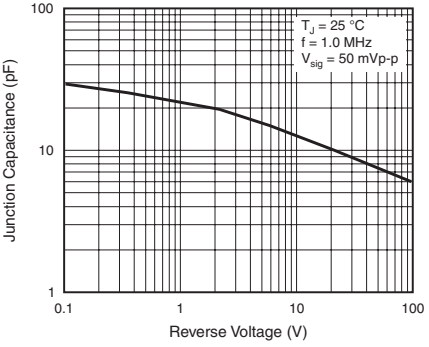


Figure 7. Typical Junction Capacitance

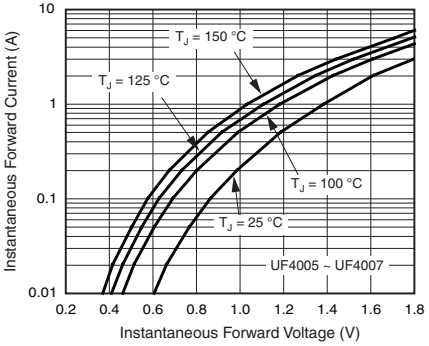
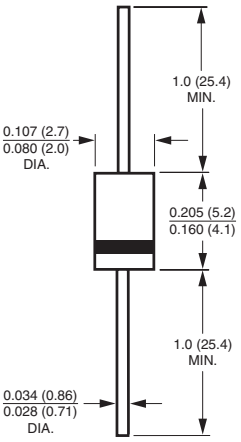


Figure 5. Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Miniature Ultrafast Plastic Rectifier

DO-204AL (DO-41)

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Soft recovery characteristics
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	40 A
t_{rr}	15 ns
V_F	0.95 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AL (DO-41)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG1A	UG1B	UG1C	UG1D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
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Document Number: 88760
Revision: 20-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A		V_F	0.95	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 200	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	15	ns
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	25 35	ns
Maximum stored charge	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	8.0 12	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	7	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**UG1A**	**UG1B**	**UG1C**	**UG1D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	60 20				°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UG1D-E3/54	0.334	54	5500	13" diameter paper tape and reel
UG1D-E3/73	0.334	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

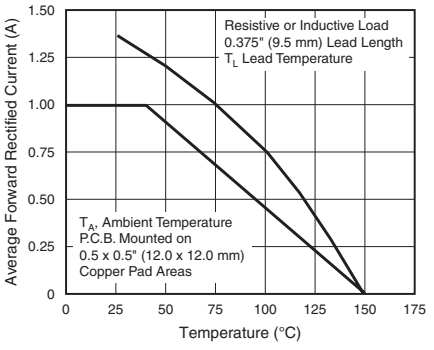


Figure 1. Forward Current Derating Curves

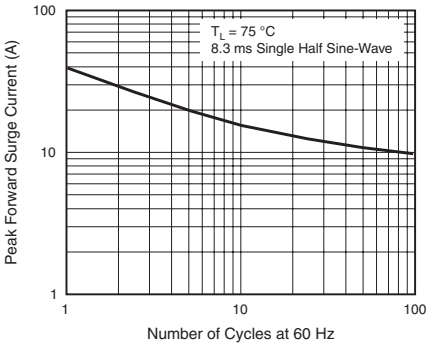


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

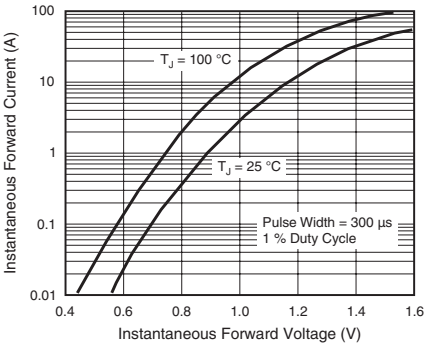


Figure 3. Typical Instantaneous Forward Characteristics

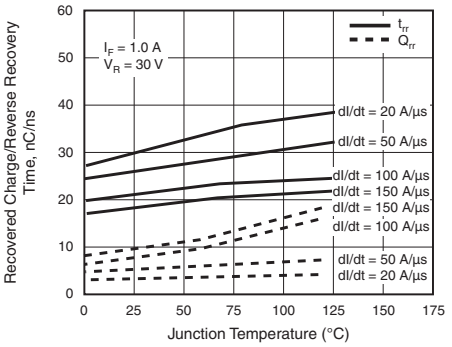


Figure 5. Reverse Switching Charateristics

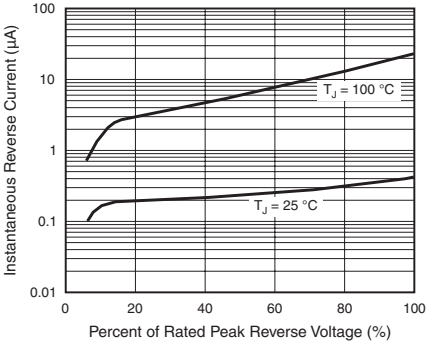


Figure 4. Typical Reverse Characteristics

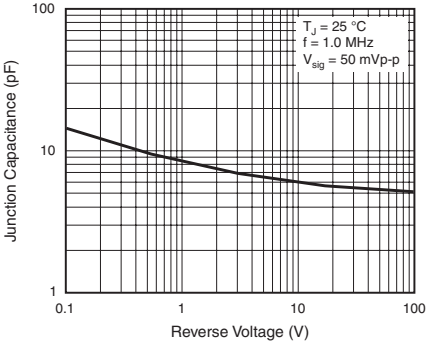
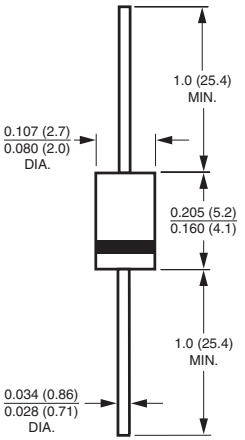


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Surface Mount Ultrafast Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
t_{rr}	50 ns, 75 ns
V_F	1.0 V, 1.7 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	US1A	US1B	US1D	US1G	US1J	US1K	US1M	UNIT
Device marking code		UA	UB	UD	UG	UJ	UK	UM	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_L = 110 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Operating and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	US1A	US1B	US1D	US1G	US1J	US1K	US1M	UNIT
Maximum instantaneous forward voltage (1)	1.0 A		V_F	1.0				1.7			V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 50							μA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50				75			ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15				10			pF

Note:

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	SYMBOL	US1A	US1B	US1D	US1G	US1J	US1K	US1M	UNIT
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	75 27							°C/W

Note:

(1) P.C.B. mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pad area

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
US1J-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
US1J-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
US1JHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
US1JHE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

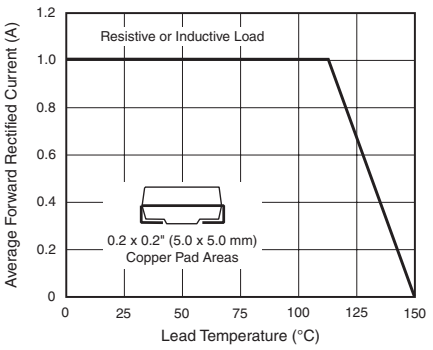


Figure 1. Forward Current Derating Curve

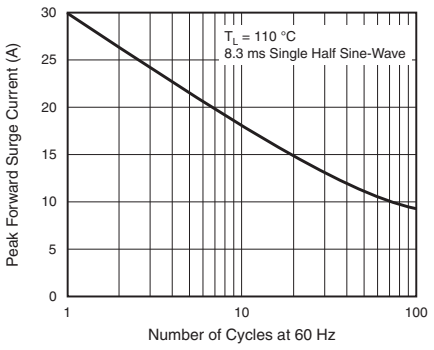


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

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Document Number: 88768
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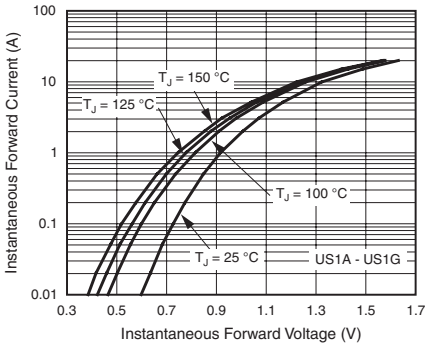


Figure 3. Typical Instantaneous Forward Characteristics

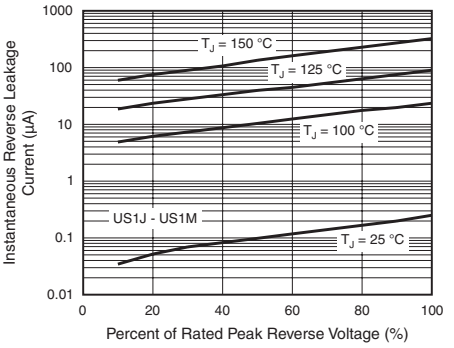


Figure 6. Typical Reverse Leakage Characteristics

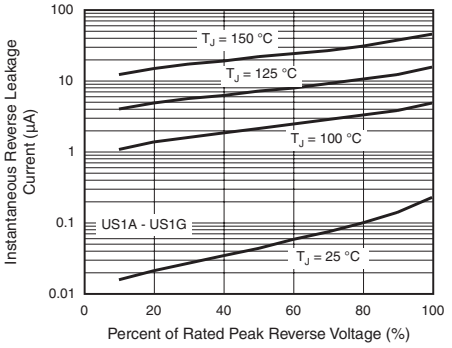


Figure 4. Typical Reverse Leakage Characteristics

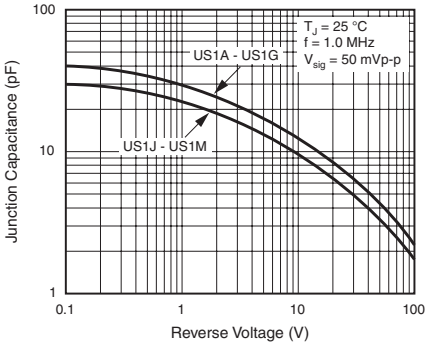


Figure 7. Typical Junction Capacitance

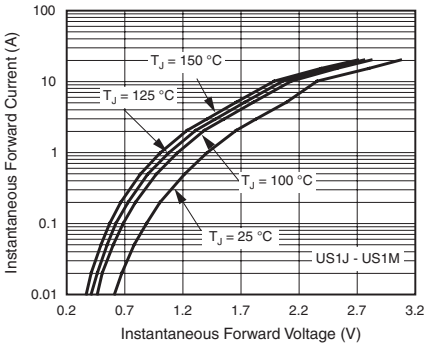


Figure 5. Typical Instantaneous Forward Characteristics

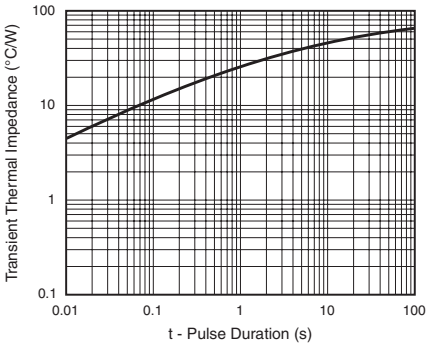
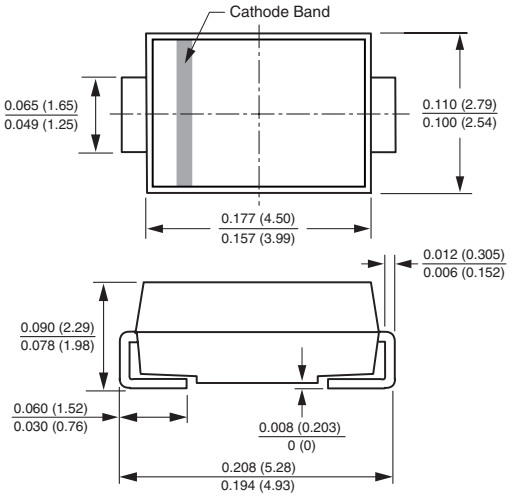


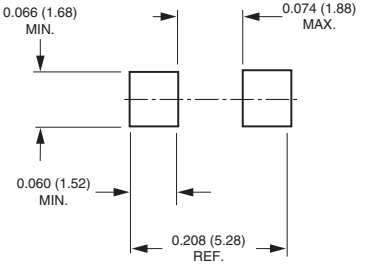
Figure 8. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Ultrafast Avalanche SMD Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Low reverse current
- Soft recovery characteristics
- Ultrafast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	200 V to 600 V
I_{FSM}	30 A
I_R	1.0 µA
V_F	1.4 V
t_{rr}	75 ns
E_R	20 mJ
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYG20D	BYG20G	BYG20J	UNIT
Device marking code		BYG20D	BYG20G	BYG20J	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	V
Average forward current	$I_{F(AV)}$	1.5			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R}$ = 1 A, T_J = 25 °C	E_R	20			mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYG20D**	**BYG20G**	**BYG20J**	**UNIT**
Maximum instantaneous forward voltage (1)	at I_F = 1 A I_F = 1.5 A	T_J = 25 °C	V_F		1.3 1.4		V
Maximum DC reverse current	at $V_R = V_{RRM}$	T_J = 25 °C T_J = 100 °C	I_R		1 10		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}		75		ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYG20D**	**BYG20G**	**BYG20J**	**UNIT**
Typical thermal resistance, junction to lead T_L = const.	$R_{\theta JL}$		25		°C/W
Typical thermal resistance, junction to ambient	$R_{\theta JA}$		150 (1) 125 (2) 100 (3)		°C/W

Notes:

(1) Mounted on epoxy-glass hard tissue

(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu

(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYG20D-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG20D-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG20DHE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYG20DHE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

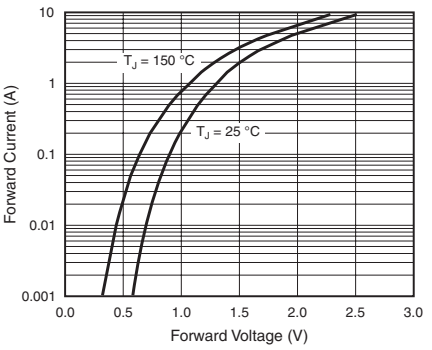


Figure 1. Forward Current vs. Forward Voltage

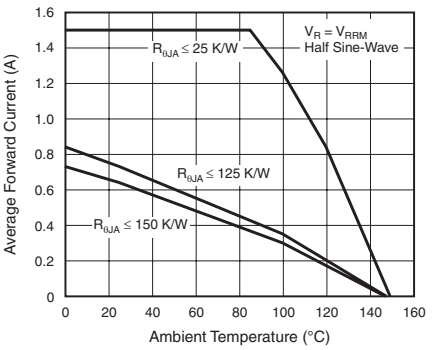


Figure 2. Max. Average Forward Current vs. Ambient Temperature

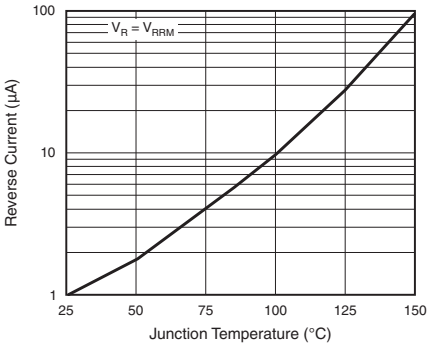


Figure 3. Reverse Current vs. Junction Temperature

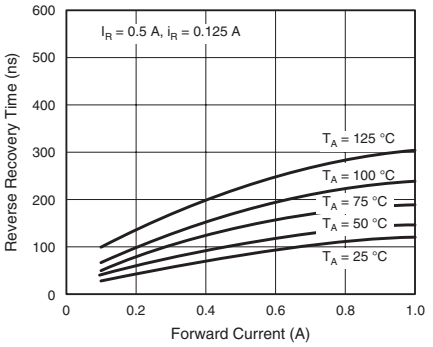


Figure 6. Reverse Recovery Time vs. Forward Current

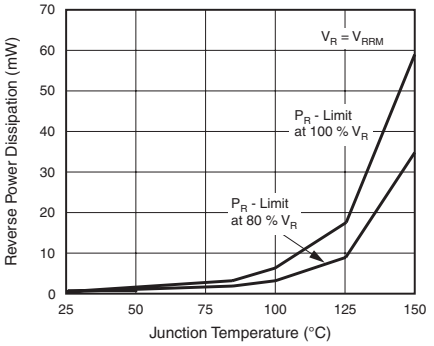


Figure 4. Max. Reverse Power Dissipation vs. Junction Temperature

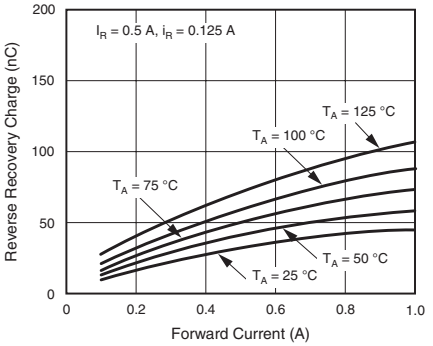


Figure 7. Reverse Recovery Charge vs. Forward Current

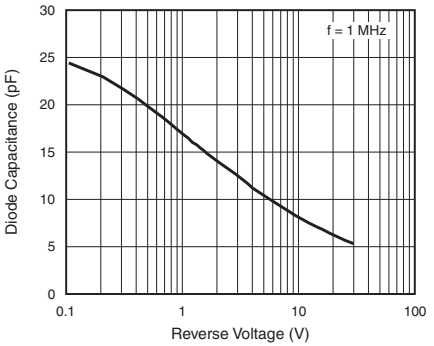


Figure 5. Diode Capacitance vs. Reverse Voltage

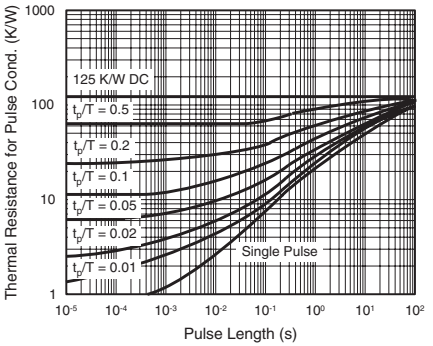
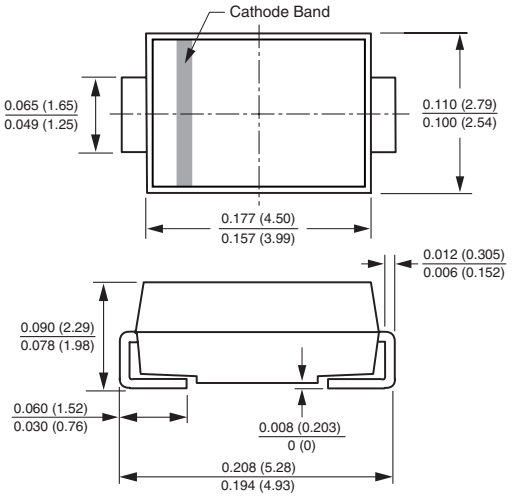


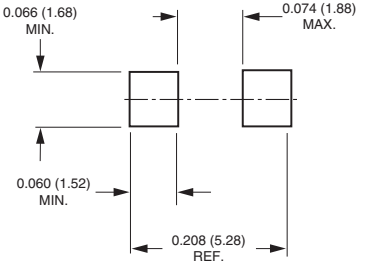
Figure 8. Thermal Response

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Ultrafast Avalanche SMD Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Low reverse current
- High reverse voltage
- Ultra fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	1000 V
I_{FSM}	30 A
I_R	5.0 µA
t_{rr}	75 ns
E_R	20 mJ
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**BYG23M**	**UNIT**
Device marking code		BYG23M	
Maximum repetitive peak reverse voltage	V_{RRM}	1000	V
Average forward current T_A = 65 °C	$I_{F(AV)}$	1.5	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30	A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R}$ = 1 A, T_J = 25 °C	E_R	20	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYG23M**	**UNIT**
Minimum breakdown voltage	I_R = 100 µA		V_{BR}	1000	V
Maximum instantaneous voltage (1)	I_F = 1.0 A	T_J = 25 °C T_J = 150 °C	V_F	1.7 1.35	V
Maximum reverse current	$V_R = V_{RRM}$	T_J = 25 °C T_J = 125 °C	I_R	5 50	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	75	ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**BYG23M**	**UNIT**
Typical thermal resistance, junction to case	R_{thJC}	25	°C/W
Typical thermal resistance, junction to ambient	$R_{\theta JA}$	150 (1) 125 (2) 100 (3)	°C/W

Notes:

(1) Mounted on epoxy-glass hard tissue, 17 mm^2 35 µm Cu
(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu
(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE Q'TY**	**DELIVERY MODE**
BYG23M-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG23M-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG23MHE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYG23MHE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

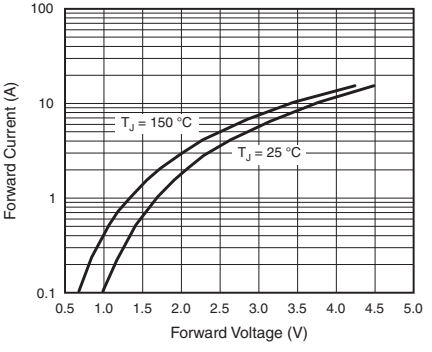


Figure 1. Max. Forward Current vs. Forward Voltage

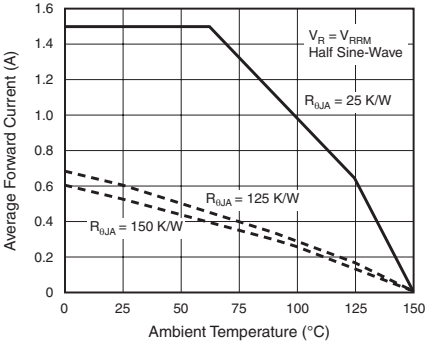


Figure 2. Max. Average Forward Current vs. Ambient Temperature

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88962
Revision: 27-Aug-07

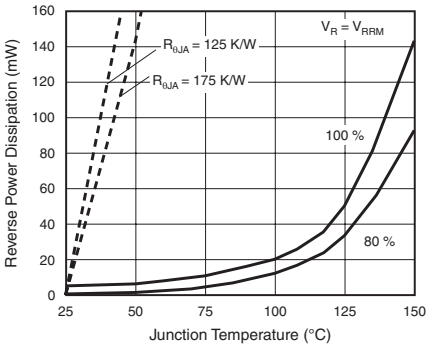


Figure 3. Max. Reverse Power Dissipation vs. Junction Temperature

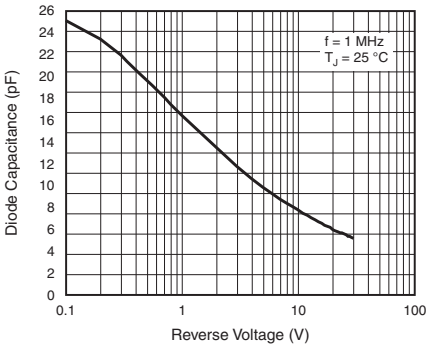


Figure 5. Diode Capacitance vs. Reverse Voltage

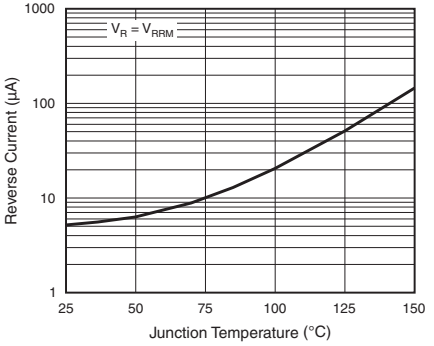
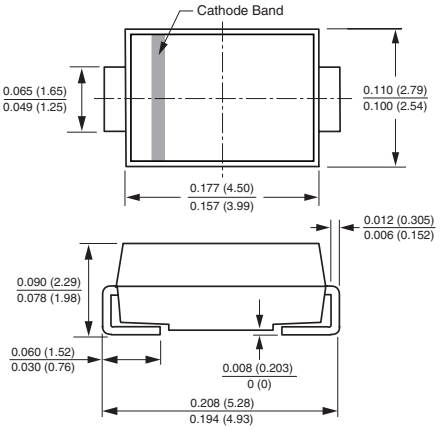


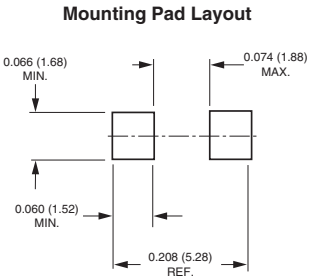
Figure 4. Reverse Current vs. Junction Temperature

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



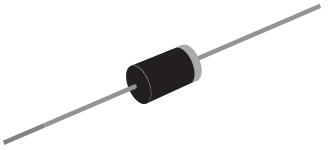
Mounting Pad Layout



SUF15G & SUF15J

Vishay General Semiconductor

Ultrafast Plastic Rectifier



GP20

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: GP20

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	400 V, 600 V
I_{FSM}	50 A
t_{rr}	35 ns
V_F	1.8 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SUF15G	SUF15J	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Maximum RMS voltage	V_{RMS}	280	420	V
Maximum DC blocking voltage	V_{DC}	400	600	V
Maximum average forward rectified current, 0.375" (9.5 mm) lead length at T_A = 50 °C	$I_{F(AV)}$	1.5		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SUF15G	SUF15J	UNIT
Maximum instantaneous forward voltage (1)	1.5 A		V_F	1.8		V
Maximum peak reverse current at rated peak reverse voltage		T_A = 25 °C T_A = 100 °C	I_R	10 100		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	35		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
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Revision: 20-Aug-07

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	SUF15G	SUF15J	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	65 20		°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SUF15J-E3/54	0.886	54	1400	13" diameter paper tape and reel
SUF15J-E3/73	0.886	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

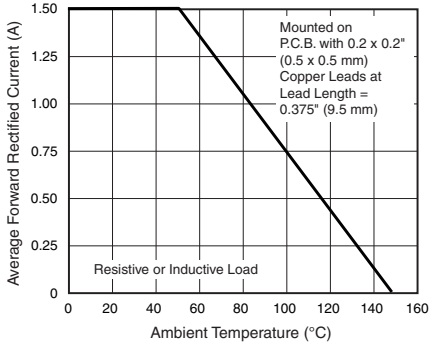


Figure 1. Maximum Forward Current Derating Curve

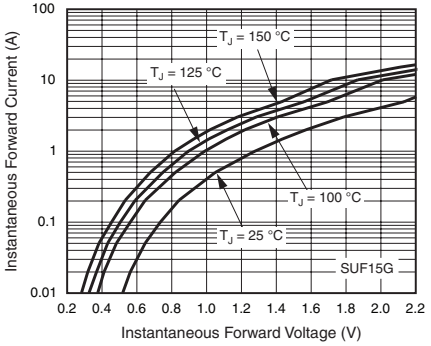


Figure 3. Typical Instantaneous Forward Characteristics

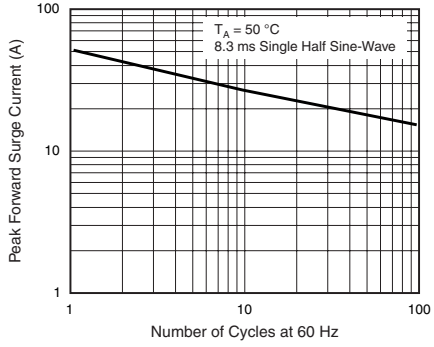


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

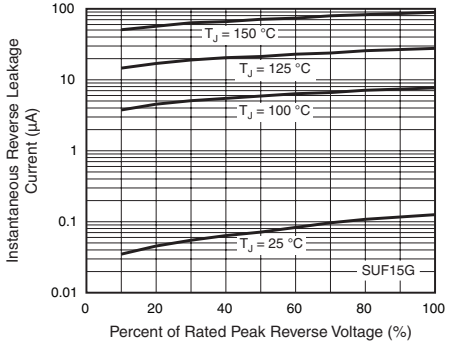


Figure 4. Typical Reverse Leakage Characteristics

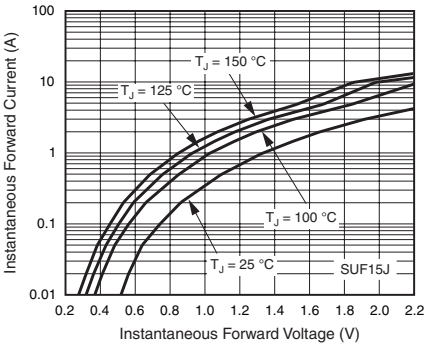


Figure 5. Typical Instantaneous Forward Characteristics

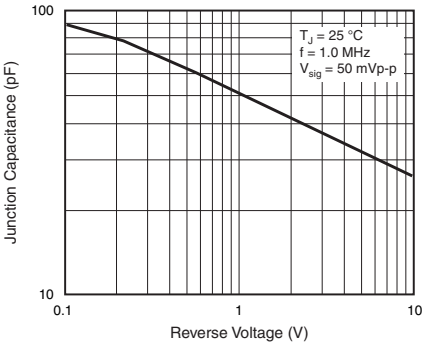


Figure 7. Typical Junction Capacitance

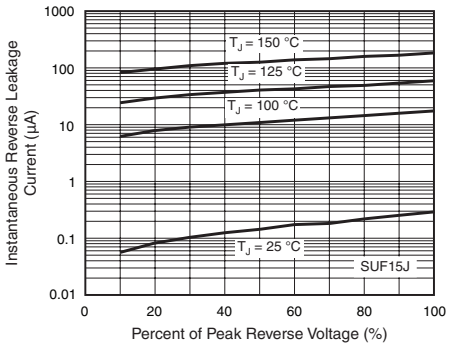


Figure 6. Typical Reverse Leakage Characteristics

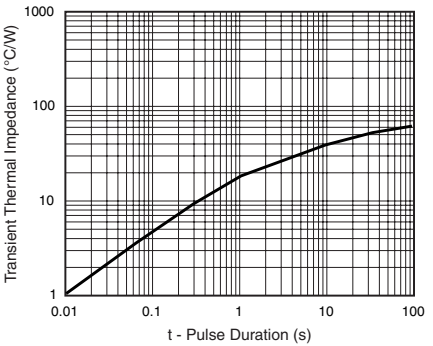
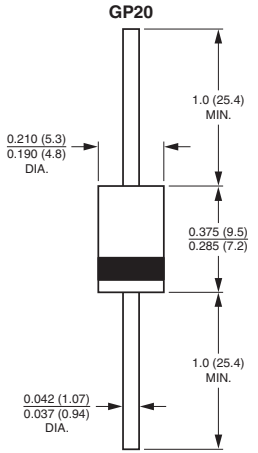


Figure 8. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Ultrafast Avalanche SMD Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package0
- Ideal for automated placement
- Glass passivated junction
- Low reverse current
- Low forward voltage
- Soft recovery characteristic
- Ultra fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	35 A
I_R	1.0 µA
V_F	1.1 V
t_{rr}	25 ns
E_R	20 mJ
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for highreliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYG22A	BYG22B	BYG22D	UNIT
Device marking code		BYG22A	BYG22B	BYG22D	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	V
Average forward current	$I_{F(AV)}$	2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	35			A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R}$ = 1 A, T_J = 25 °C	E_R	20			mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYG22A**	**BYG22B**	**BYG22D**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 2.0 A	T_J = 25 °C	V_F		1.0 1.1		V
Maximum reverse current	$V_R = V_{RRM}$	T_J = 25 °C T_J = 100 °C	I_R		1 10		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}		25		ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYG22A**	**BYG22B**	**BYG22D**	**UNIT**
Maximum thermal resistance, junction to lead T_L = const.	$R_{\theta JL}$		25		°C/W
Maximum thermal resistance, junction to ambient	$R_{\theta JA}$		150 (1) 125 (2) 100 (3)		°C/W

Notes:

(1) Mounted on epoxy-glass hard tissue

(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu

(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYG22A-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG22A-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG22AHE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYG22AHE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

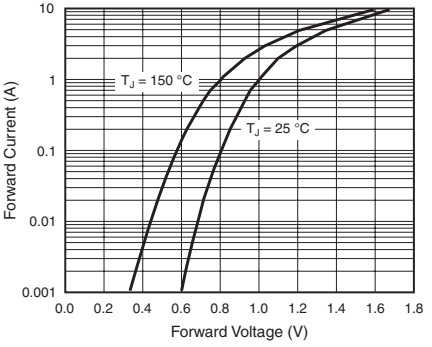


Figure 1. Forward Current vs. Forward Voltage

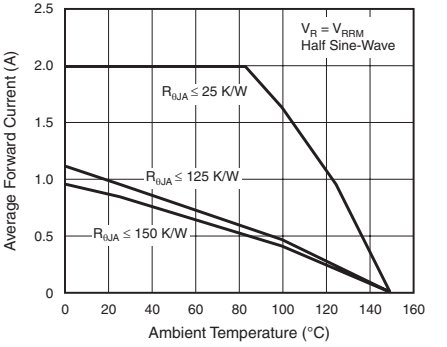


Figure 2. Max. Average Forward Current vs. Ambient Temperature

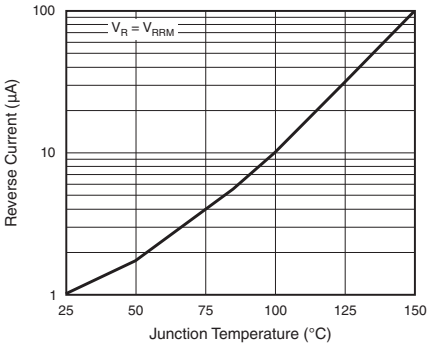


Figure 3. Reverse Current vs. Junction Temperature

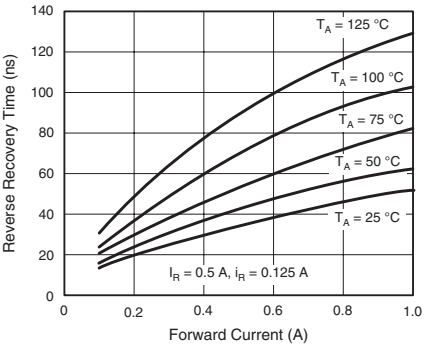


Figure 6. Max. Reverse Recovery Time vs. Forward Current

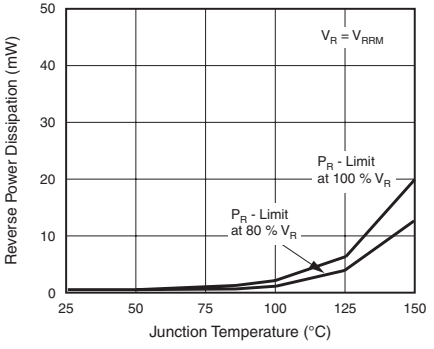


Figure 4. Max. Reverse Power Dissipation vs. Junction Temperature

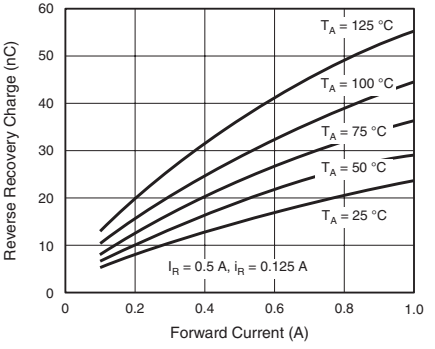


Figure 7. Max. Reverse Recovery Charge vs. Forward Current

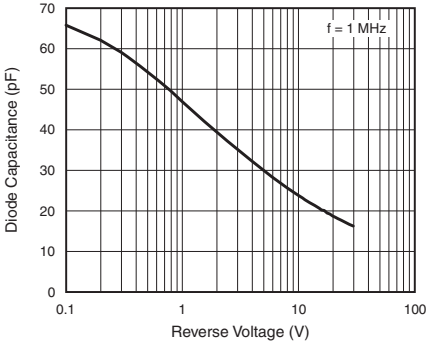


Figure 5. Diode Capacitance vs. Reverse Voltage

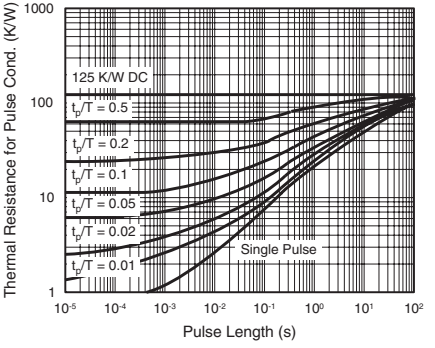
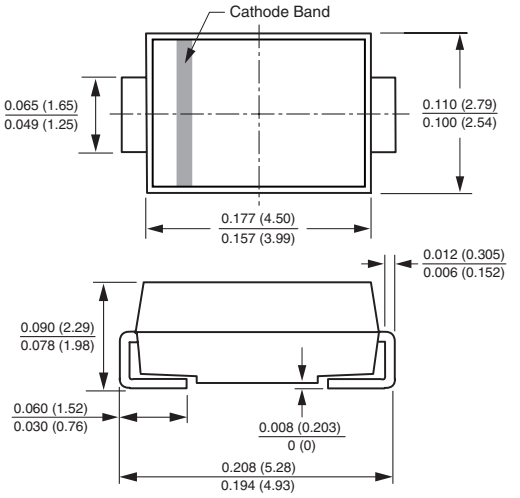


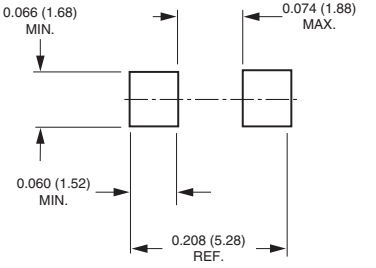
Figure 8. Thermal Response

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

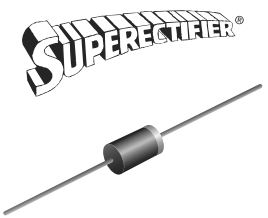
DO-214AC (SMA)



Mounting Pad Layout



Glass Passivated Ultrafast Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 400 V
I_{FSM}	75 A
t_{rr}	50 ns
V_F	0.95 V, 1.25 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EGP20A	EGP20B	EGP20C	EGP20D	EGP20F	EGP20G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	2.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	75						A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**EGP20A**	**EGP20B**	**EGP20C**	**EGP20D**	**EGP20F**	**EGP20G**	**UNIT**
Maximum instantaneous forward voltage	2.0 A		V_F	0.95				1.25		V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0						µA
		T_A = 125 °C		100						
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50						ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	70				45		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**EGP20A**	**EGP20B**	**EGP20C**	**EGP20D**	**EGP20F**	**EGP20G**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	40						°C/W
	$R_{\theta JL}$ (1)	15						

Note

(1) Thermal resistance from junction to ambient, and from junction to lead at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
EGP20D-E3/54	0.452	54	4000	13" Diameter paper tape and reel
EGP20D-E3/73	0.452	73	2000	Ammo pack packaging
EGP20DHE3/54 (1)	0.452	54	4000	13" Diameter paper tape and reel
EGP20DHE3/73 (1)	0.452	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

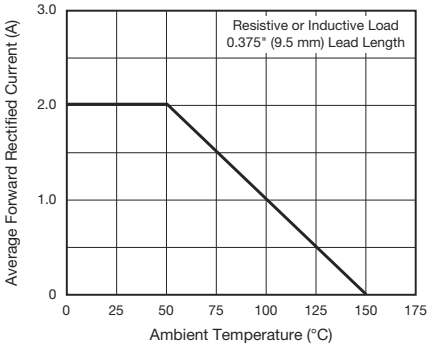


Fig. 1 - Maximum Forward Current Derating Curve

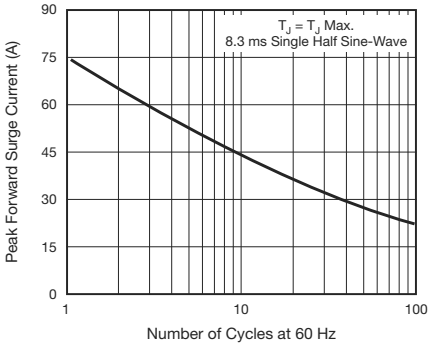


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

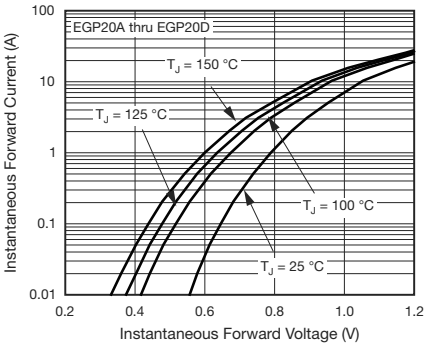


Fig. 3 - Typical Instantaneous Forward Characteristics

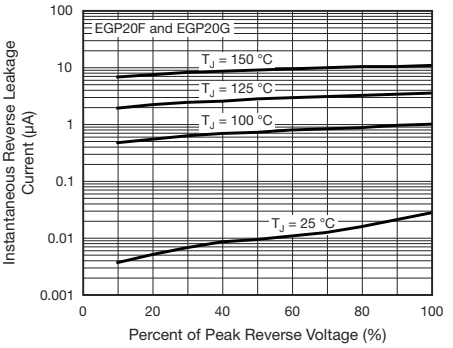


Fig. 6 - Typical Reverse Leakage Characteristics

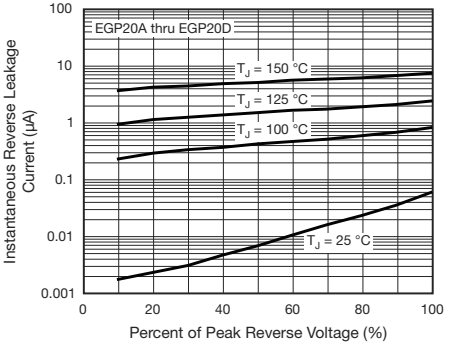


Fig. 4 - Typical Reverse Leakage Characteristics

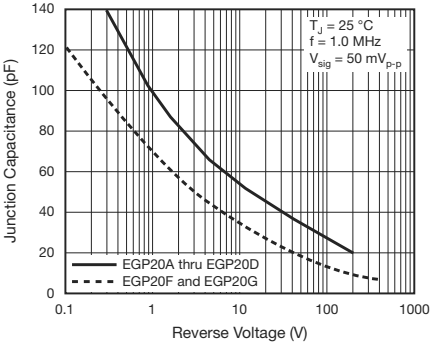


Fig. 7 - Typical Junction Capacitance

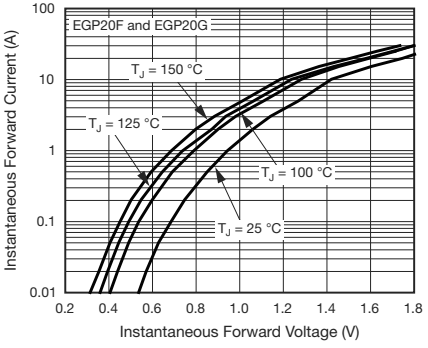


Fig. 5 - Typical Instantaneous Forward Characteristics

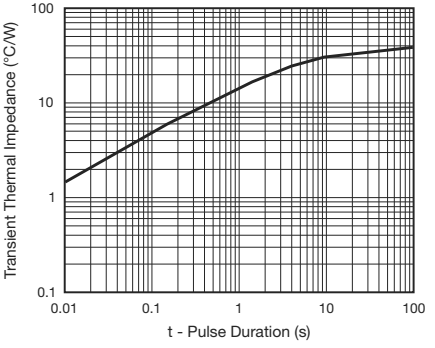
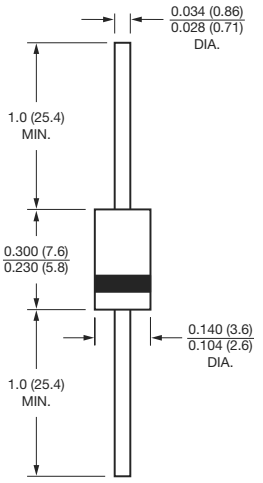


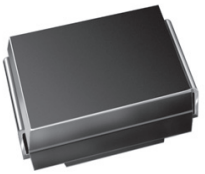
Fig. 8 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	50 A
t_{rr}	20 ns
V_F	0.90 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT
Device marking code		EA	EB	EC	ED	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_L = 110 °C	$I_{F(AV)}$	2.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT
Maximum instantaneous forward voltage (1)	2.0 A		V_F	0.90				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 350				μA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT
Max. reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20				ns
Maximum reverse recovery time	I_F = 2.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_r = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	30 50				ns
Maximum stored charge	I_F = 2.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_r = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	10 25				nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	18				pF

Note:

(1) Pulse test: 300 ms pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	75 20				°C/W

Note:

(1) Units mounted on P.C.B. 5.0 x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ES2D-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
ES2D-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
ES2DHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
ES2DHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

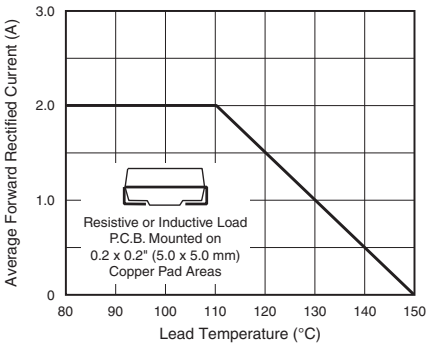


Figure 1. Maximum Forward Current Derating Curve

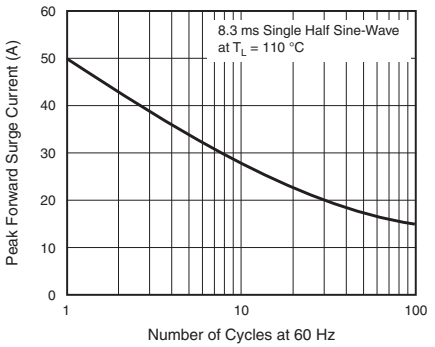


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

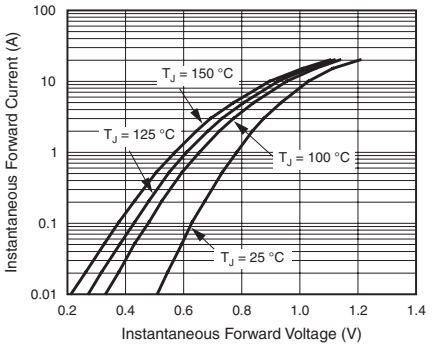


Figure 3. Typical Instantaneous Forward Characteristics

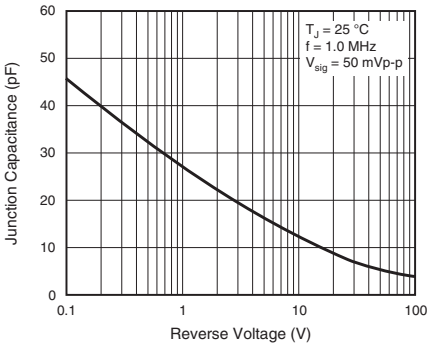


Figure 5. Typical Junction Capacitance

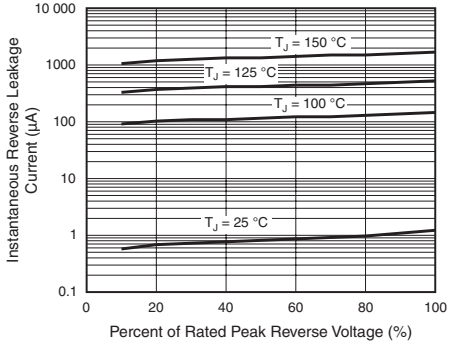
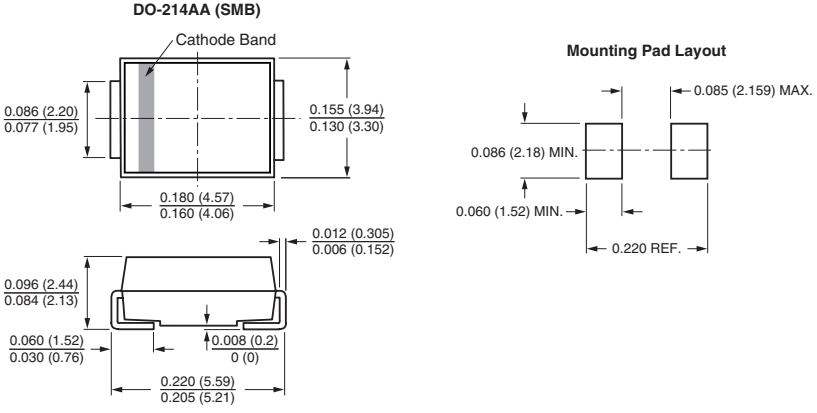
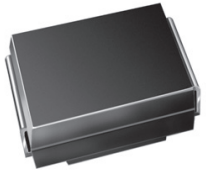


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	300 V, 400 V
I_{FSM}	50 A
t_{rr}	35 ns
V_F	1.1 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES2F	ES2G	UNIT
Device marking code		EF	EG	
Maximum repetitive peak reverse voltage	V_{RRM}	300	400	V
Working peak reverse voltage	V_{RWM}	225	300	V
Maximum RMS voltage	V_{RMS}	210	280	V
Maximum average forward rectified current at T_L = 110 °C	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88588
Revision: 20-Nov-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	ES2F	ES2G	UNIT
Maximum instantaneous forward voltage (1)	2.0 A		V_F	1.1		V
Maximum reverse current at V_{RRM}		T_A = 25 °C T_A = 100 °C	I_R	10 200		μA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 100 A/μs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Maximum reverse recovery current	I_F = 1.0 A, dI/dt = 100 A/μs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		I_{RM}	3.0		A
Maximum stored charge	I_F = 1.0 A, dI/dt = 100 A/μs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		Q_{rr}	50		nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	15		pF

Note:

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	ES2F	ES2G	UNIT
Maximum thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	75 25		°C/W

Note:

(1) Units mounted on P.C.B. 5.0 x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ES2G-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
ES2G-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
ES2GHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
ES2GHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

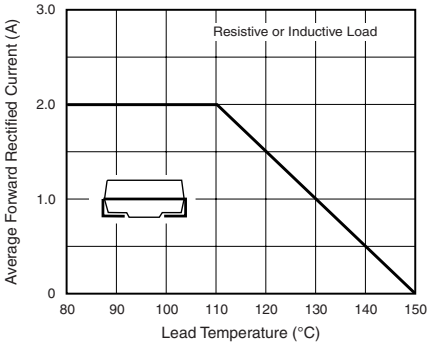


Figure 1. Maximum Forward Current Derating Curve

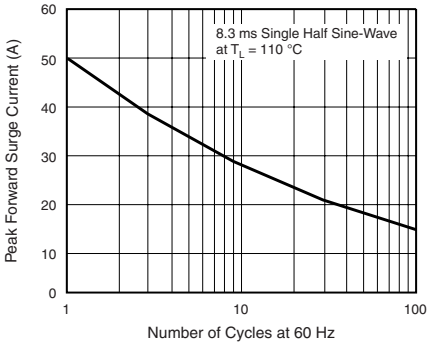


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

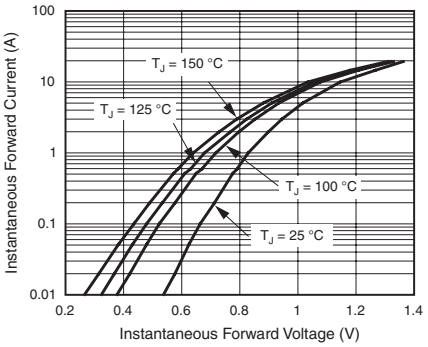


Figure 3. Typical Instantaneous Forward Characteristics

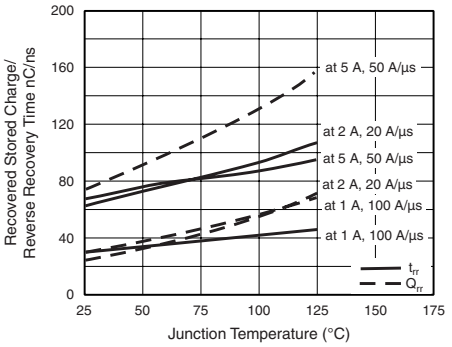


Figure 5. Reverse Switching Characteristics

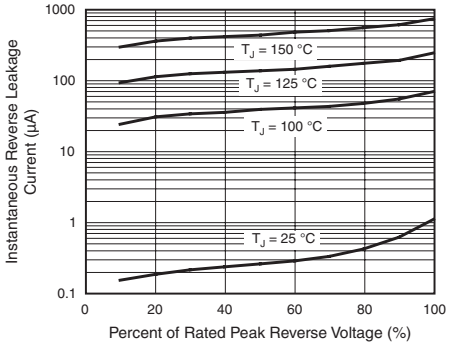


Figure 4. Typical Reverse Leakage Characteristics

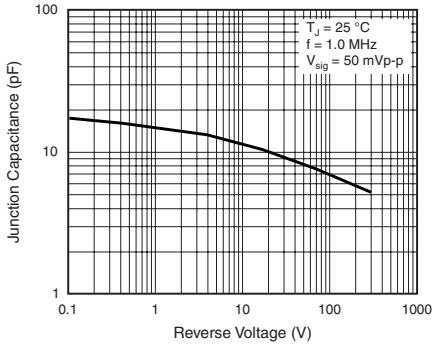
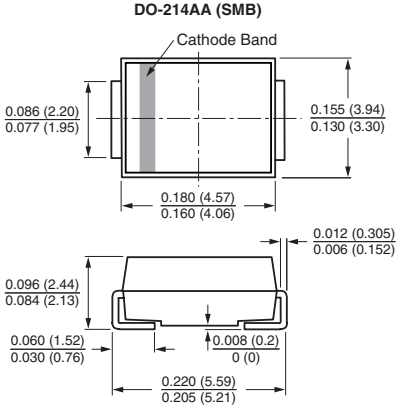
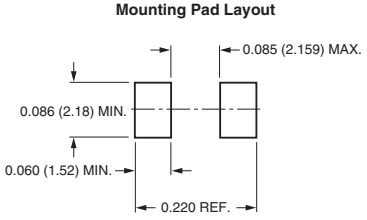


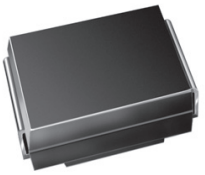
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power loss
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converter and inverter for both consumer and automotive.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	25 ns
V_F	0.93 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH2B**	**ESH2C**	**ESH2D**	**UNIT**
Device marking code		EHB	EHC	EHD	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	60			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2 A		V_F	0.93	V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C T_A = 125 °C		I_R	2.0 50	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Typical reverse recovery time	I_F = 2 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	35 55	ns
Typical stored charge	I_F = 2 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	20 35	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	30	pF

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH2B**	**ESH2C**	**ESH2D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	65 20			°C/W

Note:
(1) Units mounted on P.C.B. with 8.0 x 8.0 mm land areas.

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ESH2D-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
ESH2D-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
ESH2DHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
ESH2DHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

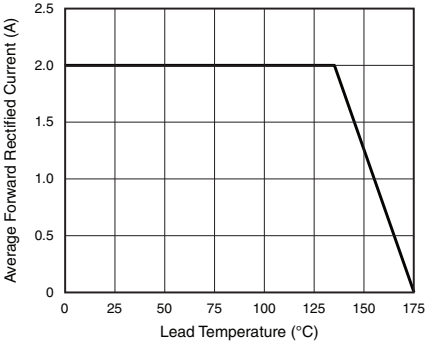


Figure 1. Maximum Forward Current Derating Curve

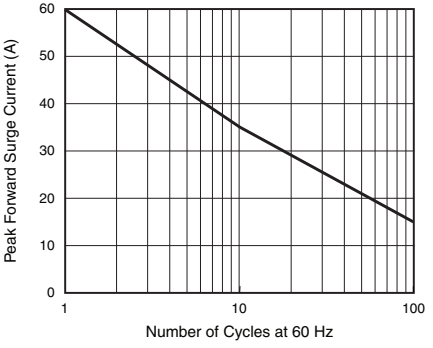


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

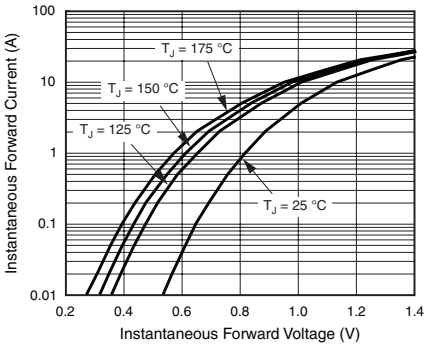


Figure 3. Typical Instantaneous Forward Characteristics

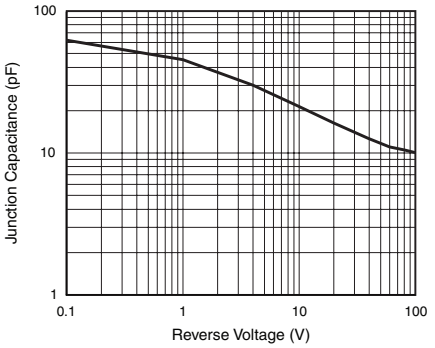


Figure 5. Typical Junction Capacitance

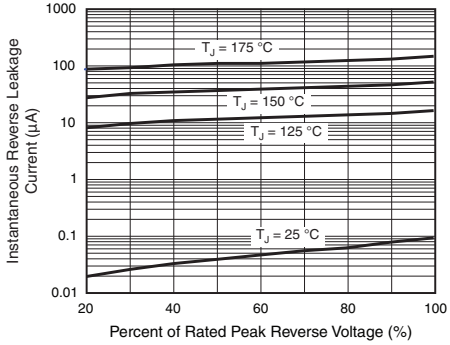


Figure 4. Typical Reverse Leakage Characteristics

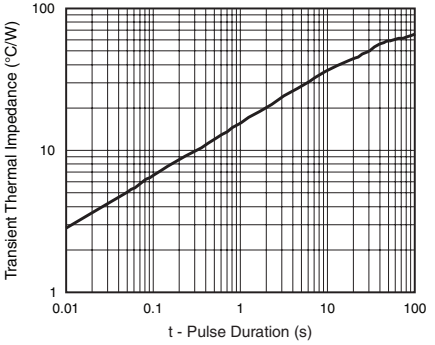
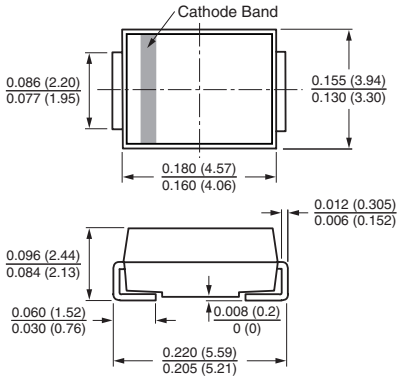


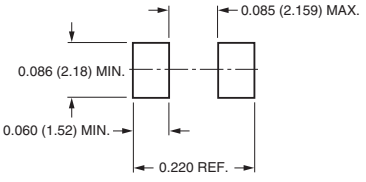
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



Mounting Pad Layout



ESH2PB, ESH2PC & ESH2PD

Vishay General Semiconductor

High Current Density Surface Mount Ultrafast Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- Low thermal resistance
- Meets MSL level 1 per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds of ac-to-ac and dc-to-dc converters in high temperature conditions for both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	25 ns
V_F at I_F = 2 A	0.75 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ESH2PB	ESH2PC	ESH2PD	UNIT
Device marking code		P2B	P2C	P2D	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 2 A	T_J = 25 °C T_J = 125 °C	V_F	0.90 0.75	0.98 0.82	V
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	0.2 12.6	1.0 25	µA

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89016
Revision: 13-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		t_{rr}	-	25	ns
Typical reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	- -	25 35	ns
Typical stored charge			Q_{rr}	- -	10 15	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	-	25	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH2PB**	**ESH2PC**	**ESH2PD**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$		80 15 22		°C/W

Note:
(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ESH2PB-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
ESH2PB-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
ESH2PBHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
ESH2PBHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

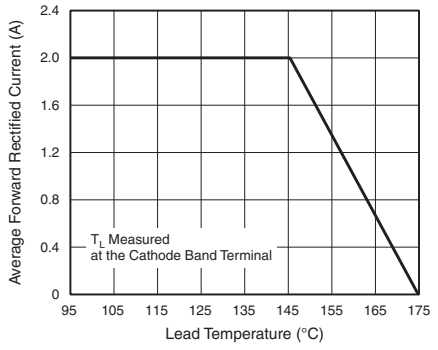


Figure 1. Forward Current Derating Curve

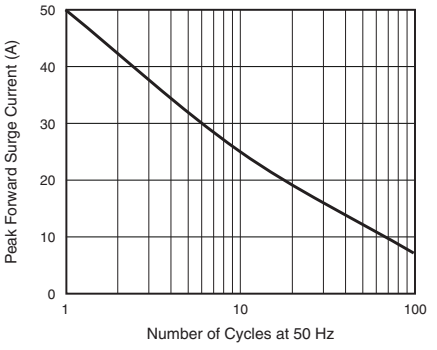


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

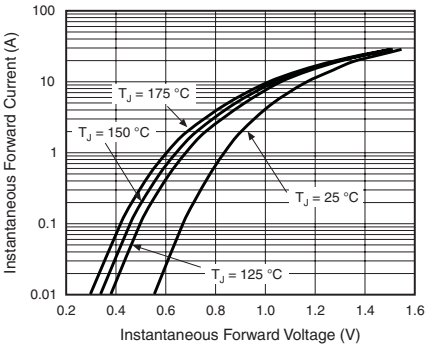


Figure 3. Typical Instantaneous Forward Characteristics

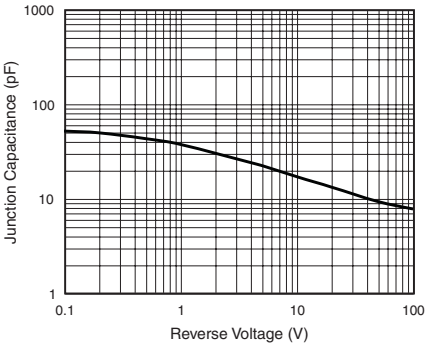


Figure 5. Typical Junction Capacitance

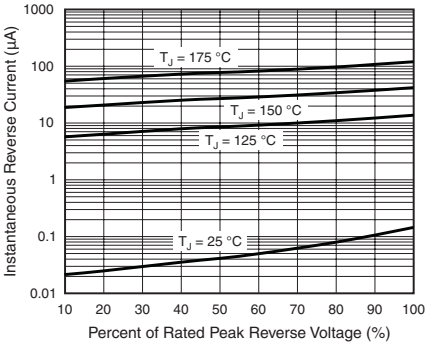
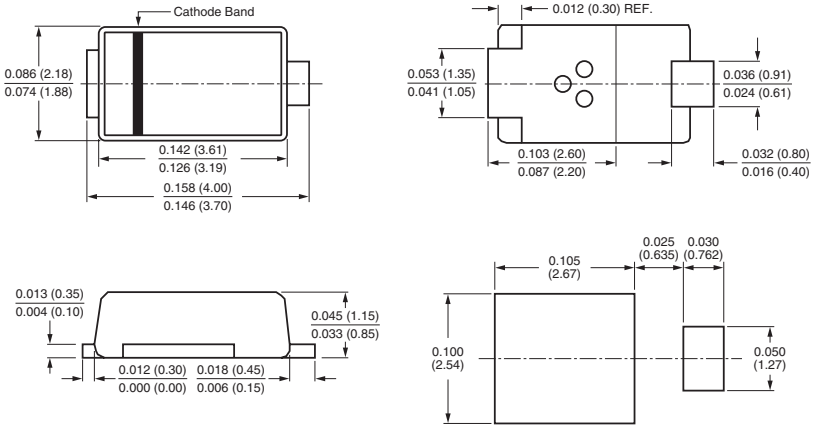


Figure 4. Typical Reverse Leakage Characteristics

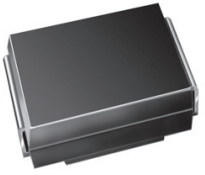
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89016
Revision: 13-May-08

Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	400 V, 600 V
I_{FSM}	35 A
t_{rr}	50 ns
V_F	1.20 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MURS240**	**MURS260**	**UNIT**
Device marking codes		M2G	M2J	
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Maximum average forward rectified current at T_L = 125 °C (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	35		A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MURS240**	**MURS260**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2.0 A	T_J = 25 °C T_J = 125 °C	V_F	1.45 1.20		V
Maximum instantaneous reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	5.0 150		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	75		ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	50		ns

Notes:
(1) Pulse test: t_p = 300 µs, duty cycle ≤ 2 %
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MURS240**	**MURS260**	**UNIT**
Typical thermal resistance junction to lead	$R_{\theta JL}$	15		°C/W

Note:
(1) Units mounted on P.C.B. with 30 mm x 30 mm copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MURS240-E3/52T	0.093	52T	750	7" diameter plastic tape and reel
MURS240-E3/5BT	0.093	5BT	3200	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

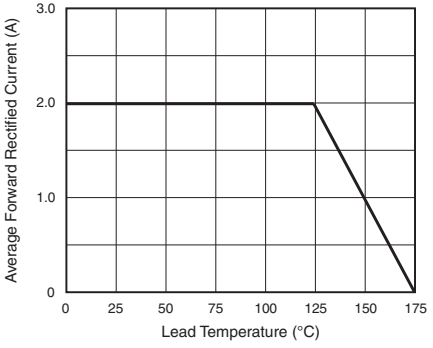


Figure 1. Forward Current Derating Curve

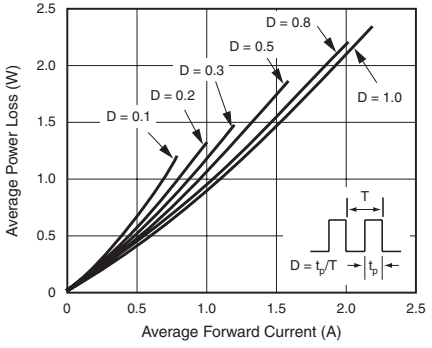


Figure 2. Forward Power Loss Characteristics

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

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Revision: 01-Aug-08

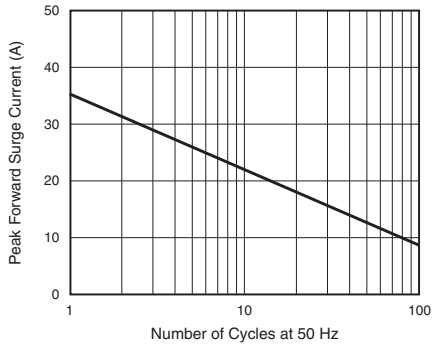


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

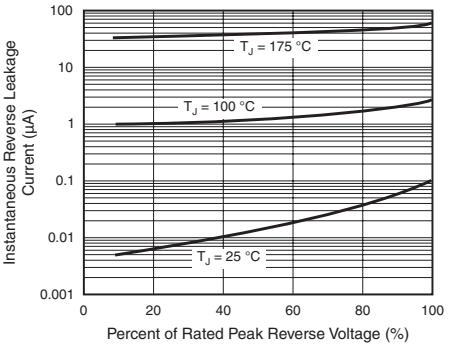


Figure 5. Typical Reverse Leakage Characteristics

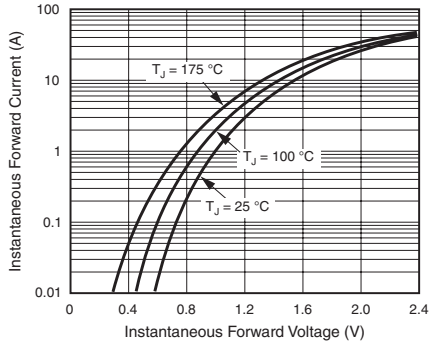


Figure 4. Typical Instantaneous Forward Characteristics

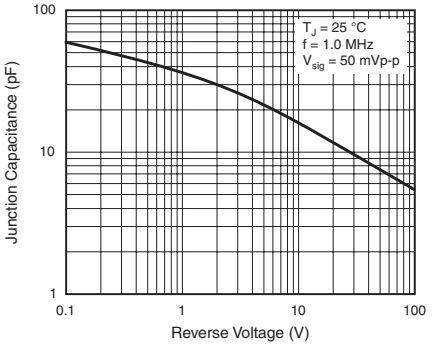
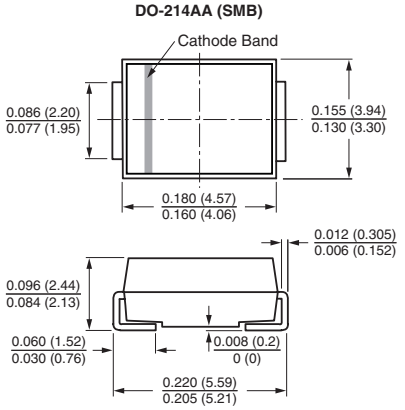
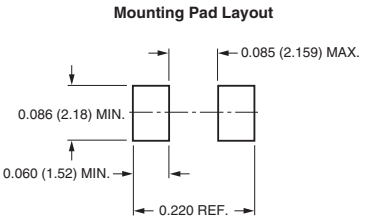


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

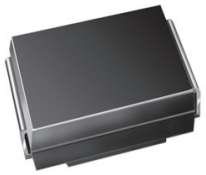




USB260

Vishay General Semiconductor

Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	600 V
I_{FSM}	90 A
t_{rr}	30 ns
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETERS	SYMBOL	USB260	UNIT
Device marking code		U60	
Maximum repetitive peak reverse voltage	V_{RRM}	600	V
Maximum RMS voltage	V_{RMS}	420	V
Maximum DC blocking voltage	V_{DC}	600	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	90	A
Non-repetitive avalanche energy at I_{AS} = 2.0 A, L = 10 mH, T_J = 25 °C	E_{AS}	20	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84705
Revision: 13-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETERS	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 10 μA	T_J = 25 °C	V_{BR}	600 (minimum)		V
Instantaneous forward voltage (1)	I_F = 1 A	T_J = 25 °C	V_F	1.25	-	V
	I_F = 2.0 A	T_J = 25 °C T_J = 125 °C		1.5 1.0	1.6 1.1	
Maximum reverse current (2)	V_R = 600 V	T_J = 25 °C T_J = 125 °C		- 30	5.0 100	μA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	30		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	45		pF

Notes:

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETERS	**SYMBOL**	**USB260**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	45 10	°C/W

Note:

(1) Units mounted on P.C.B. with 2.0 x 2.0" copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
USB260-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
USB260-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
USB260HE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
USB260HE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

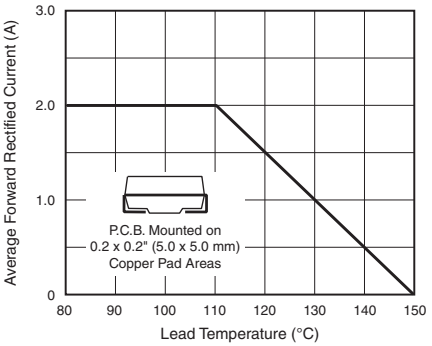


Figure 1. Maximum Forward Current Derating Curve

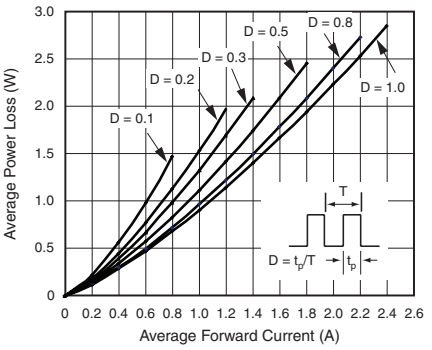


Figure 2. Forward Power Loss Characteristics

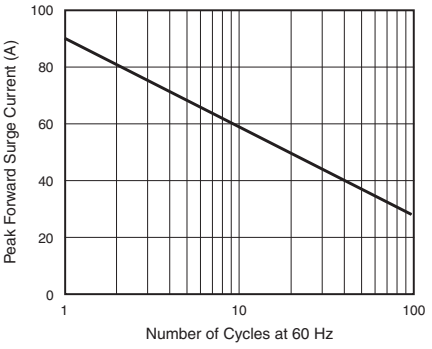


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

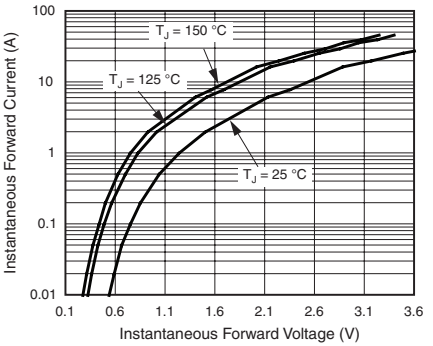


Figure 4. Typical Instantaneous Forward Characteristics

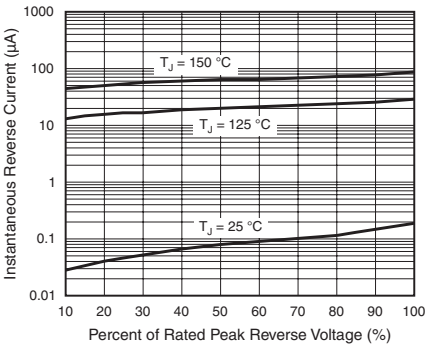


Figure 5. Typical Reverse Leakage Characteristics

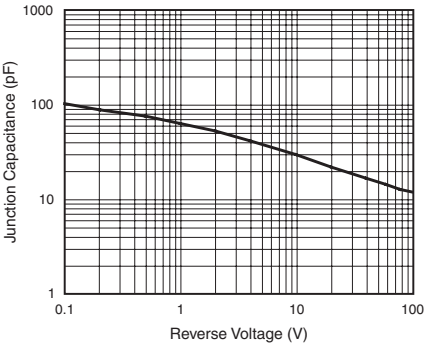


Figure 6. Typical Junction Capacitance

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

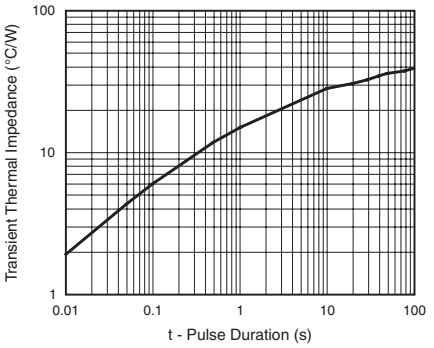
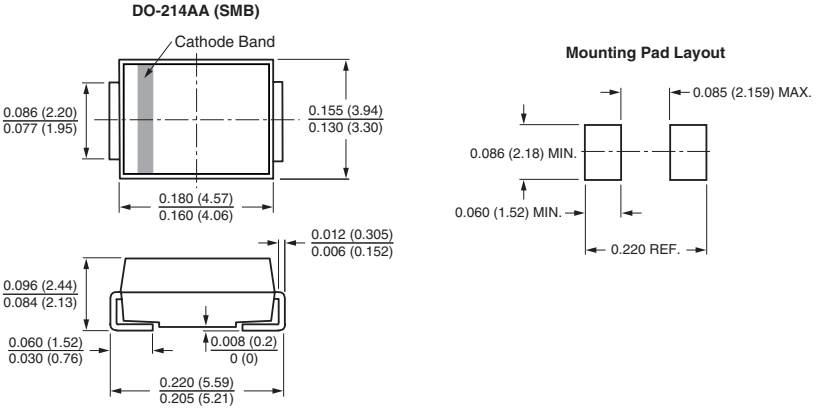


Figure 7. Typical Transient Thermal Impedance

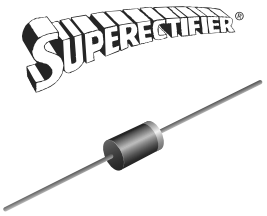
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



FGP20B thru FGP20D

Vishay General Semiconductor

Glass Passivated Ultrafast Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	100 V to 200 V
I_{FSM}	50 A
t_{rr}	35 ns
V_F	0.95 V
I_R	2.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FGP20B	FGP20C	FGP20D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_L = 75 °C	$I_{F(AV)}$	2.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50			A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175			°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88877
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	FGP20B	FGP20C	FGP20D	UNIT
Maximum instantaneous forward voltage	2.0 A		V_F	0.95			V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	2.0			µA
		T_A = 100 °C		50			
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35			ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	45			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	FGP20B	FGP20C	FGP20D	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	60			°C/W
	$R_{\theta JL}$ (2)	20			

Notes

(1) Thermal resistance from junction to ambient 0.375" (9.5 mm) lead length mounted on PCB with 0.47" x 0.47" (12 mm x 12 mm) copper pads

(2) Thermal resistance from junction to lead at 0.375" (9.5 mm) lead length with both leads attached to heatsinks

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
FGP20D-E3/54	0.424	54	4000	13" diameter paper tape and reel
FGP20D-E3/73	0.424	73	2000	Ammo pack packaging
FGP20DHE3/54 (1)	0.424	54	4000	13" diameter paper tape and reel
FGP20DHE3/73 (1)	0.424	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

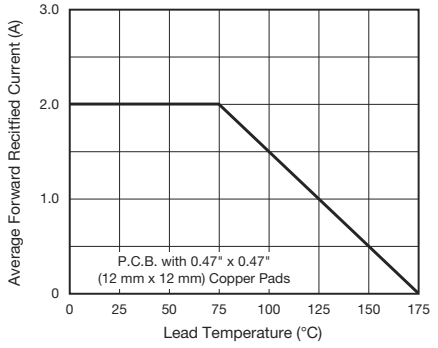


Fig. 1 - Maximum Forward Current Derating Curve

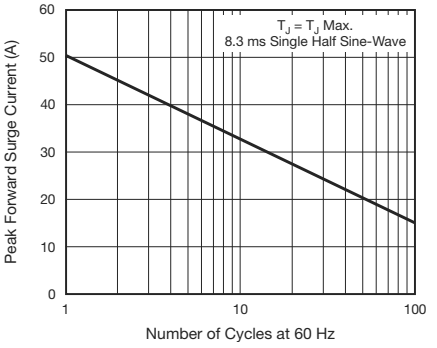


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

FGP20B thru FGP20D

Vishay General Semiconductor

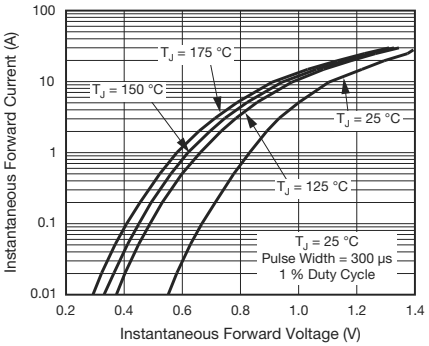


Fig. 3 - Typical Instantaneous Forward Characteristics

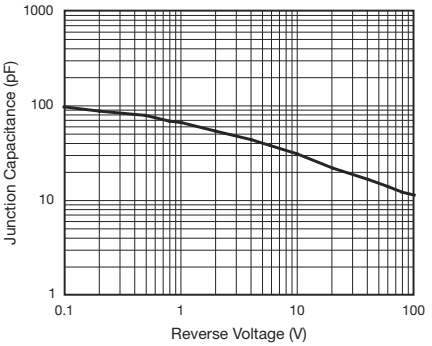


Fig. 5 - Typical Junction Capacitance

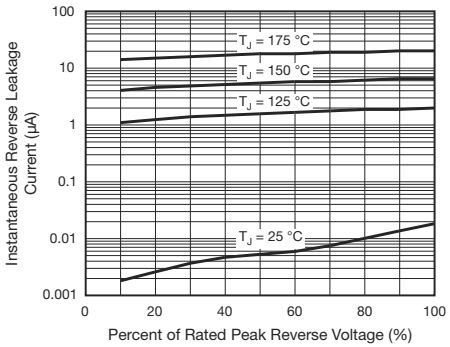
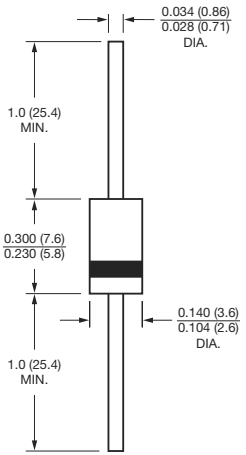


Fig. 4 - Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



For technical questions within your region, please contact one of the following:
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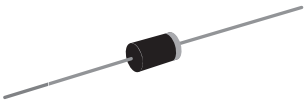
Document Number: 88877
Revision: 01-Feb-11

Soft Recovery Ultrafast Plastic Rectifier



DO-204AC (DO-15)

FEATURES

- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	50 A
t_{rr}	15 ns
V_F	0.88 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBYV27-50	SBYV27-100	SBYV27-150	SBYV27-200	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Minimum reverse breakdown voltage at 100 µA	V_{BR}	55	110	165	220	V
Maximum average forward rectified current 0.375" (9.5 mm) lead lengths at T_L = 85 °C	$I_{F(AV)}$	2.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SBYV27-50**	**SBYV27-100**	**SBYV27-150**	**SBYV27-200**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A	T_J = 25 °C T_J = 150 °C	V_F	1.07 0.88				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 200				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	15				ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15				pF

Note:

(1) Pulse test: 300 µs pulse width, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**SBYV27-50**	**SBYV27-100**	**SBYV27-150**	**SBYV27-200**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	45				°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SBYV27-200-E3/54	0.404	54	4000	13" diameter paper tape and reel
SBYV27-200-E3/73	0.404	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

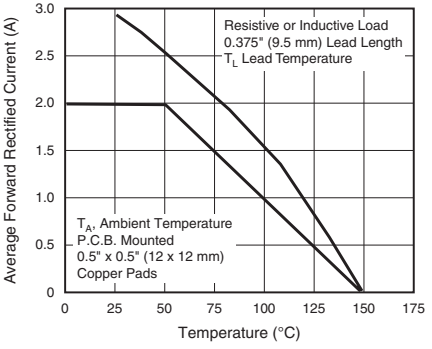


Figure 1. Maximum Forward Current Derating Curves

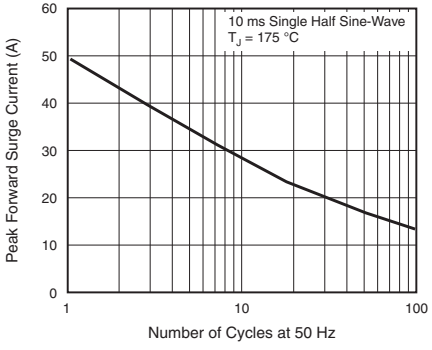


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

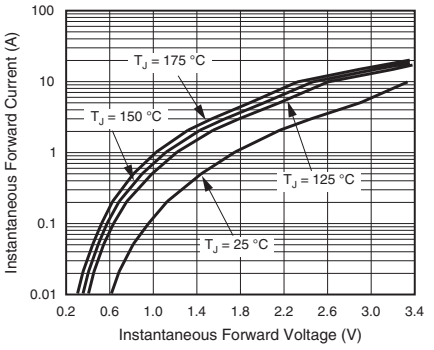


Figure 3. Typical Instantaneous Forward Characteristics

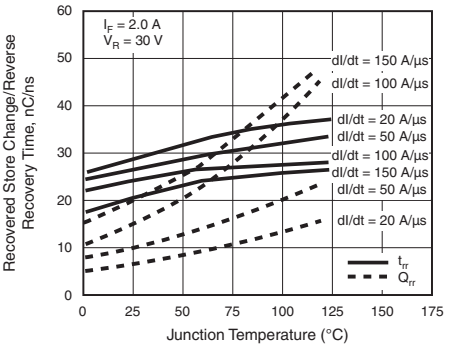


Figure 5. Reverse Switching Charateristics

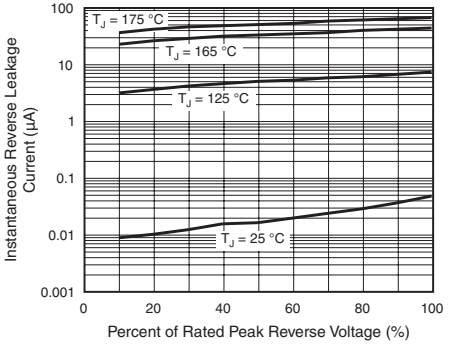


Figure 4. Typical Reverse Leakage Characteristics

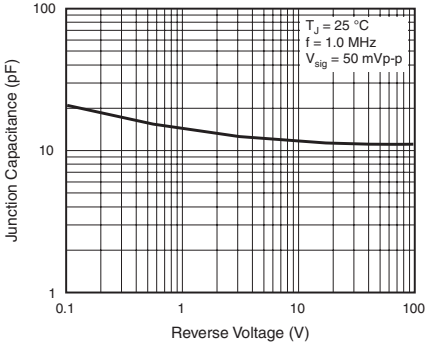
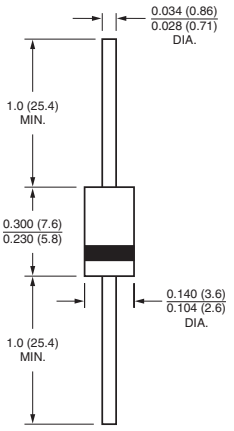


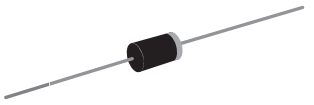
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Miniature Ultrafast Plastic Rectifier



DO-204AC (DO-15)

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Soft recovery characteristics
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	80 A
t_{rr}	15 ns
V_F	0.95 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG2A	UG2B	UG2C	UG2D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length at T_L = 75 °C (Fig. 1)	$I_{F(AV)}$	2.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2.0 A		V_F	0.95	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 200	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	15	ns
Typical reverse recovery time	I_F = 2.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	25 35	ns
Typical stored charge	I_F = 2.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	10 22	nC
Typical junction capacitance	4 V, 1 MHz		C_J	15	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**UG2A**	**UG2B**	**UG2C**	**UG2D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	45				°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UG2D-E3/54	0.404	54	4000	13" diameter paper tape and reel
UG2D-E3/73	0.404	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

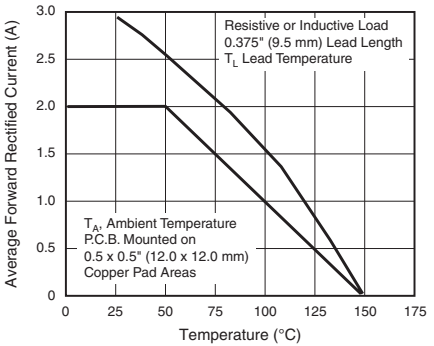


Figure 1. Maximum Forward Current Derating Curves

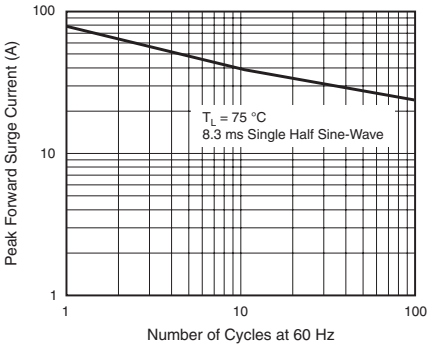


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

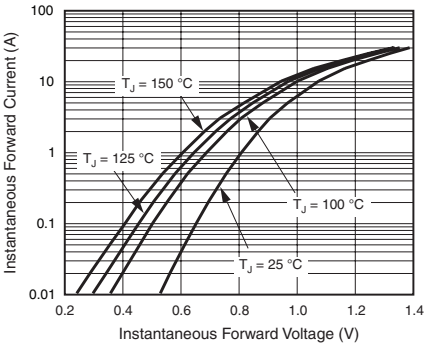


Figure 3. Typical Instantaneous Forward Characteristics

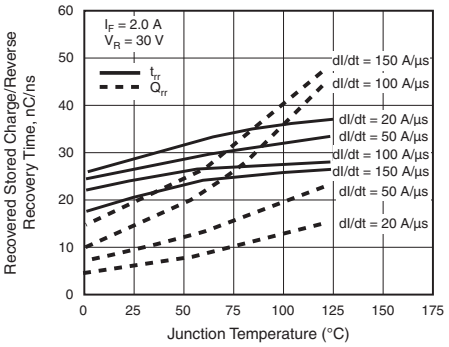


Figure 5. Reverse Switching Charateristics

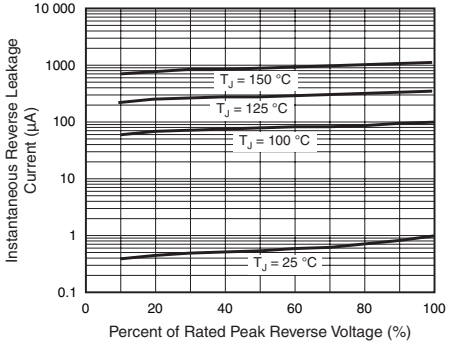


Figure 4. Typical Reverse Leakage Characteristics

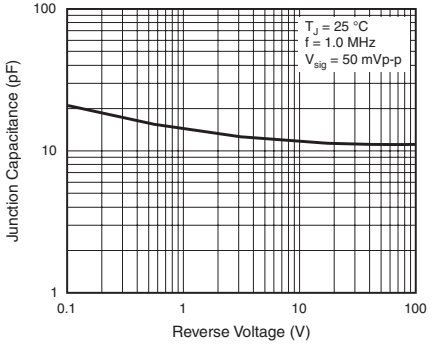
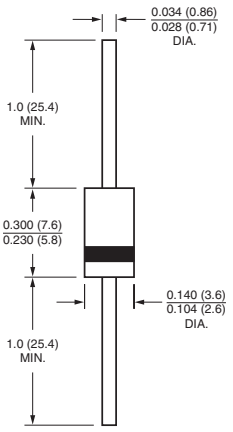


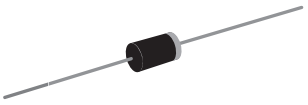
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Ultrafast Plastic Rectifier



DO-204AC (DO-15)

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	300 V, 400 V
I_{FSM}	50 A
t_{rr}	35 ns
V_F at I_F = 2.0 A	0.910 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-204AC (DO-15)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG2F	UG2G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	300	400	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage (1)	I_F = 1.0 A I_F = 2.0 A	T_J = 25 °C	V_F	0.921 1.016	- 1.10	V
	I_F = 1.0 A I_F = 2.0 A	T_J = 125 °C		0.772 0.910	- 1.02	
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 100 °C	I_R	1.8 108	10 200	µA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	23	35	ns
Typical reverse recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}	t_{rr}	31	-	ns
Typical reverse recovery current		I_{RM}	1.7	-	A
Typical stored charge		Q_{rr}	29	-	nC
Typical junction capacitance	4.0 V, 1 MHz	C_J	10	-	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UG2F**	**UG2G**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	45 14		°C/W

Note:

(1) Thermal resistance junction to lead P.C.B. mounted 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UG2G-E3/54	0.404	54	4000	13" diameter paper tape and reel
UG2G-E3/73	0.404	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

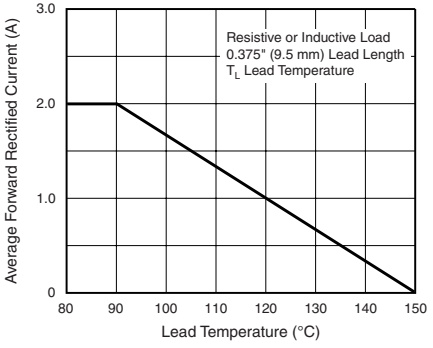


Figure 1. Maximum Forward Current Derating Curves

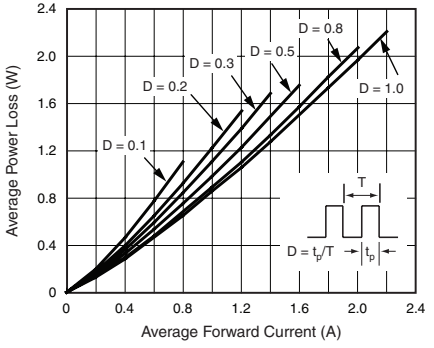


Figure 2. Forward Power Loss Characteristics

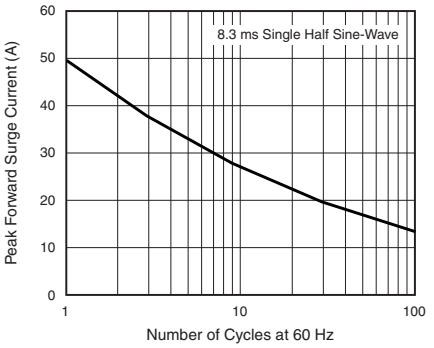


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

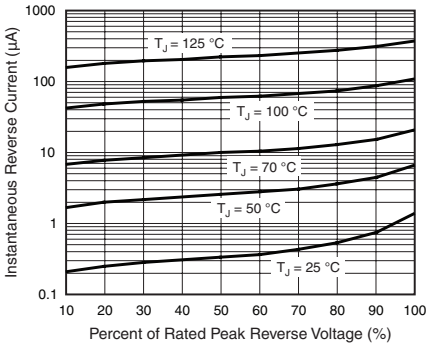


Figure 5. Typical Reverse Leakage Characteristics

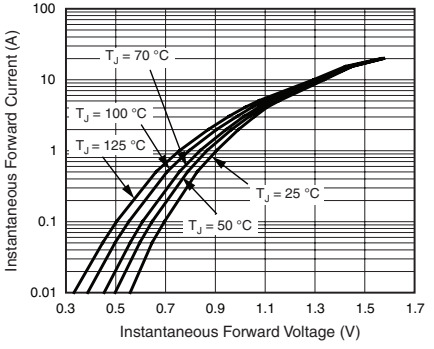


Figure 4. Typical Instantaneous Forward Characteristics

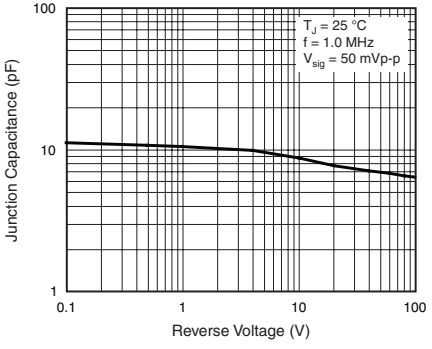
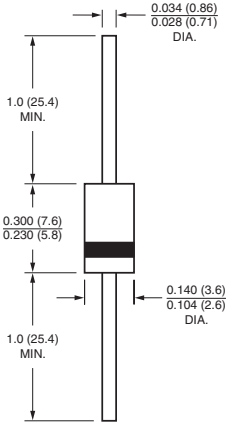


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

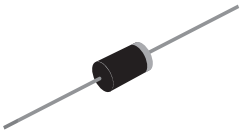
DO-204AC (DO-15)



31GF4

Vishay General Semiconductor

Ultrafast Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	400 V
I_{FSM}	60 A
t_{rr}	30 ns
V_F	1.25 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	400	V
Maximum RMS voltage	V_{RMS}	280	V
Maximum DC blocking voltage	V_{DC}	400	V
Maximum average forward rectified current, 0.375" (9.5 mm) lead length with FIN without FIN/PCB	$I_{F(AV)}$	3.0 1.5	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	60	A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150	°C
Reverse avalanche energy (8/20 µs surge)	E_{AR}	10	mJ

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88529
Revision: 20-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Minimum reverse breakdown voltage	10 µA	V_{BR}	400	V
Maximum instantaneous forward voltage (1)	3.0 A	V_F	1.25	V
Maximum DC reverse current at rated DC blocking voltage		I_R	20	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	30	ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Typical thermal resistance, junction to ambient (1)	$R_{\theta JA}$	80	°C/W

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
31GF4-E3/54	1.13	54	1400	13" diameter paper tape and reel
31GF4-E3/73	1.13	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

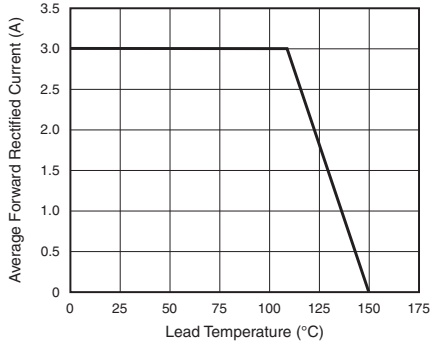


Figure 1. Maximum Forward Current Derating Curve

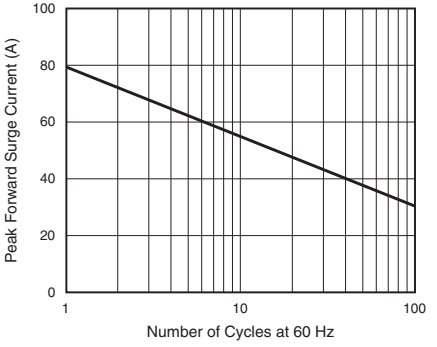


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

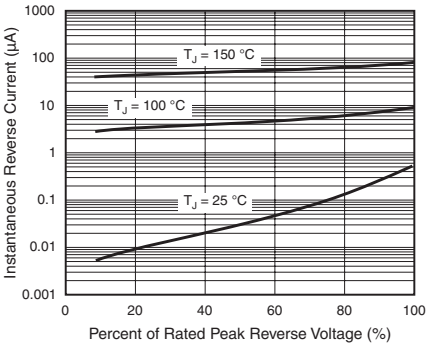


Figure 3. Typical Reverse Characteristics

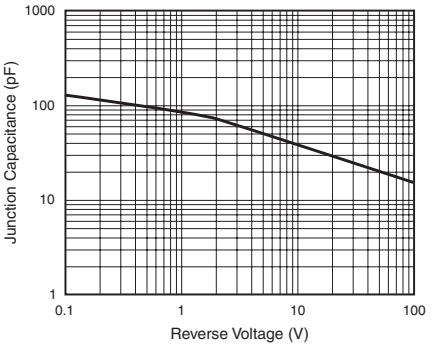


Figure 5. Typical Junction Capacitance

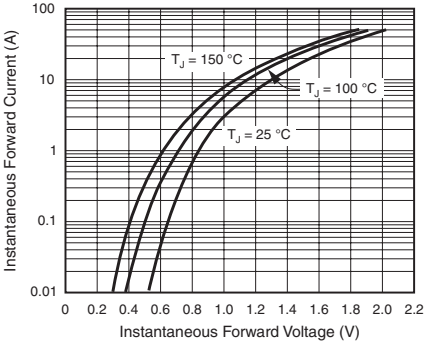
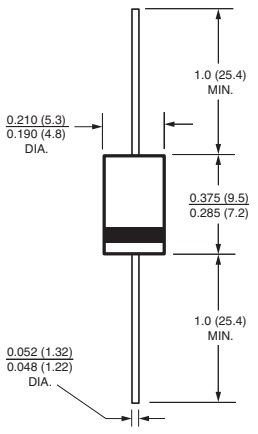


Figure 4. Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



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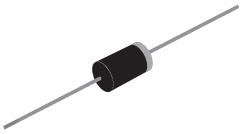
Document Number: 88529
Revision: 20-Aug-07

Ultrafast Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	600 V
I_{FSM}	90 A
t_{rr}	30 ns
V_F	1.6 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	600	V
Maximum RMS voltage	V_{RMS}	420	V
Maximum DC blocking voltage	V_{DC}	600	V
Maximum average forward rectified current, 0.375" (9.5 mm) lead length at T_L = 110 °C	$I_{F(AV)}$	3.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	90	A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150	°C
Reverse avalanche energy (8/20 µs surge)	E_{AR}	10	mJ

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VALUE**	**UNIT**
Minimum reverse breakdown voltage	10 µA	V_{BR}	600	V
Maximum instantaneous forward voltage (1)	3.0 A	V_F	1.6	V
Maximum DC reverse current at rated DC blocking voltage		I_R	20	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	30	ns

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	30 8.0	°C/W

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
31GF6-E3/54	1.13	54	1400	13" diameter paper tape and reel
31GF6-E3/73	1.13	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

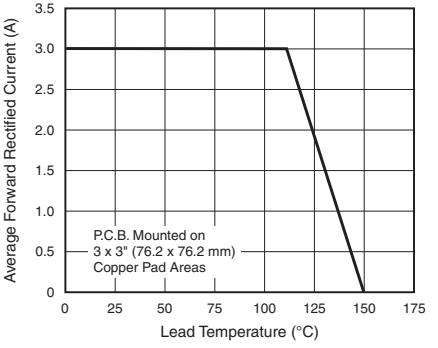


Figure 1. Maximum Forward Current Derating Curve

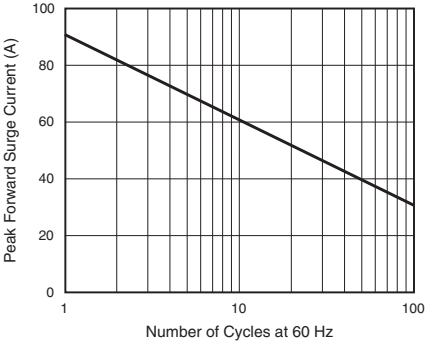


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

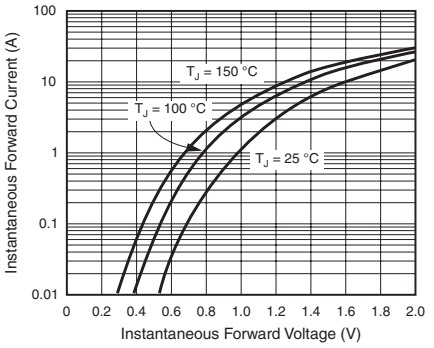


Figure 3. Typical Forward Voltage

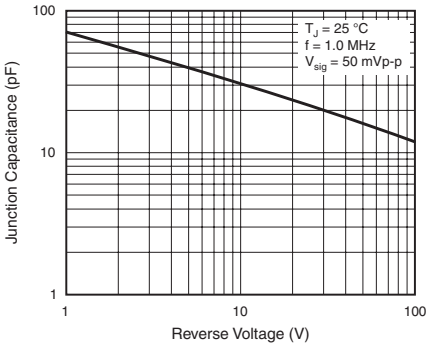


Figure 5. Typical Junction Capacitance

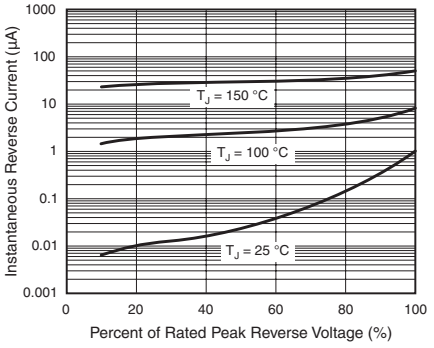
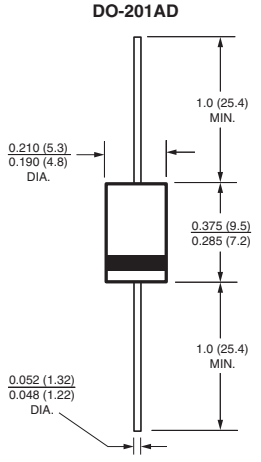
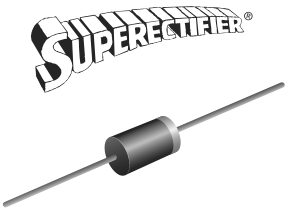


Figure 4. Typical Reverse Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Glass Passivated Ultrafast Rectifier



GP20

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 400 V
I_{FSM}	125 A
t_{rr}	50 ns
V_F	0.95 V, 1.25 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: GP20, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EGP30A	EGP30B	EGP30C	EGP30D	EGP30F	EGP30G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	3.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125						A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 150						°C

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DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Document Number: 88584
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	EGP30A	EGP30B	EGP30C	EGP30D	EGP30F	EGP30G	UNIT
Maximum instantaneous forward voltage	3.0 A		V_F	0.95				1.25		V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0						μA
		T_A = 125 °C		100						
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50						ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	85				75		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	EGP30A	EGP30B	EGP30C	EGP30D	EGP30F	EGP30G	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	20						°C/W
	$R_{\theta JL}$ (1)	8.0						

Note

(1) Thermal resistance from junction to ambient, and from junction to lead at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
EGP30G-E3/54	1.01	54	1400	13" diameter paper tape and reel
EGP30G-E3/73	1.01	73	1000	Ammo pack packaging
EGP30GHE3/54 (1)	1.01	54	1400	13" diameter paper tape and reel
EGP30GHE3/73 (1)	1.01	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

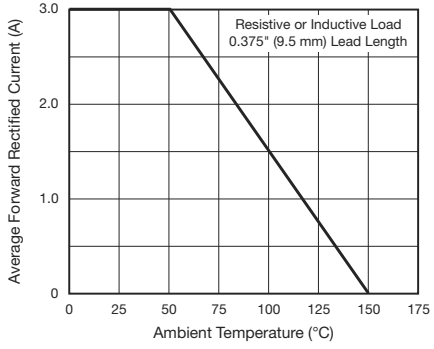


Fig. 1 - Maximum Forward Current Derating Curve

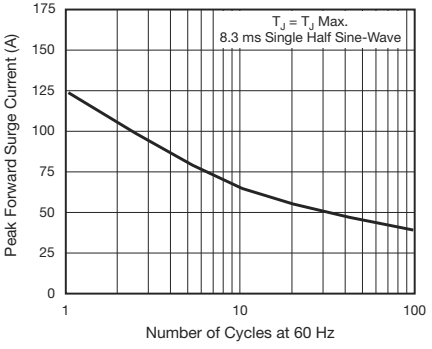


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

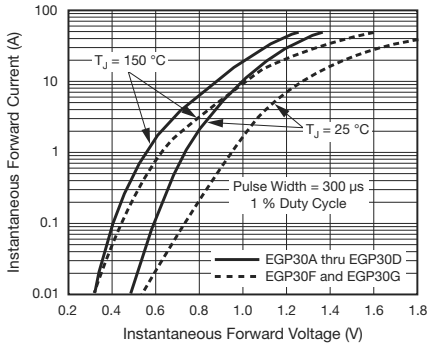


Fig. 3 - Typical Instantaneous Forward Characteristics

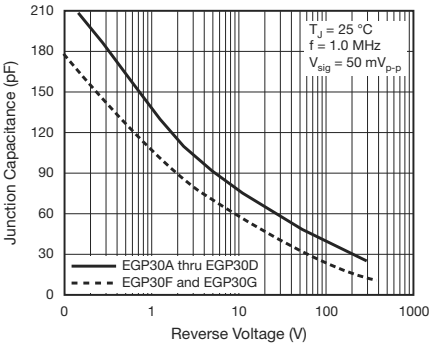


Fig. 5 - Typical Junction Capacitance

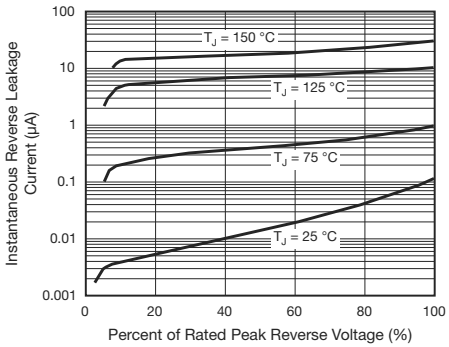


Fig. 4 - Typical Reverse Leakage Characteristics

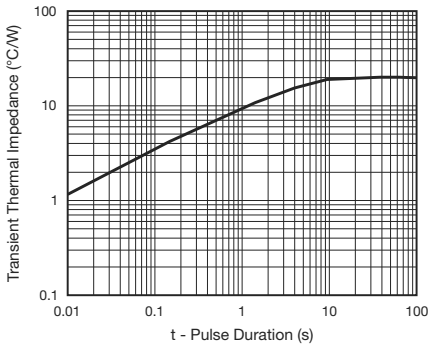
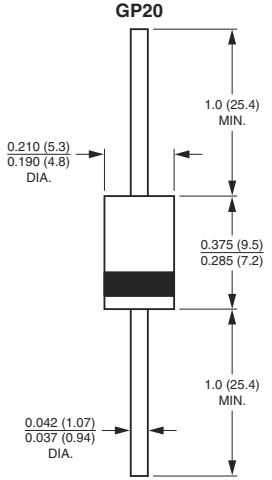


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Surface Mount Ultrafast Plastic Rectifier

DO-214AB (SMC)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	100 A
t_{rr}	20 ns
V_F	0.90 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES3A	ES3B	ES3C	ES3D	UNIT
Device marking code		EA	EB	EC	ED	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_L = 100 °C	$I_{F(AV)}$	3.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**ES3A**	**ES3B**	**ES3C**	**ES3D**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A		V_F	0.90				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 500				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20				ns
Maximum reverse recovery time	I_F = 3.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	30 50				ns
Maximum stored charge	I_F = 3.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	15 35				nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	45				pF

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**ES3A**	**ES3B**	**ES3C**	**ES3D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	47 12				°C/W

Note:
(1) Units mounted on P.C.B. with 0.31 x 0.31" (8.0 x 8.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ES3D-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
ES3D-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
ES3DHE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
ES3DHE3/9AT (1)	0.211	9AT	3500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

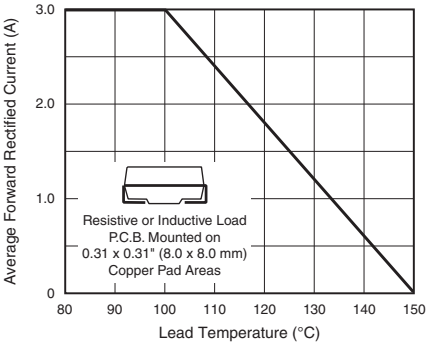


Figure 1. Maximum Forward Current Derating Curve

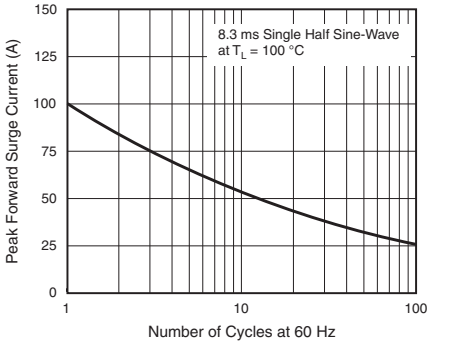


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
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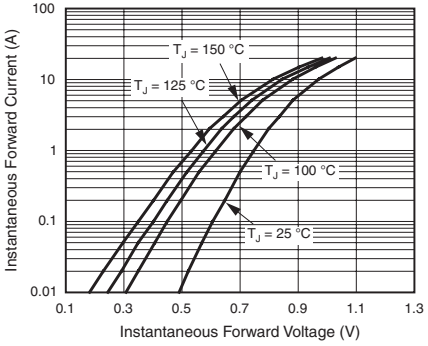


Figure 3. Typical Instantaneous Forward Characteristics

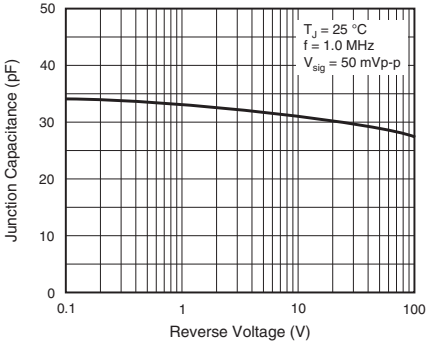


Figure 5. Typical Junction Capacitance

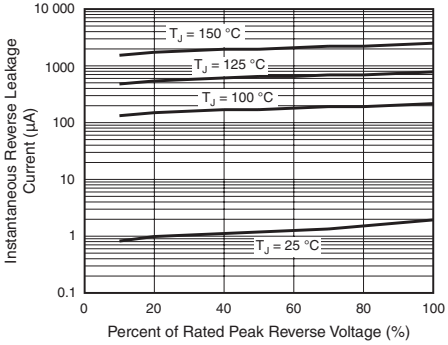
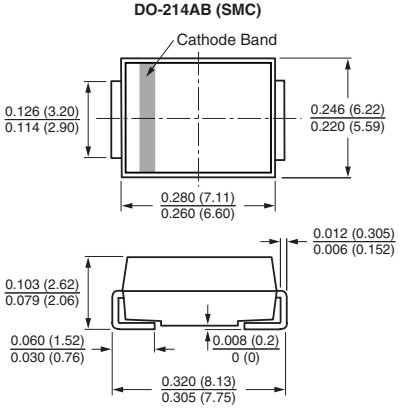
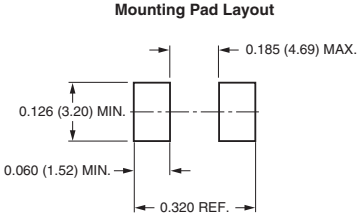


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Surface Mount Ultrafast Plastic Rectifier

DO-214AB (SMC)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	300 V, 400 V
I_{FSM}	100 A
t_{rr}	35 ns
V_F	1.1 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**ES3F**	**ES3G**	**UNIT**
Device marking code		EF	EG	
Maximum repetitive peak reverse voltage	V_{RRM}	300	400	V
Working peak reverse voltage	V_{RWM}	225	300	V
Maximum RMS voltage	V_{RMS}	210	280	V
Maximum average forward rectified current at T_L = 110 °C	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

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Document Number: 88590
Revision: 20-Nov-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	ES3F	ES3G	UNIT
Maximum instantaneous forward voltage (1)	3.0 A		V_F	1.1		V
Maximum DC reverse current at working peak reverse voltage		T_A = 25 °C T_A = 100 °C	I_R	10 350		μA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 100 A/μs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Maximum reverse recovery current	I_F = 1.0 A, dI/dt = 100 A/μs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		I_{RM}	3.0		A
Maximum stored charge	I_F = 1.0 A, dI/dt = 100 A/μs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		Q_{rr}	50		nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	30		pF

Note:
(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	ES3F	ES3G	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 15		°C/W

Note:
(1) Units mounted on P.C.B. 5.0 x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ES3G-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
ES3G-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
ES3GHE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
ES3GHE3/9AT (1)	0.211	9AT	3500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

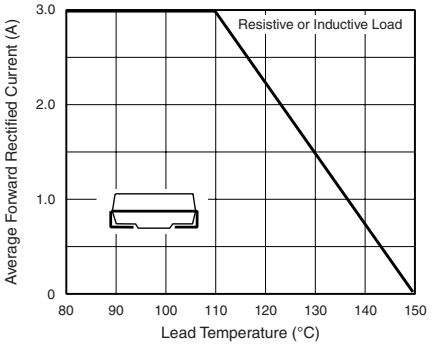

Figure 1. Maximum Forward Current Derating Curve

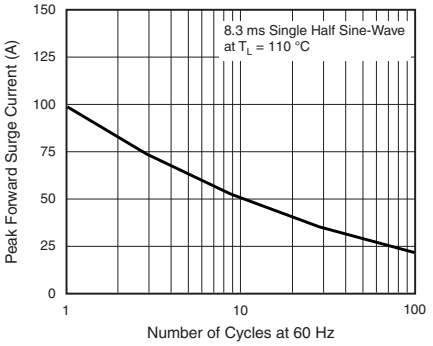

Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

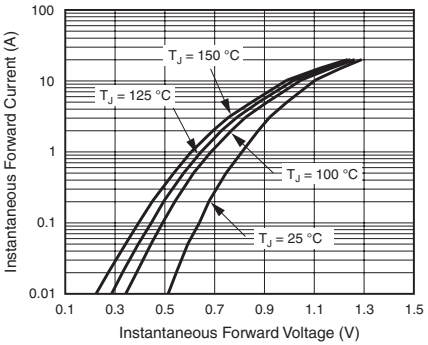

Figure 3. Typical Instantaneous Forward Characteristics

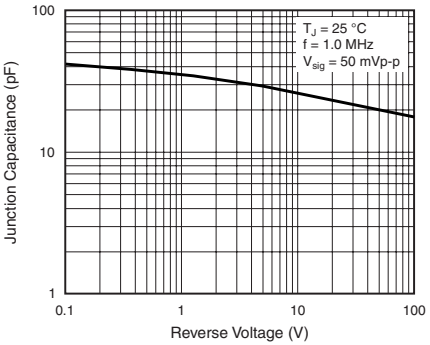

Figure 6. Typical Junction Capacitance

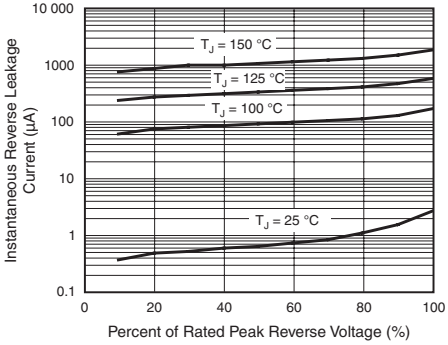

Figure 4. Typical Reverse Leakage Characteristics

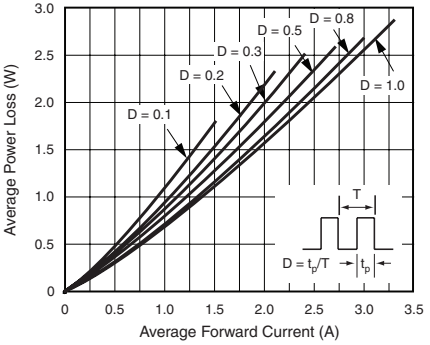

Figure 7. Forward Power Loss Characteristics

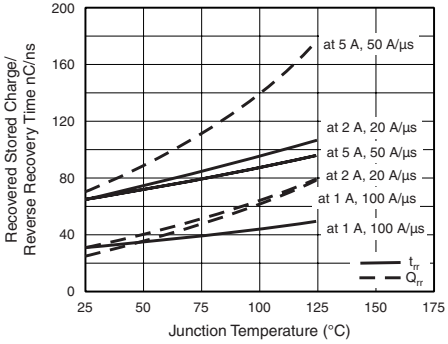

Figure 5. Reverse Switching Characteristics

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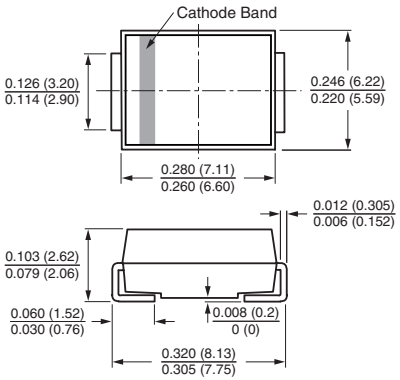
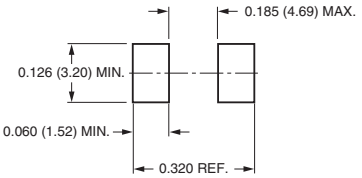
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AB (SMC)



Mounting Pad Layout



ESH3B, ESH3C & ESH3D

Vishay General Semiconductor

Surface Mount Ultrafast Plastic Rectifiers

DO-214AB (SMC)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power loss
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converter and inverter for both consumer and automotive.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	25 ns
V_F	0.90 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ESH3B	ESH3C	ESH3D	UNIT
Device marking code		EHB	EHC	EHD	
Maximum repetitive peak reverse voltage	V_{RMM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	3.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125			A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175			°C

For technical questions within your region, please contact one of the following:
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Document Number: 84648
Revision: 27-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 3 A		V_F	0.90	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 125 °C	I_R	5.0 150	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Typical reverse recovery time	I_F = 3 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	40 55	ns
Typical stored charge	I_F = 3 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	25 60	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	70	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH3B**	**ESH3C**	**ESH3D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 15			°C/W

Note:

(1) Units mounted on P.C.B. with 12.0 x 12.0 mm land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ESH3D-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
ESH3D-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
ESH3DHE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
ESH3DHE3/9AT (1)	0.211	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

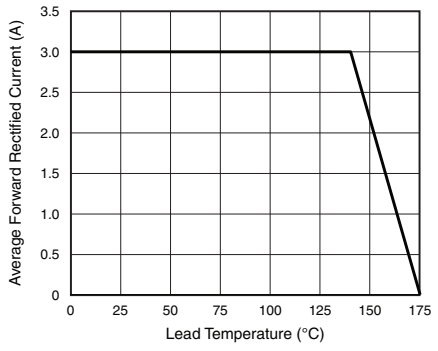


Figure 1. Maximum Forward Current Derating Curve

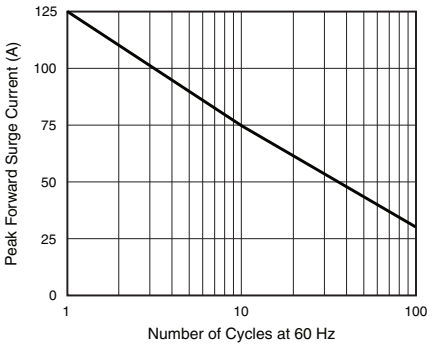


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

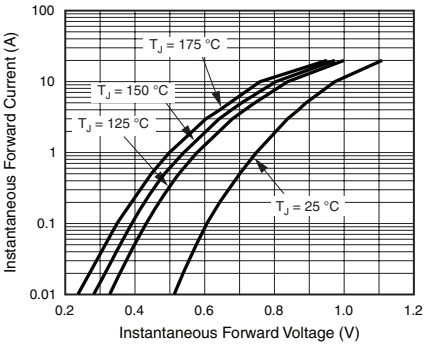


Figure 3. Typical Instantaneous Forward Characteristics

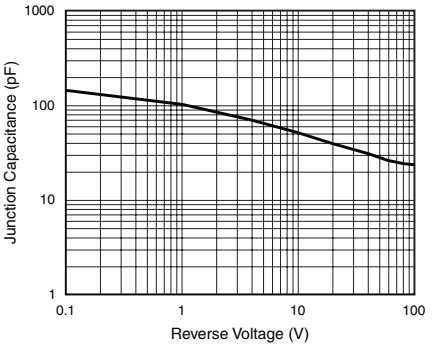


Figure 5. Typical Junction Capacitance

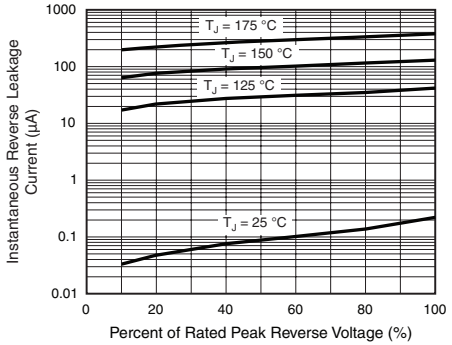


Figure 4. Typical Reverse Leakage Characteristics

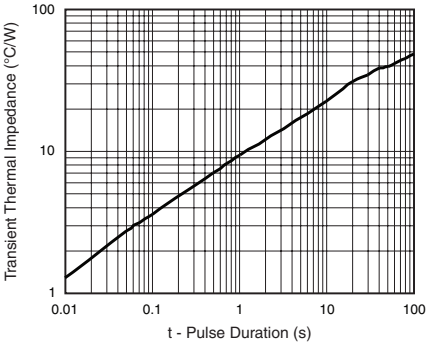
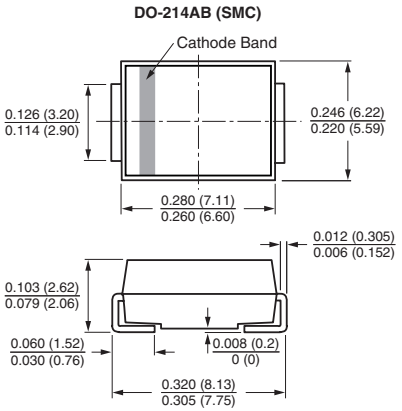
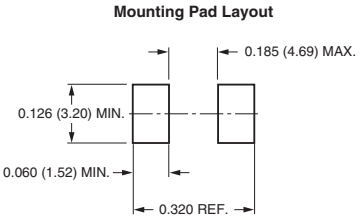


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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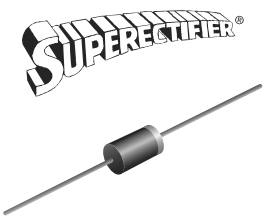
Document Number: 84648
Revision: 27-Aug-07

FGP30B thru FGP30D

Vishay General Semiconductor

Glass Passivated Ultrafast Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	100 V to 200 V
I_{FSM}	125 A
t_{rr}	35 ns
V_F	0.95 V
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FGP30B	FGP30C	FGP30D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 25 °C	$I_{F(AV)}$	3.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125			A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175			°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

FGP30B thru FGP30D

Vishay General Semiconductor

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	FGP30B	FGP30C	FGP30D	UNIT
Maximum instantaneous forward voltage	3.0 A		V_F (1)	0.95			V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0			μA
		T_A = 100 °C		50			
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35			ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	70			pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	FGP30B	FGP30C	FGP30D	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55			°C/W
	$R_{\theta JL}$ (2)	20			

Notes

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length and mounted on PCB with 1.1" x 1.1" (30 mm x 30 mm) copper pads

(2) Thermal resistance from junction to lead at 0.375" (9.5 mm) lead length with both leads attached to heatsinks

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
FGP30D-E3/54	0.452	54	4000	13" diameter paper tape and reel
FGP30D-E3/73	0.452	73	2000	Ammo pack packaging
FGP30DHE3/54 (1)	0.452	54	4000	13" diameter paper tape and reel
FGP30DHE3/73 (1)	0.452	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

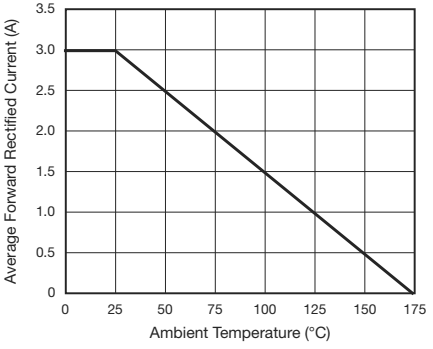


Fig. 1 - Maximum Forward Current Derating Curve

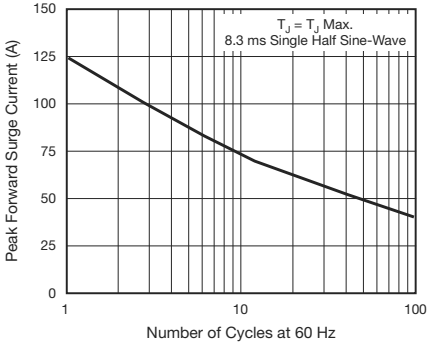


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

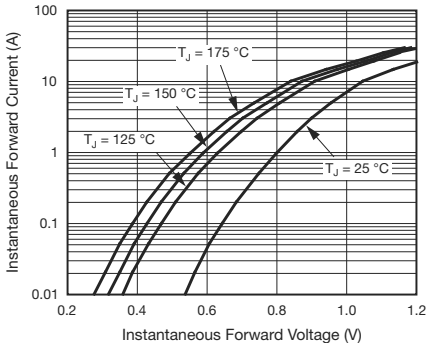


Fig. 3 - Typical Instantaneous Forward Characteristics

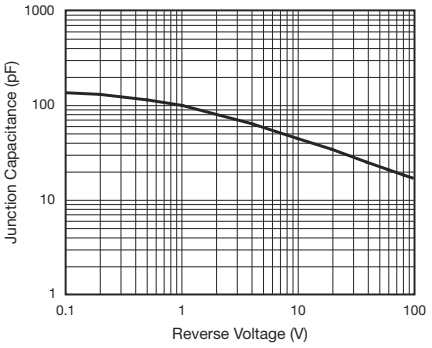


Fig. 5 - Typical Junction Capacitance

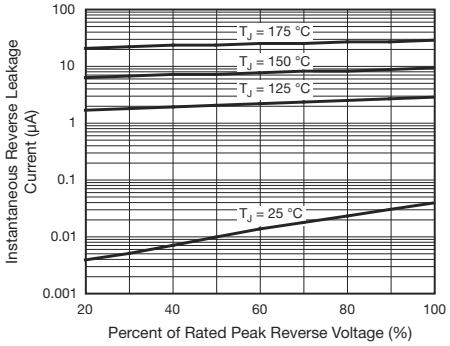


Fig. 4 - Typical Reverse Leakage Characteristics

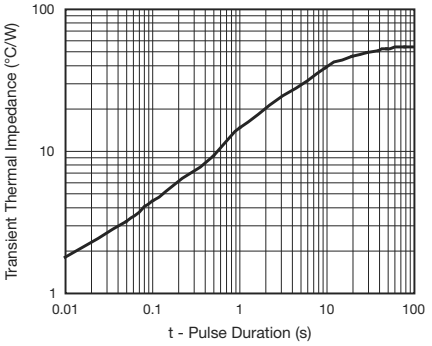
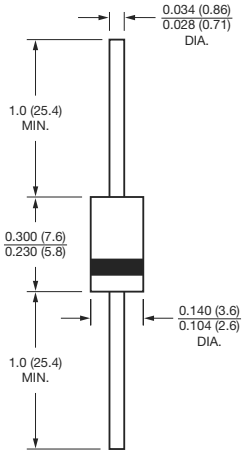


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Surface Mount Ultrafast Plastic Rectifier

DO-214AB (SMC)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	200 V
I_{FSM}	125 A
t_{rr}	25 ns
V_F	0.71 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	MURS320	UNIT
Device marking code			MD	
Maximum repetitive peak reverse voltage		V_{RRM}	200	V
Working peak reverse voltage		V_{RWM}	200	V
Maximum DC blocking voltage		V_{DC}	200	V
Maximum average forward rectified current at: (Fig. 1)	T_L = 140 °C T_L = 130 °C	$I_{F(AV)}$	3.0 4.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I_{FSM}	125	A
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175	°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88689
Revision: 27-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MURS320**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 3.0 A I_F = 4.0 A I_F = 3.0 A	T_J = 25 °C T_J = 25 °C T_J = 150 °C	V_F	0.875 0.890 0.710	V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	5.0 150	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	35	ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	25	ns

Note:

(1) Pulse test: t_p = 300 µs, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**MURS320**	**UNIT**
Typical thermal resistance junction to ambient	$R_{\theta JL}$	11	°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MURS320-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
MURS320-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
MURS320HE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
MURS320HE3/9AT (1)	0.211	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

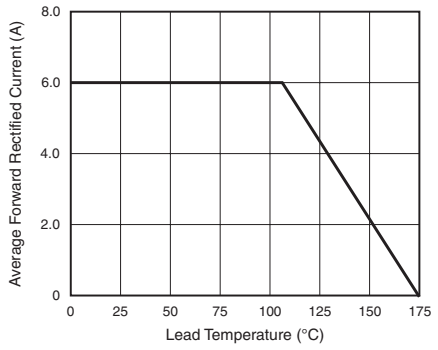


Figure 1. Forward Current Derating Curve

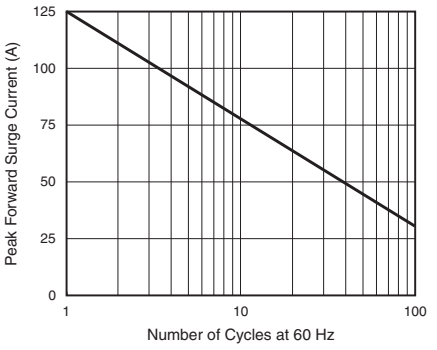


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

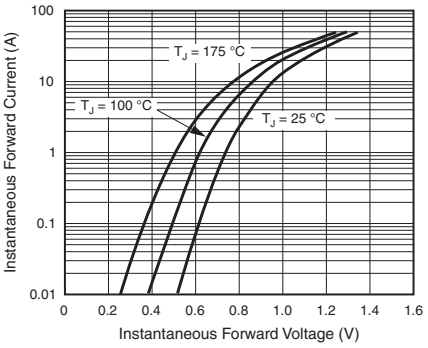


Figure 3. Typical Forward Voltage

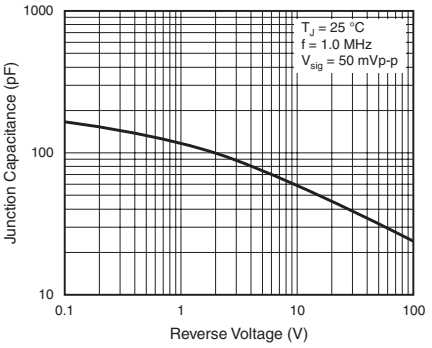


Figure 5. Typical Junction Capacitance

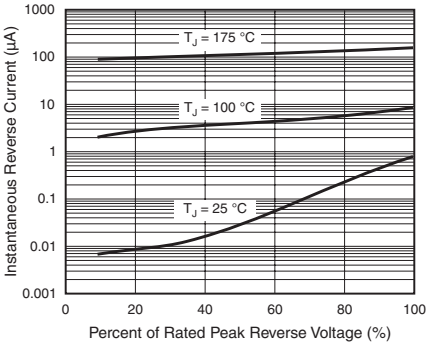
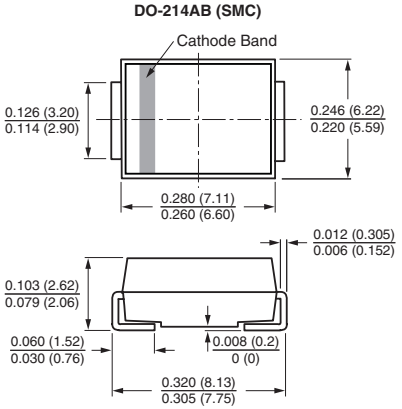
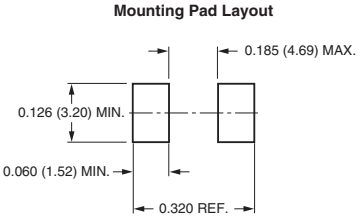


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Surface Mount Ultrafast Plastic Rectifier

DO-214AB (SMC)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	400 V, 600 V
I_{FSM}	125 A
t_{rr}	50 ns
V_F	1.05 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MURS340**	**MURS360**	**UNIT**
Device marking code		MG	MJ	
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Working peak reverse voltage	V_{RWM}	400	600	V
Maximum DC blocking voltage	V_{DC}	400	600	V
Maximum average forward rectified current at: (T_L = 130 °C) (Fig. 1) (T_L = 115 °C)	$I_{F(AV)}$	3.0 4.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125		A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MURS340**	**MURS360**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 3.0 A I_F = 4.0 A I_F = 3.0 A	T_J = 25 °C T_J = 25 °C T_J = 150 °C	V_F	1.25 1.28 1.05		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	10 250		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	75		ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	25		ns

Note:

(1) Pulse test: t_p = 300 µs, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MURS340**	**MURS360**	**UNIT**
Typical thermal resistance junction to ambient	$R_{\theta JL}$	11		°C/W

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MURS340-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
MURS340-E3/9AT	0.211	9AT	3200	13" diameter plastic tape and reel
MURS340HE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
MURS340HE3/9AT (1)	0.211	9AT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

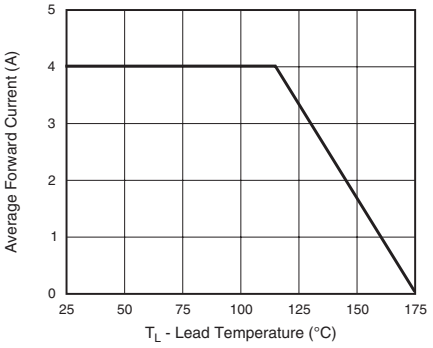


Figure 1. Forward Current Derating Curve

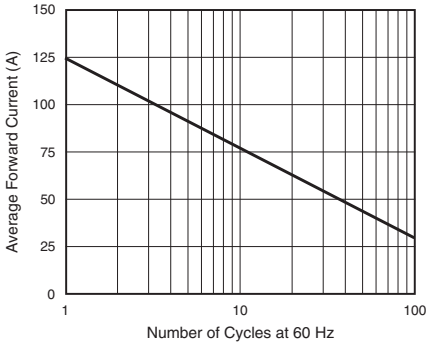


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

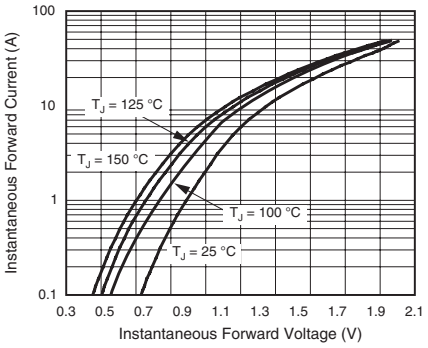


Figure 3. Typical Instantaneous Forward Characteristics

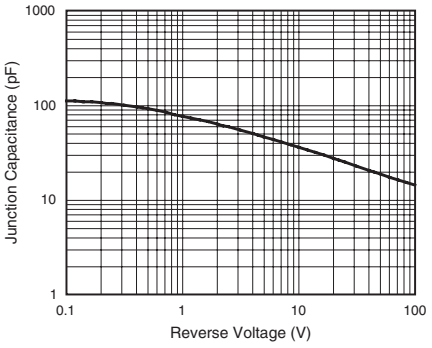


Figure 5. Typical Junction Capacitance

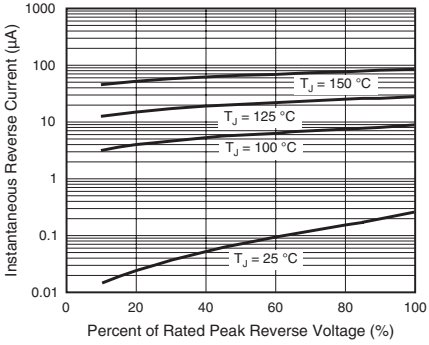


Figure 4. Typical Reverse Characteristics

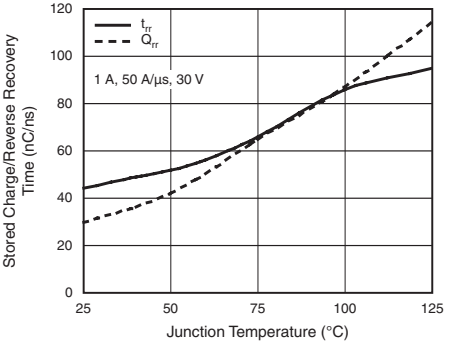
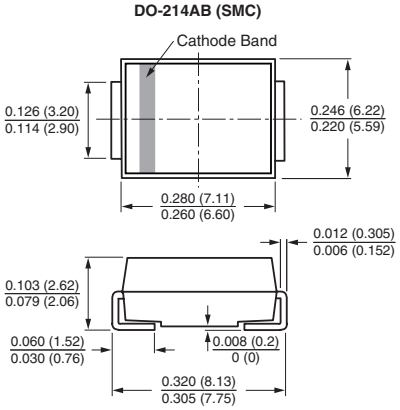
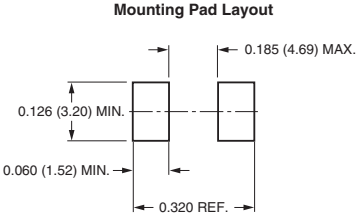


Figure 6. Typical Reverse Switching Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Ultrafast Plastic Rectifier

Case Style P600

FEATURES

- Glass passivated chip junction
- Ideal for printed circuit boards
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: P600

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	400 V, 600 V
I_{FSM}	80 A
t_{rr}	35 ns
V_F	1.8 V, 2.0 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SUF30G	SUF30J	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Maximum RMS voltage	V_{RMS}	280	420	V
Maximum DC blocking voltage	V_{DC}	400	600	V
Maximum average forward rectified current, 0.200" (5.0 mm) lead length at T_A = 60 °C	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SUF30G	SUF30J	UNIT
Maximum instantaneous forward voltage (1)	3.0 A		V_F	1.8	2.0	V
Maximum peak reverse current at rated peak reverse voltage		T_A = 25 °C T_A = 100 °C	I_R	10 100		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	60		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88754
Revision: 20-Aug-07

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	SUF30G	SUF30J	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$	25		°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.200" (5.0 mm) lead length with both leads attached to heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SUF30J-E3/54	1.834	54	800	13" diameter paper tape and reel
SUF30J-E3/73	1.834	73	300	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

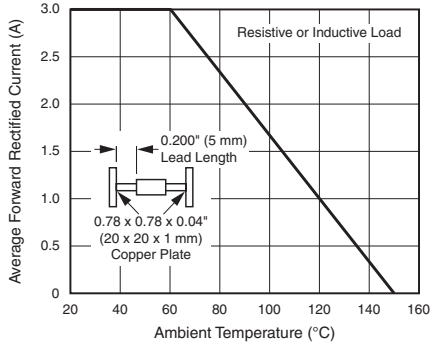


Figure 1. Forward Current Derating Curve

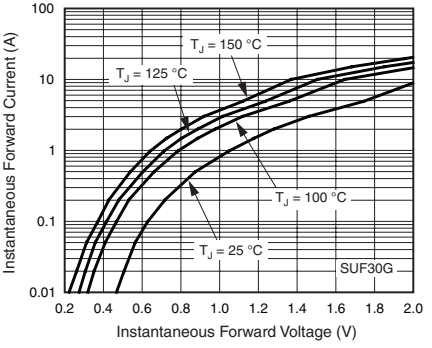


Figure 3. Typical Instantaneous Forward Characteristics

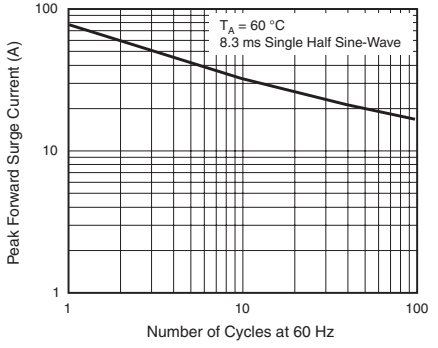


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

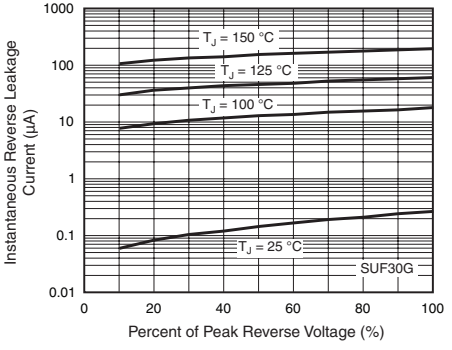


Figure 4. Typical Reverse Leakage Characteristics

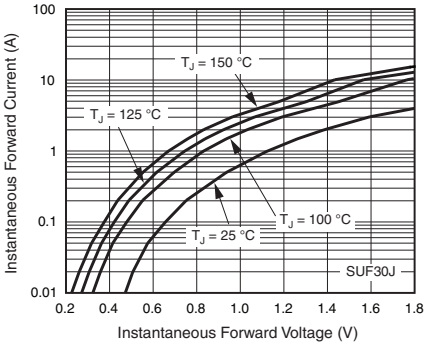


Figure 5. Typical Instantaneous Forward Characteristics

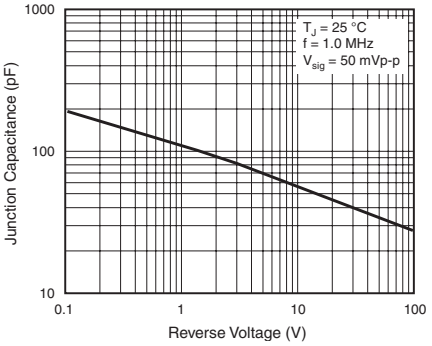


Figure 7. Typical Junction Capacitance

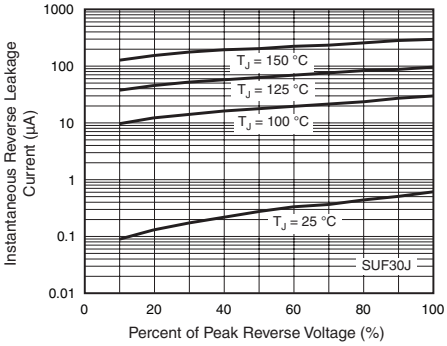


Figure 6. Typical Reverse Leakage Characteristics

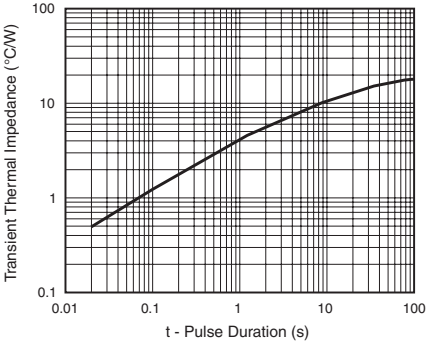
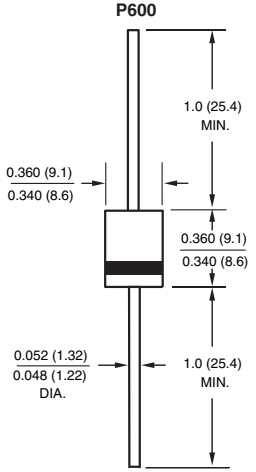


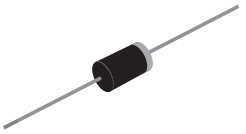
Figure 8. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88754
Revision: 20-Aug-07

Soft Recovery Ultrafast Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	150 A
t_{rr}	50 ns, 75 ns
V_F	1.0 V, 1.7 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UF 5400	UF 5401	UF 5402	UF 5403	UF 5404	UF 5405	UF 5406	UF 5407	UF 5408	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	300	400	500	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	210	280	350	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	300	400	500	600	800	1000	V
Maximum average forward rectified current, 0.375" (9.5 mm) lead length at T_A= 55 °C	$I_{F(AV)}$	3.0									A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150									A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150									°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)													
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UF 5400**	**UF 5401**	**UF 5402**	**UF 5403**	**UF 5404**	**UF 5405**	**UF 5406**	**UF 5407**	**UF 5408**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A		V_F	1.0					1.7				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	10									µA
		T_A = 100 °C		75					200				
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	T_J = 25 °C	t_{rr}	50					75				ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	45					36				pF

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**SYMBOL**	**UF 5400**	**UF 5401**	**UF 5402**	**UF 5403**	**UF 5404**	**UF 5405**	**UF 5406**	**UF 5407**	**UF 5408**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	20 8.5									°C/W

Note:

(1) Thermal resistance from junction to lead and from junction to ambient with 0.375" (9.5 mm) lead length, both leads attached to heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UF5406-E3/54	1.172	54	1400	13" diameter paper tape and reel
UF5406-E3/73	1.172	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

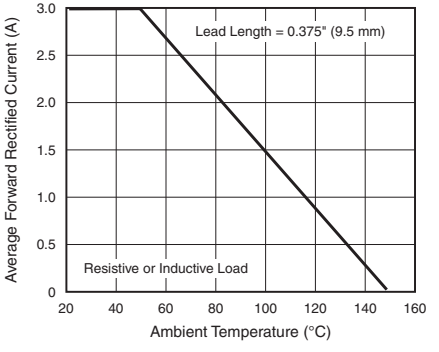


Figure 1. Maximum Forward Current Derating Curve

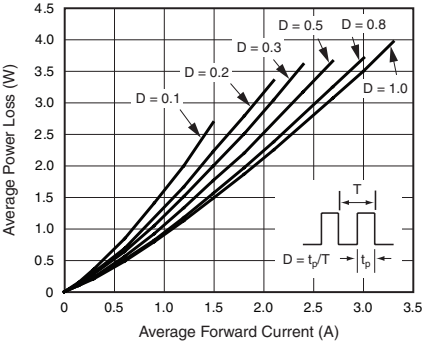


Figure 2. Forward Power Loss Characteristics

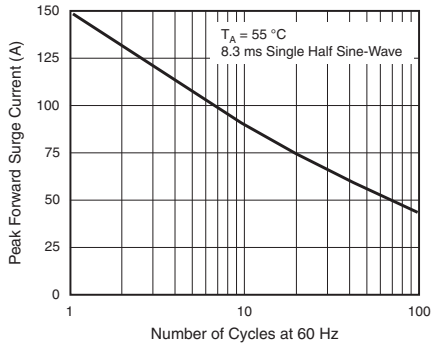


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

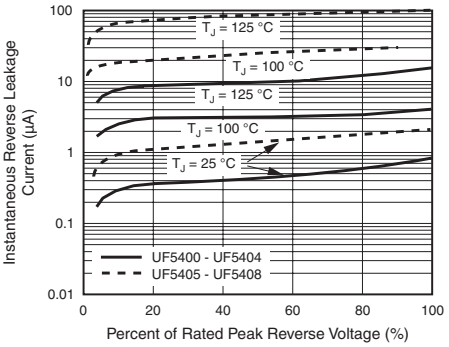


Figure 5. Typical Reverse Leakage Characteristics

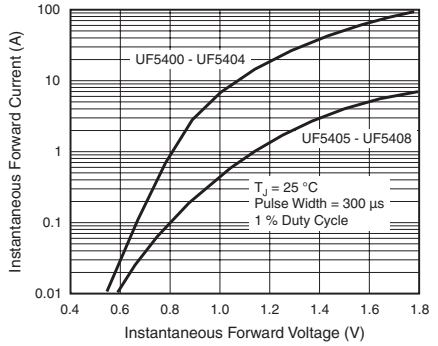


Figure 4. Typical Instantaneous Forward Characteristics

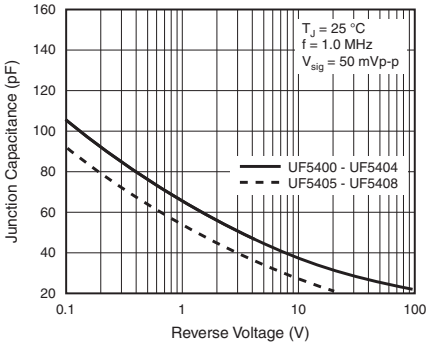
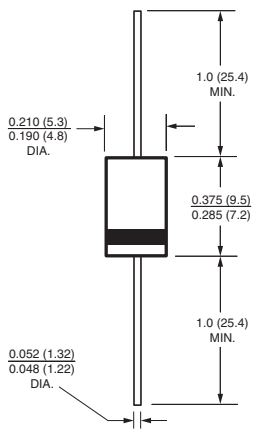


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

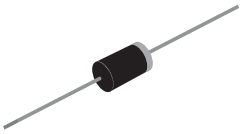
DO-201AD



SBYV28-50 thru SBYV28-200

Vishay General Semiconductor

Soft Recovery Ultrafast Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.5 A
V_{RRM}	50 V to 200 V
I_{FSM}	90 A
t_{rr}	20 ns
V_F	0.89 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SBYV28-50	SBYV28-100	SBYV28-150	SBYV28-200	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Minimum reverse breakdown voltage at 100 µA	V_{BR}	55	110	165	220	V
Maximum average forward rectified current 0.375" (9.5 mm) lead lengths at T_L = 85 °C	$I_{F(AV)}$	3.5				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	90				A
Operating and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

For technical questions within your region, please contact one of the following:
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Document Number: 88737
Revision: 20-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SBYV28-50**	**SBYV28-100**	**SBYV28-150**	**SBYV28-200**	**UNIT**
Maximum instantaneous forward voltage (1)	3.5 A	T_J = 25 °C T_J = 150 °C	V_F	1.1 0.89				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 300				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	T_J = 25 °C	t_{rr}	20				ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	20				pF

Note:

(1) Pulse test: t_p = 300 µs, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**SBYV28-50**	**SBYV28-100**	**SBYV28-150**	**SBYV28-200**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	25				°C/W

Note:

(1) Lead length = 3/8" on P.C. Board with 1.5" x 1.5" copper surface

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SBYV28-200-E3/54	1.138	54	1400	13" diameter paper tape and reel
SBYV28-200-E3/73	1.138	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

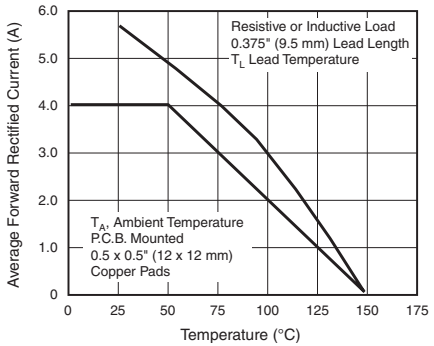


Figure 1. Forward Current Derating Curves

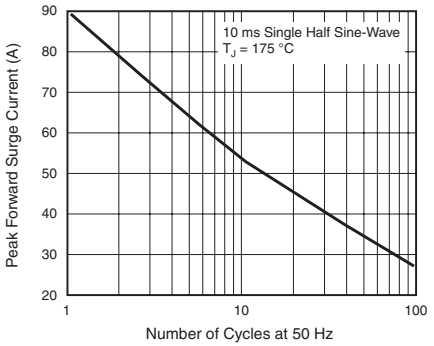


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

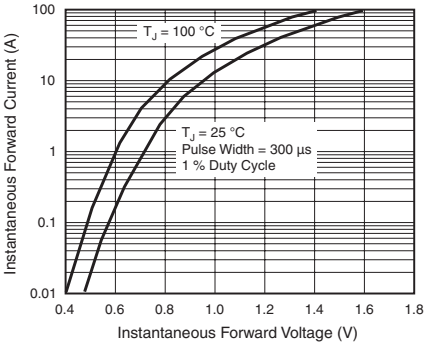


Figure 3. Typical Instantaneous Forward Characteristics

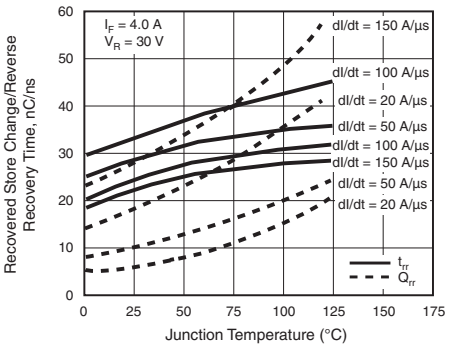


Figure 5. Reverse Switching Characteristics

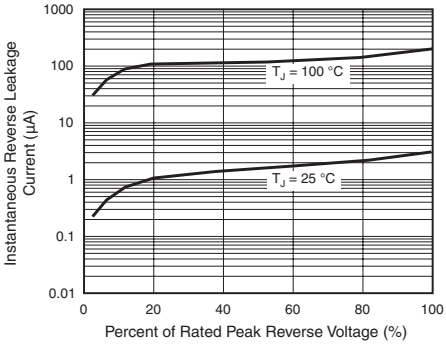


Figure 4. Typical Reverse Leakage Characteristics

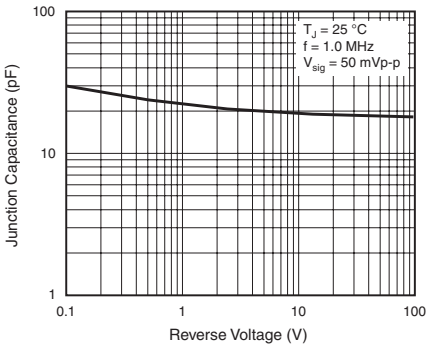
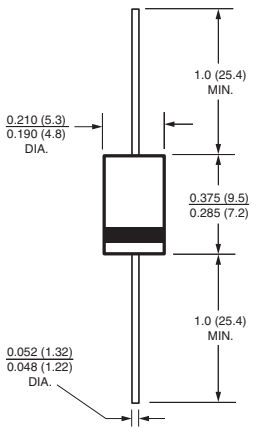


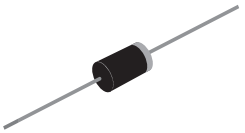
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



Ultrafast Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	200 V
I_{FSM}	150 A
t_{rr}	25 ns
V_F	0.710 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	V
Working peak reverse voltage	V_{RWM}	200	V
Maximum DC blocking voltage	V_{DC}	200	V
Maximum average forward rectified current at T_A = 80 °C (Fig. 1)	$I_{F(AV)}$	4.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150	A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A 3.0 A 4.0 A	T_J = 150 °C T_J = 25 °C T_J = 25 °C	V_F	0.710 0.875 0.890	V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	5.0 150	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25	ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	35	ns
Maximum forward recovery time	I_F = 1.0 A, di/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	25	ns

Note:

(1) Pulse test: t_p = 300 µs, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Typical thermal resistance junction to ambient (1)	$R_{\theta JA}$	28	°C/W

Note:

(1) Lead length = 1/2" on P.C. board with 1/2" x 1/2" copper surface

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MUR420-E3/54	1.138	54	1400	13" diameter paper tape and reel
MUR420-E3/73	1.138	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

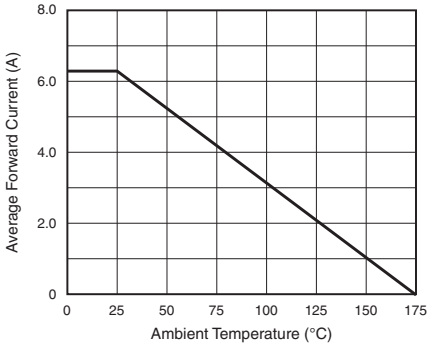


Figure 1. Forward Current Derating Curve

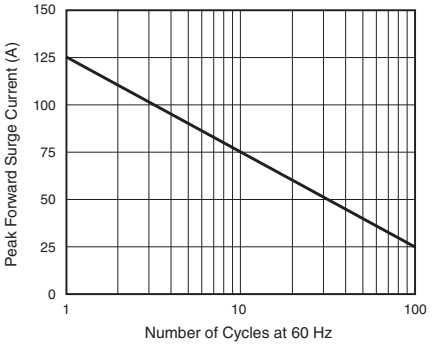


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

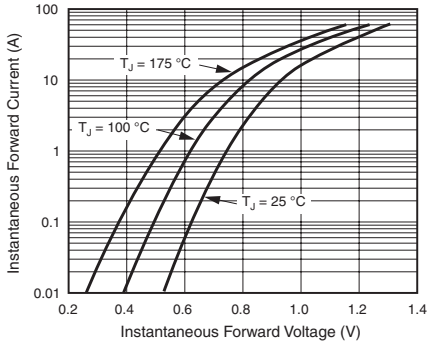


Figure 3. Typical Instantaneous Forward Characteristics

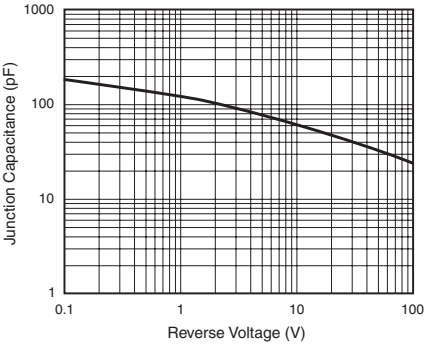


Figure 5. Typical Junction Capacitance

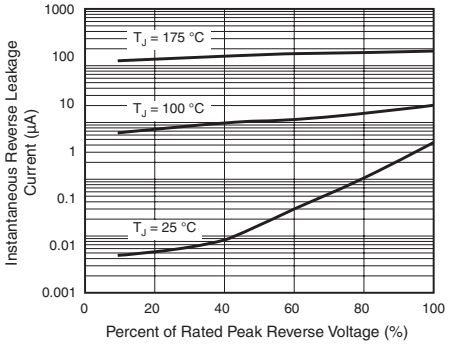
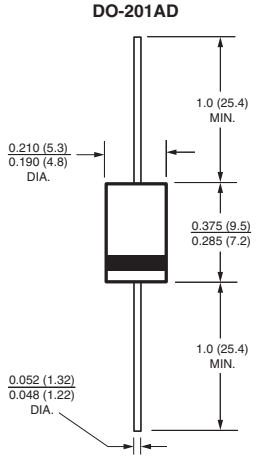
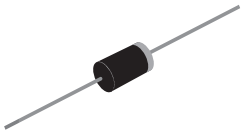


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Ultrafast Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	400 V and 600 V
I_{FSM}	125 A
t_{rr}	50 ns
V_F	1.05 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MUR440**	**MUR460**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Working peak reverse voltage	V_{RWM}	400	600	V
Maximum DC blocking voltage	V_{DC}	400	600	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	4.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125		A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		C

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Document Number: 88686
Revision: 20-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MUR440**	**MUR460**	**UNIT**
Maximum instantaneous forward voltage (1)	3.0 A 3.0 A 4.0 A	T_J = 150 °C T_J = 25 °C T_J = 25 °C	V_F	1.05 1.25 1.28		V
Maximum instantaneous reverse current at rated DC blocking voltage (1)		T_J = 25 °C T_J = 150 °C	I_R	10 250		µA
Max. reverse recovery time	I_F = 0.5, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}		t_{rr}	75		ns
Maximum forward recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, recovery to 1.0 V		t_{fr}	50		ns

Note:

(1) Pulse test: t_p = 300 µs, duty cycle ≤ 2 %

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MUR440**	**MUR460**	**UNIT**
Typical thermal resistance junction to ambient (1)	$R_{\theta JA}$	28		°C/W

Note:

(1) Lead length = 1/2" on P.C. board with 1.5" x 1.5" copper surface

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE**	**BASE QUANTITY**	**DELIVERY MODE**
MUR460-E3/54	1.138	54	1400	13" diameter paper tape
MUR460-E3/73	1.138	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

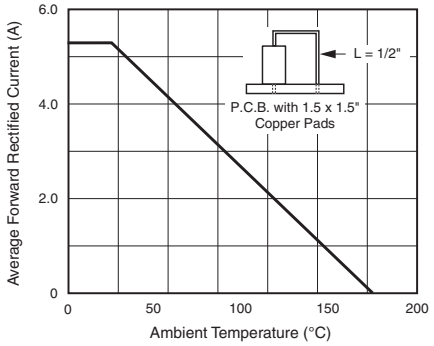


Figure 1. Forward Current Derating Curve

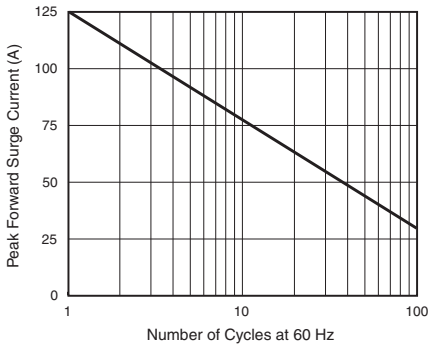


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

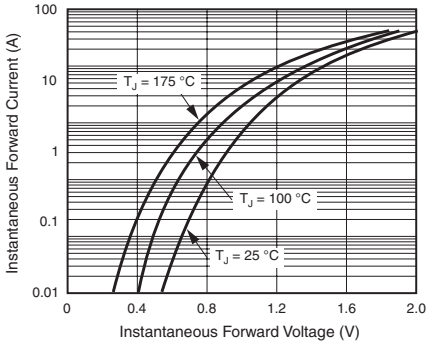


Figure 3. Typical Instantaneous Forward Characteristics

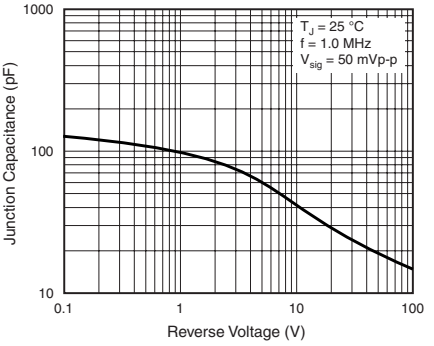


Figure 5. Typical Junction Capacitance per Leg

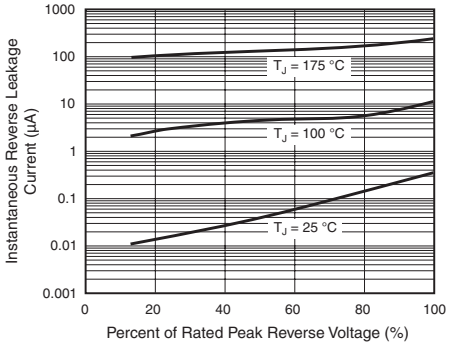
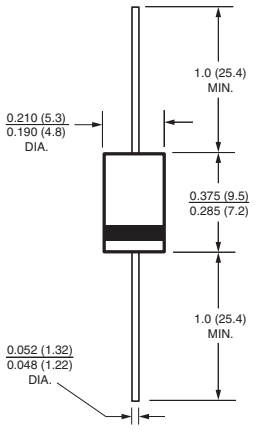


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



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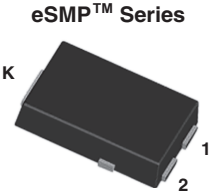
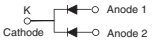
Document Number: 88686
Revision: 20-Aug-07

High Current Density Surface Mount Ultrafast Rectifiers



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 2.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	40 A
t_{rr}	25 ns
V_F at I_F = 2.0 A	0.77 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer computer, automotive and telecommunication applications.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	UH4PBC	UH4PCC	UH4PDC	UNIT
Device marking code			H4BC	H4CC	H4DC	
Maximum repetitive peak reverse voltage		V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	4.0 2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	40			A
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 175			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 1.0 A I_F = 2.0 A	T_A = 25 °C	V_F	0.84 0.93	- 1.05	V
	I_F = 1.0 A I_F = 2.0 A	T_A = 125 °C		0.68 0.77	- 0.85	
Reverse current per diode (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 6.4	5 25	µA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20	25	ns
Typical reverse recovery time per diode	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}			24	-	
Typical softness factor (t_b/t_a) per diode	I_F = 2 A, dI/dt = 200 A/µs, V_R = 200 V, Irr = 0.1 I_{RM} T_A = 125 °C		S	0.3	-	-
Typical reverse recovery current per diode			I_{RM}	5.4	-	A
Typical stored charge per diode			Q_{rr}	88	-	nC
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	21	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**UH4PBC**	**UH4PCC**	**UH4PDC**	**UNIT**	
Typical thermal resistance per diode	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 4			°C/W	

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UH4PDC-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
UH4PDC-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
UH4PDCHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
UH4PDCHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
UH4PDC-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
UH4PDC-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
UH4PDCHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
UH4PDCHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

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Document Number: 88991
Revision: 30-Jul-08

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

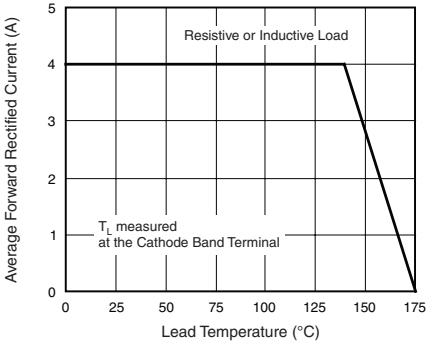


Figure 1. Maximum Forward Current Derating Curve

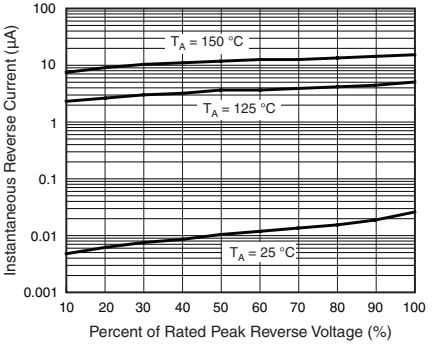


Figure 4. Typical Reverse Leakage Characteristics Per Diode

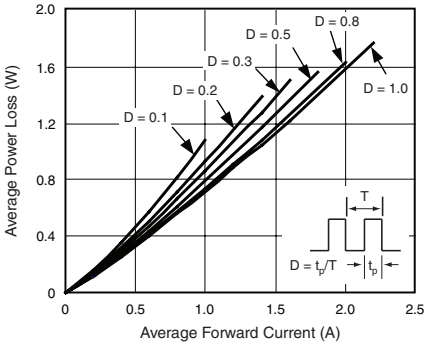


Figure 2. Forward Power Loss Characteristics Per Diode

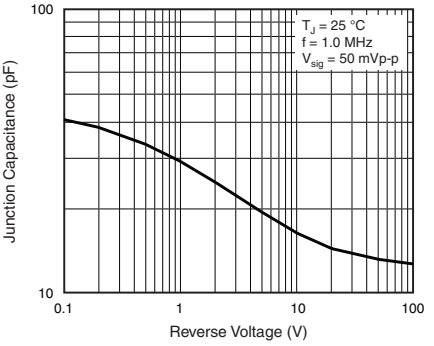


Figure 5. Typical Junction Capacitance Per Diode

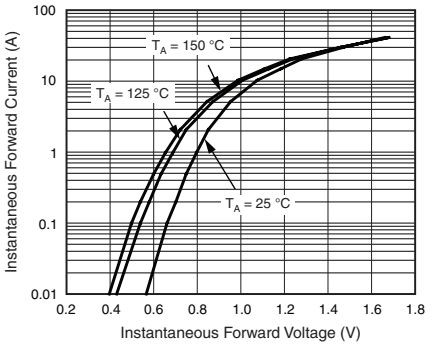


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

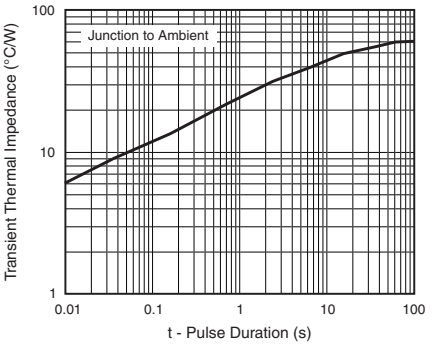
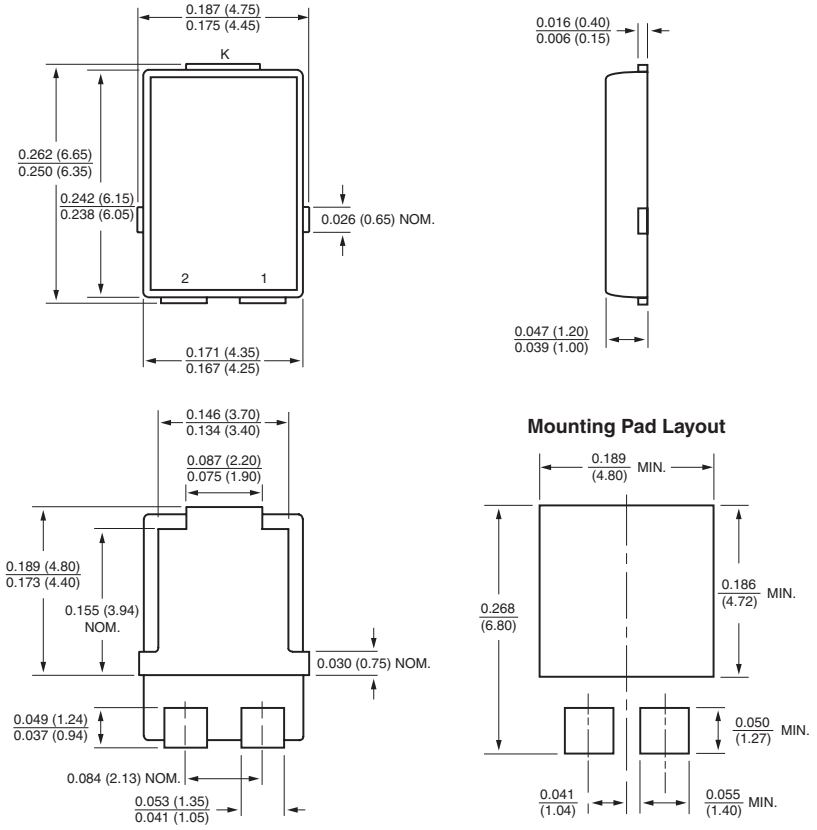


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

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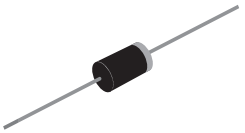
Document Number: 88991
Revision: 30-Jul-08

Miniature Ultrafast Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	150 A
t_{rr}	20 ns
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-201AD

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG4A	UG4B	UG4C	UG4D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	4.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 4.0 A		V_F	0.95	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 300	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20	ns
Typical reverse recovery time	I_F = 4.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	30 50	ns
Typical stored charge	I_F = 4.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	15 30	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	20	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**UG4A**	**UG4B**	**UG4C**	**UG4D**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	25				°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UG4D-E3/54	1.138	54	1400	13" diameter paper tape and reel
UG4D-E3/73	1.138	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

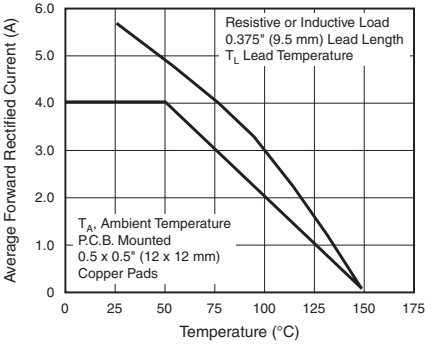


Figure 1. Forward Current Derating Curves

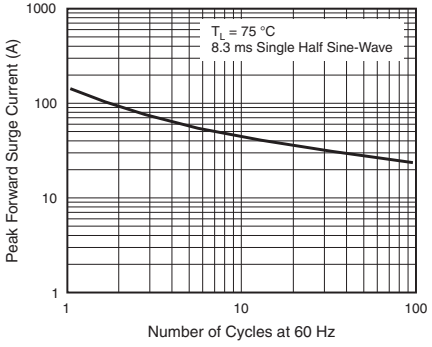


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

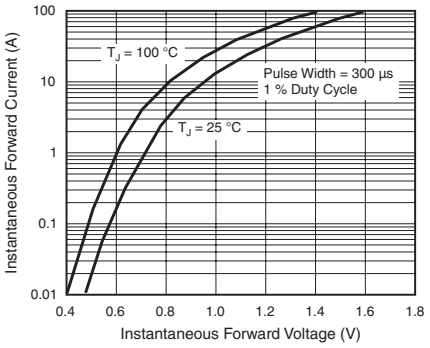


Figure 3. Typical Instantaneous Forward Characteristics

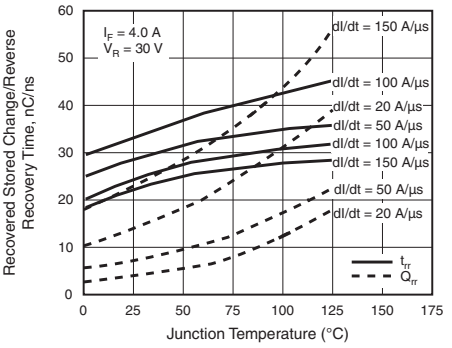


Figure 5. Reverse Switching Charateristics

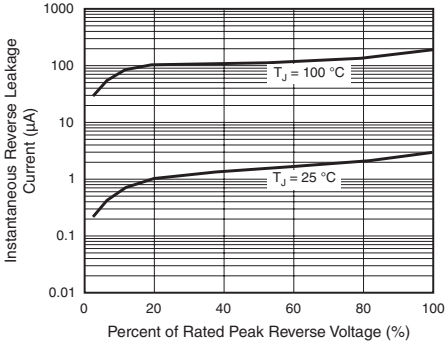


Figure 4. Typical Reverse Leakage Characteristics

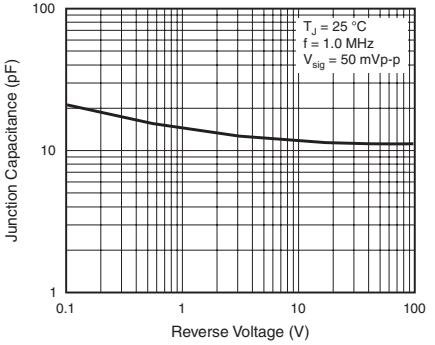
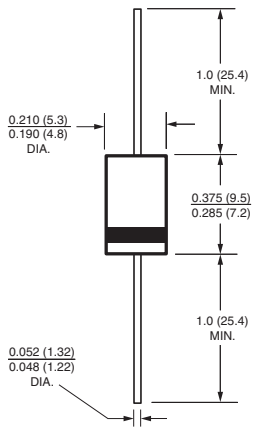


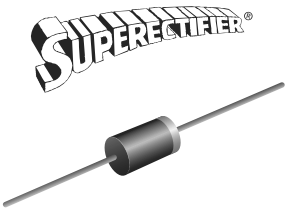
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



Glass Passivated Ultrafast Rectifier



GP20

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	50 V to 400 V
I_{FSM}	150 A
t_{rr}	50 ns
V_F	0.95 V, 1.25 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

MECHANICAL DATA

Case: GP20, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EGP50A	EGP50B	EGP50C	EGP50D	EGP50F	EGP50G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_L = 55 °C	$I_{F(AV)}$	5						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150						A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 150						°C

For technical questions within your region, please contact one of the following:
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Document Number: 88585
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	EGP50A	EGP50B	EGP50C	EGP50D	EGP50F	EGP50G	UNIT
Maximum instantaneous forward voltage	5.0 A		V_F	0.95				1.25		V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0						μA
		T_A = 125 °C		50						
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	50						ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	95				75		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	EGP50A	EGP50B	EGP50C	EGP50D	EGP50F	EGP50G	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	20						°C/W
	$R_{\theta JL}$ (1)	5.0						

Note

(1) Thermal resistance from junction to ambient, and from junction to lead at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
EGP50G-E3/54	1.01	54	1400	13" diameter paper tape and reel
EGP50G-E3/73	1.01	73	1000	Ammo pack packaging
EGP50GHE3/54 (1)	1.01	54	1400	13" diameter paper tape and reel
EGP50GHE3/73 (1)	1.01	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

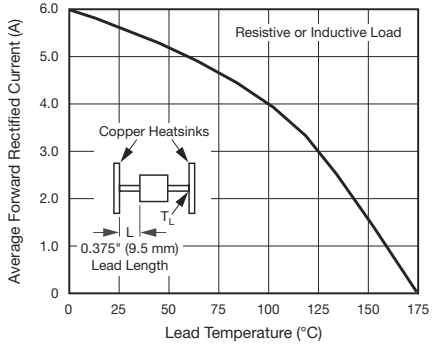


Fig. 1 - Maximum Forward Current Derating Curve

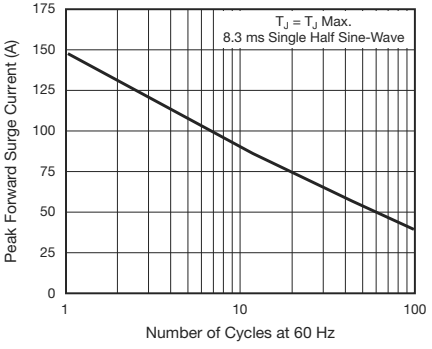


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

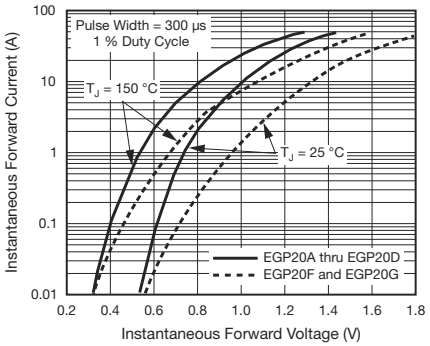


Fig. 3 - Typical Instantaneous Forward Characteristics

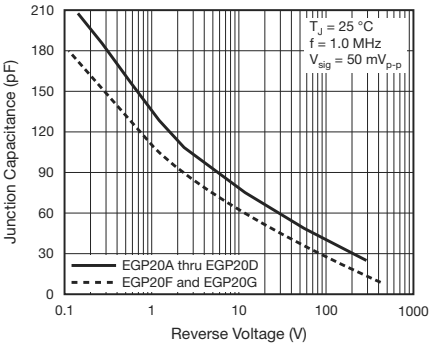


Fig. 5 - Typical Junction Capacitance

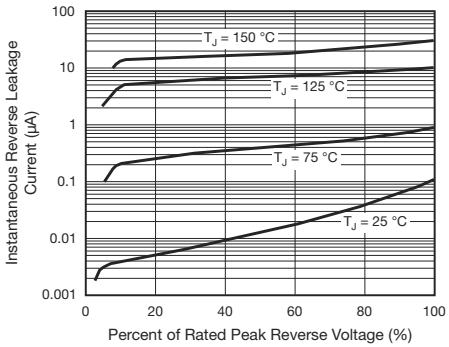


Fig. 4 - Typical Reverse Leakage Characteristics

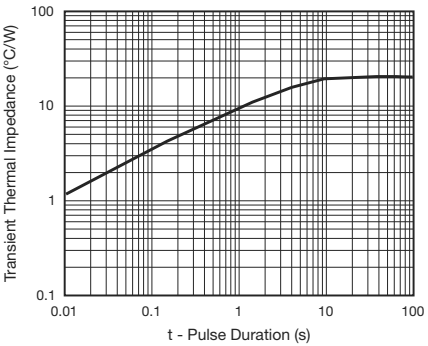
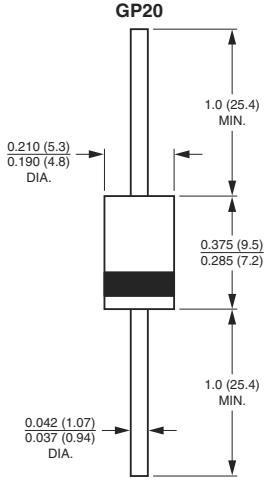


Fig. 6 - Typical Transient Thermal Impedance

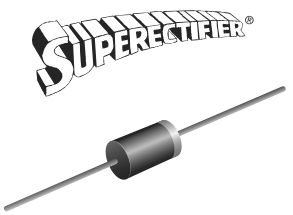
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



FGP50B thru FGP50D

Vishay General Semiconductor

Glass Passivated Ultrafast Rectifier



GP20

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	100 V to 200 V
I_{FSM}	135 A
t_{rr}	35 ns
V_F	0.95 V
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: GP20, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FGP50B	FGP50C	FGP50D	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (fig. 1)	$I_{F(AV)}$	5.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	135			A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175			°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

FGP50B thru FGP50D

Vishay General Semiconductor

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	FGP50B	FGP50C	FGP50D	UNIT
Maximum instantaneous forward voltage	5.0 A		V_F (1)	0.95			V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0			μA
		T_A = 100 °C		50			
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35			ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	100			pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	FGP50B	FGP50C	FGP50D	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	60			°C/W
	$R_{\theta JL}$ (2)	20			

Notes

(1) Thermal resistance from junction to lead at 0.375" (9.5 mm) lead length with both leads attached to heatsinks

(2) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length and mounted on PCB

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
FGP50D-E3/54	1.01	54	1400	13" diameter paper tape and reel
FGP50D-E3/73	1.01	73	2000	Ammo pack packaging
FGP50DHE3/54 (1)	1.01	54	1400	13" diameter paper tape and reel
FGP50DHE3/73 (1)	1.01	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

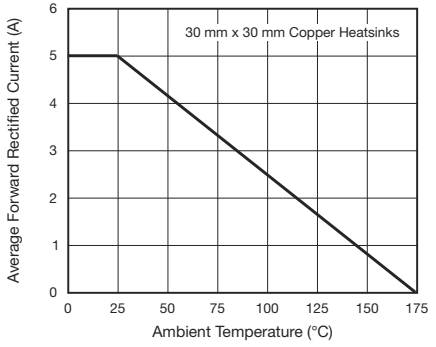


Fig. 1 - Maximum Forward Current Derating Curve

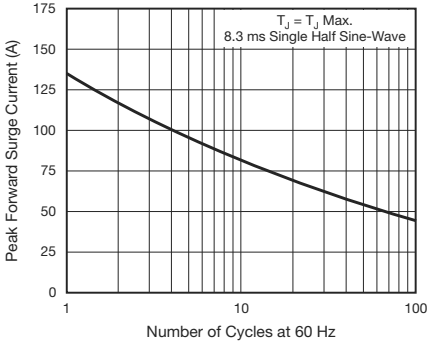


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

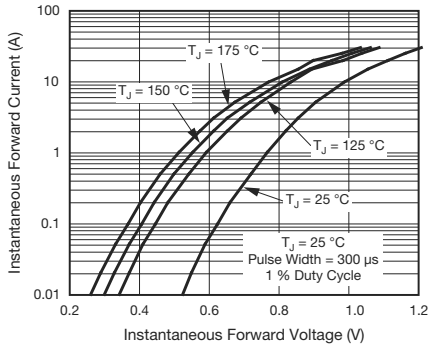


Fig. 3 - Typical Instantaneous Forward Characteristics

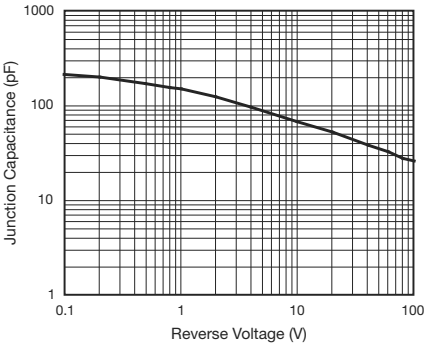


Fig. 5 - Typical Junction Capacitance

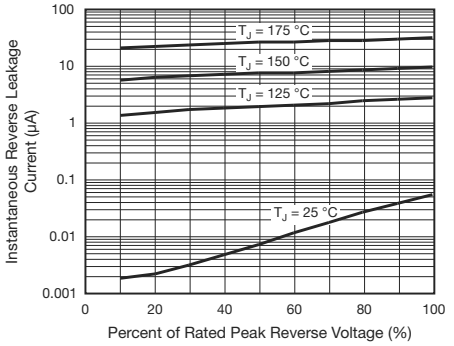
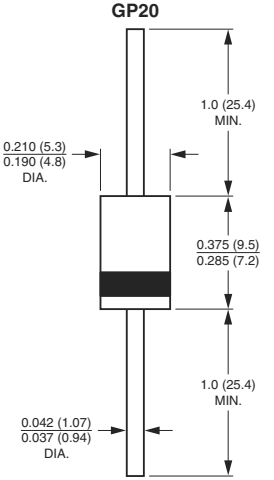
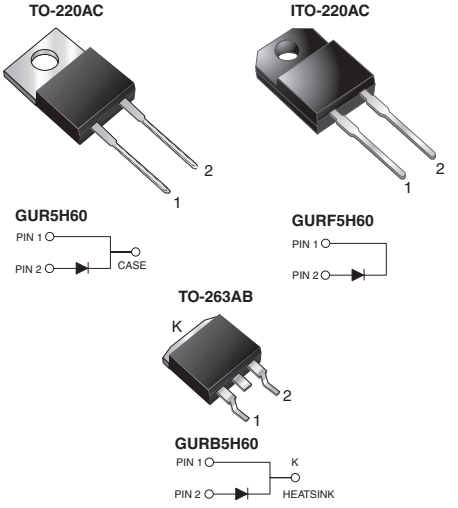


Fig. 4 - Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage and high frequency power factor corrector, freewheeling diodes and secondary dc-to-dc rectification application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	600 V
I_{FSM}	90 A
t_{rr}	30 ns
V_F	1.6 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	600	V
Maximum working reverse voltage	V_{RWM}	480	V
Maximum RMS voltage	V_{RMS}	420	V
Maximum DC blocking voltage	V_{DC}	600	V
Maximum average forward rectified current	$I_{F(AV)}$	5	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	90	A
Reverse energy	E_R	10	mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 5 A	T_J = 25 °C T_J = 150 °C	V_F	1.8 1.6	V
Maximum DC reverse current	V_{RWM}	T_J = 25 °C T_J = 150 °C	I_R	20 400	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	30	ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**GUR**	**GURF**	**GURB**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.0	3.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	GUR5H60-E3/45	1.80	45	50/tube	Tube
ITO-220AC	GURF5H60-E3/45	1.95	45	50/tube	Tube
TO-263AB	GURB5H60-E3/45	1.33	45	50/tube	Tube
TO-263AB	GURB5H60-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	GUR5H60HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	GURF5H60HE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	GURB5H60HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	GURB5H60HE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

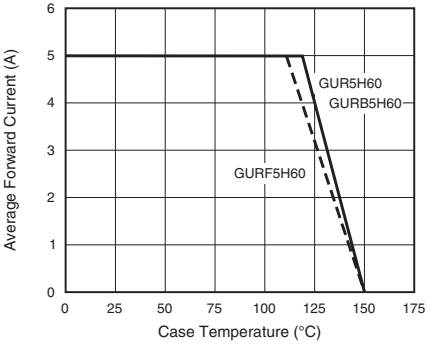


Figure 1. Forward Current Derating Curve

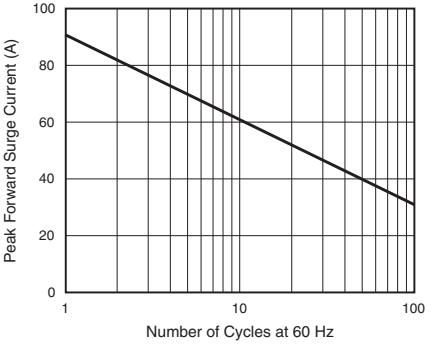


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

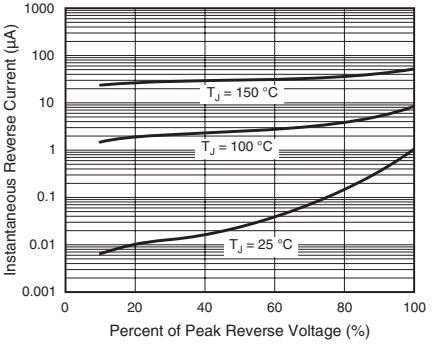


Figure 3. Typical Reverse Current

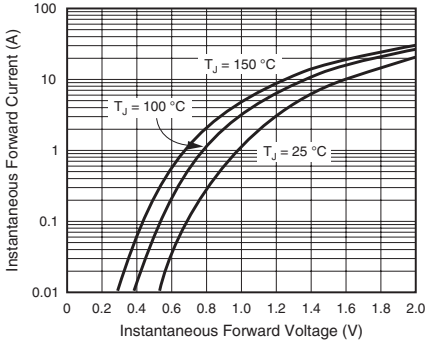


Figure 4. Typical Forward Voltage

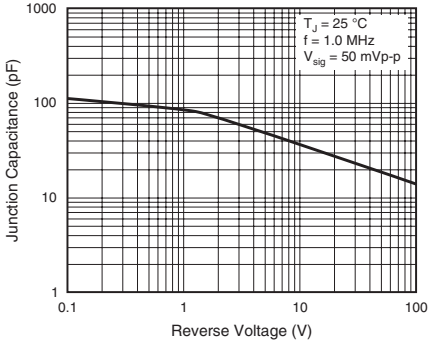
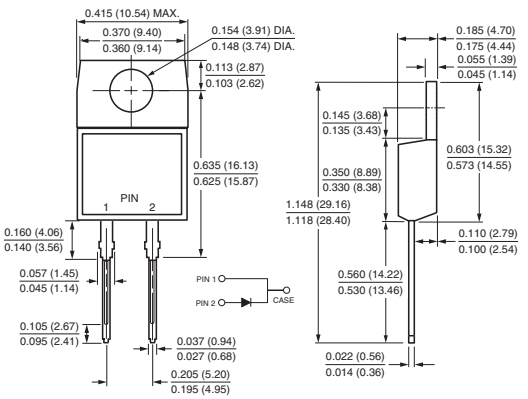


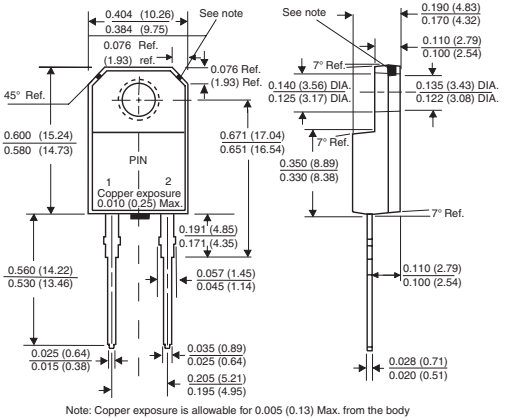
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC

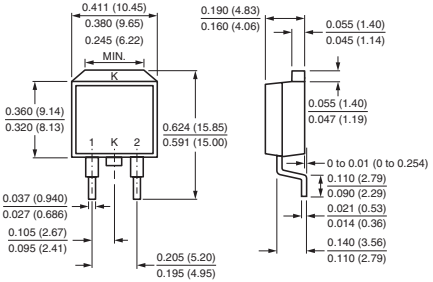


ITO-220AC

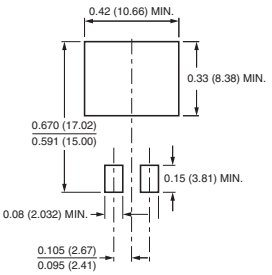


Note: Copper exposure is allowable for 0.005 (0.13) Max. from the body

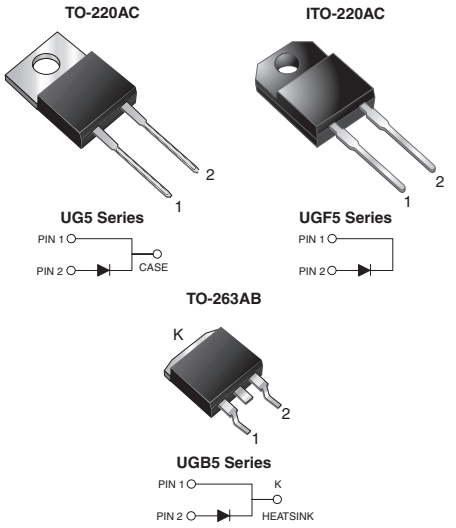
TO-263AB



Mounting Pad Layout



High Voltage Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage and high frequency power factor corrector, freewheeling diodes and secondary dc-to-dc rectification application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	500 V, 600 V
I_{FSM}	65 A
t_{rr}	25 ns
V_F	1.5 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG5HT	UG5JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	500	600	V
Maximum working reverse voltage	V_{RWM}	400	480	V
Maximum RMS voltage	V_{RMS}	350	420	V
Maximum DC blocking voltage	V_{DC}	500	600	V
Maximum average forward rectified current	$I_{F(AV)}$	5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	65		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG5HT**	**UG5JT**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 5 A I_F = 5 A	T_J = 25 °C T_J = 125 °C	V_F	1.75 1.50		V
Maximum DC reverse current at V_{RWM}		T_J = 25 °C T_J = 100 °C T_J = 125 °C	I_R	30 800 4.0		µA µA mA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Typical softness factor (t_b/t_a)	I_F = 5.0 A, dI/dt = 240 A/µs, V_R = 400 V, I_{rr} = 0.1 I_{RM}		S	0.9		-
Maximum reverse recovery current	I_F = 5.0 A, dI/dt = 40 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	3.0		A
Maximum reverse recovery current	I_F = 5.0 A, dI/dt = 240 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	9.0		A
Peak forward recovery time	I_F = 5.0 A, dI/dt = 64 A/µs, V_F = 1.1 $V_{F\ max.}$		t_{fr}	500		ns

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG5**	**UGF5**	**UGB5**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	3.0	5.5	3.0	°C/W

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UG5JT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF5JT-E3/45	1.95	45	50/tube	Tube
TO-263AB	UGB5JT-E3/45	1.33	45	50/tube	Tube
TO-263AB	UGB5JT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	UG5JTHE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	UGF5JTHE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	UGB5JTHE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	UGB5JTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

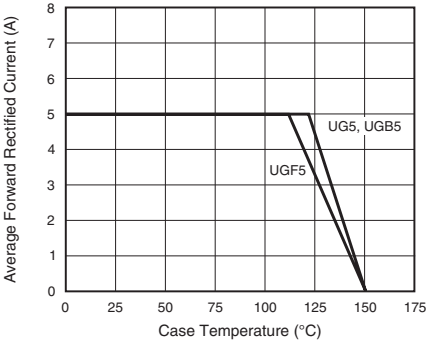


Figure 1. Forward Current Derating Curve

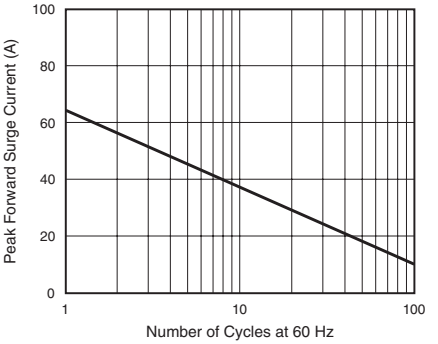


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

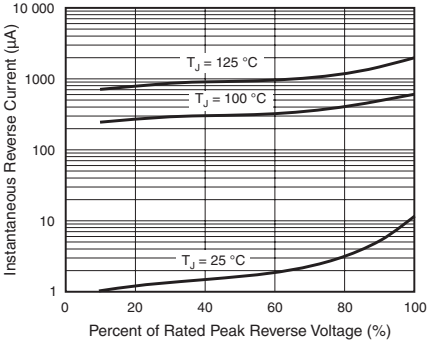


Figure 3. Typical Reverse Charateristics

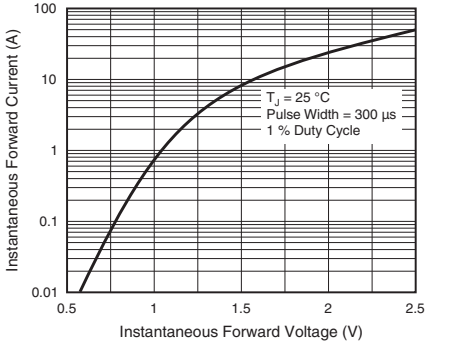


Figure 4. Typical Instantaneous Forward Charateristics

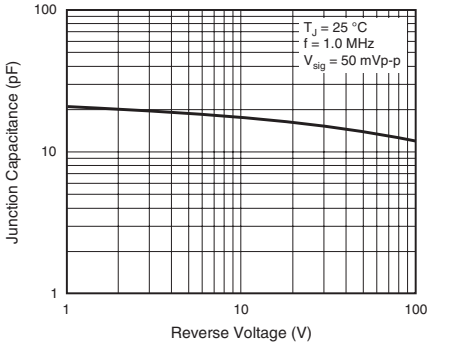


Figure 5. Typical Junction Capacitance

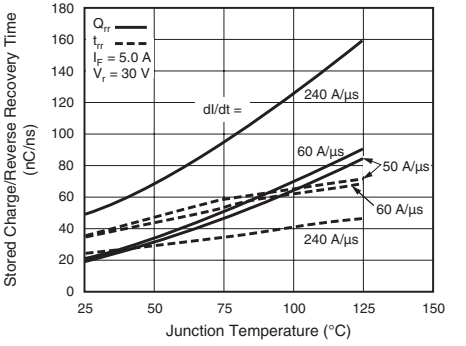
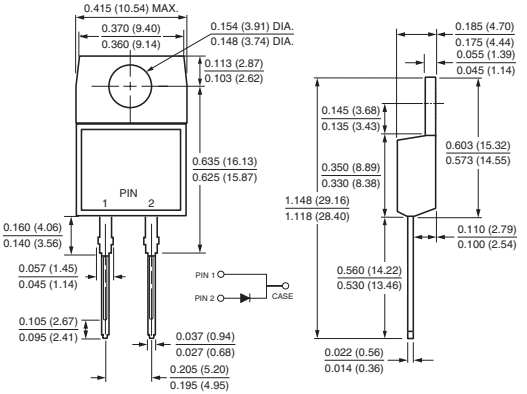


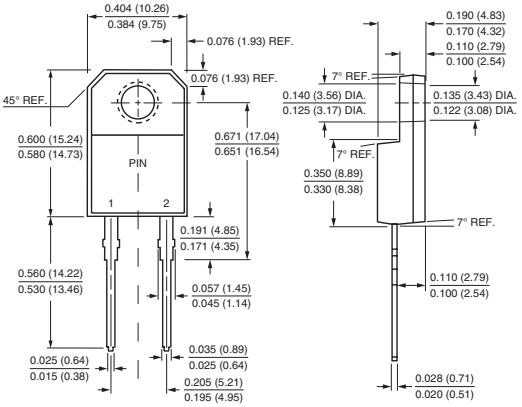
Figure 6. Reverse Switching Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

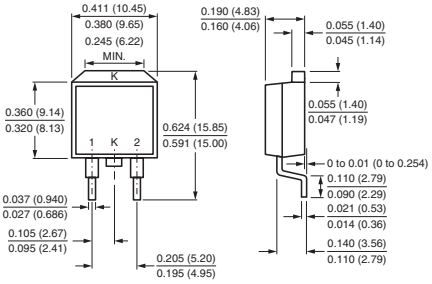
TO-220AC



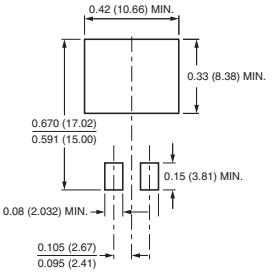
ITO-220AC



TO-263AB



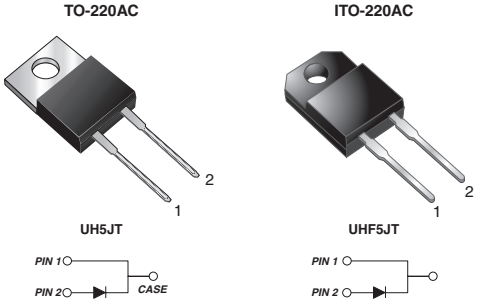
Mounting Pad Layout



UH5JT & UH5JT

Vishay General Semiconductor

High Voltage Ultrafast Rectifier



FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage continuous mode power factor correctors (CCM PFC), switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	600 V
I_{FSM}	60 A
t_{rr}	25 ns
V_F at I_F = 5.0 A	1.39 V
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UH5JT	UHF5JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	600		V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	8		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	60		A
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage (1)	I_F = 2.5 A I_F = 5.0 A	T_A = 25 °C	V_F	1.71 2.3	- 3.0	V
	I_F = 2.5 A I_F = 5.0 A	T_A = 125 °C		1.13 1.39	- 1.8	

For technical questions within your region, please contact one of the following:
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Document Number: 88999
Revision: 13-May-08

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Reverse current (2)	V_R = 600 V	T_A = 25 °C T_A = 125 °C	I_R	- -	5.0 100	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	-	25	ns
	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}			-	40	
Typical softness factor (t_b/t_a)	I_F = 5 A, dI/dt = 200 A/µs, V_R = 400 V, T_J = 125 °C		S	0.55	-	-
Typical reverse recovery current			I_{RM}	5.8	7.0	A
Typical stored charge			Q_{rr}	140	-	nC
Typical forward recovery time	I_F = 5 A, dI/dt = 40 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	160	-	ns

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UH5JT**	**UHF5JT**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	3.0	6.6	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UH5JT-E3/4W	1.83	4W	50/tube	Tube
ITO-220AC	UHF5JT-E3/4W	1.70	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

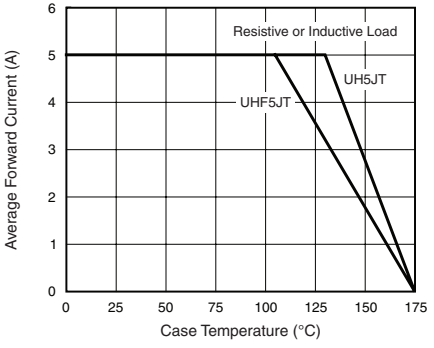


Figure 1. Maximum Forward Current Derating Curve

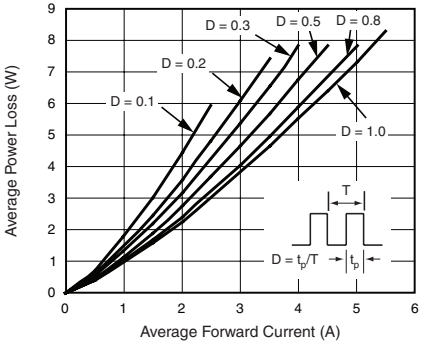


Figure 2. Forward Power Loss Characteristics

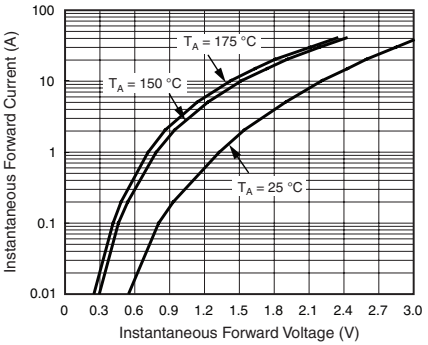


Figure 3. Typical Instantaneous Forward Characteristics

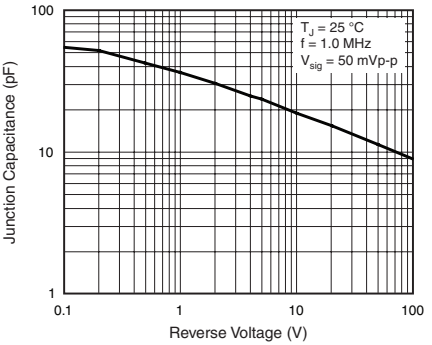


Figure 5. Typical Junction Capacitance

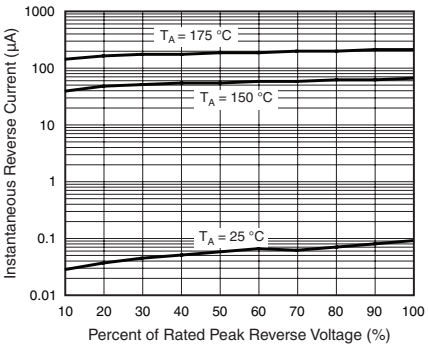


Figure 4. Typical Reverse Leakage Characteristics

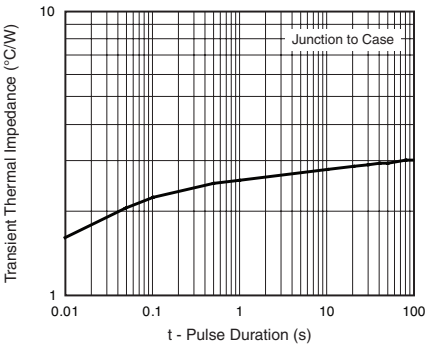
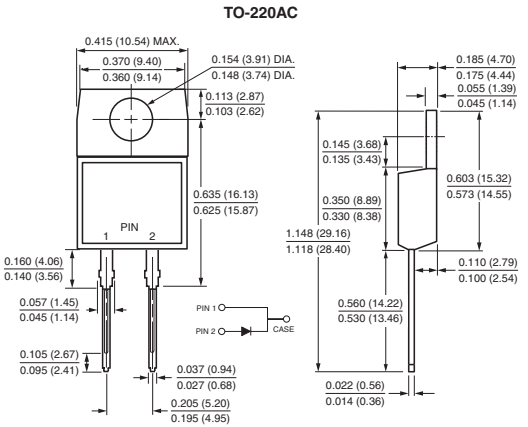
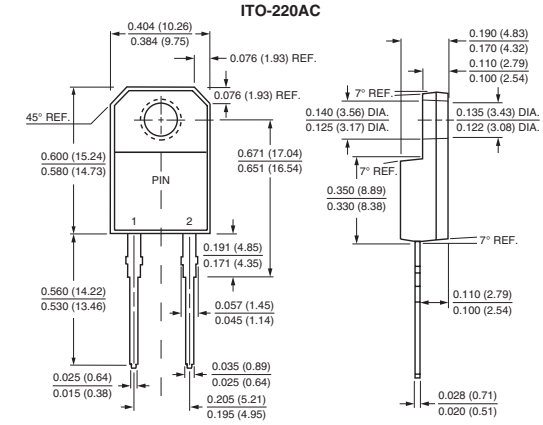


Figure 6. Typical Transient Thermal Impedance

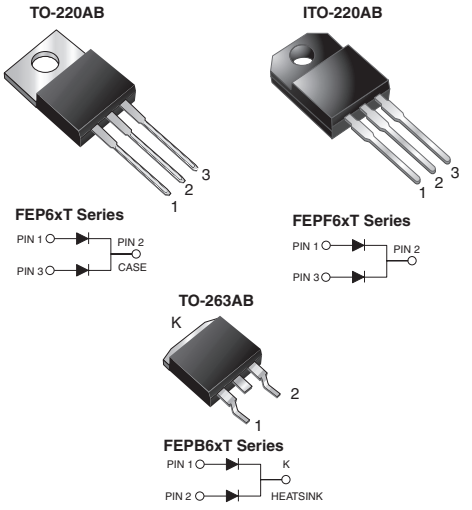
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual Common-Cathode Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	75 A
t_{rr}	35 ns
V_F	0.975 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FEP6AT	FEP6BT	FEP6CT	FEP6DT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 105 °C	$I_{F(AV)}$	6.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	75				A
Operating storage and temperature range	T_J, T_{STG}	- 55 to + 150				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**FEP6AT**	**FEP6BT**	**FEP6CT**	**FEP6DT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	3.0 A		V_F	0.975				V
Maximum DC reverse current at rated DC blocking voltage per diode		T_C = 25 °C T_C = 100 °C	I_R	5.0 50				μA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35				ns
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	28				pF

Note:

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**FEP6**	**FEPF6**	**FEPB6**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	3.6	5.1	3.6	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	FEP6DT-E3/45	1.81	45	50/tube	Tube
ITO-220AB	FEPF6DT-E3/45	1.97	45	50/tube	Tube
TO-263AB	FEPB6DT-E3/45	1.33	45	50/tube	Tube
TO-263AB	FEPB6DT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AB	FEP6DTHE3/45 (1)	1.81	45	50/tube	Tube
ITO-220AB	FEPF6DTHE3/45 (1)	1.97	45	50/tube	Tube
TO-263AB	FEPB6DTHE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	FEPB6DTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

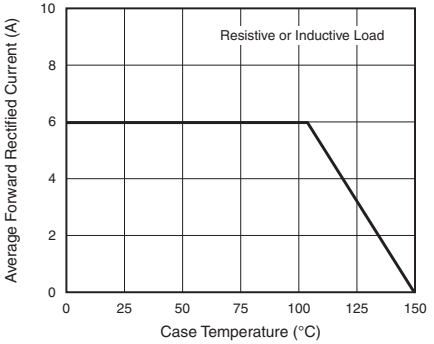


Figure 1. Maximum Forward Current Derating Curve

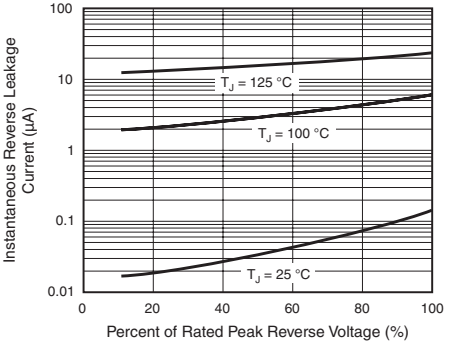


Figure 4. Typical Reverse Leakage Characteristics Per Diode

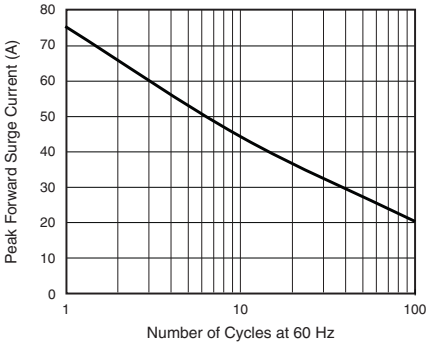


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

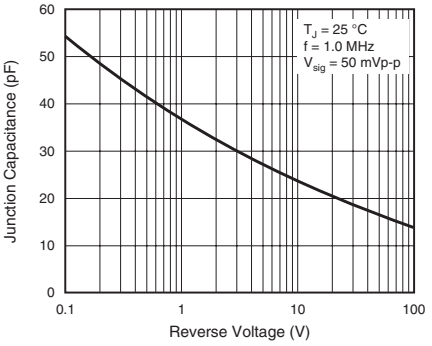


Figure 5. Typical Junction Capacitance Per Diode

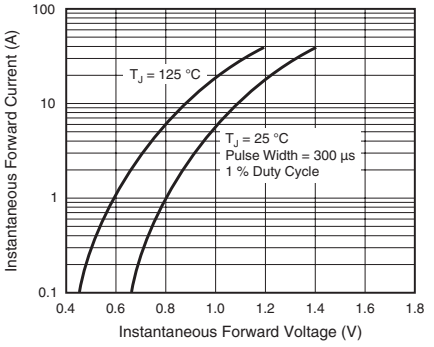
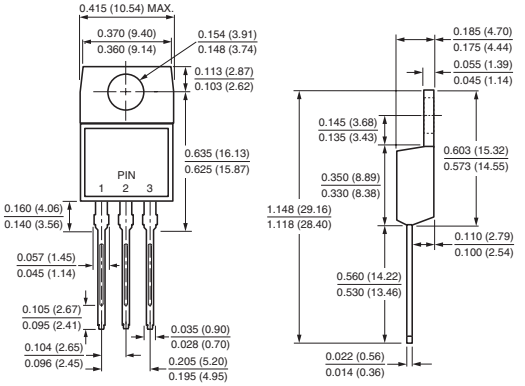


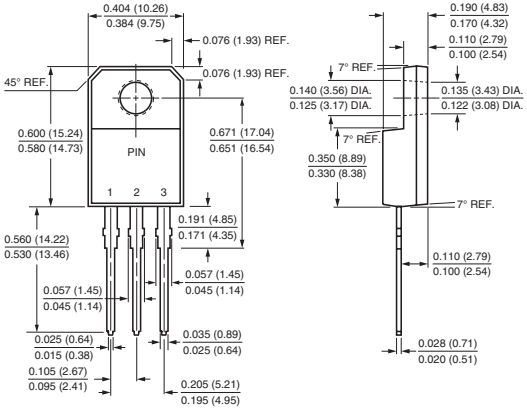
Figure 3. Typical Instantaneous Forward Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

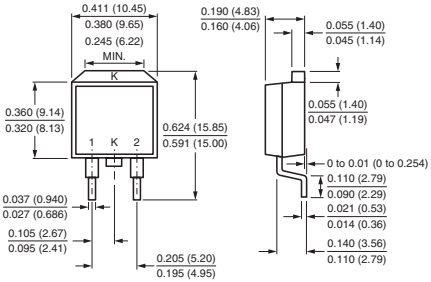
TO-220AB



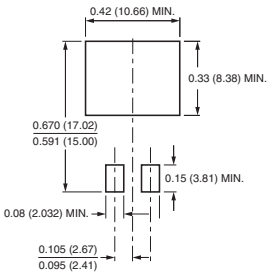
ITO-220AB



TO-263AB



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
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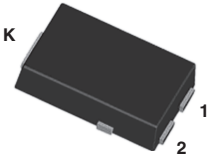
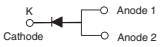
High Current Density Surface Mount Ultrafast High Voltage Rectifier

eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	600 V
I_{FSM}	80 A
t_{rr}	25 ns
V_F at I_F = 6.0 A	1.59 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high voltage, high frequency power factor corrections, switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**UH6PJ**	**UNIT**
Device marking code		H6PJ	
Maximum repetitive peak reverse voltage	V_{RRM}	600	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	6.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80	A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175	°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 3.0 A I_F = 6.0 A	T_A = 25 °C	V_F	1.98 2.45	- 3.0	V
	I_F = 3.0 A I_F = 6.0 A	T_A = 125 °C		1.23 1.59	- 1.8	
Reverse current (2)	V_R = 600 V	T_A = 25 °C T_A = 125 °C	I_R	- 28	10 200	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20	25	ns
	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}			30	45	
Typical softness factor (t_b/t_a)	I_F = 6 A, dI/dt = 200 A/µs, V_R = 400 V, T_J = 125 °C		S	0.88	-	-
Typical reverse recovery current			I_{RM}	6.1	-	A
Typical stored charge			Q_{rr}	150	-	nC
Typical forward recovery time	I_F = 6 A, dI/dt = 48 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	155	-	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	30	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**UH6PJ**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	90 5	°C/W

Notes:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

(2) Pulse measurement

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
UH6PJ-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
UH6PJ-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
UH6PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
UH6PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

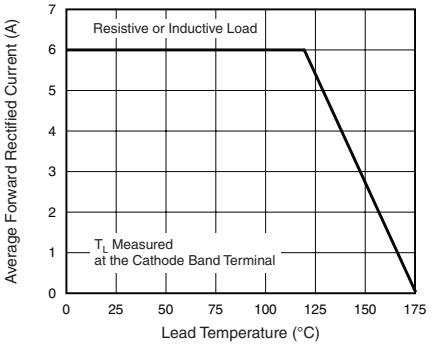


Figure 1. Maximum Forward Current Derating Curve

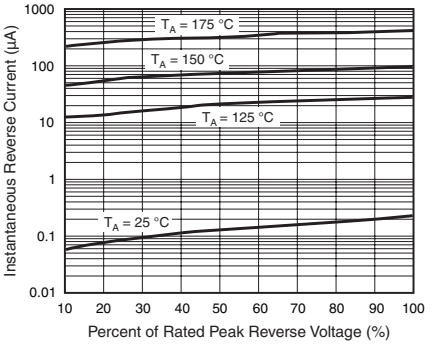


Figure 4. Typical Reverse Characteristics

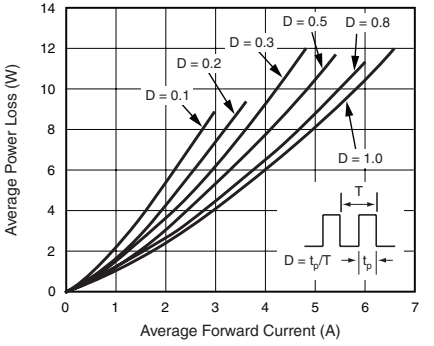


Figure 2. Forward Power Loss Characteristics

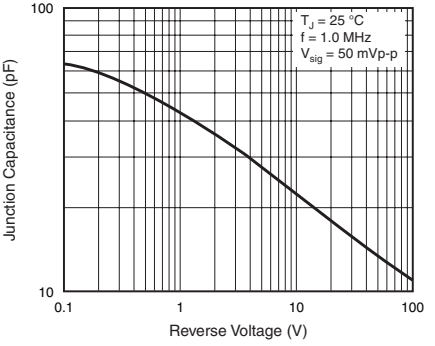


Figure 5. Typical Junction Capacitance

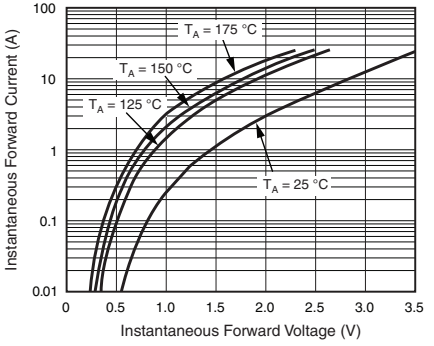
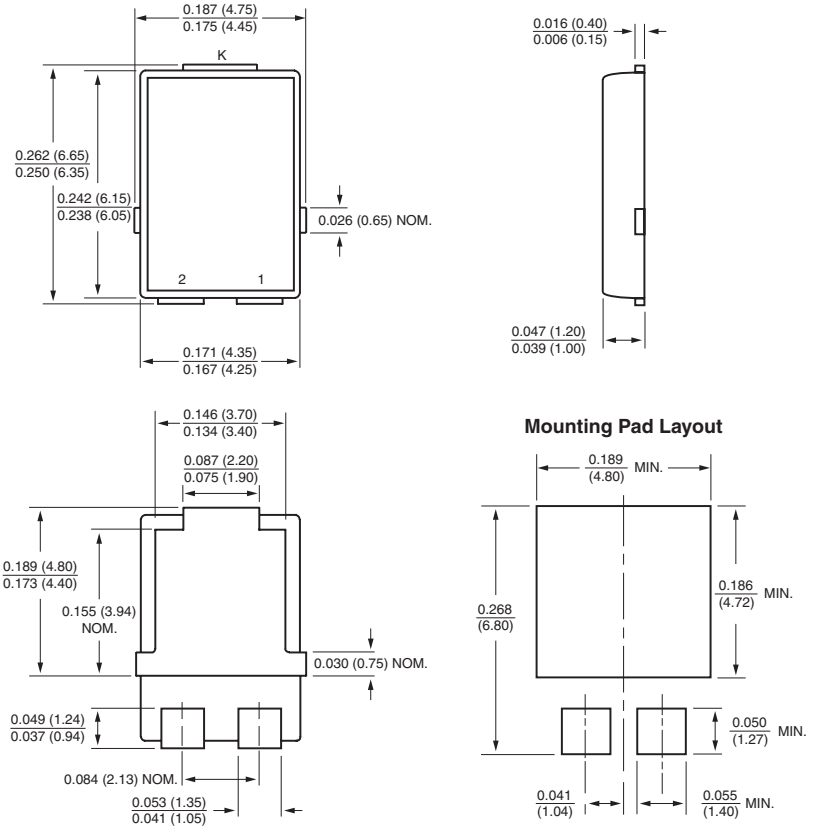


Figure 3. Typical Instantaneous Forward Characteristics

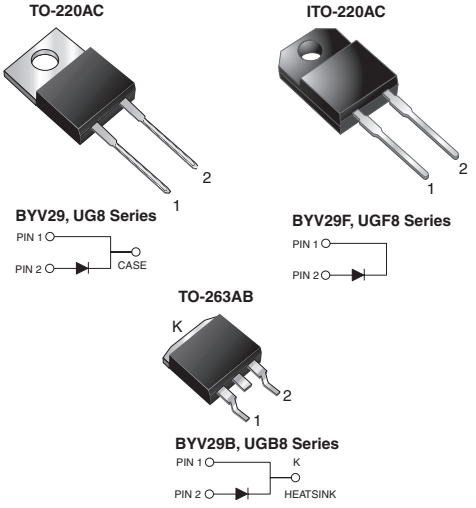
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	300 V, 400 V
I_{FSM}	110 A
t_{rr}	35 ns
V_F	1.03 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYV29-300 UG8FT	BYV29-400 UG8GT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	300	400	V
Maximum working reverse voltage	V_{RWM}	300	400	V
Maximum RMS voltage	V_{RMS}	210	280	V
Maximum DC blocking voltage	V_{DC}	300	400	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	8.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	110		A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150		°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYV29-300 UG8FT**	**BYV29-400 UG8GT**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 8 A I_F = 8 A I_F = 20 A	T_J = 25 °C T_J = 150 °C T_J = 25 °C	V_F	1.25 1.03 1.40		V
Maximum DC reverse current at V_{RRM}		T_C = 25 °C T_C = 100 °C	I_R	10 350		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Maximum reverse recovery current	I_F = 10 A, dI/dt = 50 A/µs, V_R = 30 V, T_C = 100 °C		I_{RM}	5.5		A
Maximum recovered stored charged	I_F = 2 A, dI/dt = 20 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		Q_{rr}	55		nC

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYV29 UG8**	**BYV29F UGF8**	**BYV29B UGB8**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.5	5.5	2.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	BYV29-400-E3/45	1.80	45	50/tube	Tube
ITO-220AC	BYV29F-400-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYV29B-400-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYV29B-400-E3/81	1.77	81	800/reel	Tape and reel
TO-220AC	BYV29-400HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	BYV29F-400HE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	BYV29B-400HE3/45 (1)	1.77	45	50/tube	Tube
TO-263AB	BYV29B-400HE3/81 (1)	1.77	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

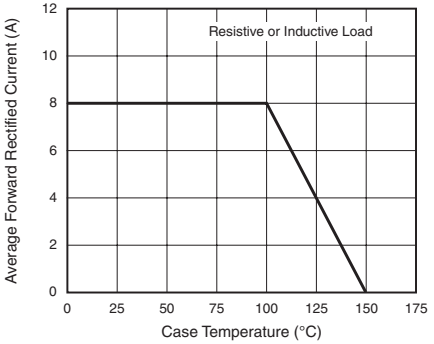


Figure 1. Maximum Forward Current Derating Curve

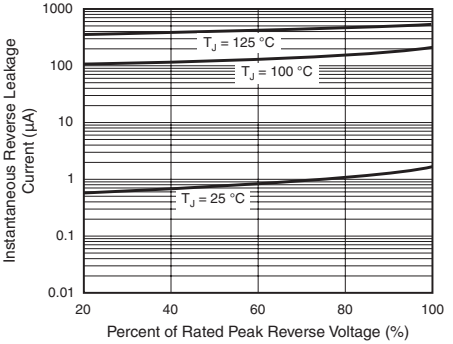


Figure 4. Typical Reverse Leakage Charateristics

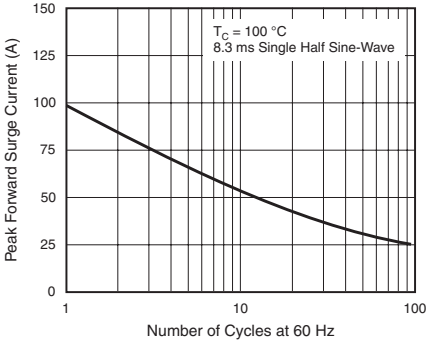


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

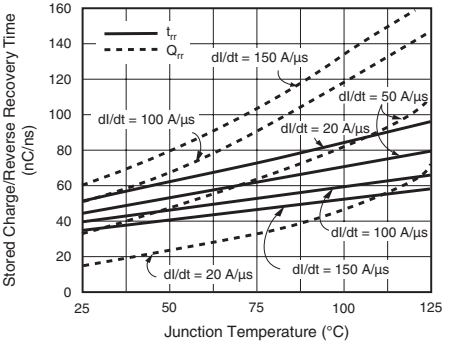


Figure 5. Reverse Switching Characteristics Per Leg

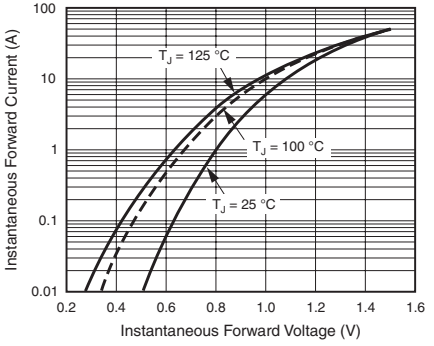


Figure 3. Typical Instantaneous Forward Charateristics

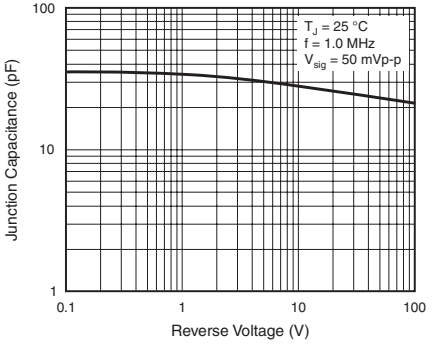
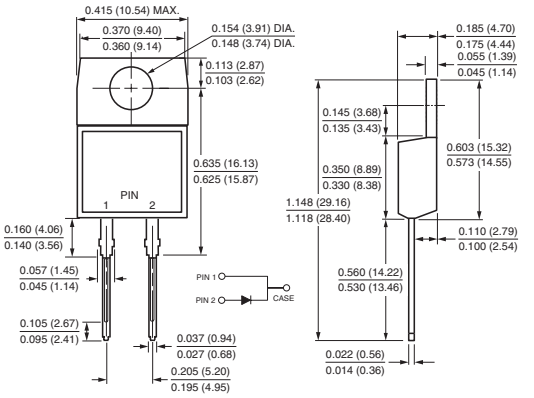


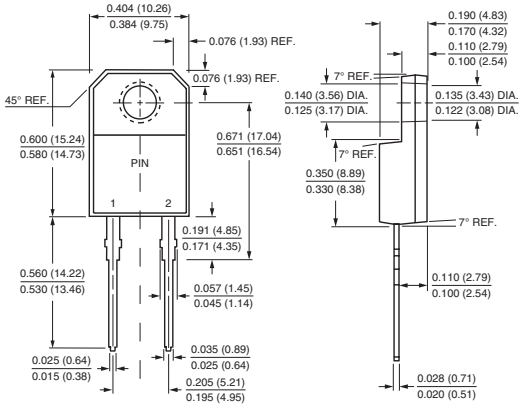
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

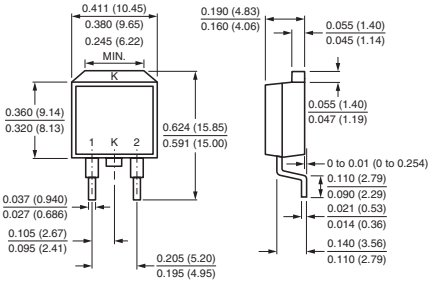
TO-220AC



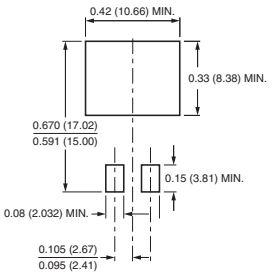
ITO-220AC



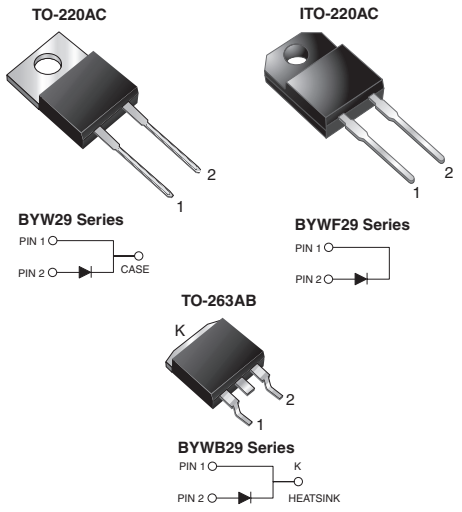
TO-263AB



Mounting Pad Layout



Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	100 A
t_{rr}	25 ns
V_F	0.8 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYW29-50	BYW29-100	BYW29-150	BYW29-200	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 105 °C	$I_{F(AV)}$	8.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100				A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 150				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYW29-50**	**BYW29-100**	**BYW29-150**	**BYW29-200**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 20 A I_F = 8.0 A	T_J = 25 °C T_J = 150 °C	V_F	1.3 0.8				V
Maximum DC reverse current at rated DC blocking voltage		T_C = 25 °C T_C = 100 °C	I_R	10 500				µA
Maximum reverse recovery time	I_F = 1 A, V_R = 30 V, dI/dt = 100 A/µs, I_{rr} = 10 % I_{RM}		t_{rr}	25				ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	45				pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYW**	**BYWF**	**BYWB**	**UNIT**
Typical thermal resistance from junction to case per leg	$R_{\theta JC}$	2.5	5.5	2.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	BYW29-200-E3/45	1.80	45	50/tube	Tube
ITO-220AC	BYWF29-200-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYWB29-200-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYWB29-200-E3/81	1.77	81	800/reel	Tape and reel
TO-220AC	BYW29-200HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	BYWF29-200HE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	BYWB29-200HE3/45 (1)	1.77	45	50/tube	Tube
TO-263AB	BYWB29-200HE3/81 (1)	1.77	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

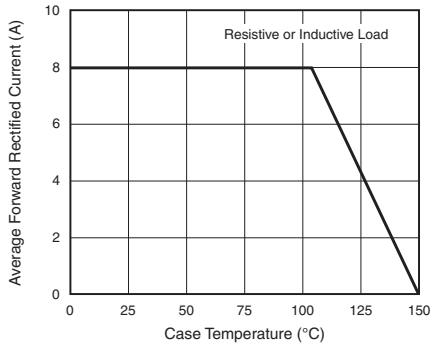


Figure 1. Maximum Forward Current Derating Curve

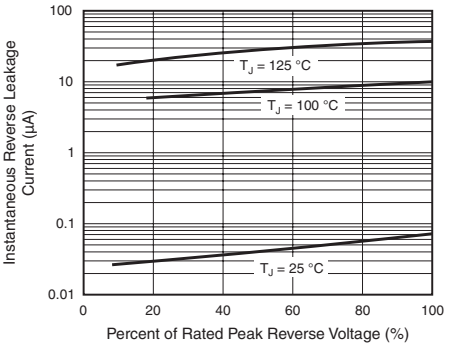


Figure 4. Typical Reverse Leakage Charateristics

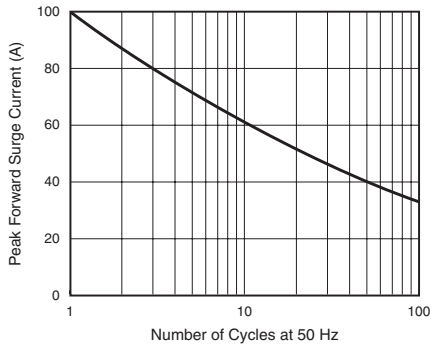


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

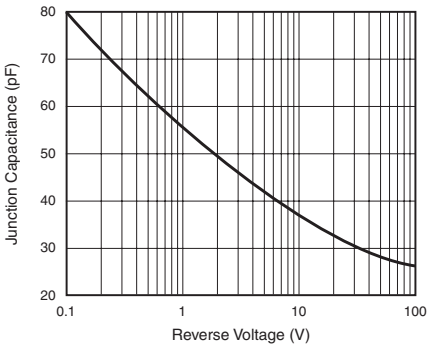


Figure 5. Typical Junction Capacitance

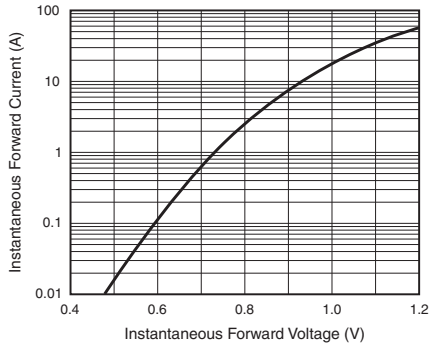
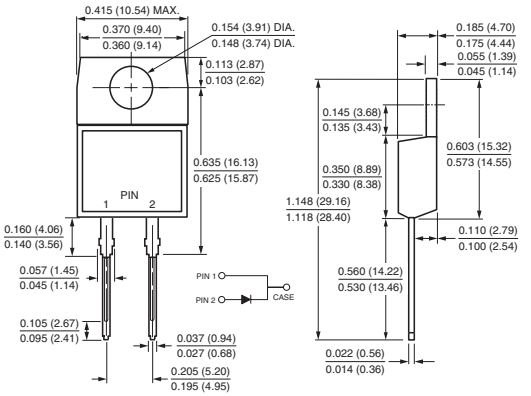


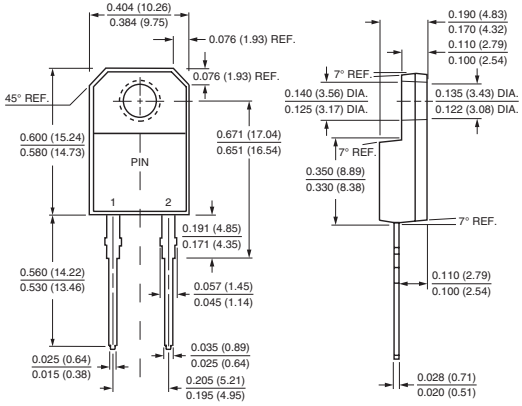
Figure 3. Typical Instantaneous Forward Charateristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

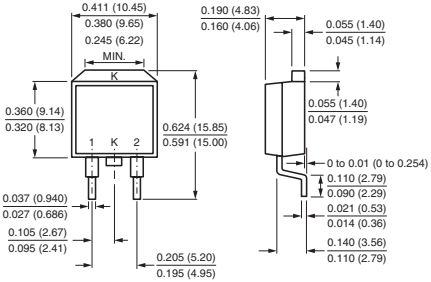
TO-220AC



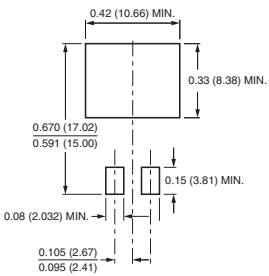
ITO-220AC



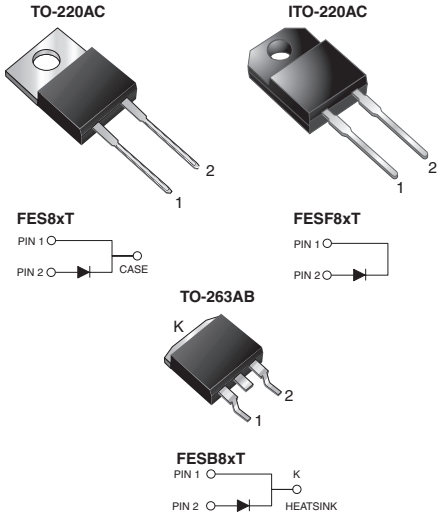
TO-263AB



Mounting Pad Layout



Ultrafast Plastic Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meests JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 600 V
I_{FSM}	125 A
t_{rr}	35 ns, 50 ns
V_F	0.95 V, 1.30 V, 1.50 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FES 8AT	FES 8BT	FES 8CT	FES 8DT	FES 8FT	FES 8GT	FES 8HT	FES 8JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	500	600	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	350	420	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	500	600	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	8.0								A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125								A
Operating storage and temperature range	T_J, T_{STG}	- 55 to + 150								°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500								V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)												
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**FES 8AT**	**FES 8BT**	**FES 8CT**	**FES 8DT**	**FES 8FT**	**FES 8GT**	**FES 8HT**	**FES 8JT**	**UNIT**
Maximum instantaneous forward voltage (1)	8.0 A		V_F	0.95				1.3		1.5		V
Maximum DC reverse current at rated DC blocking voltage		T_C = 25 °C T_C = 100 °C	I_R	10 500								µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35				50				ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	85						50		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**FES**	**FESF**	**FESB**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.2	5.0	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	FES8JT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	FESF8JT-E3/45	1.85	45	50/tube	Tube
TO-263AB	FESB8JT-E3/45	1.33	45	50/tube	Tube
TO-263AB	FESB8JT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	FES8JTHE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	FESF8JTHE3/45 (1)	1.85	45	50/tube	Tube
TO-263AB	FESB8JTHE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	FESB8JTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

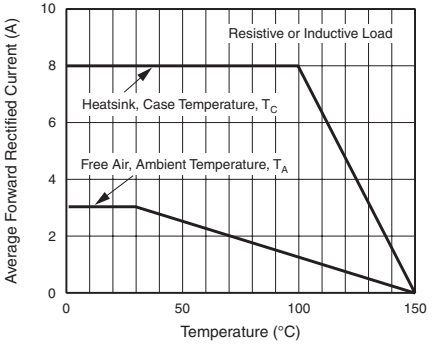


Figure 1. Maximum Forward Current Derating Curve

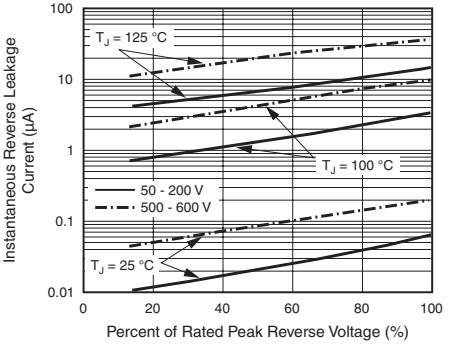


Figure 4. Typical Reverse Leakage Characteristics

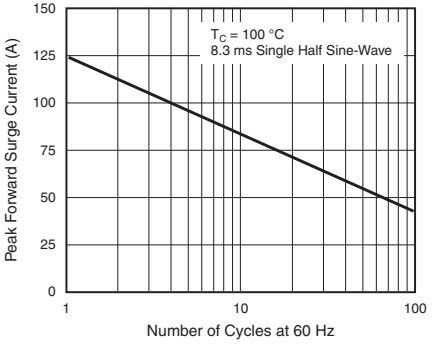


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

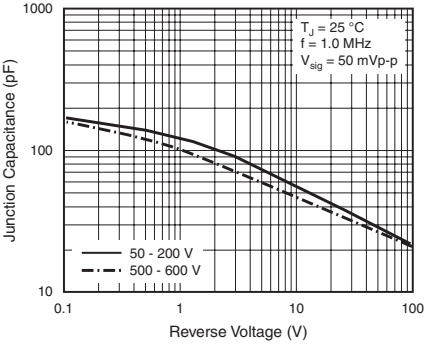


Figure 5. Typical Junction Capacitance

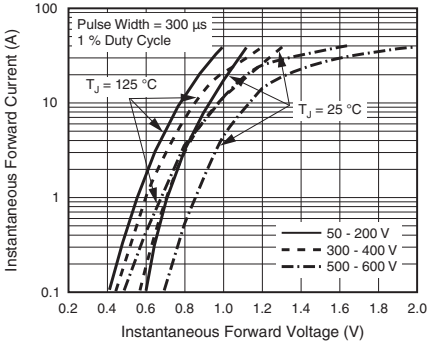
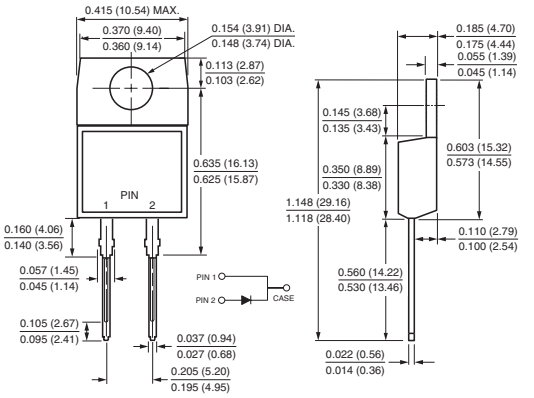


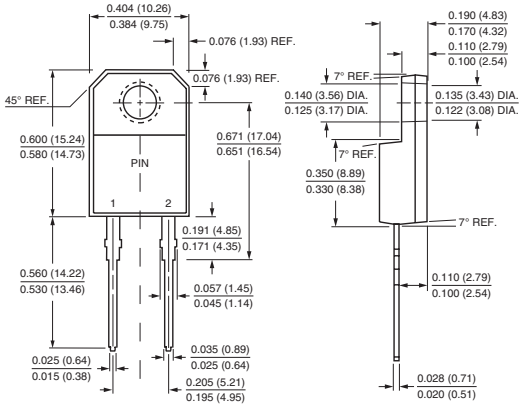
Figure 3. Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

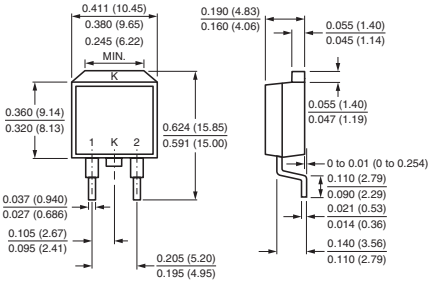
TO-220AC



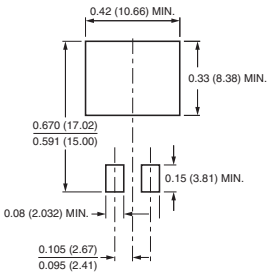
ITO-220AC



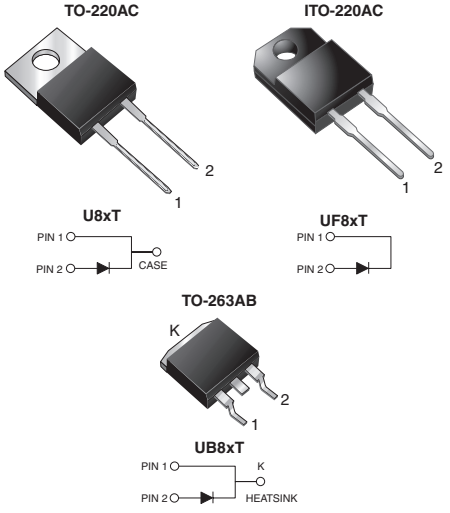
TO-263AB



Mounting Pad Layout



Ultrafast Rectifier



FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer computer, automotive and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	100 V to 200 V
I_{FSM}	100 A
t_{rr}	20 ns
V_F at I_F = 8 A	0.79 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	U8BT	U8CT	U8DT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$V_{F(AV)}$	8.0			V
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100			A
Isolation voltage (ITO-220AC only) from terminals to heatsink t = 1 min	V_{AC}	1500			V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 5 A I_F = 8 A I_F = 20 A	T_A = 25 °C	V_F	0.90 0.96 1.12	- 1.02 -	V
	I_F = 5 A I_F = 8 A I_F = 20 A	T_A = 150 °C		0.72 0.79 0.99	- 0.86 -	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 100 °C	I_R	- 200	10 500	µA mA
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	15	20	ns
Reverse recovery time	I_F = 1.0 A, dI/dt = 100 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	19	-	ns
Storage charge			Q_{rr}	7.1	-	nC
Reverse recovery time	I_F = 8 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	23	-	ns
Storage charge			Q_{rr}	6.5	-	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	25	-	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**U8XT**	**UF8XT**	**UB8XT**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	4.0	5.0	4.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	U8DT-E3/4W	1.83	4W	50/tube	Tube
ITO-220AC	UF8DT-E3/4W	1.69	4W	50/tube	Tube
TO-263AB	UB8DT-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	UB8DT-E3/8W	1.37	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

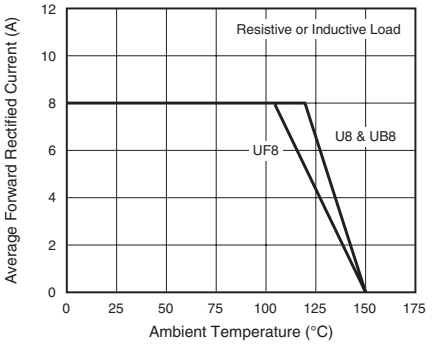


Figure 1. Maximum Forward Current Derating Curve

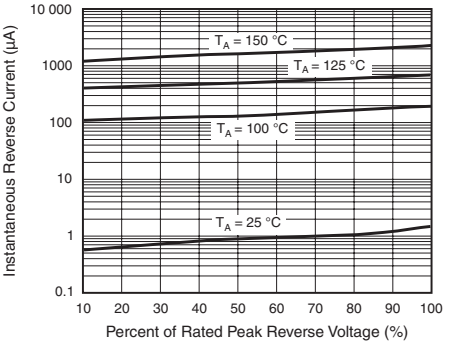


Figure 4. Typical Reverse Leakage Charateristics

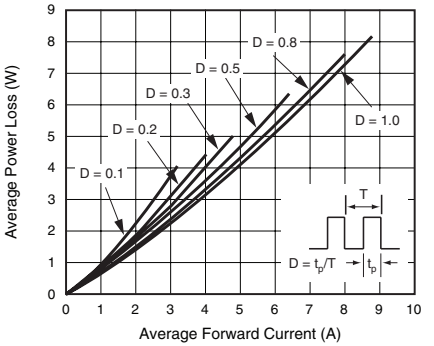


Figure 2. Forward Power Loss Characteristics

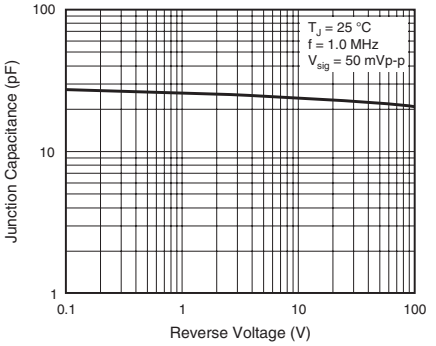


Figure 5. Typical Junction Capacitance

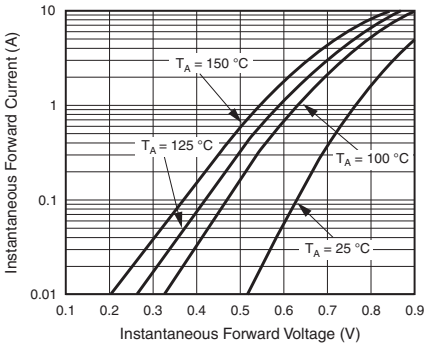
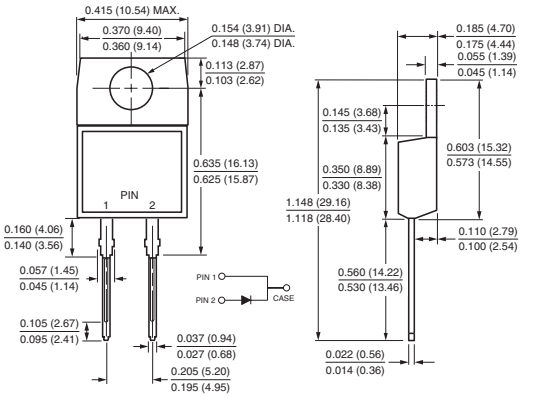


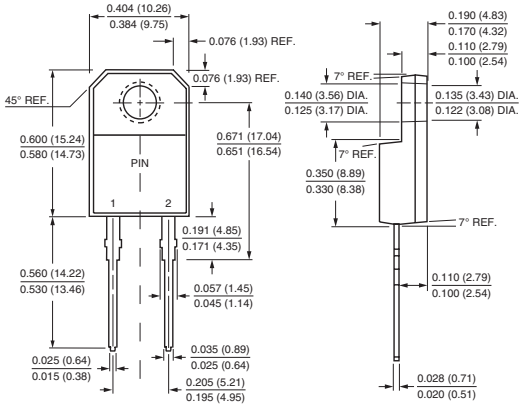
Figure 3. Typical Instantaneous Forward Charateristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

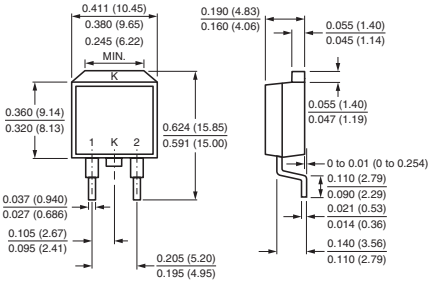
TO-220AC



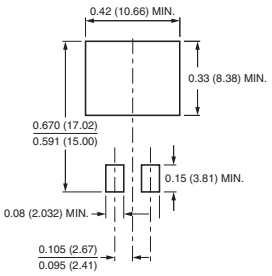
ITO-220AC



TO-263AB



Mounting Pad Layout

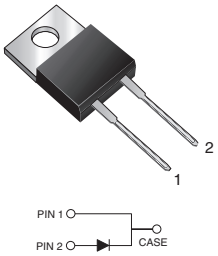


For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89086
Revision: 13-May-08

Ultrafast Plastic Rectifier

TO-220AC



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	125 A
t_{rr}	35 ns
V_F	0.895 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI1401	GI1402	GI1403	GI1404	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 125 °C	$I_{F(AV)}$	8.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125				A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GI1401**	**GI1402**	**GI1403**	**GI1404**	**UNIT**
Maximum instantaneous forward voltage	I_F = 4 A I_F = 8 A I_F = 4 A I_F = 8 A	T_J = 25 °C T_J = 25 °C T_J = 100 °C T_J = 100 °C	V_F	0.900 0.975 0.800 0.895				V
Maximum DC reverse current at rated DC blocking voltage		T_C = 25 °C T_C = 100 °C	I_R	5.0 150				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35				ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	85				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GI1401**	**GI1402**	**GI1403**	**GI1404**	**UNIT**
Typical thermal resistance (1, 2)	$R_{\theta JA}$ $R_{\theta JC}$	15 2.2				°C/W

Notes:

(1) Thermal resistance from junction to ambient in free air, no heatsink

(2) Thermal resistance from junction to case and ambient mounted on heatsink

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	GI1401-E3/45	1.80	45	50/tube	Tube
TO-220AC	GI1401HE3/45 (1)	1.80	45	50/tube	Tube

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

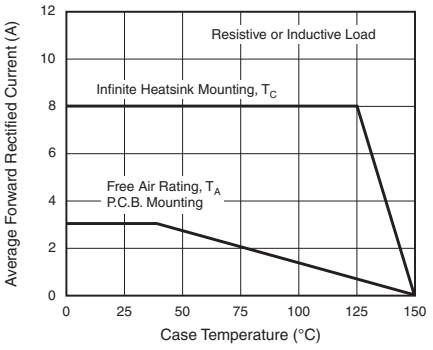


Figure 1. Maximum Forward Current Derating Curve

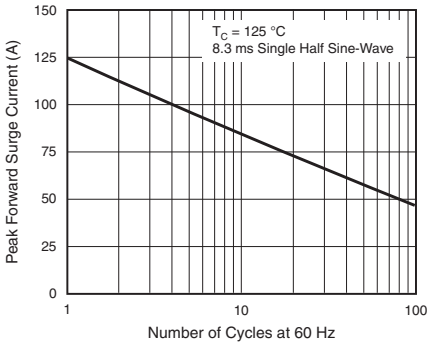


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

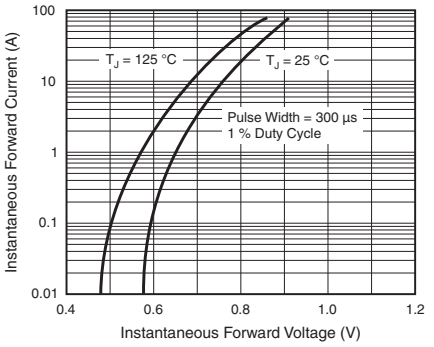


Figure 3. Typical Instantaneous Forward Characteristics

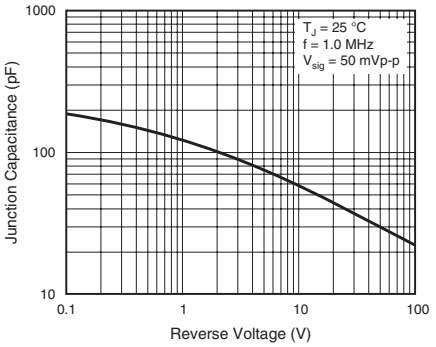


Figure 5. Typical Junction Capacitance

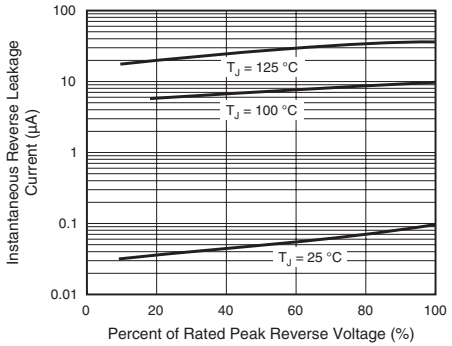
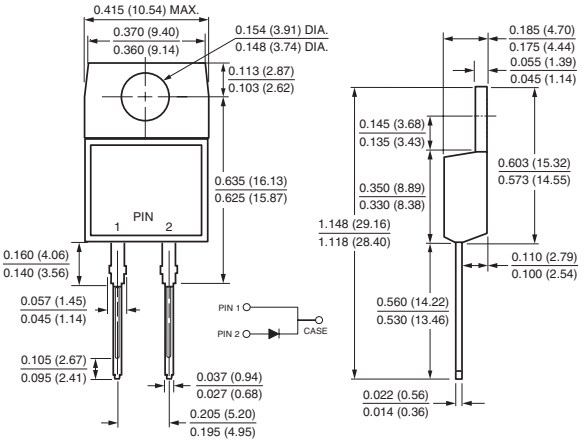


Figure 4. Typical Reverse Leakage Characteristics

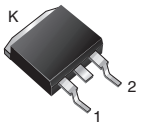
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

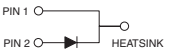
TO-220AC



Ultrafast Plastic Rectifier

TO-263AB





FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	125 A
t_{rr}	35 ns
V_F	0.895 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GIB1401	GIB1402	GIB1403	GIB1404	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 125 °C	$I_{F(AV)}$	8.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125				A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GIB1401**	**GIB1402**	**GIB1403**	**GIB1404**	**UNIT**
Maximum instantaneous forward voltage	I_F = 4 A I_F = 8 A I_F = 4 A I_F = 8 A	T_J = 25 °C T_J = 25 °C T_J = 100 °C T_J = 100 °C	V_F	0.900 0.975 0.800 0.895				V
Maximum DC reverse current at rated DC blocking voltage		T_C = 25 °C T_C = 100 °C	I_R	5.0 150				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35				ns
Typical junction capacitance	4 V, 1 MHz		C_J	85				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GIB1401**	**GIB1402**	**GIB1403**	**GIB1404**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JC}$	2.25				°C/W

Note:

(1) Thermal resistance from junction to case mounted on heatsink

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-263AB	GIB1401-E3/45	1.33	45	50/tube	Tube
TO-263AB	GIB1401-E3/81	1.33	81	900/reel	Tape and reel
TO-263AB	GIB1401HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	GIB1401HE3/81 (1)	1.33	81	900/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

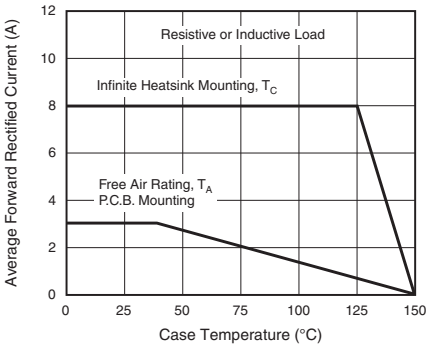


Figure 1. Maximum Forward Current Derating Curve

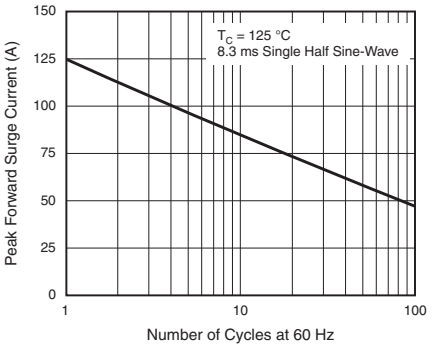


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

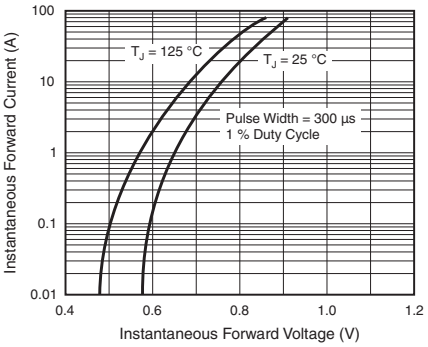


Figure 3. Typical Instantaneous Forward Characteristics

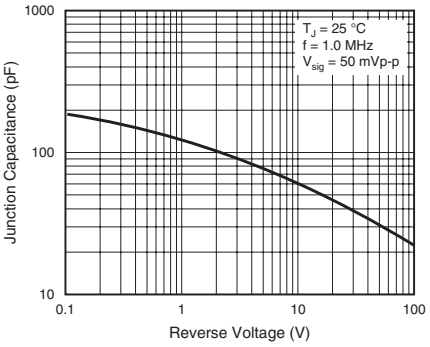


Figure 5. Typical Junction Capacitance

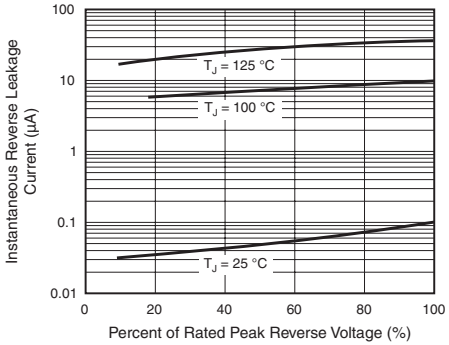
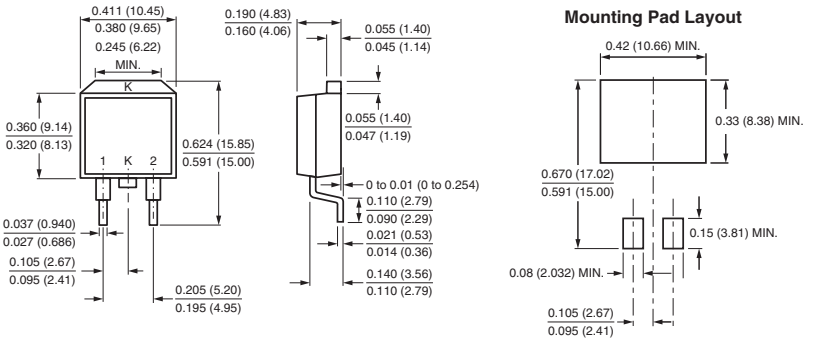


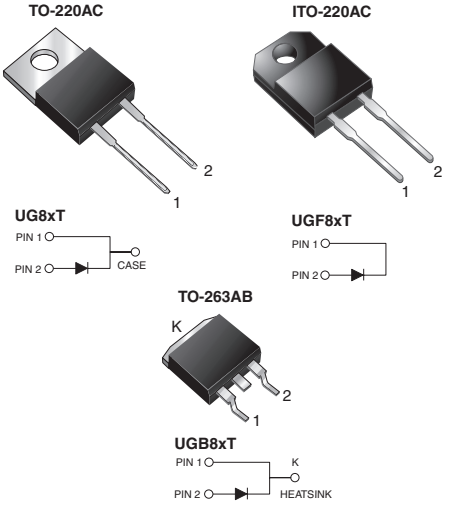
Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AB



Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	150 A
t_{rr}	20 ns
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG8AT	UG8BT	UG8CT	UG8DT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	8.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C
Isolation voltage (ITO-220AC only) from terminals to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG8AT**	**UG8BT**	**UG8CT**	**UG8DT**	**UNIT**
Maximum instantaneous forward voltage (1)	8.0 A 20.0 A 5.0 A	T_J = 150 °C	V_F	1.0 1.2 0.95				V
Maximum DC reverse current at rated DC blocking voltage		T_J = 25 °C T_J = 100 °C	I_R	10 300				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20				ns
Maximum reverse recovery time	I_F = 8.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	30 50				ns
Maximum recovered stored charged	I_F = 8.0 A, V_R = 30 V, dI/dt = 50 A/µs	T_J = 25 °C T_J = 100 °C	Q_{rr}	20 45				nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	45				pF

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG8AT**	**UGF8AT**	**UGB8AT**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	4.0	5.0	4.0	°C/W

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UG8DT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF8DT-E3/45	1.95	45	50/tube	Tube
TO-263AB	UGB8DT-E3/45	1.33	45	50/tube	Tube
TO-263AB	UGB8DT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	UG8DTHE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	UGF8DTHE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	UGB8DTHE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	UGB8DTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

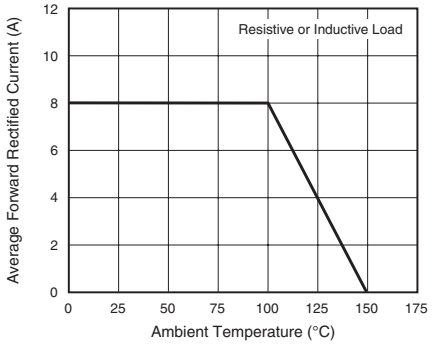


Figure 1. Maximum Forward Current Derating Curve

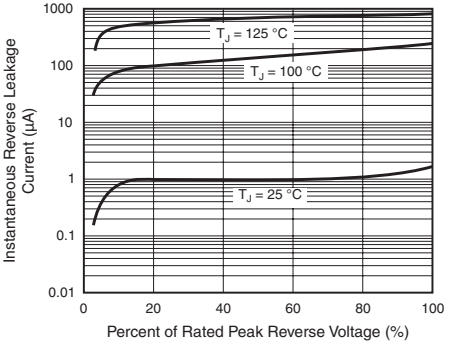


Figure 4. Typical Reverse Charateristics

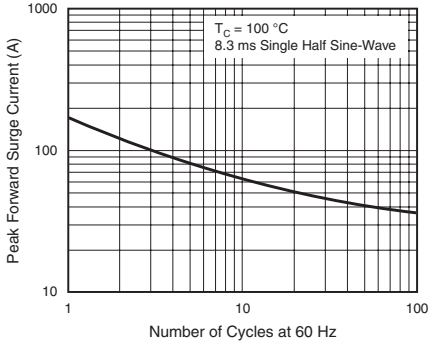


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

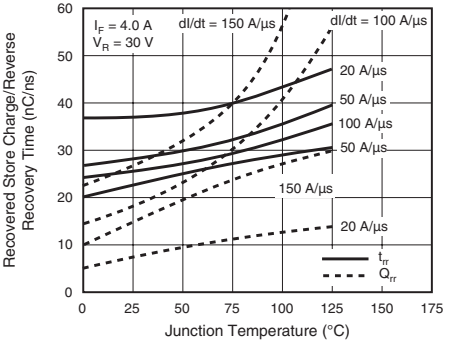


Figure 5. Reverse Switching Characteristics

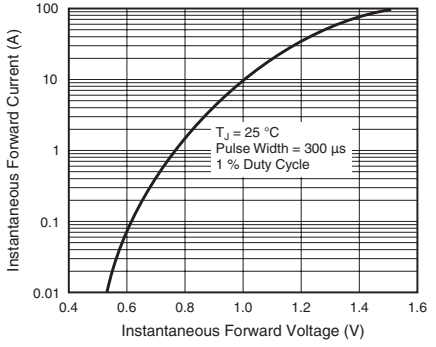


Figure 3. Typical Instantaneous Forward Charateristics

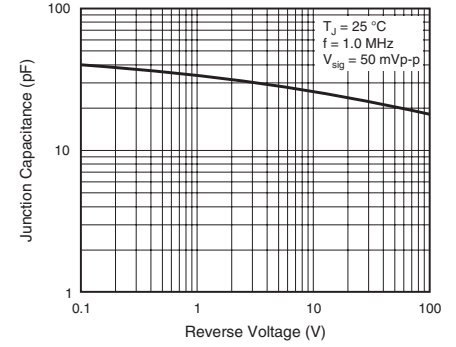
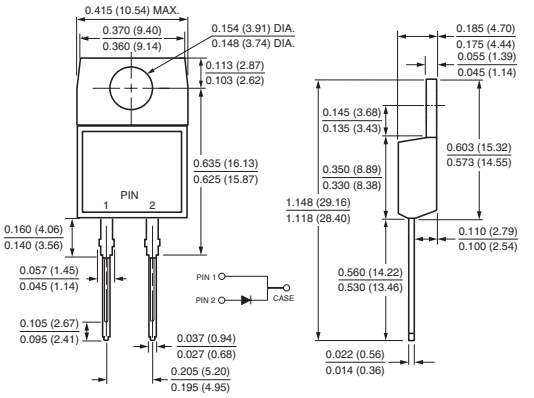


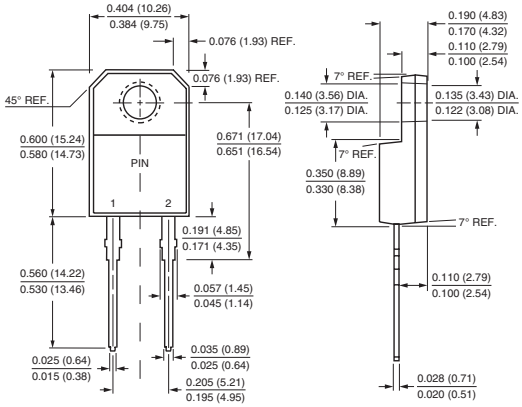
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

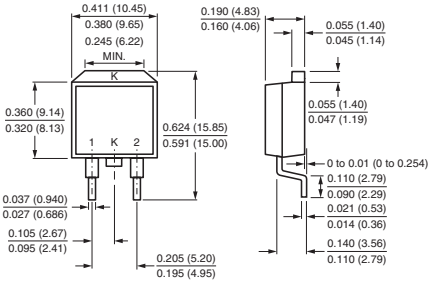
TO-220AC



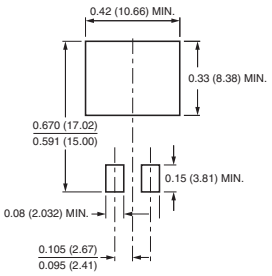
ITO-220AC



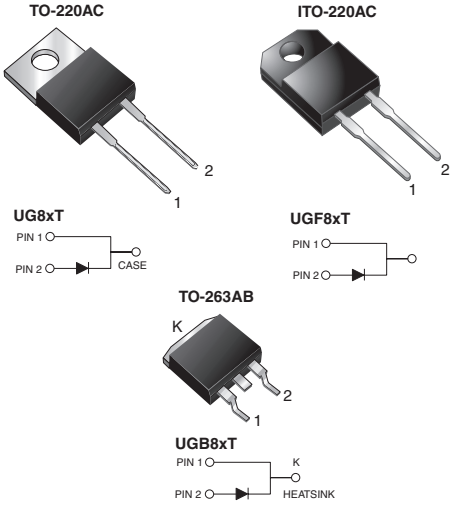
TO-263AB



Mounting Pad Layout



High Voltage Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage and high frequency power factor correction application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	500 V, 600 V
I_{FSM}	100 A
t_{rr}	25 ns
t_{fr}	500 ns
V_F	1.5 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG8HT	UG8JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	500	600	V
Maximum working reverse voltage	V_{RWM}	400	480	V
Maximum RMS voltage	V_{RMS}	350	420	V
Maximum DC blocking voltage	V_{DC}	500	600	V
Maximum average forward rectified current	$I_{F(AV)}$	8.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG8HT**	**UG8JT**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 8 A I_F = 8 A	T_J = 25 °C T_J = 125 °C	V_F	1.75 1.50		V
Maximum DC reverse current at V_{RWM}		T_J = 25 °C T_J = 100 °C T_J = 125 °C	I_R	30 800 4.0		µA µA mA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25		ns
	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Typical softness factor (t_b/t_a)	I_F = 8.0 A, dI/dt = 240 A/µs, V_R = 400 V, I_{rr} = 0.1 I_{RM}		S	1.0		-
Maximum reverse recovery current	I_F = 8.0 A, dI/dt = 64 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	5.5		A
	I_F = 8.0 A, dI/dt = 240 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	10		A
Peak forward recovery time	I_F = 8.0 A, dI/dt = 64 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	500		ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG8**	**UGF**	**UGB8**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.2	5.0	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UG8JT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF8JT-E3/45	1.95	45	50/tube	Tube
TO-263AB	UGB8JT-E3/45	1.33	45	50/tube	Tube
TO-263AB	UGB8JT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	UG8JTHE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	UGF8JTHE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	UGB8JTHE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	UGB8JTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

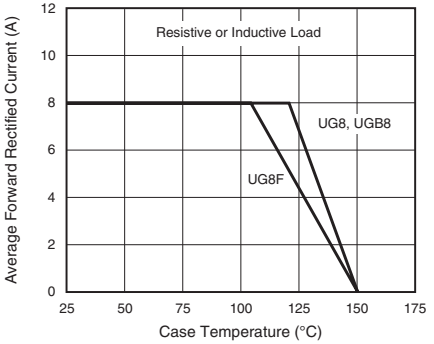


Figure 1. Maximum Forward Current Derating Curve

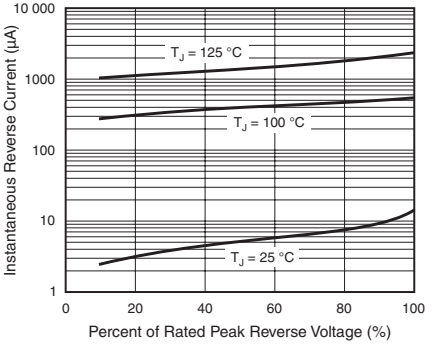


Figure 4. Typical Reverse Leakage Characteristics

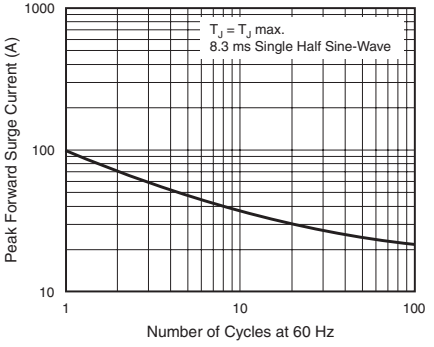


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

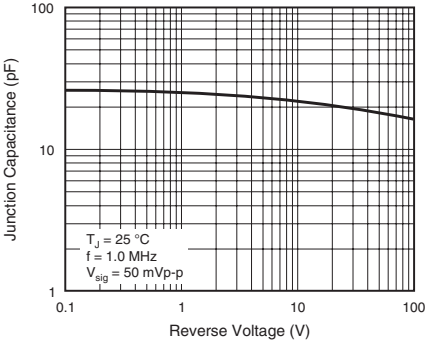


Figure 5. Typical Junction Capacitance

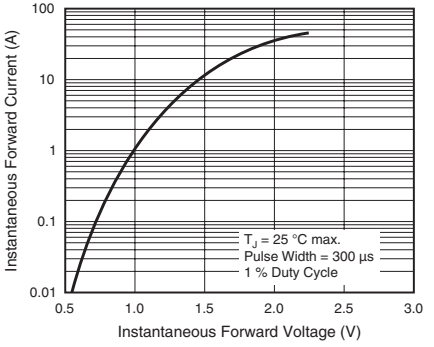


Figure 3. Typical Instantaneous Forward Characteristics

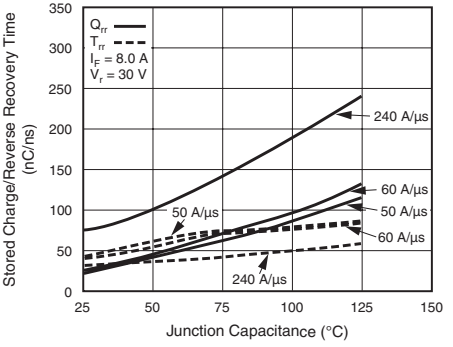
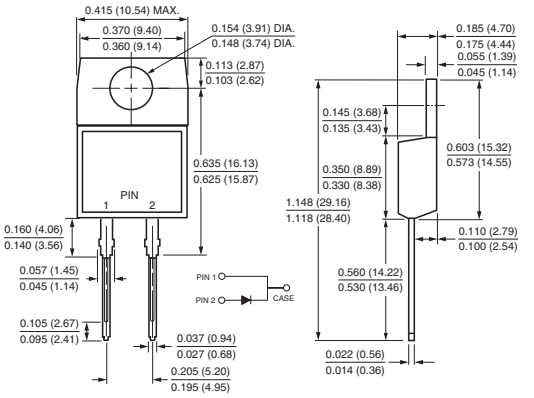


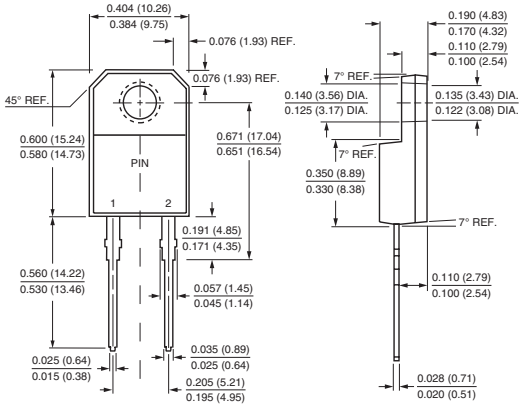
Figure 6. Reverse Switching Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

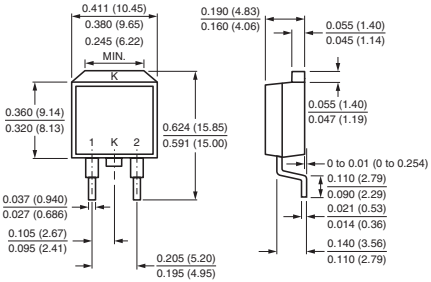
TO-220AC



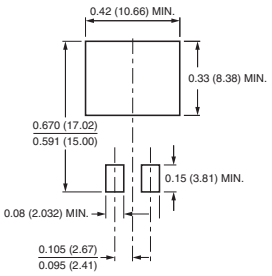
ITO-220AC



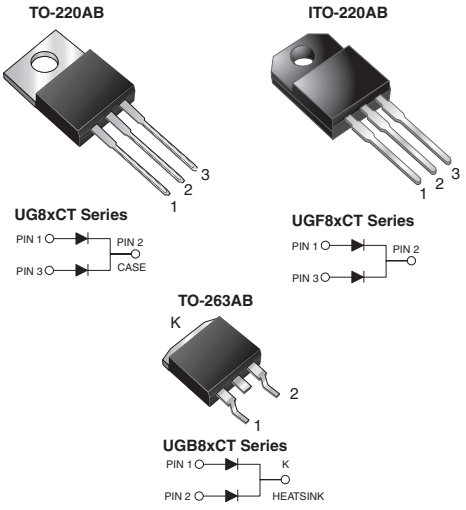
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Ultrafast Plastic Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage and high frequency power factor corrector, freewheeling diodes and secondary dc-to-dc rectification application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 4.0 A
V_{RRM}	500 V, 600 V
I_{FSM}	65 A
t_{rr}	25 ns
V_F	1.50 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UG8HCT**	**UG8JCT**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	500	600	V
Maximum working reverse voltage	V_{RWM}	400	480	V
Maximum RMS voltage	V_{RMS}	350	420	V
Maximum DC blocking voltage	V_{DC}	500	600	V
Maximum average forward rectified current	$I_{F(AV)}$	8.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	65		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG8HCT**	**UG8JCT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 4 A I_F = 4 A	T_J = 25 °C T_J = 125 °C	V_F	1.75 1.50		V
Maximum DC reverse current per diode at V_{RWM}		T_J = 25 °C T_J = 100 °C T_J = 125 C	I_R	30 800 4		µA µA mA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25		ns
Maximum reverse recovery time per diode	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Typical softness factor (t_b/t_a)	I_F = 4.0 A, dI/dt = 240 A/µs, V_R = 400 V, I_{rr} = 0.1 I_{RM}		S	0.9		-
Maximum reverse recovery current per diode	I_F = 4.0 A, dI/dt = 32 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	3.0		A
Maximum reverse recovery current per diode	I_F = 4.0 A, dI/dt = 240 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	8.0		A
Peak forward recovery time per diode	I_F = 4.0 A, dI/dt = 64 A/µs, V_F = 1.1 $V_{F\ max.}$		t_{fr}	500		ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG8**	**UGF8**	**UGB8**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	3.5	6.0	3.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	UG8JCT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	UGF8JCT-E3/45	2.00	45	50/tube	Tube
TO-263AB	UGB8JCT-E3/45	1.35	45	50/tube	Tube
TO-263AB	UGB8JCT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	UG8JCTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	UGF8JCTHE3/45 (1)	2.00	45	50/tube	Tube
TO-263AB	UGB8JCTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	UGB8JCTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88766
Revision: 09-Nov-07

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

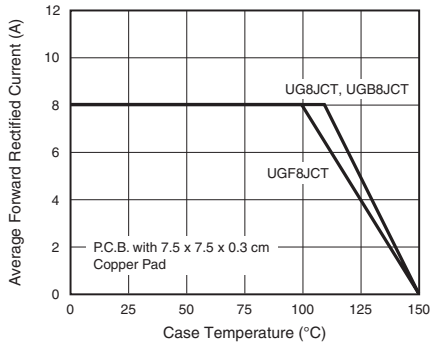


Figure 1. Maximum Forward Current Derating Curve

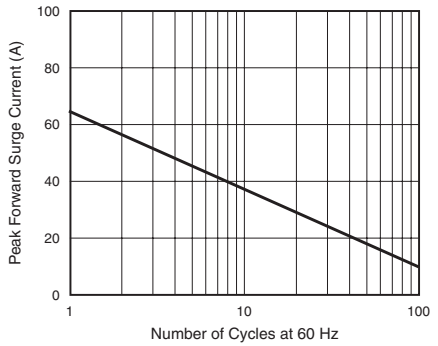


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

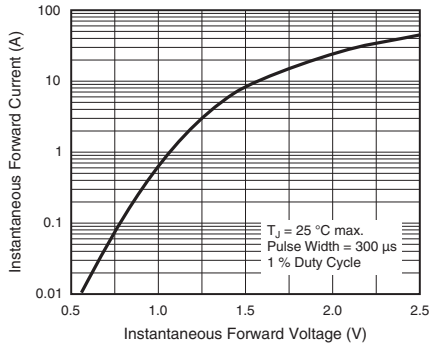


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

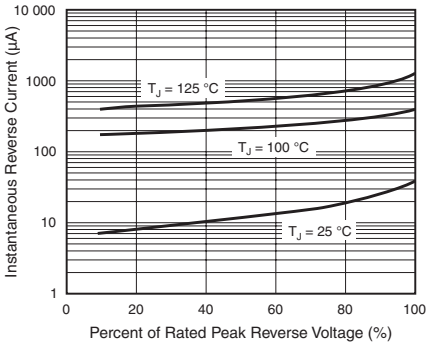


Figure 4. Typical Reverse Leakage Characteristics Per Diode

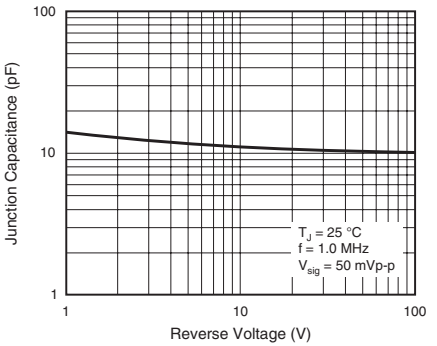


Figure 5. Typical Junction Capacitance Per Diode

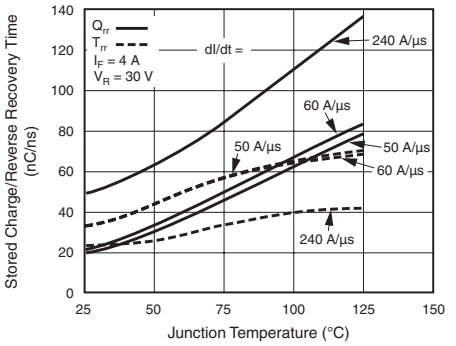
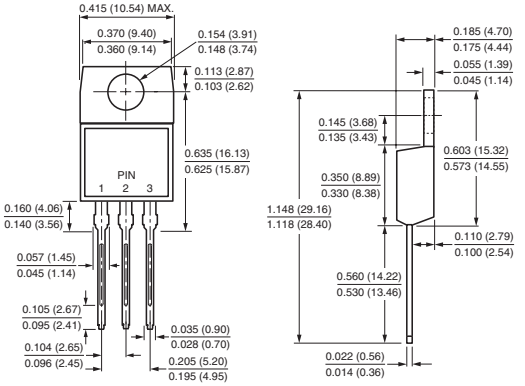


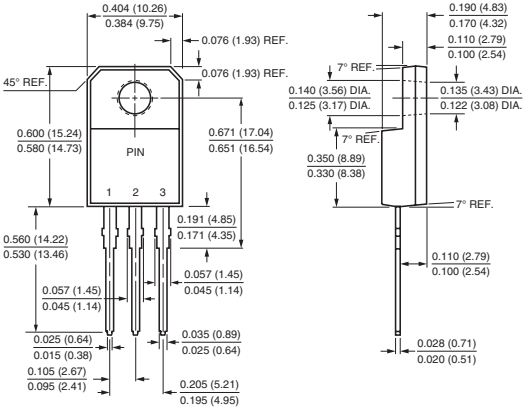
Figure 6. Reverse Switching Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

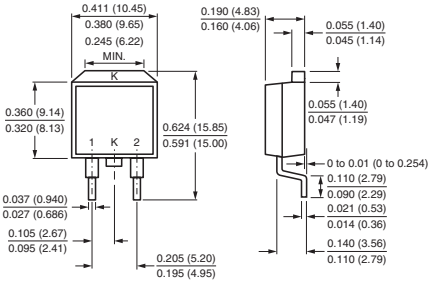
TO-220AB



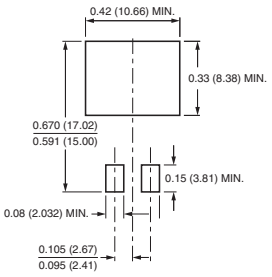
ITO-220AB



TO-263AB



Mounting Pad Layout



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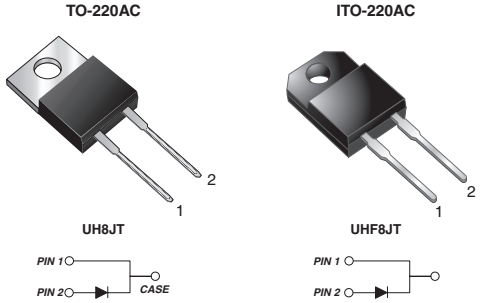
Document Number: 88766
Revision: 09-Nov-07

High Voltage Ultrafast Rectifier



FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage continuous mode power factor correctors (CCM PFC), switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	600 V
I_{FSM}	80 A
t_{rr}	25 ns
V_F at I_F = 8 A	1.47 V
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UH8JT	UHF8JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	600		V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	8.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80		A
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage (1)	I_F = 4 A I_F = 8 A	T_A = 25 °C	V_F	1.82 2.30	- 3.0	V
	I_F = 4 A I_F = 8 A	T_A = 125 °C		1.20 1.47	- 1.8	

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Reverse current (2)	V_R = 600 V, T_A = 25 °C	I_R	-	5.0	µA
	V_R = 600 V, T_A = 125 °C		-	100	
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	-	25	ns
	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		-	45	
Typical softness factor (t_b/t_a)	I_F = 8 A, dI/dt = 200 A/µs, V_R = 400 V, T_J = 125 °C	S	0.5	-	-
Typical reverse recovery current		I_{RM}	7.0	7.7	A
Typical stored charge		Q_{rr}	160	-	nC
Typical forward recovery time	I_F = 8 A, dI/dt = 64 A/µs, V_F = 1.1 x $V_{F\ max.}$	t_{fr}	150	-	ns

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UH8JT**	**UHF8JT**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.0	4.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UH8JT-E3/45	1.83	45	50/tube	Tube
ITO-220AC	UHF8JT-E3/45	1.72	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

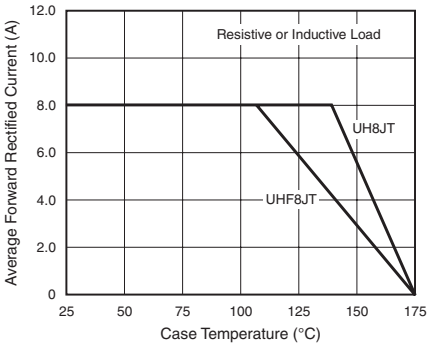


Figure 1. Maximum Forward Current Derating Curve

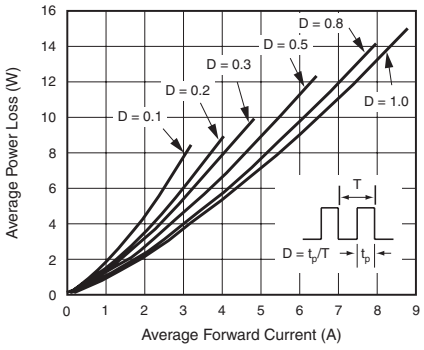


Figure 2. Forward Power Loss Characteristics

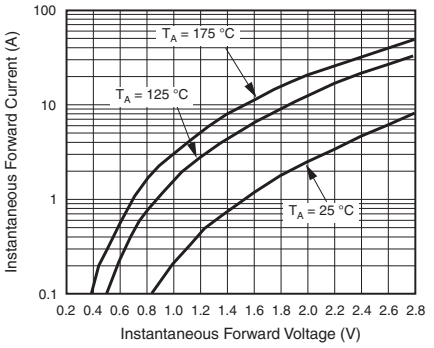


Figure 3. Typical Instantaneous Forward Characteristics

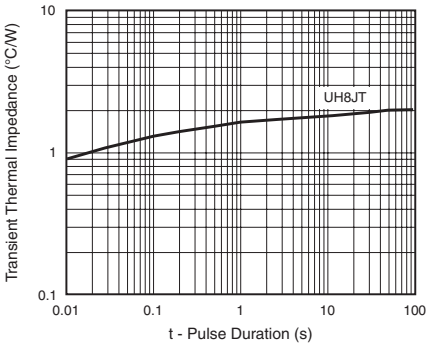


Figure 6. Typical Transient Thermal Impedance

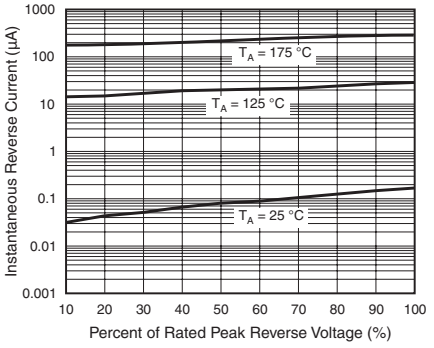


Figure 4. Typical Reverse Leakage Characteristics

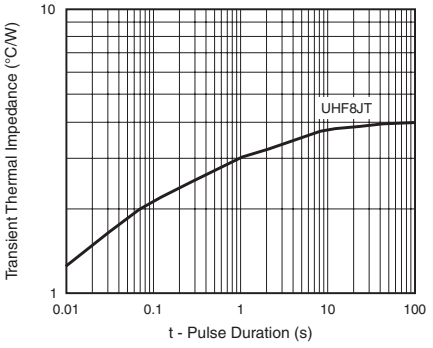


Figure 7. Typical Transient Thermal Impedance

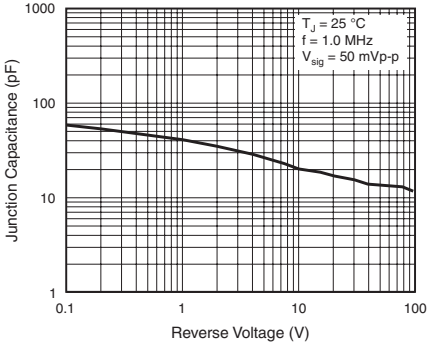
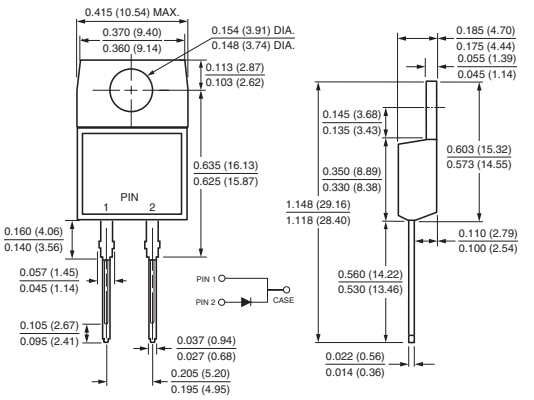


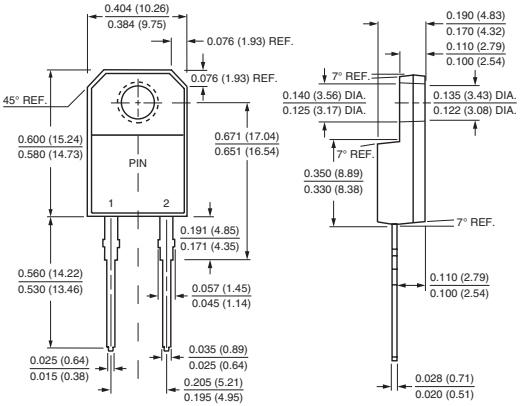
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC



ITO-220AC



For technical questions within your region, please contact one of the following:
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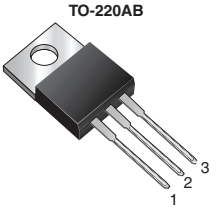
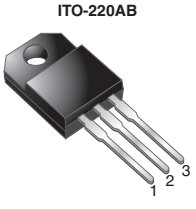
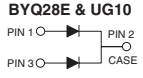
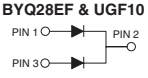
Document Number: 88956
Revision: 13-May-08

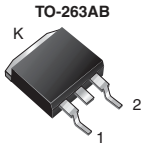
Dual Common Cathode Ultrafast Rectifier

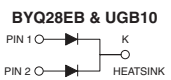












PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	55 A
t_{rr}	25 ns
V_F	0.895 V
T_J max.	150 °C

FEATURES

- Glass passivated chip junction
- Ultrafast recovery times
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG10BCT	UG10CCT	UG10DCT	UNIT
		BYQ28E-100	BYQ28E-150	BYQ28E-200	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Working peak reverse voltage	V_{RWM}	100	150	200	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current at T_C = 100 °C — total device per diode	$I_{F(AV)}$	10 5.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	55			A
Non-repetitive peak reverse current per diode at t_p = 100 µs	I_{RSM}	0.2			A
Electrostatic discharge capacitor voltage, human body model: C = 250 pF, R = 1.5 kΩ	V_C	8			kV
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150			°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500			V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A I_F = 5 A I_F = 5 A	T_J = 25 °C T_J = 25 °C T_J = 150 °C	V_F	1.25 1.10 0.895	V
Maximum reverse current per diode at working peak reverse voltage		T_J = 25 °C T_J = 100 °C	I_R	10 200	µA
Maximum reverse recovery time per diode	I_F = 1.0 A, dI/dt = 100 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	25	ns
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20	ns
Maximum stored charge per diode	I_F = 2 A, dI/dt = 20 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		Q_{rr}	9	nC

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG10**	**UGF10**	**UGB10**	**UNIT**
		BYQ28E	**BYQ28EF**	**BYQ28EB**	
Typical thermal resistance per diode, junction to ambient	$R_{\theta JA}$	50	55	50	°C/W
Typical thermal resistance per diode, junction to case	$R_{\theta JC}$	4.5	6.7	4.8	

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	BYQ28E-200-E3/45	1.80	45	50/tube	Tube
ITO-220AB	BYQ28EF-200-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYQ28EB-200-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYQ28EB-200-E3/81	1.77	81	800/reel	Tape and reel
TO-220AB	BYQ28E-200HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AB	BYQ28EF-200HE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	BYQ28EB-200HE3/45 (1)	1.77	45	50/tube	Tube
TO-263AB	BYQ28EB-200HE3/81 (1)	1.77	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

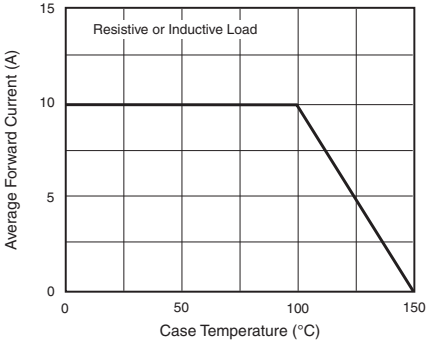


Figure 1. Forward Current Derating Curve

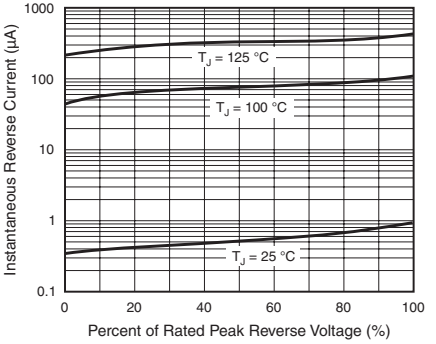


Figure 4. Typical Reverse Characteristics Per Diode

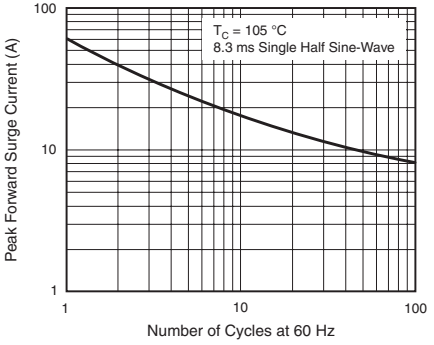


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

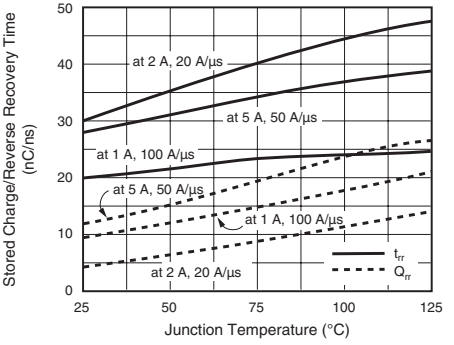


Figure 5. Reverse Switching Characteristics Per Diode

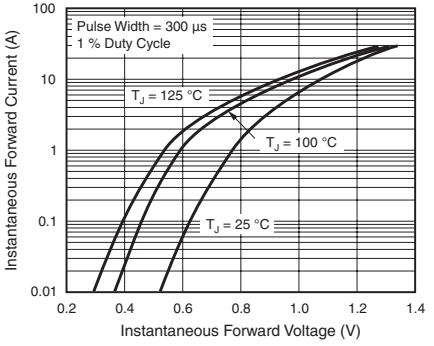


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

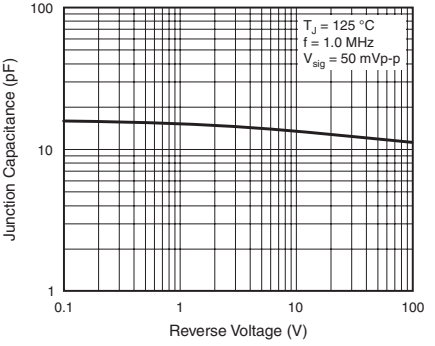
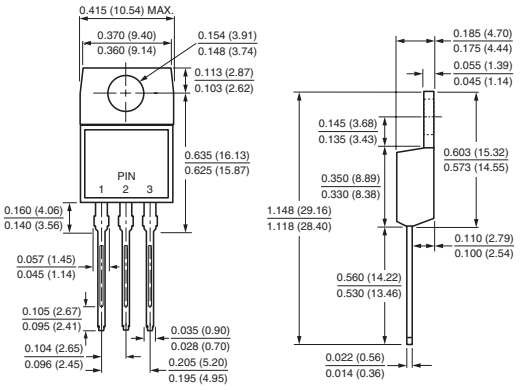


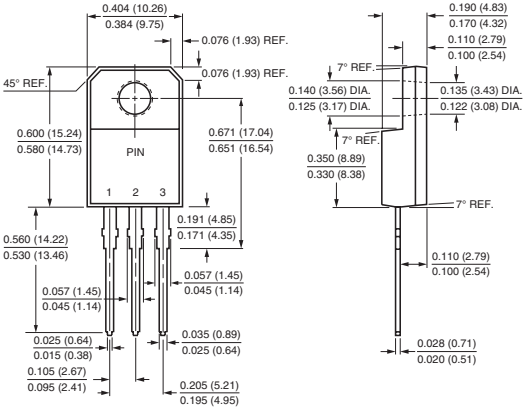
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

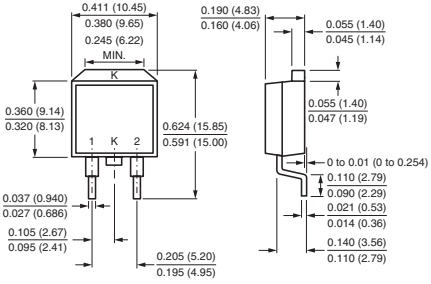
TO-220AB



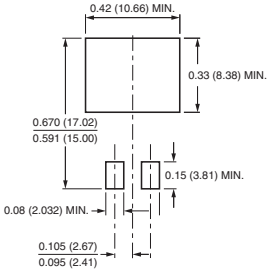
ITO-220AB



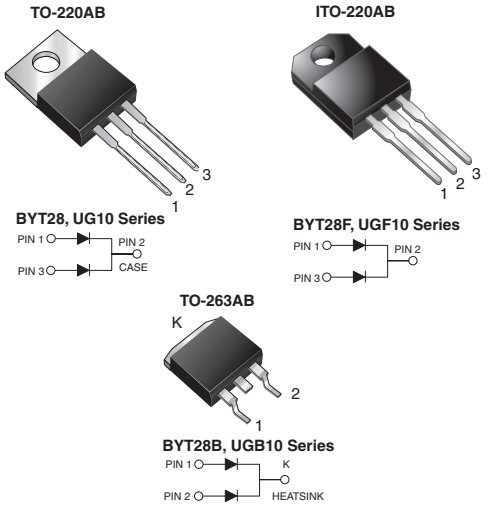
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Ultrafast Soft Recovery Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	300 V, 400 V
I_{FSM}	60 A
t_{rr}	35 ns
V_F	1.05 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYT28-300 UG10FCT	BYT28-400 UG10GCT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	300	400	V
Maximum working reverse voltage	V_{RWM}	300	400	V
Maximum RMS voltage	V_{RMS}	210	280	
Maximum DC blocking voltage	V_{DC}	300	400	V
Maximum average forward rectified current at T_C = 100 °C — total device	$I_{F(AV)}$	10		A
Maximum average forward rectified current at T_C = 100 °C — per diode	$I_{F(AV)}$	5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	60		A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150		°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 5 A, I_F = 10 A I_F = 5 A	T_J = 25 °C T_J = 25 °C T_J = 150 °C	V_F	1.30 1.40 1.05	V
Maximum reverse current per diode at V_{RRM}		T_J = 25 °C T_J = 100 °C	I_R	10 200	µA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35	ns
Maximum reverse recovery time per diode	I_F = 1.0 A, dI/dt = 100 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50	ns
Maximum reverse recovery current per diode	I_F = 5 A, dI/dt = 50 A/µs, V_R = 30 V, T_C = 100 °C		I_{RM}	3.0	A
Maximum stored charge per diode	I_F = 2 A, dI/dt = 20 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		Q_{rr}	50	nC

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYT28 UG10**	**BYT28F UGF10**	**BYT28B UGB10**	**UNIT**
Typical thermal resistance junction to case per diode	$R_{\theta JC}$	4.5	6.7	4.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	BYT28-400-E3/45	1.80	45	50/tube	Tube
ITO-220AB	BYT28F-400-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYT28B-400-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYT28B-400-E3/81	1.77	81	800/reel	Tape and reel
TO-220AB	BYT28-400HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AB	BYT28F-400HE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	BYT28B-400HE3/45 (1)	1.77	45	50/tube	Tube
TO-263AB	BYT28B-400HE3/81 (1)	1.77	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

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Document Number: 88552
Revision: 06-Nov-07

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

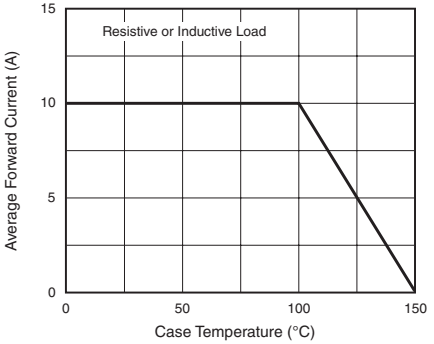


Figure 1. Forward Current Derating Curve

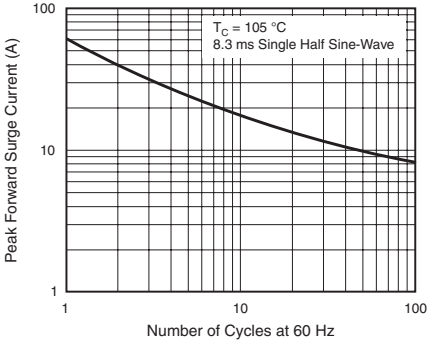


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

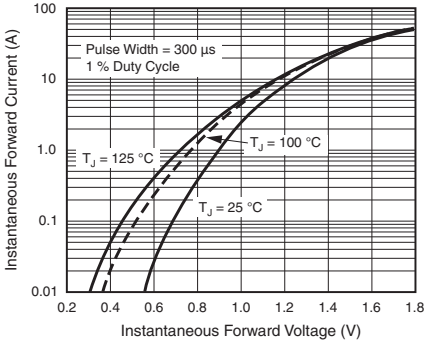


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

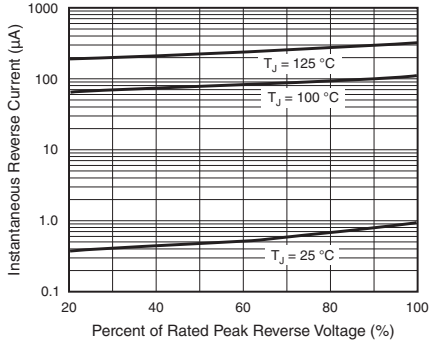


Figure 4. Typical Reverse Characteristics Per Diode

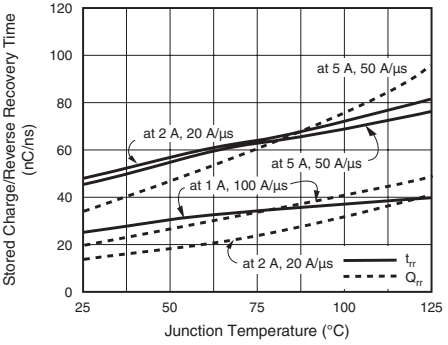


Figure 5. Reverse Switching Characteristics Per Diode

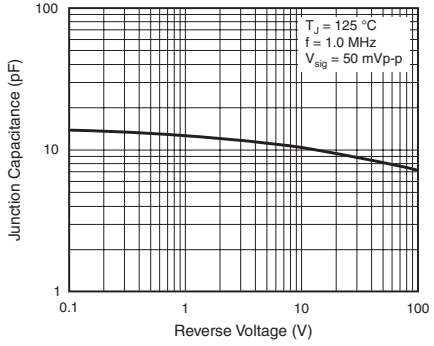
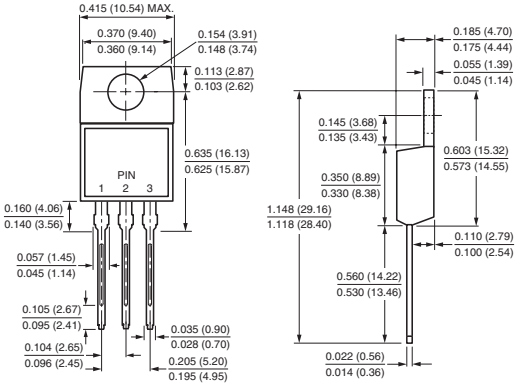


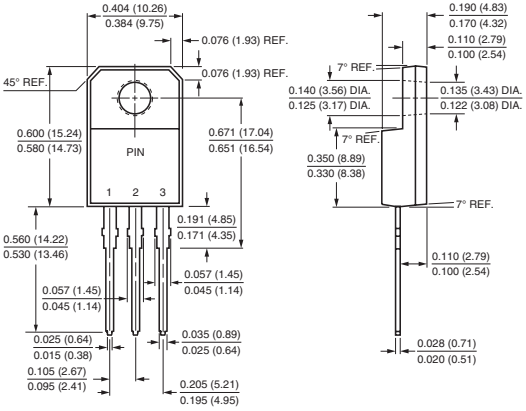
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

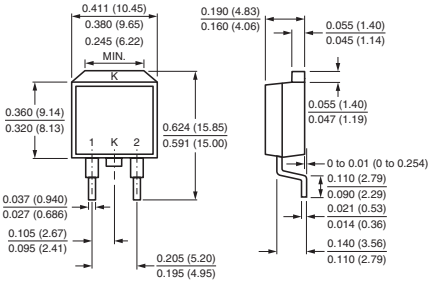
TO-220AB



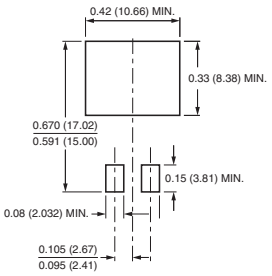
ITO-220AB



TO-263AB



Mounting Pad Layout



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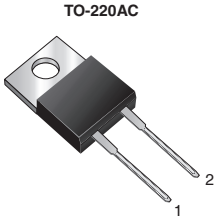
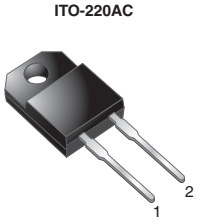
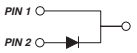
High Voltage Ultrafast Rectifier







FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage continuous mode power factor correctors (CCM PFC), switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	600 V
I_{FSM}	90 A
t_{rr}	25 ns
V_F at I_F = 10 A	1.41 V
T_J max.	175 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UH10JT	UHF10JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	600		V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	90		A
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage (1)	I_F = 5 A I_F = 10 A	T_A = 25 °C	V_F	1.70 2.5	- 3.0	V
	I_F = 5 A I_F = 10 A	T_A = 125 °C		1.15 1.41	- 1.80	

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Reverse current (2)	V_R = 600 V	T_A = 25 °C T_A = 125 °C	I_R	- 27	10 150	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	-	25	ns
	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}			-	45	
Typical softness factor (t_b/t_a)	I_F = 10 A, dI/dt = 200 A/µs, V_R = 400 V, T_J = 125 °C		S	0.45	-	-
Typical reverse recovery c urrent			I_{RM}	7.5	-	A
Typical stored charge			Q_{rr}	200	-	nC
Typical forward recovery time	I_F = 10 A, dI/dt = 80 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	160	-	ns

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UH10JT**	**UHF10JT**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.0	4.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UH10JT-E3/4W	1.84	4W	50/tube	Tube
ITO-220AC	UHF10JT-E3/45	1.73	45	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

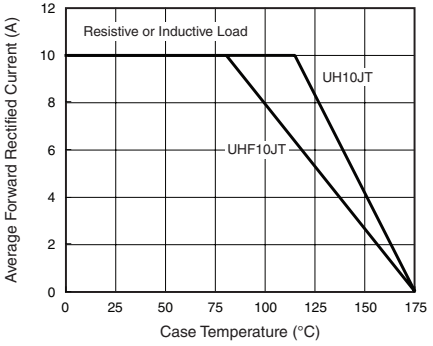


Figure 1. Maximum Forward Current Derating Curve

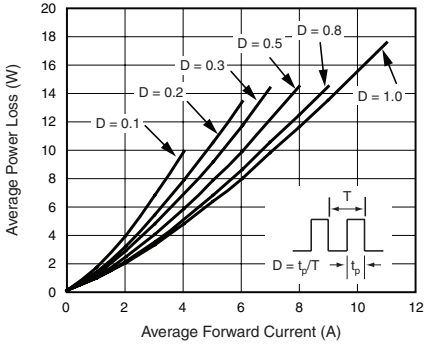


Figure 2. Forward Power Loss Characteristics

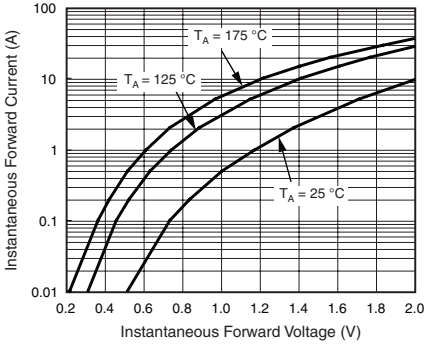


Figure 3. Typical Instantaneous Forward Characteristics

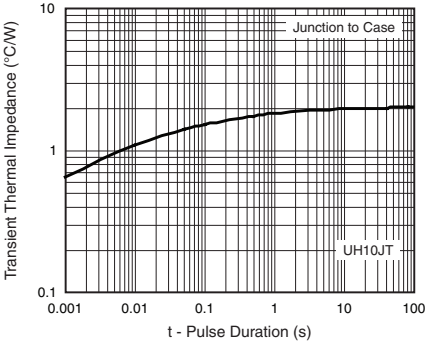


Figure 6. Typical Transient Thermal Impedance

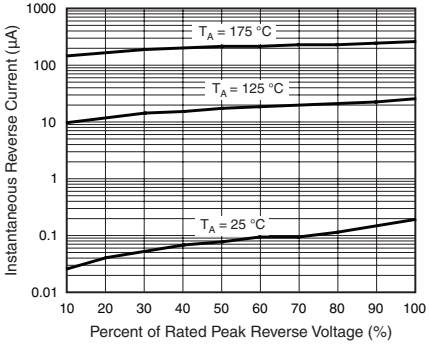


Figure 4. Typical Reverse Leakage Characteristics

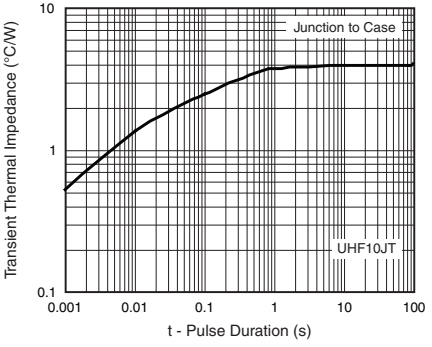


Figure 7. Typical Transient Thermal Impedance

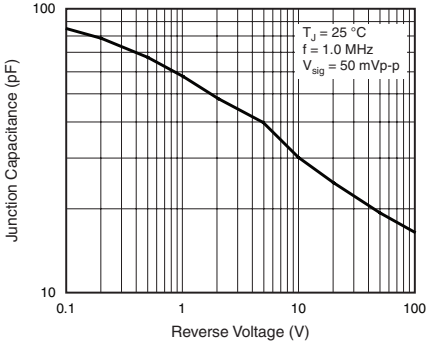
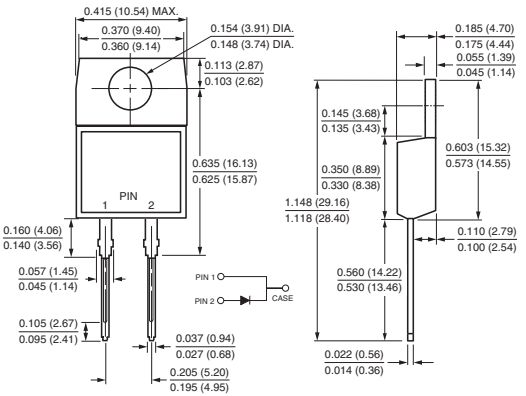


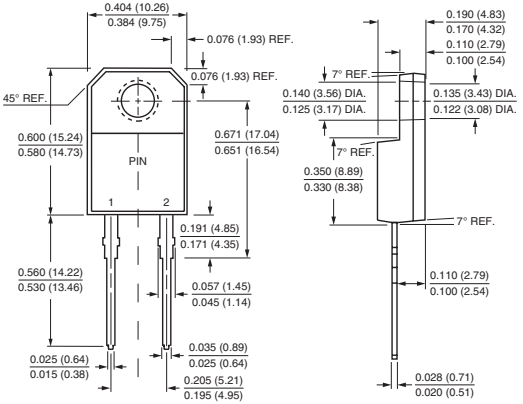
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC



ITO-220AC



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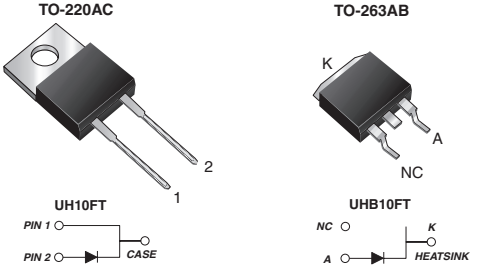
Document Number: 88998
Revision: 25-Aug-08

Ultrafast Recovery Rectifier



FEATURES

- Oxide planar chip junction
- Ultrafast recovery times
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converter and inverter for consumer.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	300 V
I_{FSM}	180 A
t_{rr}	25 ns
V_F	0.83 V
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AC and TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UH10FT	UHB10FT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	300		V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	180		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 5.0 A I_F = 5.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.96 0.77	- -	V
	I_F = 10 A I_F = 10 A	T_J = 25 °C T_J = 125 °C		1.0 0.83	1.2 0.90	
Maximum reverse current (2)	V_R = 300 V	T_J = 25 °C T_J = 125 °C	I_R	0.5 25	5 150	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20	25	ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	28	35	ns
Typical softness factor (t_b/t_a)	I_F = 10 A, dI/dt = 200 A/µs, V_R = 200 V, T_J = 125 °C		S	0.36	-	-
Typical reverse recovery current			I_{RM}	7.0	-	ns
Typical stored charge			Q_{rr}	160	-	A
Typical forward recovery time	I_F = 10 A, dI/dt = 80 A/µs, V_{FR} = 1.1 x $V_{F\ max.}$		t_{fr}	150	-	ns

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UH10FT**	**UHB10FT**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UH10FT-E3/4W	1.82	4W	50/tube	Tube
TO-263AB	UHB10FT-E3/4W	1.32	4W	50/tube	Tube
TO-263AB	UHB10FT-E3/8W	1.32	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

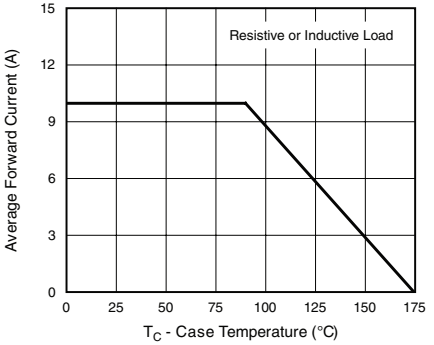


Figure 1. Maximum Forward Current Derating Curve

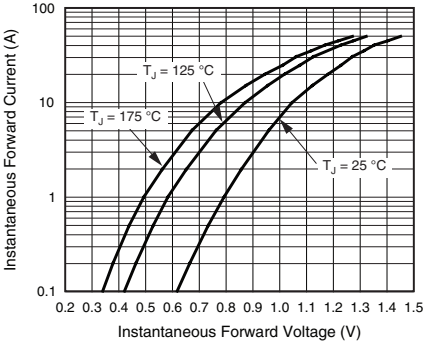


Figure 4. Typical Instantaneous Forward Characteristics

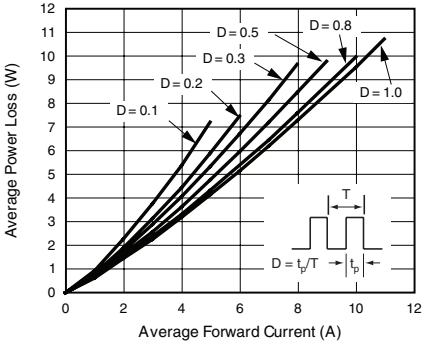


Figure 2. Forward Power Loss Characteristics

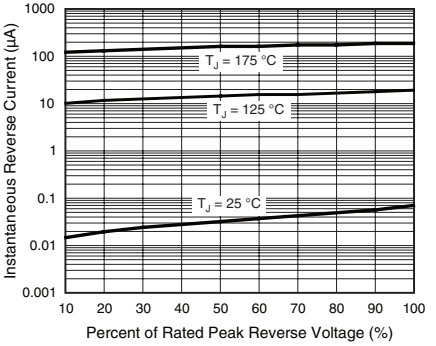


Figure 5. Typical Reverse Leakage Charactersitics

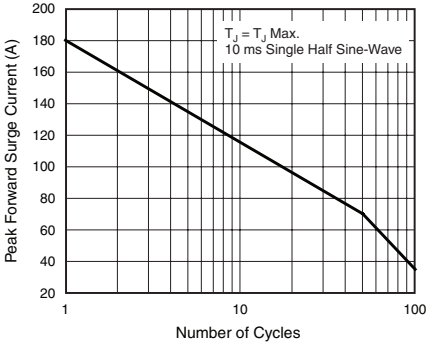


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

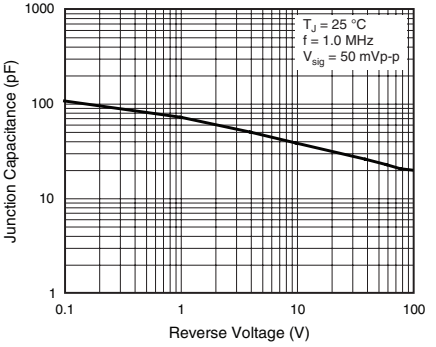
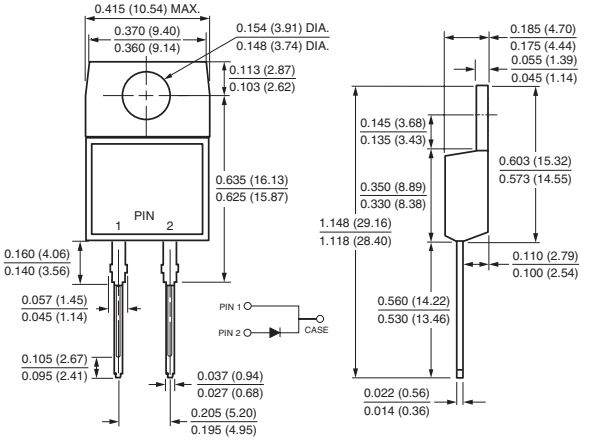


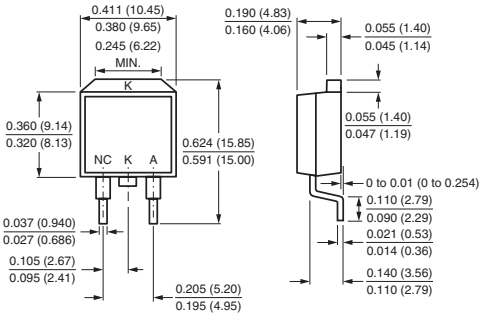
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

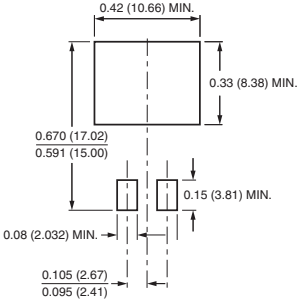
TO-220AC



TO-263AB



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
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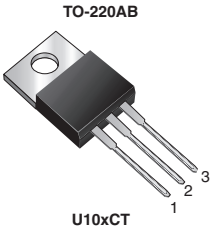
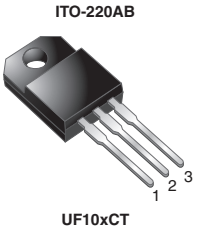
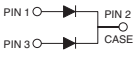
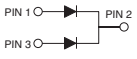
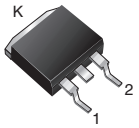
Dual Common-Cathode Ultrafast Rectifier

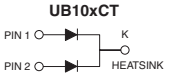












PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	55 A
t_{rr}	25 ns
V_F	0.89 V
T_J max.	150 °C

FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, IT-220AB)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB and TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	U(F,B)10BCT	U(F,B)10CCT	U(F,B)10DCT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100	150	200	V
Max. average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$		10 5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}		55		A
Electrostatic discharge capacitor voltage, human body model: C = 150 pF, R = 1.5 kΩ (contact mode)		V_C		8		kV
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min per diode		V_{AC}		1500		V
Operating junction and storage temperature range		T_J, T_{STG}		- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 3.0 A I_F = 5.0 A	T_J = 25 °C	V_F	0.97 1.05	- 1.10	V
	I_F = 3.0 A I_F = 5.0 A	T_J = 150 °C		0.79 0.89	- 0.95	
Maximum reverse current per diode (2)	rated V_R	T_J = 25 °C T_J = 100 °C	I_R	0.5 100	5.0 200	µA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	13	20	ns
	I_F = 1.0 A, dI/dt = 100 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}			19.7	25	
Maximum stored charge per diode	I_F = 2 A, dI/dt = 20 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		Q_{rr}	3	9	nC

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**U10xCT**	**UF10xCT**	**UB10xCT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ $R_{\theta JC}$	25 5.3	25 7.5	25 5.3	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	U10DCT-E3/4W	1.87	4W	50/tube	Tube
ITO-220AB	UF10DCT-E3/4W	1.77	4W	50/tube	Tube
TO-263AB	UB10DCT-E3/4W	1.31	4W	50/tube	Tube
TO-263AB	UB10DCT-E3/8W	1.31	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

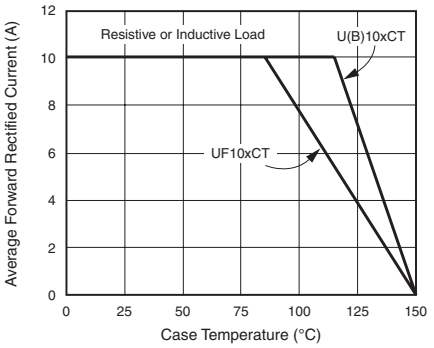


Figure 1. Maximum Forward Current Derating Curve

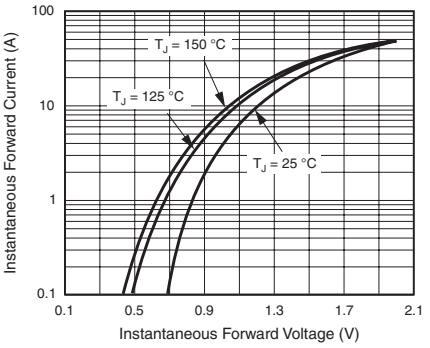


Figure 4. Typical Instantaneous Forward Characteristics Per Diode

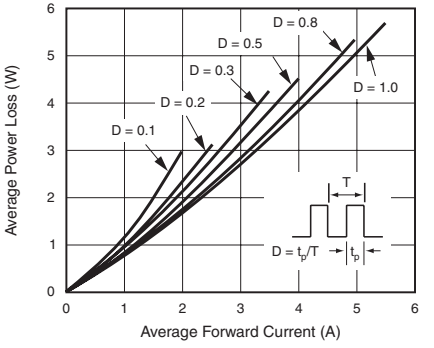


Figure 2. Forward Power Loss Characteristics Per Diode

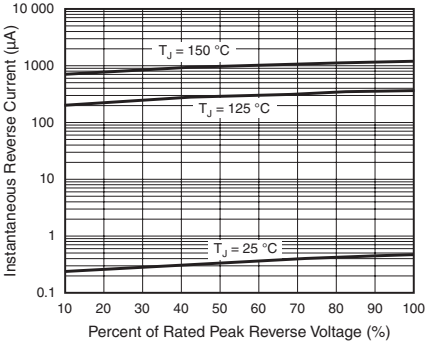


Figure 5. Typical Reverse Characteristics Per Diode

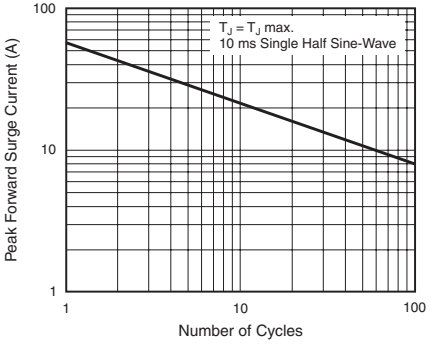


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

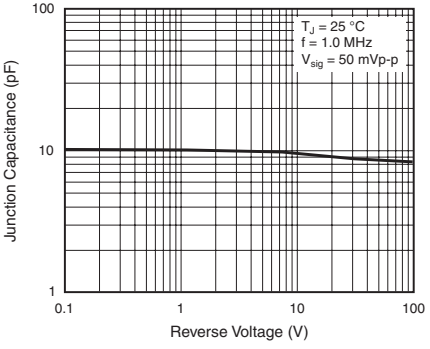
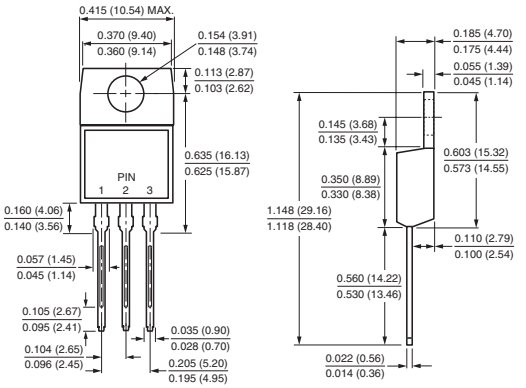


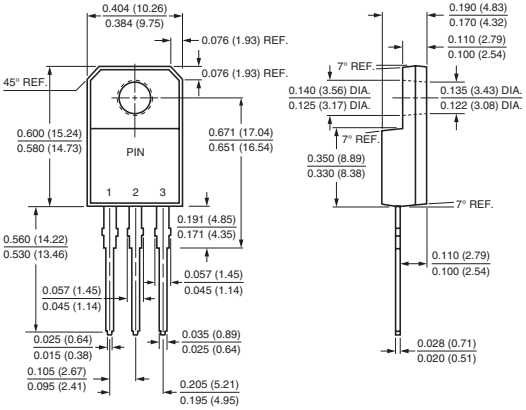
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

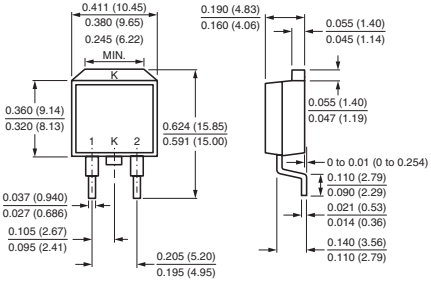
TO-220AB



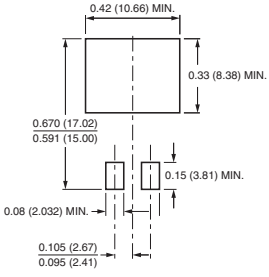
ITO-220AB



TO-263AB



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
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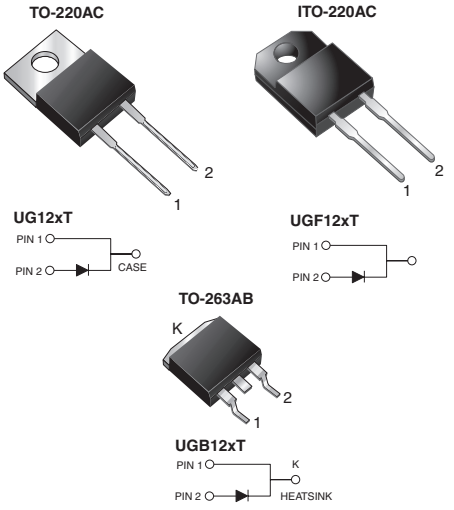
Document Number: 88967
Revision: 13-May-08

High Voltage Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage and high frequency power factor correction, freewheeling diodes and secondary dc-to-dc rectification application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	500 V, 600 V
V_{FSM}	135 A
t_{rr}	30 ns
V_F	1.5 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	UG12HT	UG12JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	500	600	V
Maximum working reverse voltage	V_{RWM}	400	480	V
Maximum RMS voltage	V_{RMS}	350	420	V
Maximum DC blocking voltage	V_{DC}	500	600	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	12		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	135		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C
Isolation voltage (ITO-220AC only) from terminals to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG12HT**	**UG12JT**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 12 A I_F = 12 A	T_J = 25 °C T_J = 125 °C	V_F	1.75 1.50		V
Maximum reverse current		T_J = 25 °C T_J = 125 °C	I_R	30 4.0		µA mA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	30		ns
	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Typical softness factor (t_b/t_a)	I_F = 12 A, dI/dt = 240 A/µs, V_R = 400 V, I_{rr} = 0.1 I_{RM}		S	0.9		-
Maximum reverse recovery current	I_F = 12 A, dI/dt = 96 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	7.5		A
Peak forward recovery time	I_F = 12 A, dI/dt = 96 A/µs, V_F = 1.1 V x $V_{F\ max.}$		t_{fr}	500		ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG12**	**UGF12**	**UGB12**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	1.73	3.04	1.73	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UG12JT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF12JT-E3/45	1.95	45	50/tube	Tube
TO-263AB	UGB12JT-E3/45	1.33	45	50/tube	Tube
TO-263AB	UGB12JT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	UG12JTHE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	UGF12JTHE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	UGB12JTHE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	UGB12JTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

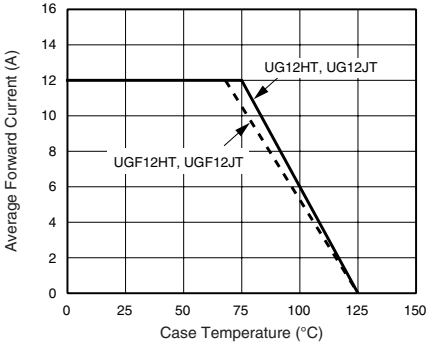


Figure 1. Forward Current Derating Curve

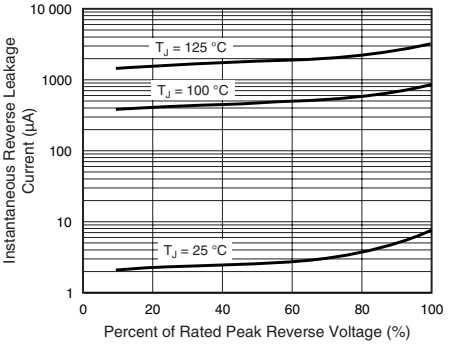


Figure 4. Typical Reverse Leakage Characteristics Per Leg

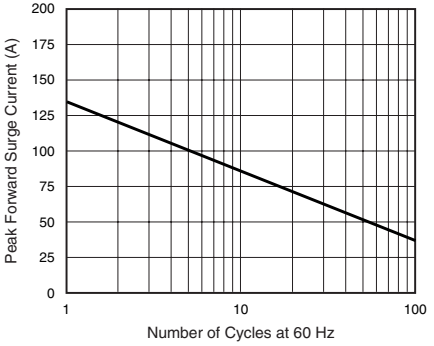


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

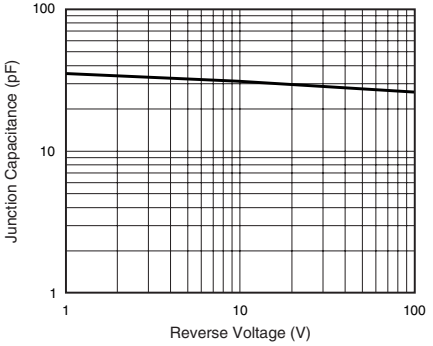


Figure 5. Typical Junction Capacitance Per Leg

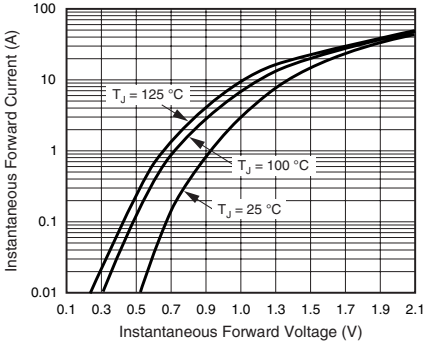


Figure 3. Typical Instantaneous Forward Characteristics Per Leg

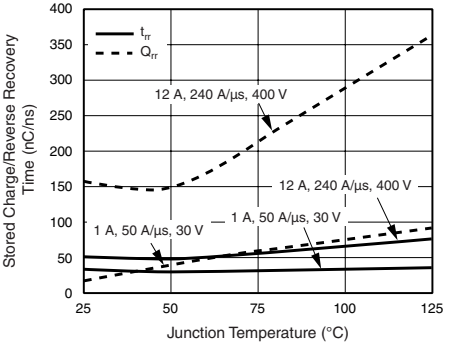
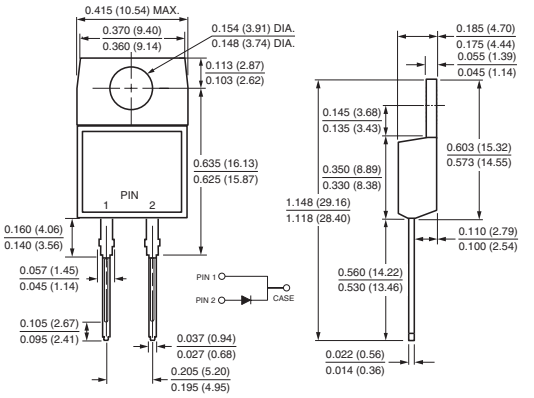


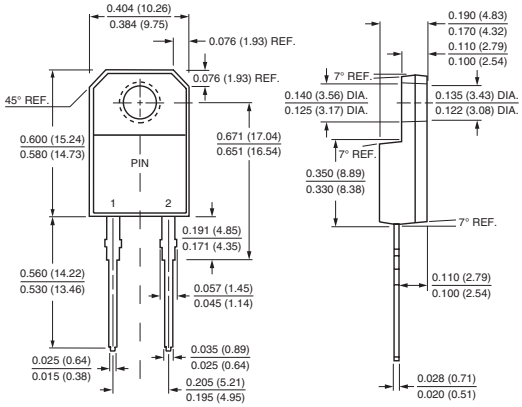
Figure 6. Reverse Switching Characteristics Per Leg

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

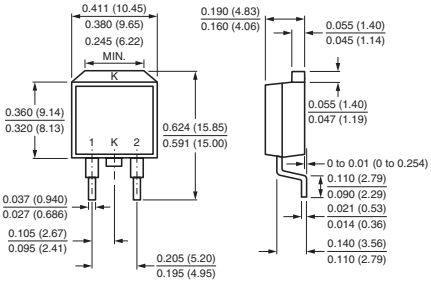
TO-220AC



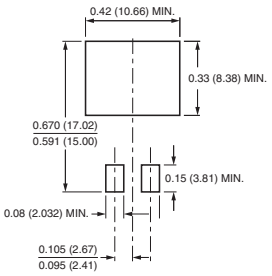
ITO-220AC



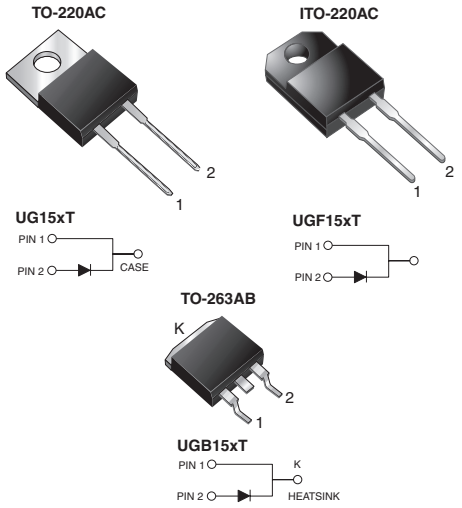
TO-263AB



Mounting Pad Layout



High Voltage Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery times
- Soft recovery charateristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage, high frequency power factor correctors, switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	500 V, 600 V
I_{FSM}	135 A
t_{rr}	35 ns
V_F	1.5 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG15HT	UG15JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	500	600	V
Maximum working reverse voltage	V_{RWM}	400	480	V
Maximum RMS voltage	V_{RMS}	350	420	V
Maximum DC blocking voltage	V_{DC}	500	600	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	15		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	135		A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG15HT**	**UG15JT**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 15 A	T_J = 25 °C T_J = 125 °C	V_F	1.75 1.50		V
Maximum DC reverse current at V_{RWM}		T_J = 25 °C T_J = 125 °C	I_R	30 4.0		µA mA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35		ns
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	50		ns
Typical softness factor (t_b/t_a)	I_F = 15 A, dI/dt = 240 A/µs, V_R = 400 V, I_{rr} = 0.1 I_{RM}		S	0.9		-
Maximum reverse recovery current	I_F = 15 A, dI/dt = 120 A/µs, V_R = 400 V, T_C = 125 °C		I_{RM}	9.0		A
Peak forward recovery time	I_F = 15 A, dI/dt = 120 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	500		ns

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG15**	**UGF15**	**UGB15**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	1.5	3.0	1.5	°C/W

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	UG15JT-E3/45	1.85	45	50/tube	Tube
ITO-220AC	UGF15JT-E3/45	1.98	45	50/tube	Tube
TO-263AB	UGB15JT-E3/45	1.35	45	50/tube	Tube
TO-263AB	UGB15JT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AC	UG15JTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AC	UGF15JTHE3/45 (1)	1.98	45	50/tube	Tube
TO-263AB	UGB15JTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	UGB15JTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

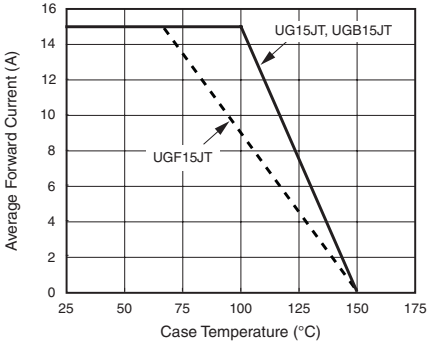


Figure 1. Forward Current Derating Curve

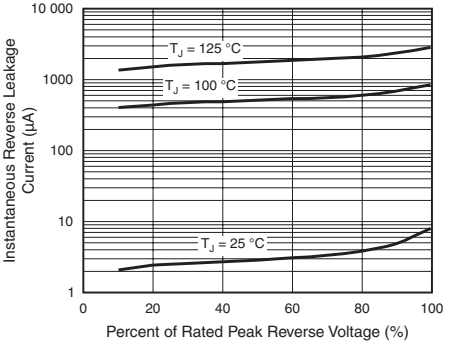


Figure 4. Typical Reverse Leakage Characteristics

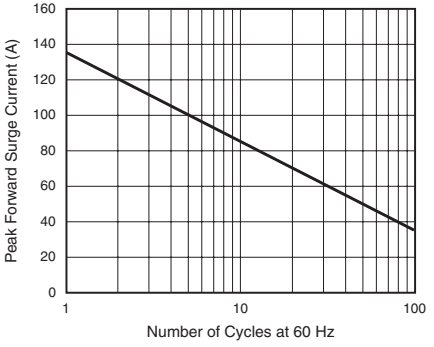


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

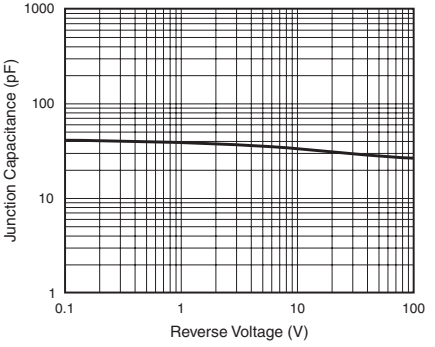


Figure 5. Typical Junction Capacitance

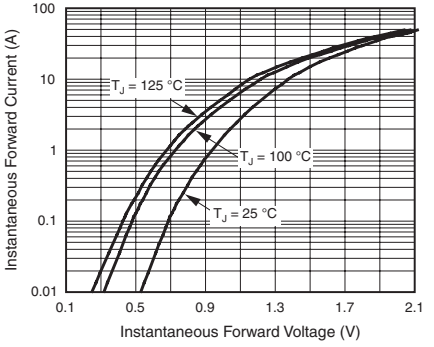


Figure 3. Typical Instantaneous Forward Characteristics

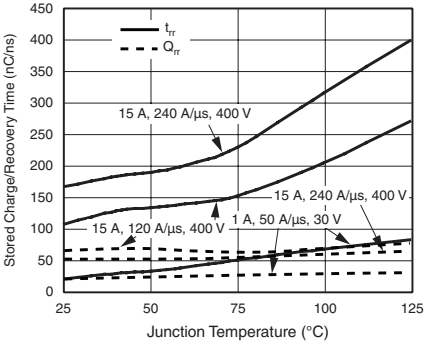
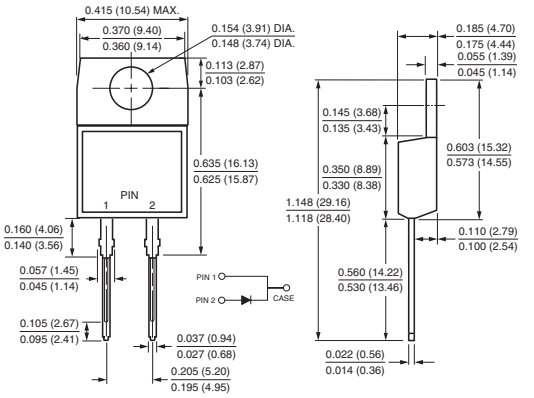


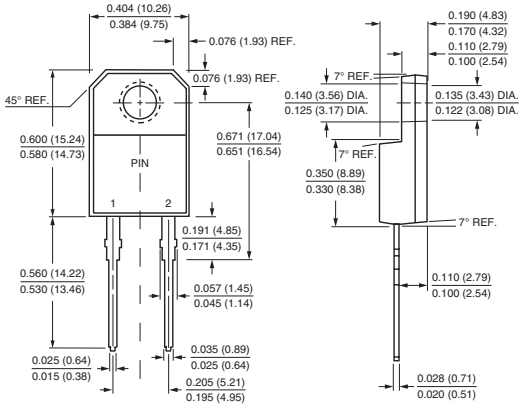
Figure 6. Reverse Switching Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

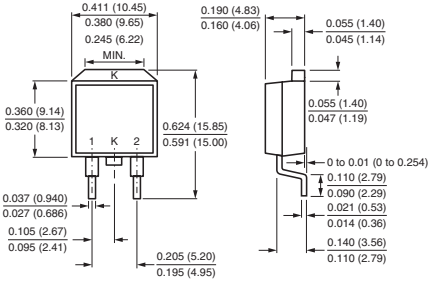
TO-220AC



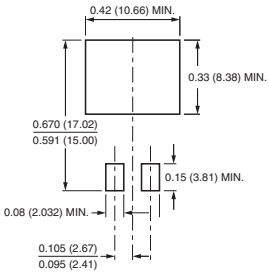
ITO-220AC



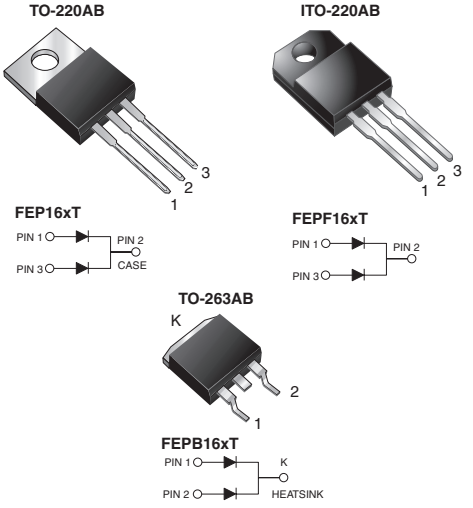
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Ultrafast Plastic Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- AEC-Q101 qualified
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 8.0 A
V_{RRM}	50 V to 600 V
I_{FSM}	200 A, 125 A
t_{rr}	35 ns, 50 ns
V_F	0.95 V, 1.30 V, 1.50 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FEP 16AT	FEP 16BT	FEP 16CT	FEP 16DT	FEP 16FT	FEP 16GT	FEP 16HT	FEP 16JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	500	600	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	350	420	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	500	600	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	16								A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	200				125				A
Operating storage and temperature range	T_J, T_{STG}	- 55 to +150								°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500								V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)												
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**FEP 16AT**	**FEP 16BT**	**FEP 16CT**	**FEP 16DT**	**FEP 16FT**	**FEP 16GT**	**FEP 16HT**	**FEP 16JT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	8.0 A		V_F	0.95				1.30		1.50		V
Maximum DC reverse current per diode at rated DC blocking voltage		T_C = 25 °C T_C = 100 °C	I_R	10 500								µA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35				50				ns
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	85						60		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**FEP**	**FEPF**	**FEPB**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	2.2	3.1	2.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	FEP16JT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	FEPF16JT-E3/45	1.97	45	50/tube	Tube
TO-263AB	FEPB16JT-E3/45	1.35	45	50/tube	Tube
TO-263AB	FEPB16JT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	FEP16JTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	FEPF16JTHE3/45 (1)	1.97	45	50/tube	Tube
TO-263AB	FEPB16JTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	FEPB16JTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

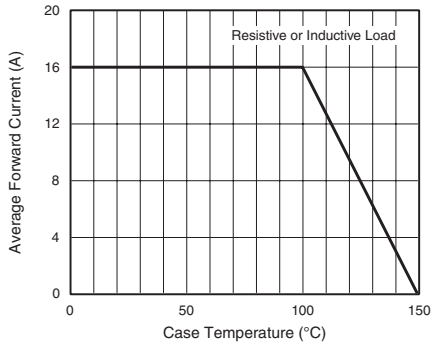


Figure 1. Forward Current Derating Curve

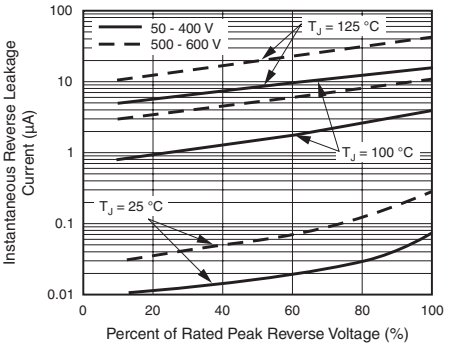


Figure 4. Typical Reverse Characteristics Per Diode

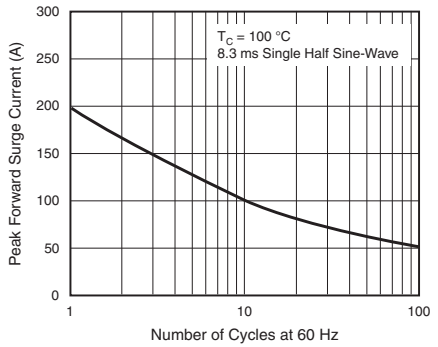


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

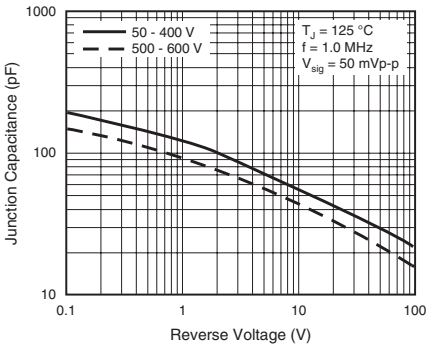


Figure 5. Typical Junction Capacitance Per Diode

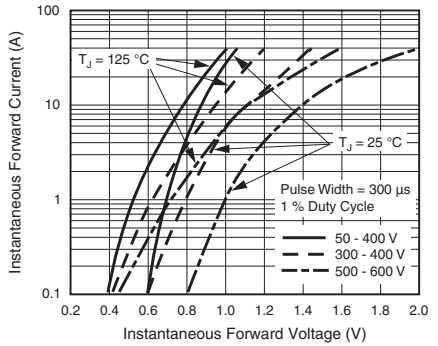
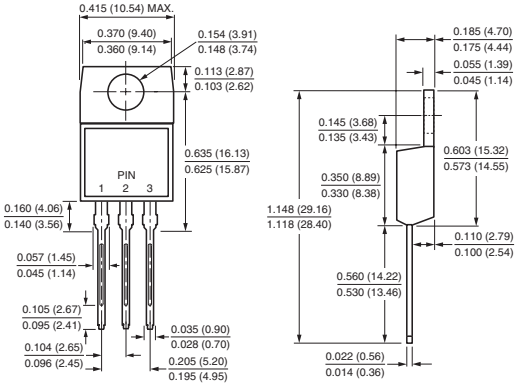


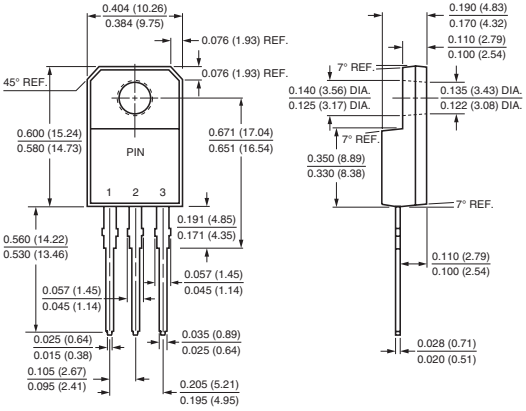
Figure 3. Typical Instantaneous Forward Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

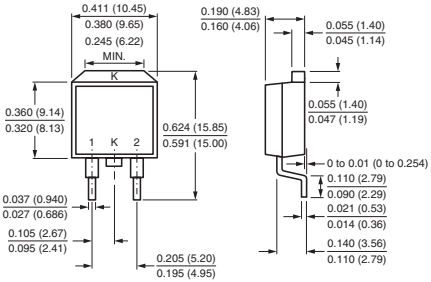
TO-220AB



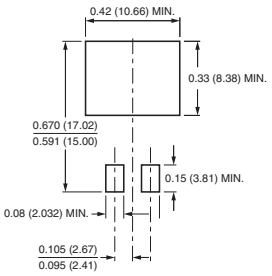
ITO-220AB



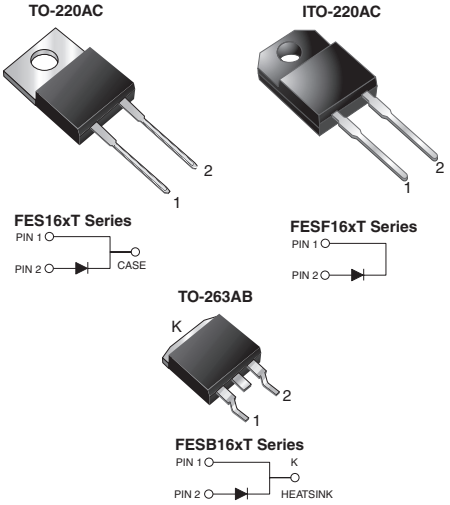
TO-263AB



Mounting Pad Layout



Ultrafast Plastic Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	16 A
V_{RRM}	50 V to 600 V
I_{FSM}	250 A
t_{rr}	35 ns, 50 ns
V_F	0.975 V, 1.30 V, 1.50 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FES 16AT	FES 16BT	FES 16CT	FES 16DT	FES 16FT	FES 16GT	FES 16HT	FES 16JT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	500	600	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	350	420	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	500	600	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	16								A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	250								A
Operating storage and temperature range	T_J, T_{STG}	- 65 to + 150								°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500								V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**FES 16AT**	**FES 16BT**	**FES 16CT**	**FES 16DT**	**FES 16FT**	**FES 16GT**	**FES 16HT**	**FES 16JT**	**UNIT**
Maximum instantaneous forward voltage (1)	16 A	V_F	0.975				1.30		1.50		V
Maximum DC reverse current at rated DC blocking voltage	T_C = 25 °C T_C = 100 °C	I_R	10 500								µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	35				50				ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	175						145		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**FES**	**FESF**	**FESB**	**UNIT**
Typical thermal resistance, junction to case	$R_{\theta JC}$	1.2	1.7	1.2	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	FES16JT-E3/45	1.78	45	50/tube	Tube
ITO-220AC	FESF16JT-E3/45	1.80	45	50/tube	Tube
TO-263AB	FESB16JT-E3/45	1.33	45	50/tube	Tube
TO-263AB	FESB16JT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	FES16JTHE3/45 (1)	1.78	45	50/tube	Tube
ITO-220AC	FESF16JTHE3/45 (1)	1.80	45	50/tube	Tube
TO-263AB	FESB16JTHE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	FESB16JTHE3/81 (1)	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

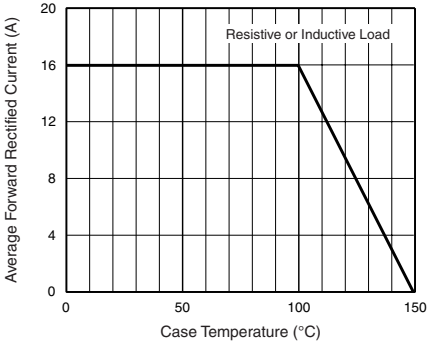


Figure 1. Maximum Forward Current Derating Curve

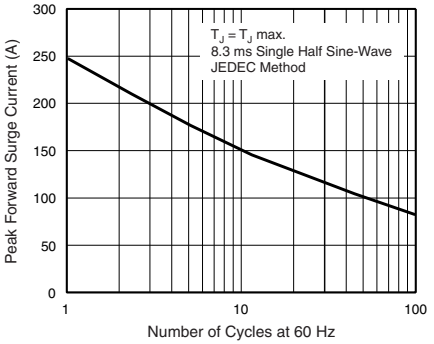


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

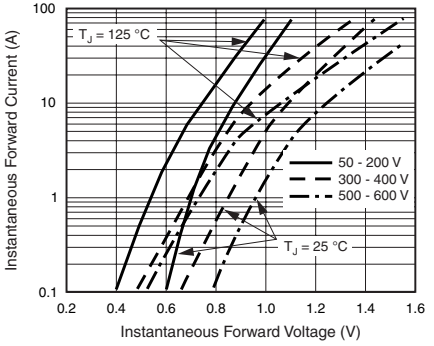


Figure 3. Typical Instantaneous Forward Characteristics

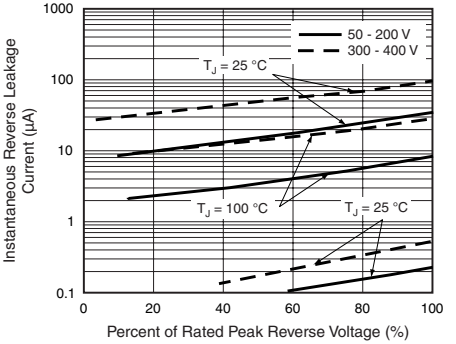


Figure 4. Typical Reverse Leakage Characteristics

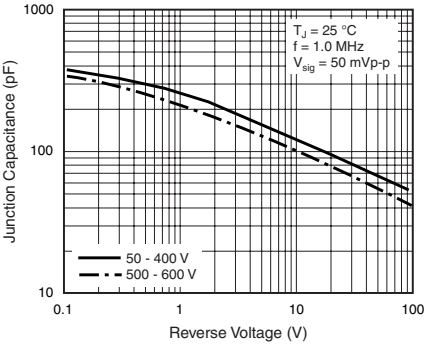
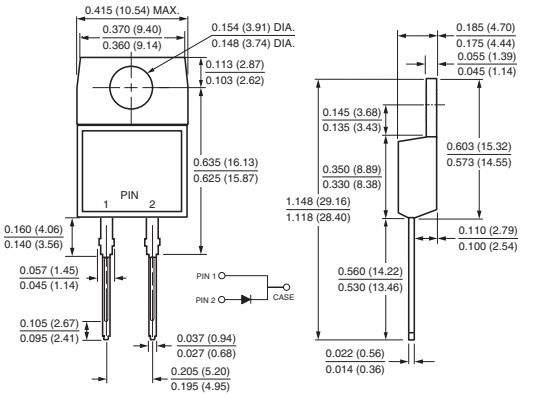


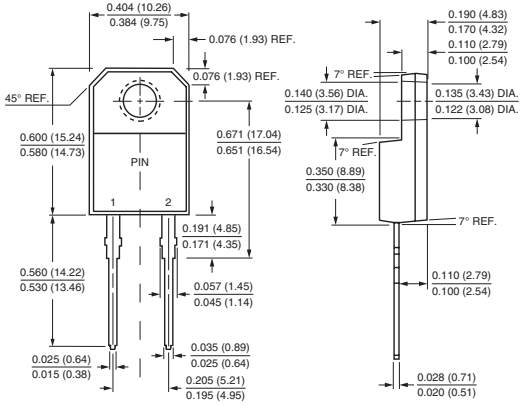
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

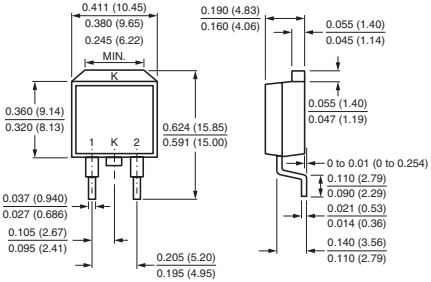
TO-220AC



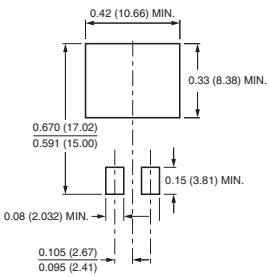
ITO-220AC



TO-263AB



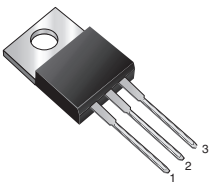
Mounting Pad Layout

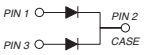


For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual Common-Cathode Ultrafast Plastic Rectifier

TO-220AB





FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	16 A
V_{RRM}	50 V to 200 V
I_{FSM}	125 A
t_{rr}	35 ns
V_F	0.895 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI2401	GI2402	GI2403	GI2404	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	16				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	125				A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GI2401**	**GI2402**	**GI2403**	**GI2404**	**UNIT**
Maximum instantaneous forward voltage per diode	I_F = 4 A I_F = 8 A I_F = 4 A I_F = 8 A	T_J = 25 °C T_J = 25 °C T_J = 100 °C T_J = 100 °C	V_F	0.900 0.975 0.800 0.895				V
Maximum DC reverse current at rated DC blocking voltage per diode		T_C = 25 °C T_C = 100 °C	I_R	50 150			5.0 500	µA
Maximum reverse recovery time per diode	I_F = 0 .5 A, I_R = 1.0 A, I_{rr} = 0.25A		t_{rr}	35				ns
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	85				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GI2401**	**GI2402**	**GI2403**	**GI2404**	**UNIT**
Typical thermal resistance per diode (1)	$R_{\theta JA}$ $R_{\theta JC}$	16 2.2				°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to case per leg mounted on heatsink

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	GI2401-E3/45	1.85	45	50/tube	Tube
TO-220AB	GI2401HE3/45 (1)	1.85	45	50/tube	Tube

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

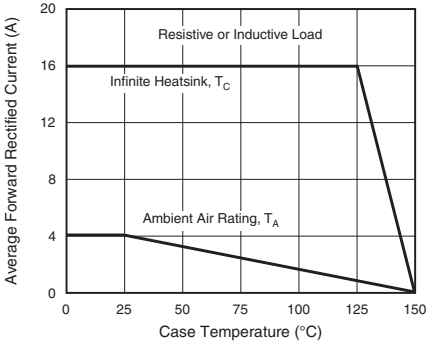


Figure 1. Maximum Forward Current Derating Curve

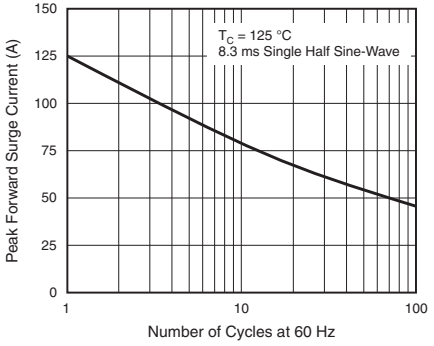


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

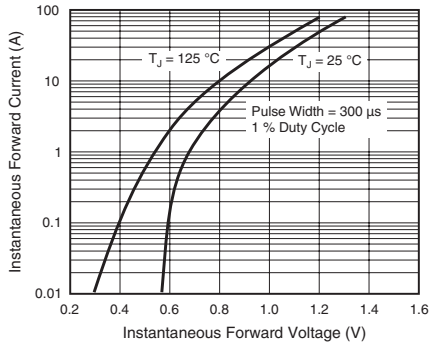


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

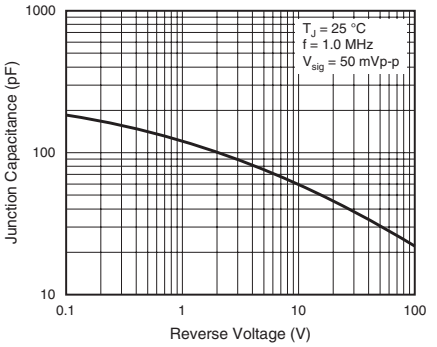


Figure 5. Typical Junction Capacitance Per Diode

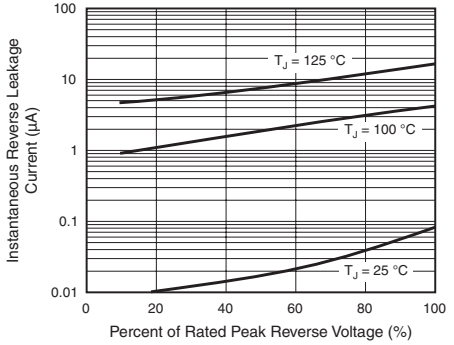
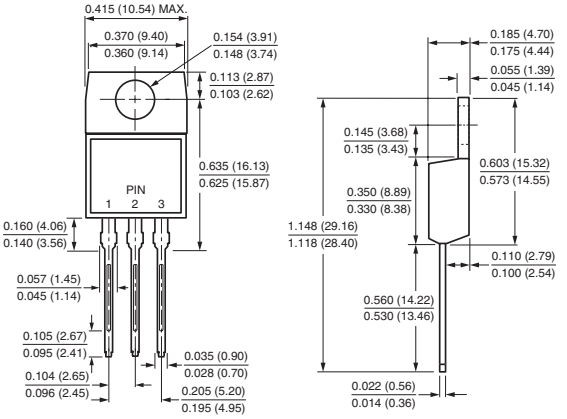


Figure 4. Typical Reverse Leakage Characteristics Per Diode

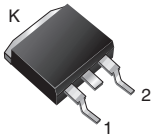
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

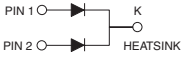
TO-220AB



Dual Common-Cathode Ultrafast Plastic Rectifier

TO-263AB





FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	16 A
V_{RRM}	50 V to 200 V
I_{FSM}	125 A
t_{rr}	35 ns
V_F	0.895 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GIB2401	GIB2402	GIB2403	GIB2404	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 125 °C	$I_{F(AV)}$	16				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	125				A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GIB2401**	**GIB2402**	**GIB2403**	**GIB2404**	**UNIT**
Maximum instantaneous forward voltage per diode	I_F = 4 A I_F = 8 A I_F = 4 A I_F = 8 A	T_J = 25 °C T_J = 25 °C T_J = 100 °C T_J = 100 °C	V_F	0.900 0.975 0.800 0.895				V
Maximum DC reverse current per diode at rated DC blocking voltage		T_C = 25 °C T_C = 100 °C	I_R	50 150			5.0 500	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	35				ns
Typical junction capacitance per diode	4 V, 1 MHz		C_J	85				pF

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GIB2401**	**GIB2402**	**GIB2403**	**GIB2404**	**UNIT**
Typical thermal resistance per diode (1)	$R_{\theta JC}$	1.2				°C/W

Note:

(1) Thermal resistance from junction to case per leg mounted on heatsink

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-263AB	GIB2401-E3/45	1.35	45	50/tube	Tube
TO-263AB	GIB2401-E3/81	1.35	81	900/reel	Tape and reel
TO-263AB	GIB2401HE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	GIB2401HE3/81 (1)	1.35	81	900/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

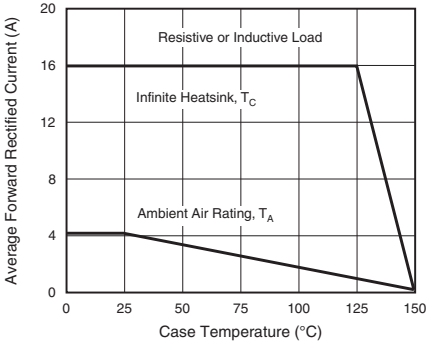


Figure 1. Maximum Forward Current Derating Curve

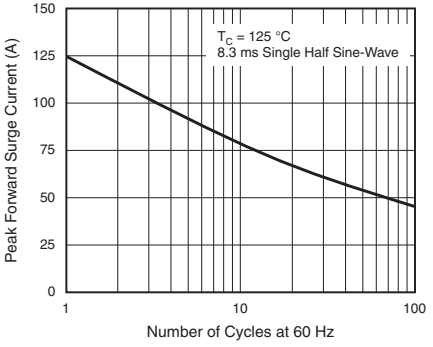


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

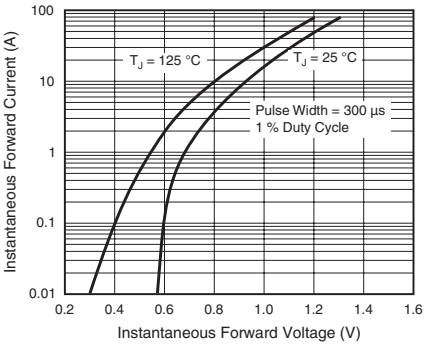


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

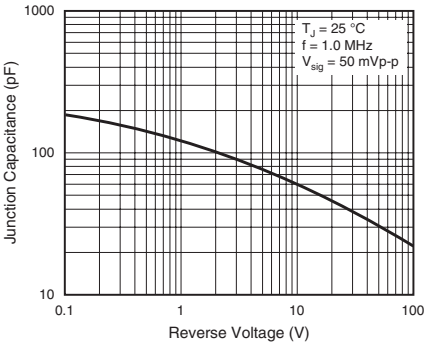


Figure 5. Typical Junction Capacitance Per Diode

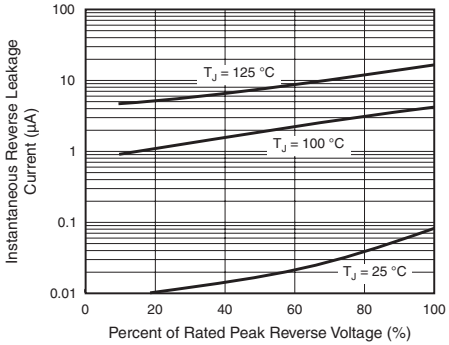
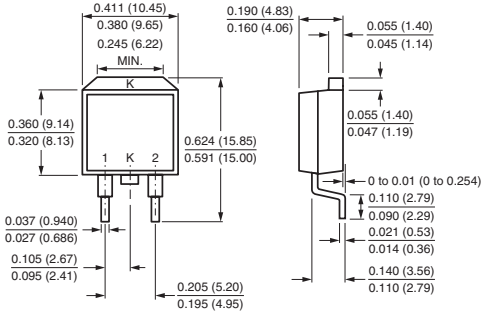
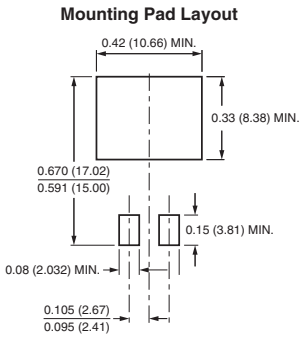


Figure 4. Typical Reverse Leakage Characteristics Per Diode

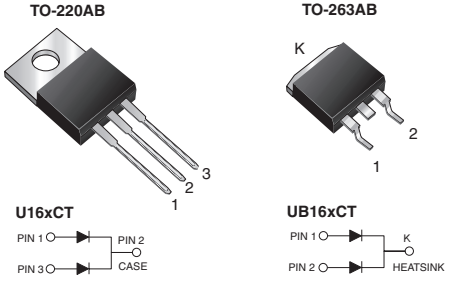
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AB





Dual Common-Cathode Ultrafast Plastic Rectifier



FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters or polarity protection specifically for DCM application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 8.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	80 A
t_{rr}	35 ns
V_F at I_F = 8 A	0.87 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB and TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	U(B)16BCT	U(B)16CCT	U(B)16DCT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100	150	200	V
Max. average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	16 8.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	80			A
Electrostatic discharge capacitor voltage, human body model: C = 150 pF, R = 1.5 kΩ (contact mode)		V_C	8			kV
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 4 A I_F = 8 A	T_J = 25 °C	V_F	0.90 0.99	- 1.10	V
	I_F = 4 A I_F = 8 A	T_J = 125 °C		0.77 0.87	- 0.95	
Reverse current per diode (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	0.5 155	10 600	µA
Reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	28	35	ns
Reverse recovery time per diode	I_F = 8 A, dI/dt = 20 A/µs, V_R = 200 V, I_{rr} = 0.1 I_{RM}		t_{rr}	67	80	ns
Stored charge per diode			Q_{rr}	33	-	nC
Forward recovery time per diode	I_F = 8 A, dI/dt = 64 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	160	-	ns
Peak forward voltage per diode			V_{FP}	3.3	-	V

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**U16xCT**	**UB16xCT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	3.5		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	U16DCT-E3/4W	1.87	4W	50/tube	Tube
TO-263AB	UB16DCT-E3/4W	1.31	4W	50/tube	Tube
TO-263AB	UB16DCT-E3/8W	1.31	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

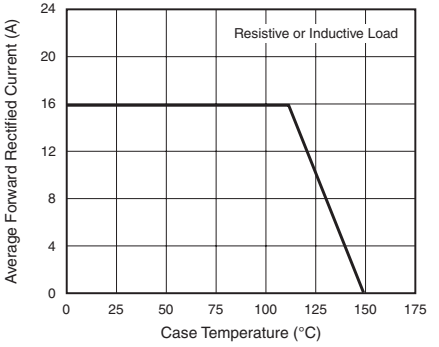


Figure 1. Maximum Forward Current Derating Curve

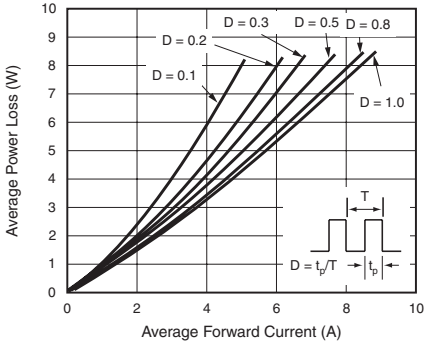


Figure 2. Forward Power Loss Characteristics Per Diode

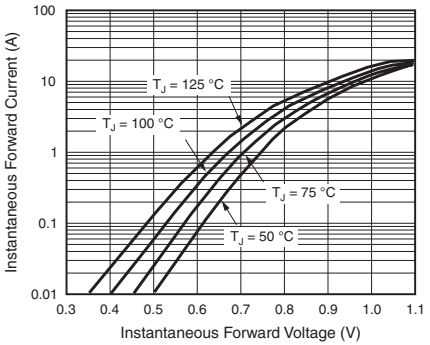


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

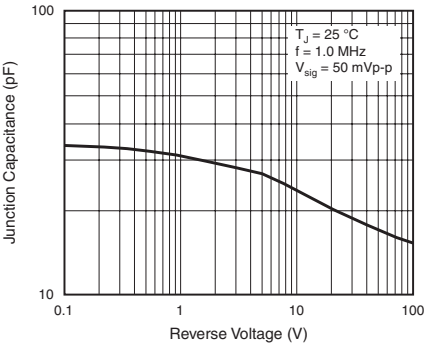


Figure 5. Typical Junction Capacitance Per Diode

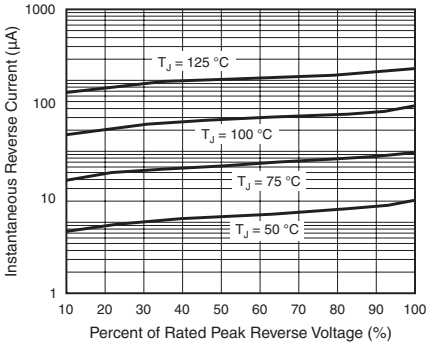


Figure 4. Typical Reverse Characteristics Per Diode

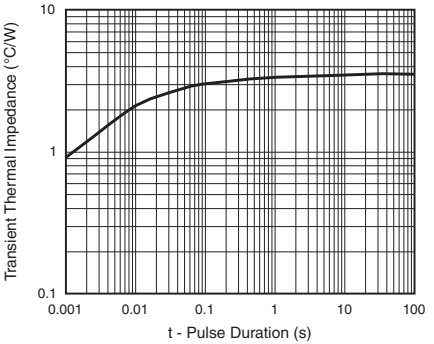
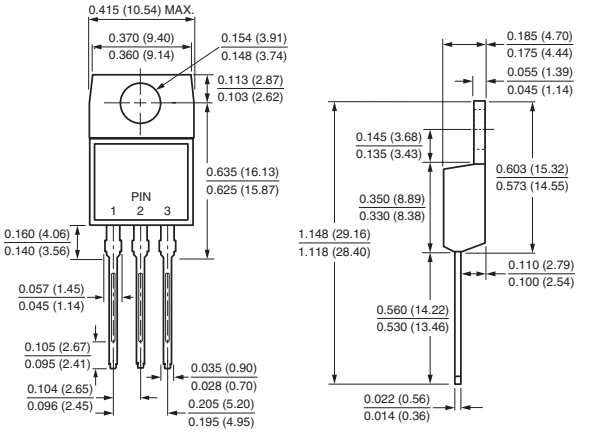


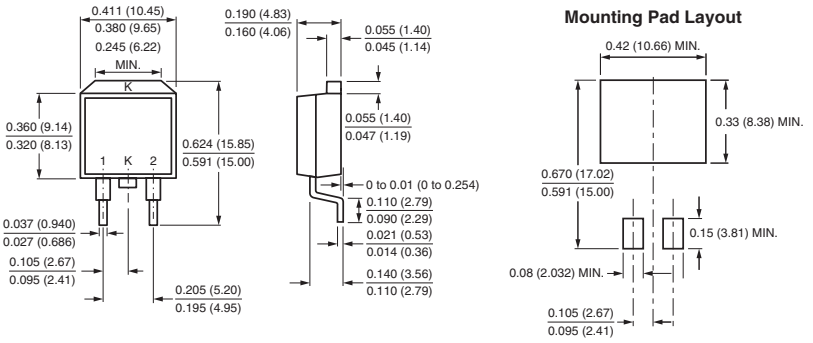
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

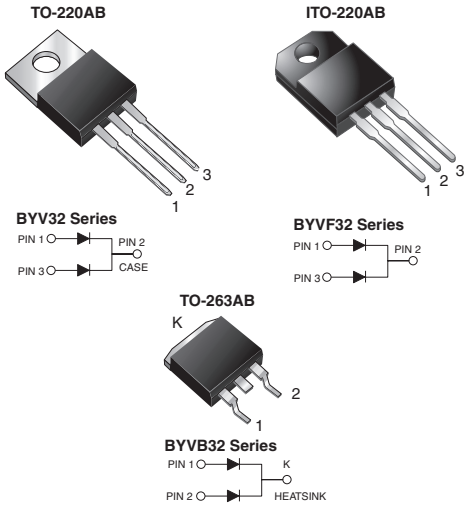
TO-220AB



TO-263AB



Dual Common-Cathode Ultrafast Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	18 A
V_{RRM}	50 V to 200 V
I_{FSM}	150 A
t_{rr}	25 ns
V_F	0.85 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYV32-50	BYV32-100	BYV32-150	BYV32-200	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 125 °C	$I_{F(AV)}$	18				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Operating storage and temperature range	T_J, T_{STG}	- 65 to + 150				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYV32-50**	**BYV32-100**	**BYV32-150**	**BYV32-200**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A I_F = 5.0 A	T_J = 25 °C T_J = 100 °C	V_F	1.15 0.85				V
Maximum DC reverse current per diode at rated DC blocking voltage		T_J = 25 °C T_J = 100 °C	I_R	10 600				µA
Maximum reverse recovery time per diode	I_F = 1 A, V_R = 30 V, dI/dt = 100 A/µs, I_{rr} = 10 % I_{RM}		t_{rr}	25				ns
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	45				pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYV**	**BYVF**	**BYVB**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	1.6	5.0	1.6	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	BYV32-200-E3/45	1.85	45	50/tube	Tube
ITO-220AB	BYVF32-200-E3/45	1.97	45	50/tube	Tube
TO-263AB	BYVB32-200-E3/45	1.35	45	50/tube	Tube
TO-263AB	BYVB32-200-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	BYV32-200HE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	BYVF32-200HE3/45 (1)	1.97	45	50/tube	Tube
TO-263AB	BYVB32-200HE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	BYVB32-200HE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

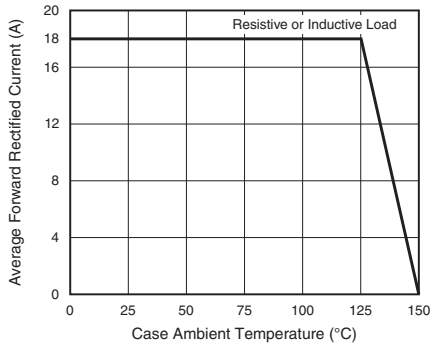


Figure 1. Forward Current Derating Curve

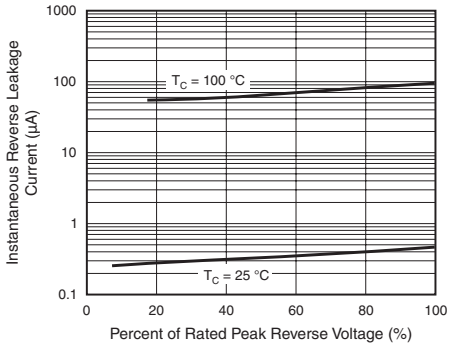


Figure 4. Typical Reverse Leakage Characteristics Per Diode

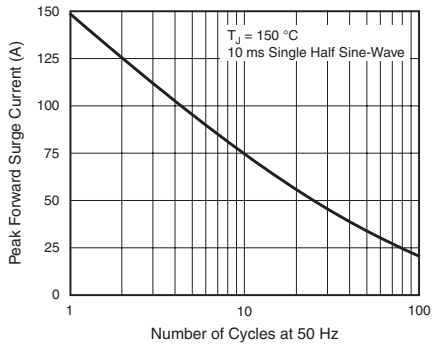


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

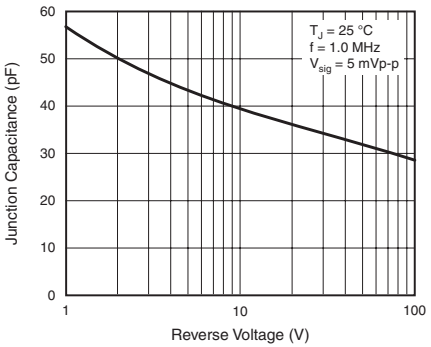


Figure 5. Typical Junction Capacitance Per Diode

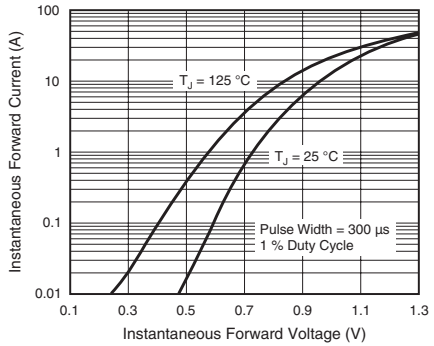
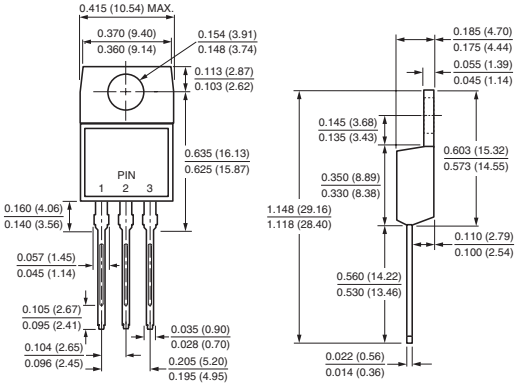


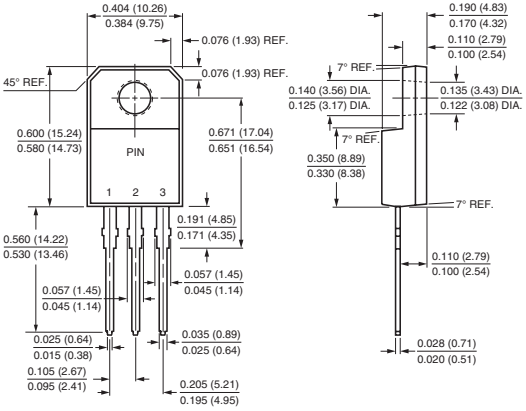
Figure 3. Typical Instantaneous Forward Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

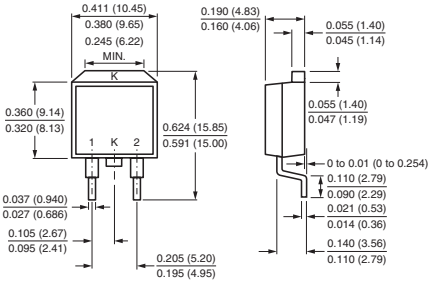
TO-220AB



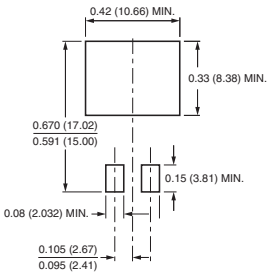
ITO-220AB



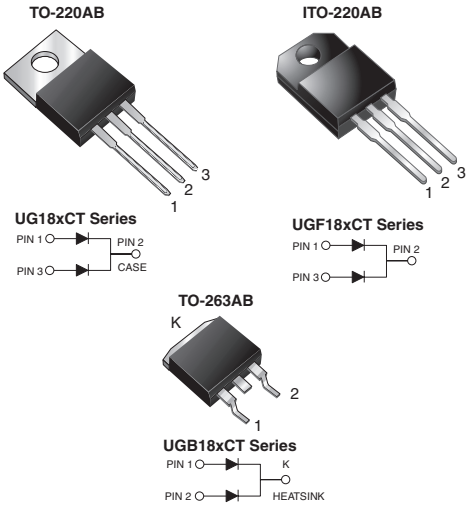
TO-263AB



Mounting Pad Layout



Dual Common-Cathode Ultrafast Plastic Rectifier



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	18 A
V_{RRM}	50 V to 200 V
I_{FSM}	175 A
t_{rr}	20 ns
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG18ACT	UG18BCT	UG18CCT	UG18DCT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 105 °C	$I_{F(AV)}$	18				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	175				A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 150				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG18ACT**	**UG18BCT**	**UG18CCT**	**UG18DCT**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	9.0 A 20 A 5.0 A	T_J = 100 °C	V_F	1.1 1.2 0.95				V
Maximum DC reverse current at rated DC blocking voltage per diode		T_A = 25 °C T_A = 100 °C	I_R	10 300				µA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20				ns
Maximum reverse recovery time per diode	I_F = 9.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	30 50				ns
Maximum stored charge per diode	I_F = 9.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	20 45				nC
Typical junction capacitance per diode	at 4.0 V, 1 MHz		C_J	30				pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**UG18**	**UGF18**	**UGB18**	**UNIT**
Typical thermal resistance from junction to case per diode	$R_{\theta JC}$	4.0	6.0	4.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	UG18DCT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	UGF18DCT-E3/45	2.00	45	50/tube	Tube
TO-263AB	UGB18DCT-E3/45	1.35	45	50/tube	Tube
TO-263AB	UGB18DCT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	UG18DCTHE3/45 (1)	1.85	45	50/tube	Tube
ITO-220AB	UGF18DCTHE3/45 (1)	2.00	45	50/tube	Tube
TO-263AB	UGB18DCTHE3/45 (1)	1.35	45	50/tube	Tube
TO-263AB	UGB18DCTHE3/81 (1)	1.35	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

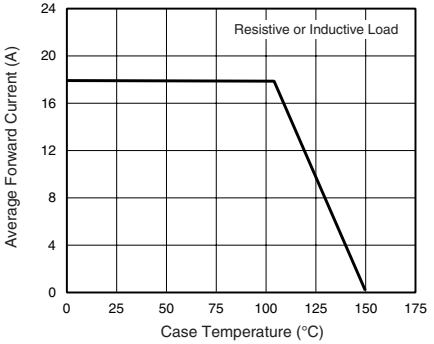


Figure 1. Forward Current Derating Curve

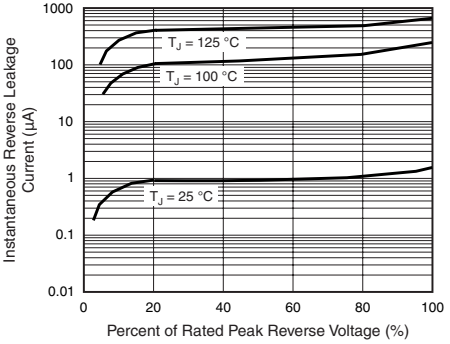


Figure 4. Typical Reverse Leakage Characteristics Per Diode

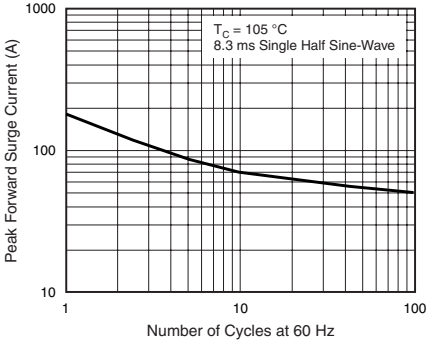


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

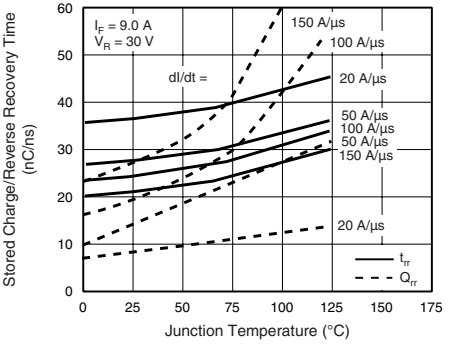


Figure 5. Reverse Switching Characteristics Per Diode

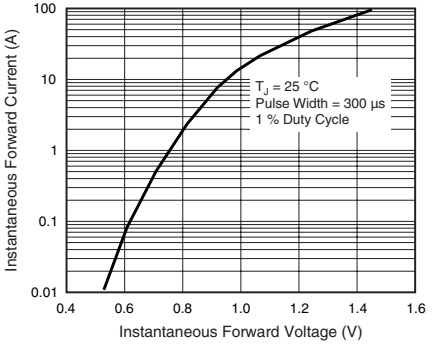


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

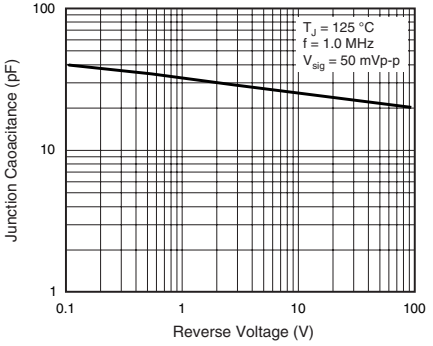
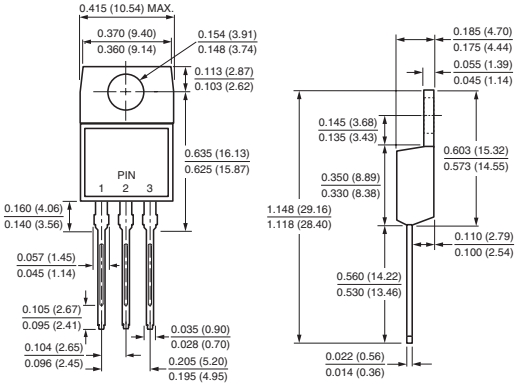


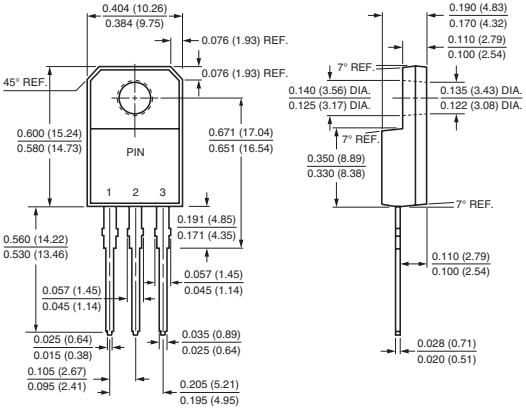
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

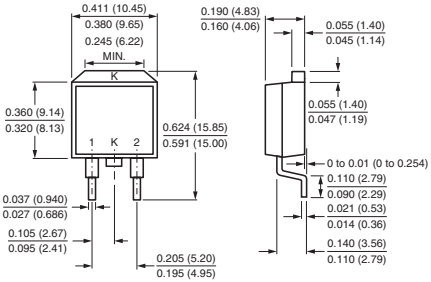
TO-220AB



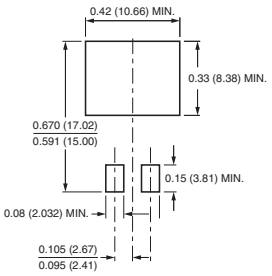
ITO-220AB



TO-263AB

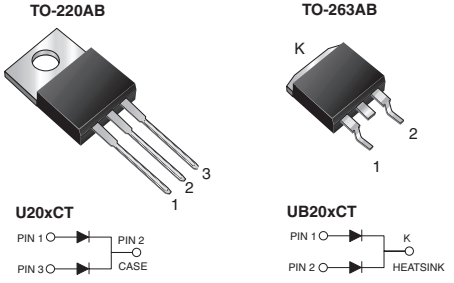


Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual Common-Cathode Ultrafast Plastic Rectifier



FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters or polarity protection specifically for DCM application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	100 A
t_{rr}	26 ns
V_F at I_F = 10 A	0.834 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB and TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	U(B)20BCT	U(B)20CCT	U(B)20DCT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Max. average forward rectified current (Fig. 1) total device per diode	$I_{F(AV)}$	20 10			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	100			A
Electrostatic discharge capacitor voltage, human body model: C = 150 pF, R = 1.5 kΩ (contact mode)	V_C	8			kV
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 10 A	T_J = 25 °C	V_F	0.854 0.931	- 1.00	V
	I_F = 5.0 A I_F = 10 A	T_J = 100 °C		0.760 0.834	- 0.91	
Reverse current per diode (2)	rated V_R	T_J = 25 °C T_J = 100 °C	I_R	1.2 120	15 500	µA
Reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	26	35	ns
Reverse recovery time per diode	I_F = 10 A, dIdt = 20 A/µs, V_R = 200 V, I_{rr} = 0.1 I_{RM}		t_{rr}	73	80	ns
Stored charge per diode			Q_{rr}	30	-	nC
Forward recovery time per diode	I_F = 10 A, dI/dt = 80 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	160	-	ns
Peak forward voltage per diode			V_{FP}	2.6	-	V

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**U20xCT**	**UB20xCT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	3.0		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	U20DCT-E3/4W	1.87	4W	50/tube	Tube
TO-263AB	UB20DCT-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	UB20DCT-E3/8W	1.37	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

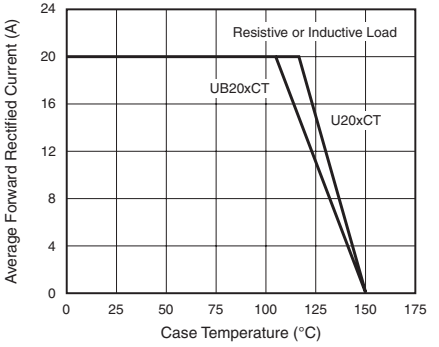


Figure 1. Maximum Forward Current Derating Curve

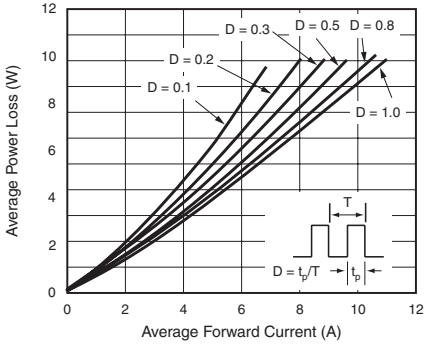


Figure 2. Forward Power Loss Characteristics Per Diode

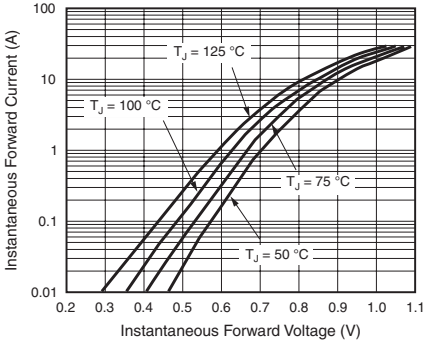


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

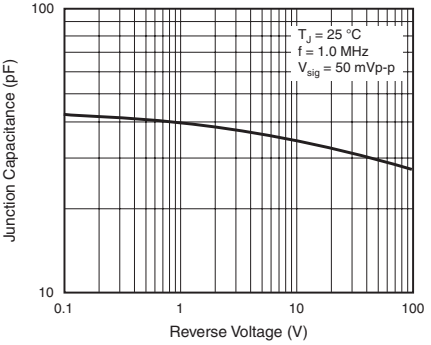


Figure 5. Typical Junction Capacitance Per Diode

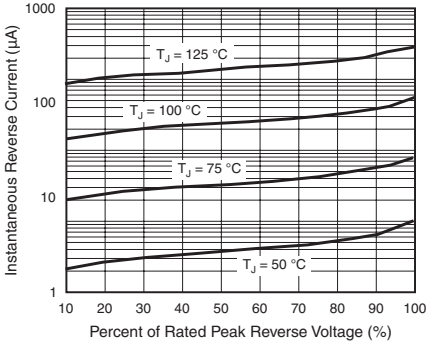


Figure 4. Typical Reverse Characteristics Per Diode

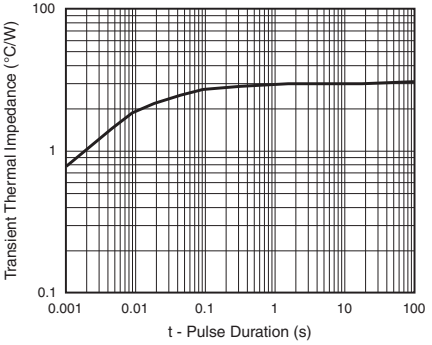
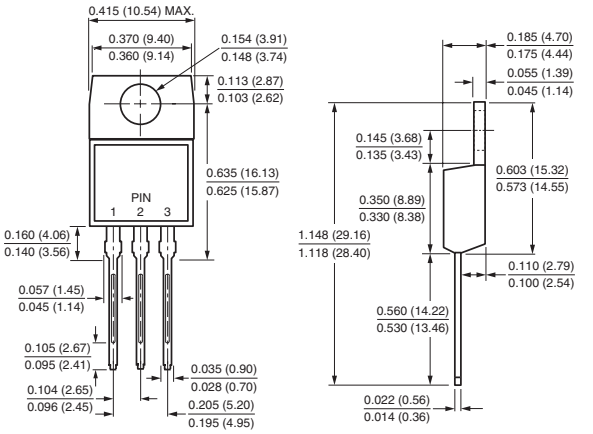


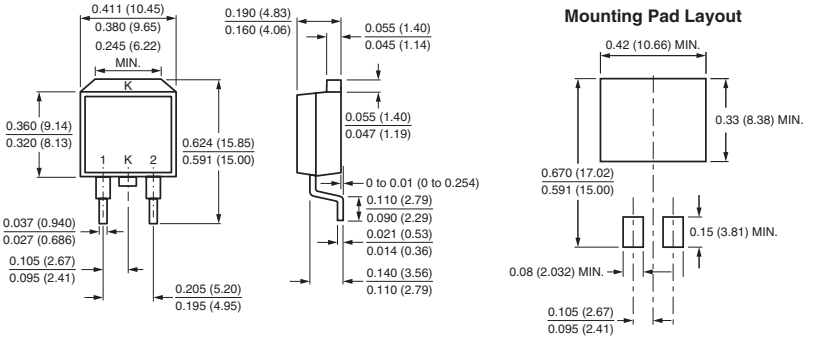
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

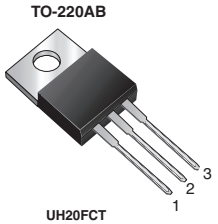


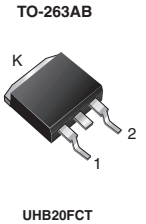
TO-263AB

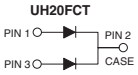


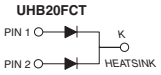
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Dual Common-Cathode Ultrafast Recovery Rectifier









FEATURES

- Oxide planar chip junction
- Ultrafast recovery times
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency power factor correctors, switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
V_{RRM}	300 V
I_{FSM}	180 A
t_{rr}	25 ns
V_F	0.83 V
T_J max.	175 °C

MECHANICAL DATA

Case: TO-220AB and TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	UH20FCT	UHB20FCT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	300		V
Maximum average forward rectified current (see Fig.1)	per device per diode	$I_{F(AV)}$	20 10		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	per diode	I_{FSM}	180		A
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 5.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.96 0.77	- -	V
	I_F = 10 A I_F = 10 A	T_J = 25 °C T_J = 125 °C		1.0 0.83	1.2 0.90	

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum reverse current per diode (2)	V_R = 300 V	T_J = 25 °C T_J = 125 °C	I_R	0.5 25	5 150	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20	25	ns
Maximum reverse recovery time per diode	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	28	35	ns
Typical softness factor (t_b/t_a)	I_F = 10 A, dI/dt = 200 A/µs, V_R = 200 V, T_J = 125 °C per diode		S	0.36	-	-
Typical reverse recovery current			I_{RM}	7.0	-	A
Typical stored charge			Q_{rr}	160	-	nC
Typical forward recovery time per diode	I_F = 10 A, dI/dt = 80 A/µs, V_{FR} = 1.1 x $V_{F\ max.}$		t_{fr}	150	-	ns

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UH20FCT**	**UHB20FCT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.0	2.0	°C/W

ORDERING INFORMATION					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	UH20FCT-E3/4W	1.88	4W	50/tube	Tube
TO-263AB	UHB20FCT-E3/4W	1.38	4W	50/tube	Tube
TO-263AB	UHB20FCT-E3/8W	1.38	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

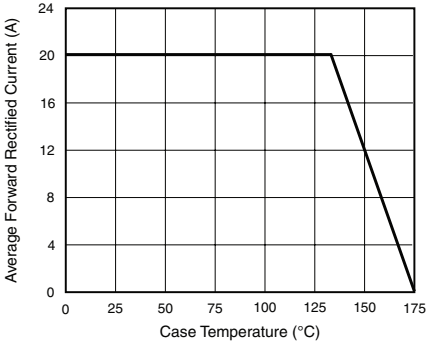


Figure 1. Maximum Forward Current Derating Curve

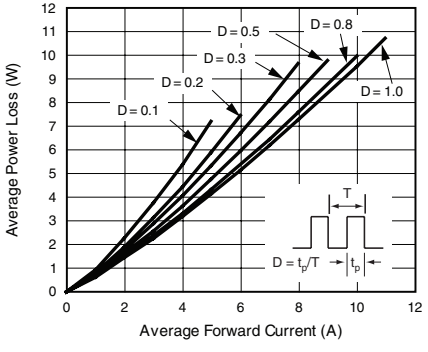


Figure 2. Forward Power Loss Characteristics Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

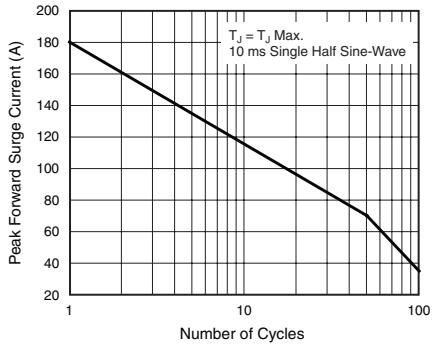


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

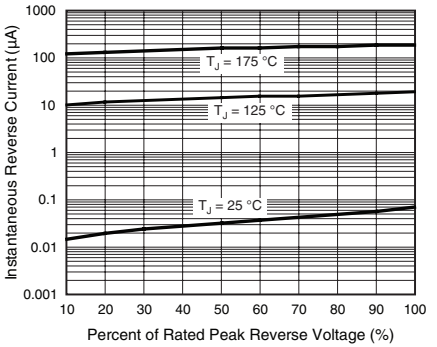


Figure 5. Typical Reverse Leakage Characteristics Per Diode

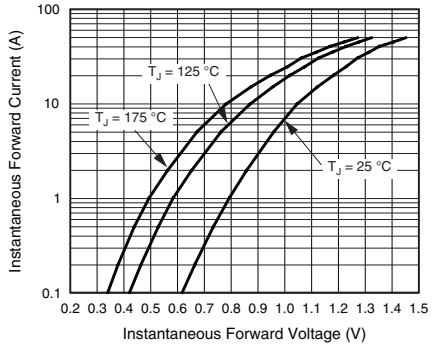


Figure 4. Typical Instantaneous Forward Characteristics Per Diode

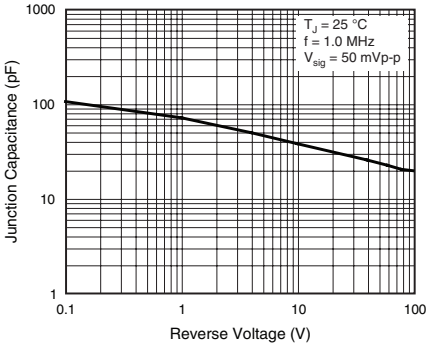
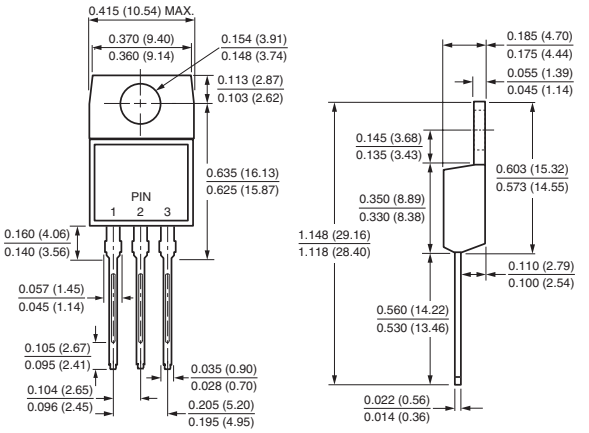


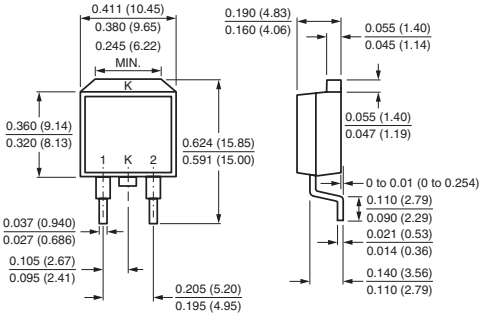
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

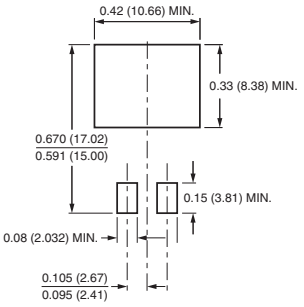
TO-220AB



TO-263AB

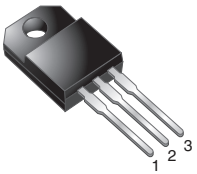


Mounting Pad Layout

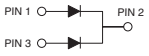


Dual Common-Cathode Ultrafast Recovery Rectifier

ITO-220AB



UHF20FCT



FEATURES

- Oxide planar chip junction
- Ultrafast recovery times
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency power factor correctors, switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

MECHANICAL DATA

Case: ITO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(peak)}$	2 x 10 A
V_{RRM}	300 V
I_{FSM}	180 A
t_{rr}	25 ns
V_F at I_F = 10 A	0.85 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	UHF20FCT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	300	V
Maximum DC working forward current at T_C = 125 °C	per device per diode	$I_{F(peak)}$	20 10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	per diode	I_{FSM}	180	A
Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min		V_{AC}	1500	V
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A I_F = 10.0 A	T_A = 25 °C	V_F	0.96 1.02	- 1.20	V
	I_F = 5.0 A I_F = 10.0 A	T_A = 125 °C		0.77 0.85	- -	
Maximum reverse current per diode (2)	V_R = 300 V	T_A = 25 °C T_A = 125 °C	I_R	0.06 25	5 150	µA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	20	25	ns
Maximum reverse recovery time per diode	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}	t_{rr}	28	35	ns
Typical softness factor (t_b/t_a)	I_F = 10 A, dI/dt = 200 A/µs, V_R = 200 V, T_J = 125 °C per diode	S	0.36	-	-
Typical reverse recovery current		I_{RM}	7.0	-	A
Typical stored charge		Q_{rr}	160	-	nC
Typical forward recovery time per diode	I_F = 10 A, dI/dt = 80 A/µs, V_{FR} = 1.1 x $V_{F\ max.}$	t_{fr}	150	-	ns

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**UHF20FCT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JA}$ (1) $R_{\theta JC}$ (2)	50 4.6	°C/W

Notes:

(1) Without heatsink, free air

(2) With infinite heatsink

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ITO-220AB	UHF20FCT-E3/4W	1.74	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

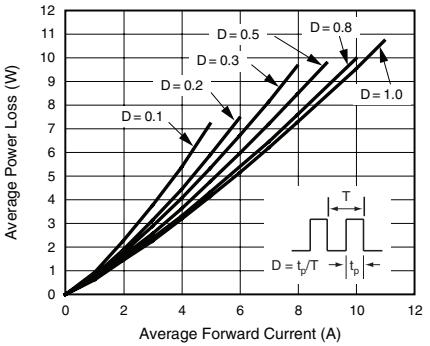


Figure 1. Forward Power Loss Characteristics Per Diode

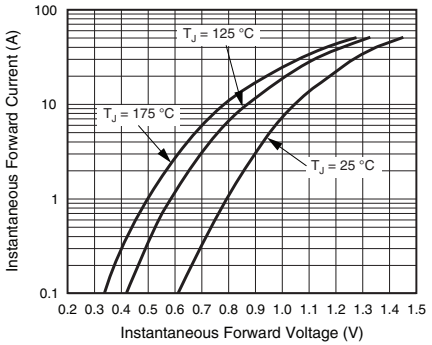


Figure 2. Typical Instantaneous Forward Characteristics Per Diode

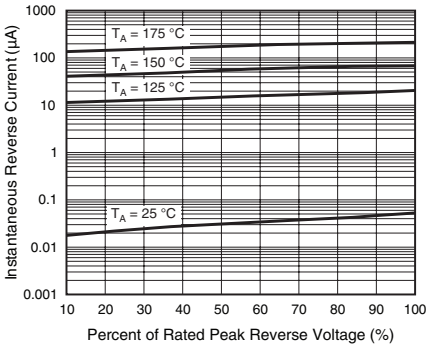


Figure 3. Typical Reverse Leakage Characteristics Per Diode

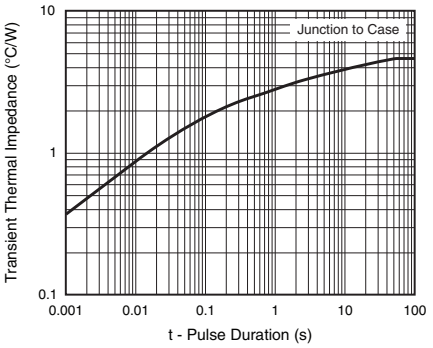


Figure 5. Typical Transient Thermal Impedance Per Diode

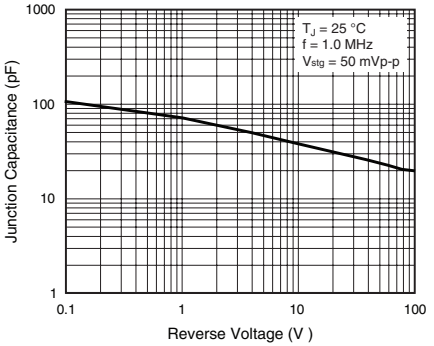
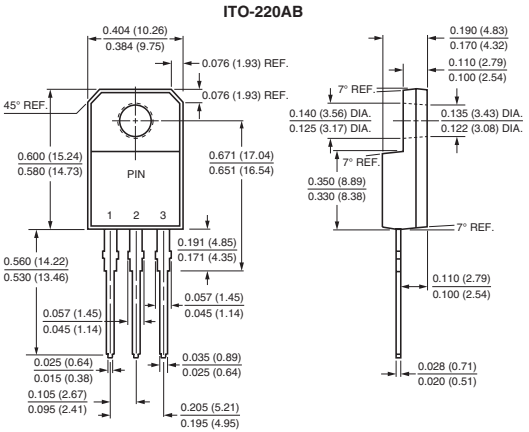
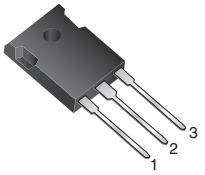


Figure 4. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Dual Common Cathode Ultrafast Rectifier



TO-247AD (TO-3P)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	50 V to 600 V
I_{FSM}	300 A
t_{rr}	35 ns, 50 ns
V_F	0.95 V, 1.3 V, 1.5 V
T_J max.	150 °C

FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low thermal resistance
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	FEP 30AP	FEP 30BP	FEP 30CP	FEP 30DP	FEP 30FP	FEP 30GP	FEP 30HP	FEP 30JP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	500	600	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	210	280	350	420	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	300	400	500	600	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	30								A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	300								A
Operating storage and temperature range	T_J, T_{STG}	- 55 to + 150								°C/W

For technical questions within your region, please contact one of the following:
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Document Number: 88597
Revision: 29-Aug-07

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS	SYMBOL	FEP 30AP	FEP 30BP	FEP 30CP	FEP 30DP	FEP 30FP	FEP 30GP	FEP 30HP	FEP 30JP	UNIT
Maximum instantaneous forward voltage per diode	15.0 A	V_F	0.95				1.3		1.5		V
Maximum DC reverse current at rated DC blocking voltage per diode	T_C = 25 °C T_C = 100 °C	I_R	10 500								µA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	35				50				ns
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	175						145		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	SYMBOL	FEP 30AP	FEP 30BP	FEP 30CP	FEP 30DP	FEP 30FP	FEP 30GP	FEP 30HP	FEP 30JP	UNIT
Typical thermal resistance per diode (1)	$R_{\theta JC}$	1.0								°C/W

Note:

(1) Thermal resistance from junction to case per diode mounted on heatsink

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-247AD	FEP30JP-E3/45	6.15	30	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

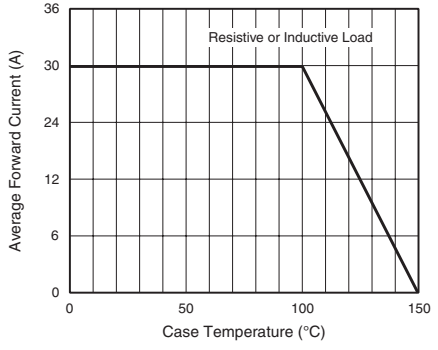


Figure 1. Forward Current Derating Curve

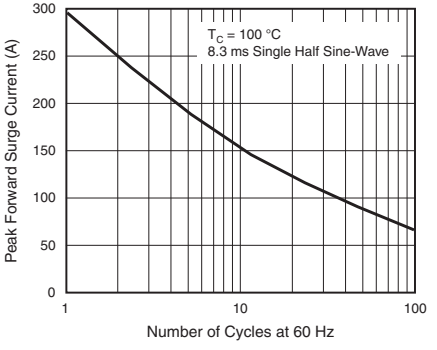


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

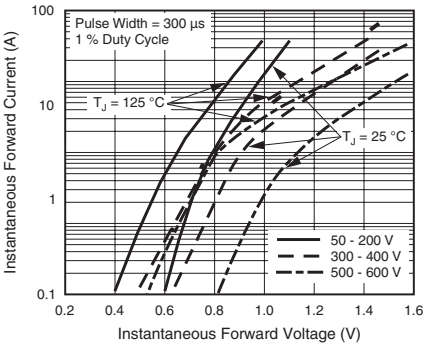


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

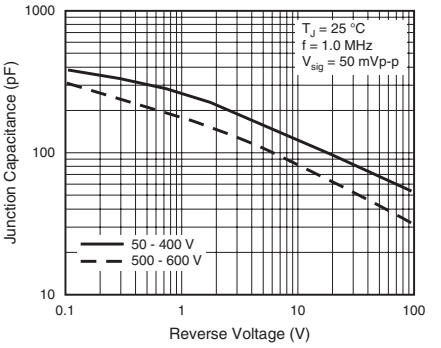


Figure 5. Typical Junction Capacitance Per Diode

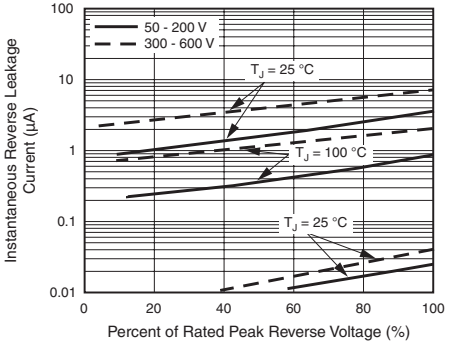
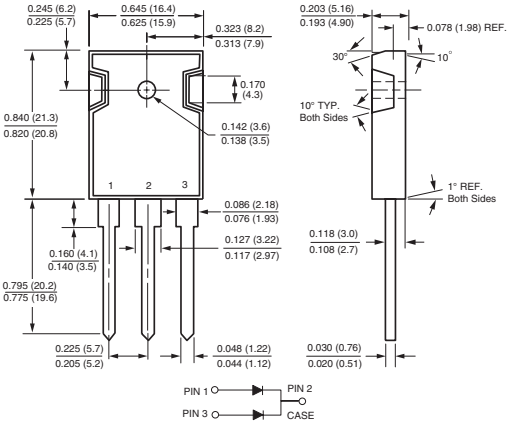


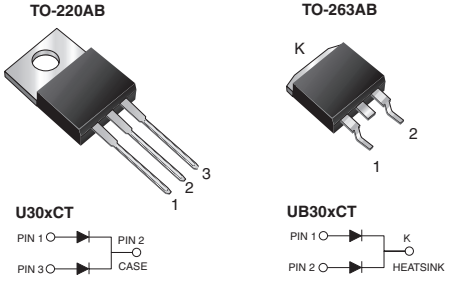
Figure 4. Typical Reverse Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



Dual Common-Cathode Ultrafast Plastic Rectifier



FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters or polarity protection specifically for CCM application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 15 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	160 A
t_{rr}	17 ns
V_F at I_F = 15 A	0.892 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AB and TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	U(B)30BCT	U(B)30CCT	U(B)30DCT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	100	150	200	V
Max. average forward rectified current (Fig. 1)	total device per diode	$I_{F(AV)}$	30 15			A
Peak forward surge current single half sine-wave superimposed on rated load per diode	8.3 ms 10 ms	I_{FSM}	160 150			A
Electrostatic discharge capacitor voltage, human body model: C = 150 pF, R = 1.5 kΩ (contact mode)		V_C	8			kV
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode (1)	I_F = 7.5 A I_F = 15 A	T_J = 25 °C	V_F	0.875 0.964	- 1.05	V
	I_F = 7.5 A I_F = 15 A	T_J = 100 °C		0.800 0.892	- 0.95	
Reverse current per diode (2)	rated V_R	T_J = 25 °C T_J = 100 °C	I_R	1.3 200	20 600	µA
Reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	17	25	ns
Reverse recovery time per diode	I_F = 15 A, dI/dt = 200 A/µs, V_R = 200 V, I_{rr} = 0.1 I_{RM}		t_{rr}	36	45	ns
Stored charge per diode			Q_{rr}	110	-	nC
Forward recovery time per diode	I_F = 15 A, dI/dt = 120 A/µs, V_F = 1.1 x $V_{F\ max.}$		t_{fr}	175	-	ns
Peak forward voltage per diode			V_{FP}	3.1	-	V

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**U30xCT**	**UB30xCT**	**UNIT**
Typical thermal resistance per diode	$R_{\theta JC}$	2.4		°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AB	U30DCT-E3/4W	1.87	4W	50/tube	Tube
TO-263AB	UB30DCT-E3/4W	1.37	4W	50/tube	Tube
TO-263AB	UB30DCT-E3/8W	1.37	8W	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

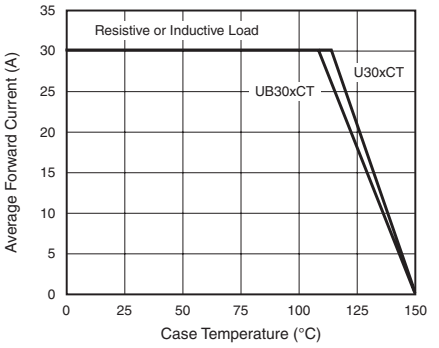


Figure 1. Maximum Forward Current Derating Curve

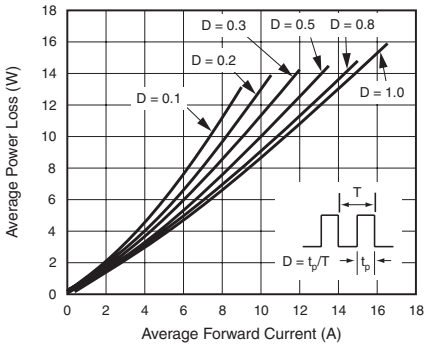


Figure 2. Forward Power Loss Characteristics Per Diode

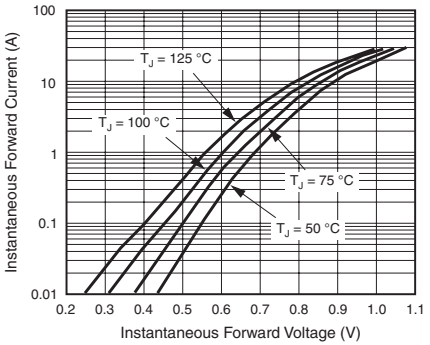


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

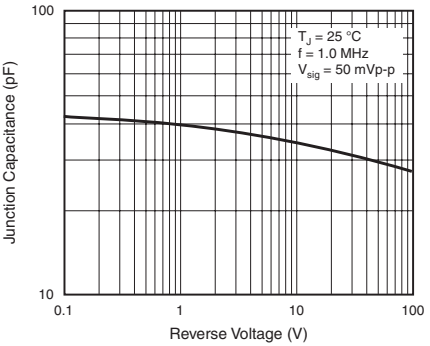


Figure 5. Typical Junction Capacitance Per Diode

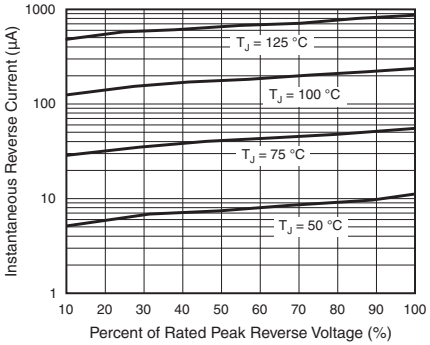


Figure 4. Typical Reverse Characteristics Per Diode

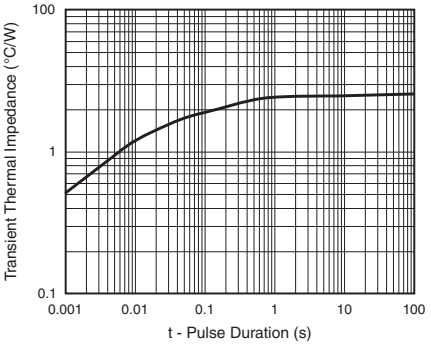
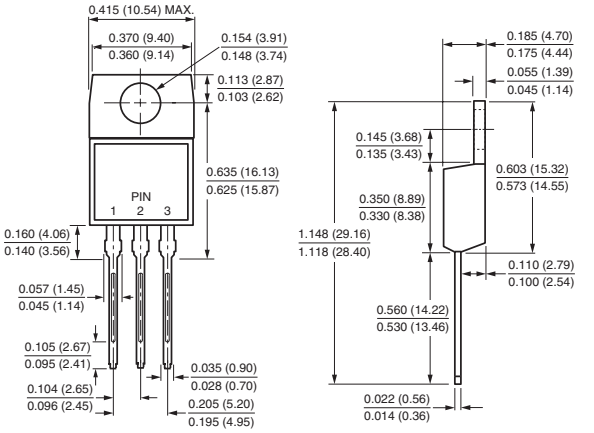


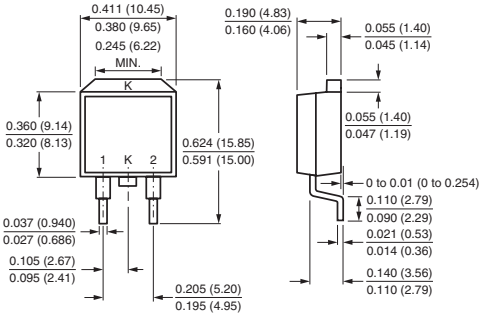
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

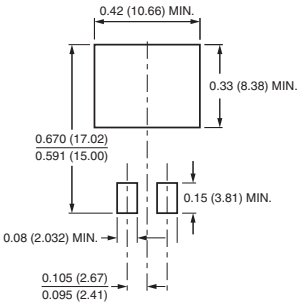
TO-220AB



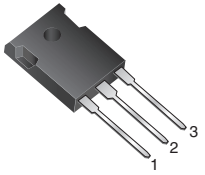
TO-263AB



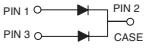
Mounting Pad Layout



Dual Common-Cathode Ultrafast Plastic Rectifier



TO-247AD (TO-3P)



FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	50 V to 200 V
I_{FSM}	300 A
t_{rr}	25 ns
V_F	0.85 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	UG30APT	UG30BPT	UG30CPT	UG30DPT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current at T_C = 120 °C	$I_{F(AV)}$	30				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	300				A
Operating and storage temperature range	T_J, T_{STG}	- 65 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	UG30APT	UG30BPT	UG30CPT	UG30DPT	UNIT
Maximum instantaneous forward voltage per diode	15 A 30 A 10 A	T_J = 100 °C	V_F	1.0 1.15 0.85				V
Maximum DC reverse current at rated DC blocking voltage per diode		T_A = 25 °C T_A = 100 °C	I_R	15 800				µA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**UG30APT**	**UG30BPT**	**UG30CPT**	**UG30DPT**	**UNIT**
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	25				ns
Maximum reverse recovery time	I_F = 15 A, V_R = 30 V, dI/dt = 50 A/µs, I_{RR} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	35 50				ns
Maximum recovered stored charge	I_F = 15 A, V_R = 30 V, dI/dt = 50 A/µs, I_{RR} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	Q_{rr}	22 50				nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	70				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**UG30APT**	**UG30BPT**	**UG30CPT**	**UG30DPT**	**UNIT**
Typical thermal resistance per diode (1)	$R_{\theta JC}$	2.0				°C/W

Note:

(1) Thermal resistance from junction to case per diode mounted on heatsink

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD	UG30DPT-E3/45	6.15	30	30/tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

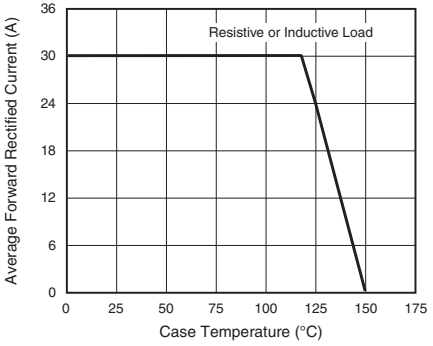


Figure 1. Maximum Forward Current Derating Curve

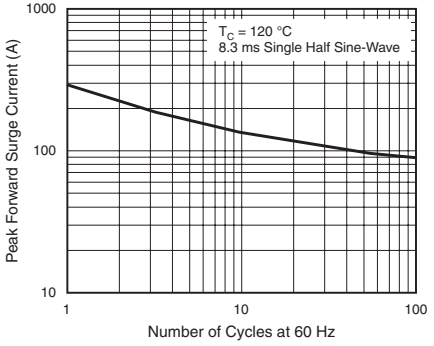


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

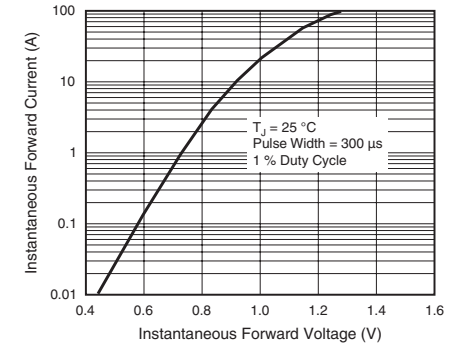


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

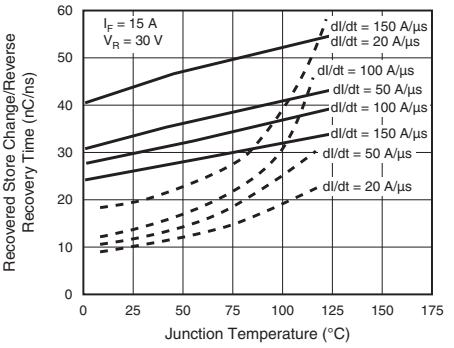


Figure 5. Reverse Switching Characteristics Per Diode

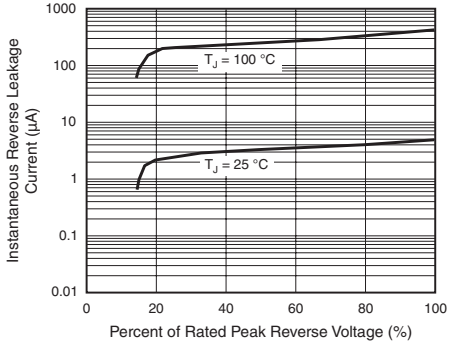


Figure 4. Typical Reverse Leakage Characteristics Per Diode

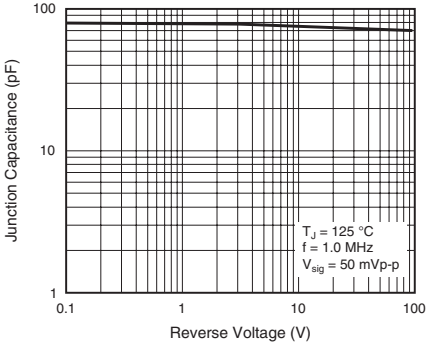
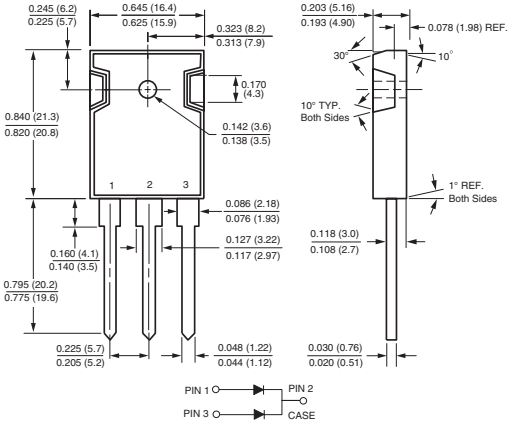


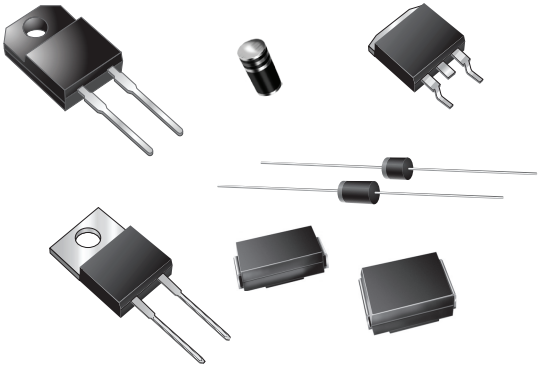
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-247AD (TO-3P)



Fast Recovery Rectifiers



Contents

(for full listing please see Selector Guide on page 30)

Introduction to Fast Recovery Rectifiers

Vishay General Semiconductor

Fast recovery rectifiers are for use in applications requiring swithing times from 100 to 750 ns. Typical applications are: SMPS, motor conrollers, electronic ballasts and high voltage TV/CRT. They are available in plastic, glass and SUPERECTIFIER® constructions. Package offerings are axial leaded, surface mount and power packages.

We offer these devices in a variety of packages for your convenience.

P600

GP20

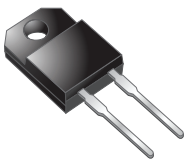
DO-204AC (DO-15)

DO-201AD

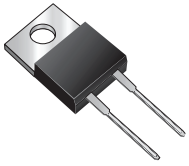
DO-204AL (DO-41)

R-1

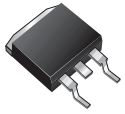
MPG06



ITO-220AC

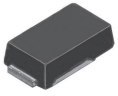


TO-220AC



TO-263AB

DO-214BA (GF1)



DO-220AA (SMP)

DO-214AB (SMC)

DO-214AA (SMB)

DO-214AC (SMA)

For technical questions within your region, please contact:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89090
Revision: 15-Jul-08

Fast Recovery Rectifiers Part Numbering System

1. SURFACE MOUNT

a) SMD

RSxy RSxPy

R = Fast recovery
S = Surface mount
x = Forward current (in A)
1 = 1.0 A
2 = 1.5 A
3 = 3.0 A
P = SMP package
y = Reverse voltage (in V)

A = 50 V	G = 400 V
B = 100 V	J = 600 V
D = 200 V	K = 800 V

b) GF1 SUPERECTIFIER®

RGF1y

R = Fast recovery
GF = Glass flat-pack
1 = 1.0 A
y = Reverse voltage

A = 50 V	J = 600 V
B = 100 V	K = 800 V
D = 200 V	M = 1000 V
G = 400 V	

2. AXIAL

a) Plastic (silicone rubber passivated)

SRPx00y

SR = Fast switching recovery
P = Plastic
x = Forward current (in A)
y = Reverse voltage (in V)

A = 50 V	G = 400 V
B = 100 V	J = 600 V
D = 200 V	K = 800 V

b) Plastic (die-level glass passivated)

RMPG06y

R = Fast recovery
MP = Miniature plastic
G = Glass passivated die
06 = 0.6 A package style
y = Reverse voltage (in V)

A = 50 V	G = 400 V
B = 100 V	J = 600 V
D = 200 V	K = 800 V

c) SUPERECTIFIER®

RGPxxy

R = Fast recovery
GP = Glass plastic
xx = Forward current (in A)

02 = 0.25 A	20 = 2.0 A
10 = 1.0 A	30 = 3.0 A
15 = 1.5 A	

y = Reverse voltage (in V)

A = 50 V	J = 600 V
B = 100 V	K = 800 V
D = 200 V	M = 1000 V
G = 400 V	

"E" suffix denotes lead diameter in 24 mils

Notes:

- Part numbering system for all parts, excluding JEDEC, ProElectron and industry standard part numbers
- For JEDEC and ProElectron part numbers, please see part number explanations on page 18

GHR16

Vishay General Semiconductor

Photoflash Rectifier

Case Style R-1

FEATURES

- Glass passivated chip junction
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage rectification of photoflash application.

MECHANICAL DATA

Case: R-1

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	1600 V
I_{FSM}	20 A
V_F	1.5 V
t_{rr}	300 ns
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1600	V
Maximum RMS voltage	V_{RMS}	1120	V
Maximum DC blocking voltage	V_{DC}	1600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	0.5	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	20	A
Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead length at T_L = 55 °C	$I_{R(AV)}$	100	µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage drop	0.5 A		V_F	1.5	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	300	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	10	pF

For technical questions within your region, please contact one of the following:
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Document Number: 88618
Revision: 08-Apr-08

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GHR16-E3/54	0.2	54	5500	13" diameter paper tape and reel
GHR16-E3/73	0.2	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

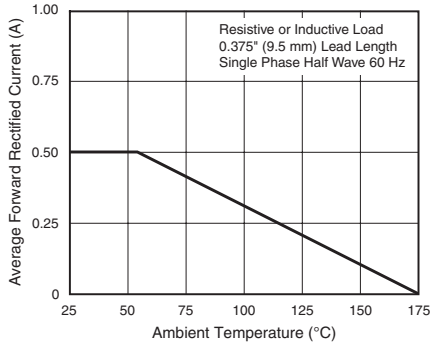


Figure 1. Maximum Forward Current Derating Curve

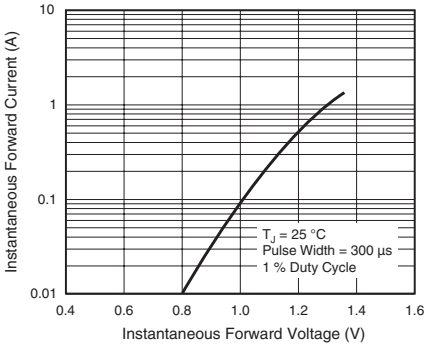


Figure 3. Typical Instantaneous Forward Characteristics

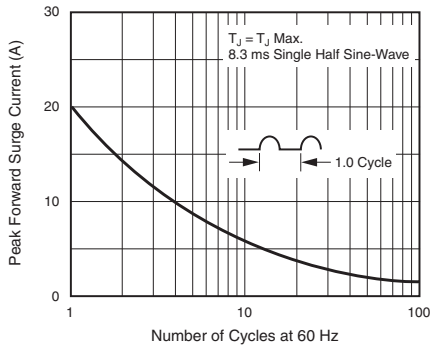


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

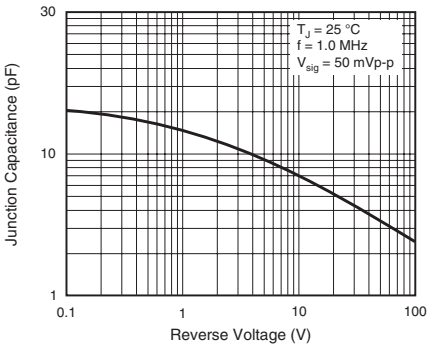
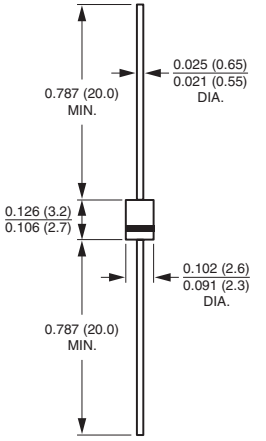


Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style R-1



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Document Number: 88618
Revision: 08-Apr-08

Surface Mount Glass Passivated Junction Fast Switching Rectifier

DO-213AA (GL34)

FEATURES

- Superectifier structure for high reliability condition
- Ideal for automated placement
- Fast switching for high efficiency
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	50 V to 800 V
I_{FSM}	10 A
t_{rr}	150 ns, 250 ns
V_F	1.3 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-213AA, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER FAST SWITCHING DEVICE: 1st BAND IS RED	SYMBOL	RGL34A	RGL34B	RGL34D	RGL34G	RGL34J	RGL34K	UNIT
Polarity color bands (2nd band)		Gray	Red	Orange	Yellow	Green	Blue	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current at T_T = 55 °C	$I_{F(AV)}$	0.5						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	10						A
Maximum full load reverse current, full cycle average T_A = 55 °C	$I_{R(AV)}$	30						µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**RGL34A**	**RGL34B**	**RGL34D**	**RGL34G**	**RGL34J**	**RGL34K**	**UNIT**
Maximum instantaneous forward voltage	0.5 A		V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0						μA
		T_A = 125 °C		50						
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	4						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**RGL34A**	**RGL34B**	**RGL34D**	**RGL34G**	**RGL34J**	**RGL34K**	**UNIT**
Maximum thermal resistance	$R_{\theta JA}$ (1)	150						°C/W
	$R_{\theta JT}$ (2)	70						

Notes

(1) Thermal resistance from junction to ambient, 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to terminal, 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RGL34J-E3/98	0.036	98	2500	7" diameter plastic tape and reel
RGL34J-E3/83	0.036	83	9000	13" diameter plastic tape and reel
RGL34JHE3/98 (1)	0.036	98	2500	7" diameter plastic tape and reel
RGL34JHE3/83 (1)	0.036	83	9000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

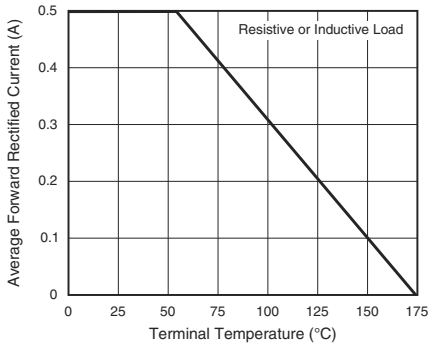


Fig. 1 - Forward Current Derating Curve

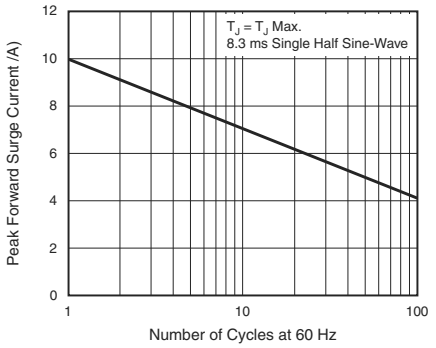


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

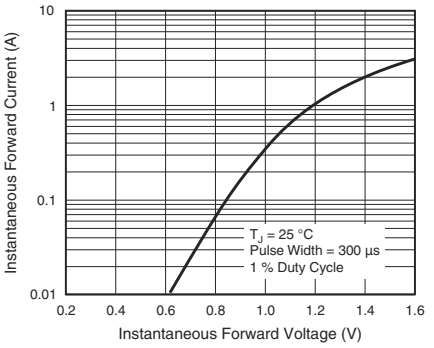


Fig. 3 - Typical Instantaneous Forward Characteristics

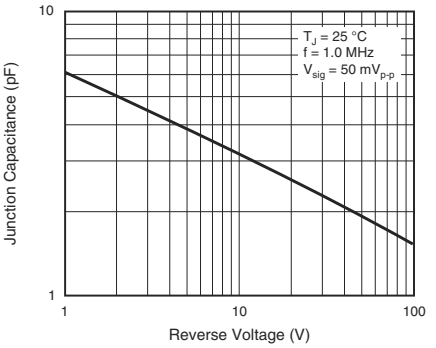


Fig. 5 - Typical Junction Capacitance

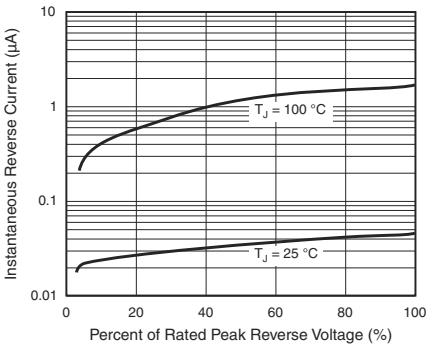
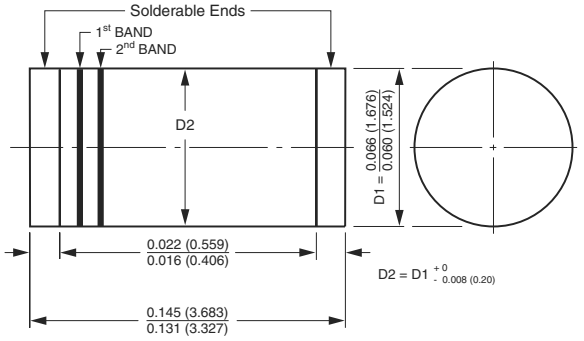


Fig. 4 - Typical Reverse Characteristics

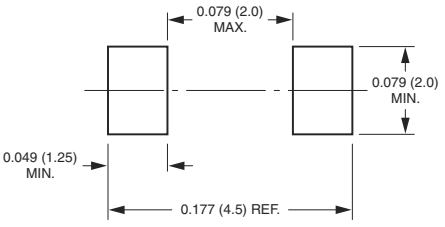
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AA (GL34)

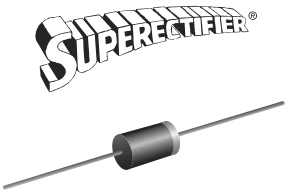


1st band denotes type and polarity
2nd band denotes voltage type

Mounting Pad Layout



Glass Passivated Junction Fast Switching Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current, typical I_R less than 0.2 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	1200 V to 2000 V
I_{FSM}	20 A
t_{rr}	300 ns
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

High voltage rectification of G2 grid CRT and TV, snubber circuit of camera flash, snubber circuit of automotive ignition module.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RGP02-12E	RGP02-14E	RGP02-15E	RGP02-16E	RGP02-17E	RGP02-18E	RGP02-20E	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1200	1400	1500	1600	1700	1800	2000	V
Maximum RMS voltage	V_{RMS}	840	980	1050	1120	1190	1260	1400	V
Maximum DC blocking voltage	V_{DC}	1200	1400	1500	1600	1700	1800	2000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	0.5							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated	I_{FSM}	20							A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
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Document Number: 88699
Revision: 21-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	RGP02-12E	RGP02-14E	RGP02-15E	RGP02-16E	RGP02-17E	RGP02-18E	RGP02-20E	UNIT
Maximum instantaneous forward voltage	0.1 A		V_F	1.8							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							μA
		T_A = 125 °C		50							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	300							ns

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	RGP02-12E	RGP02-14E	RGP02-15E	RGP02-16E	RGP02-17E	RGP02-18E	RGP02-20E	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	65							°C/W
	$R_{\theta JL}$ (1)	30							

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
RGP02-12E-E3/54	0.24	54	5500	13" diameter paper tape and reel
RGP02-12E-E3/73	0.24	73	3000	Ammo pack packaging
RGP02-12EHE3/54 (1)	0.24	54	5500	13" diameter paper tape and reel
RGP02-12EHE3/73 (1)	0.24	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

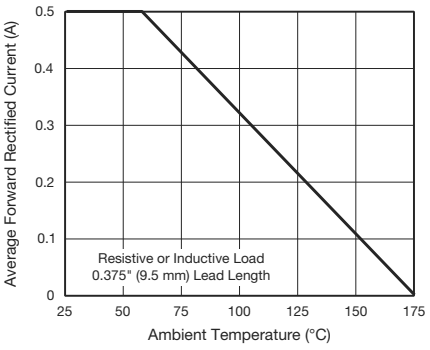


Fig. 1 - Forward Current Derating Curve

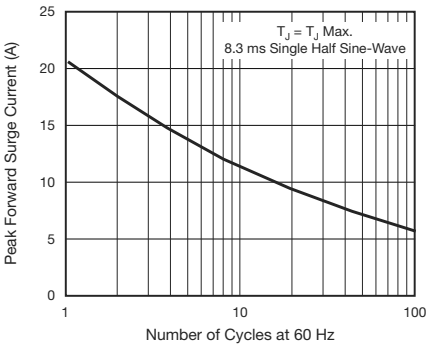


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

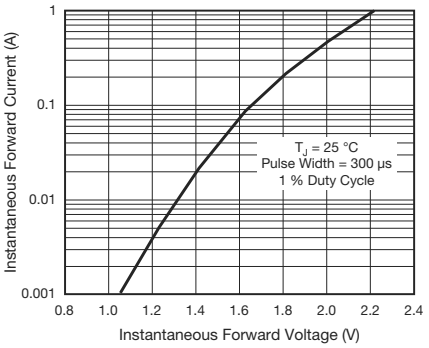


Fig. 3 - Typical Instantaneous Forward Characteristics

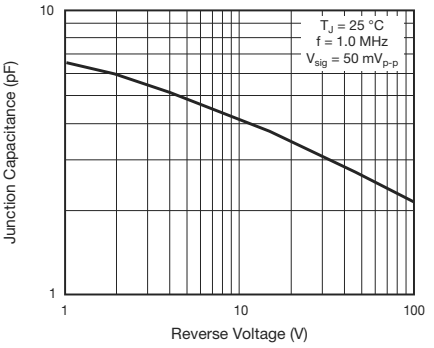


Fig. 5 - Typical Junction Capacitance

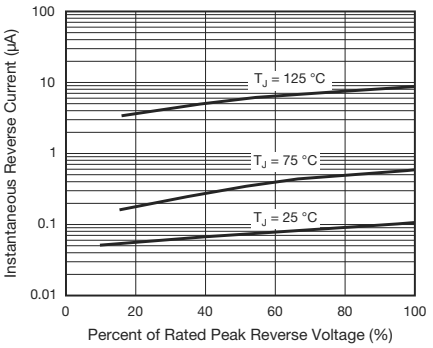
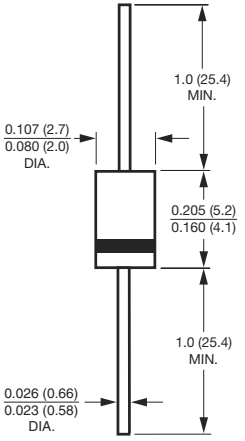


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



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Document Number: 88699
Revision: 21-Jan-11

Fast Switching Plastic Rectifier

DO-204AL (DO-41)

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-204AL, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 600 V
I_{FSM}	30 A
t_{rr}	200 ns
I_R	5.0 µA
V_F	1.2 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N4933	1N4934	1N4935	1N4936	1N4937	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	V
Maximum RMS voltage	V_{RMS}	35	70	145	280	420	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A= 75 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30					A
Maximum reverse recovery current (1)	I_{RM}	2.0					A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	1N4933	1N4934	1N4935	1N4936	1N4937	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.2					V
Maximum DC reverse current at rated DC blocking voltage		T_A= 25 °C T_A= 100 °C	I_R	5.0 100					µA
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}		t_{rr}	200					ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	12					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**1N4933**	**1N4934**	**1N4935**	**1N4936**	**1N4937**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	55 25					°C/W

Note:

(1) Thermal resistance from junction to ambient, and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N4933-E3/54	0.33	54	5500	13" diameter paper tape and reel
1N4933-E3/73	0.33	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

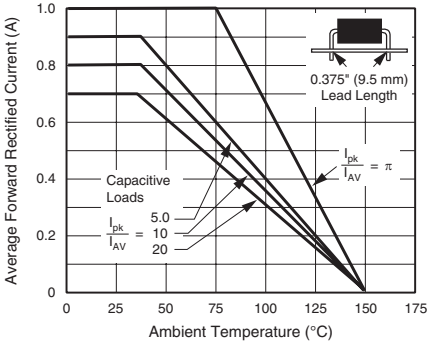


Figure 1. Forward Current Derating Curves

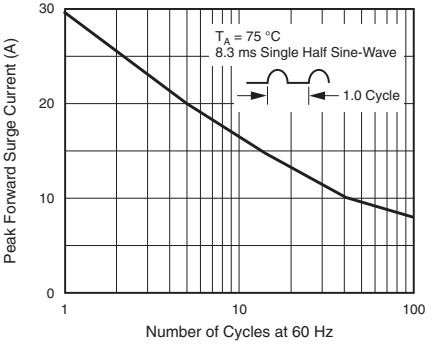


Figure 3. Maximum Non-repetitive Peak Forward Surge Current

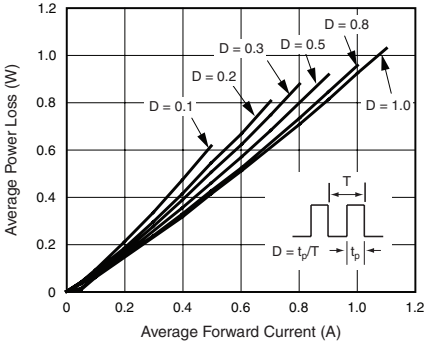


Figure 2. Forward Power Loss Characteristics

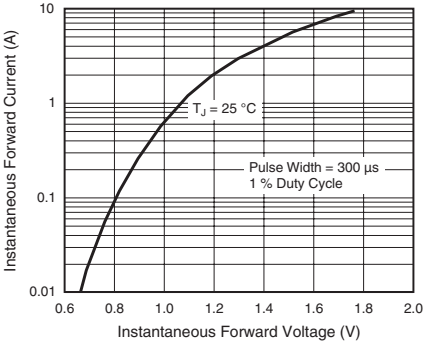


Figure 4. Typical Instantaneous Forward Characteristics

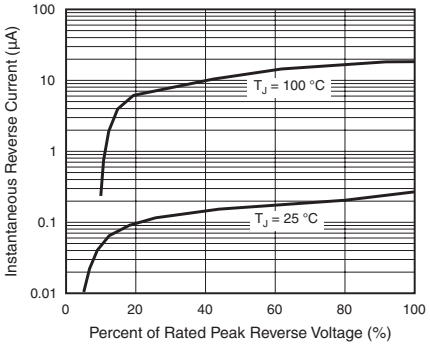


Figure 5. Typical Reverse Characteristics

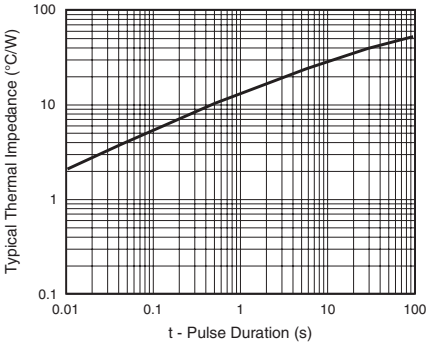


Figure 7. Typical Transient Thermal Impedance

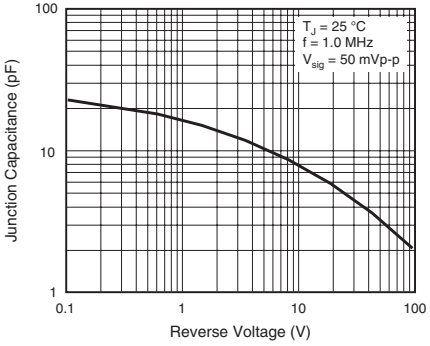
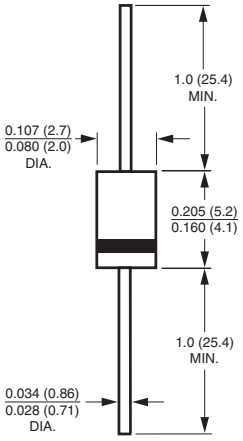


Figure 6. Typical Junction Capacitance

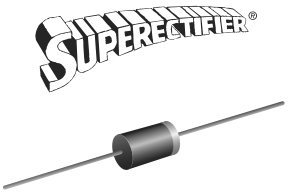
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note: Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix "E" part numbers

Glass Passivated Junction Fast Switching Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 600 V
I_{FSM}	30 A
t_{rr}	200 ns
I_R	5.0 µA
V_F	1.2 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N4933GP	1N4934GP	1N4935GP	1N4936GP	1N4937GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	V
Maximum RMS voltage	V_{RMS}	35	70	145	280	420	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30					A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

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Document Number: 88509
Revision: 21-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	1N4933GP	1N4934GP	1N4935GP	1N4936GP	1N4937GP	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.2					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					μA
		T_A = 125 °C		100					
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V		t_{rr}	200					ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	1N4933GP	1N4934GP	1N4935GP	1N4936GP	1N4937GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55					°C/W

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1N4933GP-E3/54	0.336	54	5500	13" diameter paper tape and reel
1N4933GP-E3/73	0.336	73	3000	Ammo pack packaging
1N4933GPHE3/54 (1)	0.336	54	5500	13" diameter paper tape and reel
1N4933GPHE3/73 (1)	0.336	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

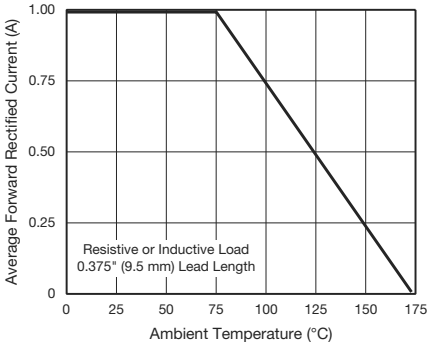


Fig. 1 - Forward Current Derating Curve

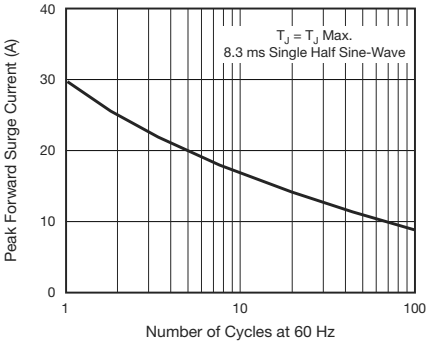


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

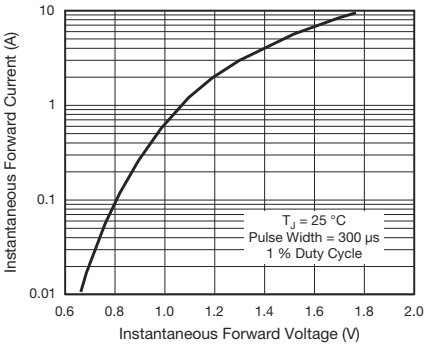


Fig. 3 - Typical Instantaneous Forward Characteristics

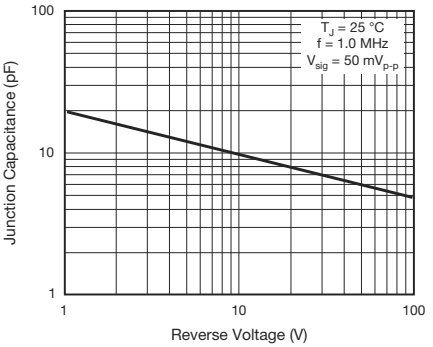


Fig. 5 - Typical Junction Capacitance

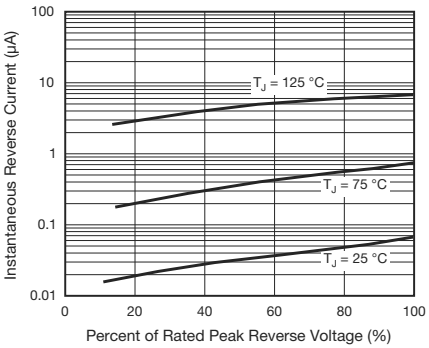


Fig. 4 - Typical Reverse Characteristics

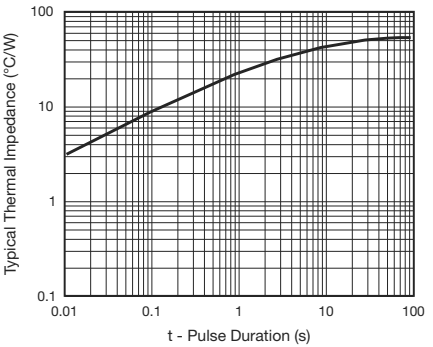
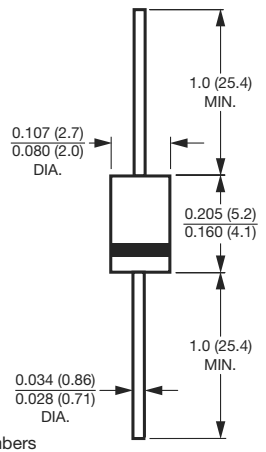


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

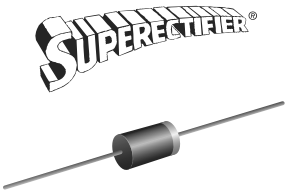
DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

Glass Passivated Junction Fast Switching Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	25 A
t_{rr}	150 ns, 250 ns, 500 ns
I_R	1.0 µA
V_F	1.3 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N4942GP	1N4944GP	1N4946GP	1N4947GP	1N4948GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	25					A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**1N4942GP**	**1N4944GP**	**1N4946GP**	**1N4947GP**	**1N4948GP**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.3					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	1.0					μA
		T_A = 150 °C		200					
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150		250		500	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**1N4942GP**	**1N4944GP**	**1N4946GP**	**1N4947GP**	**1N4948GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55					°C/W

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N4946GP-E3/54	0.336	54	5500	13" diameter paper tape and reel
1N4946GP-E3/73	0.336	73	3000	Ammo pack packaging
1N4946GPHE3/54 (1)	0.336	54	5500	13" diameter paper tape and reel
1N4946GPHE3/73 (1)	0.336	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

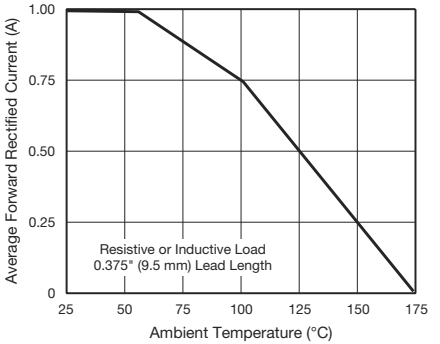


Fig. 1 - Forward Current Derating Curve

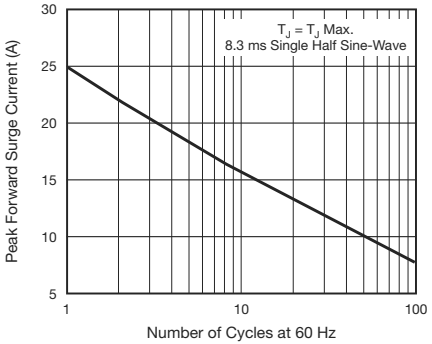


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

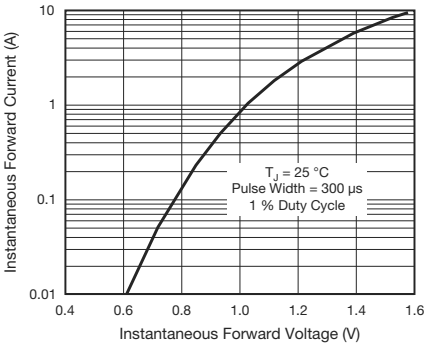


Fig. 3 - Typical Instantaneous Forward Characteristics

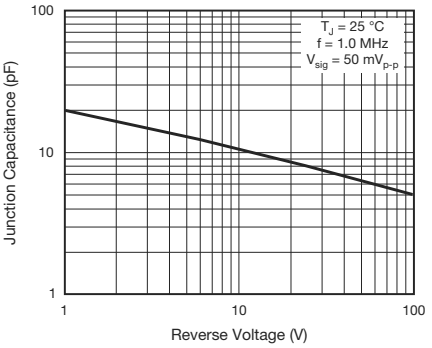


Fig. 5 - Typical Junction Capacitance

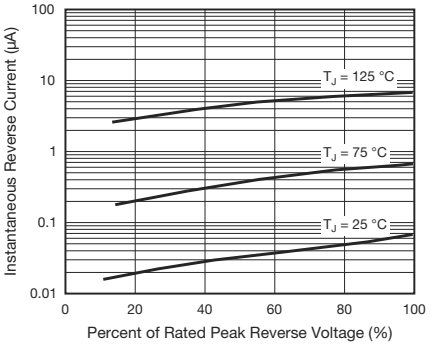


Fig. 4 - Typical Reverse Characteristics

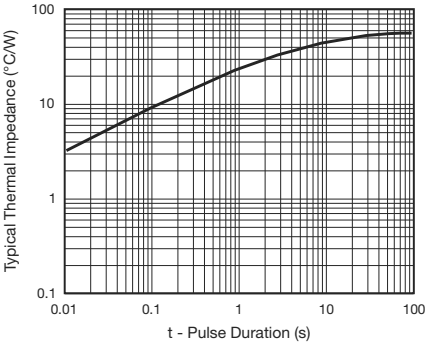
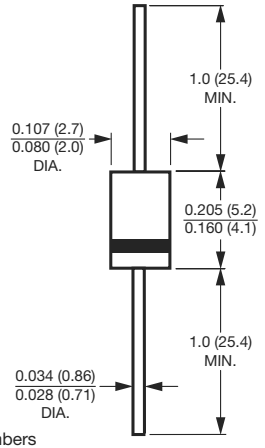


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

Glass Passivated Junction Fast Switching Rectifier

DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	50 A
t_{rr}	150 ns, 250 ns, 300 ns, 500 ns
I_R	0.5 µA
V_F	1.2 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N5615GP	1N5617GP	1N5619GP	1N5621GP	1N5623GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1000	A
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50					A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88522
Revision: 21-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	1N5615GP	1N5617GP	1N5619GP	1N5621GP	1N5623GP	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.2					V
Maximum DC reverse current at rated DC blocking voltage		T_A= 25 °C	I_R	0.5					μA
		T_A= 100 °C		25					
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150		250	300	500	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	25					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	1N5615GP	1N5617GP	1N5619GP	1N5621GP	1N5623GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	45					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1N5619GP-E3/54	0.425	54	4000	13" diameter paper tape and reel
1N5619GP-E3/73	0.425	73	2000	Ammo pack packaging
1N5619GPHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
1N5619GPHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

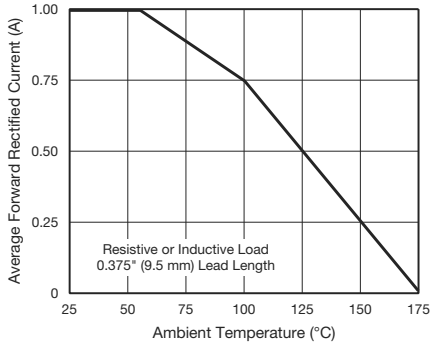


Fig. 1 - Forward Current Derating Curve

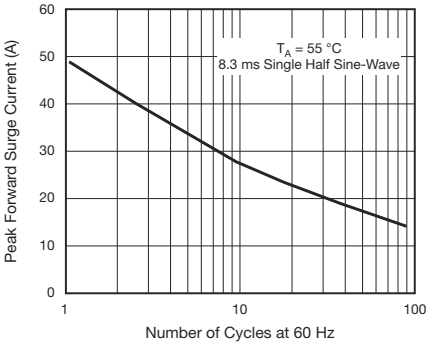


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

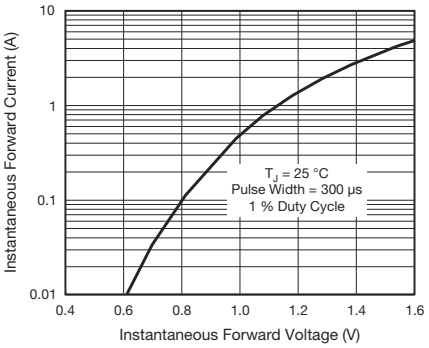


Fig. 3 - Typical Instantaneous Forward Characteristics

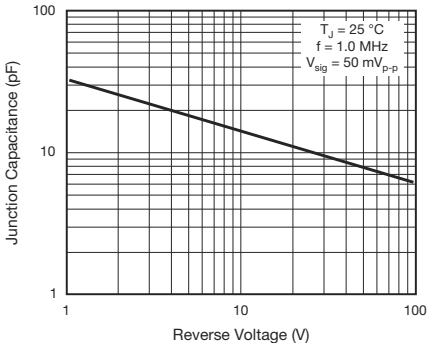


Fig. 5 - Typical Junction Capacitance

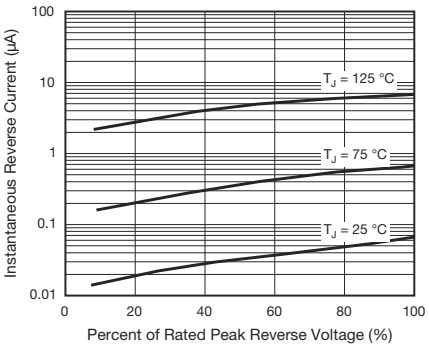


Fig. 4 - Typical Reverse Characteristics

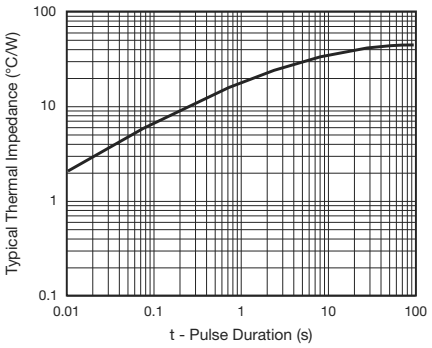
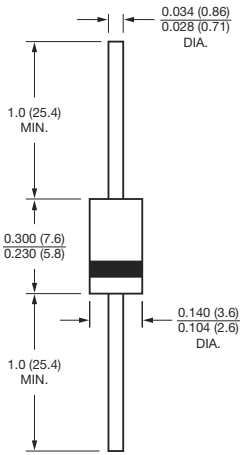


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Fast Switching Plastic Rectifier

DO-204AL (DO-41)

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-204AL, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	400 V to 1000 V
I_{FSM}	20 A
t_{rr}	150 ns, 250 ns, 500 ns
I_R	5.0 µA
V_F	1.3 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BA157	BA158	BA159D	BA159	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	20				A
Maximum operation junction temperature	T_J	- 65 to + 125				°C
Maximum storage temperature	T_{STG}	- 65 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	BA157	BA158	BA159D	BA159	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.3				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150	250	500		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	12				pF

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BA158-E3/54	0.33	54	5500	13" diameter paper tape and reel
BA158-E3/73	0.33	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

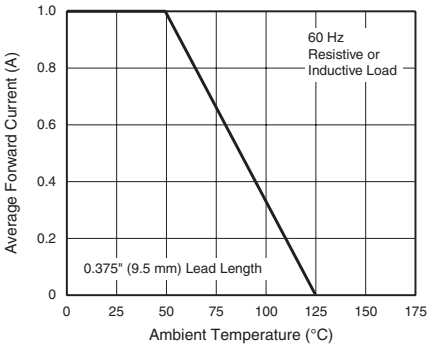


Figure 1. Forward Current Derating Curve

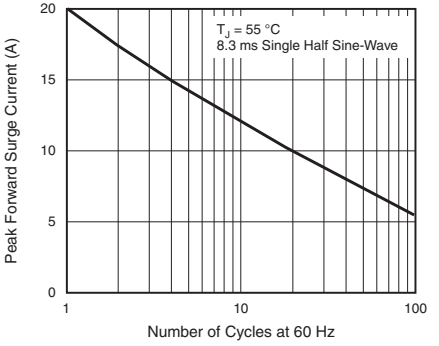


Figure 2. Maximum Non-repetitive Peak Forward Surge Current

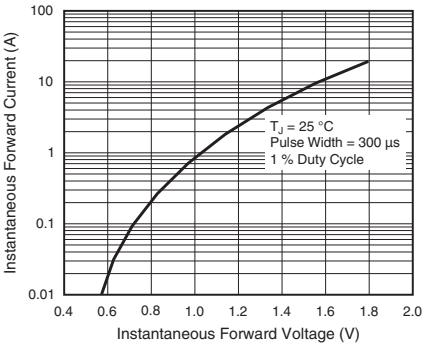


Figure 3. Typical Instantaneous Forward Characteristics

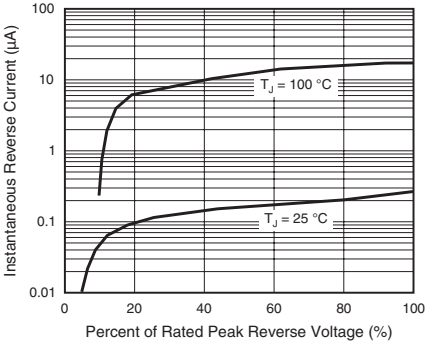


Figure 4. Typical Reverse Characteristics

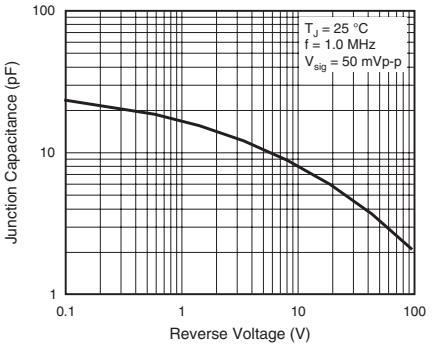


Figure 5. Typical Junction Capacitance

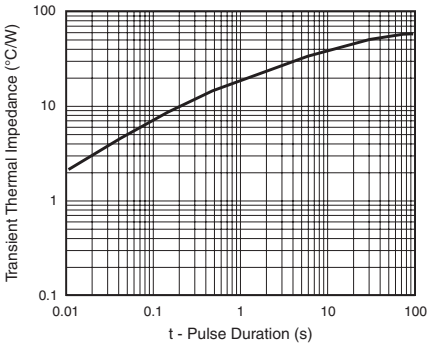
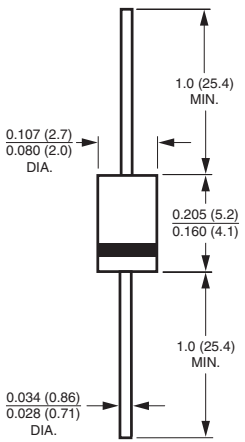


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

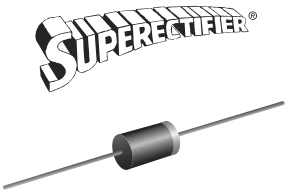
DO-204AL (DO-41)



BA157GP thru BA159GP

Vishay General Semiconductor

Glass Passivated Junction Fast Switching Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For general purpose of medium frequency rectification.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	400 V to 1000 V
I_{FSM}	20 A
t_{rr}	150 ns, 250 ns, 500 ns
I_R	5.0 µA
V_F	1.3 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BA157GP	BA158GP	BA159DGP	BA159GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	20				A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	BA157GP	BA158GP	BA159DGP	BA159GP	UNIT
Maximum instantaneous forward voltage	1.0 A	V_F	1.3				V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C	I_R	5.0				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	150	250	500	500	ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	15				pF

For technical questions within your region, please contact one of the following:
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Document Number: 88537
Revision: 21-Jan-11

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	BA157GP	BA158GP	BA159DGP	BA159GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55				°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BA158GP-E3/54	0.336	54	5500	13" Diameter paper tape and reel
BA158GP-E3/73	0.336	73	3000	Ammo pack packaging
BA158GPHE3/54 (1)	0.336	54	5500	13" Diameter paper tape and reel
BA158GPHE3/73 (1)	0.336	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

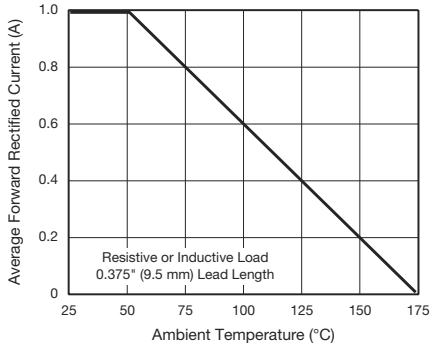


Fig. 1 - Forward Current Derating Curve

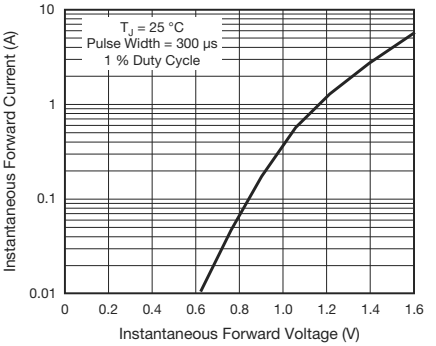


Fig. 3 - Typical Instantaneous Forward Characteristics

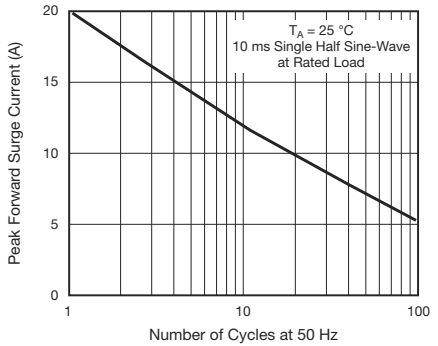


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

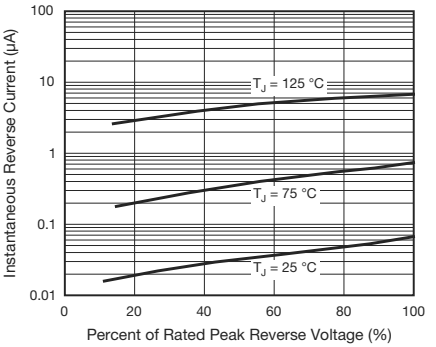


Fig. 4 - Typical Reverse Characteristics

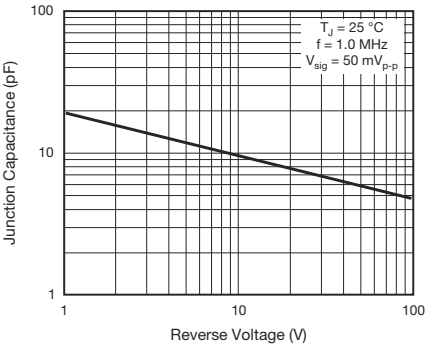


Fig. 5 - Typical Junction Capacitance

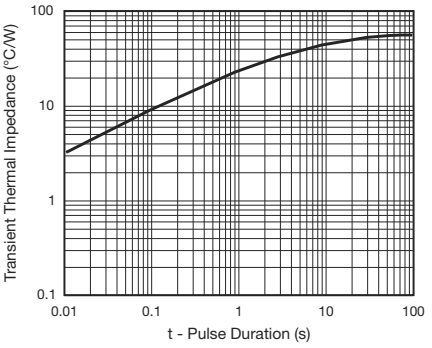
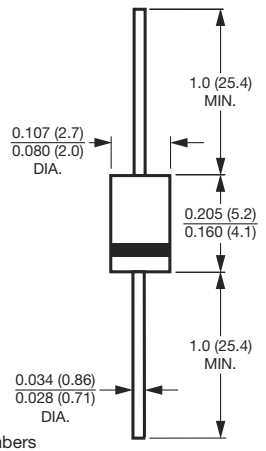


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

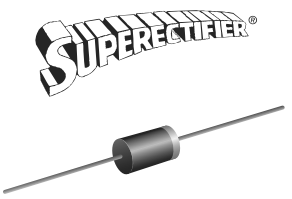
• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88537
Revision: 21-Jan-11

BYD33DGP thru BYD33MGP

Vishay General Semiconductor

Avalanche Glass Passivated Junction Fast Switching Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Avalanche surge capability guaranteed
- Fast reverse recovery time
- Low switching losses, high efficiency
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	30 A
E_{RSM}	10 mJ, 7 mJ
t_{rr}	150 ns, 250 ns, 300 ns
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high frequency rectification of switching power supplies, inverters, converters and freewheeling applications for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	BYD33DGP	BYD33GGP	BYD33JGP	BYD33KGP	BYD33MGP	UNIT
Device marking code			33DGP	33GGP	33JGP	33KGP	33MGP	V
Maximum repetitive peak reverse voltage		V_{RRM}	200	400	600	800	1000	V
Maximum DC blocking voltage		V_{DC}	200	400	600	800	1000	V
Maximum average forward rectified current 0.375 " (9.5 mm) lead length at T_A = 55 °C		$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I_{FSM}	30					A
Non-repetitive peak reverse avalanche energy at L = 120 mH, $T_J = T_J$ max. prior to surge	D to J	E_{RSM}	10					mJ
	K to M		7					
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length T_A = 55 °C		$I_{R(AV)}$	100					µA
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175					°C

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BYD33DGP thru BYD33MGP

Vishay General Semiconductor

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	BYD33DGP	BYD33GGP	BYD33JGP	BYD33KGP	BYD33MGP	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F (1)	1.3					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					μA
		T_A = 150 °C		200					
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150		250	300		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15					pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	BYD33DGP	BYD33GGP	BYD33JGP	BYD33KGP	BYD33MGP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BYD33JGP-E3/54	0.336	54	5500	13" diameter paper tape and reel
BYD33JGP-E3/73	0.336	73	3000	Ammo pack packaging
BYD33JGPHE3/54 (1)	0.336	54	5500	13" diameter paper tape and reel
BYD33JGPHE3/73 (1)	0.336	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

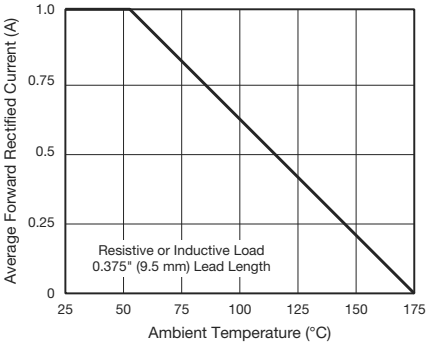


Fig. 1 - Forward Current Derating Curve

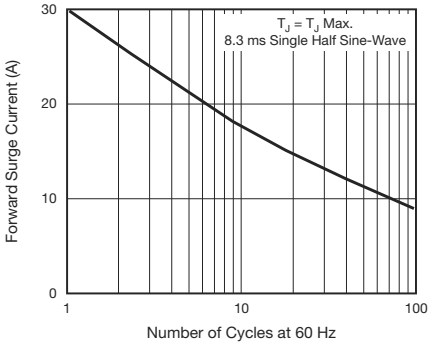


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88914
Revision: 01-Feb-11

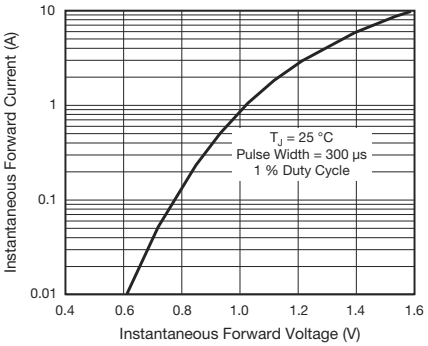


Fig. 3 - Typical Instantaneous Forward Characteristics

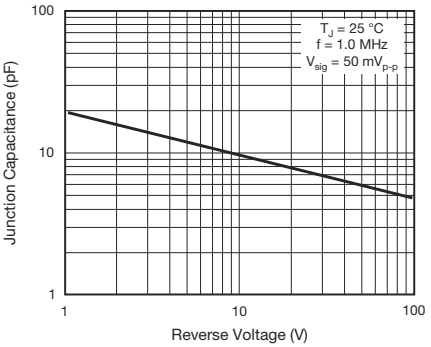


Fig. 5 - Typical Junction Capacitance

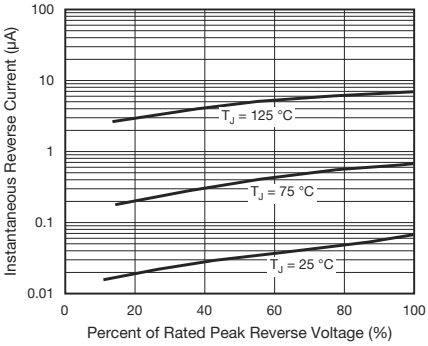


Fig. 4 - Typical Reverse Characteristics

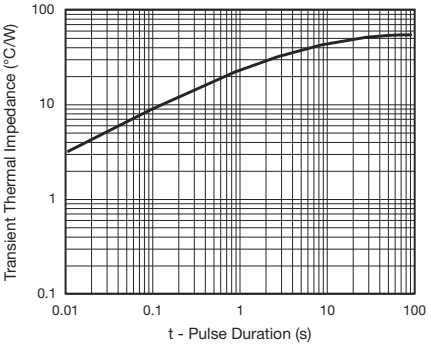
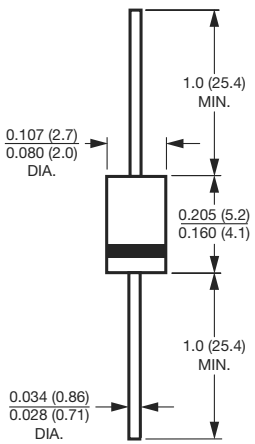


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



BYM11-50 thru BYM11-1000, RGL41A thru RGL41M

Vishay General Semiconductor

Surface Mount Glass Passivated Junction Fast Switching Rectifier

DO-213AB

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
t_{rr}	150 ns, 250 ns, 500 ns
V_F	1.3 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

FEATURES

- Superectifier structure for high reliability condition
- Ideal for automated placement
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

MECHANICAL DATA

Case: DO-213AB, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYM 11-50	BYM 11-100	BYM 11-200	BYM 11-400	BYM 11-600	BYM 11-800	BYM 11-1000	UNIT
FAST SWITCHING TIME DEVICE: 1ST BAND IS RED		RGL41A	RGL41B	RGL41D	RGL41G	RGL41J	RGL41K	RGL41M	
Polarity color bands (2nd band)		Gray	Red	Orange	Yellow	Green	Blue	Violet	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_T = 55 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Maximum full load reverse current, full cycle average at T_A = 55 °C	$I_{R(AV)}$	50							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
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Document Number: 88547
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYM 11-50**	**BYM 11-100**	**BYM 11-200**	**BYM 11-400**	**BYM 11-600**	**BYM 11-800**	**BYM 11-1000**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.3							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							µA
		T_A = 125 °C		50							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	500		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**BYM 11-50**	**BYM 11-100**	**BYM 11-200**	**BYM 11-400**	**BYM 11-600**	**BYM 11-800**	**BYM 11-1000**	**UNIT**
Maximum thermal resistance	$R_{\theta JA}$ (1)	75							°C/W
	$R_{\theta JT}$ (2)	30							

Notes

(1) Thermal resistance from junction to ambient, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to terminal, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RGL41J-E3/96	0.114	96	1500	7" diameter plastic tape and reel
RGL41J-E3/97	0.114	97	5000	13" diameter plastic tape and reel
BYM11-600-E3/96	0.114	96	1500	7" diameter plastic tape and reel
BYM11-600-E3/97	0.114	97	5000	13" diameter plastic tape and reel
RGL41JHE3/96 (1)	0.114	96	1500	7" diameter plastic tape and reel
RGL41JHE3/97 (1)	0.114	97	5000	13" diameter plastic tape and reel
BYM11-600HE3/96 (1)	0.114	96	1500	7" diameter plastic tape and reel
BYM11-600HE3/97 (1)	0.114	97	5000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

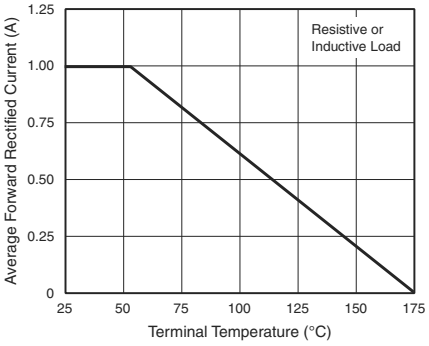

Fig. 1 - Forward Current Derating Curve

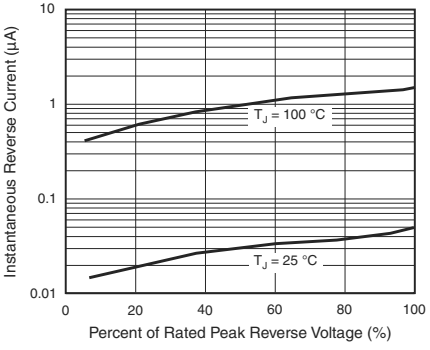

Fig. 4 - Typical Reverse Characteristics

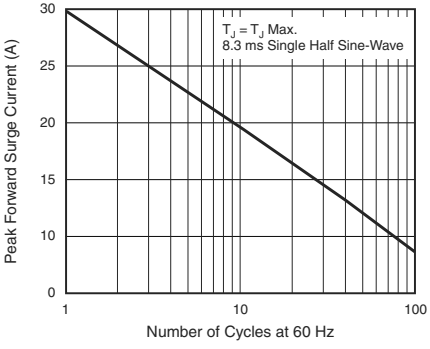

Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

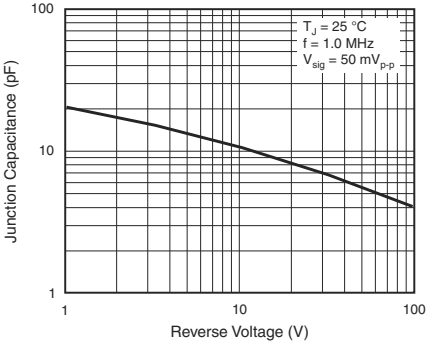

Fig. 5 - Typical Junction Capacitance

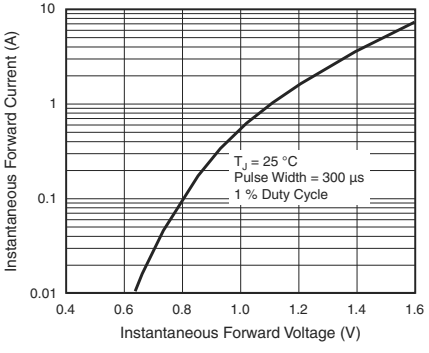

Fig. 3 - Typical Instantaneous Forward Characteristics

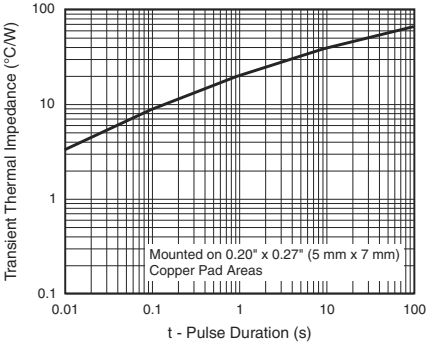

Fig. 6 - Typical Transient Thermal Impedance

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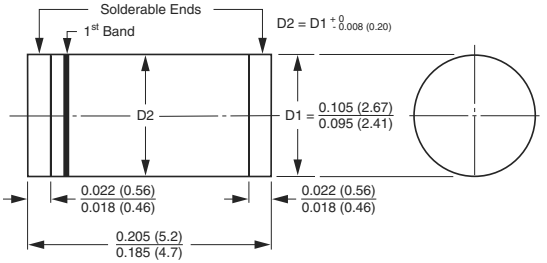
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

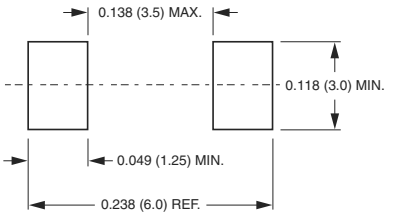
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AB

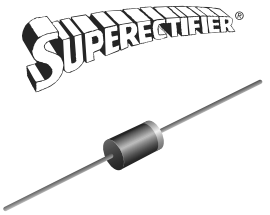


1st band denotes type and positive end (cathode)

Mounting Pad Layout



Glass Passivated Junction Fast Switching Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For general purpose of medium frequency rectification.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
t_{rr}	750 ns
I_R	10 µA
V_F	1.2 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI810	GI811	GI812	GI814	GI816	GI817	GI818	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A= 75 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	GI810	GI811	GI812	GI814	GI816	GI817	GI818	UNIT
Maximum instantaneous forward voltage	1.0 A	V_F	1.2							V
Maximum DC reverse current at rated DC blocking voltage	T_A= 25 °C	I_R	10							µA
	T_A= 100 °C		100							
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs	t_{rr}	750							ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	25							pF

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88628
Revision: 21-Jan-11

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	GI810	GI811	GI812	GI814	GI816	GI817	GI818	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	45							°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GI816-E3/54	0.425	54	4000	13" diameter paper tape and reel
GI816-E3/73	0.425	73	2000	Ammo pack packaging
GI816HE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
GI816HE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

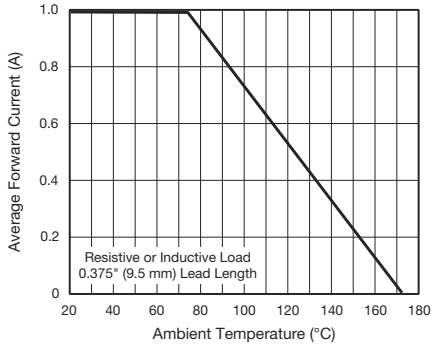


Fig. 1 - Forward Current Derating Curve

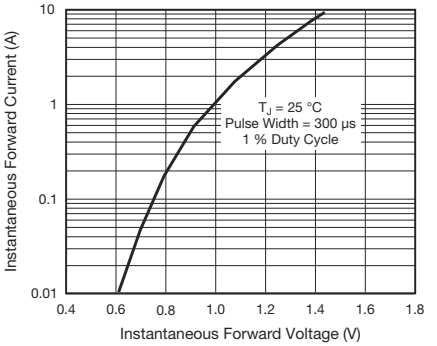


Fig. 3 - Typical Instantaneous Forward Characteristics

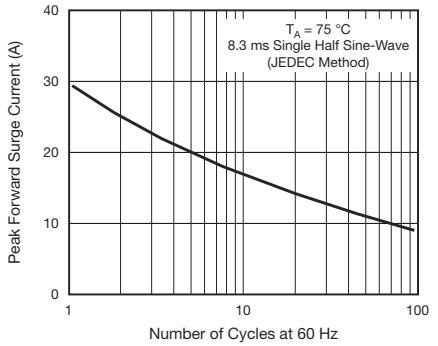


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

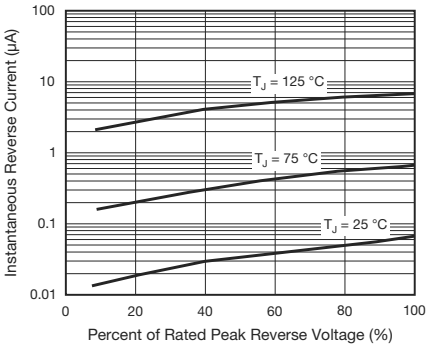


Fig. 4 - Typical Reverse Characteristics

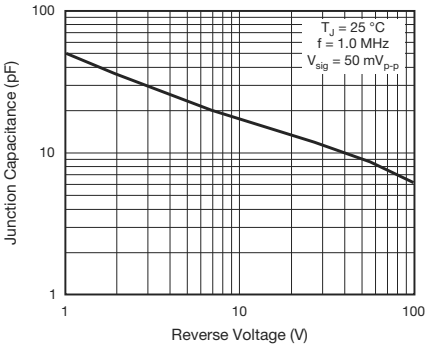


Fig. 5 - Typical Junction Capacitance

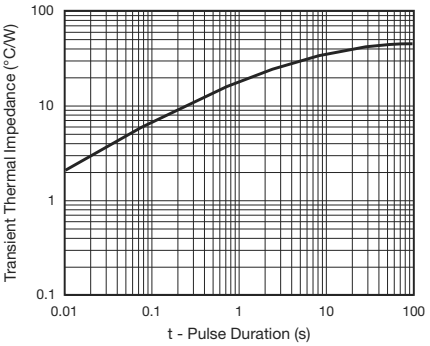
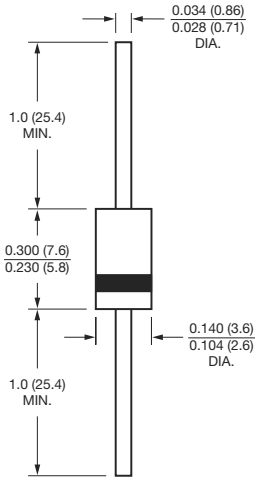


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Surface Mount Glass Passivated Junction Fast Switching Rectifier

DO-214BA (GF1)

PPRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
V_F	1.3 V
t_{rr}	150 ns, 250 ns, 500 ns
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

FEATURES

- Superectifier structure for high reliability condition
- Ideal for automated placement
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

MECHANICAL DATA

Case: DO-214BA, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RGF1A	RGF1B	RGF1D	RGF1G	RGF1J	RGF1K	RGF1M	UNIT
Device marking code		RA	RB	RD	RG	RJ	RK	RM	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_L = 120 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Maximum full load reverse current, full cycle average T_A = 55 °C	$I_{R(AV)}$	50							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**RGF1A**	**RGF1B**	**RGF1D**	**RGF1G**	**RGF1J**	**RGF1K**	**RGF1M**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.3							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							μA
		T_A = 125 °C		100							
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	500		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.5							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**RGF1A**	**RGF1B**	**RGF1D**	**RGF1G**	**RGF1J**	**RGF1K**	**RGF1M**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	80							°C/W
	$R_{\theta JL}$ (1)	28							

Note

(1) Thermal resistance from junction to ambient and from junction to lead, P.C.B. mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RGF1J-E3/67A	0.104	67A	1500	7" diameter plastic tape and reel
RGF1J-E3/5CA	0.104	5CA	6500	13" diameter plastic tape and reel
RGF1JHE3/67A (1)	0.104	67A	1500	7" diameter plastic tape and reel
RGF1JHE3/5CA (1)	0.104	5CA	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

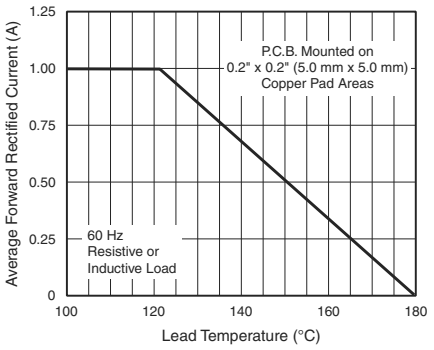


Fig. 1 - Forward Current Derating Curve

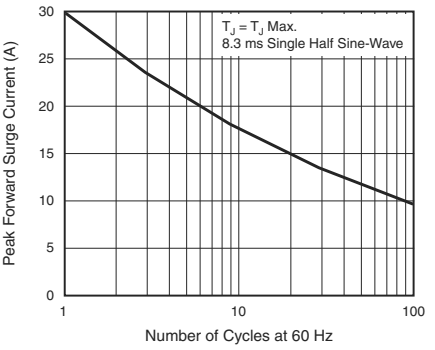


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

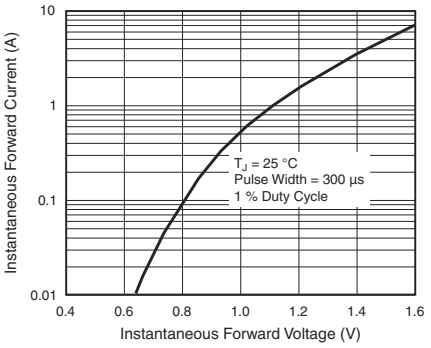


Fig. 3 - Typical Instantaneous Forward Characteristics

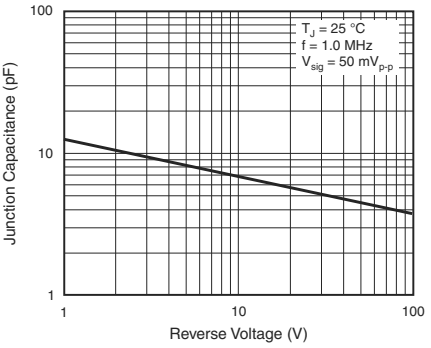


Fig. 5 - Typical Junction Capacitance

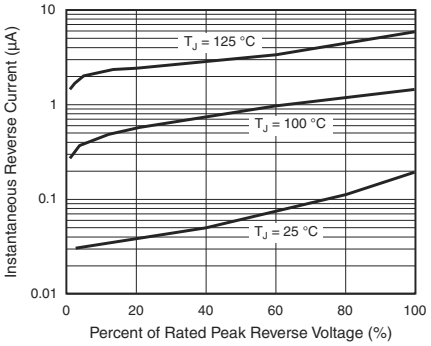


Fig. 4 - Typical Reverse Characteristics

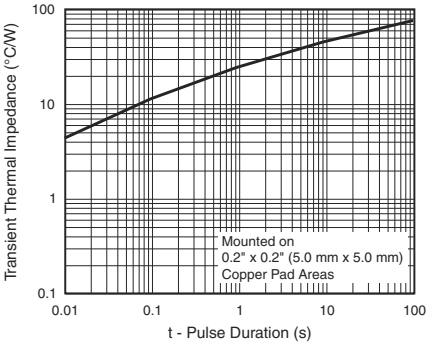
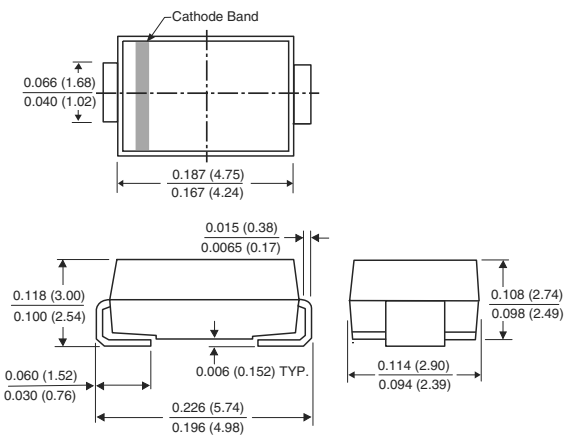


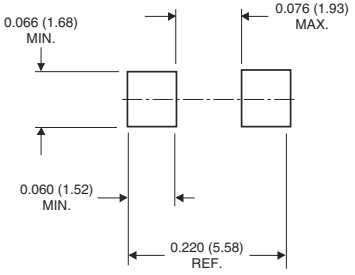
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

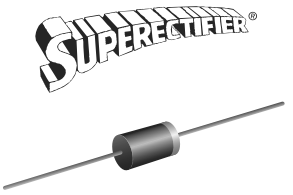
DO-214BA (GF1)



Mounting Pad Layout



Glass Passivated Junction Fast Switching Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
t_{rr}	150 ns, 250 ns, 500 ns
I_R	5.0 µA
V_F	1.3 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive, and telecommunication.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RGP10A	RGP10B	RGP10D	RGP10G	RGP10J	RGP10K	RGP10M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length T_A = 55 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Document Number: 88700
Revision: 09-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	RGP10A	RGP10B	RGP10D	RGP10G	RGP10J	RGP10K	RGP10M	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.3							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							µA
		T_A = 150 °C		200							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	500		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	15							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	RGP10A	RGP10B	RGP10D	RGP10G	RGP10J	RGP10K	RGP10M	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55							°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
RGP10J-E3/54	0.336	54	5500	13" diameter paper tape and reel
RGP10J-E3/73	0.336	73	3000	Ammo pack packaging
RGP10JHE3/54 (1)	0.336	54	5500	13" diameter paper tape and reel
RGP10JHE3/73 (1)	0.336	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

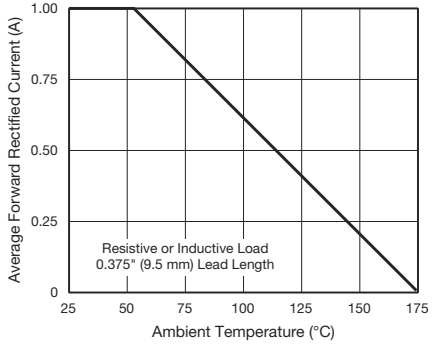


Fig. 1 - Forward Current Derating Curve

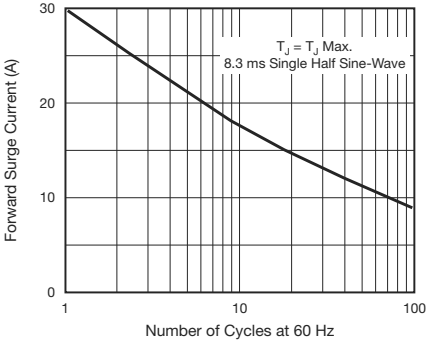


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

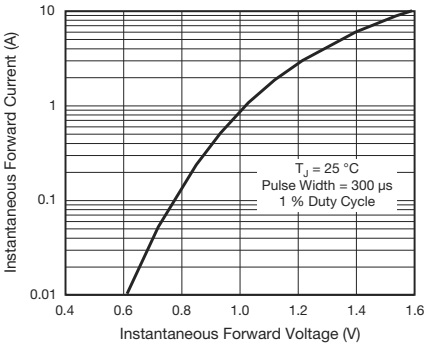


Fig. 3 - Typical Instantaneous Forward Characteristics

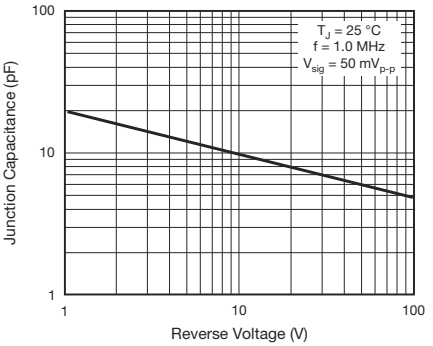


Fig. 5 - Typical Junction Capacitance

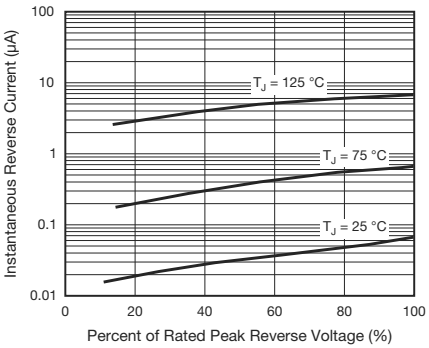


Fig. 4 - Typical Reverse Characteristics

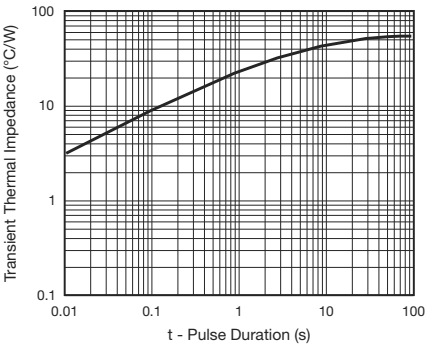
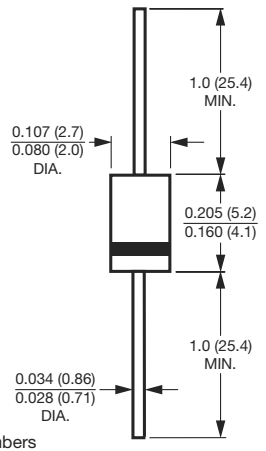


Fig. 6 - Typical Transient Thermal Impedance

PACKAGING OUTLINE DIMENSIONS in inches (millimeters)

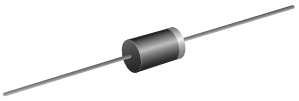
DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

Miniature Fast Switching Plastic Rectifier



MPG06

FEATURES

- Glass passivated chip junction
- Fast switching for high efficiency
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	40 A
t_{rr}	150 ns, 200 ns, 250 ns
V_F	1.3 V
I_R	5.0 µA
T_J max.	150 °C

MECHANICAL DATA

Case: MPG06, molded epoxy over passivated chip
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RMPG06A	RMPG06B	RMPG06D	RMPG06G	RMPG06J	RMPG06K	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 25 °C	$I_{F(AV)}$	1.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMATER	**TEST CONDITIONS**		**SYMBOL**	**RMPG06A**	**RMPG06B**	**RMPG06D**	**RMPG06G**	**RMPG06J**	**RMPG06K**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0						μA
		T_A = 125 °C		50						
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				200	250	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	6.6						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**RMPG06A**	**RMPG06B**	**RMPG06D**	**RMPG06G**	**RMPG06J**	**RMPG06K**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	67						°C/W
	$R_{\theta JL}$ (1)	30						

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, PCB mounted with 0.22" x 0.22" (5.5 mm x 5.5 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RMPG06J-E3/54	0.202	54	5500	13" diameter paper tape and reel
RMPG06J-E3/73	0.202	73	3000	Ammo pack packaging
RMPG06JHE3/54 (1)	0.202	54	5500	13" diameter paper tape and reel
RMPG06JHE3/73 (1)	0.202	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

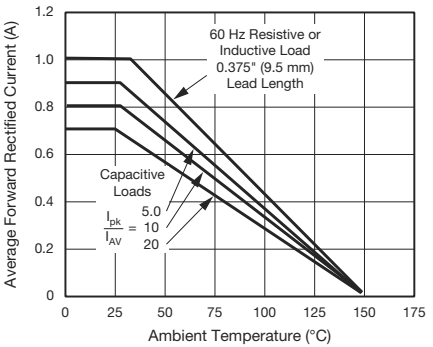


Fig. 1 - Forward Current Derating Curve

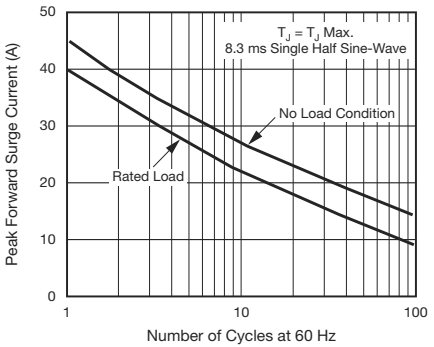


Fig. 2 - Maximum Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

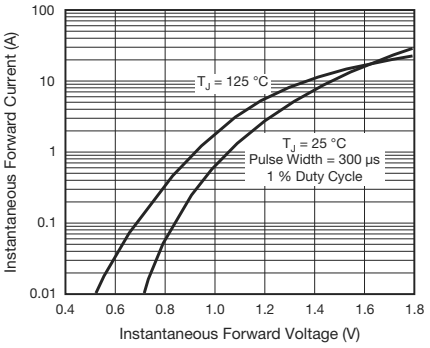


Fig. 3 - Typical Instantaneous Forward Characteristics

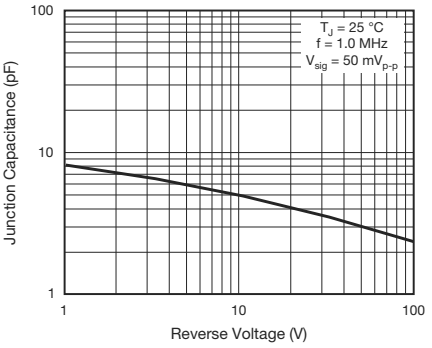


Fig. 5 - Typical Junction Capacitance

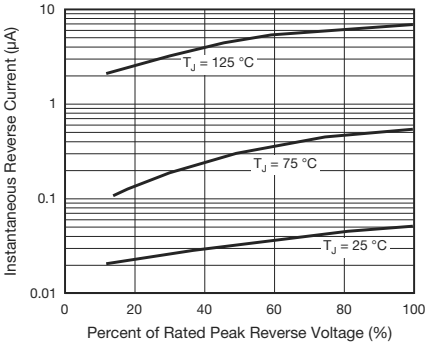


Fig. 4 - Typical Reverse Characteristics

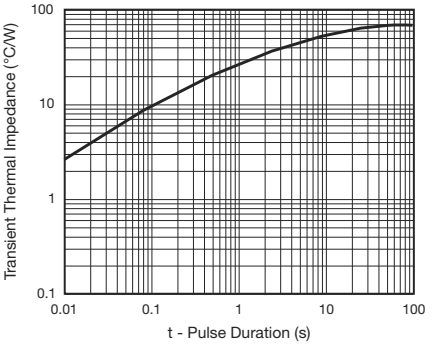
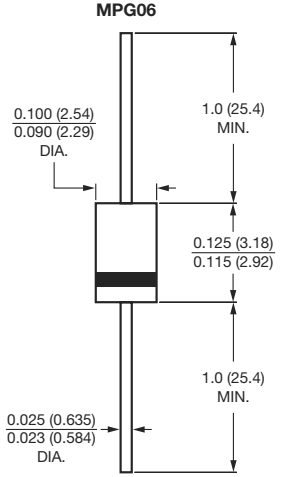
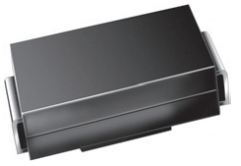


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Surface Mount Fast Switching Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Fast switching for high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	30 A
t_{rr}	150 ns, 250 ns, 500 ns
V_F	1.3 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RS1A	RS1B	RS1D	RS1G	RS1J	RS1K	UNIT
Device marking code		RA	RB	RD	RG	RJ	RK	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	500	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current at T_L = 90 °C	$I_{F(AV)}$	1.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88707
Revision: 11-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS	SYMBOL	RS1A	RS1B	RS1D	RS1G	RS1J	RS1K	UNIT
Maximum instantaneous forward voltage	1.0 A	V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage	T_A= 25 °C T_A= 125 °C	I_R	5.0 50						μA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	150				250	500	ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	10				7.0		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	RS1A	RS1B	RS1D	RS1G	RS1J	RS1K	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	105 32						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	REFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
RS1J-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
RS1J-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
RS1JHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
RS1JHE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

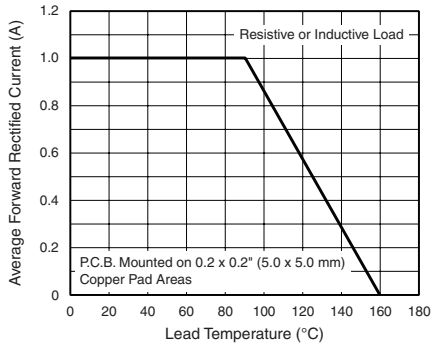


Figure 1. Forward Current Derating Curve

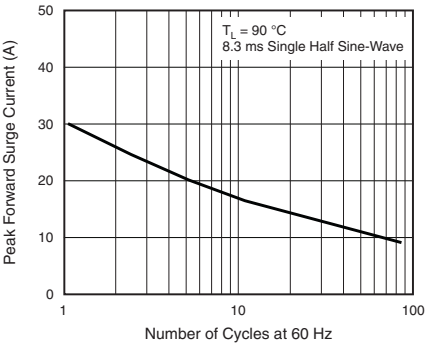


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

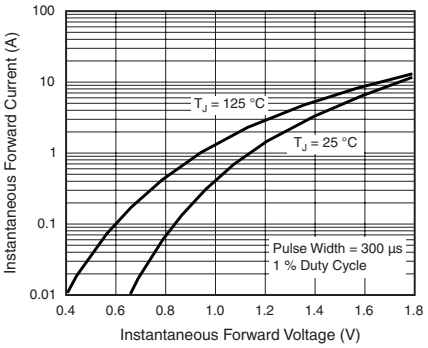


Figure 3. Typical Instantaneous Forward Characteristics

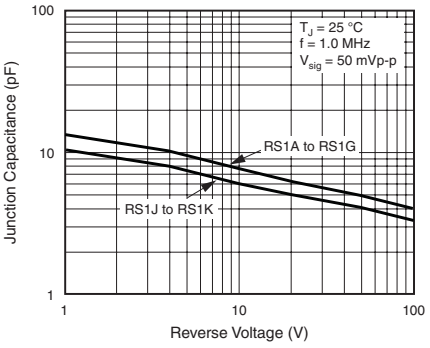


Figure 5. Typical Junction Capacitance

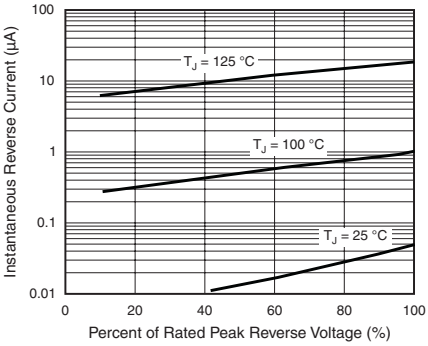


Figure 4. Typical Reverse Characteristics

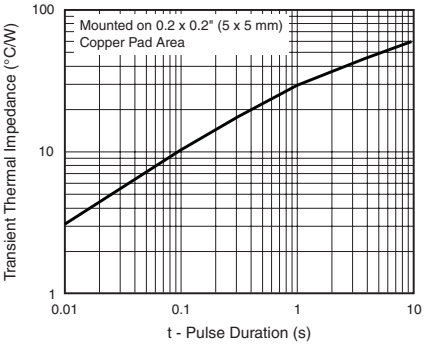
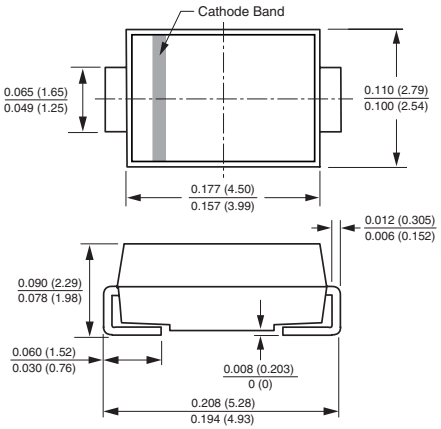


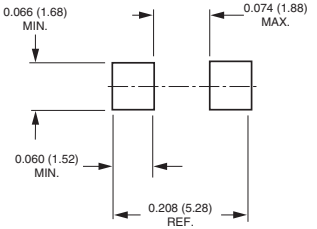
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



High Current Density Surface Mount Glass-Passivated Fast Switching Rectifier

eSMP™ Series

DO-220AA (SMP)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_{FSM}	30 A
t_{rr}	150 ns, 250 ns
I_R	1 µA
T_J max.	150 °C

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated chip junction
- Fast switching for high efficiency
- Low thermal resistance
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	RS1PB	RS1PD	RS1PG	RS1PJ	UNIT
Device marking code		RB	RD	RG	RJ	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	RS1PB	RS1PD	RS1PG	RS1PJ	UNIT
Maximum instantaneous forward voltage (1)	I_F = 1.0 A		V_F	1.3				V
Maximum reverse current at rated V_R voltage (2)		T_A = 25 °C T_A = 125 °C	I_R	1.0 60				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150			250	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	9				pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**RS1PB**	**RS1PD**	**RS1PG**	**RS1PJ**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	115 15 20				°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RS1PB-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
RS1PB-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
RS1PBHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
RS1PBHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

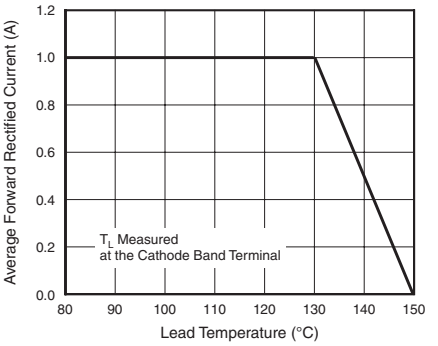


Figure 1. Maximum Forward Current Derating Curve

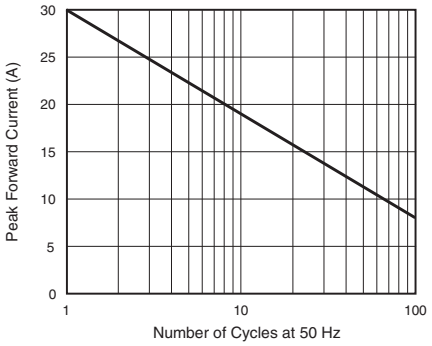


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

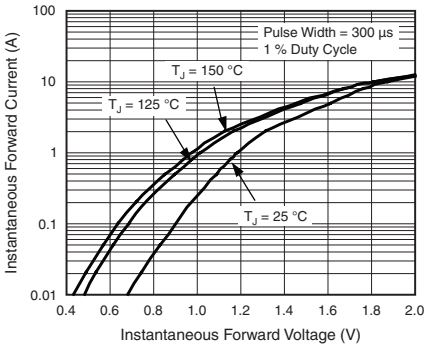


Figure 3. Typical Instantaneous Forward Characteristics

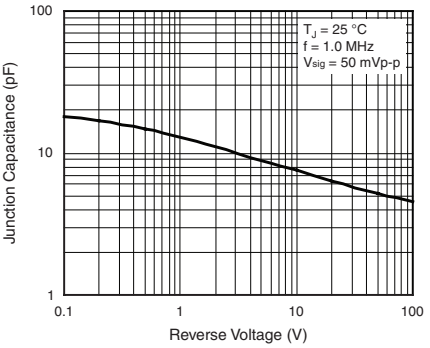


Figure 5. Typical Junction Capacitance

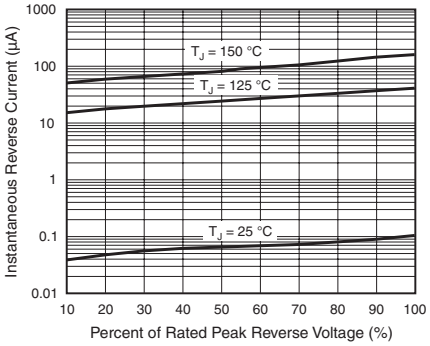


Figure 4. Typical Reverse Characteristics

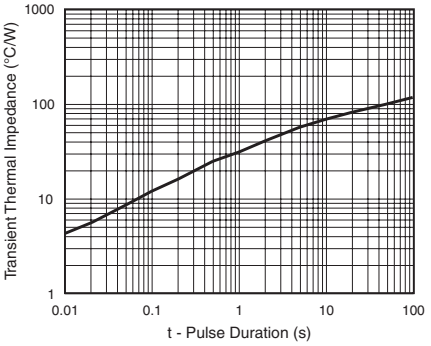
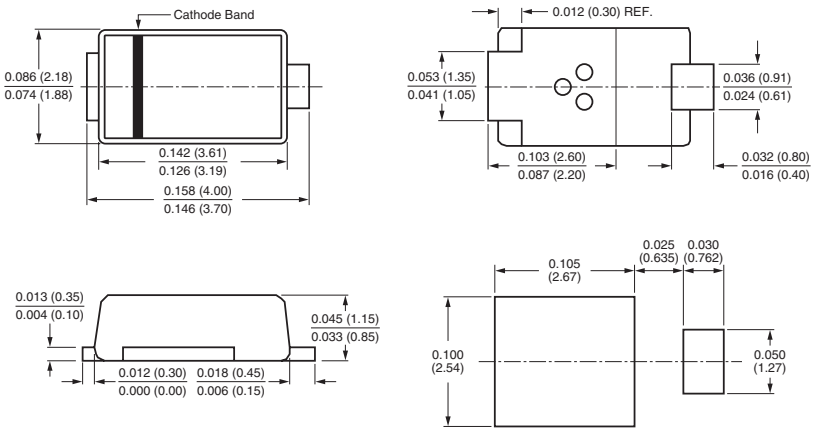


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



Fast Switching Plastic Rectifier

DO-204AL (DO-41)

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	30 A
t_{rr}	100 ns, 200 ns
I_R	10 µA
V_F	1.3 V
T_J max.	125 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-204AL, molded epoxy body

Epoxy meets UL-94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SRP100A	SRP100B	SRP100D	SRP100G	SRP100J	SRP100K	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30						A
Operating junction temperature range	T_J	- 50 to + 125						°C
Storage temperature range	T_{STG}	- 50 to + 150						°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88743
Revision: 08-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	SRP100A	SRP100B	SRP100D	SRP100G	SRP100J	SRP100K	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 200						µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	100				200		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	12						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	SRP100A	SRP100B	SRP100D	SRP100G	SRP100J	SRP100K	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$	41						°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SRP100J-E3/54	0.33	54	5500	13" diameter paper tape and reel
SRP100J-E3/73	0.33	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

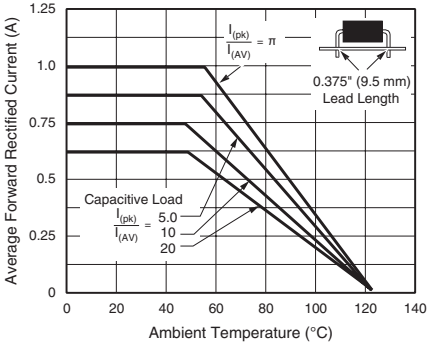


Figure 1. Forward Current Derating Curves

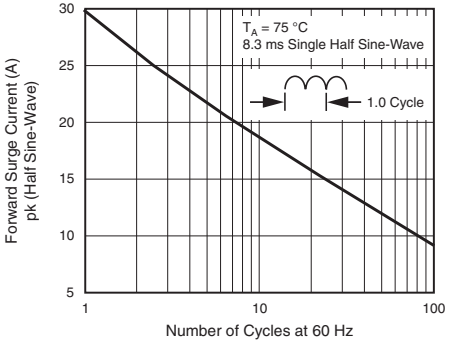


Figure 2. Maximum Non-repetitive Peak Forward Surge Current

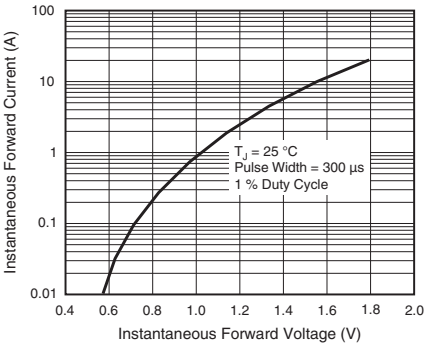


Figure 3. Typical Instantaneous Forward Characteristics

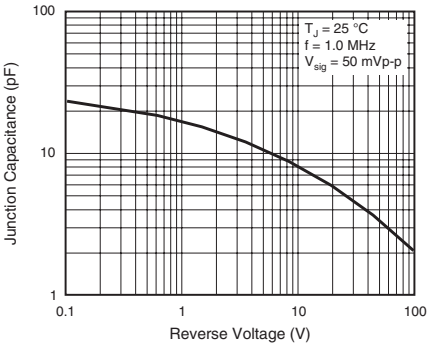


Figure 5. Typical Junction Capacitance

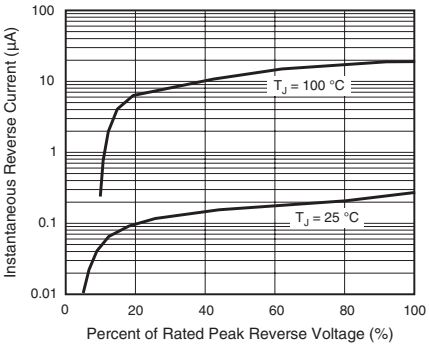


Figure 4. Typical Reverse Characteristics

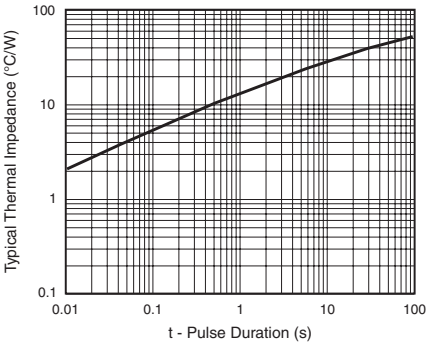
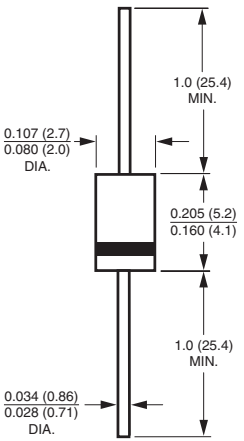


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Fast Avalanche SMD Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Low reverse current
- Soft recovery characteristic
- Fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	800 V, 1000 V
I_{FSM}	30 A
I_R	1.0 µA
V_F	1.6 V
t_{rr}	120 ns
E_R	20 mJ
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYG21K	BYG21M	UNIT
Device marking code		BYG21K	BYG21M	
Maximum repetitive peak reverse voltage	V_{RRM}	800	1000	V
Average forward current	$I_{F(AV)}$	1.5		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30		A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R}$ = 1 A, T_J = 25 °C	E_R	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYG21K**	**BYG21M**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1 A I_F = 1.5 A	T_J = 25 °C	V_F	1.5 1.6		V
Maximum reverse current	$V_R = V_{RRM}$	T_J = 25 °C T_J = 100 °C	I_R	1 10		µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	120		ns

Note:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**BYG21K**	**BYG21M**	**UNIT**
Typical thermal resistance, junction to lead T_L = const.	$R_{\theta JL}$	25		°C/W
Typical thermal resistance, junction to ambient	$R_{\theta JA}$	150 (1) 125 (2) 100 (3)		°C/W

Notes:
(1) Mounted on epoxy-glass hard tissue
(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu
(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE Q'TY**	**DELIVERY MODE**
BYG21K-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG21K-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG21KHE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYG21KHE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

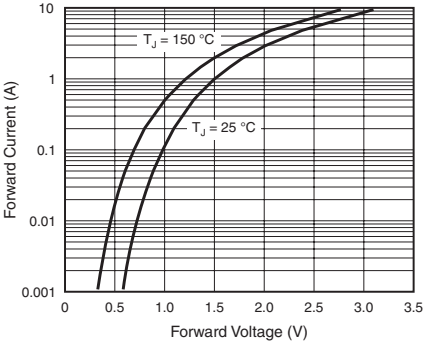


Figure 1. Forward Current vs. Forward Voltage

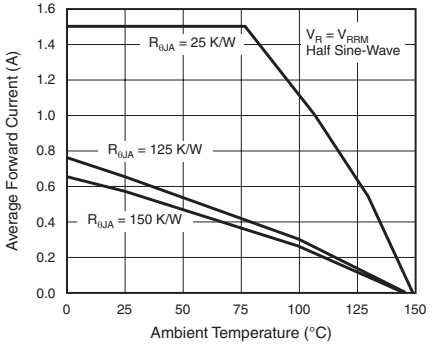


Figure 2. Max. Average Forward Current vs. Ambient Temperature

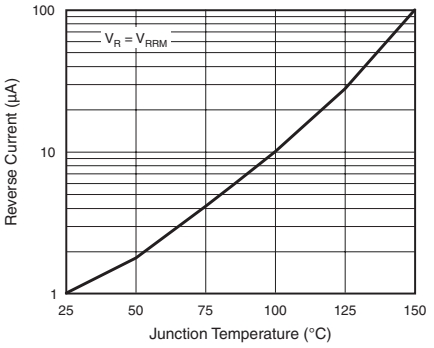


Figure 3. Reverse Current vs. Junction Temperature

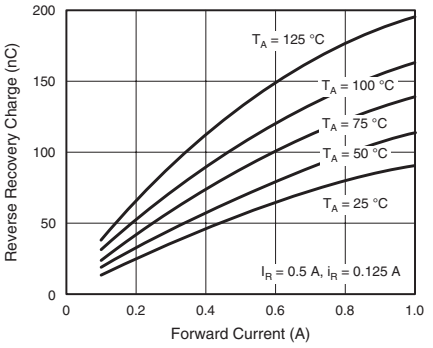


Figure 6. Max. Reverse Recovery Charge vs. Forward Current

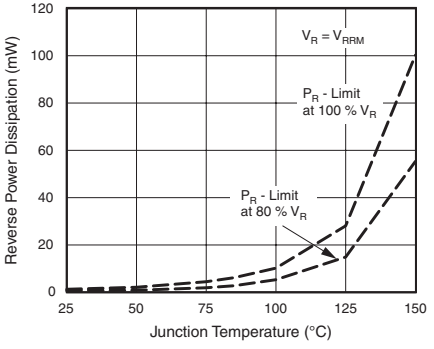


Figure 4. Max. Reverse Power Dissipation vs. Junction Temperature

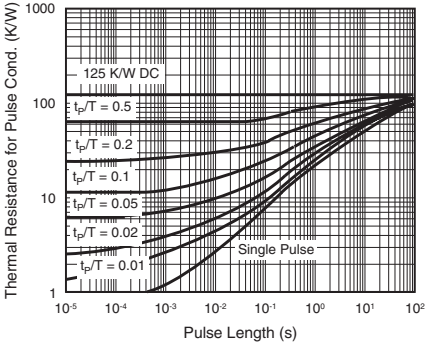


Figure 7. Thermal Response

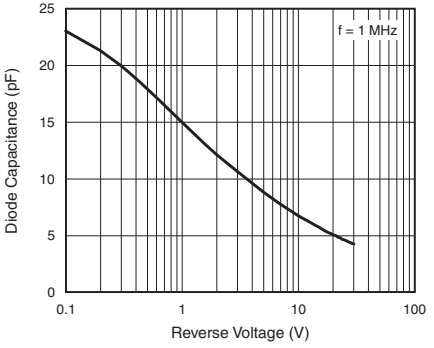
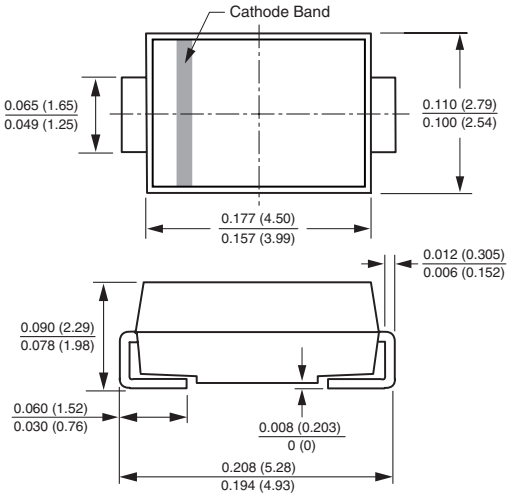


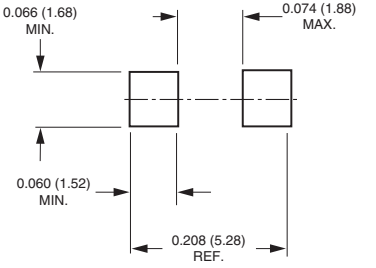
Figure 5. Diode Capacitance vs. Reverse Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Fast Avalanche SMD Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Low reverse current
- Soft recovery characteristics
- Fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	200 V to 600 V
I_{FSM}	30 A
I_R	1.0 µA
V_F	1.25 V
t_{rr}	140 ns
E_R	20 mJ
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYG24D	BYG24G	BYG24J	UNIT
Device marking code		BYG24D	BYG24G	BYG24J	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	V
Average forward current T_A = 65 °C	$I_{F(AV)}$	1.5			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R}$ = 1 A, T_J = 25 °C	E_R	20			mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYG24D**	**BYG24G**	**BYG24J**	**UNIT**
Minimum breakdown voltage	I_R = 100 µA		V_{BR}	200	400	600	V
Maximum instantaneous forward voltage (1)	I_F = 1 A I_F = 1.5 A	T_J = 25 °C	V_F	1.15 1.25			V
Maximum reverse current	$V_R = V_{RRM}$	T_J = 25 °C T_J = 100 °C	I_R	1 10			µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	140			ns

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYG24D**	**BYG24G**	**BYG24J**	**UNIT**
Junction to case	R_{thJC}	25			°C/W
Maximum thermal resistance, junction to ambient	$R_{\theta JA}$	150 (1) 125 (2)			°C/W

Notes:

(1) Mounted on epoxy-glass hard tissue 35 µm x 17 mm^2 cooper area per electrode

(2) Mounted on epoxy-glass hard tissue 35 µm x 50 mm^2 cooper area per electrode

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYG24D-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG24D-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG24DHE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYG24DHE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

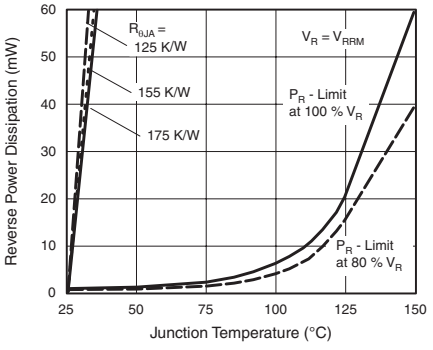


Figure 1. Max. Reverse Power Dissipation vs. Junction Temperature

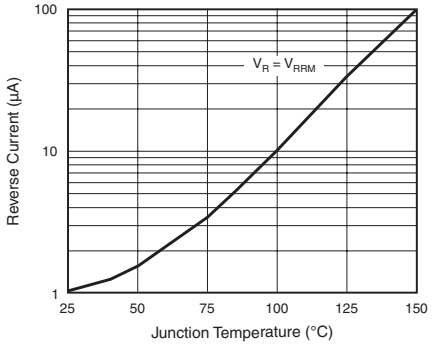


Figure 2. Reverse Current vs. Junction Temperature

For technical questions within your region, please contact one of the following:
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Revision: 11-Apr-08

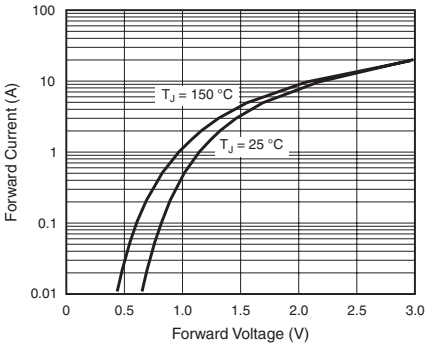


Figure 3. Forward Current vs. Forward Voltage

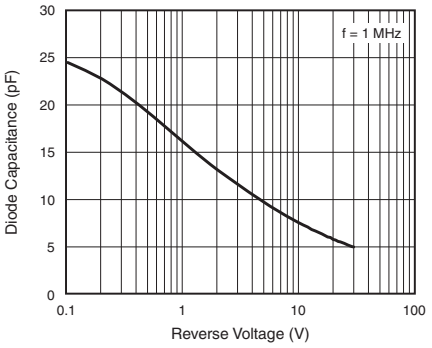


Figure 5. Diode Capacitance vs. Reverse Voltage

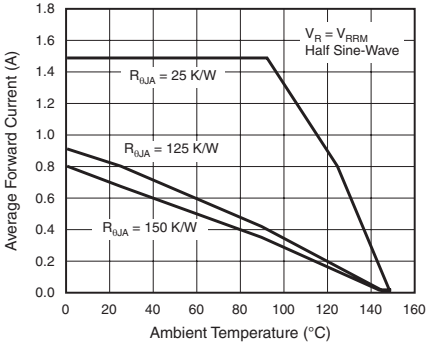
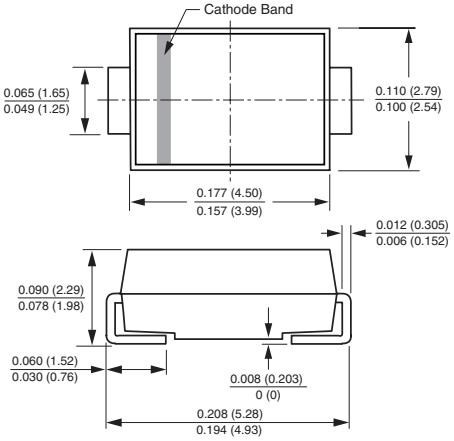


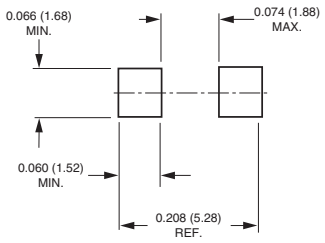
Figure 4. Average Forward Current vs. Ambient Temperature

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



Glass Passivated Junction Fast Switching Rectifier

DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
t_{rr}	150 ns, 250 ns, 500 ns
I_R	5.0 µA
V_F	1.3 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RGP15A	RGP15B	RGP15D	RGP15G	RGP15J	RGP15K	RGP15M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A= 55 °C	$I_{F(AV)}$	1.5							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A= 55 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88701
Revision: 21-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	RGP15A	RGP15B	RGP15D	RGP15G	RGP15J	RGP15K	RGP15M	UNIT
Maximum instantaneous forward voltage	1.5 A		V_F	1.3							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							μA
		T_A = 150 °C	I_R	200							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	500		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	25							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	RGP15A	RGP15B	RGP15D	RGP15G	RGP15J	RGP15K	RGP15M	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	45							°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
RGP15J-E3/54	0.425	54	4000	13" diameter paper tape and reel
RGP15J-E3/73	0.425	73	2000	Ammo pack packaging
RGP15JHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
RGP15JHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

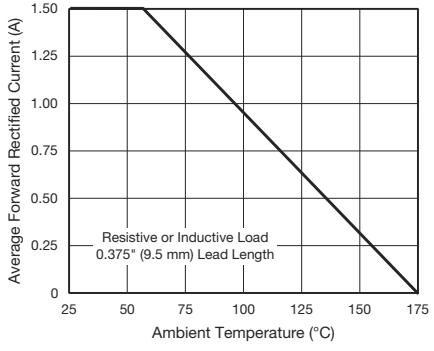


Fig. 1 - Forward Current Derating Curve

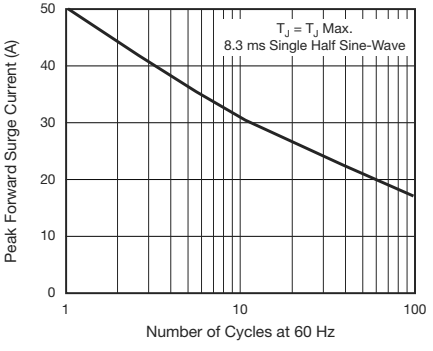


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

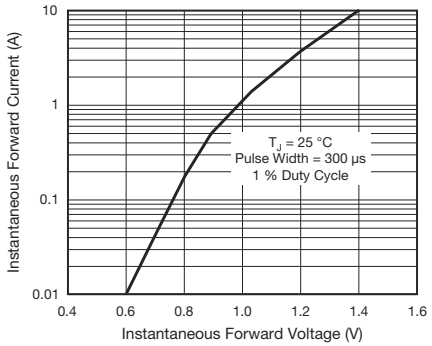


Fig. 3 - Typical Instantaneous Forward Characteristics

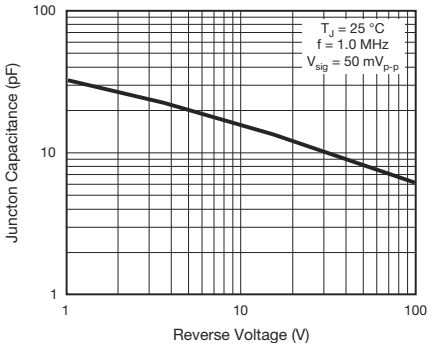


Fig. 5 - Typical Junction Capacitance

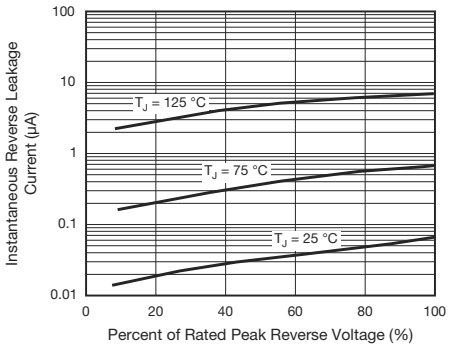


Fig. 4 - Typical Reverse Characteristics

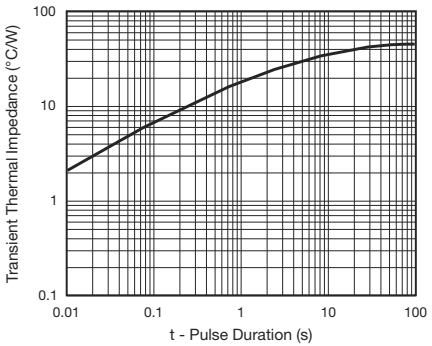
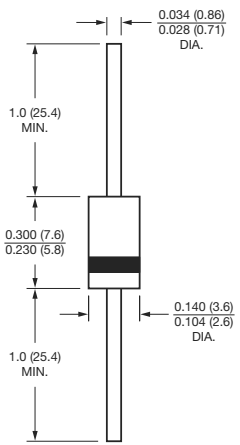


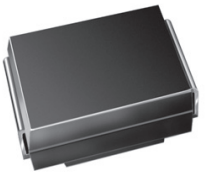
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Surface Mount Fast Switching Rectifier



DO-214AA (SMB)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Fast switching for high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 800 V
I_{FSM}	50 A
t_{rr}	150 ns, 250 ns, 500 ns
V_F	1.3 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RS2A	RS2B	RS2D	RS2G	RS2J	RS2K	UNIT
Device marking code		RA	RB	RD	RG	RJ	RK	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	500	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current at T_L = 100 °C	$I_{F(AV)}$	1.5						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**RS2A**	**RS2B**	**RS2D**	**RS2G**	**RS2J**	**RS2K**	**UNIT**
Maximum instantaneous forward voltage	1.5 A		V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 125 °C	I_R	5.0 200						μA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	500	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	20				17		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**RS2A**	**RS2B**	**RS2D**	**RS2G**	**RS2J**	**RS2K**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	55 18						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.27 x 0.27" (7.0 x 7.0 mm) copper pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**REFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RS2J-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
RS2J-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
RS2JHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
RS2JHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

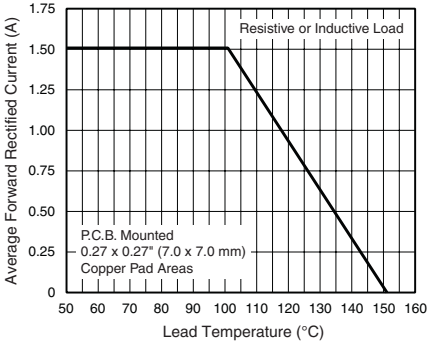


Figure 1. Forward Current Derating Curve

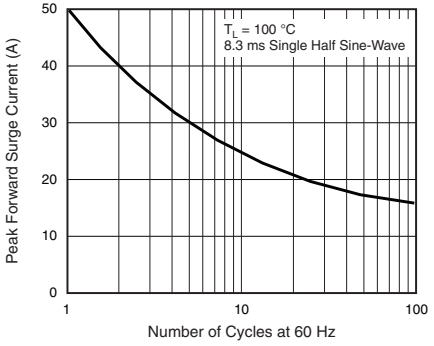


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

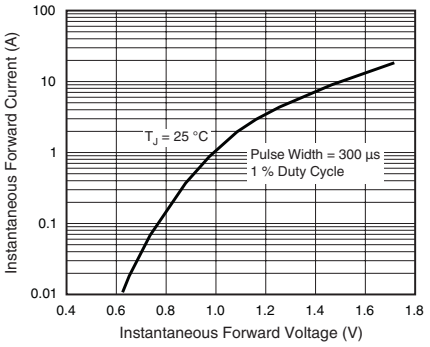


Figure 3. Typical Instantaneous Forward Characteristics

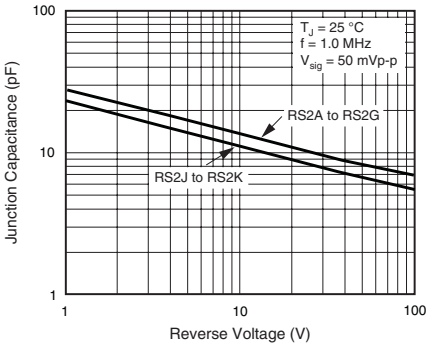


Figure 5. Typical Junction Capacitance

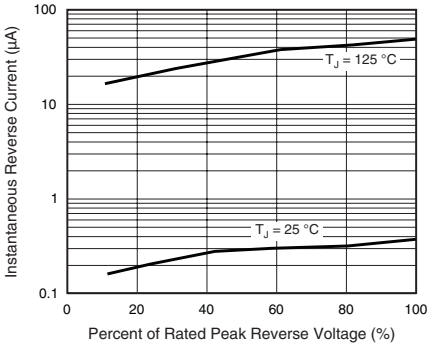
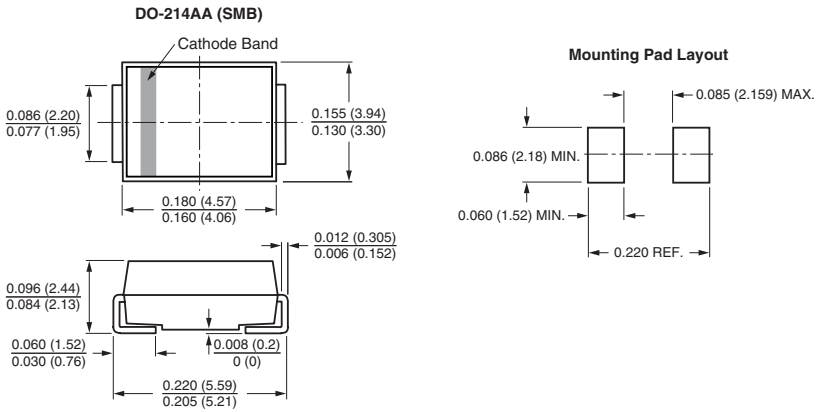


Figure 4. Typical Reverse Characteristics

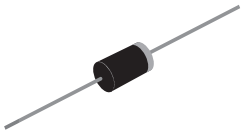
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



BY296P thru BY299P

Vishay General Semiconductor

Soft Recovery Plastic Rectifier



DO-201AD

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	100 V to 800 V
I_{FSM}	70 A
t_{rr}	500 ns
I_R	10 µA
V_F	1.3 V
T_J max.	125 °C

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BY296P	BY297P	BY298P	BY299P	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	600	800	V
Maximum RMS voltage	V_{RMS}	70	140	420	560	V
Maximum DC blocking voltage	V_{DC}	100	200	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	2.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	70				A
Operating junction temperature range	T_J	- 50 to + 125				°C
Storage temperature range	T_{STG}	- 50 to + 150				°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88948
Revision: 08-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	BY296P	BY297P	BY298P	BY299P	UNIT
Maximum instantaneous forward voltage	3.0 A		V_F	1.3				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 500				µA
Maximum reverse recovery time	I_F = 10 mA, I_R = 10 mA, I_{rr} = 1.0 mA		t_{rr}	500				ns
Maximum forward recovery time	I_F = 100 mA		t_{rr}	1.0				µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	28				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	BY296P	BY297P	BY298P	BY299P	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$	15				°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length with both leads equally heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BY298P-E3/54	1.1	54	1400	13" diameter paper tape and reel
BY298P-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

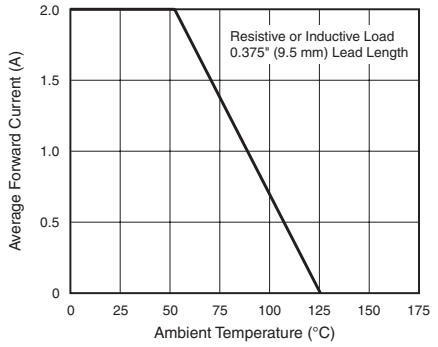


Figure 1. Forward Current Derating Curve

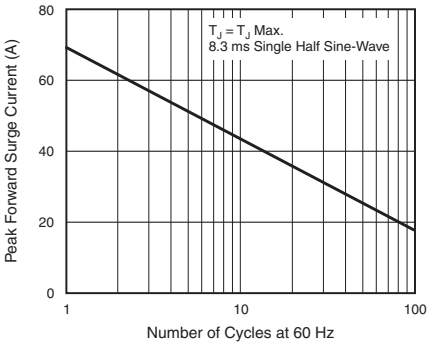


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

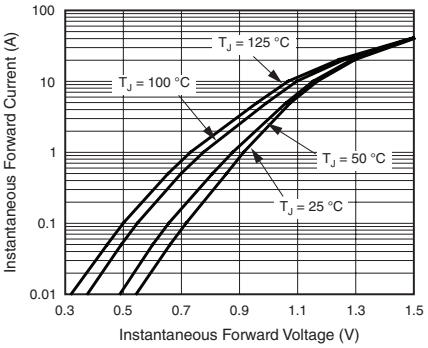


Figure 3. Typical Instantaneous Forward Characteristics

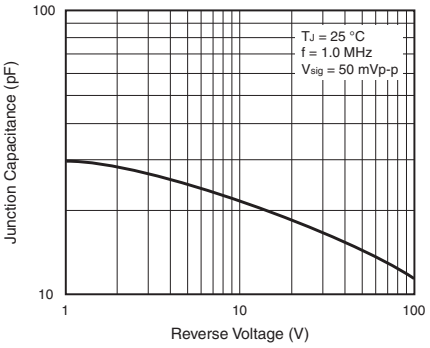


Figure 5. Typical Junction Capacitance

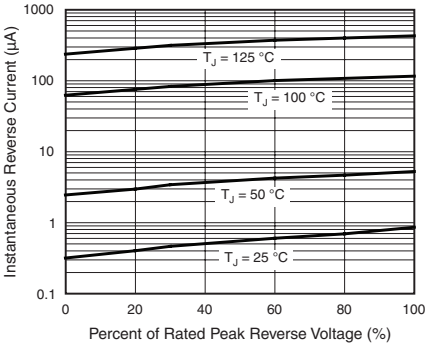
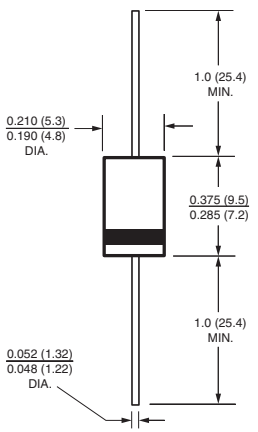


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



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Document Number: 88948
Revision: 08-Apr-08

VISHAY

RGP20A thru RGP20J

Vishay General Semiconductor

Glass Passivated Junction Fast Switching Rectifier

GP20

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current, typical I_R less than 0.2 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 600 V
I_{FSM}	80 A
t_{rr}	150 ns, 250 ns
V_F	1.3 V
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: GP20, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RGP20A	RGP20B	RGP20D	RGP20G	RGP20J	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	2.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	80					A
Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100					µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

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DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**RGP20A**	**RGP20B**	**RGP20D**	**RGP20G**	**RGP20J**	**UNIT**
Maximum instantaneous forward voltage	2.0 A		V_F	1.3					V
Maximum DC reverse current at rated DC blocking voltage		T_A= 25 °C	I_R	5.0					μA
		T_A= 125 °C		100					
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	35					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**RGP20A**	**RGP20B**	**RGP20D**	**RGP20G**	**RGP20J**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	22					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RGP20J-E3/54	1.013	54	1400	13" diameter paper tape and reel
RGP20J-E3/73	1.013	73	1000	Ammo pack packaging
RGP20JHE3/54 (1)	1.013	54	1400	13" diameter paper tape and reel
RGP20JHE3/73 (1)	1.013	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

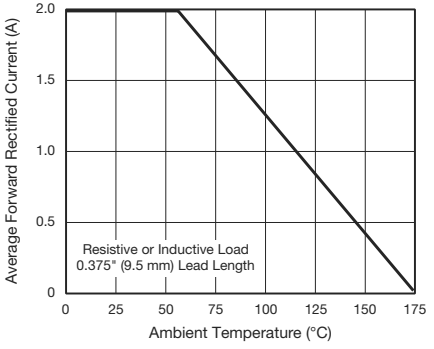


Fig. 1 - Forward Current Derating Curve

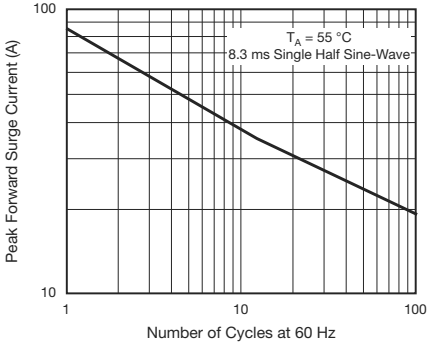


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

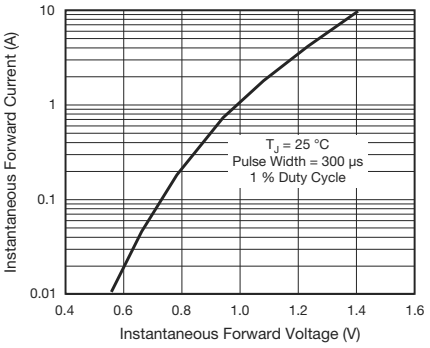


Fig. 3 - Typical Instantaneous Forward Characteristics

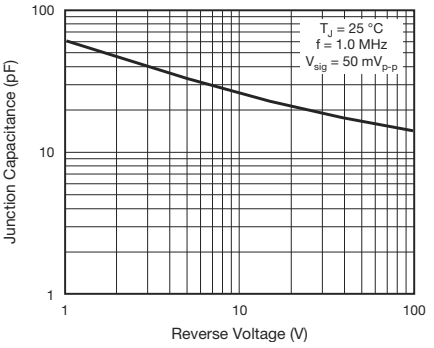


Fig. 5 - Typical Junction Capacitance

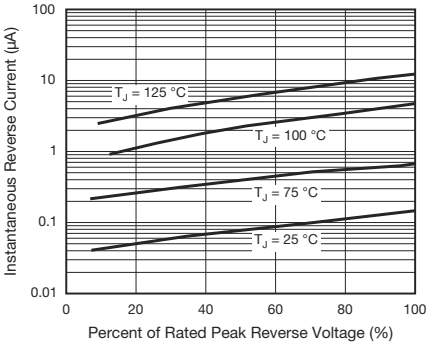


Fig. 4 - Typical Reverse Characteristics

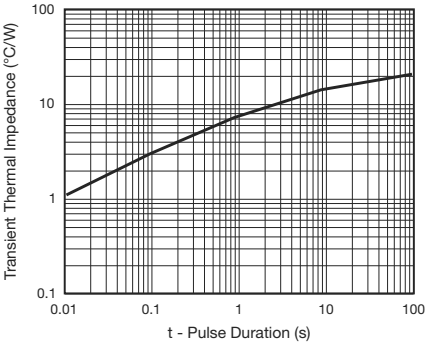
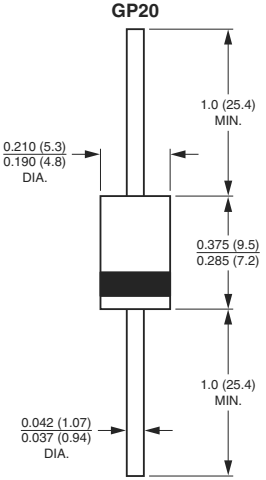


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Glass Passivated Junction Fast Switching Rectifier

DO-201AD

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current, typical I_R less than 0.2 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	100 A
t_{rr}	150 ns, 250 ns, 500 ns
I_R	5.0 µA
V_F	1.3 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For general purpose of medium frequency rectification.

MECHANICAL DATA

Case: DO-201AD, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RGP25A	RGP25B	RGP25D	RGP25G	RGP25J	RGP25K	RGP25M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	2.5							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88703
Revision: 21-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	RGP25A	RGP25B	RGP25D	RGP25G	RGP25J	RGP25K	RGP25M	UNIT
Maximum instantaneous forward voltage	2.5 A		V_F	1.3							V
Maximum DC reverse current at rated DC blocking voltage		T_A= 25 °C	I_R	5.0							μA
		T_A= 125 °C		200							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	500		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	60							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	RGP25A	RGP25B	RGP25D	RGP25G	RGP25J	RGP25K	RGP25M	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	20							°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
RGP25J-E3/54	1.28	54	1400	13" diameter paper tape and reel
RGP25J-E3/73	1.28	73	1000	Ammo pack packaging
RGP25JHE3/54 (1)	1.28	54	1400	13" diameter paper tape and reel
RGP25JHE3/73 (1)	1.28	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

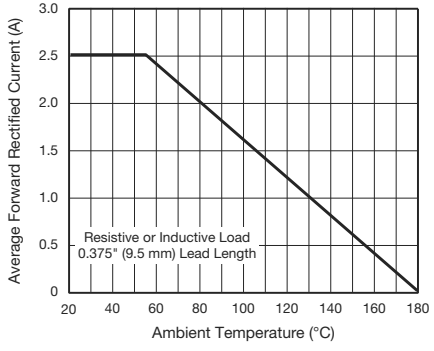


Fig. 1 - Forward Current Derating Curve

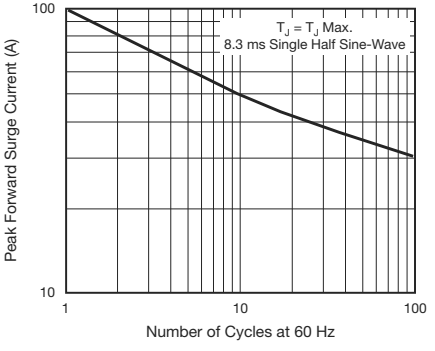


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

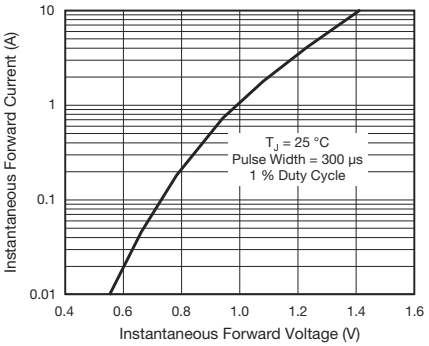


Fig. 3 - Typical Instantaneous Forward Characteristics

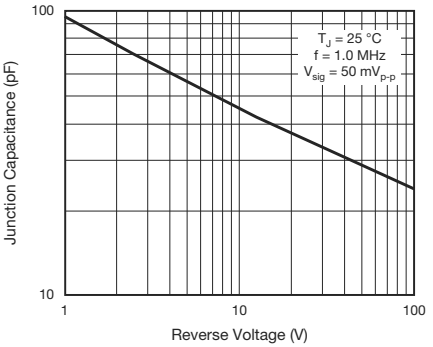


Fig. 5 - Typical Junction Capacitance

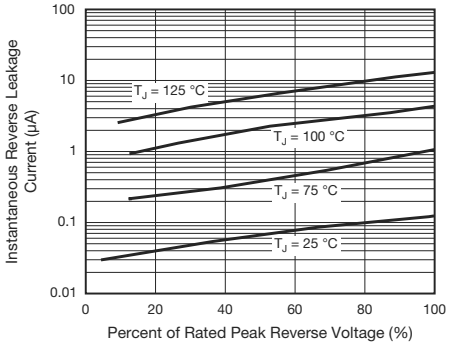
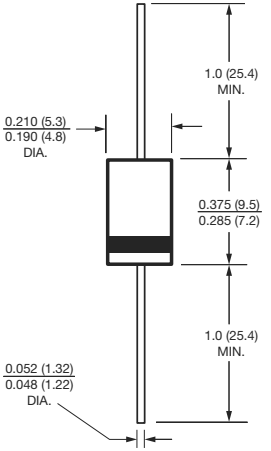


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



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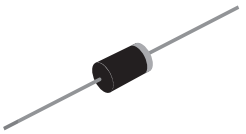
Document Number: 88703
Revision: 21-Jan-11

Soft Recovery Fast-Switching Plastic Rectifier



DO-201AD

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	100 V to 800 V
I_{FSM}	100 A
t_{rr}	500 ns
I_R	10 µA
V_F	1.25 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BY396P	BY397P	BY398P	BY399P	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	800	V
Maximum RMS voltage	V_{RMS}	70	140	280	560	V
Maximum DC blocking voltage	V_{DC}	100	200	400	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead lengths at T_A = 50 °C	$I_{F(AV)}$	3.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load at T_A= 50 °C	I_{FSM}	100				A
Maximum repetitive peak forward surge at f < 15 kHz	I_{FRM}	10				A
Operating junction temperature range	T_J	- 50 to + 125				°C
Storage temperature range	T_{STG}	- 50 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	BY396P	BY397P	BY398P	BY399P	UNIT
Maximum instantaneous forward voltage	3.0 A		V_F	1.25				V
Maximum DC reverse current at rated DC blocking voltage		T_A= 25 °C T_A= 100 C	I_R	10 500				µA
Maximum reverse recovery time	I_F = 10 mA, I_R = 10 mA, I_{rr} = 1.0 mA		t_{rr}	500				ns
Maximum forward recovery time	100 mA, dI/dt = 50 A/µs		t_{fr}	1.0				µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	28				pF

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**BY396P**	**BY397P**	**BY398P**	**BY399P**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	22				°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5mm) lead length with both leads to heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BY398P-E3/54	1.1	54	1400	13" diameter paper tape and reel
BY398P-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

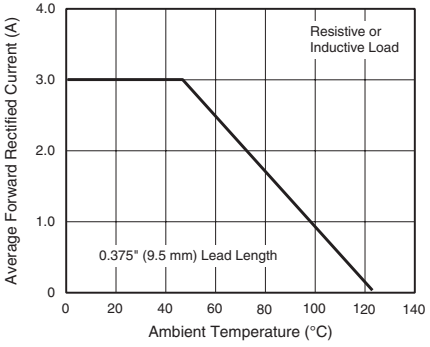


Figure 1. Forward Current Derating Curve

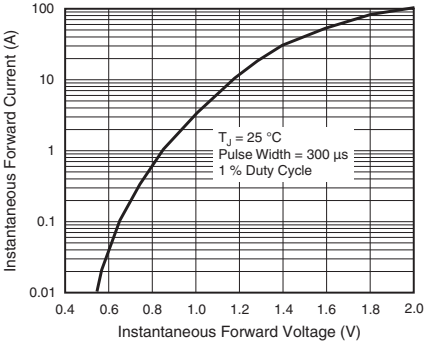


Figure 3. Typical Instantaneous Forward Characteristics

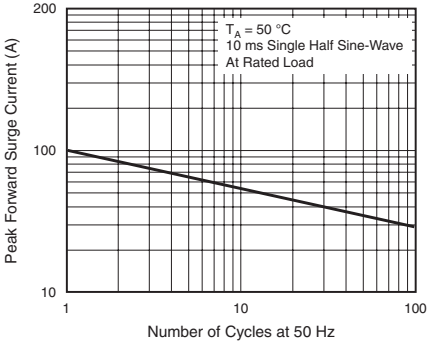


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

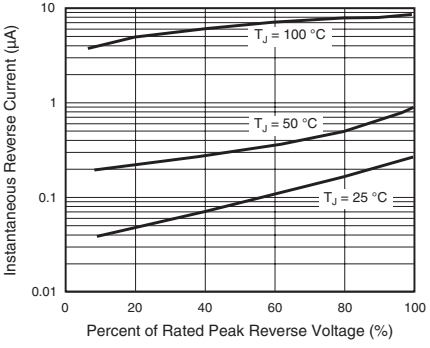


Figure 4. Typical Reverse Characteristics

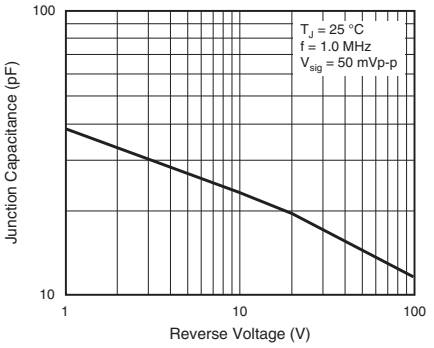
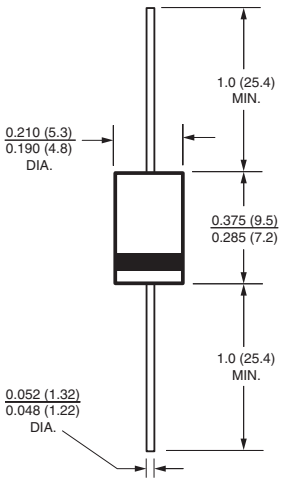


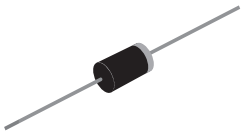
Figure 5. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



Fast Switching Plastic Rectifier



DO-201AD

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	100 A
t_{rr}	200 ns
I_R	10 µA
V_F	1.25 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI850	GI851	GI852	GI854	GI856	GI858	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum non-repetitive peak reverse voltage	V_{RSM}	75	150	250	450	650	880	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 90 °C	$I_{F(AV)}$	3.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100						A
Operating junction and storage temperature	T_J, T_{STG}	- 50 to + 150						°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88630
Revision: 10-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GI850**	**GI851**	**GI852**	**GI854**	**GI856**	**GI858**	**UNIT**
Maximum instantaneous forward voltage	3.0 A 9.4 A	T_J = 175 °C	V_F	1.25 1.10						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 150	150	200	250	300	500	µA
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}		t_{rr}	200						ns
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}		$I_{RM(REC)}$	2.0						A
Typical junction capacitance	4.0 V, 1 MHz		C_J	28						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**GI850**	**GI851**	**GI852**	**GI854**	**GI856**	**GI858**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	22 8.0						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, with both leads equally heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GI856-E3/54	1.1	54	1400	13" diameter paper tape and reel
GI856-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

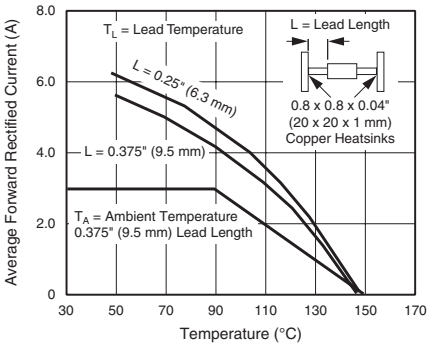


Figure 1. Forward Current Derating Curves

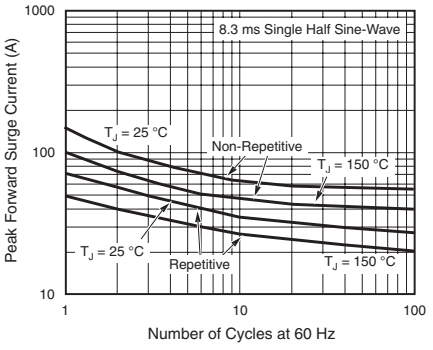


Figure 2. Maximum Peak Forward Surge Current

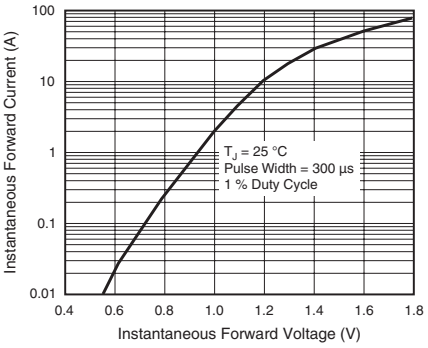


Figure 3. Typical Instantaneous Forward Characteristics

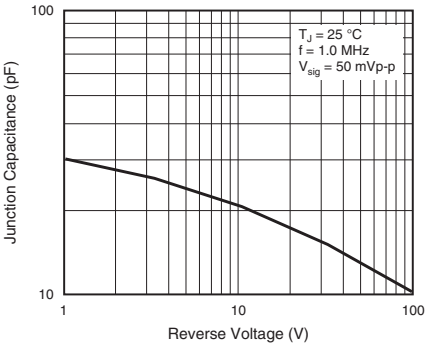


Figure 5. Typical Junction Capacitance

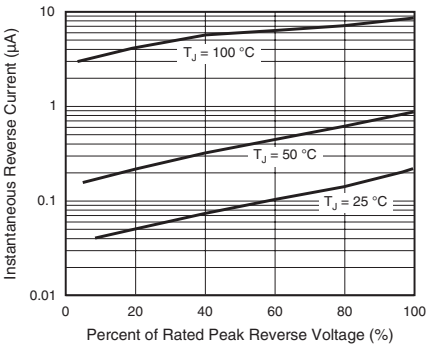
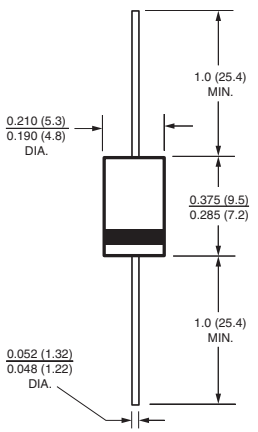


Figure 4. Typical Reverse Characteristics

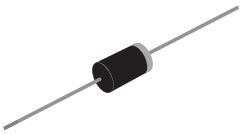
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88630
Revision: 10-Apr-08

Medium-Switching Plastic Rectifier



DO-201AD

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	100 A
t_{rr}	750 ns
I_R	10 µA
V_F	1.25 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI910	GI911	GI912	GI914	GI916	GI917	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 90 °C	$I_{F(AV)}$	3.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100						A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	GI910	GI911	GI912	GI914	GI916	GI917	UNIT
Maximum instantaneous forward voltage	3.0 A 9.4 A	T_J = 175 °C	V_F	1.25 1.10						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 300						µA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GI910**	**GI911**	**GI912**	**GI914**	**GI916**	**GI917**	**UNIT**
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	t_{rr}	750						ns
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	$I_{RM(REC)}$	2.0						A
Typical junction capacitance	4.0 V, 1 MHz	C_J	28						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**GI910**	**GI911**	**GI912**	**GI914**	**GI916**	**GI917**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	22 8.0						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, with both leads equally heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GI916-E3/54	1.1	54	1400	13" diameter paper tape and reel
GI916-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

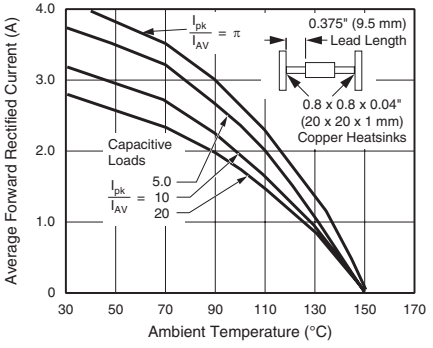


Figure 1. Forward Current Derating Curves

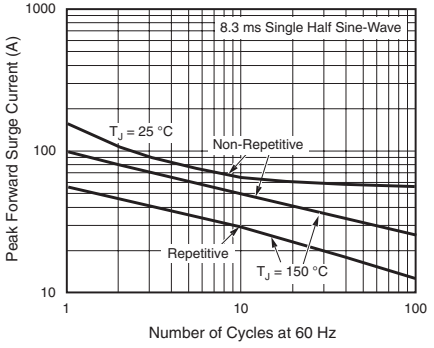


Figure 2. Maximum Peak Forward Surge Current

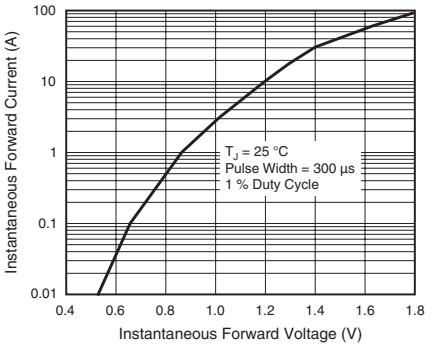


Figure 3. Typical Instantaneous Forward Characteristics

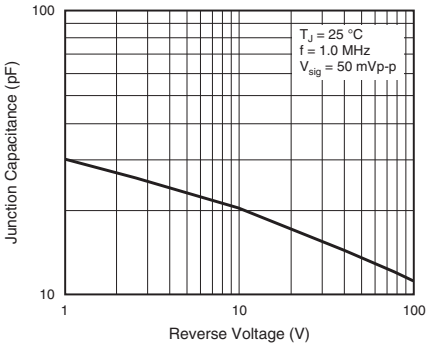


Figure 5. Typical Junction Capacitance

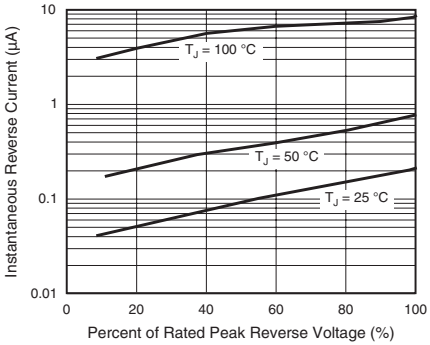
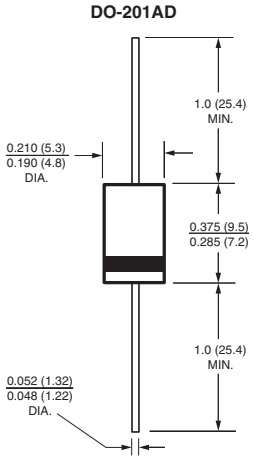


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Glass Passivated Junction Fast Switching Rectifier

DO-201AD

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current, typical I_R less than 0.2 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	125 A
V_F	1.3 V
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-201AD, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RGP30A	RGP30B	RGP30D	RGP30G	RGP30J	RGP30K	RGP30M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	3.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Document Number: 88704
Revision: 21-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	RGP30A	RGP30B	RGP30D	RGP30G	RGP30J	RGP30K	RGP30M	UNIT
Maximum instantaneous forward voltage	3.0 A		V_F	1.3							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							μA
		T_A = 125 °C		100							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	150				250	500		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	60							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	RGP30A	RGP30B	RGP30D	RGP30G	RGP30J	RGP30K	RGP30M	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	20							°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
RGP30J-E3/54	1.28	54	1400	13" diameter paper tape and reel
RGP30J-E3/73	1.28	73	1000	Ammo pack packaging
RGP30JHE3/54 (1)	1.28	54	1400	13" diameter paper tape and reel
RGP30JHE3/73 (1)	1.28	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

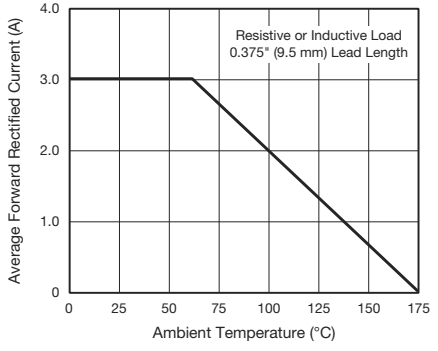


Fig. 1 - Forward Current Derating Curve

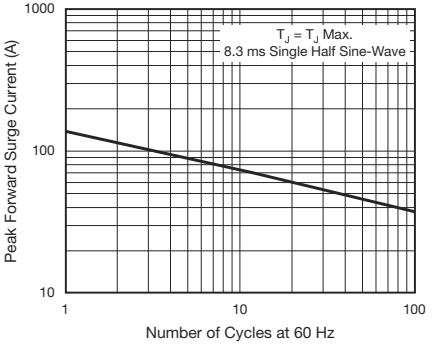


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

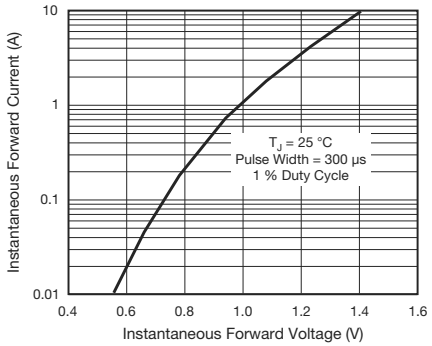


Fig. 3 - Typical Instantaneous Forward Characteristics

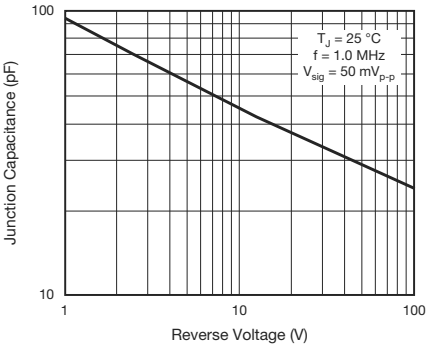


Fig. 5 - Typical Junction Capacitance

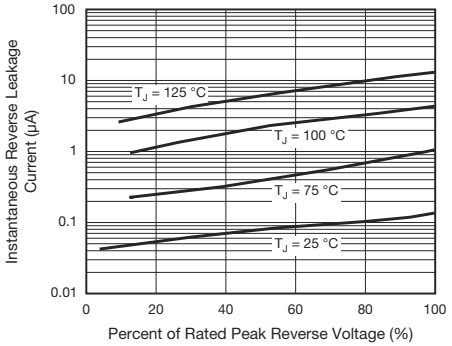
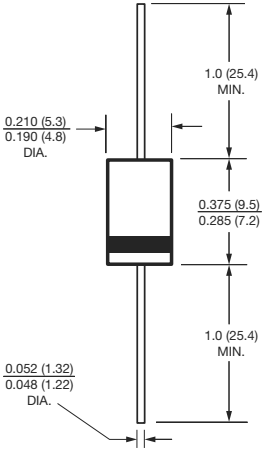


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88704
Revision: 21-Jan-11

Surface Mount Fast Switching Rectifier

DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Fast switching for high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	100 A
t_{rr}	150 ns, 250 ns, 500 ns
V_F	1.3 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	RS3A	RS3B	RS3D	RS3G	RS3J	RS3K	UNIT
Device marking code		RA	RB	RD	RG	RJ	RK	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	500	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current at T_L = 75 °C	$I_{F(AV)}$	3.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**RS3A**	**RS3B**	**RS3D**	**RS3G**	**RS3J**	**RS3K**	**UNIT**
Maximum instantaneous forward voltage	2.5 A	V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C T_A = 125 °C	I_R	10 250						μA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	150				250	500	ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	44				34		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**RS3A**	**RS3B**	**RS3D**	**RS3G**	**RS3J**	**RS3K**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 15						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.3 x 0.3" (8.0 x 8.0 mm) copper pad area

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**REFFERED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RS3J-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
RS3J-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
RS3JHE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
RS3JHE3/9AT (1)	0.211	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

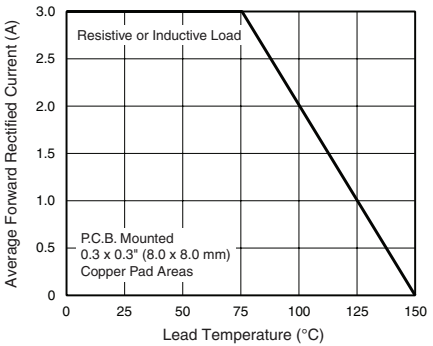


Figure 1. Forward Current Derating Curve

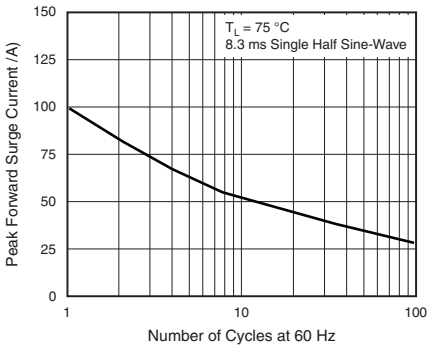


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

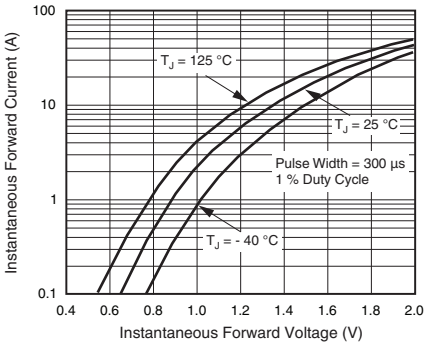


Figure 3. Typical Instantaneous Forward Characteristics

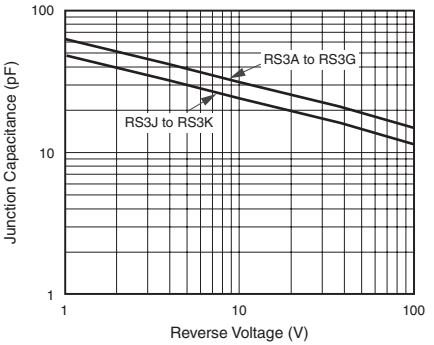


Figure 5. Typical Junction Capacitance

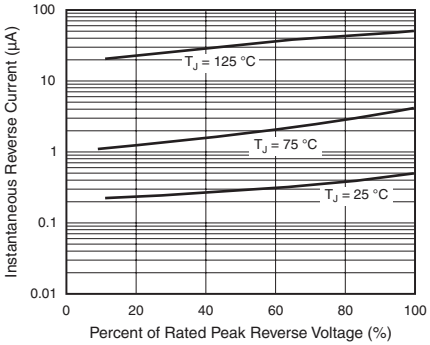


Figure 4. Typical Reverse Characteristics

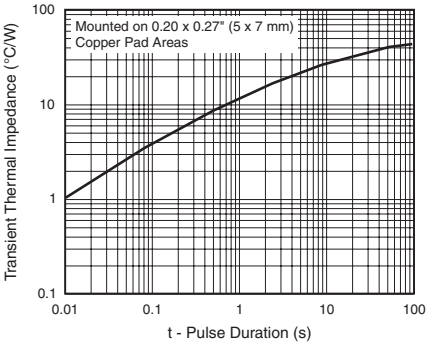
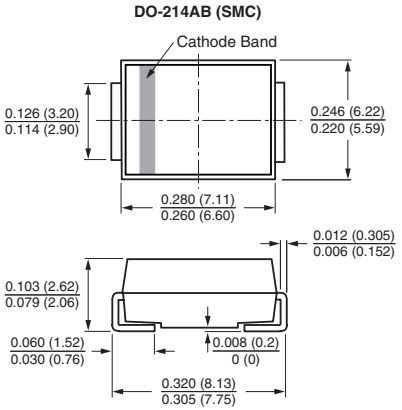
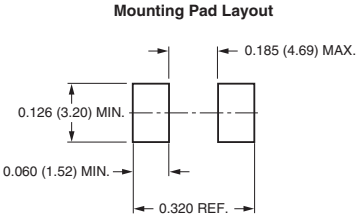


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

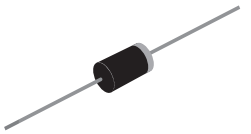




SRP300A thru SRP300K

Vishay General Semiconductor

General Purpose Plastic Rectifier



DO-201AD

FEATURES

- Glass passivated chip junction
- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	150 A
t_{rr}	100 ns, 150 ns, 200 ns
I_R	10 μA
V_F	1.3 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SRP300A	SRP300B	SRP300D	SRP300G	SRP300J	SRP300K	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	3.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150						A
Operating junction temperature range	T_J	- 50 to + 125						°C
Storage temperature range	T_{STG}	- 50 to + 150						°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88744
Revision: 10-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SRP300A**	**SRP300B**	**SRP300D**	**SRP300G**	**SRP300J**	**SRP300K**	**UNIT**
Maximum instantaneous forward voltage	3.0 A		V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10						µA
				200			300	400	500	
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	100		150		200		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	28						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**SRP300A**	**SRP300B**	**SRP300D**	**SRP300G**	**SRP300J**	**SRP300K**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	22						°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length with both leads equally heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SRP300J-E3/54	1.1	54	1400	13" diameter paper tape and reel
SRP300J-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

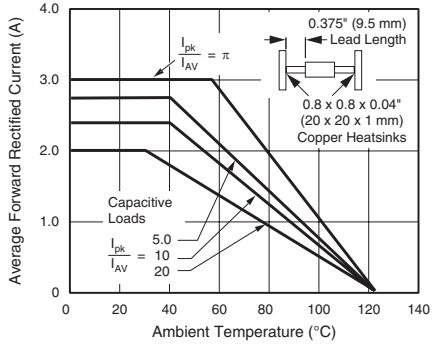


Figure 1. Forward Current Derating Curves

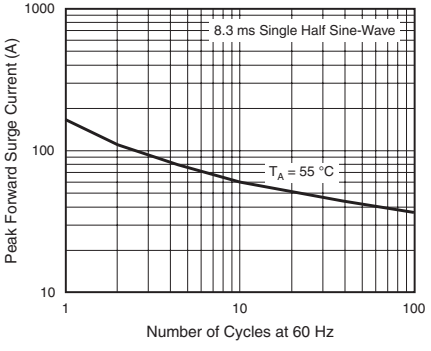


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

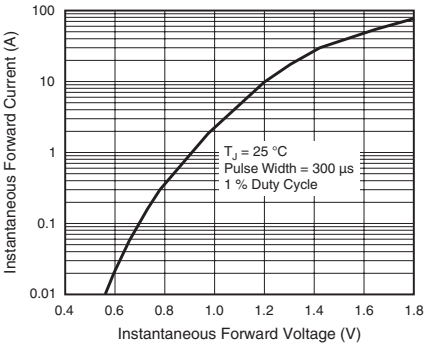


Figure 3. Typical Instantaneous Forward Characteristics

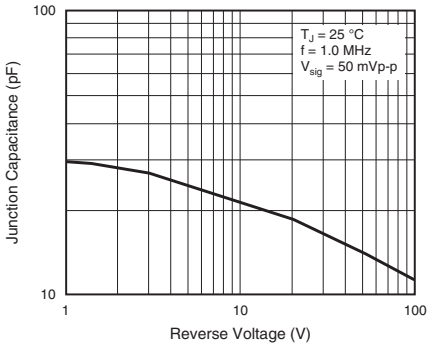


Figure 5. Typical Junction Capacitance

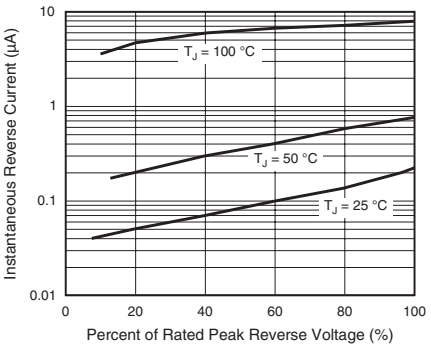
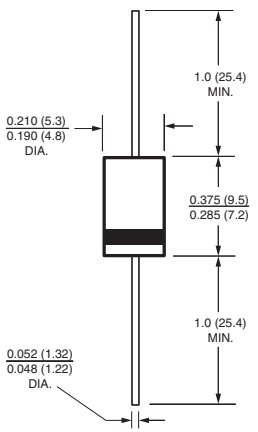


Figure 4. Typical Reverse Characteristics

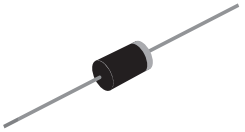
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88744
Revision: 10-Apr-08

Soft Recovery Fast-Switching Plastic Rectifier



DO-201AD

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in medium frequency rectification of switching mode power supplies, inverters, converters, TV sanning, Ultrasonic-system, speed controlled DC motors, low RF interference and freewheeling diode circuit.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	100 V to 800 V
I_{FSM}	200 A
t_{rr}	200 ns
I_R	10 µA
V_F	1.35 V
T_J max.	125 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	BY500-100	BY500-200	BY500-400	BY500-600	BY500-800	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	100	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_L = 45 °C	$I_{F(AV)}$	5.0					A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load at T_A = 25 °C	I_{FSM}	200					A
Maximum repetitive peak forward surge	I_{FRM}	10					A
Operating junction temperature range	T_J	- 50 to + 125					°C
Storage temperature range	T_{STG}	- 50 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BY500-100**	**BY500-200**	**BY500-400**	**BY500-600**	**BY500-800**	**UNIT**
Maximum instantaneous forward voltage	5.0 A		V_F	1.35					V
Maximum DC reverse current at rated DC blocking voltage		T_A= 25 °C T_A= 100 °C	I_R	10 1.0					µA mA
Maximum reverse recovery time (1)			t_{rr}	200					ns
Maximum reverse recovery current	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}		$I_{RM(REC)}$	2.0					A
Typical junction capacitance	4.0 V, 1 MHz		C_J	28					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**BY500-100**	**BY500-200**	**BY500-400**	**BY500-600**	**BY500-800**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	22					°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length with both leads to heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BY500-400-E3/54	1.1	54	1400	13" diameter paper tape and reel
BY500-400-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

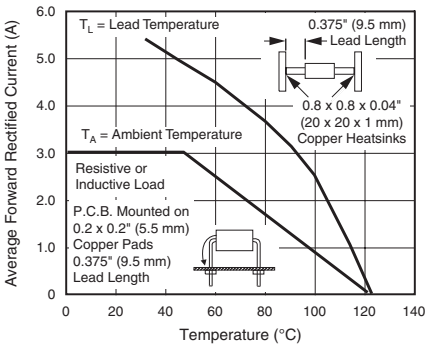


Figure 1. Forward Current Derating Curves

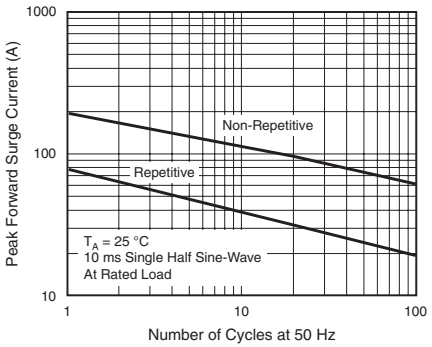


Figure 2. Maximum Peak Forward Surge Current

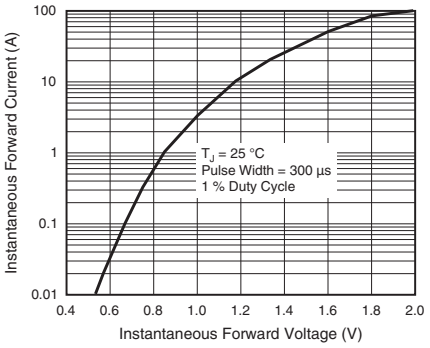


Figure 3. Typical Instantaneous Forward Characteristics

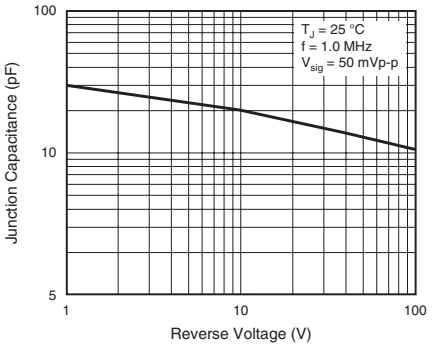


Figure 5. Typical Junction Capacitance

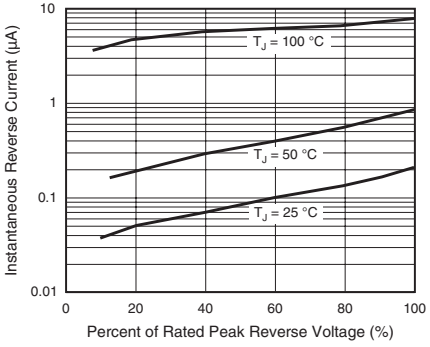
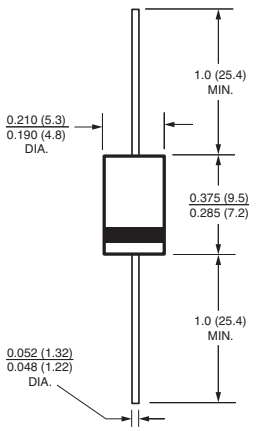


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



GI820 thru GI828

Vishay General Semiconductor

Fast Switching Plastic Rectifier

Case Style P600

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward current operation
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: P600, void-free molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	300 A
t_{rr}	200 ns
V_F	1.05 V
I_R	10 µA
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI820	GI821	GI822	GI824	GI826	GI828	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum non-repetitive peak reverse voltage	V_{RSM}	75	150	250	450	650	880	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	5.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	300						A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150						°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88629
Revision: 10-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	GI820	GI821	GI822	GI824	GI826	GI828	UNIT
Maximum instantaneous forward voltage	5.0 A 15.7 A	T_J = 25 °C T_J = 100 °C	V_F	1.10 1.05						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 1.0						µA
Typical junction capacitance	4.0 V, 1 MHz		C_J	300						pF
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}		t_{rr}	200						ns
Maximum reverse recovery current	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs,		$I_{RM(REC)}$	2.0						A

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	GI820	GI821	GI822	GI824	GI826	GI828	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$	10						°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length with both leads equally heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GI826-E3/54	2.1	54	800	13" diameter paper tape and reel
GI826-E3/73	2.1	73	300	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

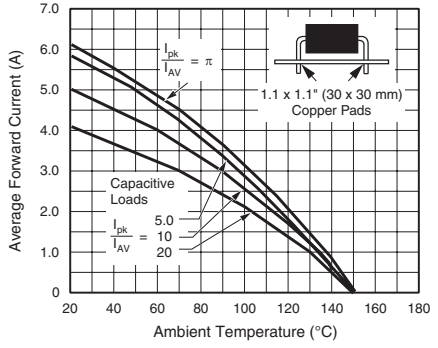


Figure 1. Forward Current Derating Curves

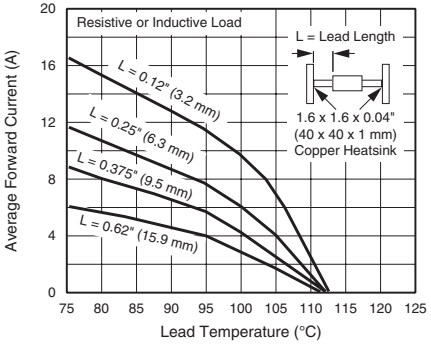


Figure 2. Forward Current Derating Curve

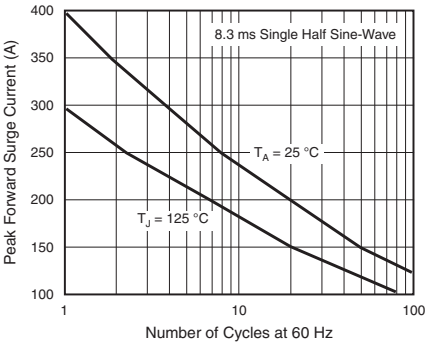


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

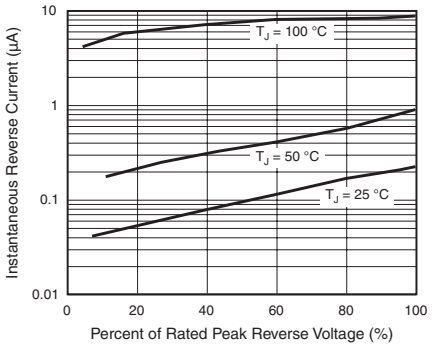


Figure 5. Typical Reverse Characteristics

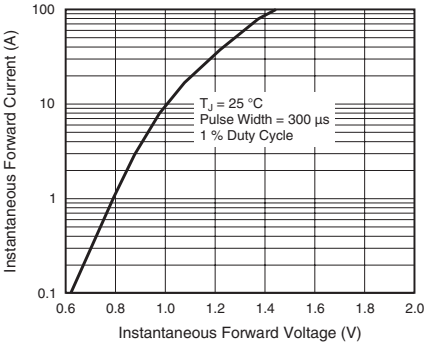


Figure 4. Typical Instantaneous Forward Characteristics

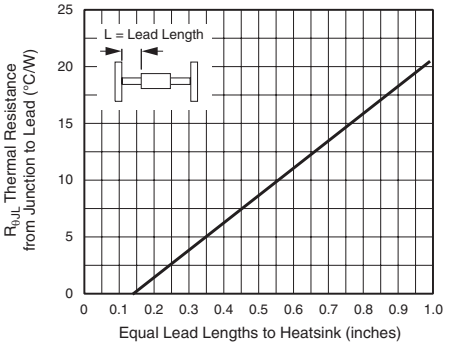
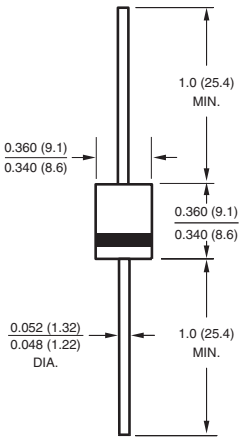


Figure 6. Typical Thermal Resistance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style P600



Fast Switching Fast Rectifier

Case Style P600

FEATURES

- Fast switching for high efficiency
- Low forward voltage drop
- Low leakage current
- High forward current operation
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	300 A
t_{rr}	100 ns, 150 ns, 200 ns
V_F	1.3 V
I_R	10 µA
T_J max.	125 °C

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: P600, void-free molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SRP600A	SRP600B	SRP600D	SRP600G	SRP600J	SRP600K	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	6.0						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	300						A
Operating junction temperature range	T_J	- 50 to + 125						°C
Storage temperature range	T_{STG}	- 50 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**SRP600A**	**SRP600B**	**SRP600D**	**SRP600G**	**SRP600J**	**SRP600K**	**UNIT**
Maximum instantaneous forward voltage	6.0 A		V_F	1.3						V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	10 1.0						µA mA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	100		150		200		ns

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**SRP600A**	**SRP600B**	**SRP600D**	**SRP600G**	**SRP600J**	**SRP600K**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	10						°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length with both leads equally heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SRP600J-E3/54	2.1	54	800	13" diameter paper tape and reel
SRP600J-E3/73	2.1	73	300	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

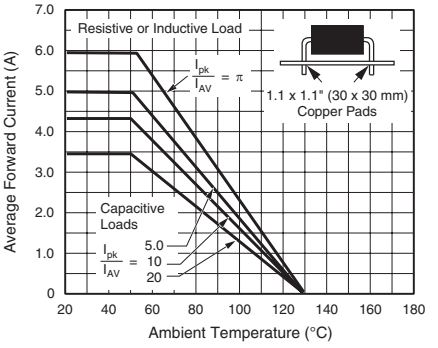


Figure 1. Forward Current Derating Curves

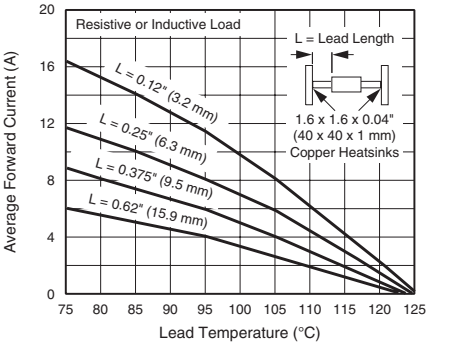


Figure 2. Forward Current Derating Curve

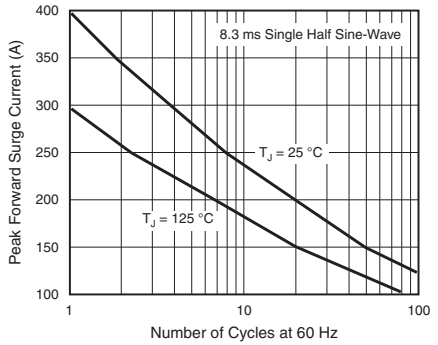


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

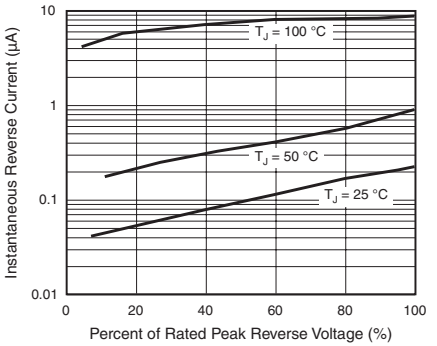


Figure 5. Typical Reverse Characteristics

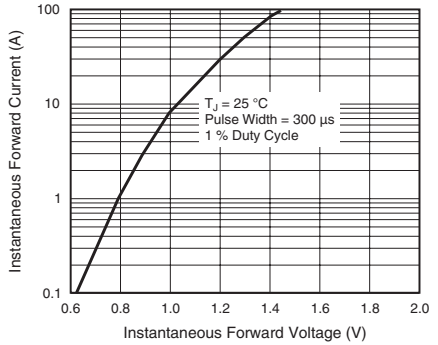


Figure 4. Typical Instantaneous Forward Characteristics

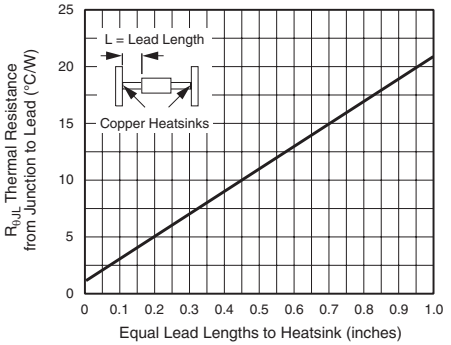
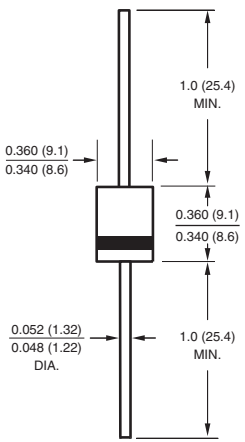


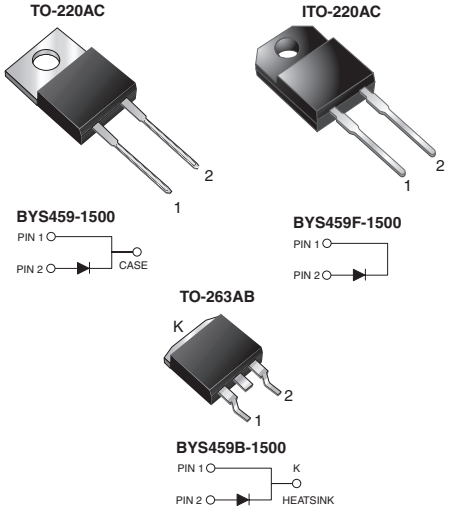
Figure 6. Typical Thermal Resistance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style P600



High Voltage Damper Diodes



FEATURES

- Glass passivated chip junction
- Fast reverse recovery time
- Low switching loss, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage and high frequency rectification of switching mode inverters, converters, freewheeling and ideal for CRT horizontal deflection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.5 A
V_{RRM}	1500 V
I_{FSM}	130 A
t_{rr}	350 ns
t_{fr}	250 ns
V_F	1.2 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1500	V
Maximum working reverse voltage	V_{RWM}	1300	V
Maximum DC blocking voltage	V_{DC}	1500	V
Maximum average forward rectified current	$I_{F(AV)}$	6.5	A
Peak working forward current at f = 48 kHz	$I_{F(Peak)}$	12	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	130	A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500	V

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 6.5 A, I_F = 6.5 A,	T_J = 25 °C T_J = 125 °C	V_F	1.3 1.2	V
Maximum DC reverse current	V_{RWM}	T_J = 25 °C T_J = 125 °C	I_R	250 1.0	µA mA
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V		t_{rr}	350	ns
Maximum reverse recovery charge	I_F = 2.0 A, dI/dt = 20 A/µs		Q_{rr}	3.0	µC
Maximum forward recovery time	I_F = 6.5 A, dI/dt = 52 A/µs		t_{fr}	250	ns
Peak forward recovery overshoot voltage	I_F = 6.5 A, dI/dt = 52 A/µs		V_{FP}	20	V

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYS459**	**BYS459F**	**BYS459B**	**UNIT**
Typical thermal resistance from junction to ambient	$R_{\theta JA}$	60	55	60	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	BYS459-1500-E3/45	1.80	45	50/tube	Tube
ITO-220AC	BYS459F-1500-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYS459B-1500-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYS459B-1500-E3/81	1.77	81	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

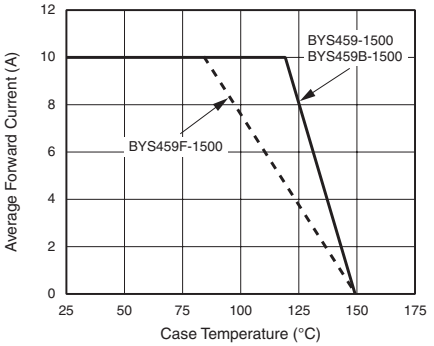


Figure 1. Forward Current Derating Curve

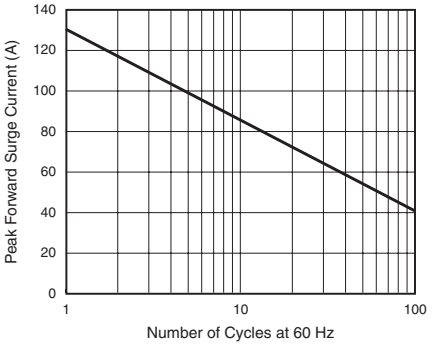


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

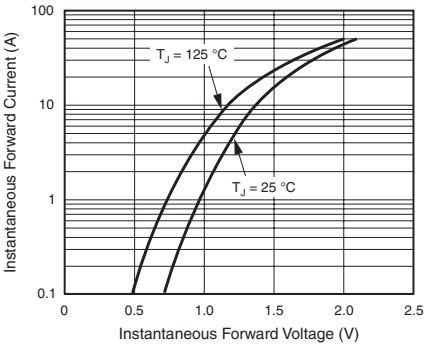


Figure 3. Typical Forward Voltage

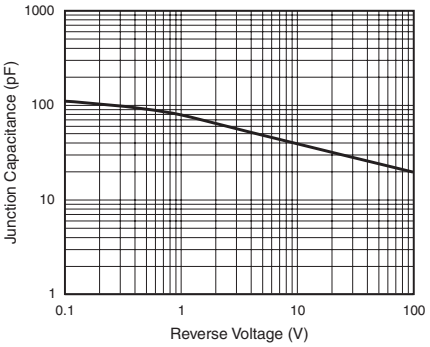


Figure 5. Typical Capacitance

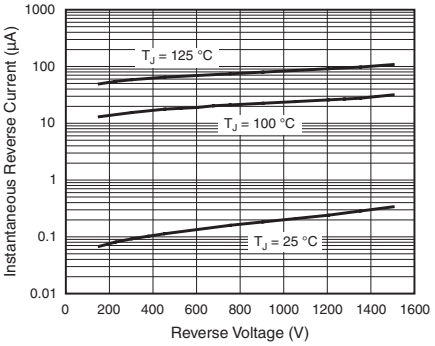


Figure 4. Typical Reverse Current

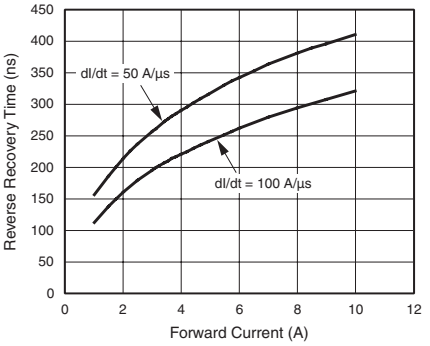
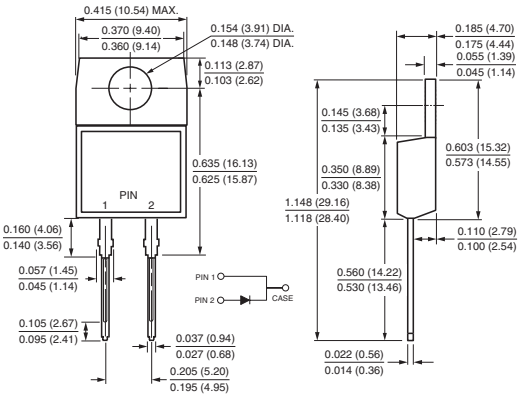


Figure 6. Typical Reverse Recovery Time

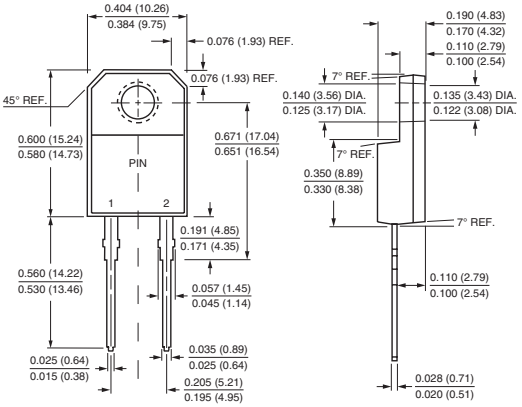
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

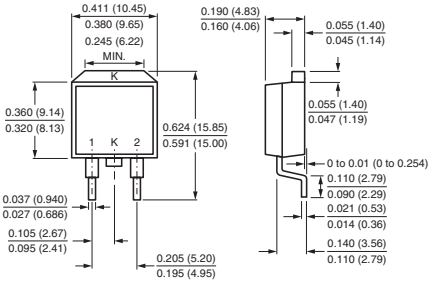
TO-220AC



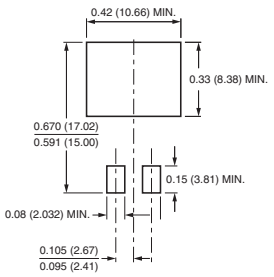
ITO-220AC



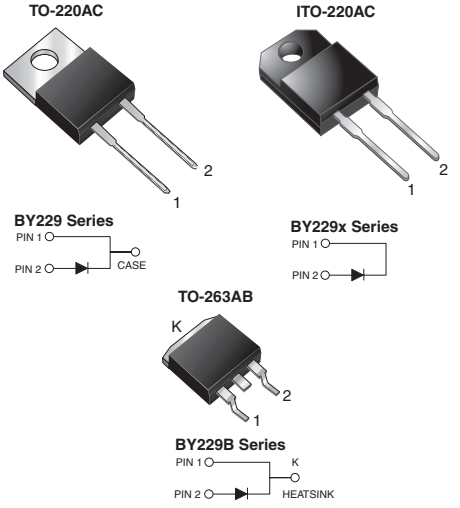
TO-263AB



Mounting Pad Layout



Fast Switching Plastic Rectifier



FEATURES

- Glass passivated chip junction
- Superfast recovery time for high efficiency
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whiskter test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	100 A
t_{rr}	145 ns
V_F	1.85 V
T_J max.	150 °C

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BY229-200	BY229-400	BY229-600	BY229-800	UNIT
Maximum recurrent peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	8.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100				A
Maximum slope of reverse recovery current I_F = 2.0 A, V_R = 30 V, dI/dt = 20 µs	dI/dt	60				A/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BY229-200**	**BY229-400**	**BY229-600**	**BY229-800**	**UNIT**
Maximum instantaneous forward voltage (1)	20 A		V_F	1.85				V
Maximum DC reverse current at rated DC blocking voltage		T_J = 25 °C T_J = 125 °C	I_R	10 300				µA
Maximum reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}		t_{rr}	145				ns
Maximum recovered stored charge	I_F = 2.0 A, V_R = 30 V, dI/dt = 20 A/µs		Q_{rr}	700				nC

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BY229**	**BY229X**	**BY229B**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.0	4.8	2.0	°C/W
Typical thermal resistance from junction to air	$R_{\theta JA}$	20	-	20	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	BY229-200-E3/45	1.80	45	50/tube	Tube
ITO-220AC	BY229X-200-E3/45	1.95	45	50/tube	Tube
TO-263AB	BY229B-200-E3/45	1.77	45	50/tube	Tube
TO-263AB	BY229B-200-E3/81	1.77	81	800/reel	Tape and reel
TO-220AC	BY229-200HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	BY229X-200HE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	BY229B-200HE3/45 (1)	1.77	45	50/tube	Tube
TO-263AB	BY229B-200HE3/81 (1)	1.77	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

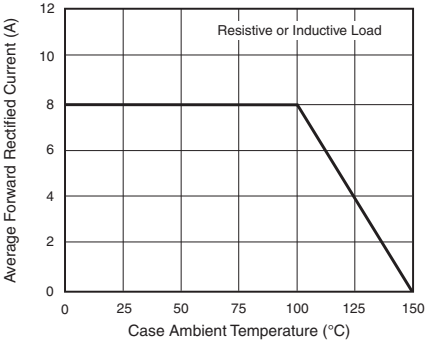


Figure 1. Forward Current Derating Curve

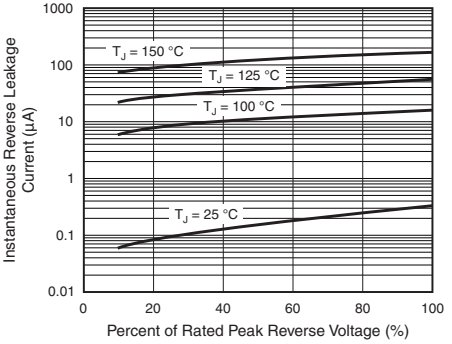


Figure 4. Typical Reverse Leakage Characteristics

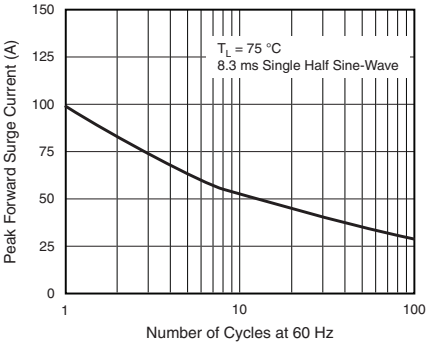


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

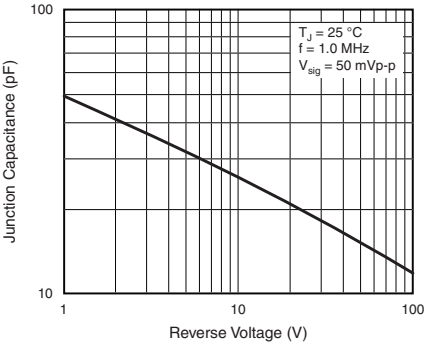


Figure 5. Typical Junction Capacitance

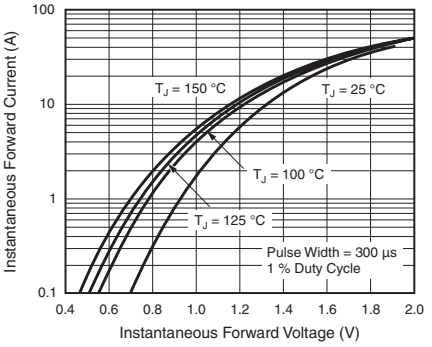
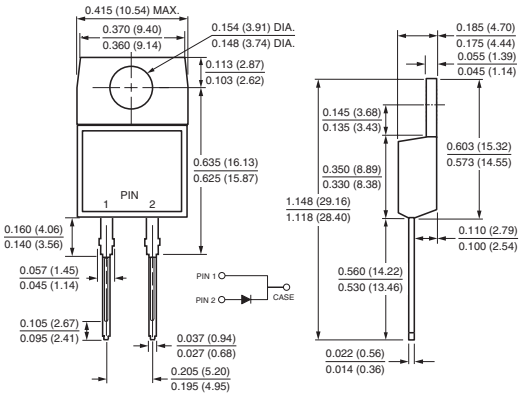


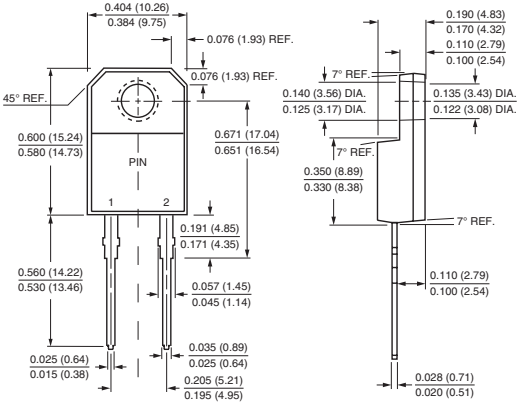
Figure 3. Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

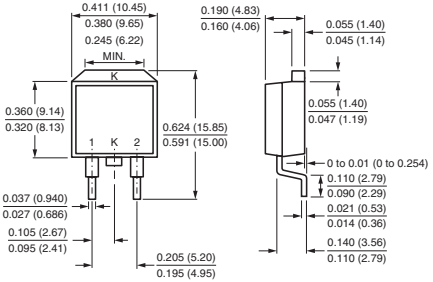
TO-220AC



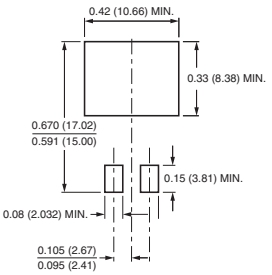
ITO-220AC



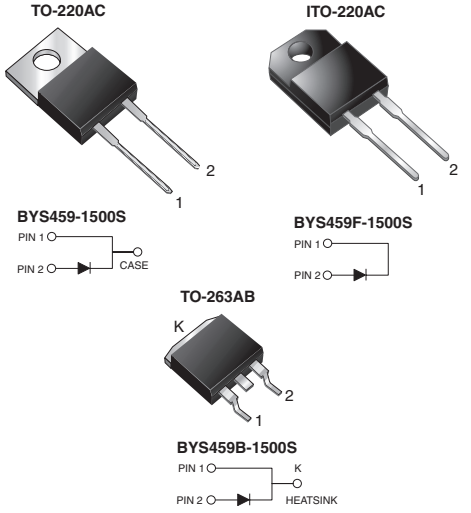
TO-263AB



Mounting Pad Layout



High Voltage Damper Diodes



FEATURES

- Glass passivated chip junction
- Fast reverse recovery time
- Low switching loss, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage and high frequency rectification of switching mode inverters, converters, freewheeling and ideal for CRT horizontal deflection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	1500 V
I_{FSM}	130 A
t_{rr}	220 ns
t_{fr}	300 ns
V_F	1.25 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	1500	V
Maximum working reverse voltage	V_{RWM}	1300	V
Maximum DC blocking voltage	V_{DC}	1500	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10	A
Peak working forward current at f = 82 kHz	$I_{F(Peak)}$	10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	130	A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500	V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88551
Revision: 06-Nov-07

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage (1)	I_F = 6.5 A, I_F = 6.5 A,	T_J = 25 °C T_J = 125 °C	V_F	1.35 1.25	V
Maximum DC reverse current	V_{RWM}	T_J = 25 °C T_J = 125 °C	I_R	250 1.0	µA mA
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V		t_{rr}	220	ns
Maximum reverse recovery charge	I_F = 2.0 A, dI/dt = 20 A/µs, V_R = 30 V		Q_{rr}	0.95	µC
Maximum forward recovery time	I_F = 6.5 A, dI/dt = 52 A/µs, V_R = 5 V		t_{fr}	300	ns
Peak forward recovery overshoot voltage	I_F = 6.5 A, dI/dt = 52 A/µs		V_{FP}	27	V

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	BYS459	BYS459F	BYS459B	UNIT
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	BYS459-1500S-E3/45	1.80	45	50/tube	Tube
ITO-220AC	BYS459F-1500S-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYS459B-1500S-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYS459B-1500S-E3/81	1.77	81	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

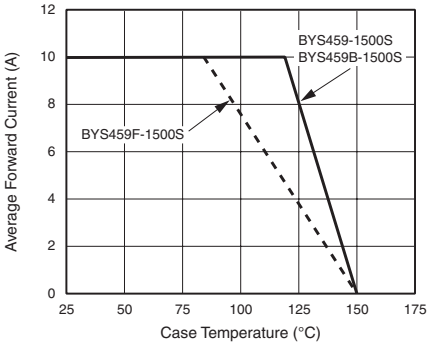


Figure 1. Forward Current Derating Curve

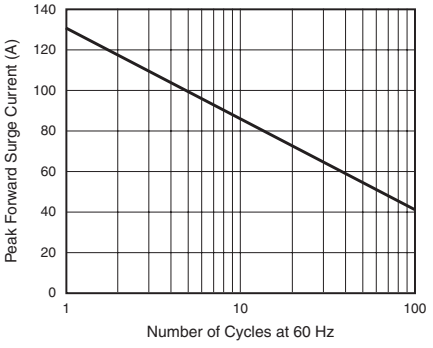


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

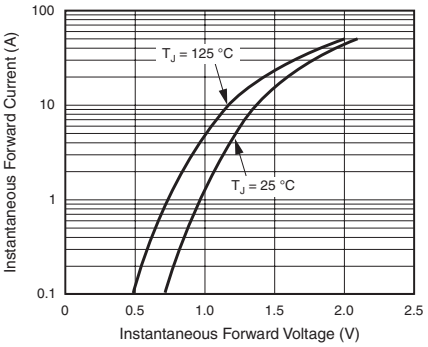


Figure 3. Typical Forward Voltage

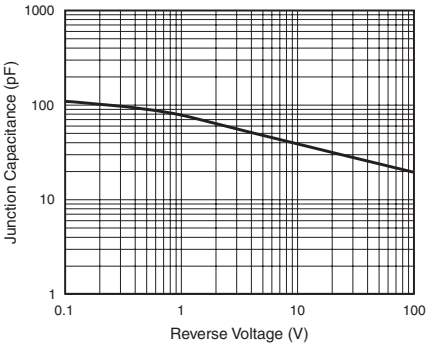


Figure 5. Typical Capacitance

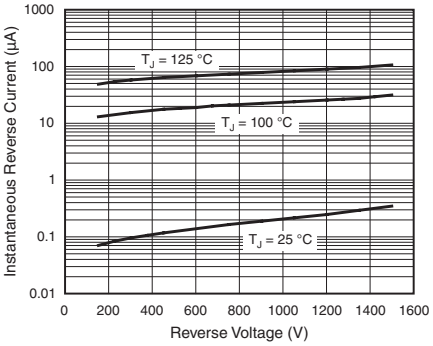


Figure 4. Typical Reverse Current

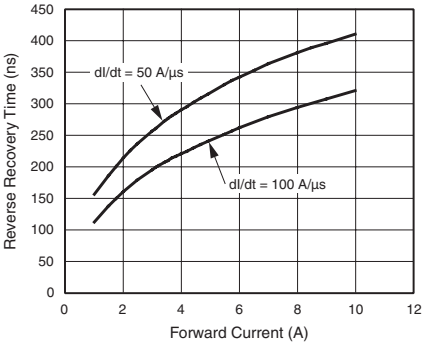
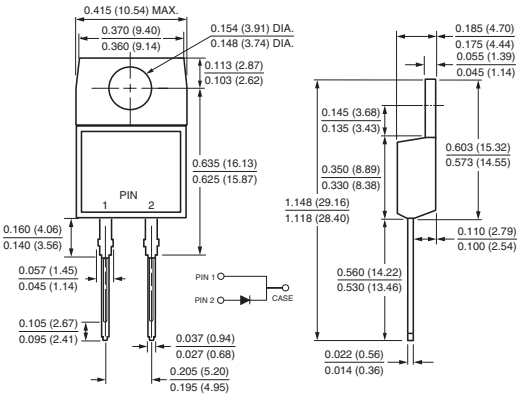


Figure 6. Typical Reverse Recovery Time

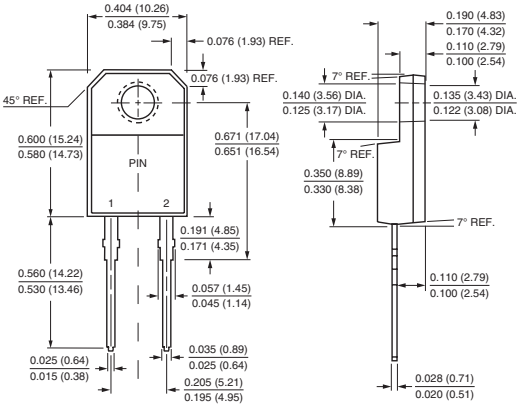
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

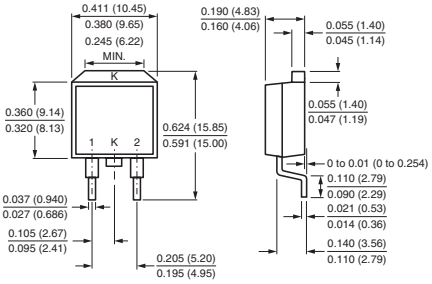
TO-220AC



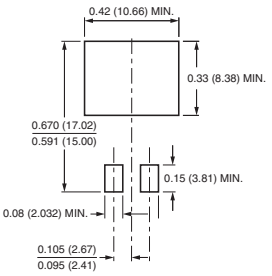
ITO-220AC



TO-263AB



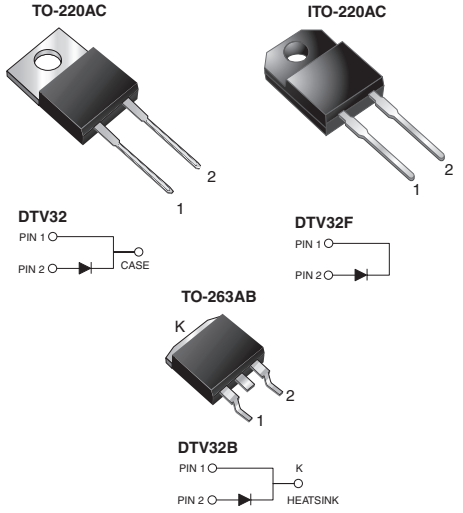
Mounting Pad Layout



DTV32, DTV32F & DTV32B

Vishay General Semiconductor

High Voltage Damper Diodes



FEATURES

- Glass passivated chip junction
- High breakdown voltage capability
- Very fast reverse recovery time
- Fast forward recovery time
- High efficiency, low switching losses
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high resolution display TV and monitor horizontal deflection application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	1500 V
t_{rr}	175 ns
t_{fr}	280 ns
V_F	1.35 V

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO263AB
Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs Maximum

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	1500	V
Maximum RMS voltage	V_{RMS}	1050	V
Maximum DC blocking voltage	V_{DC}	1500	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	130	A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500	V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88575
Revision: 07-Nov-07

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 6 A I_F = 6 A	T_J = 25 °C T_J = 125 °C	V_F	1.5 1.35	V
Maximum DC reverse current at V_{RRM}		T_J = 25 °C T_J = 125 °C	I_R	100 1.0	µA mA
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	175	ns
Typical forward recovery time	I_F = 6 A, dI/dt = 48 A/µs, V_{FR} = 3 V		t_{fr}	280	ns
Peak forward recovery overshoot voltage	I_F = 6 A, dI/dt = 48 A/µs, T_J = 100 °C	typical maximum	V_{FP}	8 12	V

Note:

(1) Pulse test: 300 µs pulse width, 2 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**DTV32**	**DTV32B**	**DTV32F**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.0		4.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	DTV32-E3/45	1.80	45	50/tube	Tube
ITO-220AC	DTV32F-E3/45	1.95	45	50/tube	Tube
TO-263AB	DTV32B-E3/45	1.77	45	50/tube	Tube
TO-263AB	DTV32B-E3/81	1.77	81	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

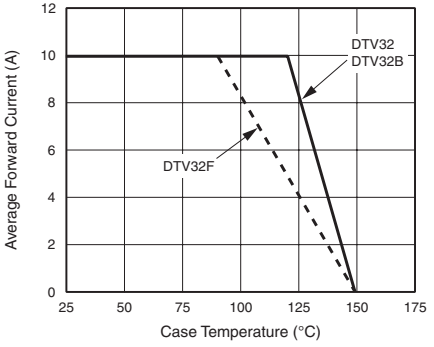


Figure 1. Forward Current Derating Curve

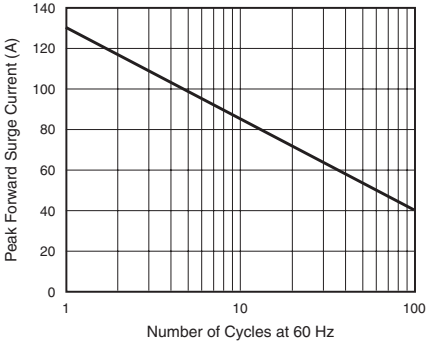


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

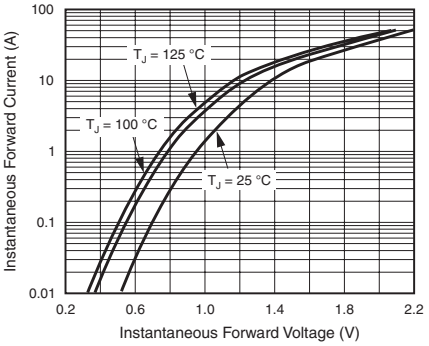


Figure 3. Typical Forward Voltage

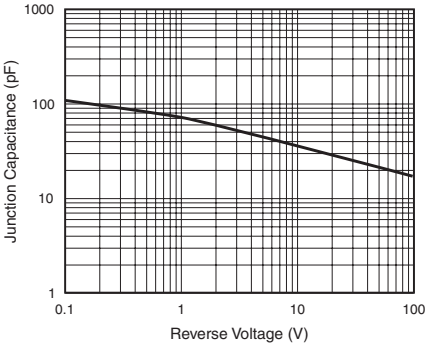


Figure 5. Typical Capacitance

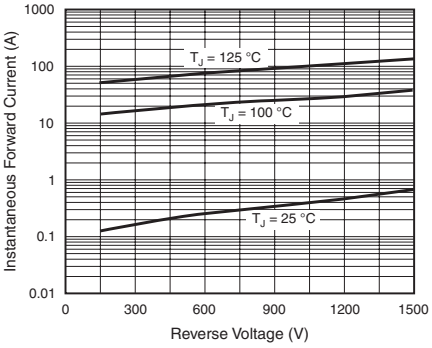


Figure 4. Typical Reverse Current

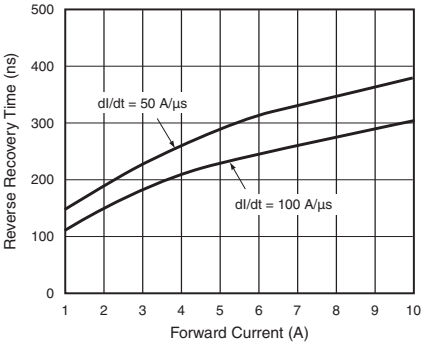
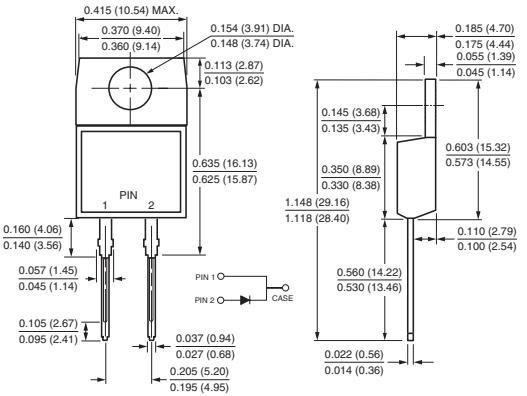


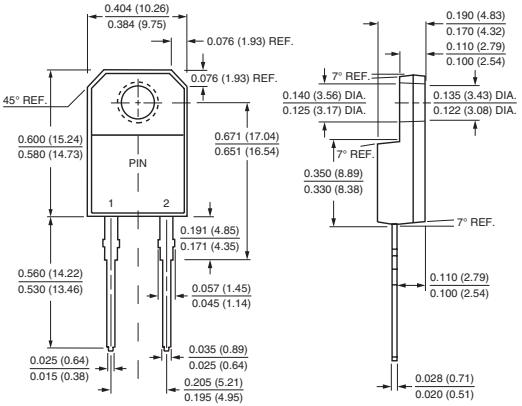
Figure 6. Typical Reverse Recovery Time

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

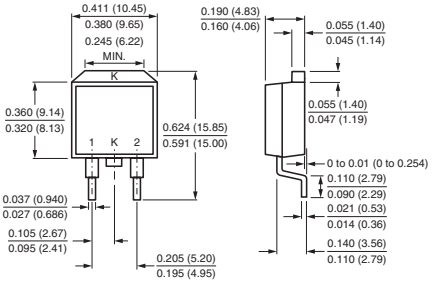
TO-220AC



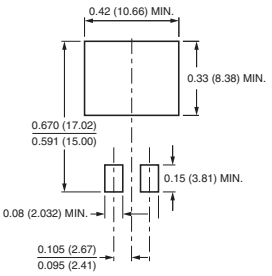
ITO-220AC



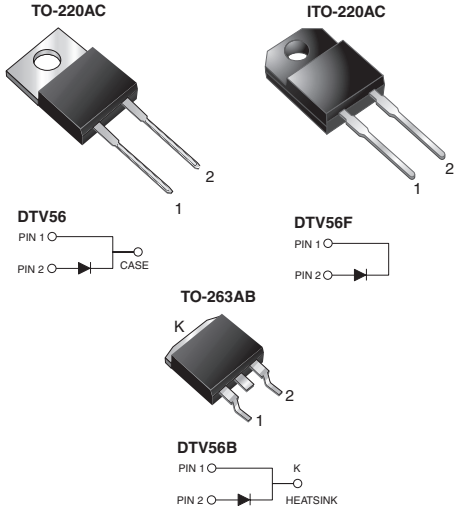
TO-263AB



Mounting Pad Layout



High Voltage Damper Diodes



FEATURES

- Glass passivated chip junction
- High breakdown voltage capability
- Very fast reverse recovery time
- Fast forward recovery time
- High efficiency, low switching losses
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high resolution display TV and monitor horizontal deflection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	1500 V
t_{rr}	135 ns
t_{fr}	350 ns
V_F	1.5 V

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1500	V
Maximum RMS voltage	V_{RMS}	1050	V
Maximum DC blocking voltage	V_{DC}	1500	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load at T_C = 100 °C	I_{FSM}	130	A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150	°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500	V

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88576
Revision: 07-Nov-07

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**VALUE**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 6 A I_F = 6 A	T_J = 25 °C T_J = 125 °C	V_F	1.8 1.5	V
Maximum DC reverse current at V_{RRM}		T_J = 25 °C T_J = 125 °C	I_R	100 1.0	µA mA
Maximum reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}		t_{rr}	135	ns
Typical forward recovery time	I_F = 6 A, dI/dt = 48 A/µs, V_{FR} = 3 V		t_{fr}	350	ns
Peak forward recovery overshoot voltage	I_F = 6 A, dI/dt = 48 A/µs	typical maximum	V_{FP}	10 14	V

Note:

(1) Pulse test: 300 µs pulse width, 2 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**DTV56**	**DTV56B**	**DTV56F**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.0		4.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	DTV56-E3/45	1.80	45	50/tube	Tube
ITO-220AC	DTV56F-E3/45	1.95	45	50/tube	Tube
TO-263AB	DTV56B-E3/45	1.77	45	50/tube	Tube
TO-263AB	DTV56B-E3/81	1.77	81	800/reel	Tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

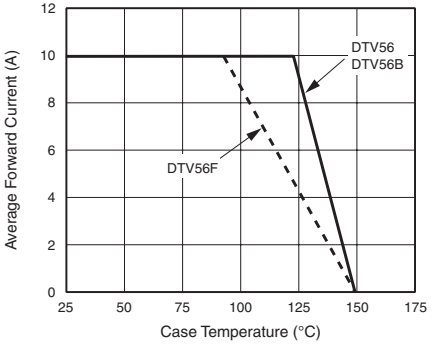


Figure 1. Forward Current Derating Curve

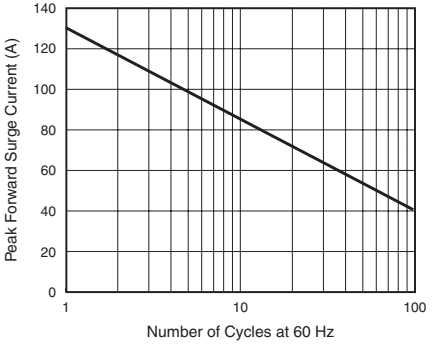


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

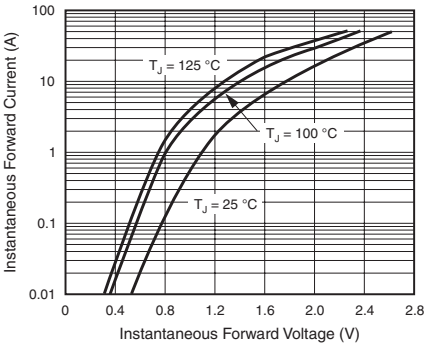


Figure 3. Typical Forward Voltage

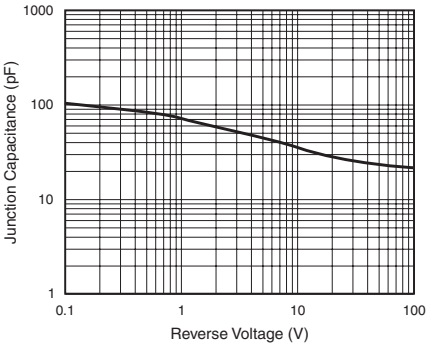


Figure 5. Typical Capacitance

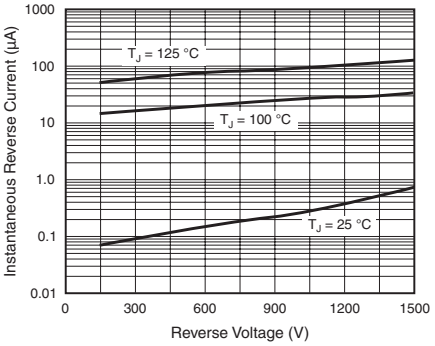


Figure 4. Typical Reverse Current

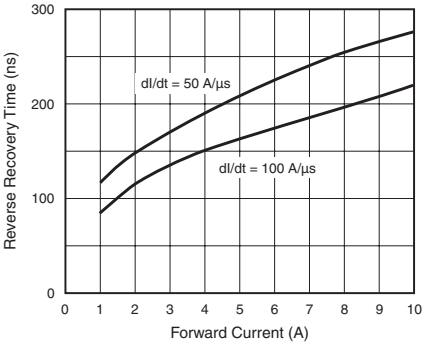


Figure 6. Typical Reverse Recovery Time

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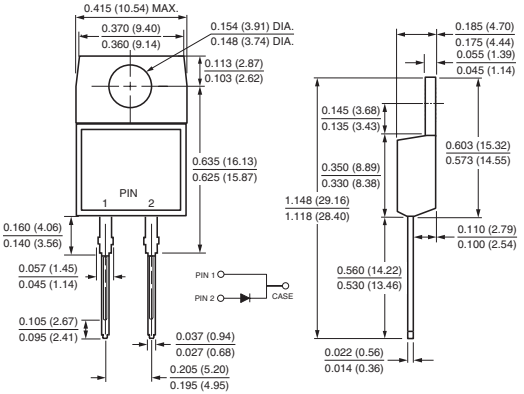
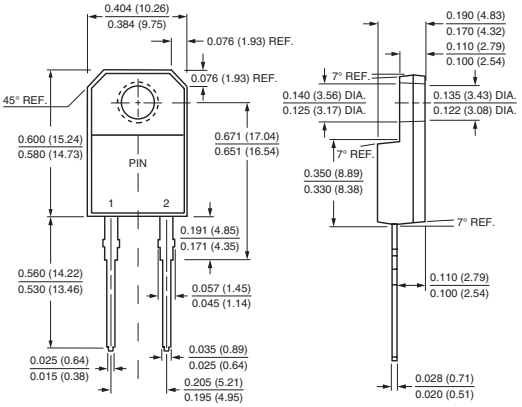
Document Number: 88576
Revision: 07-Nov-07

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

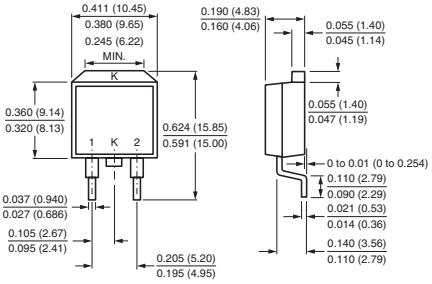
TO-220AC



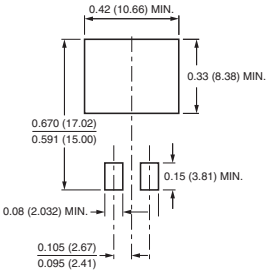
ITO-220AC



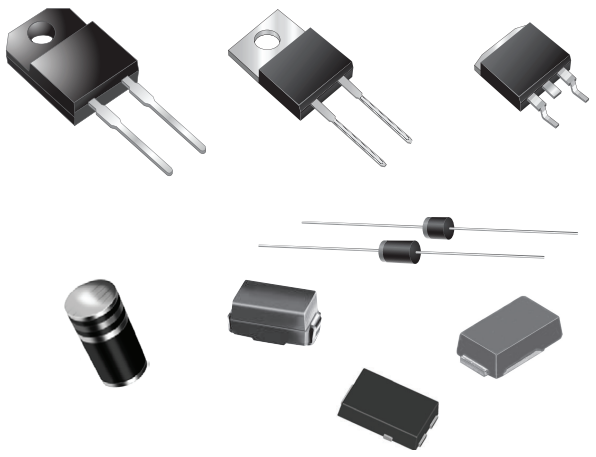
TO-263AB



Mounting Pad Layout



Standard Rectifiers



Contents

(for full listing please see Selector Guide on page 32)

Introduction to Standard Rectifiers

Vishay General Semiconductor

Standard Recovery Rectifiers are for general purpose use. Typical recovery times are approximately 2 µs. Typical applications are consumer products. They are available in plastic, glass, and SUPERECTIFIER® constructions. Package offerings are axial leaded, surface mount, and power package.

We offer these devices in a variety of packages for your convenience.

P600

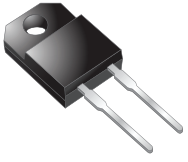
GP20

DO-204AC (DO-15)

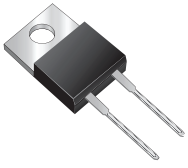
DO-201AD

DO-204AL (DO-41)

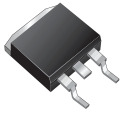
MPG06



ITO-220AC



TO-220AC



TO-263AB

DO-214BA (GF1)

TO-277A (SMPC)

DO-220AA (SMP)

DO-214AB (SMC)

DO-214AA (SMB)

DO-214AC (SMA)

For technical questions within your region, please contact:
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Document Number: 89091
Revision: 15-Jul-08

Standard Rectifiers Part Numbering System

1. SURFACE MOUNT

a) SMD

Sxy SxPy

S = Surface mount
x = Forward current (in A)
1 = 1.0 A 4 = 4.0 A
2 = 1.5 A 5 = 5.0 A
3 = 3.0 A
P = SMP or SMPC package
y = Reverse voltage (in V)
A = 50 V J = 600 V
B = 100 V K = 800 V
D = 200 V M = 1000 V
G = 400 V

b) GF1 SUPERECTIFIER®

GF1y

GF = Glass flat-pack
1 = 1.0 A
y = Reverse voltage (in V)
A = 50 V J = 600 V
B = 100 V K = 800 V
D = 200 V M = 1000 V
G = 400 V

2. AXIAL

a) Plastic (silicone rubber passivated)

Px00y

P = Plastic
x = Forward current (in A)
y = Reverse voltage (in V)
A = 50 V J = 600 V
B = 100 V K = 800 V
D = 200 V M = 1000 V
G = 400 V

b) Plastic (die-level glass passivated)

MPG06y

MP = Miniature plastic
G = Glass passivated die
06 = 0.6 A package style
y = Reverse voltage (in V)
A = 50 V J = 600 V
B = 100 V K = 800 V
D = 200 V M = 1000 V
G = 400 V

c) SUPERECTIFIER®

GPxxy GP02-yy

GP = Glass plastic
xx = Forward current (in A)
02 = 0.25 A 15 = 1.5 A
08 = 0.8 A 20 = 2.0 A
10 = 1.0 A 30 = 3.0 A
y = Reverse voltage (in V)
A = 50 V N = 1100 V
B = 100 V Q = 1200 V
D = 200 V T = 1300 V
G = 400 V V = 1400 V
J = 600 V W = 1500 V
K = 800 V Y = 1600 V
M = 1000 V
yy = Reverse voltage (in V)
20 = 2000 V 35 = 3500 V
25 = 2500 V 40 = 4000 V
30 = 3000 V
"E" suffix denotes lead diameter in 24 mils

CGPxx DGPxx

C = 1400 V
D = 1500 V
GP = Glass plastic
xx = Forward current (in A)
15 = 1.5 A
20 = 2.0 A
30 = 3.0 A

3. POWER PACKAGES

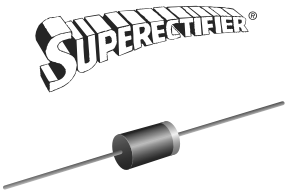
NSp8yT

NS = Non-switching
p = Package designator
B = TO-263
"blank" = TO-220
F = ITO-220
8 = 8.0 A forward current
y = Reverse voltage (in V)
A = 50 V J = 600 V
B = 100 V K = 800 V
D = 200 V M = 1000 V
G = 400 V
T = Single TO-220 designator

Notes:

- Part numbering system for all parts, excluding JEDEC, ProElectron and industry standard part numbers
- For JEDEC and ProElectron part numbers, please see part number explanations on page 18

High Voltage Glass Passivated Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in rectification of high voltage power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.25 A
V_{RRM}	1000 V to 4000 V
I_{FSM}	15 A
I_R	5.0 µA
V_F	3.5 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI250-1	GI250-2	GI250-3	GI250-4	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1000	2000	3000	4000	V
Maximum RMS voltage	V_{RMS}	700	1400	2100	2800	V
Maximum DC blocking voltage	V_{DC}	1000	2000	3000	4000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{F(AV)}$	0.25				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	15				A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				°C

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Document Number: 88625
Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	GI250-1	GI250-2	GI250-3	GI250-4	UNIT
Maximum instantaneous forward voltage	0.25 A		V_F	3.5				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0				µA
		T_A = 100 °C		50				
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0				µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	3.0				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	GI250-1	GI250-2	GI250-3	GI250-4	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	130				°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GI250-4E3/54	0.339	54	5500	13" diameter paper tape and reel
GI250-4E3/73	0.339	73	3000	Ammo pack packaging
GI250-4HE3/54 (1)	0.339	54	5500	13" diameter paper tape and reel
GI250-4HE3/73 (1)	0.339	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

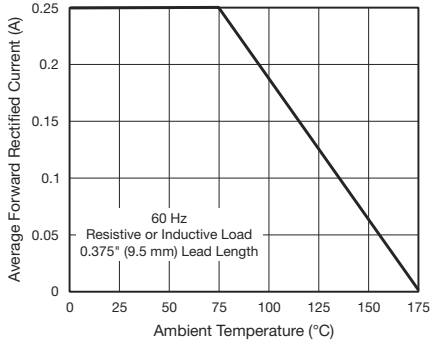


Fig. 1 - Forward Current Derating Curve

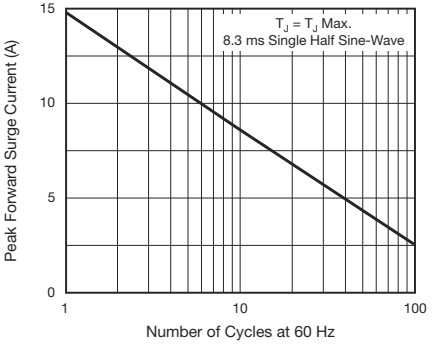


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

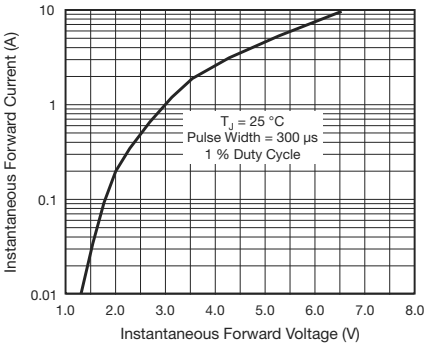


Fig. 3 - Typical Instantaneous Forward Characteristics

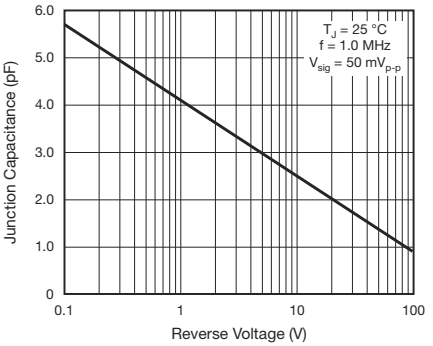


Fig. 5 - Typical Junction Capacitance

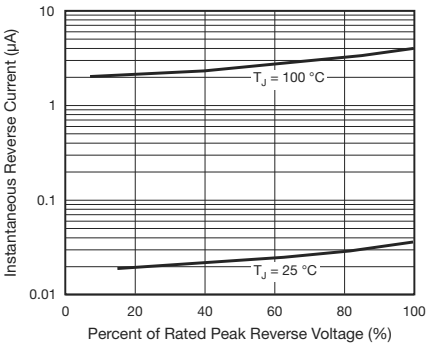
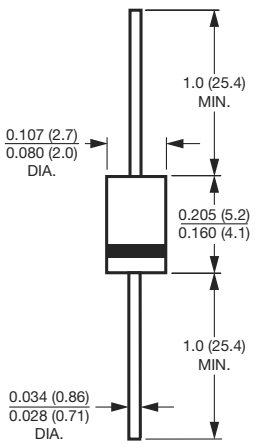


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



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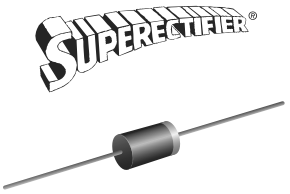
Document Number: 88625
Revision: 20-Jan-11

High Voltage Glass Passivated Junction Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in rectification of high voltage power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.25 A
V_{RRM}	1000 V to 4000 V
I_{FSM}	15 A
I_R	5.0 µA
V_F	3.0 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GP02-20	GP02-25	GP02-30	GP02-35	GP02-40	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	2000	2500	3000	3500	4000	V
Maximum RMS voltage	V_{RMS}	1400	1750	2100	2450	2800	V
Maximum DC blocking voltage	V_{DC}	2000	2500	3000	3500	4000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	0.25					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	15					A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GP02-20**	**GP02-25**	**GP02-30**	**GP02-35**	**GP02-40**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	3.0					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					μA
		T_A = 100 °C		50					
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0					μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	3.0					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**GP02-20**	**GP02-25**	**GP02-30**	**GP02-35**	**GP02-40**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	130					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GP02-20E3/54	0.339	54	5500	13" diameter paper tape and reel
GP02-20E3/73	0.339	73	3000	Ammo pack packaging
GP02-20HE3/54 (1)	0.339	54	5500	13" diameter paper tape and reel
GP02-20HE3/73 (1)	0.339	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

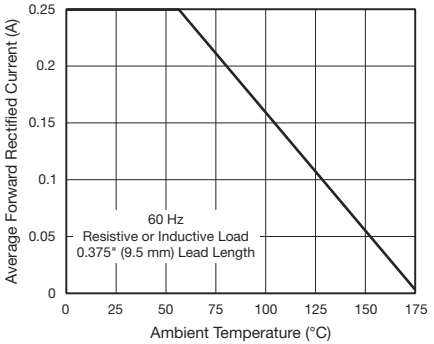


Fig. 1 - Forward Current Derating Curve

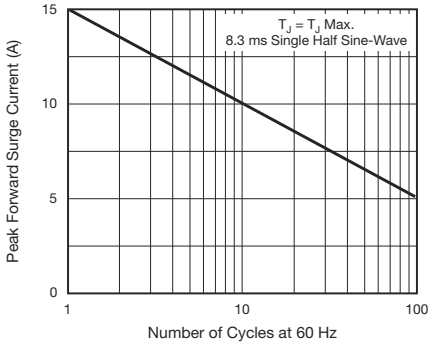


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

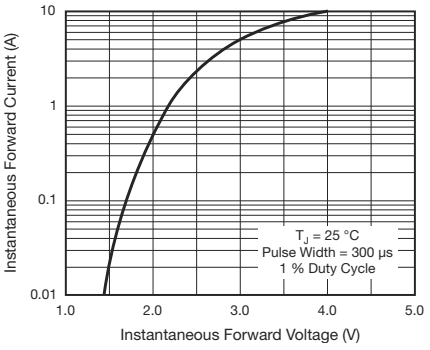


Fig. 3 - Typical Instantaneous Forward Characteristics

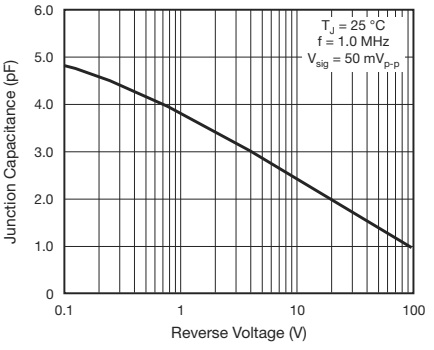


Fig. 5 - Typical Junction Capacitance

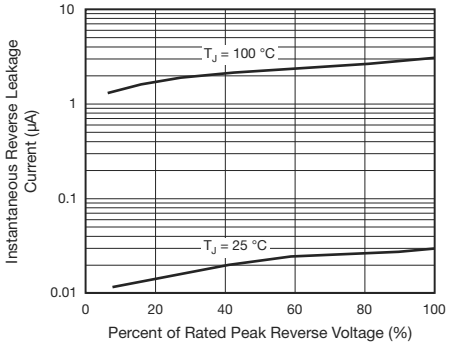
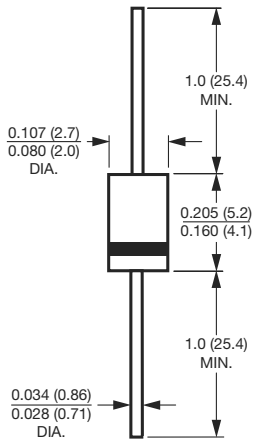


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Surface Mount Glass Passivated Junction Rectifier

DO-213AA (GL34)

FEATURES

- Superectifier structure for high reliability condition
- Ideal for automated placement
- Low forward voltage drop
- Low leakage current
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-213AA, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	50 V to 600 V
I_{FSM}	10 A
V_F	1.2 V, 1.3 V
I_R	5.0 µA
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER STANDARD RECOVERY DEVICE: 1ST BAND IS WHITE	SYMBOL	GL34A	GL34B	GL34D	GL34G	GL34J	UNIT
Polarity color bands (2nd band)		Gray	Red	Orange	Yellow	Green	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	V
Maximum average forward rectified current at T_L = 75 °C	$I_{F(AV)}$	0.5					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	10					A
Max. full load reverse current, full cycle average at T_A = 55 °C	$I_{R(AV)}$	30					µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

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Document Number: 88634
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	GL34A	GL34B	GL34D	GL34G	GL34J	UNIT
Maximum instantaneous forward voltage	0.5 A		V_F	1.2				1.3	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					μA
		T_A = 125 °C		50					
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	1.5					μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	4.0					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	GL34A	GL34B	GL34D	GL34G	GL34J	UNIT
Maximum thermal resistance	$R_{\theta JA}$ (1)	150					°C/W
	$R_{\theta JT}$ (2)	70					

Notes

(1) Thermal resistance from junction to ambient, 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to terminal, 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GL34G-E3/98	0.036	98	2500	7" diameter plastic tape and reel
GL34G-E3/83	0.036	83	9000	13" diameter plastic tape and reel
GL34GHE3/98 (1)	0.036	98	2500	7" diameter plastic tape and reel
GL34GHE3/83 (1)	0.036	83	9000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

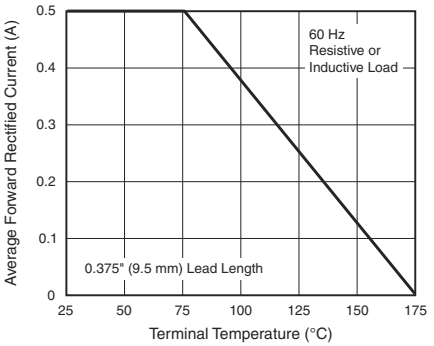


Fig. 1 - Forward Current Derating Curve

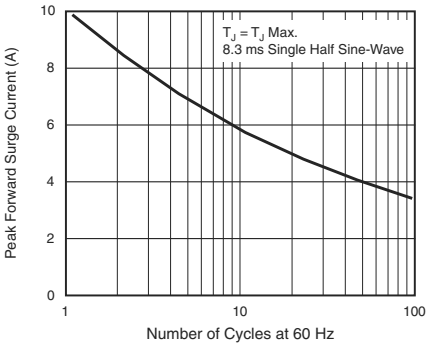


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

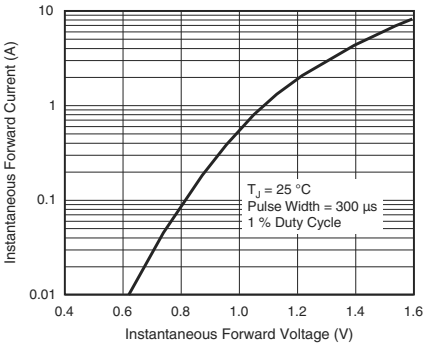


Fig. 3 - Typical Instantaneous Forward Characteristics

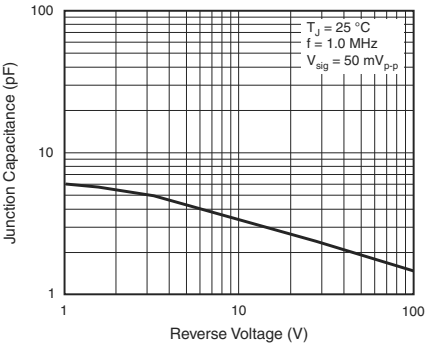


Fig. 5 - Typical Junction Capacitance

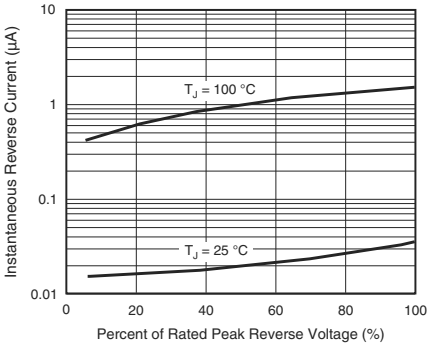
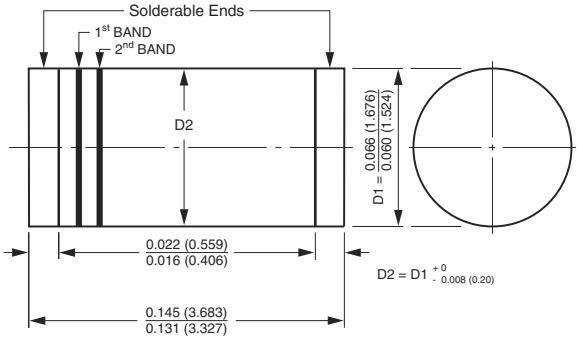


Fig. 4 - Typical Reverse Characteristics

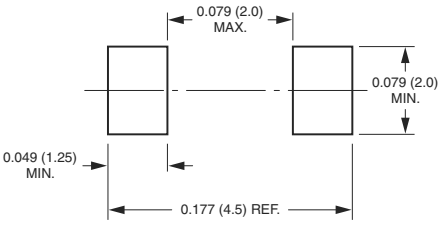
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AA (GL34)



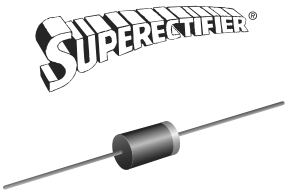
1st band denotes type and polarity
2nd band denotes voltage type

Mounting Pad Layout



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Glass Passivated Junction Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.8 A
V_{RRM}	50 V to 600 V
I_{FSM}	25 A
I_R	5.0 µA
V_F	1.3 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GP08A	GP08B	GP08D	GP08G	GP08J	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	0.8					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	25					A
Maximum full load reverse current full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	30					µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GP08A**	**GP08B**	**GP08D**	**GP08G**	**GP08J**	**UNIT**
Maximum instantaneous forward voltage	0.8 A		V_F	1.3					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					μA
		T_A = 125 °C		50					
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0					μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.0					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**GP08A**	**GP08B**	**GP08D**	**GP08G**	**GP08J**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GP08J-E3/54	0.335	54	5500	13" diameter paper tape and reel
GP08J-E3/73	0.335	73	3000	Ammo pack packaging
GP08JHE3/54 (1)	0.335	54	5500	13" diameter paper tape and reel
GP08JHE3/73 (1)	0.335	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

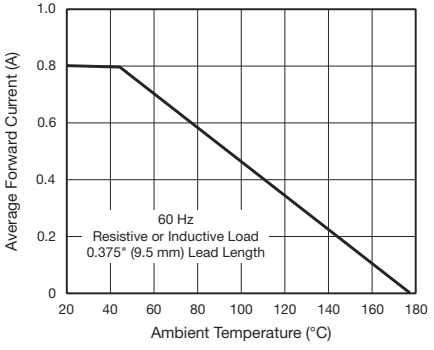


Fig. 1 - Forward Current Derating Curve

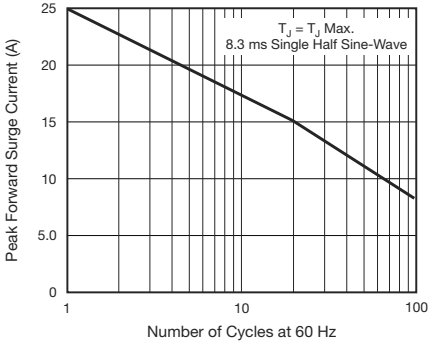


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

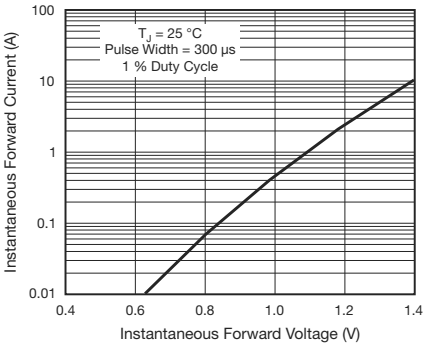


Fig. 3 - Typical Instantaneous Forward Characteristics

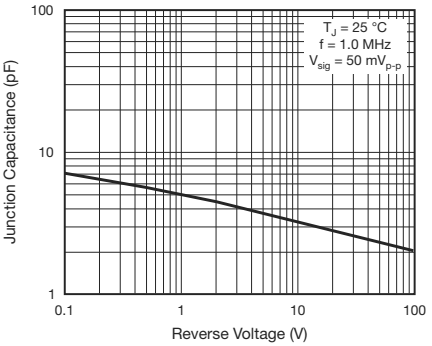


Fig. 5 - Typical Junction Capacitance

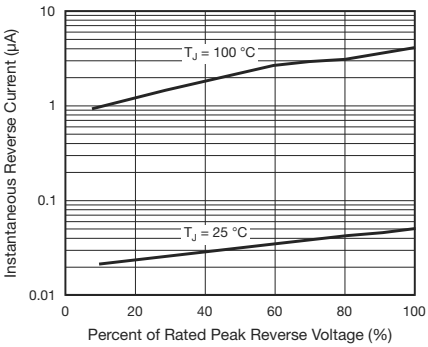


Fig. 4 - Typical Reverse Characteristics

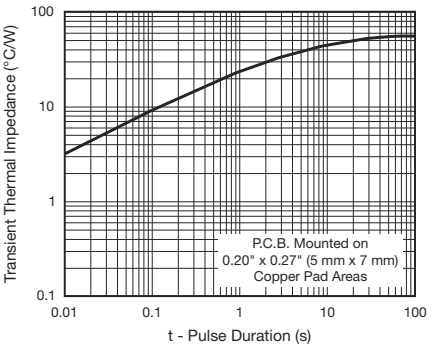
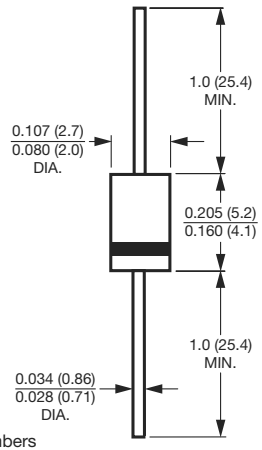


Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

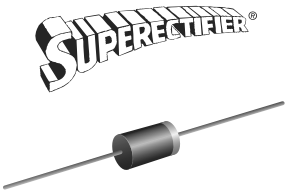
DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix "E" part numbers

Glass Passivated Junction Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	30 A
I_R	1.0 µA
V_F	1.0 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted) (1)

PARAMETER	SYMBOL	1N3611GP	1N3612GP	1N3613GP	1N3614GP	1N3957GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1000	A
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30					A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

Note

(1) JEDEC registered values

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DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**1N3611GP**	**1N3612GP**	**1N3613GP**	**1N3614GP**	**1N3957GP**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.0					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R (1)	1.0					µA
		T_A = 150 °C		300					
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0					µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.0					pF

Note

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**1N3611GP**	**1N3612GP**	**1N3613GP**	**1N3614GP**	**1N3957GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55					°C/W
	$R_{\theta JL}$ (1)	25					

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N3612GP-E3/54	0.335	54	5500	13" diameter paper tape and reel
1N3612GP-E3/73	0.335	73	3000	Ammo pack packaging
1N3612GPHE3/54 (1)	0.335	54	5500	13" diameter paper tape and reel
1N3612GPHE3/73 (1)	0.335	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

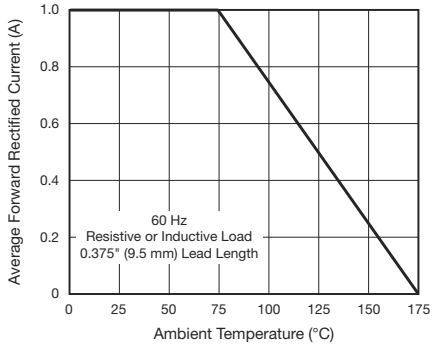


Fig. 1 - Max. Forward Current Derating

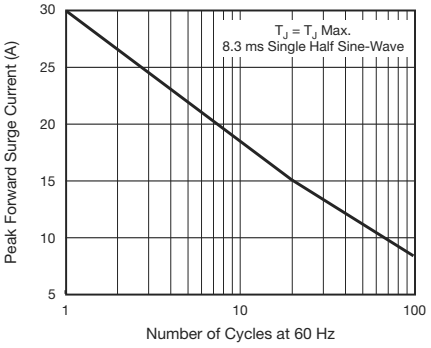


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

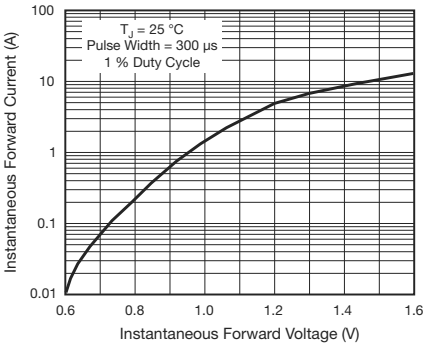


Fig. 3 - Typical Instantaneous Forward Characteristics

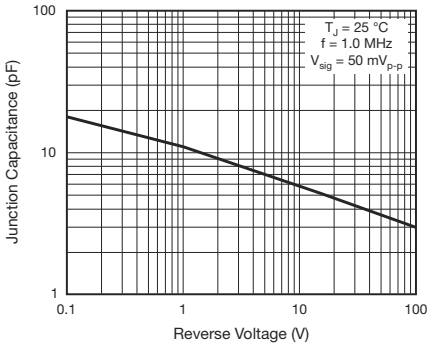


Fig. 5 - Typical Junction Capacitance

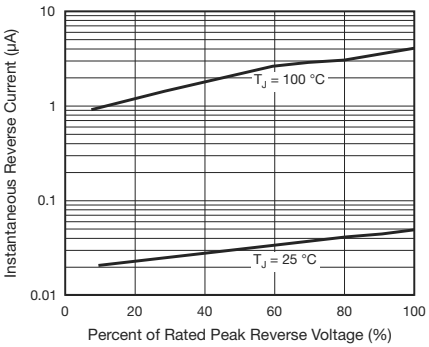


Fig. 4 - Typical Reverse Characteristics

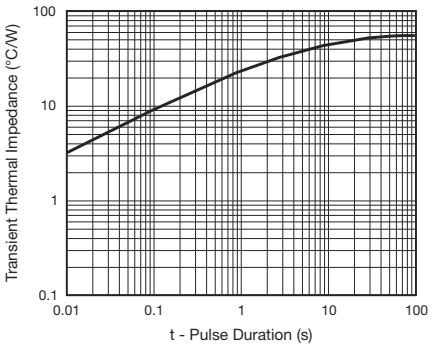
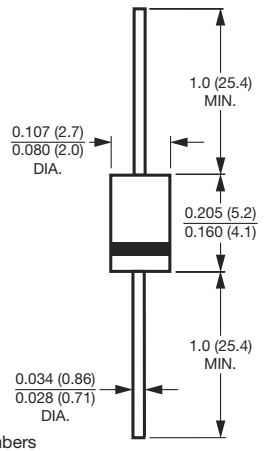


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

General Purpose Plastic Rectifier

DO-204AL (DO-41)

FEATURES

- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-204AL, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM} (8.3 ms sine-wave)	30 A
I_{FSM} (square wave t_p = 1 ms)	45 A
V_F	1.1 V
I_R	5.0 µA
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N4001	1N4002	1N4003	1N4004	1N4005	1N4006	1N4007	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Non-repetitive peak forward surge current square waveform T_A = 25 °C (Fig. 3) t_p = 1 ms t_p = 2 ms t_p = 5 ms	I_{FSM}	45 35 30							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length T_L = 75 °C	$I_{R(AV)}$	30							µA
Rating for fusing (t < 8.3 ms) (1)	I^2t	3.7							A^2s
Operating junction and storage temperature	T_J, T_{STG}	- 50 to + 150							°C

Note:

(1) For device using on bridge rectifier application

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**1N4001**	**1N4002**	**1N4003**	**1N4004**	**1N4005**	**1N4006**	**1N4007**	**UNIT**
Maximum instantaneous forward voltage	1.0 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C T_A = 125 °C	I_R	5.0 50							µA
Typical junction capacitance	4.0 V, 1 MHz	C_J	15							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**1N4001**	**1N4002**	**1N4003**	**1N4004**	**1N4005**	**1N4006**	**1N4007**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 25							°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N4004-E3/54	0.33	54	5500	13" diameter paper tape and reel
1N4004-E3/73	0.33	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

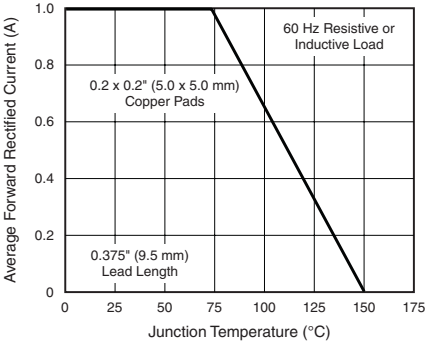


Figure 1. Forward Current Derating Curve

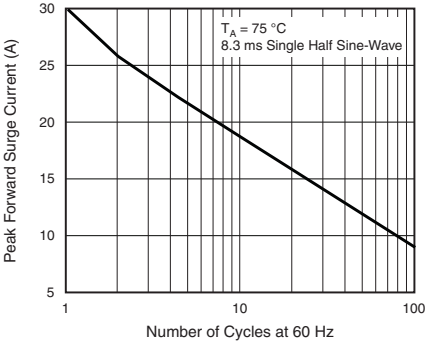


Figure 2. Maximum Non-repetitive Peak Forward Surge Current

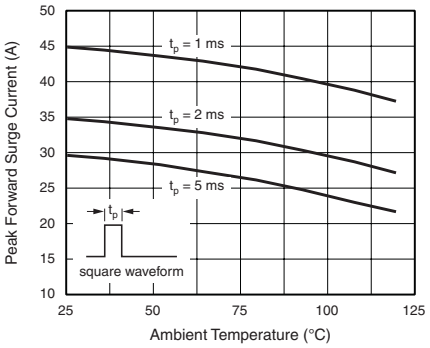


Figure 3. Typical Instantaneous Forward Characteristics

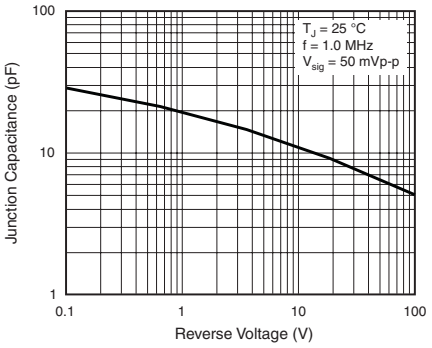


Figure 6. Typical Junction Capacitance

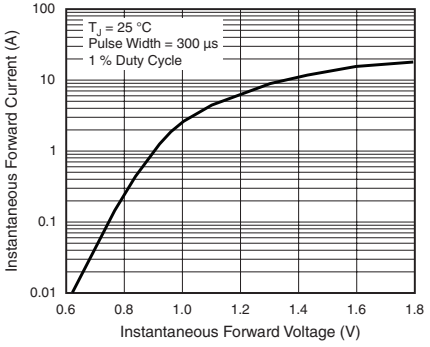


Figure 4. Typical Instantaneous Forward Characteristics

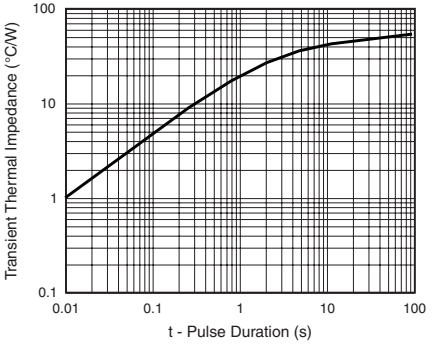


Figure 7. Typical Transient Thermal Impedance

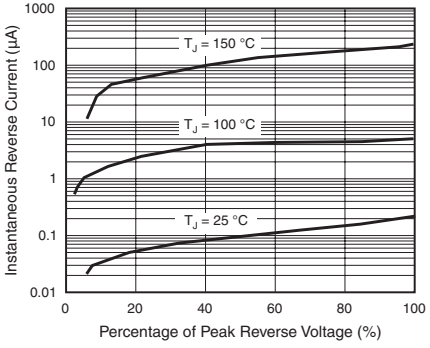
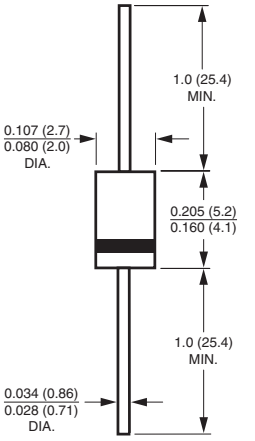


Figure 5. Typical Reverse Characteristics

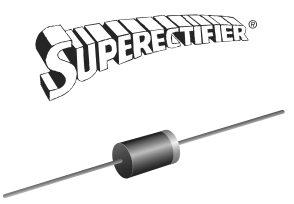
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note: Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix "E" part numbers

Glass Passivated Junction Rectifier



DO-204AL (DO-41)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM} (8.3 ms sine-wave)	30 A
I_{FSM} (square wave t_p = 1 ms)	45 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for both consumer and automotive applications.

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N4001GP	1N4002GP	1N4003GP	1N4004GP	1N4005GP	1N4006GP	1N4007GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS} (1)	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC} (1)	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{F(AV)}$ (1)	1.0							A
Non-repetitive peak forward surge current square waveform T_A = 25 °C (fig. 3) t_p = 1 ms	I_{FSM} (1)	45							A
Non-repetitive peak forward surge current square waveform T_A = 25 °C (fig. 3) t_p = 2 ms	I_{FSM} (1)	35							A
Non-repetitive peak forward surge current square waveform T_A = 25 °C (fig. 3) t_p = 5 ms	I_{FSM} (1)	30							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length T_A = 75 °C	$I_{R(AV)}$ (1)	30							µA
Rating for fusing (t < 8.3 ms)	I^2t (2)	3.7							A^2s
Operating junction and storage temperature range	T_J, T_{STG} (1)	- 65 to + 175							°C

Notes

(1) JEDEC registered values

(2) For device using on bridge rectifier application

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**1N4001GP**	**1N4002GP**	**1N4003GP**	**1N4004GP**	**1N4005GP**	**1N4006GP**	**1N4007GP**	**UNIT**
Maximum instantaneous forward voltage	1.0 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C	I_R (1)	5.0							µA
	T_A = 125 °C		50							
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	2.0							µs
Typical junction capacitance	4.0 V, 1 MHz	C_J	8.0							pF

Note

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**1N4001GP**	**1N4002GP**	**1N4003GP**	**1N4004GP**	**1N4005GP**	**1N4006GP**	**1N4007GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55							°C/W
	$R_{\theta JL}$ (1)	25							

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N4004GP-E3/54	0.335	54	5500	13" diameter paper tape and reel
1N4004GP-E3/73	0.335	73	3000	Ammo pack packaging
1N4004GPHE3/54 (1)	0.335	54	5500	13" diameter paper tape and reel
1N4004GPHE3/73 (1)	0.335	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

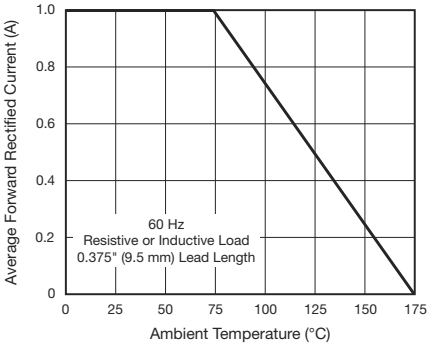


Fig. 1 - Forward Current Derating Curve

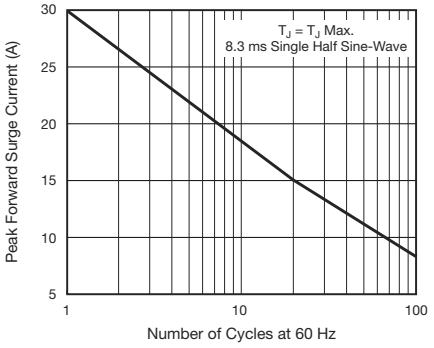


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

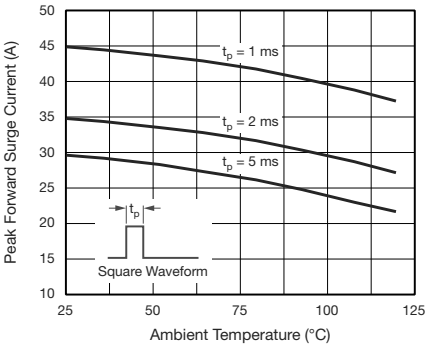


Fig. 3 - Non-Repetitive Peak Forward Surge Current

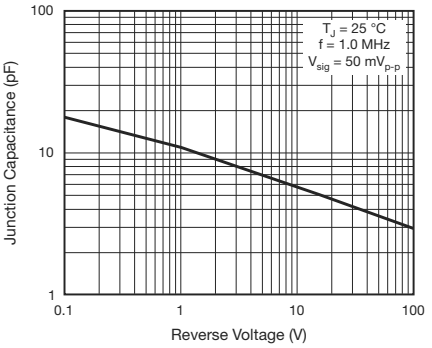


Fig. 6 - Typical Junction Capacitance

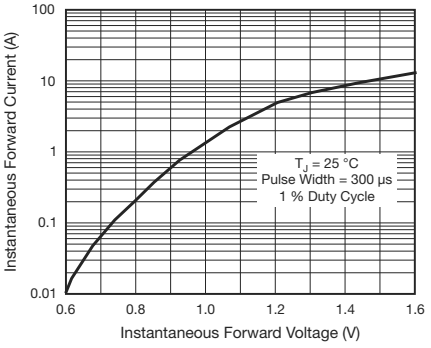


Fig. 4 - Typical Instantaneous Forward Characteristics

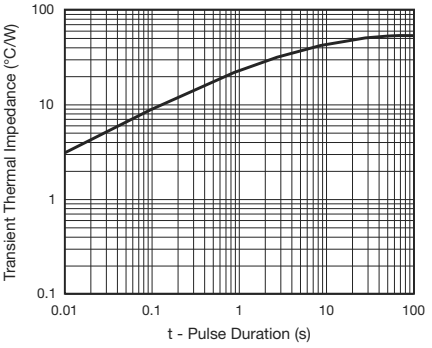


Fig. 7 - Typical Transient Thermal Impedance

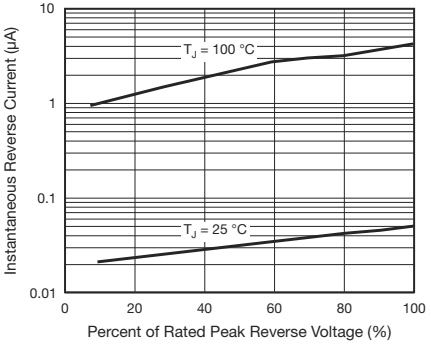
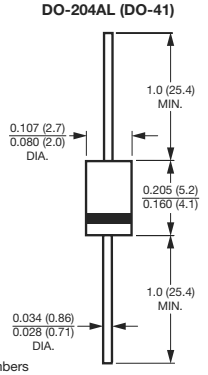


Fig. 5 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS

in inches (millimeters)



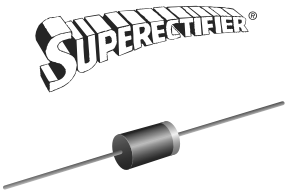
Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix "E" part numbers

1N4245GP thru 1N4249GP

Vishay General Semiconductor

Glass Passivated Junction Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	25 A
I_R	1.0 µA
V_F	1.2 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted) (1)

PARAMETER	SYMBOL	1N4245GP	1N4246GP	1N4247GP	1N4248GP	1N4249GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	25					A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	50					µA
Operating junction temperature range	T_J	- 65 to + 160					°C
Storage temperature range	T_{STG}	- 65 to + 175					°C

Note

(1) JEDEC registered values

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Document Number: 88506
Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	1N4245GP	1N4246GP	1N4247GP	1N4248GP	1N4249GP	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F (1)	1.2					V
Maximum reverse current at rated DC blocking voltage		T_A = 25 °C	I_R (1)	1.0					μA
		T_A = 125 °C		25					
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.0					pF

Note

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	1N4245GP	1N4246GP	1N4247GP	1N4248GP	1N4249GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55					°C/W
	$R_{\theta JL}$ (1)	25					

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1N4247GP-E3/54	0.335	54	5500	13" diameter paper tape and reel
1N4247GP-E3/73	0.335	73	3000	Ammo pack packaging
1N4247GPHE3/54 (1)	0.335	54	5500	13" diameter paper tape and reel
1N4247GPHE3/73 (1)	0.335	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

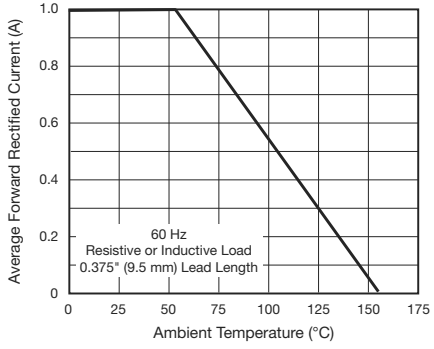


Fig. 1 - Forward Current Derating Curve

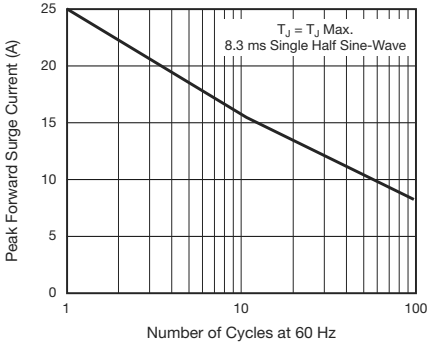


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

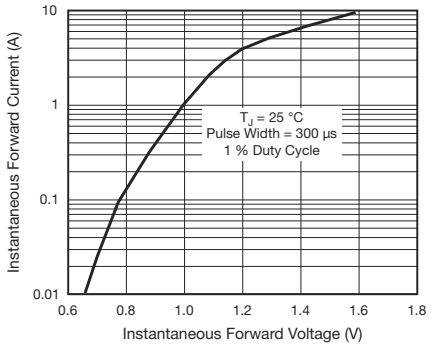


Fig. 3 - Typical Instantaneous Forward Characteristics

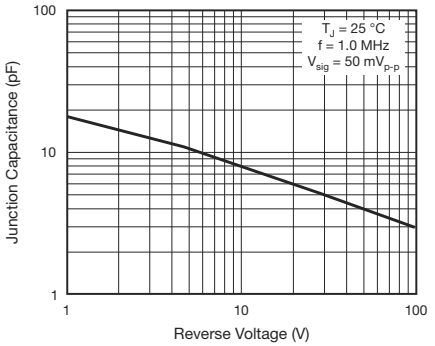


Fig. 5 - Typical Junction Capacitance

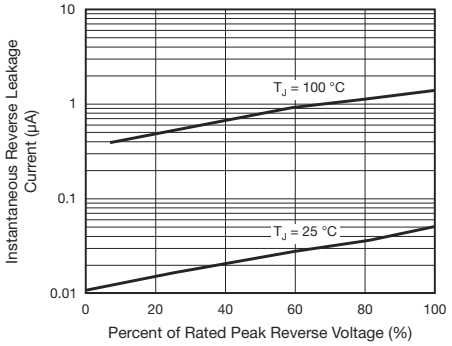


Fig. 4 - Typical Reverse Characteristics

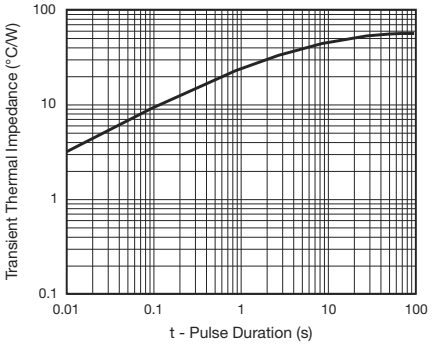
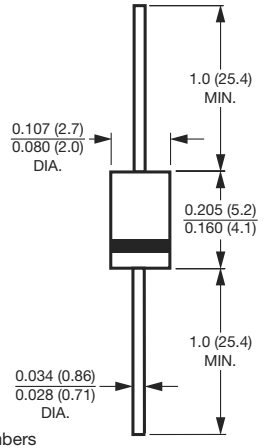


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

Glass Passivated Junction Rectifier

DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	50 A
I_R	5.0 µA
V_F	1.0 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted) (1)

PARAMETER	SYMBOL	1N4383GP	1N4384GP	1N4385GP	1N4585GP	1N4586GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 100 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50					A
Maximum full load reverse current, full cycle average 0.375"(9.5 mm) lead length at T_A = 100 °C	$I_{R(AV)}$	275	250	225	200	200	µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

Note
(1) JEDEC registered values

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**1N4383GP**	**1N4384GP**	**1N4385GP**	**1N4585GP**	**1N4586GP**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.0					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					μA
		T_A = 150 °C		250					
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr} (1)	2.0					μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15					pF

Note

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**1N4383GP**	**1N4384GP**	**1N4385GP**	**1N4585GP**	**1N4586GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	45					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N4385GP-E3/54	0.425	54	4000	13" diameter paper tape and reel
1N4385GP-E3/73	0.425	73	2000	Ammo pack packaging
1N4385GPHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
1N4385GPHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

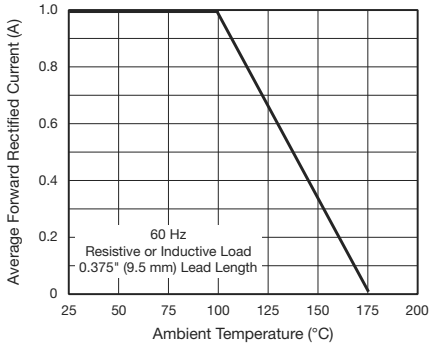


Fig. 1 - Forward Current Derating Curve

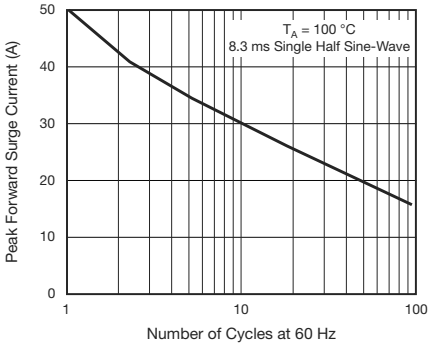


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

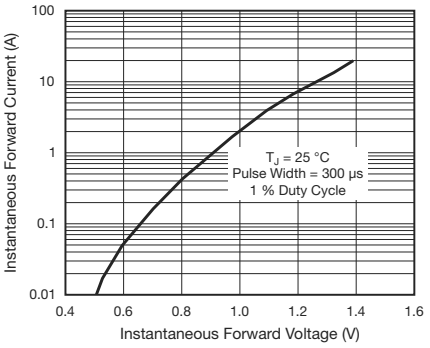


Fig. 3 - Typical Instantaneous Forward Characteristics

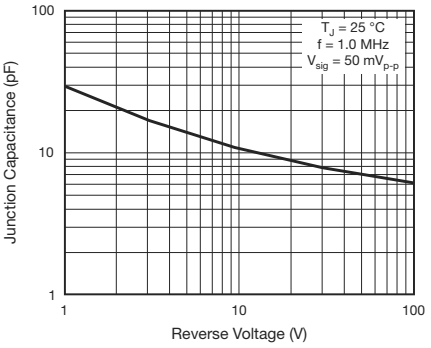


Fig. 5 - Typical Junction Capacitance

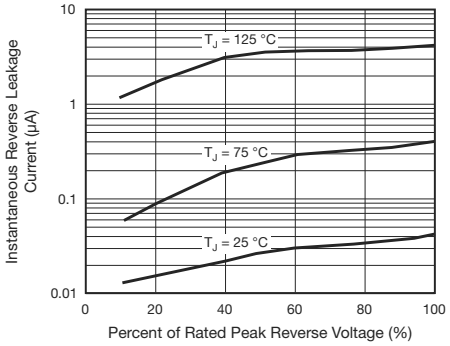


Fig. 4 - Typical Reverse Characteristics

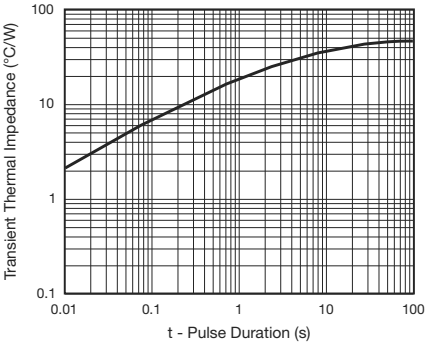
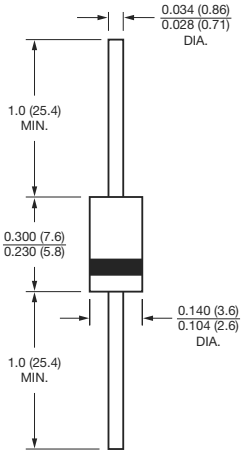


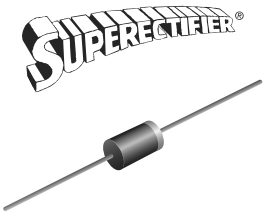
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Glass Passivated Junction Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	50 A
I_R	5.0 µA
V_F	1.2 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	1N5059GP	1N5060GP	1N5061GP	1N5062GP	UNIT
Maximum repetitive peak reverse voltage		V_{RRM} (1)	200	400	600	800	V
Maximum RMS voltage		V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage		V_{DC} (1)	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C		$I_{F(AV)}$ (1)	1.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I_{FSM} (1)	50				A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at	T_A = 25 °C	$I_{R(AV)}$ (1)	5.0				µA
	T_A = 75 °C		150				
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175				°C

Note

(1) JEDEC registered values

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	1N5059GP	1N5060GP	1N5061GP	1N5062GP	UNIT
Max. instantaneous forward voltage	1.0 A	T_A = 75 °C	V_F (1)	1.2				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R (1)	5.0				μA
		T_A = 175 °C		300				
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0				μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15				pF

Note

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	1N5059GP	1N5060GP	1N5061GP	1N5062GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	45				°C/W
	$R_{\theta JL}$ (1)	20				

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1N5061GP-E3/54	0.425	54	4000	13" diameter paper tape and reel
1N5061GP-E3/73	0.425	73	2000	Ammo pack packaging
1N5061GPHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
1N5061GPHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

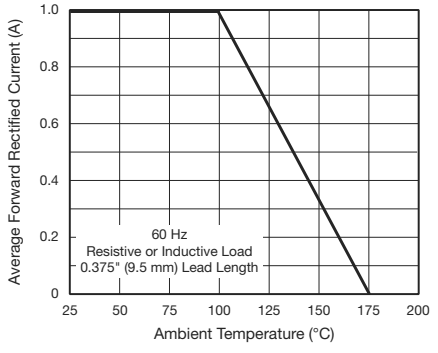


Fig. 1 - Forward Current Derating Curve

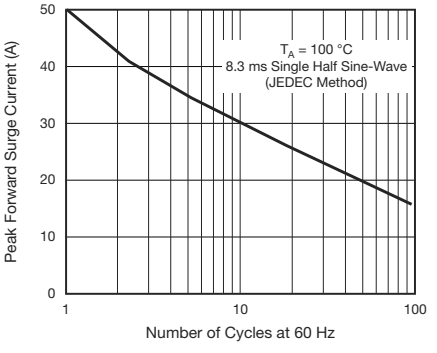


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

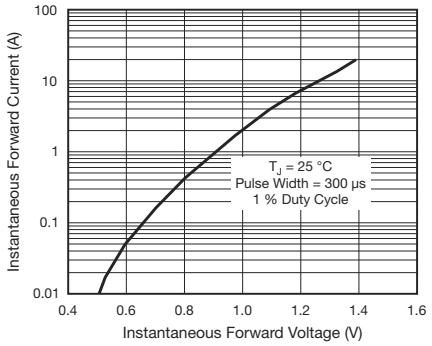


Fig. 3 - Typical Instantaneous Forward Characteristics

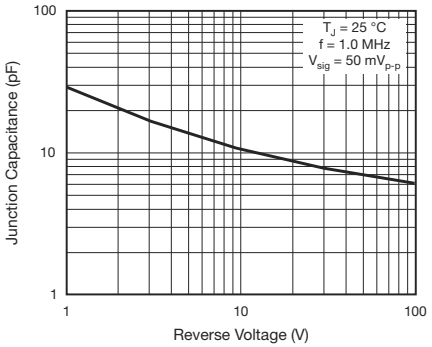


Fig. 5 - Typical Junction Capacitance

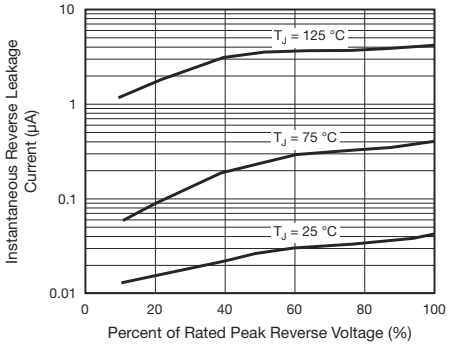


Fig. 4 - Typical Reverse Characteristics

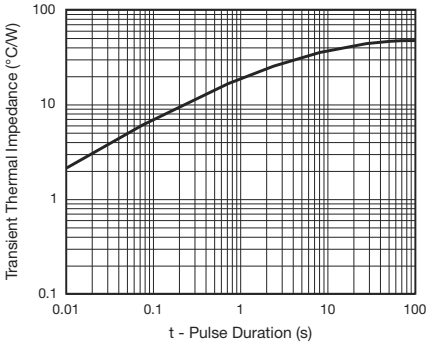
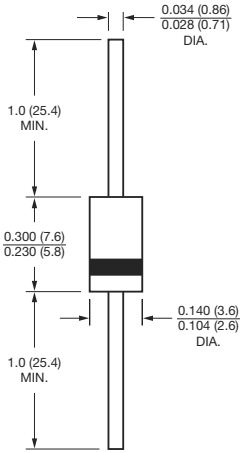


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Glass Passivated Junction Rectifier

DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	50 A
I_R	0.5 µA
V_F	1.2 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N5614GP	1N5616GP	1N5618GP	1N5620GP	1N5622GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM} (1)	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC} (1)	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM} (1)	50					A
Operating junction and storage temperature range	T_J, T_{STG} (1)	- 65 to + 175					°C

Note
(1) JEDEC registered values

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	1N5614GP	1N5616GP	1N5618GP	1N5620GP	1N5622GP	UNIT
Minimum reverse breakdown voltage	50 µA		V_{BR} (1)	220	440	660	880	1100	V
Maximum instantaneous forward voltage	1.0 A		V_F (1)	1.2					V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R (1)	0.5					µA
		T_A = 100 °C		25					
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr} (1)	2.0					µs
Maximum junction capacitance	12 V, 1 MHz		C_J	45	35	25	20	15	pF

Note

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	1N5614GP	1N5616GP	1N5618GP	1N5620GP	1N5622GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	45					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1N5618GP-E3/54	0.425	54	4000	13" diameter paper tape and reel
1N5618GP-E3/73	0.425	73	2000	Ammo pack packaging
1N5618GPHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
1N5618GPHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

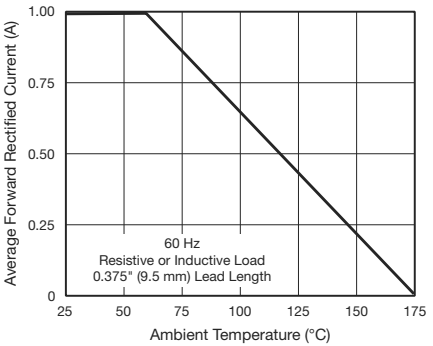


Fig. 1 - Forward Current Derating Curve

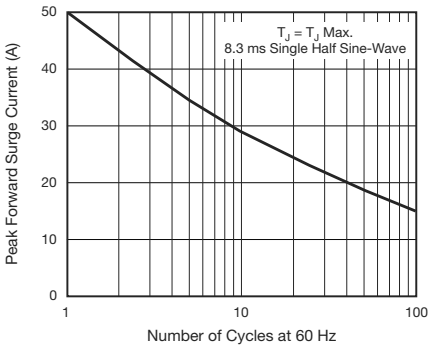


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

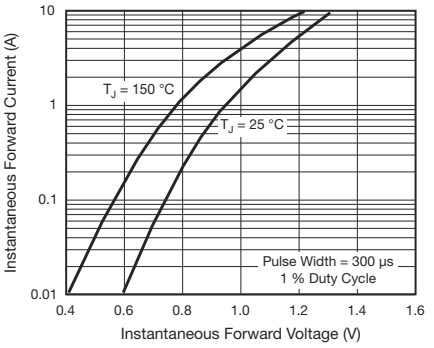


Fig. 3 - Typical Instantaneous Forward Characteristics

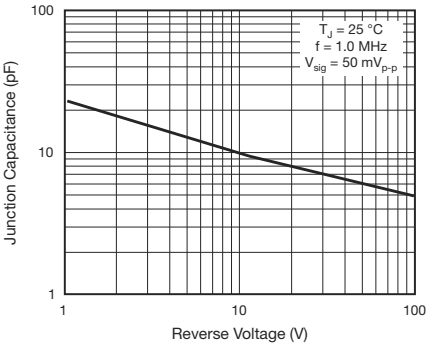


Fig. 5 - Typical Junction Capacitance

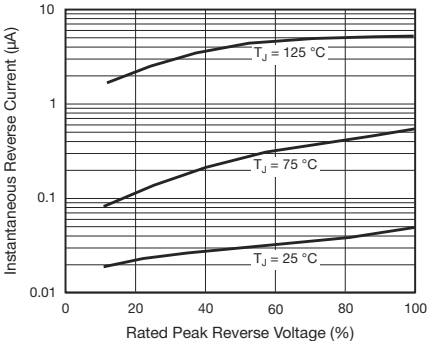
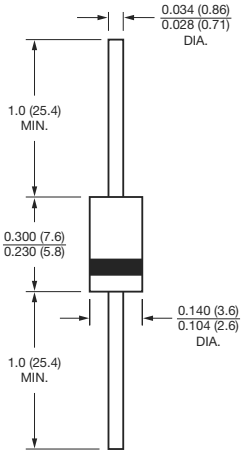


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Surface Mount Glass Passivated Junction Rectifier

DO-213AB

FEATURES

- Superectifier structure for high reliability condition
- Ideal for automated placement
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
I_R	10 µA
V_F	1.1 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-213AB, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER STANDARD RECOVERY DEVICE: 1ST BAND IS WHITE	SYMBOL	1N6478	1N6479	1N6480	1N6481	1N6482	1N6483	1N6484	UNIT
Polarity color bands (2nd band)		Gray	Red	Orange	Yellow	Green	Blue	Violet	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Maximum full load reverse current, full cycle average at T_A = 75 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
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Document Number: 88527
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	1N6478	1N6479	1N6480	1N6481	1N6482	1N6483	1N6484	UNIT
Maximum instantaneous forward voltage	1.0 A	T_A = 25 °C	V_F	1.1							V
		T_A = 75 °C		1.0							
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	10							μA
		T_A = 125 °C		200							
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.0							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	SYMBOL	1N6478	1N6479	1N6480	1N6481	1N6482	1N6483	1N6484	UNIT
Maximum thermal resistance	$R_{\theta JA}$ (1)	50							°C/W
	$R_{\theta JT}$ (2)	20							

Notes

(1) Thermal resistance from junction to ambient, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to terminal, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1N6482-E3/96	0.114	96	1500	7" diameter plastic tape and reel
1N6482-E3/97	0.114	97	5000	13" diameter plastic tape and reel
1N6482HE3/96 (1)	0.114	96	1500	7" diameter plastic tape and reel
1N6482HE3/97 (1)	0.114	97	5000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

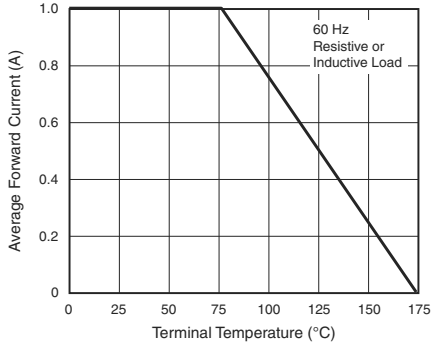


Fig. 1 - Forward Current Derating Curve

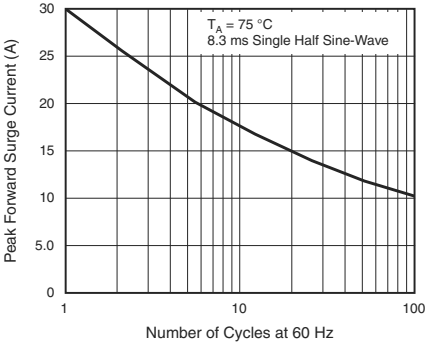


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

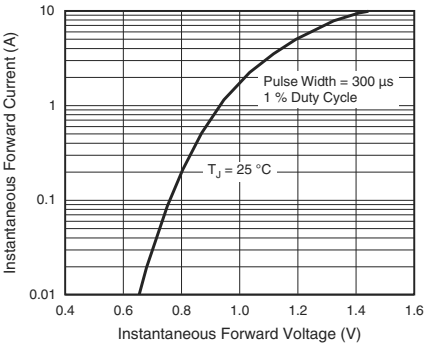


Fig. 3 - Typical Instantaneous Forward Characteristics

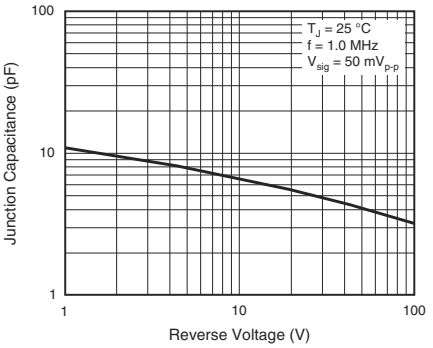


Fig. 5 - Typical Junction Capacitance

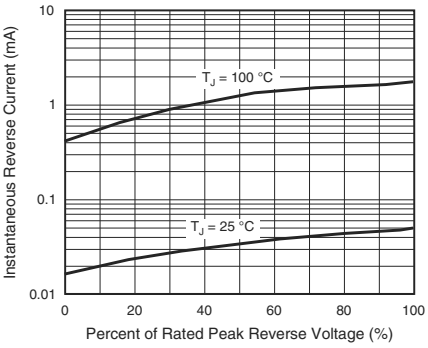


Fig. 4 - Typical Reverse Characteristics

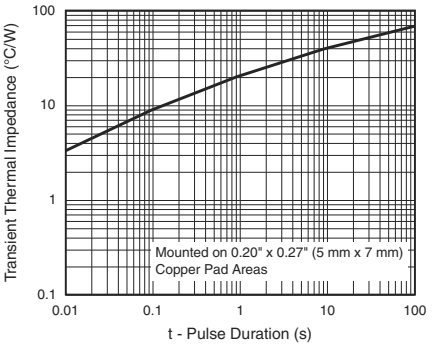
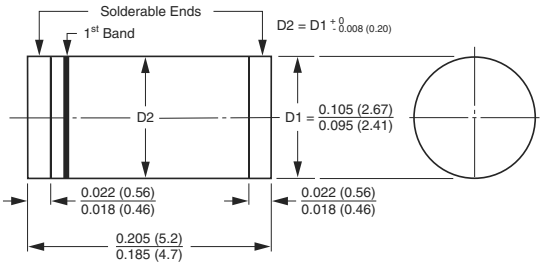


Fig. 6 - Typical Transient Thermal Impedance

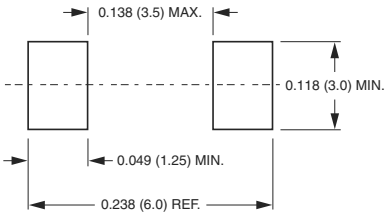
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AB



1st band denotes type and positive end (cathode)

Mounting Pad Layout



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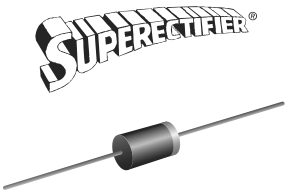
Document Number: 88527
Revision: 01-Feb-11

BYD13DGP thru BYD13MGP

Vishay General Semiconductor

Avalanche Glass Passivated Junction Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Avalanche surge capability guaranteed
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	30 A
E_{RSM}	7 mJ
V_F	1.1 V, 1.2 V
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supply, inverters, converters and freewheeling applications for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYD13DGP	BYD13GGP	BYD13JGP	BYD13KGP	BYD13MGP	UNIT
Device marking code		13DGP	13GGP	13JGP	13KGP	13MGP	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (fig. 1)	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30					A
Non-repetitive peak reverse avalanche energy at L = 120 mH, $T_J = T_J$ maximum prior to surge	E_{RSM}	7					mJ
Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead lengths at T_A = 75 °C	$I_{R(AV)}$	30					µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BYD13DGP**	**BYD13GGP**	**BYD13JGP**	**BYD13KGP**	**BYD13MGP**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F (1)	1.1			1.2		V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					μA
		T_A = 125 °C		50					
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	3.0					μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.0			7.0		pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**BYD13DGP**	**BYD13GGP**	**BYD13JGP**	**BYD13KGP**	**BYD13MGP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55					°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYD13JGP-E3/54	0.335	54	5500	13" diameter paper tape and reel
BYD13JGP-E3/73	0.335	73	3000	Ammo pack packaging
BYD13JGPHE3/54 (1)	0.335	54	5500	13" diameter paper tape and reel
BYD13JGPHE3/73 (1)	0.335	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

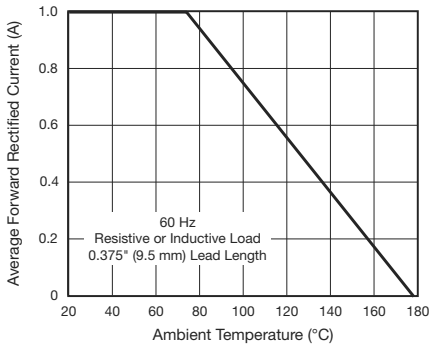


Fig. 1 - Forward Current Derating Curve

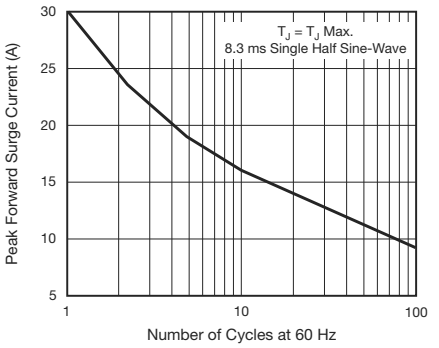


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

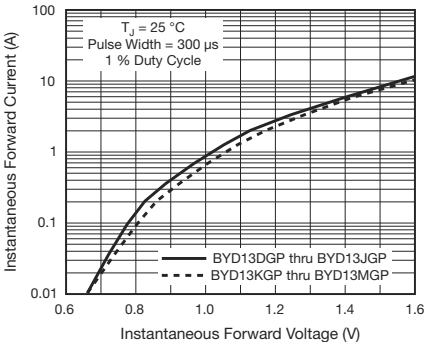


Fig. 3 - Typical Instantaneous Forward Characteristics

BYD13DGP.....200 V

BYD13GGP.....400 V

BYD13JGP.....600 V

BYD13KGP.....800 V

BYD13MGP.....1000 V

Fig. 5 - Maximum Repetitive Peak Reverse Voltage, V_{RRM}

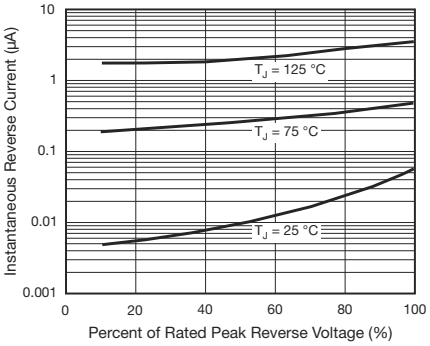


Fig. 4 - Typical Reverse Characteristics

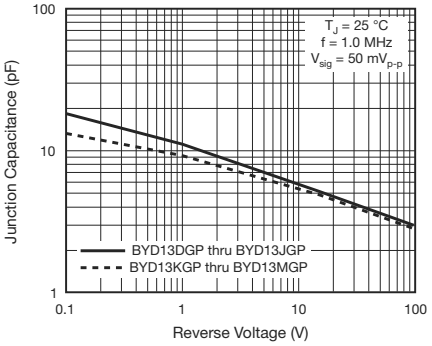
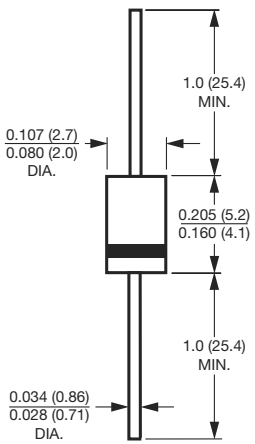


Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



BYM10-50 thru BYM10-1000, GL41A thru GL41Y

Vishay General Semiconductor

Surface Mount Glass Passivated Junction Rectifier

DO-213AB

FEATURES

- Superectifier structure for high reliability condition
- Ideal for automated placement
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-213AB, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Two bands indicate cathode end - 1st band denotes device type and 2nd band denotes repetitive peak reverse voltage rating

PRIMARY CHARACTERISTICS		
$I_{F(AV)}$		1.0 A
V_{RRM}	BYM-50-1000	50 V to 1000 V
	GL41A-Y	50 V to 1600 V
I_{FSM}		30 A
I_R		10 µA
E_{AS}		5 mJ
V_F		1.1 V, 1.2 V
T_J max.		175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYM 10-50	BYM 10-100	BYM 10-200	BYM 10-400	BYM 10-600	BYM 10-800	BYM 10-1000			UNIT
STANDARD RECOVERY DEVICE: 1ST BAND IS WHITE		GL41A	GL41B	GL41D	GL41G	GL41J	GL41K	GL41M	GL41T	GL41Y	
Polarity color bands (2nd band)		Gray	Red	Orange	Yellow	Green	Blue	Violet	White	Brown	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	1300	1600	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	910	1120	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	1300	1600	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	1.0									A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30									A

For technical questions within your region, please contact one of the following:
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Document Number: 88546
Revision: 01-Feb-11

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**SYMBOL**	**BYM 10-50**	**BYM 10-100**	**BYM 10-200**	**BYM 10-400**	**BYM 10-600**	**BYM 10-800**	**BYM 10-1000**			**UNIT**
STANDARD RECOVERY DEVICE: 1ST BAND IS WHITE		**GL41A**	**GL41B**	**GL41D**	**GL41G**	**GL41J**	**GL41K**	**GL41M**	**GL41T**	**GL41Y**	
Maximum full load reverse current full cycle average at T_A = 75 °C	$I_{R(AV)}$	30									µA
Non-repetitive peak reverse avalanche energy at T_J = 25 °C, I_{AS} = 1 A, L = 10 mH	E_{AS}	5							-		mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175									°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)												
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**BYM 10-50**	**BYM 10-100**	**BYM 10-200**	**BYM 10-400**	**BYM 10-600**	**BYM 10-800**	**BYM 10-1000**			**UNIT**
			GL41A	**GL41B**	**GL41D**	**GL41G**	**GL41J**	**GL41K**	**GL41M**	**GL41T**	**GL41Y**	
Maximum instantaneous forward voltage	1.0 A	V_F	1.1					1.2				V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C	I_R	10									µA
	T_A = 125 °C		50									
Typical junction capacitance	4.0 V, 1 MHz	C_J	8.0									pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**SYMBOL**	**BYM 10-50**	**BYM 10-100**	**BYM 10-200**	**BYM 10-400**	**BYM 10-600**	**BYM 10-800**	**BYM 10-1000**			**UNIT**
		GL41A	**GL41B**	**GL41D**	**GL41G**	**GL41J**	**GL41K**	**GL41M**	**GL41T**	**GL41Y**	
Typical thermal resistance	$R_{\theta JA}$ (1)	75									°C/W
	$R_{\theta JT}$ (2)	30									

Notes

(1) Thermal resistance from junction to ambient, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

(2) Thermal resistance from junction to terminal, 0.24" x 0.24" (6.0 mm x 6.0 mm) copper pads to each terminal

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BYM10-600-E3/96	0.114	96	1500	7" diameter plastic tape and reel
BYM10-600-E3/97	0.114	97	5000	13" diameter plastic tape and reel
GL41J-E3/96	0.114	96	1500	7" diameter plastic tape and reel
GL41J-E3/97	0.114	97	5000	13" diameter plastic tape and reel
BYM10-600HE3/96 (1)	0.114	96	1500	7" diameter plastic tape and reel
BYM10-600HE3/97 (1)	0.114	97	5000	13" diameter plastic tape and reel
GL41JHE3/96 (1)	0.114	96	1500	7" diameter plastic tape and reel
GL41JHE3/97 (1)	0.114	97	5000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

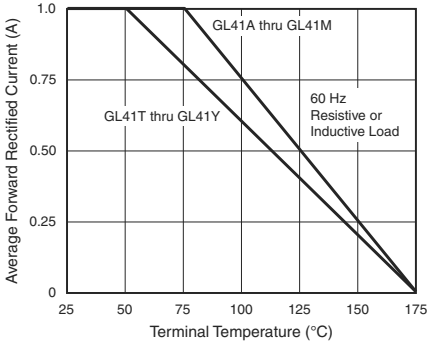


Fig. 1 - Forward Current Derating Curve

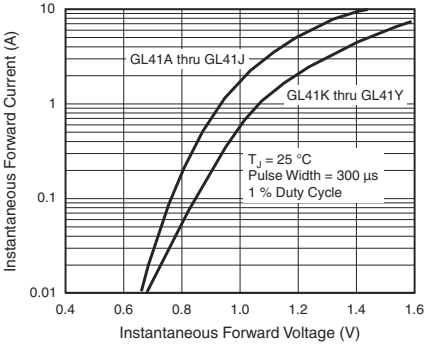


Fig. 3 - Typical Instantaneous Forward Characteristics

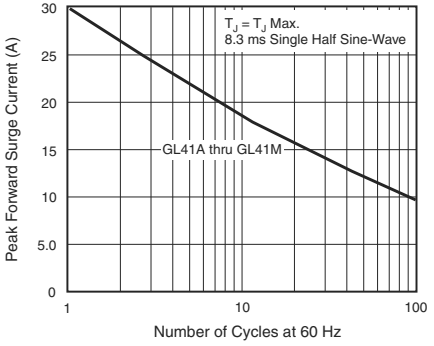


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

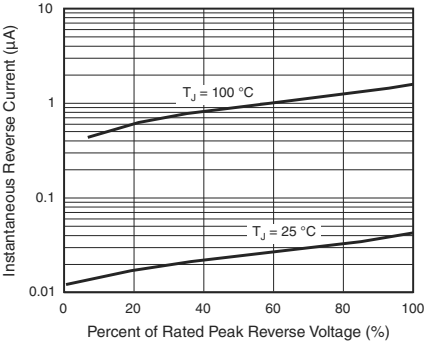


Fig. 4 - Maximum Non-Repetitive Peak Forward Surge Current

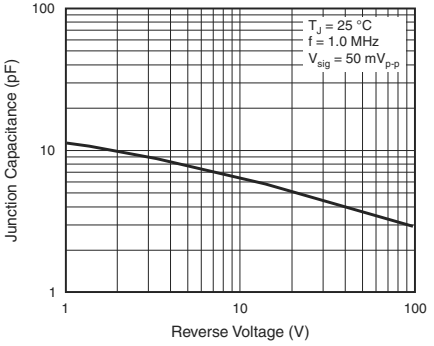


Fig. 5 - Typical Junction Capacitance

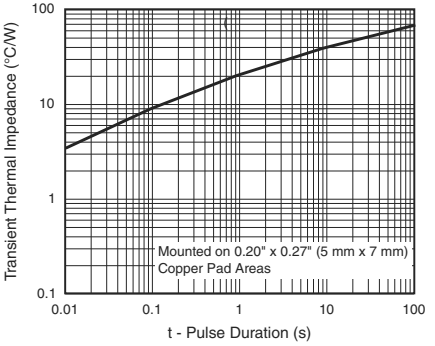
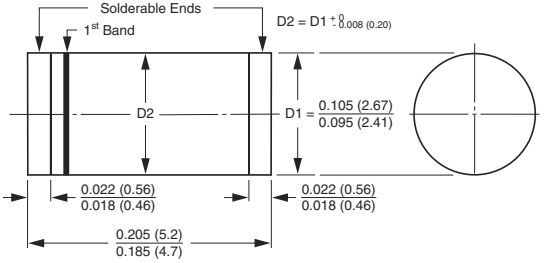


Fig. 6 - Typical Transient Thermal Impedance

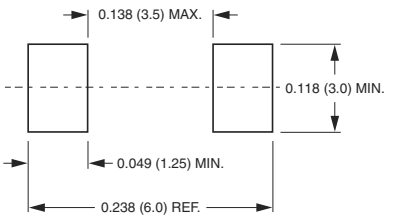
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-213AB



1st band denotes type and positive end (cathode)

Mounting Pad Layout



Surface Mount Glass Passivated Rectifier

DO-214BA (GF1)

FEATURES

- Superectifier structure for high reliability condition
- Ideal for automated placement
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
V_F	1.1 V, 1.2 V
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214BA, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GF1A	GF1B	GF1D	GF1G	GF1J	GF1K	GF1M	UNIT
Device marking code		GA	GB	GD	GG	GJ	GK	GM	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_L = 125 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Document Number: 88617
Revision: 01-Feb-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	GF1A	GF1B	GF1D	GF1G	GF1J	GF1K	GF1M	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.1					1.2		V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							μA
		T_A = 125 °C		50							
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0							μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	SYMBOL	GF1A	GF1B	GF1D	GF1G	GF1J	GF1K	GF1M	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$	80							°C/W
	$R_{\theta JL}$	26							

Note

(1) Thermal resistance from junction to ambient and from junction to lead, PCB mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GF1J-E3/67A	0.104	67A	1500	7" diameter plastic tape and reel
GF1J-E3/5CA	0.104	5CA	6500	13" diameter plastic tape and reel
GF1JHE3/67A (1)	0.104	67A	1500	7" diameter plastic tape and reel
GF1JHE3/5CA (1)	0.104	5CA	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

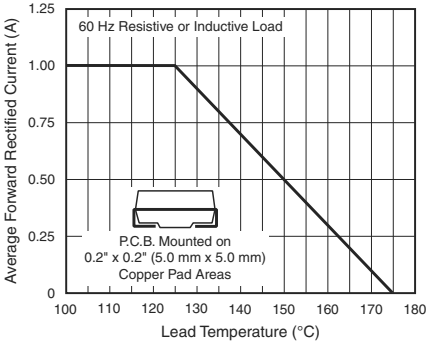


Fig. 1 - Forward Current Derating Curve

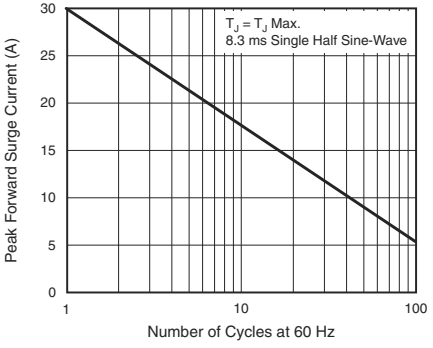


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

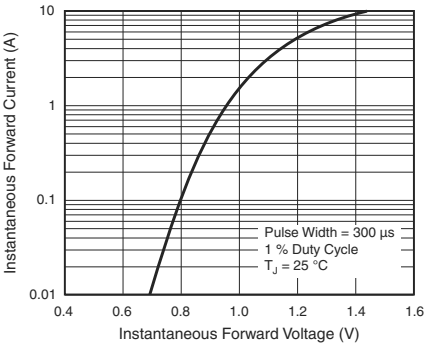


Fig. 3 - Typical Instantaneous Forward Characteristics

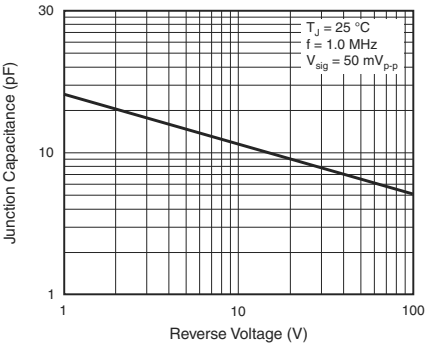


Fig. 5 - Typical Junction Capacitance

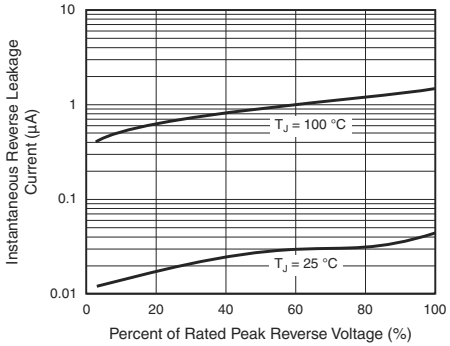


Fig. 4 - Typical Reverse Characteristics

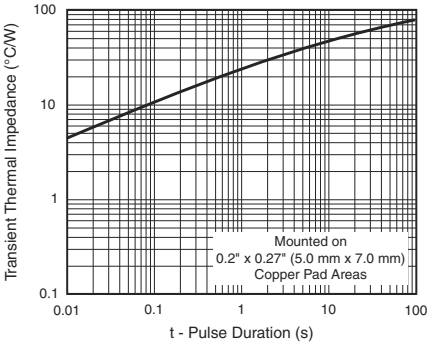
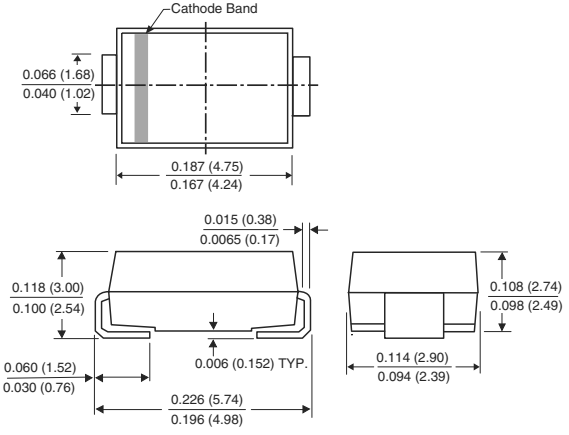


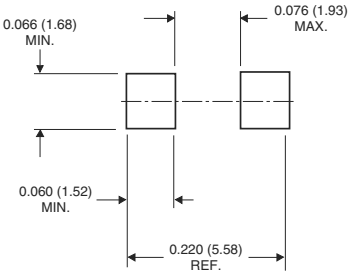
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214BA (GF1)



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Miniature High Voltage Glass Passivated Rectifier

DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage rectification of power supplies, inverters, converters, freewheeling diodes applications

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	1200 V to 1600 V
I_{FSM}	30 A
I_R	10 µA
V_F	1.1 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI1-1200GP	GI1-1400GP	GI1-1600GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1200	1400	1600	V
Maximum RMS voltage	V_{RMS}	840	980	1120	V
Maximum DC blocking voltage	V_{DC}	1200	1400	1600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GI1-1200GP**	**GI1-1400GP**	**GI1-1600GP**	**UNIT**
Maximum instantaneous forward voltage	I_F = 1.0 A		V_F (1)	1.1			V
	I_F = 3.14 A			1.3			
Maximum reverse current	Rated V_R	T_A = 25 °C	I_R (1)	10			µA
		T_A = 100 °C		100			
Maximum reverse recovery time	I_{FM} = 20 mA, I_{RM} = 2 mA		t_{rr}	25			µs
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	typical	t_{rr}	0.7			µs
		maximum		1.5			
Maximum forward recovery time	I_{FM} = 20 mA		t_{fr}	1.0			µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15			pF

Note

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**GI1-1200GP**	**GI1-1400GP**	**GI1-1600GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55			°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GI1-1200-E3/54	0.425	54	4000	13" diameter paper tape and reel
GI1-1200-E3/73	0.425	73	2000	Ammo pack packaging
GI1-1200HE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
GI1-1200HE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

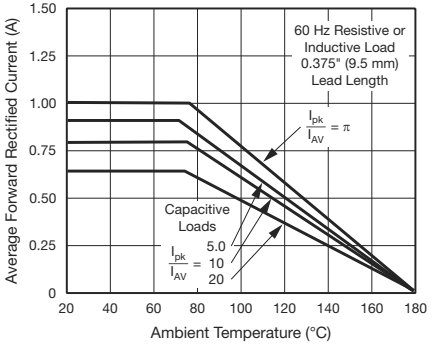


Fig. 1 - Forward Current Derating Curve

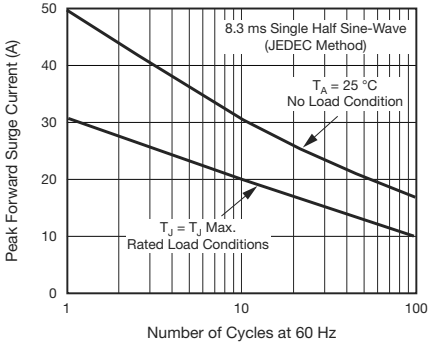


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

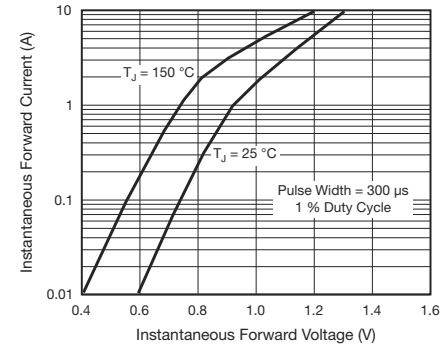


Fig. 3 - Typical Instantaneous Forward Characteristics

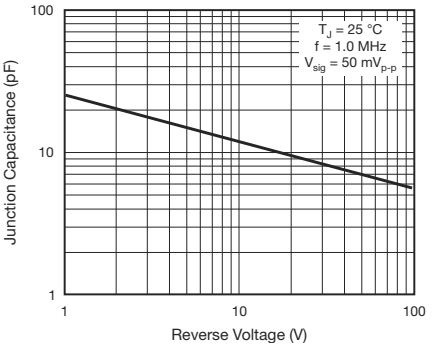


Fig. 5 - Typical Junction Capacitance

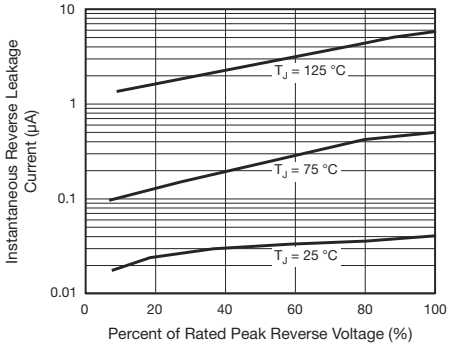
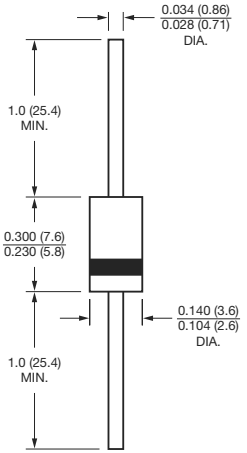


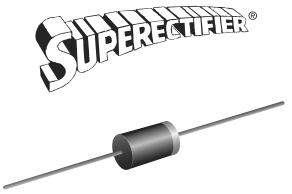
Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Glass Passivated Junction Rectifier



DO-204AL (DO-41)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1600 V
I_{FSM}	30 A, 25 A
I_R	5.0 µA
V_F	1.1 V, 1.2 V, 1.3 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	A	B	D	G	J	K	M	N	Q	T	V	W	Y	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50 to 1600 (fig. 5)													V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (fig. 1)	$I_{F(AV)}$	1.0													A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							25						A
Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{R(AV)}$	30													µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							- 65 to + 150						°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

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Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)																	
PARAMETER	TEST CONDITIONS		SYMBOL	A	B	D	G	J	K	M	N	Q	T	V	W	Y	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.1					1.2				1.3				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0													µA
		T_A = 125 °C		50													
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	3.0													µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	8.0					7.0				5.0				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)																
PARAMETER	SYMBOL	A	B	D	G	J	K	M	N	Q	T	V	W	Y	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	55													°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GP10J-E3/54	0.335	54	5500	13" diameter paper tape and reel
GP10J-E3/73	0.335	73	3000	Ammo pack packaging
GP10JHE3/54 (1)	0.335	54	5500	13" diameter paper tape and reel
GP10JHE3/73 (1)	0.335	73	3000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

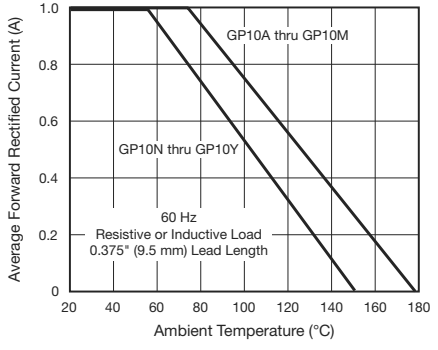


Fig. 1 - Forward Current Derating Curve

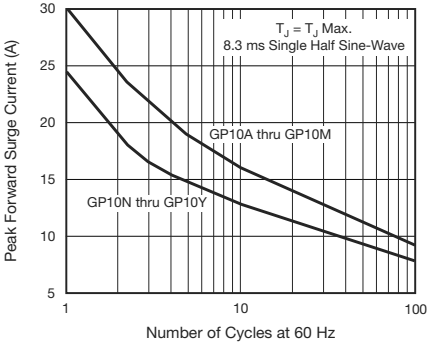


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

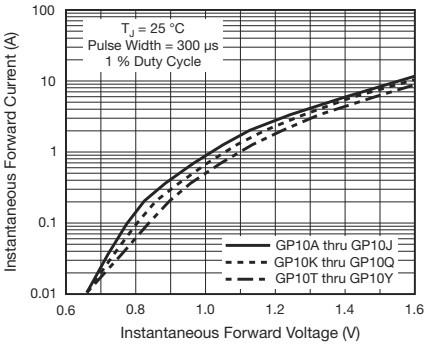


Fig. 3 - Typical Instantaneous Forward Characteristics

GP10A..... 50 V
GP10B..... 100 V
GP10D..... 200 V
GP10G..... 400 V
GP10J..... 600 V
GP10K..... 800 V
GP10M.....1000 V
GP10N..... 1100 V
GP10Q..... 1200 V
GP10T.....1300 V
GP10V..... 1400 V
GP10W..... 1500 V
GP10Y..... 1600 V

Fig. 5 - Maximum Repetitive Peak Reverse Voltage, V_{RRM}

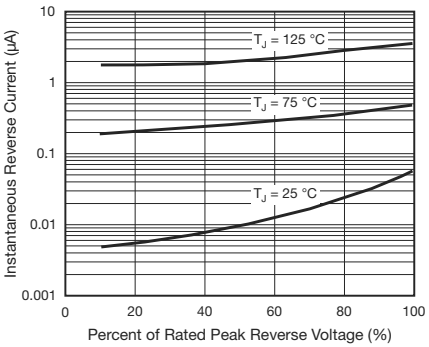


Fig. 4 - Typical Reverse Characteristics

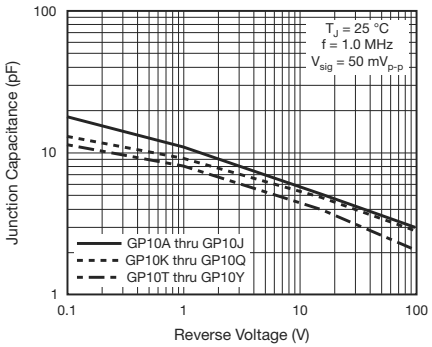
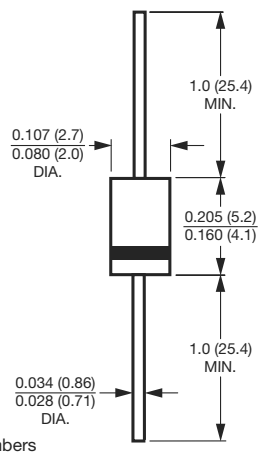


Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

Glass Passivated Junction Rectifier

DO-204AL (DO-41)

FEATURES

- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

MECHANICAL DATA

Case: DO-204AL, molded epoxy over passivated chip

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GPP10A	GPP10B	GPP10D	GPP10G	GPP10J	GPP10K	GPP10M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 75 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length T_A = 75 °C	$I_{R(AV)}$	30							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GPP10A**	**GPP10B**	**GPP10D**	**GPP10G**	**GPP10J**	**GPP10K**	**GPP10M**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 50							µA
Maximum junction capacitance	4.0 V, 1 MHz		C_J	6							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**GPP10A**	**GPP10B**	**GPP10D**	**GPP10G**	**GPP10J**	**GPP10K**	**GPP10M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 25							°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GPP10J-E3/54	0.34	54	5500	13" diameter paper tape and reel
GPP10J-E3/73	0.34	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

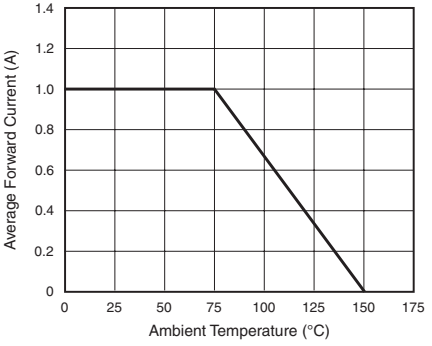


Figure 1. Forward Current Derating Curve

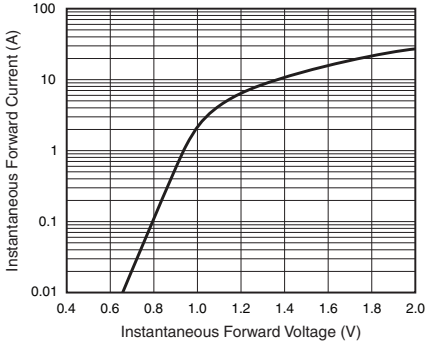


Figure 2. Typical Instantaneous Forward Characteristics Per Diode

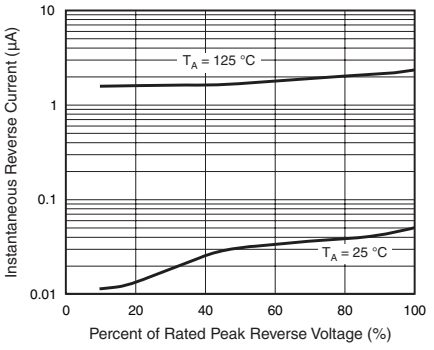


Figure 3. Typical Reverse Characteristics

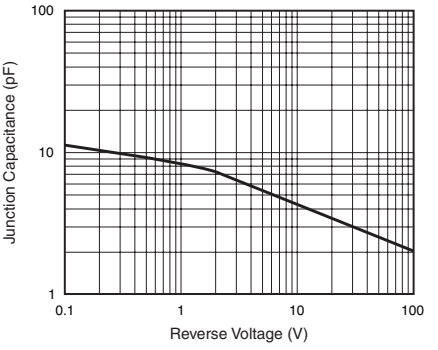
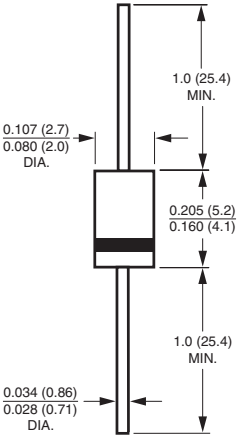


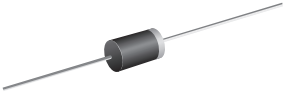
Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



General Purpose Plastic Rectifier



DO-204AL (DO-41)

FEATURES

- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	1.0 µA
V_F	1.0 V, 1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	M100A	M100B	M100D	M100G	M100J	M100K	M100M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 100 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50							A
Maximum full load reverse current full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88659
Revision: 26-Mar-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**M100A**	**M100B**	**M100D**	**M100G**	**M100J**	**M100K**	**M100M**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.0					1.1		V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	1.0 50							µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0							µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**M100A**	**M100B**	**M100D**	**M100G**	**M100J**	**M100K**	**M100M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	50 25							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
M100J-E3/54	0.33	54	5500	13" diameter paper tape and reel
M100J-E3/73	0.33	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

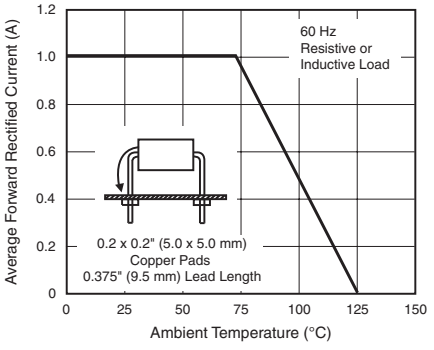


Figure 1. Forward Current Derating Curve

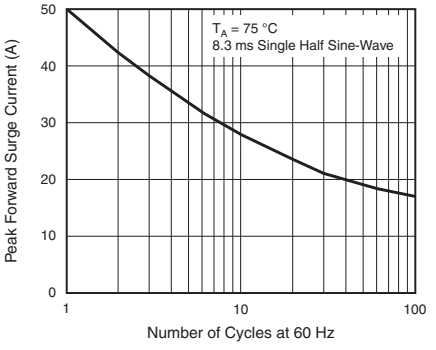


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

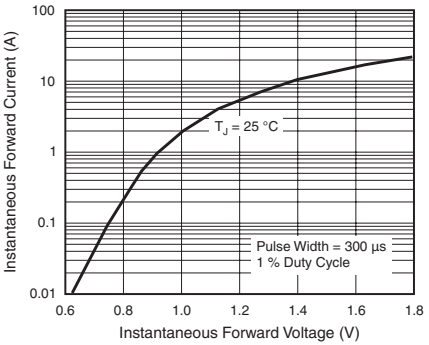


Figure 3. Typical Instantaneous Forward Characteristics

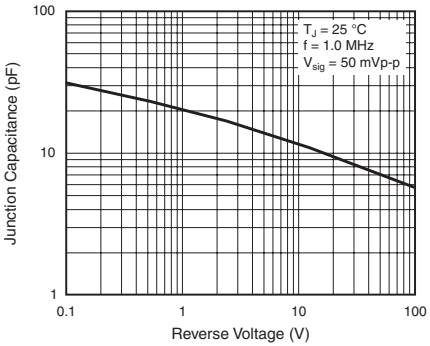


Figure 5. Typical Junction Capacitance

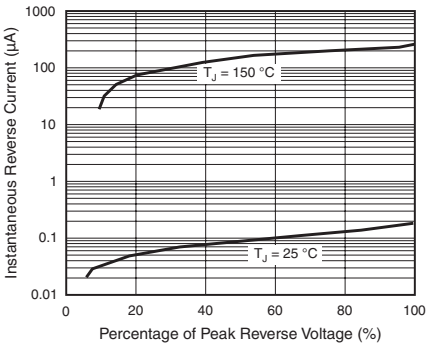


Figure 4. Typical Reverse Characteristics

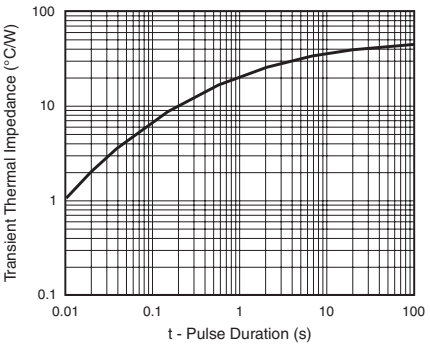
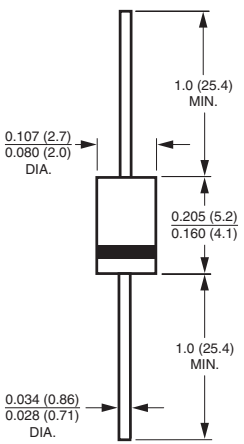


Figure 6. Typical Transient Thermal Impedance

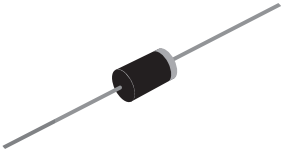
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88659
Revision: 26-Mar-08

Miniature Glass Passivated Junction Plastic Rectifier



Case Style MPG06

FEATURES

- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	40 A
V_F	1.1 V
I_R	5.0 µA
T_J max.	150 °C

MECHANICAL DATA

Case: MPG06, molded epoxy over passivated chip

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MPG06A	MPG06B	MPG06D	MPG06G	MPG06J	MPG06K	MPG06M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 25 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40							A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MPG06A**	**MPG06B**	**MPG06D**	**MPG06G**	**MPG06J**	**MPG06K**	**MPG06M**	**UNIT**
Maximum instantaneous forward voltage	1.0 A		V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 125 °C	I_R	5.0 50							µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	0.6							µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	10							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**MPG06A**	**MPG06B**	**MPG06D**	**MPG06G**	**MPG06J**	**MPG06K**	**MPG06M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	67 30							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted with 0.22 x 0.22" (5.5 x 5.5 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MPG06J-E3/54	0.202	54	5500	13" diameter paper tape and reel
MPG06J-E3/73	0.202	73	3000	Ammo pack packaging
MPG06JHE3/54 (1)	0.202	54	5500	13" diameter paper tape and reel
MPG06JHE3/73 (1)	0.202	73	3000	Ammo pack packaging

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

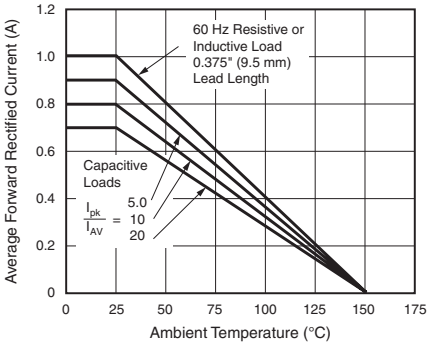


Figure 1. Forward Current Derating Curve

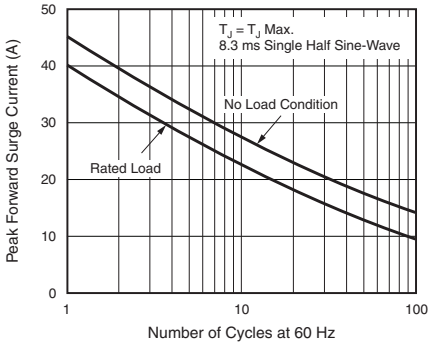


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

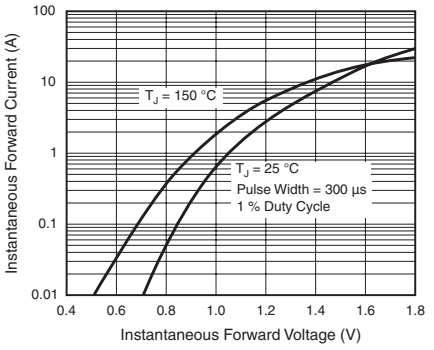


Figure 3. Typical Instantaneous Forward Characteristics

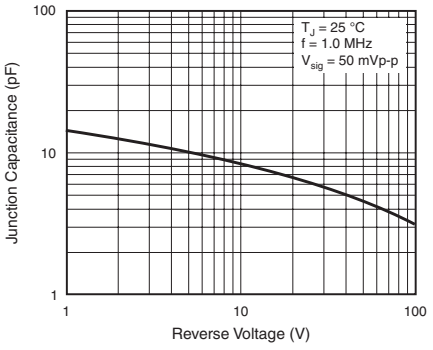


Figure 5. Typical Junction Capacitance

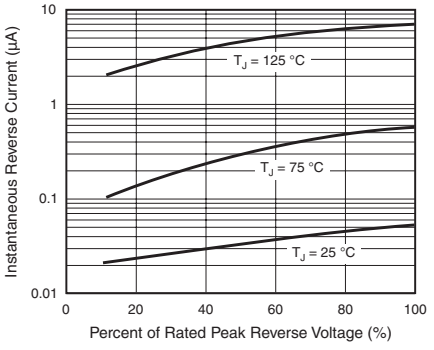


Figure 4. Typical Reverse Characteristics

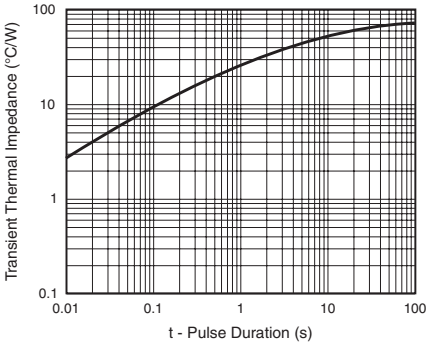
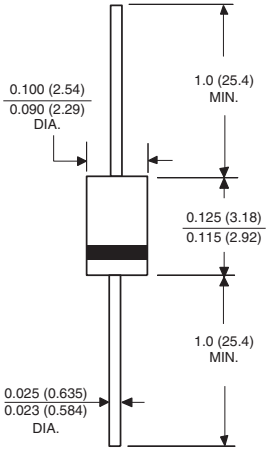


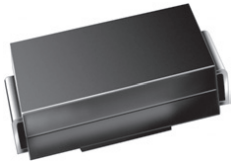
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style MPG06



Surface Mount Glass Passivated Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	40 A, 30 A
E_{AS}	5 mJ
I_R	1.0 µA, 5.0 µA
V_F	1.1 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S1A	S1B	S1D	S1G	S1J	S1K	S1M	UNIT
Device marking code		SA	SB	SD	SG	SJ	SK	SM	
Maximum recurrent peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40					30		A
Non-repetitive peak reverse avalanche energy at 25 °C, I_{AS} = 1 A, L = 10 mH	E_{AS}	5							mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88711
Revision: 07-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	S1A	S1B	S1D	S1G	S1J	S1K	S1M	UNIT
Maximum instantaneous forward voltage	1.0 A		V_F	1.1							V
Maximum DC reverse current at Rated DC blocking voltage		T_A = 25 °C	I_R	1.0					5.0		µA
		T_A= 125 °C		50							
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	1.8							µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	12							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	S1A	S1B	S1D	S1G	S1J	S1K	S1M	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$	75					85		°C/W
	$R_{\theta JL}$	27					30		

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	REFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S1J-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
S1J-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
S1JHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel
S1JHE3/5AT (1)	0.064	5AT	7500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

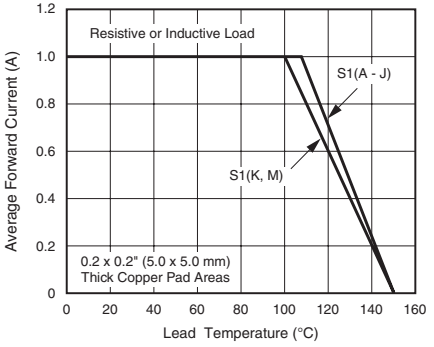


Figure 1. Forward Current Derating Curve

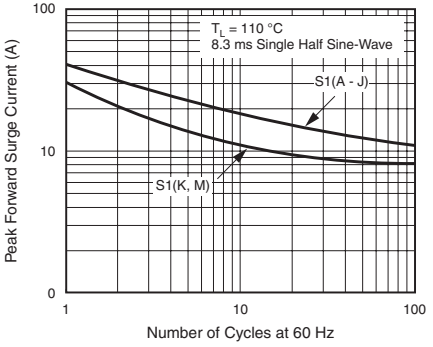


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

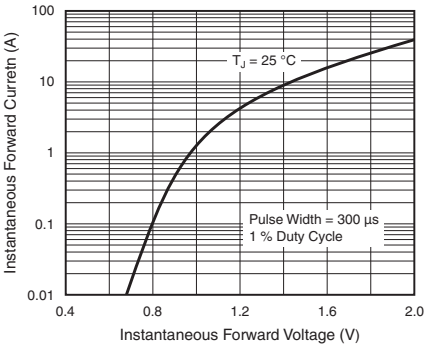


Figure 3. Typical Instantaneous Forward Characteristics

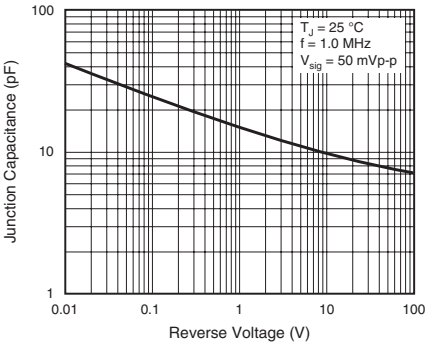


Figure 5. Typical Junction Capacitance

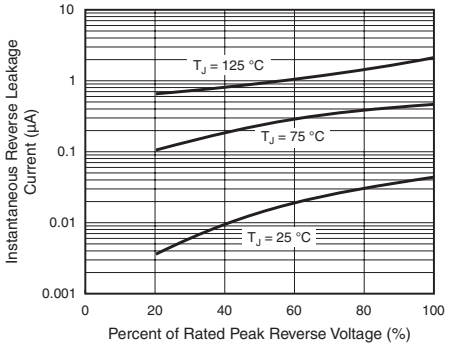


Figure 4. Typical Reverse Leakage Characteristics

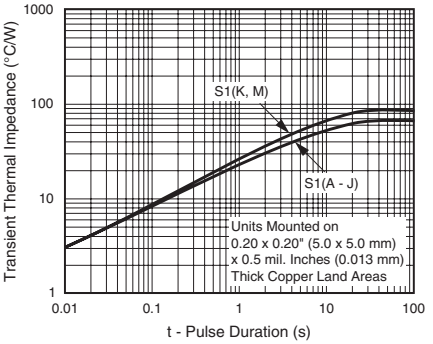
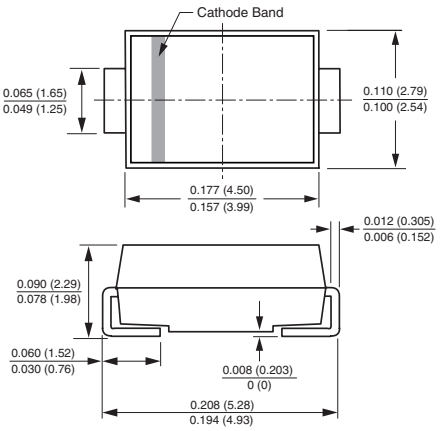


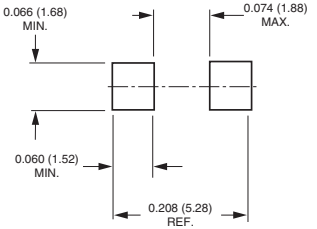
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Surface Mount Glass-Passivated Recitifiers

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V to 1000 V
I_{FSM}	30 A
I_R	3.0 µA
V_F at I_F = 1.0 A	0.861 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer and telecommunication.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-214AC (SMA)
Epoxy meets UL 94V-0 flammability rating
Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test
Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S1BA	S1DA	S1GA	S1JA	S1KA	S1MA	UNIT
Device marking code		BA	DA	GA	JA	KA	MA	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	800	1000	V
Average forward current	$I_{F(AV)}$	1.0						A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 1.0 A I_F = 1.0 A	T_J = 25 °C T_J = 125 °C	V_F	0.960 0.861	1.1 -	V
Reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	0.09 20	3 80	µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	1.0	-	µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	8	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**S1BA**	**S1DA**	**S1GA**	**S1JA**	**S1KA**	**S1MA**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	95 22						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
S1JA-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
S1JA-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

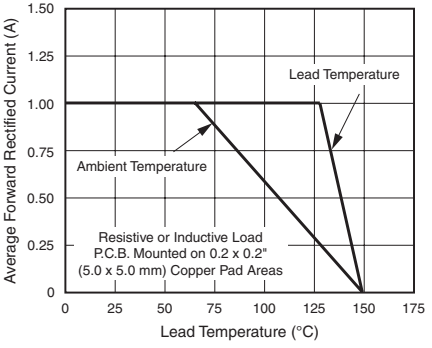


Figure 1. Maximum Forward Current Derating Curve

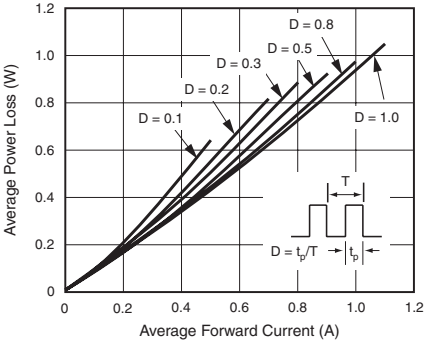


Figure 2. Forward Power Loss Characteristics

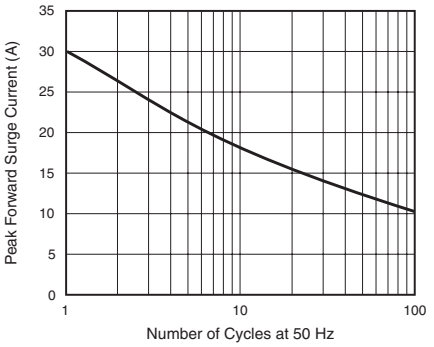


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

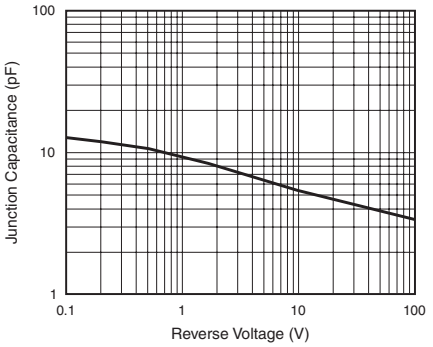


Figure 6. Typical Junction Capacitance

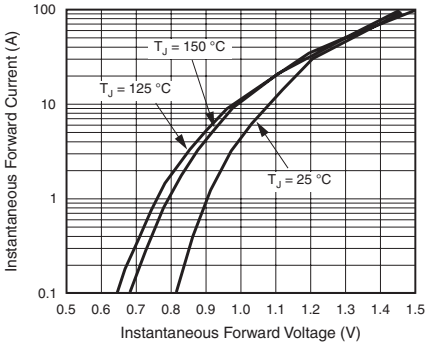


Figure 4. Typical Instantaneous Forward Characteristics

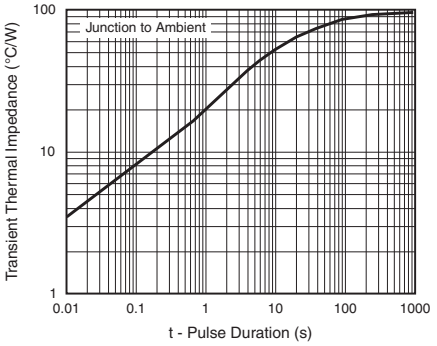


Figure 7. Typical Transient Thermal Impedance

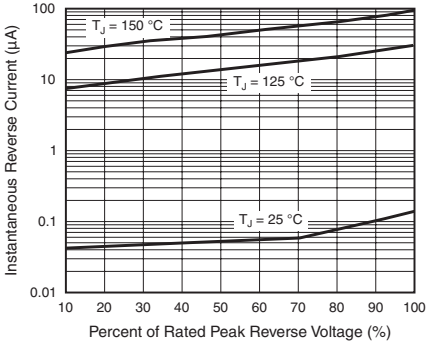
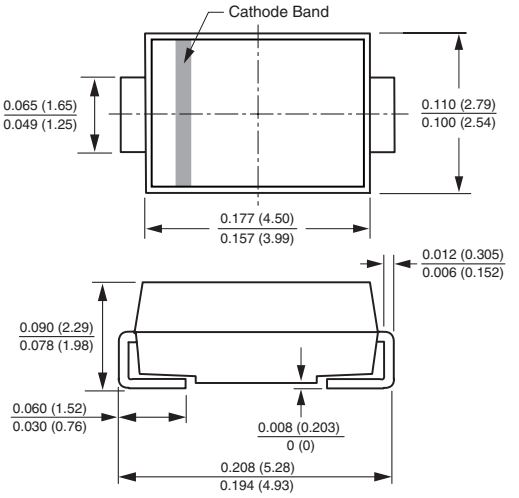


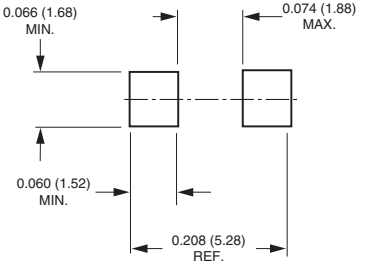
Figure 5. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



High Current Density Surface Mount Glass-Passivated Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V to 1000 V
I_R	1 µA
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-220AA (SMP)
Epoxy meets UL 94V-0 flammability rating
Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test
Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S1PB	S1PD	S1PG	S1PJ	S1PK	S1PM	UNIT
Device marking code		SB	SD	SG	SJ	SK	SM	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	100	200	400	600	800	1000	V
Average forward current	$I_{F(AV)}$	1.0						A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**S1PB**	**S1PD**	**S1PG**	**S1PJ**	**S1PK**	**S1PM**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 1.0 A I_F = 1.0 A	T_J = 25 °C T_J = 125 °C	V_F	1.1 0.95						V
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	1.0 50				1.0 100		µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	1.8						µs
Typical junction capacitance time	4.0 V, 1 MHz		C_J	6.0						pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**S1PB**	**S1PD**	**S1PG**	**S1PJ**	**S1PK**	**S1PM**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 15 20						°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JC}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
S1PJ-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
S1PJ-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
S1PJHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
S1PJHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

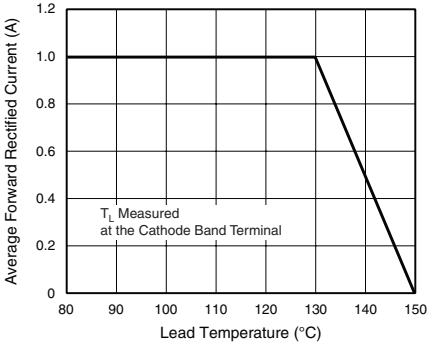


Figure 1. Maximum Forward Current Derating Curve

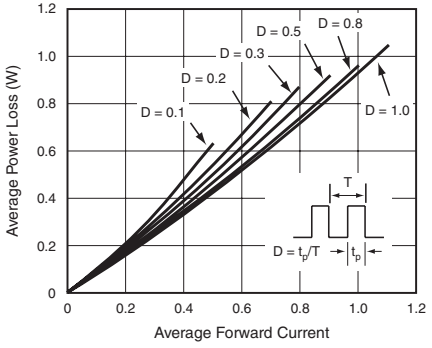


Figure 2. Forward Power Loss Characteristics

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

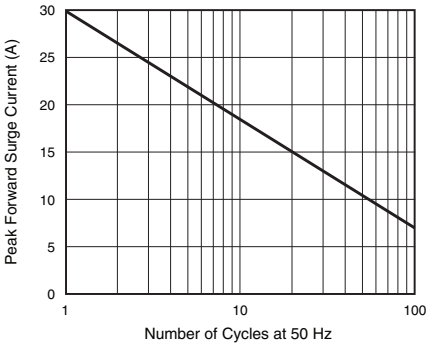


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

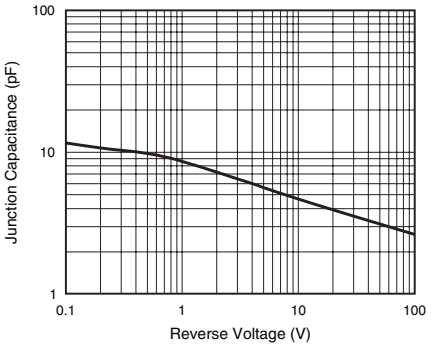


Figure 6. Typical Junction Capacitance

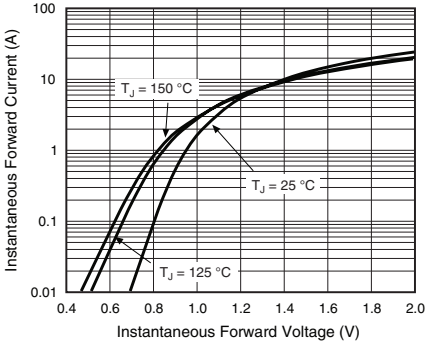


Figure 4. Typical Instantaneous Forward Characteristics

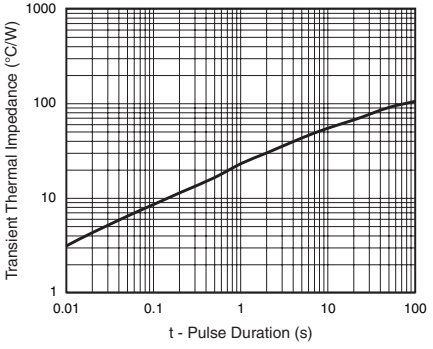


Figure 7. Typical Transient Thermal Impedance

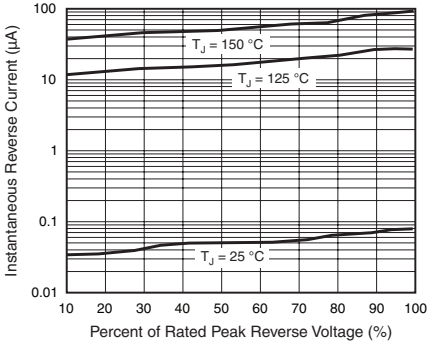
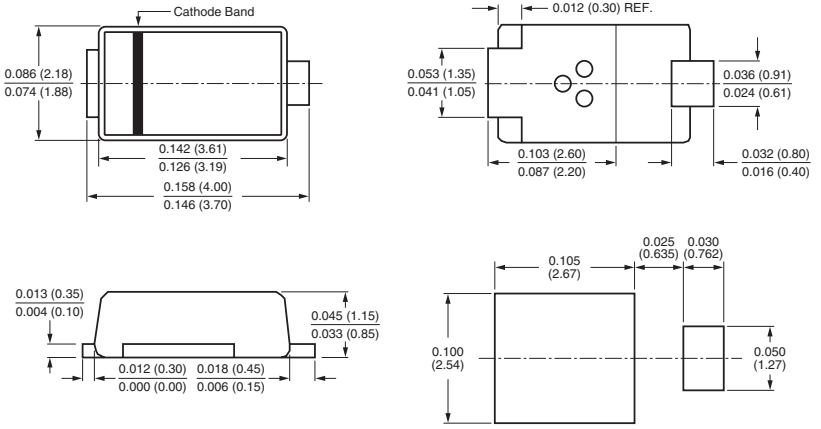


Figure 5. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88917
Revision: 26-May-08

General Purpose Plastic Rectifier

DO-204AL (DO-41)

FEATURES

- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
V_F	1.4 V
I_R	5.0 μA
T_J max.	150 °C

MECHANICAL DATA

Case: DO-204AL, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N5391	1N5392	1N5393	1N5394	1N5395	1N5396	1N5397	1N5398	1N5399	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	300	400	500	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	210	280	350	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	300	400	500	600	800	1000	V
Maximum average forward rectified current 0.500" (12.7 mm) lead length at T_L = 70 °C	$I_{F(AV)}$	1.5									A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50									A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_L = 70 °C	$I_{R(AV)}$	300									μA
Operation junction and storage temperature range	T_J, T_{STG}	- 50 to + 150									°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)													
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**1N5391**	**1N5392**	**1N5393**	**1N5394**	**1N5395**	**1N5396**	**1N5397**	**1N5398**	**1N5399**	**UNIT**
Maximum instantaneous forward voltage	1.5 A	T_A = 70 °C	V_F	1.4									V
Maximum DC reverse current at rated DC blocking voltage		T_J = 25 °C T_J = 150 °C	I_R	5.0 300									µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0									µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15									pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**SYMBOL**	**1N5391**	**1N5392**	**1N5393**	**1N5394**	**1N5395**	**1N5396**	**1N5397**	**1N5398**	**1N5399**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	55 25									°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N5391-E3/54	0.336	54	5500	13" diameter paper tape and reel
1N5391-E3/73	0.336	73	3000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

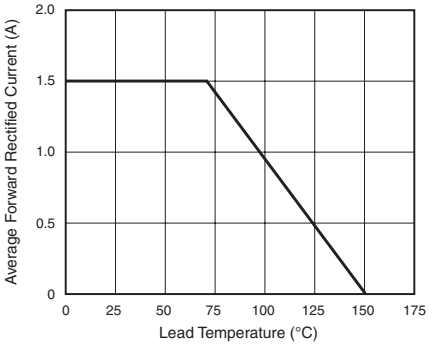


Figure 1. Forward Current Derating Curve

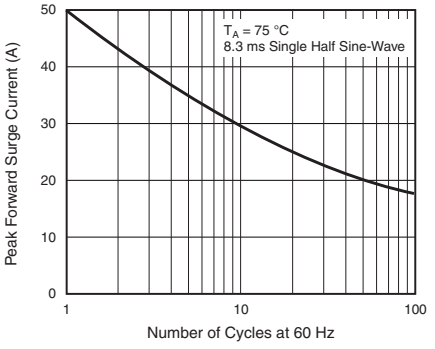


Figure 2. Maximum Non-repetitive Peak Forward Surge Current

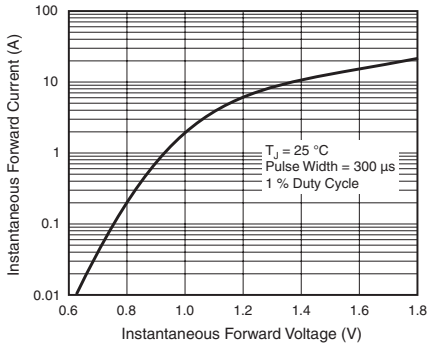


Figure 3. Typical Instantaneous Forward Characteristics

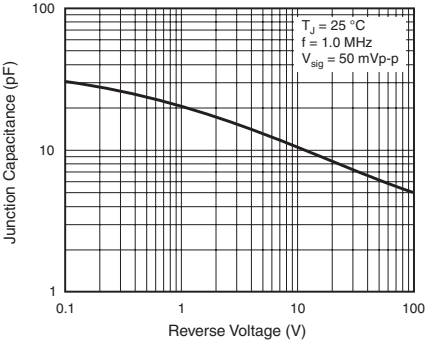


Figure 5. Typical Junction Capacitance

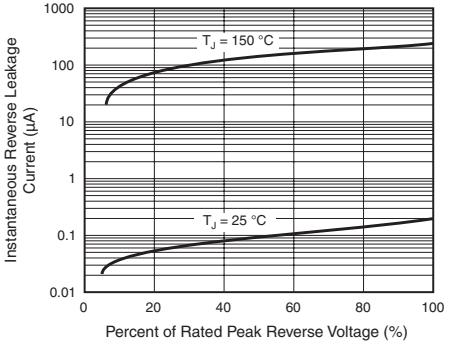


Figure 4. Typical Reverse Characteristics

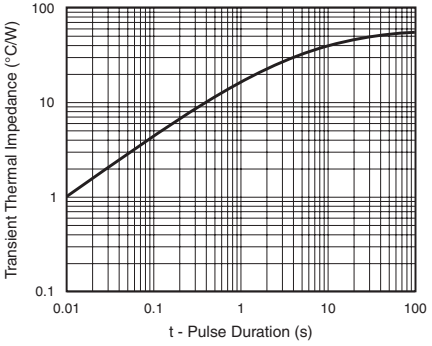
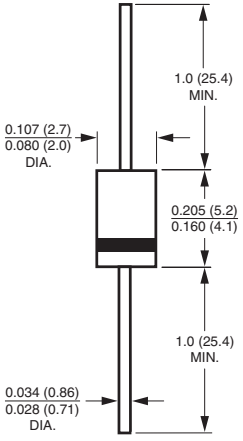


Figure 6. Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

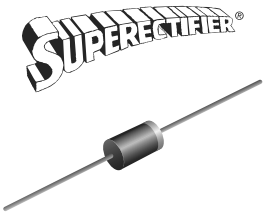
DO-204AL (DO-41)



1N5391GP thru 1N5399GP

Vishay General Semiconductor

Glass Passivated Junction Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	5.0 µA
V_F	1.4 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted) (1)

PARAMETER	SYMBOL	1N5391GP	1N5392GP	1N5393GP	1N5394GP	1N5395GP	1N5396GP	1N5397GP	1N5398GP	1N5399GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	300	400	500	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	210	280	350	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	300	400	500	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_L = 70 °C	$I_{F(AV)}$	1.5									A
Peak forward surge current 8.3 ms single half sine-wave super-imposed on rated load	I_{FSM}	50									A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 70 °C	$I_{R(AV)}$	300									µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175									°C

Note
(1) JEDEC registered values

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88515
Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)													
PARAMETER	TEST CONDITIONS		SYMBOL	1N5391GP	1N5392GP	1N5393GP	1N5394GP	1N5395GP	1N5396GP	1N5397GP	1N5398GP	1N5399GP	UNIT
Maximum instantaneous forward voltage	1.5 A	T_A = 70 °C	V_F (1)	1.4									V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R (1)	5.0									µA
		T_A = 150 °C		300									
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0									µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15									pF

Note

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	SYMBOL	1N5391GP	1N5392GP	1N5393GP	1N5394GP	1N5395GP	1N5396GP	1N5397GP	1N5398GP	1N5399GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	45									°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
1N5397GP-E3/54	0.425	54	4000	13" diameter paper tape and reel
1N5397GP-E3/73	0.425	73	2000	Ammo pack packaging
1N5397GPHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
1N5397GPHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

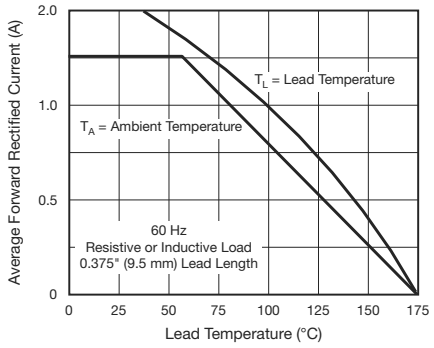


Fig. 1 - Forward Current Derating Curve

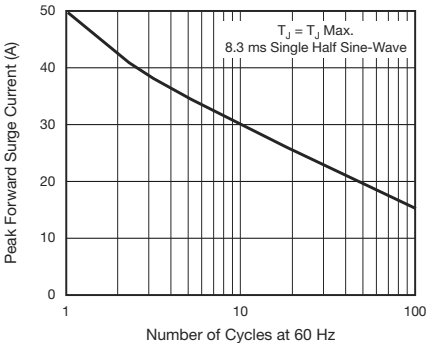


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

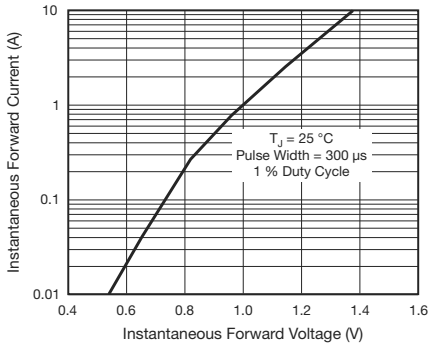


Fig. 3 - Typical Instantaneous Forward Characteristics

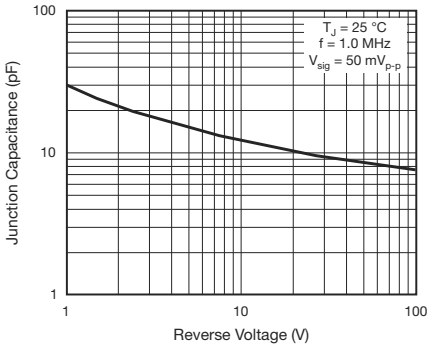


Fig. 5 - Typical Junction Capacitance

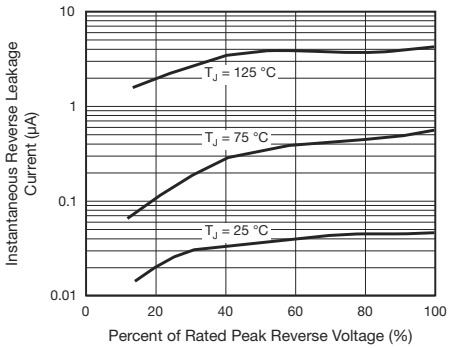


Fig. 4 - Typical Reverse Characteristics

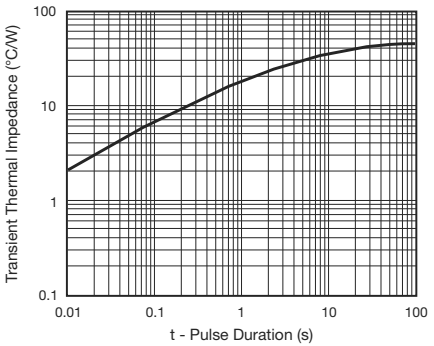
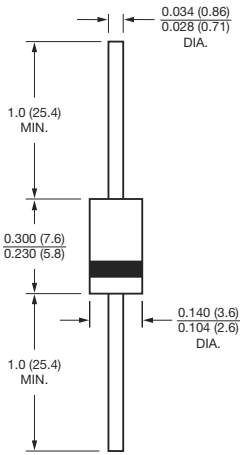


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Glass Passivated Junction Plastic Controlled Avalanche Rectifier

DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Controlled avalanche characteristics
- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	400 V to 800 V
P_{RM}	500 W
I_{FSM}	50 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	AGP15-400	AGP15-600	AGP15-800	UNIT
Maximum recurrent peak reverse voltage	V_{RRM}	400	600	800	V
Maximum RMS voltage	V_{RMS}	280	420	560	V
Maximum DC blocking voltage	V_{DC}	400	600	800	V
Maximum peak power dissipation in the avalanche region 20 µs pulse	P_{RM}	500			W
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	I_{AV}	1.5			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50			A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100			µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**AGP15-400**	**AGP15-600**	**AGP15-800**	**UNIT**
Minimum avalanche breakdown voltage	100 µA	V_{BR}	450	675	880	V
Maximum avalanche breakdown voltage	100 µA	V_{BR}	750	1000	1200	V
Maximum instantaneous forward voltage	1.5 A	V_F	1.1			V
Maximum reverse current at rated DC blocking voltage		I_R	5.0			µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	2.0			µs
Typical junction capacitance	4.0 V, 1 MHz	C_J	15			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**AGP15-400**	**AGP15-600**	**AGP15-800**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	25			°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
AGP15-400-E3/54	0.425	54	4000	13" diameter paper tape and reel
AGP15-400-E3/73	0.425	73	2000	Ammo pack packaging
AGP15-400HE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
AGP15-400HE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

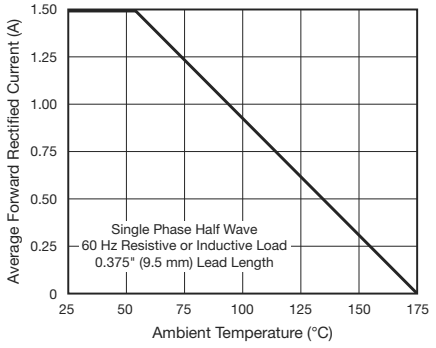


Fig. 1 - Maximum Forward Current Derating Curve

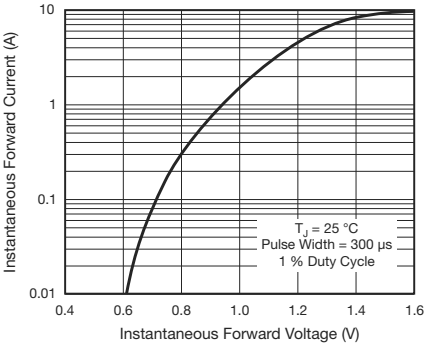


Fig. 2 - Typical Instantaneous Forward Characteristics

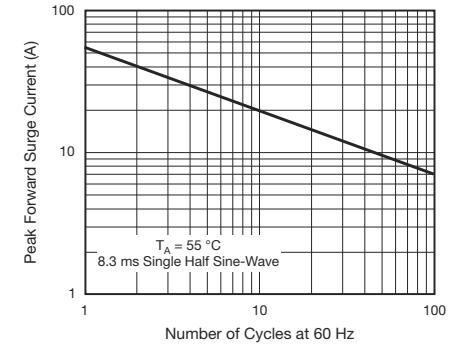


Fig. 3 - Maximum Non-repetitive Peak Forward Surge Current

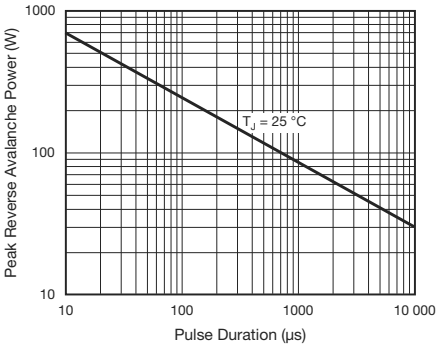


Fig. 5 - Typical Reverse Leakage Characteristics

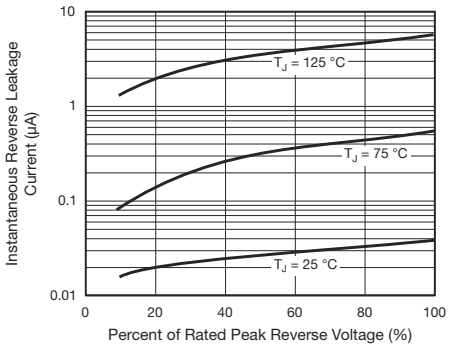
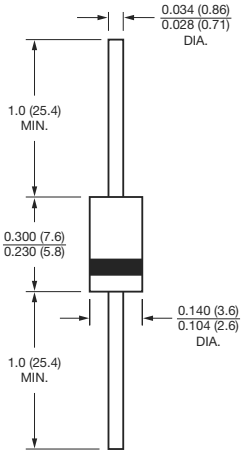


Fig. 4 - Maximum Non-repetitive Reverse Avalanche Power Dissipation

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

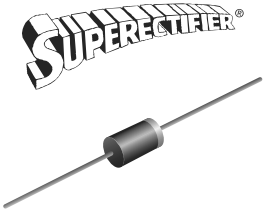
DO-204AC (DO-15)



BY448GP

Vishay General Semiconductor

Miniature Clamper/Damper Glass Passivated Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage rectification of power supplies, inverters, converters and freewheeling diodes specially designed for clamping circuits, horizontal deflection systems and damper applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	1650 V
I_{FSM}	40 A
I_R	5.0 µA
V_F	1.6 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**BY448GP**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	1650	V
Maximum RMS voltage	V_{RMS}	1150	V
Maximum DC blocking voltage	V_{DC}	1650	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 50 °C	$I_{F(AV)}$	1.5	A
Peak forward surge current 8.3 ms single half sine wave superimposed on rated load	I_{FSM}	40	A
Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead length at T_A = 100 °C	$I_{R(AV)}$	50	µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175	°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88543
Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BY448GP**	**UNIT**
Maximum instantaneous forward voltage	I_F = 3.0 A		V_F (1)	1.6	V
Maximum reverse current	V_R = 1650 V	T_A = 25 °C	I_R	5.0	μA
		T_A = 100 °C		100	
Maximum reverse recovery time	I_F = 0.5 A, I_R = 50 mA		t_{rr}	20	μs
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	typical	t_{rr}	0.5	μs
		maximum		1.5	
Typical junction capacitance	4.0 V, 1 MHz		C_J	15	pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**BY448GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55	°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BY448GP-E3/54	0.425	54	4000	13" diameter paper tape and reel
BY448GP-E3/73	0.425	73	2000	Ammo pack packaging
BY448GPHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
BY448GPHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

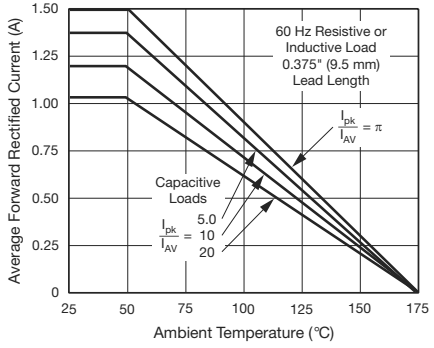


Fig. 1 - Forward Current Derating Curve

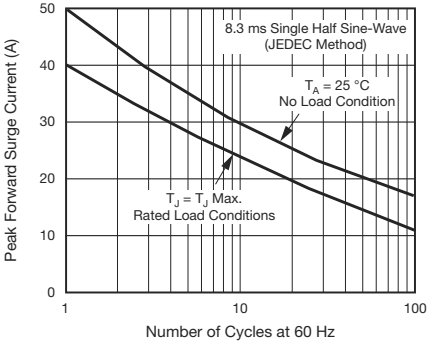


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

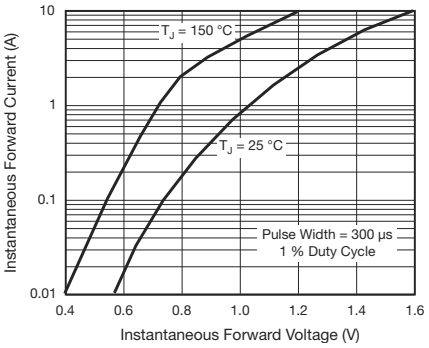


Fig. 3 - Typical Instantaneous Forward Characteristics

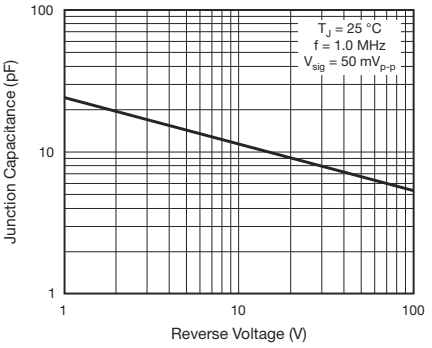


Fig. 5 - Typical Junction Capacitance

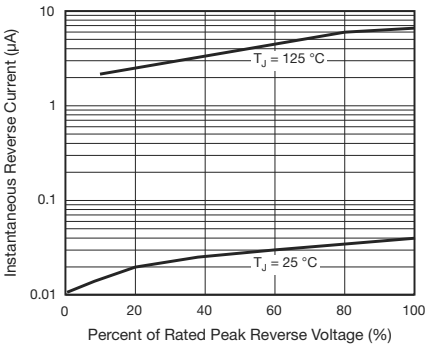
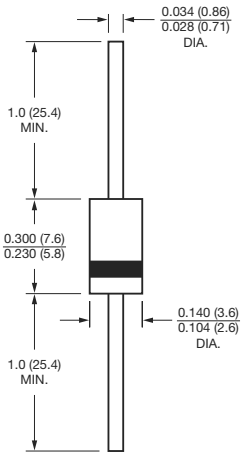


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88543
Revision: 20-Jan-11

Standard Avalanche SMD Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Controlled avalanche characteristics
- Glass passivated junction
- Low reverse current
- High surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	200 V to 1600 V
I_{FSM}	30 A
I_R	1.0 µA
V_F	1.15 V
E_R	20 mJ
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, automotive grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Note

- BYG10Y for commercial grade only

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	UNIT
Device marking code		BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	1600	V
Average forward current	$I_{F(AV)}$	1.5						A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30						A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R}$ = 1 A, T_J = 25 °C (for BYG10D thru BYG10M)	E_R	20						mJ
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	UNIT
Maximum instantaneous forward voltage (1)	I_F = 1 A	T_J = 25 °C	V_F	1.1						V
	I_F = 1.5 A			1.15						
Maximum DC reverse current	$V_R = V_{RRM}$	T_J = 25 °C	I_R	1						µA
		T_J = 100 °C		10						
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	4						µs

Note

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	UNIT
Typical thermal resistance, junction to lead	$R_{\theta JL}$	25						°C/W
Typical thermal resistance, junction to ambient	$R_{\theta JA}$ (1)	150						°C/W
	$R_{\theta JA}$ (2)	125						
	$R_{\theta JA}$ (3)	100						

Notes

(1) Mounted on epoxy-glass hard tissue

(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu

(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 35 µm Cu

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BYG10D-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG10D-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG10DHE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel
BYG10DHE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel

Note

(1) Automotive grade

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

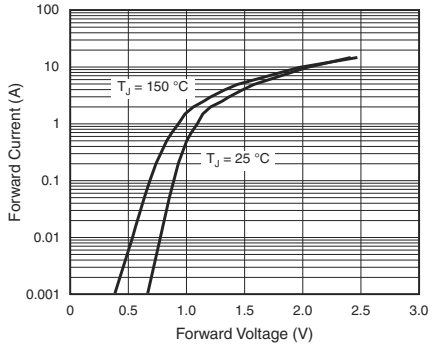


Fig. 1 - Forward Current vs. Forward Voltage

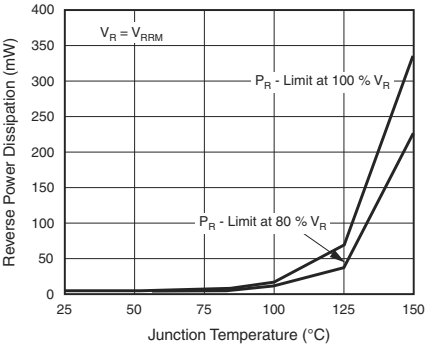


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

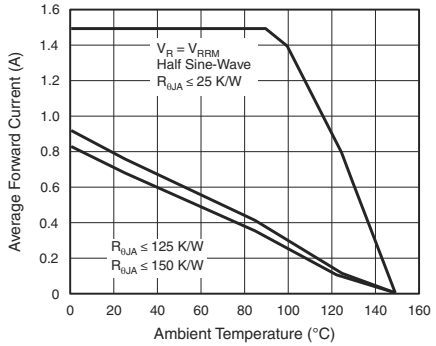


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

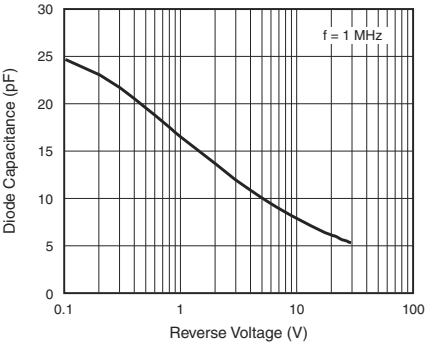


Fig. 5 - Diode Capacitance vs. Reverse Voltage

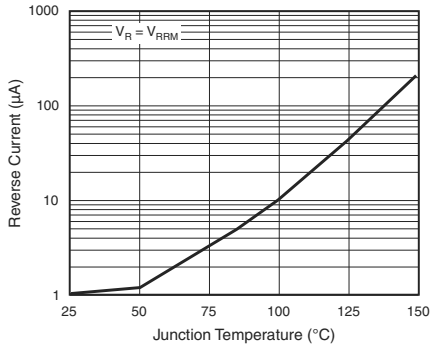


Fig. 3 - Reverse Current vs. Junction Temperature

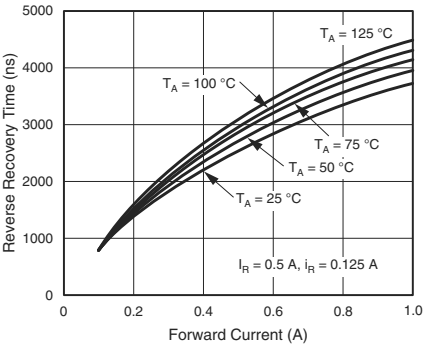


Fig. 6 - Reverse Recovery Time vs. Forward Current

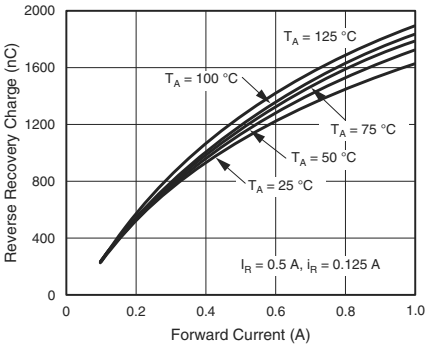
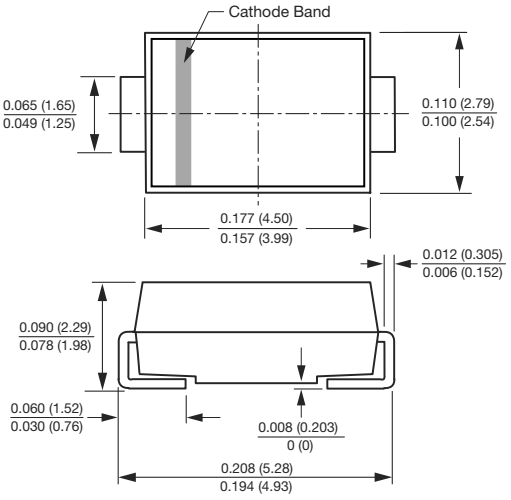


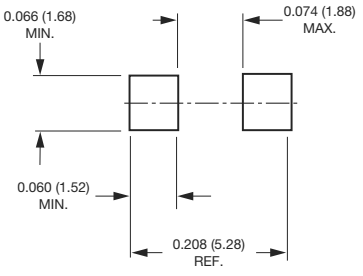
Fig. 7 - Reverse Recovery Charge vs. Forward Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Miniature Clamper/Damper Glass Passivated Rectifier

DO-204AC (DO-15)

FEATURES

- Superectifier structure
- Cavity-free glass passivated junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage rectification of power supplies, inverters, converters and freewheeling diodes specially designed for clamping circuits, horizontal deflection systems and damper applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	1400 V, 1500 V
I_{FSM}	40 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	CGP15	DGP15	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1400	1500	V
Maximum RMS voltage	V_{RMS}	980	1050	V
Maximum DC blocking voltage	V_{DC}	1400	1500	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 50 °C	$I_{F(AV)}$	1.5		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40		A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 100 °C	$I_{R(AV)}$	50		µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**CGP15**	**DGP15**	**UNIT**
Maximum instantaneous forward voltage	I_F = 1.0 A		V_F (1)	1.1		V
Maximum reverse current	Rated V_R	T_A = 25 °C	I_R	5.0		µA
		T_A = 100 °C		100		
Maximum reverse recovery time	I_F = 0.5 A, I_R = 50 mA		t_{rr}	15	20	µs
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	typical	t_{rr}	1.0		µs
		maximum		1.5		
Typical junction capacitance	4.0 V, 1 MHz		C_J	15		pF

Note

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**CGP15**	**DGP15**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55		°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
CGP15-E3/54	0.425	54	4000	13" diameter paper tape and reel
CGP15-E3/73	0.425	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

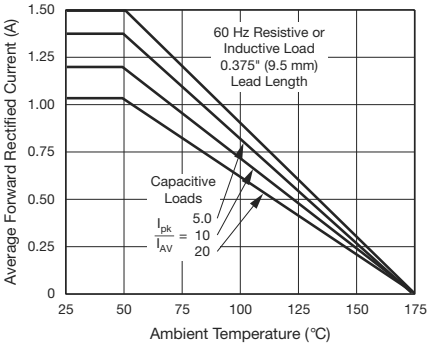


Fig. 1 - Forward Current Derating Curve

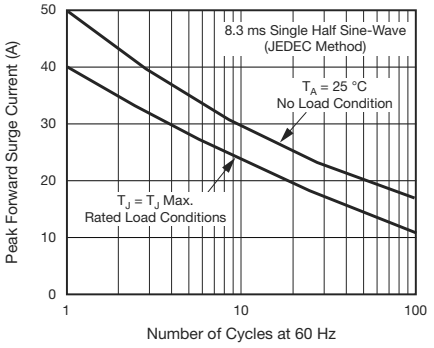


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

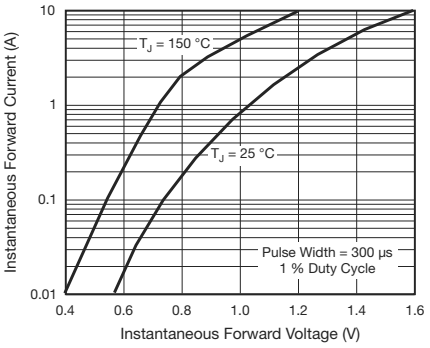


Fig. 3 - Typical Instantaneous Forward Characteristics

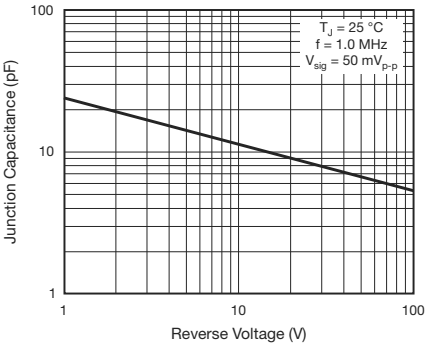


Fig. 5 - Typical Junction Capacitance

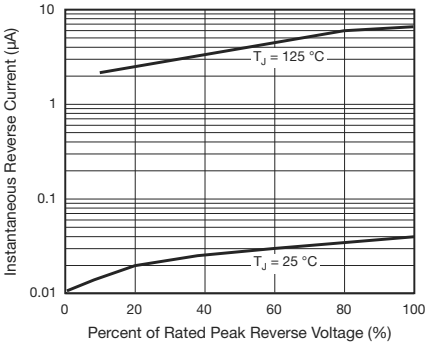
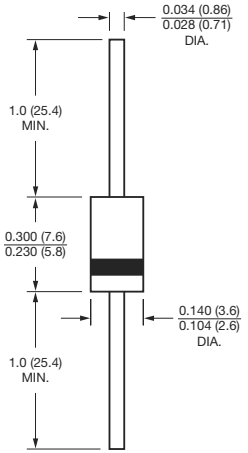


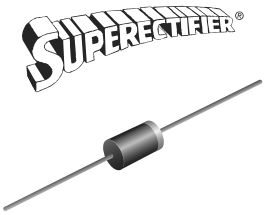
Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Glass Passivated Junction Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for both consumer and automotive applications.

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GP15A	GP15B	GP15D	GP15G	GP15J	GP15K	GP15M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	1.5							A
Peak forward surge current 8.3 ms single half-sine wave superimposed on rated load	I_{FSM}	50							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Document Number: 88638
Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	GP15A	GP15B	GP15D	GP15G	GP15J	GP15K	GP15M	UNIT
Maximum instantaneous forward voltage	1.5 A		V_F	1.1							V
Maximum reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							μA
		T_A = 150 °C		200							
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 V, I_{rr} = 0.25 A		t_{rr}	3.5							μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	15							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	GP15A	GP15B	GP15D	GP15G	GP15J	GP15K	GP15M	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	45							°C/W
	$R_{\theta JL}$ (1)	20							

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GP15J-E3/54	0.425	54	4000	13" diameter paper tape and reel
GP15J-E3/73	0.425	73	2000	Ammo pack packaging
GP15JHE3/54 (1)	0.425	54	4000	13" diameter paper tape and reel
GP15JHE3/73 (1)	0.425	73	2000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

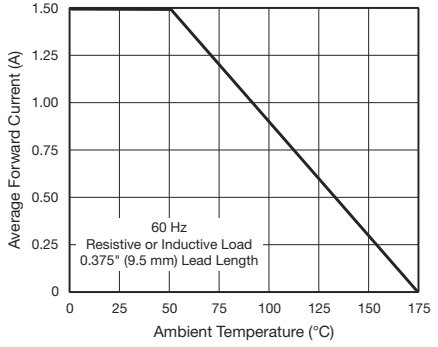


Fig. 1 - Forward Current Derating Curve

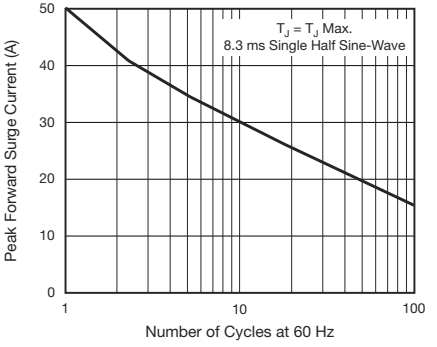


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

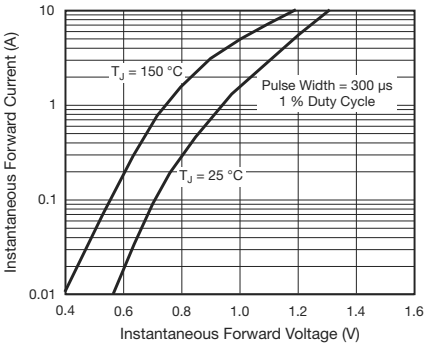


Fig. 3 - Typical Instantaneous Forward Characteristics

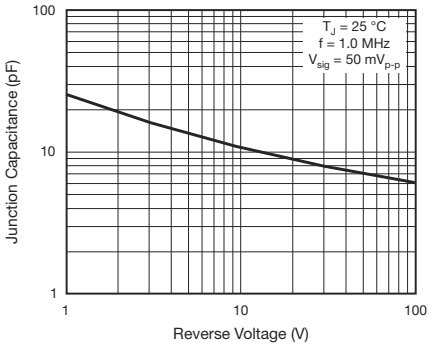


Fig. 5 - Typical Junction Capacitance

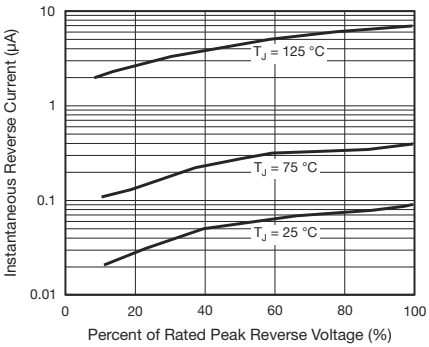


Fig. 4 - Typical Reverse Characteristics

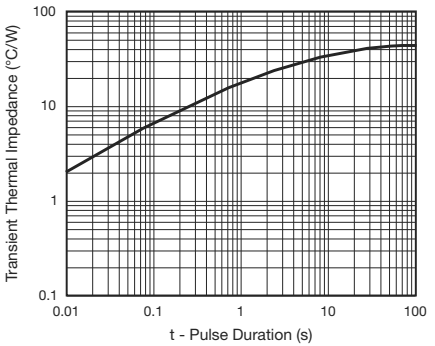
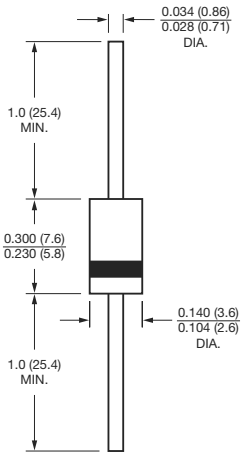


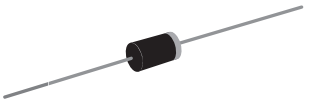
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Glass Passivated Junction Plastic Rectifiers



DO-204AC (DO-15)

FEATURES

- Glass passivated chip junction
- Ideal for printed circuit boards
- Low forward voltage drop
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectifier of power supply, inverters, freewheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: DO-204AC (DO-15), molded epoxy over passivated chip

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
V_F	0.95 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GPP15A	GPP15B	GPP15D	GPP15G	GPP15J	GPP15K	GPP15M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length at T_A = 50 °C	$I_{F(AV)}$	1.5							A
Peak forward surge current 8.3 ms single sine-wave superimposed on rated load	I_{FSM}	50							A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	GPP15A	GPP15B	GPP15D	GPP15G	GPP15J	GPP15K	GPP15M	UNIT
Maximum instantaneous forward voltage	1.5 A	T_J = 25 °C T_J = 125 °C	V_F	1.1 0.95							V
Maximum DC reverse current at rated DC blocking voltage		T_J = 25 °C T_J = 125 °C	I_R	5.0 100							µA
Typical junction capacitance	4.0 V, 1 MHz		C_J	8							pF

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	GPP15A	GPP15B	GPP15D	GPP15G	GPP15J	GPP15K	GPP15M	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$	50							°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GPP15J-E3/54	0.35	54	4000	13" diameter paper tape and reel
GPP15J-E3/73	0.35	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

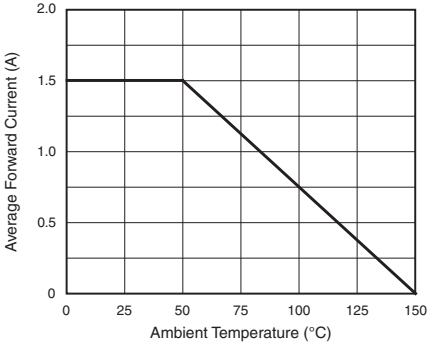


Figure 1. Forward Current Derating Curve

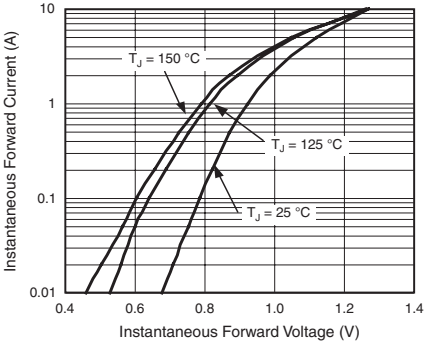


Figure 3. Typical Instantaneous Forward Characteristics

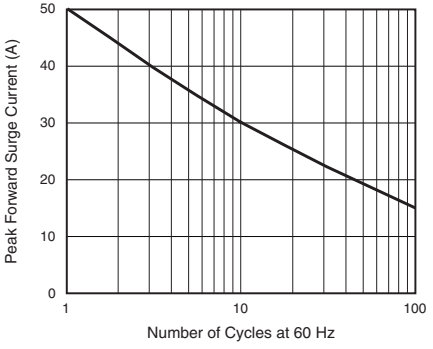


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

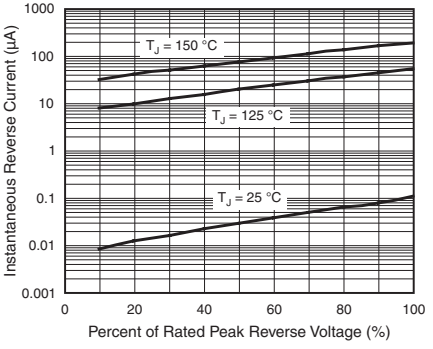


Figure 4. Typical Reverse Characteristics

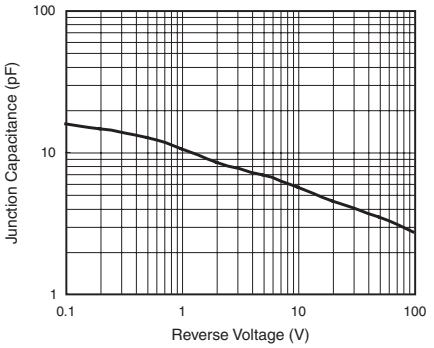


Figure 5. Typical Junction Capacitance

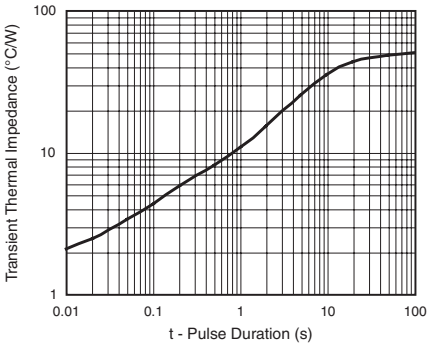
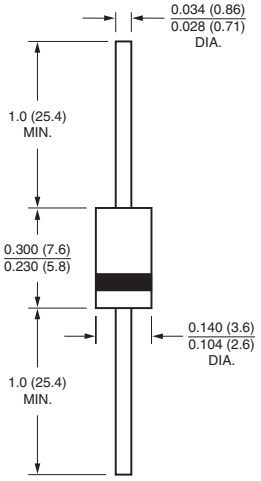


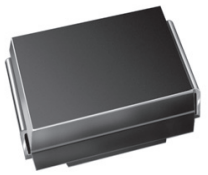
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Surface Mount Glass Passivated Rectifier



DO-214AA (SMB)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	1.0 µA
V_F	1.15 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S2A	S2B	S2D	S2G	S2J	S2K	S2M	UNIT
Device marking code		SA	SB	SD	SG	SJ	SK	SM	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_L= 100 °C	$I_{F(AV)}$	1.5							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50							A
Operating and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88712
Revision: 08-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS	SYMBOL	S2A	S2B	S2D	S2G	S2J	S2K	S2M	UNIT
Maximum instantaneous forward voltage	1.5 A	V_F	1.15							V
Maximum DC reverse current at rated DC blocking voltage	T_A= 25 °C T_A= 125 °C	I_R	1.0 125							µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	2.0							µs
Typical junction capacitance	4.0 V, 1 MHz	C_J	16							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	S2A	S2B	S2D	S2G	S2J	S2K	S2M	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	53 16							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.3 x 0.3" (8.0 x 8.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	REFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S2J-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
S2J-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
S2JHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
S2JHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

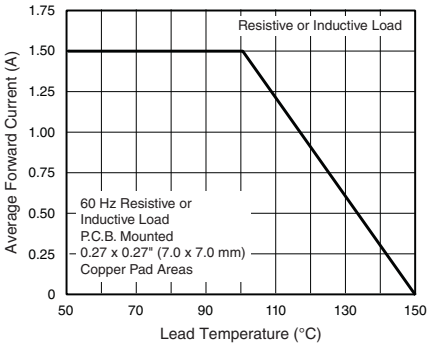


Figure 1. Forward Current Derating Curve

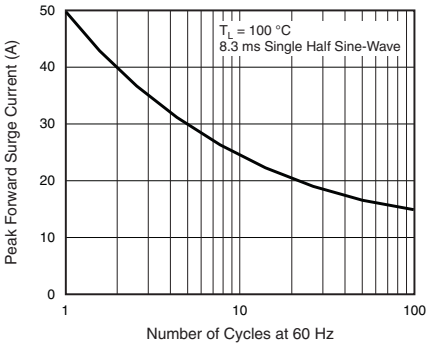


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

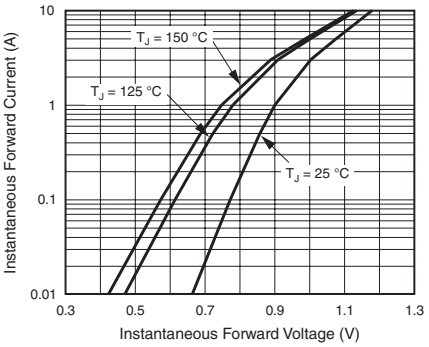


Figure 3. Typical Instantaneous Forward Characteristics

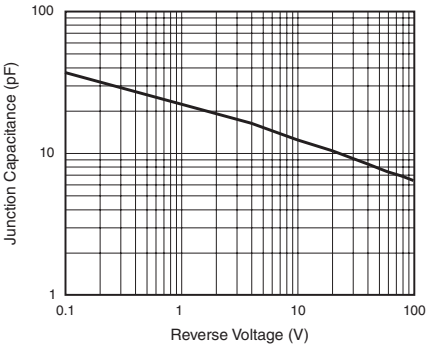


Figure 5. Typical Junction Capacitance

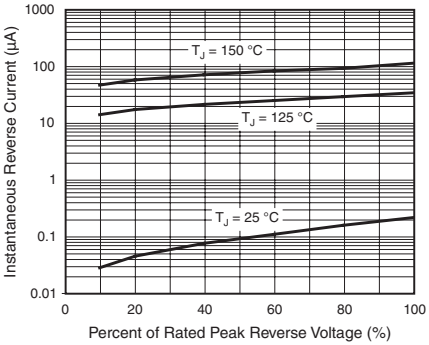


Figure 4. Typical Reverse Characteristics

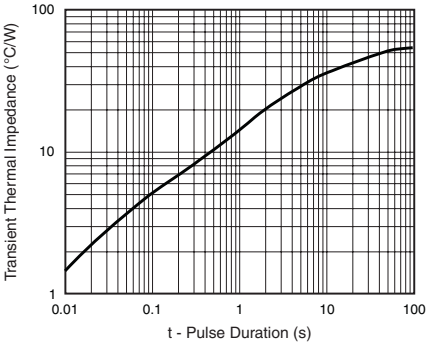
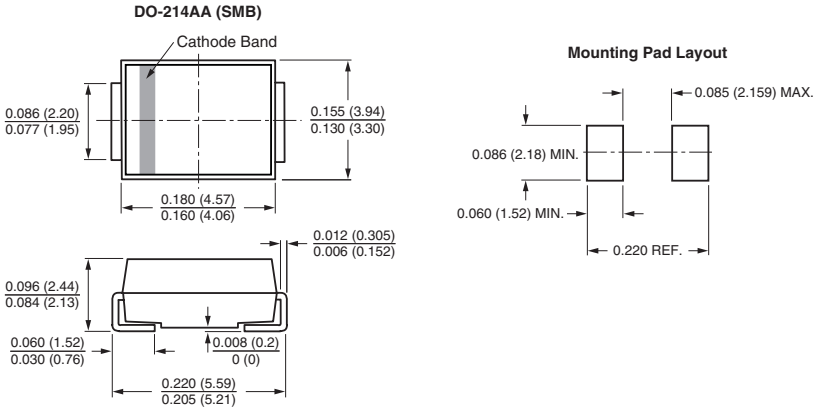


Figure 6. Typical Transient Thermal Impedance

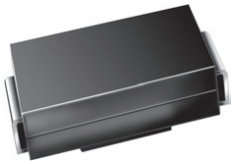
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



SA2B thru SA2M

Vishay General Semiconductor

Surface Mount Glass-Passivated Recitifiers



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer and telecommunication.

MECHANICAL DATA

Case: DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	100 V to 1000 V
I_{FSM}	55 A
I_R	3.0 µA
V_F at I_F = 2.0 A	0.854 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SA2B	SA2D	SA2G	SA2J	SA2K	SA2M	UNIT
Device marking code		2B	2D	2G	2J	2K	2M	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	800	1000	V
Average forward current	$I_{F(AV)}$	2.0						A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	55						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage (1)	I_F = 1.0 A I_F = 2.0 A	T_J = 25 °C	V_F	0.911 0.954	- 1.1	V
	I_F = 1.0 A I_F = 2.0 A	T_J = 125 °C		0.805 0.854	- 0.95	
Reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	0.19 28	3 90	µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	1.5	-	µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	11	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**SA2B**	**SA2D**	**SA2G**	**SA2J**	**SA2K**	**SA2M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	80 12						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead, P.C.B. mounted on 0.79 x 0.79" (20 x 20 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SA2J-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
SA2J-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

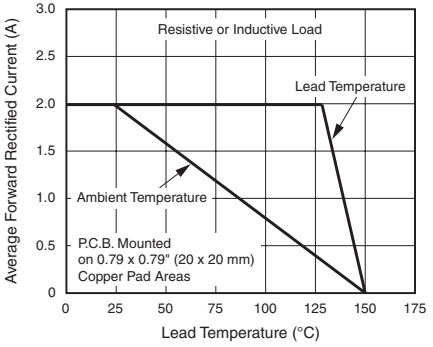


Figure 1. Maximum Forward Current Derating Curve

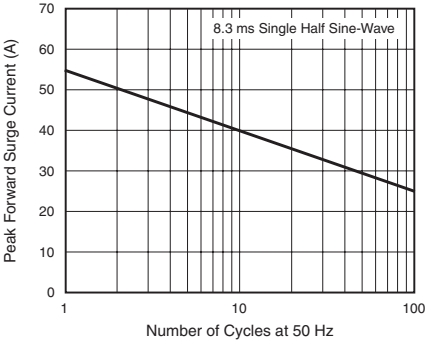


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

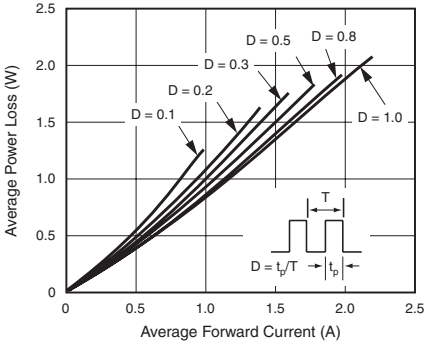


Figure 2. Forward Power Loss Characteristics

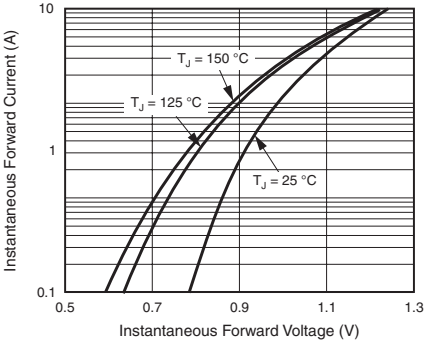


Figure 4. Typical Instantaneous Forward Characteristics

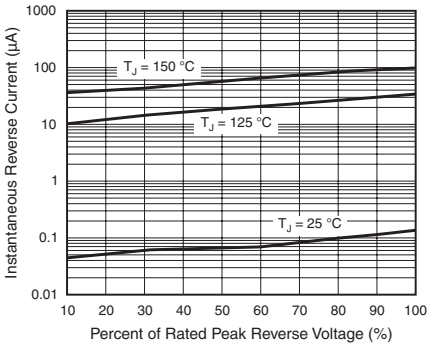


Figure 5. Typical Reverse Leakage Characteristics

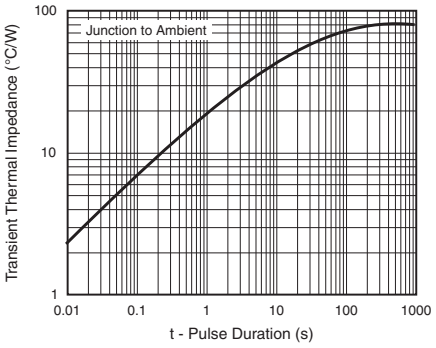


Figure 7. Typical Transient Thermal Impedance

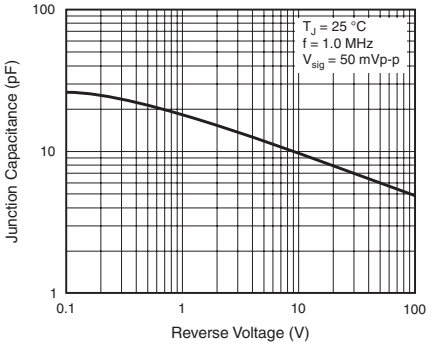
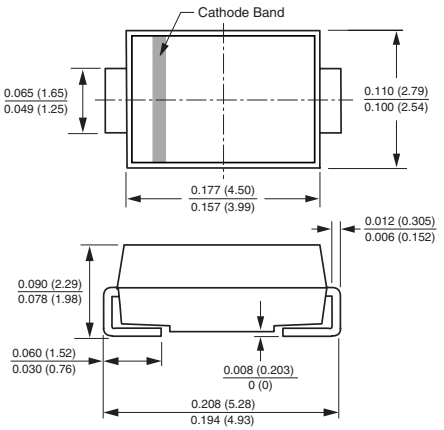


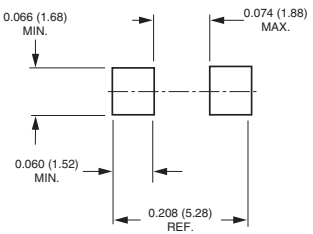
Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



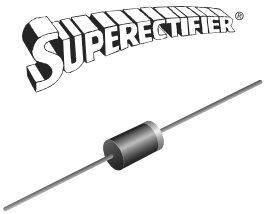
Mounting Pad Layout



CGP20, DGP20

Vishay General Semiconductor

Miniature Clamper/Damper Glass Passivated Rectifier



DO-204AC (DO-15)

FEATURES

- Superectifier structure
- Cavity-free glass passivated junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage rectification of power supplies, inverters, converters and freewheeling diodes specially designed for clamping circuits, horizontal deflection systems and damper applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	1400 V, 1500 V
I_{FSM}	40 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	CGP20	DGP20	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1400	1500	V
Maximum RMS voltage	V_{RMS}	980	1050	V
Maximum DC blocking voltage	V_{DC}	1400	1500	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 50 °C	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	40		A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 100 °C	$I_{R(AV)}$	200		µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88568
Revision: 14-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**CGP20**	**DGP20**	**UNIT**
Maximum instantaneous forward voltage	I_F = 2.0 A		V_F (1)	1.1		V
Maximum reverse current	Rated V_R	T_A = 25 °C	I_R	5.0		µA
		T_A = 100 °C		100		
Maximum reverse recovery time	I_F = 0.5 A, I_R = 50 mA		t_{rr}	15	20	µs
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	typical	t_{rr}	1.0		µs
		maximum		1.5		
Typical junction capacitance	4.0 V, 1 MHz		C_J	15		pF

Note

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**CGP20**	**DGP20**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55		°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
CGP20-E3/54	0.425	54	4000	13" diameter paper tape and reel
CGP20-E3/73	0.425	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

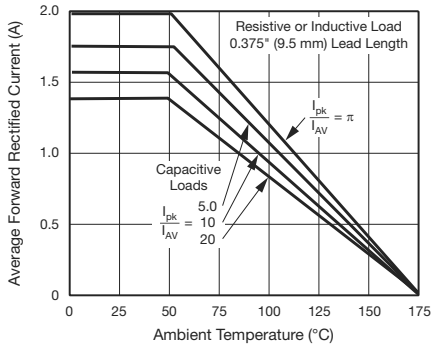


Fig. 1 - Forward Current Derating Curve

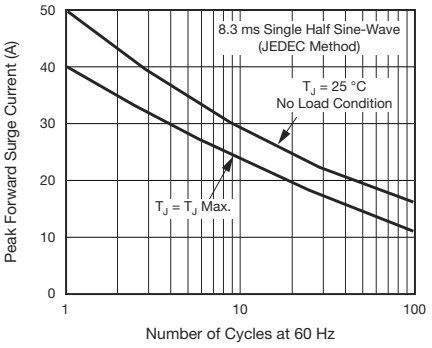


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

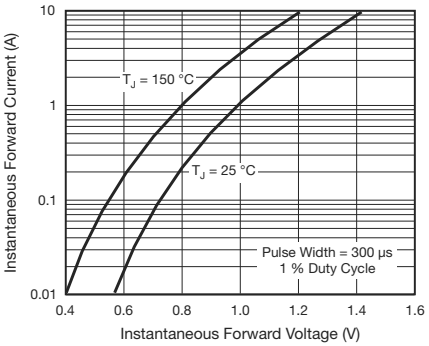


Fig. 3 - Typical Instantaneous Forward Characteristics

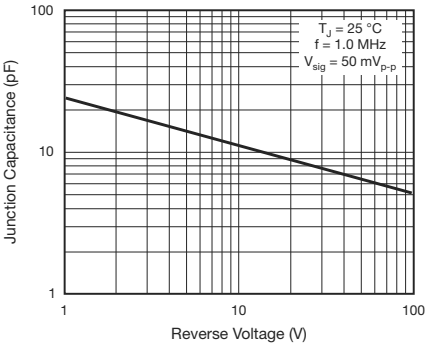


Fig. 5 - Typical Junction Capacitance

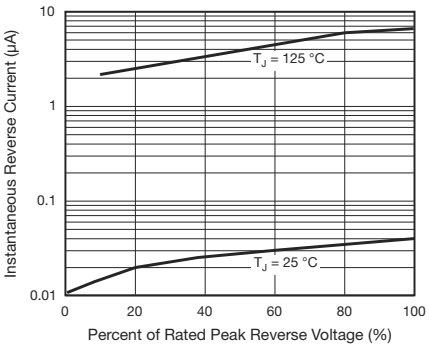
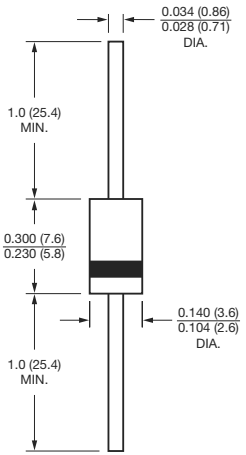


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)

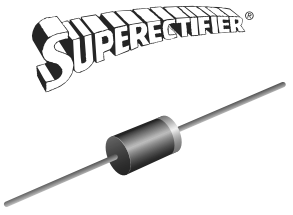


VISHAY

GP20A thru GP20J

Vishay General Semiconductor

Glass Passivated Junction Rectifier



GP20

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 600 V
I_{FSM}	65 A
V_F	1.2 V, 1.1 V
I_R	5.0 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for both consumer and automotive applications.

MECHANICAL DATA

Case: GP20, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GP20A	GP20B	GP20D	GP20G	GP20J	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	2.0					A
Peak forward surge current 8.3 ms single half sine wave superimposedon rated load	I_{FSM}	65					A
Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100					µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GP20A**	**GP20B**	**GP20D**	**GP20G**	**GP20J**	**UNIT**
Maximum instantaneous forward voltage	2.0 A		V_F	1.2		1.1			V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	5.0					µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	40					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**GP20A**	**GP20B**	**GP20D**	**GP20G**	**GP20J**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	25					°C/W
	$R_{\theta JL}$ (1)	10					

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GP20J-E3/54	1.013	54	1400	13" diameter paper tape and reel
GP20J-E3/73	1.013	73	1000	Ammo pack packaging
GP20JHE3/54 (1)	1.013	54	1400	13" diameter paper tape and reel
GP20JHE3/73 (1)	1.013	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

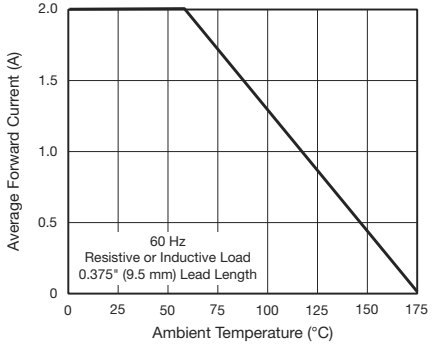


Fig. 1 - Forward Current Derating Curve

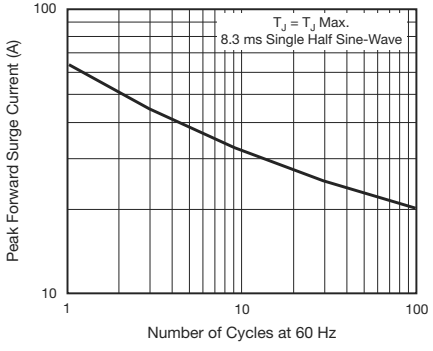


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

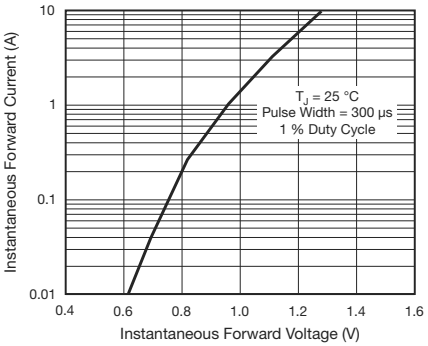


Fig. 3 - Typical Instantaneous Forward Characteristics

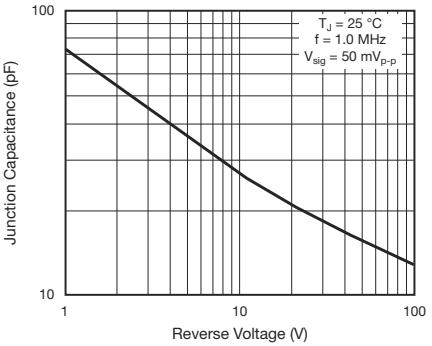


Fig. 5 - Typical Junction Capacitance

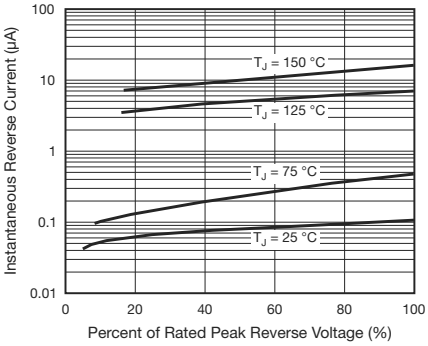


Fig. 4 - Typical Reverse Characteristics

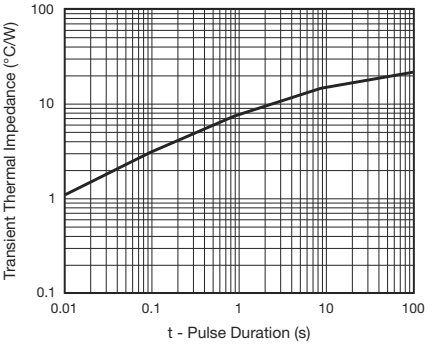
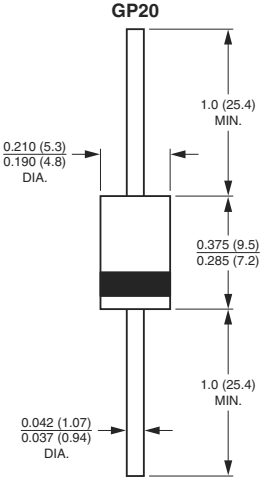


Fig. 6 - Typical Transient Thermal Impedance

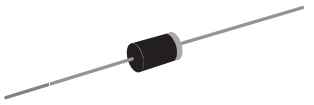
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



GPP20A thru GPP20M

Vishay General Semiconductor

Glass Passivated Junction Rectifier



DO-204AC (DO-15)

FEATURES

- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	70 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-204AC, molded epoxy over passivated chip

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GPP20A	GPP20B	GPP20D	GPP20G	GPP20J	GPP20K	GPP20M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	2.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	70							A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88642
Revision: 30-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GPP20A**	**GPP20B**	**GPP20D**	**GPP20G**	**GPP20J**	**GPP20K**	**GPP20M**	**UNIT**
Maximum instantaneous forward voltage	2.0 A		V_F	1.1							V
Maximum reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 50							µA
Maximum junction capacitance	4.0 V, 1 MHz		C_J	12							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**GPP20A**	**GPP20B**	**GPP20D**	**GPP20G**	**GPP20J**	**GPP20K**	**GPP20M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	25 20							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GPP20J-E3/54	0.417	54	4000	13" diameter paper tape and reel
GPP20J-E3/73	0.417	73	2000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

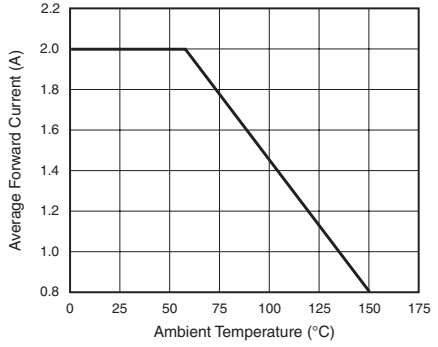


Figure 1. Forward Current Derating Curve

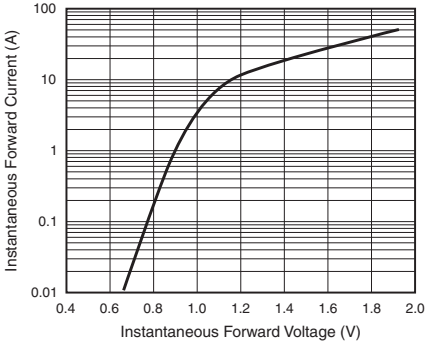


Figure 2. Typical Instantaneous Forward Characteristics

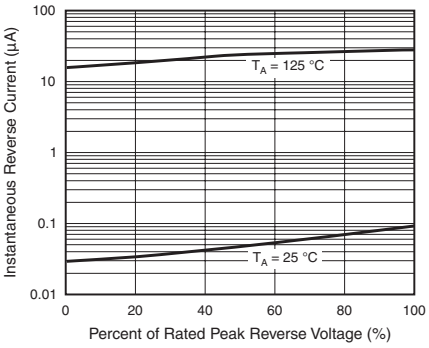


Figure 3. Typical Reverse Characteristics

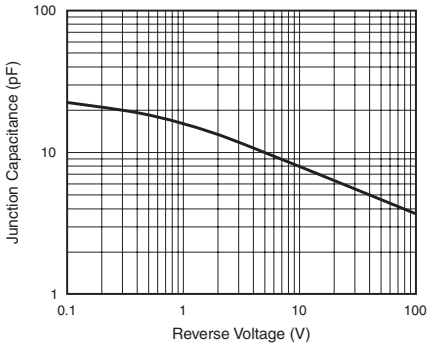
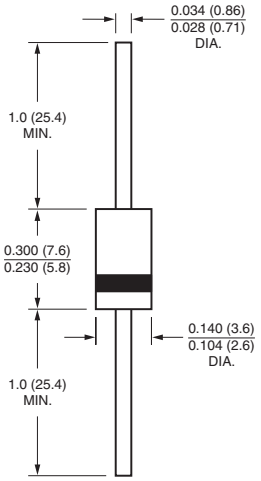


Figure 4. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AC (DO-15)



Clamper/Damper Glass Passivated Rectifier

DO-201AD

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 **RoHS** COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.5 A
V_{RRM}	1500 V
I_{FSM}	50 A
I_R	5.0 µA
V_F	1.6 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in high voltage rectification of power supplies, inverters, converters and freewheeling diodes specially designed for clamping circuits, horizontal deflection systems and damper applications.

MECHANICAL DATA

Case: DO-201AD, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BY228GP	UNIT
Maximum non repetitive peak reverse voltage	V_{RSM}	1650	V
Maximum repetitive peak reverse voltage	V_{RRM}	1500	V
Maximum RMS voltage	V_{RMS}	1050	V
Maximum DC blocking voltage	V_{DC}	1500	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 50 °C	$I_{F(AV)}$	2.5	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50	A
Working peak forward current at T_A = 75 °C	I_{FWM}	5.0	A
Peak repetitive forward surge current at T_A = 75 °C	I_{FRM}	10	A
Operating junction temperature range	T_J	- 65 to + 150	°C
Storage temperature range	T_{STG}	- 65 to + 200	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**BY228GP**	**UNIT**
Maximum instantaneous forward voltage	I_F = 2.5 A		V_F (1)	1.6	V
Maximum reverse current	V_R = 1500 V	T_A = 25 °C	I_R	5.0	µA
		T_J = 140 °C		200	
Maximum reverse recovery time	I_F = 1.0 A, I_R = 50 mA, dI/dt = 50 mA/µs		t_{rr}	20	µs
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	typical	t_{rr}	0.5	µs
		maximum		2.0	
Maximum forward recovery time	I_F = 5.0 A with t_r = 0.1 µs		t_{fr}	1.0	µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	40	pF

Note
(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**BY228GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	20	°C/W

Note
(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BY228GP-E3/54	1.28	54	1400	13" diameter paper tape and reel
BY228GP-E3/73	1.28	73	1000	Ammo pack packaging
BY228GPHE3/54 (1)	1.28	54	1400	13" diameter paper tape and reel
BY228GPHE3/73 (1)	1.28	73	1000	Ammo pack packaging

Note
(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

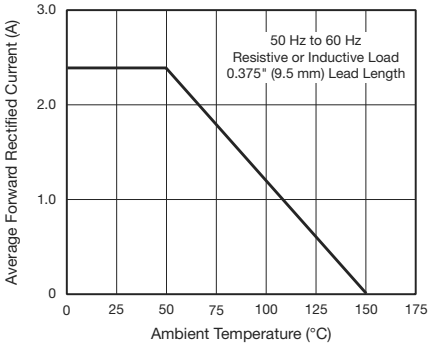


Fig. 1 - Forward Current Derating Curve

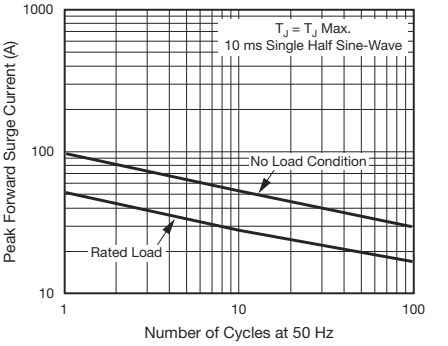


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
Document Number: 88539
Revision: 20-Jan-11

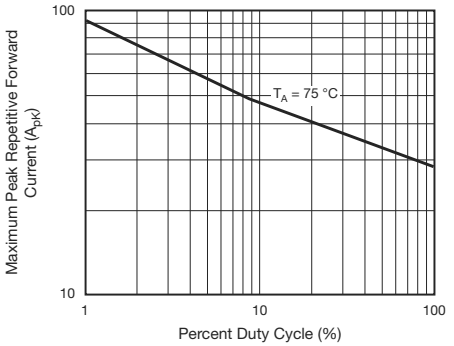


Fig. 3 - Maximum Peak Repetitive Forward Surge Current

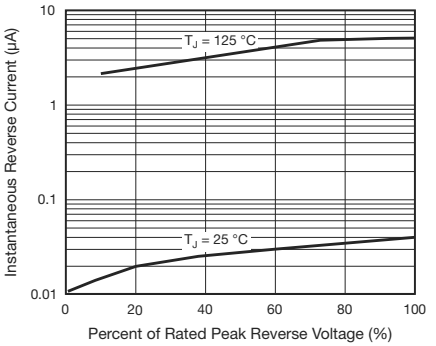


Fig. 5 - Typical Reverse Characteristics

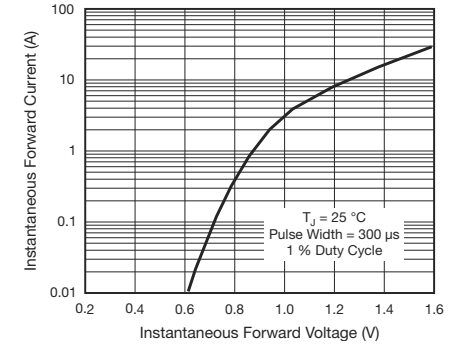


Fig. 4 - Typical Instantaneous Forward Characteristics

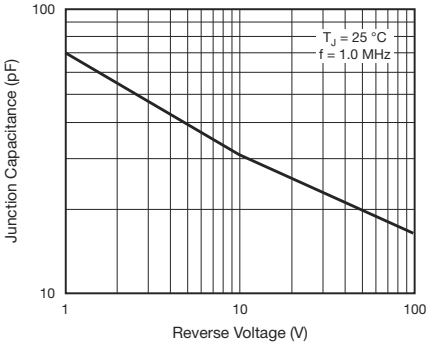
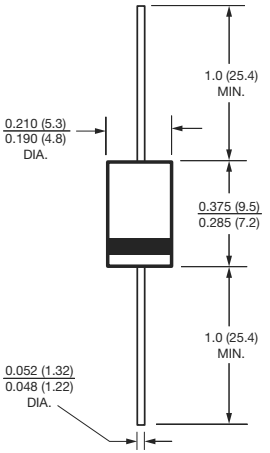


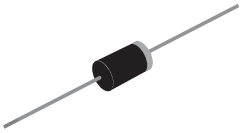
Fig. 6 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



General Purpose Plastic Rectifier



DO-201AD

FEATURES

- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL-94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	200 A
I_R	5.0 µA
V_F	1.2 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	1N5400	1N5401	1N5402	1N5403	1N5404	1N5405	1N5406	1N5407	1N5408	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	300	400	500	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	210	280	350	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	300	400	500	600	800	1000	V
Maximum average forward rectified current 0.5" (12.5 mm) lead length at T_L = 105 °C	$I_{F(AV)}$	3.0									A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200									A
Maximum full load reverse current, full cycle average 0.5" (12.5 mm) lead length at T_L = 105 °C	$I_{R(AV)}$	500									µA
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150									°C

For technical questions within your region, please contact one of the following:
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Document Number: 88516
Revision: 02-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)												
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**1N5400**	**1N5401**	**1N5402**	**1N5403**	**1N5404**	**1N5405**	**1N5406**	**1N5407**	**1N5408**	**UNIT**
Maximum instantaneous forward voltage	3.0 A	V_F	1.2									V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C T_A = 150 °C	I_R	5.0 500									µA
Typical junction capacitance	4.0 V, 1 MHz	C_J	30									pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**SYMBOL**	**1N5400**	**1N5401**	**1N5402**	**1N5403**	**1N5404**	**1N5405**	**1N5406**	**1N5407**	**1N5408**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$	20									°C/W

Note:

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, P.C.B. mounted with 0.8 x 0.8" (20 x 20 mm) copper heatsinks

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N5404-E3/54	1.1	54	1400	13" diameter paper tape and reel
1N5404-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

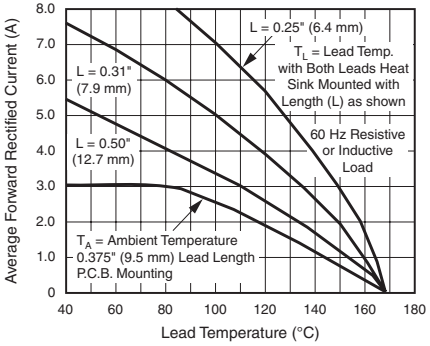


Figure 1. Forward Current Derating Curve

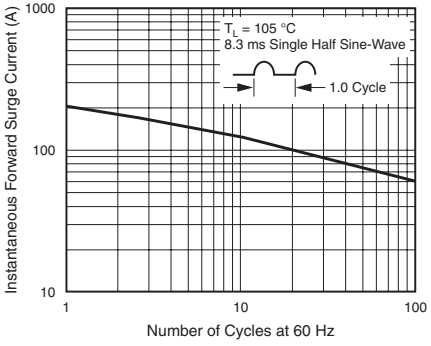


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

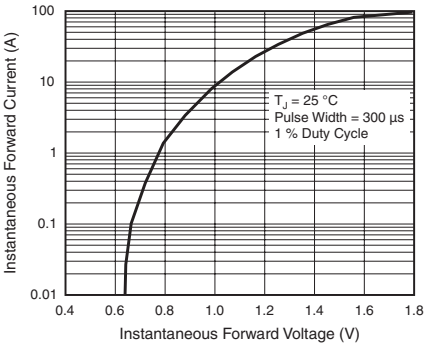


Figure 3. Typical Instantaneous Forward Characteristics

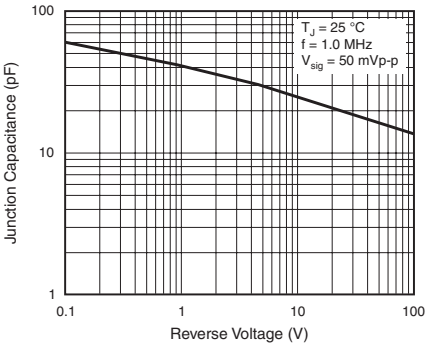


Figure 5. Typical Junction Capacitance

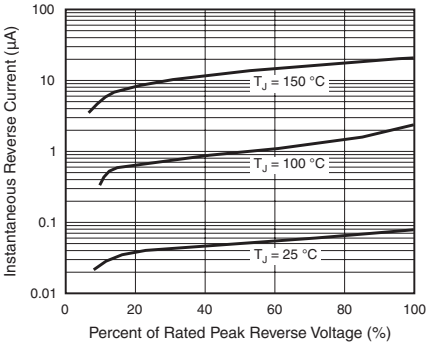


Figure 4. Typical Reverse Characteristics

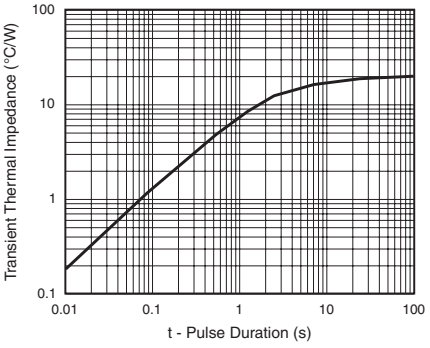
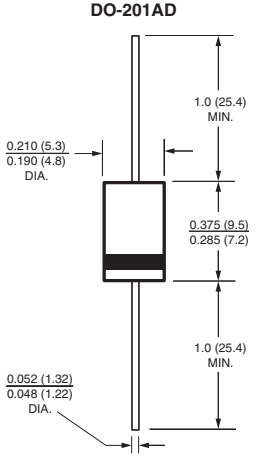


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Glass Passivated Junction Rectifier

DO-201AD

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	125 A
I_R	5.0 µA
V_F	0.95 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-201AD, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted) (1)

PARAMETER	SYMBOL	1N5624GP	1N5625GP	1N5626GP	1N5627GP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 70 °C	$I_{F(AV)}$	3.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125				A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 70 °C	$I_{R(AV)}$	200				µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				°C

Note

(1) JEDEC registered values

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**1N5624GP**	**1N5625GP**	**1N5626GP**	**1N5627GP**	**UNIT**
Maximum instantaneous forward voltage	3.0 A	T_A = 25 °C	V_F (1)(2)	1.0				V
		T_A = 70 °C		0.95				
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0				µA
		T_A = 150 °C		300		200		
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	3.0				µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	40				pF

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**1N5624GP**	**1N5625GP**	**1N5626GP**	**1N5627GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	20				°C/W

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
1N5626GP-E3/54	1.28	54	1400	13" diameter paper tape and reel
1N5626GP-E3/73	1.28	73	1000	Ammo pack packaging
1N5626GPHE3/54 (1)	1.28	54	1400	13" diameter paper tape and reel
1N5626GPHE3/73 (1)	1.28	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

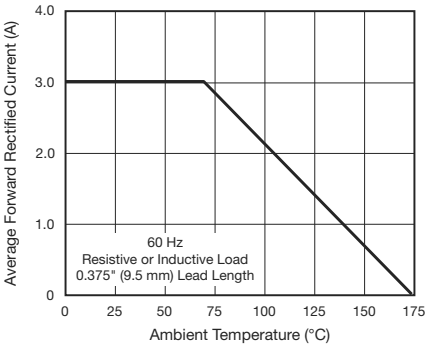


Fig. 1 - Forward Current Derating Curve

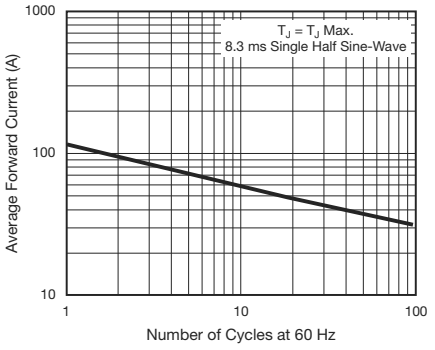


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

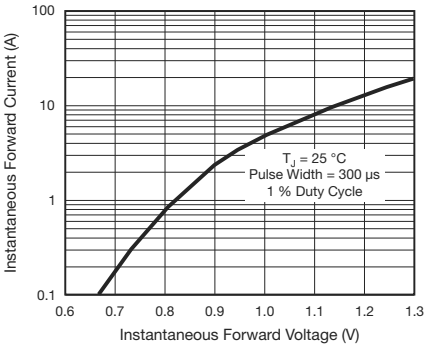


Fig. 3 - Typical Instantaneous Forward Characteristics

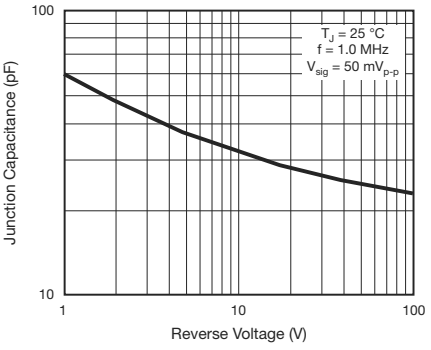


Fig. 5 - Typical Junction Capacitance

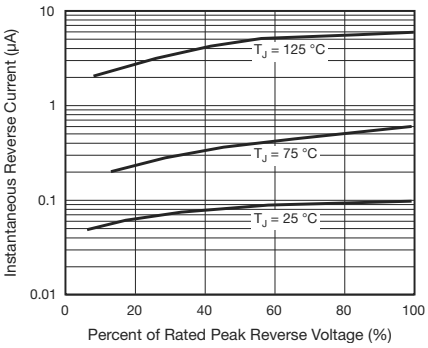
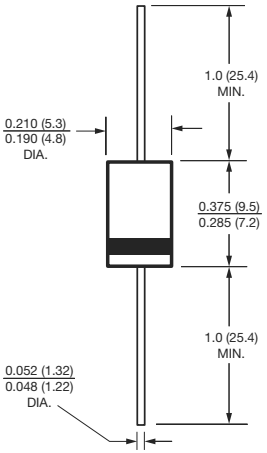


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



Glass Passivated Junction Plastic Rectifier

DO-201AD

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	200 V to 1300 V
I_{FSM}	100 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-201AD, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BY251GP	BY252GP	BY253GP	BY254GP	BY255GP	UNIT
Maximum non repetitive peak reverse voltage	V_{RSM}	220	440	660	880	1430	V
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1300	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	910	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1300	V
Maximum average forward rectified current 10 mm lead length at T_A = 55 °C	$I_{F(AV)}$	3.0					A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	100					A
Maximum full load reverse current, full cycle average 10 mm lead length at T_A = 55 °C	$I_{R(AV)}$	100					µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175					°C

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Document Number: 88541
Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	BY251GP	BY252GP	BY253GP	BY254GP	BY255GP	UNIT
Maximum instantaneous forward voltage	3.0 A		V_F	1.1					V
Maximum reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0					µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 V, I_{rr} = 0.25 A		t_{rr}	3.0					µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	40					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	BY251GP	BY252GP	BY253GP	BY254GP	BY255GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	20					°C/W
	$R_{\theta JL}$ (1)	10					

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BY253GP-E3/54	1.28	54	1400	13" diameter paper tape and reel
BY253GP-E3/73	1.28	73	1000	Ammo pack packaging
BY253GPHE3/54 (1)	1.28	54	1400	13" diameter paper tape and reel
BY253GPHE3/73 (1)	1.28	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

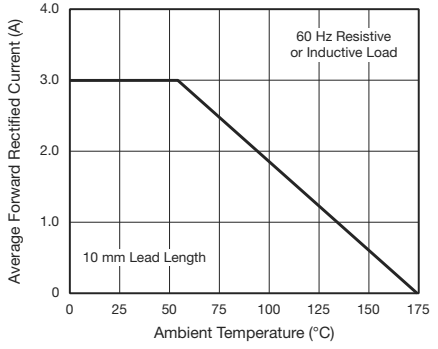


Fig. 1 - Forward Current Derating Curve

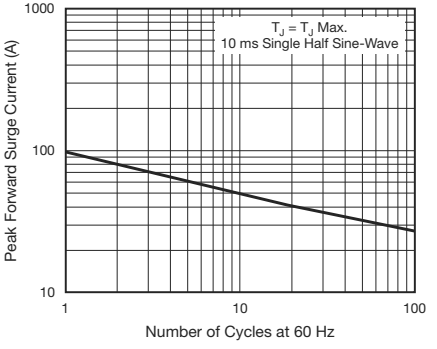


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

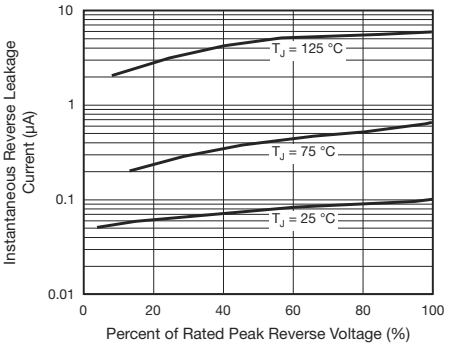


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

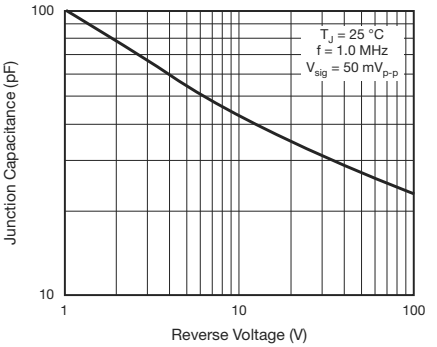


Fig. 5 - Typical Junction Capacitance

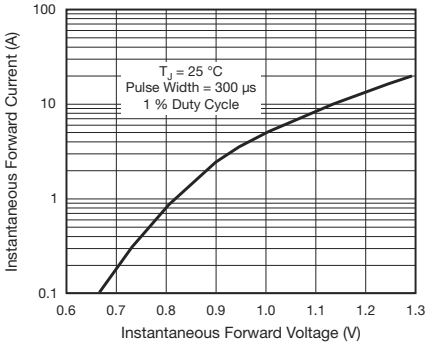
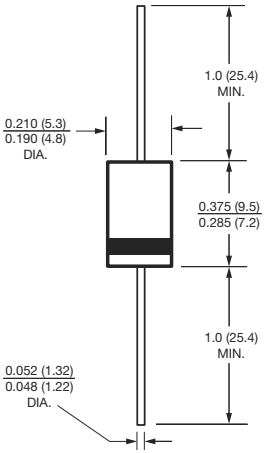


Fig. 4 - Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



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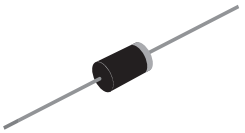
Revision: 20-Jan-11

General Purpose Plastic Rectifier



DO-201AD

FEATURES

- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	200 V to 1300 V
I_{FSM}	150 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BY251P	BY252P	BY253P	BY254P	BY255P	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1300	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	910	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	1300	V
Maximum average forward rectified current 10 mm lead length	$I_{F(AV)}$	3.0					A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	150					A
Maximum full load reverse current, full cycle average 10 mm lead length	$I_{R(AV)}$	100					µA
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**BY251P**	**BY252P**	**BY253P**	**BY254P**	**BY255P**	**UNIT**
Maximum instantaneous forward voltage	3.0 A	V_F	1.1					V
Maximum reverse current at rated DC blocking voltage	T_A = 25 °C	I_R	5.0					µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 V, I_{rr} = 0.25 A	t_{rr}	3.0					µs
Typical junction capacitance	4.0 V, 1 MHz	C_J	40					pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**BY251P**	**BY252P**	**BY253P**	**BY254P**	**BY255P**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	20 10					°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BY253P-E3/54	1.1	54	1400	13" diameter paper tape and reel
BY253P-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

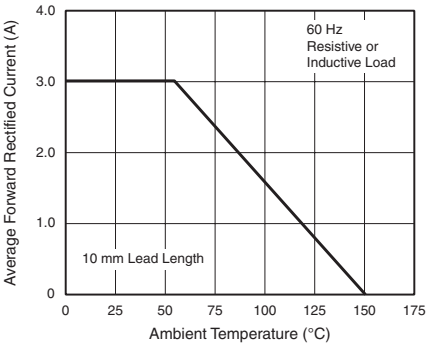


Figure 1. Forward Current Derating Curve

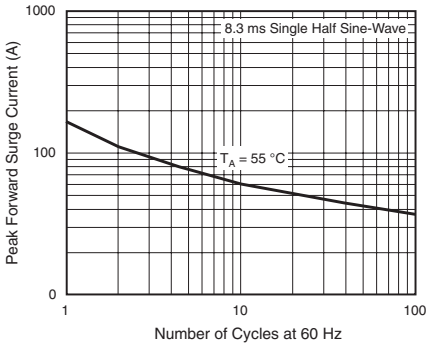


Figure 2. Maximum Non-repetitive Peak Forward Surge Current

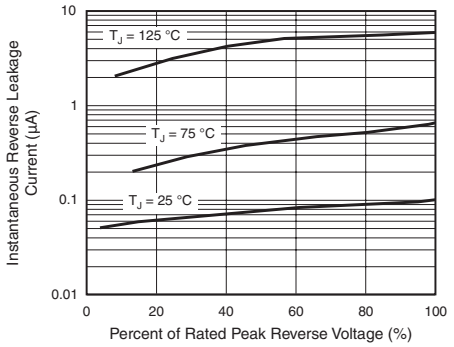


Figure 3. Maximum Non-repetitive Peak Forward Surge Current

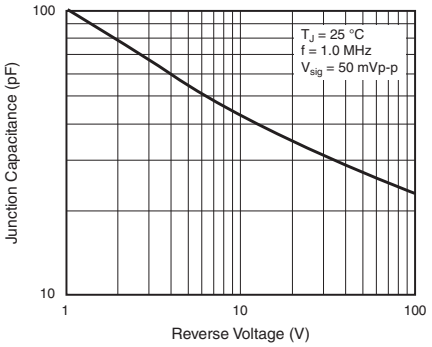


Figure 5. Typical Junction Capacitance

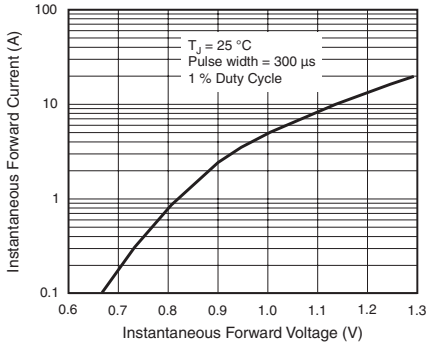
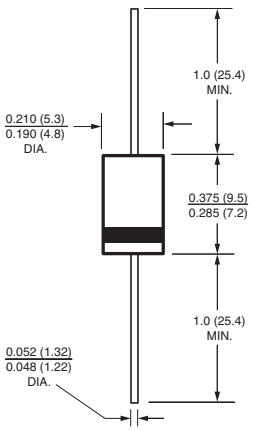


Figure 4. Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



Clamper/Damper Glass Passivated Rectifier

DO-201AD

FEATURES

- Superectifier structure
- Cavity-free glass passivated junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in high voltage rectification of power supplies, inverters, converters and freewheeling diodes specially designed for clamping circuits, horizontal deflection systems and damper applications.

MECHANICAL DATA

Case: DO-201AD, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	1400 V, 1500 V
I_{FSM}	100 A
I_R	5.0 µA
V_F	1.2 V
T_J max.	175 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	CGP30	DGP30	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	1400	1500	V
Maximum RMS voltage	V_{RMS}	980	1050	V
Maximum DC blocking voltage	V_{DC}	1400	1500	V
Maximum average forward rectified current 0.375" (9.5 mm) lead lengths at T_A = 50 °C	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100		A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 70 °C	$I_{R(AV)}$	200		µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175		°C

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Document Number: 88569
Revision: 20-Jan-11

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	CGP30	DGP30	UNIT
Maximum instantaneous forward voltage	I_F = 3.0 A		V_F (1)	1.2		V
Maximum reverse current	Rated V_R	T_A = 25 °C	I_R	5.0		μA
		T_A = 100 °C		100		
Maximum reverse recovery time	I_F = 0.5 A, I_R = 50 mA		t_{rr}	15	20	μs
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	Typical	t_{rr}	1.0		μs
		Maximum		2.0		
Typical junction capacitance	4.0 V, 1 MHz		C_J	40		pF

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	CGP30	DGP30	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	20		°C/W

Note

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, with leads attached to heat sink

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
CGP30-E3/54	1.28	54	1400	13" diameter paper tape and reel
CGP30-E3/73	1.28	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

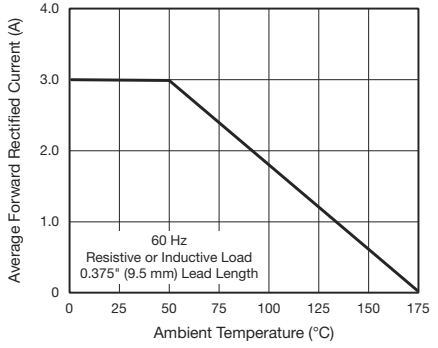


Fig. 1 - Forward Current Derating Curve

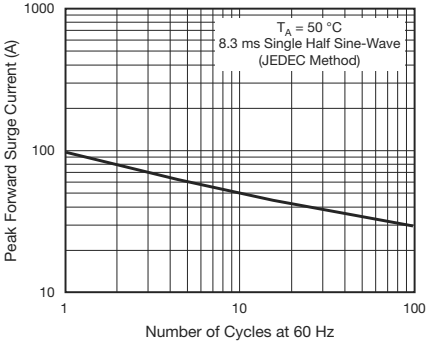


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

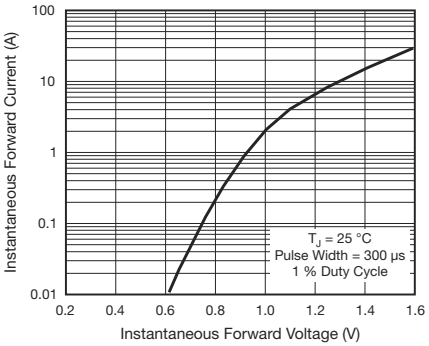


Fig. 3 - Typical Instantaneous Forward Characteristics

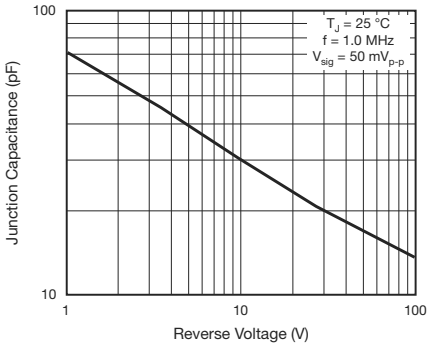


Fig. 5 - Typical Junction Capacitance

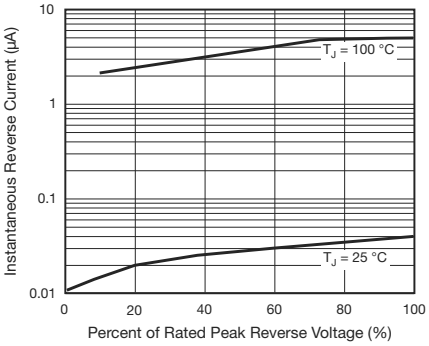
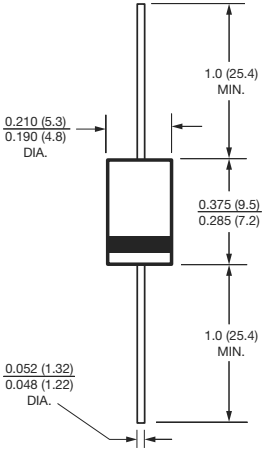


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



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Document Number: 88569
Revision: 20-Jan-11

Glass Passivated Junction Plastic Rectifier

DO-201AD

FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Low leakage current, typical I_R less than 0.1 µA
- Low forward voltage drop
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	125 A
I_R	5.0 µA
V_F	1.2 V, 1.1 V
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in high voltage rectification of power supply, inverters, converters, freewheeling diodes and snubber circuit application.

MECHANICAL DATA

Case: DO-201AD, molded epoxy over glass body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GP30A	GP30B	GP30D	GP30G	GP30J	GP30K	GP30M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	3.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	125							A
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{R(AV)}$	100							µA
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GP30A**	**GP30B**	**GP30D**	**GP30G**	**GP30J**	**GP30K**	**GP30M**	**UNIT**
Maximum instantaneous forward voltage	3.0 A		V_F	1.2		1.1					V
Maximum reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	5.0							μA
		T_A = 125 °C		100							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 V, I_{rr} = 0.25 A		t_{rr}	5.0							μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	40							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**GP30A**	**GP30B**	**GP30D**	**GP30G**	**GP30J**	**GP30K**	**GP30M**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	20							°C/W
	$R_{\theta JL}$ (1)	10							

Note

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GP30J-E3/54	1.28	54	1400	13" diameter paper tape and reel
GP30J-E3/73	1.28	73	1000	Ammo pack packaging
GP30JHE3/54 (1)	1.28	54	1400	13" diameter paper tape and reel
GP30JHE3/73 (1)	1.28	73	1000	Ammo pack packaging

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

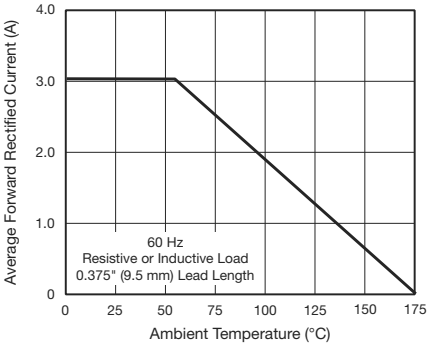


Fig. 1 - Forward Current Derating Curve

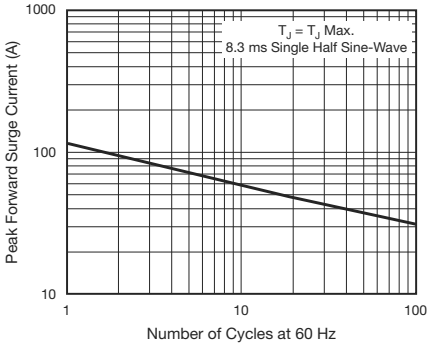


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

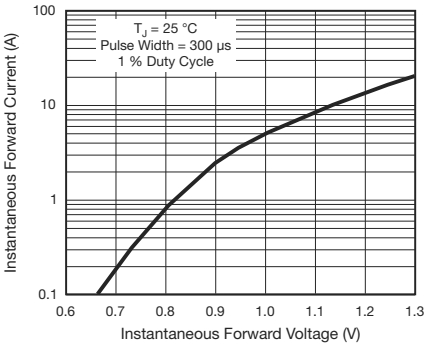


Fig. 3 - Typical Instantaneous Forward Characteristics

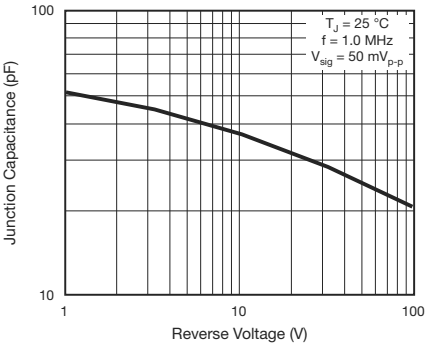


Fig. 5 - Typical Junction Capacitance

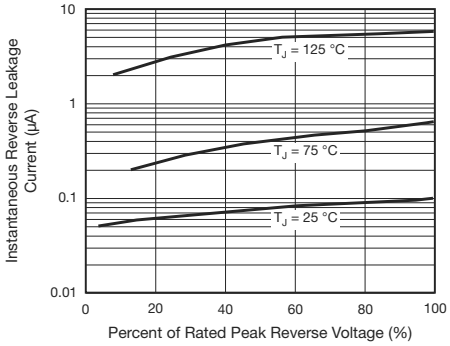
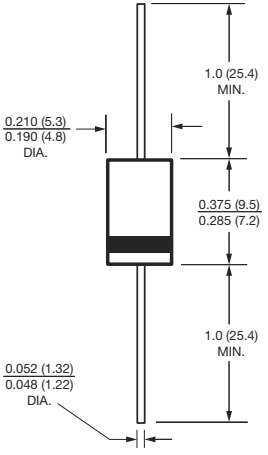


Fig. 4 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

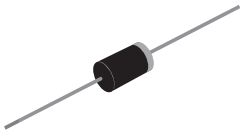
DO-201AD



GI500 thru GI510

Vishay General Semiconductor

General Purpose Plastic Rectifier



DO-201AD

FEATURES

- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	100 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI500	GI501	GI502	GI504	GI506	GI508	GI510	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 95 °C	$I_{F(AV)}$	3.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100							A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

For technical questions within your region, please contact one of the following:
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Document Number: 88626
Revision: 02-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	GI500	GI501	GI502	GI504	GI506	GI508	GI510	UNIT
Maximum instantaneous forward voltage	9.4 A	T_J = 25 °C T_J = 175 °C	V_F				1.1 1.0				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R				5.0 50				µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}				2.0				µs
Typical junction capacitance	4.0 V, 1 MHz		C_J				28				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	GI500	GI501	GI502	GI504	GI506	GI508	GI510	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$				20 5.0				°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted with 0.8 x 0.8" (20 x 20 mm) copper heatsinks

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GI506-E3/54	1.1	54	1400	13" diameter paper tape and reel
GI506-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

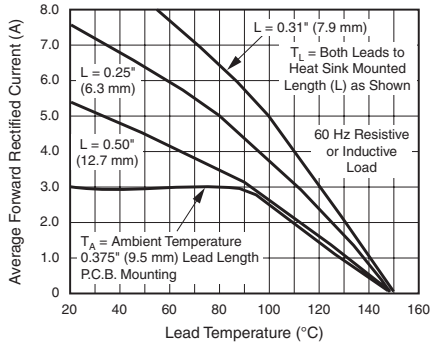


Figure 1. Forward Current Derating Curve

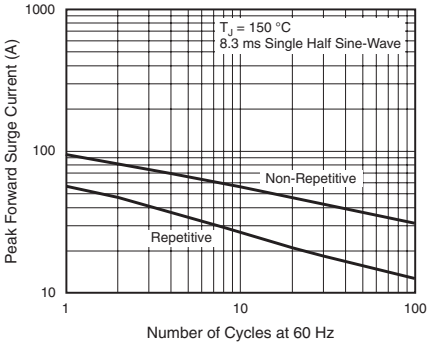


Figure 2. Maximum Non-repetitive Peak Forward Surge Current

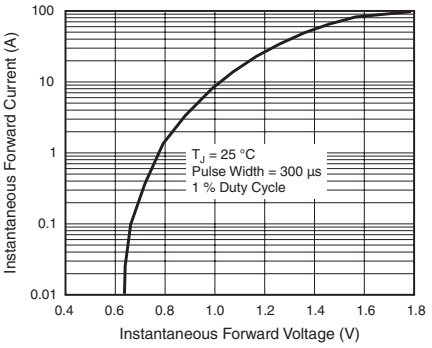


Figure 3. Typical Instantaneous Forward Characteristics

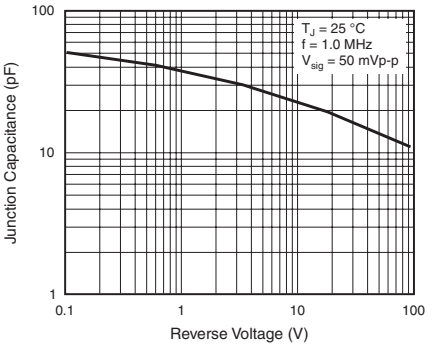


Figure 5. Typical Junction Capacitance

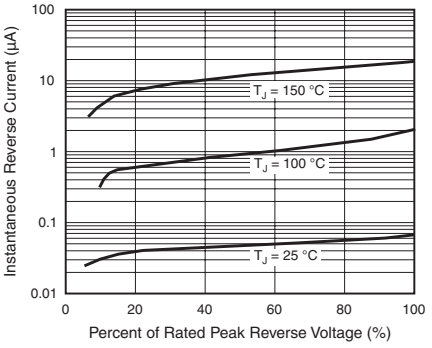


Figure 4. Typical Reverse Characteristics

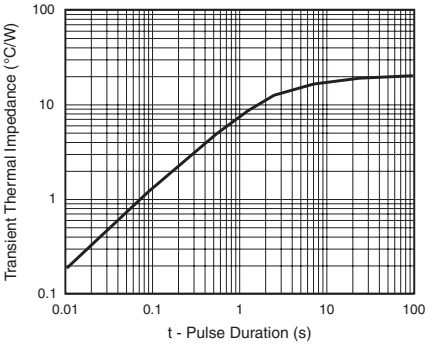
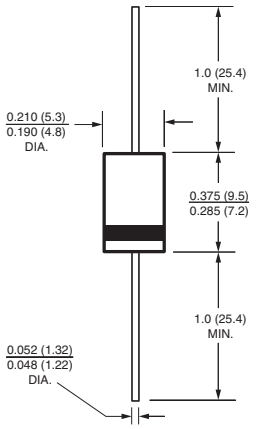


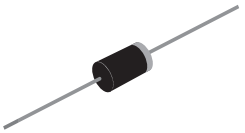
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-201AD



General Purpose Plastic Rectifier



DO-201AD

FEATURES

- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	200 A
I_R	5.0 µA
V_F	1.2 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-201AD, molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	P300A	P300B	P300D	P300G	P300J	P300K	P300M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	3.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200							A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**P300A**	**P300B**	**P300D**	**P300G**	**P300J**	**P300K**	**P300M**	**UNIT**
Maximum instantaneous forward voltage	3.0 A		V_F	1.2							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 25							µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.0							µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	30							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**P300A**	**P300B**	**P300D**	**P300G**	**P300J**	**P300K**	**P300M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	20 5.0							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted with 0.8 x 0.8" (20 x 20 mm) copper heatsinks

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
P300J-E3/54	1.1	54	1400	13" diameter paper tape and reel
P300J-E3/73	1.1	73	1000	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

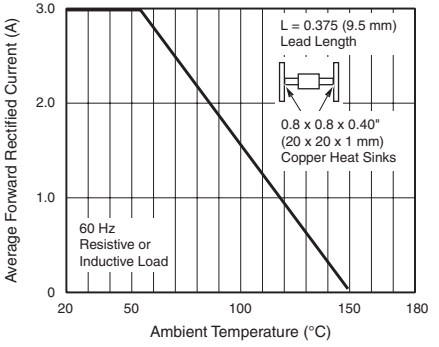


Figure 1. Forward Current Derating Curve

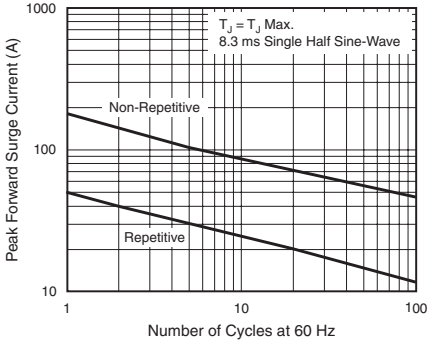


Figure 2. Maximum Peak Forward Surge Current

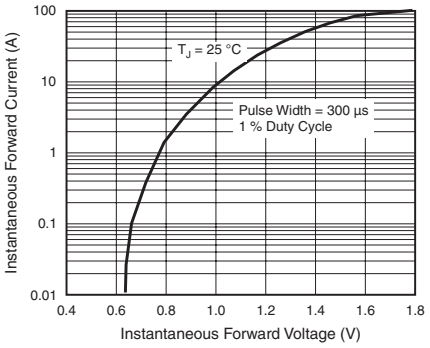


Figure 3. Typical Instantaneous Forward Characteristics

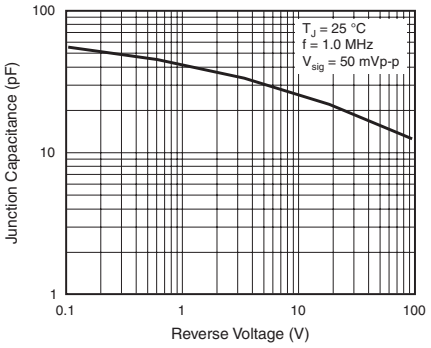


Figure 5. Typical Junction Capacitance Per Leg

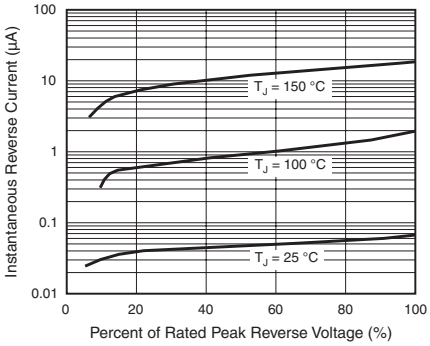


Figure 4. Typical Reverse Characteristics

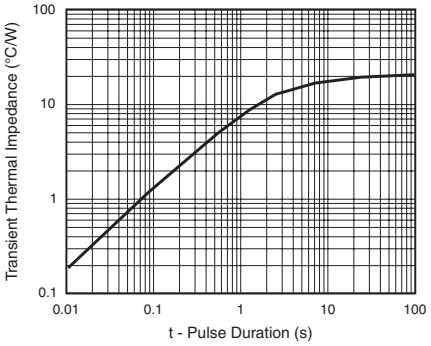
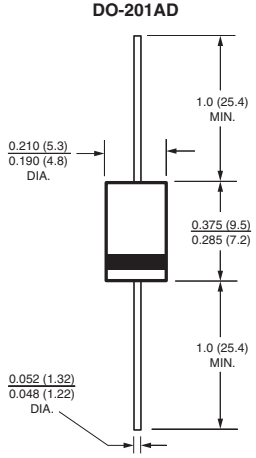


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Surface Mount Glass Passivated Rectifier

DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	100 A
I_R	10 µA
V_F	1.15 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S3A	S3B	S3D	S3G	S3J	S3K	S3M	UNIT
Device marking code		SA	SB	SD	SG	SJ	SK	SM	
Maximum recurrent peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_L = 103 °C	$I_{F(AV)}$	3.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100							A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88713
Revision: 08-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	S3A	S3B	S3D	S3G	S3J	S3K	S3M	UNIT
Maximum instantaneous forward voltage	2.5 A		V_F	1.15							V
Maximum DC reverse current at rated DC blocking voltage		T_A= 25 °C T_A= 125 °C	I_R	10 250							µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.5							µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	60							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	SYMBOL	S3A	S3B	S3D	S3G	S3J	S3K	S3M	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	47 13							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.3 x 0.3" (8.0 x 8.0 mm) copper pad area

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	REFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S3J-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
S3J-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
S3JHE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
S3JHE3/9AT (1)	0.211	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

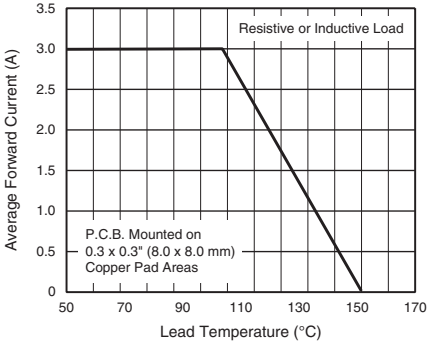


Figure 1. Forward Current Derating Curve

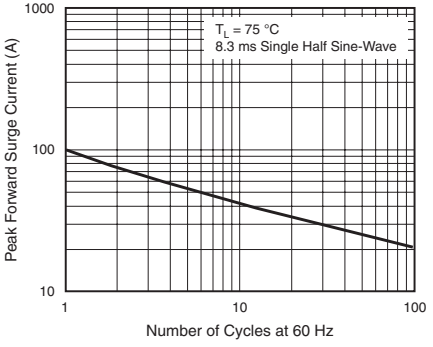


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

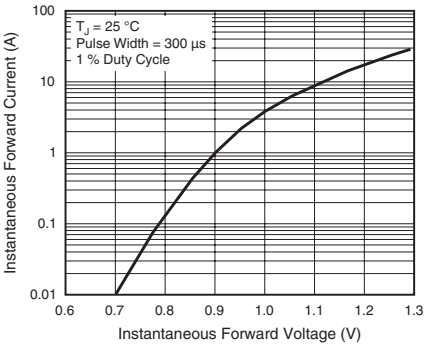


Figure 3. Typical Instantaneous Forward Characteristics

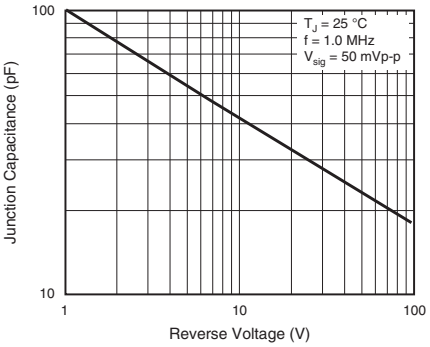


Figure 5. Typical Junction Capacitance

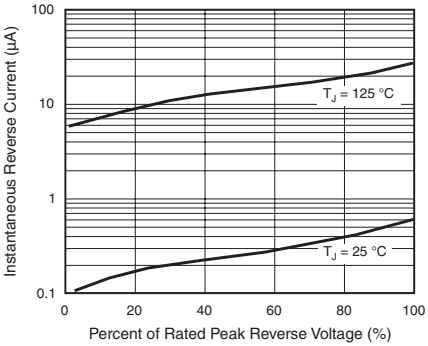


Figure 4. Typical Reverse Characteristics

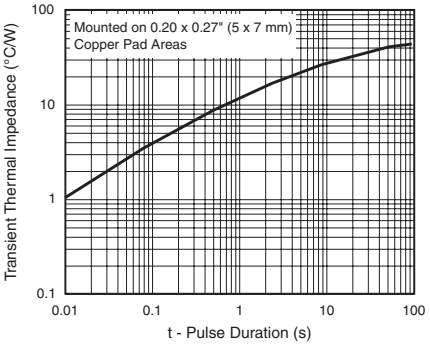
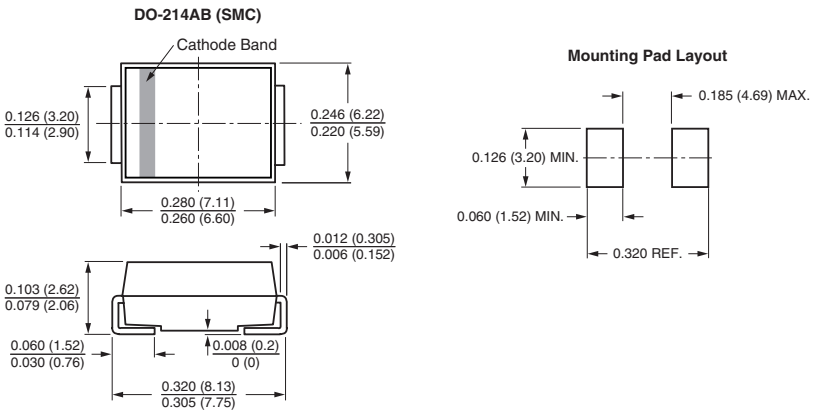


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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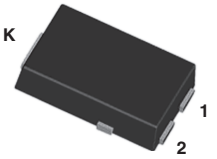
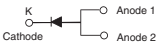
Document Number: 88713
Revision: 08-Apr-08

High Current Density Surface Mount Glass Passivated Rectifiers

eSMP™ Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	100 V to 1000 V
I_{FSM}	100 A
I_R	10 µA
V_F at I_F = 4 A	0.860 V
T_J max.	150 °C

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: TO-277A (SMPC)

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, high reliability/ automotive grade (AEC-Q101 qualified)
Base P/N-M3 - halogen-free and RoHS compliant, commercial grade
Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S4PB	S4PD	S4PG	S4PJ	S4PK	S4PM	UNIT
Device marking code		S4PB	S4PD	S4PG	S4PJ	S4PK	S4PM	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	800	1000	V
Average forward current	$I_{F(AV)}$	4.0						A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	100						A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	I_F = 2.0 A I_F = 4.0 A	T_A = 25 °C	V_F	0.897 0.958	- 1.10	V
	I_F = 2.0 A I_F = 4.0 A	T_A = 125 °C		0.783 0.860	- 0.95	
Reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 55	10 100	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.5	-	µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	30	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**S4PB**	**S4PD**	**S4PG**	**S4PJ**	**S4PK**	**S4PM**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1) $R_{\theta JL}$	60 4						°C/W

Note:

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
S4PJ-E3/86A	0.10	86A	1500	7" diameter plastic tape and reel
S4PJ-E3/87A	0.10	87A	6500	13" diameter plastic tape and reel
S4PJHE3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
S4PJHE3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel
S4PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
S4PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
S4PJHM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
S4PJHM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note:

(1) High reliability/automotive grade (AEC-Q101 qualified)

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

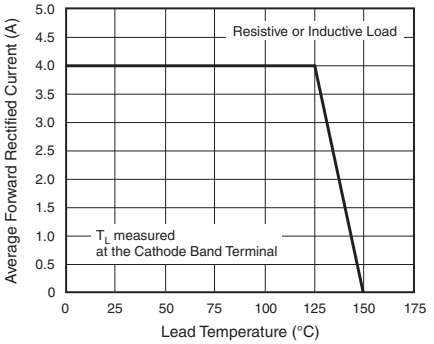


Figure 1. Maximum Forward Current Derating Curve

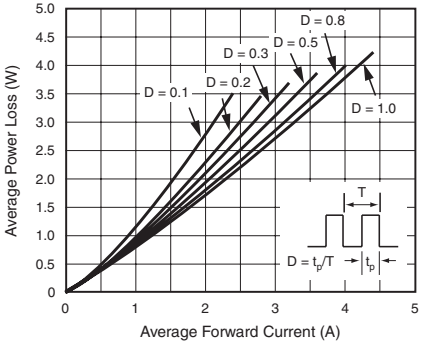


Figure 2. Forward Power Loss Characteristics

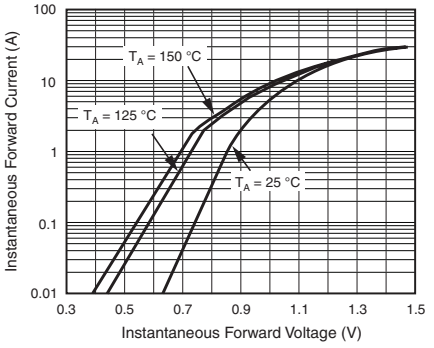


Figure 3. Typical Instantaneous Forward Characteristics

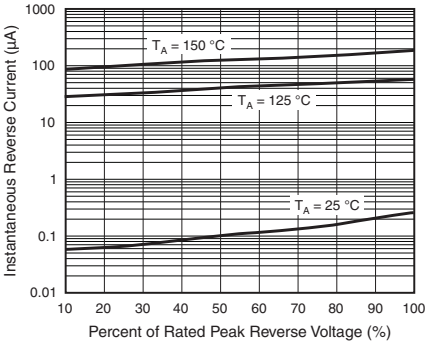


Figure 4. Typical Reverse Leakage Characteristics

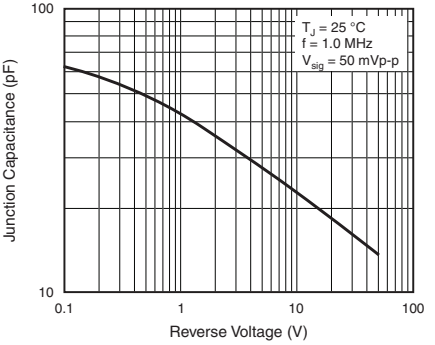


Figure 5. Typical Junction Capacitance

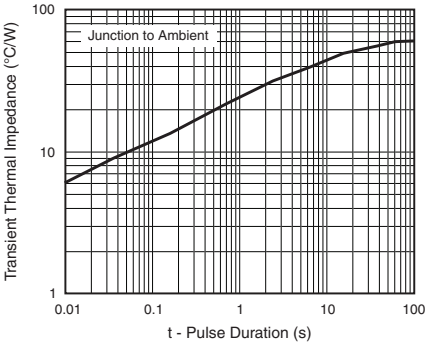
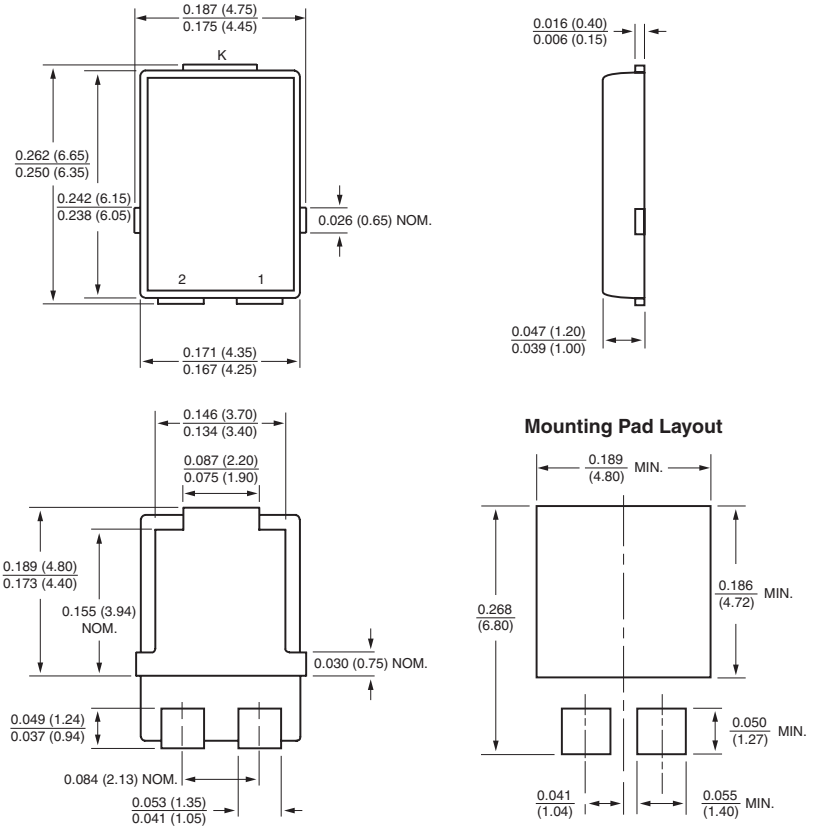


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Conform to JEDEC TO-277A

Surface Mount Glass Passivated Rectifier

DO-214AB (SMC)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	100 A
I_R	10 µA
V_F	1.15 V
T_J max.	150 °C

MECHANICAL DATA

Case: DO-214AB (SMC)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S5A	S5B	S5D	S5G	S5J	S5K	S5M	UNIT
Device marking code		5A	5B	5D	5G	5J	5K	5M	
Maximum recurrent peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_L = 75 °C	$I_{F(AV)}$	5.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	100							A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**S5A**	**S5B**	**S5D**	**S5G**	**S5J**	**S5K**	**S5M**	**UNIT**
Maximum instantaneous forward voltage	5.0 A		V_F	1.15							V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 125 °C	I_R	10 250							μA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.5							μs
Typical junction capacitance	4.0 V, 1 MHz		C_J	40							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**S5A**	**S5B**	**S5D**	**S5G**	**S5J**	**S5K**	**S5M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JL}$	10							°C/W

Note:

(1) Thermal resistance from junction to lead mounted on P.C.B. with 0.3 x 0.3" (8.0 x 8.0 mm) copper pad area

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**REFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
S5J-E3/57T	0.211	57T	850	7" diameter plastic tape and reel
S5J-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel
S5JHE3/57T (1)	0.211	57T	850	7" diameter plastic tape and reel
S5JHE3/9AT (1)	0.211	9AT	3500	13" diameter plastic tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

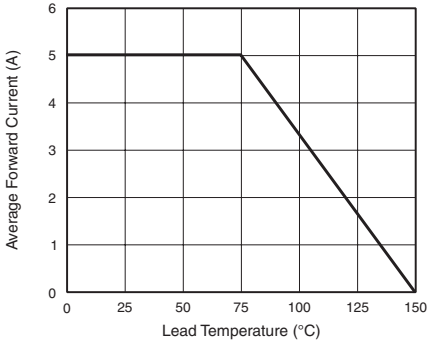

Figure 1. Forward Current Derating Curve

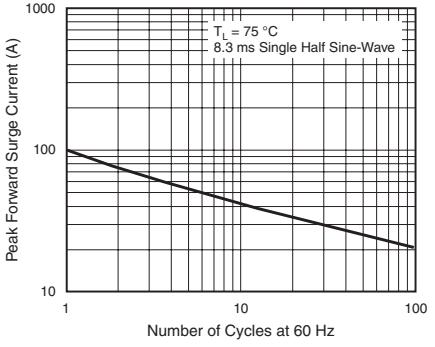

Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

For technical questions within your region, please contact one of the following:
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Document Number: 88931
Revision: 08-Apr-08

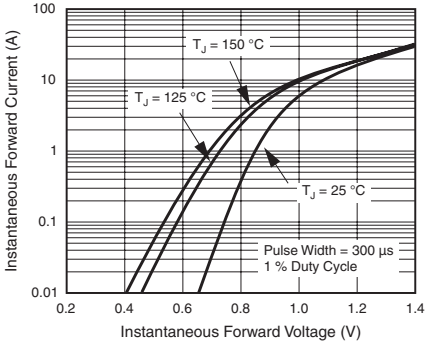


Figure 3. Typical Instantaneous Forward Characteristics

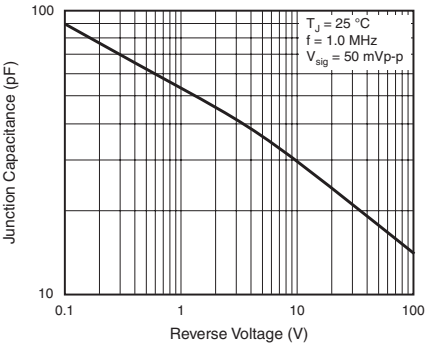


Figure 5. Typical Junction Capacitance

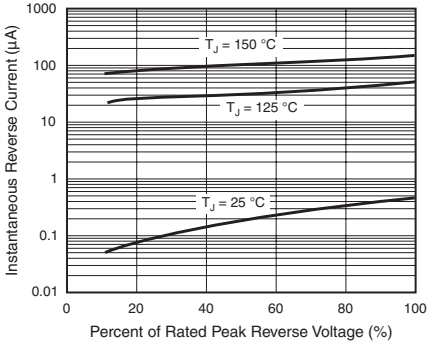
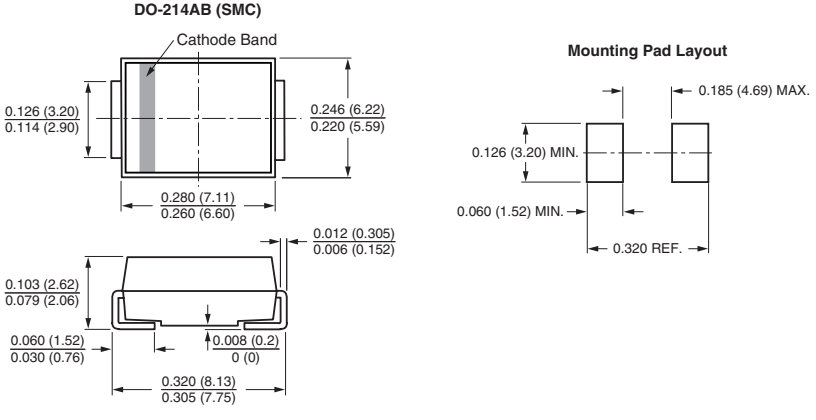


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



High Current Axial Plastic Rectifier

Case Style P600

FEATURES

- Low forward voltage drop
- Low leakage current, I_R less than 0.1 µA
- High forward current capability
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	400 A
V_F	0.9 V, 0.95 V
I_R	5.0 µA
T_J max.	150 °C

MECHANICAL DATA

Case: P600, void-free molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GI750	GI751	GI752	GI754	GI756	GI758	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum non-repetitive peak reverse voltage	V_{RSM}	60	120	240	480	720	1200	V
Maximum average forward rectified current at T_A = 60 °C, P.C.B. mounting (Fig. 1) T_L = 60 °C, 0.125" (3.18 mm) lead length (Fig. 2)	$I_{F(AV)}$	6.0 22						A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	400						A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	GI750	GI751	GI752	GI754	GI756	GI758	UNIT
Maximum instantaneous forward voltage at:	6.0 A 100 A		V_F	0.90 1.25					0.95 1.30	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 1.0						µA mA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.5						µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	150						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	GI750	GI751	GI752	GI754	GI756	GI758	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	20 4.0						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted with 1.1" x 1.1" (30 x 30 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GI756-E3/54	2.1	54	800	13" diameter paper tape and reel
GI756-E3/73	2.1	73	300	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

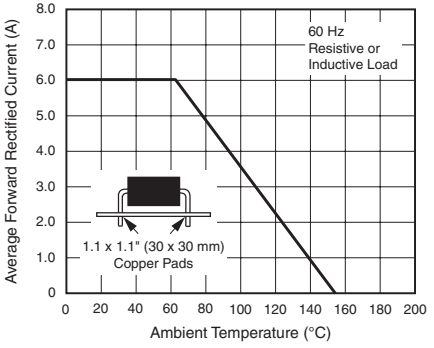


Figure 1. Maximum Forward Current Derating Curve

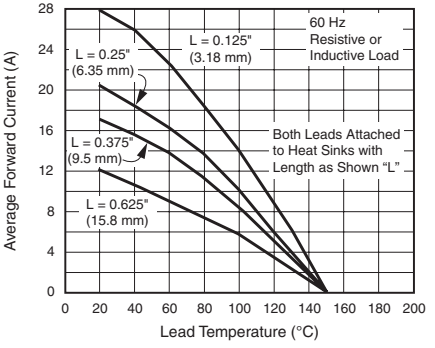


Figure 2. Maximum Forward Current Derating Curve

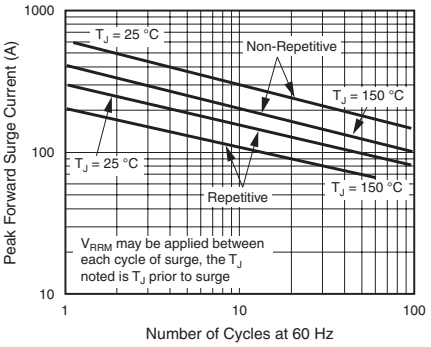


Figure 3. Maximum Peak Forward Surge Current

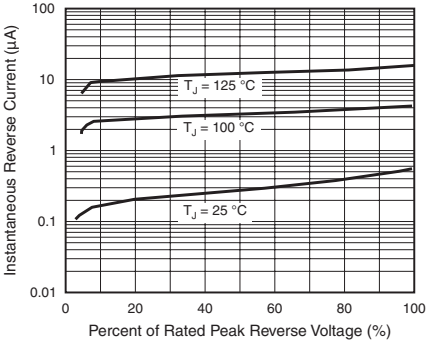


Figure 5. Typical Reverse Characteristics

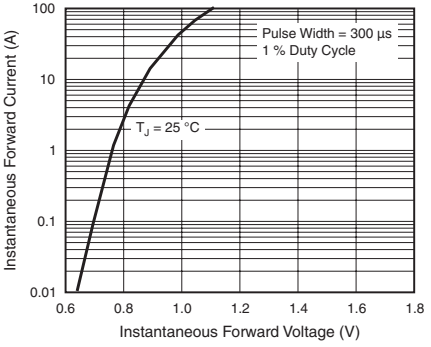


Figure 4. Typical Instantaneous Forward Characteristics

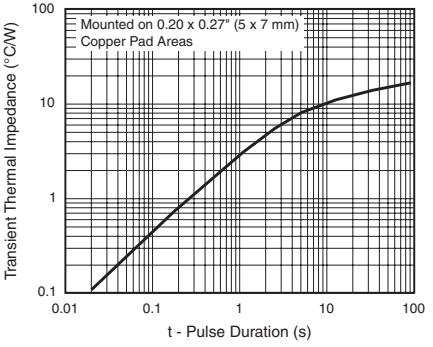
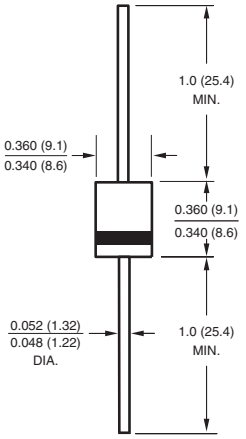


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style P600



Glass Passivated Junction Rectifier

Case Style P600

FEATURES

- Glass passivated chip junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.2 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 400 V
I_{FSM}	500 A
V_F	1.1 V
I_R	5.0 µA
T_J max.	175 °C

MECHANICAL DATA

Case: P600, molded epoxy over passivated junction

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GPP60A	GPP60B	GPP60D	GPP60G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at T_A = 55 °C	$I_{F(AV)}$	6.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	500				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175				°C

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**GPP60A**	**GPP60B**	**GPP60D**	**GPP60G**	**UNIT**
Maximum instantaneous forward voltage	6.0 A		V_F	1.1				V
Maximum reverse current at rated DC blocking voltage		T_A = 25 °C T_A = 100 °C	I_R	5.0 100				µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	5.5				µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	110				pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**GPP60A**	**GPP60B**	**GPP60D**	**GPP60G**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	20 4.0				°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GPP60J-E3/54	2.0	54	800	13" diameter paper tape and reel
GPP60J-E3/73	2.0	73	300	Ammo pack packaging
GPP60JHE3/54 (1)	2.0	54	800	13" diameter paper tape and reel
GPP60JHE3/73 (1)	2.0	73	300	Ammo pack packaging

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

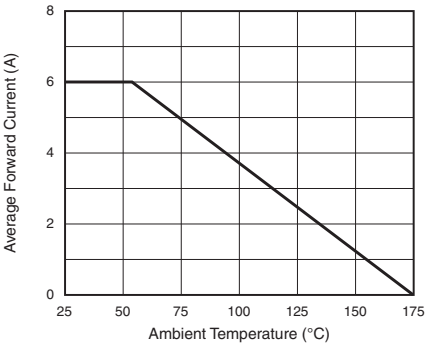


Figure 1. Forward Current Derating Curve

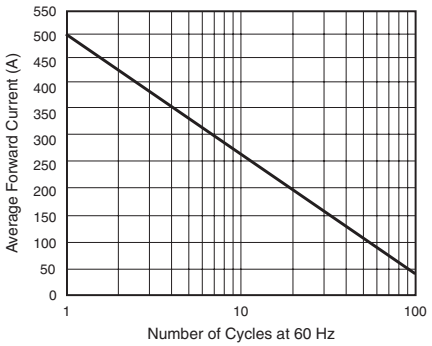


Figure 2. Maximum Non-repetitive Forward Surge Current

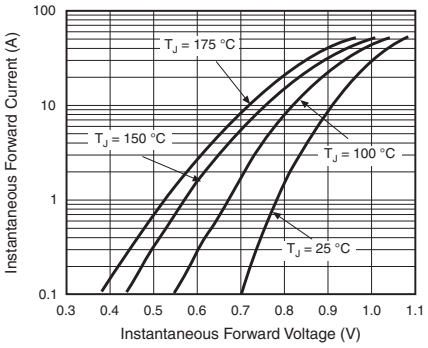


Figure 3. Typical Instantaneous Forward Characteristics

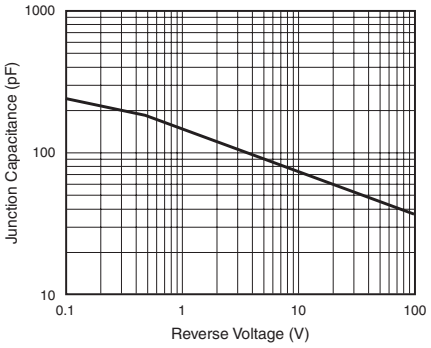


Figure 5. Typical Junction Capacitance

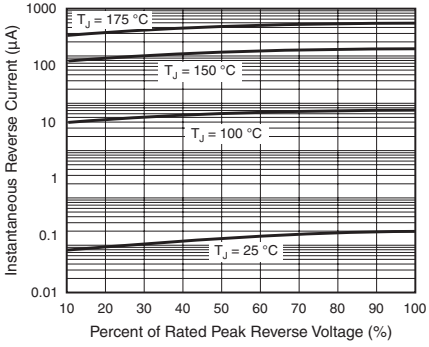
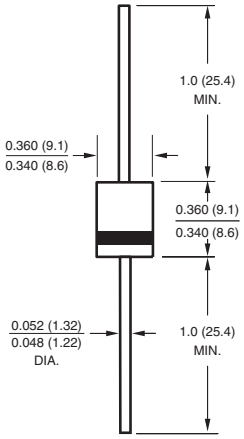


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style P600



General Purpose Plastic Rectifier

Case Style P600

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	400 A
V_F	0.9 V, 1.0 V
I_R	5.0 µA
T_J max.	150 °C

FEATURES

- Low forward voltage drop
- Low leakage current
- High forward current capability
- High forward surge capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.
(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: P600, void-free molded epoxy body

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	P600A	P600B	P600D	P600G	P600J	P600K	P600M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_A = 60 °C, 0.375" (9.5 mm) lead length (Fig. 1) T_L = 60 °C, 0.125" (3.18 mm) lead length (Fig. 2)	$I_{F(AV)}$	6.0 22							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	400							A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

For technical questions within your region, please contact one of the following:
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Document Number: 88692
Revision: 30-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**P600A**	**P600B**	**P600D**	**P600G**	**P600J**	**P600K**	**P600M**	**UNIT**
Maximum instantaneous forward voltage	6.0 A 100 A		V_F	0.90 1.30						1.0 1.4	V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C T_A =100 °C	I_R	5.0 1.0							µA mA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.5							µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	150							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**P600A**	**P600B**	**P600D**	**P600G**	**P600J**	**P600K**	**P600M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	20 4.0							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length, P.C.B. mounted with 1.1" x 1.1" (30 x 30 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
P600J-E3/54	2.1	54	800	13" diameter paper tape and reel
P600J-E3/73	2.1	73	300	Ammo pack packaging

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

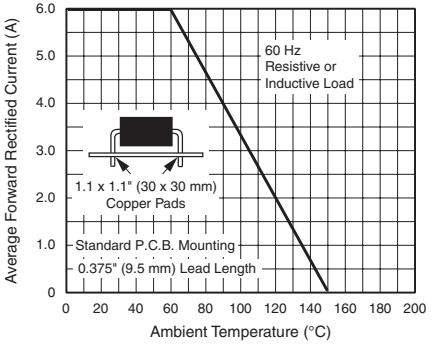


Figure 1. Maximum Forward Current Derating Curve

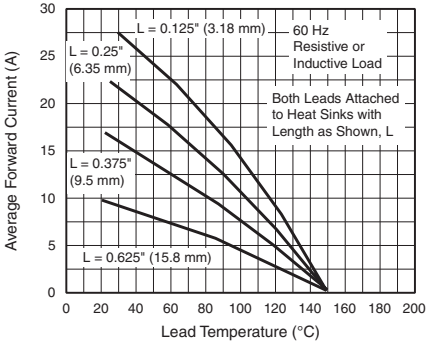


Figure 2. Maximum Non-repetitive Forward Surge Current

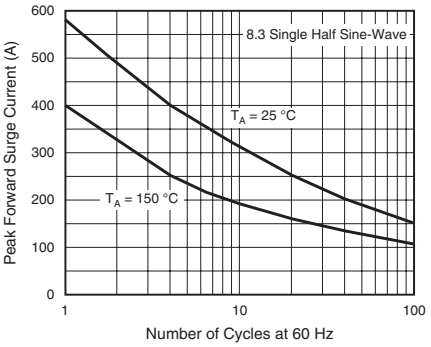


Figure 3. Typical Instantaneous Forward Characteristics

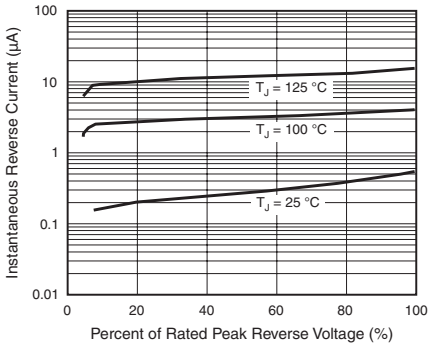


Figure 5. Typical Reverse Characteristics

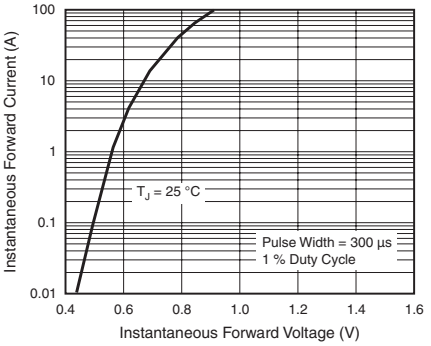


Figure 4. Typical Instantaneous Forward Characteristics

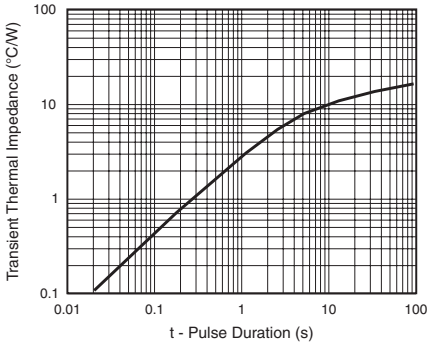
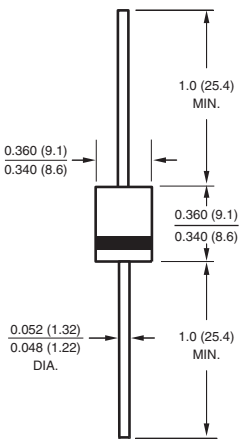


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style P600



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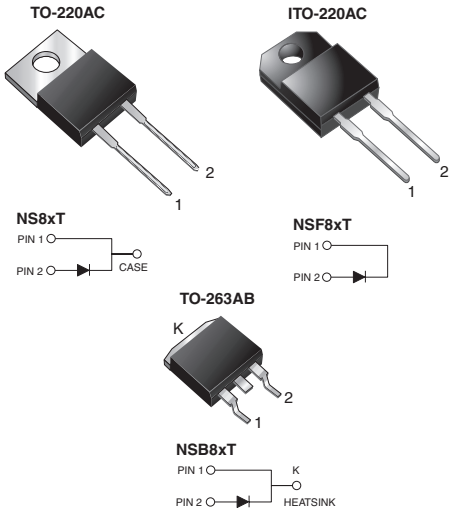
Document Number: 88692
Revision: 30-Apr-08

Glass Passivated General Purpose Plastic Rectifier



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	125 A
V_F	1.1 V
T_J max.	150 °C

FEATURES

- Glass passivated chip junction
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC-Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	NS8AT	NS8BT	NS8DT	NS8GT	NS8JT	NS8KT	NS8MT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at T_C = 100 °C	$I_{F(AV)}$	8.0							A
Peak forward surge current 8.3 ms single sine-wave superimposed on rated load	I_{FSM}	125							A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500							V

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**NS8AT**	**NS8BT**	**NS8DT**	**NS8GT**	**NS8JT**	**NS8KT**	**NS8MT**	**UNIT**
Maximum instantaneous forward voltage (1)	8.0 A	T_J = 25 °C	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage		T_J = 25 °C T_J = 100 °C	I_R	10 100							µA
Typical junction capacitance	4.0 V, 1 MHz		C_J	55							pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**NSxT**	**NSFxT**	**NSBxT**	**UNIT**
Typical thermal resistance from junction to case	$R_{\theta JC}$	3.0	5.0	3.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	NS8JT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	NSF8JT-E3/45	1.95	45	50/tube	Tube
TO-263AB	NSB8JT-E3/45	1.77	45	50/tube	Tube
TO-263AB	NSB8JT-E3/81	1.77	81	800/reel	Tape and reel
TO-220AC	NS8JTHE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	NSF8JTHE3/45 (1)	1.95	45	50/tube	Tube
TO-263AB	NSB8JTHE3/45 (1)	1.77	45	50/tube	Tube
TO-263AB	NSB8JTHE3/81 (1)	1.77	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

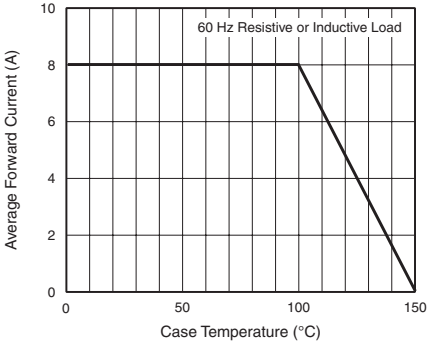


Figure 1. Forward Current Derating Curve

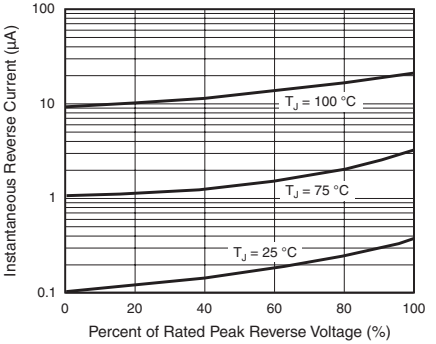


Figure 4. Typical Reverse Characteristics

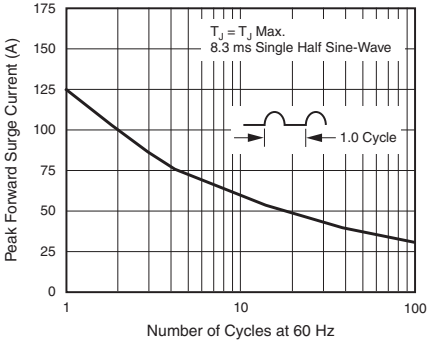


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

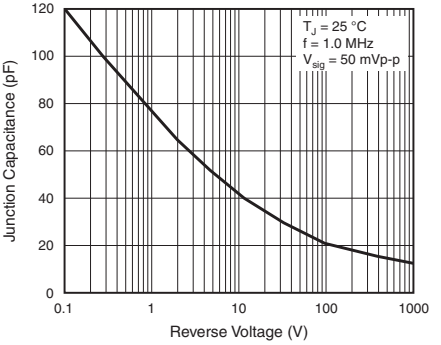


Figure 5. Typical Junction Capacitance Per Leg

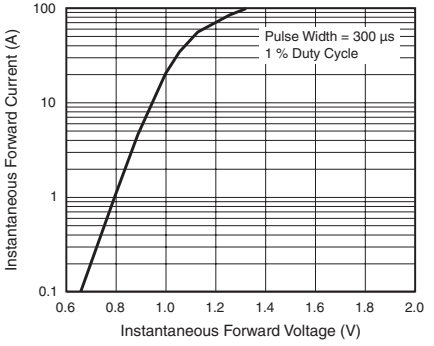
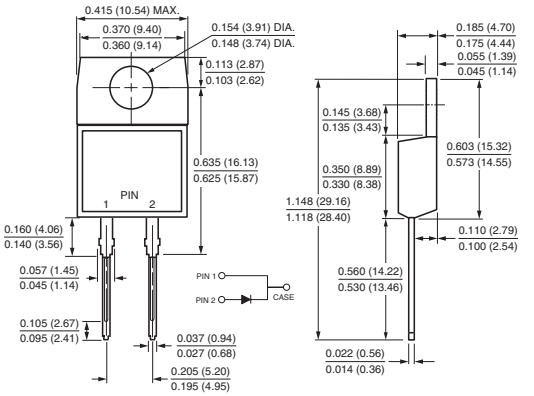


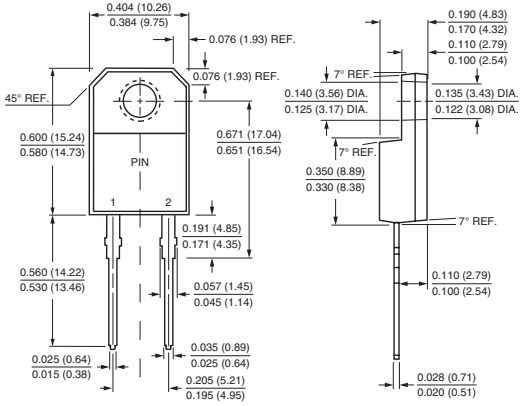
Figure 3. Typical Instantaneous Forward Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

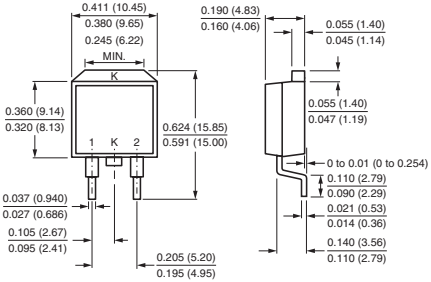
TO-220AC



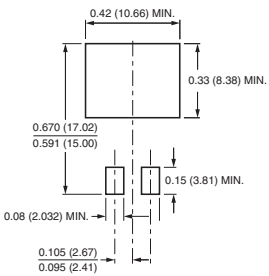
ITO-220AC



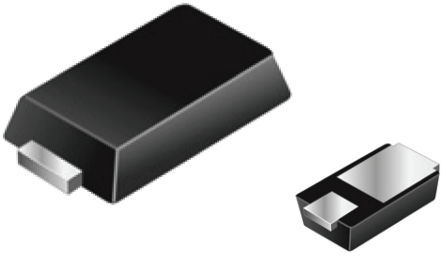
TO-263AB



Mounting Pad Layout



ESD Capability Rectifiers



Contents

(for full listing please see Selector Guide on page 34)

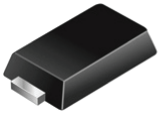
Introduction to ESD Capability Rectifiers

Vishay General Semiconductor

ESD capability rectifiers are used in rail-to-rail protection of signal line applications, and in power line protections for small current sensors and equipments.

Vishay General Semiconductor offers high ESD voltage capability rectifiers with typical performance > 25 kV (immunity to IEC 61000-4-2 air discharge mode). The devices' low junction capacitances reduce signal loss of high frequency data communications. They also feature high forward surge current capability with minimum 20 A to 30 A at 10 ms single pulse sine wave.

We offer these devices in SE15P, SE10P, SE07P and MSE1P series, with jumper pad type connection to accept high surge energy. Input voltage range: V_{RRM}: 100 V to 600 V. Average output current capability: 0.7 A thru 1.5 A. Devices are available in SMP and MicroSMP packages.



SMP

MicroSMP

For technical questions within your region, please contact:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89092
Revision: 27-Jun-08

ESD Capability Rectifiers Part Numbering System

SURFACE MOUNT

SMD

SExPy MSExPy

S = Surface mount
E = ESD capability rectifier
M = MicroSMP
x = Forward current (in A)
- 07 = 0.7 A
- 10 = 1.0 A
- 15 = 1.5 A

P = SMP or MicroSMP
y = Reverse voltage (in V)
- B = 100 V
- D = 200 V
- G = 400 V
- J = 600 V

Note:
- Part numbering system for all parts, excluding JEDEC, ProElectron and industry standard part numbers

SE07PB thru SE07PJ

Vishay General Semiconductor

Surface Mount ESD Capability Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.7 A
V_{RRM}	100 V to 600 V
I_R	5 µA
V_F at I_F = 0.7 A	0.865 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-220AA (SMP)
Epoxy meets UL 94V-0 flammability rating
Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test
Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	SE07PB	SE07PD	SE07PG	SE07PJ	UNIT
Device marking code		07B	07D	07G	07J	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Average forward current (Fig. 1)	$I_{F(AV)}$	0.7				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	20				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 0.7 A I_F = 0.7 A	T_J = 25 °C T_J = 125 °C	V_F	0.965 0.865	1.05 0.95	V
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	- 3.7	5.0 50	µA
Typical junction capacitance time	4.0 V, 1 MHz		C_J	5.0	-	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

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Document Number: 89023
Revision: 26-May-08

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**SE07PB**	**SE07PD**	**SE07PG**	**SE07PJ**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 25 30				°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C, unless otherwise noted)					
STANDARD	**TEST TYPE**	**TEST CONDITIONS**	**SYMBOL**	**CLASS**	**VALUE**
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V_C	H3B	> 8 kV
AEC-Q101-002	Machine model (contact mode)	C = 200 pF, R = 0 Ω		M4	> 400 V
JESD22-A114	Human body model (contact mode)	C = 150 pF, R = 1.5 kΩ		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω		C	> 400 V
IEC 61000-4-2 (2)	Human body model (contact mode)	C = 150 pF, R = 150 Ω		4	> 8 kV
	Human body model (air-discharge mode) (1)	C = 150 pF, R = 150 Ω		4	> 15 kV

Notes:

(1) Immunity to IEC 61000-4-2 air discharge mode has a typical performance > 30 kV

(2) System ESD standard

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SE07PJ-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SE07PJ-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

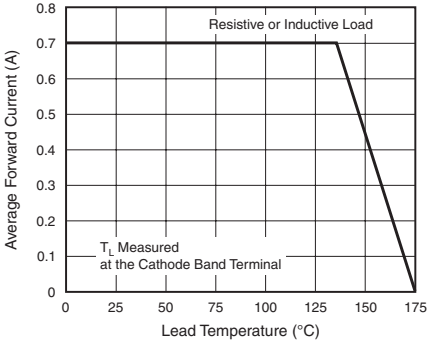


Figure 1. Maximum Forward Current Derating Curve

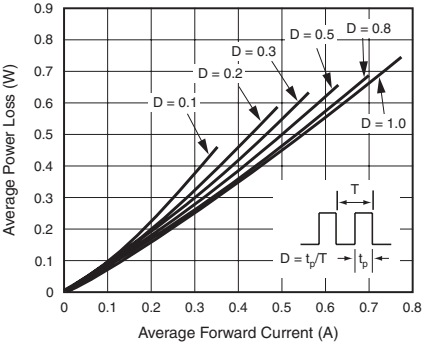


Figure 2. Forward Power Loss Characteristics

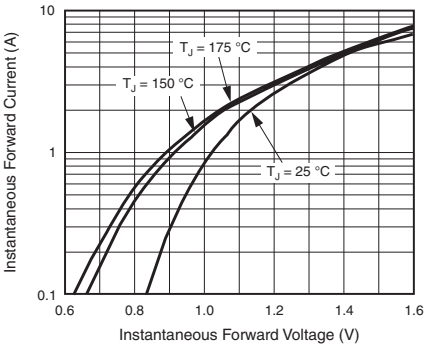


Figure 3. Typical Instantaneous Forward Characteristics

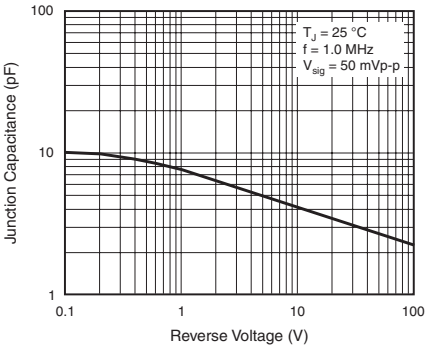


Figure 5. Typical Junction Capacitance

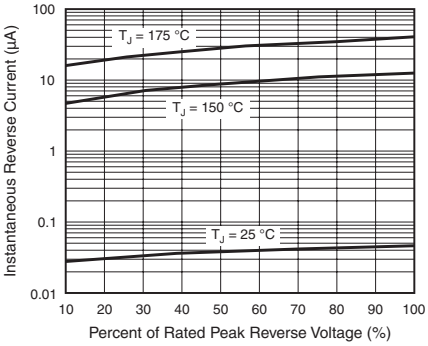
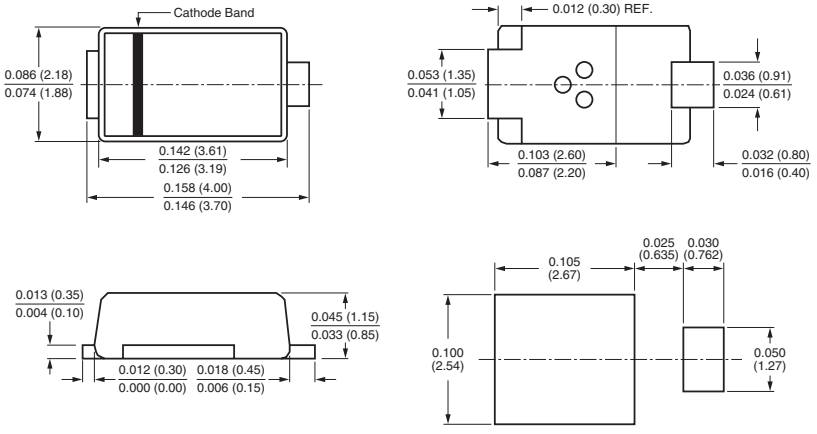


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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Document Number: 89023
Revision: 26-May-08

SE10PB thru SE10PJ

Vishay General Semiconductor

Surface Mount ESD Capability Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V to 600 V
I_R	5 µA
V_F at I_F = 1.0 A	0.86 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	SE10PB	SE10PD	SE10PG	SE10PJ	UNIT
Device marking code		10B	10D	10G	10J	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Average forward current (Fig. 1)	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	25				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 1.0 A, I_F = 1.0 A,	T_J = 25 °C T_J = 125 °C	V_F	0.960 0.860	1.05 0.95	V
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	- 4.8	5.0 50	µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	780	-	-
Typical junction capacitance time	4.0 V, 1 MHz		C_J	7.0	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**SE10PB**	**SE10PD**	**SE10PG**	**SE10PJ**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 25 30				°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C, unless otherwise noted)					
STANDARD	**TEST TYPE**	**TEST CONDITIONS**	**SYMBOL**	**CLASS**	**VALUE**
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V_C	H3B	> 8 kV
AEC-Q101-002	Machine model (contact mode)	C = 200 pF, R = 0 Ω		M4	> 400 V
JESD22-A114	Human body model (contact mode)	C = 150 pF, R = 1.5 kΩ		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω		C	> 400 V
IEC 61000-4-2 (2)	Human body model (contact mode)	C = 150 pF, R = 150 Ω		4	> 8 kV
	Human body model (air-discharge mode) (1)	C = 150 pF, R = 150 Ω		4	> 15 kV

Notes:

(1) Immunity to IEC 61000-4-2 air discharge mode has a typical performance > 30 kV

(2) System ESD standard

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SE10PJ-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SE10PJ-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

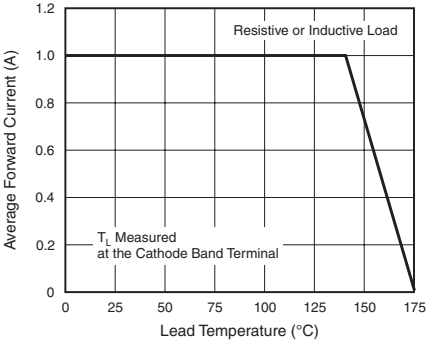


Figure 1. Maximum Forward Current Derating Curve

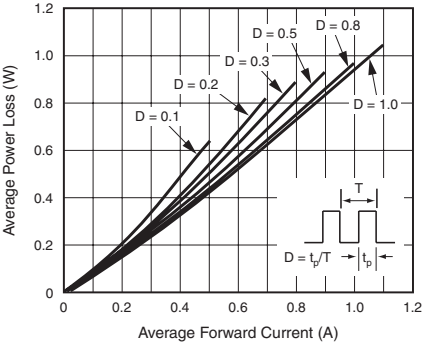


Figure 2. Forward Power Loss Characteristics

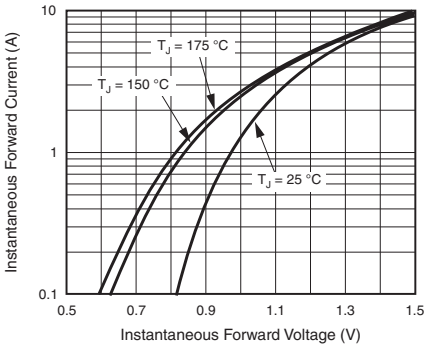


Figure 3. Typical Instantaneous Forward Characteristics

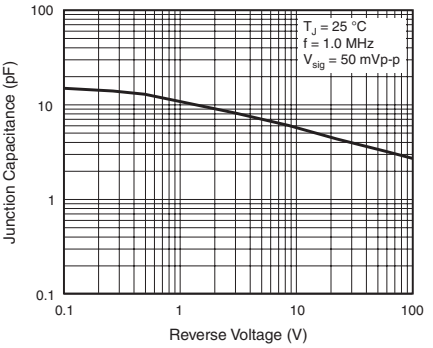


Figure 5. Typical Junction Capacitance

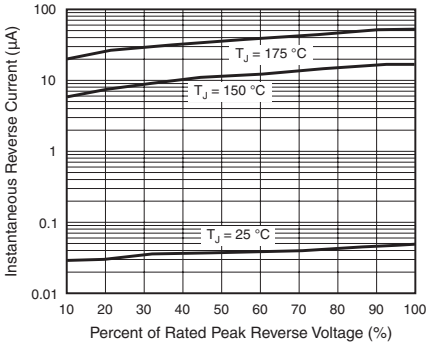
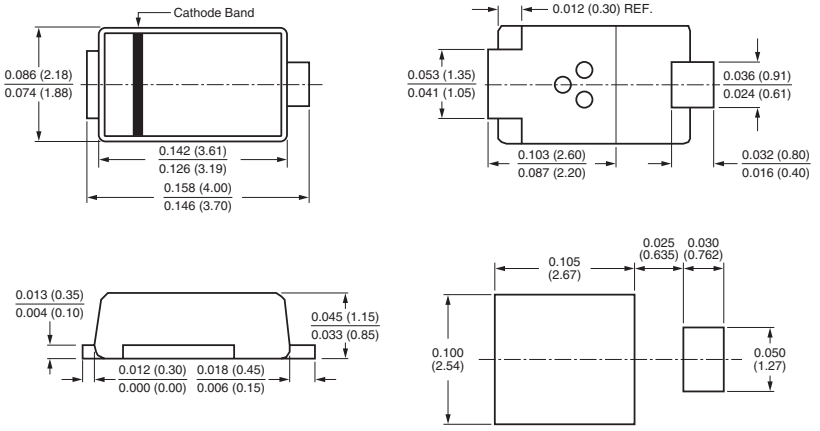


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

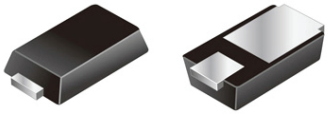
DO-220AA (SMP)



MSE1PB thru MSE1PJ

Vishay General Semiconductor

Surface Mount ESD Capability Rectifiers



eSMP™ Series

Top View Bottom View

MicroSMP

FEATURES

- Very low profile - typical height of 0.68 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop, low leakage current
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 200 V, 400 V, 600 V
I_{FSM}	20 A
V_F at I_F = 1.0 A	0.925 V
I_R	1 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	MSE1PB	MSE1PD	MSE1PG	MSE1PJ	UNIT
Device marking code		SB	SD	SG	SJ	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	20				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 0.5 A I_F = 1.0 A	T_A = 25 °C	V_F	0.940 1.016	- 1.1	V
	I_F = 0.5 A I_F = 1.0 A	T_A = 125 °C		0.834 0.925	- 0.98	
Maximum reverse current (2)	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 3.7	1.0 50	µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	780	-	ns

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89067
Revision: 21-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Typical junction capacitance	4.0 V, 1 MHz	C_J	5	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**MSE1PB**	**MSE1PD**	**MSE1PG**	**MSE1PJ**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	110 30 40				°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas. R_{qJL} is measured at the terminal of cathode band. R_{qJC} is measured at the top center of the body

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C, unless otherwise noted)					
STANDARD	**TEST TYPE**	**TEST CONDITIONS**	**SYMBOL**	**CLASS**	**VALUE**
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V_C	H3B	> 8 kV
AEC-Q101-002	Machine model (contact mode)	C = 200 pF, R = 0 Ω		M4	> 400 V
JESD22-A114	Human body model (contact mode)	C = 150 pF, R = 1.5 kΩ		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω		C	> 400 V
IEC 61000-4-2 (2)	Human body model (contact mode)	C = 150 pF, R = 150 Ω		4	> 8 kV
	Human body model (air-discharge mode) (1)	C = 150 pF, R = 150 Ω		4	> 15 kV

Notes:

(1) Immunity to IEC 61000-4-2 air discharge mode has a typical performance > 30 kV

(2) System ESD standard

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MSE1PJ-E3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSE1PJ-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

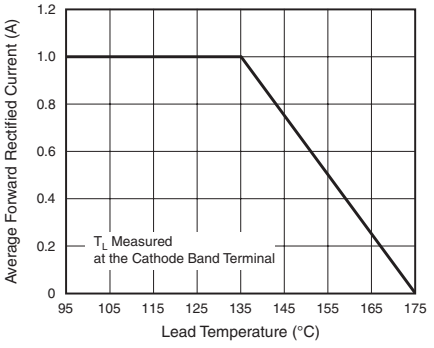


Figure 1. Forward Current Derating Curve

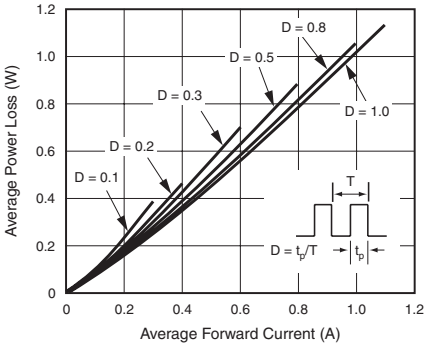


Figure 2. Forward Power Loss Characteristics

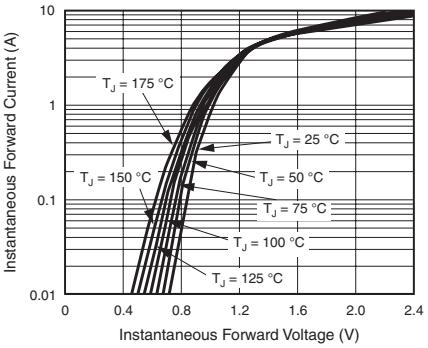


Figure 3. Typical Instantaneous Forward Characteristics

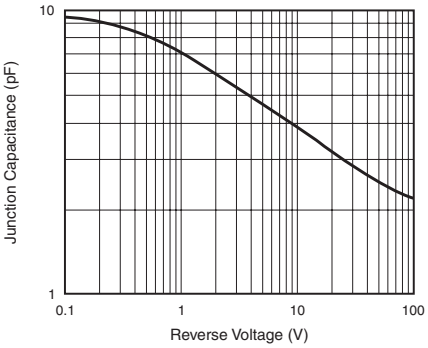


Figure 5. Typical Junction Capacitance

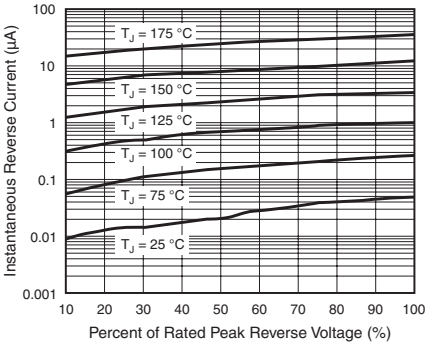
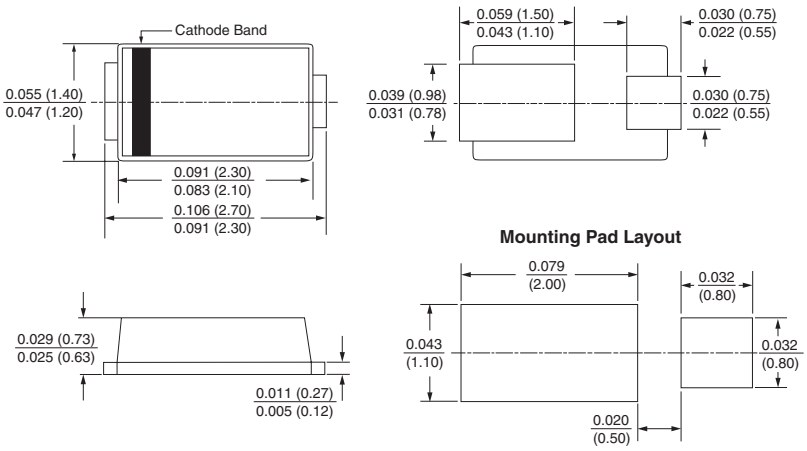


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP



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PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89067
Revision: 21-Aug-08

Surface Mount ESD Capability Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- Typical I_R less than 0.1 µA
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	100 V to 600 V
I_R	5 µA
V_F at I_F = 1.5 A	0.868 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	SE15PB	SE15PD	SE15PG	SE15PJ	UNIT
Device marking code		15B	15D	15G	15J	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	V
Average forward current (Fig. 1)	$I_{F(AV)}$	1.5				A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30				A
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage (1)	I_F = 1.5 A, I_F = 1.5 A,	T_J = 25 °C T_J = 125 °C	V_F	0.968 0.868	1.05 0.95	V
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	- 5.4	5.0 50	µA
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	900	-	ns
Typical junction capacitance time	4.0 V, 1 MHz		C_J	9.5	-	pF

Notes:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**SE15PB**	**SE15PD**	**SE15PG**	**SE15PJ**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	105 25 30				°C/W

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T_A = 25 °C, unless otherwise noted)					
STANDARD	**TEST TYPE**	**TEST CONDITIONS**	**SYMBOL**	**CLASS**	**VALUE**
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V_C	H3B	> 8 kV
AEC-Q101-002	Machine model (contact mode)	C = 200 pF, R = 0 Ω		M4	> 400 V
JESD22-A114	Human body model (contact mode)	C = 150 pF, R = 1.5 kΩ		3B	> 8 kV
JESD22-A115	Machine model (contact mode)	C = 200 pF, R = 0 Ω		C	> 400 V
IEC 61000-4-2 (2)	Human body model (contact mode)	C = 150 pF, R = 150 Ω		4	> 8 kV
	Human body model (air-discharge mode) (1)	C = 150 pF, R = 150 Ω		4	> 15 kV

Notes:

(1) Immunity to IEC 61000-4-2 air discharge mode has a typical performance > 30 kV

(2) System ESD standard

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SE15PJ-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SE15PJ-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

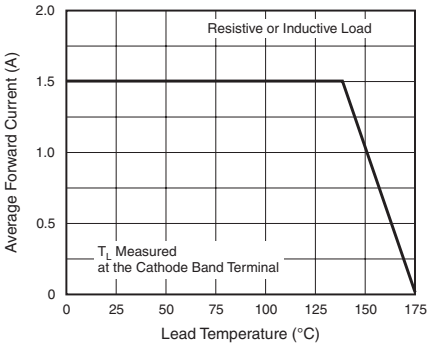


Figure 1. Maximum Forward Current Derating Curve

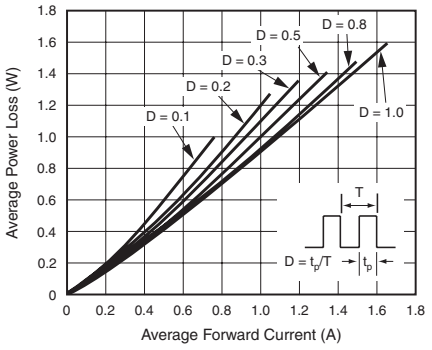


Figure 2. Forward Power Loss Characteristics

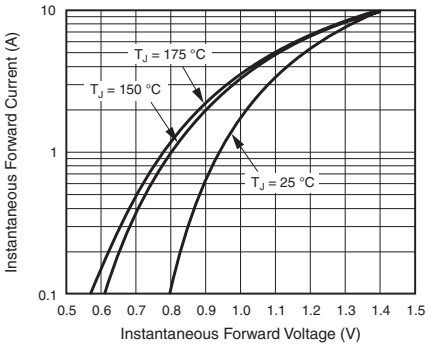


Figure 3. Typical Instantaneous Forward Characteristics

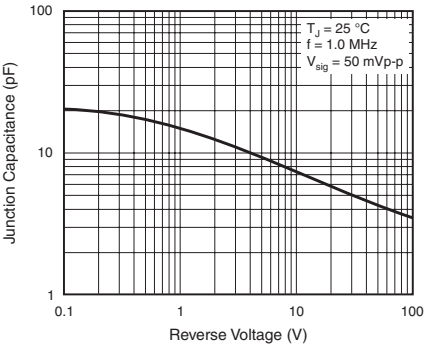


Figure 5. Typical Junction Capacitance

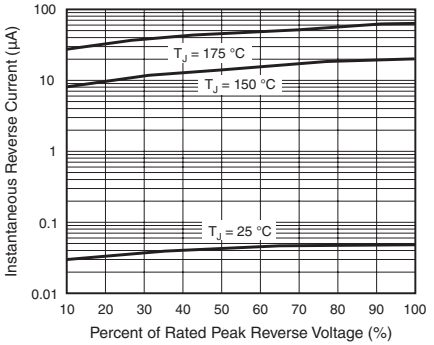
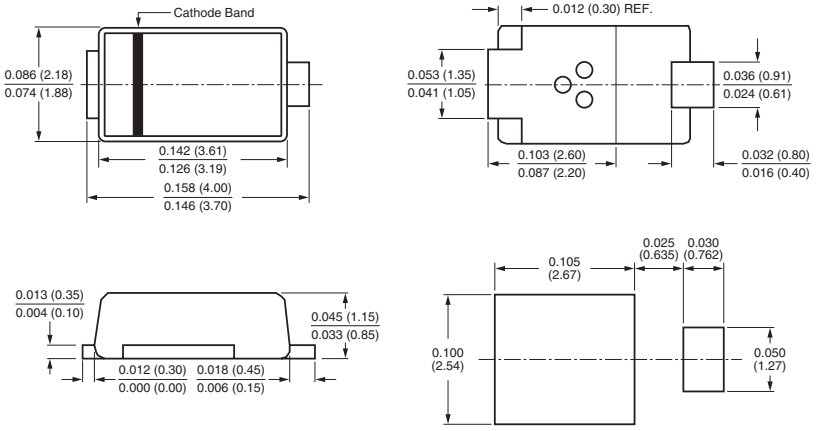


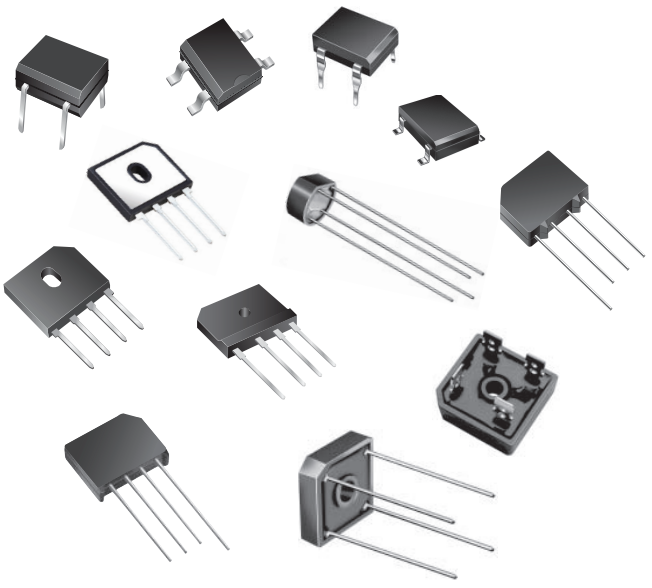
Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



Bridge Rectifiers



Contents

(for full listing please see Selector Guide on page 35)

Introduction to Bridge Rectifiers

Vishay General Semiconductor

Bridge Rectifiers are essential for any electronic equipment that requires full wave rectification of an AC power source. The bridge rectifier is comprised of four separate rectifier components configured into a “bridge” arrangement in a single package. This is illustrated in Fig. 1. General Semiconductor manufactures a complete line of bridge rectifiers which can meet the power and case style requirements at almost all electronic equipment. These include standard, fast and ultrafast recovery types. The various case designs are shown below in Fig. 2

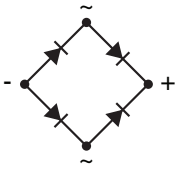
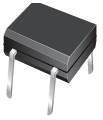
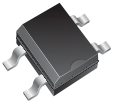


Figure 1.

We offer these devices in a variety of packages for your convenience.



MBM

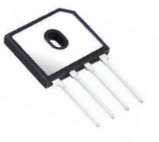


TO-269AA (MBS)

DFM

DFS

DFLS



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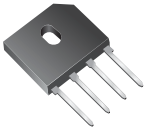

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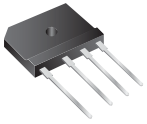
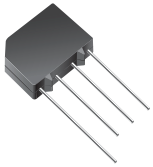
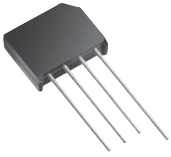


GSIB-5S

GBL



KBPM



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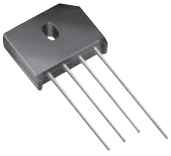
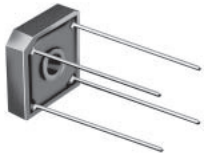


KBU



GBPC1, GBPC6, GBPC12-35W

GBPC12-35

WOG

Figure 2.

For technical questions within your region, please contact:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89093
Revision: 15-Jul-08

Bridge Rectifiers Part Numbering System

1. MINI BRIDGE

aMByS ByS MByM ByM

a = Type designator
"blank" = Standard recovery
R = Fast recovery
MB or B = Mini bridge package style
y = Reverse voltage (x 100) (in V)
2 = 200 V 4 = 400 V
6 = 600 V (standard only)
"M" suffix = Thru-hole mount
"S" suffix = Surface mount

2. DFM/DFS/DFLS

a) Standard

DFyyyaA DFLxxyyya

DF = DIP frame package style
L = Low profile package
xx = Forward current (in A)
15 = 1.5 A
yyy = Reverse Voltage (in V)
005 = 50 V 06 = 600 V
01 = 100 V 08 = 800 V
02 = 200 V 10 = 1000 V
04 = 400 V 14 = 1400 V
a = Type designator
M = Thru-hole mount
S = Surface mount
"A" suffix = With lower forward surge current

b) Enhanced (Ultrafast)

EDF1ya

EDF = Enhanced "DF"
1 = 1.0 A
y = Reverse voltage (in V)
A = 50 V C = 150 V
B = 100 V D = 200 V
a = Type designator
M = Thru-hole mount
S = Surface mount

3. WG

xWyyyG

x = Forward current (in A)
"blank" = 1.5 A
2 = 2.0 A
W = "WOG" package style
yyy = Reverse voltage (in V)
005 = 50 V 06 = 600 V
01 = 100 V 08 = 800 V
02 = 200 V 10 = 1000 V
04 = 400 V
G = Glass passivated chip

4. KBPM

xKBPyyyM

x = Forward current (in A)
"blank" = 1.0 A
2 = 2.0 A
3 = 3.0 A
KBP = Package style
K = In-line package designator
B = Bridge
P = Plastic
yyy = Reverse voltage (in V)
005 = 50 V 06 = 600 V
01 = 100 V 08 = 800 V
02 = 200 V 10 = 1000 V
04 = 400 V
M = Miniature

5. GBPC

GBPCxxyyya

GBPC = Glass passivated bridge plastic case style
xx = Forward current (in A)
yyy = Reverse voltage (in V)
005 = 50 V 06 = 600 V
01 = 100 V 08 = 800 V
02 = 200 V 10 = 1000 V
04 = 400 V
a = Lead type designator (for 12 A to 35 A)
W = Wire leads
"blank" = Fast-on lug-terminals

6. GBL/KBL

aBLyyy

a = Type designator
G = Glass passivated chip
K = Silicone rubber passivated chip designator
BL = "bridge with in-line" mount designator
yyy = Reverse voltage (in V)
005 = 50 V 06 = 600 V
01 = 100 V 08 = 800 V
02 = 200 V 10 = 1000 V
04 = 400 V

7. GBU/KBU

aBUxy

a = Type designator
G = Glass passivated chip
K = Silicone rubber passivated chip designator
BU = Bridge with universal mounting hole package style
x = Forward current (in A)
y = Reverse voltage (in V)
A = 50 V J = 600 V
B = 100 V K = 800 V
D = 200 V M = 1000 V
G = 400 V

Notes:
- Part numbering system for all parts, excluding JEDEC, ProElectron and industry standard part numbers
- For JEDEC and ProElectron part numbers, please see part number explanations on page 18

8. GSIB/VSIB

GSIBxx(A)yy VSIBxx(A)yy

GSIB, VSIB = Single in-line bridge
xx = Forward current (in A)
A = Type with lower forward surge current
yy = Voltage/10 (in V)

20 = 200 V	60 = 600 V
40 = 400 V	80 = 800 V

9. G2SB/G2SBA/G3SBA/G5SBA

G2SByy G2SBAyy G3SBAyy G5SBAyy

GxSB = Single in-line bridge
x = Package classification
2 = GBL package
3 or 5 = GBU package
A = Type with lower forward surge current
yy = Voltage/10 (in V)

20 = 200 V	60 = 600 V
40 = 400 V	80 = 800 V

10. ENHANCED POWER BRIDGE

BUxxyy BUxxyyA BUxxyy5S

BU = High current density bridge rectifier
xx = Forward current (in A)
yy = Voltage/100 (in V)

06 = 600 V	10 = 1000 V
08 = 800 V	

"A" suffix = With lower forward surge current
5S = BU-5S forming type

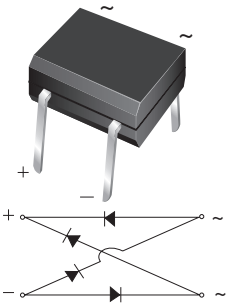
Notes:

- Part numbering system for all parts, excluding JEDEC, ProElectron and industry standard part numbers
- For JEDEC and ProElectron part numbers, please see part number explanations on page 18

For technical questions within your region, please contact:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 89085
Revision: 27-Aug-08

Miniature Glass Passivated Single-Phase Bridge Rectifiers



Case Style MBM

FEATURES

- UL recognition, file number E54214
- Ideal for printed circuit boards
- Applicable for automative insertion
- High surge current capability
- Recommended for non-automotive applications
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, lighting ballaster, battery charger, home appliances, office equipment, and telecommunication applications.

MECHANICAL DATA

Case: MBM

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	200 V, 400 V, 600 V
I_{FSM}	35 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MB2M	MB4M	MB6M	UNIT
Device marking code		2	4	6	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	V
Maximum RMS voltage	V_{RMS}	140	280	420	V
Maximum DC blocking voltage	V_{DC}	200	400	600	V
Maximum average forward output rectified current (Fig. 1) on glass-epoxy P.C.B. / on aluminum substrate	$I_{F(AV)}$	0.5 (1) / 0.8 (2)			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	35			A
Rating for fusing (t < 8.3 ms)	I^2t	5.0			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

(2) On aluminum substrate P.C.B. with an area of 0.8" x 0.8" (20 x 20 mm) mounted on 0.05 x 0.05" (1.3 x 1.3 mm) solder pad

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**MB2M**	**MB4M**	**MB6M**	**UNIT**
Maximum instantaneous forward voltage drop per diode	0.4 A	V_F	1.0			V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 100			µA
Typical junction capacitance per diode (1)		C_J	13			pF

Note:

(1) Measured at 1.0 MHz and applied reverse voltage of 4.0 V

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MB2M**	**MB4M**	**MB6M**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JA}$ $R_{\theta JL}$	85 (1) 70 (2) 20 (1)			°C/W

Notes:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

(2) On aluminum substrate P.C.B. with an area of 0.8" x 0.8" (20 x 20 mm) mounted on 0.05 x 0.05" (1.3 x 1.3 mm) solder pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MB2M-E3/45	0.22	45	100	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

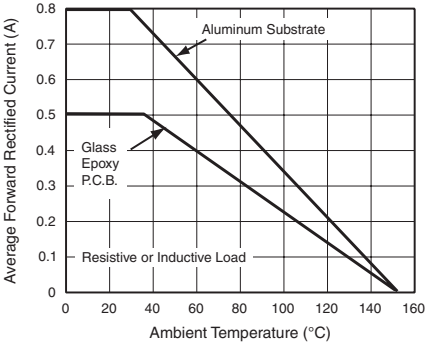


Figure 1. Derating Curve for Output Rectified Current

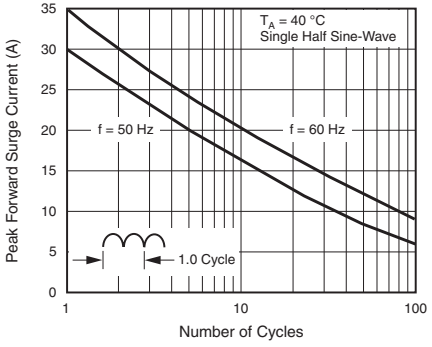


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

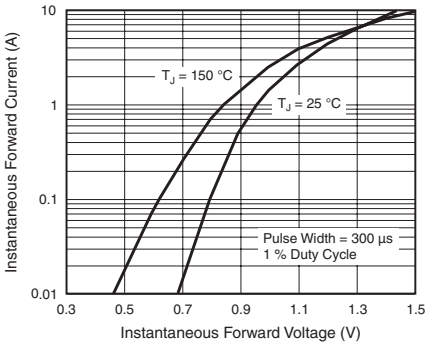


Figure 3. Typical Forward Voltage Characteristics Per Diode

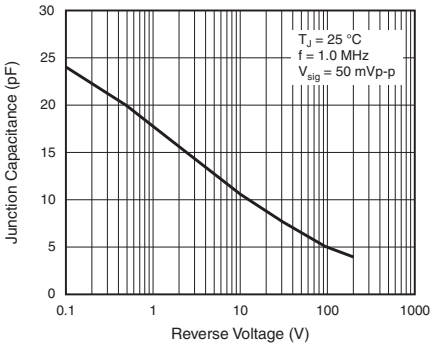


Figure 5. Typical Junction Capacitance Per Diode

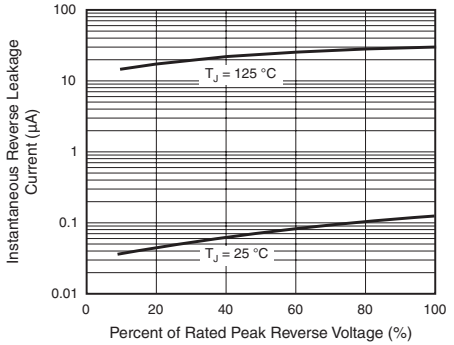
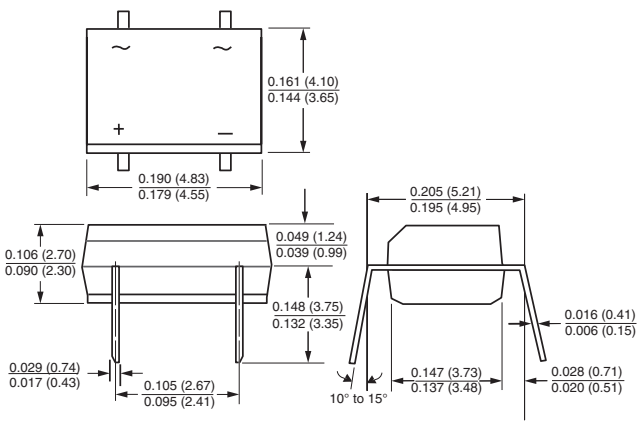


Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

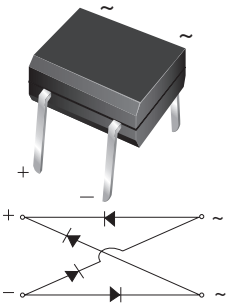
Case Style MBM



B2M, B4M & B6M

Vishay General Semiconductor

Miniature Glass Passivated Single-Phase Bridge Rectifiers



Case Style MBM

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	200 V, 400 V, 600 V
I_{FSM}	30 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

FEATURES

- UL recognized, file number E54214
- Ideal for printed circuit boards
- Applicable for automative insertion
- Middle surge current capability
- Recommended for non-automotive applications
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, lighting ballaster, battery charger, home appliances, office equipment, and telecommunication applications.

MECHANICAL DATA

Case: MBM

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	B2M	B4M	B6M	UNIT
Device marking code		B2	B4	B6	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	V
Maximum RMS voltage	V_{RMS}	140	280	420	V
Maximum DC blocking voltage	V_{DC}	200	400	600	V
Maximum average forward output rectified current (Fig. 1) on glass-epoxy P.C.B.	$I_{F(AV)}$	0.5 (1)			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load (JEDEC method)	I_{FSM}	30			A
Rating for fusing (t < 8.3 ms)	I^2t	5.0			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

Note:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88898
Revision: 01-Feb-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**B2M**	**B4M**	**B6M**	**UNIT**
Maximum instantaneous forward voltage drop per diode	0.5 A	V_F	1.0			V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 100			µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	13			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**B2M**	**B4M**	**B6M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	90 40			°C/W

Note:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B2M-E3/45	0.22	45	100	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

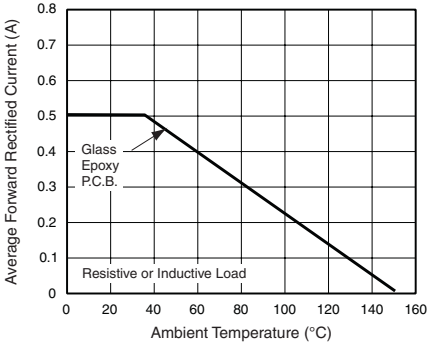


Figure 1. Derating Curve for Output Rectified Current

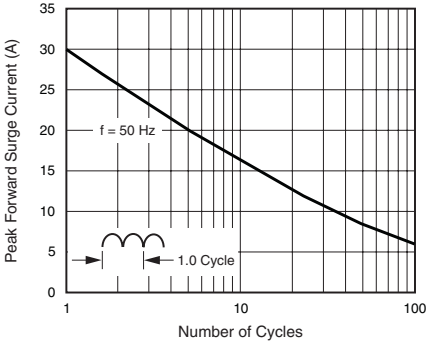


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

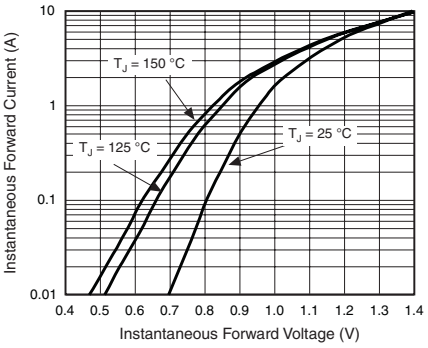


Figure 3. Typical Forward Voltage Characteristics Per Diode

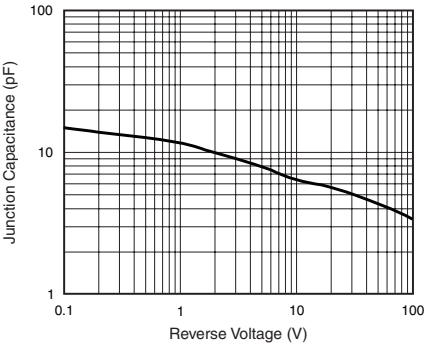


Figure 5. Typical Junction Capacitance Per Diode

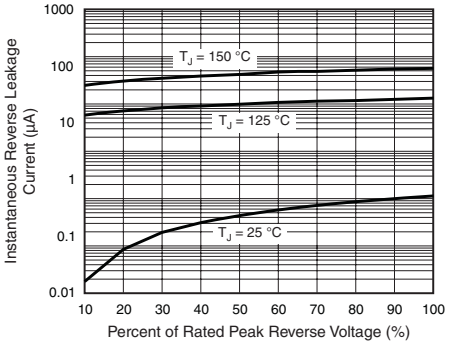
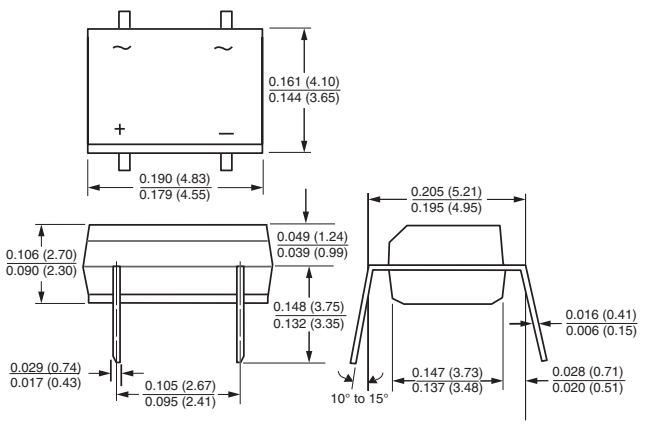


Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

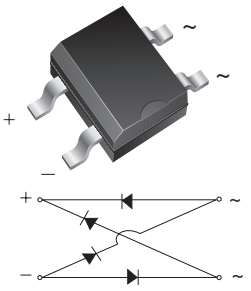
Case Style MBM



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88898
Revision: 01-Feb-08

Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifier



TO-269AA (MBS)

FEATURES

- UL recognition, file number E54214
- Saves space on printed circuit boards
- Ideal for automated placement
- High surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	200 V, 400 V, 600 V
I_{FSM}	35 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, lighting ballaster, Battery charger, home appliances, office equipment, and telecommunication applications.

MECHANICAL DATA

Case: TO-269AA (MBS)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MB2S	MB4S	MB6S	UNIT
Device marking code		2	4	6	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	V
Maximum RMS voltage	V_{RMS}	140	280	420	V
Maximum DC blocking voltage	V_{DC}	200	400	600	V
Maximum average forward output rectified current (Fig. 1) on glass-epoxy P.C.B. / on aluminum substrate	$I_{F(AV)}$	0.5 (1) / 0.8 (2)			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	35			A
Rating for fusing (t < 8.3 ms)	I^2t	5.0			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

(2) On aluminum substrate P.C.B. with an area of 0.8" x 0.8" (20 x 20 mm) mounted on 0.05 x 0.05" (1.3 x 1.3 mm) solder pad

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**MB2S**	**MB4S**	**MB6S**	**UNIT**
Maximum instantaneous forward voltage drop per diode	0.4 A	V_F	1.0			V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 100			µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	13			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**MB2S**	**MB4S**	**MB6S**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JA}$ $R_{\theta JL}$	85 (1) 70 (2) 20 (1)			°C/W

Notes:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

(2) On aluminum substrate P.C.B. with an area of 0.8" x 0.8" (20 x 20 mm) mounted on 0.05 x 0.05" (1.3 x 1.3 mm) solder pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
MB2S-E3/45	0.22	45	100	Tube
MB2S-E3/80	0.22	80	3000	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

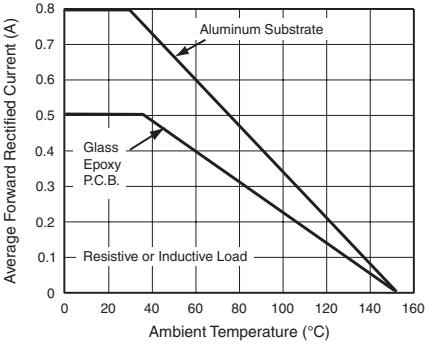


Figure 1. Derating Curve for Output Rectified Current

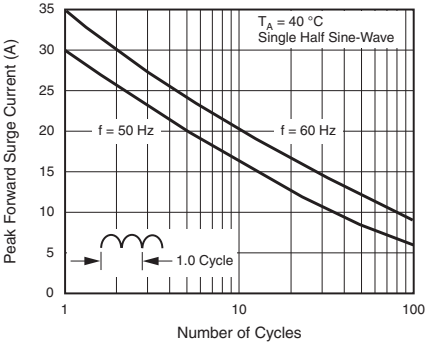


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

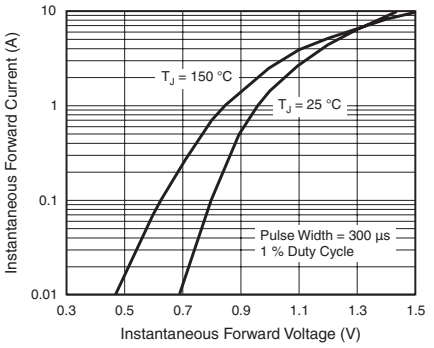


Figure 3. Typical Forward Voltage Characteristics Per Diode

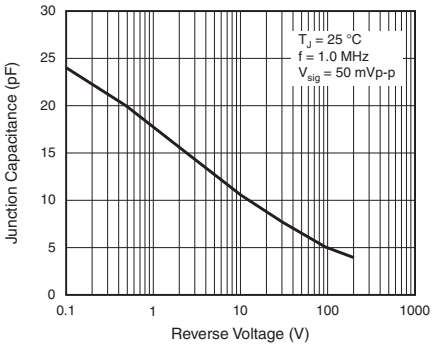


Figure 5. Typical Junction Capacitance Per Diode

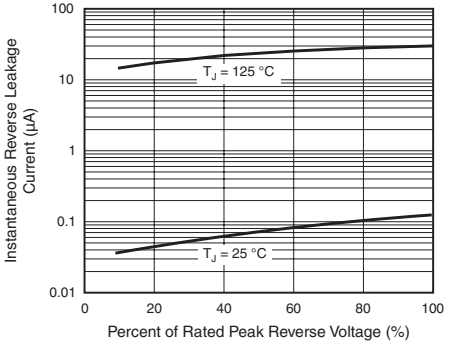
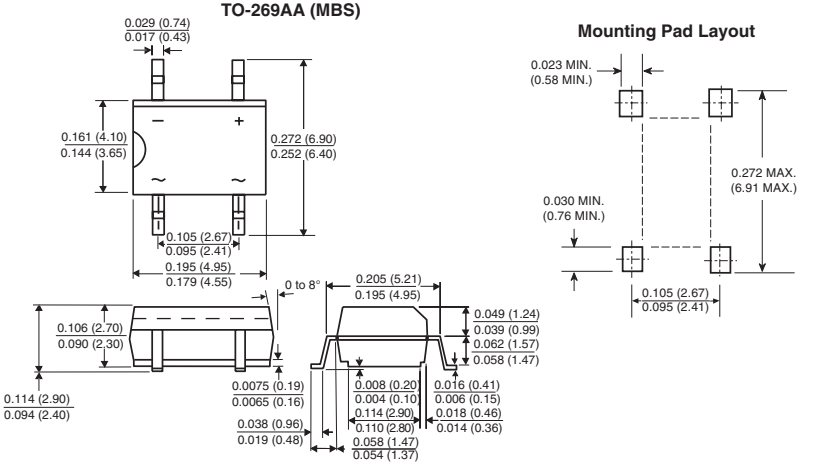
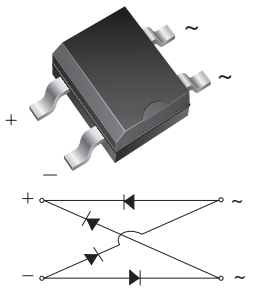


Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifier



TO-269AA (MBS)

FEATURES

- UL recognition, file number E54214
- Saves space on printed circuit boards
- Ideal for automated placement
- Middle surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, lighting ballaster, battery charger, home appliances, office equipment, and telecommunication applications.

MECHANICAL DATA

Case: TO-269AA (MBS)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	200 V, 400 V, 600 V
I_{FSM}	30 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	B2S	B4S	B6S	UNIT
Device marking code		B2	B4	B6	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	V
Maximum RMS voltage	V_{RMS}	140	280	420	V
Maximum DC blocking voltage	V_{DC}	200	400	600	V
Maximum average forward output rectified current on glass-epoxy P.C.B. (Fig. 1)	$I_{F(AV)}$	0.5 (1)			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30			A
Rating for fusing (t < 8.3 ms)	I^2t	5.0			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

Note:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Max. instantaneous forward voltage drop per diode	0.5 A		V_F	1.0	V
Maximum DC reverse current at rated DC blocking voltage per diode		T_A = 25 °C T_A = 125 °C	I_R	5.0 100	µA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	13	pF

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88893
Revision: 01-Feb-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**B2S**	**B4S**	**B6S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$		90 40		°C/W

Note:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B2S-E3/80	0.22	80	3000	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

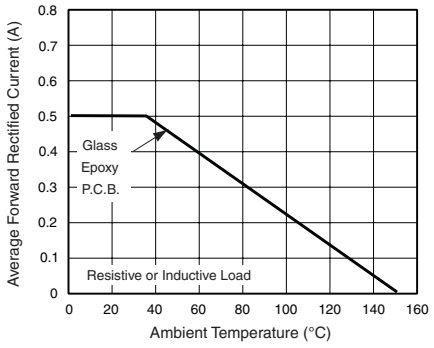


Figure 1. Derating Curve for Output Rectified Current

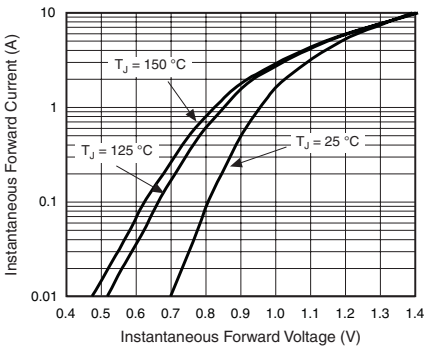


Figure 3. Typical Forward Voltage Characteristics Per Diode

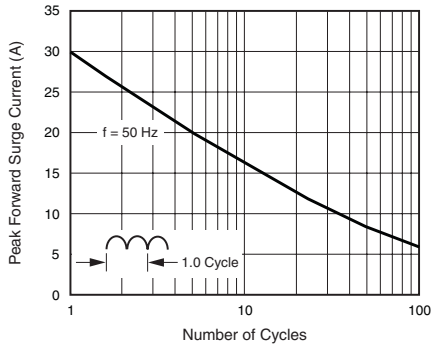


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

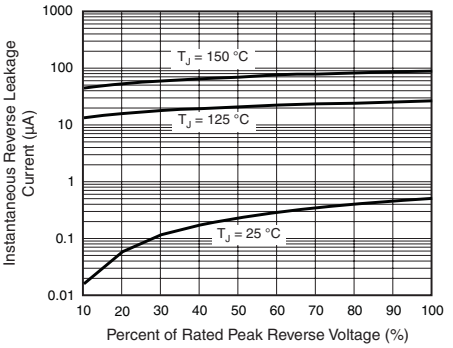


Figure 4. Typical Reverse Leakage Characteristics Per Diode

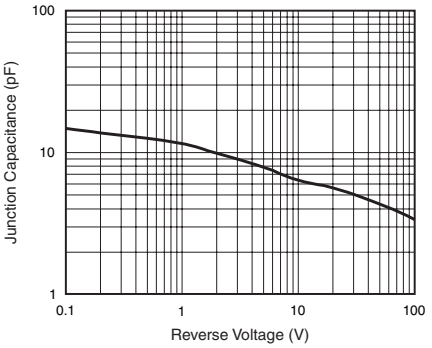
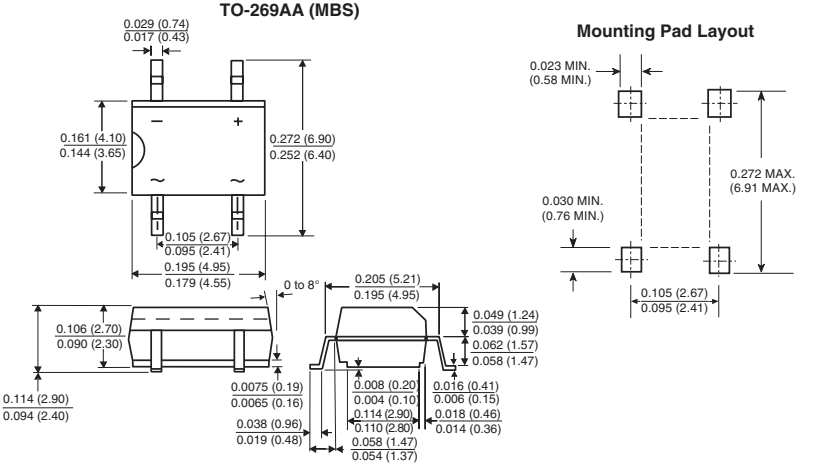
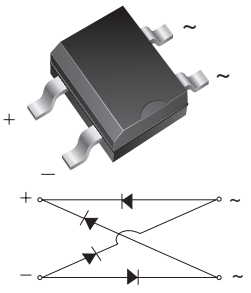


Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Miniature Glass Passivated Fast Recovery Surface Mount Bridge Rectifier



TO-269AA (MBS)

FEATURES

- UL recognition, file number E54214
- Saves space on printed circuit boards
- Ideal for automated placement
- Fast recovery, low switching loss
- High surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, lighting ballaster, battery charger, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.5 A
V_{RRM}	200 V, 400 V
I_{FSM}	30 A
t_{rr}	150 ns
V_F	1.25 V
T_J max.	150 °C

MECHANICAL DATA

Case: TO-269AA (MBS)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	RMB2S	RMB4S	UNIT
Device marking code			2R	4R	
Maximum repetitive peak reverse voltage		V_{RRM}	200	400	V
Maximum RMS voltage		V_{RMS}	140	280	V
Maximum DC blocking voltage		V_{DC}	200	400	V
Maximum average forward output rectified current at T_A = 30 °C	on glass-epoxy P.C.B. on aluminum substrate	$I_{F(AV)}$	0.5 (1) 0.8 (2)		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I_{FSM}	30		A
Rating for fusing (t < 8.3 ms)		I^2t	5.0		A^2s
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150		°C

Notes:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

(2) On aluminum substrate P.C.B. with an area of 0.8" x 0.8" (20 x 20 mm) mounted on 0.05 x 0.05" (1.3 x 1.3 mm) solder pad

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**RMB2S**	**RMB4S**	**UNIT**
Maximum instantaneous forward voltage drop per diode	0.4 A	V_F	1.25		V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 100		µA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	150		ns
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	13		pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**RMB2S**	**RMB4S**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JA}$ $R_{\theta JL}$	85 (1) 70 (2) 20 (1)		°C/W

Notes:

(1) On glass epoxy P.C.B. mounted on 0.05 x 0.05" (1.3 x 1.3 mm) pads

(2) On aluminum substrate P.C.B. with an area of 0.8" x 0.8" (20 x 20 mm) mounted on 0.05 x 0.05" (1.3 x 1.3 mm) solder pad

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
RMB4S-E3/45	0.22	45	100	Tube
RMB4S-E3/80	0.22	80	3000	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

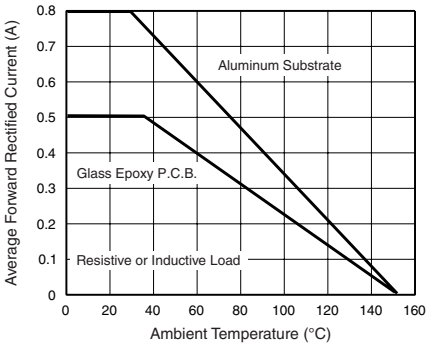


Figure 1. Maximum Forward Current Derating Curve

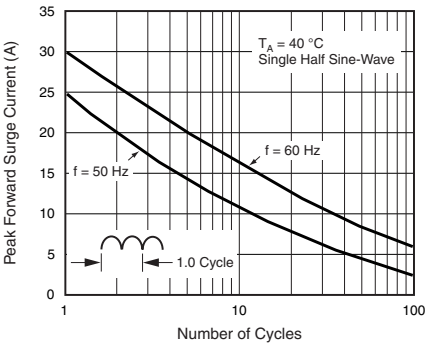


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

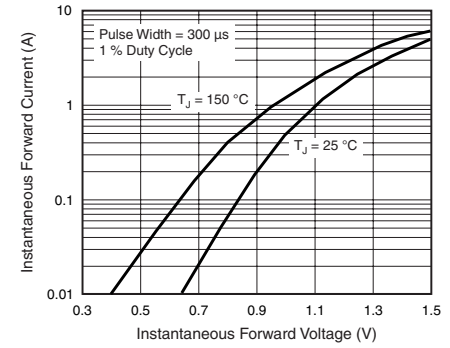


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

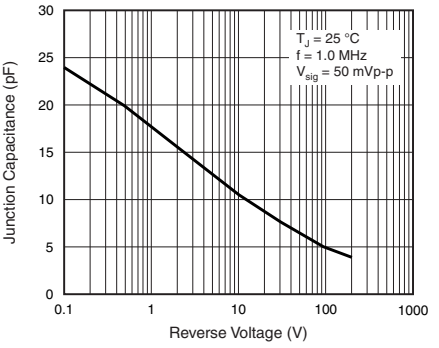


Figure 5. Typical Junction Capacitance Per Diode

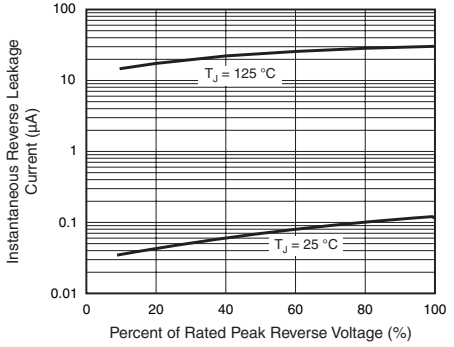
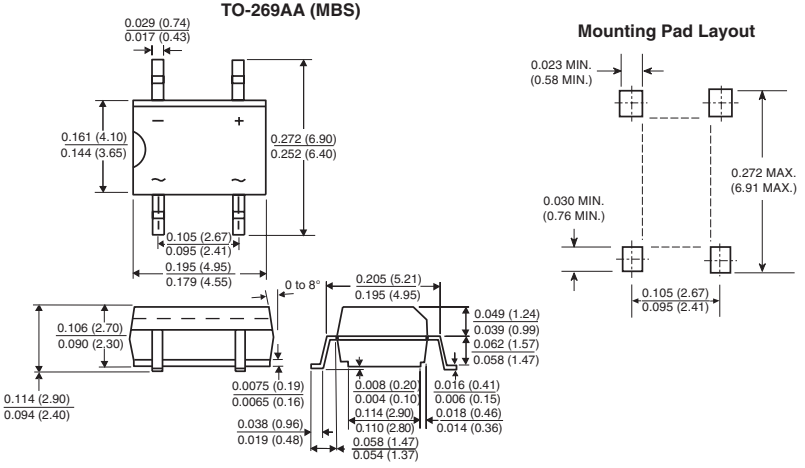


Figure 4. Typical Reverse Leakage Characteristics Per Diode

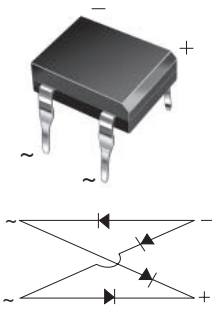
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



B40C800DM thru B380C800DM

Vishay General Semiconductor

Glass Passivated Ultrafast Bridge Rectifier



Case Style DFM

FEATURES

- Ideal for automated placement
- High surge current capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.9 A
V_{RRM}	65 V to 600 V
I_{FSM}	45 A
I_R	10 µA
V_F	1.0 V
T_J max.	125 °C

MECHANICAL DATA

Case: DFM

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	B40 C800DM	B80 C800DM	B125 C800DM	B250 C800DM	B380 C800DM	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	65	125	200	400	600	V
Maximum RMS input voltage R- and C-load		V_{RMS}	40	80	125	250	380	V
Maximum average forward output current for free air operation at T_A = 45 °C	R- and L-load	$I_{F(AV)}$	0.9					A
	C-load		0.8					
Maximum DC blocking voltage		V_{DC}	65	125	200	400	600	V
Maximum peak working voltage		V_{RWM}	90	180	300	600	900	V
Maximum non-repetitive peak voltage		V_{RSM}	100	200	350	650	1000	V
Maximum repetitive peak forward surge current		I_{FRM}	10					A
Peak forward surge current single sine-wave on rated load		I_{FSM}	45					A
Rating for fusing at T_J = 125 °C (t < 100 ms)		I^2t	10					A^2s
Minimum series resistor C-load at V_{RMS} = ± 10 %		R_T	1.0	2.0	4.0	8.0	12	Ω
Maximum load capacitance	+ 50 % - 10 %	C_L	5000	2500	1000	500	200	µF
Operating junction temperature range		T_J	- 40 to + 125					°C
Storage temperature range		T_{STG}	- 40 to + 150					°C

For technical questions within your region, please contact one of the following:
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Document Number: 88533
Revision: 29-May-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**B40 C800DM**	**B80 C800DM**	**B125 C800DM**	**B250 C800DM**	**B380 C800DM**	**UNIT**
Maximum instantaneous forward voltage drop per diode	0.9 A	V_F	1.0					V
Maximum reverse current at rated repetitive peak voltage per diode		I_R	10					µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**B40 C800DM**	**B80 C800DM**	**B125 C800DM**	**B250 C800DM**	**B380 C800DM**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15					°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.5 x 0.5" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B38C800DM-E3/45	0.416	45	50	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

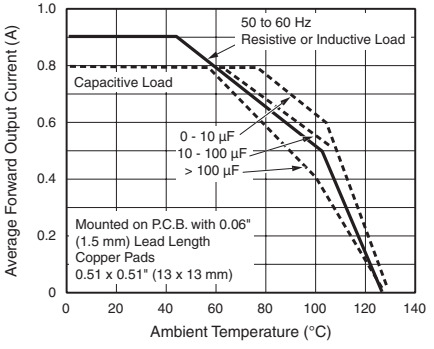


Figure 1. Derating Curves Output Rectified Current for B40C800D...B125C800DM

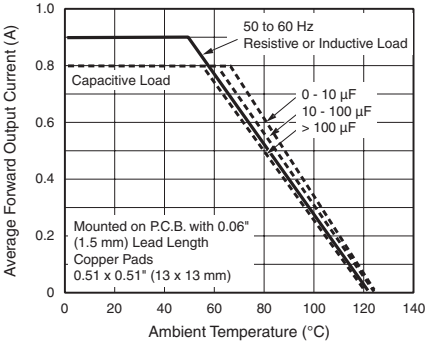


Figure 2. Derating Curves Output Rectified Current for B250C800D...B360C800DM

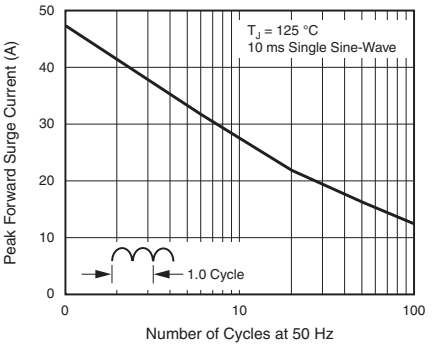


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

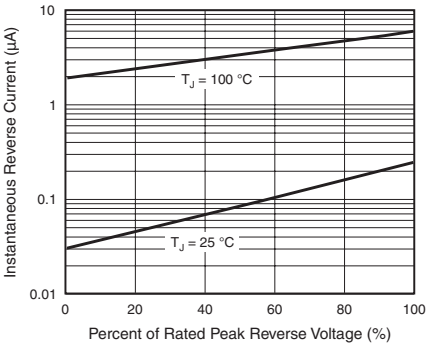


Figure 5. Typical Reverse Leakage Characteristics Per Diode

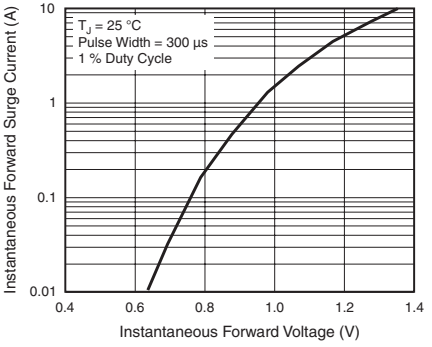


Figure 4. Typical Forward Characteristics Per Diode

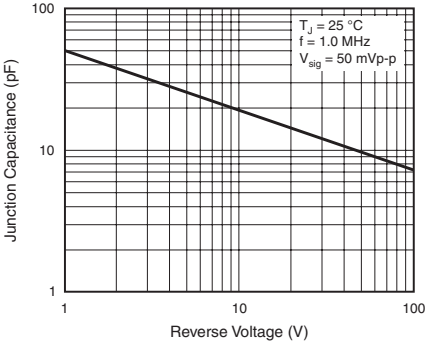
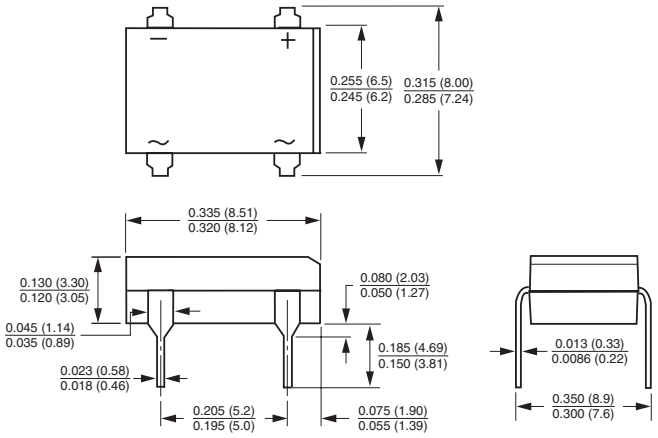


Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style DFM



Glass Passivated Single-Phase Bridge Rectifier

Case Style WOG

FEATURES

- Ideal for printed circuit boards
- High case dielectric strength
- High surge current capability
- Typical I_R less than 0.1 µA
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, adapter, charger, lighting ballaster on consumers and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	0.9 A
V_{RRM}	65 V to 600 V
I_{FSM}	45 A
I_R	10 µA
V_F	1.0 V
T_J max.	125 °C

MECHANICAL DATA

Case: WOG

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	B40 C800G	B80 C800G	B125 C800G	B250 C800G	B380 C800G	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	65	125	200	400	600	V
Maximum RMS input voltage R- and C-load		V_{RMS}	40	80	125	250	380	V
Maximum average forward output current for free air operation at T_A = 45 °C	R- and L-load C-load	$I_{F(AV)}$	0.9 0.8					A
Maximum non-repetitive peak voltage		V_{RSM}	100	200	350	600	1000	V
Maximum DC blocking voltage		V_{DC}	65	125	200	400	600	V
Maximum peak working voltage		V_{RWM}	90	180	300	600	900	V
Maximum repetitive peak forward surge current		I_{FRM}	10					A
Peak forward surge current single sine-wave on rated load		I_{FSM}	45					A
Rating for fusing at T_J = 125 °C (t < 100 ms)		I^2t	10					A^2s
Minimum series resistor C-load at V_{RMS} = ± 10 %		R_t	1.0	2.0	4.0	8.0	12	Ω
Maximum load capacitance	+ 50 % - 10 %	C_L	5000	2500	1000	500	200	µF
Operating junction temperature range		T_J	- 40 to + 125					°C
Storage temperature range		T_{STG}	- 40 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**B40 C800G**	**B80 C800G**	**B125 C800G**	**B250 C800G**	**B380 C800G**	**UNIT**
Maximum instantaneous forward voltage drop per diode	0.9 A	V_F	1.0					V
Maximum reverse current at rated repetitive peak voltage per diode		I_R	10					µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**B40 C800G**	**B80 C800G**	**B125 C800G**	**B250 C800G**	**B380 C800G**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	36 11					°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. at 0.375" (9.5 mm) lead lengths with 0.22 x 0.22" (5.5 x 5.5 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
B380C800G-E4/51	1.12	51	100	Plastic bag

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

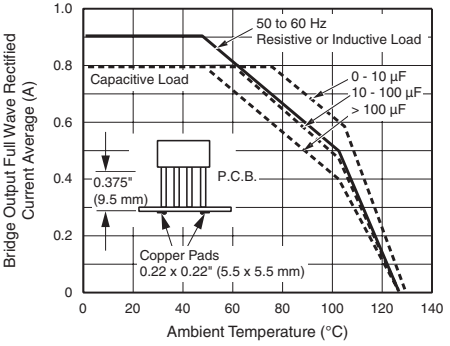


Figure 1. Derating Curves Output Rectified Current for B40C800G...B125C800G

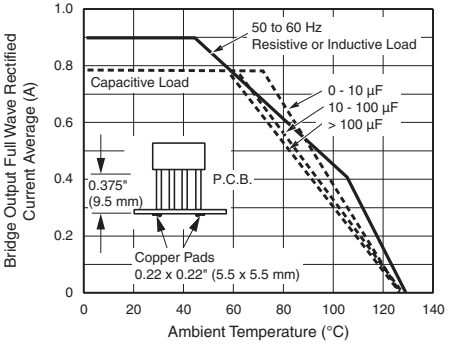


Figure 2. Derating Curves Output Rectified Current for B250C800G...B380C800G

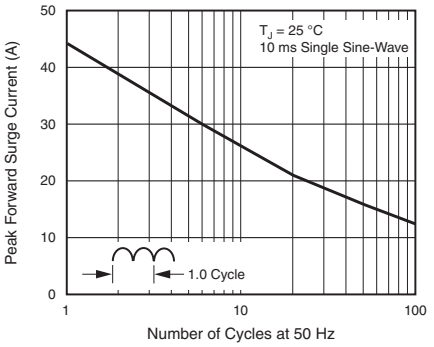


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

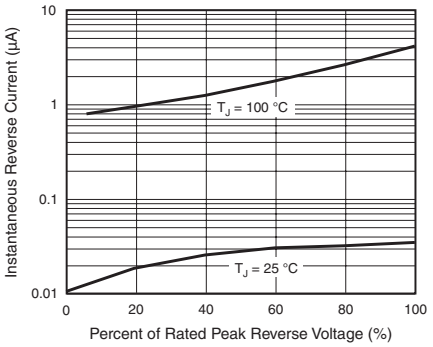


Figure 5. Typical Reverse Characteristics Per Diode

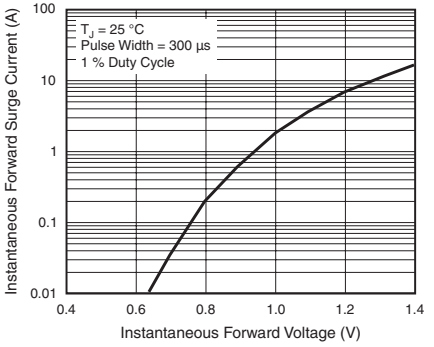


Figure 4. Typical Forward Characteristics Per Diode

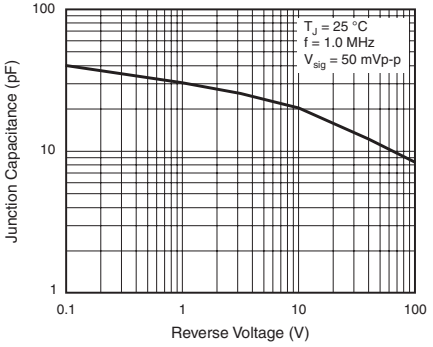
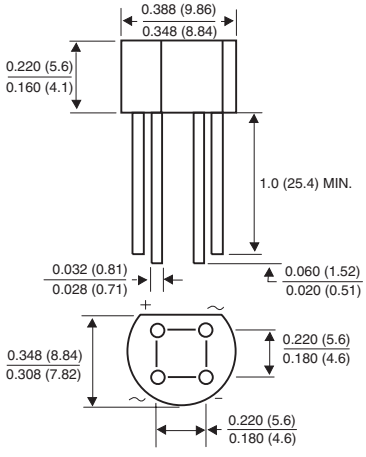


Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style WOG



Glass Passivated Single-Phase Bridge Rectifier

Case Style WOG

FEATURES

- Ideal for printed circuit boards
- High case dielectric strength
- High surge current capability
- Typical I_R less than 0.1 µA
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	65 V to 600 V
I_{FSM}	45 A
I_R	10 µA
V_F	1.0 V
T_J max.	125 °C

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, adapter, charger, lighting ballaster on consumers and home appliances applications.

MECHANICAL DATA

Case: WOG

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	B40 C1000G	B80 C1000G	B125 C1000G	B250 C1000G	B380 C1000G	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	65	125	200	400	600	V
Maximum RMS input voltage R- and C-load		V_{RMS}	40	80	125	250	380	V
Maximum DC blocking voltage		V_{DC}	65	125	200	400	600	V
Maximum peak working voltage		V_{RWM}	90	180	300	600	800	V
Maximum non-repetitive peak voltage		V_{RSM}	100	200	350	600	1000	V
Maximum repetitive peak forward surge current		I_{FRM}	10					A
Maximum average forward output current for free air operation at T_A = 45 °C	R- and L-load C-load	$I_{F(AV)}$	1.2 1.0					A
Peak forward surge current single sine-wave on rated load		I_{FSM}	45					A
Rating for fusing at T_J = 125 °C (t < 8.3 ms)		I^2t	10					A^2s
Minimum series resistor C-load at V_{RMS} = ± 10 %		R_t	1.0	2.0	4.0	8.0	12	Ω
Maximum load capacitance	+ 50 % - 10 %	C_L	5000	2500	1000	500	200	µF
Operating junction temperature range		T_J	- 40 to + 125					°C
Storage temperature range		T_{STG}	- 40 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS	SYMBOL	B40 C1000G	B80 C1000G	B125 C1000G	B250 C1000G	B380 C1000G	UNIT
Maximum instantaneous forward voltage drop per diode	1.0 A	V_F	1.0					V
Maximum reverse current at rated repetitive peak voltage per diode	T_A = 25 °C	I_R	10					µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	B40 C1000G	B80 C1000G	B125 C1000G	B250 C1000G	B380 C1000G	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	36 11					°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. at 0.375" (9.5 mm) lead lengths with 0.22 x 0.22" (5.5 x 5.5 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
B380C1000G-E4/51	1.12	51	100	Plastic bag

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

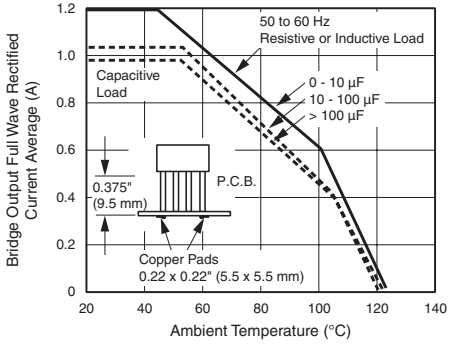


Figure 1. Derating Curves Output Rectified Current for B40C1000G...B125C1000G

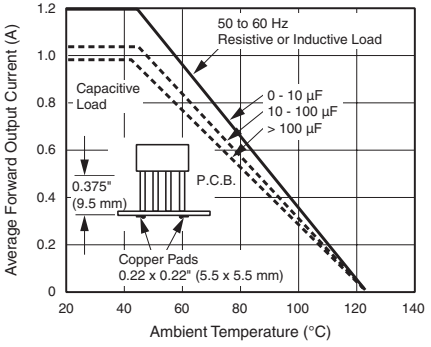


Figure 2. Derating Curves Output Rectified Current for B250C1000G...B380C1000G

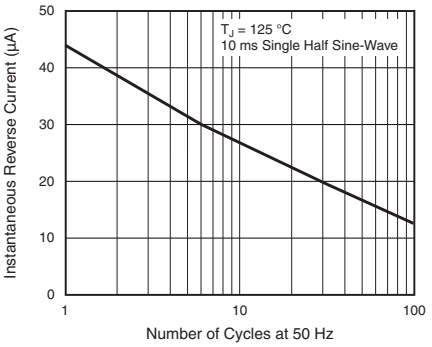


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

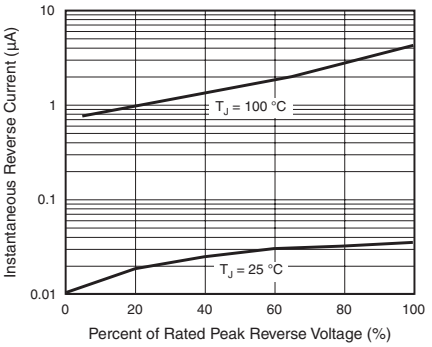


Figure 5. Typical Reverse Characteristics Per Diode

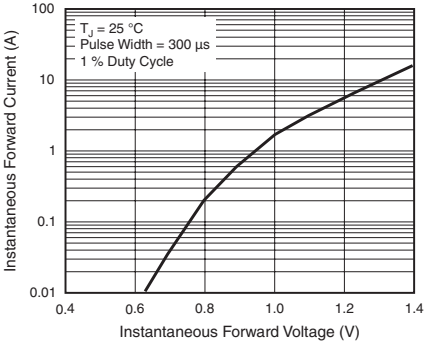


Figure 4. Typical Forward Characteristics Per Diode

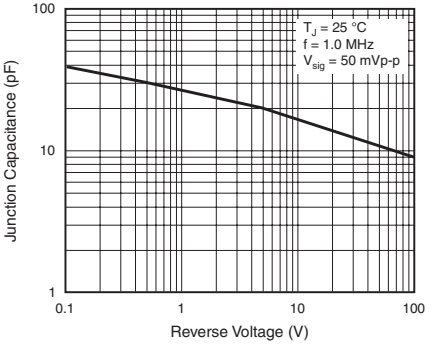
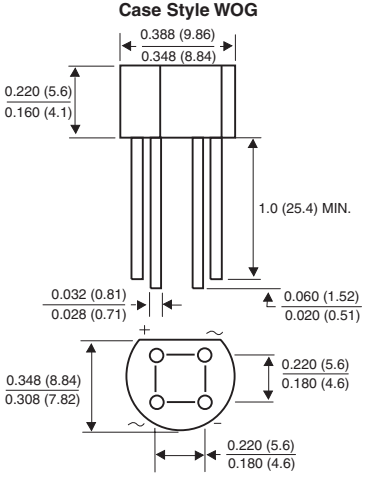


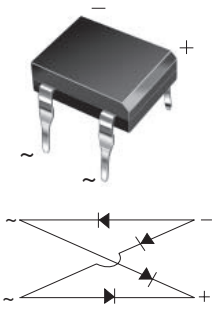
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style WOG



Miniature Glass Passivated Single-Phase Bridge Rectifiers



Case Style DFM

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	5 µA
V_F	1.1 V
T_J max.	150 °C

FEATURES

- UL recognition, file number E54214
- Ideal for printed circuit boards
- Applicable for automative insertion
- High surge current capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

MECHANICAL DATA

Case: DFM

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	DF005M	DF01M	DF02M	DF04M	DF06M	DF08M	DF10M	UNIT
Device marking code		DF005	DF01	DF02	DF04	DF06	DF08	DF10	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward output rectified current at T_A = 40 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	50							A
Rating for fusing (t < 8.3 ms)	I^2t	10							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**DF005M**	**DF01M**	**DF02M**	**DF04M**	**DF06M**	**DF08M**	**DF10M**	**UNIT**
Maximum instantaneous forward voltage drop per diode	1.0 A	V_F	1.1							V
Maximum reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	25							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**DF005M**	**DF01M**	**DF02M**	**DF04M**	**DF06M**	**DF08M**	**DF10M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.5 x 0.5" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
DF06M-E3/45	0.416	45	50	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

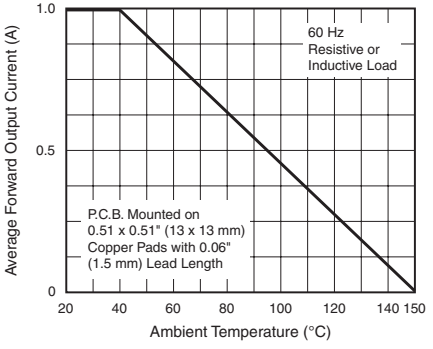


Figure 1. Derating Curve Output Rectified Current

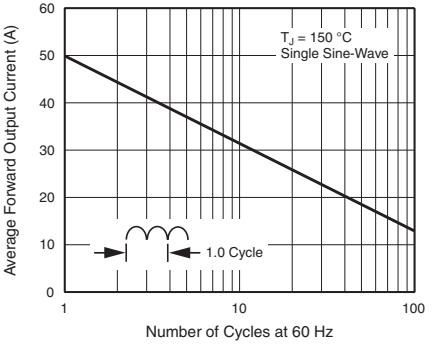


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88571
Revision: 14-Jan-08

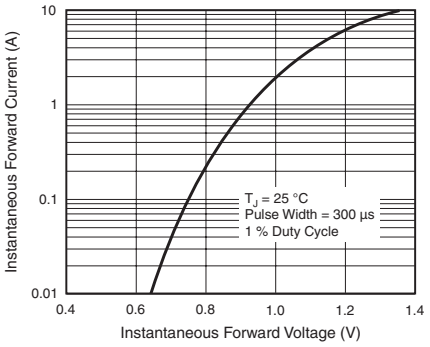


Figure 3. Typical Forward Characteristics Per Diode

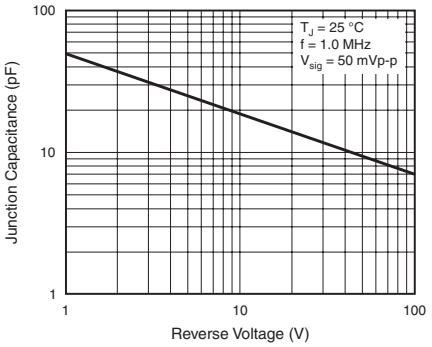


Figure 5. Typical Junction Capacitance Per Diode

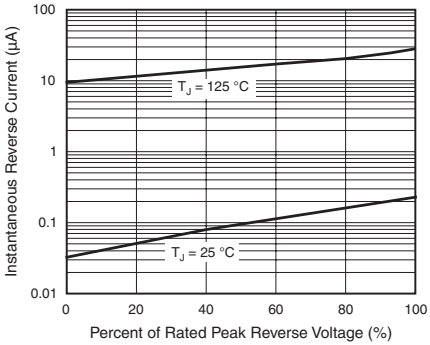


Figure 4. Typical Reverse Leakage Characteristics Per Diode

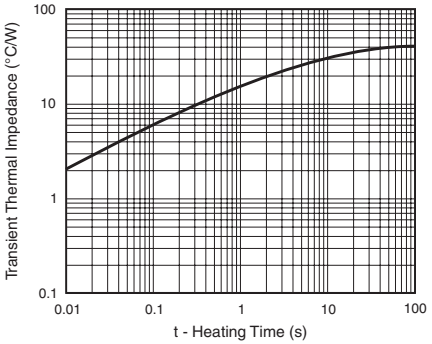
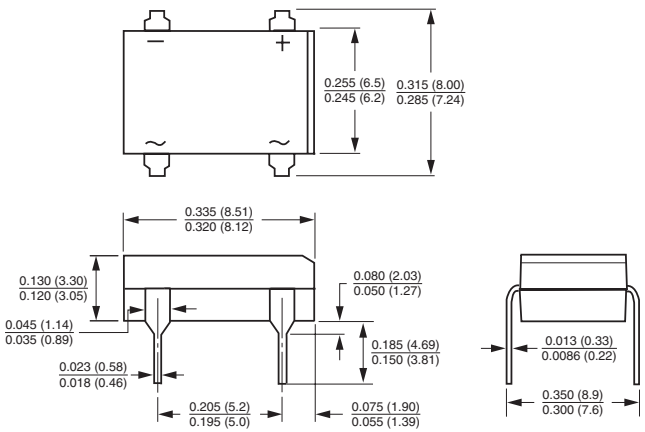


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

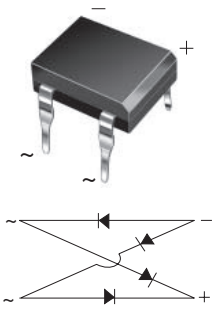
Case Style DFM



DF005MA thru DF10MA

Vishay General Semiconductor

Miniature Glass Passivated Single-Phase Bridge Rectifiers



Case Style DFM

FEATURES

- UL recognition, file number E54214
- Ideal for printed circuit boards
- Applicable for automative insertion
- High surge current capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
I_R	5 µA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: DFM

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	DF005MA	DF01MA	DF02MA	DF04MA	DF06MA	DF08MA	DF10MA	UNIT
Device marking code		DFA005	DFA01	DFA02	DFA04	DFA06	DFA08	DFA10	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward output rectified current at T_A = 40 °C	$I_{F(AV)}$	1.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	30							A
Rating for fusing (t < 8.3 ms)	I^2t	4.5							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

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Document Number: 88572
Revision: 14-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**DF005MA**	**DF01MA**	**DF02MA**	**DF04MA**	**DF06MA**	**DF08MA**	**DF10MA**	**UNIT**
Maximum instantaneous forward voltage drop per diode	1.0 A	V_F	1.1							V
Maximum reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	25							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**DF005MA**	**DF01MA**	**DF02MA**	**DF04MA**	**DF06MA**	**DF08MA**	**DF10MA**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.5 x 0.5" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
DF06MA-E3/45	0.403	45	50	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

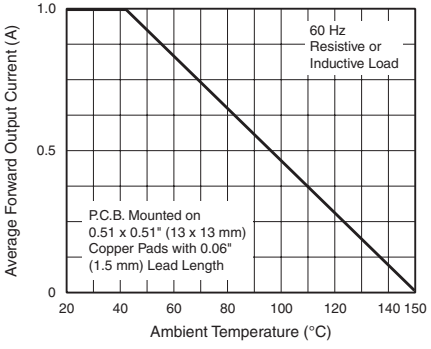


Figure 1. Derating Curve Output Rectified Current

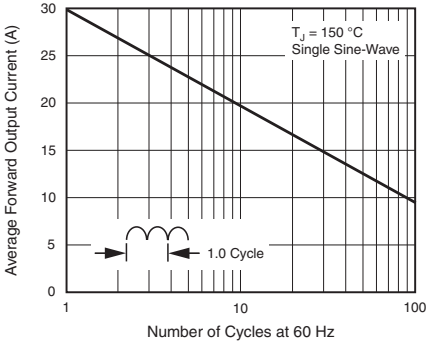


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

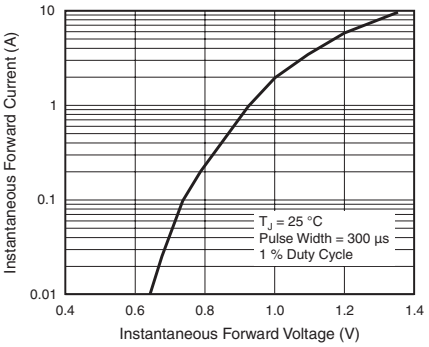


Figure 3. Typical Forward Characteristics Per Diode

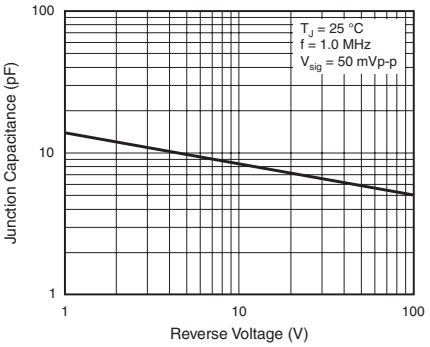


Figure 5. Typical Junction Capacitance Per Diode

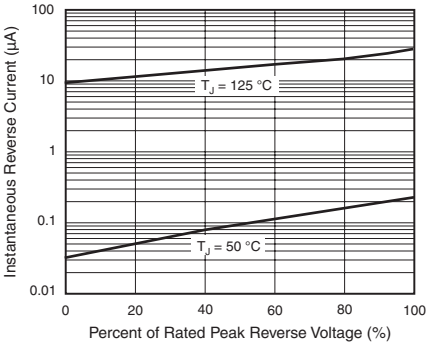


Figure 4. Typical Reverse Leakage Characteristics Per Diode

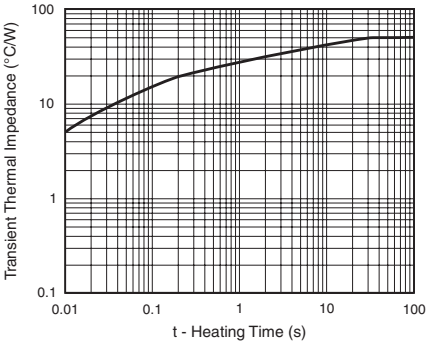
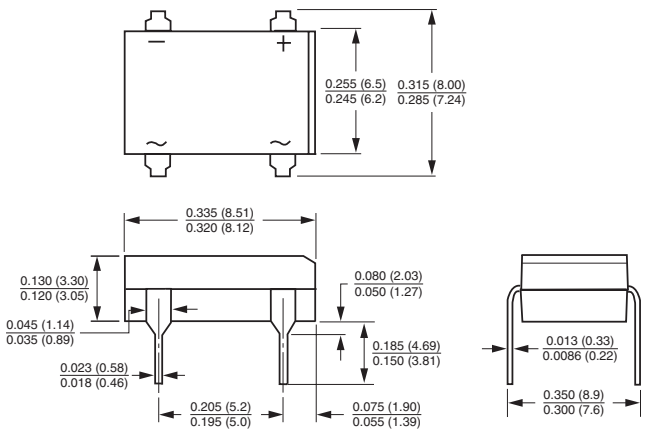


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style DFM



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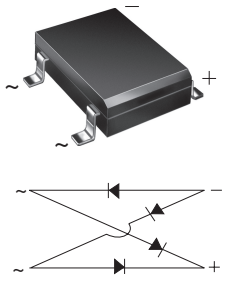
Document Number: 88572
Revision: 14-Jan-08

Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifiers



Case Style DFS

FEATURES

- UL recognition, file number E54214
- Ideal for automated placement
- High surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	5 µA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: DFS

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	DF005S	DF01S	DF02S	DF04S	DF06S	DF08S	DF10S	UNIT
Device marking code		DF005S	DF01S	DF02S	DF04S	DF06S	DF08S	DF10S	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward output rectified current at T_A = 40 °C (1)	$I_{F(AV)}$	1.0							A
Peak forward surge current single half sine-wave superimposed on rated load	I_{FSM}	50							A
Rating for fusing (t < 8.3 ms)	I^2t	10							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**DF005S**	**DF01S**	**DF02S**	**DF04S**	**DF06S**	**DF08S**	**DF10S**	**UNIT**
Maximum instantaneous forward voltage drop per diode	1.0 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode (1)		C_J	25							pF

Note:

(1) Measured at 1.0 MHz and applied reverse voltage of 4.0 V

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**DF005S**	**DF01S**	**DF02S**	**DF04S**	**DF06S**	**DF08S**	**DF10S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15							°C/W

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
DF06S-E3/45	0.399	45	50	Tube
DF06S-E3/77	0.399	77	1500	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

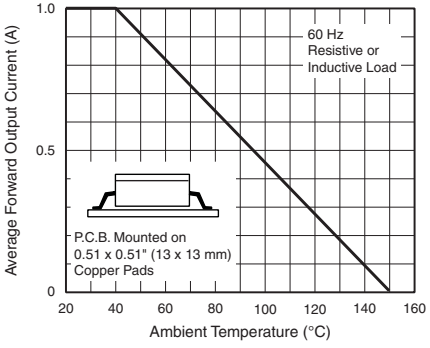


Figure 1. Derating Curve Output Rectified Current

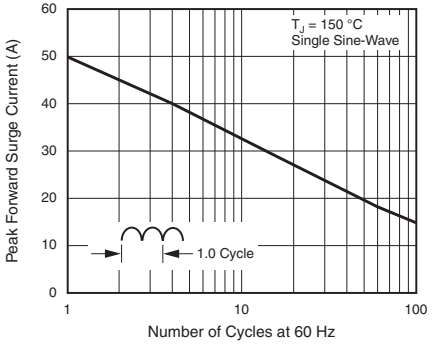


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

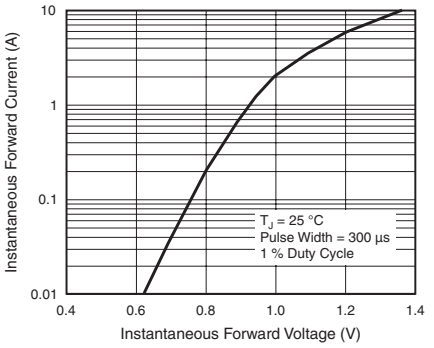


Figure 3. Typical Forward Characteristics Per Diode

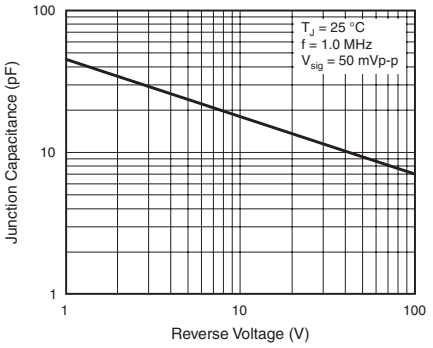


Figure 5. Typical Junction Capacitance Per Diode

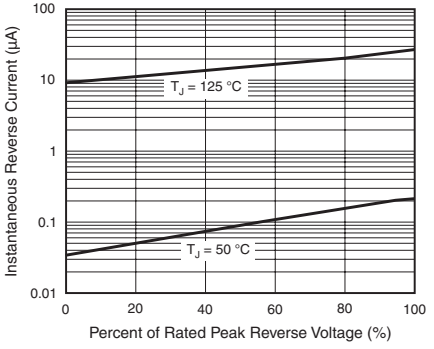


Figure 4. Typical Reverse Leakage Characteristics Per Diode

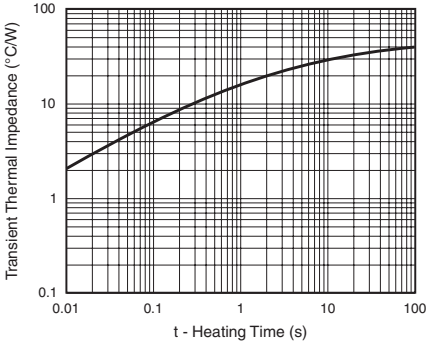
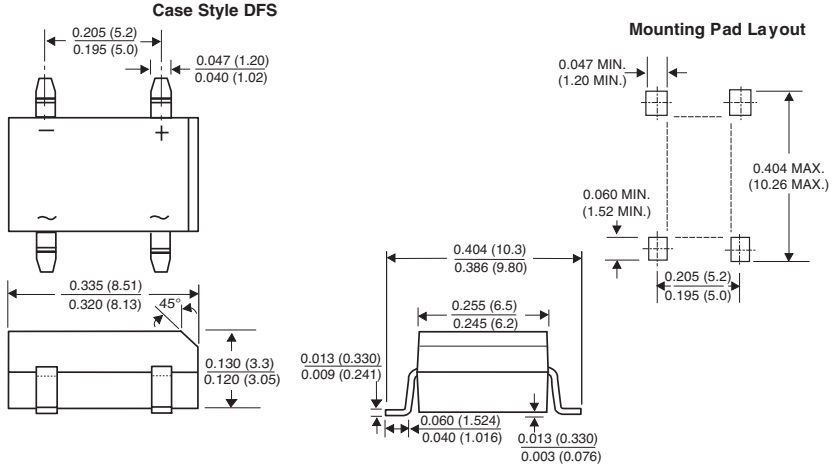


Figure 6. Typical Transient Thermal Impedance

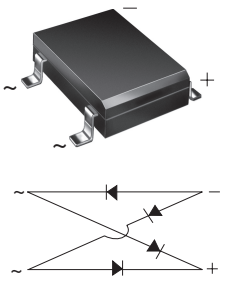
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



DF005SA thru DF10SA

Vishay General Semiconductor

Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifiers



Case Style DFS

FEATURES

- UL recognition, file number E54214
- Ideal for automated placement
- Middle surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	30 A
I_R	5 μA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: DFS

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	DF005SA	DF01SA	DF02SA	DF04SA	DF06SA	DF08SA	DF10SA	UNIT
Device marking code		DFA005S	DFA01S	DFA02S	DFA04S	DFA06S	DFA08S	DFA10S	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward output rectified current at T_A = 40 °C (1)	$I_{F(AV)}$	1.0							A
Peak forward surge current single half sine-wave superimposed on rated load	I_{FSM}	30							A
Rating for fusing (t < 8.3 ms)	I^2t	4.5							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88574
Revision: 30-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**DF005SA**	**DF01SA**	**DF02SA**	**DF04SA**	**DF06SA**	**DF08SA**	**DF10SA**	**UNIT**
Maximum instantaneous forward voltage drop per diode	1.0 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode (1)		C_J	25							pF

Note:

(1) Measured at 1.0 MHz and applied reverse voltage of 4.0 V

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**DF005SA**	**DF01SA**	**DF02SA**	**DF04SA**	**DF06SA**	**DF08SA**	**DF10SA**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15							°C/W

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
DF06SA-E3/45	0.386	45	50	Tube
DF06SA-E3/77	0.386	77	1500	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

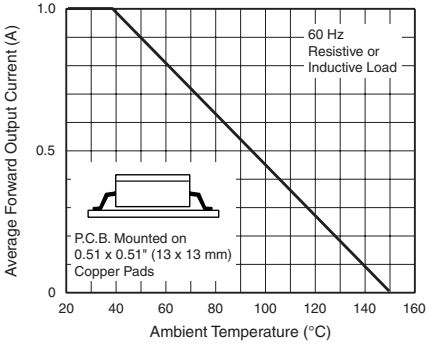


Figure 1. Derating Curve Output Rectified Current

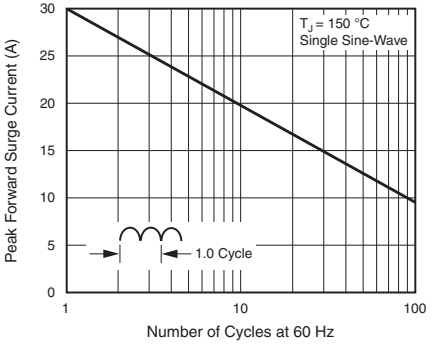


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

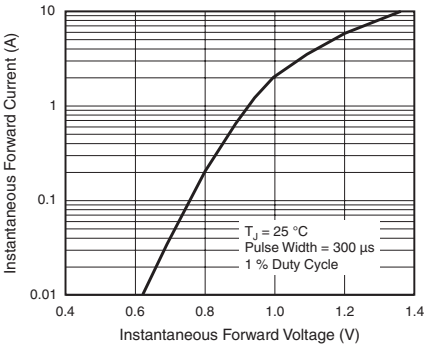


Figure 3. Typical Forward Characteristics Per Diode

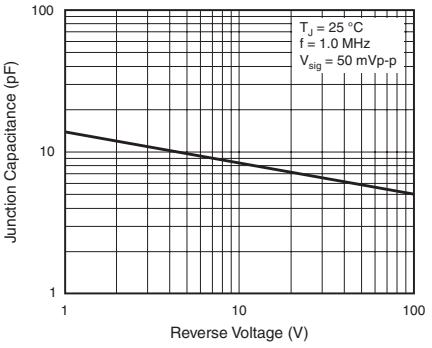


Figure 5. Typical Junction Capacitance Per Diode

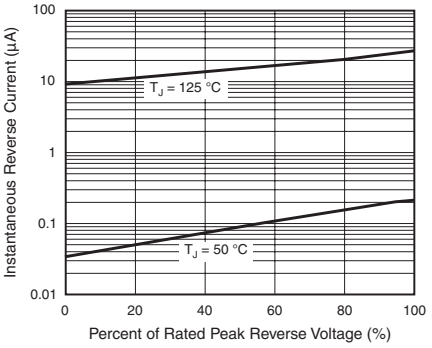


Figure 4. Typical Reverse Leakage Characteristics Per Diode

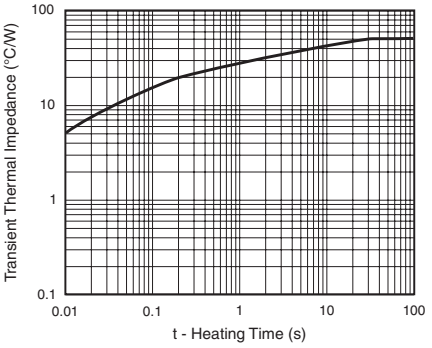
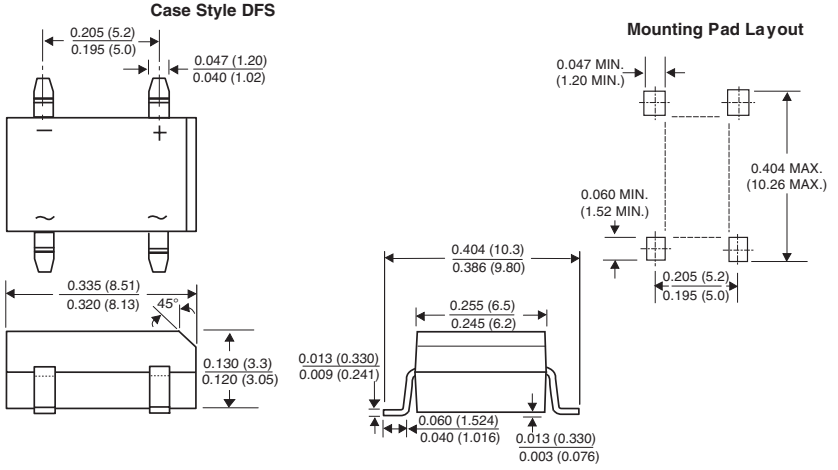


Figure 6. Typical Transient Thermal Impedance

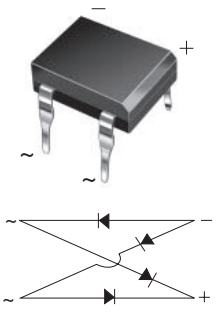
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88574
Revision: 30-Jan-08

Miniature Glass Passivated Ultrafast Bridge Rectifier



Case Style DFM

FEATURES

- UL recognition, file number E54214
- Ideal for printed circuit boards
- Ultrafast reverse recovery time for high frequency
- Applicable for automative insertion
- High surge current capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

MECHANICAL DATA

Case: DFM

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	50 A
I_R	5 µA
V_F	1.05 V
t_{rr}	50 ns
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EDF1AM	EDF1BM	EDF1CM	EDF1DM	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	106	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Max. average forward output rectified current at T_A = 40 °C	$I_{F(AV)}$	1.0				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	50				A
Rating for fusing (t < 8.3 ms)	I^2t	10				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	EDF1AM	EDF1BM	EDF1CM	EDF1DM	UNIT
Maximum instantaneous forward voltage drop per diode	1.0 A	V_F	1.05				V
Maximum reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 1.0				µA mA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	50				ns

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**EDF1AM**	**EDF1BM**	**EDF1CM**	**EDF1DM**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	38 12				°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.5 x 0.5" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
EDF1DM-E3/45	0.418	45	50	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

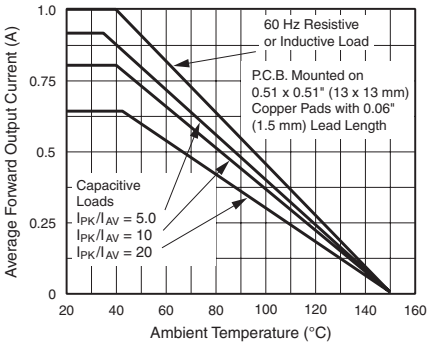


Figure 1. Derating Curves Output Rectified Current

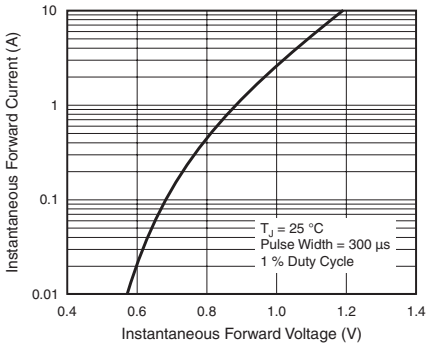


Figure 3. Typical Forward Characteristics Per Diode

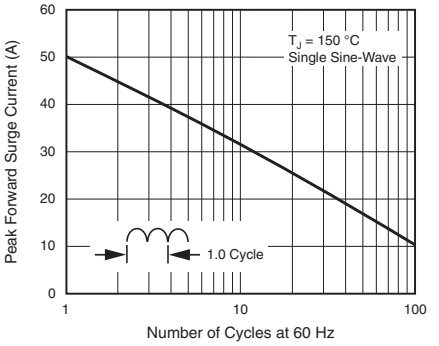


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

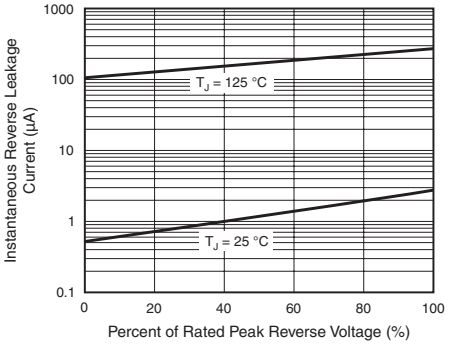


Figure 4. Typical Reverse Leakage Characteristics Per Diode

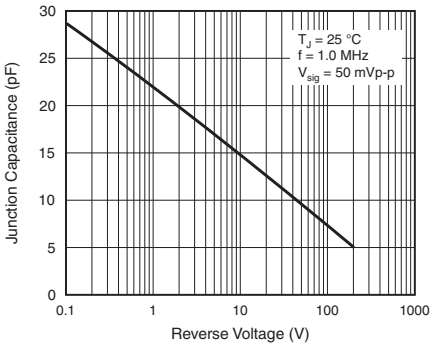
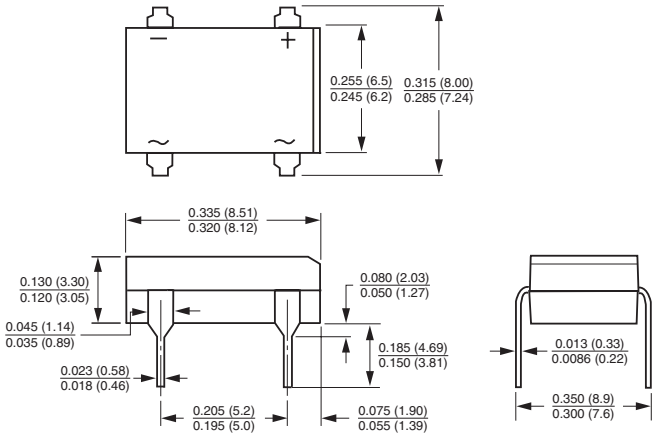


Figure 5. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

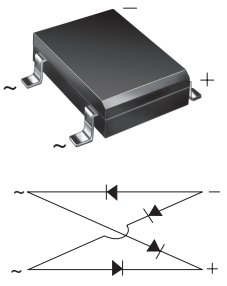
Case Style DFM



EDF1AS thru EDF1DS

Vishay General Semiconductor

Miniature Glass Passivated Ultrafast Surface Mount Bridge Rectifiers



Case Style DFS

FEATURES

- UL recognition, file number E54214
- Ideal for automated placement
- Ultrafast reverse recovery time for high frequency
- High surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	50 A
I_R	5 μA
V_F	1.05 V
t_{rr}	50 ns
T_J max.	150 °C

MECHANICAL DATA

Case: DFS

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	EDF1AS	EDF1BS	EDF1CS	EDF1DS	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	106	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward output rectified current at T_A = 40 °C (1)	$I_{F(AV)}$	1.0				A
Peak forward surge current single half sine-wave superimposed on rated load	I_{FSM}	50				A
Rating for fusing (t < 8.3 ms)	I^2t	10				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Note:

(1) Pulse test: 300 ms pulse width, 1 % duty cycle

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88578
Revision: 30-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**EDF1AS**	**EDF1BS**	**EDF1CS**	**EDF1DS**	**UNIT**
Maximum instantaneous forward voltage drop per diode	1.0 A (1)	V_F	1.05				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 1.0				µA mA
Maximum reverse recovery time per diode	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	t_{rr}	50				ns

Note:

(1) Pulse test: 300 ms pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**EDF1AS**	**EDF1BS**	**EDF1CS**	**EDF1DS**	**UNIT**	
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	38 12				°C/W	

Note:

(1) P.C.B. mounted with 0.2 x 0.2" (5.0 x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
EDF1DS-E3/45	0.406	45	50	Tube
EDF1DS-E3/77	0.406	77	1500	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

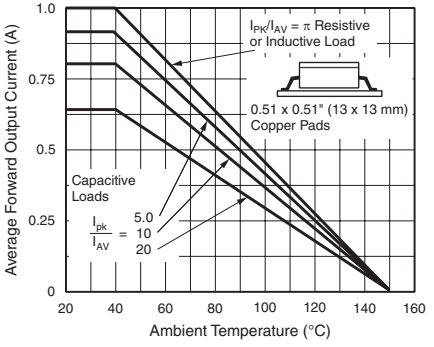


Figure 1. Derating Curves Output Rectified Current

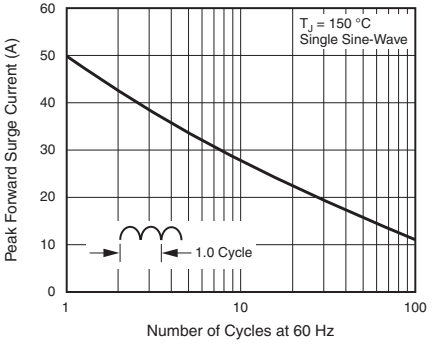


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

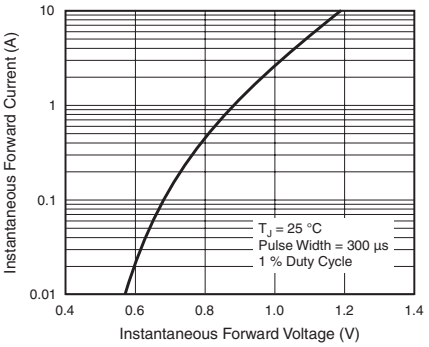


Figure 3. Typical Forward Characteristics Per Diode

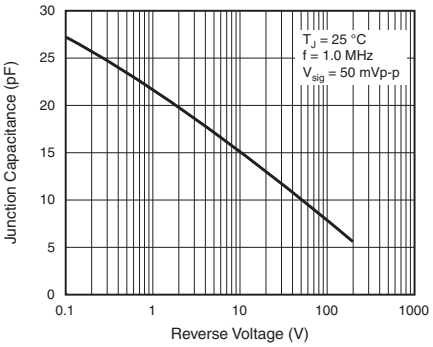


Figure 5. Typical Junction Capacitance Per Diode

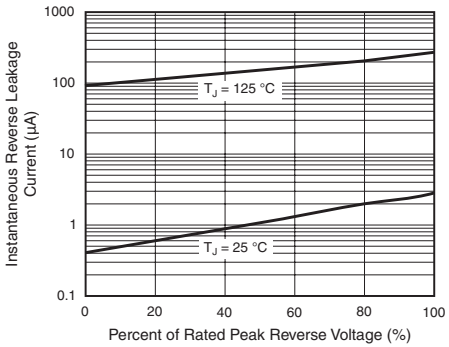
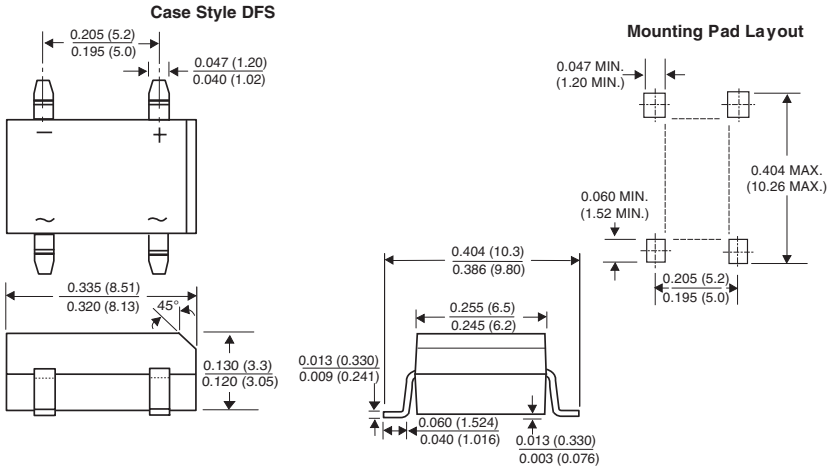
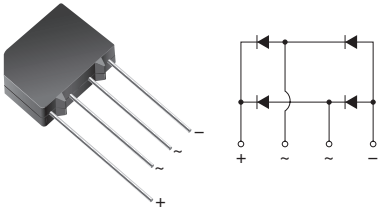


Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Glass Passivated Single-Phase Bridge Rectifier



Case Style KBPM

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit board
- High surge current capability
- High case dielectric strength
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	60 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: KBPM

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	KBP 005M	KBP 01M	KBP 02M	KBP 04M	KBP 06M	KBP 08M	KBP 10M	UNIT
		3N246	3N247	3N248	3N249	3N250	3N251	3N252	
Maximum repetitive peak reverse voltage (1)	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage (1)	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage (1)	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward output rectified current at T_A = 40 °C	$I_{F(AV)}$	1.5							A
Peak forward surge current single half sine-wave (1) T_A = 25 °C / T_J = 150 °C	I_{FSM}	60 40							A
Rating for fusing (t < 8.3 ms)	I^2t	10							A^2s
Operating junction and storage temperature range (1)	T_J, T_{STG}	- 55 to + 150							°C

Note:

(1) JEDEC registered values

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**KBP 005M**	**KBP 01M**	**KBP 02M**	**KBP 04M**	**KBP 06M**	**KBP 08M**	**KBP 10M**	**UNIT**
			3N246	**3N247**	**3N248**	**3N249**	**3N250**	**3N251**	**3N252**	
Maximum instantaneous forward voltage drop per diode (1)	1.0 A 1.57 A	V_F	1.0 1.3							V
Maximum DC reverse current at rated DC blocking voltage per diode (1)	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	15							pF

Note:
(1) JEDEC registered values

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**KBP 005M**	**KBP 01M**	**KBP 02M**	**KBP 04M**	**KBP 06M**	**KBP 08M**	**KBP 10M**	**UNIT**
		3N246	**3N247**	**3N248**	**3N249**	**3N250**	**3N251**	**3N252**	
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 13							°C/W

Note:
(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with, 0.47 x 0.47" (12 x 12 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
KBP06M-E4/45	1.895	45	30	Tube
KBP06M-E4/51	1.895	51	600	Anti-static PVC tray
3N250-E4/45	1.895	45	30	Tube
3N250-E4/51	1.895	51	600	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

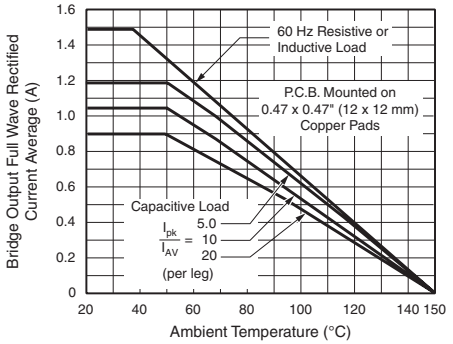


Figure 1. Derating Curve Output Rectified Current

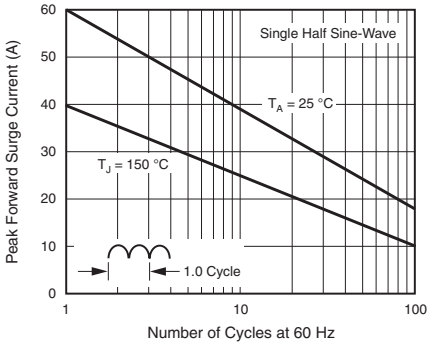


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

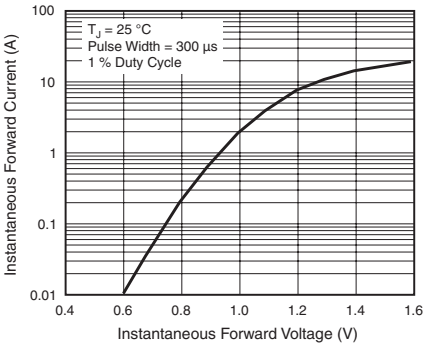


Figure 3. Typical Forward Characteristics Per Diode

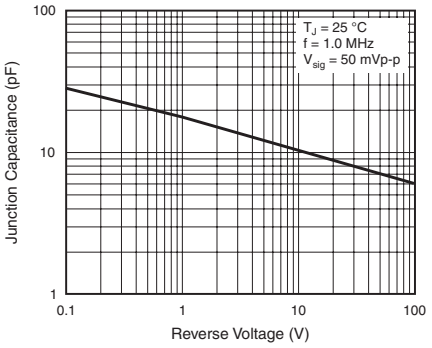


Figure 5. Typical Junction Capacitance Per Diode

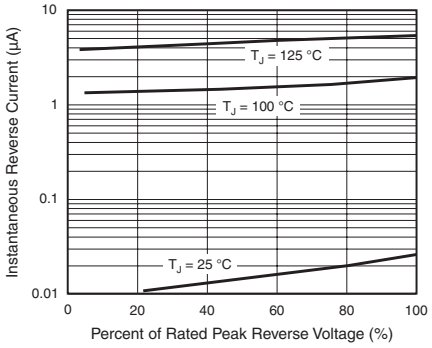
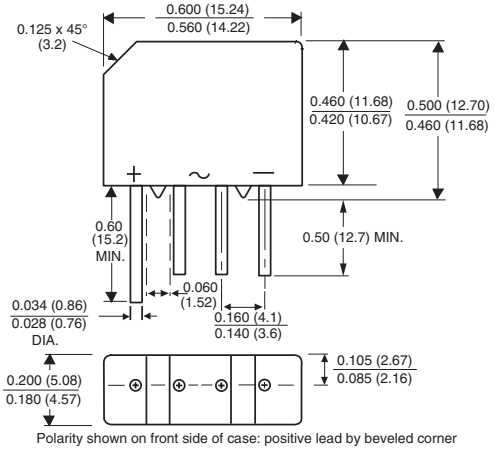


Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style KBPM



Polarity shown on front side of case: positive lead by beveled corner

Glass Passivated Single-Phase Bridge Rectifier

Case Style WOG

FEATURES

- Ideal for printed circuit boards
- High case dielectric strength
- High surge current capability
- Typical I_R less than 0.1 µA
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	65 V to 600 V
I_{FSM}	50 A
I_R	10 µA
V_F	1.0 V
T_J max.	125 °C

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, adapter, charger, lighting ballaster on consumers and home appliances applications.

MECHANICAL DATA

Case: WOG

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	B40 C1500G	B80 C1500G	B125 C1500G	B250 C1500G	B380 C1500G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	65	125	200	400	600	V
Maximum RMS input voltage R- and C-load	V_{RMS}	40	80	125	250	380	V
Maximum DC blocking voltage	V_{DC}	65	125	200	400	600	V
Maximum peak working voltage	V_{RWM}	90	180	300	600	800	V
Maximum non-repetitive peak voltage	V_{RSM}	100	200	350	600	1000	V
Maximum repetitive peak forward surge current	I_{FRM}	10					A
Maximum average forward output current for free air operation at T_A = 45 °C R- and L-load / C-load	$I_{F(AV)}$	1.6 / 1.5					A
Peak forward surge current single sine-wave on rated load	I_{FSM}	50					A
Rating for fusing at T_J = 125 °C (t < 100 ms)	I^2t	12.5					A^2s
Minimum series resistor C-load at V_{RMS} = ± 10 %	R_t	1.0	2.0	4.0	8.0	12	Ω
Maximum load capacitance + 50 % - 10 %	C_L	5000	2500	1000	500	200	µF
Operating junction temperature range	T_J	- 40 to + 125					°C
Storage temperature range	T_{STG}	- 40 to + 150					°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS	SYMBOL	B40 C1500G	B80 C1500G	B125 C1500G	B250 C1500G	B380 C1500G	UNIT
Maximum instantaneous forward voltage drop per diode	1.5 A	V_F	1.0					V
Maximum reverse current at rated repetitive peak voltage per diode	T_A = 25 °C	I_R	10					µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	B40 C1500G	B80 C1500G	B125 C1500G	B250 C1500G	B380 C1500G	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	36 11					°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. at 0.375" (9.5 mm) lead lengths with 0.22 x 0.22" (5.5 x 5.5 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
B380C1500G-E4/51	1.12	51	100	Plastic bag

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

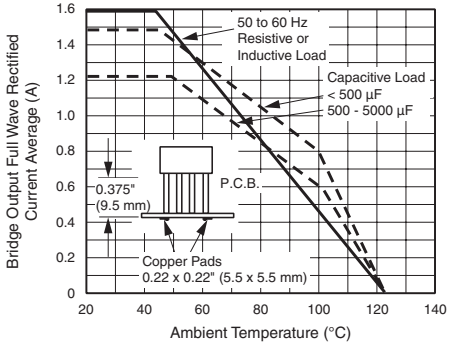


Figure 1. Derating Curves Output Rectified Current for B40C1500G...B125C1500G

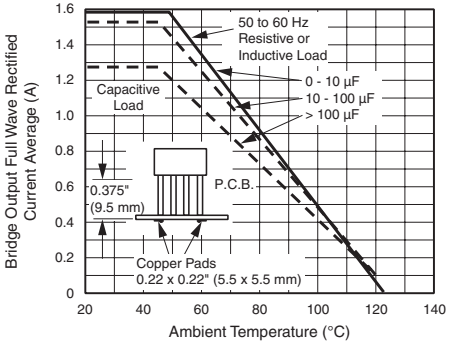


Figure 2. Derating Curves Output Rectified Current for B250C1500G...B380C1500G

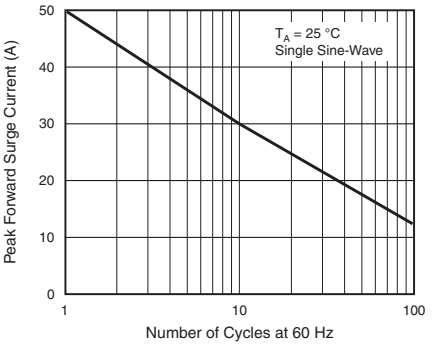


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

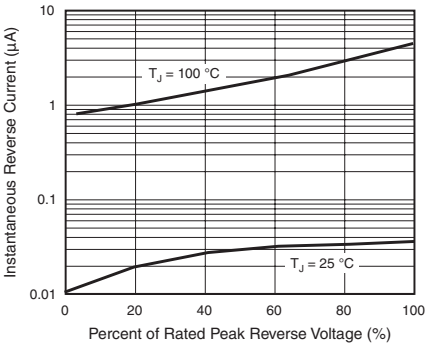


Figure 5. Typical Reverse Characteristics Per Diode

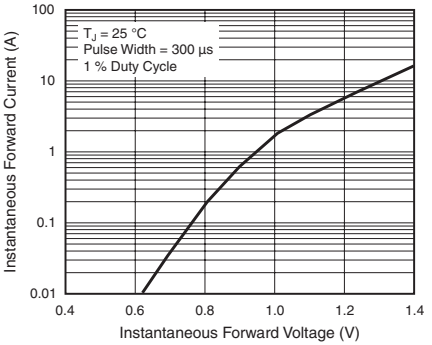


Figure 4. Typical Forward Characteristics Per Diode

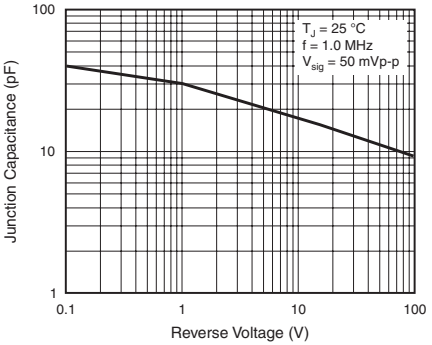
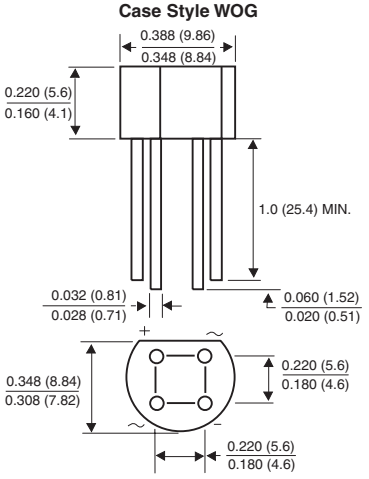
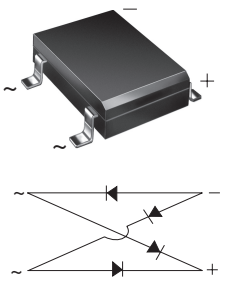


Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifiers



Case Style DFS

FEATURES

- UL recognition, file number E54214
- Ideal for automated placement
- High surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	5 µA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: DFS

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	DF15005S	DF1501S	DF1502S	DF1504S	DF1506S	DF1508S	DF1510S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward output rectified current at T_A = 40 °C (1)	$I_{F(AV)}$	1.5							A
Peak forward surge current single half sine-wave superimposed on rated load	I_{FSM}	50							A
Rating for fusing (t < 8.3 ms)	I^2t	10							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**DF15005S**	**DF1501S**	**DF1502S**	**DF1504S**	**DF1506S**	**DF1508S**	**DF1510S**	**UNIT**
Maximum instantaneous forward voltage drop per diode	1.5 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode (1)		C_J	25							pF

Note:

(1) Measured at 1.0 MHz and applied reverse voltage of 4.0 V

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**DF15005S**	**DF1501S**	**DF1502S**	**DF1504S**	**DF1506S**	**DF1508S**	**DF1510S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15							°C/W

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
DF1506S-E3/45	0.399	45	50	Tube
DF1506S-E3/77	0.399	77	1500	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

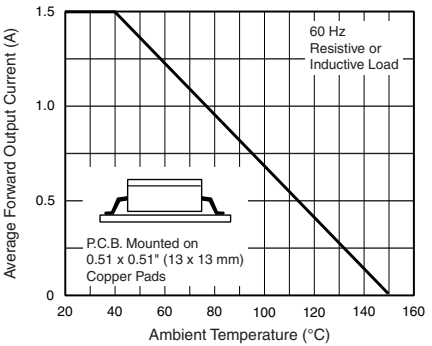


Figure 1. Derating Curve Output Rectified Current

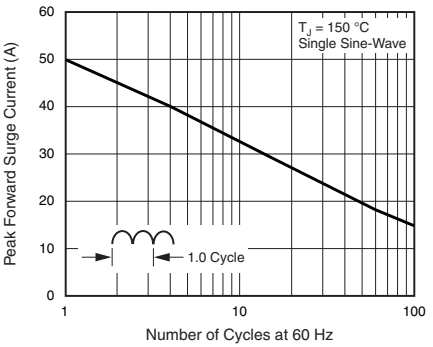


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

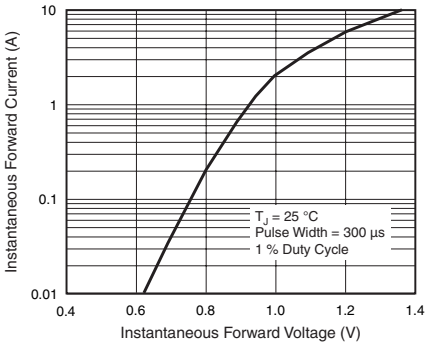


Figure 3. Typical Forward Characteristics Per Diode

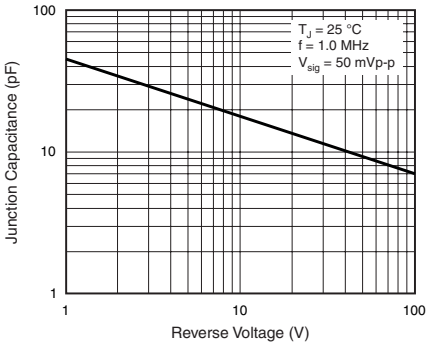


Figure 5. Typical Junction Capacitance Per Diode

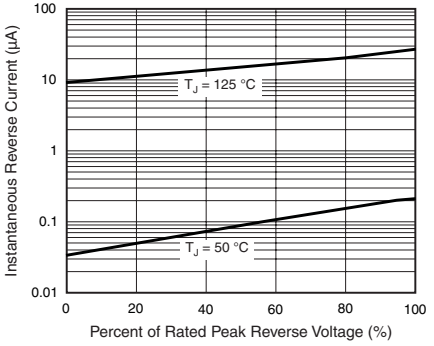


Figure 4. Typical Reverse Leakage Characteristics Per Diode

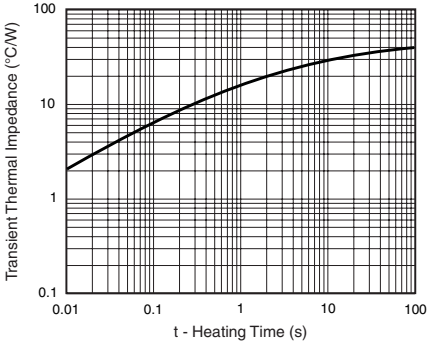
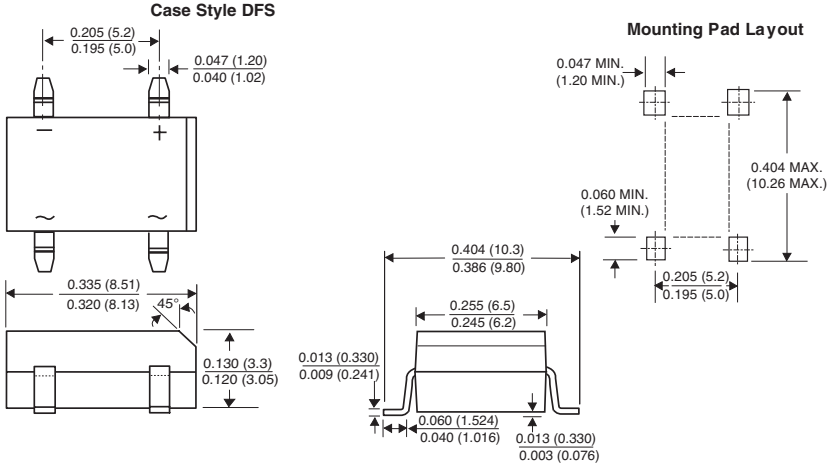


Figure 6. Typical Transient Thermal Impedance

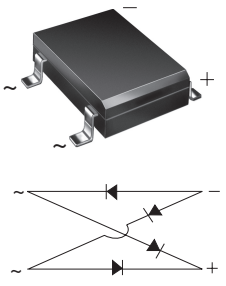
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



DFL15005S thru DFL1514S

Vishay General Semiconductor

Low Profile Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifiers



Case Style Low Profile DFS

FEATURES

- Low profile: typical height of 2.5 mm
- UL recognition, file number E54214
- Ideal for automated placement
- High surge current capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 250 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1400 V
I_{FSM}	50 A
I_R	5 µA
V_F	1.1 V
T_J max.	150 °C

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for SMPS, lighting ballaster, adapter, battery charger, home appliances, office equipment, and telecommunication applications.

MECHANICAL DATA

Case: Low profile DFS

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	DFL 15005S	DFL 1501S	DFL 1502S	DFL 1504S	DFL 1506S	DFL 1508S	DFL 1510S	DFL 1514S	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	1400	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	980	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	1400	V
Maximum average forward output rectified current at T_A = 40 °C (1)	$I_{F(AV)}$	1.5								A
Peak forward surge current single half sine-wave superimposed on rated load	I_{FSM}	50								A
Rating for fusing (t < 8.3 ms)	I^2t	10								A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150								°C

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88874
Revision: 31-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**DFL 15005S**	**DFL 1501S**	**DFL 1502S**	**DFL 1504S**	**DFL 1506S**	**DFL 1508S**	**DFL 1510S**	**DFL 1514S**	**UNIT**
Max. instantaneous forward voltage drop per diode	1.5 A	V_F	1.1								V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500								µA
Typical junction capacitance per diode (1)		C_J	16								pF

Note:

(1) Measured at 1.0 MHz and applied reverse voltage of 4.0 V

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**DFL 15005S**	**DFL 1501S**	**DFL 1502S**	**DFL 1504S**	**DFL 1506S**	**DFL 1508S**	**DFL 1510S**	**DFL 1514S**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15								°C/W

Note:

(1) Units mounted on P.C.B. with 0.51 x 0.51" (13 x 13 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
DFL1506S-E3/45	0.341	45	50	Tube
DFL1506S-E3/77	0.341	77	1500	13" diameter paper tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

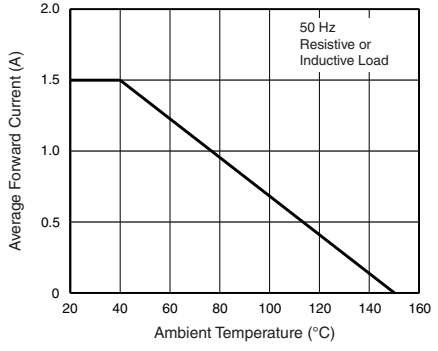


Figure 1. Forward Current Derating Curve Per Diode

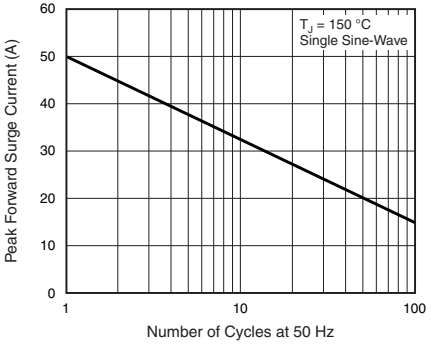


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

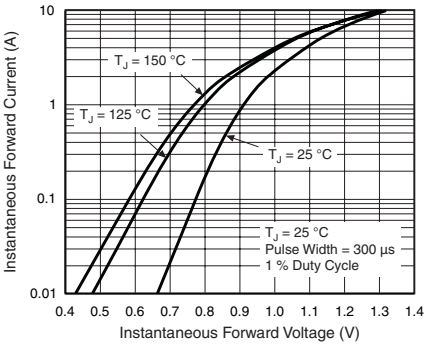


Figure 3. Typical Forward Voltage Characteristics Per Diode

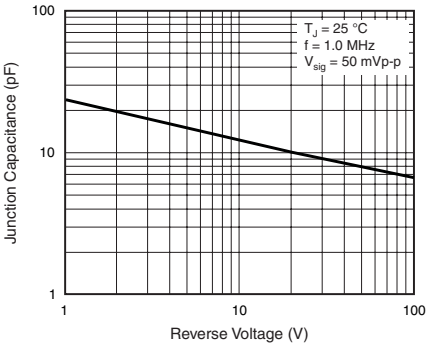


Figure 5. Typical Junction Capacitance Per Diode

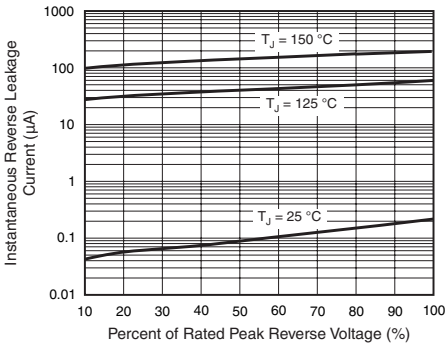
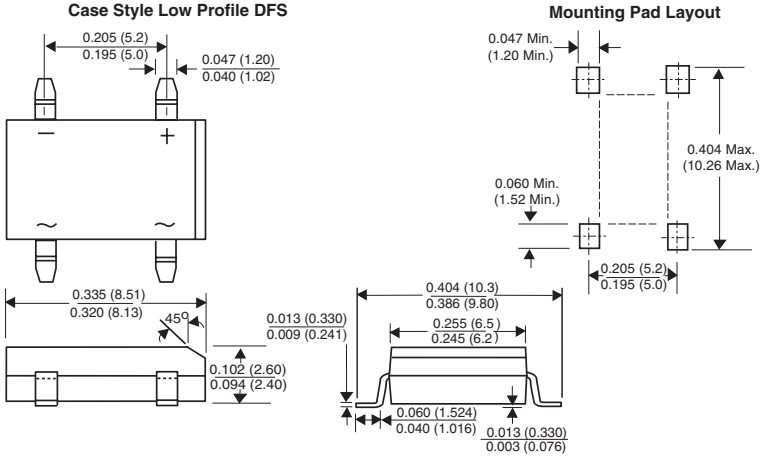
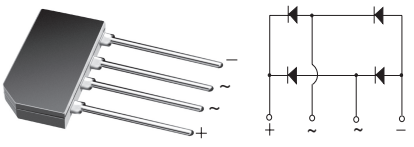


Figure 4. Typical Reverse Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Glass Passivated Single-Phase Bridge Rectifier



Case Type GBL

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- Typical I_R less than 0.1 µA
- High case dielectric strength
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	200 V, 600 V, 800 V
I_{FSM}	80 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBL

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	G2SB20	G2SB60	G2SB80	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	600	800	V
Maximum RMS voltage	V_{RMS}	140	420	560	V
Maximum DC blocking voltage	V_{DC}	200	600	800	V
Maximum average forward rectified output current at T_A = 25 °C	$I_{F(AV)}$	1.5			A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	80			A
Rating for fusing (t < 8.3 ms)	I^2t	27			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	G2SB20	G2SB60	G2SB80	UNIT
Maximum instantaneous forward voltage drop per diode	0.75 A	V_F	1.00			V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 300			µA

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THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**G2SB20**	**G2SB60**	**G2SB80**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	40 12			°C/W

Note:

(1) Unit mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
G2SB60-E3/45	2.045	45	20	Tube
G2SB60-E3/51	2.045	51	400	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

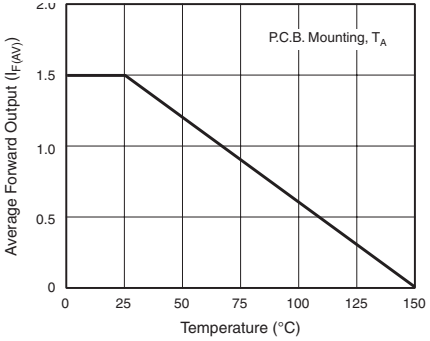


Figure 1. Derating Curve Output Rectified Current

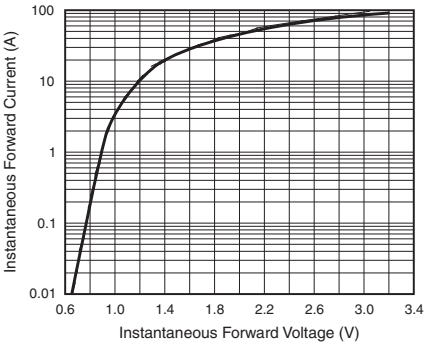


Figure 3. Typical Forward Characteristics Per Diode

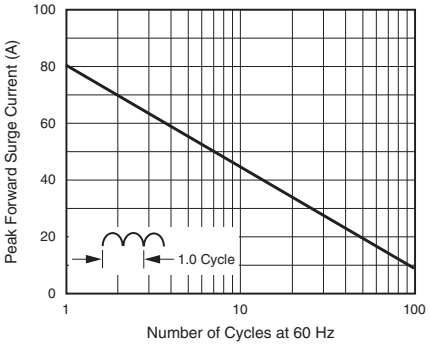


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

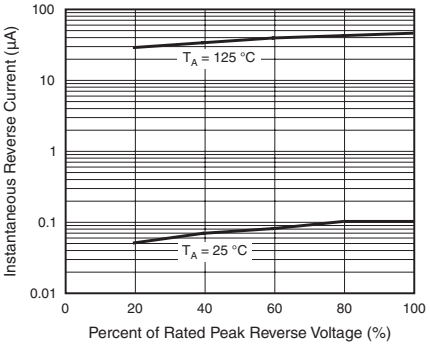


Figure 4. Typical Reverse Characteristics Per Diode

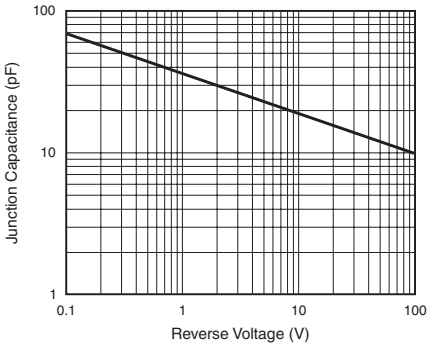


Figure 5. Typical Junction Capacitance Per Diode

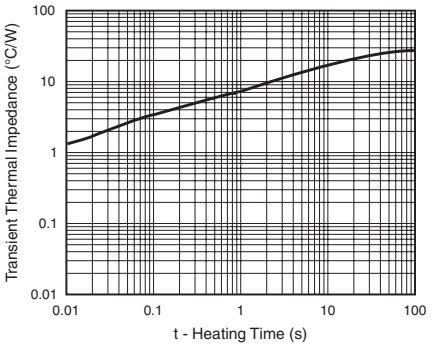
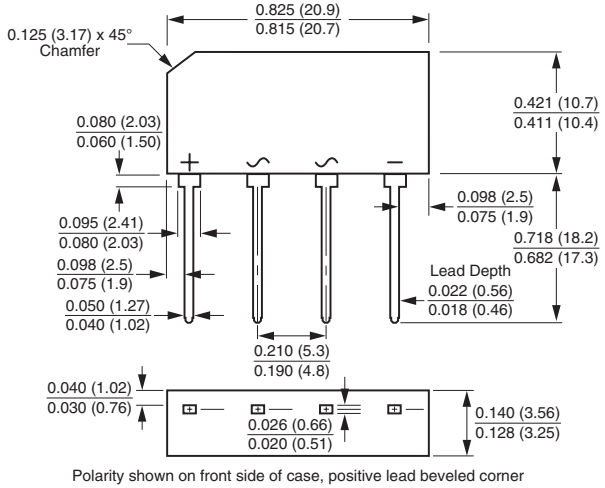


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBL

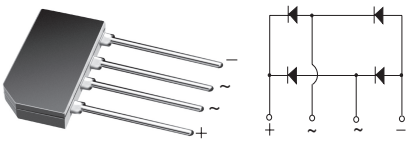


Polarity shown on front side of case, positive lead beveled corner

G2SBA20, G2SBA60 & G2SBA80

Vishay General Semiconductor

Glass Passivated Single-Phase Bridge Rectifier



Case Type GBL

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- Typical I_R less than 0.1 µA
- High case dielectric strength
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	200 V, 600 V, 800 V
I_{FSM}	60 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBL

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**G2SBA20**	**G2SBA60**	**G2SBA80**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	200	600	800	V
Maximum RMS voltage	V_{RMS}	140	420	560	V
Maximum DC blocking voltage	V_{DC}	200	600	800	V
Maximum average forward rectified output current at T_A = 25 °C	$I_{F(AV)}$	1.5			A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	60			A
Rating for fusing (t < 8.3 ms)	I^2t	15			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**G2SBA20**	**G2SBA60**	**G2SBA80**	**UNIT**
Maximum instantaneous forward voltage drop per diode	0.75 A	V_F	1.00			V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 300			µA

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Document Number: 88604
Revision: 12-Feb-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**G2SBA20**	**G2SBA60**	**G2SBA80**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	40 12			°C/W

Note:

(1) Unit mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
G2SBA60-E3/45	2.017	45	20	Tube
G2SBA60-E3/51	2.017	51	400	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

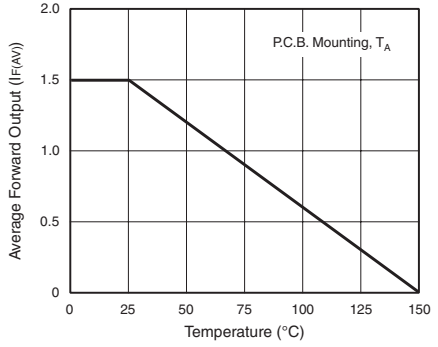


Figure 1. Derating Curve Output Rectified Current

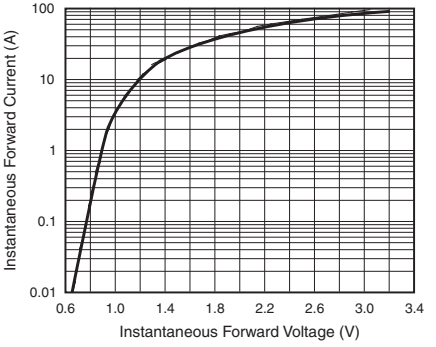


Figure 3. Typical Forward Characteristics Per Diode

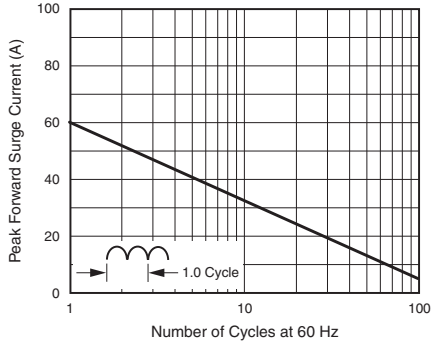


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

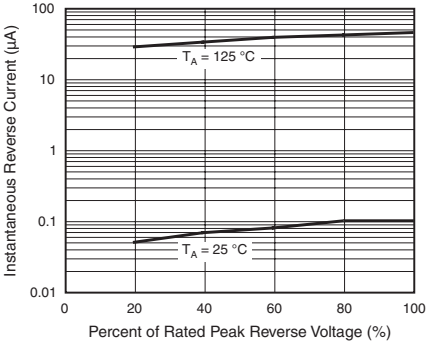


Figure 4. Typical Reverse Characteristics Per Diode

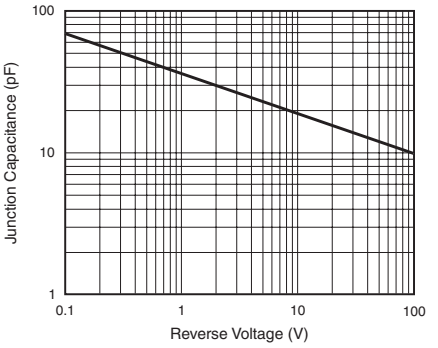


Figure 5. Typical Junction Capacitance Per Diode

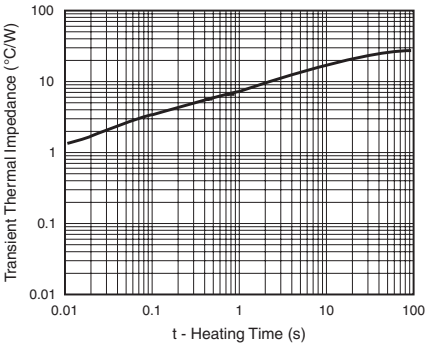
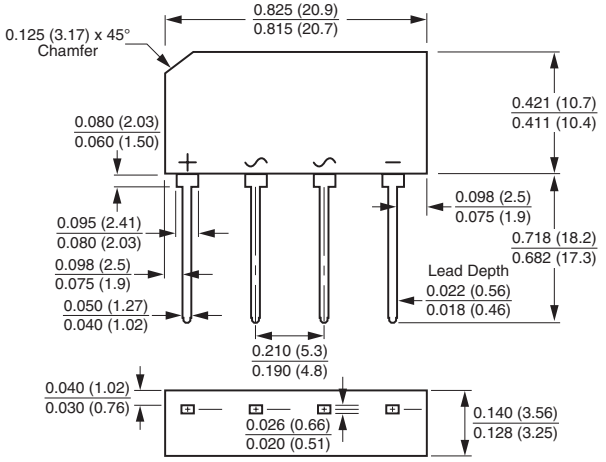


Figure 6. Typical Transient Thermal Impedance

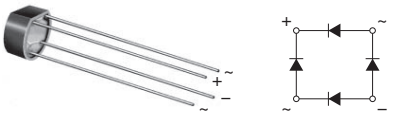
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBL



Polarity shown on front side of case, positive lead beveled corner

Glass Passivated Single-Phase Bridge Rectifier



Case Style WOG

FEATURES

- UL recognition, file number E54214
- Ideal for printed circuit boards
- Typical I_R less than 0.1 µA
- High case dielectric strength
- High surge current capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	50 V to 1000 V
I_{FSM}	50 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, adapter, charger, lighting ballaster on consumers and home appliances applications.

MECHANICAL DATA

Case: WOG

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	W005G	W01G	W02G	W04G	W06G	W08G	W10G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length at T_A = 25 °C	$I_{F(AV)}$	1.5							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	50							A
Rating for fusing (t < 8.3 ms)	I^2t	10							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**W005G**	**W01G**	**W02G**	**W04G**	**W06G**	**W08G**	**W10G**	**UNIT**
Maximum instantaneous forward voltage drop per diode	1.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	14							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**W005G**	**W01G**	**W02G**	**W04G**	**W06G**	**W08G**	**W10G**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	36 11							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length P.C.B. mounting. P.C.B. size 0.22 x 0.22" (5.5 x 5.5 mm)

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
W06G-E4/51	1.12	51	100	Plastic bag

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

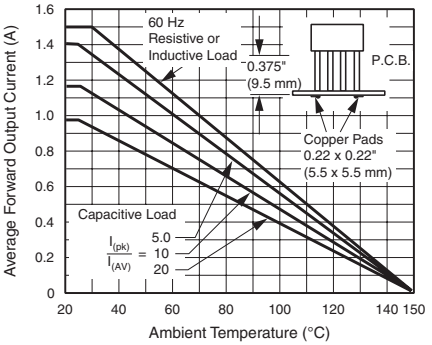


Figure 1. Derating Curve Output Rectified Current

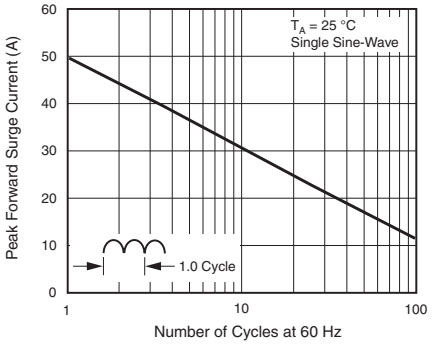


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

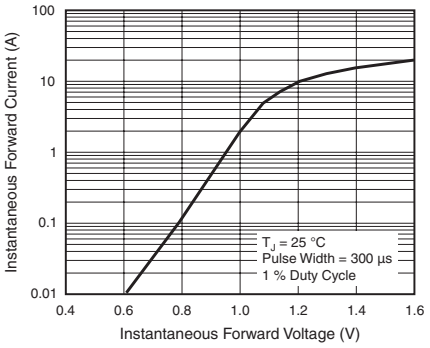


Figure 3. Typical Forward Characteristics Per Diode

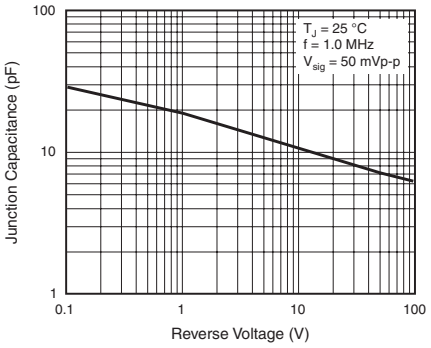


Figure 5. Typical Junction Capacitance Per Diode

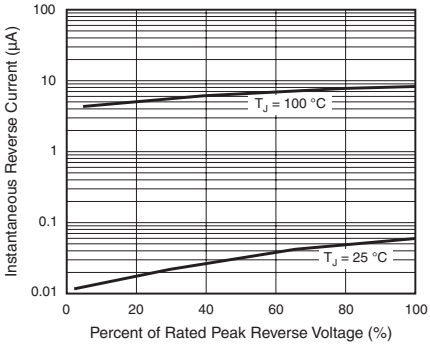


Figure 4. Typical Reverse Leakage Characteristics Per Diode

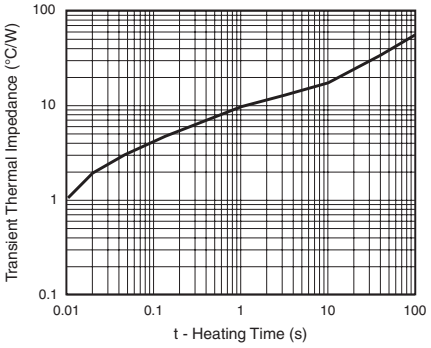
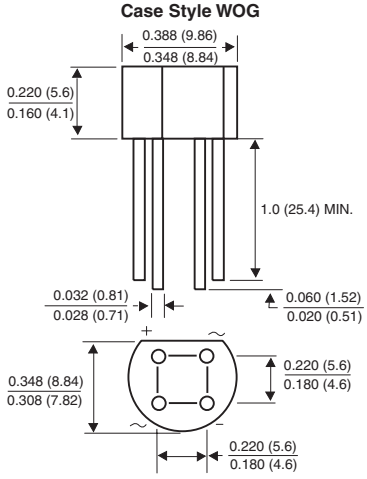
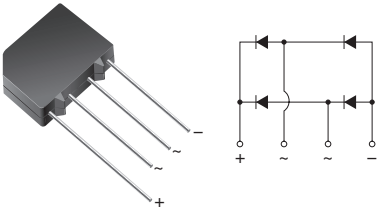


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Glass Passivated Single-Phase Bridge Rectifier



Case Style KBPM

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit board
- High surge current capability
- High case dielectric strength
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	60 A
I_R	5 µA
V_F	1.1 V
T_J max.	165 °C

MECHANICAL DATA

Case: KBPM

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	2KBP 005M	2KBP 01M	2KBP 02M	2KBP 04M	2KBP 06M	2KBP 08M	2KBP 10M	UNIT
		3N253	3N254	3N255	3N256	3N257	3N258	3N259	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Max. average forward output rectified current at T_A = 55 °C	$I_{F(AV)}$	2.0							A
Peak forward surge current single half sine-wave superimposed on rated load	I_{FSM}	60							A
Rating for fusing (t < 8.3 ms)	I^2t	15							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 165							°C

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88532
Revision: 15-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**2KBP 005M**	**2KBP 01M**	**2KBP 02M**	**2KBP 04M**	**2KBP 06M**	**2KBP 08M**	**2KBP 10M**	**UNIT**
			3N253	**3N254**	**3N255**	**3N256**	**3N257**	**3N258**	**3N259**	
Maximum instantaneous forward voltage drop per diode	3.14 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	25							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**2KBP 005M**	**2KBP 01M**	**2KBP 02M**	**2KBP 04M**	**2KBP 06M**	**2KBP 08M**	**2KBP 10M**	**UNIT**
		3N253	**3N254**	**3N255**	**3N256**	**3N257**	**3N258**	**3N259**	
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	30 11							°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with, 0.47 x 0.47" (12 x 12 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
2KBP06M-E4/45	1.895	45	30	Tube
2KBP06M-E4/51	1.895	51	600	Anti-static PVC tray
3N257-E4/45	1.895	45	30	Tube
3N257-E4/51	1.895	51	600	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

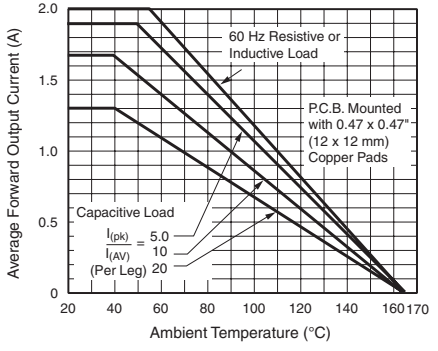


Figure 1. Derating Curve Output Rectified Current

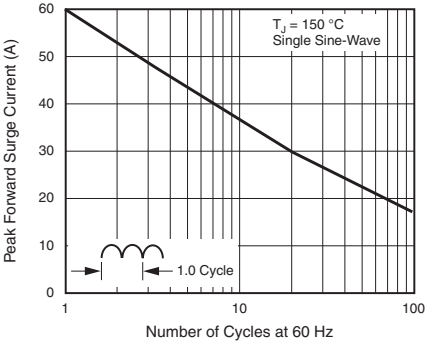


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

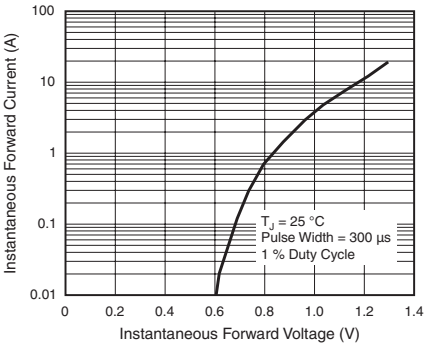


Figure 3. Typical Forward Characteristics Per Diode

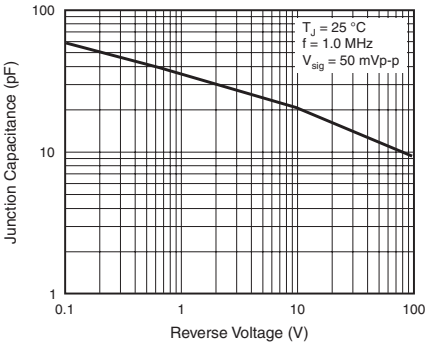


Figure 5. Typical Junction Capacitance Per Diode

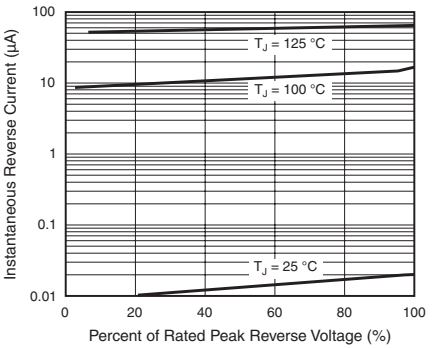
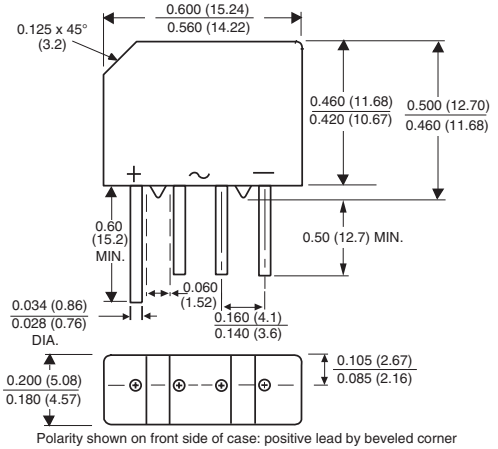


Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style KBPM



Polarity shown on front side of case: positive lead by beveled corner

Glass Passivated Single-Phase Bridge Rectifier

Case Style WOG

FEATURES

- UL recognition, file number E54214
- Ideal for printed circuit boards
- Typical I_R less than 0.5 µA
- High case dielectric strength
- High surge current capability
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, adapter, charger, lighting ballaster on consumers and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	60 A
I_R	5.0 µA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: WOG

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	2W005G	2W01G	2W02G	2W04G	2W06G	2W08G	2W10G	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current at 0.375" (9.5 mm) lead length (Fig. 1)	$I_{F(AV)}$	2.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	60							A
Rating for fusing (t < 8.3 ms)	I^2t	15							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**2W005G**	**2W01G**	**2W02G**	**2W04G**	**2W06G**	**2W08G**	**2W10G**	**UNIT**
Maximum instantaneous forward voltage drop per diode	2.0 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	40				20			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**2W005G**	**2W01G**	**2W02G**	**2W04G**	**2W06G**	**2W08G**	**2W10G**	**UNIT**	
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	40 15							°C/W	

Note:

(1) Thermal resistance from junction to ambient and from junction to lead at 0.375" (9.5 mm) lead length P.C.B. mounting

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
2W06G-E4/51	1.12	51	100	Plastic bag

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

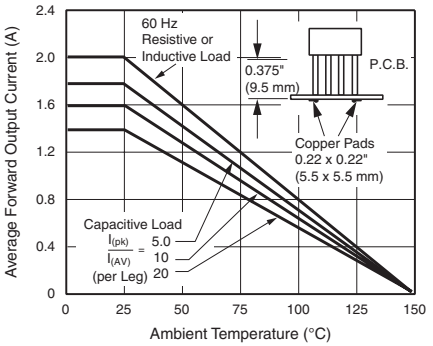


Figure 1. Derating Curve Output Rectified Current

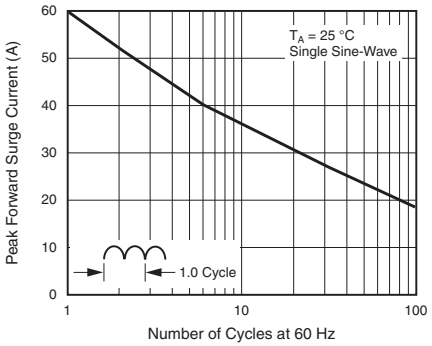


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

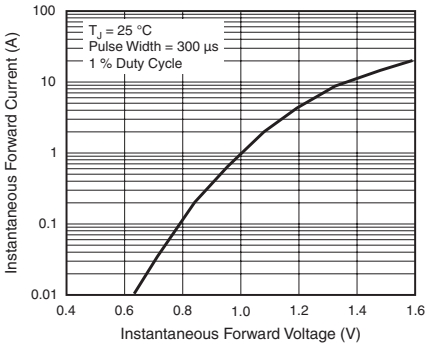


Figure 3. Typical Forward Characteristics Per Diode

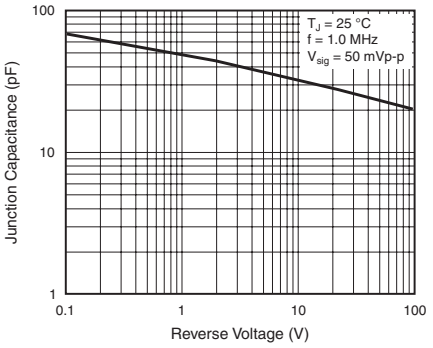


Figure 5. Typical Junction Capacitance Per Diode

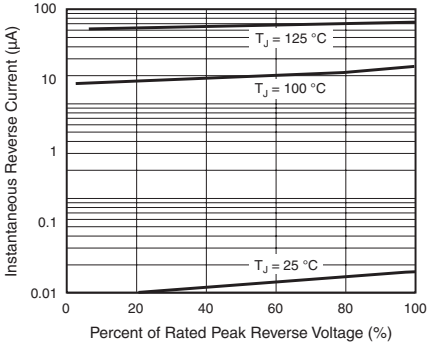


Figure 4. Typical Reverse Leakage Characteristics Per Diode

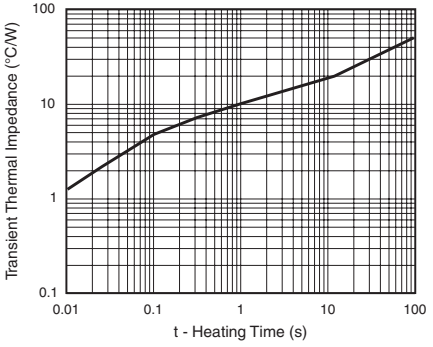
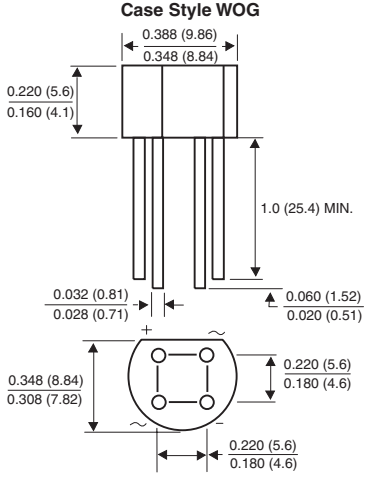


Figure 6. Typical Transient Thermal Impedance

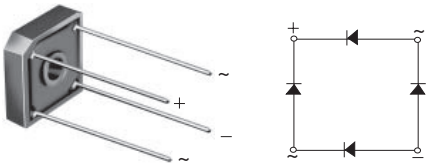
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



GBPC1005 thru GBPC110

Vishay General Semiconductor

Glass Passivated Single-Phase Bridge Rectifier



Case Style GBPC1

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- Typical I_R less than 0.1 µA
- High surge current capability
- High case dielectric strength 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	60 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBPC1
Epoxy meets UL 94V-0 flammability rating
Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102
E4 suffix for consumer grade
Polarity: As marked, positive lead by belevled corner
Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.
Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBPC 1005	GBPC 101	GBPC 102	GBPC 104	GBPC 106	GBPC 108	GBPC 110	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS bridge input voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 60 °C (1)	$I_{F(AV)}$	3.0							A
Maximum average forward rectified output current at T_A = 25 °C (2)	$I_{F(AV)}$	2.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	60							A
Rating for fusing (t < 8.3 ms)	I^2t	15							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Notes:

(1) Unit mounted on 4.0 x 4.0 x 0.11" thick (10.5 x 10.5 x 0.3 cm) aluminum plate

(2) Unit mounted on P.C.B. at 0.375" (9.5 mm) lead length with 0.5 x 0.5" (12 x 12 mm) copper pads

For technical questions within your region, please contact one of the following:
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Document Number: 88611
Revision: 15-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS	SYMBOL	GBPC 1005	GBPC 101	GBPC 102	GBPC 104	GBPC 106	GBPC 108	GBPC 110	UNIT
Maximum instantaneous forward voltage drop per diode	1.5 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	21							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	GBPC 1005	GBPC 101	GBPC 102	GBPC 104	GBPC 106	GBPC 108	GBPC 110	UNIT
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JC}$	12 8.0							°C/W

Note:

(1) Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GBPC106-E4/51	2.5	51	100	Paper box

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

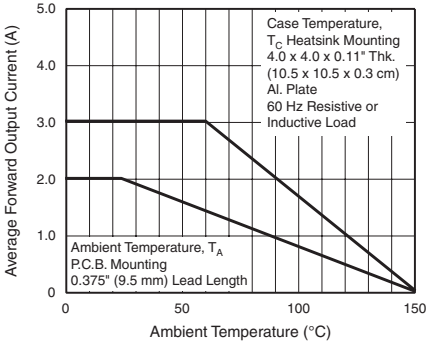


Figure 1. Derating Curve Output Rectified Current

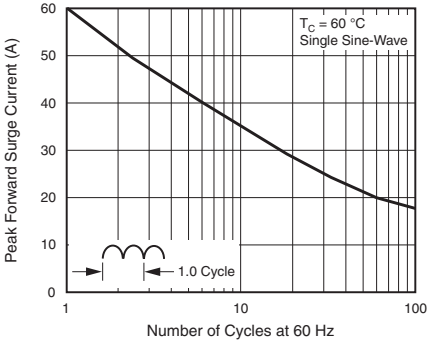


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

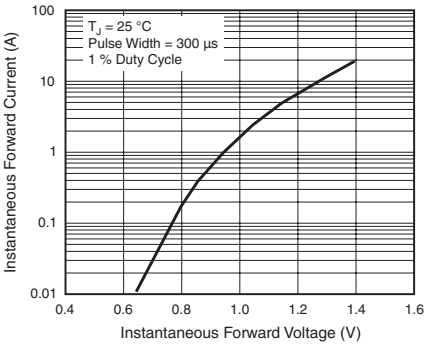


Figure 3. Typical Forward Characteristics Per Diode

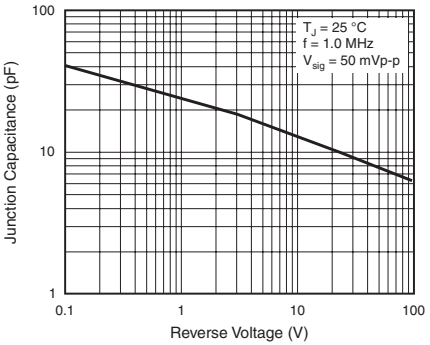


Figure 5. Typical Junction Capacitance Per Diode

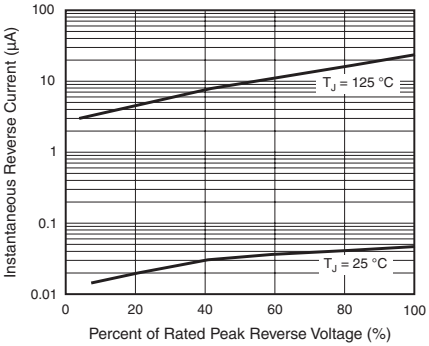


Figure 4. Typical Reverse Leakage Characteristics Per Diode

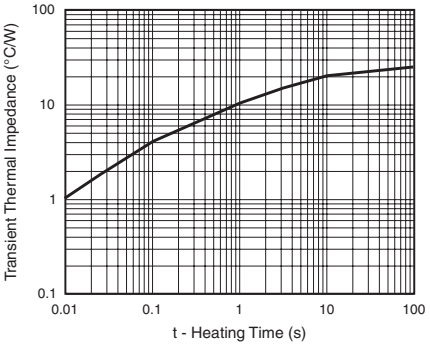
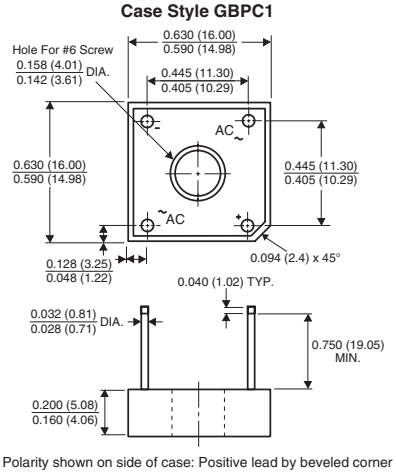


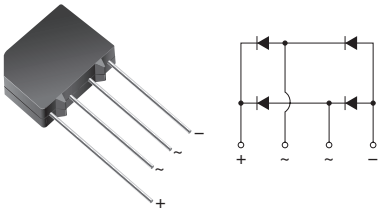
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Polarity shown on side of case: Positive lead by beveled corner

Glass Passivated Single-Phase Bridge Rectifier



Case Style KBPM

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit board
- High surge current capability
- High case dielectric strength
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, and telecommunication applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	50 V to 800 V
I_{FSM}	80 A
I_R	5 µA
V_F	1.05 V
T_J max.	150 °C

MECHANICAL DATA

Case: KBPM

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	3KBP 005M	3KBP 01M	3KBP 02M	3KBP 04M	3KBP 06M	3KBP 08M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	V
Maximum average forward output rectified current at T_A = 55 °C (Fig. 1)	$I_{F(AV)}$	3.0						A
Peak forward surge current 50 Hz single half sine-wave superimposed on rated load	I_{FSM}	80						A
Rating for fusing (t < 10 ms)	I^2t	32						A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**3KBP 005M**	**3KBP 01M**	**3KBP 02M**	**3KBP 04M**	**3KBP 06M**	**3KBP 08M**	**UNIT**
Maximum instantaneous forward voltage drop per diode	3.0 A	V_F	1.05						V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500						µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	25						pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**3KBP 005M**	**3KBP 01M**	**3KBP 02M**	**3KBP 04M**	**3KBP 06M**	**3KBP 08M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$	30 11						°C/W

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with, 0.47 x 0.47" (12 x 12 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
3KBP06M-E4/45	1.912	45	30	Tube
3KBP06M-E4/51	1.912	51	600	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

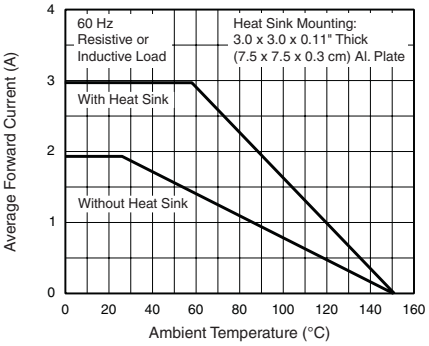


Figure 1. Forward Current Derating Curve

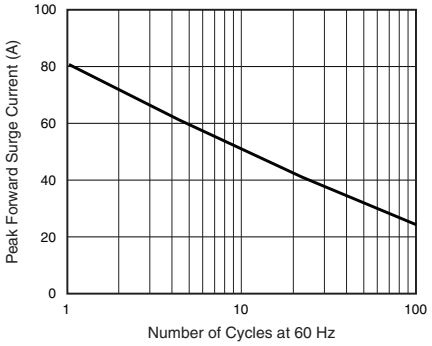


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

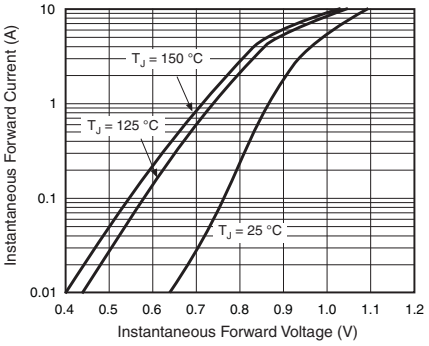


Figure 3. Typical Forward Characteristics Per Diode

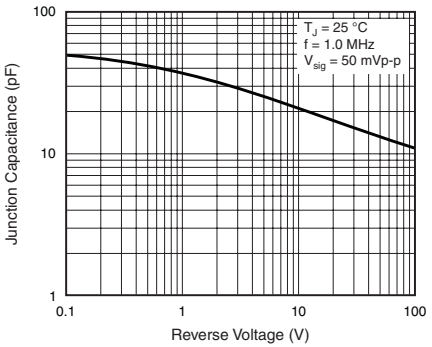


Figure 5. Typical Junction Capacitance Per Diode

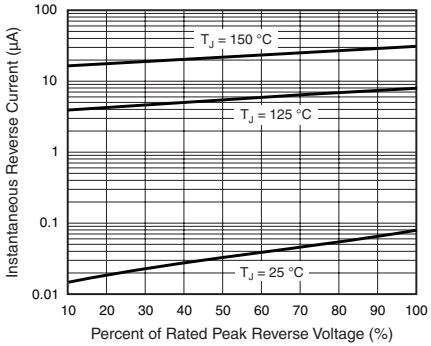
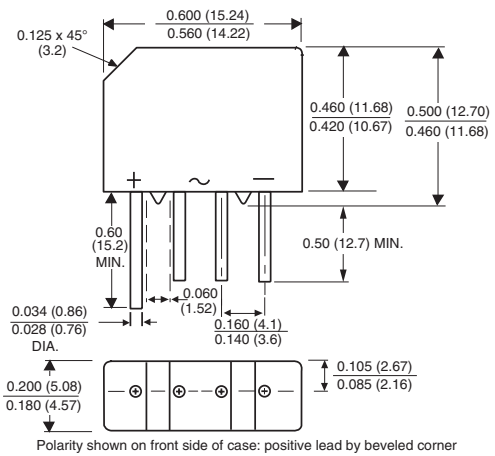


Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style KBPM

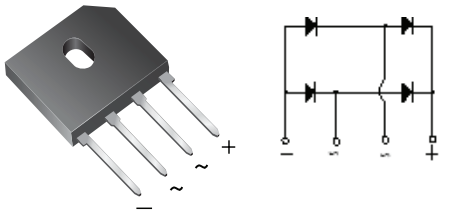


Polarity shown on front side of case: positive lead by beveled corner

G3SBA20, G3SBA60 & G3SBA80

Vishay General Semiconductor

Glass Passivated Single-Phase Bridge Rectifier



Case Style GBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, switching mode power supply, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	200 V, 600 V, 800 V
I_{FSM}	80 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	G3SBA20	G3SBA60	G3SBA80	UNIT
Maximum repetive peak reverse voltage	V_{RRM}	200	600	800	V
Maximum RMS voltage	V_{RWM}	140	420	560	V
Maximum DC blocking voltage	V_{DC}	200	600	800	V
Maximum average forward rectified output current at T_C = 100 °C (1) / T_A = 25 °C (2)	$I_{F(AV)}$	4.0 / 2.3			A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	80			A
Rating for fusing (t < 8.3 ms)	I^2t	27			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88606
Revision: 30-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**G3SBA20**	**G3SBA60**	**G3SBA80**	**UNIT**
Maximum instantaneous forward voltage per diode	2.0 A	V_F	1.00			V
Maximum DC reverse current at rated DC blocking voltage per diode	T_J = 25 °C T_J = 125 °C	I_R	5.0 400			μA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**G3SBA20**	**G3SBA60**	**G3SBA80**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (2) $R_{\theta JC}$ (1)	26 5.0			°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
G3SBA60-E3/45	3.404	45	20	Tube
G3SBA60-E3/51	3.404	51	250	Paper tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

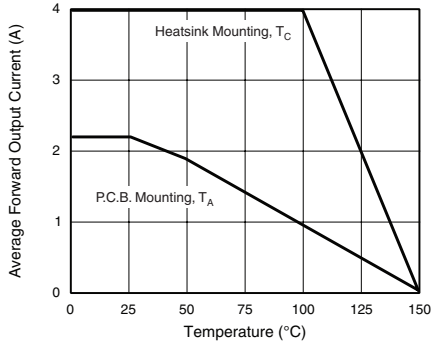


Figure 1. Derating Curve Output Rectified Current

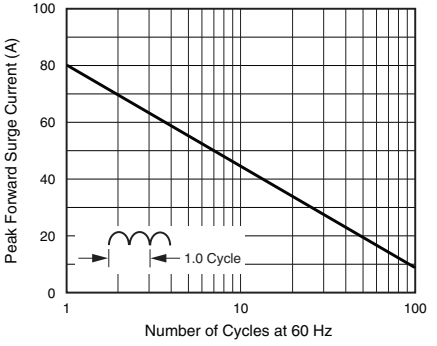


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

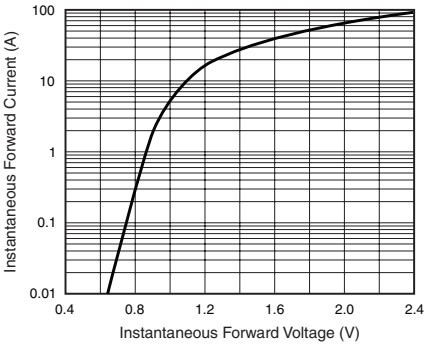


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

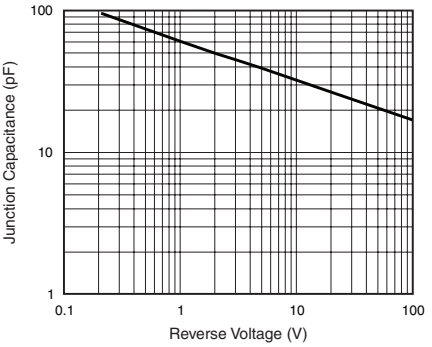


Figure 5. Typical Junction Capacitance Per Diode

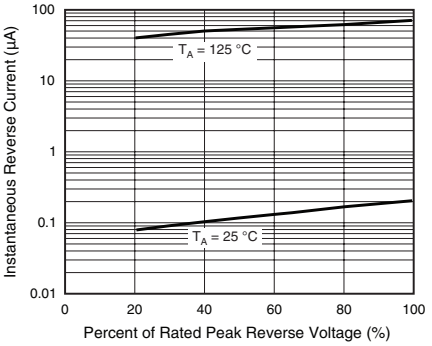


Figure 4. Typical Reverse Leakage Characteristics Per Diode

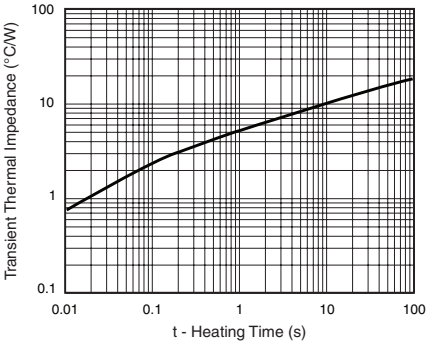
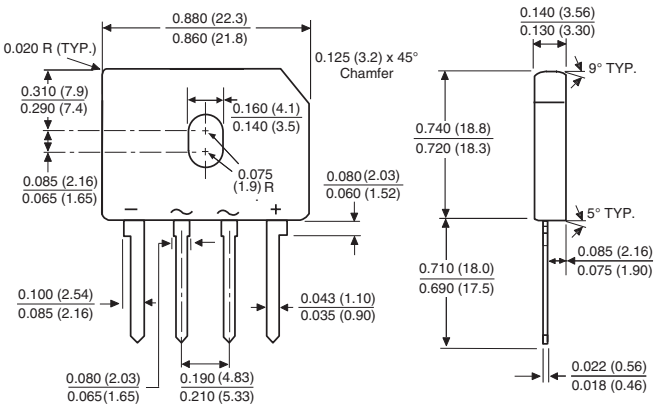


Figure 6. Typical Transient Thermal Impedance

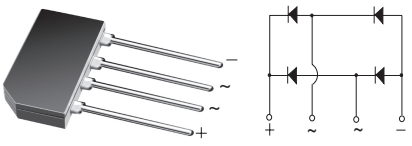
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style GBU



Polarity shown on front side of case, positive lead by beveled corner

Glass Passivated Single-Phase Bridge Rectifier



Case Type GBL

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- Typical I_R less than 0.1 µA
- High case dielectric strength
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances application.

MECHANICAL DATA

Case: GBL

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	150 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBL005	GBL01	GBL02	GBL04	GBL06	GBL08	GBL10	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 50 °C / T_A = 40 °C	$I_{F(AV)}$	4.0 (1) / 3.0 (2)							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	150							A
Rating for fusing (t < 8.3 ms)	I^2t	93							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Notes:

(1) Unit mounted on 3.0 x 3.0 x 0.11" thick (7.5 x 7.5 x 0.3 cm) aluminum plate

(2) Unit mounted on P.C.B. at 0.375" (9.5 mm) lead length and 0.5 x 0.5" (12 x 12 mm) copper pads

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GBL005**	**GBL01**	**GBL02**	**GBL04**	**GBL06**	**GBL08**	**GBL10**	**UNIT**
Maximum instantaneous forward voltage drop per diode	4.0 A	V_F	1.00							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	95				40			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**GBL005**	**GBL01**	**GBL02**	**GBL04**	**GBL06**	**GBL08**	**GBL10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 3.5 (1)							°C/W

Notes:

(1) Unit mounted on 3.0 x 3.0 x 0.11" thick (7.5 x 7.5 x 0.3 cm) aluminum plate

(2) Unit mounted on P.C.B. at 0.375" (9.5 mm) lead length and 0.5 x 0.5" (12 x 12 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GBL06-E3/45	2.18	45	20	Tube
GBL06-E3/51	2.18	51	400	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

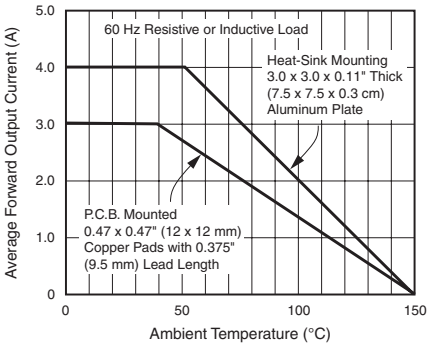


Figure 1. Derating Curves Outzput Rectified Current

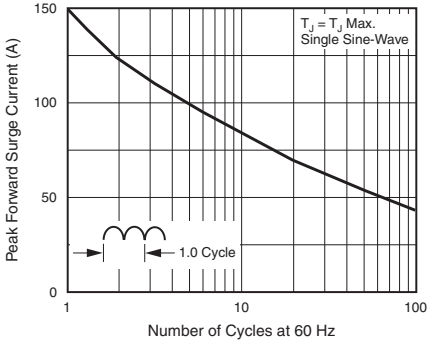


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

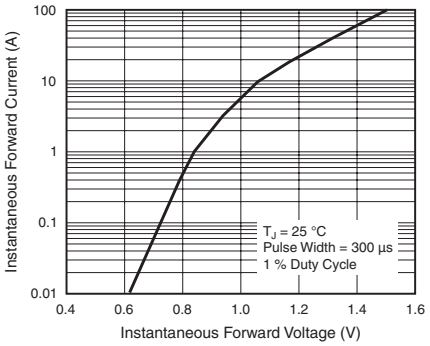


Figure 3. Typical Forward Voltage Characteristics Per Diode

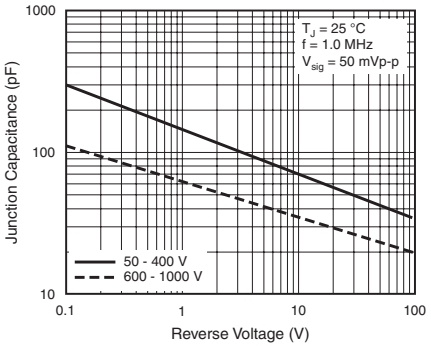


Figure 5. Typical Junction Capacitance Per Diode

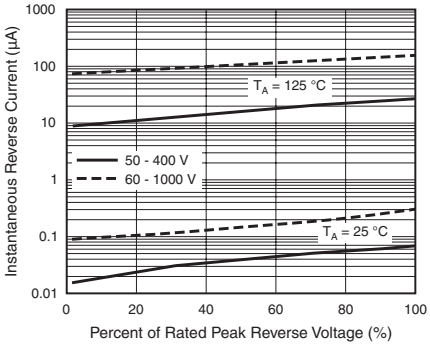


Figure 4. Typical Reverse Characteristics Per Diode

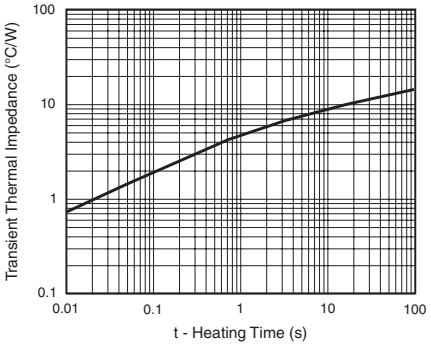
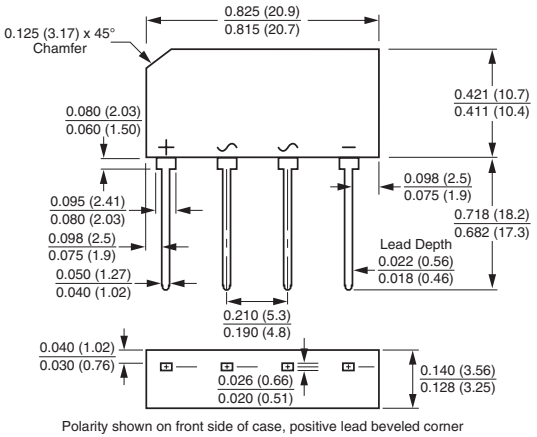


Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBL

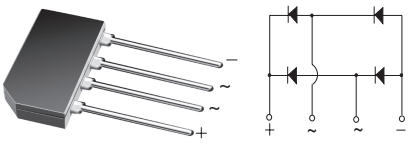


Polarity shown on front side of case, positive lead beveled corner

GBLA005 thru GBLA10

Vishay General Semiconductor

Glass Passivated Single-Phase Bridge Rectifier



Case Type GBL

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- Typical I_R less than 0.1 µA
- High case dielectric strength
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances application.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	120 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBL

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBLA005	GBLA01	GBLA02	GBLA04	GBLA06	GBLA08	GBLA10	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 50 °C (1) / T_A = 40 °C (2)	$I_{F(AV)}$	4.0 3.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	120							A
Rating for fusing (t < 8.3 ms)	I^2t	60							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Notes:

(1) Unit mounted on 3.0 x 3.0 x 0.11" thick (7.5 x 7.5 x 0.3 cm) aluminum plate

(2) Unit mounted on P.C.B. at 0.375" (9.5 mm) lead length and 0.5 x 0.5" (12 x 12 mm) copper pads

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Document Number: 88610
Revision: 30-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GBLA005**	**GBLA01**	**GBLA02**	**GBLA04**	**GBLA06**	**GBLA08**	**GBLA10**	**UNIT**
Maximum instantaneous forward voltage drop per diode	4.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**GBLA005**	**GBLA01**	**GBLA02**	**GBLA04**	**GBLA06**	**GBLA08**	**GBLA10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	47 (2) 10 (1)							°C/W

Notes:

(1) Unit mounted on 3.0 x 3.0 x 0.11" thick (7.5 x 7.5 x 0.3 cm) aluminum plate

(2) Unit mounted on P.C.B. at 0.375" (9.5 mm) lead length and 0.5 x 0.5" (12 x 12 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GBLA06-E3/45	2.133	45	20	Tube
GBLA06-E3/51	2.133	51	400	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

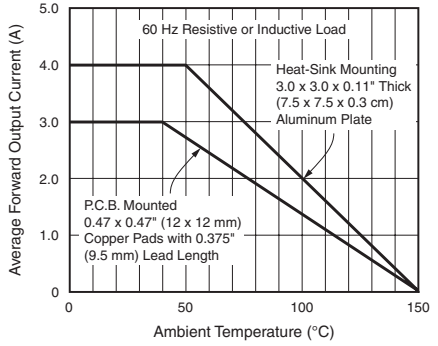


Figure 1. Derating Curves Output Rectified Current

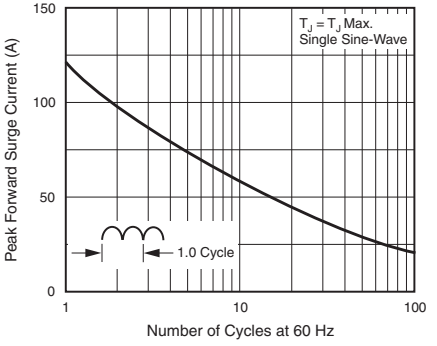


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

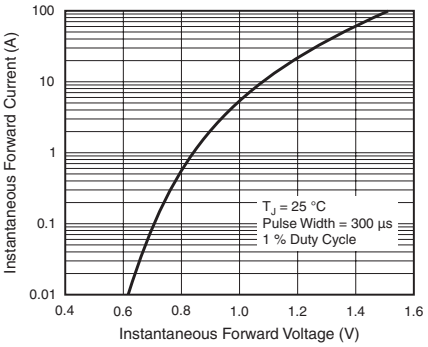


Figure 3. Typical Forward Voltage Characteristics Per Diode

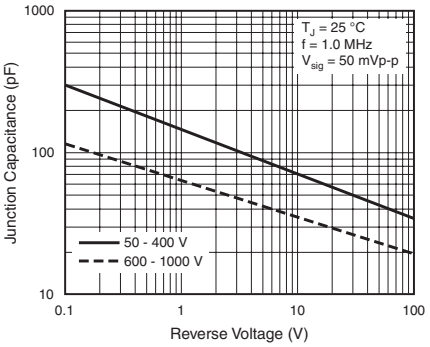


Figure 5. Typical Junction Capacitance Per Diode

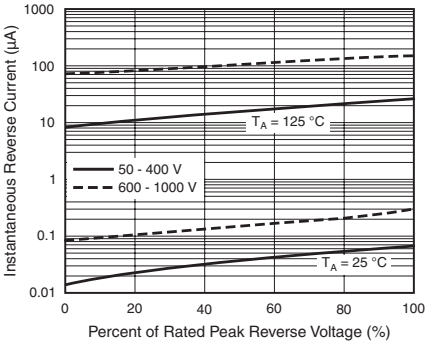


Figure 4. Typical Reverse Characteristics Per Diode

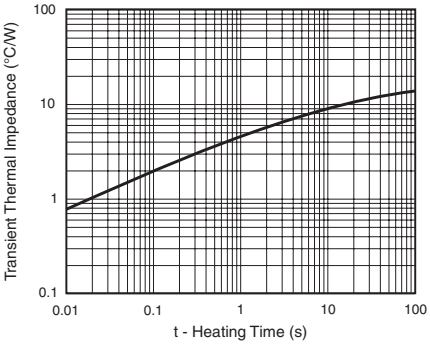
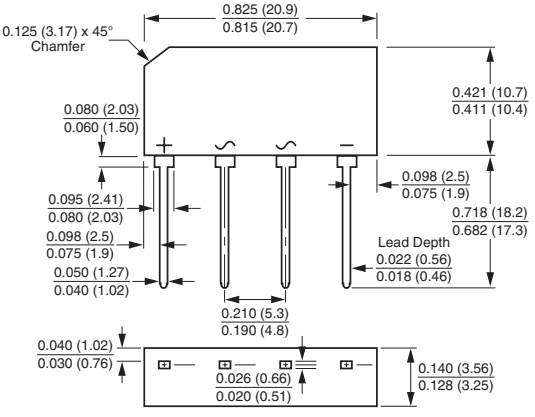


Figure 6. Typical Transient Thermal Impedance Per Diode

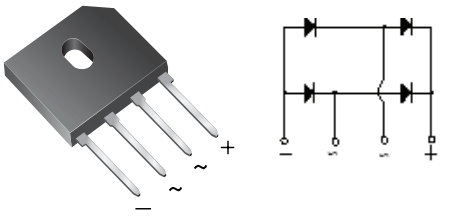
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBL



Polarity shown on front side of case, positive lead beveled corner

Glass Passivated Single-Phase Bridge Rectifier



Case Style GBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, switching mode power supply, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	150 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBU4A	GBU4B	GBU4D	GBU4G	GBU4J	GBU4K	GBU4M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 100 °C (1) / T_A = 40 °C (2)	$I_{F(AV)}$	4.0 / 3.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	150							A
Rating for fusing (t < 8.3 ms)	I^2t	93							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Notes:

(1) Unit case mounted on 1.6 x 1.6 x 0.06" thick (4.0 x 4.0 x 0.15 cm) aluminum plate

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GBU4A**	**GBU4B**	**GBU4D**	**GBU4G**	**GBU4J**	**GBU4K**	**GBU4M**	**UNIT**
Maximum instantaneous forward drop per diode	4.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 A, 1 MHz	C_J	100				45			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**GBU4A**	**GBU4B**	**GBU4D**	**GBU4G**	**GBU4J**	**GBU4K**	**GBU4M**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (2) $R_{\theta JC}$ (1)	22 4.2							°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ORDERING INFORMATION				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GBU4J-E3/45	3.565	45	20	Tube
GBU4J-E3/51	3.565	51	250	Paper tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

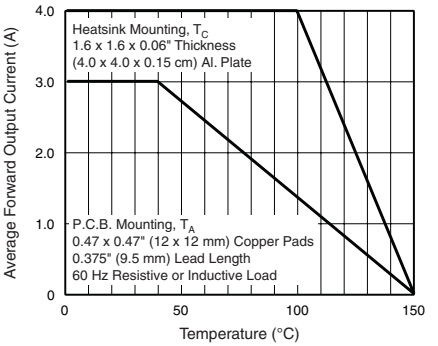


Figure 1. Derating Curve Output Rectified Current

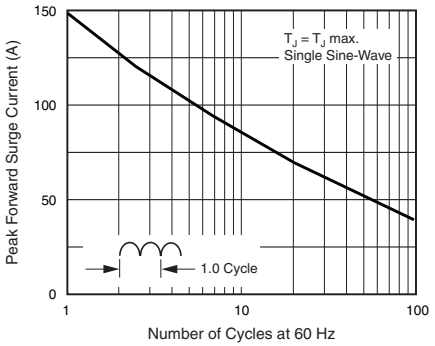


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

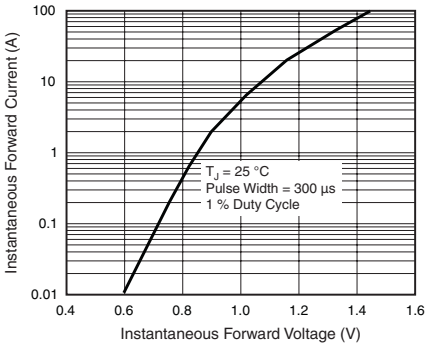


Figure 3. Typical Forward Characteristics Per Diode

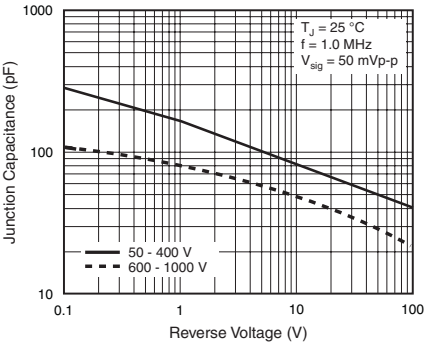


Figure 5. Typical Junction Capacitance Per Diode

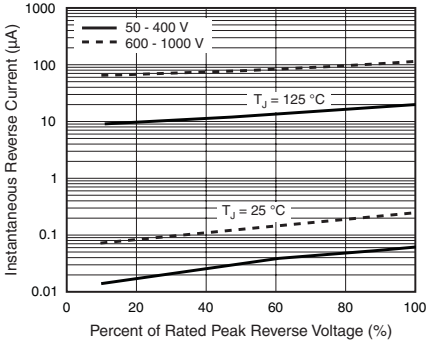


Figure 4. Typical Reverse Leakage Characteristics Per Diode

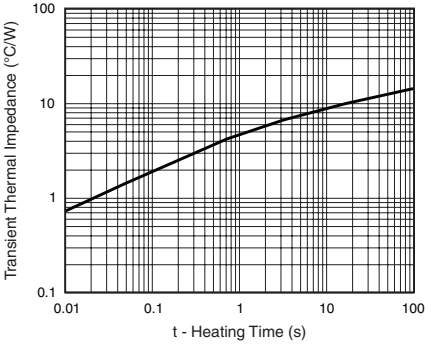
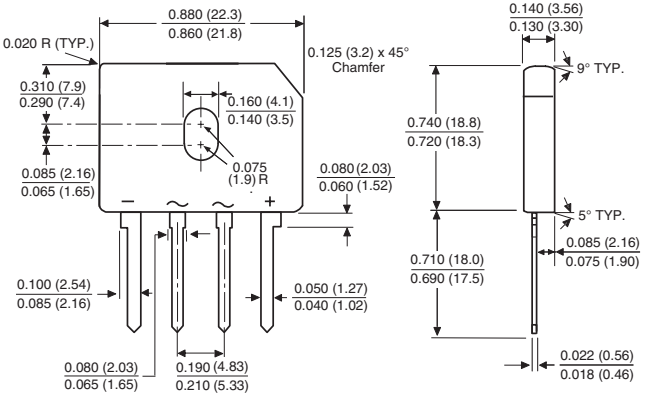


Figure 6. Typical Transient Thermal Impedance

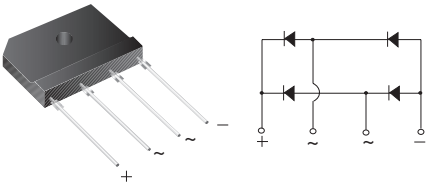
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBU



Polarity shown on front side of case, positive lead by beveled corner

Single-Phase Single In-Line Bridge Rectifier



Case Style GSIB-3G

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, switching mode power supply, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	130 A
I_R	10 µA
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-3G

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB420	GSIB440	GSIB460	GSIB480	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 100 °C / T_A = 25 °C	$I_{F(AV)}$	4.0 (1) / 2.3 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	130				A
Rating for fusing (t < 8.3 ms)	I^2t	60				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	GSIB420	GSIB440	GSIB460	GSIB480	UNIT
Maximum instantaneous forward drop per diode	2.0 A	V_F	0.95				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	GSIB420	GSIB440	GSIB460	GSIB480	UNIT
Maximum thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	26 (2) 5 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GSIB460-E3/45	4.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

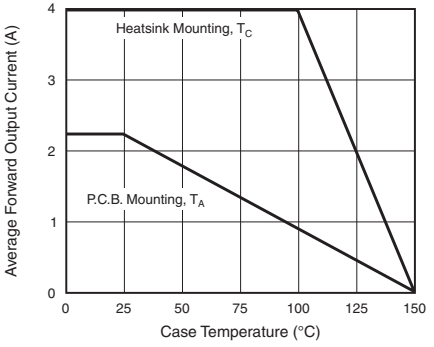


Figure 1. Derating Curve Output Rectified Current

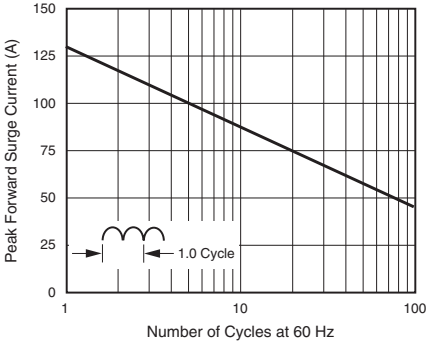


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

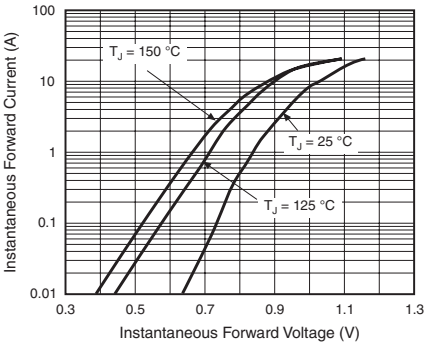


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

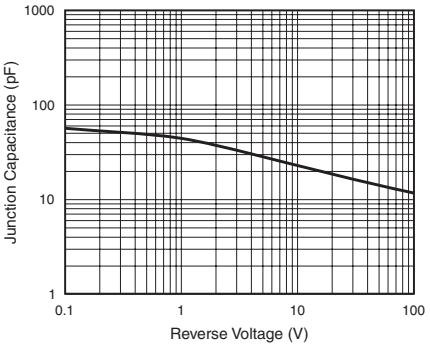


Figure 5. Typical Junction Capacitance Per Diode

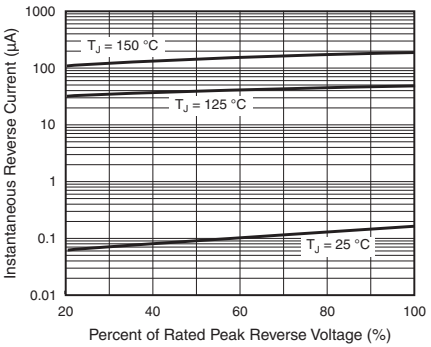


Figure 4. Typical Reverse Characteristics Per Diode

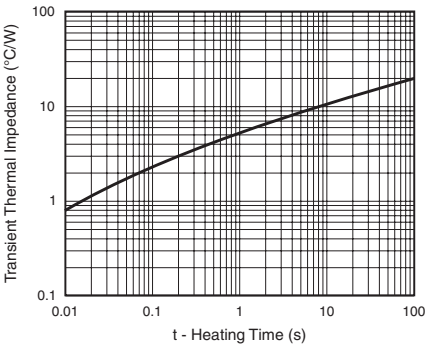
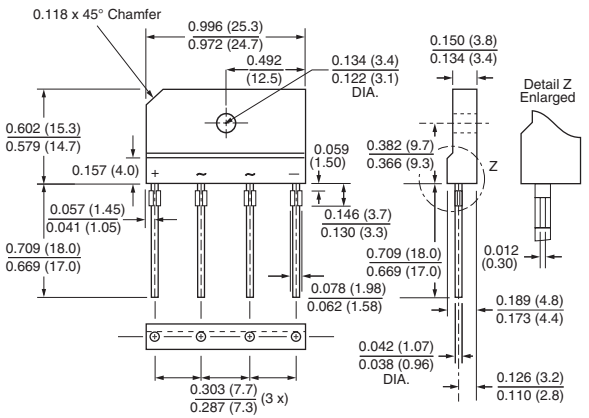


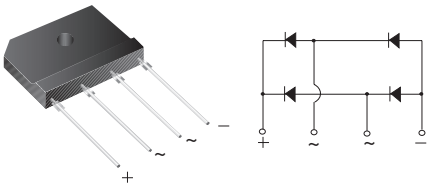
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style GSIB-3G



Glass Passivated Single-In-Line Bridge Rectifier



Case Style GSIB-3G

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, switching mode power supply, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	80 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-3G

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB4A20	GSIB4A40	GSIB4A60	GSIB4A80	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 100 °C, T_A = 25 °C	$I_{F(AV)}$	4.0 (1) 2.3 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	80				A
Rating for fusing (t < 8.3 ms)	I^2t	32				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GSIB4A20**	**GSIB4A40**	**GSIB4A60**	**GSIB4A80**	**UNIT**
Maximum instantaneous forward drop per diode	2.0 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 400				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GSIB4A20**	**GSIB4A40**	**GSIB4A60**	**GSIB4A80**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	26 (2) 5 (1)				°C/W

Noted:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GSIB4A60-E3/45	4.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

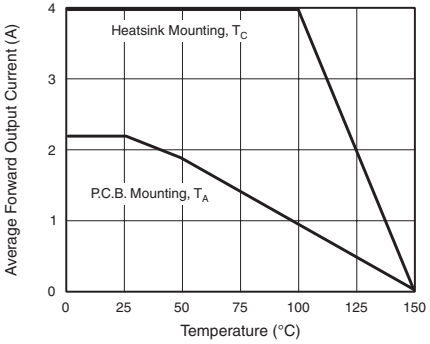


Figure 1. Derating Curve Output Rectified Current

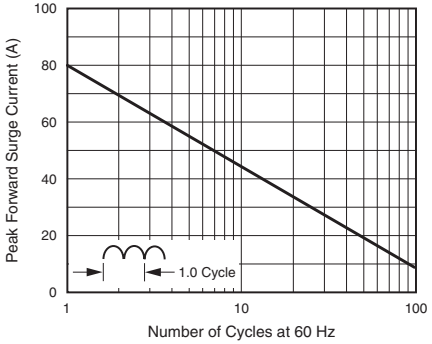


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

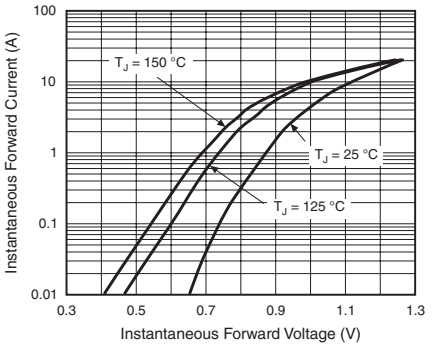


Figure 3. Typical Forward Characteristics Per Diode

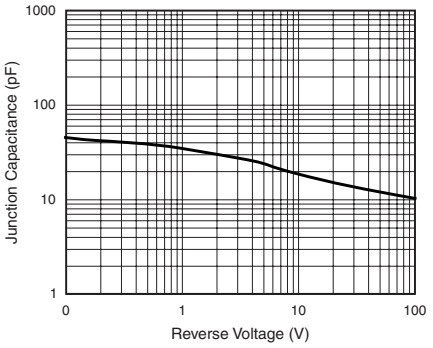


Figure 5. Typical Junction Capacitance Per Diode

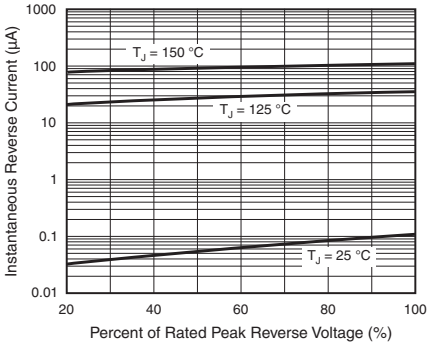


Figure 4. Typical Reverse Characteristics Per Diode

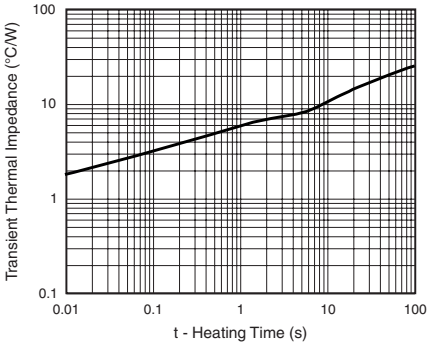
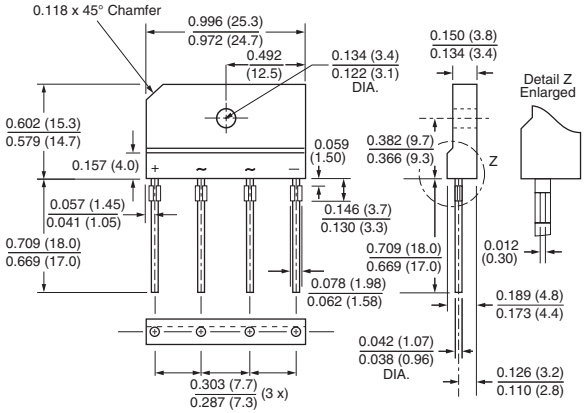


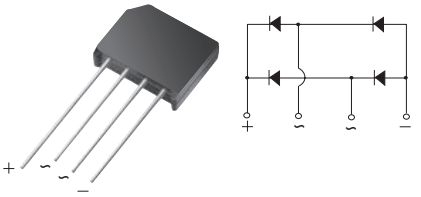
Figure 6. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style GSIB-3G



Single-Phase Bridge Rectifier



Case Style KBL

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	200 A
I_R	5 µA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: KBL

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	KBL005	KBL01	KBL02	KBL04	KBL06	KBL08	KBL10	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward current at T_A = 50 °C	$I_{F(AV)}$	4.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	200							A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	KBL005	KBL01	KBL02	KBL04	KBL06	KBL08	KBL10	UNIT
Maximum instantaneous forward drop per diode	4.0 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 1.0							µA mA

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88655
Revision: 15-Apr-08

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	KBL005	KBL01	KBL02	KBL04	KBL06	KBL08	KBL10	UNIT
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JL}$	19 (1) 2.4 (2)							°C/W

Notes:

(1) Thermal resistance from junction to ambient with units mounted on 3.0 x 3.0 x 0.11" thick (7.5 x 7.5 x 0.3 cm) aluminum plate

(2) Thermal resistance from junction to lead with units mounted on P.C.B. at 0.375" (9.5 mm) lead length and 0.5 x 0.5" (12 x 12 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
KBL06-E4/51	6.0	51	300	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

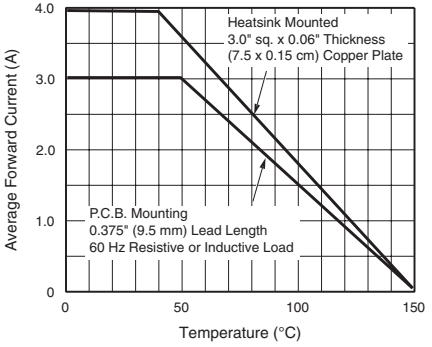


Figure 1. Derating Curve Output Rectified Current

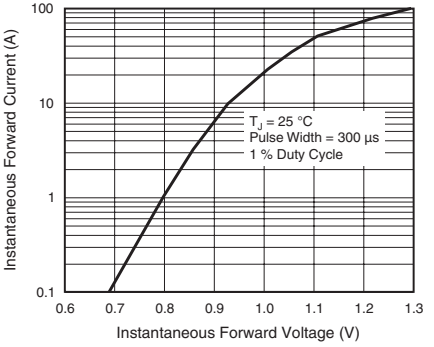


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

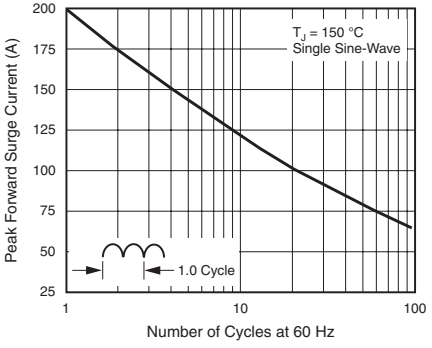


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

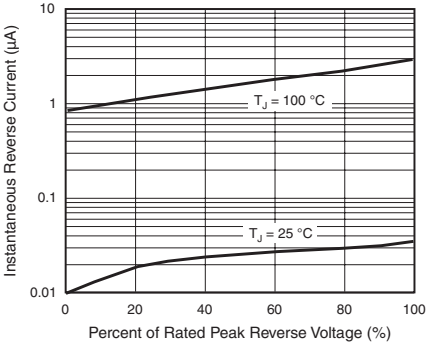


Figure 4. Typical Reverse Leakage Characteristics Per Diode

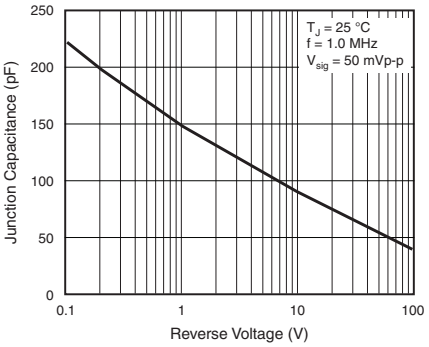
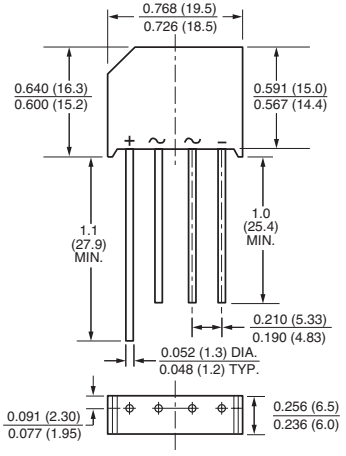


Figure 5. Typical Junction Capacitance Per Diode

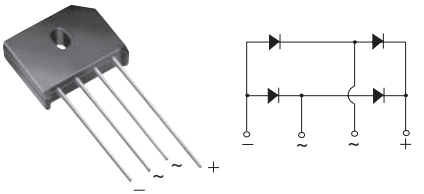
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style KBL



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Single-Phase Bridge Rectifier



Case Style KBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	200 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: KBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	KBU4A	KBU4B	KBU4D	KBU4G	KBU4J	KBU4K	KBU4M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 100 °C (1) / T_A = 30 °C (2)	$I_{F(AV)}$	4.0 4.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	200							A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

Notes:

(1) Units mounted on a 2.0 x 1.6 x 0.3" thick (5 x 4 x 0.8 cm.) aluminum plate

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**KBU4A**	**KBU4B**	**KBU4D**	**KBU4G**	**KBU4J**	**KBU4K**	**KBU4M**	**UNIT**
Maximum instantaneous forward drop per diode	4.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 1.0							µA mA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**KBU4A**	**KBU4B**	**KBU4D**	**KBU4G**	**KBU4J**	**KBU4K**	**KBU4M**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JL}$	19 (2) 4.0 (1)							°C/W

Notes:

(1) Units mounted on a 2.0 x 1.6 x 0.3" thick (5 x 4 x 0.8 cm.) aluminum plate

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
KBU4J-E4/51	8.0	51	250	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

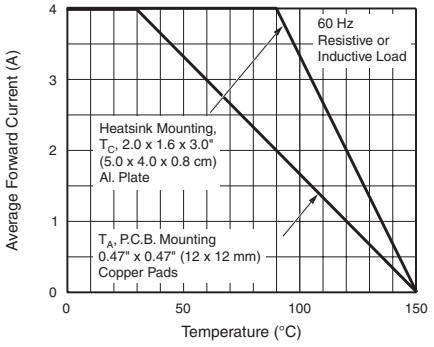


Figure 1. Derating Curve Output Rectified Current

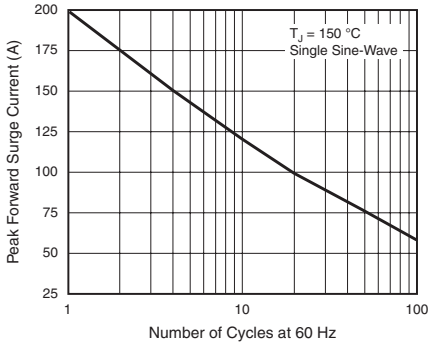


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

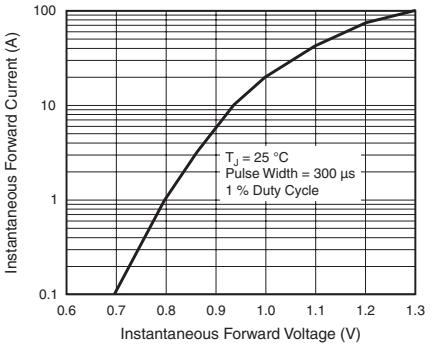


Figure 3. Typical Forward Characteristics Per Diode

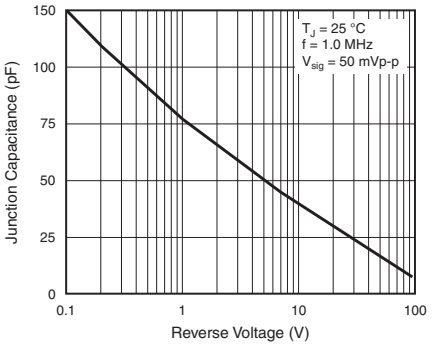


Figure 5. Typical Junction Capacitance Per Diode

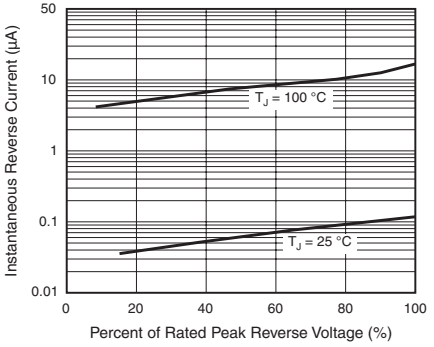
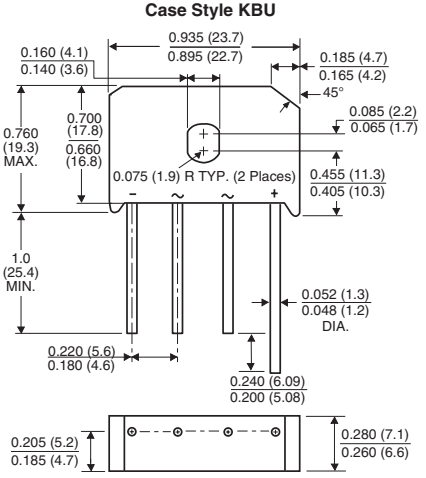


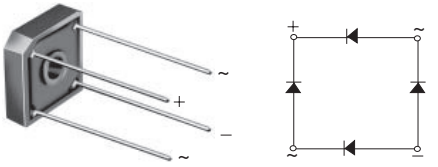
Figure 4. Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style KBU



Glass Passivated Single-Phase Bridge Rectifier



Case Style GBPC6

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- Typical I_R less than 0.5 µA
- High surge current capability
- High case dielectric strength 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	175 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBPC6

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102
E4 suffix for consumer grade

Polarity: As marked, positive lead by belevled corner

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBPC 6005	GBPC 601	GBPC 602	GBPC 604	GBPC 606	GBPC 608	GBPC 610	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS bridge input voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 50 °C (1)(2) / T_A = 40 °C (3)	$I_{F(AV)}$	6.0 3.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	175							A
Rating for fusing (t < 8.3 ms)	I^2t	127							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Notes:

(1) Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer with #6 screw

(2) Unit mounted on 5.5 x 6.0 x 0.11" thick (14 x 15 x 0.3 cm) aluminum plate

(3) Unit mounted on P.C.B. at 0.375" (9.5 mm) lead length with 0.5 x 0.5" (12 x 12 mm) copper pads

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GBPC 6005**	**GBPC 601**	**GBPC 602**	**GBPC 604**	**GBPC 606**	**GBPC 608**	**GBPC 610**	**UNIT**
Maximum instantaneous forward voltage drop per diode	3.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 V, 1 MHz	C_J	186				90			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**GBPC 6005**	**GBPC 601**	**GBPC 602**	**GBPC 604**	**GBPC 606**	**GBPC 608**	**GBPC 610**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JC}$	22 7.3							°C/W

Notes:

(1) Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer with #6 screw

(2) Unit mounted on 5.5 x 6.0 x 0.11" thick (14 x 15 x 0.3 cm) aluminum plate

(3) Unit mounted on P.C.B. at 0.375" (9.5 mm) lead length with 0.5 x 0.5" (12 x 12 mm) copper pads

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GBPC606-E4/51	3.2	51	100	Paper box

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

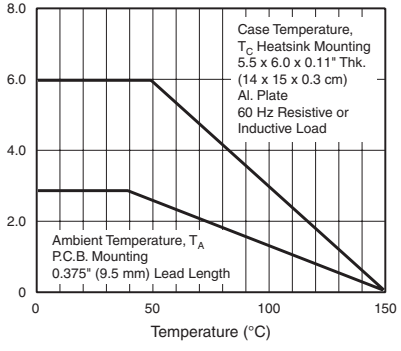


Figure 1. Derating Curve Output Rectified Current

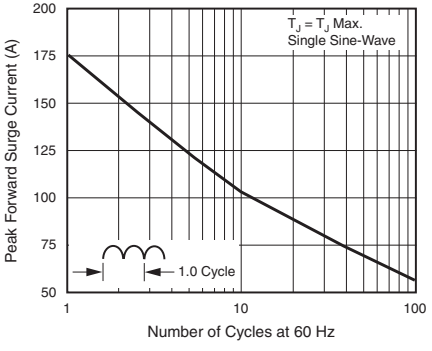


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

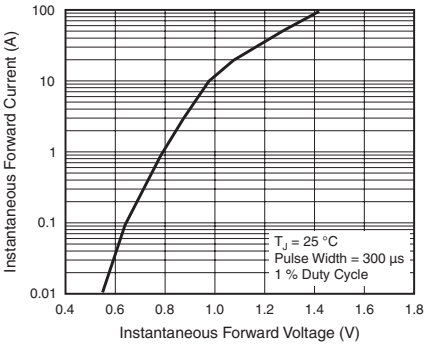


Figure 3. Typical Forward Characteristics Per Diode

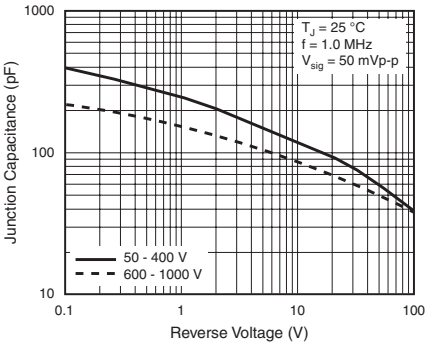


Figure 5. Typical Junction Capacitance Per Diode

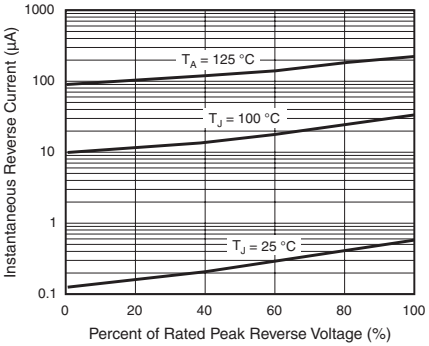


Figure 4. Typical Reverse Leakage Characteristics Per Diode

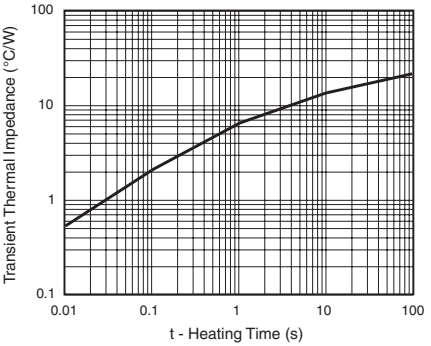
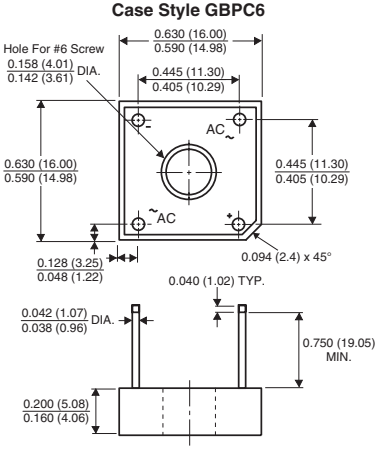


Figure 6. Typical Transient Thermal Impedance Per Diode

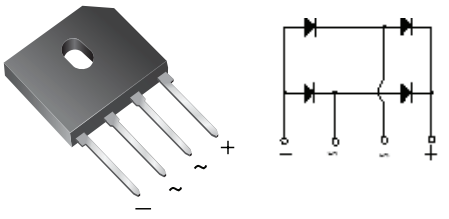
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Style GBPC6



Polarity shown on side of case: Positive lead by beveled corner

Glass Passivated Single-Phase Bridge Rectifier



Case Style GBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, switching mode power supply, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	175 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBU6A	GBU6B	GBU6D	GBU6G	GBU6J	GBU6K	GBU6M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at (Fig. 1) T_C = 90 °C (1) / T_A = 40 °C (2)	$I_{F(AV)}$	6.0 / 3.8							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	175							A
Rating for fusing (t < 8.3 ms)	I^2t	127							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GBU6A**	**GBU6B**	**GBU6D**	**GBU6G**	**GBU6J**	**GBU6K**	**GBU6M**	**UNIT**
Maximum instantaneous forward voltage drop per diode	6.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							µA
Typical junction capacitance per diode	4.0 A, 1 MHz	C_J	211				94			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**GBU6A**	**GBU6B**	**GBU6D**	**GBU6G**	**GBU6J**	**GBU6K**	**GBU6M**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (2) $R_{\theta JC}$ (1)(3)	20 2.5							°C/W

Notes:

(1) Units case mounted on aluminum plate heatsink

(2) Units mounted in free air, no heatsink on P.C.B., 0.5 x 0.5" (12 x 12 mm) copper pads, 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screws

ORDERING INFORMATION				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GBU6J-E3/45	3.857	45	20	Tube
GBU6J-E3/51	3.857	51	250	Paper tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

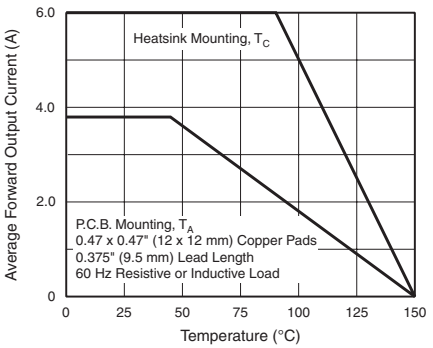


Figure 1. Derating Curve Output Rectified Current

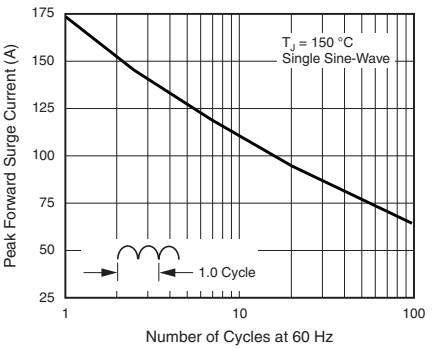


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

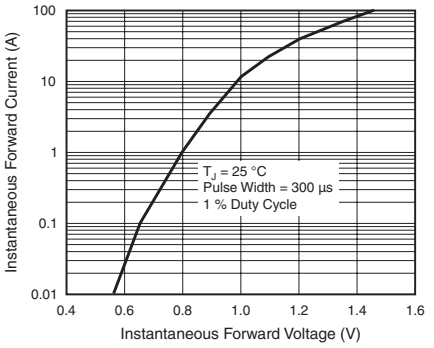


Figure 3. Typical Forward Characteristics Per Diode

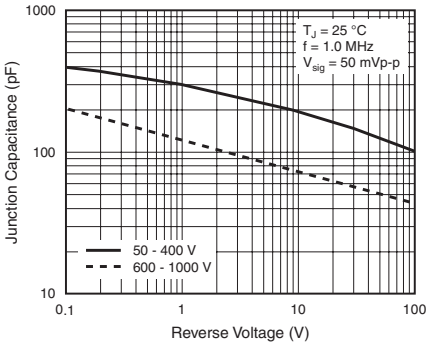


Figure 5. Typical Junction Capacitance Per Diode

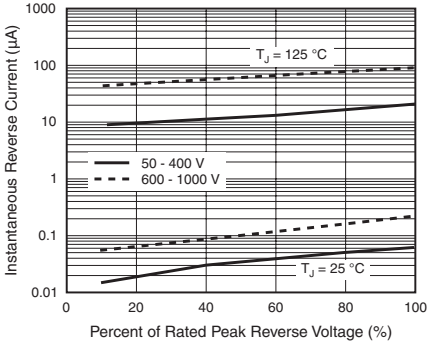


Figure 4. Typical Reverse Leakage Characteristics Per Diode

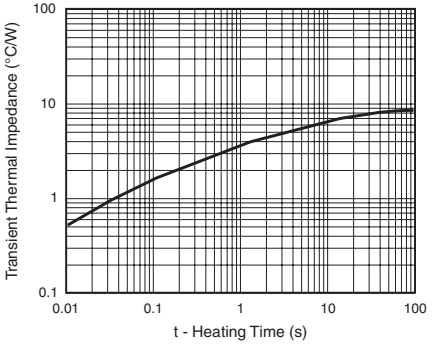
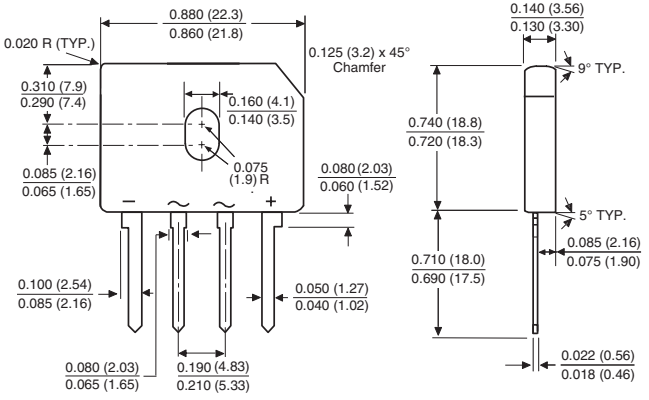


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBU

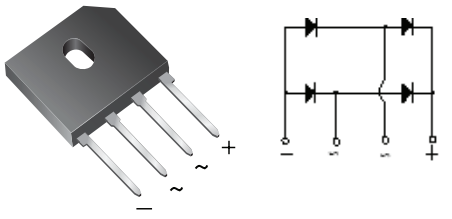


Polarity shown on front side of case, positive lead by beveled corner

G5SBA20, G5SBA60 & G5SBA80

Vishay General Semiconductor

Glass Passivated Single-Phase Bridge Rectifier



Case Style GBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, switching mode power supply, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	200 V, 600 V, 800 V
I_{FSM}	150 A
I_R	5 µA
V_F	1.05 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	G5SBA20	G5SBA60	G5SBA80	UNIT
Maximum repetive peak reverse voltage	V_{RRM}	200	600	800	V
Maximum RMS reverse voltage	V_{RWM}	140	420	560	V
Maximum DC blocking voltage	V_{DC}	200	600	800	V
Maximum average forward rectified output current at T_C = 100 °C (1) T_A = 25 °C (2)	$I_{F(AV)}$	6.0 2.8			A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	150			A
Rating for fusing (t < 8.3 ms)	I^2t	93			A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

For technical questions within your region, please contact one of the following:
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Revision: 30-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**G5SBA20**	**G5SBA60**	**G5SBA80**	**UNIT**
Maximum instantaneous forward voltage per diode	3.0 A	V_F	1.05			V
Maximum DC reverse current at rated DC blocking voltage per diode	T_J = 25 °C T_J = 125 °C	I_R	5.0 300			μA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**G5SBA20**	**G5SBA60**	**G5SBA80**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (2) $R_{\theta JC}$ (1)	22 3.4			°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
G5SBA60-E3/45	3.565	45	20	Tube
G5SBA60-E3/51	3.565	51	250	Paper tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

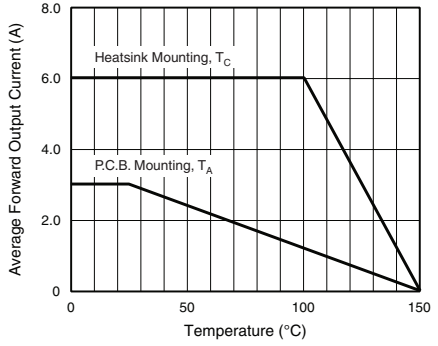


Figure 1. Derating Curve Output Rectified Current

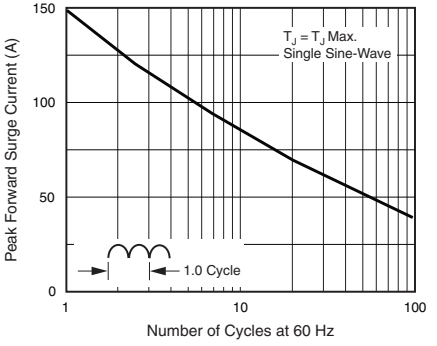


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

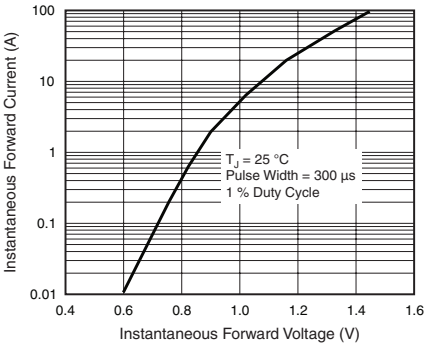


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

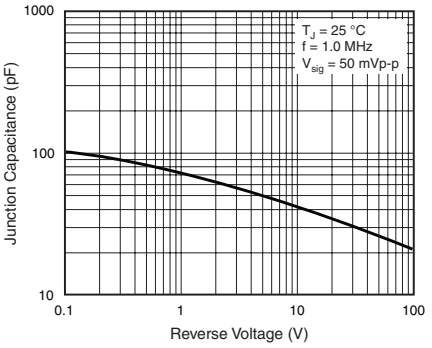


Figure 5. Typical Junction Capacitance Per Diode

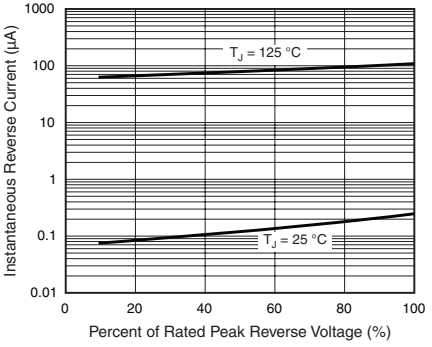


Figure 4. Typical Reverse Leakage Characteristics Per Diode

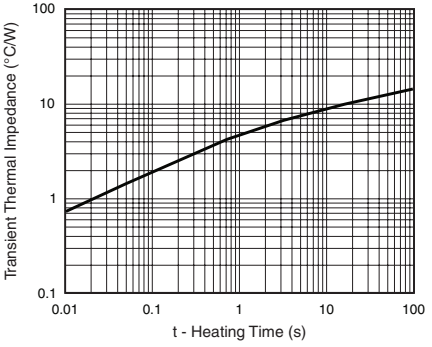
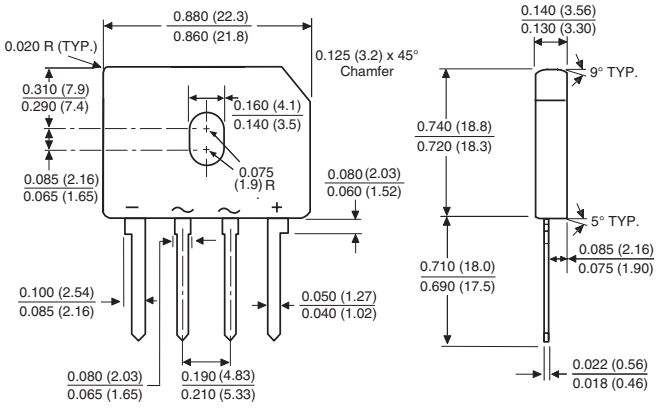


Figure 6. Typical Transient Thermal Impedance

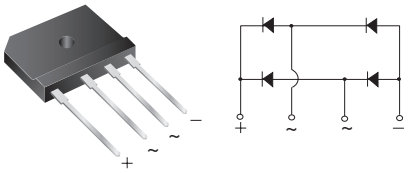
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBU



Polarity shown on front side of case, positive lead by beveled corner

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	180 A
I_R	10 µA
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB620	GSIB640	GSIB660	GSIB680	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 100 °C, T_A = 25 °C	$I_{F(AV)}$	6.0 (1) 2.8 (2)				A
Peak forward surge current single sine-wave superimposed on rated load (JEDEC method)	I_{FSM}	180				A
Rating for fusing (t < 8.3 ms)	I^2t	120				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GSIB620**	**GSIB640**	**GSIB660**	**GSIB680**	**UNIT**
Maximum instantaneous forward voltage drop per diode	3.0 A	V_F	0.95				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GSIB620**	**GSIB640**	**GSIB660**	**GSIB680**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 3.4 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GSIB660-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

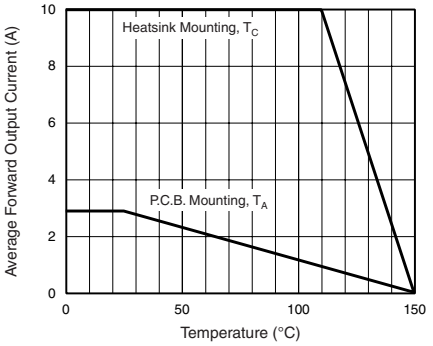


Figure 1. Derating Curve Output Rectified Current

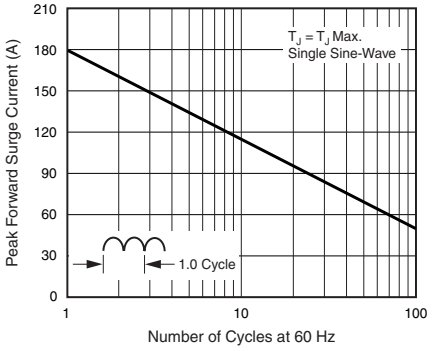


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

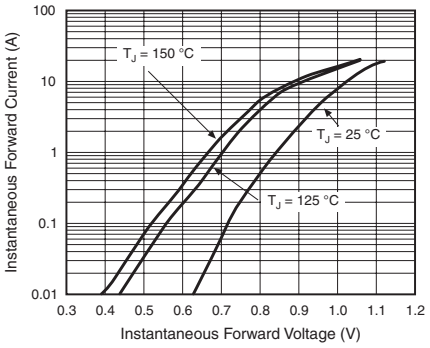


Figure 3. Typical Forward Characteristics Per Diode

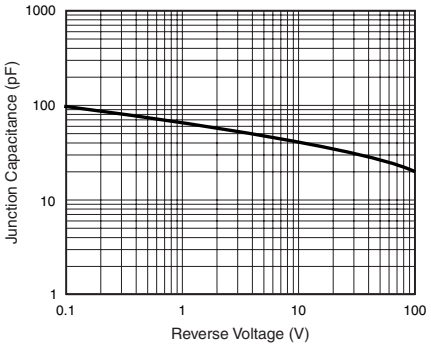


Figure 5. Typical Junction Capacitance Per Diode

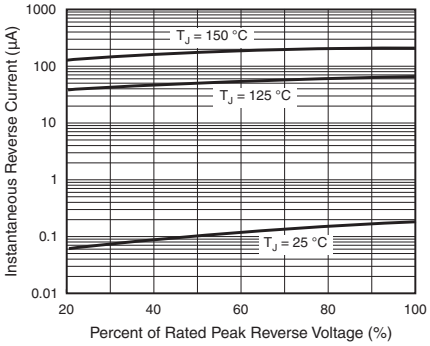


Figure 4. Typical Reverse Characteristics Per Diode

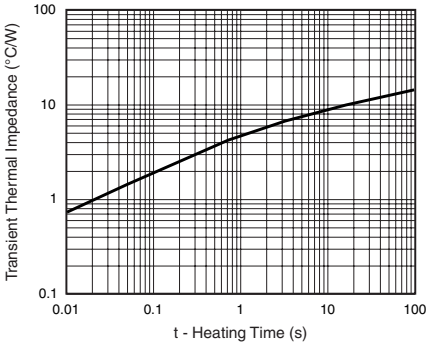
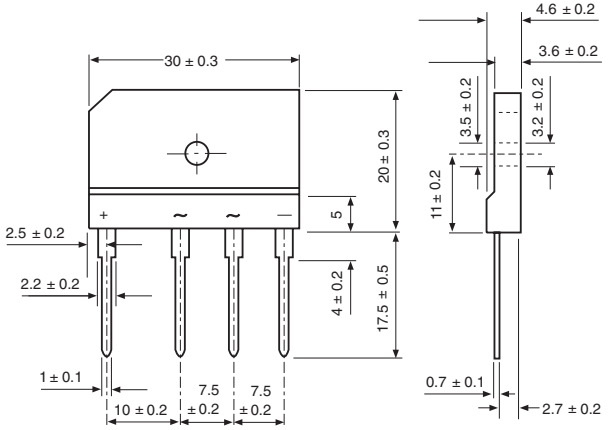


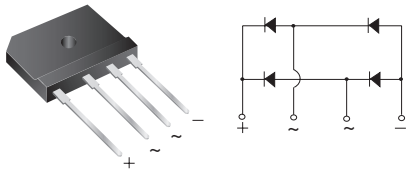
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style GSIB-5S



Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	150 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB6A20	GSIB6A40	GSIB6A60	GSIB6A80	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 100 °C / T_A = 25 °C	$I_{F(AV)}$	6.0 (1) / 2.8 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	150				A
Rating for fusing (t < 8.3 ms)	I^2t	93				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GSIB6A20**	**GSIB6A40**	**GSIB6A60**	**GSIB6A80**	**UNIT**
Maximum instantaneous forward voltage drop per diode	3.0 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GSIB6A20**	**GSIB6A40**	**GSIB6A60**	**GSIB6A80**	**UNIT**
Maximum thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 3.4 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GSIB6A60-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

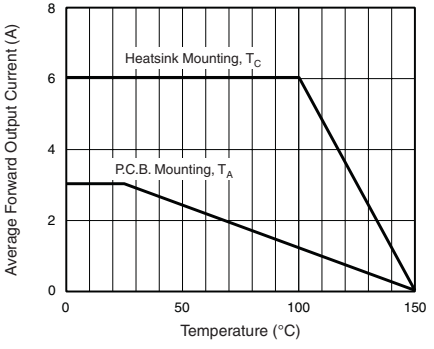


Figure 1. Derating Curve Output Rectified Current

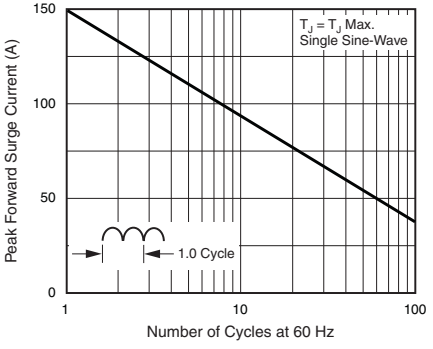


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

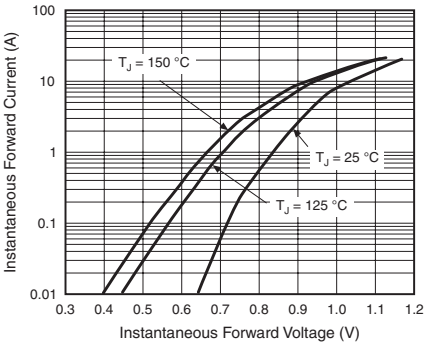


Figure 3. Typical Forward Characteristics Per Diode

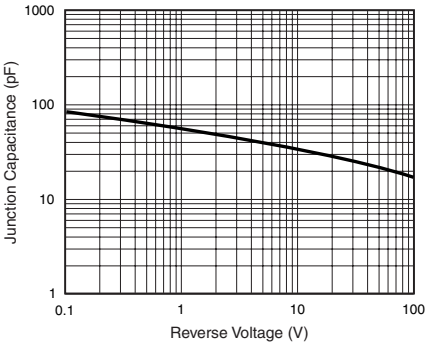


Figure 5. Typical Junction Capacitance Per Diode

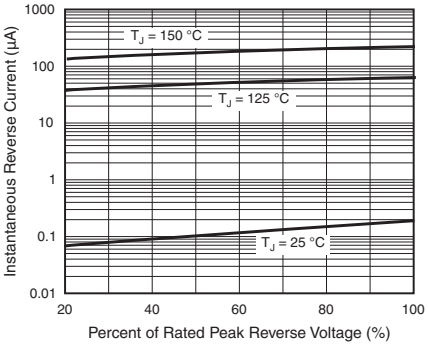


Figure 4. Typical Reverse Characteristics Per Diode

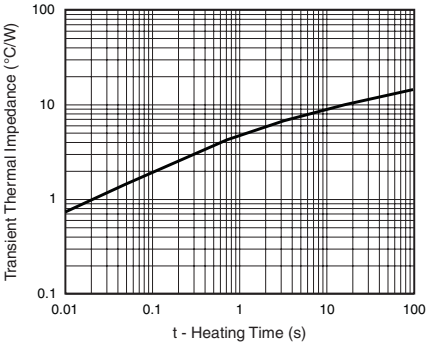
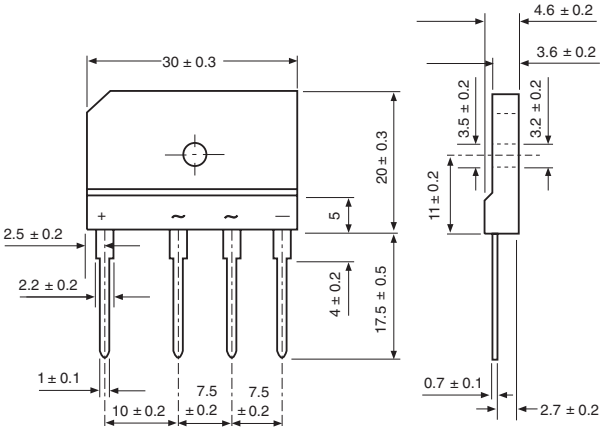


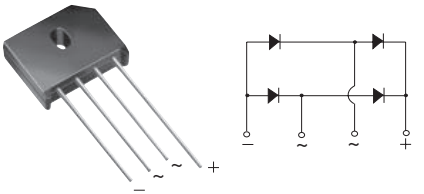
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style GSIB-5S



Single-Phase Bridge Rectifier



Case Style KBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	200 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: KBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102
E4 suffix for consumer grade

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	KBU6A	KBU6B	KBU6D	KBU6G	KBU6J	KBU6K	KBU6M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 100 °C (1)(2) / T_A = 40 °C (3)	$I_{F(AV)}$	6.0 6.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	250							A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

Notes:

(1) Recommended mounted position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

(2) Thermal resistance from junction to ambient with units in free air, P.C.B. mounted on 0.5 x 0.5" (12 x 12 mm) copper pads, 0.375" (9.5 mm) lead length

(3) Thermal resistance from junction to case with units mounted on a 2.6 x 1.4 x 0.06" thick (6.5 x 3.5 x 0.15 cm) aluminum plate

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**KBU6A**	**KBU6B**	**KBU6D**	**KBU6G**	**KBU6J**	**KBU6K**	**KBU6M**	**UNIT**
Maximum instantaneous forward drop per diode	6.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 1.0							µA mA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**KBU6A**	**KBU6B**	**KBU6D**	**KBU6G**	**KBU6J**	**KBU6K**	**KBU6M**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JC}$	8.6 3.1							°C/W

Note:

(1) Thermal resistance from junction to ambient with units in free air, P.C.B. mounted on 0.5 x 0.5" (12 x 12 mm) copper pads, 0.375" (9.5 mm) lead length

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
KBU6J-E4/51	8.0	51	250	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

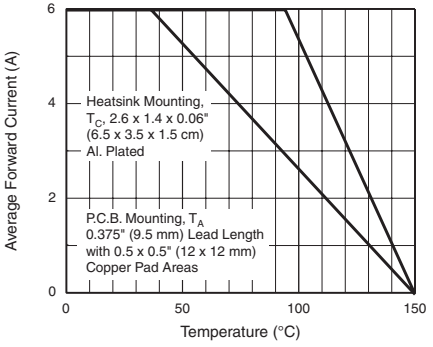


Figure 1. Derating Curve Output Rectified Current

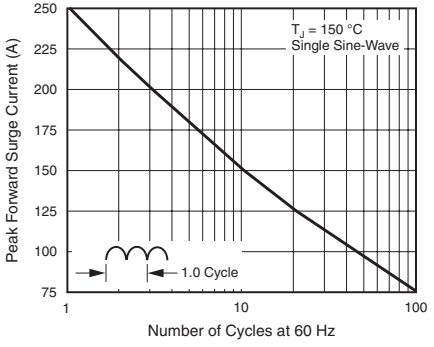


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

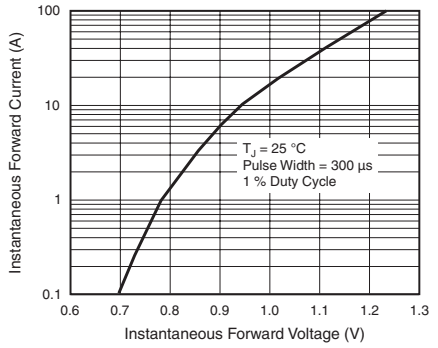


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

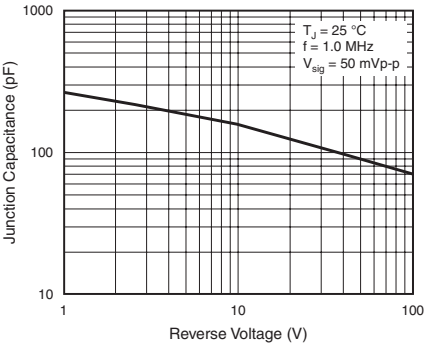


Figure 5. Typical Junction Capacitance Per Diode

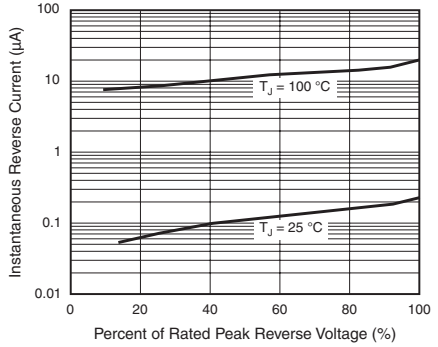
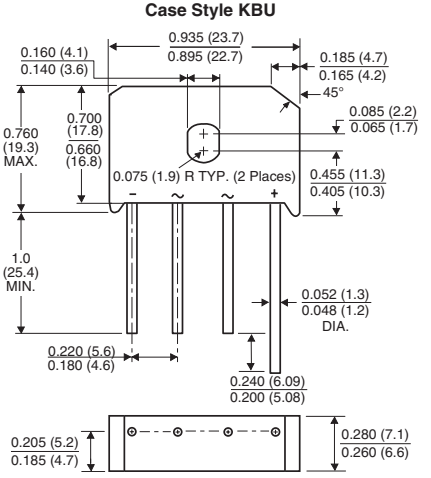


Figure 4. Typical Reverse Leakage Characteristics Per Diode

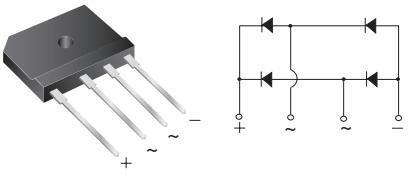
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



VSIB620 thru VSIB680

Vishay General Semiconductor

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	180 A
I_R	10 µA
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSIB620	VSIB640	VSIB660	VSIB680	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 100 °C / T_A = 25 °C	$I_{F(AV)}$	6.0 (1) / 2.8 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	180				A
Rating for fusing (t < 8.3 ms)	I^2t	120				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

For technical questions within your region, please contact one of the following:
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Document Number: 84656
Revision: 01-Feb-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VSIB620**	**VSIB640**	**VSIB660**	**VSIB680**	**UNIT**
Maximum instantaneous forward voltage drop per diode	3.0 A	V_F	0.95				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				μA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**VSIB620**	**VSIB640**	**VSIB660**	**VSIB680**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 3.4 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSIB660-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

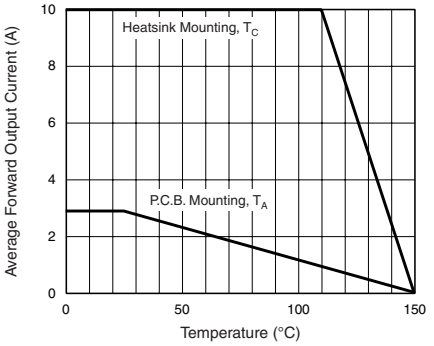


Figure 1. Derating Curve Output Rectified Current

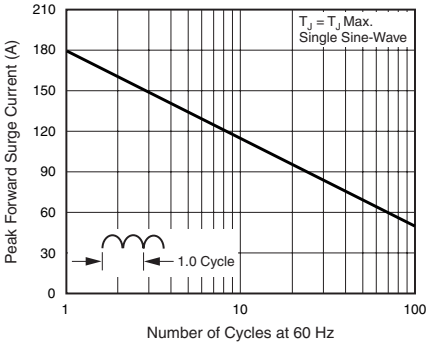


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

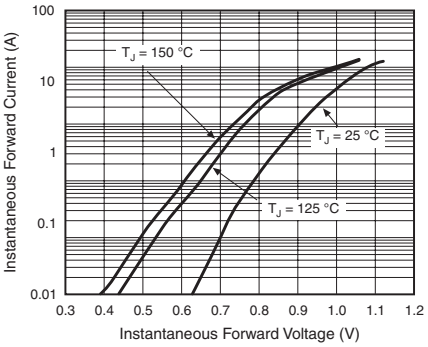


Figure 3. Typical Forward Characteristics Per Diode

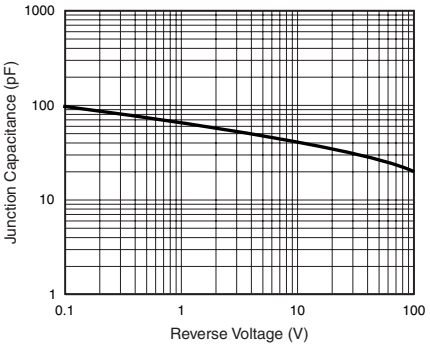


Figure 5. Typical Junction Capacitance Per Diode

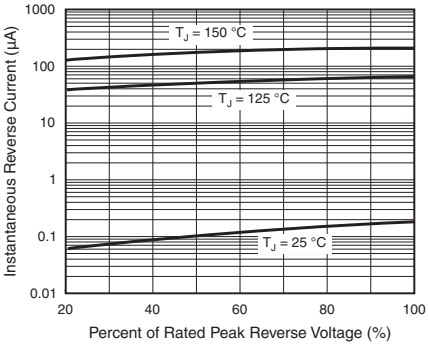


Figure 4. Typical Reverse Characteristics Per Diode

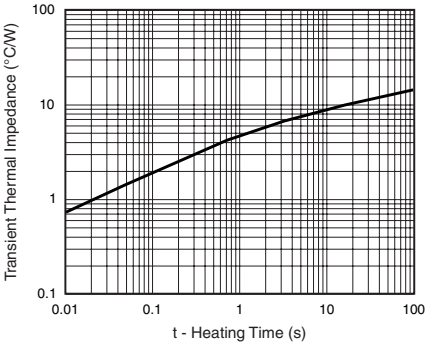
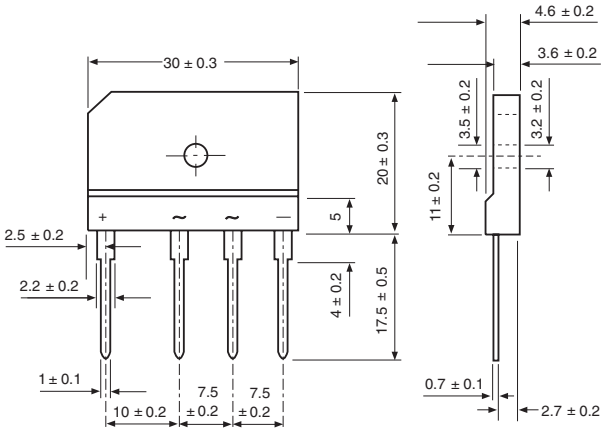


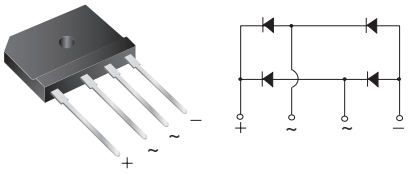
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style GSIB-5S



Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
V_{RRM}	200 V to 800 V
I_{FSM}	150 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSIB6A20	VSIB6A40	VSIB6A60	VSIB6A80	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 100 °C / T_A = 25 °C	$I_{F(AV)}$	6.0 (1) / 2.8 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	150				A
Rating for fusing (t < 8.3 ms)	I^2t	93				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VSIB6A20**	**VSIB6A40**	**VSIB6A60**	**VSIB6A80**	**UNIT**
Maximum instantaneous forward voltage drop per diode	3.0 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				μA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**VSIB6A20**	**VSIB6A40**	**VSIB6A60**	**VSIB6A80**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 3.4 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSIB6A60-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

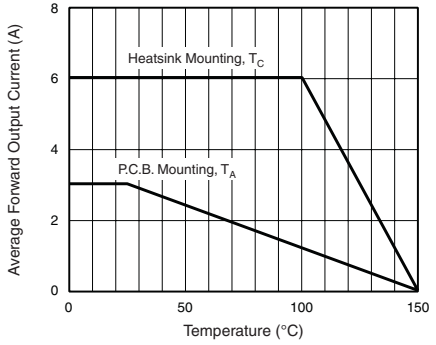


Figure 1. Derating Curve Output Rectified Current

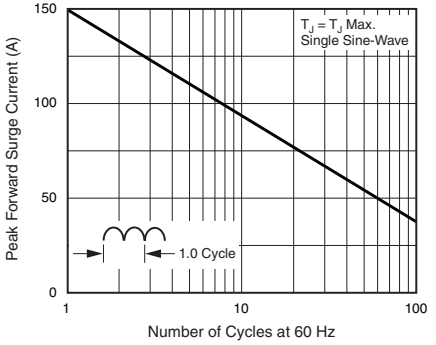


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

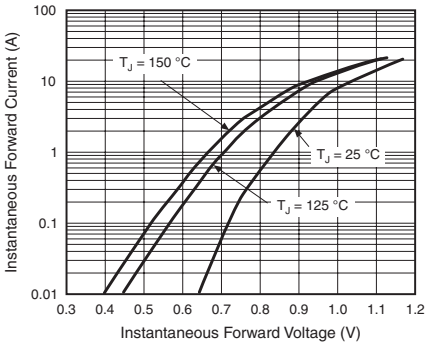


Figure 3. Typical Forward Characteristics Per Diode

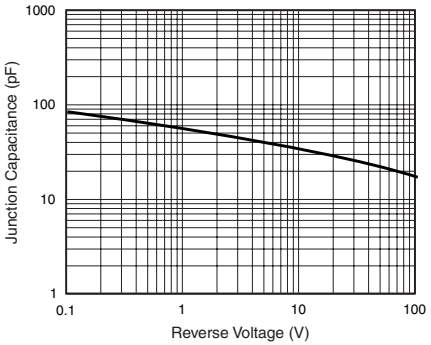


Figure 5. Typical Junction Capacitance Per Diode

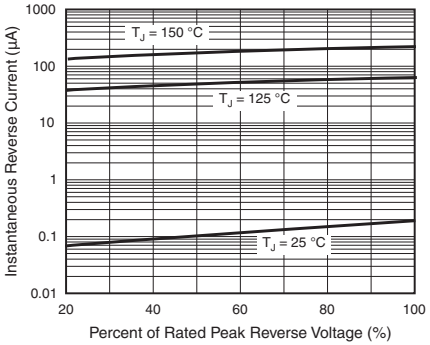


Figure 4. Typical Reverse Characteristics Per Diode

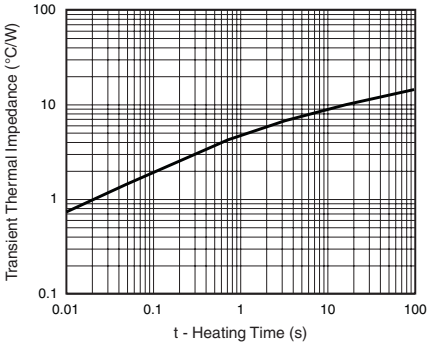
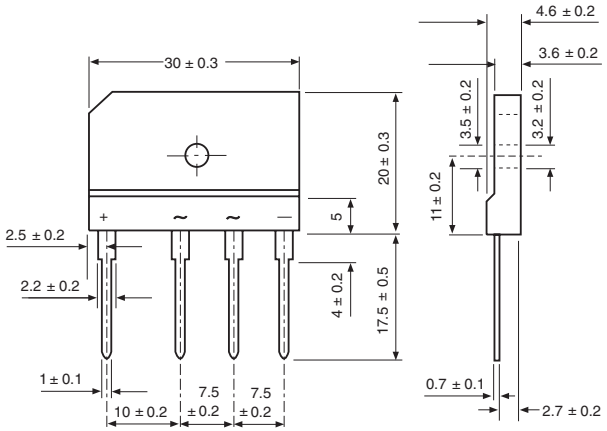


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

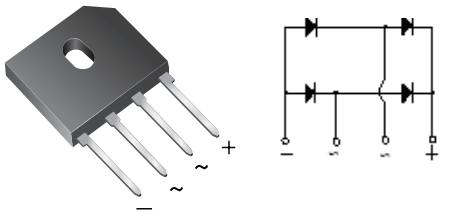
Case Style GSIB-5S



GBU8A thru GBU8M

Vishay General Semiconductor

Glass Passivated Single-Phase Bridge Rectifier



Case Style GBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, power supply, switching mode power supply, adapter, audio equipment and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	200 A
I_R	5 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBU8A	GBU8B	GBU8D	GBU8G	GBU8J	GBU8K	GBU8M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 60 °C (1) / T_A = 40 °C (2)	$I_{F(AV)}$	8.0 / 3.9							A
Peak forward surge current single sine-wave super-imposed on rated load	I_{FSM}	200							A
Rating for fusing (t < 8.3 ms)	I^2t	166							A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. with 0.5 x 0.5" (12 x 12 mm) copper pads and 0.375" (9.5 mm) lead length

For technical questions within your region, please contact one of the following:
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Document Number: 88616
Revision: 21-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS	SYMBOL	GBU8A	GBU8B	GBU8D	GBU8G	GBU8J	GBU8K	GBU8M	UNIT
Maximum instantaneous forward voltage drop per diode	8.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	5.0 500							μA
Typical junction capacitance per diode	4 V, 1 MHz	C_J	211				94			pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	GBU8A	GBU8B	GBU8D	GBU8G	GBU8J	GBU8K	GBU8M	UNIT
Typical thermal resistance	$R_{\theta JA}$ (2) $R_{\theta JC}$ (1)(3)	20 4.0							°C/W

Notes:

(1) Units case mounted on aluminum plate heatsink

(2) Units mounted in free air, no heatsink on P.C.B., 0.5 x 0.5" (12 x 12 mm) copper pads, 0.375" (9.5 mm) lead length

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screws

ORDERING INFORMATION				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
GBU8J-E3/45	3.857	45	20	Tube
GBU8J-E3/51	3.857	51	250	Paper tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

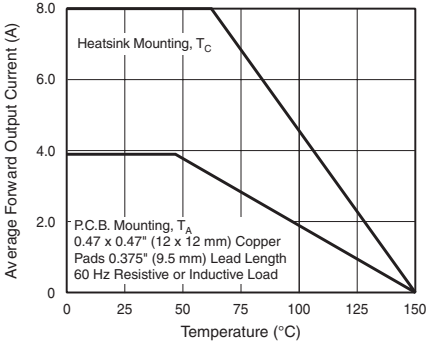


Figure 1. Derating Curve Output Rectified Current

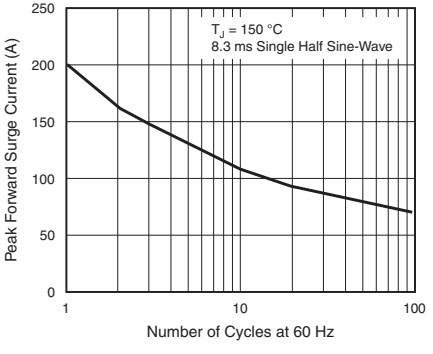


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

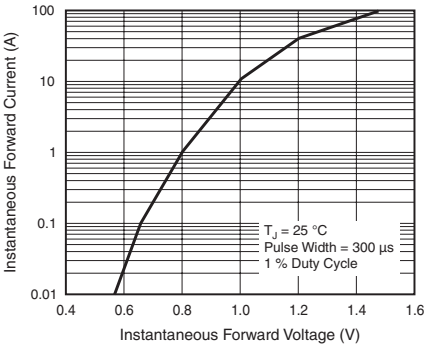


Figure 3. Typical Forward Characteristics Per Diode

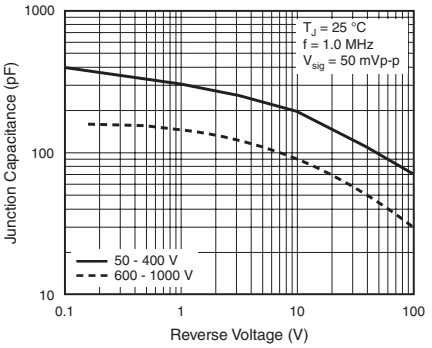


Figure 5. Typical Junction Capacitance Per Diode

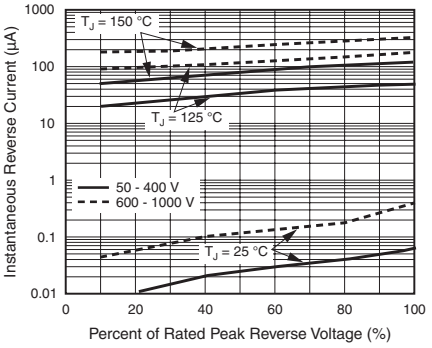


Figure 4. Typical Reverse Leakage Characteristics Per Diode

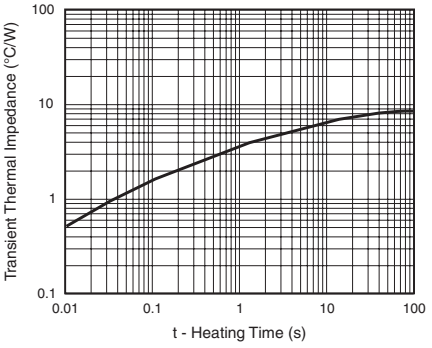
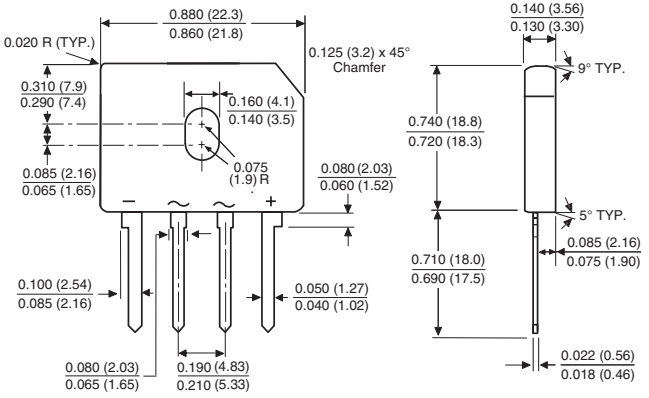


Figure 6. Typical Transient Thermal Impedance Per Diode

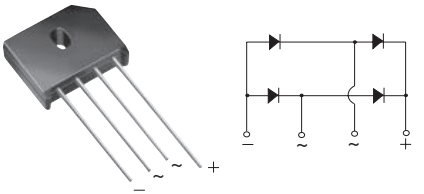
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type GBU



Polarity shown on front side of case, positive lead by beveled corner

Single-Phase Bridge Rectifier



Case Style KBU

FEATURES

- UL recognition file number E54214
- Ideal for printed circuit boards
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for monitor, TV, printer, SMPS, adapter, audio equipment, and home appliances applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	50 V to 1000 V
I_{FSM}	300 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: KBU

Epoxy meets UL 94V-0 flammability rating

Terminals: Silver plated leads, solderable per J-STD-002 and JESD22-B102

E4 suffix for consumer grade

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	KBU8A	KBU8B	KBU8D	KBU8G	KBU8J	KBU8K	KBU8M	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current at T_C = 100 °C (1)(3) / T_A = 40 °C (2)	$I_{F(AV)}$	8.0 6.0							A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	300							A
Operating junction and storage temperature range	T_J, T_{STG}	- 50 to + 150							°C

Notes:

(1) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

(2) Units mounted in free air, no heatsink, P.C.B. at 0.375" (9.5 mm) lead length with 0.5 x 0.5" (12 x 12 mm) copper pads

(3) Units mounted on a 3.0 x 3.0" x 0.11" thick (7.5 x 7.5 x 0.3 cm) aluminum plate heatsink

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**KBU8A**	**KBU8B**	**KBU8D**	**KBU8G**	**KBU8J**	**KBU8K**	**KBU8M**	**UNIT**
Maximum instantaneous forward drop per diode	8.0 A	V_F	1.0							V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 1.0							µA mA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**KBU8A**	**KBU8B**	**KBU8D**	**KBU8G**	**KBU8J**	**KBU8K**	**KBU8M**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	18 (2) 3.0 (3)							°C/W

Notes:

(1) Units mounted in free air, no heatsink, P.C.B. at 0.375" (9.5 mm) lead length with 0.5 x 0.5" (12 x 12 mm) copper pads

(2) Units mounted on a 3.0 x 3.0" x 0.11" thick (7.5 x 7.5 x 0.3 cm) aluminum plate heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
KBU8J-E4/51	8.0	51	250	Anti-static PVC tray

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

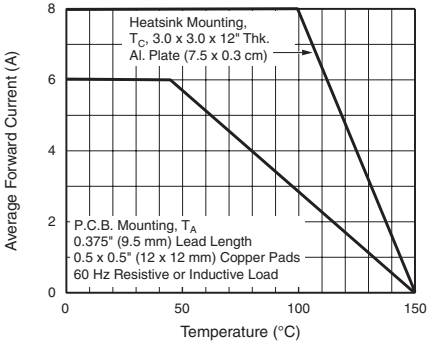


Figure 1. Derating Curve Output Rectified Current

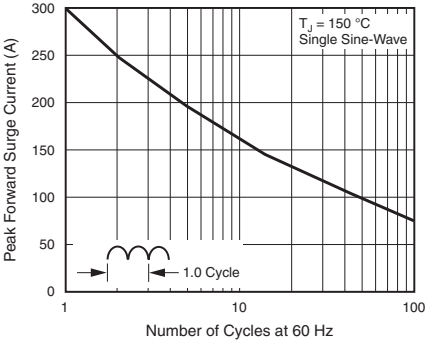


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

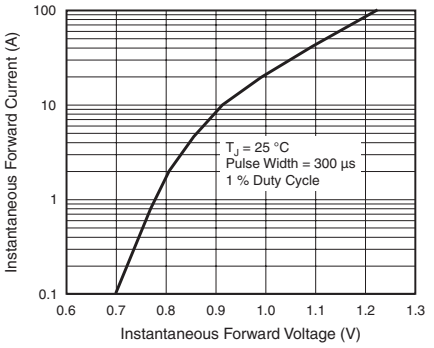


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

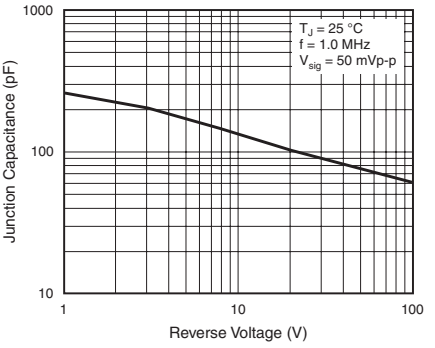


Figure 5. Typical Junction Capacitance Per Diode

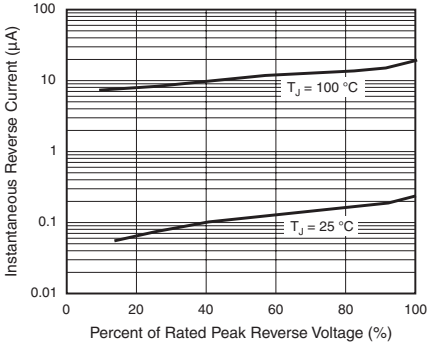
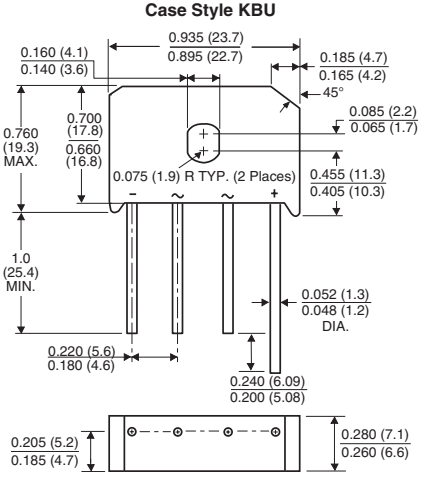


Figure 4. Typical Reverse Leakage Characteristics Per Diode

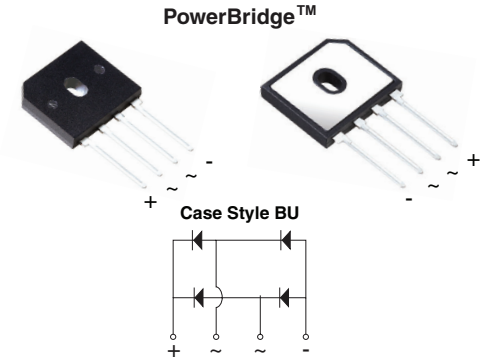
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



BU1006 thru BU1010

Vishay General Semiconductor

Enhanced Power Bridge Rectifiers



* Tested to UL standard for safety electrically isolated semiconductor devices. UL 1557 4th edition.
Dielectric tested to maximum case, storage and junction temperature to 150 °C to withstand 1500 V.

Epoxy meets UL 94V-0 flammability rating.

FEATURES

- UL recognition file number E309391 (QQQX2) UL 1557 (see *)
- Thin single in-line package
- Available for BU-5S lead forming option (part number with “5S” suffix, e.g. BU10065S)
- Superior thermal conductivity
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances and white-goods applications.

MECHANICAL DATA

Case: BU

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	600 V, 800 V, 1000 V
I_{FSM}	120 A
I_R	5 µA
V_F at I_F = 5 A	0.88 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	BU1006	BU1008	BU1010	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	600	800	1000	V
Average rectified forward current (Fig. 1, 2)	T_C = 92 °C (1) T_A = 25 °C (2)	I_O	10 3.2			A
Non-repetitive peak forward surge current 8.3 ms single sine-wave, T_J = 25 °C		I_{FSM}	120			A
Rating for fusing (t < 8.3 ms) T_J = 25 °C		I^2t	60			A^2s
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

For technical questions within your region, please contact one of the following:
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Document Number: 84801
Revision: 01-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A	T_A = 25 °C T_A = 125 °C	V_F	0.98 0.88	1.05 0.95	V
Maximum reverse current per diode	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 64	5.0 250	µA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	43	-	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BU1006**	**BU1008**	**BU1010**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$ (1) $R_{\theta JA}$ (2)	3.0 20			°C/W

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BU1006-E3/45	4.55	45	20	Tube
BU1006-E3/51	4.55	51	250	Paper tray
BU10065S-E3/45	4.55	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

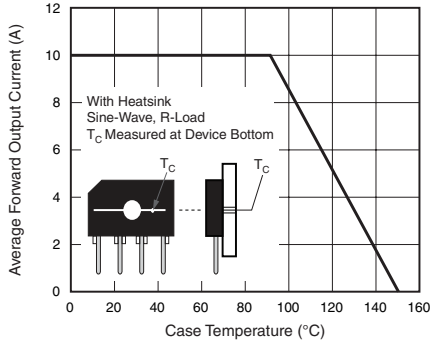


Figure 1. Derating Curve Output Rectified Current

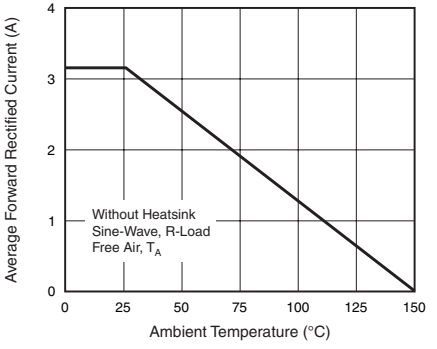


Figure 2. Forward Current Derating Curve

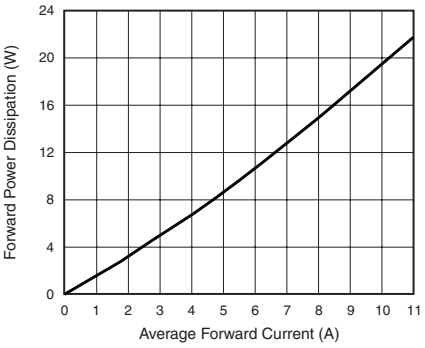


Figure 3. Forward Power Dissipation

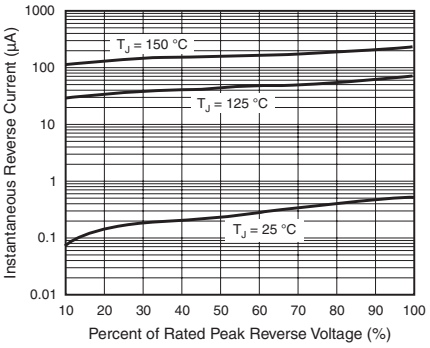


Figure 5. Typical Reverse Characteristics Per Diode

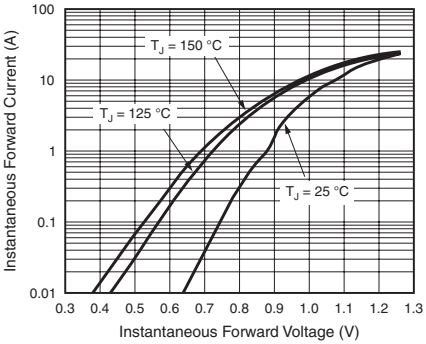


Figure 4. Typical Forward Characteristics Per Diode

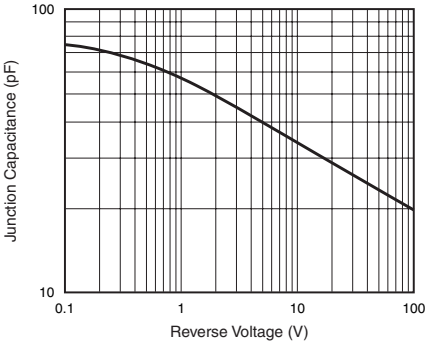
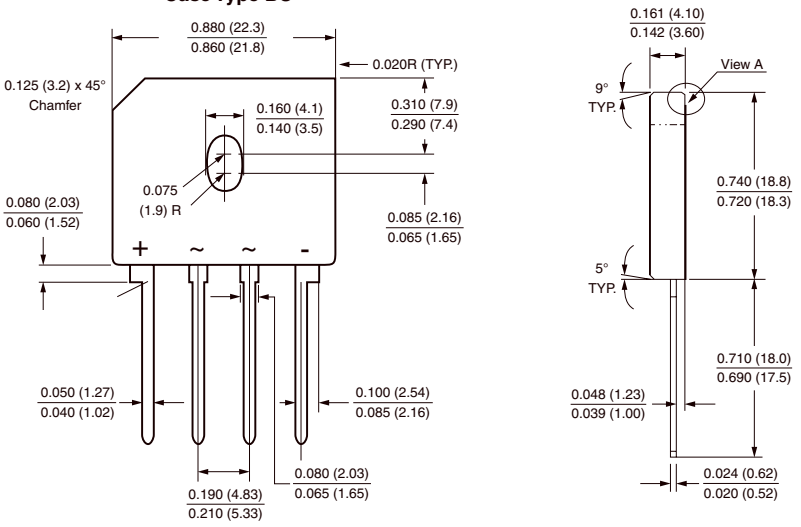


Figure 6. Typical Junction Capacitance Per Diode

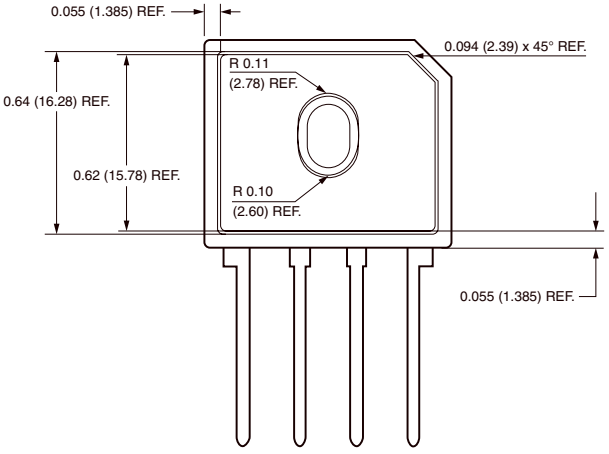
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

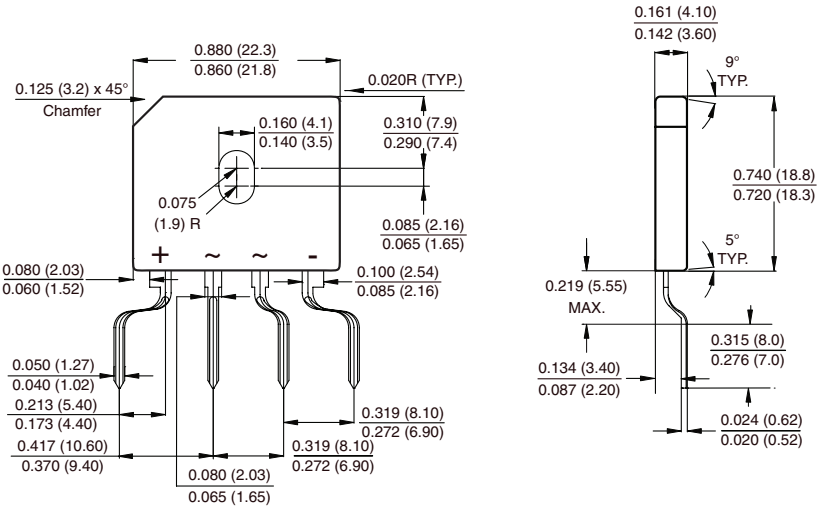
Case Type BU



Polarity shown on front side of case, positive lead beveled corner



FORMING SPECIFICATION: BU-5S in inches (millimeters)

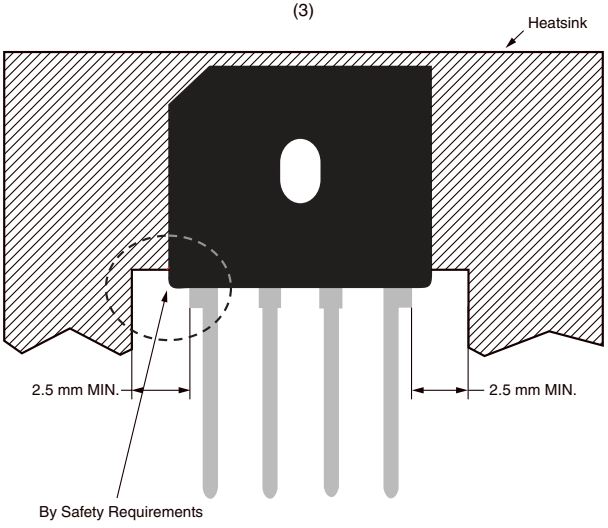


APPLICATION NOTE

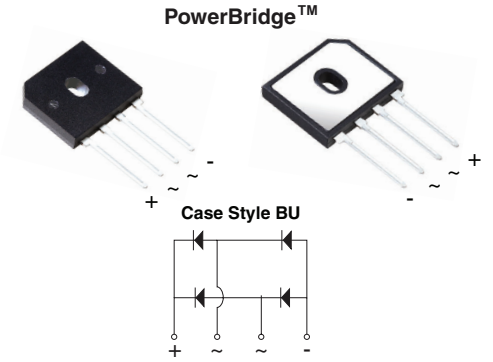
(1) Device UL approved for safety use dielectric strength of 1500 V.

(2) If device is mounted in Floating Ground (F. G.) application, insulator is recommended to use to meet safety requirement.

(3) Heat sink shape recommendation:



Enhanced Power Bridge Rectifiers



* Tested to UL standard for safety electrically isolated semiconductor devices. UL 1557 4th edition.
Dielectric tested to maximum case, storage and junction temperature to 150 °C to withstand 1500 V.

Epoxy meets UL 94V-0 flammability rating.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	600 V, 800 V, 1000 V
I_{FSM}	90 A
I_R	5 µA
V_F at I_F = 5 A	0.94 V
T_J max.	150 °C

FEATURES

- UL recognition file number E309391 (QQQX2) UL 1557 (see *)
- Thin single in-line package
- Available for BU-5S lead forming option (part number with “5S” suffix, e.g. BU1006A5S)
- Superior thermal conductivity
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances and white-goods applications.

MECHANICAL DATA

Case: BU

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	BU1006A	BU1008A	BU1010A	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	600	800	1000	V
Average rectified forward current (Fig. 1, 2)	T_C = 90 °C (1) T_A = 25 °C (2)	I_O	10 3.0			A
Non-repetitive peak forward surge current 8.3 ms single sine-wave, T_J = 25 °C		I_{FSM}	90			A
Rating for fusing (t < 8.3 ms) T_J = 25 °C		I^2t	33			A^2s
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 5.0 A	T_A = 25 °C T_A = 125 °C	V_F	1.02 0.94	1.10 1.00	V
Maximum reverse current per diode	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 45	5.0 250	µA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	30	-	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BU1006A**	**BU1008A**	**BU1010A**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$ (1) $R_{\theta JA}$ (2)	3.0 20			°C/W

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BU1006A-E3/45	4.48	45	20	Tube
BU1006A-E3/51	4.48	51	250	Paper tray
BU1006A5S-E3/45	4.48	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

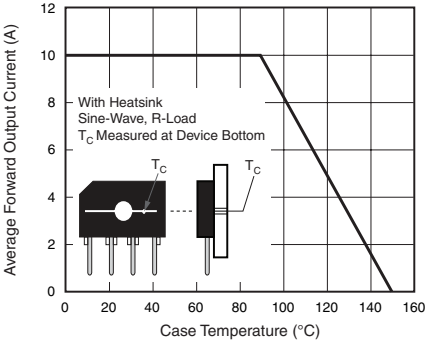


Figure 1. Derating Curve Output Rectified Current

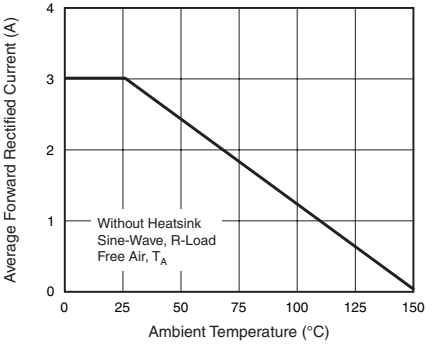


Figure 2. Forward Current Derating Curve

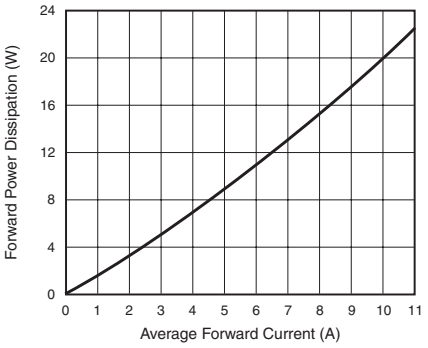


Figure 3. Forward Power Dissipation

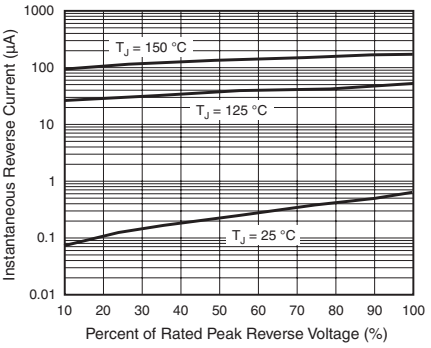


Figure 5. Typical Reverse Characteristics Per Diode

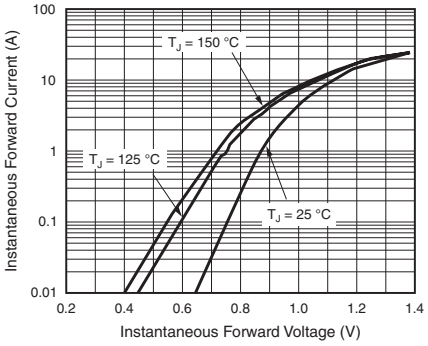


Figure 4. Typical Forward Characteristics Per Diode

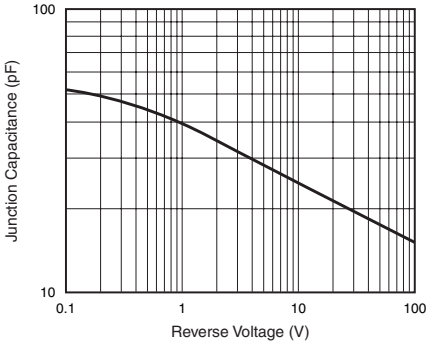
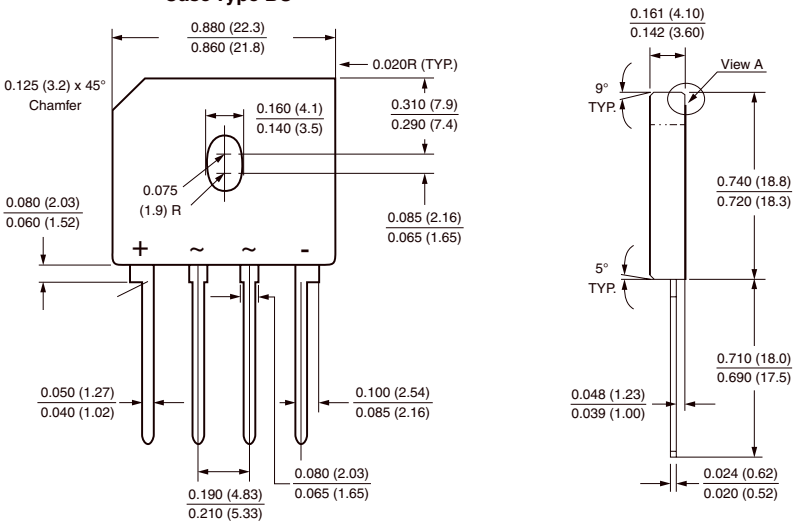


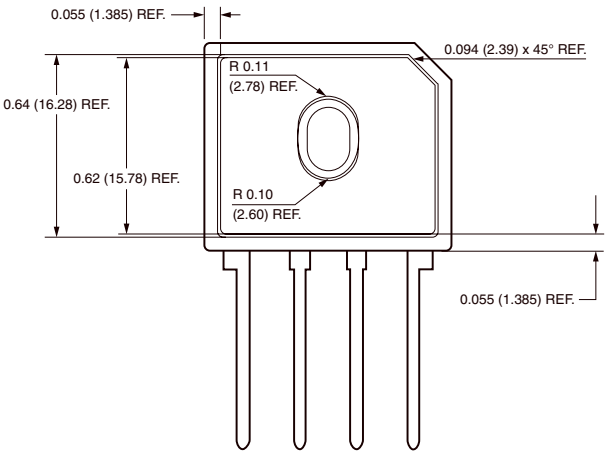
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type BU



Polarity shown on front side of case, positive lead beveled corner



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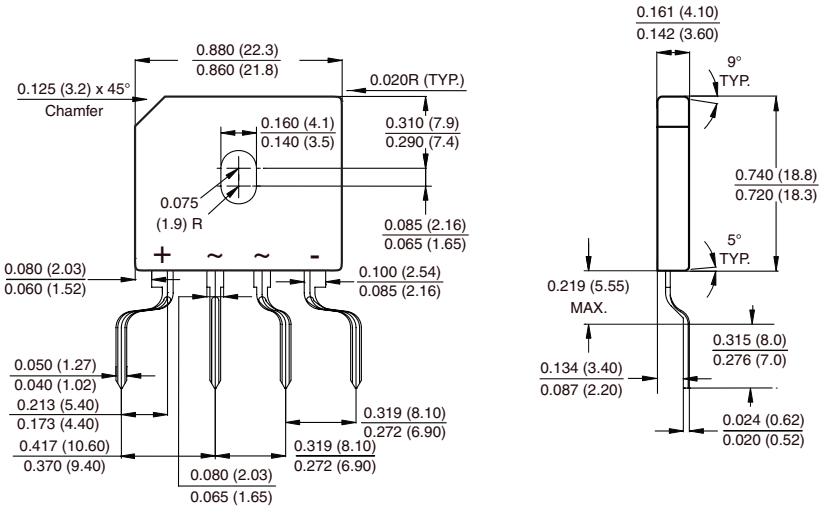
Document Number: 84800
Revision: 01-Aug-08

FORMING SPECIFICATION: BU-5S in inches (millimeters)

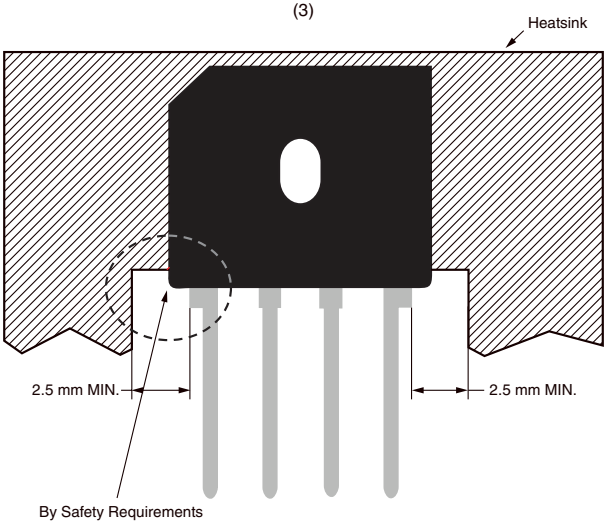


APPLICATION NOTE

(1) Device UL approved for safety use dielectric strength of 1500 V.

(2) If device is mounted in Floating Ground (F. G.) application, insulator is recommended to use to meet safety requirement.

(3) Heat sink shape recommendation:

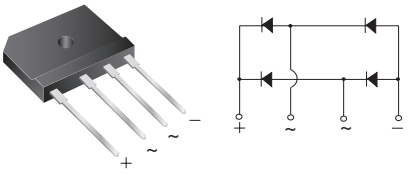


New Product

VSIB10A20 thru VSIB10A80

Vishay General Semiconductor

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 1500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	200 V to 800 V
I_{FSM}	180 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSIB10A20	VSIB10A40	VSIB10A60	VSIB10A80	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 110 °C	$I_{F(AV)}$	10 (1)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	180				A
Rating for fusing (t < 8.3 ms)	I^2t	130				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Note:

(1) Unit case mounted on aluminum plate heatsink

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84651
Revision: 01-Feb-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VSIB10A20**	**VSIB10A40**	**VSIB10A60**	**VSIB10A80**	**UNIT**
Maximum instantaneous forward voltage drop per diode	5.0 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**VSIB10A20**	**VSIB10A40**	**VSIB10A60**	**VSIB10A80**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	1.4 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSIB10A60-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

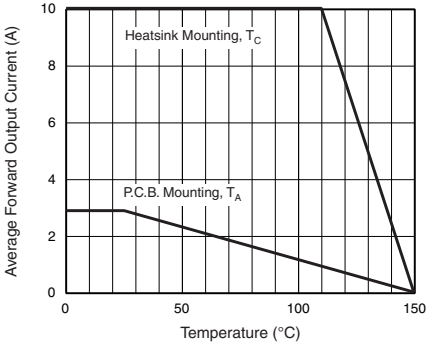


Figure 1. Derating Curve Output Rectified Current

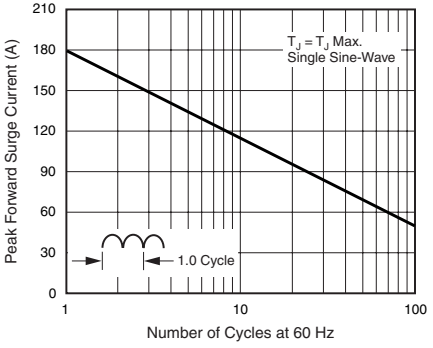


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

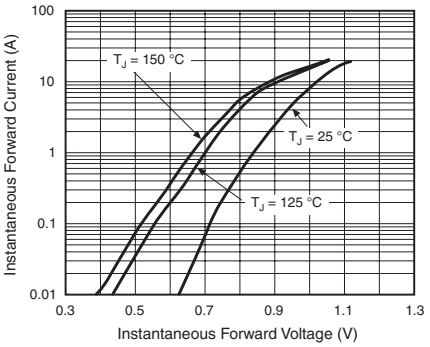


Figure 3. Typical Forward Characteristics Per Diode

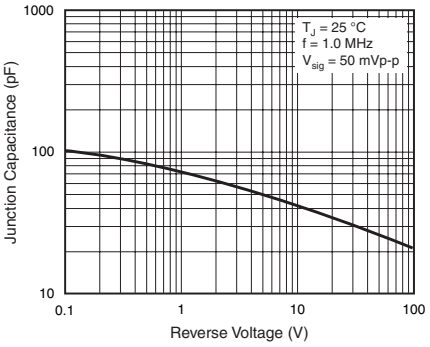


Figure 5. Typical Junction Capacitance Per Diode

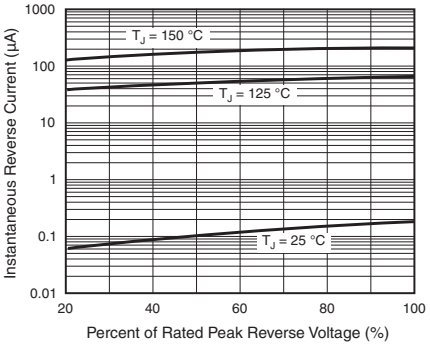


Figure 4. Typical Reverse Characteristics Per Diode

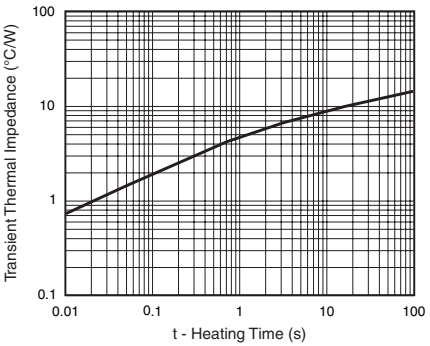
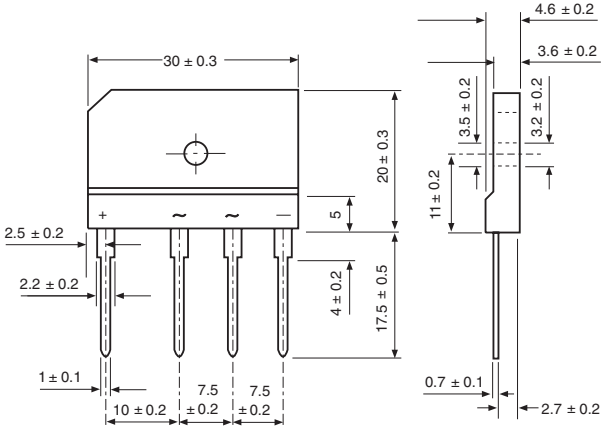


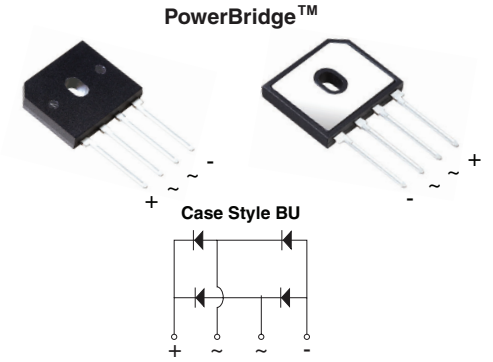
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style GSIB-5S



Enhanced Power Bridge Rectifiers



* Tested to UL standard for safety electrically isolated semiconductor devices. UL 1557 4th edition.
Dielectric tested to maximum case, storage and junction temperature to 150 °C to withstand 1500 V.

Epoxy meets UL 94V-0 flammability rating.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	600 V, 800 V, 1000 V
I_{FSM}	150 A
I_R	5 µA
V_F at I_F = 6 A	0.88 V
T_J max.	150 °C

FEATURES

- UL recognition file number E309391 (QQQX2) UL 1557 (see *)
- Thin single in-line package
- Available for BU-5S lead forming option (part number with “5S” suffix, e.g. BU12065S)
- Superior thermal conductivity
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances and white-goods applications.

MECHANICAL DATA

Case: BU

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)						
PARAMETER		**SYMBOL**	**BU1206**	**BU1208**	**BU1210**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	600	800	1000	V
Average rectified forward current (Fig. 1, 2)	T_C = 85 °C (1) T_A = 25 °C (2)	I_O	12 3.4			A
Non-repetitive peak forward surge current 8.3 ms single sine-wave, T_J = 25 °C		I_{FSM}	150			A
Rating for fusing (t < 8.3 ms) T_J = 25 °C		I^2t	93			A^2s
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 6.0 A	T_A = 25 °C T_A = 125 °C	V_F	0.98 0.88	1.05 0.95	V
Maximum reverse current per diode	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 74	5.0 250	µA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	50	-	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BU1206**	**BU1208**	**BU1210**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$ (1) $R_{\theta JA}$ (2)	2.7 20			°C/W

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BU1206-E3/45	4.66	45	20	Tube
BU1206-E3/51	4.66	51	250	Paper tray
BU12065S-E3/45	4.66	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

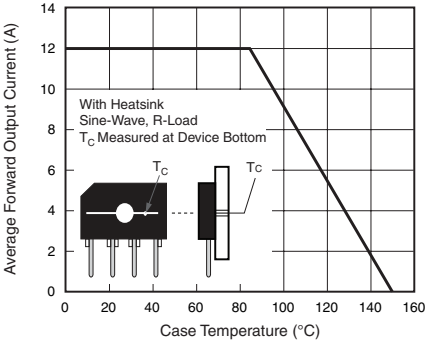


Figure 1. Derating Curve Output Rectified Current

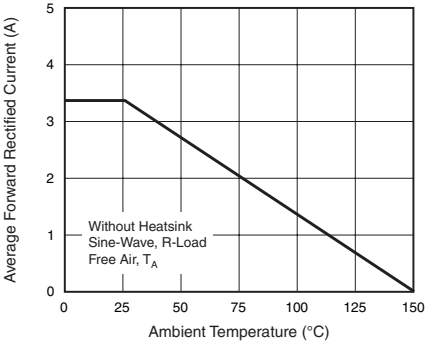


Figure 2. Forward Current Derating Curve

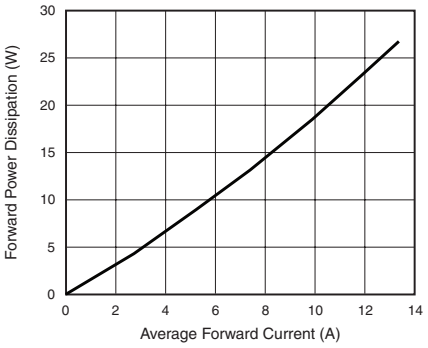


Figure 3. Forward Power Dissipation

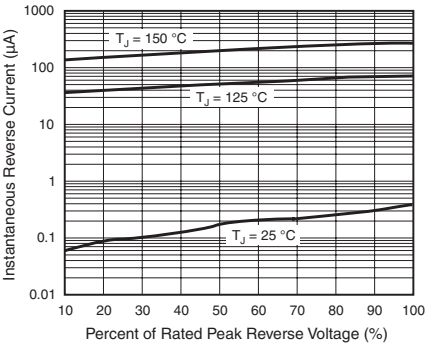


Figure 5. Typical Reverse Characteristics Per Diode

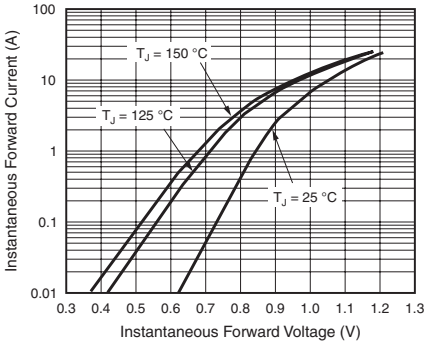


Figure 4. Typical Forward Characteristics Per Diode

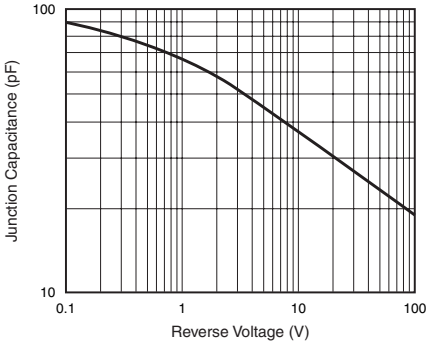
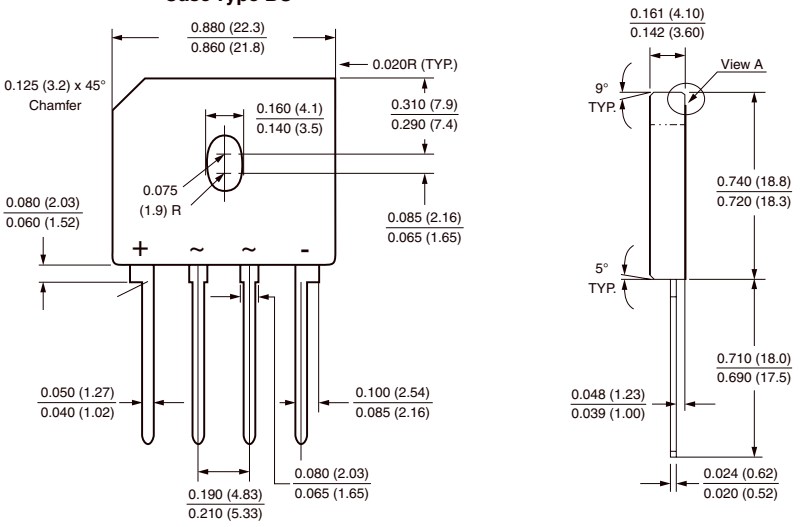


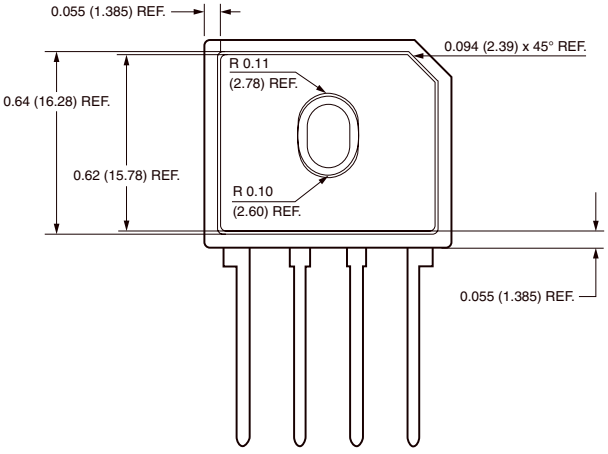
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type BU



Polarity shown on front side of case, positive lead beveled corner



For technical questions within your region, please contact one of the following:
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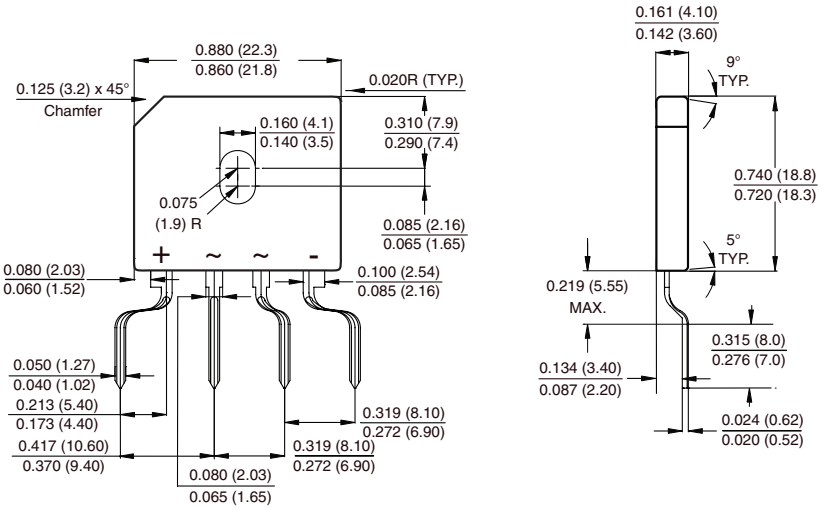
Document Number: 84802
Revision: 01-Aug-08

FORMING SPECIFICATION: BU-5S in inches (millimeters)

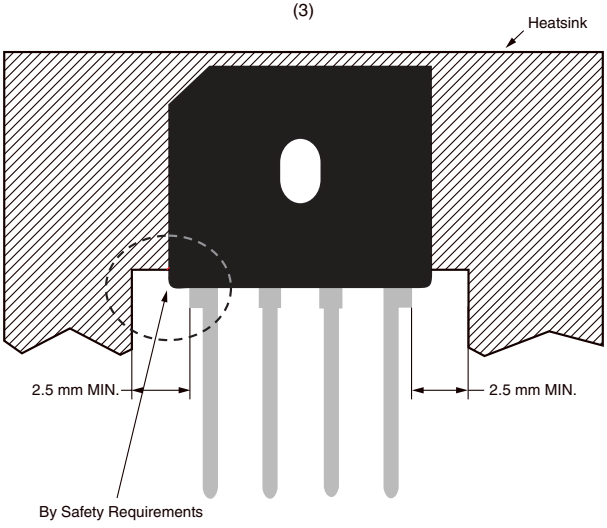


APPLICATION NOTE

(1) Device UL approved for safety use dielectric strength of 1500 V.

(2) If device is mounted in Floating Ground (F. G.) application, insulator is recommended to use to meet safety requirement.

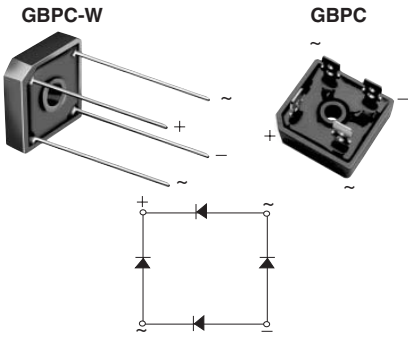
(3) Heat sink shape recommendation:



GBPC12, GBPC15, GBPC25 & GBPC35

Vishay General Semiconductor

Glass Passivated Single-Phase Bridge Rectifier



FEATURES

- UL recognition file number E54214
- Universal 3-way terminals: snap-on, wire wrap-around, or P.C.B. mounting
- Typical I_R less than 0.3 µA
- High surge current capability
- Low thermal resistance
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb e4 **RoHS** COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A, 15 A, 25 A, 35 A
V_{RRM}	50 V to 1000 V
I_{FSM}	200 A, 300 A, 300 A, 400 A
I_R	5 µA
V_F	1.1 V
T_J max.	150 °C

MECHANICAL DATA

Case: GBPC, GBPC-W

Epoxy meets UL 94V-0 flammability rating

Terminals: Nickel plated on faston lugs or silver plated on wire leads, solderable per J-STD-002 and JESD22-B102. E4 suffix for consumer grade. Suffix letter "W" added to indicate wire leads (e.g. GBPC12005W).

Polarity: As marked, positive lead by belevled corner

Mounting Torque: 20 inches-lbs. max.

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GBPC12, 15, 25, 35							UNIT
		005	01	02	04	06	08	10	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified output current (Fig. 1) GBPC12 / GBPC15 / GBPC25 / GBPC35	$I_{F(AV)}$	12 / 15 / 25 / 35							A
Peak forward surge current single sine-wave superimposed on rated load GBPC12 / GBPC15 / GBPC25 / GBPC35	I_{FSM}	200 / 300 / 300 / 400							A
Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms) for fusing GBPC12 / GBPC15 / GBPC25 / GBPC35	I^2t	160 / 375 / 375 / 660							A^2s
RMS isolation voltage from case to leads	V_{ISO}	2500							V
Operating junction storage temperature range	T_J, T_{STG}	- 55 to + 150							°C

For technical questions within your region, please contact one of the following:
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Document Number: 88612
Revision: 15-Apr-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)											
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GBPC12, 15, 25, 35**							**UNIT**
			005	**01**	**02**	**04**	**06**	**08**	**10**	
Maximum instantaneous forward drop per diode GBPC12	I_F = 6.0 A	V_F	1.1							V
Maximum instantaneous forward drop per diode GBPC15	I_F = 7.5 A									
Maximum instantaneous forward drop per diode GBPC25	I_F = 12.5 A									
Maximum instantaneous forward drop per diode GBPC35	I_F = 17.5 A									
Maximum reverse DC current at rated DC blocking voltage per diode	T_A = 25 °C	I_R	5.0							µA
	T_A = 125 °C		500							
Typical junction capacitance per diode	4 V, 1 MHz	C_J	300							pF

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)										
PARAMETER		**SYMBOL**	**GBPC12, 15, 25, 35**							**UNIT**
			005	**01**	**02**	**04**	**06**	**08**	**10**	
Typical thermal resistance (1)	GBPC12-25	$R_{\theta JC}$	1.9							°C/W
	GBPC35		1.4							

Notes:

(1) With heatsink

(2) Bolt down on heatsink with silicone thermal compound between bridge and mounting surface for maximum heat transfer with #10 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GBPC1206-E4/51	15.79	51	100	Paper box
GBPC1506-E4/51	15.79	51	100	Paper box
GBPC2506-E4/51	15.79	51	100	Paper box
GBPC3506-E4/51	15.79	51	100	Paper box
GBPC1206W-E4/51	13.8	51	100	Paper box
GBPC1506W-E4/51	13.8	51	100	Paper box
GBPC2506W-E4/51	13.8	51	100	Paper box
GBPC3506W-E4/51	13.8	51	100	Paper box

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

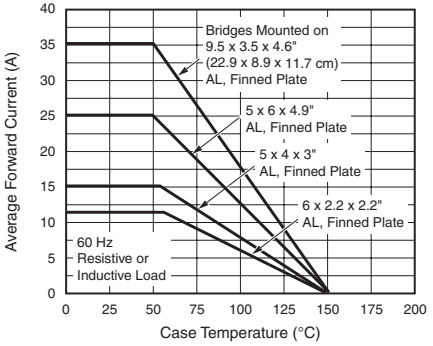


Figure 1. Maximum Output Rectified Current

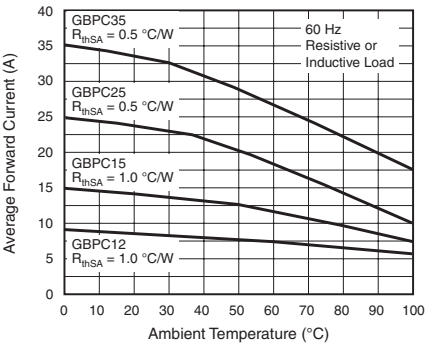


Figure 2. Maximum Output Rectified Current

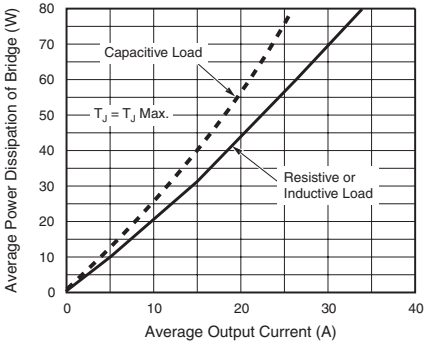


Figure 3. Maximum Power Dissipation

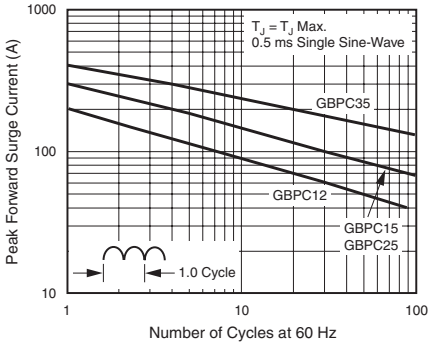


Figure 4. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

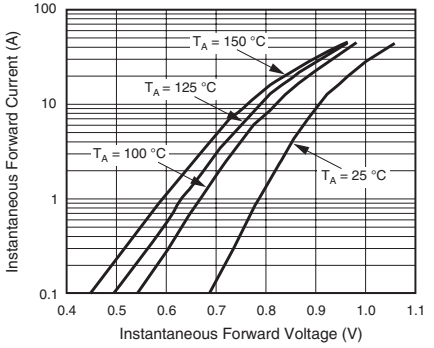


Figure 5. Typical Instantaneous Forward Characteristics Per Diode

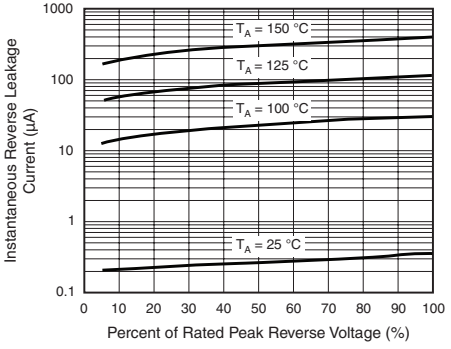


Figure 6. Typical Reverse Leakage Characteristics Per Diode

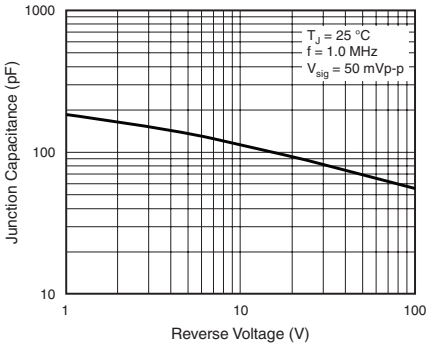


Figure 7. Typical Junction Capacitance Per Diode

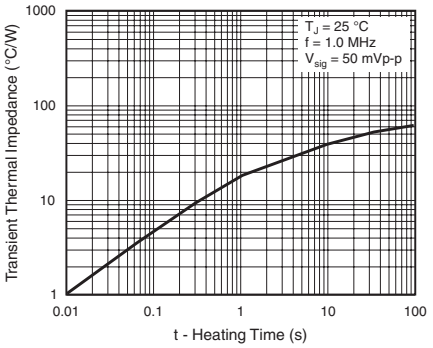
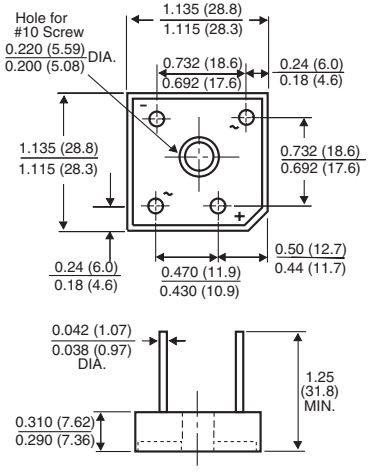


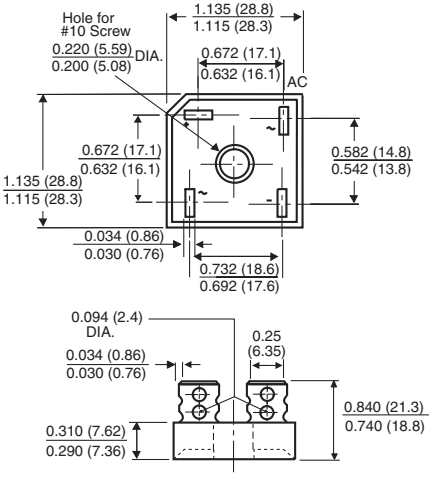
Figure 8. Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

GBPC-W



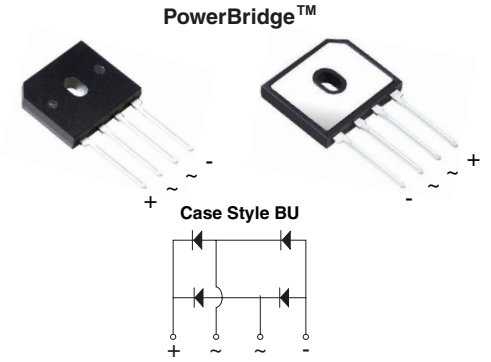
GBPC



BU1506 thru BU1510

Vishay General Semiconductor

Enhanced Power Bridge Rectifiers



* Tested to UL standard for safety electrically isolated semiconductor devices. UL 1557 4th edition.
Dielectric tested to maximum case, storage and junction temperature to 150 °C to withstand 1500 V.

Epoxy meets UL 94V-0 flammability rating.

FEATURES

- UL recognition file number E309391 (QQQX2) UL 1557 (see *)
- Thin single in-line package
- Available for BU-5S lead forming option (part number with “5S” suffix, e.g. BU15065S)
- Superior thermal conductivity
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances and white-goods applications.

MECHANICAL DATA

Case: BU

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	600 V, 800 V, 1000 V
I_{FSM}	200 A
I_R	5 µA
V_F at I_F = 7.5 A	0.87 V
T_J max.	150 °C

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	BU1506	BU1508	BU1510	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	600	800	1000	V
Average rectified forward current (Fig. 1, 2)	T_C = 80 °C (1) T_A = 25 °C (2)	I_O	15 3.4			A
Non-repetitive peak forward surge current 8.3 ms single sine-wave, T_J = 25 °C		I_{FSM}	200			A
Rating for fusing (t < 8.3 ms) T_J = 25 °C		I^2t	160			A^2s
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84803
Revision: 01-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 7.5 A	T_A = 25 °C T_A = 125 °C	V_F	0.97 0.87	1.05 0.95	V
Maximum reverse current per diode	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 90	5.0 250	µA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	70	-	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BU1506**	**BU1508**	**BU1510**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$ (1) $R_{\theta JA}$ (2)	2.5 20			°C/W

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BU1506-E3/45	4.75	45	20	Tube
BU1506-E3/51	4.75	51	250	Paper tray
BU15065S-E3/45	4.75	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

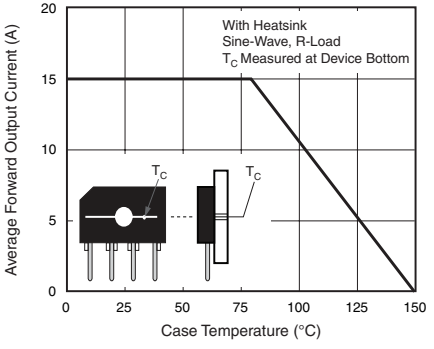


Figure 1. Derating Curve Output Rectified Current

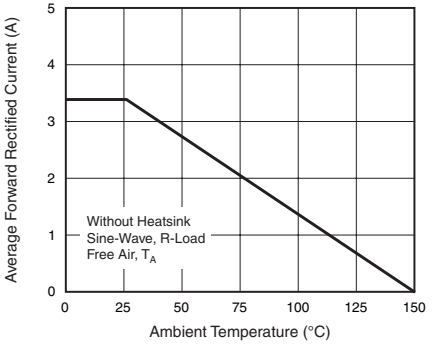


Figure 2. Forward Current Derating Curve

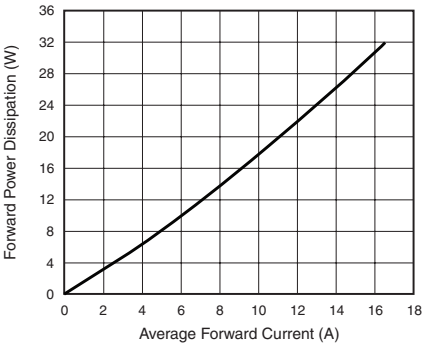


Figure 3. Forward Power Dissipation

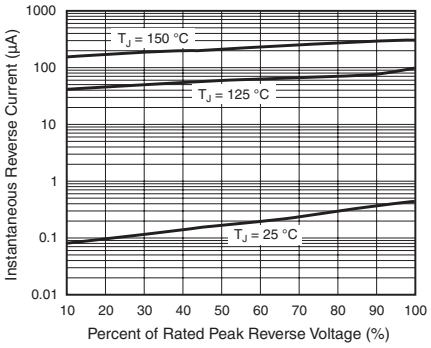


Figure 5. Typical Reverse Characteristics Per Diode

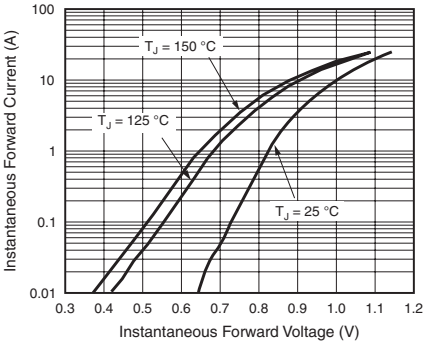


Figure 4. Typical Forward Characteristics Per Diode

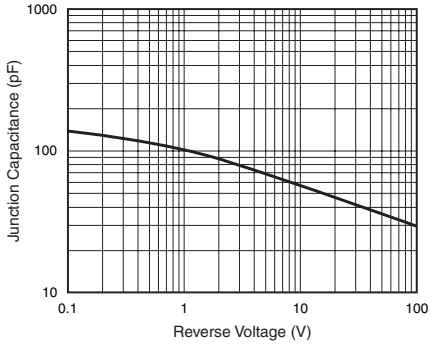
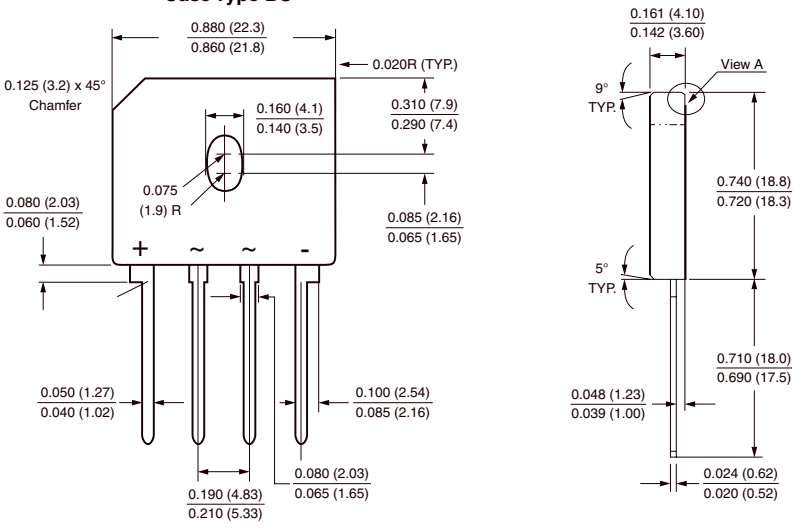


Figure 6. Typical Junction Capacitance Per Diode

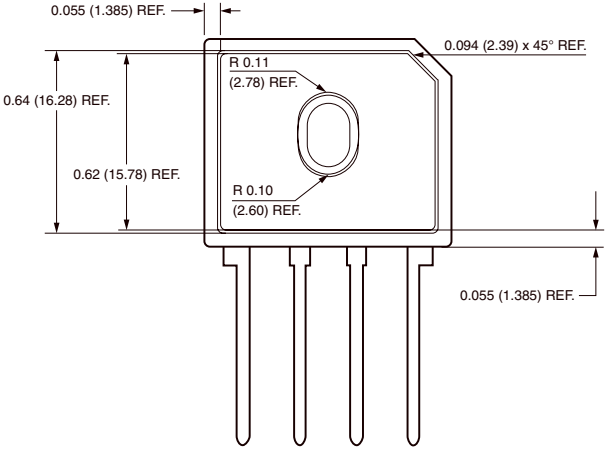
For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

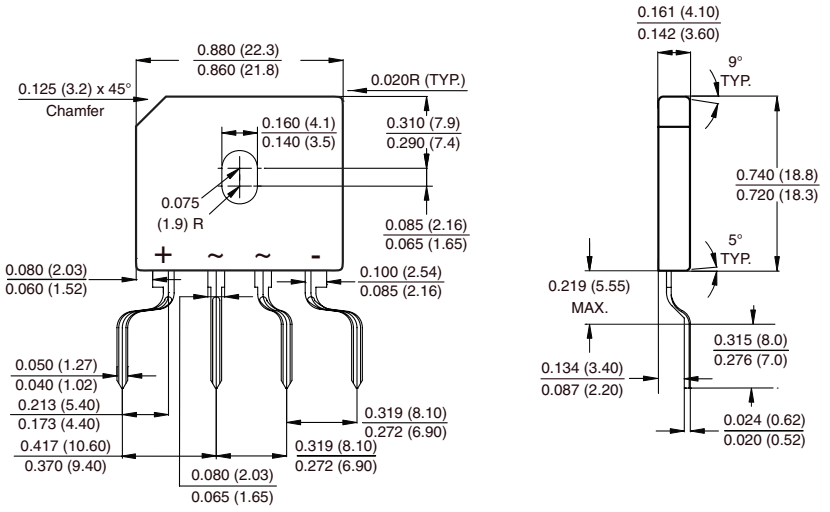
Case Type BU



Polarity shown on front side of case, positive lead beveled corner



FORMING SPECIFICATION: BU-5S in inches (millimeters)

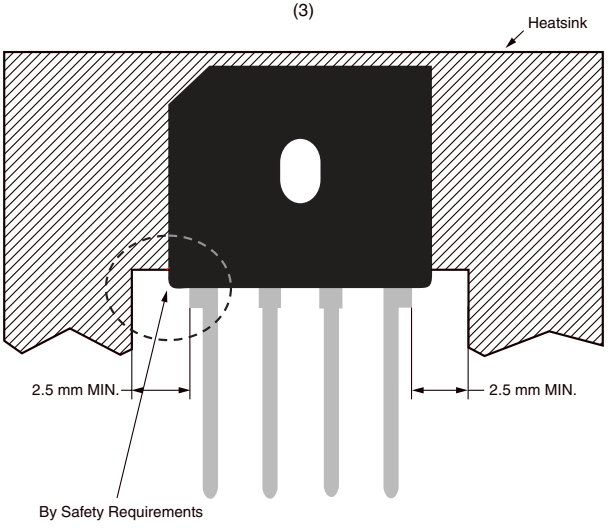


APPLICATION NOTE

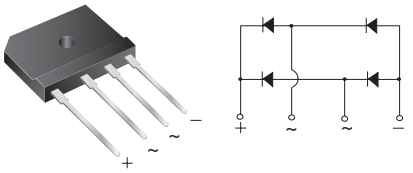
(1) Device UL approved for safety use dielectric strength of 1500 V.

(2) If device is mounted in Floating Ground (F. G.) application, insulator is recommended to use to meet safety requirement.

(3) Heat sink shape recommendation:



Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	200 V to 800 V
I_{FSM}	300 A
I_R	10 µA
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB1520	GSIB1540	GSIB1560	GSIB1580	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 107 °C / T_A = 25 °C	$I_{F(AV)}$	15 (1) / 3.5 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	300				A
Rating for fusing (t < 8.3 ms)	I^2t	240				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GSIB1520**	**GSIB1540**	**GSIB1560**	**GSIB1580**	**UNIT**
Maximum instantaneous forward voltage drop per diode	7.5 A	V_F	0.95				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GSIB1520**	**GSIB1540**	**GSIB1560**	**GSIB1580**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.5 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GSIB1560-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

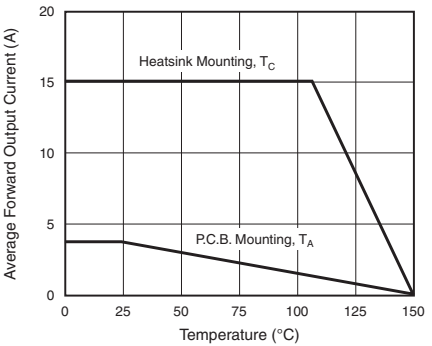


Figure 1. Derating Curve Output Rectified Current

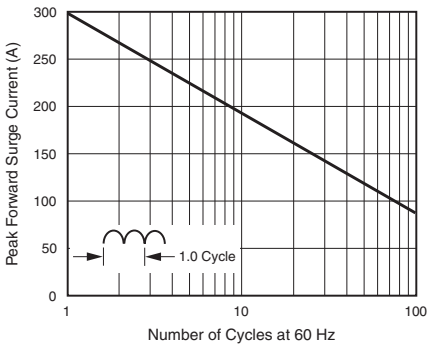


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

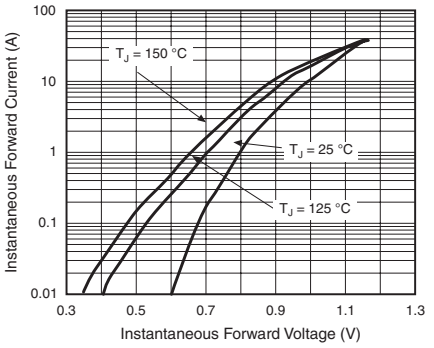


Figure 3. Typical Forward Characteristics Per Diode

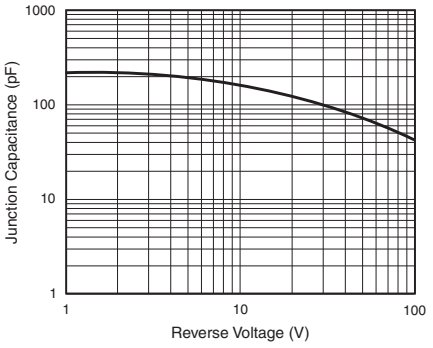


Figure 5. Typical Junction Capacitance Per Diode

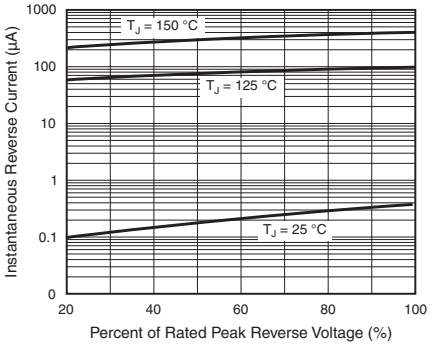


Figure 4. Typical Reverse Characteristics Per Diode

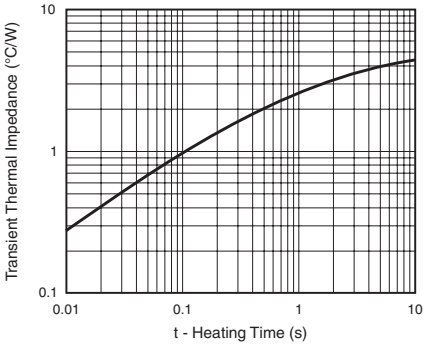
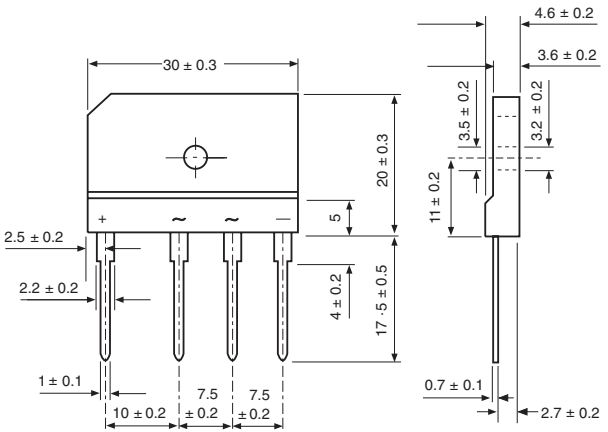


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style 5S

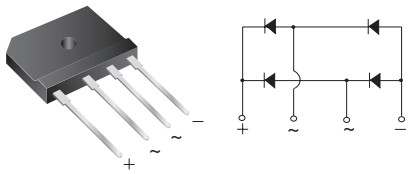


New Product

GSIB15A20 thru GSIB15A80

Vishay General Semiconductor

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	200 V to 800 V
I_{FSM}	200 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB15A20	GSIB15A40	GSIB15A60	GSIB15A80	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 107 °C (1) / T_A = 25 °C (2)	$I_{F(AV)}$	15 3.5				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	200				A
Rating for fusing (t < 8.3 ms)	I^2t	166				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

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Document Number: 88643
Revision: 31-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GSIB15A20**	**GSIB15A40**	**GSIB15A60**	**GSIB15A80**	**UNIT**
Maximum instantaneous forward voltage drop per diode	7.5 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**GSIB15A20**	**GSIB15A40**	**GSIB15A60**	**GSIB15A80**		**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.5 (1)					°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GSIB15A60-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

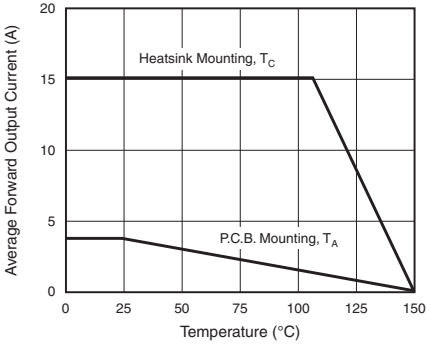


Figure 1. Derating Curve Output Rectified Current

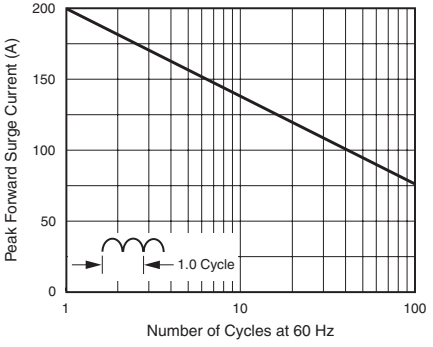


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

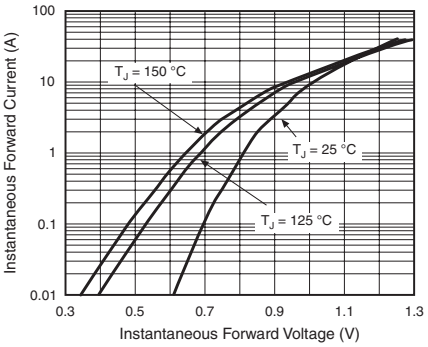


Figure 3. Typical Forward Characteristics Per Diode

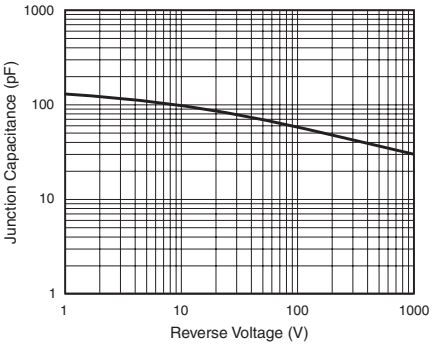


Figure 5. Typical Junction Capacitance Per Diode

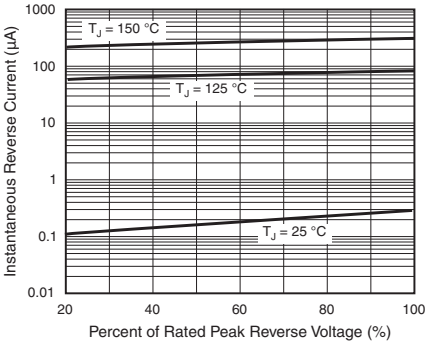


Figure 4. Typical Reverse Characteristics Per Diode

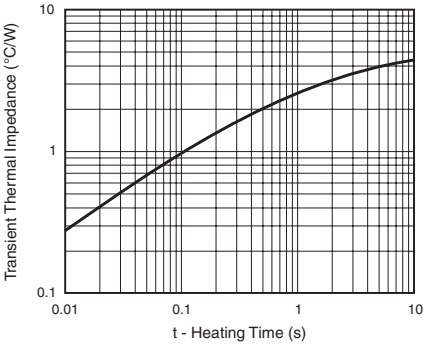
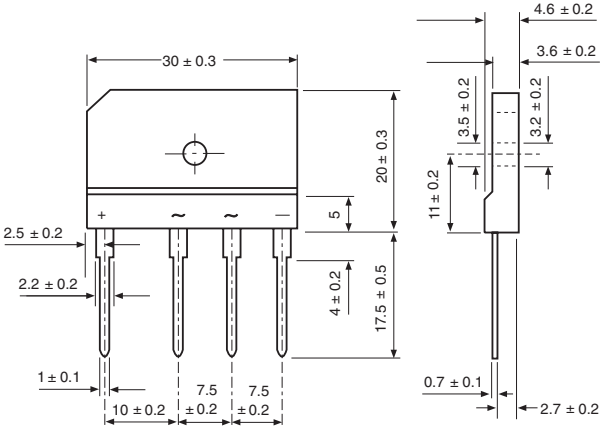


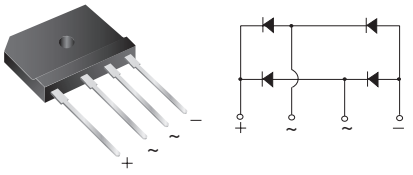
Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style GSIB-5S



Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	200 V to 800 V
I_{FSM}	300 A
I_R	10 µA
V_F	0.95 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSIB1520	VSIB1540	VSIB1560	VSIB1580	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 107 °C / T_A = 25 °C	$I_{F(AV)}$	15 (1) / 3.5 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	300				A
Rating for fusing (t < 8.3 ms)	I^2t	240				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VSIB1520**	**VSIB1540**	**VSIB1560**	**VSIB1580**	**UNIT**
Maximum instantaneous forward voltage drop per diode	7.5 A	V_F	0.95				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**VSIB1520**	**VSIB1540**	**VSIB1560**	**VSIB1580**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.5 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSIB1560-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

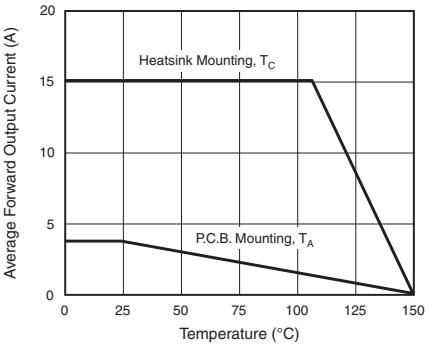


Figure 1. Derating Curve Output Rectified Current

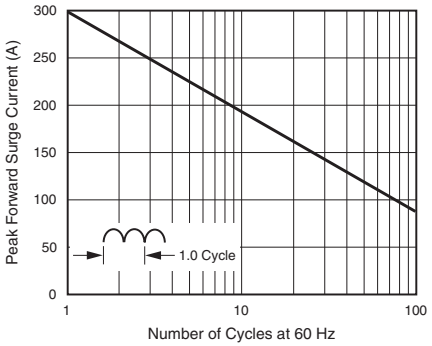


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

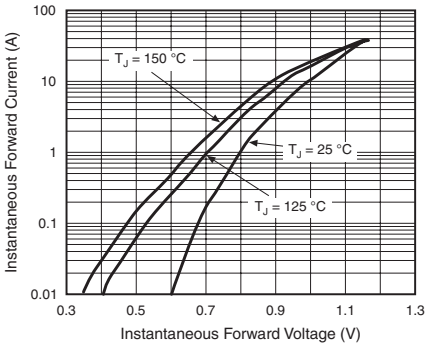


Figure 3. Typical Forward Characteristics Per Diode

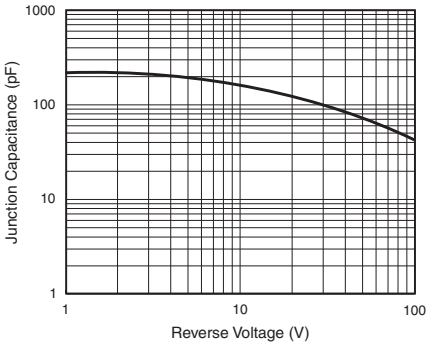


Figure 5. Typical Junction Capacitance Per Diode

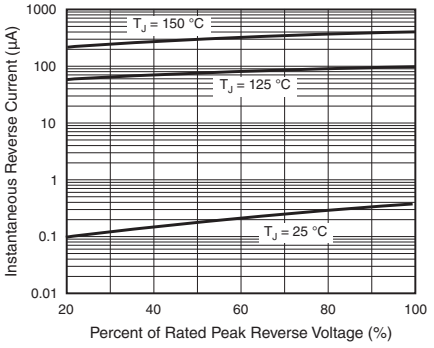


Figure 4. Typical Reverse Characteristics Per Diode

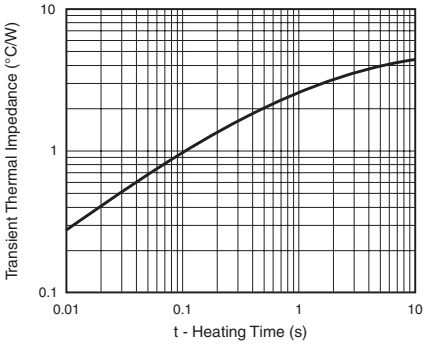
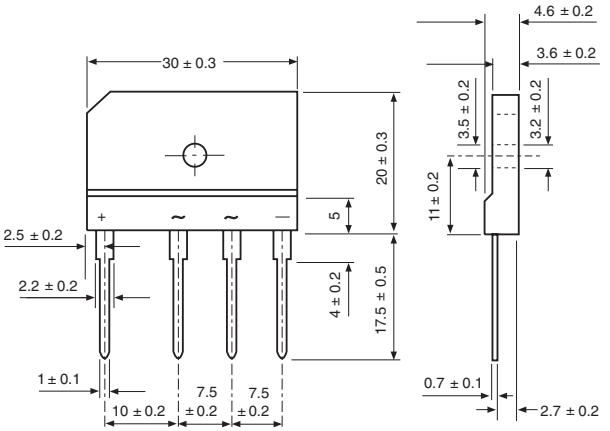


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

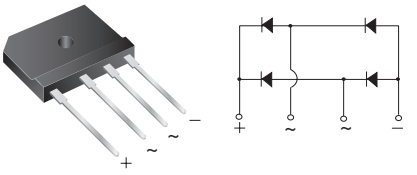
Case Style GSIB-5S



VSIB15A20 thru VSIB15A80

Vishay General Semiconductor

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	200 V to 800 V
I_{FSM}	200 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSIB15A20	VSIB15A40	VSIB15A60	VSIB15A80	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 107 °C (1) / T_A = 25 °C (2)	$I_{F(AV)}$	15 / 3.5				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	200				A
Rating for fusing (t < 8.3 ms)	I^2t	166				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84652
Revision: 01-Feb-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VSIB15A20**	**VSIB15A40**	**VSIB15A60**	**VSIB15A80**	**UNIT**
Maximum instantaneous forward voltage drop per diode	7.5 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**VSIB15A20**	**VSIB15A40**	**VSIB15A60**	**VSIB15A80**		**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.5 (1)					°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSIB15A60-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

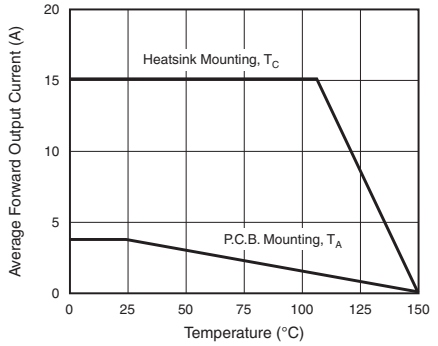


Figure 1. Derating Curve Output Rectified Current

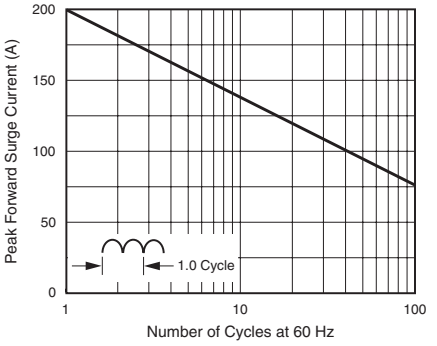


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

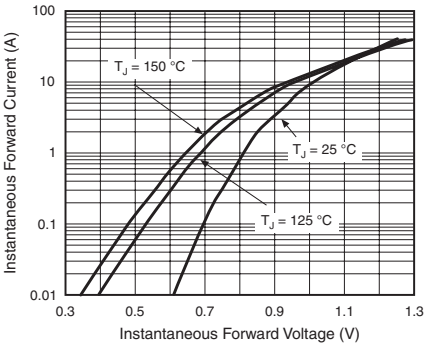


Figure 3. Typical Forward Characteristics Per Diode

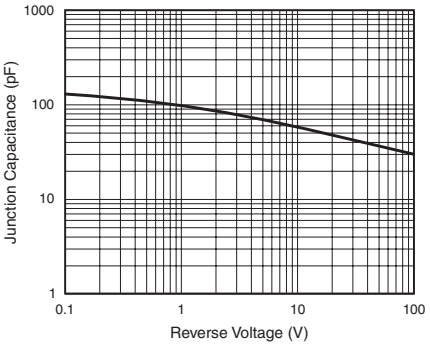


Figure 5. Typical Junction Capacitance Per Diode

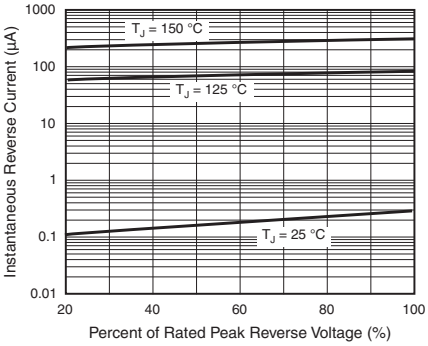


Figure 4. Typical Reverse Characteristics Per Diode

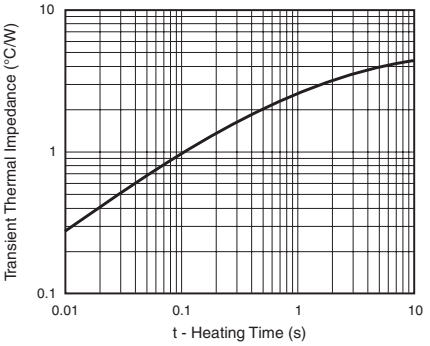
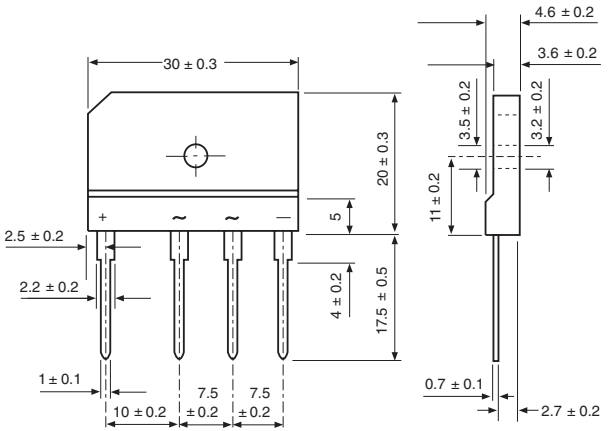


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

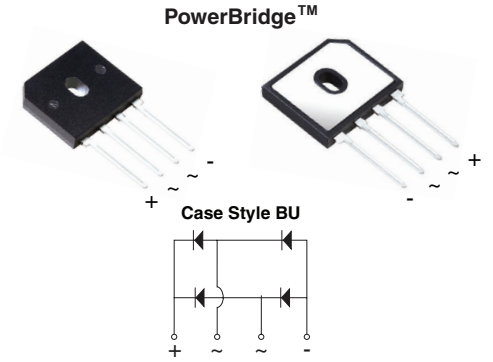
Case Style GSIB-5S



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84652
Revision: 01-Feb-08

Enhanced Power Bridge Rectifiers



* Tested to UL standard for safety electrically isolated semiconductor devices. UL 1557 4th edition.
Dielectric tested to maximum case, storage and junction temperature to 150 °C to withstand 1500 V.

Epoxy meets UL 94V-0 flammability rating.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	600 V, 800 V, 1000 V
I_{FSM}	240 A
I_R	5 µA
V_F at I_F = 10 A	0.85 V
T_J max.	150 °C

FEATURES

- UL recognition file number E309391 (QQQX2) UL 1557 (see *)
- Thin single in-line package
- Available for BU-5S lead forming option (part number with “5S” suffix, e.g. BU20065S)
- Superior thermal conductivity
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances and white-goods applications.

MECHANICAL DATA

Case: BU

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)						
PARAMETER		**SYMBOL**	**BU2006**	**BU2008**	**BU2010**	**UNIT**
Maximum repetitive peak reverse voltage		V_{RRM}	600	800	1000	V
Average rectified forward current (Fig. 1, 2)	T_C = 61 °C (1) T_A = 25 °C (2)	I_O	20 3.5			A
Non-repetitive peak forward surge current 8.3 ms single sine-wave, T_J = 25 °C		I_{FSM}	240			A
Rating for fusing (t < 8.3 ms) T_J = 25 °C		I^2t	239			A^2s
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 10 A	T_A = 25 °C T_A = 125 °C	V_F	0.95 0.85	1.05 0.95	V
Maximum reverse current per diode	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 110	5.0 350	µA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	95	-	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BU2006**	**BU2008**	**BU2010**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$ (1) $R_{\theta JA}$ (2)	2.4 20			°C/W

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BU2006-E3/45	4.76	45	20	Tube
BU2006-E3/51	4.76	51	250	Paper tray
BU20065S-E3/45	4.76	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

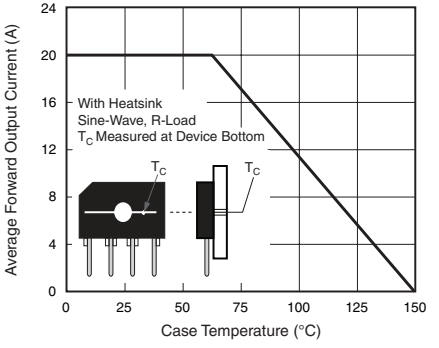


Figure 1. Derating Curve Output Rectified Current

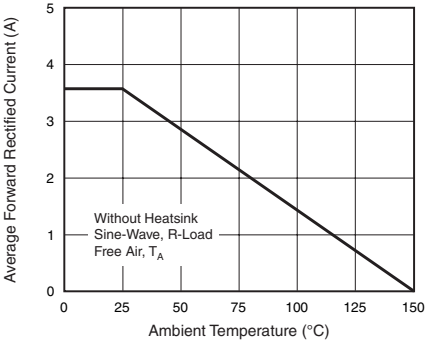


Figure 2. Forward Current Derating Curve

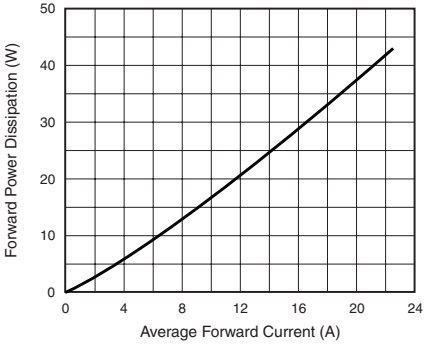


Figure 3. Forward Power Dissipation

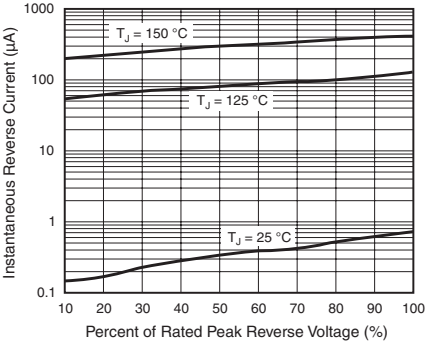


Figure 5. Typical Reverse Characteristics Per Diode

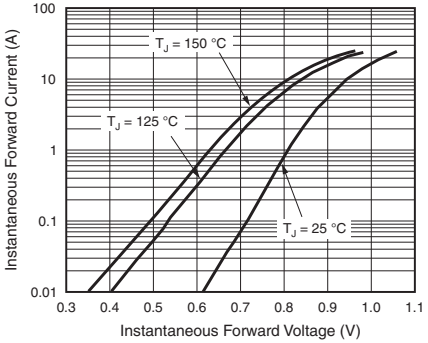


Figure 4. Typical Forward Characteristics Per Diode

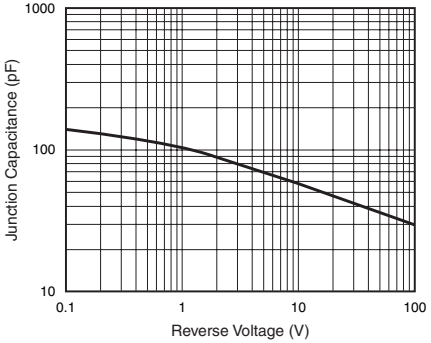
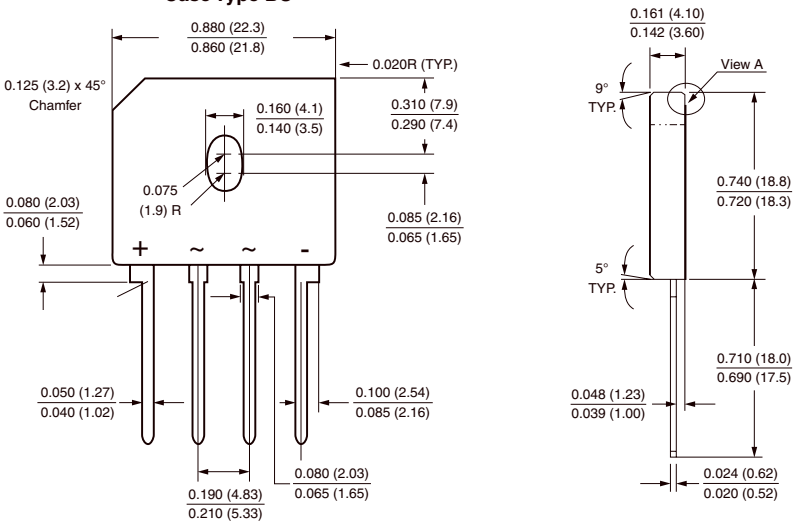


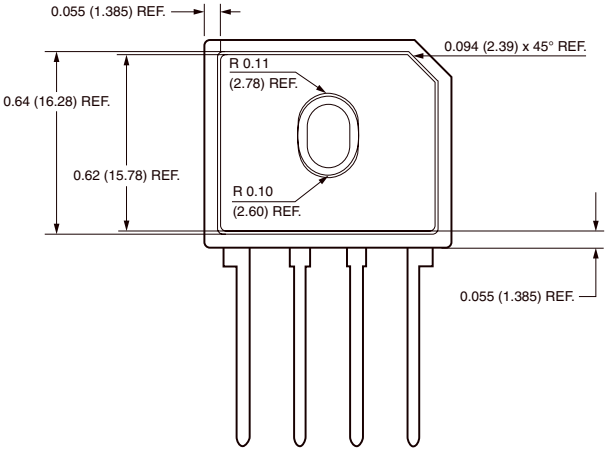
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

Case Type BU



Polarity shown on front side of case, positive lead beveled corner



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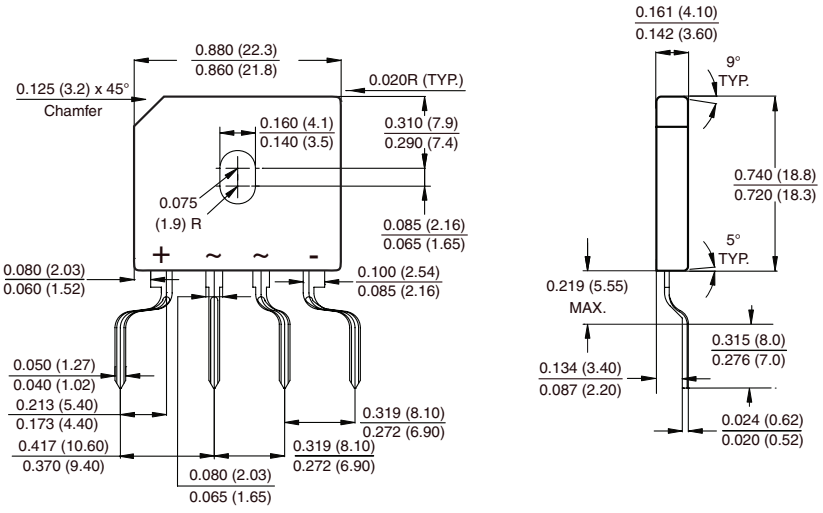
Document Number: 84804
Revision: 01-Aug-08

FORMING SPECIFICATION: BU-5S in inches (millimeters)

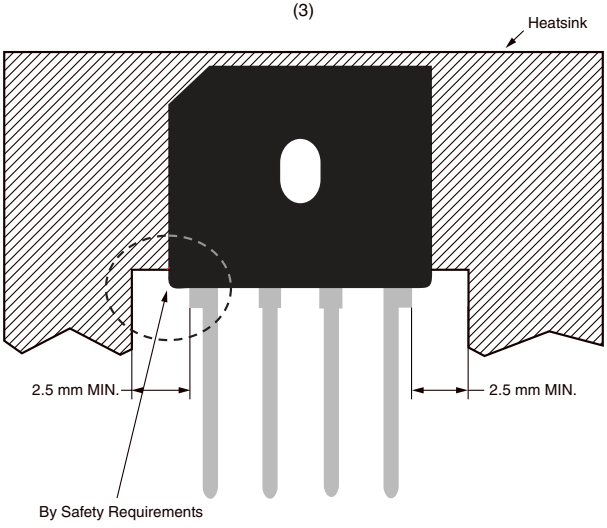


APPLICATION NOTE

(1) Device UL approved for safety use dielectric strength of 1500 V.

(2) If device is mounted in Floating Ground (F. G.) application, insulator is recommended to use to meet safety requirement.

(3) Heat sink shape recommendation:

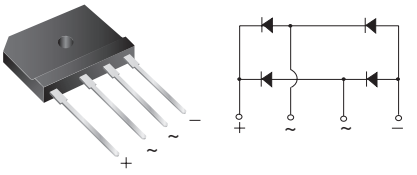


New Product

GSIB2020 thru GSIB2080

Vishay General Semiconductor

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	200 V to 800 V
I_{FSM}	240 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB2020	GSIB2040	GSIB2060	GSIB2080	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 87 °C (1) / T_A = 25 °C (2)	$I_{F(AV)}$	20 3.5				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	240				A
Rating for fusing (t < 8.3 ms)	I^2t	240				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88645
Revision: 31-Jan-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GSIB2020**	**GSIB2040**	**GSIB2060**	**GSIB2080**	**UNIT**
Maximum instantaneous forward voltage drop per diode	10 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GSIB2020**	**GSIB2040**	**GSIB2060**	**GSIB2080**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.5 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GSIB2060-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

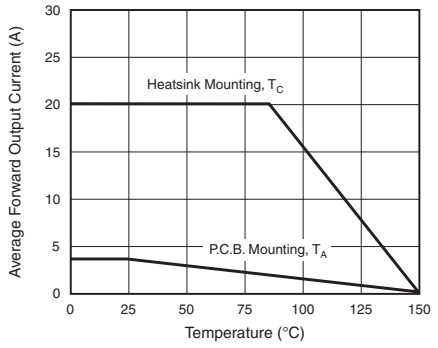


Figure 1. Derating Curve Output Rectified Current

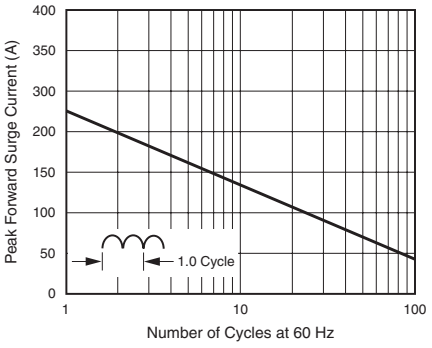


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

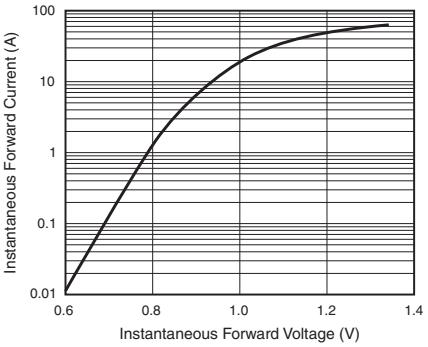


Figure 3. Typical Forward Characteristics Per Diode

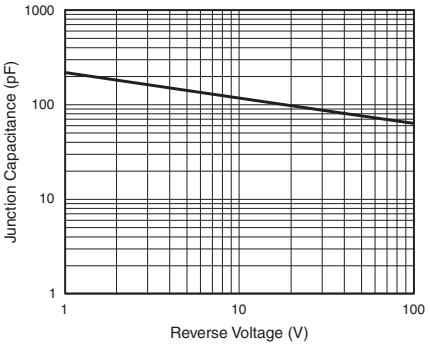


Figure 5. Typical Junction Capacitance Per Diode

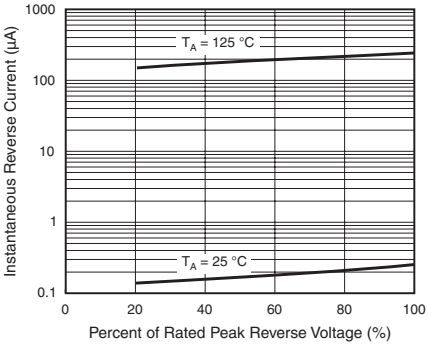


Figure 4. Typical Reverse Characteristics Per Diode

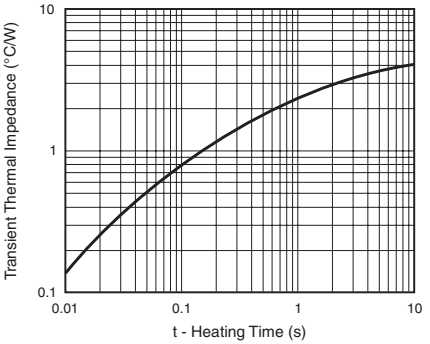
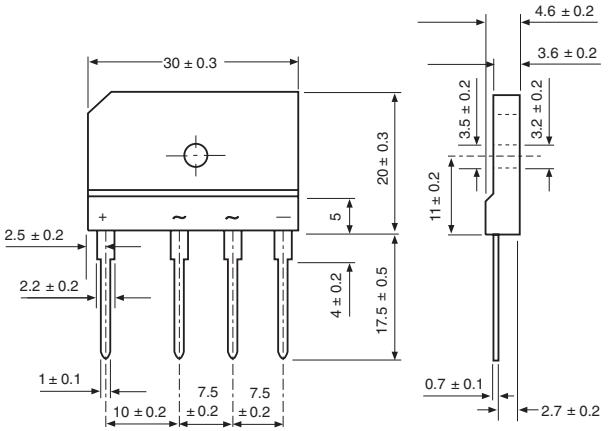


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

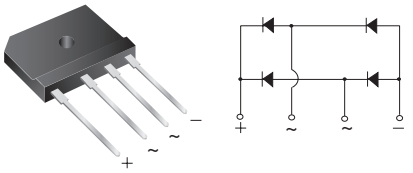
Case Style GSIB-5S



For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 88645
Revision: 31-Jan-08

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	200 V to 800 V
I_{FSM}	240 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSIB2020	VSIB2040	VSIB2060	VSIB2080	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 87 °C (1) / T_A = 25 °C (2)	$I_{F(AV)}$	20 / 3.5				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	240				A
Rating for fusing (t < 8.3 ms)	I^2t	240				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VSIB2020**	**VSIB2040**	**VSIB2060**	**VSIB2080**	**UNIT**
Maximum instantaneous forward voltage drop per diode	10 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 250				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**VSIB2020**	**VSIB2040**	**VSIB2060**	**VSIB2080**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.5 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSIB2060-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

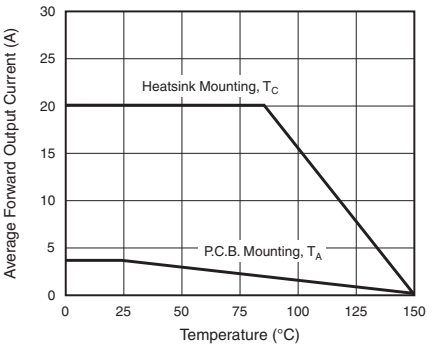


Figure 1. Derating Curve Output Rectified Current

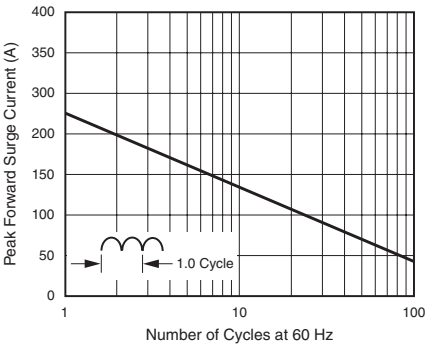


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

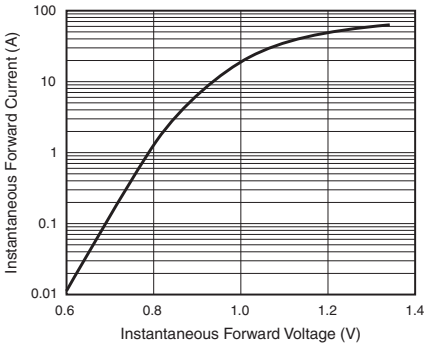


Figure 3. Typical Forward Characteristics Per Diode

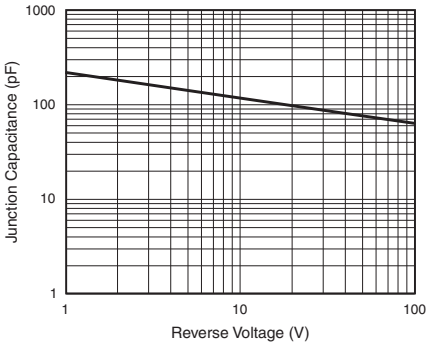


Figure 5. Typical Junction Capacitance Per Diode

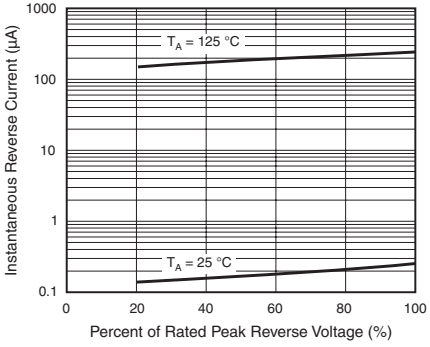


Figure 4. Typical Reverse Characteristics Per Diode

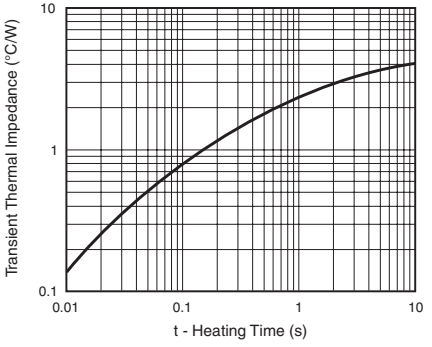
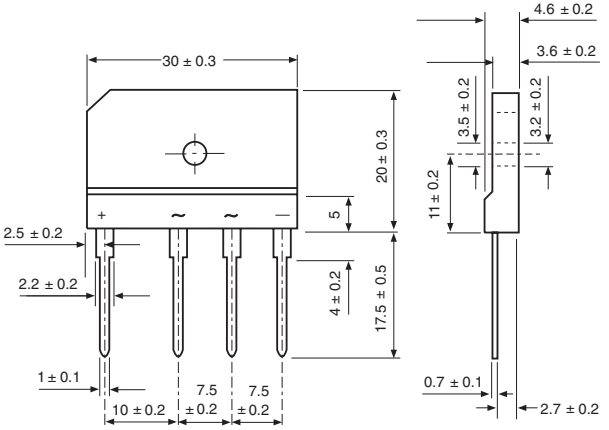


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

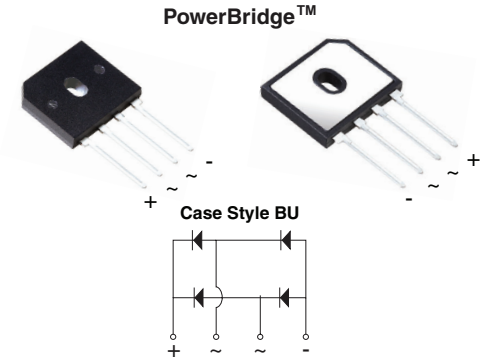
Case Style GSIB-5S



BU2506 thru BU2510

Vishay General Semiconductor

Enhanced Power Bridge Rectifiers



* Tested to UL standard for safety electrically isolated semiconductor devices. UL 1557 4th edition.
Dielectric tested to maximum case, storage and junction temperature to 150 °C to withstand 1500 V.

Epoxy meets UL 94V-0 flammability rating.

FEATURES

- UL recognition file number E309391 (QQQX2) UL 1557 (see *)
- Thin single in-line package
- Available for BU-5S lead forming option (part number with “5S” suffix, e.g. BU25065S)
- Superior thermal conductivity
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances and white-goods applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	25 A
V_{RRM}	600 V, 800 V, 1000 V
I_{FSM}	300 A
I_R	5 µA
V_F at I_F = 12.5 A	0.87 V
T_J max.	150 °C

MECHANICAL DATA

Case: BU

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102
E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)						
PARAMETER		SYMBOL	BU2506	BU2508	BU2510	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	600	800	1000	V
Average rectified forward current (Fig. 1, 2)	T_C = 60 °C (1) T_A = 25 °C (2)	I_O	25 3.5			A
Non-repetitive peak forward surge current 8.3 ms single sine-wave, T_J = 25 °C		I_{FSM}	300			A
Rating for fusing (t < 8.3 ms) T_J = 25 °C		I^2t	373			A^2s
Operating junction and storage temperature range		T_J, T_{STG}	- 55 to + 150			°C

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

Document Number: 84805
Revision: 01-Aug-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage per diode (1)	I_F = 12.5 A	T_A = 25 °C T_A = 125 °C	V_F	0.97 0.87	1.05 0.95	V
Maximum reverse current per diode	rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 120	5.0 350	µA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	125	-	pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BU2506**	**BU2508**	**BU2510**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$ (1) $R_{\theta JA}$ (2)	2.0 20			°C/W

Notes:

(1) With 60 W air cooled heatsink

(2) Without heatsink, free air

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
BU2506-E3/45	4.84	45	20	Tube
BU2506-E3/51	4.84	51	250	Paper tray
BU25065S-E3/45	4.84	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

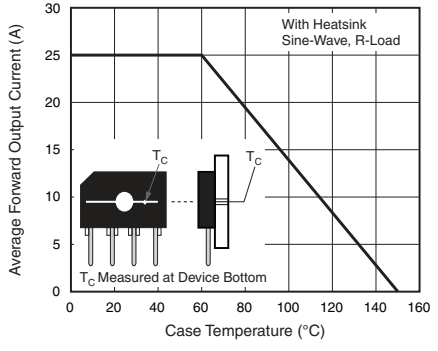


Figure 1. Derating Curve Output Rectified Current

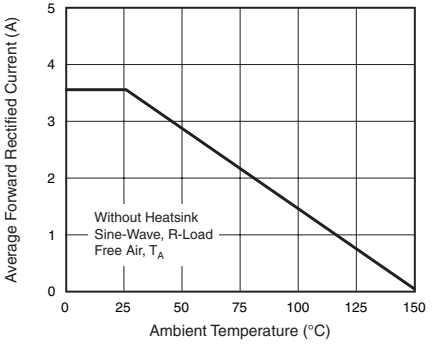


Figure 2. Forward Current Derating Curve

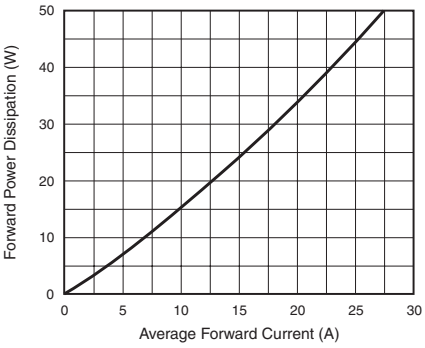


Figure 3. Forward Power Dissipation

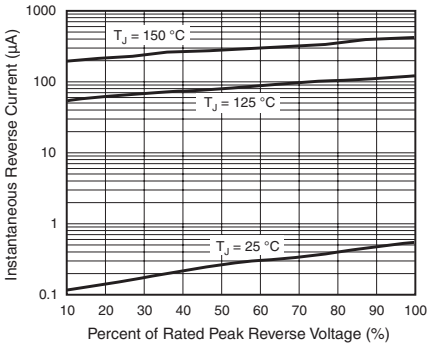


Figure 5. Typical Reverse Characteristics Per Diode

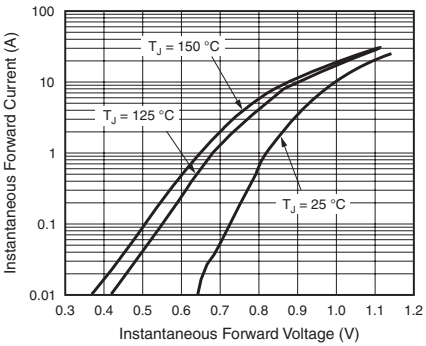


Figure 4. Typical Forward Characteristics Per Diode

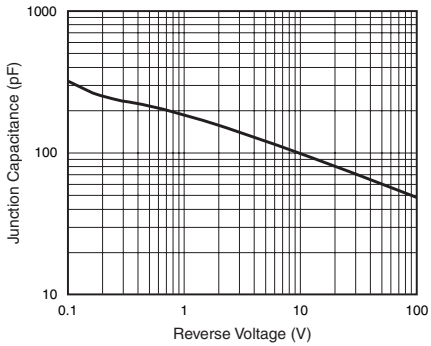
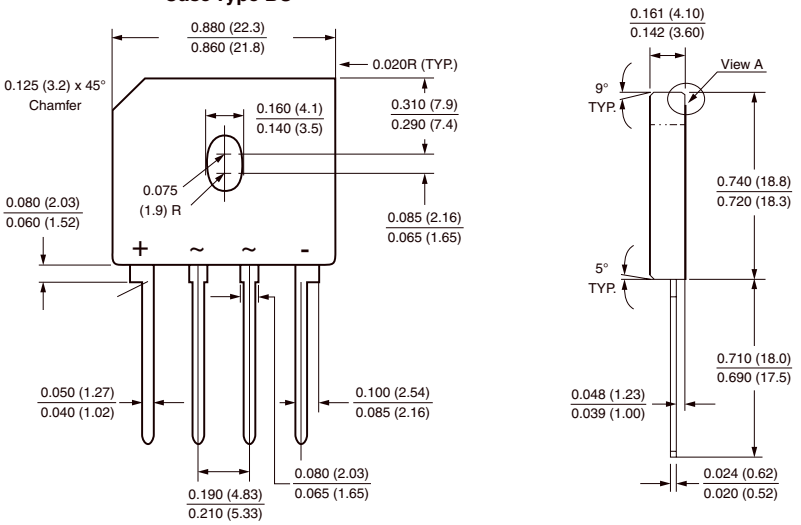


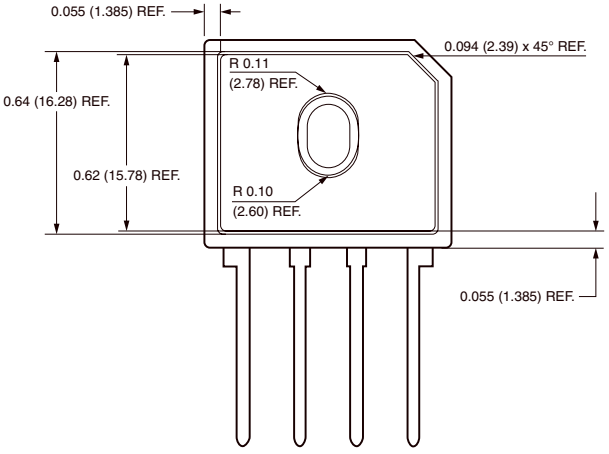
Figure 6. Typical Junction Capacitance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

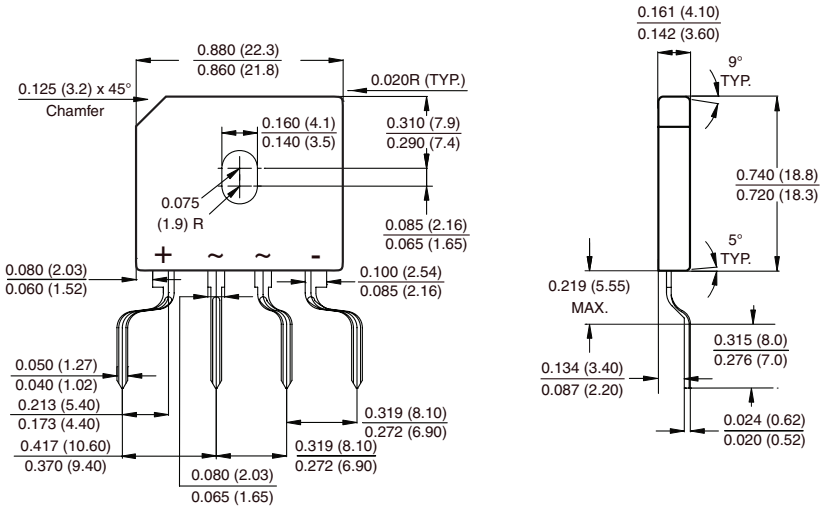
Case Type BU



Polarity shown on front side of case, positive lead beveled corner



FORMING SPECIFICATION: BU-5S in inches (millimeters)

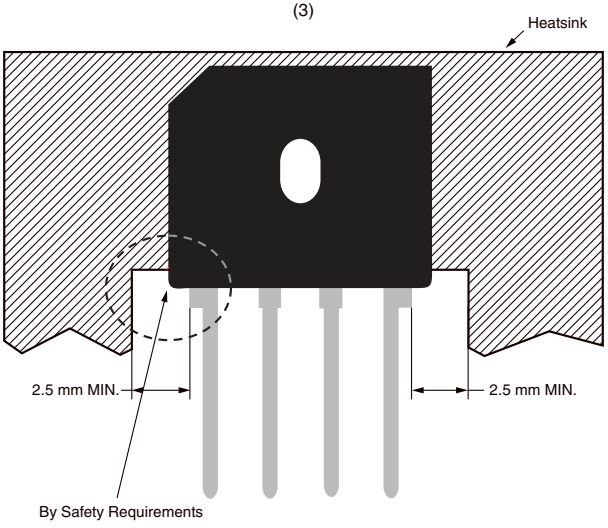


APPLICATION NOTE

(1) Device UL approved for safety use dielectric strength of 1500 V.

(2) If device is mounted in Floating Ground (F. G.) application, insulator is recommended to use to meet safety requirement.

(3) Heat sink shape recommendation:



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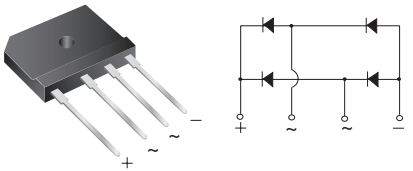
Document Number: 84805
Revision: 01-Aug-08

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	25 A
V_{RRM}	200 V to 800 V
I_{FSM}	350 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	GSIB2520	GSIB2540	GSIB2560	GSIB2580	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 98 °C / T_A = 25 °C	$I_{F(AV)}$	25 (1) / 3.5 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	350				A
Rating for fusing (t < 8.3 ms)	I^2t	500				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

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PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**GSIB2520**	**GSIB2540**	**GSIB2560**	**GSIB2580**	**UNIT**
Maximum instantaneous forward voltage drop per diode	12.5 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 350				µA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**GSIB2520**	**GSIB2540**	**GSIB2560**	**GSIB2580**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.0 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
GSIB2560-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

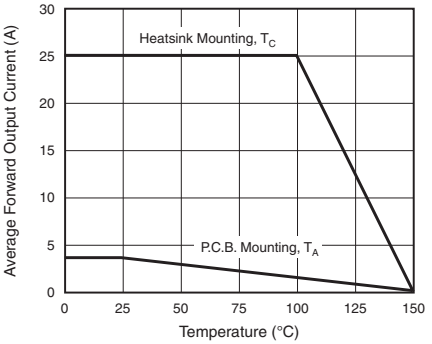


Figure 1. Derating Curve Output Rectified Current

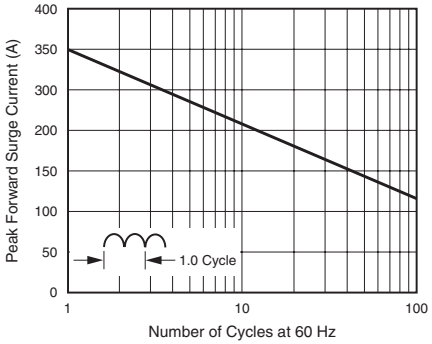


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

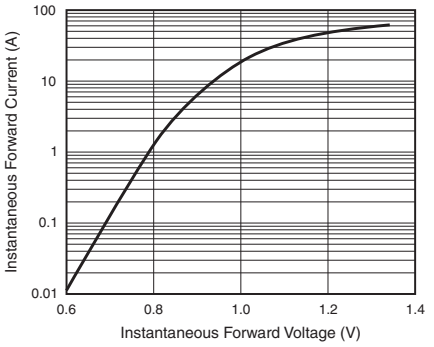


Figure 3. Typical Forward Characteristics Per Diode

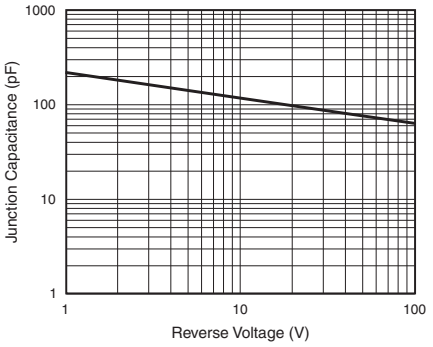


Figure 5. Typical Junction Capacitance Per Diode

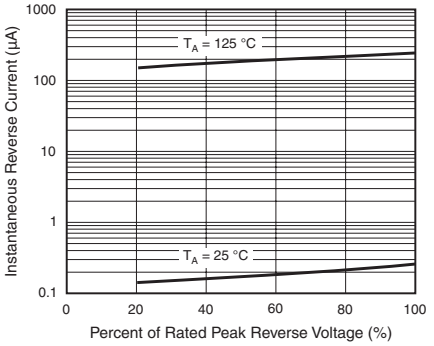


Figure 4. Typical Reverse Characteristics Per Diode

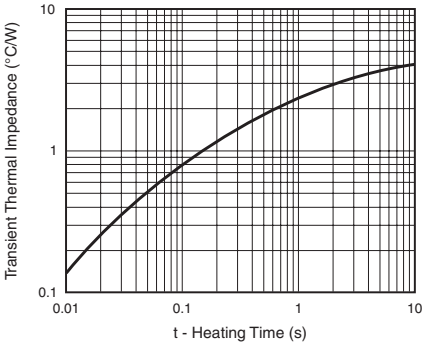
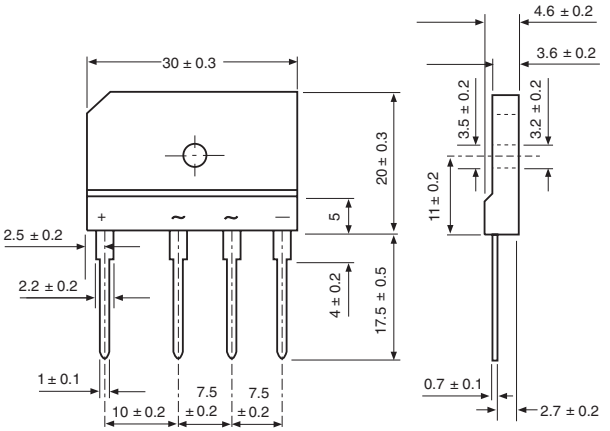


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style GSIB-5S

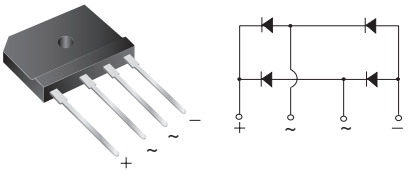


New Product

VSIB2520 thru VSIB2580

Vishay General Semiconductor

Single-Phase Single In-Line Bridge Rectifiers



Case Style GSIB-5S

FEATURES

- UL recognition file number E54214
- Thin single in-line package
- Glass passivated chip junction
- High surge current capability
- High case dielectric strength of 2500 V_{RMS}
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

General purpose use in ac-to-dc bridge full wave rectification for switching power supply, home appliances, office equipment, industrial automation applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	25 A
V_{RRM}	200 V to 800 V
I_{FSM}	350 A
I_R	10 µA
V_F	1.0 V
T_J max.	150 °C

MECHANICAL DATA

Case: GSIB-5S

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked on body

Mounting Torque: 10 cm-kg (8.8 inches-lbs) max.

Recommended Torque: 5.7 cm-kg (5 inches-lbs)

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	VSIB2520	VSIB2540	VSIB2560	VSIB2580	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	V
Maximum RMS voltage	V_{RMS}	140	280	420	560	V
Maximum DC blocking voltage	V_{DC}	200	400	600	800	V
Maximum average forward rectified output current at T_C = 98 °C, T_A = 25 °C	$I_{F(AV)}$	25 (1) 3.5 (2)				A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	350				A
Rating for fusing (t < 8.3 ms)	I^2t	500				A^2s
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150				°C

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

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Document Number: 84655
Revision: 01-Feb-08

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)							
PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**VSIB2520**	**VSIB2540**	**VSIB2560**	**VSIB2580**	**UNIT**
Maximum instantaneous forward voltage drop per diode	12.5 A	V_F	1.00				V
Maximum DC reverse current at rated DC blocking voltage per diode	T_A = 25 °C T_A = 125 °C	I_R	10 350				μA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**VSIB2520**	**VSIB2540**	**VSIB2560**	**VSIB2580**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ $R_{\theta JC}$	22 (2) 1.0 (1)				°C/W

Notes:

(1) Unit case mounted on aluminum plate heatsink

(2) Units mounted on P.C.B. without heatsink

(3) Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with #6 screw

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSIB2560-E3/45	7.0	45	20	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

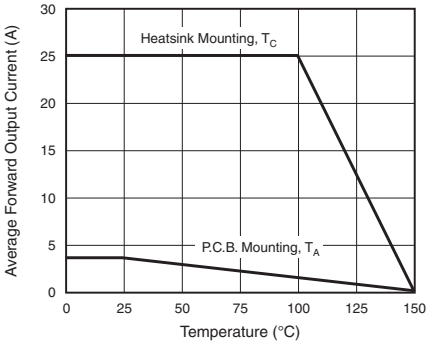


Figure 1. Derating Curve Output Rectified Current

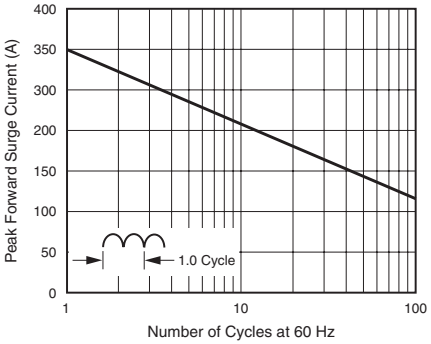


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

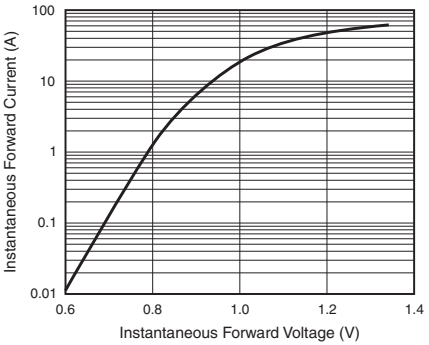


Figure 3. Typical Forward Characteristics Per Diode

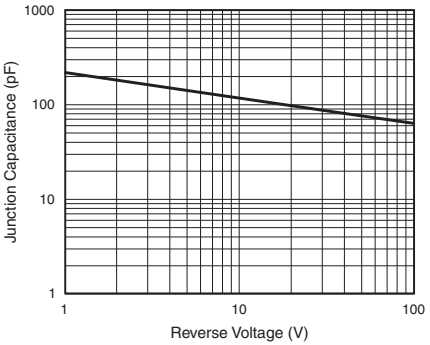


Figure 5. Typical Junction Capacitance Per Diode

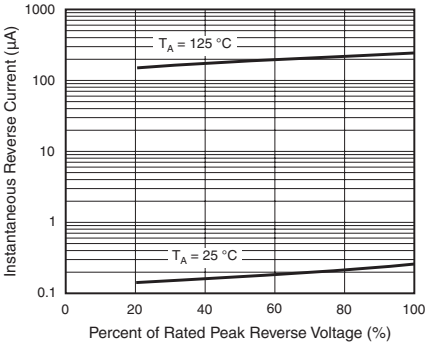


Figure 4. Typical Reverse Characteristics Per Diode

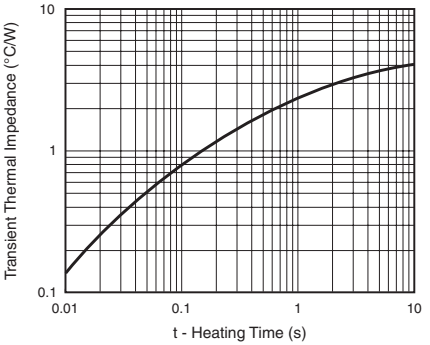
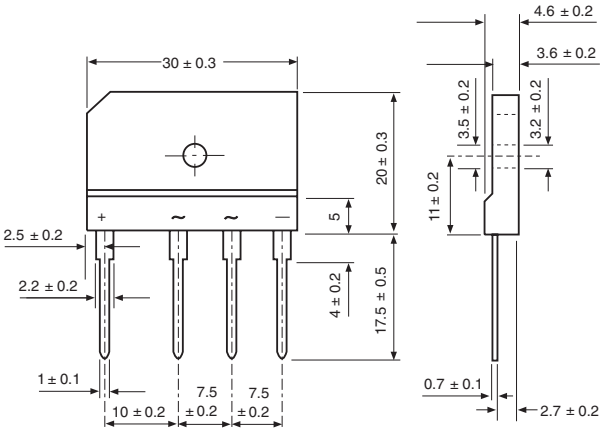


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters

Case Style GSIB-5S



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Application Notes

Contents

Fundamentals of Rectifiers

Within the diode family rectifiers are the largest class. One talks about rectifiers, if the specified current is above 0.5 A. Below 0.5 A one normally talks about diodes.

Rectifiers are primarily used, as their name already indicates, for conducting in one direction and blocking in the other.

Within rectifiers there are several groups depending on the reverse recovery characteristic (reverse recovery time t_{rr}):

- Standard rectifiers with a $t_{rr} > 500$ ns
- Fast rectifiers with a 100 ns < t_{rr} < 500 ns
- Ultrafast rectifiers with a $t_{rr} < 100$ ns
- Schottky rectifiers with majority carrier effect

Except Schottky rectifiers all these are of p-n junction technology with different processes to optimize the characteristics for different applications. They are placed in different packages, leaded like the Sinterglass, SMD like DO214AC (SMA) or TO220 to fullfill different mounting and power requirements.

Because of their predominant rectifying qualities, rectifiers are primarily used for power or signal conditioning in a variety of applications. This can range from high power output rectifier applications (e.g. power plants, railways,...) to low power switching rectifier requirements (e.g. mobile phone chargers, energy saving lamps,...). They are also used in several other specialized ways like clamping networks for SMPS (e.g. BYT42), damper and modulator diodes for the deflection circuits in CRTs (e.g. BY228), freewheeling diodes for inductive loads etc.

For specialized rectifying applications, silicon controlled rectifiers (SCRs) are used. But these are not simply diodes they have a third terminal, the gate.

The other special group of rectifiers, the Schottky rectifiers, are not use the conventional p-n junction, they have a barrier metal design. These are also non controlled rectifiers with two terminals only. Their big advantage is the excellent switching characteristic compared to even the fastest p-n junction diode. For more details about Schottky rectifiers, please refere to Application Note ”Fundamentals of Schottky Rectifiers”

Figure 1. below shows the basic rectifier characteristics with the two regions, the forward conducting region, in which the forward current I_F flows and the reverse blocking region, in which the reverse leakage current I_R flows.

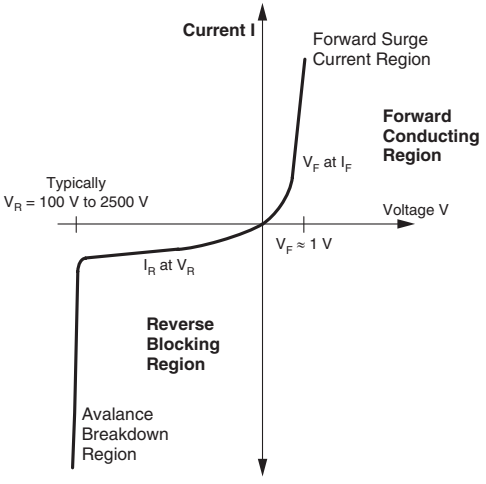

Fig. 1 - Basic Rectifier Characteristics

The major parameters for the selection of the appropriate rectifier are the maximum reverse voltage (V_{RRM}), the average forward current ($I_{F(AV)}$) and for switching application the reverse recovery characteristic (t_{rr}) too. Additional parameters may be, for example forward, surge capability (I_{FSM}) etc.

BASIC RECTIFIER PARAMETERS

V_R Reverse voltage

V_{RRM} Repetitive peak reverse voltage, including all repeated reverse transient voltages

V_{BR} Reverse breakdown voltage

I_R Reverse (leakage) current, at a specified reverse voltage V_R and temperature T_J

I_F Forward current

V_F Forward voltage drop, at a specified forward current I_F and temperature T_J

$I_{F(AV)}$ Average forward output current, at a specified current waveform (normally 10 ms/50 Hz half sine wave, sometimes 8.3 ms/60 Hz half sine wave), a specified reverse voltage and a specified mounting condition (e.g. lead-length = 10 mm or PCB mounted with certain pads and distance)

I_{FSM} Peak forward surge current, with a specified current waveform (normally 10 ms/50 Hz half sine wave, sometimes 8.3 ms/60 Hz half sine wave)

t_{rr} Reverse recovery time, at a specified forward current (normally 0.5 A), a specified reverse current (normally 1.0 A) and specified measurement conditions (normally from 0 to 0.25 A)

Physical Explanation

GENERAL TERMINOLOGY

Semiconductor diodes are used as rectifiers, switches, varactors and voltage stabilizers (see Zener databook).

Semiconductor diodes are two-terminal solid-state devices having asymmetrical voltage-current characteristics. Unless otherwise stated, this means a device has single pn-junction corresponding to the characteristics shown in figure 1.

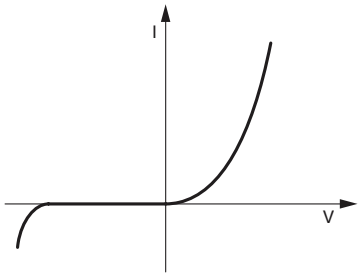

Figure 1.

An application of the voltage current curve is given by

$$I = I_S\left(\exp\frac{V}{V_T} - 1\right)$$

where

I_S = saturation current

$V_T = \frac{k \times T}{q}$ = temperature potential

If the diode is forward-biased (anode positive with respect to cathode), its forward current ($I = I_F$) increases rapidly with increasing voltage. That is, its resistance becomes very low.

If the diode is reverse-biased (anode negative with respect to cathode), its reverse current ($-I = I_R$) is extremely low. This is only valid until the breakdown voltage V_{BR} has been reached. When the reverse voltage is slightly higher than the breakdown voltage, a sharp rise in reverse current results.

Bulk resistance

Resistance of the bulk material between junction and the diode terminals.

Parallel resistance, r_P

Diode resistance resulting from HF rectification which acts as a damping resistance to the pre-tuned demodulation circuit.

Differential resistance

See forward resistance, differential

Diode capacitance, C_D

Total capacitance between the diode terminals due to case, junction and parasitic capacitances.

Breakdown voltage, V_{BR}

Reverse voltage at which a small increase in voltage results in a sharp rise of reverse current. It is given in the technical data sheet for a specified current.

Forward voltage, V_F

The voltage across the diode terminals which results from the flow of current in the forward direction.

Forward current, I_F

The current flowing through the diode in the direction of lower resistance.

Forward resistance, r_F

The quotient of DC forward voltage across the diode and the corresponding DC forward current.

Forward resistance, differential r_f

The differential resistance measured between the terminals of a diode under specified conditions of measurement, i.e., for small-signal AC voltages or currents at a point of forward direction V-I characteristic.

Case capacitance, C_{case}

Capacitance of a case without a semiconductor crystal.

Integration time, t_{av}

With certain limitations, absolute maximum ratings given in technical data sheets may be exceeded for a short time. The mean value of current or voltage is decisive over a specified time interval termed integration time. These mean values over time interval, tav, should not exceed the absolute maximum ratings.

Average rectified output current, I_{FAV}

The average value of the forward current when using the diode as a rectifier. The maximum allowable average rectified output current depends on the peak value of the applied reverse voltage during the time interval at which no current is flowing. In the absolute maximum ratings, one or both of the following are given:

- The maximum permissible average rectified output current for zero diode voltage (reverse).
- The maximum permissible average rectified output current for the maximum value of URRM during the time interval at which no current is flowing.

Note

I_{FAV} decreases with an increasing value of the reverse voltage during the interval of no current flow.

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Rectification efficiency, η_r

The ratio of the DC load voltage to the peak input voltage of an RF rectifier.

Series resistance, r_s

The total value of resistance representing the bulk, contact and lead resistance of a diode given in the equivalent circuit diagram of variable capacitance diodes.

Junction capacitance, C_J

Capacitance due to a pn junction of a diode which decreases with increasing reverse voltage.

Reverse voltage, V_R

The voltage drop which results from the flow of reverse current (through the semiconductor diode).

Reverse current, I_R (leakage current)

The current which flows when reverse bias is applied to a semiconductor junction.

Reverse resistance, R_R

The quotient of the DC reverse voltage across a diode and the corresponding DC reverse current.

Reverse resistance, differential, r_r

The differential resistance measured between the terminals of a diode under specified condition of measurement i.e., for small-signal (AC) voltage or currents at a point of reverse-voltage direction V-I characteristic.

Peak forward current, I_{FRM}

The maximum forward current with sine-wave operation, f ≥ 25 Hz, or pulse operation, f ≥ 25 Hz, having a duty cycle $t_P/T \leq 0.5$.

Peak reverse voltage, V_{RRM}

The maximum reverse voltage having an operating frequency f ≥ 25 Hz for sine-wave as well as pulse operation.

Peak surge forward current, I_{FSM}

The maximum permissible surge current in a forward direction having a specified waveform with a short specified time interval (i.e., 10 ms) unless otherwise specified. It is not an operating value. During frequent repetitions, there is a possibility of change in the device's characteristic.

Peak surge reverse voltage, V_{RSM}

The maximum permissible surge voltage applied in a reverse direction. It is not an operating value. During frequent repetitions, there is a possibility of change in the device's characteristic.

Power dissipation, P_V

An electrical power converted into heat. Unless otherwise specified, this value is given in the data sheets under absolute maximum ratings, with T_A = 25 °C at a specified distance from the case (both ends).

Switching on characteristic

Forward recovery time, t_{fr}

The time required for the voltage to reach a specified value (normally 110 % of the steady state forward voltage drop), after instantaneous switching from zero or a specified reverse voltage to a specified forward biased condition (forward current).

This recovery time is especially noticeable when higher currents are to be switched within a short time. The reason is that the forward resistance during the turn-on time could be higher than the DC current (inductive behavior). This can result in the destruction of a diode because of high instantaneous power loss if constant current control is used.

Turn on transient peak voltage, V_{fp}:

The voltage peak (overshoot) after instantaneous switching from zero or a specified reverse voltage to a specified forward biased condition (forward current). The forward recovery is very important especially when higher forward currents must be switched on within a very short time (switching on losses).

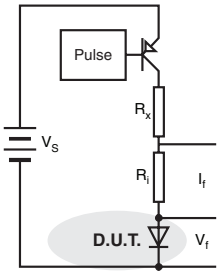

Figure 2.

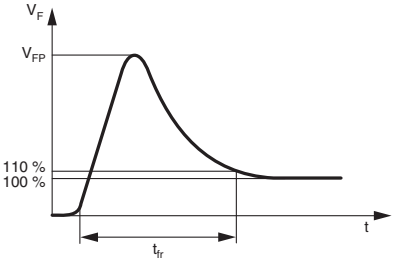

Figure 3.

Switching off characteristic, inductive load

Reverse recovery time, t_{rr}

The time required for the current to reach a specified reverse current, i_r (normally 0.25 % of I_{RM}), after switching from a specified forward current I_F to a specified reverse biased condition (reverse voltage V_{Batt}) with a specified slope dI_F/dt.

Peak reverse recovery current, I_{RM}

The peak reverse current after switching from a specified forward current I_F to a specified reverse biased condition (reverse voltage V_R) with a specified switching slope dI_F/dt.

The reverse recovery is very important especially when switching from higher currents to high reverse voltage within a very short time (switching off losses).

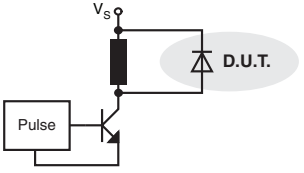

Figure 4.

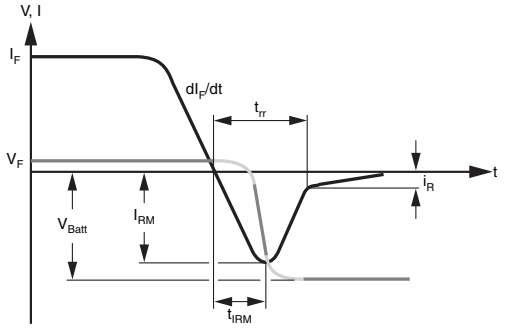

Figure 5.

Reverse avalanche energy, E_R:

The reverse avalanche energy when using the rectifier as a freewheeling diode with an indicutive load. When the inductance is switched off, the current through the inductance will keep on flowing through the D.U.T. until the stored energy,

$$E_R = \frac{1}{2} \times L \times I^2$$

is dissipated within the rectifier. Under this condition the diode is in a reverse avalanche mode with a reverse current at the beginning which is equal to the current that was flowing through the inductance just before it was switched off.

The reverse energy capability depends on the reverse current and the junction temperature prior to the avalanche mode.

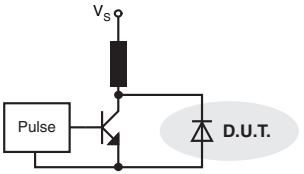

Figure 6.

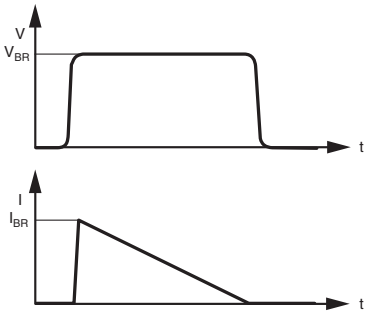

Figure 7.

Switching off characteristic, instantaneous switching

Reverse recovery time, t_{rr}:

The time required for the current to reach a specified reverse current, i_r (normally 0.25 A), after instantaneous switching from a specified forward current I_F (normally 0.5 A) to a specified reverse current I_R (normally 1.0 A).

Reverse recovery charge, Q_{rr}:

The charged stored within the diode when instantaneous switched from a specified forward current I_F (normally 0.5 A) to a specified reverse current I_R (normally 1.0 A).

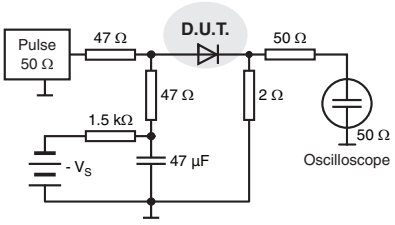

Figure 8.

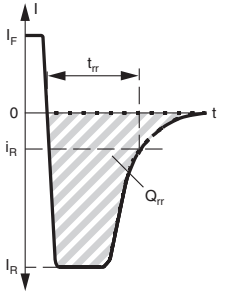

Figure 9.

Reliability

The requirements concerning quality and reliability of products are always increasing. It is not sufficient to only deliver fault-free parts. In addition, it must be ensured that the delivered goods serve their purpose safely and failure free, i.e. reliably. From the delivery of the device and up to its use in a final product, there are some occasions where the device or the final product may fail despite testing and outgoing inspection.

In principle, this sequence is valid for all components of a product.

For these reasons, the negative consequences of a failure, which become more serious and expensive the later they occur, are obvious. The manufacturer is therefore interested in supplying products with the lowest possible

- AOQ (Average Outgoing Quality) value
- EFR (Early Failure Rate) value
- LFR (Long-term Failure Rate) value

AVERAGE OUTGOING QUALITY (AOQ)

All outgoing products are sampled after 2 x 100 % testing. This is known as “Average Outgoing Quality” (AOQ). The results of this inspection are recorded in ppm (parts per million) using the method defined in JEDEC 16.

EARLY FAILURE RATE (EFR)

EFR is an estimate (in ppm) of the number of early failures related to the number of devices used. Early failures are normally those which occur within the first 300 to 1000 hours. Essentially, this period of time covers the guarantee period of the finished unit.

Low EFR values are therefore very important to the device user. The early life failure rate is heavily influenced by complexity. Consequently, ‘designing-in’ of better quality during the development and design phase, as well as optimized process control during manufacturing, significantly reduces the EFR value. Normally, the early failure rate should not be significantly higher than the random failure rate. EFR is given in ppm (parts per million).

LONG-TERM FAILURE RATE (LFR)

LFR shows the failure rate during the operational period of the devices. This period is of particular interest to the manufacturer of the final product. Based on the LFR value, estimations concerning long-term failure rate, reliability and a device’s or module’s usage life may be derived. The usage life time is normally the period of constant failure rate. All failures occuring during this period are random.

Within this period the failure rate is:

$$\lambda = \frac{\text{sum of failures}}{\Sigma(\text{quantity} \times \text{time to failure})} \frac{1}{\text{hours}}$$

The measure of λ is FIT (Failures In Time = number of failures in 10^9 device hours).

Example

A sample of 500 semiconductor devices is tested in a operating life test (dynamic electric operation). The devices operate for a period of 10 000 hours.

Failures: 1 failure after 1000 h
1 failure after 2000 h

The failure rate may be calculated from this sample by

$$\lambda = \frac{2}{1 \times 1000 + 1 \times 2000 + 498 \times 10\,000} \frac{1}{\text{h}}$$

$$\lambda = \frac{2}{4\,983\,000} \frac{1}{\text{h}} = 4{,}01 \times 10^{-7} \frac{1}{\text{h}}$$

This is a λ-value of 400 FIT, or this sample has a failure rate of 0.04 %/1000 h on average.

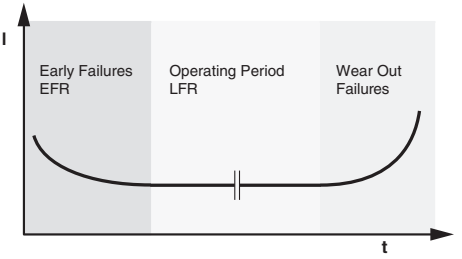

Figure 1. Bath Tub Curve

CONFIDENCE LEVEL

The failure rate λ calculated from the sample is an estimate of the unknown failure rate of the lot.

The interval of the failure rate (confidence interval) may be calculated, depending on the confidence level and sample size.

The following is valid:

- The larger the sample size, the narrower the confidence interval.
- The lower the confidence level of the statement, the narrower the confidence interval.

The confidence level applicable to the failure rate of the whole lot when using the estimated value of λ is derived from the χ^2-distribution. In practice, only the upper limit of the confidence interval (the maximum average failure rate) is used.

Therefore:

$$\lambda_{max.} = \frac{\chi^2/2\ (r;\ P_A)}{n \times t} \text{ in } \frac{1}{h}$$

$$LFR = \frac{\chi^2/2\ (r;\ P_A)}{n \times t} \times 1 \times 10^9 \text{ in [FIT]}$$

r: Number of failures

P_A: Confidence level

n: Sample size

t: Time in hours

n × t: Device hours

The $\chi^2/2$ for λ are taken from table 4.

For the above example from table 4:

$\chi^2/2$ (r = 2; P_A = 60 %) = 3.08

n × t = 4 983 000 h

$$\lambda_{max.} = \frac{3{,}08}{4\ 983\ 000} = 6{,}18 \times 10^{-7}\ \frac{1}{h}$$

This means that the failure rate of the lot does not exceed 0.0618 %/1000 h (618 FIT) with a probability of 60 %.

If a confidence level of 90 % is chosen from table 1:

$\chi^2/2$ (r = 2; P_A = 90 %) = 5.3

$$\lambda_{max.} = \frac{5{,}3}{4\ 983\ 000} = 1{,}06 \times 10^{-6}\ \frac{1}{h}$$

This means that the failure rate of the lot does not exceed 0.106 %/1000 h (1060 FIT) with a probability of 90 %.

TABLE 1

NUMBER OF FAILURES	CONFIDENCE LEVEL			
	50 %	60 %	90 %	95 %
0	0.60	0.93	2.31	2.96
1	1.68	2.00	3.89	4.67
2	2.67	3.08	5.30	6.21
3	3.67	4.17	6.70	7.69
4	4.67	5.24	8.00	9.09
5	5.67	6.25	9.25	10.42
6	6.67	7.27	10.55	11.76
7	7.67	8.33	11.75	13.16
8	8.67	9.35	13.00	14.30
9	9.67	10.42	14.20	15.63
10	10.67	11.42	15.40	16.95

OPERATING LIFE TEST

Number of devices tested: n = 50

Number of failures (positive qualification): c = 0

Test time: t = 2000 h

Confidence level: P_A = 60 %

$\chi^2/2$ (0; 60 %) = 0.93

$$\lambda_{max.} = \frac{0{,}93}{50 \times 2000} = 9{,}3 \times 10^{-6}\ \frac{1}{h}$$

This means, that the failure rate of the lot does not exceed 0.93 %/1000 h (9300 FIT) with a probability of 60 %.

This example demonstrates that it is only possible to verify LFR values of 9300 FIT with a confidence level of 60 % in a normal qualification tests (50 devices, 2000 h).

To obtain LFR values which meet today's requirements (< 50 FIT), the following conditions have to be fulfilled:

- Very long test periods
- Large quantities of devices
- Accelerated testing (e.g. higher temperature)

MEAN TIME TO FAILURE (MTTF)

For systems which can not be repaired and whose devices must be changed, e.g. semiconductors, the following is valid:

$$MTTF = \frac{1}{\lambda}$$

MTTF is the average fault-free operating period per a monitored (time) unit.

Accelerating Stress Tests

Innovation cycles in the field of semiconductors are becoming shorter and shorter. This means that products must be brought to the market quicker. At the same time, expectations concerning the quality and reliability of the products have become higher.

Manufacturers of semiconductors must therefore assure long operating periods with high reliability but in a short time. Sample stress testing is the most commonly used way of assuring this.

The rule of Arrhenius describes this temperature dependent change of the failure rate.

$$\lambda(T_2) = \lambda(T_1) \times e^{-\left[\frac{E_A}{k} \times \left(\frac{1}{T_1} - \frac{1}{T_2}\right)\right]}$$

Boltzmann's constant	$k = 8.63 \times 10^{-5}$ eV/K
Activation energy	E_A in eV
Junction temperature real operation	T_1 in Kelvin
Junction temperature stress test	T_2 in Kelvin
Failure rate real operation	$\lambda\ (T_1)$
Failure rate stress test	$\lambda\ (T_2)$

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Document Number: 84066
Revision: 22-Jul-08

The acceleration factor is described by the exponential function as being:

$$AF = \frac{\lambda(T_2)}{\lambda(T_1)} \times e^{\left[\frac{E_A}{k} \times \left(\frac{1}{T_1} - \frac{1}{T_2}\right)\right]}$$

Example

The following conditions apply to an operating life stress test:

Environmental temperature during stress test

$T_A = 70\ °C$

Power dissipation of the device

$P_V = 100\ mW$

Thermal resistance junction/environment

$R_{thJA} = 300\ K/W$

The system temperature/junction temperature results from:

$$T_J = T_A + R_{thJA} \times P_V$$

$$T_J = 70\ °C + 300\ K/W \times 100\ mW$$

$$T_J = 100\ °C$$

Operation in the field at an ambient temperature of 50 °C and at an average power dissipation of 80 mW is utilized. This results in a junction temperature in operation of $T_J = 74\ °C$. The activation energy used for opto components is $E_A = 0.8\ eV$.

The resulting acceleration factor is:

$$AF = \frac{\lambda(373\ K)}{\lambda(347\ K)} \times e^{\left[\frac{E_A}{k} \times \left(\frac{1}{347\ K} - \frac{1}{373\ K}\right)\right]}$$

$AF \approx 6{,}5$

This signifies that, in this example, the failure rate is lower by a factor of 6.5 compared to the stress test.

Other accelerating stress tests may be:

- Humidity (except displays type TDS)
  $T_A = 85\ °C$
  RH = 85 %
- Temperature cycling
  Temperature interval as specified

The tests are carried out according to the requirements of appropriate IEC-standards (see also chapter ‘Qualification and Release’).

ACTIVATION ENERGY

There are some conditions which need to be fulfilled in order to use Arrhenius’ method:

- The validity of Arrhenius’ rule has to be verified.
- ‘Failure-specific’ activation energies must be determined.

These conditions may be verified by a series of tests. Today, this procedure is generally accepted and used as a basis for estimating operating life. The values of activation energies can be determined by experiments for different failure mechanisms.

Values often used for different device groups are:

Opto components	0.8 eV
Bipolar ICs	0.7 eV
MOS ICs	0.6 eV
Transistors	0.7 eV
Diodes	0.7 eV

By using this method, it is possible to provide long-term predictions for the actual operation of semiconductors even with relatively short test periods.

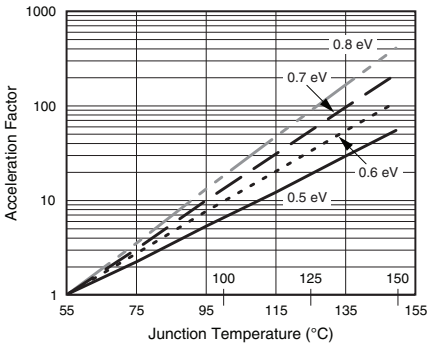

Figure 2. Acceleration Factor for Different Activation Energies
Normalized to $T_J = 55\ °C$

Assembly Instructions

GENERAL

Semiconductor devices can be mounted in any position. The terminal length may be bent at a distance greater than 1.5 mm from the case provided no mechanical force has an effect on the case.

If the device is to be mounted near heat generating components, consideration must be given to the resultant increase in ambient temperature.

SOLDERING INSTRUCTIONS

Leaded Devices

Protection against overheating is essential when a device is being soldered. It is recommended, therefore, that connection terminals are left as long as possible, are soldered at the tip only, and that any heat generated is quickly conducted away. The time during which the specified maximum permissible device junction temperature is exceeded during the soldering operation should be as short as possible, (i.e. for silicon, 260 °C for 5 s).

Avoid any force on the body or leads during or just after soldering.

Do not correct the position of an already soldered device by pushing, pulling or twisting the body. Prevent fast cooling after soldering.

The maximum soldering temperatures are shown in table 1.

TABLE 1 - MAXIMUM SOLDERING TEMPERATURES

	IRON SOLDERING			DIP OR FLOW SOLDERING			
	IRON TEMPERATURE	SOLDERING DISTANCE FROM THE CASE	MAXIMUM ALLOWABLE SOLDERING TIME	SOLDERING TEMPERATURE	SOLDERING DISTANCE FROM THE CASE		MAXIMUM ALLOWABLE SOLDERING TIME
					VERTICAL	HORIZONTAL	
Glass case	≤ 260 °C ≤ 260 °C 260 to 400 °C	1.5 to 5 mm > 5 mm > 5 mm	5 s 10 s 5 s	≤ 260 °C	> 1.5 mm	> 5 mm	5 s
Plastic case	≤ 260 °C ≤ 260 °C	2 to 5 mm > 5 mm	3 s 5 s	≤ 260 °C	> 1.5 mm	> 5 mm	3 s

Surface Mounted Devices

Surface mounted devices (SMD) are components which are mounted directly on the surface of a printed circuit board without having to drill holes. In addition, these components can be completely submerged in a solder bath (overhead soldering). The SMD technology offers the following main advantages:

Higher packing density (miniaturization)

Reduction of the component mounting costs by fully automatic mounting

a) Gluing

In the case of flow or drag soldering, the components must be glued to the printed circuit board. The adhesive used for this purpose must be electrically neutral and must not react chemically with the materials of the printed circuit board or the components. The adhesive must not negatively affect subsequent soldering. After mounting, the adhesive must be hardened. The ultraviolet and/or thermal radiation commonly used for hardening is uncritical for our components. In the case of other soldering methods, gluing can be omitted if the flux or the solder paste provides sufficient adhesion of the components to the printed circuit board.

b) Soldering

The pins of Vishay components are already tinned.

Dip soldering, flow soldering, reflow soldering, and vapor phase soldering are permissible.

The maximum temperature of 260 °C over a period of 5 s must not be exceeded during soldering.

No aggressive fluxes may be used.

A soldering iron should be used only in exceptional cases (repairs, etc.). A temperature regulated miniature soldering iron must be used, and care should be taken to avoid touching the component with the tip of the soldering iron.

For optoelectronic semiconductor components, the maximum soldering temperature is 240 °C for 5 s.

c) Cooling

Cooling of the components with a fan after soldering is permissible.

d) Cleaning

If cleaning is necessary after soldering, it is recommended to wash with water which contains a detergent free of deposits.

Important layout notes

If components are to be arranged in rows, then separate soldering surfaces must be provided for each component. If this is not carried out, a block of solder forms between the components during soldering, and a rigid connection results. This can cause breakage or cracks in the component as the result of the slightest bending of the board, and thus lead to failure. If it is necessary to solder a wire (standard conductor, etc.) to the board, a separate soldering surface must be provided in order to avoid excessive heating of the components during soldering with a soldering iron.

HEAT REMOVAL

To keep the thermal equilibrium, the heat generated in the semiconductor junction(s) must be removed.

In the case of low-power devices, the natural heat-conductive path between the case and surrounding air is usually adequate for this purpose. However, in the case of medium-power devices, heat radiation may have to be improved by the use of star or flag-shaped heat dissipators, which increase the heat radiating surface.

Finally, in the case of high-power devices, special heat sinks must be provided, the cooling effect of which can be increased further by the use of special coolants or air blowers.

The heat generated in the junction is conveyed to the case or header by conduction rather than convection. A measure of the effectiveness of heat conduction is the inner thermal resistance or thermal resistance junction case, R_{thJC}, the value of which is governed by the construction of the device.

Any heat transfer from the case to the surrounding air involves radiation convection and conduction. The effectiveness of transfer is expressed in terms of an R_{thCA}-value, i.e. the external or case-ambient thermal resistance. The total thermal resistance between junction and ambient is consequently

$$R_{thJA} = R_{thJC} + R_{thCA}$$

The total maximum power, $P_{tot\ max.}$ of a semiconductor device can be expressed as follows

$$P_{tot\ max.} = \frac{T_{J\ max.} - T_A}{R_{thJA}} = \frac{T_{max.} - T_A}{R_{thJC} + R_{thCA}}$$

where

$T_{J\ max.}$ is the maximum junction temperature,

T_A is the highest ambient temperature likely to be reached under the most unfavorable conditions,

R_{thJA} is the thermal resistance between junction and ambient. For diodes with axial leads, it is measured with a heat sink at a specified distance from the case,

R_{thJC} is the thermal resistance between junction and case,

R_{thCA} is the thermal resistance between case and ambient. Its value is cooling dependent. When using heat sink, it can be influenced through thermal contact between the case and heat sink, thermal distribution in the heat sink and heat transfer to the surroundings.

Therefore, the maximum permissible total power dissipation for a given semiconductor device can be influenced only by changing T_A and R_{thCA}. The value of R_{thCA} can be obtained either from the data of heat sink suppliers or through direct measurements.

Heat due to energy losses is mainly conducted with power diodes without cooling pins through the connecting leads and hence the pc board.

Figure 1. shows the thermal resistance plotted as a function of edge length. The values are valid with a heat source in the middle of the plate, resting air and vertical position. With horizontal position, thermal resistance increases approximately by 15 to 20 %.

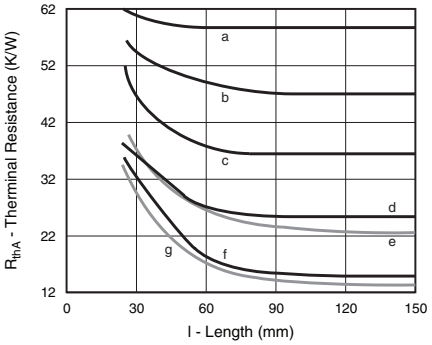

Figure 1.

Pertinax boards 1.5 mm thick

a: Pertinax non-metallized

b: Pertinax with 35 mm copper metallization on one side; heat source fitted to non-metallized side

c: Pertinax with 70 mm copper metallization on one side; heat source fitted to non-metallized side

d: Pertinax with 35 mm copper metallization on one side; heat source fitted to metallized side

e: Pertinax with 35 mm copper metallization on both sides

f: Pertinax with 70 mm copper metallization on one side; heat source fitted to metallized side

g: Pertinax with 70 mm copper metallization on both sides

R_{tha}: Thermal resistance of boards

l: Edge length

When using cooling plates as heat sink without optimum performance, the following approach is acceptable.

The curves shown in figures 2. and 3. are given for thermal resistance, R_{thCA}, by using square plates of aluminium with edge length a but with different thicknesses. The device case should be mounted directly on the cooling plate.

The edge length a derived from figures 2. and 3. for a given R_{thCA} value must be multiplied with α and β:

$a' = a \times \beta \times \alpha$

where

$\alpha = 1.00$ for vertical arrangement
$\alpha = 1.15$ for horizontal arrangement
$\beta = 1.00$ for bright surface
$\beta = 0.85$ for dull black surface

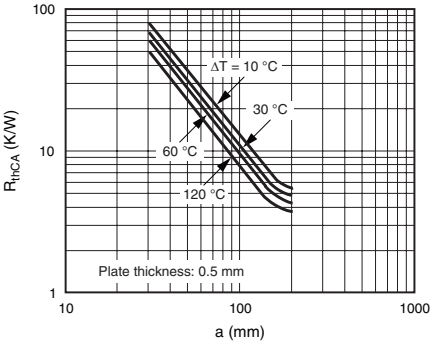

Figure 2.

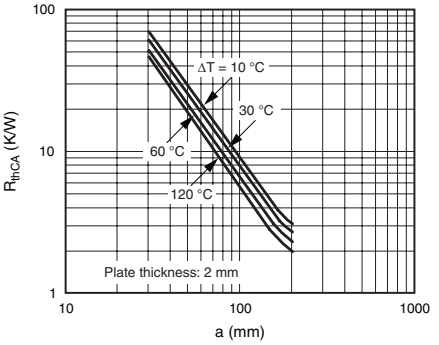

Figure 3.

Example

For a silicon power rectifier with $T_{J\ max.}$ = 150 °C and R_{thJC} = 5 K/W, a 2 mm aluminium square sheet is used in a horizontal arrangement. The maximum ambient temperature is 50 °C and the maximum power dissipation is $P_{tot\ max.}$ = 8 W.

$$P_{tot\ max.} = \frac{T_{J\ max.} - T_A}{R_{thJC} + R_{thCA}}$$

$$P_{thCA} = \frac{T_{J\ max.} - T_A}{P_{tot}} - R_{thJC} = \frac{150\ °C - 50\ °C}{8\ W} - 5\ °C/W = 7.5\ °C/W$$

$\Delta T = T_{case} - T_A$ can be calculated from

$$P_{tot\ max.} = \frac{T_{J\ max.} - T_A}{R_{thJC} + R_{thCA}} = \frac{T_{case} - T_A}{R_{thCA}}$$

$$T_{case} - T_A = \frac{R_{thCA}(T_{J\ max.} - T_A)}{R_{thJC} + R_{thCA}} = \frac{7.5\ °C(150\ °C - 50\ °C)}{5\ °C/W + 7.5\ °C/W} = 60\ °C$$

With R_{thCA} = 7.5 °C/W and ΔT = 60 °C, plate thickness = 2 mm. Therefore, the edge length a = 90 mm. This value should be multiplied with α = 1.15 due to the horizontal arrangement. Hence, the actual edge length = 105 mm.

For a given plate sheet length, the allowable power dissipation should be first calculated with a supposed ΔT. The result should be corrected then with the actual ΔT.

BOARDS FOR R_{thJA} DEFINITION

Epoxy glass hard tissue, board thickness 1.5 mm, copper overlay 35 µm

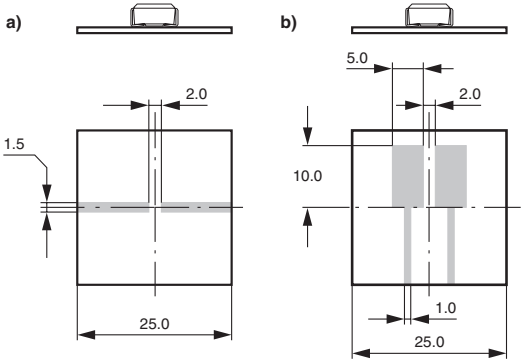

Figure 4. DO214AC Diodes

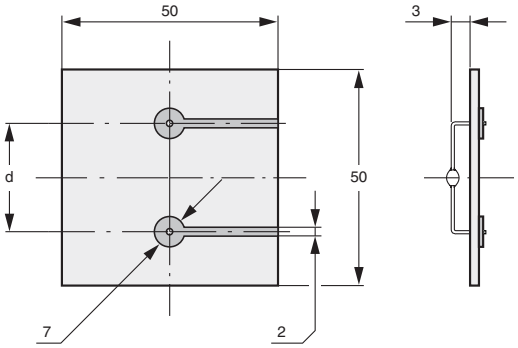

Figure 5. Leaded Diodes

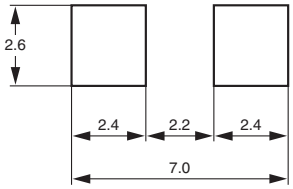

Figure 6. Recommended Footpads for DO214AC

Vishay: ISO/TS 16949:2002 Certified

Vishay is proud to have acquired ISO/TS 16949:2002 certification for all power diode manufacturing sites. This demonstrates our philosophy in quality management system deployment using the automotive “Process Approach” for example:

- Line-of-sight to the customer processes
- Value of product driven by efficient processes

Aligned with our common business practices and intrinsic technology, divisional processes are mapped into functional processes focusing on process interaction and performance linked to customer satisfaction.

Following are some common questions associated with ISO/TS 16949:2002.

WHAT IS ISO?

ISO (the international Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees (the ISO/TC).

WHAT IS ISO 9000?

ISO 9000 is a family of standards for quality management systems. ISO 9000 includes the following standards:

- ISO 9000:2000, quality management systems - fundamentals and vocabulary
- ISO 9001:2000, quality management systems - requirements
- ISO 9004:2000, quality management systems - guidelines for performance improvements

A company or organization that has been independently audited and certified to be in conformance with ISO 9001 may publicly state that it is “ISO 9001 certified” or “ISO 9001 registered”. Certification to an ISO 9000 standard does not guarantee the compliance (and therefore the quality) of end products and services; rather, it certifies that consistent business processes are being applied.

WHAT IS ISO 9001:2000?

The last revision of ISO 9000 was ISO 9000:1994 (revised in 1994): The three 'models' for quality management systems being ISO 9001, ISO 9002 and ISO 9003. The current revision is ISO 9000:2000 (revised in 2000) and combines the three standards (9001, 9002 and 9003) into one, now called 9001. The ISO 9001:2000 promotes the adoption of a process approach when developing, implementing and improving the effectiveness of a quality management system, to enhance customer satisfaction by meeting customer requirements.

WHAT IS ISO/TS?

The main task of ISO technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document such as:

- An ISO Publicly Available Specification (ISO/PAS)
- An ISO Technical Specification (ISO/TS)

An ISO/PAS or ISO/TS is reviewed after three years to decide whether it should be confirmed for a further three years, revised to become an International Standard, or withdrawn.

WHAT IS ISO/TS 16949:2002?

The International Automotive Task Force (IATF) is a group of automotive manufacturers and their respective trade associations, formed to provide improved quality products to automotive customers worldwide. The ISO/TS 16949:2002 was jointly developed by IATF members and submitted to the ISO for approval and publication. The document is a common automotive quality system requirements catalog based on ISO 9001:2000, AVSQ (Italian), EAQF (French), QS-9000 (U.S.) and VDA6.1 (German) automotive catalogs. This document, coupled with customer-specific requirements defines quality system requirements for use in automotive supply chains.

WHICH ORGANIZATION CAN OBTAIN CERTIFICATION/REGISTRATION TO ISO/TS 16949:2002?

Any organization in the automotive supply chain meeting the scope below (and its definition for Automotive, Site and Manufacturing) can obtain certification to ISO/TS 16949:2002

- ISO/TS 16949:2002, in conjunction with ISO 9001:2000, defines the quality management system requirements for the design and development, production and, when relevant, installation and service of automotive-related products.
- ISO/TS 16949:2002 is applicable to sites of the organization where production and/or service parts specified by the customer are manufactured.

WHAT IS CUSTOMER SPECIFIC REQUIREMENTS (ISO/TS-16949) SEMICONDUCTOR COMMODITY?

The Automotive Electronics Council (AEC) revised the previous QS-9000 (2nd edition) Semiconductor Supplement to align with the ISO/TS 16949:2002 standard. The Semiconductor Supplement, Second Edition, coordinates its paragraph numbering with the base document.

The goal of this Semiconductor Supplement is to assist the semiconductor industry in the application of ISO/TS 16949:2002 for the development of fundamental quality systems that provide for continuous improvement, emphasizing defect prevention and the reduction of variation and waste in the semiconductor supply chain.

WHAT DOES ISO/TS 16949:2002 REGISTRATIONS MEAN TO VGS AND OUR CUSTOMERS?

Vishay is both a direct and indirect supplier to the automotive industry. That is, product is supplied directly to these organizations, and also to other first tier suppliers of automotive electronics. ISO/TS16949 presents an opportunity to upgrade our existing certification at our manufacturing sites as part of our commitment to continuous improvement and total customer satisfaction. While ensuring the quality system can deliver the quality levels and improvements required by our automotive customers, it also benefits our customers in other end markets, by ensuring the highest quality products and services.

Vishay's certification under ISO/TS16949 and the Semiconductor Supplement is an achievement that our whole team is proud of. It underscores our commitment, as one of the leading suppliers of power semiconductors, to continuous improvement and total customer satisfaction.

TMBS®, Trench MOS Barrier Schottky Rectifiers Address Weaknesses of Traditional Planar Schottky Devices

Max Chen, Research and Development Senior Director, Vishay General Semiconductor
Henry Kuo, Research and Development Senior Manager, Vishay General Semiconductor
Sweetman Kim, Marketing Senior Manager, Vishay General Semiconductor

Until recently, silicon-based Schottky barrier rectifiers were limited to operating voltages below 100 V for most applications. However, the trend in high-frequency applications has been towards greater power consumption, requiring higher reverse bias voltages (100 V and above) for higher-output adapters. In consumer electronics, there has been a rapid increase in the power consumption of computers, game consoles, and LCD TVs. A similar development has occurred in the design of high-power, high-efficiency telecom base station power supplies. Higher voltage spikes and/or higher switching frequencies are the inevitable outcome of this trend.

Consequently, Schottky rectifiers are now being designed with higher operating voltage ranges. To meet the requirements of the consumer electronics and telecom applications, 100 V Schottky rectifiers have become more common, with new designs moving toward reverse bias voltage ratings of 120 V and 150 V or even 200 V. However, as higher operating voltages have become more common, the performance limitations of Schottky devices have become more obvious.

As shown in figure 1., planar structures typically implement a carefully designed P-type guard-ring structure, a high-resistivity silicon epitaxial layer, and a high Schottky barrier height to achieve breakdown voltages of 100 V and above with an acceptable reverse leakage current. In this structure, the P-type guard-ring injects minority carriers into the semiconductor drift region; these carriers slow down the Schottky rectifiers under switching conditions.

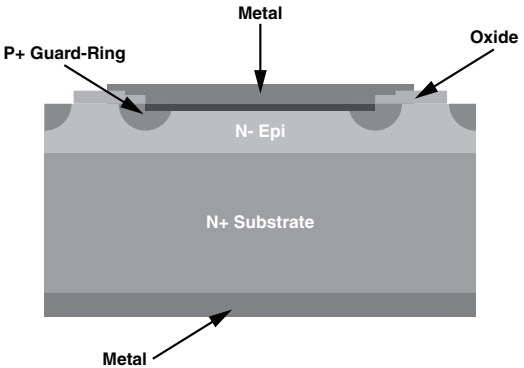

Figure 1. Planar Structures Achieve Breakdown Voltages of 100 V and Above by Utilizing a P-type Guard-Ring Structure, a High-Resistivity Silicon Epitaxial Layer, and a High Schottky Barrier Height

As the operating voltage moves to 100 V and above, the high-resistivity silicon and high Schottky barrier height become factors in significantly increasing on-state voltage drop and slowing switching speeds. These limitations can be alleviated by using an innovative device built on a trench metal oxide (MOS) technology.

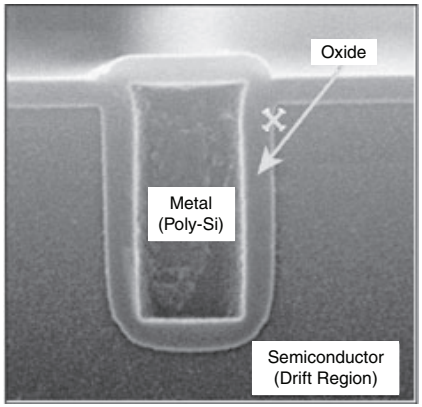

Figure 2. SEM Photograph of a Single TMBS Sub-Micron Cell

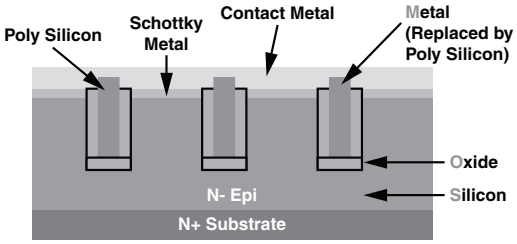

Figure 3. Multi-Cell Structure of a TMBS

The increased on-state voltage drop and slower switching speeds of traditional planar Schottky rectifiers can be overcome by a new series of 100 V rectifiers that apply the Trench MOS Barrier Schottky (TMBS®) structure. A single TMBS sub-micron cell is shown in the SEM photograph of figure 2. and the multi-cell structure of the device is illustrated in figure 3. The parameters that affect TMBS performance include the trench depth, mesa width, trench oxide thickness, doping of the epitaxial layer, and electric field termination. These parameters are related to stress, charge coupling, optimized forward voltage drop (V_F), and reverse current (I_R).

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Document Number: 89106
Revision: 23-Jul-08

As shown in figure 4., depletion regions occur when the TMBS device is in reverse bias, and the MOS couples the charge along its sidewall. The depletion regions of two adjacent MOS transistors will overlap as the reverse bias increases, resulting in “pinch-off” (an overlapped depletion region). The Schottky diode’s interface leakage current (I_R) is reduced by this pinch-off electric field.

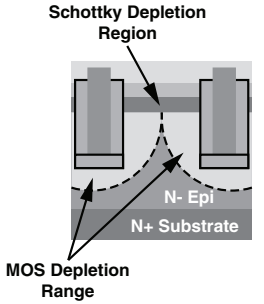


Figure 4. The Depletion Regions of two Adjacent MOS Structures will Overlap as the Reverse Bias Increases, Resulting in an Overlapped Depletion Region

In the Trench MOS Barrier structure, stored charges are minimized under switching conditions as depletion regions diminish minority carrier injections to the drift region. The switching speed is much improved, especially under high working temperature and high conduction current conditions.

As depicted in figure 5., the Trench MOS structure provides charge-coupling effects in the drift region that will change the shape of the electric field distribution from linear to non-linear, where same reverse breakdown voltages (which is the integration of electric field along the distance of drift region) will be obtained even with much lower resistivity silicon, as indicated by the sharp gradient of TMBS electric-field curve.

By altering the electric field distribution, the TMBS structure moves the stronger electric field away from the Schottky metal-silicon interface to the silicon bulk. As indicated in figure 5., the surface electric field (E-field) of the TMBS device is much lower than the planar Schottky devices. The reduced surface field will suppress the barrier-lowering effect, which significantly reduces the leakage current for a given Schottky barrier height. This allows lower Schottky barrier heights to be used without sacrificing reverse leakage performance, which in turn results in a lower forward on-state voltage drop.

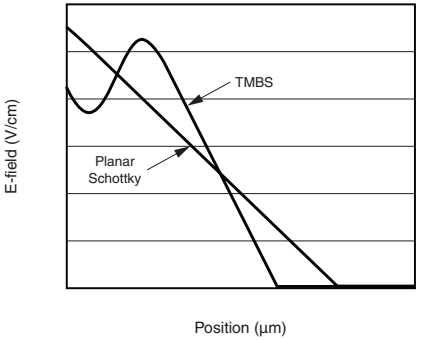


Figure 5. A Comparison of the Electric Field Curves of the TMBS and Planar Schottky Along the Semiconductor Drift Region Shows the Surface Electric Field of the TMBS is Much Lower than the Planar Schottky

TMBS AND PLANAR SCHOTTKY PERFORMANCE AND ELECTRICAL COMPARISON

When compared to conventional planar Schottky rectifiers with the same chip sizes and barrier heights, a 100 V TMBS device shows remarkable forward voltage drop performance (Figure 6.). The switching performance of the TMBS is also better, as shown in figure 7.

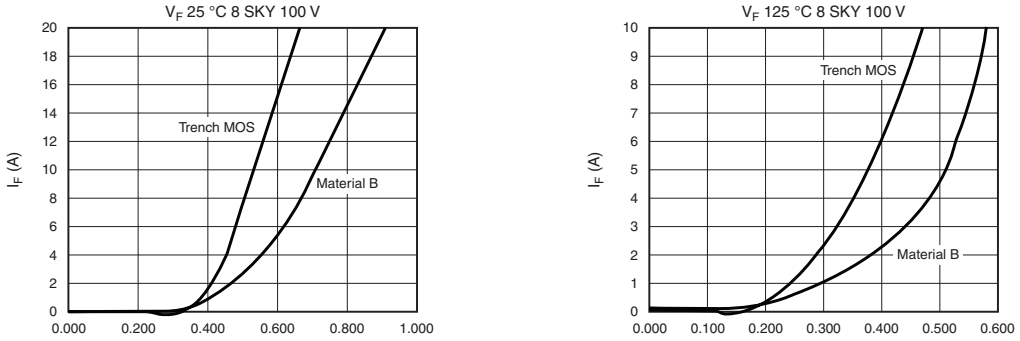
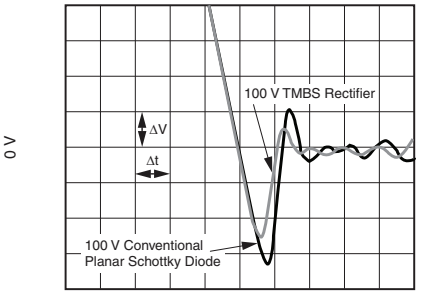


Figure 6. V_F Comparison of TMBS and Conventional Planar Schottky Rectifiers



ΔV = 200 mV Δt = 25.0 ns

Figure 7. t_{rr} Curves of TMBS and Planar Schottky Rectifiers Show TMBS has Better Switching Performance

We performed a series of experiments in which TMBS rectifiers were tested against benchmark planar Schottky rectifiers to compare the two structures in an actual application. In the first test, we used a 350 W switch mode power supply (SMPS) as a test vehicle. TMBS devices rated at 40 A and 100 V were compared to industry-standard Schottky rectifiers rated at 20 A and 100 V (MXXXXH100CT) and two such devices with ratings of 60 A and 100 V (XXCTQ100 and STXXXXH100CT). All devices in this evaluation are packaged in the standard TO-220.

The results show that at a 67 % output (about 235 W) to full rated power levels, the 20 A rated device has the lowest total power supply efficiency of 78.3 % (Table 1). When the 60 A rated devices were substituted for the 20 A devices in the same power supply slot, efficiency improvements of 0.8 % and 0.9 % were observed. These improvements translate into a savings of 2.35 W and 2.77 W, respectively, for the power supply. Even when the 40 A TMBS rectifier is used to replace a traditional planar device rated at 60 A, we see an improvement in efficiency of 0.4 %. Compared to a baseline 20 A planar Schottky rectifier, the efficiency improvement is 1.3 %, for a power savings of 3.72 W.

TABLE 1

PART NUMBER	INPUT POWER (W)	OUTPUT POWER (W)	EFFICIENCY	POWER SAVING
Industry 20 A planar Schottky (MXXXXH100CT)	299	234	78.3 %	0 (Base)
Industry 60 A planar Schottky (XXCTQ100)	298	236	79.1 %	2.35 W
Industry 60 A planar Schottky (SXXXXXH100CT)	297	235	79.2 %	2.77 W
Industry 40 A TMBS (VTS40100CT)	297	236	79.6 %	3.72 W

Note

- Efficiency evaluation on a 350 W SMPS (switch-mode power supply), comparing TMBS with industry-standard planar Schottky products. TMBS provides efficiency improvement of 1.3 %, for a power savings of 3.72 W

By evaluating TMBS rectifiers with ratings of 40 A and 100 V (VTS40100CT) in a 120 W adapter, we were able to further demonstrate the capabilities of the new TMBS devices. The typical solution for this application is a synchronous rectification approach implemented with two 40 A, 100 V MOSFETs and a matching driver IC. From test data as described in Table 2, and under full-rated 120 W output conditions, the pair of TMBS rectifiers provide the same total adapter efficiency of 87 % as the more complicated, more costly, and less robust synchronous rectification solution.

TABLE 2

ORIGINAL 40 A/100 V SR SOLUTION			CHANGE TO 40 A/100 V TMBS		
INPUT VOLTAGE	**90 V_{AC}**	**100 V_{AC}**	**INPUT VOLTAGE**	**90 V_{AC}**	**100 V_{AC}**
I_{in} (A)	1.56	1.39	I_{in} (A)	1.56	1.40
P_{in} (W)	140	139	P_{in} (W)	140	139
V_0 (V)	20.2	20.2	V_0 (V)	20.2	20.2
I_0 (A)	6.0	6.0	I_0 (A)	6.0	6.0
P_0 (W)	121	121	P_0 (W)	121	121
Efficiency %	86.4	87.1	Efficiency %	86.2	87.0

Note

- Efficiency evaluation on 120 W adapter. The TMBS rectifier pair provides the same efficiency as the more complicated, more costly, and less robust synchronous rectification solution

The ability to withstand higher energy transients during reverse bias is another advantage of the TMBS structure. The strongest electric field of a conventional planar Schottky rectifier is at the surface of the device, which will limit heat dissipation and avalanche energy absorption. The strongest electrical field of a TMBS device, by contrast, distributes at the bottom of each trench well. The silicon bulk can thus absorb and dissipate more avalanche energy than at the surface.

For high ESD or rectification applications such as OR-ing diodes in hot-plug systems and diodes in SMPS, the ability to enable high reverse avalanche energy makes the TMBS rectifier the more suitable structure. The average of 8/20 µs reverse surge energy of the 40 A, 100 V VTS40100CT is about 170 mJ. This is about twice the conventional planar Schottky diode's reverse surge energy under the same test condition.

At a low reverse bias, TMBS devices have a much higher capacitance (C_J) than planar Schottky diodes. This high capacitance is caused by the trench sidewall and bottom capacitance being in parallel with the original Schottky barrier capacitance. When reverse bias increases, however, the TMBS capacitance falls significantly. Depletion regions will completely overlap when reverse biases are high enough.

TMBS and planar Schottky diodes have a similar electrical field distribution. Figure 8. shows the capacitance of Vishay TMBS and a planar Schottky having the same chip size. We can see that the C_J of the 100 V TMBS is close to that of the planar Schottky rectifier for reverse bias voltages over 30 V. However, since TMBS has a higher current density, a smaller chip with lower capacitance may be used for a particular application.

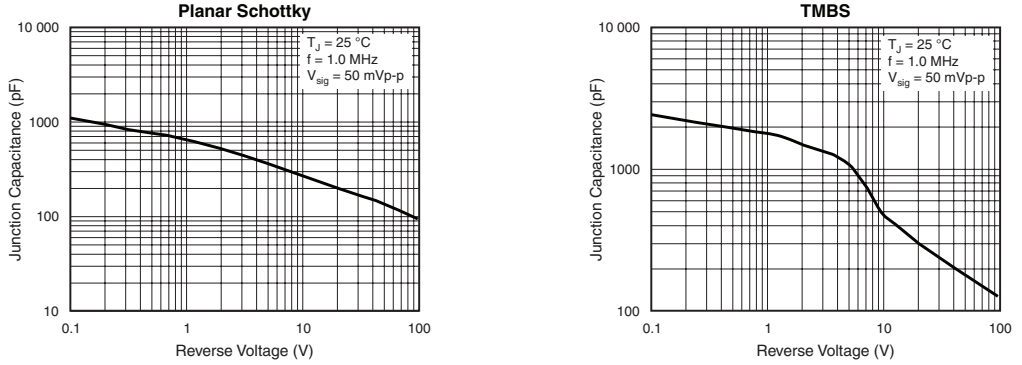


Figure 8. Capacitance Comparison Between TMBS and Planar Schottky Diodes Shows that TMBS is Close to that of the Planar Schottky Rectifier for Reverse Bias Voltages over 30 V

So far, benchmark and application tests have focused on TMBS products with a 100 V reverse bias voltage. However, 120 V products have been developed and released for applications that see higher voltage spikes and where a 100 V rated product might provide inadequate headroom to ensure long-term reliability. These 120 V products offer current ratings from 15 A to 60 A and are offered in the ITO-220, TO-220, TO-262, TO-263, and TO-247 packages.

200 V devices are the next stage for TMBS rectifiers. The devices are currently under development, and the preliminary test results as described in Table 3 have been very encouraging, showing that the TMBS rectifier provides lowest on-state voltage drop compared to the industry-benchmark 200 V planar Schottky rectifiers and 200 V ultra-fast p-n junction diodes. The comparison underscores the switching performance advantages of the TMBS rectifier.

In addition to offering half the stored charge of industry-benchmark devices, the peak switching reverse recovery current (I_{rr}) of TMBS rectifiers is also 34 % lower by comparison. This low I_{rr} will contribute to the lower switching losses of the transistor switches and improve the power conversion efficiency of the complete circuit, particularly in designs with switching frequencies above 300 kHz. The first 200 V rated TMBS rectifier has been released in Q4, 2006.

TABLE 3 - ADVANTAGES OF TMBS OVER PLANAR SCHOTTKY IN RECTIFICATION APPLICATIONS				
PRODUCT TYPE		INDUSTRY 200 V PLANAR SCHOTTKY (MXXXX200CT)	INDUSTRY 200 V ULTRAFAST DIODE (SXXX3002CG)	VISHAY 200 V TMBS (EXPERIMENTAL)
V_R (V)	at 1 mA/25 °C	259	296	210
I_R (mA)	at 200 V/125 °C	0.10	0.01	6.70
V_F (V)	at 5 A/125 °C	0.57	0.64	0.53
V_F (V)	at 15 A/125 °C	0.69	0.80	0.65
I_{rr} (A)	5 A, - 300 A/µs, 100 V, 10 %, 125 °C	7.2	7.0	4.7
t_{rr} (ns)		33	29	25
Q_{rr} (nC)		122	104	60

Note

- Comparison of electrical characteristics for the experimental 200 V TMBS rectifier and 200 V planar Schottky rectifier and ultra-fast diode.

As demonstrated in Table 1, the lower forward voltage drop and faster switching speed of the TMBS allow switch mode power supplies to achieve higher efficiency operation. The performance comparisons above (see Table 2) also show that TMBS achieves the same efficiency as a MOSFET synchronous rectifier in a 120 W adapter application, but at a lower cost. This application will be discussed further below, as well as other applications for the TMBS.

Due to the higher efficiency and better thermal performance of low on-resistance MOSFETs, synchronous rectification circuits have used them instead of planar Schottky rectifiers. However, as we have shown, TMBS is a cost-effective alternative to MOSFET synchronous rectifiers. Furthermore, TMBS offers the better performance in low output current devices such as adapters and open-frame power supplies. Synchronous MOSFET rectifiers may indeed provide good performance in high-current rectification applications, but the percent of MOSFET switching losses grows higher in the total power loss at output rectification in small current applications.

In addition, by requiring complex circuitry to control it, the MOSFET creates additional failure risks that can reduce the reliability of power supply systems. Therefore, low-V_F TMBS rectifiers are more suitable for lower-current adapters and open frame power supply designs. The performance of TMBS can compete with MOSFET in lower-current rectification applications and enjoys the advantages of shortened design cycles and lower production costs by requiring no additional control circuits. A block diagram showing a MOSFET implementation of synchronous rectification is shown in figure 9., and an alternate circuit using TMBS is shown in figure 10. As illustrated in these two figures, a single TMBS diode may replace the MOSFETs and drive circuit, thus simplifying the circuit significantly.

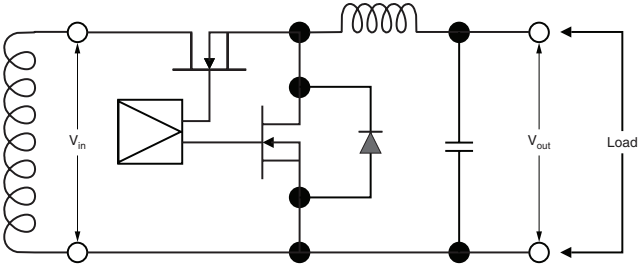


Figure 9. MOSFET Implementation of Synchronous Rectification

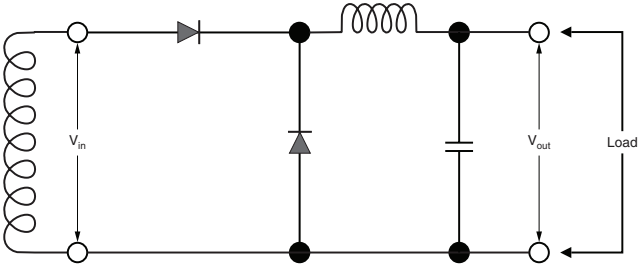


Figure 10. Alternate Circuit Using TMBS

Diodes for redundant power supplies used in high-reliability power systems (Figure 11.) are called OR-ing diodes, which are widely used in computer servers and telecommunication systems. The OR-ing diode at SMPS2 must have a reverse breakdown voltage greater than the output voltage of SMPS1 in order to protect SMPS1. It must also have a low reverse leakage current. However, if SMPS1 malfunctions and shuts down and SMPS2 turns on, it is important that the OR-ing diode have a low forward voltage drop to minimize power losses from SMPS2.

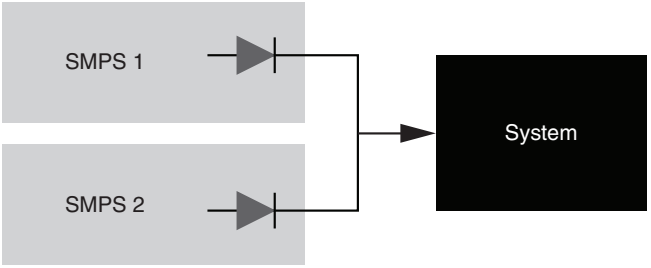


Figure 11. Redundant Power Supply Used in a High-Reliability Power System with OR-ing Diodes

In high-reliability power systems, the system is protected from a shutdown resulting from malfunctions in one of the power supplies by having redundant power supplies share electrical loads. The design aims to isolate the failed SMPS from the common bus if an SMPS failure occurs, and thus requires a switch to isolate the failed SMPS. This switch must be highly sensitive and able to react with high interrupt speed when an SMPS fails; but it must also have low conductivity for big transient loads.

For OR-ing functions in isolated redundant power supplies, TMBS diodes offer significant improvements over conventional diodes. Low-$r_{(DS)on}$ MOSFETs (OR-ing FETs) are sometimes used in these applications. However, OR-ing FETs have a lower turn speed than OR-ing diodes, which may cause undesirable 0.8 V to 1.5 V voltage drops by the body diode of the OR-ing FET after it is tripped by high-transient voltage changes from high loading to low loading. The more reliable redundant-power-system design is to use one OR-ing FET in parallel with one low-V_F Schottky diode. The 100 V TMBS Schottky diode offers an outstanding design solution in telecom redundant power systems.

Another advantage of TMBS diodes is a higher reverse energy capability, allowing them to better withstand transients when power supplies switch on. The unique trench well structure and silicon bulk in the TMBS absorb and dissipate more avalanche energy than the plain interface structure of conventional planar Schottky rectifiers. This ability to enable higher reverse avalanche energy makes the TMBS more suitable for use in high-ESD or rectification applications than the average 8 µs by 20 µs reverse surge energy of the VTS40100CT is about 170 mJ, which is about two times that of conventional planar Schottky diodes under the same testing conditions.

The First Commercial 200 V TMBS® (Trench MOS Barrier Schottky) Rectifier vs. Traditional Rectifiers in Telecom Applications

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ABSTRACT

The design and manufacturing process for the first commercial 200 V Trench MOS Barrier Schottky (TMBS®) rectifier is described. Its electrical characteristics are compared to traditional 200 V planar Schottky and 200 V ultrafast recovery diodes, showing the strengths of the TMBS rectifiers compared to both technologies. The 200 V TMBS is subsequently evaluated in telecom switchmode power supply (SMPS) and dc-to-dc converter applications, where its impact on improving system efficiency is analyzed and reported.

1. INTRODUCTION

Traditionally, the reverse blocking voltage of Schottky barrier rectifiers has been limited to well below 200 V. This is partly because, when the reverse blocking capability approaches 200 V; the forward voltage drop (V_F) of the Schottky rectifier will approach that of a PIN rectifier, making it less effective in the application. Another reason for this limitation is the need to terminate the high reverse electric field properly. A P-type guardring structure is usually built into the N-type silicon, and this guard-ring structure will induce a high degree of minority-carrier injection to the N-type drift region under forward conduction mode. When this happens, the Schottky rectifier will incur high switching losses in the circuit, also making it a less attractive component choice compared to ultrafast recovery diodes.

Addressing the weaknesses of high V_F and high switching losses in traditional 200 V Schottky rectifiers, the industry's first 200 V Trench MOS Barrier Schottky (TMBS) rectifier, constructed with a shallow trench and thin gate oxide structure, is proposed and presented in this paper.

The edge termination of this 200 V TMBS device is accomplished by a novel design fabricated together with the main cells of the device, such as that described by Hsu et al [1]. By properly selecting the critical device dimensions, a reverseblocking capability meeting 200 V application requirements is achieved using multi-trenches with dimensions of only 2.0 µm to 2.5 µm deep and a thin gate oxide layer of 0.30 µm or less. This design greatly facilitates manufacturing throughput and process control while eliminating the need for deep trench fabrication.

2. DESIGN, SIMULATION AND FABRICATION

2.1 The 200 V TMBS Design

For the design of the 200 V TMBS rectifier shown in figure 1., including the main cells and edge termination structure, comprehensive numerical analysis using the SILVACO two-dimensional device simulator was performed to show the relationship between device's electric characteristics and critical structural parameters.

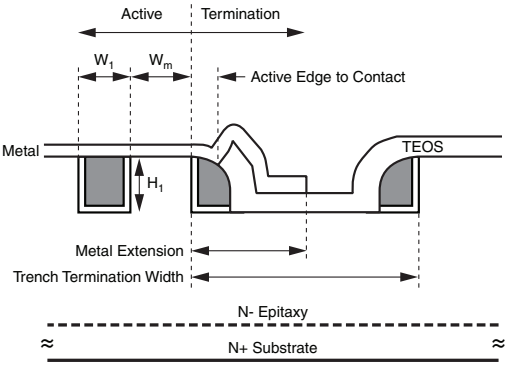

Figure 1. The Schematic Cross Section of a TMBS Diode with the Novel Trench Termination Design. W_t, W_m and H_t Represent Trench Width, Mesa Width and Trench Depth Respectively.

The structural parameters were recursively simulated based on those relationships to meet our target specifications for on-state voltage drop and reverse leakage at 125 °C. With an eye towards manufacturing throughput, we found the optimum structure has a trench depth of 2.1 µm and oxide thickness of 0.27 µm. These dimensions are much smaller than those previously published for 100 V trench rectifiers by Shimizu et al. [2]; they are also smaller than the published figures for 150 V GD-trench rectifiers with a device simulation with trench depth of 8.0 µm and oxide thickness of 0.7 µm presented by Mahalingam and Baliga [3]. This shallow-trench thin-oxide TMBS (STTO-TMBS) structure can greatly reduce the process cycle time required for trench etching in fabrication and thus improve manufacturing process throughput.

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Document Number: 89107
Revision: 23-Jul-08

2.2 Simulation Results

The electric field distribution along the centerline of an active cell was plotted against the depth into the N-type drift region for the optimized design, under 200 V reverse bias voltage. A similar simulation was carried out on a traditional 200 V planar Schottky device and the electric field curve was overlapped to the TMBS curve as depicted in figure 2.

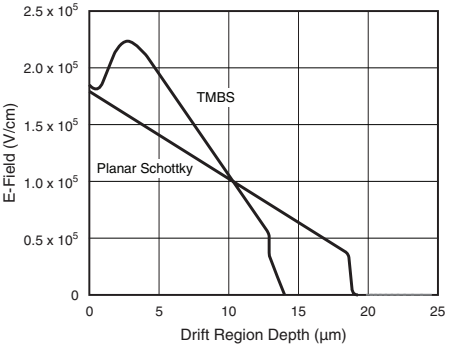

Figure 2. The Simulated Electric Field Strength at a Reverse Voltage of 200 V for TMBS and Traditional Planar Schottky

As described in figure 2., under 200 V reverse bias, we find that the TMBS rectifier has an electric field distribution with peaks at the depth of 2.8 µm and a value of 2.2 x 10^5 V/cm; this field strength is 73 % of the critical electric field of the silicon at 3.0 x 10^5 V/cm. On the other hand, the planar Schottky rectifier's electric field strength curve follows that of a typical metal-semiconductor junction characteristic, with a linear distribution. Due to the nonlinear electric field strength behavior of TMBS rectifier, we have been able to achieve the desired 200 V reverse blocking capability with a higher concentration of silicon than that found in a planar Schottky rectifier as indicated by gradients of the respective electric field strength curves which follow the formula:

$$\frac{dE(x)}{dx} = -\frac{qN_A}{\varepsilon_S}$$

Another TMBS advantage is the narrowness of the required drift region, which is 13 µm for TMBS and much less than the 19 µm found in a planar Schottky rectifier. Combining the above two factors, the TMBS rectifiers provide much less drift region conduction resistance, which is sufficient to negate the area loss contributed by the non-conducting MOS trench structures.

Besides the active cells, the electric field distribution was also analyzed for the edge termination regions. As shown in figure 3., under 200 V reverse bias voltage, the maximum electric field strength is uniform across the active cell trench corners and the termination regions. With this result, we have ensured the device performance is optimized per the material used and the design envelope of the trench physical dimensions. It also paves the way for ensuring excellent avalanche capability when reverse overstress occurs.

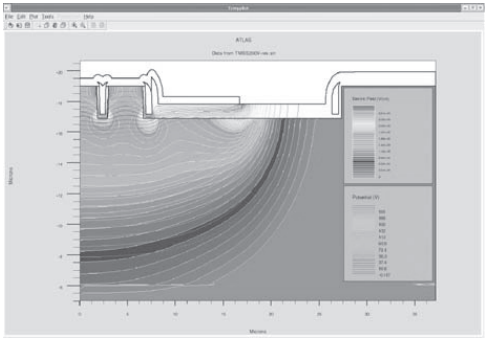

Figure 3. The Simulated Electric Field Distributions and Equipotential Lines of a TMBS Diode Under 200 V Reverse Bias

2.3 Fabrication

The fabrication process starts with trench etching in the active and termination regions (Figure 1.). After gate oxidation, an N+ polysilicon layer is deposited and an etching back process forms the poly spacer in the termination region. With the MOS structure formed in the trenches by the polysilicon-oxide-silicon configuration, a passivation layer is deposited, followed by definition of the metal-semiconductor (M-S) contact region. After the formation of the M-S Schottky contact with a selected barrier metal, a conduction metal layer is deposited, and a mask is used to define the metal region. The wafers are then subjected to a back grinding and backside metalization process to form the ohmic contact for the wafer backside. For the critical Schottky contact in this process flow, and to achieve specific device characteristics, a proprietary sputtering process and salicide structure have been developed to enable selection of Schottky barrier heights from 0.70 eV to above 0.80 eV.

3. DEVICE CHARACTERIZATION

3.1 Parametric Measurement

Our 200 V TMBS wafers were sawn to chips and assembled in TO-220 packages for parametric measurement. Their static DC characteristics were checked by multifunction production testers and high-power curve tracers (Tektronix-371A). A constant temperature chamber was used for specific-T_J measurement to simulate the actual device working environment. An LEM tester with module LEM Q_{rr} 50 A was used for device switching performance characterization, where several combinations of I_F, dI/dt, and VR conditions were measured.

The 200 V TMBS is designed to have optimized V_F performance with the current density near 180 A/cm^2. As far as switching performance is concerned, in high forward-current and high-frequency switching applications, 200 V TMBS limits the minority carrier injection and quickly recombines minority carriers through high-concentration

majority carriers. The device's punch-through design, which enhances this recombination effect, also contributes to the excellent switching performance of the 200 V TMBS rectifier.

3.2 Benchmarking Test with Planar Schottky and Ultrafast Rectifier

The electrical characteristics of packaged 200 V TMBS rectifiers were compared to industry standard planar Schottky barrier rectifiers with a 90 A datasheet rating and to three types of 30 A rated ultrafast recovery diodes (UFRD) from leading power semiconductor manufacturers. When compared to planar Schottky rectifiers, the forward voltage drop (V_F) of 200 V TMBS device achieved a better than 13 % improvement at a current density of 180 A/cm^2 and junction temperature of 125 °C (Figure 4.). In fact, the 200 V TMBS provided various degrees of V_F improvement over the whole forward current range. On the other hand, when compared to an UFRD having the same die size, the 200 V TMBS showed a V_F improvement of 16 % at a current density of 180 A/cm^2 (at T_J = 125 °C) while its switching characteristics are the same (see Table 1).

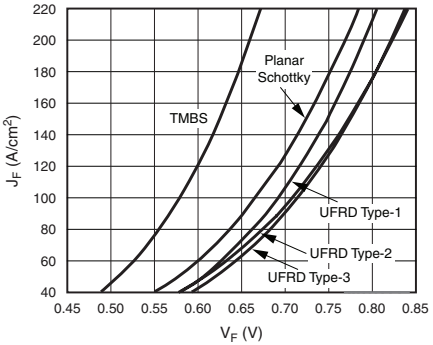

Figure 4. J_F - V_F Curves for 200 V Rectifiers Under Benchmark (T_J = 125 °C)

TABLE 1 - ELECTRICAL CHARACTERISTICS COMPARISON OF 200 V RECTIFIERS

200 V RECTIFIERS COMPARISON		TMBS	PLANAR SCHOTTKY	UFRD TYPE-1	UFRD TYPE-2	UFRD TYPE-3
Die size (cm^2)	Die size	9.1 x 10^{-2}	2.0 x 10^{-1}	9.1 x 10^{-2}	7.7 x 10^{-2}	9.9 x 10^{-2}
V_R (V)	at 1 mA	210	222	269	266	287
I_R (mA)	at 200 V/125 °C	8.3	1.1	0.1	1.8	0.1
V_F (V)	at 15 A/125 °C	0.63	0.63	0.76	0.81	0.77
I_{rr} (A)	I_F = 15 A, dI/dt = - 200 A/µs, V_R = 200 V, 125 °C	5.8	8.6	7.2	5.8	7.1
t_{rr} (ns)		45	63	43	34	42
Q_{rr} (nC)		136	280	155	100	152

One commercial UFRD (Type-2) was observed to have better reverse-recovery performance compared to 200 V TMBS under condition of I_F = 15 A, dI/dt = 200 A/µs, V_R = 200 V, and T_J = 125 °C (Figure 5.), but its V_F was the highest observed also. According to data comparisons at 125 °C, this commercial UFRD was calculated to have a 19 % higher V_F than the 200 V TMBS under the same current density of 180 A/cm^2.

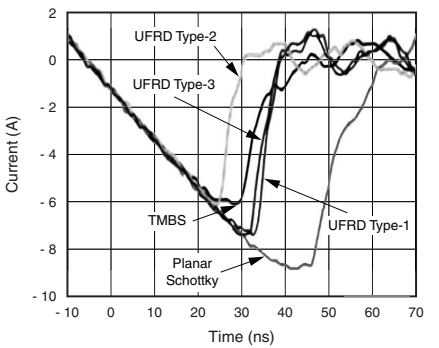

Figure 5. Switching Performance Comparisons Between 200 V Rectifiers (I_F = 15 A, dI/dt = 200A/µs, V_R = 200 V, T_J = 125 °C)

4. APPLICATION TEST

4.1 Efficiency Benchmark on SMPS

To assess the benefits of the device within an application, the 200 V TMBS rectifiers with the die size specified in Table 1 were used in a state-of-the-art ac-to-dc telecom SMPS with a 1800 W maximum output. The SMPS is built with a phase shift full-bridge ZVS (Zero Voltage Switching) topology. When measured at a 30 A, 51 V_{DC} output current, the 200 V TMBS solution provided a 0.44 % efficiency improvement compared to a commercial 200 V planar Schottky rectifier. It is worth noting that the die size of the TMBS used in this evaluation occupies only 46 % of the area of the planar Schottky. Four Schottky rectifiers were used in this SMPS, each with a common-cathode dual-rectifier configuration. The total silicon usage with the TMBS approach is 0.73 cm^2, compared to 1.60 cm^2 for the traditional planar Schottky technology in the 1800 W SMPS evaluation. Following is the test result in a chamber with constant 50 °C ambient temperature.

TABLE 2

PRODUCT	POWER LOADING	P_{in} (W)	P_{out} (W)	EFFICIENCY	POWER SAVING (W)
TMBS	~ 30 %	573	515	89.9 %	1.13
Planar Schottky		574	515	89.7 %	0 (base point)
UFRD Type-1		574	515	89.8 %	0.41
TMBS	~ 90 %	1685	1551	92.1 %	7.42
Planar Schottky		1691	1549	91.6 %	0 (base point)
UFRD Type-1		1688	1550	91.8 %	3.29

Note

- Efficiency comparisons between TMBS, planar Schottky, and UFRD used in a 1800 W rated SMPS at 50 °C ambient temperature; all devices packaged in the TO-247. Die sizes as described in Table 1.

4.2 Efficiency Benchmark on DC/DC Converter

To understand the benefit of the TMBS device, we tested one full-brick, 48 V input, and 32 V/18 A output isolated telecom dc-to-dc converter. This dc-to-dc converter topology has two forward converters in parallel with a 350 kHz switching frequency and uses four 200 V-rated 30 A rectifiers. Both of the UFRD Type-2 and UFRD Type-3 devices are ultrafast rectifiers with a typical t_{rr} of less than 17 ns.

The TMBS rectifier can deliver a 1 % efficiency improvement over the ultrafast rectifier in this application at an ambient temperature of 25 °C. Translated into power savings, this means the TMBS can reduce power dissipation by more than 5 W compared to ultrafast rectifiers in this dc-to-dc converter application. This power reduction is very important in dc-to-dc converter designs; and in particular from a thermal management point of view. Based on our comparisons to date with commercially available parts, there are no available planar Schottky rectifiers that can function within this 350 kHz application; when attempted, the converter shut down immediately due to its overload protection function.

In the next stage of testing, with the ambient temperature increased to 35 °C, the TMBS rectifier has demonstrated power savings of more than 9 W compared to the UFRD Type-2 sample, while the UFRD Type-3 sample would cause converter overload protection function to be triggered in this 35 °C ambient temperature test.

TABLE 3

PRODUCT	POWER LOADING	P_{in} (W)	P_{out} (W)	EFFICIENCY	POWER SAVING (W)
TMBS	~ 50 %	310	284	91.7 %	2.72
UFRD Type-2		312	284	90.9 %	0 (base point)
UFRD Type-3		312	284	90.9 %	0.15
TMBS	~ 100 %	621	569	91.6 %	7.14
UFRD Type-2		627	569	90.7 %	1.71
UFRD Type-3		628	568	90.5 %	0 (base point)

Note

- Efficiency comparisons between TMBS and two types UFRD on 600 W rated dc-to-dc converter at 25 °C ambient temperature; all devices packaged in the TO-263. Die sizes as described in Table 1.

5. SUMMARY

The development of a new 200 V TMBS rectifier built on a high-efficiency fabrication process and achieving improved electrical characteristics has been reported. The device parameters and specifications are carefully optimized to maximize efficiency in the manufacturing process and achieve target electrical characteristics. The forward voltage drop of the fabricated 200 V TMBS rectifier is 13 % lower than same-size planar Schottky rectifiers while exhibiting a reverse recovery charge of only 49 % of the comparable performance planar device value. The 200 V TMBS was evaluated in an 1800 W SMPS as the output rectifier, where the TMBS device required less than half the die size area to achieve 0.3 % better efficiency than the traditional planar Schottky rectifier. In the dc-to-dc converter evaluation, the overall performance of the 200 V TMBS is far superior to 200 V ultrafast diodes. These results indicate that TMBS rectifiers have high potential to become the preferred rectifier choice for 200 V applications in the future.

6. REFERENCES

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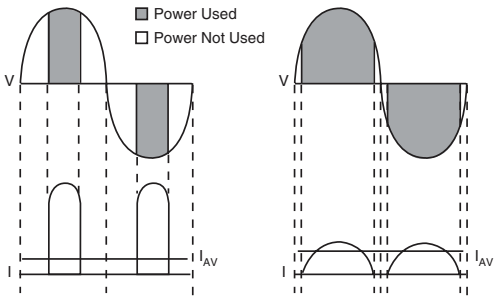
Power Factor Correction with Ultrafast Diodes

By Neven A. Soric, Applications Engineer

More and more switched mode power supplies (SMPS) are being designed with an active power factor correction (PFC) input stage. This is mainly due to the introduction of regulations aimed at restricting the harmonic content of the load current drawn from power lines. However, both the user and the power company benefit from PFC, so it just makes good sense.

Non-PFC power supplies use a capacitive input filter, when powered from the AC power line. This results in rectification of the AC line, which in turn causes high peak currents at the crests of the AC voltage, as in figure 1.a. These peak currents lead to excessive voltage drops in the wiring and imbalance problems in the three-phase power delivery system. This means that the full energy potential of the AC line is not utilized.



a. No Power Factor Correction b. Power Factor Corrected Input

Figure 1. Non-PFC vs. PFC Waveforms (Current, Voltage)

Power Factor Correction (PFC) can be defined as the reduction of the harmonic content, and/or the aligning of the phase angle of incoming current so that it is in phase with the line voltage. By making the current waveform look as sinusoidal and in phase with the voltage waveform as possible, as in figure 1.b., the power drawn by the power supply from the line is maximized for real power.

Real power is equal to $V_{RMS} \times I_{RMS} \times \cos \varphi$, where φ is the phase difference between the voltage and current waveforms. Therefore, as φ approaches zero, $\cos \varphi$ approaches unity, which maximizes the real power (now just $V_{RMS} \times I_{RMS}$).

Mathematically, Power Factor (PF) is equal to Real Power/ Apparent Power.

The basic concept behind PFC is to make the input look as much like a resistor as possible. Resistors have a power factor of 1 (unity). This is ideal, because it allows the power distribution system to operate at its maximum efficiency.

Lets consider a continuous conduction mode (CCM) boost converter being used for active PFC. The boost topology was chosen because it is the least expensive (cheapest) solution, and cost is always a major consideration. Please refer to figure 2.

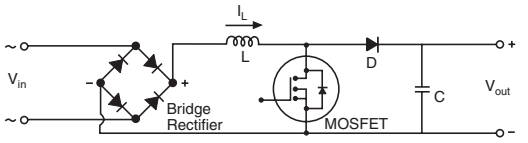


Figure 2. Continuous Mode Boost Converter Circuit

The input full-wave bridge rectifier converts the alternating current (AC) to direct current (DC). The MOSFET is used as an electronic switch, and is cycled “on” and “off” by an external source. While the MOSFET is “on”, the inductor (L) current increases. While the MOSFET is “off”, the inductor delivers current to the capacitor (C) through the forward biased output diode (D). The inductor current does not fall to zero during each switching cycle, which is why this is known as a “continuous conduction mode.” The MOSFET is pulse-width-modulated so that the input impedance of the circuit appears purely resistive, and the ratio of peak to average current is kept low.

The most cost-effective way of reducing losses in the circuit is by choosing a suitable diode for the application. Diodes for use in PFC circuits typically have higher forward voltages than conventional ultrafast epitaxial diodes, but much shorter (faster) reverse recovery times.

Vishay recommends the use of the UH-series for PFC applications.

TABLE 1 - PFC ULTRAFAST RECTIFIERS - MINI SELECTOR GUIDE					
VISHAY PART NUMBERS	**CASE OUTLINE**	**DESCRIPTION**	**I_{AV} (A)**	**V_{RRM} (V)**	**t_{rr} (ns)**
USB260	DO-214AA(SMB)	Plastic SMD	2	600	30
MURS260	DO-214AA(SMB)	Plastic SMD	2	600	50
31GF6	DO-201AD	Plastic Axial	3	600	30
SUF30J	P600	Plastic Axial	3	600	35
MURS360	DO-214AB(SMC)	Plastic SMD	3	600	50
MUR460	DO-201AD	Plastic Axial	4	600	50
UHF5JT	ITO-220AC	Isolated Power Pack	5	600	25
UH5JT	TO-220AC	Plastic Power Pack	5	600	25
UG5JT	TO-220AC	Plastic Power Pack	5	600	25
UGB5JT	TO-263AB	Power Pack SMD	5	600	25
UGF5JT	ITO-220AC	Isolated Power Pack	5	600	25
UH8JT	TO-220AC	Plastic Power Pack	8	600	25
UHF8JT	ITO-220AC	Isolated Power Pack	8	600	25
UG8JT	TO-220AC	Plastic Power Pack	8	600	25
UGB8JT	TO-263AB	Power Pack SMD	8	600	25
UGF8JT	ITO-220AC	Isolated Power Pack	8	600	25
UHF10JT	ITO-220AC	Isolated Power Pack	10	600	25
UG12JT	TO-220AC	Plastic Power Pack	12	600	30
UGB12JT	TO-263AB	Power Pack SMD	12	600	30
UGF12JT	ITO-220AC	Isolated Power Pack	12	600	30
UG15JT	TO-220AC	Plastic Power Pack	15	600	35
UGB15JT	TO-263AB	Power Pack SMD	15	600	35
UGF15JT	ITO-220AC	Isolated Power Pack	15	600	35

Rectifiers for Power Factor Correction (PFC)

CCM (Continuous-Conduction-Mode) and CRM (Critical-Conduction-Mode) devices are most widely adapted in commercial applications for power factor correction. CCM devices are often used in SMPS with output power ratings greater than 300 W; while CRM devices are often used in SMPS with output power ratings less than 300 W. CRM PFC devices operate in the boundary mode between CCM PFC and DCM (Discontinuous-Conduction-Mode) PFC devices.

PFC devices are generally selected base on the speed of their reverse recovery time (t_{rr}). Currently for CCM and CRM PFC devices in market, rectifiers up to 600 V with t_{rr} smaller or equal to 35 ns are generally used as CCM PFC; rectifiers up to 600 V with reverse recovery time between 35 ns to 60 ns are used as CRM PFC.

It should be noted there is a tradeoff between forward voltage drops and switching speed; when the reverse recovery time of Ultrafast rectifiers are less than 35 ns, their forward voltage drops would increase significantly, in turn the devices' forward surge current abilities would be diminished, therefore cautious attention should be taken when selecting the appropriate CCM or CRM PFC devices for various switch mode power supply applications, such that expected performance could be achieved and better reliability would still be ensured.

WHAT ARE THE EFFECTS OF NON-PFC-EQUIPPED CIRCUITS

Non-PFC power supplies use a capacitive input filter, as shown in figure 1., when powered from AC power line. This results in rectification of the AC line, which in turn causes peak currents at the crest of the AC voltage, as shown in figure 2. These peak currents lead to excessive voltage drops in the wiring and imbalance problems in the three-phase power delivery system. This means that the full energy potential of the AC line is not utilized.

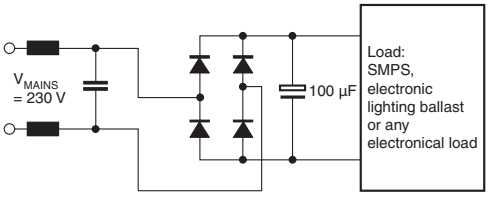


Figure 1. Standard Bridge Rectification of Line Voltage

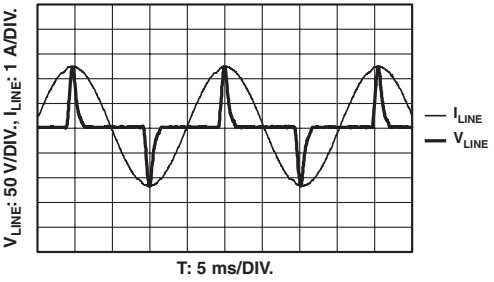


Figure 2. 20 W Resistive Load Powered by a Circuit Like figure 1.

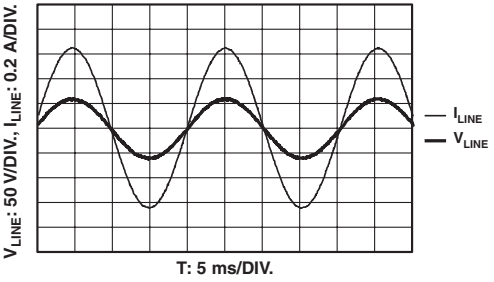


Figure 3. Same Load Like figure 2., but Unity Powerfactor

Power Factor Correction (PFC) can be defined as the reduction of the harmonic content. By making the current waveform look as sinusoidal as possible, as shown in figure 3., the power drawn by the power supply from the line is then maximized to real power. Assuming that the voltage is almost sinusoidal, power factor depends first of all on the current waveform.

Thus real power can be defined as:

$$P = V_{RMS} \times I_1 \times \sin(\omega_1 t)$$

$$S = \sqrt{P^2 + Q^2}$$

$$S = V_{RMS} \times \sqrt{I_1^2 \times \sin(\omega_1 t)^2 + I_2^2 \times \sin(\omega_2 t)^2 + ... + I_n^2 \times \sin(\omega_n t)^2}$$

That means that real power only is carried by the fundamental harmonic, all the higher harmonics are carrying only reactive power. Eliminating the higher harmonics means increasing power factor to unity.

The defination of power factor is:

$$\text{Power factor} = \frac{\text{Real power}}{\text{Apparent power}}$$

For the circuit in figure 1. the power factor is typically about 40 to 50 %.

For example (related to figures 1. and 2.):

The following measurements can be done with the circuit in figure 1.:

C =	100 µF	R =	680 Ω
I_{TRMS} =	495 mA	P =	20 W
S =	43 VA	Q =	38 var
Power factor =	0.464		

With the same resistor directly connected to the line terminals or using power factor correction the following results can be achieved:

I_{TRMS} =	172 mA	P =	20 W
S =	20 W	Q =	0
Power factor =	1		

This simple example gives a good impression what happens if all electronic equipment is powered without PFC. Obviously we see in this example the same real power, but big differences in RMS current.

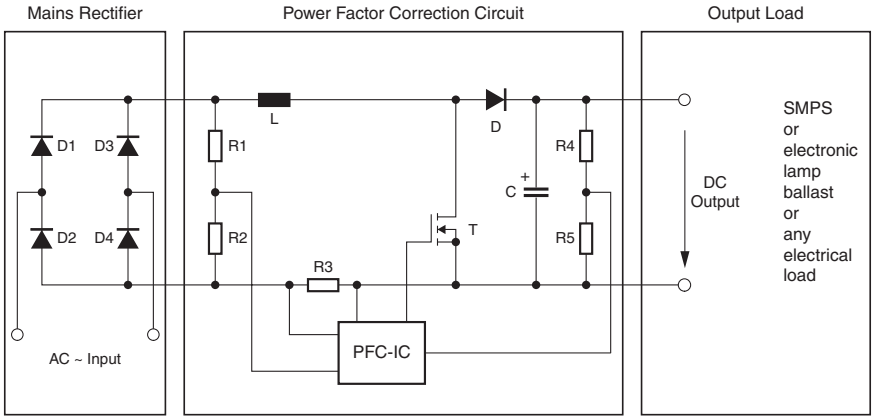


Figure 4. Typical Boost Converter Topology for Active PFC

Because it is the most cost saving solution the continuous conduction mode (CCM) boost converter as shown in figure 4. is today the most used topology for active power factor correction.

The bridge rectifier BR1 converts the AC input current into DC current. The MOSFET T is used as an electronic switch, and is cycled “on” and “off” driven by the PFC-IC. While the MOSFET is “on” the inductor current through L increases. While the MOSFET is “off”, the inductor delivers current to the capacitor C through the forward biased output rectifier diode D. The inductor current does not fall to zero during the entire switching cycle, because this operation is called “continuous conduction mode (CCM)”. This mode is suitable for almost all load current variations. If a constant load current is expected the so-called “discontinuous conduction mode (DCM)”, where currents falls at the end of each cycle to zero, should be preferred. The MOSFET anyway is pulse-width-modulated so that the input impedance of the circuit appears purely resistive, and the ratio of peak to average current is kept low.

The most cost-effective way of reducing losses in the circuit is by choosing a suitable diode D for the application. Diodes for use in PFC circuits typically have higher forward voltages than conventional fast epitaxial diodes, but much shorter (faster) reverse recovery times.

HOW A STANDARD PFC CIRCUIT WORKS

Figure 4. shows the typical topology of a PFC pre-stage that is built of a standard boost converter driven by a control IC. It is important that at the output of the Rectifier BR1 there will be no ”large” smoothing capacitor with several µF connected, because that would eliminate all efforts of the PFC circuit, although it would operate sufficiently. The input voltage of the PFC is a rectified DC voltage pulsed with double line frequency. The shown switch is usually implemented by an IGBT or Power-MOS transistor.

Operation principle:

The instantaneous value of the current through the boost inductor has to be adapted as well as possible to the instantaneous value of the line voltage through suitable pulse-width modulation of the transistor switch T. The actual inductor current can be won by the voltage drop at R3. The input voltage can be found at the voltage divider R1, R2. The current amplitude will be regulated on the value of the output voltage, R4, R5.

To be able to control the current through the boost inductor, the output voltage of the PFC has to be higher at every moment of operation than the crest of the line input voltage. For 230 V mains the DC output should be about 400 V. A large capacitor at the ouput does not affect the power factor, but is good for smoothing the DC voltage.

An additional advantage of PFC circuit is the regulated DC voltage that gives the opportunity of having a following SMPS to be wide range operated (e.g. 110 V to 230 V input voltage).

ADVANTAGES OF CIRCUITS WITH PFC

- The use of PFC allows the manufacturer of electrical load to use smaller, more cost-effective mains rectifiers because of smaller RMS current with PFC.
- Offers a stable regulated output voltage which is the input voltage for the following electrical load. Indeed the PFC makes it a system based wide-range power supply itself.
- The following electrical load (SMPS, Electronic ballast unit or other electrical load) can be much simpler, which is also a cost saving factor.

VISHAY General Semiconductor recommends the use of their ultrafast rectifier series of PFC rectifier.

RECOMMENDED REVERSE VOLTAGES FOR MOST USED LINE VOLTAGE LEVELS	
V_{LINE} RMS (V)	V_{RRM} (V)
110	400
120	400
230	600
277	600

Design Guidelines for Schottky Rectifiers

Known limitations of Schottky rectifiers
- including limited high temperature operation, high leakage and limited voltage range -
can be measured and controlled, allowing wide application on switch mode power supplies.

By Jon Schleisner, Senior Technical Marketing Manager

Schottky rectifiers have been used in the power supply industry for approximately 15 years. During this time, significant fiction as well as fact has been associated with this type of rectifier. The primary assets of Schottky devices are switching speeds approaching zero-time and very low forward voltage drop (V_F). This combination makes Schottky barrier rectifiers ideal for the output stages of switching power supplies. On the negative side, Schottky devices are also known for limited high-temperature operation, high leakage and limited voltage range B_{VR}. Though these limitations exist, they are quantifiable and controllable, allowing wide application of these devices in switch mode power supplies.

High leakage, when associated with standard P-N junction rectifiers, usually indicates “badness,” implying poor reliability. In a Schottky device, leakage at high temperature (75 °C and greater) is often on the order to several milliamps, depending on chip size. In the case of Schottky barrier rectifiers, high-temperature leakage and forward voltage drop are controlled by two primary factors: the size of the chip’s active area and the barrier height (ϕB).

Design of a Schottky rectifier can be viewed as a tradeoff. A high barrier height device exhibits low leakage at high temperature, however, the forward voltage drop increases. These parameters are also controlled by the die size and resistivity of the starting material. A larger die will lower the VF but raise the leakage if all other parameters are held constant. The resistivity of the starting material must be chosen in a range where the breakdown voltage (B_{VR}) is not degraded at the low end and the forward end of the resistivity range. Since a larger chip size is obviously more expensive, this is not the primary method for controlling these parameters. Chip size is usually set to a dimension where the current density through the die is kept at a safe level.

BARRIER HEIGHT (ϕB), A FACTOR

Vishay General Semiconductor produces two product lines of Schottky barrier rectifiers. One line is referred to as the “MBR” series, a high-temperature, low-leakage, relatively high VF type of Schottky device with a high barrier height (ϕB). The second line is the “SBL” series, designed to operate at lower temperature (125 °C or less); however, while leakage current is higher, forward voltage drop (V_F) is significantly lower and they are designed with a low-ϕB barrier height. The low- ϕB-line SBL series uses a nichrome barrier metal with a barrier height of ϕB = 0.64 eV. The high-ϕB MBR series uses a nichrome-platinum barrier metal to achieve barrier height (ϕB = 0.71 eV). Both series are guard-ring protected against excessive transient voltages.

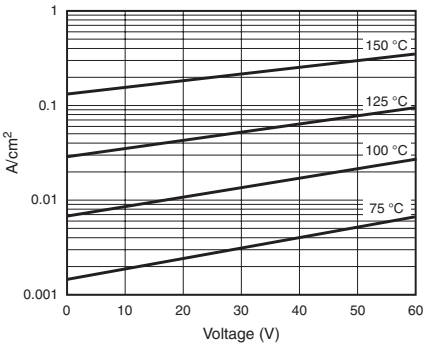


Figure 1.

Both the low and high-barrier-height Schottky devices are valuable in a variety of applications.When the true operating temperature of the Schottky rectifier exceeds 125 °C, the high-barrier-height series must be used to avoid thermal runaway.

This occurs when excessive self-heating of the rectifier causes large leakage currents, resulting in additional selfheating. The process becomes a form of positive thermal feedback and may lead to damage in the rectifier or inappropriate functioning of the circuit utilizing the device.

Using a high-barrier-height (MBR) component prevents this anomaly, but sacrifices higher forward voltage. Operating the low barrier height (SBL) series at a junction temperature of 125 °C, a decision on the use of a low- or high-barrier-height Schottky device must be made.

The following procedure has been developed to provide an analytical method of selecting the most efficient Schottky barrier device for a given application.

CALCULATING THE BARRIER HEIGHT (ϕB) OF SCHOTTKY RECTIFIERS

Calculating the barrier height of a Schottky rectifier where ϕB is not given is a straightforward process. The following two equations will yield an excellent engineering approximation of the barrier height, ϕB:

$$\phi B = (- KT/q)\ LN\ (J/R \times T) \qquad (1)$$

$J_0 = I_0$ /ACTIVE AREA (cm^2)
ϕB = barrier height (eV)
K = Boltzmann's constant = 8.62 x 105 eV/°K
T = ambient temperature in degrees kelvin
J_0 = current density at zero volts
R* = Richardon's constant = 112/cm^2k^2
I_0 = forward current at zero volts

To solve Equation One, the current density J_0 (Equation Two) must be found first:

$$J_0 = I_0 /ACTIVE\ AREA\ (cm^2) \qquad (2)$$

Vishay General Semiconductor provides the active area of its Schottky die in its product literature. If a manufacturer does not supply this information, decapsulating the device under question and measuring it with a precision caliper can provide an approximation of the active Schottky area, assuming 90 % of the total chip area is active.

$$Total\ die\ area \times 0.9 = active\ area \qquad (3)$$

The calculation of Io is done graphically (Figure 2.). A minimum of three low-current room-temperature forward voltage drop V_F measurements are needed. This data is graphed on semi-log paper (Figure 2.) where the vertical axis (log scales) is the current and the horizontal axis (linear scale) is the measured V_F When these points are graphed, the result should be a true straight line. If the graph curves downward (see the dotted line on the left side of figure 2.), it indicates that the lowest measurement current is being affected by the rectifier's room temperature leakage. In this case, the current level at which the V_F measurements are taken should be increased to "swamp" out the contribution of low level leakage on the measurement. If the current levels are raised excessively, the series resistance of the device in question will influence the measurements. This causes a downward curve as represented by the dotted line on the right side of Figure 2. Again, the results should yield a true straight line.

The point where the line intercepts the vertical axis is the current at zero Volts (I_0). J_0 is then calculated:

$$J_0 = I_0 /ACTIVE\ AREA\ (cm^2) \qquad (2)$$

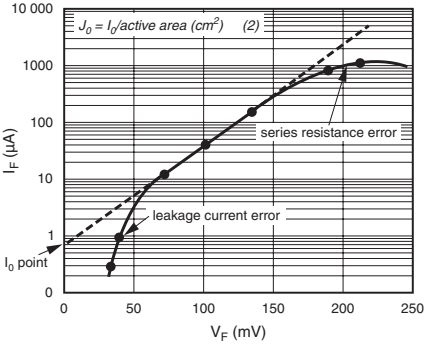


Figure 2. Calculation of J_0 (current density at zero volts)

This result is then placed into the first equation:

$$\phi B = (- KT/q)\ LN\ (J_0/R \times T^2) \qquad (1)$$

The results of the calculation are usually in the range of 0.6 eV to 0.8 eV. Results well outside this range indicated either a defective rectifier, measurement, or calculation error.

SELECTING EFFICIENT SCHOTTKY DEVICES

Normalized graphs of the low (SBL) and high (MBR) barrier height processes are provided.The vertical axis on all graphs is in amperes per square centimeter (A/cm^2).The horizontal axis provides forward voltage drop for the low and high barrier parts.Two additional graphs have the horizontal axis labeled for reverse voltage (V_R) for both the low and high barrier series. The graphs for the low barrier (SBL) series parts have curves for operation at 75 °C, 100 °C and 125 °C.

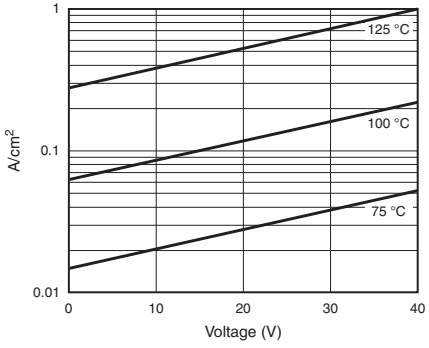


Figure 3. Voltage vs. Die Area Leakage Barrier Height = 0.64 V

These curves may be used in two ways. If the die size, barrier height, temperature and forward current (I_F) are known, VF can be graphically calculated. Using the leakage curves, and knowing the reverse voltage (V_R) to which the device will be subjected, it is possible to find the leakage current. Conversely, if the circuit parameters are set, the curves will provide the die size in A/cm^2 equations, making it possible to analytically select either a low or high-barrier-height rectifier for maximum circuit efficiency. Most Schottky rectifiers are used in switch mode power supplies.

To select a Schottky rectifier that yields maximum efficiency, it is necessary to determine the "duty cycle equilibrium point", or the duty cycle point at which both a low- and high-barrier-height part will dissipate precisely the same amount of power:

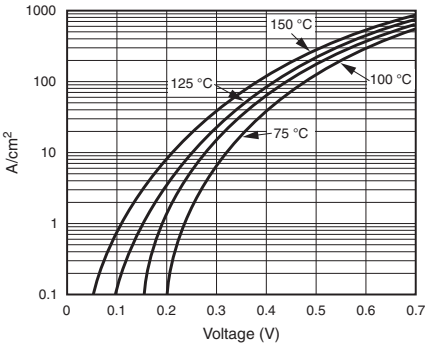


Figure 4. Die Area Current vs. Forward Voltage Drop
Barrier Height = 0.71

$$D\,(P_{df}\phi BL) + (1 - D)(P_{dr}\phi BL) + = D(P_{dr}\phi BH) + (1 - D)(D_{dr}\phi BH) \quad (1)$$

$$P_{dt} = P_{df} + P_{dr} \quad (2)$$

$$P_{df} = I_F \times V_F \quad (3)$$

$$P_{dr} = I_R \times V_R \quad (4)$$

D = duty cycle forward conduction

$1 - D$ = duty cycle reverse blocking

I_F = forward current

I_R = reverse current

P_{df} = power dissipation in forward

P_{dr} = power dissipation in reverse

P_{dt} = total power dissipation

V_F = forward voltage drop

V_R - reverse voltage

ϕBL = low barrier height

ϕBH = high barrier height

The following is an example of the use of this equation:

Given the need for a 30 V Schottky capable of operating at 10 A, the choice is between a SBL1040 (ϕB = 0.64) or a MBR1045 (ϕBH = 0.71). These two devices were chosen for convenience in this example because of their equal die size (0.0477 cm^2 active area).

The equilibrium point must be calculated for 75 °C, 100 °C and 125 °C. For demonstration purposes, only the 75 °C equilibrium point will be calculated in the same manner.The reverse leakage (I_R) and forward voltage drop (V_F) are derived from Graphs 1 through 4 using the temperature, die size and ϕB given above.

For the low-barrier-height SBL1040:

$$P_{dr} = V_R \times I_R = \text{Watts} \quad (4)$$

$$30\ V \times (1.9 \times 10^{-3}\ A) = 0.057\ W$$

$$P_{dr} = I_F \times V_F = \text{Watts} \quad (3)$$

$$10\ A \times 0.46\ V = 4.6\ W$$

For the high-barrier-height MBR1045:

$$P_{dr} = V_R \times I_R = \text{Watts} \quad (4)$$

$$-30\ V \times (1.43 \times 10^{-4}\ A) = 4.29 \times 10^{-3}\ W$$

$$P_{df} = I_F \times V_F = \text{Watts}$$

$$10\ A \times 0.565\ V = 5.65\ W$$

Solving for the equilibrium point at 75 °C:

LOW BARRIER **HIGH BARRIER**

$$(D \times P_{df}\phi BL) + [(1 - D) \times P_{dr}\phi BL] = (D \times P_{df}\phi BH) + [(1 - D) \times P_{dr}\phi BH]$$

$$(D \times 4.6\ W) + [(1 - D)\ 0.057\ W] = (D \times 5.65\ W) + [(1 - D)\ 0.00429\ W]$$

$$0.05271 = 1.1027 \times D$$

$$D = 0.0478$$

$$D\% = 0.0478 \times 100$$

Duty cycle equilibrium point, D - 4.78 %

Switching loss is assumed to be equal on both sides of the equation and thus ignored. This procedure is then repeated for 100 °C and 125 °C. After calculating the equilibrium point for 100 °C and 125 °C, the results are:

DUTY CYCLE EQUILIBRIUM	
TEMPERATURE	**POINT %**
75 °C	4.78 %
100 °C	15.93 %
125 °C	52.42 %

The results of these calculations are graphed in figure 6. To the left of the equilibrium curve, the high-barrier-height MBR1045 is most efficient; to the right of the equilibrium curve, the low barrier-height SBL1040 is more efficient. This is easy to understand because the high-barrier-height part exhibits lower reverse power loss and at a low duty cycle more time is spent in the reverse mode.

With the duty cycle higher than the equilibrium point, the part spends a larger percentage of time in the forward mode, and the low-barrier-height type part has a lower V_F and the forward power losses are reduced.

With knowledge of the application, including expected duty cycle and temperature, it is possible to choose the most efficient Schottky barrier rectifier, constructing a graph similar to figure 1.

It is thus easy to graph the duty cycle versus temperature, as in figure 6., and by knowing the application (expected duty cycle and temperature), make the intelligent choice of the most efficient Schottky rectifier for the application in question.

This analysis technique enables the design engineer to make an efficient and cost-effective choice of Schottky rectifier in duty-cycle-based systems. In addition, light has hopefully been shed on the difference in design philosophies between the low- and high - ϕB style of Schottky rectifiers.

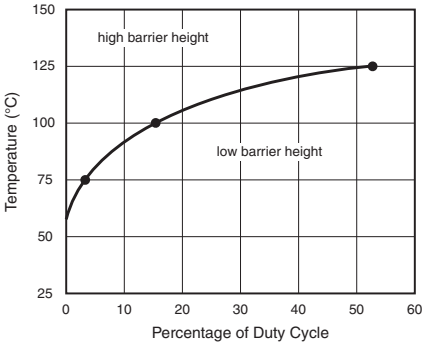


Figure 6. Duty Cycle Equilibrium MBR1045 vs. SBL1040

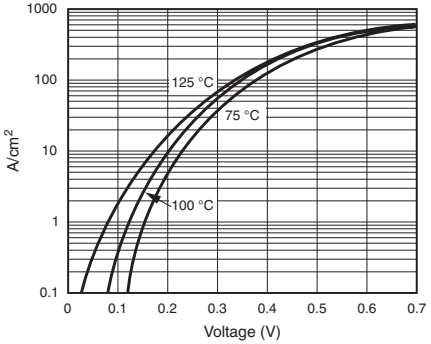


Figure 5. Die Area Current vs. Forward Voltage Drop
Barrier Height = 0.64

Notes on SUPERECTIFIER® Products

Vishay General Semiconductor

Vishay General Semiconductor's SUPERECTIFIER® is exactly that, a super rectifier. There is nothing else in the world like it. This is the most cost effective and highly reliable device on the market, which is the result of a combination of patented technologies. No other 0.25 to 3.0 A rectifier of any kind - plastic, glass, or metal - can match (or even approach) SUPERECTIFIER's combination of features ... the result of Vishay General Semiconductor's unique glass-plastic construction:

- Brazed at greater than 600 °C at both leads and die; eliminates all soft solders
- Exclusive UL recognized flame-retardant epoxy molding compound rated 94V-0, the highest available
- Patented glass passivation process
- Reliability proven to meet military and automotive requirements
- Hermetically sealed construction
- High temperature soldering guaranteed: 350 °C/10 s/0.375" (9.5 mm), lead length at 5 lbs (2.25 kg) tension

Most other rectifiers rated up to 3.0 A are soft soldered with silicone rubber passivation or pressure contacted. SUPERECTIFIER uses a patented brazed construction and glass passivation to seal its junction hermetically. Only high temperature brazing operations are used to withstand the 600 °C required to melt and fuse the glass. This technique tremendously enhances mechanical strength and temperature cycling capability, increasing operating and storage temperature range while reducing thermal resistance. It is one of the few rectifiers using an exclusive flame-retardant molding compound, meeting UL flammability rating 94V-0, the highest rating available. The SUPERECTIFIER won't go up in flames. In summary, SUPERECTIFIER is the world's only rectifier with totally brazed construction, patented glass passivated junction, flame-retardant molding encapsulation and meets the most stringent reliability requirements.

These devices lend themselves to a wide variety of applications. They can withstand the harsh environment of the automotive world, meeting the long term reliability and specialized electrical performance requirements of the computer, consumer and telecommuniction markets. The small size of the SUPERECTIFIER with its capability up to 3.0 A enables high density board layout in electronic assemblies and equipment, while increasing reliability.

We offer the SUPERECTIFIER construction in standard recovery, fast recovery, and ultrafast types in both axial and surface mount packages.

For additional information, please see the application note "SUPERECTIFIER Design Brings New Level of Reliability to Surface Mount Components."

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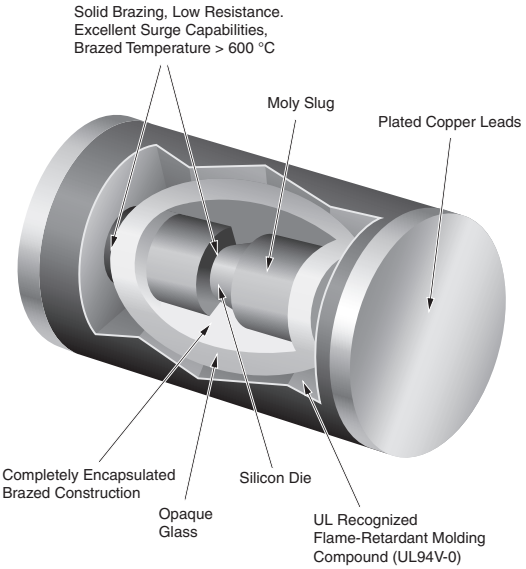
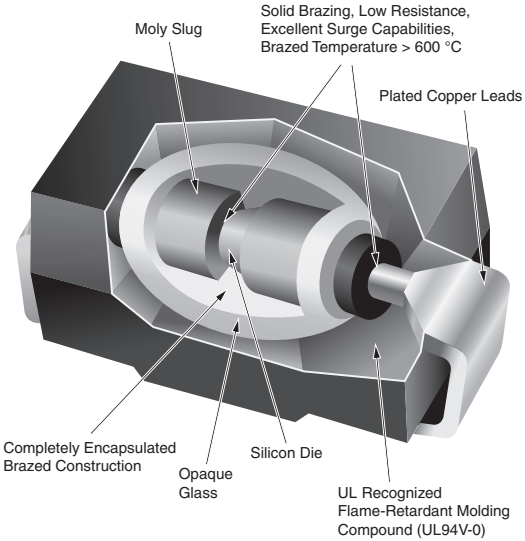
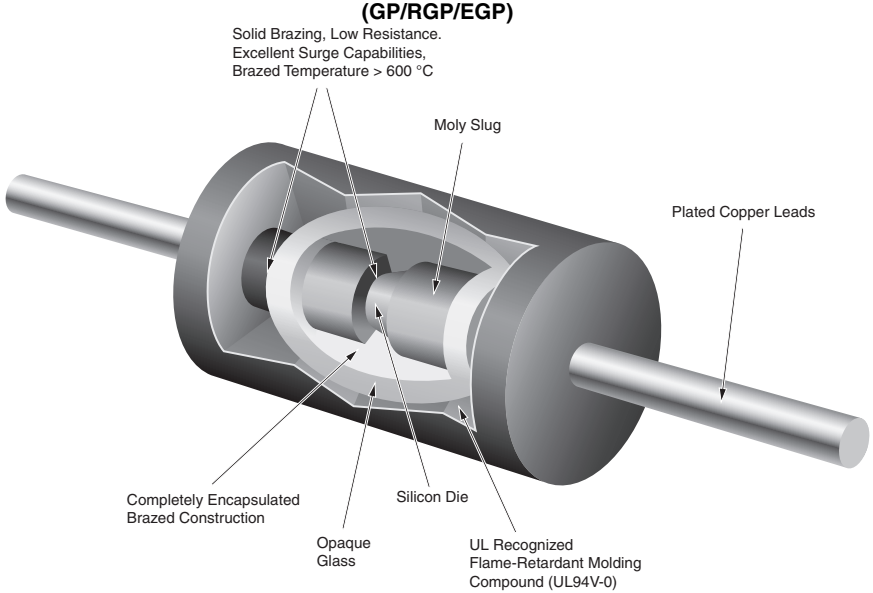
SUPERECTIFIERS (GL/RGL/EGL)



SUPERECTIFIERS (GF1/RGF1/EGF1)



SUPERECTIFIERS (GP/RGP/EGP)



SUPERECTIFIER® Design Brings New Level of Reliability to Surface Mount Components

By Joseph M. Beck, Senior Applications Engineer

Surface Mount technology is here to stay. After years of plodding through cautious experimentation, many manufacturers now have fully automated production lines in place. These production lines place circuit components at speeds that until recently would have been unthinkable. Finally being realized are the benefits of what was once considered a "Voo Doo" manufacturing technology. Component manufacturers have learned a great deal over the past several years as well. Initially most surface mount components were nothing more than retrofit, lead formed versions of their conventional leaded, through-hole counterparts. For most manufacturers this was the quickest and least costly method of "developing" a line of surface mountable components.

It was soon discovered, however, that this approach to component assembly would be unacceptable. Surface mount technology placed new demands upon circuit components. Electrically, the same power was being required from smaller and smaller packages. Package geometries and dimensions became critical in relation to pick and place equipment and circuit board mounting. In addition, the construction of these devices needed to be such that they would suffer no ill effects when subjected to the rigors of the new assembly environment that surface mount technology presented. Encountered in this environment was extremely high-speed pick and place equipment, component adhesive attachment, immersion in molten solder and rapid temperature changes associated with reflow soldering processes. All this meant that component manufacturers would have to re-think their approach to device fabrication. Yes, components needed to be smaller; but they also needed to be more reliable.

At Vishay General Semiconductor, the development of new surface mount components is not something that is taken lightly. It is realized that in order to produce a truly reliable surface mount product one must first consider all relevant aspects of the technology. Only when this process has been completed can a product be developed which is surface mountable, and inherently reliable.

SURFACE MOUNT SUPERECTIFIER®

Vishay General Semiconductor manufactures surface mount rectifiers in the popular MELF (metalized electro-face) package style. These devices, denoted as SUPERECTIFIERS, are available with a wide variety of electrical characteristics. The main difference, however, between these rectifiers and other MELF style devices lies in the area of device construction. Figure 1. shows the unique construction employed in the manufacture of the SUPERECTIFIER.

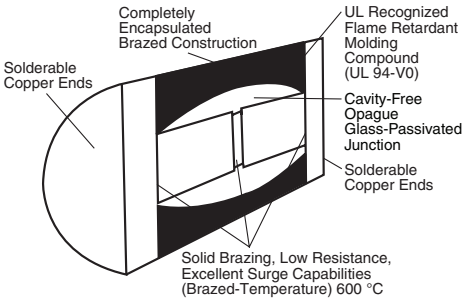


Figure 1. SUPERECTIFIER Construction

The construction of the SUPERECTIFIER does not internally utilize any soft solders. All interconnects are accomplished by the use of a high temperature brazing process (600 °C). Hence, any chances of solder void occurrence or internal solder reflow during circuit board processing are eliminated. In addition, the silicon rectifier junction is completely encapsulated by a cavity-free glass. This glass encapsulation ensures that the rectifier junction is hermetically isolated from humidity and other harmful environmental intrusions.

The resultant sub-assembly could be considered to be a fully functional surface mount rectifier. In fact, many component manufacturers offer MELF devices which have this appearance; namely, an oblong glass bead with two protruding metal end terminations. However, in order that the device have a uniform shape, the General Semiconductor sub-assembly is over molded with epoxy. The result is a smooth, perfectly cylindrical package.

TWO SIZES

Two different size SUPERECTIFIER MELF packages are available. Vishay General Semiconductor designation GL34 and GL41 are for 0.5 A and 1.0 A rectifier types, respectively. JEDEC mechanical specifications DO-213AA and DO-213AB detail the dimensions of the GL34 and GL41, respectively. Figure 2. gives these package dimensions.

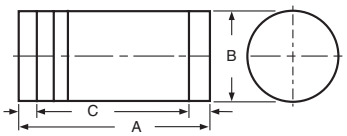


Figure 2. Dimensional Outline

DIMENSIONAL OUTLINE in inches

DIMENSION	GL34 DO-213AA		GL41 DO-213AB	
	MIN.	MAX.	MIN.	MAX.
A	0.130	0.146	0.189	0.205
B	0.063	0.067	0.094	0.105
C	0.016	0.022	0.016	0.022

MANUFACTURING CONSIDERATIONS

Pick and Place-Surface mount SUPERECTIFIERS are supplied on tape and reel in accordance with JEDEC standard RS-481A. Removal of the devices from the embossed carrier tape is easily accomplished by all vacuum pick-up mechanisms which utilize a compliant tip. The compliant tip will form a tight seal around the cylindrical MELF design once contact with the device has been made. This is not always the case, however, when MELF devices with a non-uniform package outline are used. Figure 3. shows two such MELF outlines. Figure 3.A is a device with a concave package outline. This type of package is difficult to consistently remove from the carrier tape as the exact position of pick-up on the component body is critical. Figure 3.B is that of the most common form of MELF packaging. This type of construction utilizes a nontransparent glass body which is often characterized by pitting and surface irregularities. The irregularities make it difficult for a vacuum pick-up to form a tight seal around the device body. The result is that components are often dropped onto the production room floor instead of being placed on the targeted circuit board.Vishay General Semiconductor solves these problems with a smooth surface and perfectly cylindrical package outline.

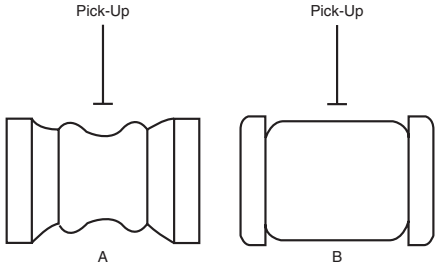


Figure 3. Non-Uniform Melf Outlines

Bonding Pads - The geometries and dimensions of bonding pads are critical to the proper mounting, soldering and overall performance of all surface mount components. Figure 4. gives the recommended pad layouts for GL34 and GL41 MELF outlines. Use of these pad layouts will be primary assistance in the following three areas:

- Surface mount technology by nature dictates that smaller component packages dissipate the same power as their larger through-hole counterparts. Hence, adequate bonding pad land area is required in order to aid the component package in the dissipation of this power.The recommended pad layouts provide the needed land area for GL34 and GL41 devices to operate safely at their maximum ratings.
- Component adhesive attachment allows the package to shift slightly from its original placement position prior to adhesive curing. In addition, most adhesives tend to spread during the curing process which also may allow package misalignment. The geometry of the recommended pad layouts will tend to minimize such movements.This assumes, of course, that the package was originally positioned correctly.
- During reflow soldering, solder surface tension can have a significant effect on the movement and final position of components in relations to their bonding pads. The recommended pad layouts will actually make use of the solder surfacetensions to bring MELF devices into alignment with the two bonding pad land areas.

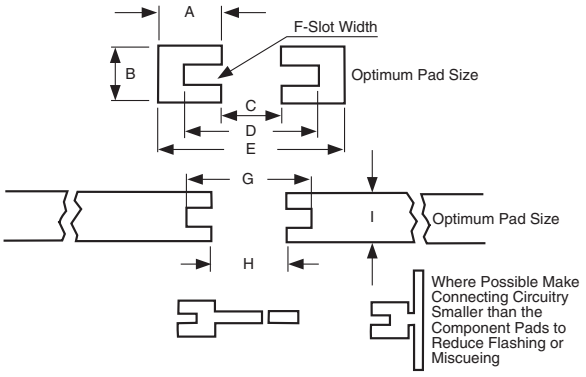
This means that MELF devices which are initially placed in slight misalignment on their bonding pads will reposition themselves during solder reflow until a position of alignment is reached.

Soldering - Surface mount SUPERECTIFIERS are capable of withstanding all present forms of wave and reflow soldering. The following guidelines should be followed, however, in order to ensure overall package integrity:

- GL34-Maximum temperature at device and terminations not to exceed 400 °C for 5 s. Complete device submersible temperature not to exceed 260 °C for 10 s in solder bath.
- GL41-Maximum temperature at device end terminations not to exceed 450 °C for 5 s. Complete device submersible temperature not to exceed 265 °C for 10 s in solder bath.

Vishay General Semiconductor's surface mount SUPERECTIFIERS combine superb electrical performance with unmatched levels of reliability. The construction of the SUPERECTIFIER virtually eliminates all problems associated with high-speed pick and place of MELF components. In addition, SUPERECTIFIER construction ensures that performance and reliability are never compromised when the device is subjected to the demands of surface mount assembly techniques or when other seemingly harmful environments are encountered. Quite simply, no other surface mount rectifier comes close to offering all the advantages of the SUPERECTIFIER MELF.

All surface mount components are small and save space. However, performance and reliability should never be considered necessary trade-offs in order to utilize surface mount technology. Use of Vishay General Semiconductor surface mount SUPERECTIFIERS requires no such sacrifices; no trade-offs.



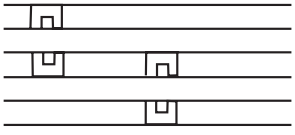


Figure 4. Recommended Pad Layout

RECOMMENDED PAD LAYOUT in inches		
DIMENSION	**GL34**	**GL41**
A	0.069	0.100
B	0.63	0.100
C	0.69	0.100
D	0.138	0.200
E	0.207	0.300
F	0.016	0.025
G	0.138	0.200
H	0.035 to 0.80	0.050 to 0.125
I	0.048 min.	0.075 min.

PART NUMBER	**CURRENT (A)**	**VOLTAGE (V)**	**t_{rr} (ns)**	**PACKAGING**
GENERAL PURPOSE				
GL34-J	0.5	50 to 600	-	GL34
1N6478-84	1.0	50 to 1000	-	GL41
GL41A-Y	1.0	50 to 1600	-	GL41
FAST RECOVERY				
RGL34A-J	0.5	50 to 600	150 to 250	GL34
RGL41A-M	1.0	50 to 1000	150 to 500	GL41
ULTRA FAST RECOVERY				
EGL34A-G	0.5	50 to 400	50.0	GL34
EGL41A-G	1.0	50 to 400	50.0	GL41

Using Rectifiers in Voltage Multiplier Circuits

By Joseph M. Beck, Senior Applications Engineer

Systems designs frequently call for a high voltage, low current power source that needs only minimal regulation. A few familiar examples are CRT circuits, electrostatic copiers, and photoflash applications. Required voltages typically range from 10 to 30 kV and the current demand rarely exceeds 5 milliamperes.

When your design requires this type of power source, you may want to consider a voltage multiplier circuit. They are inexpensive, easy to design, versatile, and can provide virtually any output voltage that is an odd or even multiple of the input voltage.

This article explores the basic operation of multiplier circuits and discusses guidelines for electronic component selection. Since General Semiconductor is the industry's leading manufacturer of rectifier products, we will place special emphasis on selecting rectifier diodes for multiplier circuits.

BASIC OPERATING PRINCIPLES

Most voltage multiplier circuits, regardless of their topology, consist chiefly of rectifiers and capacitors. Figure 1. shows three basic multiplier circuits.

The operating principle of all three circuits is essentially the same. Capacitors connected in series are charged and discharged on alternate half-cycles of the supply voltage. Rectifiers and additional capacitors are used to force equal voltage increments across each of these series capacitors. The multiplier circuit's output voltage is simply the sum of these series capacitor voltages.

A wide variety of alternating signal inputs are used with multiplier circuits. The most popular are sine and square wave inputs. For simplicity, this discussion will be limited to sine wave inputs; the calculations become somewhat more involved with asymmetrical signals.

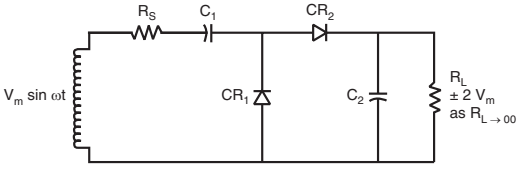


Figure 1A. Basic Multiplier Circuits. Half-Wave Voltage Doubler

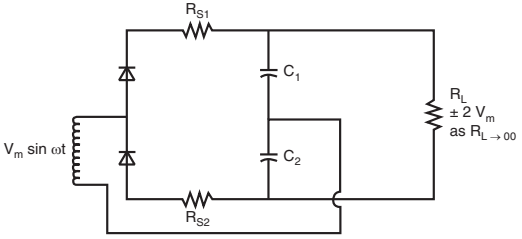


Figure 1B. Basic Multiplier Circuits. Half-Wave Voltage Doubler

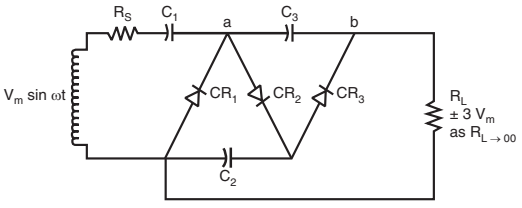


Figure 1C. Basic Multiplier Circuits. Half-Wave Voltage Tripler

Voltage Doublers - Figure 1A. shows a half-wave voltage doubler circuit. It functions as follows. On the negative halfcycle of the input voltage, capacitor C_1 charges, through rectifier CR_1, to a voltage of V_m. On the positive half-cycle, the input voltage, in series with the voltage of C_1 ($V_{C1} = V_m$), charges capacitor C_2 through rectifier CR_2 to the desired output voltage of 2 V_m. Capacitor C_1, which aides in the charging of a capacitor C_2, sees alternating current ("AC Cap") while C_2 sees only direct current ("DC Cap"). In this circuit, the output voltage and the input signal have the same ripple frequency.

The same operating principle extends to the full-wave voltage doubler circuit of figure 1B. On the negative half-cycle of the input voltage, capacitor C_2 is charged through rectifier CR_2 to a voltage of V_m. On the positive half-cycle, capacitor C_1 is also charged to a voltage of V_m, through rectifier CR_1. The series voltages of capacitors C_1 and C_2 ($V_{C1} = V_{C2} = V_m$) yield the desired output voltage: 2 V_m. In this case, capacitors C_1 and C_2 are "DC capacitors"; they see no alternating current. The output ripple frequency of the full-wave doubler is twice that of the input signal.

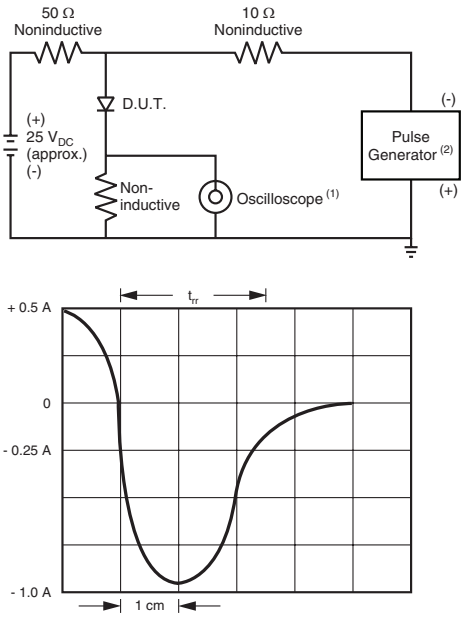


Figure 2. Reverse Recovery Time Characteristic and Test Circuit Diagram

Voltage Tripler - Higher output voltages are possible through the use of a half-wave voltage tripler circuit, shown in figure 1C. This circuit operates as follows. On the negative half-cycle of the input voltage, capacitor C_1 charges through rectifier CR_1 to a voltage of V_m. On the positive half-cycle, the input voltage, in series with the stored voltage on C_1 ($V_{C1} = V_m$), charges capacitor C_2 through rectifier CR_2 to a voltage of 2 V_m. On the next negative half-cycle, the charge on C_1 is replenished. At the same time, the input voltage, in series with the stored voltage on C_2 ($V_{C2} = 2\ V_m$), charges capacitor C_3 through CR_3 to a voltage of 2 V_m ($V_{C3} = V_b - V_a = (V_m + V_{C2}) - V_{C1} = 2\ V_m$). V_{C1} and V_{C3}, in series, provide the output voltage of 3 V_m. In this case, the output ripple frequency is equal to that of the input signal.

Although half-wave and full-wave multiplier circuits can provide equivalent output voltages, there are some fundamental differences that should be considered. First, the full-wave circuit has the advantage of higher output ripple frequency (twice that of the half-wave circuit). In addition, the full-wave circuit provides better voltage regulation than the half-wave circuit, since the latter relies upon one capacitor (C_1 in figure 1A.) to provide the charging energy to a single DC load capacitor (C_2 in figure 1A.). The full-wave circuit, however, requires that the secondary side of the transformer be capable of withstanding high voltages (approximately 1/2 of the output voltage). For this reason, the half-wave multiplier is usually the preferred circuit when high voltage outputs (V_0 = kV) are required.

DESIGN GUIDELINES

Capacitor selection - The size of capacitors used in multiplier circuits is directly proportional to the frequency of the input signal. Capacitors used in off-line, 60 Hz applications are usually in the range of 1.0 to 200 µF while those used in higher frequency applications, say 10 kHz, are typically in the range of 0.02 to 0.06 µF. In practice, it is usually easier, and less costly, to use the same large capacitance value for all capacitors, both “AC” and “DC” type. The overall capacitive reactance of the circuit must be considered, however, to determine the largest permissible value.

The voltage rating of capacitors is determined solely by the type of multiplier circuit. In the half-wave doubler circuit of figure 1A., C_4 must be capable of withstanding a maximum voltage of V_m, while C_2 must withstand a voltage of 2 V_m. In the full-wave doubler circuit of figure 1B., both C_1 and C_2 must withstand voltages of Vm. The half-wave voltage tripler of figure 1C. requires C_1 to withstand a voltage of V_m, and both C_2 and C_3 to withstand voltages of 2 V_m. A good rule of thumb is to select capacitors whose voltage rating is approximately twice that of the actual peak applied voltage. For example, a capacitor which will see a peak voltage of 2 V_m should have a voltage rating of approximately 4 V_m.

RECTIFIER DIODE SELECTION

Several basic device parameters should be considered:

Repetitive Peak Reverse Voltage (V_{RRM}) - Repetitive peak reverse voltage is the maximum allowable instantaneous value of reverse voltage across the rectifier diode. Applied reverse voltages below this maximum value will produce only negligible leakage currents through the device.Voltages in excess of this maximum value, however, can cause circuit malfunction - and even permanent component damage - because significant reverse currents will flow through the device. For example, Vishay General Semiconductor’s GP02-40 rectifier diode has a peak reverse voltage rating (V_{RRM}) of 4000 V, maximum. Applied reverse voltages of 4 kV or less will produce a maximum reverse leakage current, I_R, of 5 µA through the device when operated at room temperature (25 °C). In most cases, this leakage current is considered negligible, and the device is said to be completely blocking ($I_R = 0$).

In the case of the three circuits of figure 1., the maximum reverse voltage seen by each rectifier diode is 2 V_m. So devices must be selected with reverse voltage (V_{RRM}) ratings of at least 2 V_m.

Reverse Recovery Time (t_{rr}) - In general terms, reverse recovery time is a measure of the time needed for a rectifier diode to reach a state of complete blocking ($I_R = 0$) upon the application of a reverse bias. Ideally, this time should be zero. In reality, however, there’s a finite period of time in which a stored charge at the diode junction must be “swept away” before the device can enter its blocking mode. This stored charge is directly related to the amount of forward current flowing through the device just prior to the application

of the reverse bias.Fortunately, since operating currents are very low in multiplier circuits, reverse recovery times are kept to a minimum. Nevertheless, t_{rr} plays an important role in multiplier design.

When selecting rectifier diodes, the frequency of the input signal to the multiplier network must be considered. For symmetrical signal inputs, the device chosen must be capable of switching at speeds faster than the rise and fall times of the input. If the reverse recovery time of the rectifier is too long, the efficiency and regulation of the circuit will suffer. In the worst case, insufficient recovery speeds will result in excessive device heating, as reverse power losses in the rectifier become significant. Continued operation in this mode usually results in permanent damage to the device.

The reverse recover time (t_{rr}) specification is very dependent upon the circuit and the conditions being used to make the measurement.Several industry standard t_{rr} test circuits exist (Figure 2. is the test circuit used for the GP02-40).Therefore, it's very important to note which test circuit is being referenced, as the same device may measure differently on different test circuits. Furthermore, the t_{rr} specification should be used for qualitative, not quantitative purposes, since conditions specified for t_{rr} measurement rarely reflect those found in actual real life circuit operation. The t_{rr} specification is most valuable when comparing two or more devices that are measured on the same circuit, under the same conditions.

Figure 3. shows the relationship between forward current and t_{rr} in the GPO2-40. As you can see, decreasing current flow in the multiplier circuit makes it possible to use higher input frequencies. An increase in current flow has the opposite effect. Ideally, the multiplier network load should draw no current.

Peak forward Surge Current (I_{FSM}) - A peak forward surge current rating is given for most rectifier diodes. Most often, this rating corresponds to the maximum peak value of a single half- sine wave (50 or 60 Hz) which, when superimposed upon the devices rated load current (JEDEC method), can be conducted, without damage by the rectifier. This rating becomes important when considering the large capacitance associated with multiplier circuitry.

Surge currents can develop in multiplier circuits, due to capacitive loading effects. The large step-up turns ratio between primary and secondary of most high voltage transformers causes the first multiplier capacitor (C_1, secondary side) to be reflected as a much larger capacitance into the primary.For example, a transformer with a turns ratio of 25 will cause a 1.0 µF capacitance to be reflected into the primary circuitry as a capacitance of (1.0)(25) µF, or 625 µF. At circuit turn-on, large currents will be developed in the primary side as this effective capacitance begins charging.

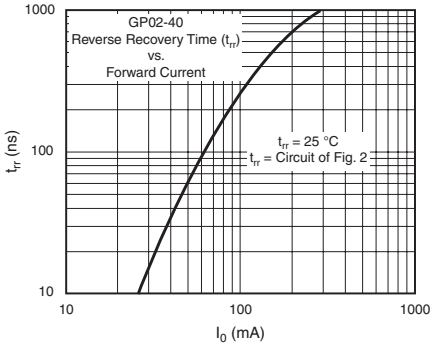


Figure 3. t_{rr} as a Function of Forward Current

On the secondary side, significant surge currents can flow through the rectifiers during initial capacitor charging at turn-on. The addition of a series resistance (R_S in figure 1.) can greatly reduce these current surges, as well as those in the primary circuitry. For example, the GPO2-40 has a forward surge rating, I_{FSM}, of 15 A. Considering a maximum secondary voltage of 260 V_{RMS}, 60 Hz, the calculation of R_S is as follows:

$$R_S \geq V_{peak}/I_{FSM} \qquad eq.1$$
$$R_S \geq (1.41)(260)/15$$
$$R_S \geq 24.4\ \Omega$$

Other Parameters - Of lesser significance are the forward current rating, I_0, and maximum forward voltage, V_F.

Forward current, I_0 - As stated earlier, in the ideal multiplier configuration the load will draw no current. Ideally, the only significant current flow through the rectifiers occurs during capacitor charging. Therefore, devices with very low current ratings (hundreds of milliamperes) can be used. It must be noted, however, that the forward current and forward surge current ratings are related, since both are a function of silicon die area. Generally speaking, devices with a high surge current rating, I_{FSM}, will also have a high forward current, I_0, rating, and vice versa.

Forward Voltage, V_F - In practice, the forward voltage drop, V_F, of the rectifiers does not have a significant effect on the multiplier networkfs overall efficiency. For instance, the GP02-40 has a typical forward drop of 2.0 V when measured at a current of 100 mA. A half-wave doubler with an 8 kV output will have less than 0.05 % (2 x 2 V/8 kV) loss in efficiency due to the forward voltage drops.

HIGHER ORDER CASCADE MULTIPLIER

Still higher voltages are possible by using the cascade multiplier circuit shown in figure 4. The output voltage is calculated as:

$$V_0 = (n)(V_m), \text{ as } I_L - 0 \qquad eq.2$$

where n = number of capacitors, or diodes, assuming equal value capacitors, ideal diodes and symmetrical signal input.

In theory, one can obtain any incremental output voltage increasing the value of n. In practice, however, voltage regulation and efficiency become increasingly poor as n increases. The potential for voltage arcing must also be considered as the value of n increases, and when higher output voltages are required. Careful mechanical design can minimize arcing, to a large extent.

From a pure circuits standpoint, voltage multipliers are relatively easy to design.The selection of circuit components, however, is one facet of the “overall design” that should not be taken for granted or trivialized. Careful consideration of all component parameters is the only way to ensure both reliable and predictable circuit performance. Put another way, ideal circuits require ideal circuit components.

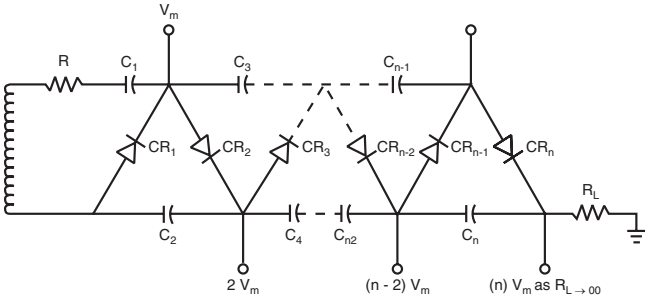


Figure 4. Cascade Multiplier

High Speed Data Line Protection

Low current Bridges Rectifiers Lend Themselves to Data Line Protection

By Jon Schleisner, Senior Technical Marketing Manager

Local Area Network (LAN) data lines require protection against direct and induced transient over voltages on the lines. Protecting these lines and the associated network is not a trivial task. The power range is somewhere between static discharge (very low power) and lightening protection which is at the other end of the spectrum (high power).

Power handling capability is only one aspect of the design. The designer must take care not to “load down” the line with a highly capacitive TVS or R/C network. As data rates go beyond 50 mb. It is not possible to use a TVS unit with capacitance above 100 pF to 200 pF. Most standard TVS devices have zero volt capacitance values greater that 500 pF. To make matters worse, the lower voltage TVS units have higher capacitance values than their higher voltage counterparts. Enter the steering diode bridge.

Vishay offers two surface mount bridge rectifiers. These components are ideal for use in protection circuits where power handling, capacitive loading and cost are all design considerations. These are the 1 A bridge (DF01S) the smaller 1/2 A (MB1S) SMD bridge rectifiers. Each diode within the 1 A part has a 0 V capacitance of 70 pF. The 1/2 bridge has a junction capacitance of about 25 pF. These components can be configured with TVS components (such as an SMBJ12) to form a high performance, low capacitance network capable of outstanding data line protection in LAN and other similar applications where data lines are exposed to transient surges beyond the scope of static discharge.Since each bridge contains four diodes each component can protect 2 independent lines.

Figure 1. shows the forward voltage drop of the 1 and 1/2 A bridge when configured as shown in figure 1. The surge can be applied in either polarity and to either input individually or simultaneously.

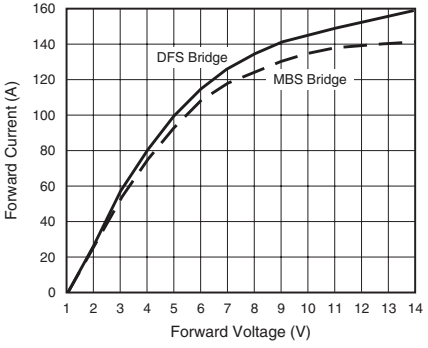


Figure 1. Forward Current vs. Forward Voltage

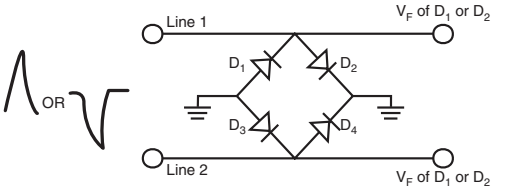


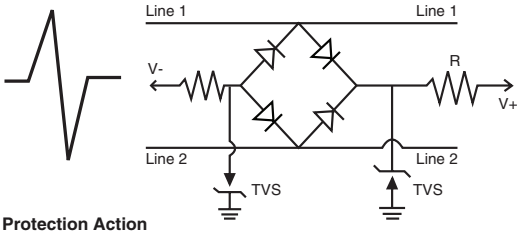
Figure 2.

These small components are capable of handling 120 (MBS) and 160 (DFS) A on the industry standard 10/1000 µs current waveform. This is the same waveform that is used to test the axial and surface mount TVS components. For the MB1S the maximum V_F encountered at 120 A is 7 V hence, it is possible to use the 100 V version of either bridge in this application without fear of reliability issues caused by reverse breakdown of the diodes within the bridge during surge events.

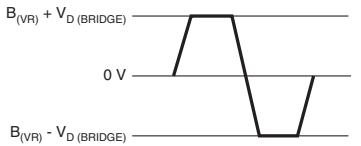
The different Steering diode/TVS configurations are illustrated in figure 3. through 7.

Figure 3. shows the classic symmetrical bidirectional protector. TVS units are utilized to provide clamping protection for both positive and negative going transients. The “ turn on threshold” of the network is specified by the B_{VR} of the TVS unit selected plus the forward voltage drop of the rectifier diode junction within the bridge being utilized. Because the currents encountered can vary between below 1 A and higher than 100 A. The forward voltage drop of the bridge may vary between 0.6 V and 7 V.

Incoming Transient



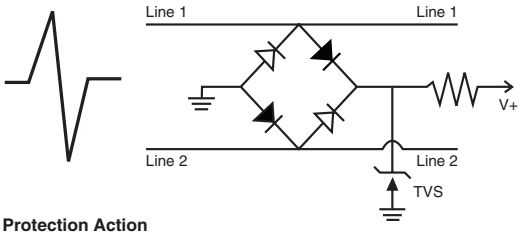
Protection Action



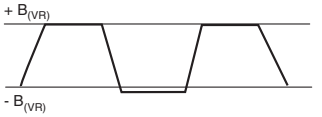
The Surge can be Applied to Either Line or Both
+ $B_{(VR)}$ and - $B_{(VR)}$ are Adjusted via TVS Parts Selection.

Figure 3.

Incoming Transient



Protection Action



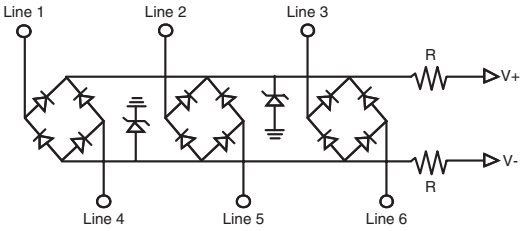
The Clamping Voltage Becomes:
$B_{(VR)\ (TVS)} + 2\ V_{F\ (BRIDGE)} = V_C$

Figure 4.

Figure 4. is a configuration designed to provide a-symmetrical bi-polar protection, that is, the diode drop of 1 V is observed for negative going transients and the B_{VR} of the selected TVS provides the turn on characteristic for a positive going surge. This is a common configuration when protecting the input stages of transceiver IC's that are powered by ground and B+ and no negative power rail is utilized. The configuration can be reversed to provide the same style of surge suppression with a negative power source.

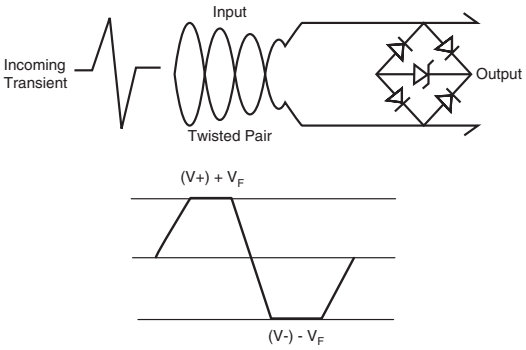
Both figure 3. and 4. have a resistor designated "R" going to either V+ or V-. These resistors can be any low power chip resistor in the 50K or above range. They are optional. The purpose of these resistors is to provide a low current forcing the TVS into the avalanche mode causing the impedance at this node to be low.This reduces crosstalk and maintains a reasonable voltage across the steering diodes minimizing the diode junction capacitance and assuring minimum circuit loading.

Figure 5. graphically shows how multiple SMD bridge rectifiers can be used in conjunction with one or two TVS units in order to protect multiple line applications. Note that the cost of the TVS units then becomes amortized over the number of lines tied into it. In significant volumes it is possible to protect multiple data lines to a legitimate 600 W (on the 10/1000 µs waveform) level at a cost far less than an individual TVS per line. And all the while the data lines are being loaded with less than 50 pF capacitance.



Multiple line protection can be implemented by tying several bridges into one set of TVS's. For single supply systems, one TVS can be eliminated and that node connected to ground.

Figure 5.

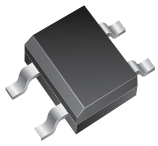


Clamping Occurs at
$V+ \text{ (or } V-) \pm V_{F\ (BRIDGE)}$

Figure 6.

Figure 6. shows an alternate method of using a SMD bridge to provide effective low loss protection for "twisted pair" arrangements.

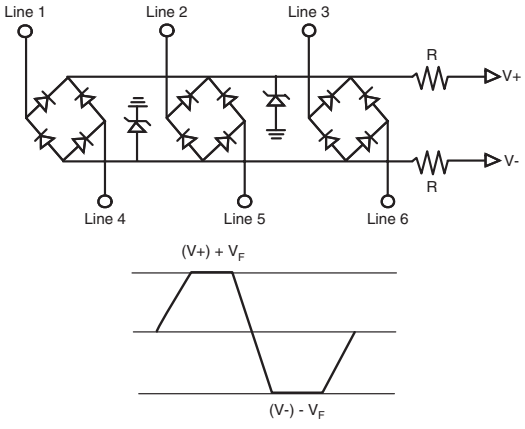
DFS



MBS

Figure 7. demonstrates a method of using the bridge rectifier arrangement to protect transceiver I/O ports by “steering” the transient overvoltages to either power supply rail or a single rail and ground. It is important to remember good “house keeping” when employing this topology ie; low inductance capacitors should bypass the power supply rails close to the circuitry being protected. If these rules are not followed the leading edge of any steep rise time transient will not be absorbed by the power supply. This will result in higher “let through” voltages and less effective protection.

The resultant performance of any of these circuits is severely influenced by parasitic elements in the circuit. Robust low impedance ground planes and simple PCB traces are essential. Series inductance in the PCB traces or grounding scheme will cause higher than expected let though voltage on fast rising transients. How fast is fast? and how much let through voltage is excessive? That will depend on the components you are protecting.



Clamping Occurs at
V+ (or V-) ± $V_{F\ (BRIDGE)}$

Figure 7.

Rectifiers Connected in Series for Increased Reverse Voltage

Using several rectifiers connected in series is necessary where the voltage rating of single rectifier is too low, or where special requirements such as very low switching losses requires the implementation of several low-loss ultra fast rectifiers. In these cases rectifiers connected in series are used for high voltage applications, e.g. TV Monitor or Automotive and in switching applications such as PFC-Boost-Converters, SMPS or other applications where low losses and high voltages are necessary.

According to the text book it is usually necessary to ensure symmetrical conditions for each rectifier. This is normally done with resistors for static conditions and with capacitors for dynamic conditions, see figure 1. Circuit Diagram, which illustrates the situation for two rectifiers.

These configurations cause an increase in power dissipation and increase costs because of the larger number of parts. If you want to avoid this by simply connecting rectifiers in series without resistors and capacitors for symmetrical conditions then the following applies.

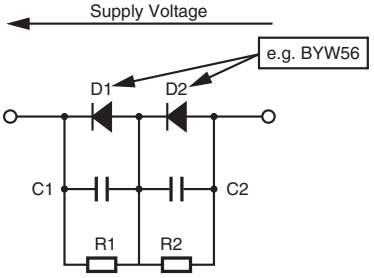


Figure 1. Circuit Diagram

STATIC CONDITIONS WITHOUT RESISTORS FOR SYMMETRY

For static conditions the important parameters are the reverse characteristics, especially the reverse breakdown-voltage. Applying a certain supply voltage will result in a certain reverse current, I_{Rsum} through both rectifiers, at which the sum of the reverse voltage across each rectifier is equal to the applied supply voltage.

In principle there are three different cases (the drawings below are exaggerated for better understanding).

Similar Rectifiers with Sufficient Reverse Breakdown-Voltage

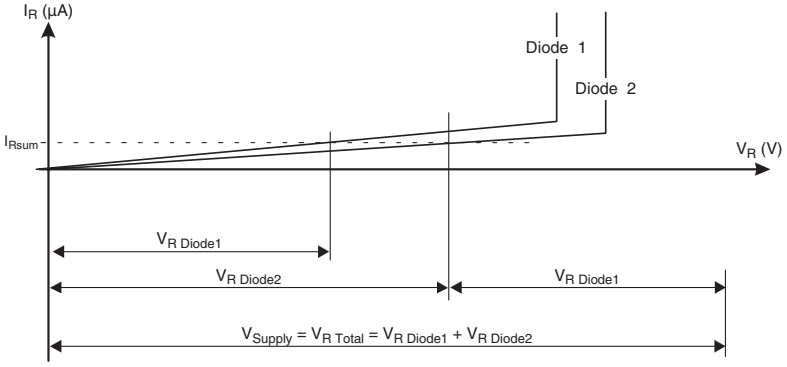


Figure 2. Static Conditions for Similar Rectifiers with Sufficient V_R

For rectifiers with similar and sufficient reverse characteristics the resulting reverse voltage across rectifier 1 and rectifier 2, $V_{R\ Diode\ 1}$ and $V_{R\ Diode\ 2}$ is well below the break down voltage. Therefore the resulting leakage current of this configuration will be very low and no problems will occur, even if there are small overvoltage spikes on the supply. This is a practicable solution, but one needs rectifiers with a breakdown-voltage which is much higher than half of the supply voltage (for 2 rectifiers) if the rectifiers are not avalanche safe!

For technical questions within your region, please contact:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 89097
Revision: 29-Jul-08

Similar Rectifiers with Insufficient Reverse Breakdown-Voltage

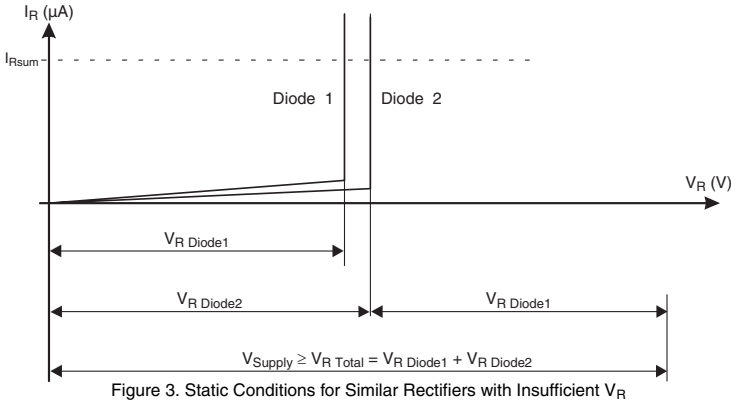


Figure 3. Static Conditions for Similar Rectifiers with Insufficient V_R

For rectifiers with similar and insufficient reverse characteristics the resulting reverse voltage across rectifier 1 and rectifier 2, $V_{R\ Diode\ 1}$ and $V_{R\ Diode\ 2}$ is the breakdown-voltage. Both rectifiers will be in the reverse avalanche mode - and they must be able to withstand it!

Normally the whole configuration will behave like a Zener-diode because the sum of the breakdown-voltages of both rectifiers is less than the applied supply voltage, with a very high reverse current mainly limited by the power supply and not the rectifier. If by chance the sum of the breakdown-voltages is exactly the supply voltage, the reverse leakage current will be mainly limited by the rectifier reverse characteristics. Because the reverse characteristics depend on the junction temperature the sum of the breakdown-voltages will change with the temperature too and the configuration will behave like a Zener-diode again.

So this is not really a practicable solution.

Rectifier with Different Reverse Breakdown-Voltages

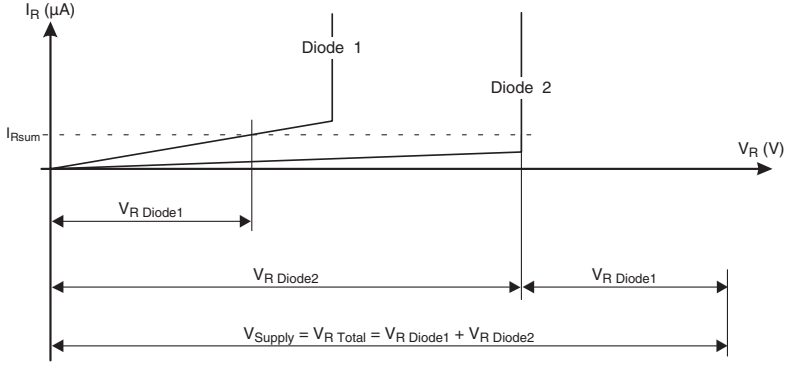


Figure 4. Static Conditions for Different Rectifiers

For rectifiers with different reverse characteristics, the resulting reverse voltage for one rectifier, the better one, rectifier 2 in figure 4. Static conditions for different rectifiers, is in the area of the breakdown-voltage ($V_{R\ Diode\ 2}$) and for the other, rectifier 1, below the breakdown-voltage ($V_{R\ Diode\ 1}$).

Because of the variations in the manufacturing processes for semiconductors it can always happen that within one certain type there will be rectifiers with different reverse characteristics as mentioned above.

If rectifier 2 is able to withstand this reverse avalanche energy, it is a practicable solution even if there are some overvoltage spikes. And there is no need for a large safety factor of the reverse break down voltage if the rectifiers are avalanche safe!

DYNAMIC CONDITIONS WITHOUT CAPACITORS FOR SYMMETRY

Switching rectifiers, which are connected in series without capacitors, from a certain forward condition, e.g. 1 A forward current, to a certain reverse condition, e.g. 1000 V reverse voltage, will generate an avalanche pulse in the faster rectifier. It is similar to a chain, there the weak part will break first, here the faster rectifier will be off first.

The reverse recovery characteristics are the important parameters for dynamic conditions, not only for rectifiers in switch mode power supply with frequencies of kHz to MHz, but also for rectifiers used for the rectification of the mains with 50 Hz or 60 Hz.

As already noted, due to variations in the manufacturing process there will be differences in the characteristics of the semiconductors. For better understanding of what is happening with each rectifier, we carried out measurements with two different ultrafast rectifiers connected in series without other components in parallel. The difference between the reverse recovery times is the same as can happen within one type due to the variations of the processes. For slower rectifiers it will be similar.

rectifier 1: (e.g. BYT53G, EGP20G)
reverse recovery time t_{rr} = 45 ns
(I_F = 0.5 A/I_R = 1.0 A/i_r = 0.25 A)
reverse breakdown-voltage
$V_{(BR)R}$ = 500 V

rectifier 2: (e.g. SF4007, UF4007)
reverse recovery time t_{rr} =60 ns
(I_F = 0.5 A/I_R = 1.0 A/i_r = 0.25 A)
reverse breakdown-voltage
$V_{(BR)R}$ = 1200 V

Dynamic Conditions with Low Reverse Voltage

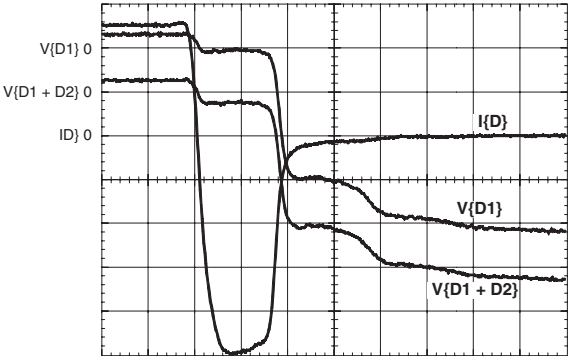


Figure 5. Dynamic Conditions with Low V_R

Figure 5. dynamic conditions with low V_R shows the dynamic characteristics with low reverse voltage, approx. 50 V, and constant current, using the test circuit for measuring the reverse recovery time trr according to JEDEC with a forward current I_F = 500 mA, a reverse current I_R = 1 A and measuring at 250 mA.

One can see the current through both rectifiers I{D}, the voltage across rectifier 1, V{D1} and the total voltage across both rectifiers, V{D1 + D2}.

As expected, the switching time of the series connection is the same as the switching time of the faster rectifier, D1, with trr = 45 ns. At the beginning the total reverse voltage is applied to the faster one (D1), V{D1} ≈ V{D1 + D2}, see figure 5. dynamic conditions with low V_R. The stored charge of rectifier 1 is less than the charge stored in rectifier 2, the slower one. Because the same current is passing through both rectifiers, the charge stored in rectifier 1 is reduced faster and rectifier 1 will be in the reverse mode with a small reverse current before all the charge stored in rectifier 2 is reduced. The reduction of the remaining charge in rectifier 2 is achieved by the low leakage current of rectifier 1, which will take a long time depending on the difference between the charges in the rectifiers.

Although the above explanations are more or less of theoretical interest because of the low applied reverse voltage, it is important to understand the mechanism. In real life situations, with high reverse voltage, the reason for switching the rectifiers in series becomes apparent when we consider the next step.

Dynamic Conditions with High Supply Voltage

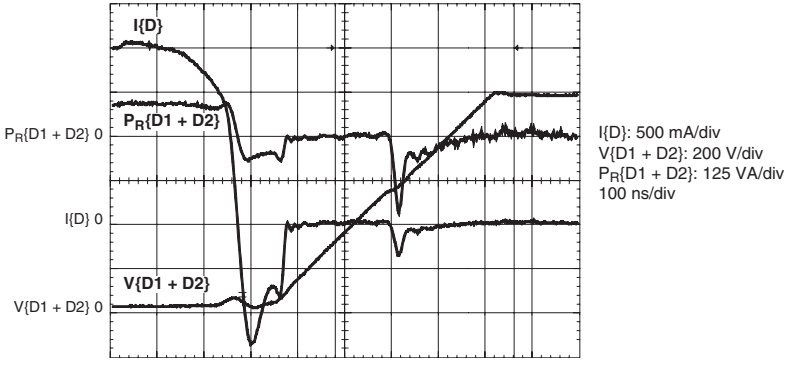


Figure 6. Dynamic Conditions with High V_R

Figure 6. dynamic conditions with high V_R shows the dynamic characteristics with high reverse voltage, approx. 1000 V, and constant current (forward current I_F = 2 A and a reverse current I_R = 1 A).

Again one can see the current through both rectifiers I{D}, the total voltage across both rectifiers connected in series, V{D1 + D2} and the total energy of both rectifiers P_R{D1 + D2}.

Understanding the mechanism, as explained in 2.1, we know that the stored charge is reduced faster in the faster rectifier, rectifier 1, therefore this rectifier is in the reverse mode first, rectifier 2 is still not in the reverse mode.

The total reverse voltage increases with a certain slope due to the inductive load. After approx. 250 ns the voltage across the rectifiers is the breakdown-voltage of rectifier 1. At this moment rectifier 1 goes into the reverse avalanche mode with a short current peak, approx. 350 mA for 40 ns and a breakdown-voltage of approx. 550 V (at 350 mA). But this means an avalanche pulse of approx. 8 µWs, which the rectifier must be able to survive!

Due to the avalanche current peak of rectifier 1 the stored charge in rectifier 2 is reduced and this rectifier will be in the reverse mode too. After this the total reverse voltage across both rectifiers can rise further, up to the maximum supply voltage of approx. 1000 V. When the final reverse voltage of both rectifiers is reached, the static conditions as described above apply.

Depending on the difference of the reverse recovery characteristics (stored charge) the current peak and the duration of the avalanche pulse will be different. Losses generated by the short avalanche pulse in the example mentioned above, see figure 6, is important and should be taken into account. Each time switching from forward to reverse takes place, this will result in an avalanche energy of approx. 8 µWs. If the frequency of this application is 100 kHz, the power loss due to the avalanche pulse is 800 mW! This can result in a temperature increase of approx. 80 °C for a rectifier in the SOD57 package such as the BYV26 or BYV27. The real reverse loss due to the avalanche of the better rectifier is given through the circuit and must definitely be taken into account when calculating the total loss of the parts!

SUMMARY

For static conditions the important parameter is the reverse characteristic. A certain supply voltage results in a certain reverse current at which the sum of the reverse voltages of all the rectifiers is equal to the applied supply voltage. If the safety factor for the reverse breakdown-voltage for each rectifier is low (e.g. 10 %), it can happen that the best rectifier (best reverse characteristics, high breakdown-voltage and low leakage current) will be in the avalanche mode all the time.

For dynamic conditions the important parameter is the switching characteristic. Switching from forward to reverse conditions will result in a short avalanche pulse in the fastest rectifier, because this rectifier is already in the reverse mode with reverse voltage and the other not, i.e. there is still some charge stored in the slower one.

Rectifiers can be connected in series without external components for symmetrical conditions if these rectifiers are able to withstand the avalanche energy and the resulting junction temperature is below the maximum guaranteed temperature. VISHAY offers a wide range of rectifiers with a special construction of the junction to be avalanche safe. In addition, they are 100 % tested with the guaranteed avalanche energy. For more details please refer to the datasheets.

General Information

Contents

Packaging Information

PACKAGING ORDERING CODE		
ANTI-STATIC PACKAGE CODE	**PREFFERED PACKAGE CODE**	**PACKAGING DESCRIPTION**
51	**P**	**Bulk**
52, 52T	**P**	**DO-214/215AA (SMB), 12 mm tape, 7" diameter plastic reel**
2A		Horizontal ammo pack (metric) or specified box height
2C		DO-214/215AA (SMB), 12 mm tape, 7" diameter paper reel
2D	**P**	**DO-218AB (SM5-8A), 24 mm tape, 13" diameter paper reel, anode towards sprocket hole**
2E	**P**	**DO-218AB (SM5-8A), 24 mm tape, 13" diameter paper reel, cathode towards sprocket hole**
2G		DO-214AC (SMA), 12 mm tape, 7" diameter paper reel
2KA		DO-214BA (GF1), 12 mm tape, 7" diameter paper reel
2M		Tube packing for 5KP/6KA type lead formed components
53		26 mm horizontal taping and ammo box packing
54	**P**	**52.4 mm horizontal tape, 13" diameter paper reel class I**
4E		Euroform, reel cathode first off reel non lead coated
4F		Euroform, ammo pack, cathode first out of box non lead coated
4G		Euroform, reel cathode last off reel non lead coated
4H		Euroform, ammo pack, cathode last out of box non lead coated
55		DO-214/215AA (SMB), 12 mm tape, 13" diameter paper reel
5A, 5AT	**P**	**DO-214AC (SMA), 12 mm tape, 13" diameter plastic reel**
5B, 5BT	**P**	**DO-214/215AA (SMB), 12 mm tape, 13" diameter plastic reel**
5CA	**P**	**DO-214BA (GF1), 12 mm tape, 13" diameter plastic reel**
56		Avisert, cathode up, cathode first off reel
57, 57T	**P**	**DO-214/215AB (SMC), 16 mm tape, 7" diameter plastic reel**
58		Avisert, cathode up, cathode first out of ammo pack
59		DO-214/215AB (SMC), 16 mm tape, 13" diameter paper reel
9A, 9AT	**P**	**DO-214/215AB (SMC), 16 mm tape, 13" diameter plastic reel**
9C		DO-214/215AB (SMC), 16 mm tape, 7" diameter paper reel
60		Avisert, cathode down, anode first off reel
61, 61T	**P**	**DO-214AC (SMA), 12 mm tape, 7" diameter plastic reel**
62		Avisert, cathode down, anode first out of ammo pack
63		DO-214AC (SMA), 12 mm tape, 13" diameter paper reel
64		Panasert, cathode up, cathode first off reel
65		Panasert, cathode up, anode out of first, ammo pack
66		Panasert, cathode up, cathode first out of ammo pack
67A	**P**	**DO-214BA (GF1), 12 mm tape, 7" diameter plastic reel**
68		Panasert, cathode down, anode first off reel
69A		DO-214BA (GF1), 12 mm tape, 13" diameter paper reel
70		Panasert, cathode down, anode first out of ammo pack
71		Panasert, cathode up, cathode first off reel, lead coat
72		Bulk pack for KBPM, GBL, GBU and special axial-leaded formed devices
73	**P**	**52.4 mm horizontal tape and ammo box packing, class I**
74		Panasert, cathode up, cathode first out of ammo pack, lead coat
75		DO-213AB (GL41), 12 mm tape, 7" diameter paper reel
76		DO-213AB (GL41), 12 mm tape, 13" diameter paper reel
77	**P**	**DFS Bridge, 16 mm tape, 13" diameter paper reel**
79		Panasert, cathode down, cathode first off reel
80	**P**	**TO-269 AA (MB-S) bridge, 12 mm tape, 13" diameter paper reel**
81	**P**	**TO-263AB 24 mm tape, 13" diameter reinforced hub paper reel**
8W	**P**	**For wire bond TO-263AB 24 mm tape, 13" diameter reinforced hub paper reel**

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com
Document Number: 88869
Revision: 30-Jul-08

PACKAGING ORDERING CODE

ANTI-STATIC PACKAGE CODE	PREFFERED PACKAGE CODE	PACKAGING DESCRIPTION
82		DO-213AA (GL34), 8 mm tape, 7" diameter paper reel
83	**P**	**DO-213AA (GL34) 8 mm tape, 13" diameter plastic reel**
84A	**P**	**DO-220AA (SMP) 12 mm tape, 7" diameter plastic reel**
85A	**P**	**DO-220AA (SMP) 12 mm tape, 13" diameter plastic reel**
86A	**P**	**SMPC, 12 mm tape, 7" diameter plastic reel**
87A	**P**	**SMPC, 12 mm tape, 13" diameter plastic reel**
38		Lead forming buck packing in anti-static bags
89A	**P**	**Micro SMP, 8 mm tape, 7" diameter plastic reel**
90		Euroform, reel, cathode first off reel, lead coated
91		Euroform, ammo pack, cathode first out of ammo pack, lead coated
92		Euroform, reel, cathode last off reel, lead coated
93		Euroform, ammo pack, cathode last out of ammo pack, lead coated
45	**P**	**Anti-static tube packaging for TO-220, TO-247AD, DFM, DFS, MBS, KBPM, GBL and GBU**
4W	**P**	**Anti-static tube packaging for wire bond TO-220, ITO-220, TO-262 and TO-263**
96	**P**	**DO-213AB (GL41), 12 mm tape, 7" diameter plastic reel**
97	**P**	**DO-213AB (GL41), 12 mm tape, 13" diameter plastic reel**
98	**P**	**DO-213AA (GL34), 8 mm tape, 7 " diameter plastic reel**
100		MPG06 pseudo radial tape, cathode first out of ammo pack
TR	**P**	**SMA, 12 mm tape, 7" diameter plastic reel (1)**
TR3	**P**	**SMA, 12 mm tape, 13" diameter plastic reel (1)**

Notes:

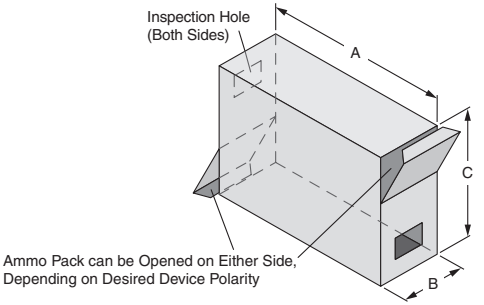
(1) Formerly sold by Vishay Telefunken® (Telefunken® is a registered trademark of Electro Holding GmbH).

- "P" and bold letter denotes preferred package code.
- A "T" suffix added to the packaging codes for SMA, SMB and SMC products indicates that the patented folded-frame construction is used. This does not apply to TR and TR3 codes or TRANSZORB® TVS in SMA and SMB.

BULK PACKAGING

CASE TYPES	PREFERRED PACKAGE CODE	PACKAGING	BOX SIZE		QUANTITY	GROSS WEIGHT	
			inches	cm	ea.	lbs.	kg
DF-M/DF-S, DFL-S	45	Anti-static plastic tubes	17.4 length	44.1 length	50	0.12	0.05
GSIB-3G	45	Anti-static plastic tubes	25.1 length	63.9 length	20	1.23	0.56
GSIB-5S	45	Anti-static plastic tubes	24.2 length	61.5 length	20	1.2	0.54
GBU	45	Anti-static plastic tubes	18.5 length	47 length	20	1.04	0.47
GBL	45	Anti-static plastic tubes	17.5 length	44.5 length	20	0.79	0.36
KBPM	45	Anti-static plastic tubes	18.5 length	47 length	30	0.75	0.34
TO-220AB, AC/ITO-220AC, AB	45	Anti-static plastic tubes	21.0 length	53.7 length	50	0.306	0.14
TO-247AD	45	Anti-static plastic tubes	20.0 length	50.8 length	30	0.572	0.26
TO-269AA (MB-S)	45	Anti-static plastic tubes	20.3 x 0.41	51.5 x 1.04	100	0.73	0.33
KBPM	51	Anti-static PVC tray	12.5 x 6.5 x 1.25	31.7 x 16.5 x 3.17	600	0.53	0.24
GBL	51	Anti-static PVC tray	12.5 x 6.1 x 1.0	30.9 x 15.5 x 2.5	400	2.20	1.0
GBPC12-35W	51	Paper box	12.5 x 12.5 x 1.7	31.7 x 31.7 x 4.3	100	3.20	2.1
GBPC1, GBPC6	51	Paper box	7.5 x 7.5 x 1.43	19.0 x 19.0 x 3.6	100	1.26/1.48	0.57/0.67
KBL	51	Anti-static PVC tray	12.2 x 6.1 x 1.5	30.9 x 15.5 x 3.8	300	4.19	1.9
GBPC12-35	51	Paper box	12.5 x 12.5 x 1.7	31.7 x 31.7 x 4.3	100	4.85	2.2
KBU4, 6, 8	51	Anti-static PVC tray	12.2 x 6.1 x 1.5	30.9 x 15.5 x 3.8	250	3.53	2.1
WOG/2WOG	51	Plastic bags	-	-	100	0.37	0.17
GBU,/BU	51	Paper tray	13.1 x 6.6 x 1.2	33.2 x 17.2 x 3.0	250	2.97/3.25	1.35/1.48
KBPM	72	Paper box	7.4 x 7.4 x 1.5	18.8 x 18.8 x 3.8	200	1.93	0.88

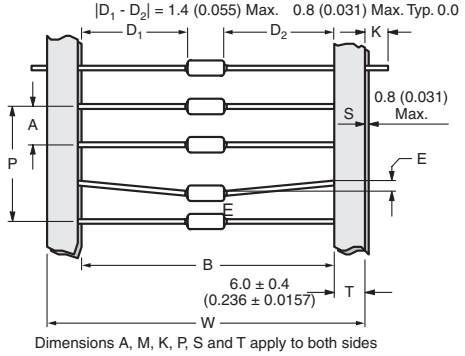
AXIAL-LEADED TAPE AND REEL PACKAGING



All Axial leaded devices are packed in accordance with EIA Standard RS-296-E. The diagrams given below refer to these specifications.

TABLE 1 - AMMO PACK PACKAGING

PACKAGING	AVAILABLE PRODUCT OUTLINES	PREFERRED PACKAGE CODE	DIMENSION A	DIMENSION B	DIMENSION C	QUANTITY BOX
26 mm horizontal tape, ammo pack	DO-204AL (DO-41), MPG06 DO-204AC P300	53 53 53	9.7" (247 mm)	1.7" (44 mm)	3.7" (95 mm)	3.0K 1.5K 0.75K
52 mm horizontal tape, ammo pack	DO-204AL, MPG06 DO-204AC, DO201AD, GP20 P600	73 73 73 73	10.0" (255 mm)	3.15" (80 mm)	4.53" (115 mm)	3.0K 2.0K 1.0K 0.3K
Radial (avisert, panasert, euroform) Vertical tape	GP10-E, RGP10-E, GP10-E, RGP10-E	58, 62, 65, 66, 70 91, 93 70, 74	13.4" (340 mm)	1.8" (47 mm)	7.9" (200 mm)	2.0K 2.5K 2.0K
Pseudo/radial tape, ammo pack	MPG06	100	13.4" (340 mm)	1.8" (47 mm)	7.9" (200 mm)	2.5K

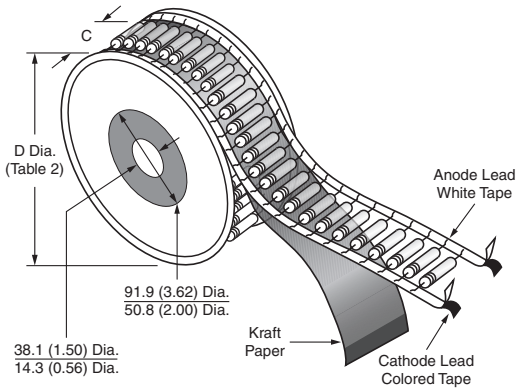


Dimensions in millimeters (inches)

Description	Symbol	
Component Pitch	A	2, 3
Inside Tape Spacing	B	2, 3
Lead to Lead Eccentricity	|D1 - D2|	-
Lead Extension	K	-
Lead Bending	E	2
Cumulative Pitch	P	3
Exposed Adhesive	S	-
Tape Width	T	-

All polarized components shall be oriented in the same direction

Figure 1.



The "C" dimension of Fig. 2 is between flanges of the component reel and shall be 1.5 mm (0.059") to 8.00 mm (0.315") greater than the overall taped component width "W" (Fig. 1). Where "W" dimension is 68.2 mm (2.68") max.

Figure 2.

AXIAL-LEADED TAPE AND REEL PACKAGING

TABLE 2 - REEL AND AMMO PACK TAPING SPECIFICATIONS

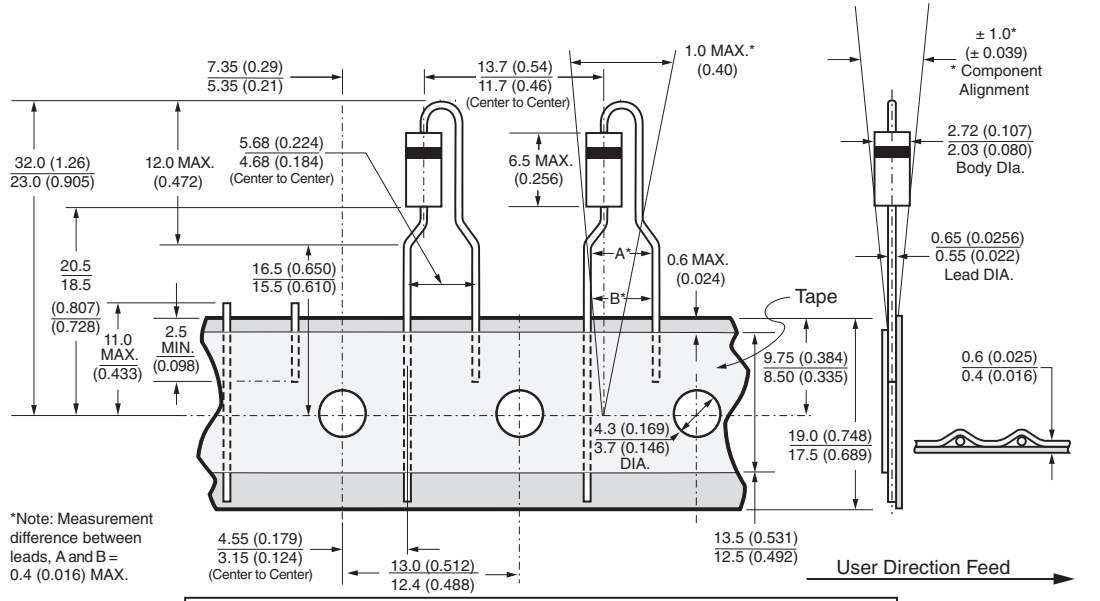
COMPONENT CASE TYPE	PREFERRED PACKAGE CODE	UNITS PER REEL	COMPONENT PITCH "A" Figure 1.		INSIDE TAPE SPACING "B" Figure 1.		REEL DIMENSION "D" Figure 2.		LEAD BENDING "E" Figure 1.		TYP. GROSS WEIGHT PER REEL	
		ea.	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg
1.5KA (PAR)	54	1400	0.395	10.0	2.06	52.4	13.0	330	0.047	1.2	3.8	1.76
DO-204AC	54	4000	0.200	5.0	2.06	52.4	13.0	330	0.047	1.2	4.66	2.11
DO-201AD	54	1400	0.395	10.0	2.06	52.4	13.0	330	0.047	1.2	4.9	2.22
DO-204AL	54	5500	0.200	5.0	2.06	52.4	13.0	330	0.047	1.2	5.2	2.3
DFS Surface Mount	77	1500	0.472	12.0	-	-	13.0	330	Figure 13.	1.95	0.885	
DO-214BA (GF1)	67A/5CA	1500/6500	0.157	4.0	-	-	7.0/13.0	178/330	Figure 13.	0.31/ 2.07	0.14/ 0.94	
DO-213AA (GL34)	98/83	2500/9000	0.157	4.0	-	-	7.0/13.0	178/330	Figure 13.	0.471/ 1.41	0.214/ 0.67	
DO-213AB (GL41)	96/97	1500/5000	0.157	4.0	-	-	7.0/13.0	178/330	Figure 13.	0.62/ 1.96	0.281/ 0.89	
GP10E Radial	Figure 7. and 8.	2500	0.500	12.7	-	-	13.0	330	0.079	2.0	3.0	1.34
GP10E	54	5500	0.200	5.0	2.06	52.4	13.0	330	0.047	1.2	4.4	1.99
GP20/1.5KE	54	1400	0.395	10.0	2.06	52.4	13.0	330	0.047	1.2	4.9/3.8	2.22/ 1.76
MPG06	54	5500	0.200	5.0	2.06	52.4	13.0	330	0.047	1.2	3.8	1.71
MPG06 Radial	50J	2000	0.500	12.7	-	-	-	-	0.080	2.0	2.4	1.07
P600	54	800	0.395	10.0	2.06	52.4	13.0	330	0.047	1.2	5.3	2.39
SMP	84A/85A	3000/ 10 000	0.157	4.0	-	-	7.0/13.0	178/330	Figure 13.		0.35/ 1.54	0.16/ 0.70
Micro SMP	89A	4500	0.157	4.0	-	-	7.0	178	Figure 13.		0.29	0.13
SMPC	86A/87A	1500/6500	0.314	8.0	-	-	7.0/13.0	178/330	Figure 13.		0.53/ 2.23	0.24/ 1.01
DO-214AC (SMA)	61, 61T, TR/5A, 5AT, TR3	1800/7500	0.157	4.0	-	-	7.0/13.0	178/330	Figure 13.		0.24/ 0.99	0.11/ 0.45
DO-214AA (SMB)	52, 52T/5B, 5BT	750/3200	0.314	8.0	-	-	7.0/13.0	178/330	Figure 13.		0.24/ 0.99	0.11/ 0.45
DO-214AB (SMC)	57T/9AT	850/3500	0.472	12.0	-	-	7.0/13.0	178/330	Figure 13.		0.44/ 1.39	0.20/ 0.63
DO-218AB	2D	750	0.630	16.0	-	-	13.0	330	Figure 13.		4.85	2.2
TO-263AB	81	800	0.630	16.0	-	-	13.0	330	Figure 13.		2.4	1.1
TO-269AA (MB-S)	80	3000	0.315	8.0	-	-	13.0	330	Figure 13.		1.43	0.65

Note:

• Package codes, 61/5A, 52/5B are matrix-frame constructions for TRANSZORB® TVS in SMA and SMB only.

TABLE 3 - COMPONENT AND INSIDE HORIZONTAL TAPE SPACING

COMPONENT BODY DIAMETER	COMPONENTS SPACING A (LEAD TO LEAD)	INSIDE TAPE SPACING "B"	CUMULATIVE PITCH TOLERANCE
0 mm to 5 mm (0.0" to 0.197")	5.0 mm ± 0.5 mm (0.197" ± 0.020")	26 mm + 1.5 mm/- 0.0 mm (1.024" + 0.059"/- 0.0")	Not to exceed 1.5 mm (0.059") over 6 consecutive components
0 mm to 5 mm (0.0" to 0.197")	5.0 mm + 0.5 mm (0.197" ± 0.020")	52.4 mm + 1.5 mm/- 0.4 mm (2.062" + 0.059"/- 0.016")	
5.01 mm to 10 mm (0.197" to 0.394")	10 mm ± 0.5 mm (0.394" ± 0.020")	52.4 mm + 1.5 mm/- 0.4 mm (2.062" + 0.059"/- 0.016")	



Available for GP10 products only utilizing 0.65 mm (0.025") diameter leads for Euroform tape by adding suffix "E" (GP10GE, 1N4004GPE). Lead coating is standard.

Figure 3. Euroform

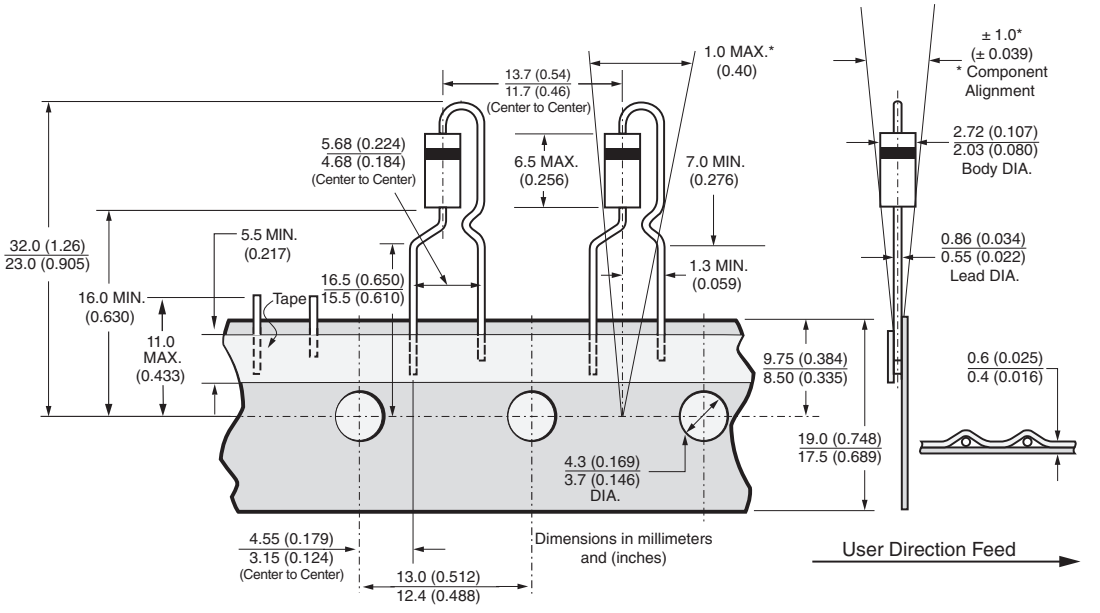
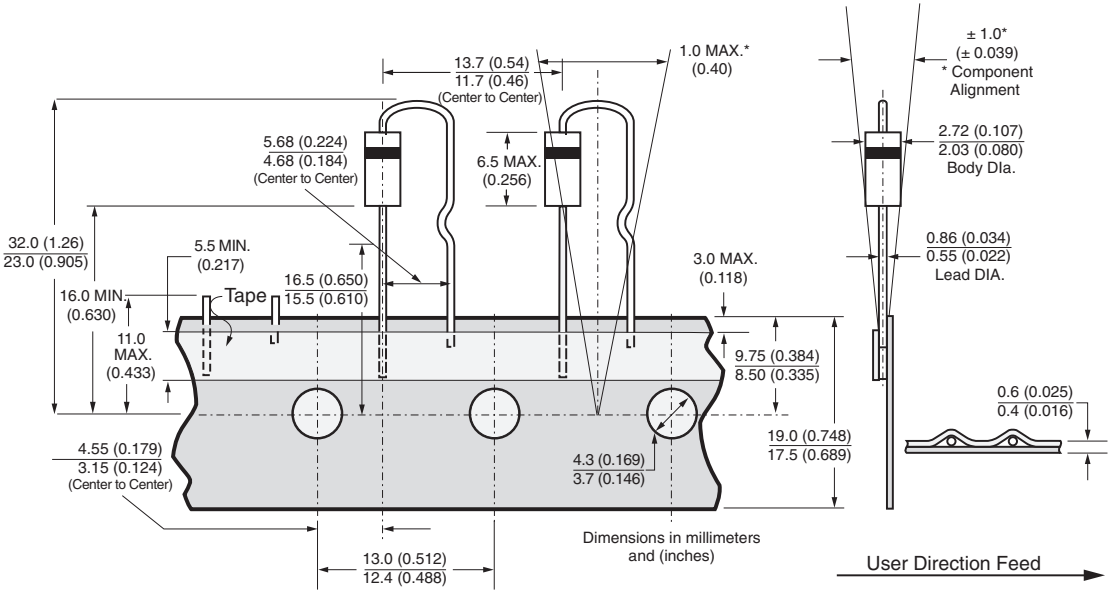


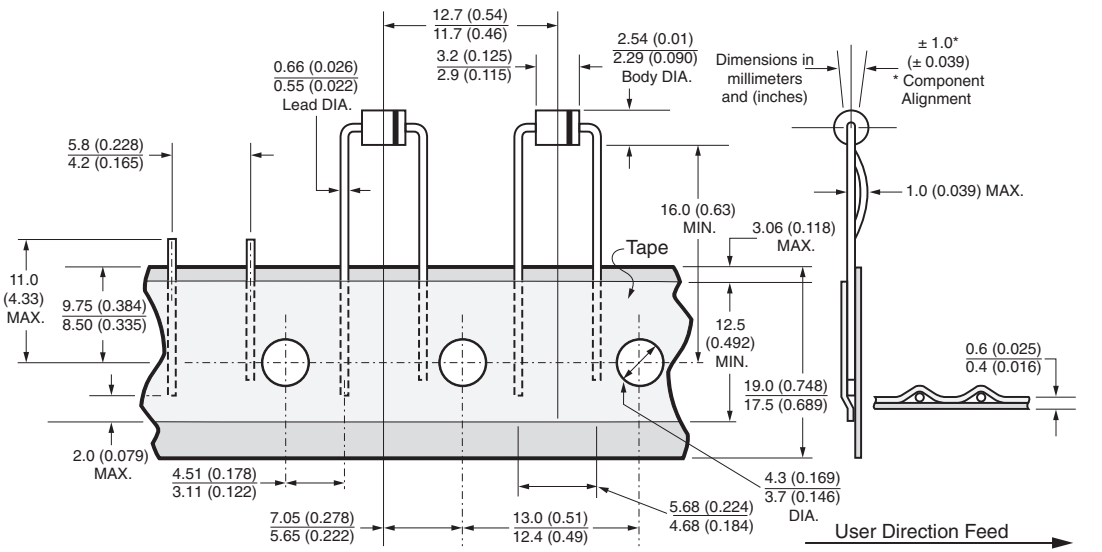
Figure 4. Panasert



Available only for GP10 style products utilizing 0.65 mm (0.025") or 0.76 mm (0.030") diameter leads for Panasert and Avisert tape. Lead coating is available on GP10 products only.

Standard polarity cathode oriented away from sprocket holes (Optional polarity cathode oriented toward sprocket holes)

Figure 5. Avisert



Available only for MPG06 product in Ammo Pack in accordance with EIA Standard RS-468-A utilizing 0.61 mm (0.024") diameter leads. Maximum cumulative pitch tolerance: 1.0 mm (0.039")/20 pitch.

Figure 6. Pseudo Radial

RADIAL TAPE PACKAGING

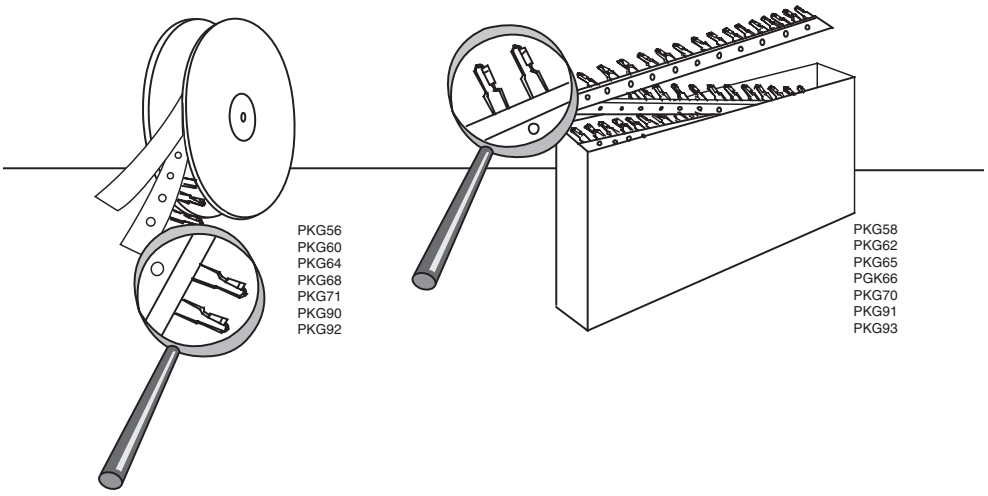


Figure 7. and 8. Reel and Ammo Box Packaging

PREFERRED PACKAGE CODE		
AVISERT	**PANASERT**	**EUROFORM**
PKG56	PKG64	PKG90
PKG58	PKG65	PKG91
PKG60	PKG66	PKG92
PKG62	PKG68	PKG93
	PKG70	
	PKG71	
	PKG74	
	PKG79	

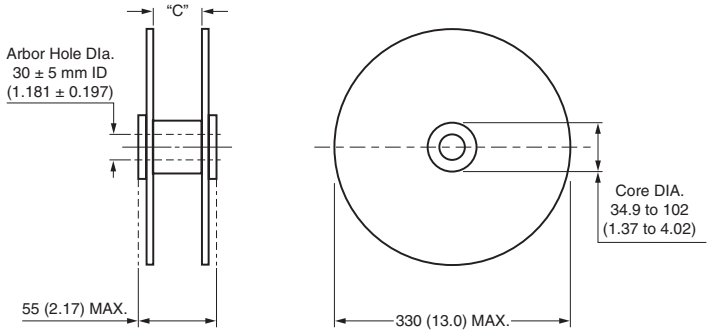


Figure 9. Reel Dimensions

Notes:

- "C" Dimension between the reel flanges shall be governed by the overall width of the taped components and shall be 1.5 mm (0.057") to 8.0 mm (0.315") greater than the overall width
- All leaded devices are packaged in accordance with EIA Standard RS-468-A specification and are available on reel or in fan fold box (ammo pack)
- All dimensions are in millimeters and (inches). The above packaging is only available from Taiwan.

SURFACE MOUNT TAPE AND REEL PACKAGING

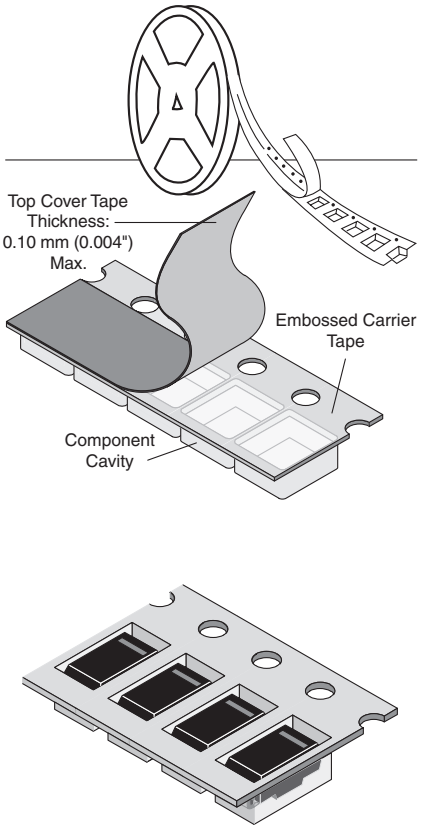


Figure 10.

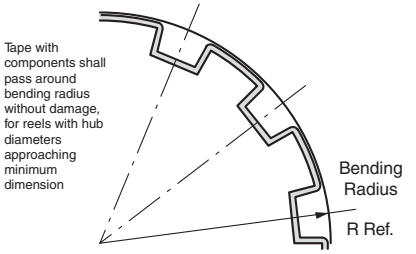


Figure 11.

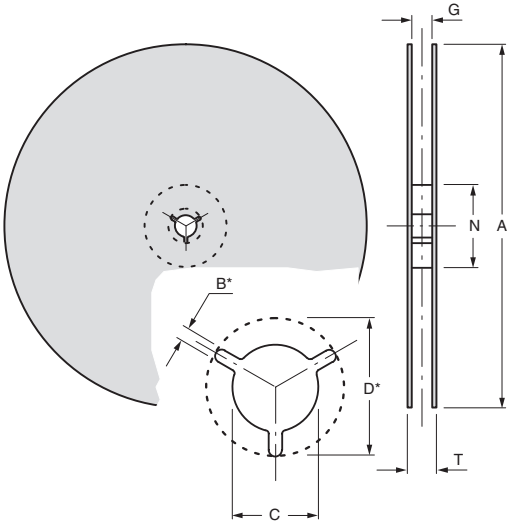
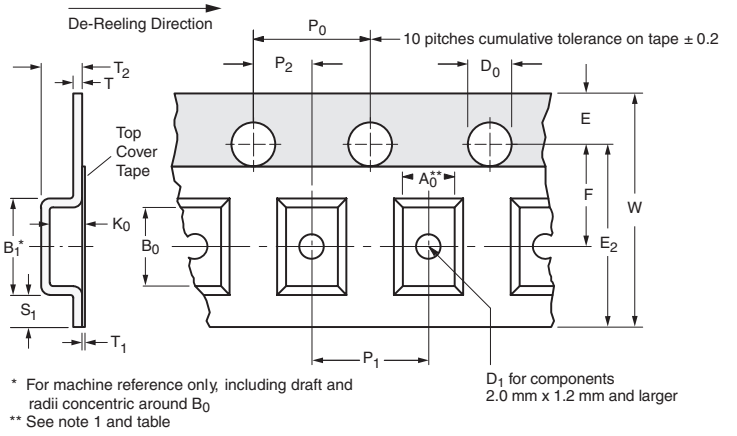


Figure 12.

All dimensions in millimeters (inches)

TAPE SIZE	A MAX.	B MAX.	C	D MAX.	N MIN.	G MAX.	T MAX.
8 mm (0.315)	330 ± 2.0 (13.0 ± 0.079) 178 ± 2.0 (7.0 ± 0.079)	1.5 (0.059)	13.0 ± 0.20 (0.51 ± 0.0008)	20.2 (0.795)	50 (1.97)	9.9 (0.389)	14.4 (0.567)
12 mm (0.472)	330 ± 2.0 (13.0 ± 0.079) 178 ± 2.0 (7.0 ± 0.079)	1.5 (0.059)	13.0 ± 0.20 (0.51 ± 0.0008)	20.2 (0.795)	50 (1.97)	14.4 (0.567)	18.4 (0.724)
16 mm (0.630)	330 ± 2.0 (13.0 ± 0.079) 178 ± 2.0 (7.0 ± 0.079)	1.5 (0.059)	13.0 ± 0.20 (0.51 ± 0.0008)	20.2 (0.795)	50 (1.97)	18.4 (0.724)	22.4 (0.802)
24 mm (0.945)	330 ± 2.0 (13.0 ± 0.079) 178 ± 2.0 (7.0 ± 0.079)	1.5 (0.059)	13.0 ± 0.20 (0.51 ± 0.0008)	20.2 (0.795)	50 (1.97)	26.4 (1.039)	30.4 (1.197)

SURFACE MOUNT TAPE AND REEL PACKAGING



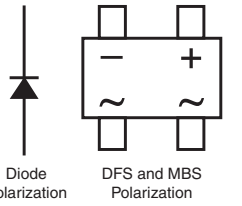


Figure 13.

8,12,16, and 24 mm Embossed Tape — All dimensions in millimeters (inches)

Tape Size	D_0	E_1	P_0	P_2	A_0, B_0, K_0	S_1 Min.	T Max.	T_1 Max.
8, 12, mm	1.5 ± 0.1/- 0 (0.059 ± 0.004)	1.75 ± 0.1 (0.069 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	2.0 ± 0.05 (0.79 ± 0.002)	See note 1	0.6 (0.024)	0.600 (0.024)	0.1 (0.004)
16, 24 mm				2.0 ± 0.1 (0.79 ± 0.004)				

Case Type	Tape Size	B_1 Max.	D_1 Min.	E_2 Min.	F	P_1	R Ref.	T_2 Max.	W
DO-213AA (GL34)	8 mm (0.315)	4.2 (0.165)	1.0 (0.39)	6.25 (0.246)	3.5 ± 0.05 (0.138 ± 0.002)	4.0 ± 0.10 (0.57 ± 0.004)	25 (0.984)	2.4 (0.094)	8.0 ± 0.30 (0.315 ± 0.012)
Micro SMP		3.28 (0.129)		6.05 (0.238)				1.919 (0.076)	
DO-213AB (GL41)	12 mm	8.2 (0.323)	1.5 (0.059)	10.25 (0.404)	5.5 ± 0.05 (0.217 ± 0.002)		30 (1.181)	4.5 (0.177)	12.0 ± 0.30 (0.472 ± 0.012)
DO-214BA (GF1)								3.15 ± 0.10 (1.00 ± 0.004)	
DO-214AC(SMA)								2.54 ± 0.10 (1.24 ± 0.004)	
SMP								1.74 ± 0.10 (0.069 ± 0.004)	
SMPC		7.0 (2.76)				8.0 ± 0.10 (0.315 ± 0.004)		1.33 ± 0.10 (0.052 ± 0.004)	
DO214/215 (SMB) TO-269AA (MB-S)		8.2 (0.323)						2.67 ± 0.10 (1.05 ± 0.004)	16.0 ± 0.2 (0.630 ± 0.008)
DO-214/215AB (SMC)	16 mm (0.630)	12.1 (0.476)		14.25 (0.561)	7.5 ± 0.05 (0.295 ± 0.002)			2.5 ± 0.10 (0.100 ± 0.004)	
DFS						12.0 ± 0.10 (0.472 ± 0.004)		3.81 ± 0.10 (0.150 ± 0.004)	
TO-263AB DO-218AB	24 mm (0.945)	20.1 (0.791)		22.25 (0.876)	11.5 ± 0.1 (0.453 ± 0.004)	16.0 ± 0.10 (0.630 ± 0.004)		5.21 ± 0.10 (0.205 ± 0.004)	24.0 ± 0.3 (0.945 ± 0.008)

Notes:

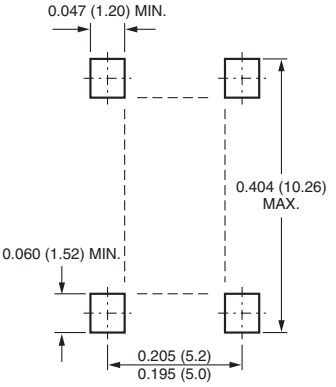
(1) A_0, B_0, and K_0 are determined by the maximum dimensions of the component size. The clearance between the component and the cavity must be within 0.05 mm (0.002") min. to 0.5 mm (0.02") max. for 8 mm tape and 12 mm tape, 0.15 mm (0.066") min. to 0.90 mm (0.035") max. for 16 mm tape and 0.15 mm (0.006") min. to 1.0 mm (0.59") max. for 24 mm tape.

(2) All surface mount components are packed in accordance with EIA standard 481-C

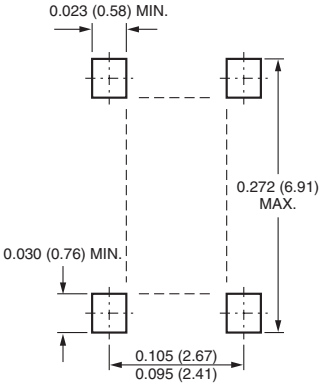
Pad Layouts/Soldering Process

VISHAY GENERAL SEMICONDUCTOR RECOMMENDED MINIMUM MOUNTING PAD LAYOUT SIZES FOR THE SURFACE MOUNT RECTIFIER

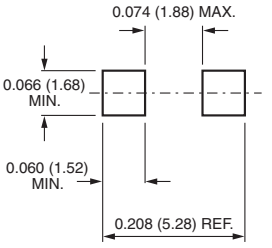
DFS BRIDGE



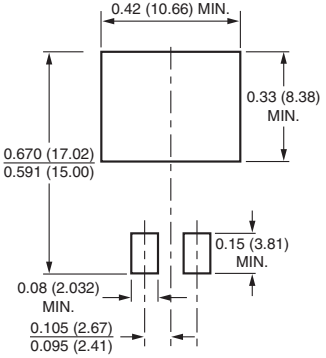
MBS BRIDGE



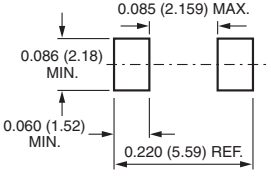
DO-214AC/DO-214BA



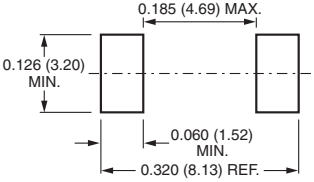
TO-263



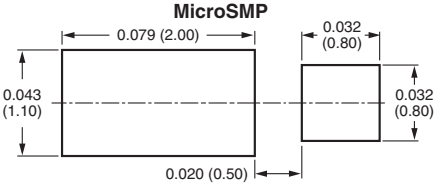
SMB/DO-214AA



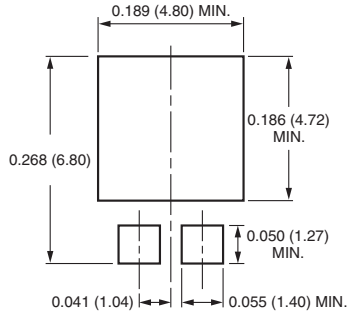
SMC/DO-214AB



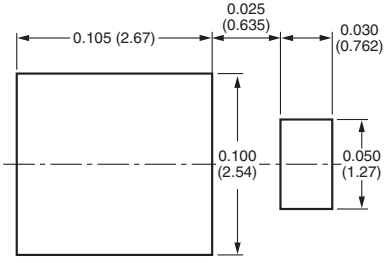
MicroSMP



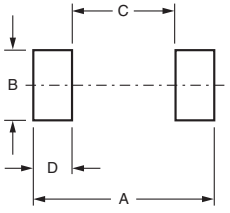
TO-277A (SMPC)



DO-220AA (SMP)



DO-213AA (GL34)/ DO-213AB (GL-41)



All dimensions in inches (millimeters)

DIMENSIONS in inches (millimeters)		
	DO-213AA (GL34)	**DO-213AB (GL41)**
A	0.177 (4.5) ref.	0.236 (6.0) ref.
B	0.079 (2.0) min.	0.118 (3.0) min.
C	0.079 (2.0) max.	0.138 (3.5) max.
D	0.050 (1.25) min.	0.050 (1.25) min.

VISHAY GENERAL SEMICONDUCTOR RECOMMENDED SOLDERING PROCESS FOR SURFACE MOUNTED AND AXIAL-LEADED COMPONENTS

RECOMMENDED WAVE SOLDERING PROFILE (Sn-Pb/Lead (Pb)-free)

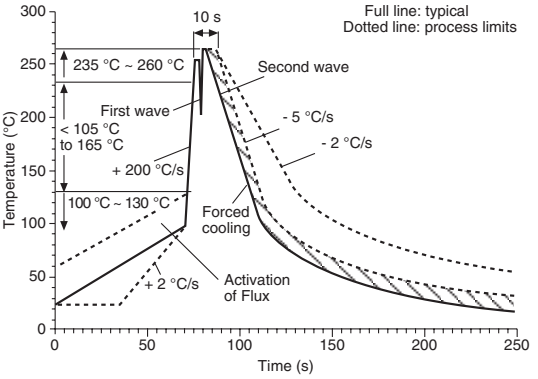


Figure 1.

Wave Soldering Notes

The profile illustrated above depends ultimately on the type of flux used with the solder paste. The peak temperature for this process should not exceed 265 °C for PC-board mounting.

REFLOW

TABLE 1 - CLASSIFICATION REFLOW PROFILE		
PROFILE FEATURE	**Sn-Pb EUTECTIC ASSEMBLY**	**LEAD (Pb)-FREE ASSEMBLY**
Preheat and soak Temperature min. ($T_{Smin.}$) Temperature max. ($T_{Smax.}$) Time ($T_{Smin.}$ to $T_{Smax.}$) (t_S)	 100 °C 150 °C 60 to 120 s	 150 °C 200 °C 60 to 120 s
Average ramp-up rate ($T_{Smax.}$ to T_P)	3 °C/s maximum	
Liquidous temperature (T_L) Time to liquidous (t_L)	183 °C 60 to 150 s	217 °C 60 to 150 s
Peak package body temperature (T_P) (1)	See classification temperature in table 2	See classification temperature in table 3
Time (t_P) (2) with 5 °C of the specified classification temperature (T_C)	20 s (2)	30 s (2)
Average ramp-down rate (T_P to $T_{Smax.}$)	6 °C/s maximum	
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum

Notes:

(1) Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum

(2) Tolerance for time at peak profile temperature (T_P) is defined as a supplier minimum and a user maximum

REFLOW PROFILE

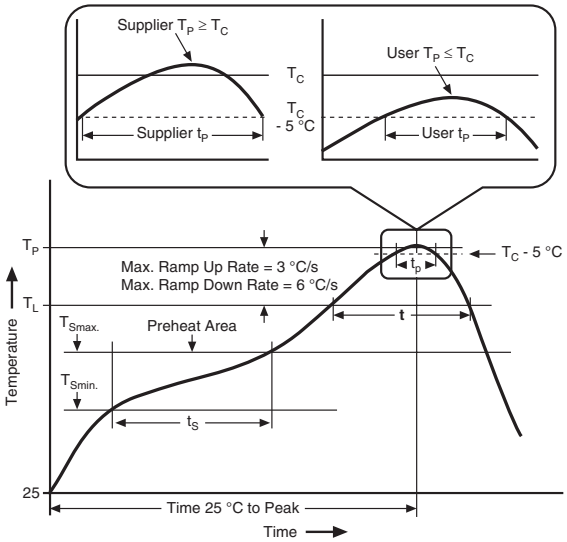


Figure 2.

TABLE 2 - Sn-Pb EUTECTIC PROCESS PACKAGE PEAK REFLOW TEMPERATURES		
PACKAGE THICKNESS	**VOLUME mm^3 < 350**	**VOLUME mm^3 ≥ 350**
< 2.5 mm	235 °C	220 °C
≥ 2.5 mm	220 °C	220 °C

TABLE 3 - LEAD (Pb)-FREE PROCESS PACKAGE CLASSIFICATION REFLOW TEMPERATURES			
PACKAGE THICKNESS	**VOLUME mm^3 < 350**	**VOLUME mm^3 350 to 2000**	**VOLUME mm^3 > 2000**
< 1.6 mm	260 °C	260 °C	260 °C
1.6 mm to 2.5 mm	260 °C	250 °C	245 °C
≥ 2.5 mm	250 °C	245 °C	245 °C

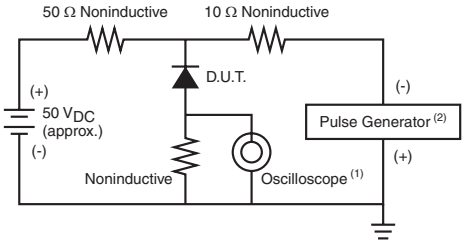
Tolerance: The device manufacturer/supplier shall assure process compatibility up to and including the stated classfication temperature at the rated MSL level.

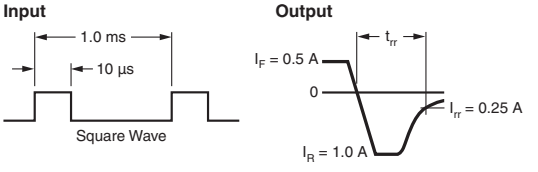
Notes:

- Package volume excludes external terminals (balls, bumps, lands, leads) and/or non-integral heatsinks.
- The maximum component temperature reached during reflow depends on package thickness and volume. The use of convection reflow processes reduces the thermal gradients between packages. However, thermal gradients due to differences in thermal mass of SMD packages may still exist.
- Recommended soldering process is accordance with J-STD-020D.

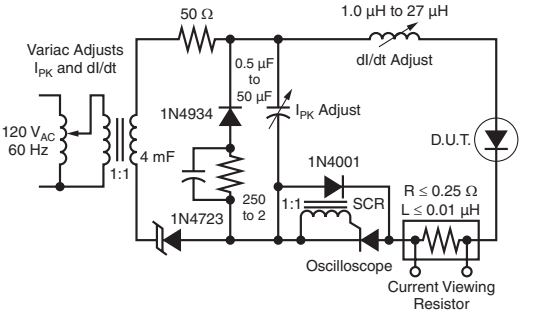
Circuits: t_{rr}, Reverse Recovery Time Characteristics and Test Diagrams

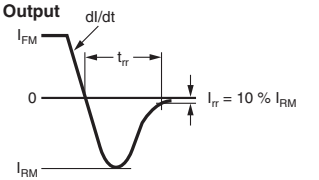
CIRCUIT 1





CIRCUIT 2



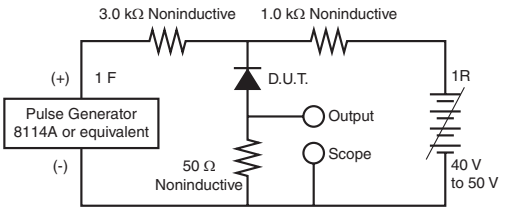


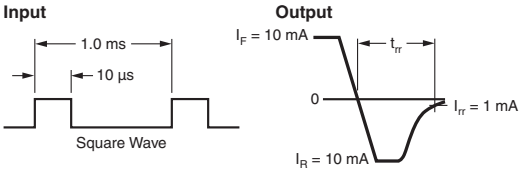
Notes:

(1) Rise time: 7 ns max. input, impedance: 1 MΩ, 22 pF

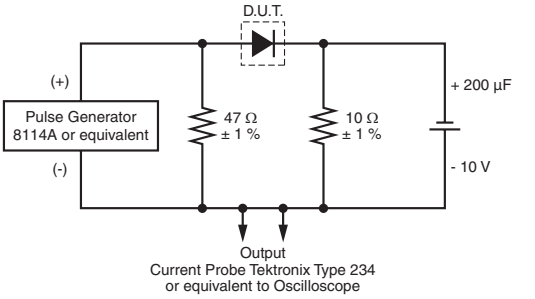
(2) Rise time: 10 ns max., source impedance: 50 Ω

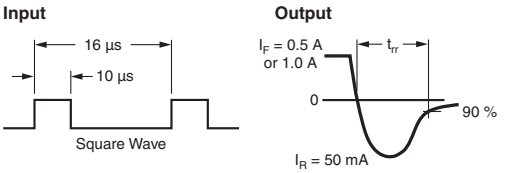
CIRCUIT 3





CIRCUIT 4





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