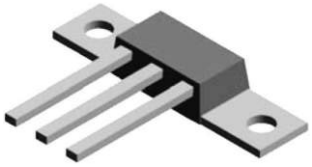
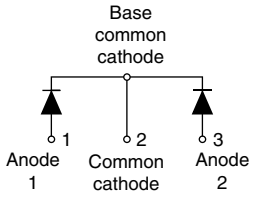
Schottky Rectifier
New Generation 3 D-61 Package, 2 x 40 A

VS-87CNQ020APbF



D-61-8



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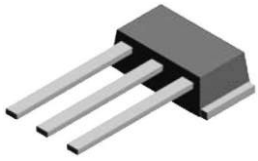

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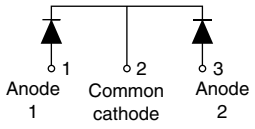

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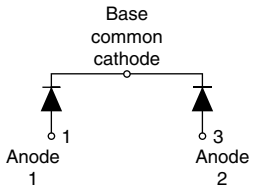
D-61-8-SL



PRODUCT SUMMARY	
$I_{F(AV)}$	2 x 40 A
V_R at 125 °C	20 V
V_R at 150 °C	10 V
I_{RM}	550 mA at 125 °C

FEATURES

Pb Available

RoHS* COMPLIANT

- 150 °C T_J operation
- Center tap module
- Optimized for 3.3 V application
- Ultralow forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- New fully transfer-mold low profile, small footprint, high current package
- Through-hole versions are currently available for use in lead (Pb)-free applications (“PbF” suffix)
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level

DESCRIPTION

The center tap Schottky rectifier module has been optimized for ultralow forward voltage drop specifically for 3.3 V output power supplies. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	80	A
V_{RRM}		20	V
I_{FSM}	t_p = 5 µs sine	6000	A
V_F	40 Apk, T_J = 125 °C (per leg)	0.32	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VS-87CNQ020APbF	UNITS
Maximum DC reverse voltage	V_R	125 °C	20	V
		150 °C	10	

* Pb containing terminations are not RoHS compliant, exemptions may apply

ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	per leg	$I_{F(AV)}$	50 % duty cycle at T_C = 135 °C, rectangular waveform		40	A
	per device				80	
Maximum peak one cycle non-repetitive surge current per leg		I_{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	6000	
			10 ms sine or 6 ms rect. pulse		1100	
Non-repetitive avalanche energy per leg		E_{AS}	T_J = 25 °C, I_{AS} = 8 A, L = 1.12 mH		36	mJ
Repetitive avalanche current per leg		I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T_J maximum V_A = 1.5 x V_R typical		8	A

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg	V_{FM} (1)	40 A	T_J = 25 °C	0.45	V
		80 A		0.51	
		40 A	T_J = 125 °C	0.32	
		80 A		0.39	
		40 A	T_J = 150 °C	0.29	
		80 A		0.37	
Maximum reverse leakage current per leg	I_{RM} (1)	T_J = 125 °C	V_R = 5 V	90	mA
			V_R = 3.3 V	70	
		T_J = 150 °C	V_R = 10 V	480	
		T_J = 25 °C	V_R = Rated V_R	5.5	
		T_J = 125 °C		550	
Threshold voltage	$V_{F(TO)}$	T_J = T_J maximum		0.191	V
Forward slope resistance	r_t			2.3	mΩ
Maximum junction capacitance per leg	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz), 25 °C		6500	pF
Typical series inductance per leg	L_S	Measured lead to lead 5 mm from package body		5.5	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/µs

Note

(1) Pulse width < 300 µs, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range		T_J, T_{Stg}		- 55 to 150	°C
Maximum thermal resistance, junction to case	per leg	R_{thJC}	DC operation	0.85	°C/W
	per package			0.42	
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased Device flatness < 5 mils	0.30	
Approximate weight				7.8	g
				0.28	oz.
Mounting torque	minimum			40 (35)	kgf · cm (lbf · in)
	maximum			58 (50)	
Marking device			Case style D-61	87CNQ020A	
			Case style D-61-8-SM	87CNQ020ASM	
			Case style D-61-8-SL	87CNQ020ASL	

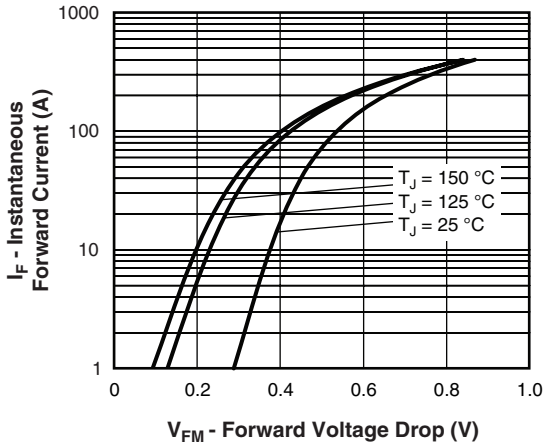


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

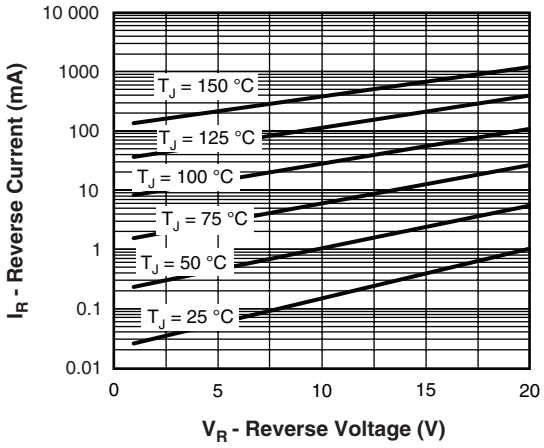


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

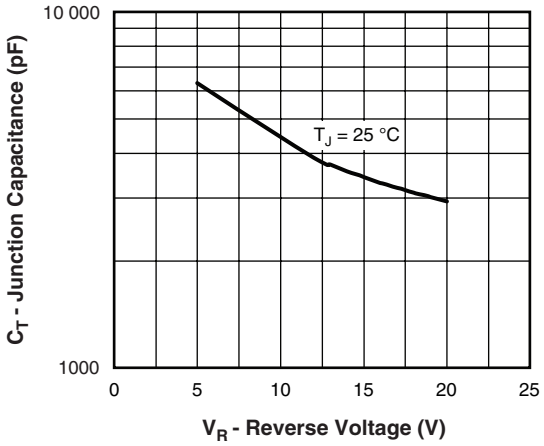


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

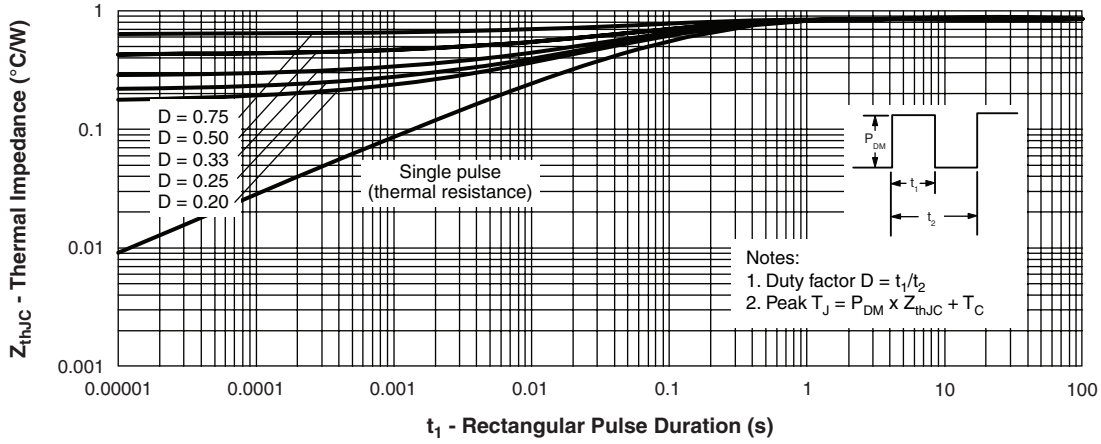


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

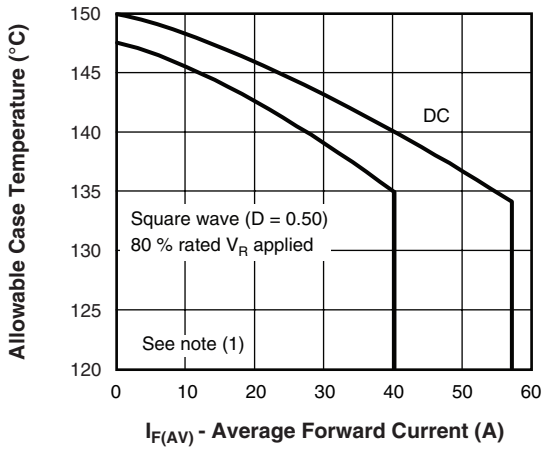


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

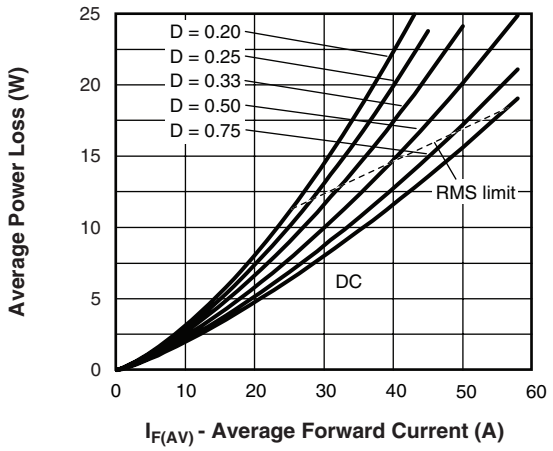


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

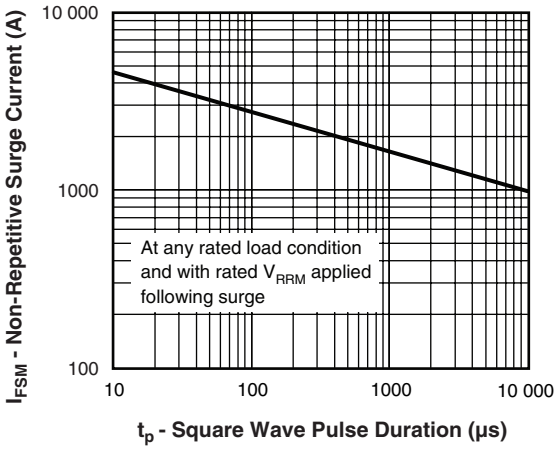


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

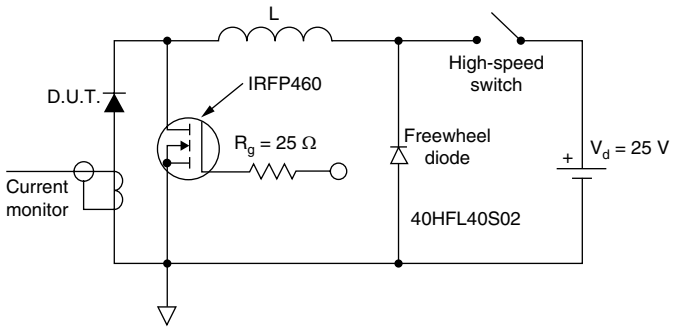


Fig. 8 - Unclamped Inductive Test Circuit

Note

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at ($I_{F(AV)}$/D) (see fig. 6);
Pd_{REV} = Inverse power loss = $V_{R1} \times I_R$ (1 - D); I_R at V_{R1} = 80 % rated V_R

ORDERING INFORMATION TABLE

Device code

VS-	87	C	N	Q	020	A	PbF
1	2	3	4	5	6	7	8

- 1 - HPP product suffix
- 2 - Current rating (80 A)
- 3 - Circuit configuration:
  C = Common cathode
- 4 - Package:
  N = D-61
- 5 - Schottky “Q” series
- 6 - Voltage rating (020 = 20 A)
- 7 - Package style:
  - A = D-61-8
  - ASM = D-61-8-SM
  - ASL = D-61-8-SL
- 8 - • None = Standard production
  • PbF = Lead (Pb)-free

Standard pack quantity: A = 10 pieces; ASM/ASL = 20 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95354
Part marking information	www.vishay.com/doc?95356

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