DISCRETE SEMICONDUCTORS

Small-signal and Medium-power Diodes

1997

Data Handbook SC01

Let's make things better.

Philips Semiconductors

PHILIPS

QUALITY ASSURED

Our quality system focuses on the continuing high quality of our components and the best possible service for our customers. We have a three-sided quality strategy: we apply a system of total quality control and assurance; we operate customer-oriented dynamic improvement programmes; and we promote a partnering relationship with our customers and suppliers.

PRODUCT SAFETY

In striving for state-of-the-art perfection, we continuously improve components and processes with respect to environmental demands. Our components offer no hazard to the environment in normal use when operated or stored within the limits specified in the data sheet.

Some components unavoidably contain substances that, if exposed by accident or misuse, are potentially hazardous to health. Users of these components are informed of the danger by warning notices in the data sheets supporting the components. Where necessary the warning notices also indicate safety precautions to be taken and disposal instructions to be followed. Obviously users of these components, in general the set-making industry, assume responsibility towards the consumer with respect to safety matters and environmental demands.

All used or obsolete components should be disposed of according to the regulations applying at the disposal location. Depending on the location, electronic components are considered to be ‘chemical’, ‘special’ or sometimes ‘industrial’ waste. Disposal as domestic waste is usually not permitted.

Small-signal and Medium-power Diodes

CONTENTS

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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ALPHANUMERIC INDEX

REPLACEMENT TYPES

The following type numbers are still included in this data handbook, but they should no longer be used for new designs.

TYPE NUMBER	REPLACEMENT TYPE
BAS11	BYD33G
BAS12	BYD33G
BYD11D	BYD13D
BYD11G	BYD13G
BYD11J	BYD13J
BYD11K	BYD13K
BYD11M	BYD13M
BYD31D	BYD33D
BYD31G	BYD33G

TYPE NUMBER	REPLACEMENT TYPE
BYD31J	BYD33J
BYD31K	BYD33K
BYD31M	BYD33M
BYD71D	BYD73D
BYD71G	BYD73G
BYD71J	BYD73J
BYD71K	BYD73K
BYD71M	BYD73M

MARKING CODES

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TYPE NUMBER TO MARKING CODE

TYPE NUMBER	MARKING CODE	PACKAGE
1N821	1N821	SOD68 (DO34)
1N821A	1N821A	SOD68 (DO34)
1N823	1N823	SOD68 (DO34)
1N823A	1N823A	SOD68 (DO34)
1N825	1N825	SOD68 (DO34)
1N825A	1N825A	SOD68 (DO34)
1N827	1N827	SOD68 (DO34)
1N827A	1N827A	SOD68 (DO34)
1N829	1N829	SOD68 (DO34)
1N829A	1N829A	SOD68 (DO34)
1N914	1N914 PH	SOD27 (DO35)
1N916	1N916 PH	SOD27 (DO35)
1N4001G	1N4001 PH	SOD57
1N4001ID	1N4001	SOD81
1N4002G	1N4002 PH	SOD57
1N4002ID	1N4002	SOD81
1N4003G	1N4003 PH	SOD57
1N4003ID	1N4003	SOD81
1N4004G	1N4004 PH	SOD57
1N4004ID	1N4004	SOD81
1N4005G	1N4005 PH	SOD57
1N4005ID	1N4005	SOD81
1N4006G	1N4006 PH	SOD57
1N4006ID	1N4006	SOD81
1N4007G	1N4007 PH	SOD57
1N4007ID	1N4007	SOD81
1N4148	1N4148 PH	SOD27 (DO35)
1N4150	1N4150 PH	SOD27 (DO35)
1N4151	1N4151 PH	SOD27 (DO35)
1N4153	1N4153 PH	SOD27 (DO35)
1N4446	1N4446 PH	SOD27 (DO35)
1N4448	1N4448 PH	SOD27 (DO35)
1N4531	4531PH	SOD68 (DO34)
1N4532	4532PH	SOD68 (DO34)
1N4728A	4728A P	SOD66 (DO41)
1N4729A	4729A P	SOD66 (DO41)
1N4730A	4730A P	SOD66 (DO41)
1N4731A	4731A P	SOD66 (DO41)
1N4732A	4732A P	SOD66 (DO41)

TYPE NUMBER	MARKING CODE	PACKAGE
1N4733A	4733A P	SOD66 (DO41)
1N4734A	4734A P	SOD66 (DO41)
1N4735A	4735A P	SOD66 (DO41)
1N4736A	4736A P	SOD66 (DO41)
1N4737A	4737A P	SOD66 (DO41)
1N4738A	4738A P	SOD66 (DO41)
1N4739A	4739A P	SOD66 (DO41)
1N4740A	4740A P	SOD66 (DO41)
1N4741A	4741A P	SOD66 (DO41)
1N4742A	4742A P	SOD66 (DO41)
1N4743A	4743A P	SOD66 (DO41)
1N4744A	4744A P	SOD66 (DO41)
1N4745A	4745A P	SOD66 (DO41)
1N4746A	4746A P	SOD66 (DO41)
1N4747A	4747A P	SOD66 (DO41)
1N4748A	4748A P	SOD66 (DO41)
1N4749A	4749A P	SOD66 (DO41)
1N5059	1N5059 PH	SOD57
1N5060	1N5060 PH	SOD57
1N5061	1N5061 PH	SOD57
1N5062	1N5062 PH	SOD57
1N5225B	5225BP	SOD27 (DO35)
1N5226B	5226BP	SOD27 (DO35)
1N5227B	5227BP	SOD27 (DO35)
1N5228B	5228BP	SOD27 (DO35)
1N5229B	5229BP	SOD27 (DO35)
1N5230B	5230BP	SOD27 (DO35)
1N5231B	5231BP	SOD27 (DO35)
1N5232B	5232BP	SOD27 (DO35)
1N5233B	5233BP	SOD27 (DO35)
1N5234B	5234BP	SOD27 (DO35)
1N5235B	5235BP	SOD27 (DO35)
1N5236B	5236BP	SOD27 (DO35)
1N5237B	5237BP	SOD27 (DO35)
1N5238B	5238BP	SOD27 (DO35)
1N5239B	5239BP	SOD27 (DO35)
1N5240B	5240BP	SOD27 (DO35)
1N5241B	5241BP	SOD27 (DO35)
1N5242B	5242BP	SOD27 (DO35)

TYPE NUMBER	MARKING CODE	PACKAGE
1N5243B	5243BP	SOD27 (DO35)
1N5244B	5244BP	SOD27 (DO35)
1N5245B	5245BP	SOD27 (DO35)
1N5246B	5246BP	SOD27 (DO35)
1N5247B	5247BP	SOD27 (DO35)
1N5248B	5248BP	SOD27 (DO35)
1N5249B	5249BP	SOD27 (DO35)
1N5250B	5250BP	SOD27 (DO35)
1N5251B	5251BP	SOD27 (DO35)
1N5252B	5252BP	SOD27 (DO35)
1N5253B	5253BP	SOD27 (DO35)
1N5254B	5254BP	SOD27 (DO35)
1N5255B	5255BP	SOD27 (DO35)
1N5256B	5256BP	SOD27 (DO35)
1N5257B	5257BP	SOD27 (DO35)
1N5258B	5258BP	SOD27 (DO35)
1N5259B	5259BP	SOD27 (DO35)
1N5260B	5260BP	SOD27 (DO35)
1N5261B	5261BP	SOD27 (DO35)
1N5262B	5262BP	SOD27 (DO35)
1N5263B	5263BP	SOD27 (DO35)
1N5264B	5264BP	SOD27 (DO35)
1N5265B	5265BP	SOD27 (DO35)
1N5266B	5266BP	SOD27 (DO35)
1N5267B	5267BP	SOD27 (DO35)
1N5817	1N5817	SOD81
1N5818	1N5818	SOD81
1N5819	1N5819	SOD81
1PS59SB10	10	SC59
1PS59SB14	14	SC59
1PS59SB15	15	SC59
1PS59SB16	16	SC59
1PS70SB40	6t3	SC70-3
1PS70SB44	6t4	SC70-3
1PS70SB45	6t5	SC70-3
1PS70SB46	6t6	SC70-3
1PS76SB10	S0	SOD323
1PS76SB17	S7	SOD323
1PS181	A3T	SC59
1PS184	B3T	SC59

TYPE NUMBER	MARKING CODE	PACKAGE
1PS193	F3T	SC59
1PS226	C3T	SC59
1PS300	A3	SC70
1PS301	B3	SC70
1PS302	C3	SC70
BA220	BA220 PH	SOD27 (DO35)
BA221	BA221 PH	SOD27 (DO35)
BA314	BA314 PH	SOD27 (DO35)
BA315	BA315 PH	SOD27 (DO35)
BA316	BA316 PH	SOD27 (DO35)
BA317	BA317 PH	SOD27 (DO35)
BA318	BA318 PH	SOD27 (DO35)
BA423A	423A PH	SOD68 (DO34)
BA423AL	black	SOD80C
BA481	grey	SOD68 (DO34)
BA482	BA482	SOD68 (DO34)
BA483	BA483	SOD68 (DO34)
BA484	BA484	SOD68 (DO34)
BA682	red	SOD80
BA683	red	SOD80
BA792	L8	SOD110
BAL74	JCp	SOT23
BAL74W	JC	SOT323
BAL99	JFp	SOT23
BAL99W	JF	SOT323
BAS11	S11	SOD91
BAS12	S12	SOD91
BAS15	BAS15	SOD68 (DO34)
BAS16	A6p	SOT23
BAS16W	A6	SOT323
BAS17	A91	SOT23
BAS19	JPp	SOT23
BAS20	JRp	SOT23
BAS21	JSp	SOT23
BAS28	JTp	SOT143
BAS29	L20	SOT23
BAS31	L21	SOT23
BAS32L	black	SOD80C
BAS35	L22	SOT23
BAS40	43p	SOT23

TYPE NUMBER	MARKING CODE	PACKAGE
BAS40W	63	SOT323
BAS40-04	44p	SOT23
BAS40-04W	64	SOT323
BAS40-05	45p	SOT23
BAS40-05W	65	SOT323
BAS40-06	46p	SOT23
BAS40-06W	66	SOT323
BAS45A	45A PH	SOD68 (DO34)
BAS45AL	black	SOD80C
BAS55	L5p	SOT23
BAS56	L51	SOT143
BAS70	73p	SOT23
BAS70W	73-	SOT323
BAS70-04	74p	SOT23
BAS70-04W	74-	SOT323
BAS70-05	75p	SOT23
BAS70-05W	75-	SOT323
BAS70-06	76p	SOT23
BAS70-06W	76-	SOT323
BAS70-07	77p	SOT143
BAS81	grey	SOD80C
BAS82	grey	SOD80C
BAS83	grey	SOD80C
BAS85	grey	SOD80C
BAS86	grey	SOD80C
BAS116	JVp	SOT23
BAS216	A6	SOD110
BAS678	L52	SOT23
BAT17	A3p	SOT23
BAT18	A2p	SOT23
BAT54	L4p	SOT23
BAT54A	L42	SOT23
BAT54AW	42	SOT323
BAT54C	L43	SOT23
BAT54CW	43	SOT323
BAT54S	L44	SOT23
BAT54SW	44	SOT323
BAT54W	L4	SOT323
BAT74	L41	SOT143
BAT81	BAT81	SOD68 (DO34)

TYPE NUMBER	MARKING CODE	PACKAGE
BAT82	BAT82	SOD68 (DO34)
BAT83	BAT83	SOD68 (DO34)
BAT85	BAT85	SOD68 (DO34)
BAT86	BAT86	SOD68 (DO34)
BAT254	L4	SOD110
BAV10	BAV10 PH	SOD27 (DO35)
BAV18	BAV18 PH	SOD27 (DO35)
BAV19	BAV19 PH	SOD27 (DO35)
BAV20	BAV20 PH	SOD27 (DO35)
BAV21	BAV21 PH	SOD27 (DO35)
BAV23	L30	SOT143
BAV23S	L31	SOT23
BAV45	BAV45	SOT18/15
BAV70	A4p	SOT23
BAV70W	A4	SOT323
BAV74	JAp	SOT23
BAV99	A7p	SOT23
BAV99W	A7	SOT323
BAV100	green	SOD80C
BAV101	green	SOD80C
BAV102	green	SOD80C
BAV103	green	SOD80C
BAV105	black	SOD80C
BAV170	JXp	SOT23
BAV199	JYp	SOT23
BAW56	A1p	SOT23
BAW56W	A1	SOT323
BAW62	BAW62 PH	SOD27 (DO35)
BAW156	JZp	SOT23
BAX12	BAX12 PH	SOD27 (DO35)
BAX14	BAX14 PH	SOD27 (DO35)
BAX18	BAX18 PH	SOD27 (DO35)
BAY80	BAY80 PH	SOD27 (DO35)
BB119	BB119 PH	SOD27 (DO35)
BB131	P1 + green	SOD323
BB132	P2 + red	SOD323
BB133	P3 + yellow	SOD323
BB134	P4 + white	SOD323
BB135	P5 + white	SOD323
BB146	P6	SOD323

TYPE NUMBER	MARKING CODE	PACKAGE
BB147	P7	SOD323
BB148	P8 + yellow	SOD323
BB149	P9 + white	SOD323
BB150	P0 + white	SOD323
BB155	PE	SOD323
BB158	PH	SOD323
BB159	PJ	SOD323
BB215	white + green	SOD80
BB405B	white on black	SOD68 (DO34)
BB417	white on black	SOD68 (DO34)
BB804	SFx (x= 0 - 3)	SOT23
BB809	yellow on black	SOD68 (DO34)
BB901	S14	SOT23
BB909A	green + red on black	SOD68 (DO34)
BB909B	green on black	SOD68 (DO34)
BB910	red + green on black	SOD68 (DO34)
BB911/A	red + white on black	SOD68 (DO34)
BBY31	S1	SOT23
BBY39	S12	SOT23
BBY40	S2	SOT23
BBY42	S13	SOT23
BBY62	S4	SOT143
BY228	BY228 PH	SOD64
BY278	BY278 PH	SOD64
BY328	BY328 PH	SOD64
BY428	BY428 PH	SOD64
BY448	BY448 PH	SOD57
BY505	black	SOD61A
BY527	BY527 PH	SOD57
BY584	orange	SOD61A
BY614	black	SOD61H2
BY8004	violet + black	SOD61AC
BY8006	violet + green	SOD61AD
BY8008	violet + red	SOD61AE
BY8010	violet + violet	SOD61AF
BY8012	violet + orange	SOD61AH
BY8014	violet + lilac	SOD61AI

TYPE NUMBER	MARKING CODE	PACKAGE
BY8016	violet + grey	SOD61AJ
BY8104	orange + black	SOD61AC
BY8106	orange + green	SOD61AD
BY8108	orange + red	SOD61AE
BY8110	orange + violet	SOD61AF
BY8112	orange + orange	SOD61AH
BY8114	orange + lilac	SOD61AI
BY8116	orange + grey	SOD61AJ
BY8404	black + black	SOD61AB
BY8406	black + green	SOD61AC
BY8408	black + red	SOD61AD
BY8410	black + violet	SOD61AE
BY8412	black + orange	SOD61AF
BY8414	black + lilac	SOD61AG
BY8416	black + grey	SOD61AH
BY8418	black + brown	SOD61AI
BY8420	black + blue	SOD61AJ
BY8424	black	SOD61AK
BYD11D	11D	SOD91
BYD11G	11G	SOD91
BYD11J	11J	SOD91
BYD11K	11K	SOD91
BYD11M	11M	SOD91
BYD13D	13D PH	SOD81
BYD13G	13G PH	SOD81
BYD13J	13J PH	SOD81
BYD13K	13K PH	SOD81
BYD13M	13M PH	SOD81
BYD17D	17D PH	SOD87
BYD17G	17G PH	SOD87
BYD17J	17J PH	SOD87
BYD17K	17K PH	SOD87
BYD17M	17M PH	SOD87
BYD31D	31D	SOD91
BYD31G	31G	SOD91
BYD31J	31J	SOD91
BYD31K	31K	SOD91
BYD31M	31M	SOD91
BYD33D	33D PH	SOD81
BYD33G	33G PH	SOD81

TYPE NUMBER	MARKING CODE	PACKAGE
BYD33J	33J PH	SOD81
BYD33K	33K PH	SOD81
BYD33M	33M PH	SOD81
BYD33U	33U PH	SOD81
BYD33V	33V PH	SOD81
BYD37D	37D PH	SOD87
BYD37G	37G PH	SOD87
BYD37J	37J PH	SOD87
BYD37K	37K PH	SOD87
BYD37M	37M PH	SOD87
BYD43U	43U PH	SOD81
BYD43V	43V PH	SOD81
BYD43-16	43-16PH	SOD81
BYD43-18	43-18PH	SOD81
BYD43-20	43-20PH	SOD81
BYD47-16	47-16PH	SOD87
BYD47-18	47-18PH	SOD87
BYD47-20	47-20PH	SOD87
BYD53U	53U PH	SOD81
BYD53V	53V PH	SOD81
BYD57D	57D PH	SOD87
BYD57G	57G PH	SOD87
BYD57J	57J PH	SOD87
BYD57K	57K PH	SOD87
BYD57M	57M PH	SOD87
BYD63	63 PH	SOD81
BYD71A	71A	SOD91
BYD71B	71B	SOD91
BYD71C	71C	SOD91
BYD71D	71D	SOD91
BYD71E	71E	SOD91
BYD71F	71F	SOD91
BYD71G	71G	SOD91
BYD73A	73A PH	SOD81
BYD73B	73B PH	SOD81
BYD73C	73C PH	SOD81
BYD73D	73D PH	SOD81
BYD73E	73E PH	SOD81
BYD73F	73F PH	SOD81
BYD73G	73G PH	SOD81

TYPE NUMBER	MARKING CODE	PACKAGE
BYD77A	77A PH	SOD87
BYD77B	77B PH	SOD87
BYD77C	77C PH	SOD87
BYD77D	77D PH	SOD87
BYD77E	77E PH	SOD87
BYD77F	77F PH	SOD87
BYD77G	77G PH	SOD87
BYG50D	BYG50D PH	SOD106 (DO214AC)
BYG50G	BYG50G PH	SOD106 (DO214AC)
BYG50J	BYG50J PH	SOD106 (DO214AC)
BYG50K	BYG50K PH	SOD106 (DO214AC)
BYG50M	BYG50M PH	SOD106 (DO214AC)
BYG60D	BYG60D PH	SOD106 (DO214AC)
BYG60G	BYG60G PH	SOD106 (DO214AC)
BYG60J	BYG60J PH	SOD106 (DO214AC)
BYG60K	BYG60K PH	SOD106 (DO214AC)
BYG60M	BYG60M PH	SOD106 (DO214AC)
BYG70D	BYG70D PH	SOD106 (DO214AC)
BYG70G	BYG70G PH	SOD106 (DO214AC)
BYG70J	BYG70J PH	SOD106 (DO214AC)
BYG80D	BYG80D PH	SOD106 (DO214AC)
BYG80G	BYG80G PH	SOD106 (DO214AC)
BYG80J	BYG80J PH	SOD106 (DO214AC)
BYG90-20	BYG90 20 PH	SOD106A
BYG90-30	BYG90 30 PH	SOD106A
BYG90-40	BYG90 40 PH	SOD106A
BYG90-90	BYG90 90 PH	SOD106A

TYPE NUMBER	MARKING CODE	PACKAGE
BYM26A	BYM26A PH	SOD64
BYM26B	BYM26B PH	SOD64
BYM26C	BYM26C PH	SOD64
BYM26D	BYM26D PH	SOD64
BYM26E	BYM26E PH	SOD64
BYM26F	BYM26F PH	SOD64
BYM26G	BYM26G PH	SOD64
BYM36A	BYM36A PH	SOD64
BYM36B	BYM36B PH	SOD64
BYM36C	BYM36C PH	SOD64
BYM36D	BYM36D PH	SOD64
BYM36E	BYM36E PH	SOD64
BYM36F	BYM36F PH	SOD64
BYM36G	BYM36G PH	SOD64
BYM56A	BYM56A PH	SOD64
BYM56B	BYM56B PH	SOD64
BYM56C	BYM56C PH	SOD64
BYM56D	BYM56D PH	SOD64
BYM56E	BYM56E PH	SOD64
BYM63	BYM63 PH	SOD64
BYM99	BYM99 PH	SOD64
BYV10-20	V10-20	SOD81
BYV10-30	V10-30	SOD81
BYV10-40	V10-40	SOD81
BYV26A	BYV26A PH	SOD57
BYV26B	BYV26B PH	SOD57
BYV26C	BYV26C PH	SOD57
BYV26D	BYV26D PH	SOD57
BYV26E	BYV26E PH	SOD57
BYV26F	BYV26F PH	SOD57
BYV26G	BYV26G PH	SOD57
BYV27-50	BYV27-50	SOD57
BYV27-100	BYV27-100	SOD57
BYV27-150	BYV27-150	SOD57
BYV27-200	BYV27-200	SOD57
BYV27-300	BYV27-300	SOD57
BYV27-400	BYV27-400	SOD57
BYV27-600	BYV27-600	SOD57
BYV28-50	BYV28-50	SOD64
BYV28-100	BYV28-100	SOD64

TYPE NUMBER	MARKING CODE	PACKAGE
BYV28-150	BYV28-150	SOD64
BYV28-200	BYV28-200	SOD64
BYV28-300	BYV28-300	SOD64
BYV28-400	BYV28-400	SOD64
BYV28-600	BYV28-600	SOD64
BYV36A	BYV36A PH	SOD57
BYV36B	BYV36B PH	SOD57
BYV36C	BYV36C PH	SOD57
BYV36D	BYV36D PH	SOD57
BYV36E	BYV36E PH	SOD57
BYV36F	BYV36F PH	SOD57
BYV36G	BYV36G PH	SOD57
BYV95A	BYV95A PH	SOD57
BYV95B	BYV95B PH	SOD57
BYV95C	BYV95C PH	SOD57
BYV96D	BYV96D PH	SOD57
BYV96E	BYV96E PH	SOD57
BYV97F	BYV97F PH	SOD57
BYV97G	BYV97G PH	SOD57
BYV98	BYV98 PH	SOD57
BYV99	BYV99 PH	SOD57
BYV2100	BYV2100 PH	SOD57
BYV4100	BYV4100 PH	SOD64
BYW54	BYW54 PH	SOD57
BYW55	BYW55 PH	SOD57
BYW56	BYW56 PH	SOD57
BYW95A	BYW95A PH	SOD64
BYW95B	BYW95B PH	SOD64
BYW95C	BYW95C PH	SOD64
BYW96D	BYW96D PH	SOD64
BYW96E	BYW96E PH	SOD64
BYW97F	BYW97F PH	SOD64
BYW97G	BYW97G PH	SOD64
BYX10G	BYX10G PH	SOD57
BYX90G	black	SOD83A
BYX101G	black	SOD88A
BYX102G	red	SOD88A
BYX103G	green	SOD88A
BYX104G	violet	SOD88A
BYX105G	black	SOD88A

TYPE NUMBER	MARKING CODE	PACKAGE
BYX106G	red	SOD88A
BYX107G	green	SOD88A
BYX108G	violet	SOD88A
BYX120G	orange	SOD88A
BZA100	BZA100	SO20 (SOT163-1)
BZD23-C3V6	3V6 PH	SOD81
BZD23-C3V9	3V9 PH	SOD81
BZD23-C4V3	4V3 PH	SOD81
BZD23-C4V7	4V7 PH	SOD81
BZD23-C5V1	5V1 PH	SOD81
BZD23-C5V6	5V6 PH	SOD81
BZD23-C6V2	6V2 PH	SOD81
BZD23-C6V8	6V8 PH	SOD81
BZD23-C7V5	7V5 PH	SOD81
BZD23-C8V2	8V2 PH	SOD81
BZD23-C9V1	9V1 PH	SOD81
BZD23-C10	10 PH	SOD81
BZD23-C11	11 PH	SOD81
BZD23-C12	12 PH	SOD81
BZD23-C13	13 PH	SOD81
BZD23-C15	15 PH	SOD81
BZD23-C16	16 PH	SOD81
BZD23-C18	18 PH	SOD81
BZD23-C20	20 PH	SOD81
BZD23-C22	22 PH	SOD81
BZD23-C24	24 PH	SOD81
BZD23-C27	27 PH	SOD81
BZD23-C30	30 PH	SOD81
BZD23-C33	33 PH	SOD81
BZD23-C36	36 PH	SOD81
BZD23-C39	39 PH	SOD81
BZD23-C43	43 PH	SOD81
BZD23-C47	47 PH	SOD81
BZD23-C51	51 PH	SOD81
BZD23-C56	56 PH	SOD81
BZD23-C62	62 PH	SOD81
BZD23-C68	68 PH	SOD81
BZD23-C75	75 PH	SOD81
BZD23-C82	82 PH	SOD81

TYPE NUMBER	MARKING CODE	PACKAGE
BZD23-C91	91 PH	SOD81
BZD23-C100	100 PH	SOD81
BZD23-C110	110 PH	SOD81
BZD23-C120	120 PH	SOD81
BZD23-C130	130 PH	SOD81
BZD23-C150	150 PH	SOD81
BZD23-C160	160 PH	SOD81
BZD23-C180	180 PH	SOD81
BZD23-C200	200 PH	SOD81
BZD23-C220	220 PH	SOD81
BZD23-C240	240 PH	SOD81
BZD23-C270	270 PH	SOD81
BZD23-C300	300 PH	SOD81
BZD23-C330	330 PH	SOD81
BZD23-C360	360 PH	SOD81
BZD23-C390	390 PH	SOD81
BZD23-C430	430 PH	SOD81
BZD23-C470	470 PH	SOD81
BZD23-C510	510 PH	SOD81
BZD27-C3V6	3V6 PH	SOD87
BZD27-C3V9	3V9 PH	SOD87
BZD27-C4V3	4V3 PH	SOD87
BZD27-C4V7	4V7 PH	SOD87
BZD27-C5V1	5V1 PH	SOD87
BZD27-C5V6	5V6 PH	SOD87
BZD27-C6V2	6V2 PH	SOD87
BZD27-C6V8	6V8 PH	SOD87
BZD27-C7V5	7V5 PH	SOD87
BZD27-C8V2	8V2 PH	SOD87
BZD27-C9V1	9V1 PH	SOD87
BZD27-C10	10 PH	SOD87
BZD27-C11	11 PH	SOD87
BZD27-C12	12 PH	SOD87
BZD27-C13	13 PH	SOD87
BZD27-C15	15 PH	SOD87
BZD27-C16	16 PH	SOD87
BZD27-C18	18 PH	SOD87
BZD27-C20	20 PH	SOD87
BZD27-C22	22 PH	SOD87
BZD27-C24	24 PH	SOD87

TYPE NUMBER	MARKING CODE	PACKAGE
BZD27-C27	27 PH	SOD87
BZD27-C30	30 PH	SOD87
BZD27-C33	33 PH	SOD87
BZD27-C36	36 PH	SOD87
BZD27-C39	39 PH	SOD87
BZD27-C43	43 PH	SOD87
BZD27-C47	47 PH	SOD87
BZD27-C51	51 PH	SOD87
BZD27-C56	56 PH	SOD87
BZD27-C62	62 PH	SOD87
BZD27-C68	68 PH	SOD87
BZD27-C75	75 PH	SOD87
BZD27-C82	82 PH	SOD87
BZD27-C91	91 PH	SOD87
BZD27-C100	100 PH	SOD87
BZD27-C110	110 PH	SOD87
BZD27-C120	120 PH	SOD87
BZD27-C130	130 PH	SOD87
BZD27-C150	150 PH	SOD87
BZD27-C160	160 PH	SOD87
BZD27-C180	180 PH	SOD87
BZD27-C200	200 PH	SOD87
BZD27-C220	220 PH	SOD87
BZD27-C240	240 PH	SOD87
BZD27-C270	270 PH	SOD87
BZD27-C300	300 PH	SOD87
BZD27-C330	330 PH	SOD87
BZD27-C360	360 PH	SOD87
BZD27-C390	390 PH	SOD87
BZD27-C430	430 PH	SOD87
BZD27-C470	470 PH	SOD87
BZD27-C510	510 PH	SOD87
BZG03-C10	BZG03C10 PH	SOD106 (DO214AC)
BZG03-C11	BZG03C11 PH	SOD106 (DO214AC)
BZG03-C12	BZG03C12 PH	SOD106 (DO214AC)
BZG03-C13	BZG03C13 PH	SOD106 (DO214AC)

TYPE NUMBER	MARKING CODE	PACKAGE
BZG03-C15	BZG03C15 PH	SOD106 (DO214AC)
BZG03-C16	BZG03C16 PH	SOD106 (DO214AC)
BZG03-C18	BZG03C18 PH	SOD106 (DO214AC)
BZG03-C20	BZG03C20 PH	SOD106 (DO214AC)
BZG03-C22	BZG03C22 PH	SOD106 (DO214AC)
BZG03-C24	BZG03C24 PH	SOD106 (DO214AC)
BZG03-C27	BZG03C27 PH	SOD106 (DO214AC)
BZG03-C30	BZG03C30 PH	SOD106 (DO214AC)
BZG03-C33	BZG03C33 PH	SOD106 (DO214AC)
BZG03-C36	BZG03C36 PH	SOD106 (DO214AC)
BZG03-C39	BZG03C39 PH	SOD106 (DO214AC)
BZG03-C43	BZG03C43 PH	SOD106 (DO214AC)
BZG03-C47	BZG03C47 PH	SOD106 (DO214AC)
BZG03-C51	BZG03C51 PH	SOD106 (DO214AC)
BZG03-C56	BZG03C56 PH	SOD106 (DO214AC)
BZG03-C62	BZG03C62 PH	SOD106 (DO214AC)
BZG03-C68	BZG03C68 PH	SOD106 (DO214AC)
BZG03-C75	BZG03C75 PH	SOD106 (DO214AC)
BZG03-C82	BZG03C82 PH	SOD106 (DO214AC)
BZG03-C91	BZG03C91 PH	SOD106 (DO214AC)
BZG03-C100	BZG03C100 PH	SOD106 (DO214AC)
BZG03-C110	BZG03C110 PH	SOD106 (DO214AC)

TYPE NUMBER	MARKING CODE	PACKAGE
BZG03-C120	BZG03C120 PH	SOD106 (DO214AC)
BZG03-C130	BZG03C130 PH	SOD106 (DO214AC)
BZG03-C150	BZG03C150 PH	SOD106 (DO214AC)
BZG03-C160	BZG03C160 PH	SOD106 (DO214AC)
BZG03-C180	BZG03C180 PH	SOD106 (DO214AC)
BZG03-C200	BZG03C200 PH	SOD106 (DO214AC)
BZG03-C220	BZG03C220 PH	SOD106 (DO214AC)
BZG03-C240	BZG03C240 PH	SOD106 (DO214AC)
BZG03-C270	BZG03C270 PH	SOD106 (DO214AC)
BZG04-8V2	BZG04 8V2 PH	SOD106 (DO214AC)
BZG04-9V1	BZG04 9V1 PH	SOD106 (DO214AC)
BZG04-10	BZG04 10 PH	SOD106 (DO214AC)
BZG04-11	BZG04 11 PH	SOD106 (DO214AC)
BZG04-12	BZG04 12 PH	SOD106 (DO214AC)
BZG04-13	BZG04 13 PH	SOD106 (DO214AC)
BZG04-15	BZG04 15 PH	SOD106 (DO214AC)
BZG04-16	BZG04 16 PH	SOD106 (DO214AC)
BZG04-18	BZG04 18 PH	SOD106 (DO214AC)
BZG04-20	BZG04 20 PH	SOD106 (DO214AC)
BZG04-22	BZG04 22 PH	SOD106 (DO214AC)
BZG04-24	BZG04 24 PH	SOD106 (DO214AC)
BZG04-27	BZG04 27 PH	SOD106 (DO214AC)

TYPE NUMBER	MARKING CODE	PACKAGE
BZG04-30	BZG04 30 PH	SOD106 (DO214AC)
BZG04-33	BZG04 33 PH	SOD106 (DO214AC)
BZG04-36	BZG04 36 PH	SOD106 (DO214AC)
BZG04-39	BZG04 39 PH	SOD106 (DO214AC)
BZG04-43	BZG04 43 PH	SOD106 (DO214AC)
BZG04-47	BZG04 47 PH	SOD106 (DO214AC)
BZG04-51	BZG04 51 PH	SOD106 (DO214AC)
BZG04-56	BZG04 56 PH	SOD106 (DO214AC)
BZG04-62	BZG04 62 PH	SOD106 (DO214AC)
BZG04-68	BZG04 68 PH	SOD106 (DO214AC)
BZG04-75	BZG04 75 PH	SOD106 (DO214AC)
BZG04-82	BZG04 82 PH	SOD106 (DO214AC)
BZG04-91	BZG04 91 PH	SOD106 (DO214AC)
BZG04-100	BZG04 100 PH	SOD106 (DO214AC)
BZG04-110	BZG04 110 PH	SOD106 (DO214AC)
BZG04-120	BZG04 120 PH	SOD106 (DO214AC)
BZG04-130	BZG04 130 PH	SOD106 (DO214AC)
BZG04-150	BZG04 150 PH	SOD106 (DO214AC)
BZG04-160	BZG04 160 PH	SOD106 (DO214AC)
BZG04-180	BZG04 180 PH	SOD106 (DO214AC)
BZG04-200	BZG04 200 PH	SOD106 (DO214AC)
BZG04-220	BZG04 200 PH	SOD106 (DO214AC)

TYPE NUMBER	MARKING CODE	PACKAGE
BZT03-C7V5	BZT03C7V5	SOD57
BZT03-C8V2	BZT03C8V2	SOD57
BZT03-C9V1	BZT03C9V1	SOD57
BZT03-C10	BZT03C10	SOD57
BZT03-C11	BZT03C11	SOD57
BZT03-C12	BZT03C12	SOD57
BZT03-C13	BZT03C13	SOD57
BZT03-C15	BZT03C15	SOD57
BZT03-C16	BZT03C16	SOD57
BZT03-C18	BZT03C18	SOD57
BZT03-C20	BZT03C20	SOD57
BZT03-C22	BZT03C22	SOD57
BZT03-C24	BZT03C24	SOD57
BZT03-C27	BZT03C27	SOD57
BZT03-C30	BZT03C30	SOD57
BZT03-C33	BZT03C33	SOD57
BZT03-C36	BZT03C36	SOD57
BZT03-C39	BZT03C39	SOD57
BZT03-C43	BZT03C43	SOD57
BZT03-C47	BZT03C47	SOD57
BZT03-C51	BZT03C51	SOD57
BZT03-C56	BZT03C56	SOD57
BZT03-C62	BZT03C62	SOD57
BZT03-C68	BZT03C68	SOD57
BZT03-C75	BZT03C75	SOD57
BZT03-C82	BZT03C82	SOD57
BZT03-C91	BZT03C91	SOD57
BZT03-C100	BZT03C100	SOD57
BZT03-C110	BZT03C110	SOD57
BZT03-C120	BZT03C120	SOD57
BZT03-C130	BZT03C130	SOD57
BZT03-C150	BZT03C150	SOD57
BZT03-C160	BZT03C160	SOD57
BZT03-C180	BZT03C180	SOD57
BZT03-C200	BZT03C200	SOD57
BZT03-C220	BZT03C220	SOD57
BZT03-C240	BZT03C240	SOD57
BZT03-C270	BZT03C270	SOD57
BZT03-C300	BZT03C300	SOD57
BZT03-C330	BZT03C330	SOD57

TYPE NUMBER	MARKING CODE	PACKAGE
BZT03-C360	BZT03C360	SOD57
BZT03-C390	BZT03C390	SOD57
BZT03-C430	BZT03C430	SOD57
BZT03-C470	BZT03C470	SOD57
BZT03-C510	BZT03C510	SOD57
BZV10	BZV10	SOD68 (DO34)
BZV11	BZV11	SOD68 (DO34)
BZV12	BZV12	SOD68 (DO34)
BZV13	BZV13	SOD68 (DO34)
BZV14	BZV14	SOD68 (DO34)
BZV37	BZV37	SOD68 (DO34)
BZV49-C2V4	2Y4	SOT89
BZV49-C2V7	2Y7	SOT89
BZV49-C3V0	3Y0	SOT89
BZV49-C3V3	3Y3	SOT89
BZV49-C3V6	3Y6	SOT89
BZV49-C3V9	3Y9	SOT89
BZV49-C4V3	4Y3	SOT89
BZV49-C4V7	4Y7	SOT89
BZV49-C5V1	5Y1	SOT89
BZV49-C5V6	5Y6	SOT89
BZV49-C6V2	6Y2	SOT89
BZV49-C6V8	6Y8	SOT89
BZV49-C7V5	7Y5	SOT89
BZV49-C8V2	8Y2	SOT89
BZV49-C9V1	9Y1	SOT89
BZV49-C10	10Y	SOT89
BZV49-C11	11Y	SOT89
BZV49-C12	12Y	SOT89
BZV49-C13	13Y	SOT89
BZV49-C15	15Y	SOT89
BZV49-C16	16Y	SOT89
BZV49-C18	18Y	SOT89
BZV49-C20	20Y	SOT89
BZV49-C22	22Y	SOT89
BZV49-C24	24Y	SOT89
BZV49-C27	27Y	SOT89
BZV49-C30	30Y	SOT89
BZV49-C33	33Y	SOT89
BZV49-C36	36Y	SOT89

TYPE NUMBER	MARKING CODE	PACKAGE
BZV49-C39	39Y	SOT89
BZV49-C43	43Y	SOT89
BZV49-C47	47Y	SOT89
BZV49-C51	51Y	SOT89
BZV49-C56	56Y	SOT89
BZV49-C62	62Y	SOT89
BZV49-C68	68Y	SOT89
BZV49-C75	75Y	SOT89
BZV55-B2V4	yellow	SOD80C
BZV55-B2V7	yellow	SOD80C
BZV55-B3V0	yellow	SOD80C
BZV55-B3V3	yellow	SOD80C
BZV55-B3V6	yellow	SOD80C
BZV55-B3V9	yellow	SOD80C
BZV55-B4V3	yellow	SOD80C
BZV55-B4V7	yellow	SOD80C
BZV55-B5V1	yellow	SOD80C
BZV55-B5V6	yellow	SOD80C
BZV55-B6V2	yellow	SOD80C
BZV55-B6V8	yellow	SOD80C
BZV55-B7V5	yellow	SOD80C
BZV55-B8V2	yellow	SOD80C
BZV55-B9V1	yellow	SOD80C
BZV55-B10	yellow	SOD80C
BZV55-B11	yellow	SOD80C
BZV55-B12	yellow	SOD80C
BZV55-B13	yellow	SOD80C
BZV55-B15	yellow	SOD80C
BZV55-B16	yellow	SOD80C
BZV55-B18	yellow	SOD80C
BZV55-B20	yellow	SOD80C
BZV55-B22	yellow	SOD80C
BZV55-B24	yellow	SOD80C
BZV55-B27	yellow	SOD80C
BZV55-B30	yellow	SOD80C
BZV55-B33	yellow	SOD80C
BZV55-B36	yellow	SOD80C
BZV55-B39	yellow	SOD80C
BZV55-B43	yellow	SOD80C
BZV55-B47	yellow	SOD80C

TYPE NUMBER	MARKING CODE	PACKAGE
BZV55-B51	yellow	SOD80C
BZV55-B56	yellow	SOD80C
BZV55-B62	yellow	SOD80C
BZV55-B68	yellow	SOD80C
BZV55-B75	yellow	SOD80C
BZV55-C2V4	yellow	SOD80C
BZV55-C2V7	yellow	SOD80C
BZV55-C3V0	yellow	SOD80C
BZV55-C3V3	yellow	SOD80C
BZV55-C3V6	yellow	SOD80C
BZV55-C3V9	yellow	SOD80C
BZV55-C4V3	yellow	SOD80C
BZV55-C4V7	yellow	SOD80C
BZV55-C5V1	yellow	SOD80C
BZV55-C5V6	yellow	SOD80C
BZV55-C6V2	yellow	SOD80C
BZV55-C6V8	yellow	SOD80C
BZV55-C7V5	yellow	SOD80C
BZV55-C8V2	yellow	SOD80C
BZV55-C9V1	yellow	SOD80C
BZV55-C10	yellow	SOD80C
BZV55-C11	yellow	SOD80C
BZV55-C12	yellow	SOD80C
BZV55-C13	yellow	SOD80C
BZV55-C15	yellow	SOD80C
BZV55-C16	yellow	SOD80C
BZV55-C18	yellow	SOD80C
BZV55-C20	yellow	SOD80C
BZV55-C22	yellow	SOD80C
BZV55-C24	yellow	SOD80C
BZV55-C27	yellow	SOD80C
BZV55-C30	yellow	SOD80C
BZV55-C33	yellow	SOD80C
BZV55-C36	yellow	SOD80C
BZV55-C39	yellow	SOD80C
BZV55-C43	yellow	SOD80C
BZV55-C47	yellow	SOD80C
BZV55-C51	yellow	SOD80C
BZV55-C56	yellow	SOD80C
BZV55-C62	yellow	SOD80C

TYPE NUMBER	MARKING CODE	PACKAGE
BZV55-C68	yellow	SOD80C
BZV55-C75	yellow	SOD80C
BZV55-F2V4	yellow	SOD80C
BZV55-F2V7	yellow	SOD80C
BZV55-F3V0	yellow	SOD80C
BZV55-F3V3	yellow	SOD80C
BZV55-F3V6	yellow	SOD80C
BZV55-F3V9	yellow	SOD80C
BZV55-F4V3	yellow	SOD80C
BZV55-F4V7	yellow	SOD80C
BZV55-F5V1	yellow	SOD80C
BZV55-F5V6	yellow	SOD80C
BZV55-F6V2	yellow	SOD80C
BZV55-F6V8	yellow	SOD80C
BZV55-F7V5	yellow	SOD80C
BZV55-F8V2	yellow	SOD80C
BZV55-F9V1	yellow	SOD80C
BZV55-F10	yellow	SOD80C
BZV55-F11	yellow	SOD80C
BZV55-F12	yellow	SOD80C
BZV55-F13	yellow	SOD80C
BZV55-F15	yellow	SOD80C
BZV55-F16	yellow	SOD80C
BZV55-F18	yellow	SOD80C
BZV55-F20	yellow	SOD80C
BZV55-F22	yellow	SOD80C
BZV55-F24	yellow	SOD80C
BZV55-F27	yellow	SOD80C
BZV55-F30	yellow	SOD80C
BZV55-F33	yellow	SOD80C
BZV55-F36	yellow	SOD80C
BZV55-F39	yellow	SOD80C
BZV55-F43	yellow	SOD80C
BZV55-F47	yellow	SOD80C
BZV55-F51	yellow	SOD80C
BZV55-F56	yellow	SOD80C
BZV55-F62	yellow	SOD80C
BZV55-F68	yellow	SOD80C
BZV55-F75	yellow	SOD80C
BZV80	yellow	SOD80

TYPE NUMBER	MARKING CODE	PACKAGE
BZV81	yellow	SOD80
BZV85-C3V6	C3V6 PH	SOD66 (DO41)
BZV85-C3V9	C3V9 PH	SOD66 (DO41)
BZV85-C4V3	C4V3 PH	SOD66 (DO41)
BZV85-C4V7	C4V7 PH	SOD66 (DO41)
BZV85-C5V1	C5V1 PH	SOD66 (DO41)
BZV85-C5V6	C5V6 PH	SOD66 (DO41)
BZV85-C6V2	C6V2 PH	SOD66 (DO41)
BZV85-C6V8	C6V8 PH	SOD66 (DO41)
BZV85-C7V5	C7V5 PH	SOD66 (DO41)
BZV85-C8V2	C8V2 PH	SOD66 (DO41)
BZV85-C9V1	C9V1 PH	SOD66 (DO41)
BZV85-C10	C10 PH	SOD66 (DO41)
BZV85-C11	C11 PH	SOD66 (DO41)
BZV85-C12	C12 PH	SOD66 (DO41)
BZV85-C13	C13 PH	SOD66 (DO41)
BZV85-C15	C15 PH	SOD66 (DO41)
BZV85-C16	C16 PH	SOD66 (DO41)
BZV85-C18	C18 PH	SOD66 (DO41)
BZV85-C20	C20 PH	SOD66 (DO41)
BZV85-C22	C22 PH	SOD66 (DO41)
BZV85-C24	C24 PH	SOD66 (DO41)
BZV85-C27	C27 PH	SOD66 (DO41)
BZV85-C30	C30 PH	SOD66 (DO41)
BZV85-C33	C33 PH	SOD66 (DO41)
BZV85-C36	C36 PH	SOD66 (DO41)
BZV85-C39	C39 PH	SOD66 (DO41)
BZV85-C43	C43 PH	SOD66 (DO41)
BZV85-C47	C47 PH	SOD66 (DO41)
BZV85-C51	C51 PH	SOD66 (DO41)
BZV85-C56	C56 PH	SOD66 (DO41)
BZV85-C62	C62 PH	SOD66 (DO41)
BZV85-C68	C68 PH	SOD66 (DO41)
BZV85-C75	C75 PH	SOD66 (DO41)
BZV86-1V4	BZV86 1V4 PH	SOD27 (DO35)
BZV86-2V0	BZV86 2V0 PH	SOD27 (DO35)
BZV86-2V6	BZV86 2V6 PH	SOD27 (DO35)
BZV86-3V2	BZV86 3V2 PH	SOD27 (DO35)
BZV87-1V4	yellow	SOD80
BZV87-2V0	yellow	SOD80

TYPE NUMBER	MARKING CODE	PACKAGE
BZV87-2V6	yellow	SOD80
BZV87-3V2	yellow	SOD80
BZV90-C2V4	BZV90C2V4	SOT223
BZV90-C2V7	BZV90C2V7	SOT223
BZV90-C3V0	BZV90C3V0	SOT223
BZV90-C3V3	BZV90C3V3	SOT223
BZV90-C3V6	BZV90C3V6	SOT223
BZV90-C3V9	BZV90C3V9	SOT223
BZV90-C4V3	BZV90C4V3	SOT223
BZV90-C4V7	BZV90C4V7	SOT223
BZV90-C5V1	BZV90C5V1	SOT223
BZV90-C5V6	BZV90C5V6	SOT223
BZV90-C6V2	BZV90C6V2	SOT223
BZV90-C6V8	BZV90C6V8	SOT223
BZV90-C7V5	BZV90C7V5	SOT223
BZV90-C8V2	BZV90C8V2	SOT223
BZV90-C9V1	BZV90C9V1	SOT223
BZV90-C10	BZV90C10	SOT223
BZV90-C11	BZV90C11	SOT223
BZV90-C12	BZV90C12	SOT223
BZV90-C13	BZV90C13	SOT223
BZV90-C15	BZV90C15	SOT223
BZV90-C16	BZV90C16	SOT223
BZV90-C18	BZV90C18	SOT223
BZV90-C20	BZV90C20	SOT223
BZV90-C22	BZV90C22	SOT223
BZV90-C24	BZV90C24	SOT223
BZV90-C27	BZV90C27	SOT223
BZV90-C30	BZV90C30	SOT223
BZV90-C33	BZV90C33	SOT223
BZV90-C36	BZV90C36	SOT223
BZV90-C39	BZV90C39	SOT223
BZV90-C43	BZV90C43	SOT223
BZV90-C47	BZV90C47	SOT223
BZV90-C51	BZV90C51	SOT223
BZV90-C56	BZV90C56	SOT223
BZV90-C62	BZV90C62	SOT223
BZV90-C68	BZV90C68	SOT223
BZV90-C75	BZV90C75	SOT223
BZW03-C7V5	BZW03C7V5	SOD64

TYPE NUMBER	MARKING CODE	PACKAGE
BZW03-C8V2	BZW03C8V2	SOD64
BZW03-C9V1	BZW03C9V1	SOD64
BZW03-C10	BZW03C10	SOD64
BZW03-C11	BZW03C11	SOD64
BZW03-C12	BZW03C12	SOD64
BZW03-C13	BZW03C13	SOD64
BZW03-C15	BZW03C15	SOD64
BZW03-C16	BZW03C16	SOD64
BZW03-C18	BZW03C18	SOD64
BZW03-C20	BZW03C20	SOD64
BZW03-C22	BZW03C22	SOD64
BZW03-C24	BZW03C24	SOD64
BZW03-C27	BZW03C27	SOD64
BZW03-C30	BZW03C30	SOD64
BZW03-C33	BZW03C33	SOD64
BZW03-C36	BZW03C36	SOD64
BZW03-C39	BZW03C39	SOD64
BZW03-C43	BZW03C43	SOD64
BZW03-C47	BZW03C47	SOD64
BZW03-C51	BZW03C51	SOD64
BZW03-C56	BZW03C56	SOD64
BZW03-C62	BZW03C62	SOD64
BZW03-C68	BZW03C68	SOD64
BZW03-C75	BZW03C75	SOD64
BZW03-C82	BZW03C82	SOD64
BZW03-C91	BZW03C91	SOD64
BZW03-C100	BZW03C100	SOD64
BZW03-C110	BZW03C110	SOD64
BZW03-C120	BZW03C120	SOD64
BZW03-C130	BZW03C130	SOD64
BZW03-C150	BZW03C150	SOD64
BZW03-C160	BZW03C160	SOD64
BZW03-C180	BZW03C180	SOD64
BZW03-C200	BZW03C200	SOD64
BZW03-C220	BZW03C220	SOD64
BZW03-C240	BZW03C240	SOD64
BZW03-C270	BZW03C270	SOD64
BZW03-C300	BZW03C300	SOD64
BZW03-C330	BZW03C330	SOD64
BZW03-C360	BZW03C360	SOD64

TYPE NUMBER	MARKING CODE	PACKAGE
BZW03-C390	BZW03C390	SOD64
BZW03-C430	BZW03C430	SOD64
BZW03-C470	BZW03C470	SOD64
BZW03-C510	BZW03C510	SOD64
BZX55-C2V4	C2V4 PH	SOD27 (DO35)
BZX55-C2V7	C2V7 PH	SOD27 (DO35)
BZX55-C3V0	C3V0 PH	SOD27 (DO35)
BZX55-C3V3	C3V3 PH	SOD27 (DO35)
BZX55-C3V6	C3V6 PH	SOD27 (DO35)
BZX55-C3V9	C3V9 PH	SOD27 (DO35)
BZX55-C4V3	C4V3 PH	SOD27 (DO35)
BZX55-C4V7	C4V7 PH	SOD27 (DO35)
BZX55-C5V1	C5V1 PH	SOD27 (DO35)
BZX55-C5V6	C5V6 PH	SOD27 (DO35)
BZX55-C6V2	C6V2 PH	SOD27 (DO35)
BZX55-C6V8	C6V8 PH	SOD27 (DO35)
BZX55-C7V5	C7V5 PH	SOD27 (DO35)
BZX55-C8V2	C8V2 PH	SOD27 (DO35)
BZX55-C9V1	C9V1 PH	SOD27 (DO35)
BZX55-C10	C10 PH	SOD27 (DO35)
BZX55-C11	C11 PH	SOD27 (DO35)
BZX55-C12	C12 PH	SOD27 (DO35)
BZX55-C13	C13 PH	SOD27 (DO35)
BZX55-C15	C15 PH	SOD27 (DO35)
BZX55-C16	C16 PH	SOD27 (DO35)
BZX55-C18	C18 PH	SOD27 (DO35)
BZX55-C20	C20 PH	SOD27 (DO35)
BZX55-C22	C22 PH	SOD27 (DO35)
BZX55-C24	C24 PH	SOD27 (DO35)
BZX55-C27	C27 PH	SOD27 (DO35)
BZX55-C30	C30 PH	SOD27 (DO35)
BZX55-C33	C33 PH	SOD27 (DO35)
BZX55-C36	C36 PH	SOD27 (DO35)
BZX55-C39	C39 PH	SOD27 (DO35)
BZX55-C43	C43 PH	SOD27 (DO35)
BZX55-C47	C47 PH	SOD27 (DO35)
BZX55-C51	C51 PH	SOD27 (DO35)
BZX55-C56	C56 PH	SOD27 (DO35)
BZX55-C62	C62 PH	SOD27 (DO35)
BZX55-C68	C68 PH	SOD27 (DO35)

TYPE NUMBER	MARKING CODE	PACKAGE
BZX55-C75	C75 PH	SOD27 (DO35)
BZX79-A2V4	A2V4 PH	SOD27 (DO35)
BZX79-A2V7	A2V7 PH	SOD27 (DO35)
BZX79-A3V0	A3V0 PH	SOD27 (DO35)
BZX79-A3V3	A3V3 PH	SOD27 (DO35)
BZX79-A3V6	A3V6 PH	SOD27 (DO35)
BZX79-A3V9	A3V9 PH	SOD27 (DO35)
BZX79-A4V3	A4V3 PH	SOD27 (DO35)
BZX79-A4V7	A4V7 PH	SOD27 (DO35)
BZX79-A5V1	A5V1 PH	SOD27 (DO35)
BZX79-A5V6	A5V6 PH	SOD27 (DO35)
BZX79-A6V2	A6V2 PH	SOD27 (DO35)
BZX79-A6V8	A6V8 PH	SOD27 (DO35)
BZX79-A7V5	A7V5 PH	SOD27 (DO35)
BZX79-A8V2	A8V2 PH	SOD27 (DO35)
BZX79-A9V1	A9V1 PH	SOD27 (DO35)
BZX79-A10	A10 PH	SOD27 (DO35)
BZX79-A11	A11 PH	SOD27 (DO35)
BZX79-A12	A12 PH	SOD27 (DO35)
BZX79-A13	A13 PH	SOD27 (DO35)
BZX79-A15	A15 PH	SOD27 (DO35)
BZX79-A16	A16 PH	SOD27 (DO35)
BZX79-A18	A18 PH	SOD27 (DO35)
BZX79-A20	A20 PH	SOD27 (DO35)
BZX79-A22	A22 PH	SOD27 (DO35)
BZX79-A24	A24 PH	SOD27 (DO35)
BZX79-A27	A27 PH	SOD27 (DO35)
BZX79-A30	A30 PH	SOD27 (DO35)
BZX79-A33	A33 PH	SOD27 (DO35)
BZX79-A36	A36 PH	SOD27 (DO35)
BZX79-A39	A39 PH	SOD27 (DO35)
BZX79-A43	A43 PH	SOD27 (DO35)
BZX79-A47	A47 PH	SOD27 (DO35)
BZX79-A51	A51 PH	SOD27 (DO35)
BZX79-A56	A56 PH	SOD27 (DO35)
BZX79-A62	A62 PH	SOD27 (DO35)
BZX79-A68	A68 PH	SOD27 (DO35)
BZX79-A75	A75 PH	SOD27 (DO35)
BZX79-B2V4	B2V4 PH	SOD27 (DO35)
BZX79-B2V7	B2V7 PH	SOD27 (DO35)

TYPE NUMBER	MARKING CODE	PACKAGE
BZX79-B3V0	B3V0 PH	SOD27 (DO35)
BZX79-B3V3	B3V3 PH	SOD27 (DO35)
BZX79-B3V6	B3V6 PH	SOD27 (DO35)
BZX79-B3V9	B3V9 PH	SOD27 (DO35)
BZX79-B4V3	B4V3 PH	SOD27 (DO35)
BZX79-B4V7	B4V7 PH	SOD27 (DO35)
BZX79-B5V1	B5V1 PH	SOD27 (DO35)
BZX79-B5V6	B5V6 PH	SOD27 (DO35)
BZX79-B6V2	B6V2 PH	SOD27 (DO35)
BZX79-B6V8	B6V8 PH	SOD27 (DO35)
BZX79-B7V5	B7V5 PH	SOD27 (DO35)
BZX79-B8V2	B8V2 PH	SOD27 (DO35)
BZX79-B9V1	B9V1 PH	SOD27 (DO35)
BZX79-B10	B10 PH	SOD27 (DO35)
BZX79-B11	B11 PH	SOD27 (DO35)
BZX79-B12	B12 PH	SOD27 (DO35)
BZX79-B13	B13 PH	SOD27 (DO35)
BZX79-B15	B15 PH	SOD27 (DO35)
BZX79-B16	B16 PH	SOD27 (DO35)
BZX79-B18	B18 PH	SOD27 (DO35)
BZX79-B20	B20 PH	SOD27 (DO35)
BZX79-B22	B22 PH	SOD27 (DO35)
BZX79-B24	B24 PH	SOD27 (DO35)
BZX79-B27	B27 PH	SOD27 (DO35)
BZX79-B30	B30 PH	SOD27 (DO35)
BZX79-B33	B33 PH	SOD27 (DO35)
BZX79-B36	B36 PH	SOD27 (DO35)
BZX79-B39	B39 PH	SOD27 (DO35)
BZX79-B43	B43 PH	SOD27 (DO35)
BZX79-B47	B47 PH	SOD27 (DO35)
BZX79-B51	B51 PH	SOD27 (DO35)
BZX79-B56	B56 PH	SOD27 (DO35)
BZX79-B62	B62 PH	SOD27 (DO35)
BZX79-B68	B68 PH	SOD27 (DO35)
BZX79-B75	B75 PH	SOD27 (DO35)
BZX79-C2V4	C2V4 PH	SOD27 (DO35)
BZX79-C2V7	C2V7 PH	SOD27 (DO35)
BZX79-C3V0	C3V0 PH	SOD27 (DO35)
BZX79-C3V3	C3V3 PH	SOD27 (DO35)
BZX79-C3V6	C3V6 PH	SOD27 (DO35)

TYPE NUMBER	MARKING CODE	PACKAGE
BZX79-C3V9	C3V9 PH	SOD27 (DO35)
BZX79-C4V3	C4V3 PH	SOD27 (DO35)
BZX79-C4V7	C4V7 PH	SOD27 (DO35)
BZX79-C5V1	C5V1 PH	SOD27 (DO35)
BZX79-C5V6	C5V6 PH	SOD27 (DO35)
BZX79-C6V2	C6V2 PH	SOD27 (DO35)
BZX79-C6V8	C6V8 PH	SOD27 (DO35)
BZX79-C7V5	C7V5 PH	SOD27 (DO35)
BZX79-C8V2	C8V2 PH	SOD27 (DO35)
BZX79-C9V1	C9V1 PH	SOD27 (DO35)
BZX79-C10	C10 PH	SOD27 (DO35)
BZX79-C11	C11 PH	SOD27 (DO35)
BZX79-C12	C12 PH	SOD27 (DO35)
BZX79-C13	C13 PH	SOD27 (DO35)
BZX79-C15	C15 PH	SOD27 (DO35)
BZX79-C16	C16 PH	SOD27 (DO35)
BZX79-C18	C18 PH	SOD27 (DO35)
BZX79-C20	C20 PH	SOD27 (DO35)
BZX79-C22	C22 PH	SOD27 (DO35)
BZX79-C24	C24 PH	SOD27 (DO35)
BZX79-C27	C27 PH	SOD27 (DO35)
BZX79-C30	C30 PH	SOD27 (DO35)
BZX79-C33	C33 PH	SOD27 (DO35)
BZX79-C36	C36 PH	SOD27 (DO35)
BZX79-C39	C39 PH	SOD27 (DO35)
BZX79-C43	C43 PH	SOD27 (DO35)
BZX79-C47	C47 PH	SOD27 (DO35)
BZX79-C51	C51 PH	SOD27 (DO35)
BZX79-C56	C56 PH	SOD27 (DO35)
BZX79-C62	C62 PH	SOD27 (DO35)
BZX79-C68	C68 PH	SOD27 (DO35)
BZX79-C75	C75 PH	SOD27 (DO35)
BZX79-F2V4	F2V4 PH	SOD27 (DO35)
BZX79-F2V7	F2V7 PH	SOD27 (DO35)
BZX79-F3V0	F3V0 PH	SOD27 (DO35)
BZX79-F3V3	F3V3 PH	SOD27 (DO35)
BZX79-F3V6	F3V6 PH	SOD27 (DO35)
BZX79-F3V9	F3V9 PH	SOD27 (DO35)
BZX79-F4V3	F4V3 PH	SOD27 (DO35)
BZX79-F4V7	F4V7 PH	SOD27 (DO35)

TYPE NUMBER	MARKING CODE	PACKAGE
BZX79-F5V1	F5V1 PH	SOD27 (DO35)
BZX79-F5V6	F5V6 PH	SOD27 (DO35)
BZX79-F6V2	F6V2 PH	SOD27 (DO35)
BZX79-F6V8	F6V8 PH	SOD27 (DO35)
BZX79-F7V5	F7V5 PH	SOD27 (DO35)
BZX79-F8V2	F8V2 PH	SOD27 (DO35)
BZX79-F9V1	F9V1 PH	SOD27 (DO35)
BZX79-F10	F10 PH	SOD27 (DO35)
BZX79-F11	F11 PH	SOD27 (DO35)
BZX79-F12	F12 PH	SOD27 (DO35)
BZX79-F13	F13 PH	SOD27 (DO35)
BZX79-F15	F15 PH	SOD27 (DO35)
BZX79-F16	F16 PH	SOD27 (DO35)
BZX79-F18	F18 PH	SOD27 (DO35)
BZX79-F20	F20 PH	SOD27 (DO35)
BZX79-F22	F22 PH	SOD27 (DO35)
BZX79-F24	F24 PH	SOD27 (DO35)
BZX79-F27	F27 PH	SOD27 (DO35)
BZX79-F30	F30 PH	SOD27 (DO35)
BZX79-F33	F33 PH	SOD27 (DO35)
BZX79-F36	F36 PH	SOD27 (DO35)
BZX79-F39	F39 PH	SOD27 (DO35)
BZX79-F43	F43 PH	SOD27 (DO35)
BZX79-F47	F47 PH	SOD27 (DO35)
BZX79-F51	F51 PH	SOD27 (DO35)
BZX79-F56	F56 PH	SOD27 (DO35)
BZX79-F62	F62 PH	SOD27 (DO35)
BZX79-F68	F68 PH	SOD27 (DO35)
BZX79-F75	F75 PH	SOD27 (DO35)
BZX84-A2V4	Y50	SOT23
BZX84-A2V7	Y51	SOT23
BZX84-A3V0	Y52	SOT23
BZX84-A3V3	Y53	SOT23
BZX84-A3V6	Y54	SOT23
BZX84-A3V9	Y55	SOT23
BZX84-A4V3	Y56	SOT23
BZX84-A4V7	Y57	SOT23
BZX84-A5V1	Y58	SOT23
BZX84-A5V6	Y59	SOT23
BZX84-A6V2	Y60	SOT23

TYPE NUMBER	MARKING CODE	PACKAGE
BZX84-A6V8	Y61	SOT23
BZX84-A7V5	Y62	SOT23
BZX84-A8V2	Y63	SOT23
BZX84-A9V1	Y64	SOT23
BZX84-A10	Y65	SOT23
BZX84-A11	Y66	SOT23
BZX84-A12	Y67	SOT23
BZX84-A13	Y68	SOT23
BZX84-A15	Y69	SOT23
BZX84-A16	Y70	SOT23
BZX84-A18	Y71	SOT23
BZX84-A20	Y72	SOT23
BZX84-A22	Y73	SOT23
BZX84-A24	Y74	SOT23
BZX84-A27	Y75	SOT23
BZX84-A30	Y76	SOT23
BZX84-A33	Y77	SOT23
BZX84-A36	Y78	SOT23
BZX84-A39	Y79	SOT23
BZX84-A43	Y80	SOT23
BZX84-A47	Y81	SOT23
BZX84-A51	Y82	SOT23
BZX84-A56	Y83	SOT23
BZX84-A62	Y84	SOT23
BZX84-A68	Y85	SOT23
BZX84-A75	Y86	SOT23
BZX84-B2V4	Z50	SOT23
BZX84-B2V7	Z51	SOT23
BZX84-B3V0	Z52	SOT23
BZX84-B3V3	Z53	SOT23
BZX84-B3V6	Z54	SOT23
BZX84-B3V9	Z55	SOT23
BZX84-B4V3	Z56	SOT23
BZX84-B4V7	Z57	SOT23
BZX84-B5V1	Z58	SOT23
BZX84-B5V6	Z59	SOT23
BZX84-B6V2	Z60	SOT23
BZX84-B6V8	Z61	SOT23
BZX84-B7V5	Z62	SOT23
BZX84-B8V2	Z63	SOT23

TYPE NUMBER	MARKING CODE	PACKAGE
BZX84-B9V1	Z64	SOT23
BZX84-B10	Z65	SOT23
BZX84-B11	Z66	SOT23
BZX84-B12	Z67	SOT23
BZX84-B13	Z68	SOT23
BZX84-B15	Z69	SOT23
BZX84-B16	Z70	SOT23
BZX84-B18	Z71	SOT23
BZX84-B20	Z72	SOT23
BZX84-B22	Z73	SOT23
BZX84-B24	Z74	SOT23
BZX84-B27	Z75	SOT23
BZX84-B30	Z76	SOT23
BZX84-B33	Z77	SOT23
BZX84-B36	Z78	SOT23
BZX84-B39	Z79	SOT23
BZX84-B43	Z80	SOT23
BZX84-B47	Z81	SOT23
BZX84-B51	Z82	SOT23
BZX84-B56	Z83	SOT23
BZX84-B62	Z84	SOT23
BZX84-B68	Z85	SOT23
BZX84-B75	Z86	SOT23
BZX84-C2V4	Z11	SOT23
BZX84-C2V7	Z12	SOT23
BZX84-C3V0	Z13	SOT23
BZX84-C3V3	Z14	SOT23
BZX84-C3V6	Z15	SOT23
BZX84-C3V9	Z16	SOT23
BZX84-C4V3	Z17	SOT23
BZX84-C4V7	Z1p	SOT23
BZX84-C5V1	Z2p	SOT23
BZX84-C5V6	Z3p	SOT23
BZX84-C6V2	Z4p	SOT23
BZX84-C6V8	Z5p	SOT23
BZX84-C7V5	Z6p	SOT23
BZX84-C8V2	Z7p	SOT23
BZX84-C9V1	Z8p	SOT23
BZX84-C10	Z9p	SOT23
BZX84-C11	Y1p	SOT23

TYPE NUMBER	MARKING CODE	PACKAGE
BZX84-C12	Y2p	SOT23
BZX84-C13	Y3p	SOT23
BZX84-C15	Y4p	SOT23
BZX84-C16	Y5p	SOT23
BZX84-C18	Y6p	SOT23
BZX84-C20	Y7p	SOT23
BZX84-C22	Y8p	SOT23
BZX84-C24	Y9p	SOT23
BZX84-C27	Y10	SOT23
BZX84-C30	Y11	SOT23
BZX84-C33	Y12	SOT23
BZX84-C36	Y13	SOT23
BZX84-C39	Y14	SOT23
BZX84-C43	Y15	SOT23
BZX84-C47	Y16	SOT23
BZX84-C51	Y17	SOT23
BZX84-C56	Y18	SOT23
BZX84-C62	Y19	SOT23
BZX84-C68	Y20	SOT23
BZX84-C75	Y21	SOT23
BZX284-B2V4	WO	SOD110
BZX284-B2V7	WP	SOD110
BZX284-B3V0	WQ	SOD110
BZX284-B3V3	WR	SOD110
BZX284-B3V6	WS	SOD110
BZX284-B3V9	WT	SOD110
BZX284-B4V3	WU	SOD110
BZX284-B4V7	WV	SOD110
BZX284-B5V1	WW	SOD110
BZX284-B5V6	WX	SOD110
BZX284-B6V2	WY	SOD110
BZX284-B6V8	WZ	SOD110
BZX284-B7V5	XA	SOD110
BZX284-B8V2	XB	SOD110
BZX284-B9V1	XC	SOD110
BZX284-B10	XD	SOD110
BZX284-B11	XE	SOD110
BZX284-B12	XF	SOD110
BZX284-B13	XG	SOD110
BZX284-B15	XH	SOD110

TYPE NUMBER	MARKING CODE	PACKAGE
BZX284-B16	XI	SOD110
BZX284-B18	XJ	SOD110
BZX284-B20	XK	SOD110
BZX284-B22	XL	SOD110
BZX284-B24	XM	SOD110
BZX284-B27	XN	SOD110
BZX284-B30	XO	SOD110
BZX284-B33	XP	SOD110
BZX284-B36	XQ	SOD110
BZX284-B39	XR	SOD110
BZX284-B43	XS	SOD110
BZX284-B47	XT	SOD110
BZX284-B51	XU	SOD110
BZX284-B56	XV	SOD110
BZX284-B62	XW	SOD110
BZX284-B68	XX	SOD110
BZX284-B75	XY	SOD110
BZX284-C2V4	YO	SOD110
BZX284-C2V7	YP	SOD110
BZX284-C3V0	YQ	SOD110
BZX284-C3V3	YR	SOD110
BZX284-C3V6	YS	SOD110
BZX284-C3V9	YT	SOD110
BZX284-C4V3	YU	SOD110
BZX284-C4V7	YV	SOD110
BZX284-C5V1	YW	SOD110
BZX284-C5V6	YX	SOD110
BZX284-C6V2	YY	SOD110
BZX284-C6V8	YZ	SOD110
BZX284-C7V5	ZA	SOD110
BZX284-C8V2	ZB	SOD110
BZX284-C9V1	ZC	SOD110
BZX284-C10	ZD	SOD110
BZX284-C11	ZE	SOD110
BZX284-C12	ZF	SOD110
BZX284-C13	ZG	SOD110
BZX284-C15	ZH	SOD110
BZX284-C16	ZI	SOD110
BZX284-C18	ZJ	SOD110
BZX284-C20	ZK	SOD110

TYPE NUMBER	MARKING CODE	PACKAGE
BZX284-C22	ZL	SOD110
BZX284-C24	ZM	SOD110
BZX284-C27	ZN	SOD110
BZX284-C30	ZO	SOD110
BZX284-C33	ZP	SOD110
BZX284-C36	ZQ	SOD110
BZX284-C39	ZR	SOD110
BZX284-C43	ZS	SOD110
BZX284-C47	ZT	SOD110
BZX284-C51	ZU	SOD110
BZX284-C56	ZV	SOD110
BZX284-C62	ZW	SOD110
BZX284-C68	ZX	SOD110
BZX284-C75	ZY	SOD110
PBYR280CT	BYR28	SOT223
PBYR290CT	BYR29	SOT223
PBYR2100CT	BYR210	SOT223
PBYR2150CT	BYR215	SOT223
PLVA450A	450A PH	SOD27 (DO35)
PLVA453A	453A PH	SOD27 (DO35)
PLVA456A	456A PH	SOD27 (DO35)
PLVA459A	459A PH	SOD27 (DO35)
PLVA462A	462A PH	SOD27 (DO35)
PLVA465A	465A PH	SOD27 (DO35)
PLVA468A	468A PH	SOD27 (DO35)
PLVA650A	p9A	SOT23
PLVA653A	p9B	SOT23
PLVA656A	p9C	SOT23
PLVA659A	p9D	SOT23
PLVA662A	p9E	SOT23
PLVA665A	p9F	SOT23
PLVA668A	p9G	SOT23
PLVA2650A	p9J	SOT23
PLVA2653A	p9K	SOT23
PLVA2656A	p9L	SOT23
PLVA2659A	p9M	SOT23
PLVA2662A	p9N	SOT23
PLVA2665A	p9O	SOT23
PLVA2668A	p9P	SOT23
PMBD352	p5g	SOT23

TYPE NUMBER	MARKING CODE	PACKAGE
PMBD353	p4f	SOT23
PMBD914	p5D	SOT23
PMBD2835	pA3	SOT23
PMBD2836	pA2	SOT23
PMBD2837	pA5	SOT23
PMBD2838	pA6	SOT23
PMBD6050	p5A	SOT23
PMBD6100	p5B	SOT23
PMBD7000	p5C	SOT23
PMBZ5226B	p8A	SOT23
PMBZ5227B	p8B	SOT23
PMBZ5228B	p8C	SOT23
PMBZ5229B	p8D	SOT23
PMBZ5230B	p8E	SOT23
PMBZ5231B	p8F	SOT23
PMBZ5232B	p8G	SOT23
PMBZ5233B	p8H	SOT23
PMBZ5234B	p8J	SOT23
PMBZ5235B	p8K	SOT23
PMBZ5236B	p8L	SOT23
PMBZ5237B	p8M	SOT23
PMBZ5238B	p8N	SOT23
PMBZ5239B	p8P	SOT23
PMBZ5240B	p8Q	SOT23
PMBZ5241B	p8R	SOT23
PMBZ5242B	p8S	SOT23
PMBZ5243B	p8T	SOT23
PMBZ5244B	p8U	SOT23
PMBZ5245B	p8V	SOT23
PMBZ5246B	p8W	SOT23
PMBZ5247B	p8X	SOT23
PMBZ5248B	p8Y	SOT23
PMBZ5249B	p8Z	SOT23
PMBZ5250B	81A	SOT23
PMBZ5251B	81B	SOT23
PMBZ5252B	81C	SOT23
PMBZ5253B	81D	SOT23
PMBZ5254B	81E	SOT23
PMBZ5255B	81F	SOT23
PMBZ5256B	81G	SOT23

TYPE NUMBER	MARKING CODE	PACKAGE
PMBZ5257B	81H	SOT23
PMLL4148	black	SOD80C
PMLL4150	black	SOD80C
PMLL4151	black	SOD80C
PMLL4153	black	SOD80C
PMLL4446	black	SOD80C
PMLL4448	black	SOD80C
PMLL5225B	yellow	SOD80C
PMLL5226B	yellow	SOD80C
PMLL5227B	yellow	SOD80C
PMLL5228B	yellow	SOD80C
PMLL5229B	yellow	SOD80C
PMLL5230B	yellow	SOD80C
PMLL5231B	yellow	SOD80C
PMLL5232B	yellow	SOD80C
PMLL5233B	yellow	SOD80C
PMLL5234B	yellow	SOD80C
PMLL5235B	yellow	SOD80C
PMLL5236B	yellow	SOD80C
PMLL5237B	yellow	SOD80C
PMLL5238B	yellow	SOD80C
PMLL5239B	yellow	SOD80C
PMLL5240B	yellow	SOD80C
PMLL5241B	yellow	SOD80C
PMLL5242B	yellow	SOD80C
PMLL5243B	yellow	SOD80C
PMLL5244B	yellow	SOD80C
PMLL5245B	yellow	SOD80C
PMLL5246B	yellow	SOD80C
PMLL5247B	yellow	SOD80C
PMLL5248B	yellow	SOD80C
PMLL5249B	yellow	SOD80C
PMLL5250B	yellow	SOD80C
PMLL5251B	yellow	SOD80C
PMLL5252B	yellow	SOD80C
PMLL5253B	yellow	SOD80C
PMLL5254B	yellow	SOD80C
PMLL5255B	yellow	SOD80C
PMLL5256B	yellow	SOD80C
PMLL5257B	yellow	SOD80C

TYPE NUMBER	MARKING CODE	PACKAGE
PMLL5258B	yellow	SOD80C
PMLL5259B	yellow	SOD80C
PMLL5260B	yellow	SOD80C
PMLL5261B	yellow	SOD80C
PMLL5262B	yellow	SOD80C
PMLL5263B	yellow	SOD80C
PMLL5264B	yellow	SOD80C
PMLL5265B	yellow	SOD80C
PMLL5266B	yellow	SOD80C
PMLL5267B	yellow	SOD80C
PRLL4001	4001	SOD87
PRLL4002	4002	SOD87
PRLL5817	817 PH	SOD87
PRLL5818	818 PH	SOD87
PRLL5819	819 PH	SOD87
PZTM1101	TM1101	SOT223
PZTM1102	TM1102	SOT223

MARKING CODE TO TYPE NUMBER

MARKING CODE	TYPE NUMBER	PACKAGE
10	1PS59SB10	SC59
10 PH	BZD23-C10	SOD81
10 PH	BZD27-C10	SOD87
100 PH	BZD23-C100	SOD81
100 PH	BZD27-C100	SOD87
10Y	BZV49-C10	SOT89
11 PH	BZD23-C11	SOD81
11 PH	BZD27-C11	SOD87
110 PH	BZD23-C110	SOD81
110 PH	BZD27-C110	SOD87
11D	BYD11D	SOD91
11G	BYD11G	SOD91
11J	BYD11J	SOD91
11K	BYD11K	SOD91
11M	BYD11M	SOD91
11Y	BZV49-C11	SOT89
12 PH	BZD23-C12	SOD81
12 PH	BZD27-C12	SOD87
120 PH	BZD23-C120	SOD81
120 PH	BZD27-C120	SOD87
12Y	BZV49-C12	SOT89
13 PH	BZD23-C13	SOD81
13 PH	BZD27-C13	SOD87
130 PH	BZD23-C130	SOD81
130 PH	BZD27-C130	SOD87
13D PH	BYD13D	SOD81
13G PH	BYD13G	SOD81
13J PH	BYD13J	SOD81
13K PH	BYD13K	SOD81
13M PH	BYD13M	SOD81
13Y	BZV49-C13	SOT89
14	1PS59SB14	SC59
15	1PS59SB15	SC59
15 PH	BZD23-C15	SOD81
15 PH	BZD27-C15	SOD87
150 PH	BZD23-C150	SOD81
150 PH	BZD27-C150	SOD87
15Y	BZV49-C15	SOT89
16	1PS59SB16	SC59
16 PH	BZD23-C16	SOD81
16 PH	BZD27-C16	SOD87
160 PH	BZD23-C160	SOD81
160 PH	BZD27-C160	SOD87
16Y	BZV49-C16	SOT89
17D PH	BYD17D	SOD87
17G PH	BYD17G	SOD87
17J PH	BYD17J	SOD87
17K PH	BYD17K	SOD87
17M PH	BYD17M	SOD87
18 PH	BZD23-C18	SOD81
18 PH	BZD27-C18	SOD87
180 PH	BZD23-C180	SOD81
180 PH	BZD27-C180	SOD87
18Y	BZV49-C18	SOT89
1N4001	1N4001ID	SOD81
1N4001 PH	1N4001G	SOD57
1N4002	1N4002ID	SOD81
1N4002 PH	1N4002G	SOD57
1N4003	1N4003ID	SOD81

MARKING CODE	TYPE NUMBER	PACKAGE
1N4003 PH	1N4003G	SOD57
1N4004	1N4004ID	SOD81
1N4004 PH	1N4004G	SOD57
1N4005	1N4005ID	SOD81
1N4005 PH	1N4005G	SOD57
1N4006	1N4006ID	SOD81
1N4006 PH	1N4006G	SOD57
1N4007	1N4007ID	SOD81
1N4007 PH	1N4007G	SOD57
1N4148 PH	1N4148	SOD27 (DO35)
1N4150 PH	1N4150	SOD27 (DO35)
1N4151 PH	1N4151	SOD27 (DO35)
1N4153 PH	1N4153	SOD27 (DO35)
1N4446 PH	1N4446	SOD27 (DO35)
1N4448 PH	1N4448	SOD27 (DO35)
1N5059 PH	1N5059	SOD57
1N5060 PH	1N5060	SOD57
1N5061 PH	1N5061	SOD57
1N5062 PH	1N5062	SOD57
1N5817	1N5817	SOD81
1N5818	1N5818	SOD81
1N5819	1N5819	SOD81
1N821	N821	SOD68 (DO34)
1N821A	1N821A	SOD68 (DO34)
1N823	1N823	SOD68 (DO34)
1N823A	1N823A	SOD68 (DO34)
1N825	1N825	SOD68 (DO34)
1N825A	1N825A	SOD68 (DO34)
1N827	1N827	SOD68 (DO34)
1N827A	1N827A	SOD68 (DO34)
1N829	1N829	SOD68 (DO34)
1N829A	1N829A	SOD68 (DO34)
1N914 PH	1N914	SOD27 (DO35)
1N916 PH	1N916	SOD27 (DO35)
20 PH	BZD23-C20	SOD81
20 PH	BZD27-C20	SOD87
200 PH	BZD23-C200	SOD81
200 PH	BZD27-C200	SOD87
20Y	BZV49-C20	SOT89
22 PH	BZD23-C22	SOD81

MARKING CODE	TYPE NUMBER	PACKAGE
22 PH	BZD27-C22	SOD87
220 PH	BZD23-C220	SOD81
220 PH	BZD27-C220	SOD87
22Y	BZV49-C22	SOT89
24 PH	BZD23-C24	SOD81
24 PH	BZD27-C24	SOD87
240 PH	BZD23-C240	SOD81
240 PH	BZD27-C240	SOD87
24Y	BZV49-C24	SOT89
27 PH	BZD23-C27	SOD81
27 PH	BZD27-C27	SOD87
270 PH	BZD23-C270	SOD81
270 PH	BZD27-C270	SOD87
27Y	BZV49-C27	SOT89
2Y4	BZV49-C2V4	SOT89
2Y7	BZV49-C2V7	SOT89
30 PH	BZD23-C30	SOD81
30 PH	BZD27-C30	SOD87
300 PH	BZD23-C300	SOD81
300 PH	BZD27-C300	SOD87
30Y	BZV49-C30	SOT89
31D	BYD31D	SOD91
31G	BYD31G	SOD91
31J	BYD31J	SOD91
31K	BYD31K	SOD91
31M	BYD31M	SOD91
33 PH	BZD23-C33	SOD81
33 PH	BZD27-C33	SOD87
330 PH	BZD23-C330	SOD81
330 PH	BZD27-C330	SOD87
33D PH	BYD33D	SOD81
33G PH	BYD33G	SOD81
33J PH	BYD33J	SOD81
33K PH	BYD33K	SOD81
33M PH	BYD33M	SOD81
33U PH	BYD33U	SOD81
33V PH	BYD33V	SOD81
33Y	BZV49-C33	SOT89
36 PH	BZD23-C36	SOD81
36 PH	BZD27-C36	SOD87

MARKING CODE	TYPE NUMBER	PACKAGE
360 PH	BZD23-C360	SOD81
360 PH	BZD27-C360	SOD87
36Y	BZV49-C36	SOT89
37D PH	BYD37D	SOD87
37G PH	BYD37G	SOD87
37J PH	BYD37J	SOD87
37K PH	BYD37K	SOD87
37M PH	BYD37M	SOD87
39 PH	BZD23-C39	SOD81
39 PH	BZD27-C39	SOD87
390 PH	BZD23-C390	SOD81
390 PH	BZD27-C390	SOD87
39Y	BZV49-C39	SOT89
3V6 PH	BZD23-C3V6	SOD81
3V6 PH	BZD27-C3V6	SOD87
3V9 PH	BZD23-C3V9	SOD81
3V9 PH	BZD27-C3V9	SOD87
3Y0	BZV49-C3V0	SOT89
3Y3	BZV49-C3V3	SOT89
3Y6	BZV49-C3V6	SOT89
3Y9	BZV49-C3V9	SOT89
4001	PRLL4001	SOD87
4002	PRLL4002	SOD87
42	BAT54AW	SOT323
423A PH	BA423A	SOD68 (DO34)
43	BAT54CW	SOT323
43 PH	BZD23-C43	SOD81
43 PH	BZD27-C43	SOD87
430 PH	BZD23-C430	SOD81
430 PH	BZD27-C430	SOD87
43U PH	BYD43U	SOD81
43V PH	BYD43V	SOD81
43Y	BZV49-C43	SOT89
43p	BAS40	SOT23
43-16PH	BYD43-16	SOD81
43-18PH	BYD43-18	SOD81
43-20PH	BYD43-20	SOD81
44	BAT54SW	SOT323
44p	BAS40-04	SOT23
450A PH	PLVA450A	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
4531PH	1N4531	SOD68 (DO34)
4532PH	1N4532	SOD68 (DO34)
453A PH	PLVA453A	SOD27 (DO35)
456A PH	PLVA456A	SOD27 (DO35)
459A PH	PLVA459A	SOD27 (DO35)
45A PH	BAS45A	SOD68 (DO34)
45p	BAS40-05	SOT23
462A PH	PLVA462A	SOD27 (DO35)
465A PH	PLVA465A	SOD27 (DO35)
468A PH	PLVA468A	SOD27 (DO35)
46p	BAS40-06	SOT23
47 PH	BZD23-C47	SOD81
47 PH	BZD27-C47	SOD87
470 PH	BZD23-C470	SOD81
470 PH	BZD27-C470	SOD87
4728A P	1N4728A	SOD66 (DO41)
4729A P	1N4729A	SOD66 (DO41)
4730A P	1N4730A	SOD66 (DO41)
4731A P	1N4731A	SOD66 (DO41)
4732A P	1N4732A	SOD66 (DO41)
4733A P	1N4733A	SOD66 (DO41)
4734A P	1N4734A	SOD66 (DO41)
4735A P	1N4735A	SOD66 (DO41)
4736A P	1N4736A	SOD66 (DO41)
4737A P	1N4737A	SOD66 (DO41)
4738A P	1N4738A	SOD66 (DO41)
4739A P	1N4739A	SOD66 (DO41)
4740A P	1N4740A	SOD66 (DO41)
4741A P	1N4741A	SOD66 (DO41)
4742A P	1N4742A	SOD66 (DO41)
4743A P	1N4743A	SOD66 (DO41)
4744A P	1N4744A	SOD66 (DO41)
4745A P	1N4745A	SOD66 (DO41)
4746A P	1N4746A	SOD66 (DO41)
4747A P	1N4747A	SOD66 (DO41)
4748A P	1N4748A	SOD66 (DO41)
4749A P	1N4749A	SOD66 (DO41)
47Y	BZV49-C47	SOT89
47-16PH	BYD47-16	SOD87
47-18PH	BYD47-18	SOD87

MARKING CODE	TYPE NUMBER	PACKAGE
47-20PH	BYD47-20	SOD87
4V3 PH	BZD23-C4V3	SOD81
4V3 PH	BZD27-C4V3	SOD87
4V7 PH	BZD23-C4V7	SOD81
4V7 PH	BZD27-C4V7	SOD87
4Y3	BZV49-C4V3	SOT89
4Y7	BZV49-C4V7	SOT89
51 PH	BZD23-C51	SOD81
51 PH	BZD27-C51	SOD87
510 PH	BZD23-C510	SOD81
510 PH	BZD27-C510	SOD87
51Y	BZV49-C51	SOT89
5225BP	1N5225B	SOD27 (DO35)
5226BP	1N5226B	SOD27 (DO35)
5227BP	1N5227B	SOD27 (DO35)
5228BP	1N5228B	SOD27 (DO35)
5229BP	1N5229B	SOD27 (DO35)
5230BP	1N5230B	SOD27 (DO35)
5231BP	1N5231B	SOD27 (DO35)
5232BP	1N5232B	SOD27 (DO35)
5233BP	1N5233B	SOD27 (DO35)
5234BP	1N5234B	SOD27 (DO35)
5235BP	1N5235B	SOD27 (DO35)
5236BP	1N5236B	SOD27 (DO35)
5237BP	1N5237B	SOD27 (DO35)
5238BP	1N5238B	SOD27 (DO35)
5239BP	1N5239B	SOD27 (DO35)
5240BP	1N5240B	SOD27 (DO35)
5241BP	1N5241B	SOD27 (DO35)
5242BP	1N5242B	SOD27 (DO35)
5243BP	1N5243B	SOD27 (DO35)
5244BP	1N5244B	SOD27 (DO35)
5245BP	1N5245B	SOD27 (DO35)
5246BP	1N5246B	SOD27 (DO35)
5247BP	1N5247B	SOD27 (DO35)
5248BP	1N5248B	SOD27 (DO35)
5249BP	1N5249B	SOD27 (DO35)
5250BP	1N5250B	SOD27 (DO35)
5251BP	1N5251B	SOD27 (DO35)
5252BP	1N5252B	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
5253BP	1N5253B	SOD27 (DO35)
5254BP	1N5254B	SOD27 (DO35)
5255BP	1N5255B	SOD27 (DO35)
5256BP	1N5256B	SOD27 (DO35)
5257BP	1N5257B	SOD27 (DO35)
5258BP	1N5258B	SOD27 (DO35)
5259BP	1N5259B	SOD27 (DO35)
5260BP	1N5260B	SOD27 (DO35)
5261BP	1N5261B	SOD27 (DO35)
5262BP	1N5262B	SOD27 (DO35)
5263BP	1N5263B	SOD27 (DO35)
5264BP	1N5264B	SOD27 (DO35)
5265BP	1N5265B	SOD27 (DO35)
5266BP	1N5266B	SOD27 (DO35)
5267BP	1N5267B	SOD27 (DO35)
53U PH	BYD53U	SOD81
53V PH	BYD53V	SOD81
56 PH	BZD23-C56	SOD81
56 PH	BZD27-C56	SOD87
56Y	BZV49-C56	SOT89
57D PH	BYD57D	SOD87
57G PH	BYD57G	SOD87
57J PH	BYD57J	SOD87
57K PH	BYD57K	SOD87
57M PH	BYD57M	SOD87
5V1 PH	BZD23-C5V1	SOD81
5V1 PH	BZD27-C5V1	SOD87
5V6 PH	BZD23-C5V6	SOD81
5V6 PH	BZD27-C5V6	SOD87
5Y1	BZV49-C5V1	SOT89
5Y6	BZV49-C5V6	SOT89
62 PH	BZD23-C62	SOD81
62 PH	BZD27-C62	SOD87
62Y	BZV49-C62	SOT89
63	BAS40W	SOT323
63 PH	BYD63	SOD81
64	BAS40-04W	SOT323
65	BAS40-05W	SOT323
66	BAS40-06W	SOT323
68 PH	BZD23-C68	SOD81

MARKING CODE	TYPE NUMBER	PACKAGE
68 PH	BZD27-C68	SOD87
68Y	BZV49-C68	SOT89
6V2 PH	BZD23-C6V2	SOD81
6V2 PH	BZD27-C6V2	SOD87
6V8 PH	BZD23-C6V8	SOD81
6V8 PH	BZD27-C6V8	SOD87
6Y2	BZV49-C6V2	SOT89
6Y8	BZV49-C6V8	SOT89
6t3	1PS70SB40	SC70-3
6t4	1PS70SB44	SC70-3
6t5	1PS70SB45	SC70-3
6t6	1PS70SB46	SC70-3
71A	BYD71A	SOD91
71B	BYD71B	SOD91
71C	BYD71C	SOD91
71D	BYD71D	SOD91
71E	BYD71E	SOD91
71F	BYD71F	SOD91
71G	BYD71G	SOD91
73A PH	BYD73A	SOD81
73B PH	BYD73B	SOD81
73C PH	BYD73C	SOD81
73D PH	BYD73D	SOD81
73E PH	BYD73E	SOD81
73F PH	BYD73F	SOD81
73G PH	BYD73G	SOD81
73p	BAS70	SOT23
73-	BAS70W	SOT323
74p	BAS70-04	SOT23
74-	BAS70-04W	SOT323
75 PH	BZD23-C75	SOD81
75 PH	BZD27-C75	SOD87
75Y	BZV49-C75	SOT89
75p	BAS70-05	SOT23
75-	BAS70-05W	SOT323
76p	BAS70-06	SOT23
76-	BAS70-06W	SOT323
77A PH	BYD77A	SOD87
77B PH	BYD77B	SOD87
77C PH	BYD77C	SOD87

MARKING CODE	TYPE NUMBER	PACKAGE
77D PH	BYD77D	SOD87
77E PH	BYD77E	SOD87
77F PH	BYD77F	SOD87
77G PH	BYD77G	SOD87
77p	BAS70-07	SOT143
7V5 PH	BZD23-C7V5	SOD81
7V5 PH	BZD27-C7V5	SOD87
7Y5	BZV49-C7V5	SOT89
817 PH	PRLL5817	SOD87
818 PH	PRLL5818	SOD87
819 PH	PRLL5819	SOD87
81A	PMBZ5250B	SOT23
81B	PMBZ5251B	SOT23
81C	PMBZ5252B	SOT23
81D	PMBZ5253B	SOT23
81E	PMBZ5254B	SOT23
81F	PMBZ5255B	SOT23
81G	PMBZ5256B	SOT23
81H	PMBZ5257B	SOT23
82 PH	BZD23-C82	SOD81
82 PH	BZD27-C82	SOD87
8V2 PH	BZD23-C8V2	SOD81
8V2 PH	BZD27-C8V2	SOD87
8Y2	BZV49-C8V2	SOT89
91 PH	BZD23-C91	SOD81
91 PH	BZD27-C91	SOD87
9V1 PH	BZD23-C9V1	SOD81
9V1 PH	BZD27-C9V1	SOD87
9Y1	BZV49-C9V1	SOT89
A1	BAW56W	SOT323
A10 PH	BZX79-A10	SOD27 (DO35)
A11 PH	BZX79-A11	SOD27 (DO35)
A12 PH	BZX79-A12	SOD27 (DO35)
A13 PH	BZX79-A13	SOD27 (DO35)
A15 PH	BZX79-A15	SOD27 (DO35)
A16 PH	BZX79-A16	SOD27 (DO35)
A18 PH	BZX79-A18	SOD27 (DO35)
A1p	BAW56	SOT23
A20 PH	BZX79-A20	SOD27 (DO35)
A22 PH	BZX79-A22	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
A24 PH	BZX79-A24	SOD27 (DO35)
A27 PH	BZX79-A27	SOD27 (DO35)
A2V4 PH	BZX79-A2V4	SOD27 (DO35)
A2V7 PH	BZX79-A2V7	SOD27 (DO35)
A2p	BAT18	SOT23
A3	1PS300	SC70
A30 PH	BZX79-A30	SOD27 (DO35)
A33 PH	BZX79-A33	SOD27 (DO35)
A36 PH	BZX79-A36	SOD27 (DO35)
A39 PH	BZX79-A39	SOD27 (DO35)
A3T	1PS181	SC59
A3V0 PH	BZX79-A3V0	SOD27 (DO35)
A3V3 PH	BZX79-A3V3	SOD27 (DO35)
A3V6 PH	BZX79-A3V6	SOD27 (DO35)
A3V9 PH	BZX79-A3V9	SOD27 (DO35)
A3p	BAT17	SOT23
A4	BAV70W	SOT323
A43 PH	BZX79-A43	SOD27 (DO35)
A47 PH	BZX79-A47	SOD27 (DO35)
A4V3 PH	BZX79-A4V3	SOD27 (DO35)
A4V7 PH	BZX79-A4V7	SOD27 (DO35)
A4p	BAV70	SOT23
A51 PH	BZX79-A51	SOD27 (DO35)
A56 PH	BZX79-A56	SOD27 (DO35)
A5V1 PH	BZX79-A5V1	SOD27 (DO35)
A5V6 PH	BZX79-A5V6	SOD27 (DO35)
A6	BAS16W	SOT323
A6	BAS216	SOD110
A62 PH	BZX79-A62	SOD27 (DO35)
A68 PH	BZX79-A68	SOD27 (DO35)
A6V2 PH	BZX79-A6V2	SOD27 (DO35)
A6V8 PH	BZX79-A6V8	SOD27 (DO35)
A6p	BAS16	SOT23
A7	BAV99W	SOT323
A75 PH	BZX79-A75	SOD27 (DO35)
A7V5 PH	BZX79-A7V5	SOD27 (DO35)
A7p	BAV99	SOT23
A8V2 PH	BZX79-A8V2	SOD27 (DO35)
A91	BAS17	SOT23
A9V1 PH	BZX79-A9V1	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
B10 PH	BZX79-B10	SOD27 (DO35)
B11 PH	BZX79-B11	SOD27 (DO35)
B12 PH	BZX79-B12	SOD27 (DO35)
B13 PH	BZX79-B13	SOD27 (DO35)
B15 PH	BZX79-B15	SOD27 (DO35)
B16 PH	BZX79-B16	SOD27 (DO35)
B18 PH	BZX79-B18	SOD27 (DO35)
B20 PH	BZX79-B20	SOD27 (DO35)
B22 PH	BZX79-B22	SOD27 (DO35)
B24 PH	BZX79-B24	SOD27 (DO35)
B27 PH	BZX79-B27	SOD27 (DO35)
B2V4 PH	BZX79-B2V4	SOD27 (DO35)
B2V7 PH	BZX79-B2V7	SOD27 (DO35)
B3	1PS301	SC70
B30 PH	BZX79-B30	SOD27 (DO35)
B33 PH	BZX79-B33	SOD27 (DO35)
B36 PH	BZX79-B36	SOD27 (DO35)
B39 PH	BZX79-B39	SOD27 (DO35)
B3T	1PS184	SC59
B3V0 PH	BZX79-B3V0	SOD27 (DO35)
B3V3 PH	BZX79-B3V3	SOD27 (DO35)
B3V6 PH	BZX79-B3V6	SOD27 (DO35)
B3V9 PH	BZX79-B3V9	SOD27 (DO35)
B43 PH	BZX79-B43	SOD27 (DO35)
B47 PH	BZX79-B47	SOD27 (DO35)
B4V3 PH	BZX79-B4V3	SOD27 (DO35)
B4V7 PH	BZX79-B4V7	SOD27 (DO35)
B51 PH	BZX79-B51	SOD27 (DO35)
B56 PH	BZX79-B56	SOD27 (DO35)
B5V1 PH	BZX79-B5V1	SOD27 (DO35)
B5V6 PH	BZX79-B5V6	SOD27 (DO35)
B62 PH	BZX79-B62	SOD27 (DO35)
B68 PH	BZX79-B68	SOD27 (DO35)
B6V2 PH	BZX79-B6V2	SOD27 (DO35)
B6V8 PH	BZX79-B6V8	SOD27 (DO35)
B75 PH	BZX79-B75	SOD27 (DO35)
B7V5 PH	BZX79-B7V5	SOD27 (DO35)
B8V2 PH	BZX79-B8V2	SOD27 (DO35)
B9V1 PH	BZX79-B9V1	SOD27 (DO35)
BA220 PH	BA220	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
BA221 PH	BA221	SOD27 (DO35)
BA314 PH	BA314	SOD27 (DO35)
BA315 PH	BA315	SOD27 (DO35)
BA316 PH	BA316	SOD27 (DO35)
BA317 PH	BA317	SOD27 (DO35)
BA318 PH	BA318	SOD27 (DO35)
BA482	BA482	SOD68 (DO34)
BA483	BA483	SOD68 (DO34)
BA484	BA484	SOD68 (DO34)
BAS15	BAS15	SOD68 (DO34)
BAT81	BAT81	SOD68 (DO34)
BAT82	BAT82	SOD68 (DO34)
BAT83	BAT83	SOD68 (DO34)
BAT85	BAT85	SOD68 (DO34)
BAT86	BAT86	SOD68 (DO34)
BAV10 PH	BAV10	SOD27 (DO35)
BAV18 PH	BAV18	SOD27 (DO35)
BAV19 PH	BAV19	SOD27 (DO35)
BAV20 PH	BAV20	SOD27 (DO35)
BAV21 PH	BAV21	SOD27 (DO35)
BAV45	BAV45	SOT18/15
BAW62 PH	BAW62	SOD27 (DO35)
BAX12 PH	BAX12	SOD27 (DO35)
BAX14 PH	BAX14	SOD27 (DO35)
BAX18 PH	BAX18	SOD27 (DO35)
BAY80 PH	BAY80	SOD27 (DO35)
BB119 PH	BB119	SOD27 (DO35)
BY228 PH	BY228	SOD64
BY278 PH	BY278	SOD64
BY328 PH	BY328	SOD64
BY428 PH	BY428	SOD64
BY448 PH	BY448	SOD57
BY527 PH	BY527	SOD57
BYG50D PH	BYG50D	SOD106 (DO214AC)
BYG50G PH	BYG50G	SOD106 (DO214AC)
BYG50J PH	BYG50J	SOD106 (DO214AC)
BYG50K PH	BYG50K	SOD106 (DO214AC)

MARKING CODE	TYPE NUMBER	PACKAGE
BYG50M PH	BYG50M	SOD106 (DO214AC)
BYG60D PH	BYG60D	SOD106 (DO214AC)
BYG60G PH	BYG60G	SOD106 (DO214AC)
BYG60J PH	BYG60J	SOD106 (DO214AC)
BYG60K PH	BYG60K	SOD106 (DO214AC)
BYG60M PH	BYG60M	SOD106 (DO214AC)
BYG70D PH	BYG70D	SOD106 (DO214AC)
BYG70G PH	BYG70G	SOD106 (DO214AC)
BYG70J PH	BYG70J	SOD106 (DO214AC)
BYG80D PH	BYG80D	SOD106 (DO214AC)
BYG80G PH	BYG80G	SOD106 (DO214AC)
BYG80J PH	BYG80J	SOD106 (DO214AC)
BYG90 20 PH	BYG90-20	SOD106A
BYG90 30 PH	BYG90-30	SOD106A
BYG90 40 PH	BYG90-40	SOD106A
BYG90 90 PH	BYG90-90	SOD106A
BYM26A PH	BYM26A	SOD64
BYM26B PH	BYM26B	SOD64
BYM26C PH	BYM26C	SOD64
BYM26D PH	BYM26D	SOD64
BYM26E PH	BYM26E	SOD64
BYM26F PH	BYM26F	SOD64
BYM26G PH	BYM26G	SOD64
BYM36A PH	BYM36A	SOD64
BYM36B PH	BYM36B	SOD64
BYM36C PH	BYM36C	SOD64
BYM36D PH	BYM36D	SOD64
BYM36E PH	BYM36E	SOD64
BYM36F PH	BYM36F	SOD64
BYM36G PH	BYM36G	SOD64

MARKING CODE	TYPE NUMBER	PACKAGE
BYM56A PH	BYM56A	SOD64
BYM56B PH	BYM56B	SOD64
BYM56C PH	BYM56C	SOD64
BYM56D PH	BYM56D	SOD64
BYM56E PH	BYM56E	SOD64
BYM63 PH	BYM63	SOD64
BYM99 PH	BYM99	SOD64
BYR210	PBYR2100CT	SOT223
BYR215	PBYR2150CT	SOT223
BYR28	PBYR280CT	SOT223
BYR29	PBYR290CT	SOT223
BYV2100 PH	BYV2100	SOD57
BYV26A PH	BYV26A	SOD57
BYV26B PH	BYV26B	SOD57
BYV26C PH	BYV26C	SOD57
BYV26D PH	BYV26D	SOD57
BYV26E PH	BYV26E	SOD57
BYV26F PH	BYV26F	SOD57
BYV26G PH	BYV26G	SOD57
BYV27-100	BYV27-100	SOD57
BYV27-150	BYV27-150	SOD57
BYV27-200	BYV27-200	SOD57
BYV27-300	BYV27-300	SOD57
BYV27-400	BYV27-400	SOD57
BYV27-50	BYV27-50	SOD57
BYV27-600	BYV27-600	SOD57
BYV28-100	BYV28-100	SOD64
BYV28-150	BYV28-150	SOD64
BYV28-200	BYV28-200	SOD64
BYV28-300	BYV28-300	SOD64
BYV28-400	BYV28-400	SOD64
BYV28-50	BYV28-50	SOD64
BYV28-600	BYV28-600	SOD64
BYV36A PH	BYV36A	SOD57
BYV36B PH	BYV36B	SOD57
BYV36C PH	BYV36C	SOD57
BYV36D PH	BYV36D	SOD57
BYV36E PH	BYV36E	SOD57
BYV36F PH	BYV36F	SOD57
BYV36G PH	BYV36G	SOD57

MARKING CODE	TYPE NUMBER	PACKAGE
BYV4100 PH	BYV4100	SOD64
BYV95A PH	BYV95A	SOD57
BYV95B PH	BYV95B	SOD57
BYV95C PH	BYV95C	SOD57
BYV96D PH	BYV96D	SOD57
BYV96E PH	BYV96E	SOD57
BYV97F PH	BYV97F	SOD57
BYV97G PH	BYV97G	SOD57
BYV98 PH	BYV98	SOD57
BYV99 PH	BYV99	SOD57
BYW54 PH	BYW54	SOD57
BYW55 PH	BYW55	SOD57
BYW56 PH	BYW56	SOD57
BYW95A PH	BYW95A	SOD64
BYW95B PH	BYW95B	SOD64
BYW95C PH	BYW95C	SOD64
BYW96D PH	BYW96D	SOD64
BYW96E PH	BYW96E	SOD64
BYW97F PH	BYW97F	SOD64
BYW97G PH	BYW97G	SOD64
BYX10G PH	BYX10G	SOD57
BZA100	BZA100	SO20 (SOT163-1)
BZG03C10 PH	BZG03-C10	SOD106 (DO214AC)
BZG03C100 PH	BZG03-C100	SOD106 (DO214AC)
BZG03C11 PH	BZG03-C11	SOD106 (DO214AC)
BZG03C110 PH	BZG03-C110	SOD106 (DO214AC)
BZG03C12 PH	BZG03-C12	SOD106 (DO214AC)
BZG03C120 PH	BZG03-C120	SOD106 (DO214AC)
BZG03C13 PH	BZG03-C13	SOD106 (DO214AC)
BZG03C130 PH	BZG03-C130	SOD106 (DO214AC)
BZG03C15 PH	BZG03-C15	SOD106 (DO214AC)

MARKING CODE	TYPE NUMBER	PACKAGE
BZG03C150 PH	BZG03-C150	SOD106 (DO214AC)
BZG03C16 PH	BZG03-C16	SOD106 (DO214AC)
BZG03C160 PH	BZG03-C160	SOD106 (DO214AC)
BZG03C18 PH	BZG03-C18	SOD106 (DO214AC)
BZG03C180 PH	BZG03-C180	SOD106 (DO214AC)
BZG03C20 PH	BZG03-C20	SOD106 (DO214AC)
BZG03C200 PH	BZG03-C200	SOD106 (DO214AC)
BZG03C22 PH	BZG03-C22	SOD106 (DO214AC)
BZG03C220 PH	BZG03-C220	SOD106 (DO214AC)
BZG03C24 PH	BZG03-C24	SOD106 (DO214AC)
BZG03C240 PH	BZG03-C240	SOD106 (DO214AC)
BZG03C27 PH	BZG03-C27	SOD106 (DO214AC)
BZG03C270 PH	BZG03-C270	SOD106 (DO214AC)
BZG03C30 PH	BZG03-C30	SOD106 (DO214AC)
BZG03C33 PH	BZG03-C33	SOD106 (DO214AC)
BZG03C36 PH	BZG03-C36	SOD106 (DO214AC)
BZG03C39 PH	BZG03-C39	SOD106 (DO214AC)
BZG03C43 PH	BZG03-C43	SOD106 (DO214AC)
BZG03C47 PH	BZG03-C47	SOD106 (DO214AC)
BZG03C51 PH	BZG03-C51	SOD106 (DO214AC)
BZG03C56 PH	BZG03-C56	SOD106 (DO214AC)
BZG03C62 PH	BZG03-C62	SOD106 (DO214AC)

MARKING CODE	TYPE NUMBER	PACKAGE
BZG03C68 PH	BZG03-C68	SOD106 (DO214AC)
BZG03C75 PH	BZG03-C75	SOD106 (DO214AC)
BZG03C82 PH	BZG03-C82	SOD106 (DO214AC)
BZG03C91 PH	BZG03-C91	SOD106 (DO214AC)
BZG04 10 PH	BZG04-10	SOD106 (DO214AC)
BZG04 100 PH	BZG04-100	SOD106 (DO214AC)
BZG04 11 PH	BZG04-11	SOD106 (DO214AC)
BZG04 110 PH	BZG04-110	SOD106 (DO214AC)
BZG04 12 PH	BZG04-12	SOD106 (DO214AC)
BZG04 120 PH	BZG04-120	SOD106 (DO214AC)
BZG04 13 PH	BZG04-13	SOD106 (DO214AC)
BZG04 130 PH	BZG04-130	SOD106 (DO214AC)
BZG04 15 PH	BZG04-15	SOD106 (DO214AC)
BZG04 150 PH	BZG04-150	SOD106 (DO214AC)
BZG04 16 PH	BZG04-16	SOD106 (DO214AC)
BZG04 160 PH	BZG04-160	SOD106 (DO214AC)
BZG04 18 PH	BZG04-18	SOD106 (DO214AC)
BZG04 180 PH	BZG04-180	SOD106 (DO214AC)
BZG04 20 PH	BZG04-20	SOD106 (DO214AC)
BZG04 200 PH	BZG04-200	SOD106 (DO214AC)
BZG04 200 PH	BZG04-220	SOD106 (DO214AC)
BZG04 22 PH	BZG04-22	SOD106 (DO214AC)

MARKING CODE	TYPE NUMBER	PACKAGE
BZG04 24 PH	BZG04-24	SOD106 (DO214AC)
BZG04 27 PH	BZG04-27	SOD106 (DO214AC)
BZG04 30 PH	BZG04-30	SOD106 (DO214AC)
BZG04 33 PH	BZG04-33	SOD106 (DO214AC)
BZG04 36 PH	BZG04-36	SOD106 (DO214AC)
BZG04 39 PH	BZG04-39	SOD106 (DO214AC)
BZG04 43 PH	BZG04-43	SOD106 (DO214AC)
BZG04 47 PH	BZG04-47	SOD106 (DO214AC)
BZG04 51 PH	BZG04-51	SOD106 (DO214AC)
BZG04 56 PH	BZG04-56	SOD106 (DO214AC)
BZG04 62 PH	BZG04-62	SOD106 (DO214AC)
BZG04 68 PH	BZG04-68	SOD106 (DO214AC)
BZG04 75 PH	BZG04-75	SOD106 (DO214AC)
BZG04 82 PH	BZG04-82	SOD106 (DO214AC)
BZG04 8V2 PH	BZG04-8V2	SOD106 (DO214AC)
BZG04 91 PH	BZG04-91	SOD106 (DO214AC)
BZG04 9V1 PH	BZG04-9V1	SOD106 (DO214AC)
BZT03C10	BZT03-C10	SOD57
BZT03C100	BZT03-C100	SOD57
BZT03C11	BZT03-C11	SOD57
BZT03C110	BZT03-C110	SOD57
BZT03C12	BZT03-C12	SOD57
BZT03C120	BZT03-C120	SOD57
BZT03C13	BZT03-C13	SOD57
BZT03C130	BZT03-C130	SOD57
BZT03C15	BZT03-C15	SOD57

MARKING CODE	TYPE NUMBER	PACKAGE
BZT03C150	BZT03-C150	SOD57
BZT03C16	BZT03-C16	SOD57
BZT03C160	BZT03-C160	SOD57
BZT03C18	BZT03-C18	SOD57
BZT03C180	BZT03-C180	SOD57
BZT03C20	BZT03-C20	SOD57
BZT03C200	BZT03-C200	SOD57
BZT03C22	BZT03-C22	SOD57
BZT03C220	BZT03-C220	SOD57
BZT03C24	BZT03-C24	SOD57
BZT03C240	BZT03-C240	SOD57
BZT03C27	BZT03-C27	SOD57
BZT03C270	BZT03-C270	SOD57
BZT03C30	BZT03-C30	SOD57
BZT03C300	BZT03-C300	SOD57
BZT03C33	BZT03-C33	SOD57
BZT03C330	BZT03-C330	SOD57
BZT03C36	BZT03-C36	SOD57
BZT03C360	BZT03-C360	SOD57
BZT03C39	BZT03-C39	SOD57
BZT03C390	BZT03-C390	SOD57
BZT03C43	BZT03-C43	SOD57
BZT03C430	BZT03-C430	SOD57
BZT03C47	BZT03-C47	SOD57
BZT03C470	BZT03-C470	SOD57
BZT03C51	BZT03-C51	SOD57
BZT03C510	BZT03-C510	SOD57
BZT03C56	BZT03-C56	SOD57
BZT03C62	BZT03-C62	SOD57
BZT03C68	BZT03-C68	SOD57
BZT03C75	BZT03-C75	SOD57
BZT03C7V5	BZT03-C7V5	SOD57
BZT03C82	BZT03-C82	SOD57
BZT03C8V2	BZT03-C8V2	SOD57
BZT03C91	BZT03-C91	SOD57
BZT03C9V1	BZT03-C9V1	SOD57
BZV10	BZV10	SOD68 (DO34)
BZV11	BZV11	SOD68 (DO34)
BZV12	BZV12	SOD68 (DO34)
BZV13	BZV13	SOD68 (DO34)

MARKING CODE	TYPE NUMBER	PACKAGE
BZV14	BZV14	SOD68 (DO34)
BZV37	BZV37	SOD68 (DO34)
BZV86 1V4 PH	BZV86-1V4	SOD27 (DO35)
BZV86 2V0 PH	BZV86-2V0	SOD27 (DO35)
BZV86 2V6 PH	BZV86-2V6	SOD27 (DO35)
BZV86 3V2 PH	BZV86-3V2	SOD27 (DO35)
BZV90C10	BZV90-C10	SOT223
BZV90C11	BZV90-C11	SOT223
BZV90C12	BZV90-C12	SOT223
BZV90C13	BZV90-C13	SOT223
BZV90C15	BZV90-C15	SOT223
BZV90C16	BZV90-C16	SOT223
BZV90C18	BZV90-C18	SOT223
BZV90C20	BZV90-C20	SOT223
BZV90C22	BZV90-C22	SOT223
BZV90C24	BZV90-C24	SOT223
BZV90C27	BZV90-C27	SOT223
BZV90C2V4	BZV90-C2V4	SOT223
BZV90C2V7	BZV90-C2V7	SOT223
BZV90C30	BZV90-C30	SOT223
BZV90C33	BZV90-C33	SOT223
BZV90C36	BZV90-C36	SOT223
BZV90C39	BZV90-C39	SOT223
BZV90C3V0	BZV90-C3V0	SOT223
BZV90C3V3	BZV90-C3V3	SOT223
BZV90C3V6	BZV90-C3V6	SOT223
BZV90C3V9	BZV90-C3V9	SOT223
BZV90C43	BZV90-C43	SOT223
BZV90C47	BZV90-C47	SOT223
BZV90C4V3	BZV90-C4V3	SOT223
BZV90C4V7	BZV90-C4V7	SOT223
BZV90C51	BZV90-C51	SOT223
BZV90C56	BZV90-C56	SOT223
BZV90C5V1	BZV90-C5V1	SOT223
BZV90C5V6	BZV90-C5V6	SOT223
BZV90C62	BZV90-C62	SOT223
BZV90C68	BZV90-C68	SOT223
BZV90C6V2	BZV90-C6V2	SOT223
BZV90C6V8	BZV90-C6V8	SOT223
BZV90C75	BZV90-C75	SOT223

MARKING CODE	TYPE NUMBER	PACKAGE
BZV90C7V5	BZV90-C7V5	SOT223
BZV90C8V2	BZV90-C8V2	SOT223
BZV90C9V1	BZV90-C9V1	SOT223
BZW03C10	BZW03-C10	SOD64
BZW03C100	BZW03-C100	SOD64
BZW03C11	BZW03-C11	SOD64
BZW03C110	BZW03-C110	SOD64
BZW03C12	BZW03-C12	SOD64
BZW03C120	BZW03-C120	SOD64
BZW03C13	BZW03-C13	SOD64
BZW03C130	BZW03-C130	SOD64
BZW03C15	BZW03-C15	SOD64
BZW03C150	BZW03-C150	SOD64
BZW03C16	BZW03-C16	SOD64
BZW03C160	BZW03-C160	SOD64
BZW03C18	BZW03-C18	SOD64
BZW03C180	BZW03-C180	SOD64
BZW03C20	BZW03-C20	SOD64
BZW03C200	BZW03-C200	SOD64
BZW03C22	BZW03-C22	SOD64
BZW03C220	BZW03-C220	SOD64
BZW03C24	BZW03-C24	SOD64
BZW03C240	BZW03-C240	SOD64
BZW03C27	BZW03-C27	SOD64
BZW03C270	BZW03-C270	SOD64
BZW03C30	BZW03-C30	SOD64
BZW03C300	BZW03-C300	SOD64
BZW03C33	BZW03-C33	SOD64
BZW03C330	BZW03-C330	SOD64
BZW03C36	BZW03-C36	SOD64
BZW03C360	BZW03-C360	SOD64
BZW03C39	BZW03-C39	SOD64
BZW03C390	BZW03-C390	SOD64
BZW03C43	BZW03-C43	SOD64
BZW03C430	BZW03-C430	SOD64
BZW03C47	BZW03-C47	SOD64
BZW03C470	BZW03-C470	SOD64
BZW03C51	BZW03-C51	SOD64
BZW03C510	BZW03-C510	SOD64
BZW03C56	BZW03-C56	SOD64

MARKING CODE	TYPE NUMBER	PACKAGE
BZW03C62	BZW03-C62	SOD64
BZW03C68	BZW03-C68	SOD64
BZW03C75	BZW03-C75	SOD64
BZW03C7V5	BZW03-C7V5	SOD64
BZW03C82	BZW03-C82	SOD64
BZW03C8V2	BZW03-C8V2	SOD64
BZW03C91	BZW03-C91	SOD64
BZW03C9V1	BZW03-C9V1	SOD64
C10 PH	BZV85-C10	SOD66 (DO41)
C10 PH	BZX55-C10	SOD27 (DO35)
C10 PH	BZX79-C10	SOD27 (DO35)
C11 PH	BZV85-C11	SOD66 (DO41)
C11 PH	BZX55-C11	SOD27 (DO35)
C11 PH	BZX79-C11	SOD27 (DO35)
C12 PH	BZV85-C12	SOD66 (DO41)
C12 PH	BZX55-C12	SOD27 (DO35)
C12 PH	BZX79-C12	SOD27 (DO35)
C13 PH	BZV85-C13	SOD66 (DO41)
C13 PH	BZX55-C13	SOD27 (DO35)
C13 PH	BZX79-C13	SOD27 (DO35)
C15 PH	BZV85-C15	SOD66 (DO41)
C15 PH	BZX55-C15	SOD27 (DO35)
C15 PH	BZX79-C15	SOD27 (DO35)
C16 PH	BZV85-C16	SOD66 (DO41)
C16 PH	BZX55-C16	SOD27 (DO35)
C16 PH	BZX79-C16	SOD27 (DO35)
C18 PH	BZV85-C18	SOD66 (DO41)
C18 PH	BZX55-C18	SOD27 (DO35)
C18 PH	BZX79-C18	SOD27 (DO35)
C20 PH	BZV85-C20	SOD66 (DO41)
C20 PH	BZX55-C20	SOD27 (DO35)
C20 PH	BZX79-C20	SOD27 (DO35)
C22 PH	BZV85-C22	SOD66 (DO41)
C22 PH	BZX55-C22	SOD27 (DO35)
C22 PH	BZX79-C22	SOD27 (DO35)
C24 PH	BZV85-C24	SOD66 (DO41)
C24 PH	BZX55-C24	SOD27 (DO35)
C24 PH	BZX79-C24	SOD27 (DO35)
C27 PH	BZV85-C27	SOD66 (DO41)
C27 PH	BZX55-C27	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
C27 PH	BZX79-C27	SOD27 (DO35)
C2V4 PH	BZX55-C2V4	SOD27 (DO35)
C2V4 PH	BZX79-C2V4	SOD27 (DO35)
C2V7 PH	BZX55-C2V7	SOD27 (DO35)
C2V7 PH	BZX79-C2V7	SOD27 (DO35)
C3	1PS302	SC70
C30 PH	BZV85-C30	SOD66 (DO41)
C30 PH	BZX55-C30	SOD27 (DO35)
C30 PH	BZX79-C30	SOD27 (DO35)
C33 PH	BZV85-C33	SOD66 (DO41)
C33 PH	BZX55-C33	SOD27 (DO35)
C33 PH	BZX79-C33	SOD27 (DO35)
C36 PH	BZV85-C36	SOD66 (DO41)
C36 PH	BZX55-C36	SOD27 (DO35)
C36 PH	BZX79-C36	SOD27 (DO35)
C39 PH	BZV85-C39	SOD66 (DO41)
C39 PH	BZX55-C39	SOD27 (DO35)
C39 PH	BZX79-C39	SOD27 (DO35)
C3T	1PS226	SC59
C3V0 PH	BZX55-C3V0	SOD27 (DO35)
C3V0 PH	BZX79-C3V0	SOD27 (DO35)
C3V3 PH	BZX55-C3V3	SOD27 (DO35)
C3V3 PH	BZX79-C3V3	SOD27 (DO35)
C3V6 PH	BZV85-C3V6	SOD66 (DO41)
C3V6 PH	BZX55-C3V6	SOD27 (DO35)
C3V6 PH	BZX79-C3V6	SOD27 (DO35)
C3V9 PH	BZV85-C3V9	SOD66 (DO41)
C3V9 PH	BZX55-C3V9	SOD27 (DO35)
C3V9 PH	BZX79-C3V9	SOD27 (DO35)
C43 PH	BZV85-C43	SOD66 (DO41)
C43 PH	BZX55-C43	SOD27 (DO35)
C43 PH	BZX79-C43	SOD27 (DO35)
C47 PH	BZV85-C47	SOD66 (DO41)
C47 PH	BZX55-C47	SOD27 (DO35)
C47 PH	BZX79-C47	SOD27 (DO35)
C4V3 PH	BZV85-C4V3	SOD66 (DO41)
C4V3 PH	BZX55-C4V3	SOD27 (DO35)
C4V3 PH	BZX79-C4V3	SOD27 (DO35)
C4V7 PH	BZV85-C4V7	SOD66 (DO41)
C4V7 PH	BZX55-C4V7	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
C4V7 PH	BZX79-C4V7	SOD27 (DO35)
C51 PH	BZV85-C51	SOD66 (DO41)
C51 PH	BZX55-C51	SOD27 (DO35)
C51 PH	BZX79-C51	SOD27 (DO35)
C56 PH	BZV85-C56	SOD66 (DO41)
C56 PH	BZX55-C56	SOD27 (DO35)
C56 PH	BZX79-C56	SOD27 (DO35)
C5V1 PH	BZV85-C5V1	SOD66 (DO41)
C5V1 PH	BZX55-C5V1	SOD27 (DO35)
C5V1 PH	BZX79-C5V1	SOD27 (DO35)
C5V6 PH	BZV85-C5V6	SOD66 (DO41)
C5V6 PH	BZX55-C5V6	SOD27 (DO35)
C5V6 PH	BZX79-C5V6	SOD27 (DO35)
C62 PH	BZV85-C62	SOD66 (DO41)
C62 PH	BZX55-C62	SOD27 (DO35)
C62 PH	BZX79-C62	SOD27 (DO35)
C68 PH	BZV85-C68	SOD66 (DO41)
C68 PH	BZX55-C68	SOD27 (DO35)
C68 PH	BZX79-C68	SOD27 (DO35)
C6V2 PH	BZV85-C6V2	SOD66 (DO41)
C6V2 PH	BZX55-C6V2	SOD27 (DO35)
C6V2 PH	BZX79-C6V2	SOD27 (DO35)
C6V8 PH	BZV85-C6V8	SOD66 (DO41)
C6V8 PH	BZX55-C6V8	SOD27 (DO35)
C6V8 PH	BZX79-C6V8	SOD27 (DO35)
C75 PH	BZV85-C75	SOD66 (DO41)
C75 PH	BZX55-C75	SOD27 (DO35)
C75 PH	BZX79-C75	SOD27 (DO35)
C7V5 PH	BZV85-C7V5	SOD66 (DO41)
C7V5 PH	BZX55-C7V5	SOD27 (DO35)
C7V5 PH	BZX79-C7V5	SOD27 (DO35)
C8V2 PH	BZV85-C8V2	SOD66 (DO41)
C8V2 PH	BZX55-C8V2	SOD27 (DO35)
C8V2 PH	BZX79-C8V2	SOD27 (DO35)
C9V1 PH	BZV85-C9V1	SOD66 (DO41)
C9V1 PH	BZX55-C9V1	SOD27 (DO35)
C9V1 PH	BZX79-C9V1	SOD27 (DO35)
F10 PH	BZX79-F10	SOD27 (DO35)
F11 PH	BZX79-F11	SOD27 (DO35)
F12 PH	BZX79-F12	SOD27 (DO35)

MARKING CODE	TYPE NUMBER	PACKAGE
F13 PH	BZX79-F13	SOD27 (DO35)
F15 PH	BZX79-F15	SOD27 (DO35)
F16 PH	BZX79-F16	SOD27 (DO35)
F18 PH	BZX79-F18	SOD27 (DO35)
F20 PH	BZX79-F20	SOD27 (DO35)
F22 PH	BZX79-F22	SOD27 (DO35)
F24 PH	BZX79-F24	SOD27 (DO35)
F27 PH	BZX79-F27	SOD27 (DO35)
F2V4 PH	BZX79-F2V4	SOD27 (DO35)
F2V7 PH	BZX79-F2V7	SOD27 (DO35)
F30 PH	BZX79-F30	SOD27 (DO35)
F33 PH	BZX79-F33	SOD27 (DO35)
F36 PH	BZX79-F36	SOD27 (DO35)
F39 PH	BZX79-F39	SOD27 (DO35)
F3T	1PS193	SC59
F3V0 PH	BZX79-F3V0	SOD27 (DO35)
F3V3 PH	BZX79-F3V3	SOD27 (DO35)
F3V6 PH	BZX79-F3V6	SOD27 (DO35)
F3V9 PH	BZX79-F3V9	SOD27 (DO35)
F43 PH	BZX79-F43	SOD27 (DO35)
F47 PH	BZX79-F47	SOD27 (DO35)
F4V3 PH	BZX79-F4V3	SOD27 (DO35)
F4V7 PH	BZX79-F4V7	SOD27 (DO35)
F51 PH	BZX79-F51	SOD27 (DO35)
F56 PH	BZX79-F56	SOD27 (DO35)
F5V1 PH	BZX79-F5V1	SOD27 (DO35)
F5V6 PH	BZX79-F5V6	SOD27 (DO35)
F62 PH	BZX79-F62	SOD27 (DO35)
F68 PH	BZX79-F68	SOD27 (DO35)
F6V2 PH	BZX79-F6V2	SOD27 (DO35)
F6V8 PH	BZX79-F6V8	SOD27 (DO35)
F75 PH	BZX79-F75	SOD27 (DO35)
F7V5 PH	BZX79-F7V5	SOD27 (DO35)
F8V2 PH	BZX79-F8V2	SOD27 (DO35)
F9V1 PH	BZX79-F9V1	SOD27 (DO35)
JAp	BAV74	SOT23
JC	BAL74W	SOT323
JCp	BAL74	SOT23
JF	BAL99W	SOT323
JFp	BAL99	SOT23

MARKING CODE	TYPE NUMBER	PACKAGE
JPp	BAS19	SOT23
JRp	BAS20	SOT23
JSp	BAS21	SOT23
JTp	BAS28	SOT143
JVp	BAS116	SOT23
JXp	BAV170	SOT23
JYp	BAV199	SOT23
JZp	BAW156	SOT23
L20	BAS29	SOT23
L21	BAS31	SOT23
L22	BAS35	SOT23
L30	BAV23	SOT143
L31	BAV23S	SOT23
L4	BAT54W	SOT323
L4	BAT254	SOD110
L41	BAT74	SOT143
L42	BAT54A	SOT23
L43	BAT54C	SOT23
L44	BAT54S	SOT23
L4p	BAT54	SOT23
L51	BAS56	SOT143
L52	BAS678	SOT23
L5p	BAS55	SOT23
L8	BA792	SOD110
P0 + white	BB150	SOD323
P1 + green	BB131	SOD323
P2 + red	BB132	SOD323
P3 + yellow	BB133	SOD323
P4 + white	BB134	SOD323
P5 + white	BB135	SOD323
P6	BB146	SOD323
P7	BB147	SOD323
P8 + yellow	BB148	SOD323
P9 + white	BB149	SOD323
PE	BB155	SOD323
PH	BB158	SOD323
PJ	BB159	SOD323
S0	1PS76SB10	SOD323
S1	BBY31	SOT23
S11	BAS11	SOD91

MARKING CODE	TYPE NUMBER	PACKAGE
S12	BAS12	SOD91
S12	BBY39	SOT23
S13	BBY42	SOT23
S14	BB901	SOT23
S2	BBY40	SOT23
S4	BBY62	SOT143
S7	1PS76SB17	SOD323
SFx (x= 0 - 3)	BB804	SOT23
TM1101	PZTM1101	SOT223
TM1102	PZTM1102	SOT223
V10-20	BYV10-20	SOD81
V10-30	BYV10-30	SOD81
V10-40	BYV10-40	SOD81
WO	BZX284-B2V4	SOD110
WP	BZX284-B2V7	SOD110
WQ	BZX284-B3V0	SOD110
WR	BZX284-B3V3	SOD110
WS	BZX284-B3V6	SOD110
WT	BZX284-B3V9	SOD110
WU	BZX284-B4V3	SOD110
WV	BZX284-B4V7	SOD110
WW	BZX284-B5V1	SOD110
WX	BZX284-B5V6	SOD110
WY	BZX284-B6V2	SOD110
WZ	BZX284-B6V8	SOD110
XA	BZX284-B7V5	SOD110
XB	BZX284-B8V2	SOD110
XC	BZX284-B9V1	SOD110
XD	BZX284-B10	SOD110
XE	BZX284-B11	SOD110
XF	BZX284-B12	SOD110
XG	BZX284-B13	SOD110
XH	BZX284-B15	SOD110
XI	BZX284-B16	SOD110
XJ	BZX284-B18	SOD110
XK	BZX284-B20	SOD110
XL	BZX284-B22	SOD110
XM	BZX284-B24	SOD110
XN	BZX284-B27	SOD110
XO	BZX284-B30	SOD110

MARKING CODE	TYPE NUMBER	PACKAGE
XP	BZX284-B33	SOD110
XQ	BZX284-B36	SOD110
XR	BZX284-B39	SOD110
XS	BZX284-B43	SOD110
XT	BZX284-B47	SOD110
XU	BZX284-B51	SOD110
XV	BZX284-B56	SOD110
XW	BZX284-B62	SOD110
XX	BZX284-B68	SOD110
XY	BZX284-B75	SOD110
Y10	BZX84-C27	SOT23
Y11	BZX84-C30	SOT23
Y12	BZX84-C33	SOT23
Y13	BZX84-C36	SOT23
Y14	BZX84-C39	SOT23
Y15	BZX84-C43	SOT23
Y16	BZX84-C47	SOT23
Y17	BZX84-C51	SOT23
Y18	BZX84-C56	SOT23
Y19	BZX84-C62	SOT23
Y1p	BZX84-C11	SOT23
Y20	BZX84-C68	SOT23
Y21	BZX84-C75	SOT23
Y2p	BZX84-C12	SOT23
Y3p	BZX84-C13	SOT23
Y4p	BZX84-C15	SOT23
Y50	BZX84-A2V4	SOT23
Y51	BZX84-A2V7	SOT23
Y52	BZX84-A3V0	SOT23
Y53	BZX84-A3V3	SOT23
Y54	BZX84-A3V6	SOT23
Y55	BZX84-A3V9	SOT23
Y56	BZX84-A4V3	SOT23
Y57	BZX84-A4V7	SOT23
Y58	BZX84-A5V1	SOT23
Y59	BZX84-A5V6	SOT23
Y5p	BZX84-C16	SOT23
Y60	BZX84-A6V2	SOT23
Y61	BZX84-A6V8	SOT23
Y62	BZX84-A7V5	SOT23

MARKING CODE	TYPE NUMBER	PACKAGE
Y63	BZX84-A8V2	SOT23
Y64	BZX84-A9V1	SOT23
Y65	BZX84-A10	SOT23
Y66	BZX84-A11	SOT23
Y67	BZX84-A12	SOT23
Y68	BZX84-A13	SOT23
Y69	BZX84-A15	SOT23
Y6p	BZX84-C18	SOT23
Y70	BZX84-A16	SOT23
Y71	BZX84-A18	SOT23
Y72	BZX84-A20	SOT23
Y73	BZX84-A22	SOT23
Y74	BZX84-A24	SOT23
Y75	BZX84-A27	SOT23
Y76	BZX84-A30	SOT23
Y77	BZX84-A33	SOT23
Y78	BZX84-A36	SOT23
Y79	BZX84-A39	SOT23
Y7p	BZX84-C20	SOT23
Y80	BZX84-A43	SOT23
Y81	BZX84-A47	SOT23
Y82	BZX84-A51	SOT23
Y83	BZX84-A56	SOT23
Y84	BZX84-A62	SOT23
Y85	BZX84-A68	SOT23
Y86	BZX84-A75	SOT23
Y8p	BZX84-C22	SOT23
Y9p	BZX84-C24	SOT23
YO	BZX284-C2V4	SOD110
YP	BZX284-C2V7	SOD110
YQ	BZX284-C3V0	SOD110
YR	BZX284-C3V3	SOD110
YS	BZX284-C3V6	SOD110
YT	BZX284-C3V9	SOD110
YU	BZX284-C4V3	SOD110
YV	BZX284-C4V7	SOD110
YW	BZX284-C5V1	SOD110
YX	BZX284-C5V6	SOD110
YY	BZX284-C6V2	SOD110
YZ	BZX284-C6V8	SOD110

MARKING CODE	TYPE NUMBER	PACKAGE
Z11	BZX84-C2V4	SOT23
Z12	BZX84-C2V7	SOT23
Z13	BZX84-C3V0	SOT23
Z14	BZX84-C3V3	SOT23
Z15	BZX84-C3V6	SOT23
Z16	BZX84-C3V9	SOT23
Z17	BZX84-C4V3	SOT23
Z1p	BZX84-C4V7	SOT23
Z2p	BZX84-C5V1	SOT23
Z3p	BZX84-C5V6	SOT23
Z4p	BZX84-C6V2	SOT23
Z50	BZX84-B2V4	SOT23
Z51	BZX84-B2V7	SOT23
Z52	BZX84-B3V0	SOT23
Z53	BZX84-B3V3	SOT23
Z54	BZX84-B3V6	SOT23
Z55	BZX84-B3V9	SOT23
Z56	BZX84-B4V3	SOT23
Z57	BZX84-B4V7	SOT23
Z58	BZX84-B5V1	SOT23
Z59	BZX84-B5V6	SOT23
Z5p	BZX84-C6V8	SOT23
Z60	BZX84-B6V2	SOT23
Z61	BZX84-B6V8	SOT23
Z62	BZX84-B7V5	SOT23
Z63	BZX84-B8V2	SOT23
Z64	BZX84-B9V1	SOT23
Z65	BZX84-B10	SOT23
Z66	BZX84-B11	SOT23
Z67	BZX84-B12	SOT23
Z68	BZX84-B13	SOT23
Z69	BZX84-B15	SOT23
Z6p	BZX84-C7V5	SOT23
Z70	BZX84-B16	SOT23
Z71	BZX84-B18	SOT23
Z72	BZX84-B20	SOT23
Z73	BZX84-B22	SOT23
Z74	BZX84-B24	SOT23
Z75	BZX84-B27	SOT23
Z76	BZX84-B30	SOT23

MARKING CODE	TYPE NUMBER	PACKAGE
Z77	BZX84-B33	SOT23
Z78	BZX84-B36	SOT23
Z79	BZX84-B39	SOT23
Z7p	BZX84-C8V2	SOT23
Z80	BZX84-B43	SOT23
Z81	BZX84-B47	SOT23
Z82	BZX84-B51	SOT23
Z83	BZX84-B56	SOT23
Z84	BZX84-B62	SOT23
Z85	BZX84-B68	SOT23
Z86	BZX84-B75	SOT23
Z8p	BZX84-C9V1	SOT23
Z9p	BZX84-C10	SOT23
ZA	BZX284-C7V5	SOD110
ZB	BZX284-C8V2	SOD110
ZC	BZX284-C9V1	SOD110
ZD	BZX284-C10	SOD110
ZE	BZX284-C11	SOD110
ZF	BZX284-C12	SOD110
ZG	BZX284-C13	SOD110
ZH	BZX284-C15	SOD110
ZI	BZX284-C16	SOD110
ZJ	BZX284-C18	SOD110
ZK	BZX284-C20	SOD110
ZL	BZX284-C22	SOD110
ZM	BZX284-C24	SOD110
ZN	BZX284-C27	SOD110
ZO	BZX284-C30	SOD110
ZP	BZX284-C33	SOD110
ZQ	BZX284-C36	SOD110
ZR	BZX284-C39	SOD110
ZS	BZX284-C43	SOD110
ZT	BZX284-C47	SOD110
ZU	BZX284-C51	SOD110
ZV	BZX284-C56	SOD110
ZW	BZX284-C62	SOD110
ZX	BZX284-C68	SOD110
ZY	BZX284-C75	SOD110
black	BA423AL	SOD80C
black	BAS32L	SOD80C

MARKING CODE	TYPE NUMBER	PACKAGE
black	BAS45AL	SOD80C
black	BAV105	SOD80C
black	BY505	SOD61A
black	BY614	SOD61H2
black	BY8424	SOD61AK
black	BYX90G	SOD83A
black	BYX101G	SOD88A
black	BYX105G	SOD88A
black	PMLL4148	SOD80C
black	PMLL4150	SOD80C
black	PMLL4151	SOD80C
black	PMLL4153	SOD80C
black	PMLL4446	SOD80C
black	PMLL4448	SOD80C
black + black	BY8404	SOD61AB
black + blue	BY8420	SOD61AJ
black + brown	BY8418	SOD61AI
black + green	BY8406	SOD61AC
black + grey	BY8416	SOD61AH
black + lilac	BY8414	SOD61AG
black + orange	BY8412	SOD61AF
black + red	BY8408	SOD61AD
black + violet	BY8410	SOD61AE
green	BAV100	SOD80C
green	BAV101	SOD80C
green	BAV102	SOD80C
green	BAV103	SOD80C
green	BYX103G	SOD88A
green	BYX107G	SOD88A
green on black	BB909B	SOD68 (DO34)
green + red on black	BB909A	SOD68 (DO34)
grey	BA481	SOD68 (DO34)
grey	BAS81	SOD80C
grey	BAS82	SOD80C
grey	BAS83	SOD80C
grey	BAS85	SOD80C
grey	BAS86	SOD80C
orange	BY584	SOD61A
orange	BYX120G	SOD88A

MARKING CODE	TYPE NUMBER	PACKAGE
orange + black	BY8104	SOD61AC
orange + green	BY8106	SOD61AD
orange + grey	BY8116	SOD61AJ
orange + lilac	BY8114	SOD61AI
orange + orange	BY8112	SOD61AH
orange + red	BY8108	SOD61AE
orange + violet	BY8110	SOD61AF
p4f	PMBD353	SOT23
p5A	PMBD6050	SOT23
p5B	PMBD6100	SOT23
p5C	PMBD7000	SOT23
p5D	PMBD914	SOT23
p5g	PMBD352	SOT23
p8A	PMBZ5226B	SOT23
p8B	PMBZ5227B	SOT23
p8C	PMBZ5228B	SOT23
p8D	PMBZ5229B	SOT23
p8E	PMBZ5230B	SOT23
p8F	PMBZ5231B	SOT23
p8G	PMBZ5232B	SOT23
p8H	PMBZ5233B	SOT23
p8J	PMBZ5234B	SOT23
p8K	PMBZ5235B	SOT23
p8L	PMBZ5236B	SOT23
p8M	PMBZ5237B	SOT23
p8N	PMBZ5238B	SOT23
p8P	PMBZ5239B	SOT23
p8Q	PMBZ5240B	SOT23
p8R	PMBZ5241B	SOT23
p8S	PMBZ5242B	SOT23
p8T	PMBZ5243B	SOT23
p8U	PMBZ5244B	SOT23
p8V	PMBZ5245B	SOT23
p8W	PMBZ5246B	SOT23
p8X	PMBZ5247B	SOT23
p8Y	PMBZ5248B	SOT23
p8Z	PMBZ5249B	SOT23
p9A	PLVA650A	SOT23
p9B	PLVA653A	SOT23
p9C	PLVA656A	SOT23

MARKING CODE	TYPE NUMBER	PACKAGE
p9D	PLVA659A	SOT23
p9E	PLVA662A	SOT23
p9F	PLVA665A	SOT23
p9G	PLVA668A	SOT23
p9J	PLVA2650A	SOT23
p9K	PLVA2653A	SOT23
p9L	PLVA2656A	SOT23
p9M	PLVA2659A	SOT23
p9N	PLVA2662A	SOT23
p9O	PLVA2665A	SOT23
p9P	PLVA2668A	SOT23
pA2	PMBD2836	SOT23
pA3	PMBD2835	SOT23
pA5	PMBD2837	SOT23
pA6	PMBD2838	SOT23
red	BA682	SOD80
red	BA683	SOD80
red	BYX102G	SOD88A
red	BYX106G	SOD88A
red + green on black	BB910	SOD68 (DO34)
red + white on black	BB911/A	SOD68 (DO34)
violet	BYX104G	SOD88A
violet	BYX108G	SOD88A
violet + black	BY8004	SOD61AC
violet + green	BY8006	SOD61AD
violet + grey	BY8016	SOD61AJ
violet + lilac	BY8014	SOD61AI
violet + orange	BY8012	SOD61AH
violet + red	BY8008	SOD61AE
violet + violet	BY8010	SOD61AF
white on black	BB405B	SOD68 (DO34)
white on black	BB417	SOD68 (DO34)
white + green	BB215	SOD80
yellow	BZV55-B2V4	SOD80C
yellow	BZV55-B2V7	SOD80C
yellow	BZV55-B3V0	SOD80C
yellow	BZV55-B3V3	SOD80C
yellow	BZV55-B3V6	SOD80C

MARKING CODE	TYPE NUMBER	PACKAGE
yellow	BZV55-B3V9	SOD80C
yellow	BZV55-B4V3	SOD80C
yellow	BZV55-B4V7	SOD80C
yellow	BZV55-B5V1	SOD80C
yellow	BZV55-B5V6	SOD80C
yellow	BZV55-B6V2	SOD80C
yellow	BZV55-B6V8	SOD80C
yellow	BZV55-B7V5	SOD80C
yellow	BZV55-B8V2	SOD80C
yellow	BZV55-B9V1	SOD80C
yellow	BZV55-B10	SOD80C
yellow	BZV55-B11	SOD80C
yellow	BZV55-B12	SOD80C
yellow	BZV55-B13	SOD80C
yellow	BZV55-B15	SOD80C
yellow	BZV55-B16	SOD80C
yellow	BZV55-B18	SOD80C
yellow	BZV55-B20	SOD80C
yellow	BZV55-B22	SOD80C
yellow	BZV55-B24	SOD80C
yellow	BZV55-B27	SOD80C
yellow	BZV55-B30	SOD80C
yellow	BZV55-B33	SOD80C
yellow	BZV55-B36	SOD80C
yellow	BZV55-B39	SOD80C
yellow	BZV55-B43	SOD80C
yellow	BZV55-B47	SOD80C
yellow	BZV55-B51	SOD80C
yellow	BZV55-B56	SOD80C
yellow	BZV55-B62	SOD80C
yellow	BZV55-B68	SOD80C
yellow	BZV55-B75	SOD80C
yellow	BZV55-C2V4	SOD80C
yellow	BZV55-C2V7	SOD80C
yellow	BZV55-C3V0	SOD80C
yellow	BZV55-C3V3	SOD80C
yellow	BZV55-C3V6	SOD80C
yellow	BZV55-C3V9	SOD80C
yellow	BZV55-C4V3	SOD80C
yellow	BZV55-C4V7	SOD80C

MARKING CODE	TYPE NUMBER	PACKAGE
yellow	BZV55-C5V1	SOD80C
yellow	BZV55-C5V6	SOD80C
yellow	BZV55-C6V2	SOD80C
yellow	BZV55-C6V8	SOD80C
yellow	BZV55-C7V5	SOD80C
yellow	BZV55-C8V2	SOD80C
yellow	BZV55-C9V1	SOD80C
yellow	BZV55-C10	SOD80C
yellow	BZV55-C11	SOD80C
yellow	BZV55-C12	SOD80C
yellow	BZV55-C13	SOD80C
yellow	BZV55-C15	SOD80C
yellow	BZV55-C16	SOD80C
yellow	BZV55-C18	SOD80C
yellow	BZV55-C20	SOD80C
yellow	BZV55-C22	SOD80C
yellow	BZV55-C24	SOD80C
yellow	BZV55-C27	SOD80C
yellow	BZV55-C30	SOD80C
yellow	BZV55-C33	SOD80C
yellow	BZV55-C36	SOD80C
yellow	BZV55-C39	SOD80C
yellow	BZV55-C43	SOD80C
yellow	BZV55-C47	SOD80C
yellow	BZV55-C51	SOD80C
yellow	BZV55-C56	SOD80C
yellow	BZV55-C62	SOD80C
yellow	BZV55-C68	SOD80C
yellow	BZV55-C75	SOD80C
yellow	BZV55-F2V4	SOD80C
yellow	BZV55-F2V7	SOD80C
yellow	BZV55-F3V0	SOD80C
yellow	BZV55-F3V3	SOD80C
yellow	BZV55-F3V6	SOD80C
yellow	BZV55-F3V9	SOD80C
yellow	BZV55-F4V3	SOD80C
yellow	BZV55-F4V7	SOD80C
yellow	BZV55-F5V1	SOD80C
yellow	BZV55-F5V6	SOD80C
yellow	BZV55-F6V2	SOD80C
yellow	BZV55-F6V8	SOD80C
yellow	BZV55-F7V5	SOD80C
yellow	BZV55-F8V2	SOD80C
yellow	BZV55-F9V1	SOD80C
yellow	BZV55-F10	SOD80C
yellow	BZV55-F11	SOD80C
yellow	BZV55-F12	SOD80C
yellow	BZV55-F13	SOD80C
yellow	BZV55-F15	SOD80C
yellow	BZV55-F16	SOD80C
yellow	BZV55-F18	SOD80C
yellow	BZV55-F20	SOD80C
yellow	BZV55-F22	SOD80C
yellow	BZV55-F24	SOD80C
yellow	BZV55-F27	SOD80C
yellow	BZV55-F30	SOD80C
yellow	BZV55-F33	SOD80C
yellow	BZV55-F36	SOD80C
yellow	BZV55-F39	SOD80C
yellow	BZV55-F43	SOD80C
yellow	BZV55-F47	SOD80C
yellow	BZV55-F51	SOD80C
yellow	BZV55-F56	SOD80C
yellow	BZV55-F62	SOD80C
yellow	BZV55-F68	SOD80C
yellow	BZV55-F75	SOD80C
yellow	BZV80	SOD80
yellow	BZV81	SOD80
yellow	BZV87-1V4	SOD80
yellow	BZV87-2V0	SOD80
yellow	BZV87-2V6	SOD80
yellow	BZV87-3V2	SOD80
yellow	PMLL5225B	SOD80C
yellow	PMLL5226B	SOD80C
yellow	PMLL5227B	SOD80C
yellow	PMLL5228B	SOD80C
yellow	PMLL5229B	SOD80C
yellow	PMLL5230B	SOD80C
yellow	PMLL5231B	SOD80C
yellow	PMLL5232B	SOD80C

MARKING CODE	TYPE NUMBER	PACKAGE
yellow	PMLL5233B	SOD80C
yellow	PMLL5234B	SOD80C
yellow	PMLL5235B	SOD80C
yellow	PMLL5236B	SOD80C
yellow	PMLL5237B	SOD80C
yellow	PMLL5238B	SOD80C
yellow	PMLL5239B	SOD80C
yellow	PMLL5240B	SOD80C
yellow	PMLL5241B	SOD80C
yellow	PMLL5242B	SOD80C
yellow	PMLL5243B	SOD80C
yellow	PMLL5244B	SOD80C
yellow	PMLL5245B	SOD80C
yellow	PMLL5246B	SOD80C
yellow	PMLL5247B	SOD80C
yellow	PMLL5248B	SOD80C
yellow	PMLL5249B	SOD80C
yellow	PMLL5250B	SOD80C
yellow	PMLL5251B	SOD80C
yellow	PMLL5252B	SOD80C
yellow	PMLL5253B	SOD80C
yellow	PMLL5254B	SOD80C
yellow	PMLL5255B	SOD80C
yellow	PMLL5256B	SOD80C
yellow	PMLL5257B	SOD80C
yellow	PMLL5258B	SOD80C
yellow	PMLL5259B	SOD80C
yellow	PMLL5260B	SOD80C
yellow	PMLL5261B	SOD80C
yellow	PMLL5262B	SOD80C
yellow	PMLL5263B	SOD80C
yellow	PMLL5264B	SOD80C
yellow	PMLL5265B	SOD80C
yellow	PMLL5266B	SOD80C
yellow	PMLL5267B	SOD80C
yellow on black	BB809	SOD68 (DO34)

GENERAL

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QUALITY

Total Quality Management

Philips Semiconductors is a Quality Company, renowned for the high quality of our products and service. We keep alive this tradition by constantly aiming towards one ultimate standard, that of zero defects. This aim is guided by our Total Quality Management (TQM) system which is described in our Quality manuals. The basis is outlined in the following paragraphs.

QUALITY ASSURANCE

Based on ISO 9000 standards, customer standards such as FDC, QS 9000 and IBM MDQ. Our factories are certified to ISO 9000 by external inspectorates.

PARTNERSHIPS WITH CUSTOMERS

PPM co-operations, design-in agreements, ship-to-stock, just-in-time and self-qualification programmes.

PARTNERSHIPS WITH SUPPLIERS

Ship-to-stock, statistical process control and ISO 9000 audits.

QUALITY IMPROVEMENT PROGRAMME

Continuous process and system improvement, design improvement, complete use of statistical process control, realization of our final objective of zero defects, and logistics improvement by ship-to-stock and just-in-time agreements.

Advanced quality planning

During the design and development of new products and processes, quality is built-in by advanced quality planning. Through failure-mode-and-effect analysis the critical process parameters are detected and measures taken to ensure good performance on these parameters. The capability of process steps is also planned in this phase in preparation for production under statistical process control.

Product conformance

The assurance of product conformance is an integral part of our Quality Assurance (QA) practice. This is achieved by:

- Incoming material control through partnerships with suppliers.
- In-line quality assurance to monitor process reproducibility during manufacture and initiate any necessary corrective action. Process steps are under statistical process control.
- Acceptance tests on finished products to verify conformance with the device specification. The test results are used for quality feedback and corrective actions. The inspection and test requirements are detailed in the general quality specifications SNW-EQ-611 part A.
- Periodic inspections to monitor and measure the conformance of products (see SNW-EQ-611 part A).
- Qualification tests (see SNW-EQ-611 part A).

Product reliability

With the increasing complexity of Original Equipment Manufacturer (OEM) equipment, component reliability must be extremely high. Our research laboratories and development departments study the failure mechanisms of semiconductors. Their studies result in design rules and process optimization for the highest built-in product reliability. Highly accelerated tests are applied to the products reliability evaluation. Rejects from reliability tests and from customer complaints are submitted to failure analysis, to result in corrective action.

Customer response

Our quality improvement depends on working together with our customer. We need our customer's inputs and we invite constructive comments on all aspects of our performance. Please contact our local sales representative.

PRO ELECTRON TYPE NUMBERING SYSTEM

Basic type number

This type designation code applies to discrete semiconductor devices (not integrated circuits), multiples of such devices, semiconductor chips and Darlington transistors.

FIRST LETTER

The first letter gives information about the material for the active part of the device.

A Germanium or other material with a band gap of 0.6 to 1 eV

B Silicon or other material with a band gap of 1 to 1.3 eV

C Gallium arsenide (GaAs) or other material with a band gap of 1.3 eV or more

R Compound materials, e.g. cadmium sulphide.

SECOND LETTER

The second letter indicates the function for which the device is primarily designed. The same letter can be used for multi-chip devices with similar elements.

In the following list low power types are defined by $R_{th\ j\text{-}mb}$ > 15 K/W and power types by $R_{th\ j\text{-}mb} \leq$ 15 K/W.

A Diode; signal, low power

B Diode; variable capacitance

C Transistor; low power, audio frequency

D Transistor; power, audio frequency

E Diode; tunnel

F Transistor; low power, high frequency

G Multiple of dissimilar devices/miscellaneous devices; e.g. oscillators. Also with special third letter; see under Section "Serial number".

H Diode; magnetic sensitive

L Transistor; power, high frequency

N Photocoupler

P Radiation detector; e.g. high sensitivity photo-transistor; with special third letter

Q Radiation generator; e.g. LED, laser; with special third letter

R Control or switching device; e.g. thyristor, low power; with special third letter

S Transistor; low power, switching

T Control or switching device; e.g. thyristor, power; with special third letter

U Transistor; power, switching

W Surface acoustic wave device

X Diode; multiplier, e.g. varactor, step recovery

Y Diode; rectifying, booster

Z Diode; voltage reference or regulator, transient suppressor diode; with special third letter.

SERIAL NUMBER

The number comprises three figures running from 100 to 999 for devices primarily intended for consumer equipment, or one letter (Z, Y, X, etc.) and two figures running from 10 to 99 for devices primarily intended for industrial or professional equipment.(1)

(1) When the supply of these serial numbers is exhausted, the serial number may be expanded to three figures for industrial types and four figures for consumer types.

Version letter

A letter may be added to the basic type number to indicate minor electrical or mechanical variants of the basic type.

RATING SYSTEMS

The rating systems described are those recommended by the IEC in its publication number 134.

Definitions of terms used

ELECTRONIC DEVICE

An electronic tube or valve, transistor or other semiconductor device. This definition excludes inductors, capacitors, resistors and similar components.

CHARACTERISTIC

A characteristic is an inherent and measurable property of a device. Such a property may be electrical, mechanical, thermal, hydraulic, electro-magnetic or nuclear, and can be expressed as a value for stated or recognized conditions. A characteristic may also be a set of related values, usually shown in graphical form.

BOGEY ELECTRONIC DEVICE

An electronic device whose characteristics have the published nominal values for the type. A bogey electronic device for any particular application can be obtained by considering only those characteristics that are directly related to the application.

RATING

A value that establishes either a limiting capability or a limiting condition for an electronic device. It is determined for specified values of environment and operation, and may be stated in any suitable terms. Limiting conditions may be either maxima or minima.

RATING SYSTEM

The set of principles upon which ratings are established and which determine their interpretation. The rating system indicates the division of responsibility between the device manufacturer and the circuit designer, with the object of ensuring that the working conditions do not exceed the ratings.

Absolute maximum rating system

Absolute maximum ratings are limiting values of operating and environmental conditions applicable to any electronic device of a specified type, as defined by its published data, which should not be exceeded under the worst probable conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device, taking no responsibility for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the device under consideration and of all other electronic devices in the equipment.

The equipment manufacturer should design so that, initially and throughout the life of the device, no absolute maximum value for the intended service is exceeded with any device, under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, equipment control adjustment, load variations, signal variation, environmental conditions, and variations in characteristics of the device under consideration and of all other electronic devices in the equipment.

Design maximum rating system

Design maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electronic device of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device, taking responsibility for the effects of changes in operating conditions due to variations in the characteristics of the electronic device under consideration.

The equipment manufacturer should design so that, initially and throughout the life of the device, no design maximum value for the intended service is exceeded with a bogey electronic device, under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, variation in characteristics of all other devices in the equipment, equipment control adjustment, load variation, signal variation and environmental conditions.

Design centre rating system

Design centre ratings are limiting values of operating and environmental conditions applicable to a bogey electronic device of a specified type as defined by its published data, and should not be exceeded under normal conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device in average applications, taking responsibility for normal changes in operating conditions due to rated supply voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all electronic devices.

The equipment manufacturer should design so that, initially, no design centre value for the intended service is exceeded with a bogey electronic device in equipment operating at the stated normal supply voltage.

LETTER SYMBOLS

The letter symbols for diodes detailed in this section are based on IEC publication number 747.

Basic letters

In the representation of currents, voltages and powers, lower-case letter symbols are used to indicate all instantaneous values that vary with time. All other values are represented by upper-case letters.

The following is a list of basic letter symbols used with semiconductor devices:

C	Capacitance
E, e	Energy
f	Frequency
I, i	Current
L	Inductance
P, p	Power
Q	Charge
R, r	Resistance
S	Temperature coefficient
T	Temperature
t	Time
V, v	Voltage
Z	Impedance.

Subscripts

Upper-case subscripts are used for the indication of:

- Continuous (DC) values (without signal), e.g. I_F
- Instantaneous total values, e.g. i_{RR}
- Average total values, e.g. $I_{F(AV)}$
- Peak total values, e.g. V_{RSM}
- Root-mean-square total values, e.g. $I_{F(RMS)}$.

Lower-case subscripts are used for the indication of values applying to the varying component alone:

- Instantaneous values, e.g. t_{rr}
- Root-mean-square values, e.g. $I_{f(rms)}$
- Peak values, e.g. V_{fm}
- Average values, e.g. $I_{f(av)}$.

If more than one subscript is used, the subscript for which both styles exist are either all upper-case or all lower-case.

The following is a list of subscripts used with basic letter symbols for semiconductor devices:

amb	ambient
(AV), (av)	average value
(BR)	breakdown
(CL)	clamping
d	diode
diff	differential
F, f	forward, fall
I, i	input
j	junction
j-a	junction to ambient
j-tp	junction to tie-point
K	knee
L	load
M, m	peak or crest value
max	maximum
min	minimum
nom	nominal
O, o	output
on	turn-on
P, p	Pulse
R, r	As first subscript: reverse, rise. As second subscript: repetitive, recovery.
ref	reference
(RMS), (rms)	Root-mean-square value
S, s	As first subscript: storage, series, switching. As second subscript: surge (non-repetitive).
stg	Storage
th	Thermal
tot	Total
tp	tie-point
W	Working
Z, z	Regulator, working (zener).

THERMAL CONSIDERATIONS

Thermal resistance

Circuit performance and long-term reliability are affected by the temperature of the chip. Normally, both are improved by keeping the chip temperature (junction temperature) low.

Electrical power dissipated in any semiconductor device is a source of heat. This increases the temperature of the chip with regard to some reference point, normally an ambient temperature of 25 °C in still air. The size of the increase in temperature depends on the amount of power dissipated in the device and the net thermal resistance between the heat source and the reference point. This can be expressed with the following formula:

$\Delta T_j = P_{tot} \times R_{th\ j\text{-}a}$

where:

ΔT_j is the increase in junction temperature

P_{tot} is the total power generated in the device

$R_{th\ j\text{-}a}$ is the thermal resistance from junction to ambient.

Surface mounted devices

Heat transfer can occur by radiation, conduction and convention. Surface mounted devices lose most of their heat by conduction when mounted on a substrate. Referring to Fig.1, heat conducts from its source (the junction) via the package leads and soldered connections to the substrate. Some heat radiates from the package into the surrounding air, where it is dispersed by convection or by forced cooling air. Heat that radiates from the substrate is dispersed in the same way.

The thermal resistance for surface mounted devices therefore, can be expressed as:

$R_{th\ j\text{-}a} = R_{th\ j\text{-}tp} + R_{th\ tp\text{-}a}$ (see Fig.2)

where:

$R_{th\ j\text{-}a}$ is the thermal resistance from junction to ambient

$R_{th\ j\text{-}tp}$ is the thermal resistance from junction to tie-point

$R_{th\ tp\text{-}a}$ is the thermal resistance from tie-point to ambient.

The $R_{th\ j\text{-}tp}$ value is essentially independent of external mounting method and cooling air, but is sensitive to the materials used in the package construction, the chip bonding method and the chip area, all of which are fixed.

The $R_{th\ tp\text{-}a}$ value depends on the shape and material of the tracks and substrate. For all package types these values are given in Table 1 for mounting on (FR4) printed-circuit board with small pad area. For other pad areas and printed-circuit board configurations see Fig.3.

The maximum power handling capability ($P_{tot\ max}$) is given by:

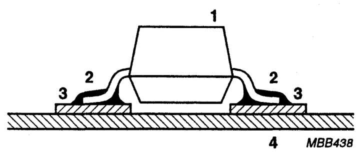
$$P_{tot\ max} = \frac{(T_{j\ max} - T_{amb})}{R_{th\ j\text{-}a}}$$

where:

$T_{j\ max}$ is the maximum junction temperature

T_{amb} is the ambient temperature.

Calculating this maximum power handling capability we have to take into account the maximum junction temperature of the particular device, the maximum temperature of the solder joints (110 °C for long time reliability) and the ambient temperature. Dependent on the ratio of the component parts of the thermal resistance, it will be possible that the junction temperature or the temperature of the solder joints (T_{tp}) will be the limiting factor. This can be shown in the following examples for SOT23 and SOD87 packages mounted on FR4 printed-circuit board.



Heat radiates from the package '1' to ambient.
Heat conducts via leads '2', solder joints '3' to the substrate '4'.

Fig.1 Heat losses.

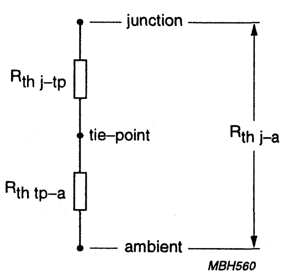


Fig.2 Representation of thermal resistance for a surface mounted diode.

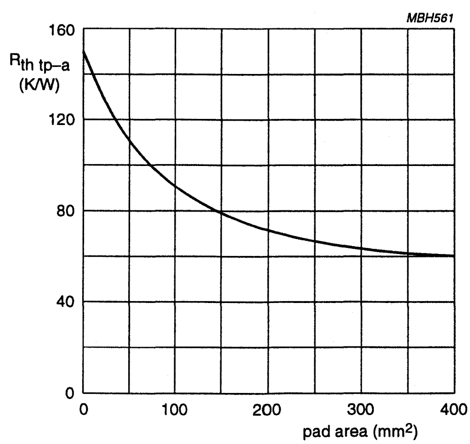


Fig.3 Thermal resistance ($R_{th\ tp\text{-}a}$) as a function of FR4 printed-circuit board pad area.

Table 1 Thermal resistance values and maximum power handling capability of surface mounted packages

PACKAGE	$R_{th\ j\text{-}a}$ (K/W)	$R_{th\ j\text{-}tp}$ (K/W)	$R_{th\ tp\text{-}a}$ (K/W)	$P_{tot\ max}$ (W)
SC59	500	350	150	0.25
SC70	500	350	150	0.25
SOD80(C)	320 - 600	170 - 450	150	0.21 - 0.47
SOD87	150	30	120	0.71
SOD106(A)	150	25	125	0.68
SOD110	315	165	150	0.40
SOD323	625	475	150	0.20
SOT23	500	350	150	0.25
SOT143	500	350	150	0.25
SOT323	625	475	150	0.20

EXAMPLE FOR THE SOT23 PACKAGE

$$P_{tot\ max} = \frac{(T_{j\ max} - T_{amb})}{R_{th\ j\text{-}a}}$$

$$= \frac{(150\,°C - 25\,°C)}{500\ K/W} = 0.25\ W$$

$$T_{tp} = T_{amb} + P_{tot\ max} \times R_{th\ tp\text{-}a}$$

$$= 25\,°C + 0.25\ W \times 150\ K/W = 62.5\,°C$$

This is below 110 °C, so $T_{j\ max}$ is the limiting factor.

EXAMPLE FOR THE SOD87 PACKAGE

$$P_{tot\ max} = \frac{(T_{j\ max} - T_{amb})}{R_{th\ j\text{-}a}}$$

$$= \frac{(175\,°C - 25\,°C)}{150\ K/W} = 1\ W$$

$$T_{tp} = T_{amb} + P_{tot\ max} \times R_{th\ tp\text{-}a}$$

$$= 25\,°C + 1\ W \times 120\ K/W = 145\,°C$$

This is above 110 °C, so the $P_{tot\ max}$ will be limited by T_{tp}, therefore:

$$P_{tot\ max} = \frac{(T_{tp} - T_{amb})}{R_{th\ tp\text{-}a}}$$

$$= \frac{(110\,°C - 25\,°C)}{120\ K/W} = 0.71\ W$$

The $P_{tot\ max}$ values given in Table 1 are based on:

$T_{amb} = 25$ °C; $T_j = T_j$ max; $T_{tp} \leq 110$ °C.

Leaded devices

Figure 4 illustrates the various components of thermal resistance for an axial leaded diode mounted with symmetrical, equal length leads. The thermal resistance from junction to ambient ($R_{th\ j\text{-}a}$) comprises the following thermal resistances:

$R_{th\ j\text{-}p}$ is the thermal resistance from junction to package

$R_{th\ p\text{-}tp}$ is the thermal resistance from package to tie-point

$R_{th\ tp\text{-}a}$ is the thermal resistance from tie-point to ambient

$R_{th\ p\text{-}a}$ is the thermal resistance from package to ambient.

The values of the thermal components depend on the diode package type, the lead length and the mounting method used.

Using the model in Fig.4 and referring to Table 2, values for the thermal resistance from junction to ambient can be calculated using the formula:

$$R_{th\ j\text{-}a} = R_{th\ j\text{-}p} + \frac{R_{th\ p\text{-}a}(R_{th\ p\text{-}tp} + R_{th\ tp\text{-}a})}{R_{th\ p\text{-}a} + R_{th\ p\text{-}tp} + R_{th\ tp\text{-}a}}$$

The maximum power handling capability ($P_{tot\ max}$) is given by:

$$P_{tot\ max} = \frac{(T_{j\ max} - T_{amb})}{R_{th\ j\text{-}a}}$$

where:

$T_{j\,max}$ is the maximum junction temperature and

T_{amb} is the ambient temperature.

Calculating this maximum power handling capability we have to take into account the maximum junction temperature of the particular device, the maximum temperature of the solder joints (110 °C for long time reliability) and the ambient temperature. Dependent on the ratio of the component parts of the thermal resistance it is possible that the junction temperature or the temperature of the solder joints (T_{tp}) will be the limiting factor. This can be shown in the following examples for a SOD57 device mounted on an FR4 printed-circuit board, as shown in Fig.5:

$$R_{th\,j\text{-}a} = 14\ \mathrm{K/W} + \frac{429\ \mathrm{K/W}\,(38\ \mathrm{K/W} + 70\ \mathrm{K/W})}{429\ \mathrm{K/W} + 38\ \mathrm{K/W} + 70\ \mathrm{K/W}}$$

$$= 100\ \mathrm{K/W}$$

and

$$P_{tot\,max} = \frac{(T_{j\,max} - T_{amb})}{R_{th\,j\text{-}a}}$$

$$= \frac{(175\,°\mathrm{C} - 60\,°\mathrm{C})}{100\ \mathrm{K/W}} = 1.15\ \mathrm{W}$$

$$T_{tp} = T_{amb} + \frac{R_{th\,p\text{-}a} \times R_{th\,tp\text{-}a}}{R_{th\,p\text{-}a} + R_{th\,p\text{-}tp} + R_{th\,tp\text{-}a}} \times P_{tot}$$

using values in Table 2:

$$T_{tp} = T_{amb} + \frac{429\ \mathrm{K/W} \times 70\ \mathrm{K/W}}{429\ \mathrm{K/W} + 38\ \mathrm{K/W} + 70\ \mathrm{K/W}} \times P_{tot}$$

is simplified to:

$$T_{tp} = T_{amb} + 56\ \mathrm{K/W} \times P_{tot}$$

using $T_{tp} = 110$ °C and $T_{amb} = 60$ °C the equation becomes:

$$P_{tot} = \frac{(T_{tp} - T_{amb})}{56\ \mathrm{K/W}}$$

$$= \frac{(110\,°\mathrm{C} - 60\,°\mathrm{C})}{56\ \mathrm{K/W}} = 0.89\ \mathrm{W}$$

This is lower than $P_{tot\,max} = 1.15$ W (for $T_{j\,max} = 175$ °C), so in this particular case $T_{tp} = 110$ °C is limiting the $P_{tot\,max}$.

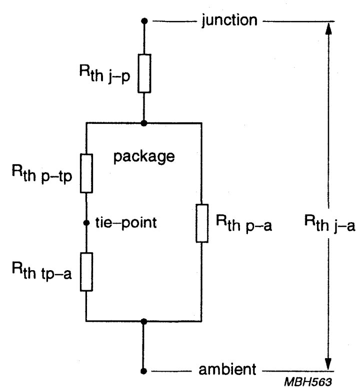


Fig.4 Representation of thermal resistance paths for a leaded device.

Table 2 Thermal resistance values for leaded packages
All values expressed in K/W, unless otherwise specified.

THERMAL RESISTANCE	CONDITIONS	SOD27	SOD57	SOD64	SOD66	SOD68	SOD81	SOD91
$R_{th\ j\text{-}p}$		125	14	10	95	150[1]	28	60
$R_{th\ p\text{-}tp}$	lead length = 5 mm	121	19	7	19	121	19	48
	lead length = 10 mm	242	38	14	38	242	38	96
	lead length = 15 mm	363	57	21	57	363	57	144
	lead length = 20 mm	484	76	28	76	484	76	192
	lead length = 25 mm	605	95	35	95	605	95	240
$R_{th\ p\text{-}a}$	lead length = 5 mm	1050	586	417	673	1343	787	1261
	lead length = 10 mm	744	429	293	473	879	527	843
	lead length = 15 mm	576	338	225	365	654	396	633
	lead length = 20 mm	469	279	183	297	520	317	507
	lead length = 25 mm	396	237	154	250	432	264	423
$R_{th\ tp\text{-}a}$	notes 2 and 3	100	–	–	–	100	–	–
	notes 2 and 4	–	70	70	70	–	70	70
	notes 2 and 5	–	55	55	55	–	55	55
	notes 2 and 6	–	45	45	45	–	45	45

Notes

1. For Schottky diodes in SOD68 package $R_{th\ j\text{-}p}$ = 125 K/W.
2. Device mounted on a 1.5 mm thick epoxy-glass printed circuit board with a copper thickness ≥ 40 μm.
3. Mounted as in Fig.6.
4. Mounted as in Fig.5.
5. Mounted with copper laminate per lead of 1 cm^2.
6. Mounted with copper laminate per lead of 2.25 cm^2.

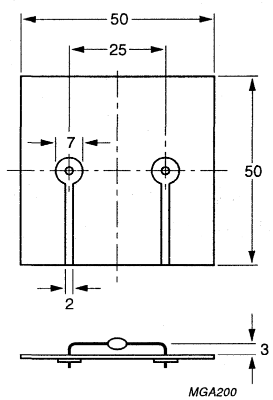


Fig.5 Leaded device mounted on printed-circuit board 50 × 50 mm.

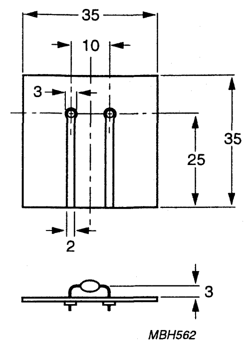


Fig.6 Leaded device mounted on printed-circuit board 35 × 35 mm.

SECTION 1

HIGH-SPEED, SWITCHING, AND GENERAL-PURPOSE DIODES

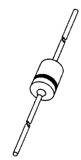
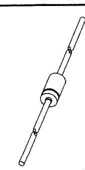
continued on next page

continued on next page

High-speed, switching, and general-purpose diodes

Selection guide

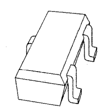
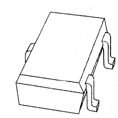
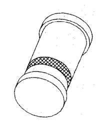
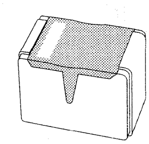
HIGH-SPEED, SWITCHING AND GENERAL-PURPOSE DIODES

TYPE NUMBER	RATINGS				CHARACTERISTICS				DOUBLE DIODE	PACKAGE (not to scale)
	V_R max.	I_F max.	I_{FRM} max.	I_{FSM} max.	V_F max.	@ I_F	C_d max.	t_{rr} max.		
	(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)		
LEADED TYPES										
1N914	75	75	225	4	1.0	10	4	4	no	
1N916	75	75	225	4	1.0	10	2	4	no	
1N4148	75	200	450	4	1.0	10	4	4	no	
1N4150	50	300	600	4	1.0	200	2.5	6	no	
1N4151	50	200	450	4	1.0	50	2	4	no	
1N4153	50	200	450	4	0.88	50	2	4	no	
1N4446	75	200	450	4	1.0	20	4	4	no	
1N4448	75	200	450	4	1.0	100	4	4	no	
BA220	10	200	400	9	0.95	100	2.5	4	no	
BA221	30	200	400	9	0.95	100	2.5	4	no	
BA316	10	100	225	4	1.1	100	2	4	no	
BA317	30	100	225	4	1.1	100	2	4	no	
BA318	50	100	225	4	1.1	100	2	4	no	
BAV10	60	300	600	9	1.0	200	2.5	6	no	
BAV18	50	250	625	9	1.0	100	5	50	no	SOD27 (DO35)
BAV19	100	250	625	9	1.0	100	5	50	no	
BAV20	150	250	625	9	1.0	100	5	50	no	
BAV21	200	250	625	9	1.0	100	5	50	no	
BAW62	75	200	450	4	1.0	100	2	4	no	
BAX12[(1)]	90	400	800	55	1.0	200	35	50	no	
BAX14	20	500	2000	55	1.0	300	35	50	no	
BAX18	75	500	2000	55	1.0	300	35	50	no	
BAY80	120	250	625	9	1.0	100	6	50	no	
1N4531	75	200	450	4	1.0	10	4	4	no	
1N4532	75	200	450	4	1.0	10	2	2	no	
BAS15	50	100	225	4	1.1	100	2	4	no	SOD68 (DO34)

Note

1. Controlled avalanche diode; I_{RRM} = 600 mA.

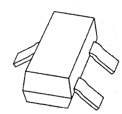
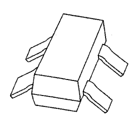
HIGH-SPEED, SWITCHING AND GENERAL-PURPOSE DIODES (continued)

TYPE NUMBER	RATINGS				CHARACTERISTICS				DOUBLE DIODE	PACKAGE (not to scale)
	V_R max.	I_F max.	I_{FRM} max.	I_{FSM} max.	V_F max.	@ I_F	C_d max.	t_{rr} max.		
	(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)		
SURFACE-MOUNT TYPES										
1PS181	80	215	500	4	1.0	50	2.0	4	yes(1)	 SC59
1PS184	80	215	500	4	1.0	50	1.5	4	yes(2)	
1PS193	80	215	500	4	1.0	50	1.5	4	no	
1PS226	80	215	500	4	1.0	50	1.5	4	yes(3)	
1PS300	80	200	500	4	1.0	50	2.0	4	yes(1)	 SC70
1PS301	80	250	500	4	1.0	50	1.5	4	yes(2)	
1PS302	80	200	500	4	1.0	50	1.5	4	yes(3)	
BAS32L	75	200	450	4	0.93	100	2	4	no	 SOD80C
BAV100	50	250	625	9	1.0	100	5	50	no	
BAV101	100	250	625	9	1.0	100	5	50	no	
BAV102	150	250	625	9	1.0	100	5	50	no	
BAV103	200	250	625	9	1.0	100	5	50	no	
BAV105	60	300	600	9	1.0	200	2.5	6	no	
PMLL4148	75	200	450	4	1.0	10	4	4	no	
PMLL4150	50	300	450	4	1.0	200	2.5	6	no	
PMLL4151	50	200	450	4	1.0	50	2	4	no	
PMLL4153	50	200	450	4	0.88	50	2	4	no	
PMLL4446	75	200	450	4	1.0	20	4	4	no	
PMLL4448	75	200	450	4	1.0	100	4	4	no	
BAS216	75	250	500	4	1.0	50	1.5	4	no	 SOD110

Notes

1. Common anode.
2. Common cathode.
3. Series connected.

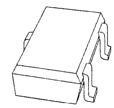
HIGH-SPEED, SWITCHING AND GENERAL-PURPOSE DIODES (continued)

TYPE NUMBER	RATINGS				CHARACTERISTICS				DOUBLE DIODE	PACKAGE (not to scale)
	V_R max.	I_F max.	I_{FRM} max.	I_{FSM} max.	V_F max.	@ I_F	C_d max.	t_{rr} max.		
	(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)		
SURFACE-MOUNT TYPES (continued)										
BAL74	50	215	500	4	1.0	50	2	4	no	
BAL99	70	215	500	4	1.0	50	1.5	4	no	
BAS16	75	215	500	4	1.0	50	1.5	4	no	
BAS19	100	200	625	9	1.0	100	5	50	no	
BAS20	150	200	625	9	1.0	100	5	50	no	
BAS21	200	200	625	9	1.0	100	5	50	no	
BAS29[4]	90	250	500	10	1.0	200	35	50	no	
BAS31[4]	90	250	500	10	1.0	200	35	50	yes[3]	
BAS35[4]	90	250	500	10	1.0	200	35	50	yes[1]	
BAS55	60	250	600	9	1.0	200	2.5	6	no	
BAS678	80	250	600	9	1.0	200	2	6	no	
BAV23S	200	225	625	9	1.0	100	5	50	yes[3]	
BAV70	70	215	450	4	1.0	50	1.5	4	yes[2]	
BAV74	50	215	450	4	1.0	100	1.5	4	yes[2]	
BAV99	75	215	450	4	1.0	50	1.5	4	yes[3]	SOT23
BAW56	75	215	450	4	1.0	50	2	4	yes[1]	
PMBD914	70	215	500	4	1.0	50	1.5	4	no	
PMBD2835	35	215	450	4	1.0	50	2.5	4	yes[1]	
PMBD2836	75	215	450	4	1.0	50	2.5	4	yes[1]	
PMBD2837	30	215	450	4	1.0	50	2.5	4	yes[2]	
PMBD2838	50	215	450	4	1.0	50	2.5	4	yes[2]	
PMBD6050	70	215	500	4	1.0	50	1.5	4	no	
PMBD6100	70	215	450	4	1.0	50	1.5	4	yes[2]	
PMBD7000	100	215	450	4	1.0	50	1.5	4	yes[3]	
BAS28	75	215	500	4	1.0	50	1.5	4	yes	
BAS56	60	200	600	9	1.0	200	2.5	6	yes	
BAV23	200	225	625	9	1.0	100	5	50	yes	SOT143

Notes

1. Common anode.
2. Common cathode.
3. Series connected.
4. Controlled avalanche diode; I_{RRM} = 600 mA.

HIGH-SPEED, SWITCHING AND GENERAL-PURPOSE DIODES (continued)

TYPE NUMBER	RATINGS				CHARACTERISTICS				DOUBLE DIODE	PACKAGE (not to scale)
	V_R max.	I_F max.	I_{FRM} max.	I_{FSM} max.	V_F max.	@ I_F	C_d max.	t_{rr} max.		
	(V)	(mA)	(mA)	(A)	(V)	(mA)	(pF)	(ns)		
SURFACE-MOUNT TYPES (continued)										
BAL74W	75	175	500	4	1.0	50	1.5	4	no	 SOT323
BAL99W	75	150	500	4	1.0	50	1.5	4	no	
BAS16W	75	175	500	4	1.0	50	1.5	4	no	
BAV70W	70	175	500	4	1.0	50	1.5	4	yes(2)	
BAV99W	75	150	500	4	1.0	50	1.5	4	yes(3)	
BAW56W	75	150	500	4	1.0	50	2.0	4	yes(1)	

Notes

1. Common anode.
2. Common cathode.
3. Series connected.

High-speed diodes 1N914; 1N916

FEATURES

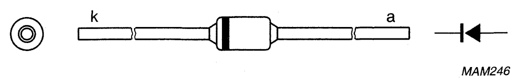
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 100 V
- Repetitive peak forward current: max. 225 mA.

APPLICATIONS

- High-speed switching.

DESCRIPTION

The 1N914; 1N916 are high-speed switching diodes fabricated in planar tecshnology, and encapsulated in hermetically sealed leaded glass SOD27 (DO-35) packages. s



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	100	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	75	mA
I_{FRM}	repetitive peak forward current		–	225	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	175	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.3	–	1000	mV
I_R	reverse current	see Fig.5			
		V_R = 20 V	–	25	nA
		V_R = 75 V	–	5	μA
		V_R = 20 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6			
	1N914		–	4	pF
	1N916		–	2	pF
t_{rr}	reverse recovery time 1N914	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	8	ns
	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 50 mA; t_r = 20 ns; see Fig.8	–	2.5	V

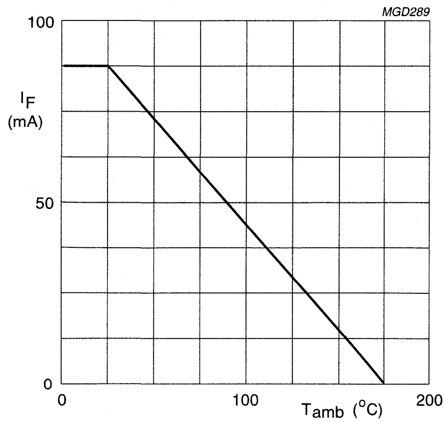
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

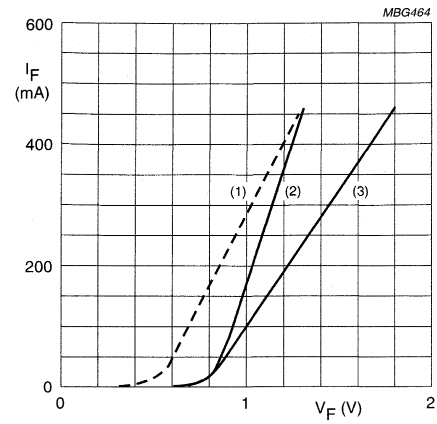
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



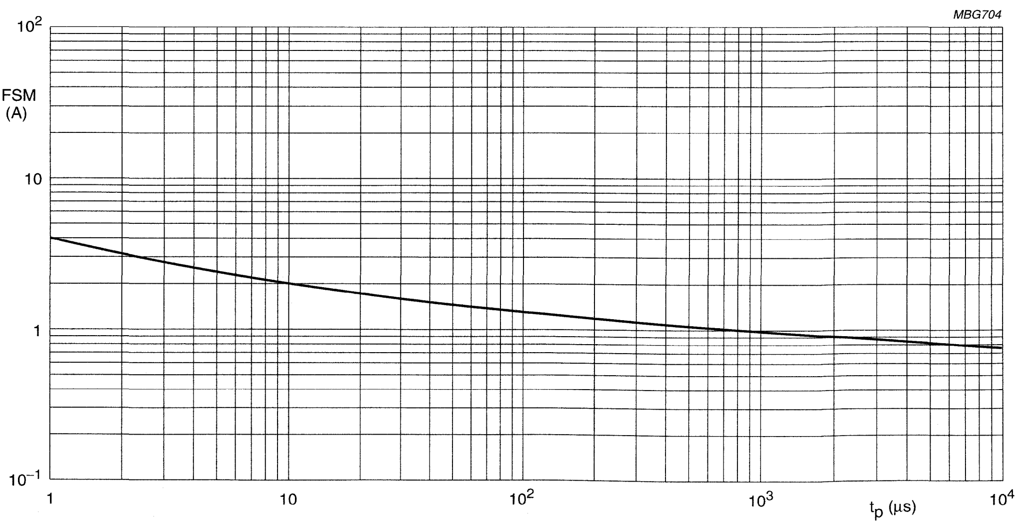
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



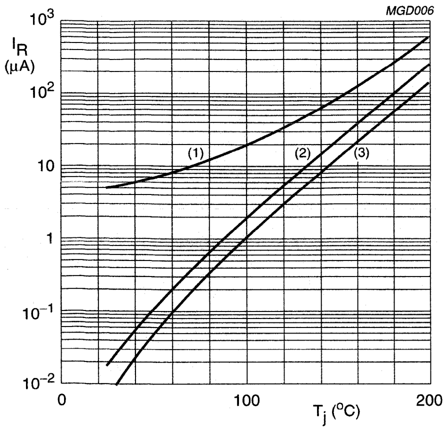
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



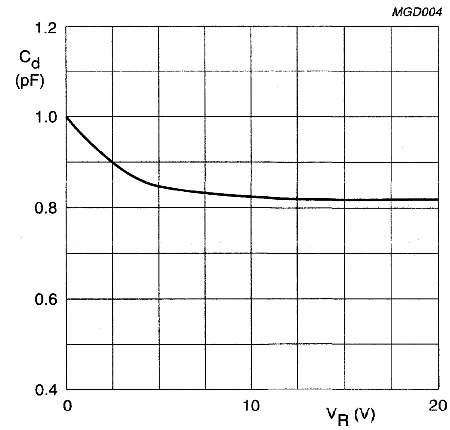
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



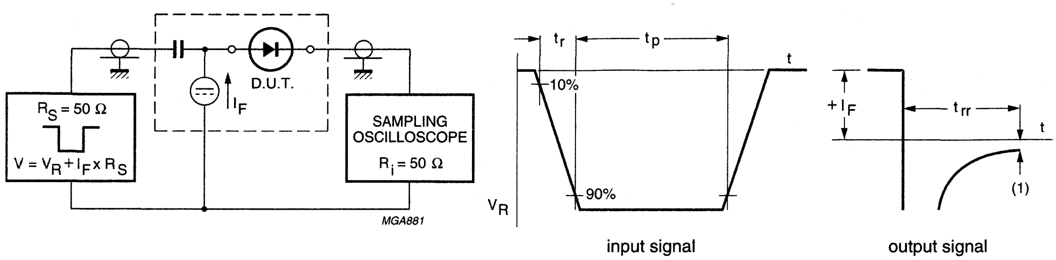
(1) V_R = 75 V; maximum values.
(2) V_R = 75 V; typical values.
(3) V_R = 20 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

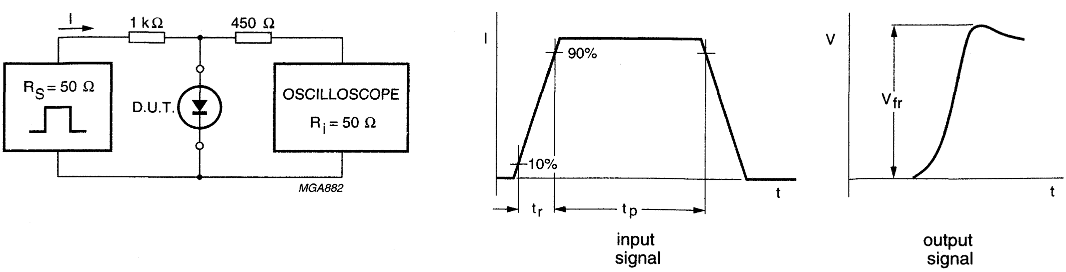


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diodes 1N4148; 1N4446; 1N4448

FEATURES

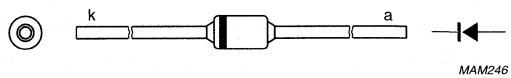
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

- High-speed switching.

DESCRIPTION

The 1N4148, 1N4446, 1N4448 are high-speed switching diodes fabricated in planar technology, and encapsulated in hermetically sealed leaded glass SOD27 (DO-35) packages.



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	200	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
	1N4148	I_F = 10 mA	–	1.0	V
	1N4446	I_F = 20 mA	–	1.0	V
	1N4448	I_F = 5 mA	0.62	0.72	V
		I_F = 100 mA	–	1.0	V
I_R	reverse current	V_R = 20 V; see Fig.5		25	nA
		V_R = 20 V; T_j = 150 °C; see Fig.5	–	50	μA
I_R	reverse current; 1N4448	V_R = 20 V; T_j = 100 °C; see Fig.5	–	3	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6		4	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7		4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 50 mA; t_r = 20 ns; see Fig.8	–	2.5	V

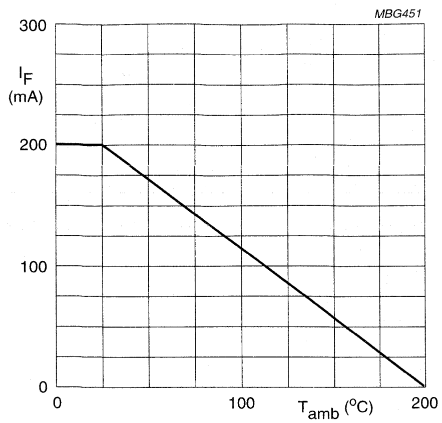
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	350	K/W

Note

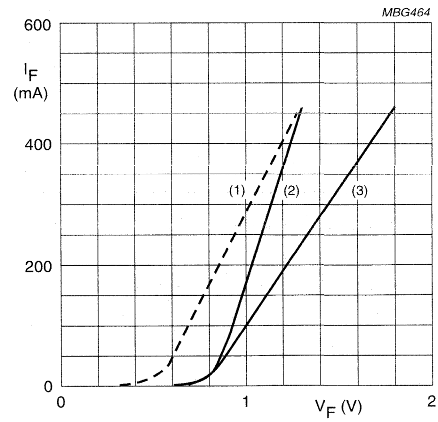
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



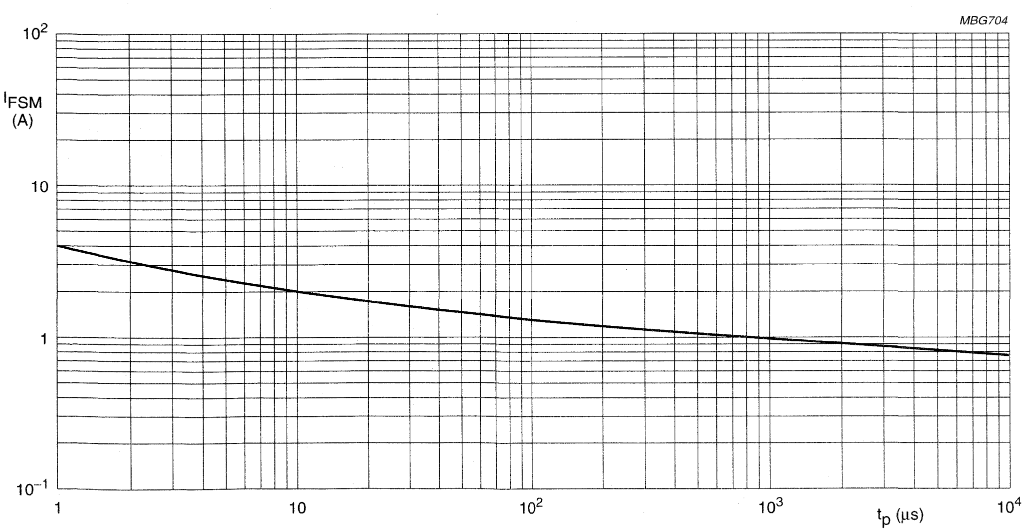
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



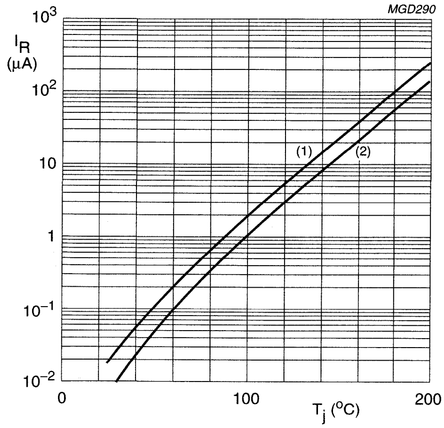
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



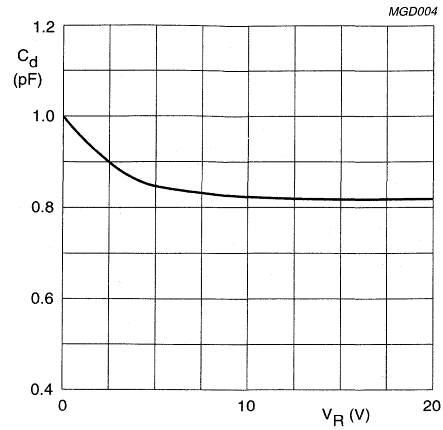
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



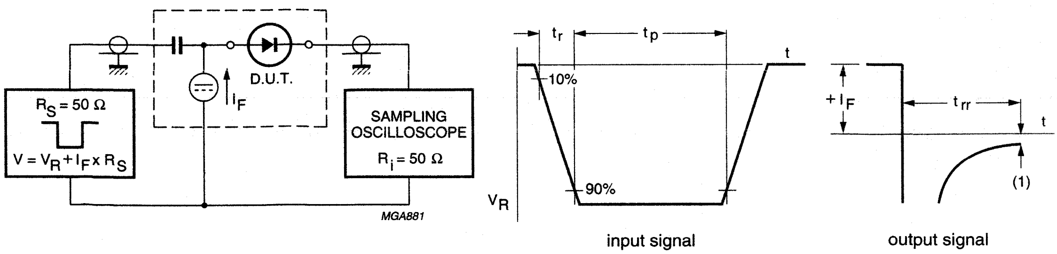
(1) $V_R = 75$ V; typical values.
(2) $V_R = 20$ V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; $T_j = 25$ °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

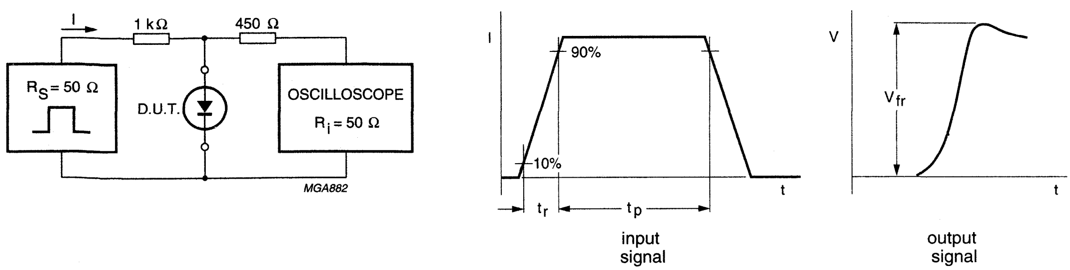


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diodes 1N4150; 1N4151; 1N4153

FEATURES

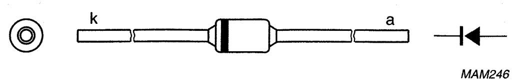
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 600 mA and 450 mA respectively.

APPLICATIONS

- High-speed switching
- 1N4150: general purpose use in computer and industrial applications
- 1N4151 and 1N4153: military and industrial applications.

DESCRIPTION

The 1N4150, 1N4151, 1N4153 are high-speed switching diodes fabricated in planar technology, and encapsulated in hermetically sealed leaded glass SOD27 (DO-35) packages.



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	1N4151		–	75	V
	1N4153		–	75	V
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current	see Fig.2; note 1			
	1N4150		–	300	mA
	1N4151		–	200	mA
	1N4153		–	200	mA
I_{FRM}	repetitive peak forward current				
	1N4150		–	600	mA
	1N4151		–	450	mA
	1N4153		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed-circuit board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
	1N4150	I_F = 1 mA	540	620	mV
		I_F = 10 mA	660	740	mV
		I_F = 50 mA	760	860	mV
		I_F = 100 mA	820	920	mV
		I_F = 200 mA	870	1000	mV
	1N4151	I_F = 50 mA	–	1000	mV
	1N4153	I_F = 0.1 mA	490	550	mV
		I_F = 0.25 mA	530	590	mV
		I_F = 1 mA	590	670	mV
		I_F = 2 mA	620	700	mV
		I_F = 10 mA	700	810	mV
		I_F = 50 mA	740	880	mV
I_R	reverse current	V_R = 50 V; see Fig.5			
	1N4150		–	0.1	μA
	1N4151		–	0.05	μA
	1N4153		–	0.05	μA
I_R	reverse current	V_R = 50 V; T_j = 150 °C; see Fig.5			
	1N4150		–	100	μA
	1N4151		–	50	μA
	1N4153		–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6			
	1N4150		–	2.5	pF
	1N4151		–	2	pF
	1N4153			2	pF

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
t_{rr}	reverse recovery time 1N4150	when switched from I_F = 10 mA to I_R = 1 mA; R_L = 100 Ω; measured at I_R = 0.1 mA; see Fig.7	–	6	ns
		when switched from I_F = 10 mA to 200 mA to I_R = 10 mA to 200 mA; R_L = 100 Ω; measured at $I_R = 0.1 \times I_F$; see Fig.7	–	4	ns
		when switched from I_F = 200 mA to 400 mA to I_R = 200 mA to 400 mA; R_L = 100 Ω; measured at $I_R = 0.1 \times I_F$; see Fig.7	–	6	ns
t_{rr}	reverse recovery time 1N4151	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
		when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	2	ns
t_{rr}	reverse recovery time 1N4153	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
		when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	2	ns
t_{fr}	forward recovery time	when switched to I_F = 200 mA; t_r = 0.4 ns; measured at V_F = 1 V; see Fig.8	–	10	ns

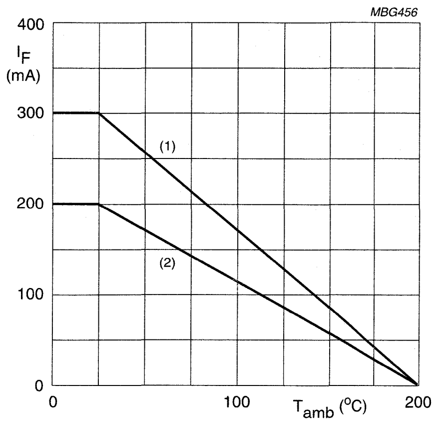
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	350	K/W

Note

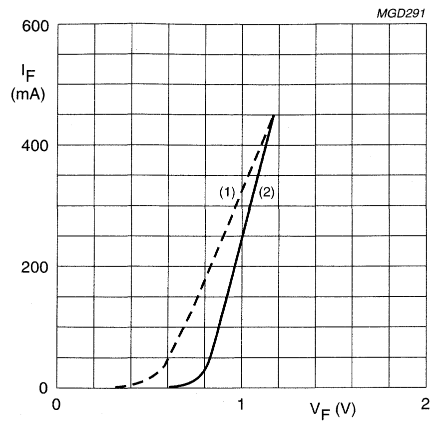
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



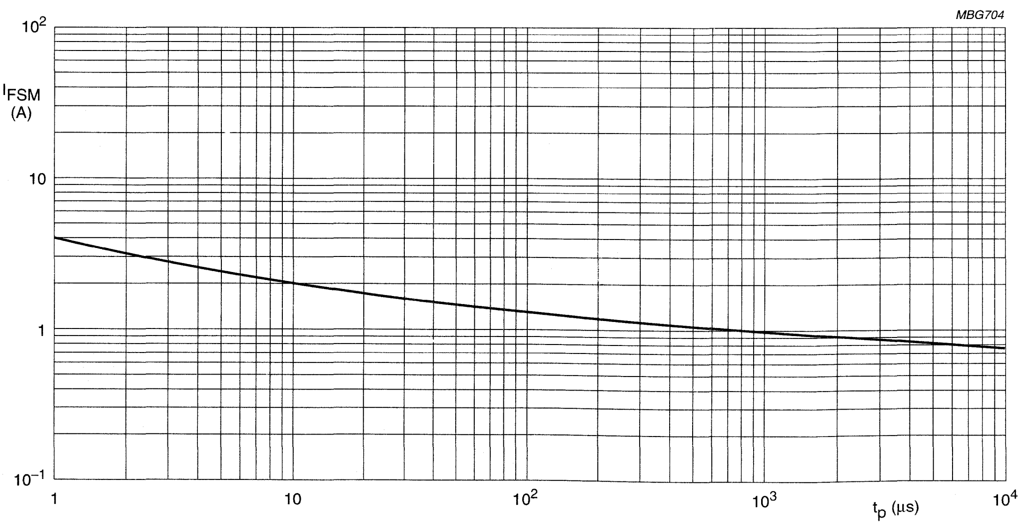
Device mounted on an FR4 printed-circuit board; lead length 10 mm.
(1) 1N4150.
(2) 1N4151; 1N4153.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



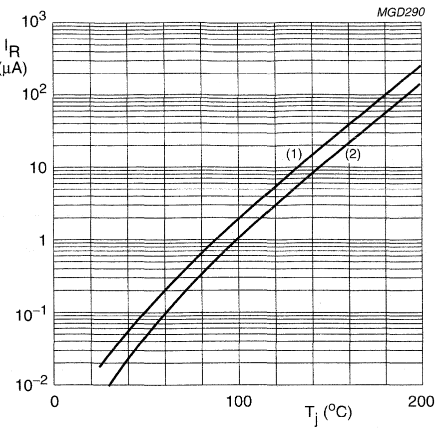
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.

Fig.3 Forward current as a function of forward voltage.



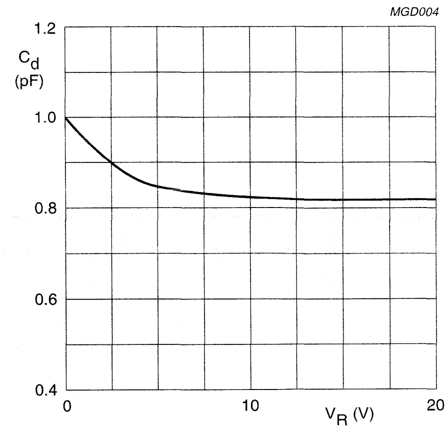
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



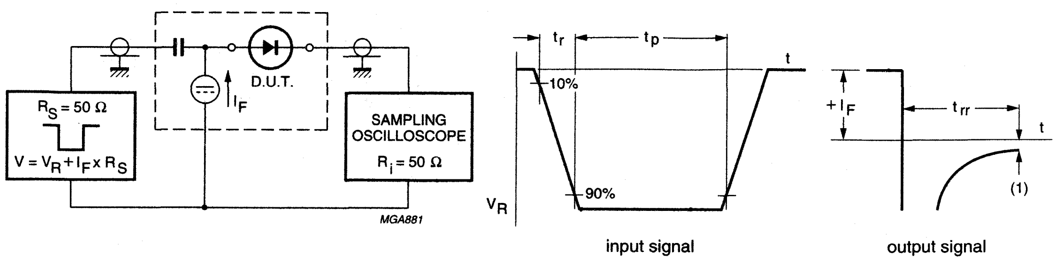
(1) V_R = 75 V; typical values.
(2) V_R = 20 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



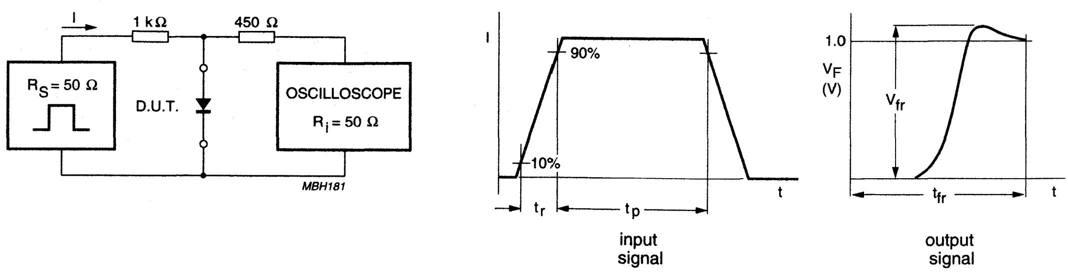
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) The value of I_R is dependent on product type.

Fig.7 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse rise time t_r = 0.4 ns; forward pulse duration t_p = 100 ns; duty factor δ = 0.01.

Fig.8 Forward recovery time test circuit and waveforms.

High-speed diodes 1N4531; 1N4532

FEATURES

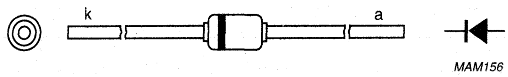
- Hermetically sealed leaded glass SOD68 (DO-34) package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

- High-speed switching
- Protection diodes in reed relays.

DESCRIPTION

The 1N4531, 1N4532 are high-speed switching diodes fabricated in planar technology, and encapsulated in hermetically sealed leaded glass SOD68 (DO-34) packages.



The diodes are type branded.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2	–	200	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

High-speed diodes 1N4531; 1N4532

ELECTRICAL CHARACTERISTICS

$T_j = 25$ °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	$I_F = 10$ mA; see Fig.3	–	1000	mV
I_R	reverse current	see Fig.5			
	IN4531	$V_R = 20$ V	–	25	nA
		$V_R = 20$ V; $T_j = 150$ °C	–	50	μA
	IN4532	$V_R = 50$ V	–	100	nA
		$V_R = 50$ V; $T_j = 150$ °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; $V_R = 0$; see Fig.6			
	IN4531		–	4	pF
	IN4532		–	2	pF
t_{rr}	reverse recovery time	when switched from $I_F = 10$ mA to $I_R = 60$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA; see Fig.7			
	IN4531		–	4	ns
	IN4532		–	2	ns
	reverse recovery time IN4532	when switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from $I_F = 100$ mA; $t_r \leq 30$ ns; see Fig.8	–	3	V

THERMAL CHARACTERISTICS

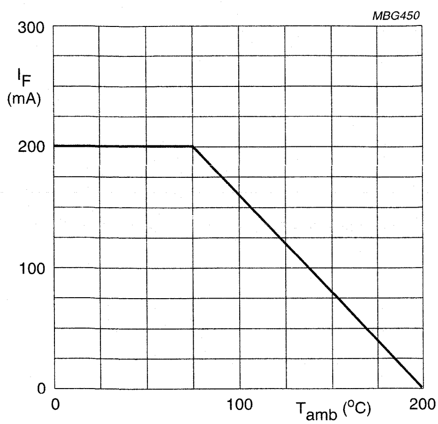
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 5 mm	120	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 5 mm; note 1	350	K/W

Note

1. Device mounted on a printed circuit-board without metallization pad.

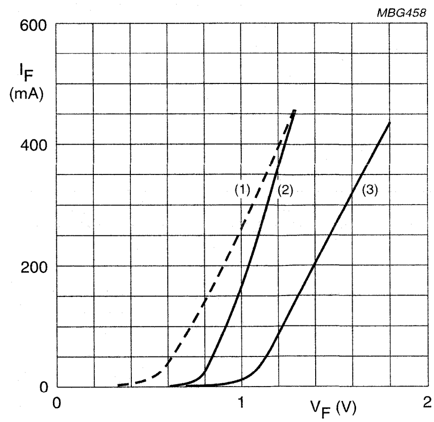
High-speed diodes 1N4531; 1N4532

GRAPHICAL DATA



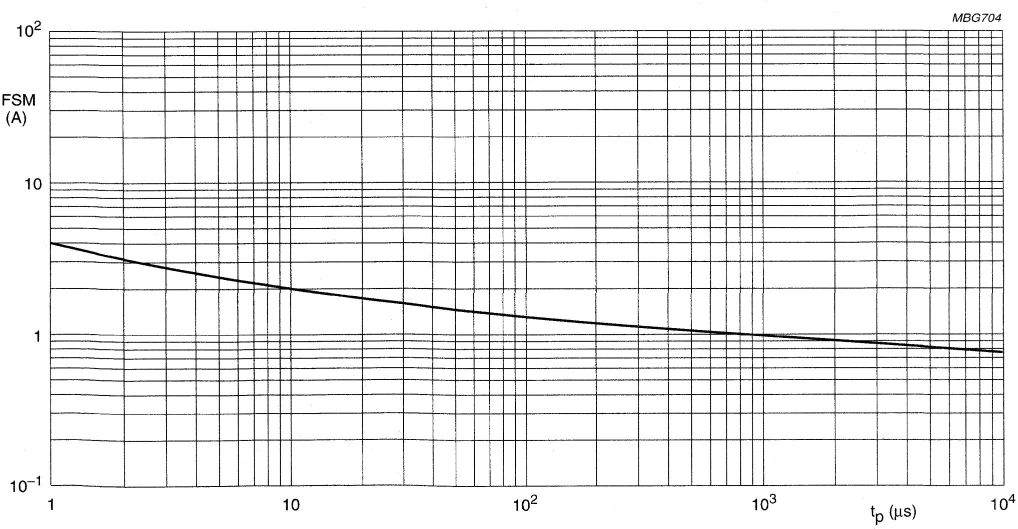
Lead length 5 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



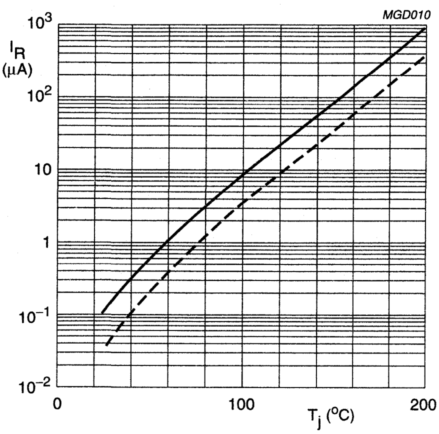
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



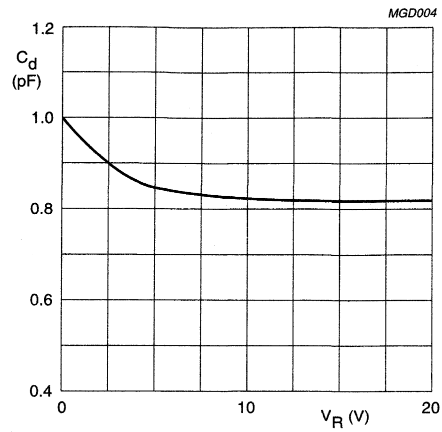
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



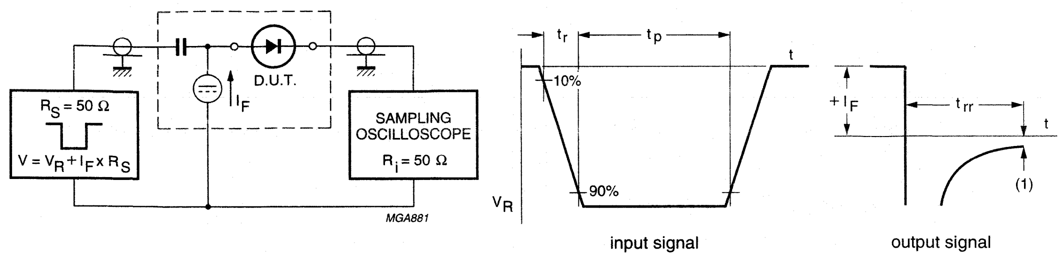
V_R = 50 V
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

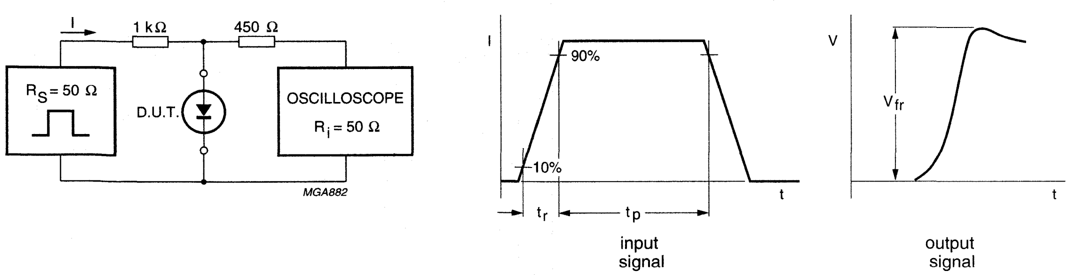


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode | 1PS181

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

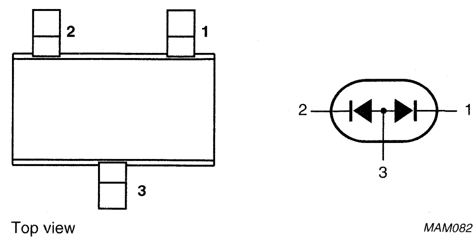
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS181 consists of two high-speed switching diodes with common anodes, fabricated in planar technology, and encapsulated in the small plastic SMD SC59 package.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	common anode



Marking code: A3T.

Fig.1 Simplified outline (SC59) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge			
		t = 1 μs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	2.0	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.7	–	1.75	V

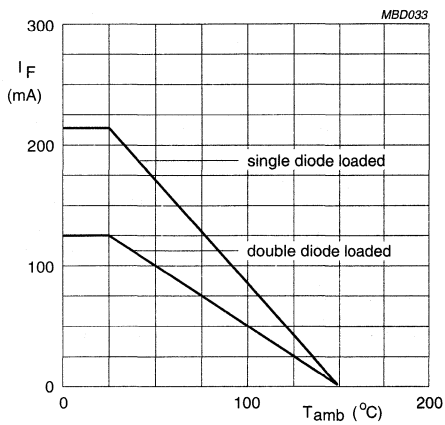
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		250	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

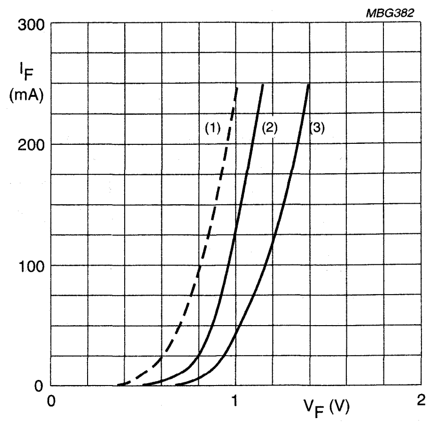
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



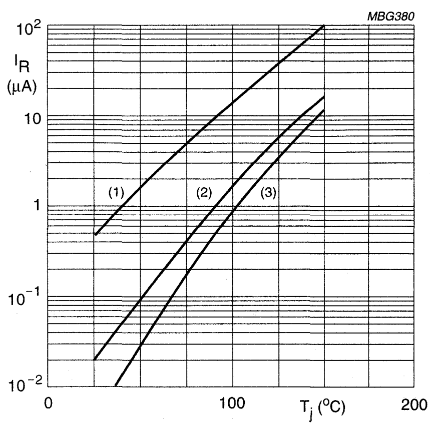
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



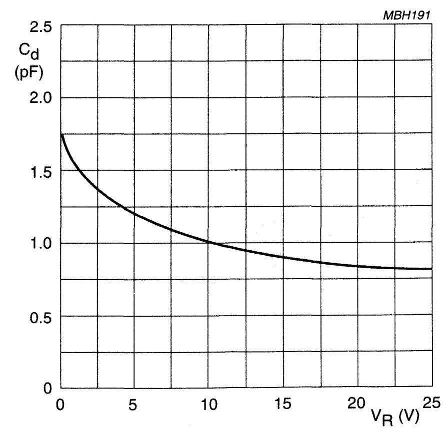
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



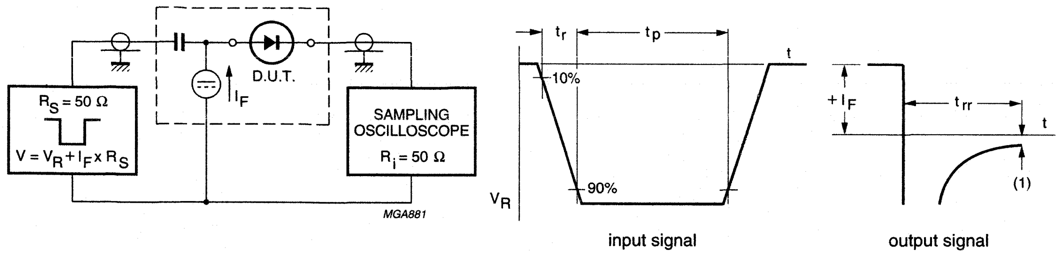
(1) V_R = 80 V; maximum values.
(2) V_R = 80 V; typical values.
(3) V_R = 25 V; typical values.

Fig.4 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

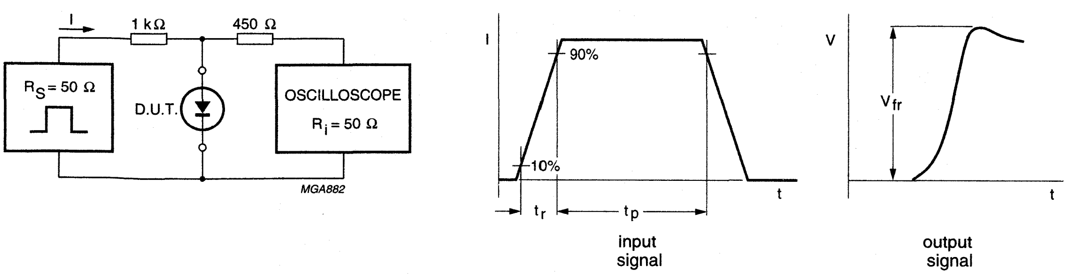


Fig.7 Forward recovery voltage test circuit and waveforms.

High-speed double diode | 1PS184

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

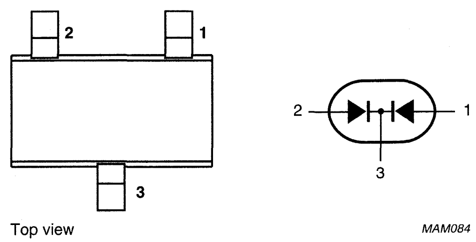
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS184 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in the small plastic SMD SC59 package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode



Marking code: B3T.

Fig.1 Simplified outline (SC59) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge			
		t = 1 μs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.7	–	1.75	V

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		250	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

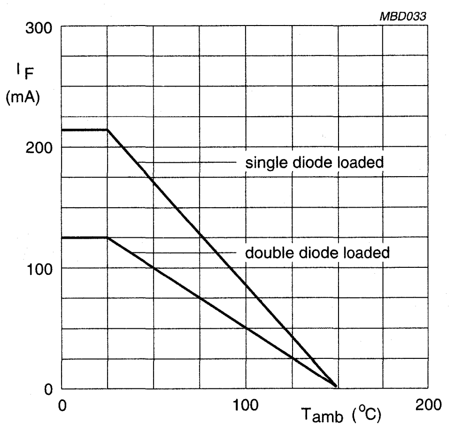
Note

1. Device mounted on an FR4 printed-circuit board.

High-speed double diode

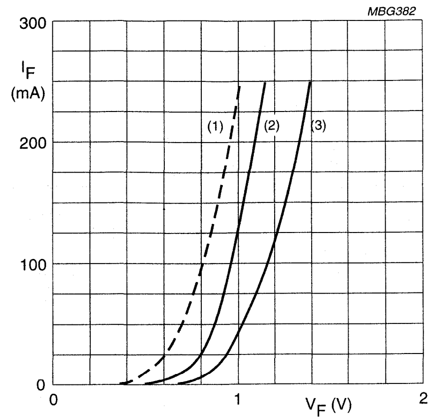
1PS184

GRAPHICAL DATA



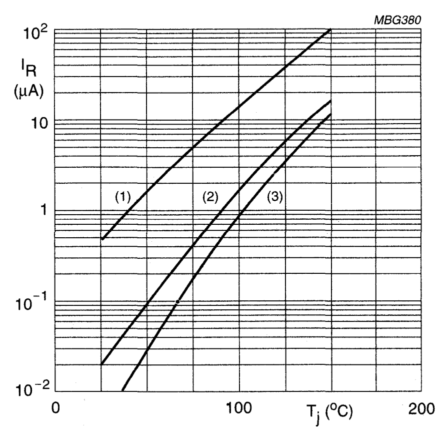
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



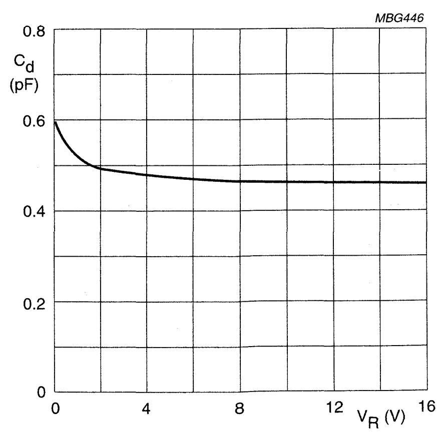
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



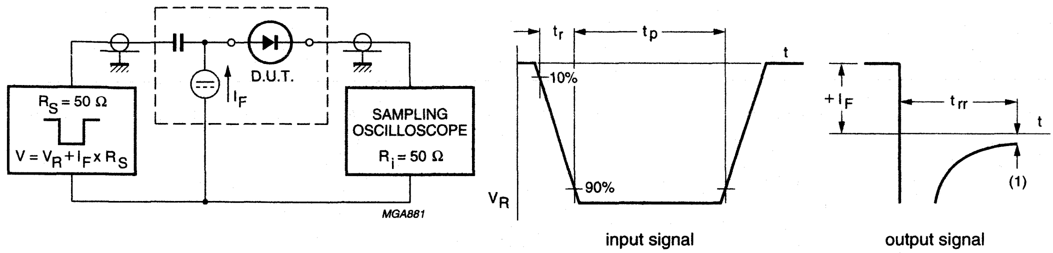
(1) V_R = 80 V; maximum values.
(2) V_R = 80 V; typical values.
(3) V_R = 25 V; typical values.

Fig.4 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

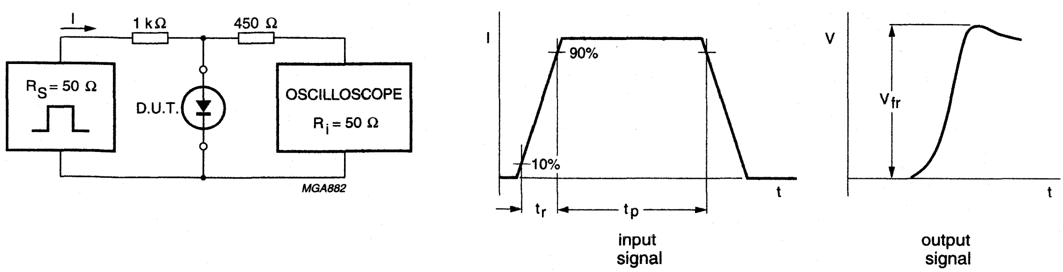


Fig.7 Forward recovery voltage test circuit and waveforms.

High-speed diode | 1PS193

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

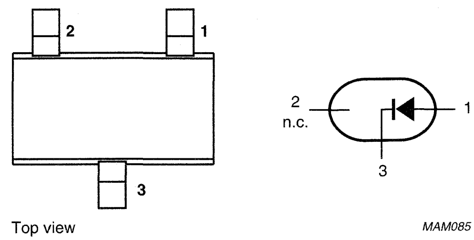
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS193 is a high-speed switching diode, fabricated in planar technology, and encapsulated in the small plastic SMD SC59 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: F3T.

Fig.1 Simplified outline (SC59) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge			
		t = 1 μs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C;	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_p = 20 ns; see Fig.7	–	1.75	V

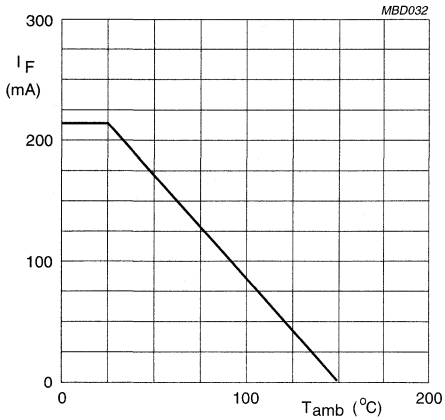
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		250	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

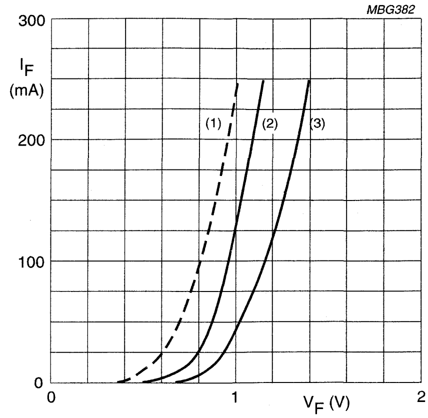
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



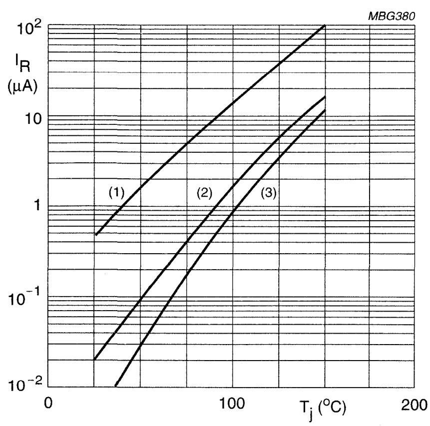
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



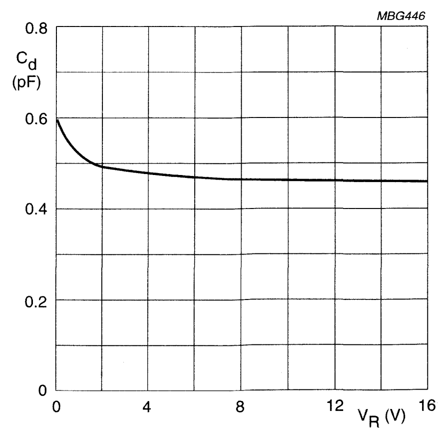
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



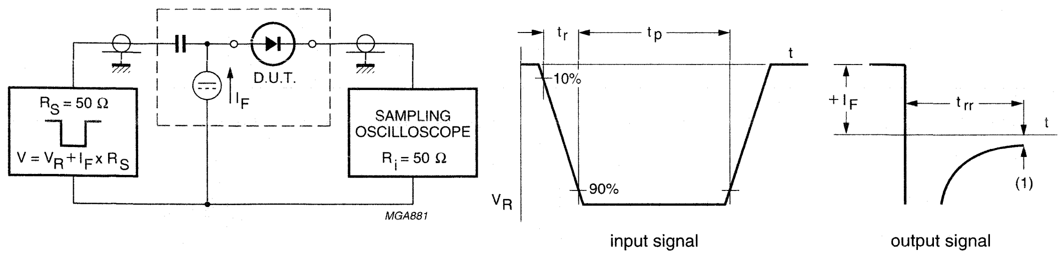
(1) V_R = 80 V; maximum values.
(2) V_R = 80 V; typical values.
(3) V_R = 25 V; typical values.

Fig.4 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

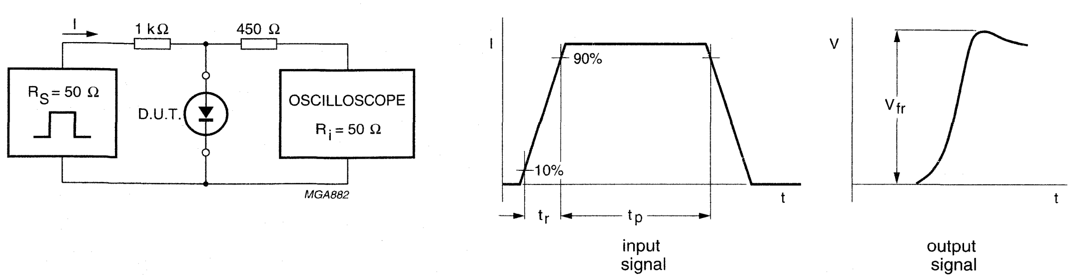


Fig.7 Forward recovery voltage test circuit and waveforms.

High-speed double diode 1PS226

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

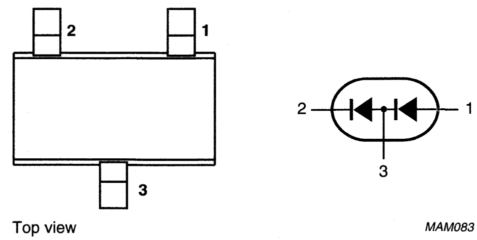
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS226 consists of two high-speed switching diodes connected in series, fabricated in planar technology, and encapsulated in the small plastic SMD SC59 package.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	common connection



Marking code: C3T.

Fig.1 Simplified outline (SC59) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge			
		t = 1 µs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

High-speed double diode | 1PS226

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.7	–	1.75	V

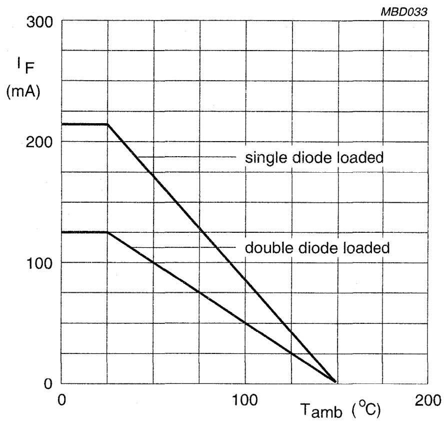
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		250	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

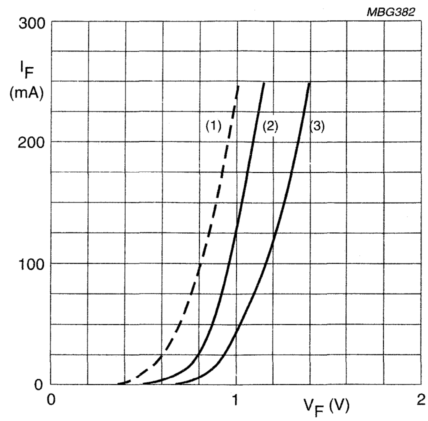
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



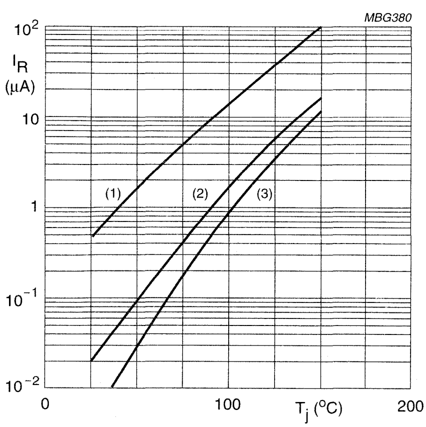
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



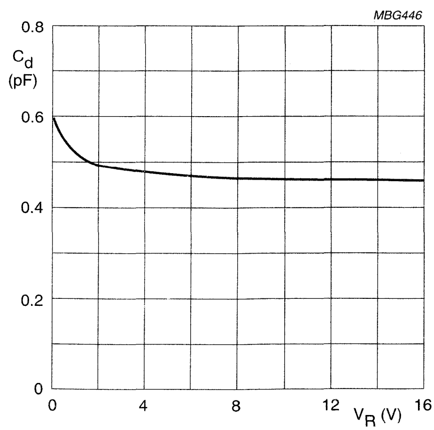
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



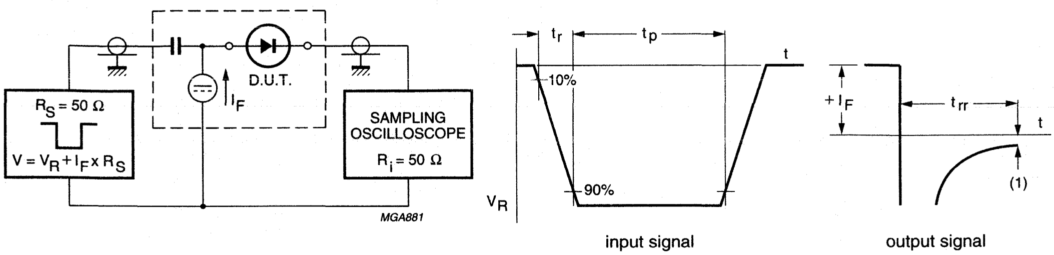
(1) V_R = 80 V; maximum values.
(2) V_R = 80 V; typical values.
(3) V_R = 25 V; typical values.

Fig.4 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

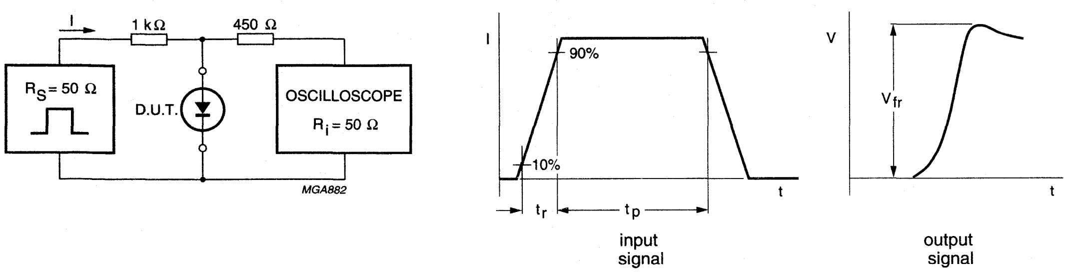


Fig.7 Forward recovery voltage test circuit and waveforms.

High-speed double diode 1PS300

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

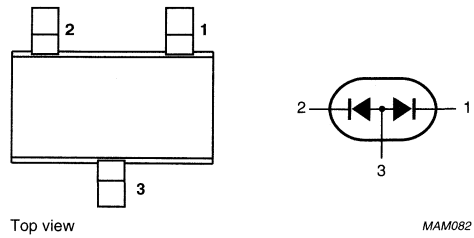
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS300 consists of two high-speed switching diodes with common anodes, fabricated in planar technology, and encapsulated in the very small rectangular plastic SMD SC70-3 package.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	common anode



Marking code: A3.

Fig.1 Simplified outline (SC70-3) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	200	mA
		double diode loaded; see Fig.2; note 1	–	170	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge			
		t = 1 µs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	300	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

High-speed double diode 1PS300

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	2	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.7	–	1.75	V

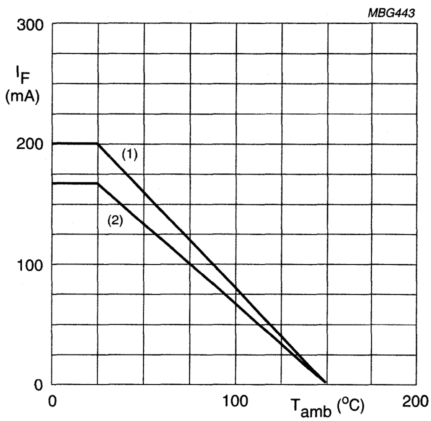
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		200	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	415	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA

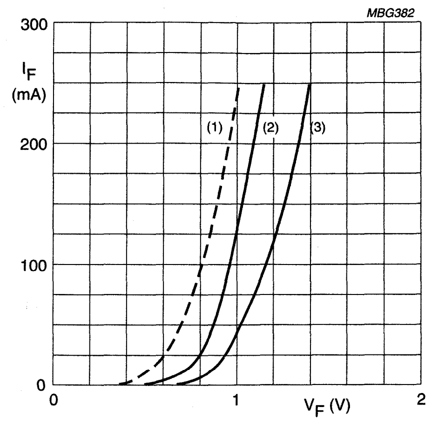


Device mounted on an FR4 printed-circuit board.

(1) Single diode loaded.

(2) Double diode loaded.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.

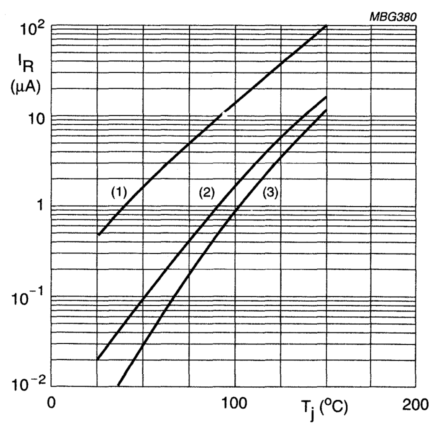


(1) T_j = 150 °C; typical values.

(2) T_j = 25 °C; typical values.

(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.

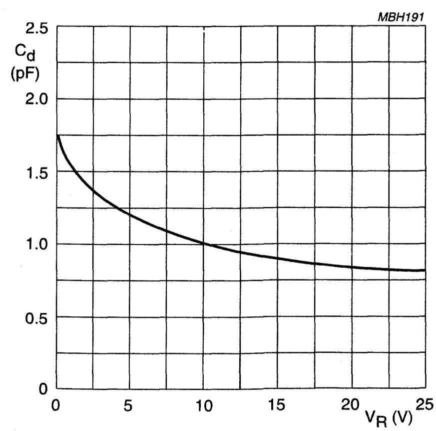


(1) V_R = 80 V; maximum values.

(2) V_R = 80 V; typical values.

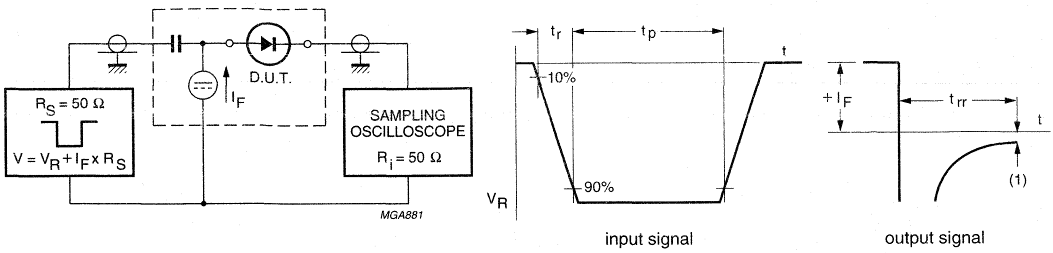
(3) V_R = 25 V; typical values.

Fig.4 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

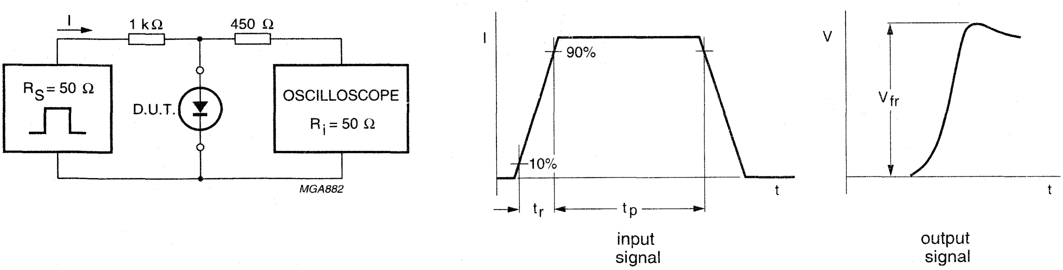


Fig.7 Forward recovery voltage test circuit and waveforms.

High-speed double diode — 1PS301

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

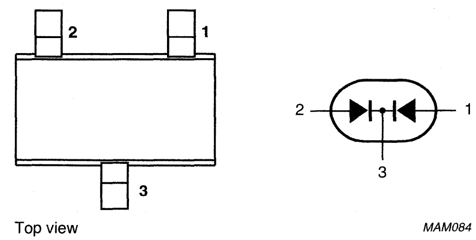
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS301 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in the very small rectangular plastic SMD SC70-3 package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode



Marking code: B3.

Fig.1 Simplified outline (SC70-3) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	250	mA
		double diode loaded; see Fig.2; note 1	–	160	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge			
		t = 1 µs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	300	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.7	–	1.75	V

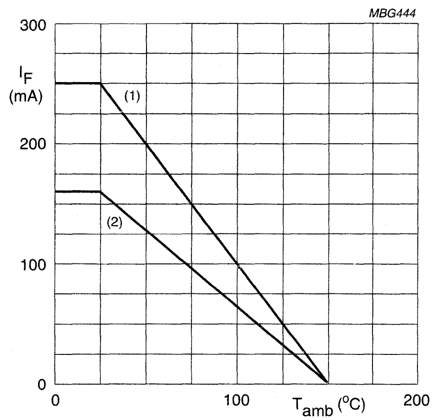
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point		200	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	415	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA

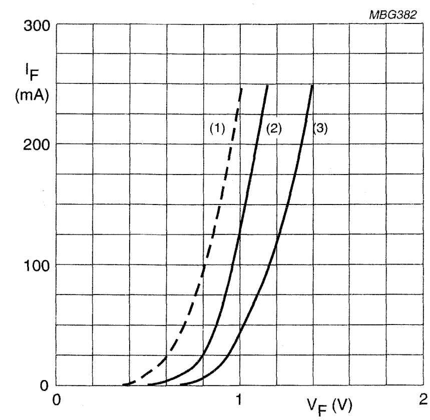


Device mounted on an FR4 printed-circuit board.

(1) Single diode loaded.

(2) Double diode loaded.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.

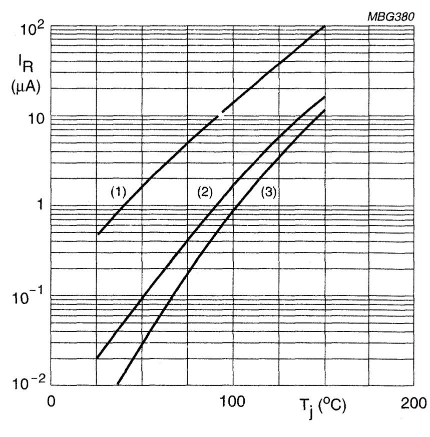


(1) T_j = 150 °C; typical values.

(2) T_j = 25 °C; typical values.

(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.

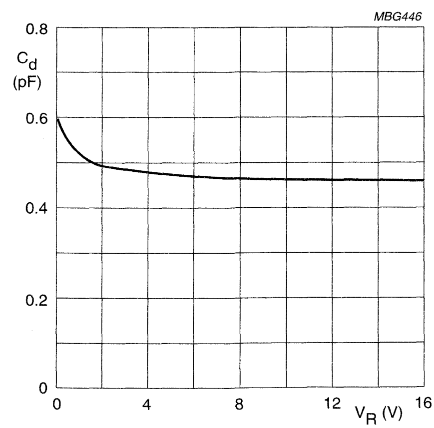


(1) V_R = 80 V; maximum values.

(2) V_R = 80 V; typical values.

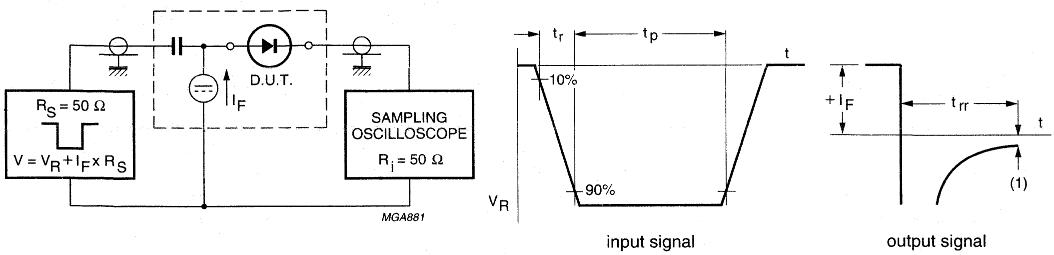
(3) V_R = 25 V; typical values.

Fig.4 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

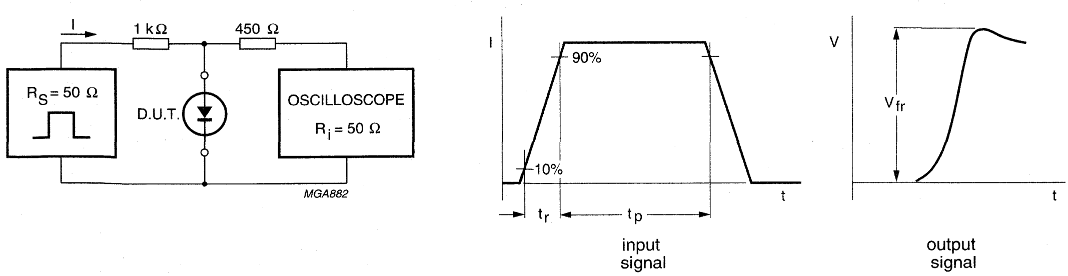


Fig.7 Forward recovery voltage test circuit and waveforms.

High-speed double diode 1PS302

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

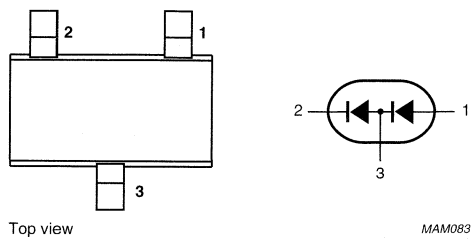
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The 1PS302 consists of two high-speed switching diodes connected in series, fabricated in planar technology, and encapsulated in the very small rectangular plastic SMD SC70-3 package.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	common connection



Marking code: C3.

Fig.1 Simplified outline (SC70-3) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	200	mA
		double diode loaded; see Fig.2; note 1	–	170	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge			
		t = 1 µs	–	4	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	300	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	610	–	mV
		I_F = 10 mA	740	–	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	–	1.2	V
I_R	reverse current	see Fig.4			
		V_R = 25 V	–	30	nA
		V_R = 80 V	–	0.5	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 80 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.5	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.7	–	1.75	V

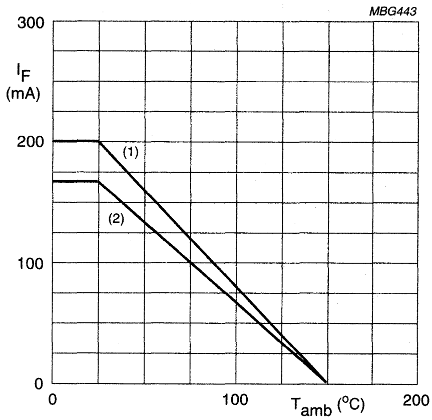
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		200	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	415	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA

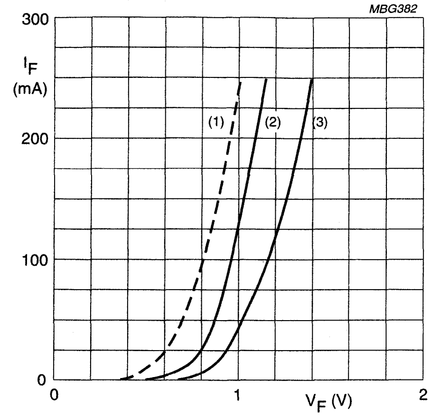


Device mounted on an FR4 printed-circuit board.

(1) Single diode loaded.

(2) Double diode loaded.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.

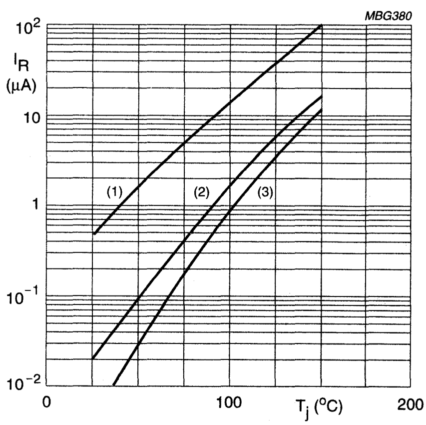


(1) T_j = 150 °C; typical values.

(2) T_j = 25 °C; typical values.

(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.

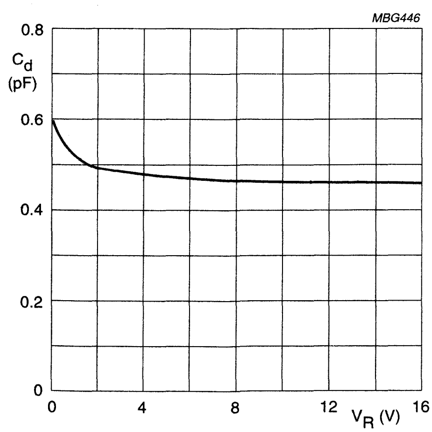


(1) V_R = 80 V; maximum values.

(2) V_R = 80 V; typical values.

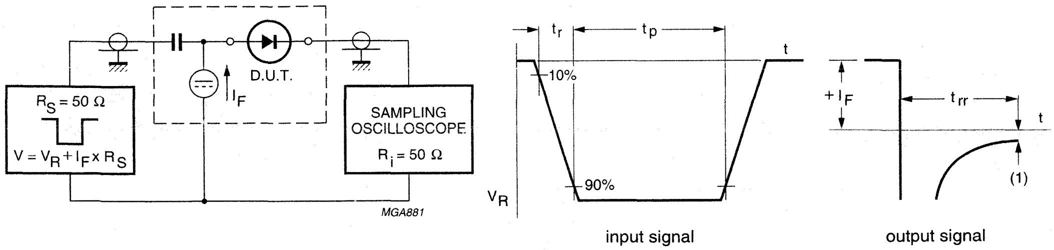
(3) V_R = 25 V; typical values.

Fig.4 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.

Fig.6 Reverse recovery voltage test circuit and waveforms.

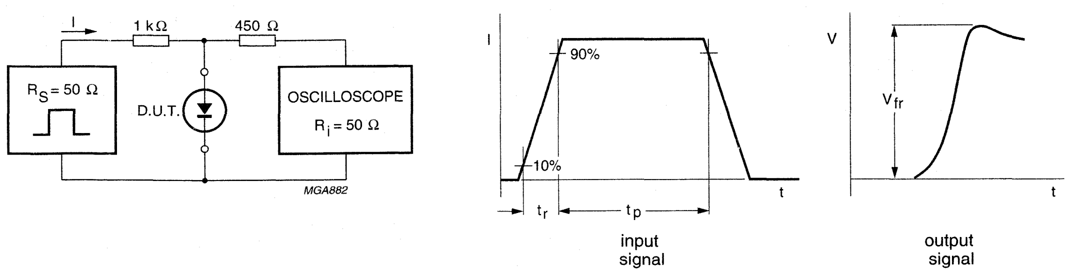


Fig.7 Forward recovery voltage test circuit and waveforms.

High-speed diode BA220

FEATURES

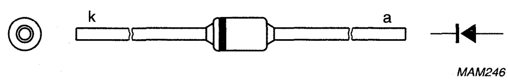
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: max. 10 V
- Repetitive peak reverse voltage: max. 10 V
- Repetitive peak forward current: max. 400 mA.

APPLICATIONS

- High-speed switching.

DESCRIPTION

The BA220 is a high-speed switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	10	V
V_R	continuous reverse voltage		–	10	V
I_F	continuous forward current	see Fig.2; note 1	–	200	mA
I_{FRM}	repetitive peak forward current		–	400	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	9	A
		t = 100 µs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	350	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

High-speed diode BA220

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 0.1 mA	460	520	mV
		I_F = 1 mA	560	620	mV
		I_F = 5 mA	640	700	mV
		I_F = 10 mA	680	750	mV
		I_F = 100 mA	825	950	mV
I_R	reverse current	see Fig.5			
		V_R = 10 V	–	1.5	μA
		V_R = 10 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 400 mA; t_r = 30 ns; see Fig.8	–	2.0	V

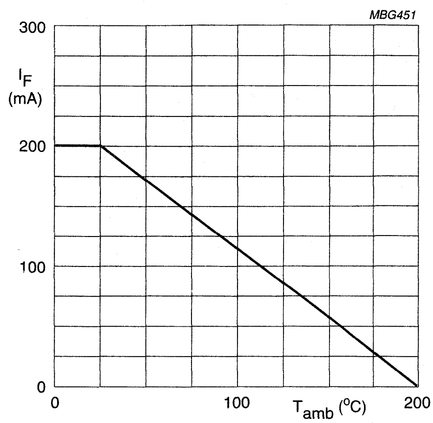
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

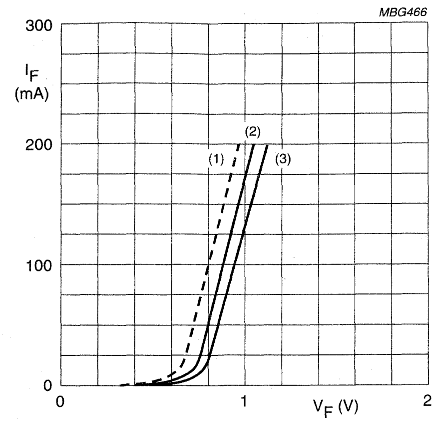
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



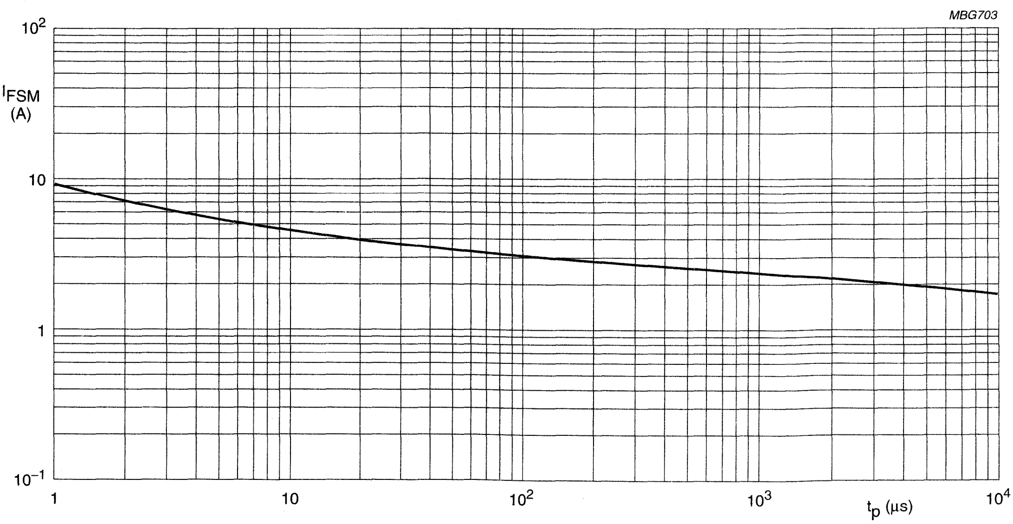
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



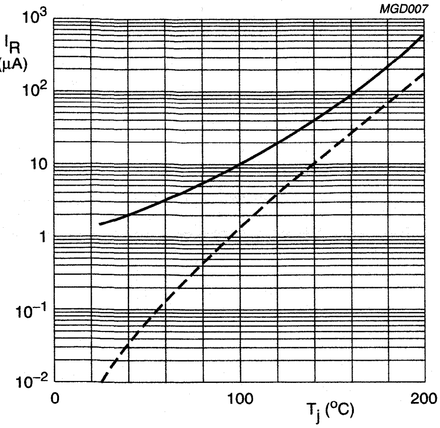
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



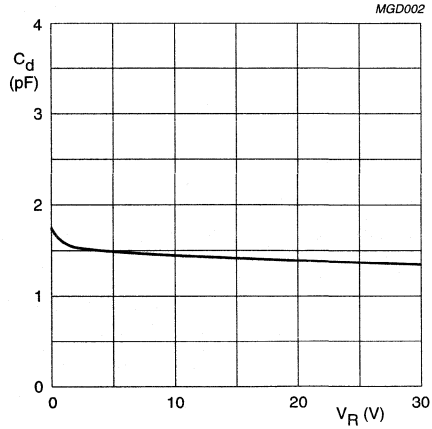
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



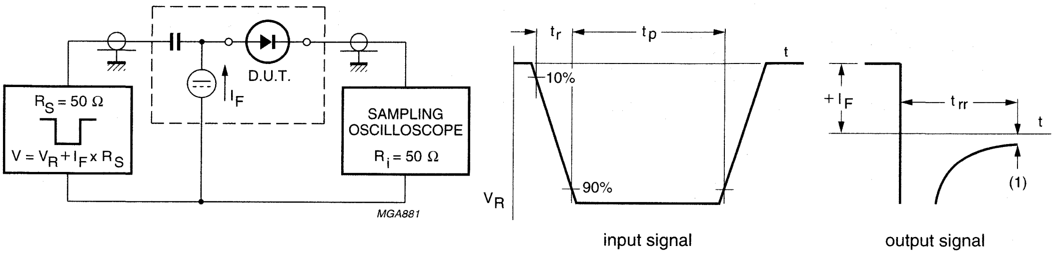
V_R = 10 V.
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

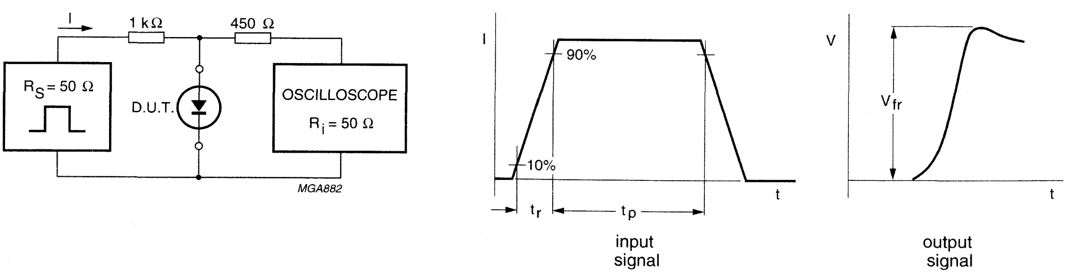


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode BA221

FEATURES

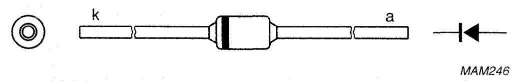
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: max. 30 V
- Repetitive peak reverse voltage: max. 30 V
- Repetitive peak forward current: max. 400 mA.

APPLICATIONS

- High-speed switching.

DESCRIPTION

The BA221 is a high-speed switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	30	V
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current	see Fig.2; note 1	–	200	mA
I_{FRM}	repetitive peak forward current		–	400	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	350	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	625	mV
		I_F = 100 mA	–	950	mV
		I_F = 200 mA	–	1050	mV
I_R	reverse current	see Fig.5			
		V_R = 10 V	–	25	nA
		V_R = 30 V	–	200	nA
		V_R = 10 V; T_j = 150 °C	–	50	μA
		V_R = 30 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 400 mA; t_r = 30 ns; see Fig.8	–	2.0	V

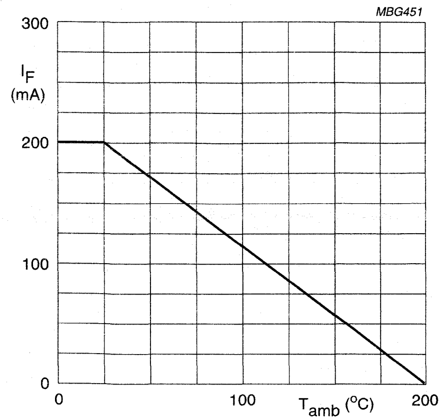
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

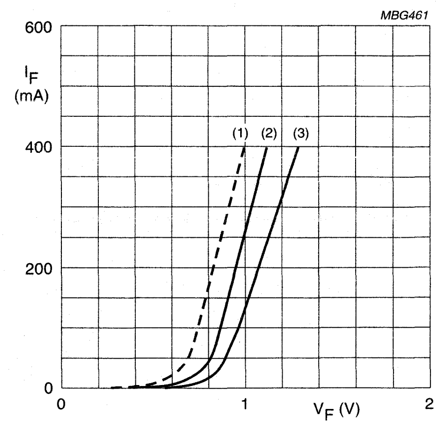
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



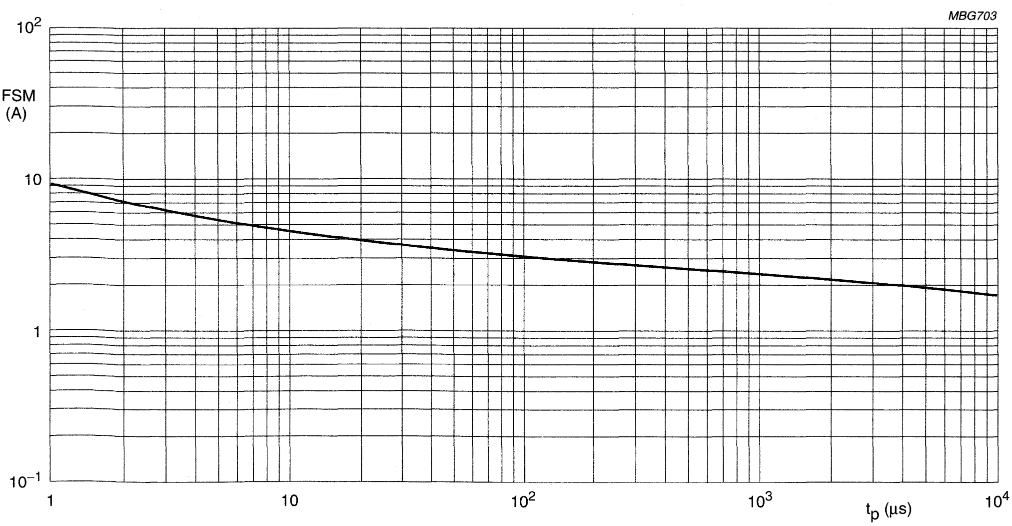
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



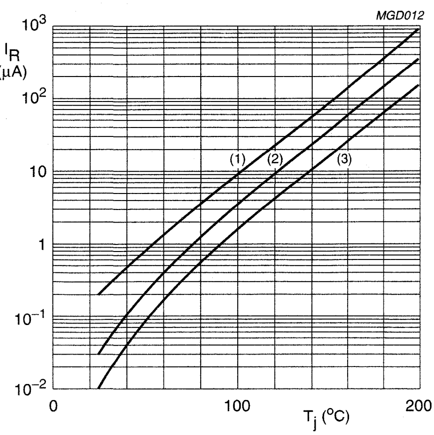
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



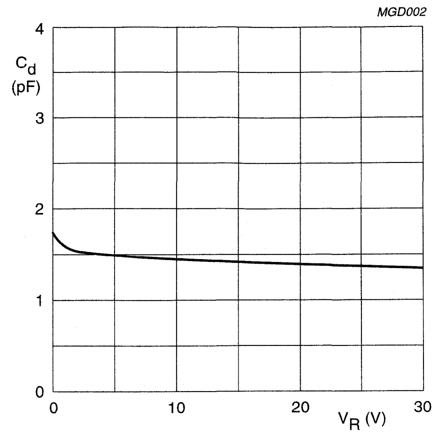
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



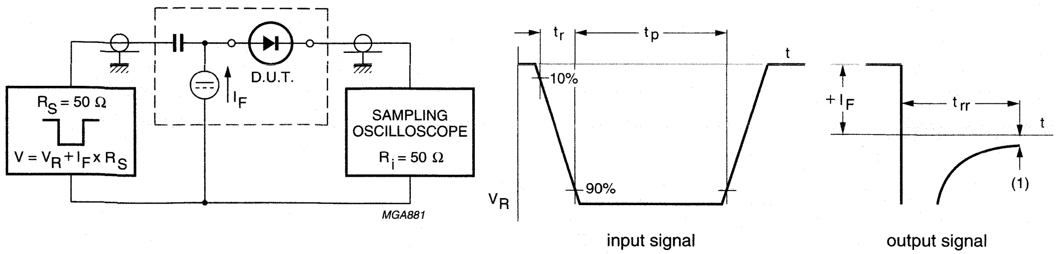
(1) V_R = 30 V; maximum values.
(2) V_R = 30 V; typical values.
(3) V_R = 10 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

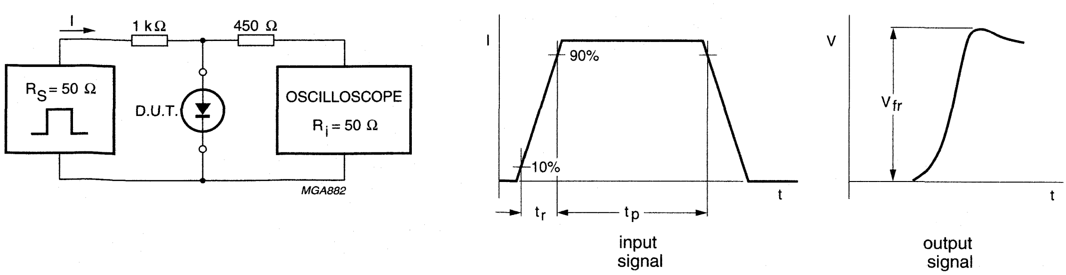


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diodes BA316; BA317; BA318

FEATURES

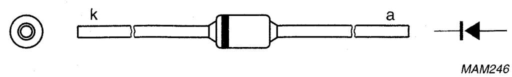
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: 10 V, 30 V, 50 V
- Repetitive peak reverse voltage: max. 15 V, 40 V, 60 V
- Repetitive peak forward current: max. 225 mA.

APPLICATIONS

- High-speed switching.

DESCRIPTION

The BA316, BA317, BA318 are high-speed switching diodes fabricated in planar technology, and encapsulated in hermetically sealed leaded glass SOD27 (DO-35) packages.



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–		
	BA316		–	15	V
	BA317		–	40	V
	BA318		–	60	V
V_R	continuous reverse voltage				
	BA316		–	10	V
	BA317		–	30	V
	BA318		–	50	V
I_F	continuous forward current	see Fig.2; note 1	–	100	mA
I_{FRM}	repetitive peak forward current		–	225	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	350	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	700	mV
		I_F = 10 mA	–	850	mV
		I_F = 100 mA	–	1100	mV
I_R	reverse current	see Fig.5			
	BA316	V_R = 10 V	–	200	nA
		V_R = 10 V; T_j = 150 °C	–	100	μA
	BA317	V_R = 10 V	–	50	nA
		V_R = 30 V	–	200	nA
		V_R = 30 V; T_j = 150 °C	–	100	μA
	BA318	V_R = 30 V	–	50	nA
		V_R = 50 V	–	200	nA
		V_R = 50 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 50 mA; t_r = 20 ns; see Fig.8	–	2.5	V

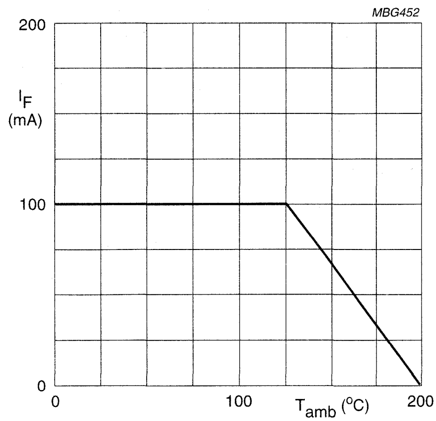
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

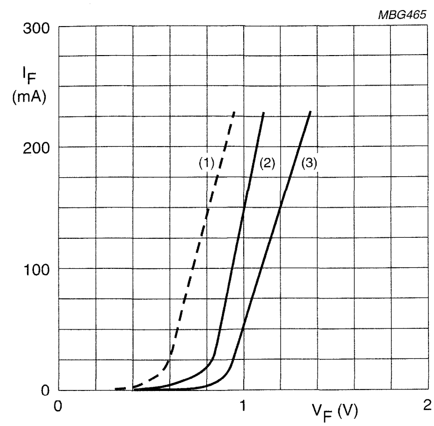
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



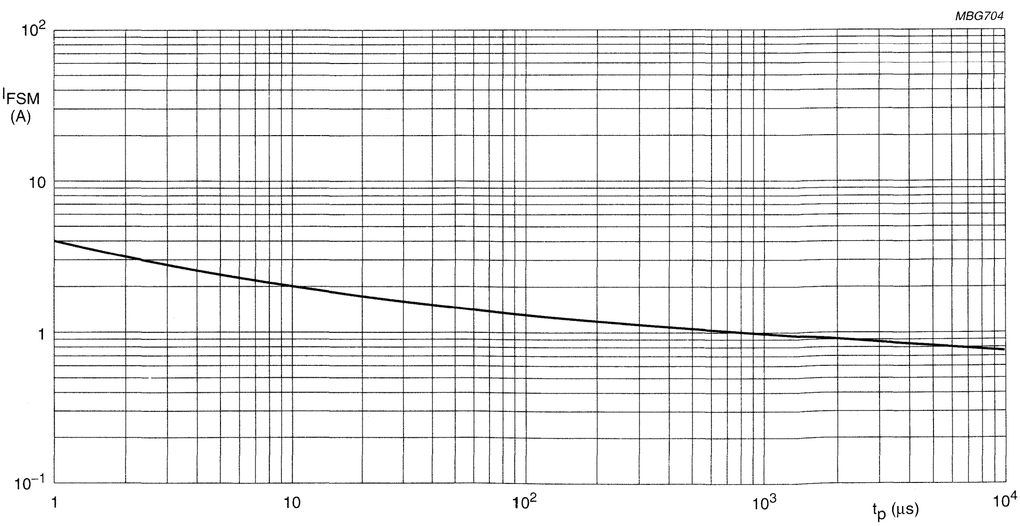
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



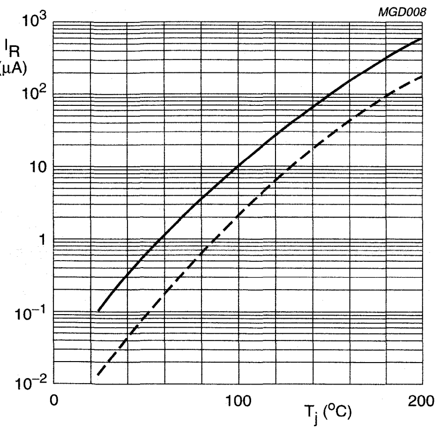
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



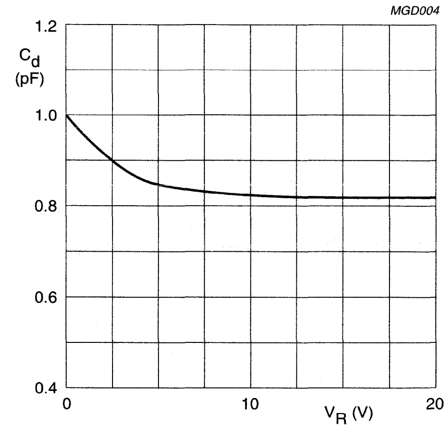
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



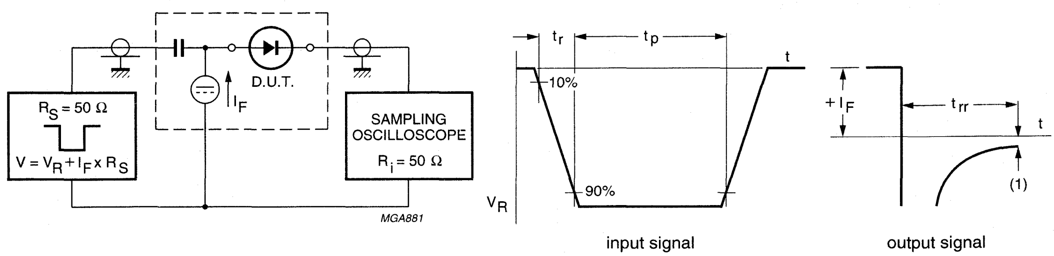
$V_R = V_{Rmax}$.
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

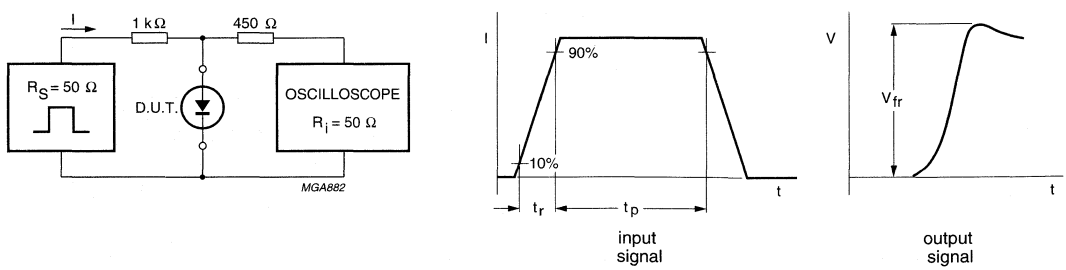


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode | BAL74

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 50 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

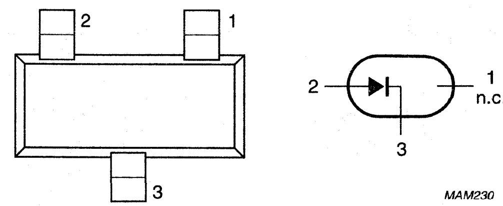
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAL74 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	not connected
2	anode
3	cathode



Marking code: JCp.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	50	V
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

High-speed diode BAL74

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 50 V	–	0.1	μA
		V_R = 50 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

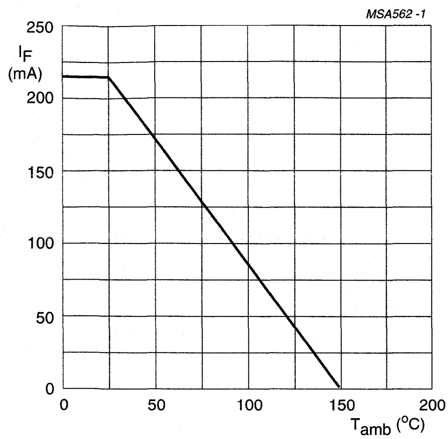
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

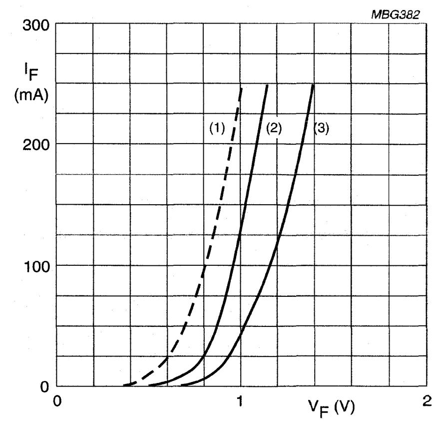
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



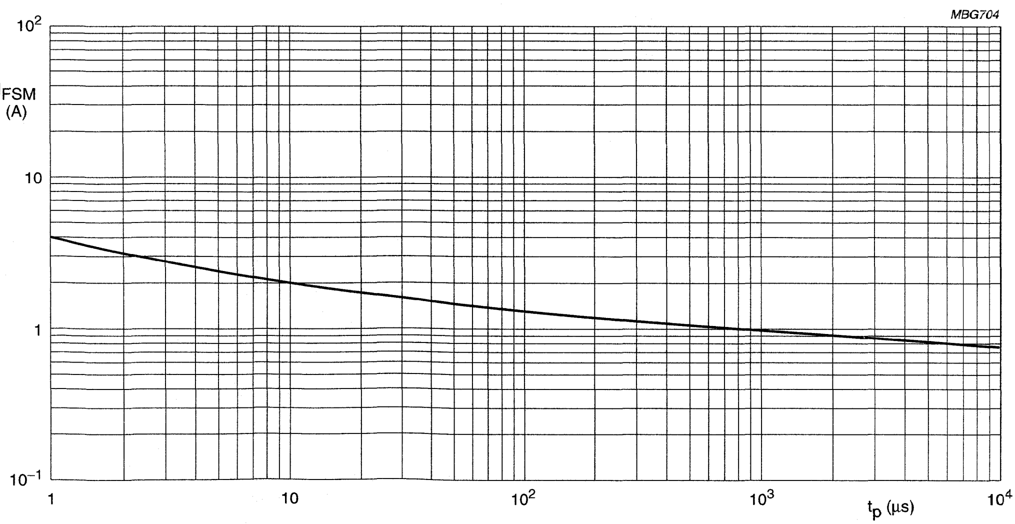
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



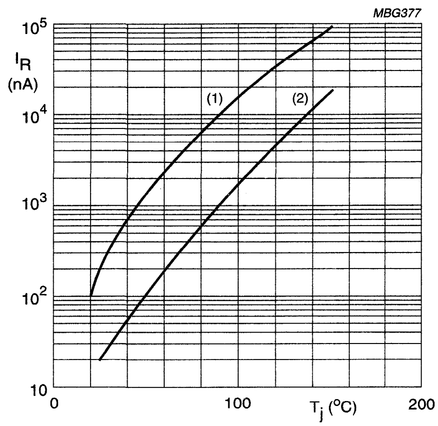
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



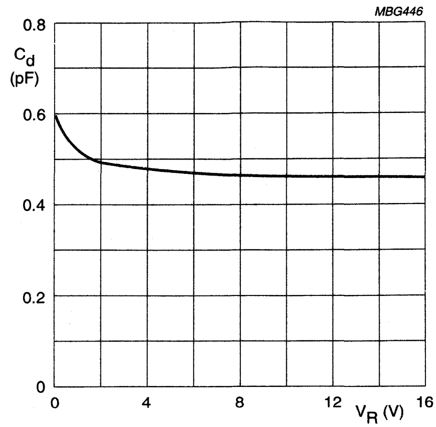
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



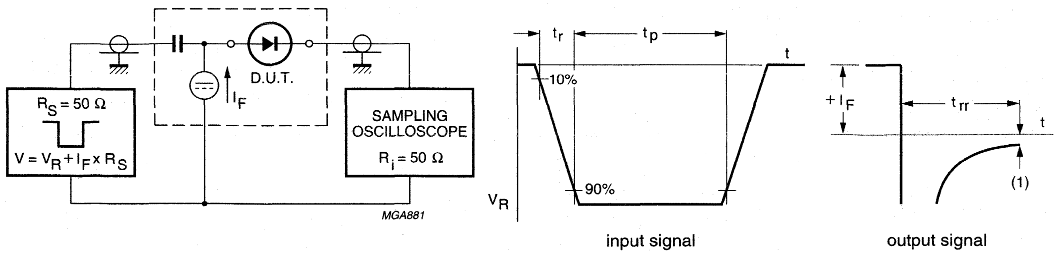
(1) V_R = 50 V; maximum values.
(2) V_R = 50 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

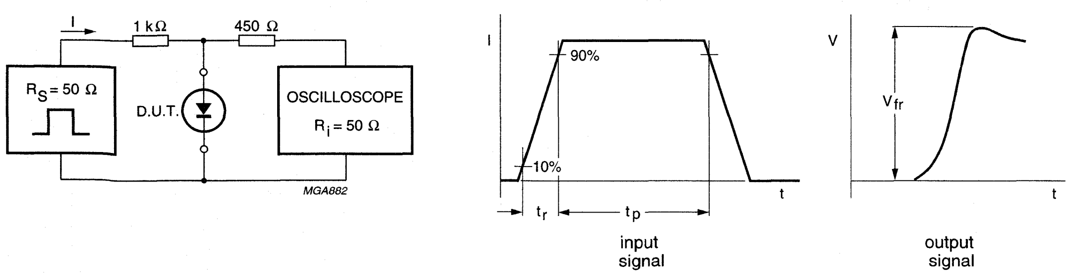


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode

BAL74W

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

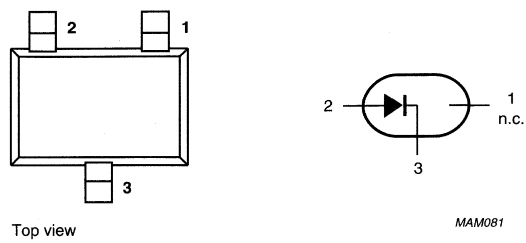
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAL74W is a high-speed switching diode fabricated in planar technology, and encapsulated in the very small plastic SMD SOT323 package.

PINNING

PIN	DESCRIPTION
1	not connected
2	anode
3	cathode



Marking code: JC.

Fig.1 Simplified outline (SOT323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	175	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	µA
		V_R = 25 V; T_j = 150 °C	–	30	µA
		V_R = 75 V; T_j = 150 °C	–	50	µA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

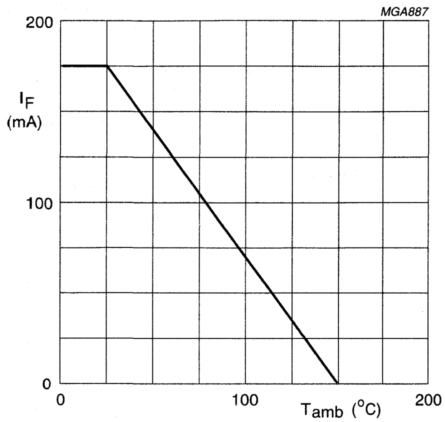
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

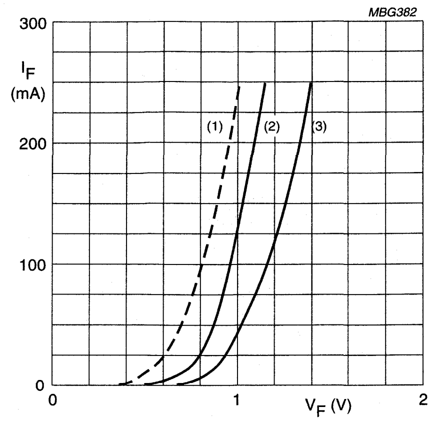
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



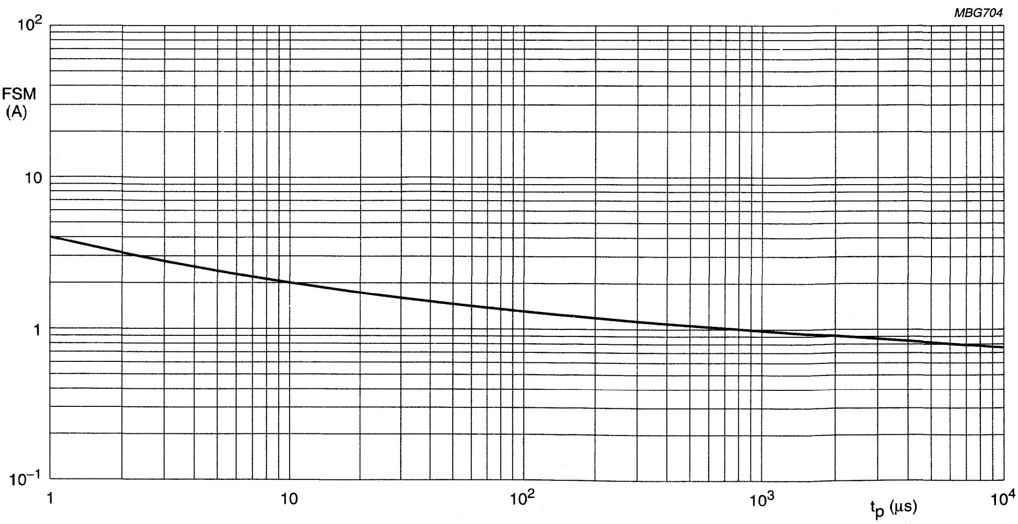
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) $T_j = 150$ °C; typical values.
(2) $T_j = 25$ °C; typical values.
(3) $T_j = 25$ °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
$T_j = 25$ °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

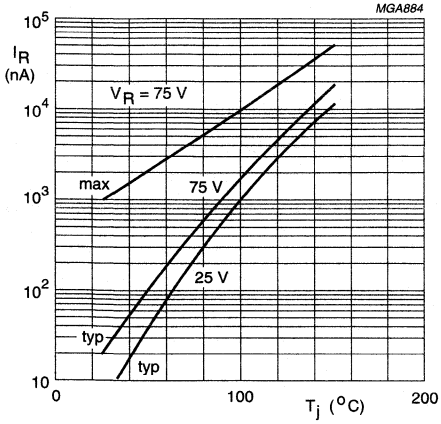
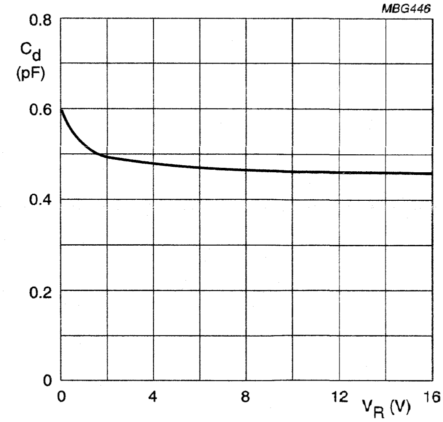
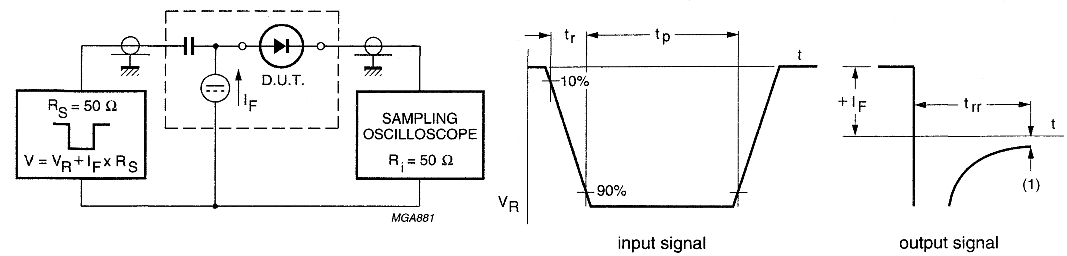


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

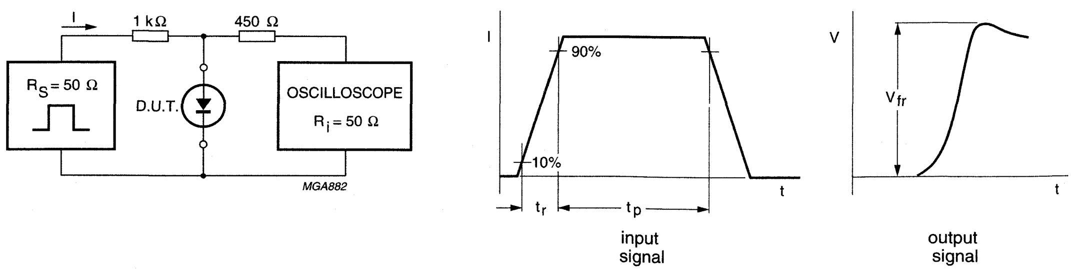


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode — BAL99

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 70 V
- Repetitive peak forward current: max. 500 mA .

APPLICATIONS

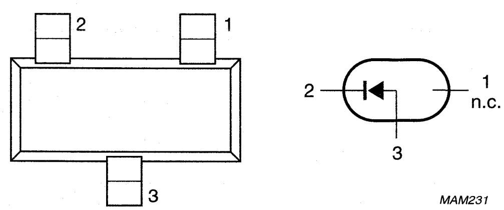
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAL99 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	not connected
2	cathode
3	anode



Marking code: JFp.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	70	V
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 70 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 70 V; T_j = 150 °C;	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

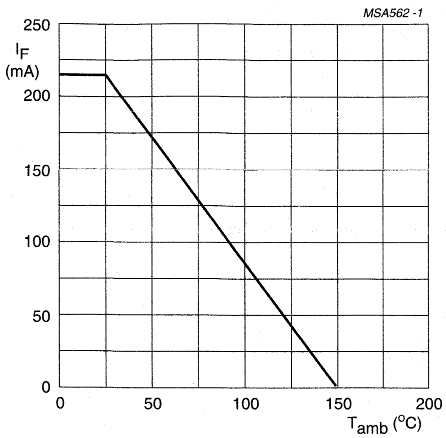
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

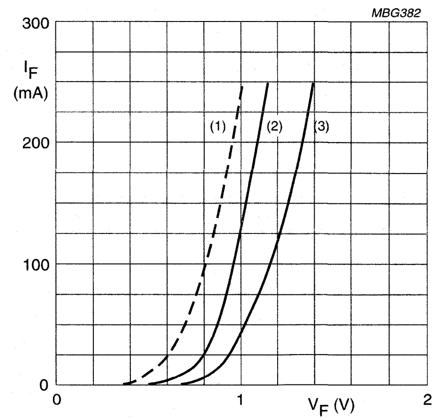
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



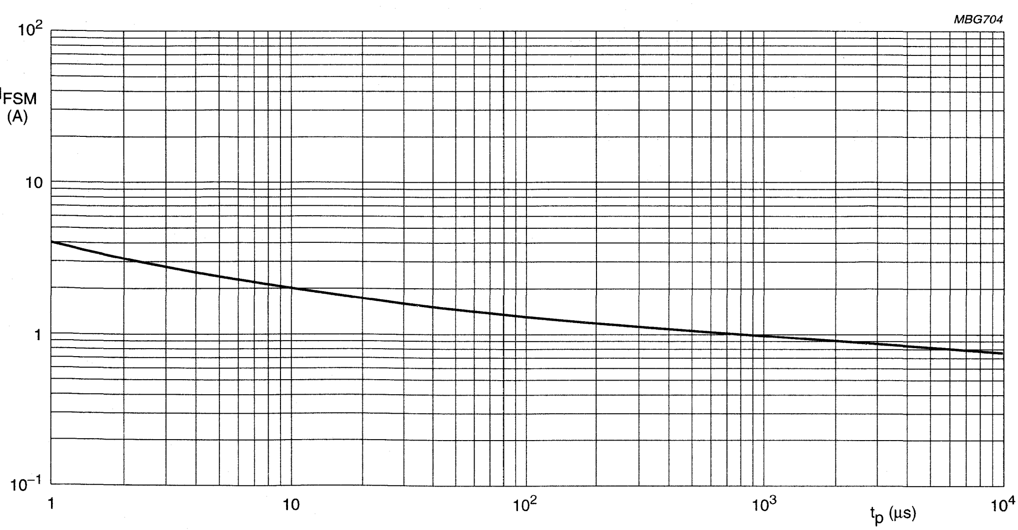
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



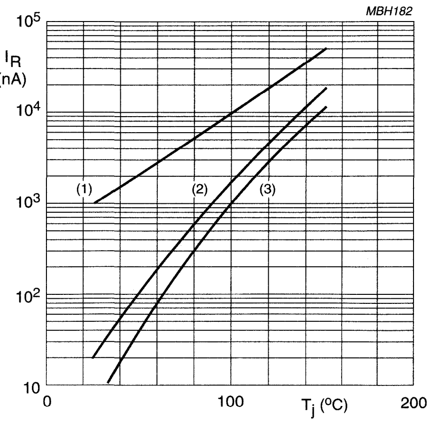
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



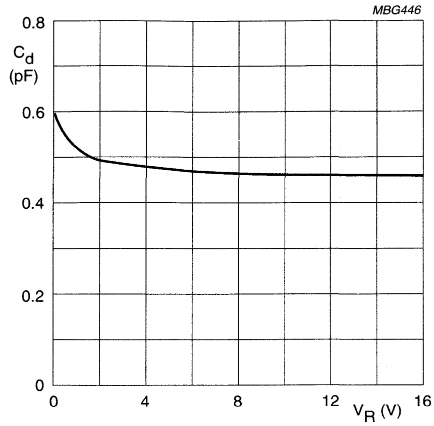
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



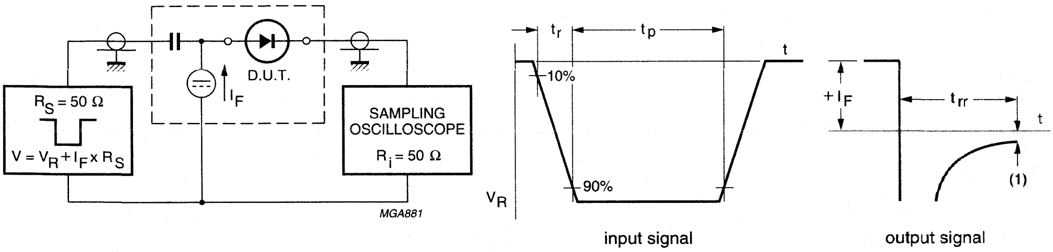
(1) V_R = 70 V; maximum values.
(2) V_R = 70 V; typical values.
(3) V_R = 25 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

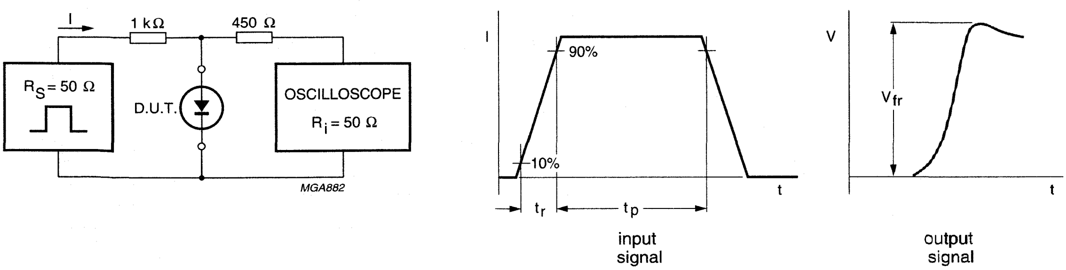


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode BAL99W

FEATURES

- Very small plastic SMD envelope
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

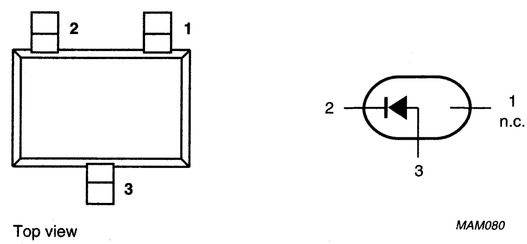
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAL99W is a high-speed switching diode fabricated in planar technology, and encapsulated in the very small plastic SMD SOT323 package.

PINNING

PIN	DESCRIPTION
1	not connected
2	cathode
3	anode



Marking code: JF.

Fig.1 Simplified outline (SOT323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	150	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

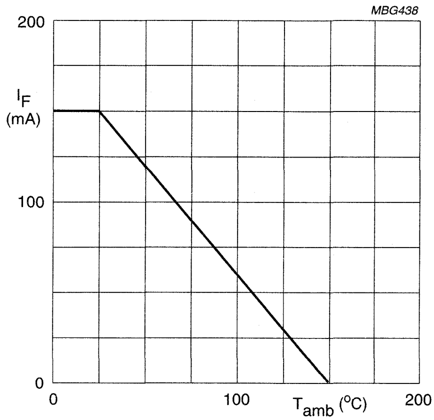
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

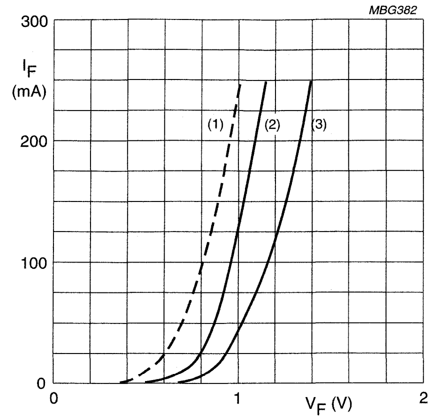
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



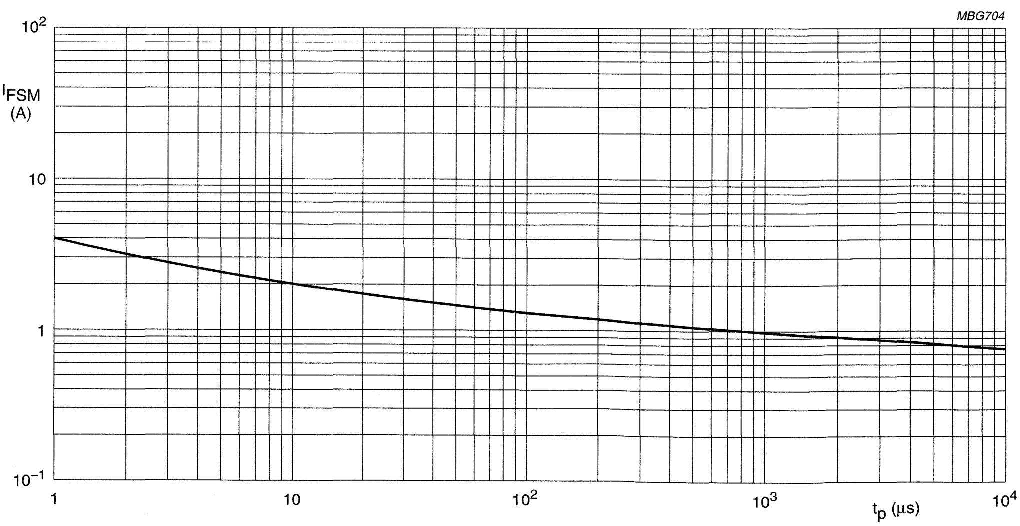
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

High-speed diode

BAL99W

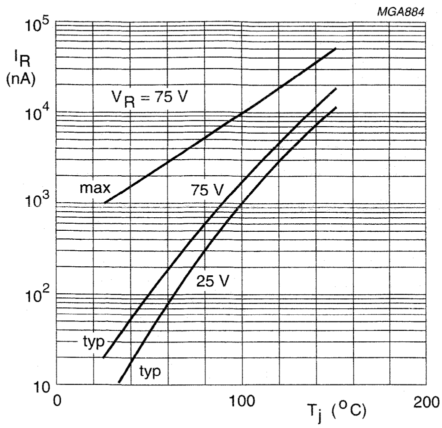
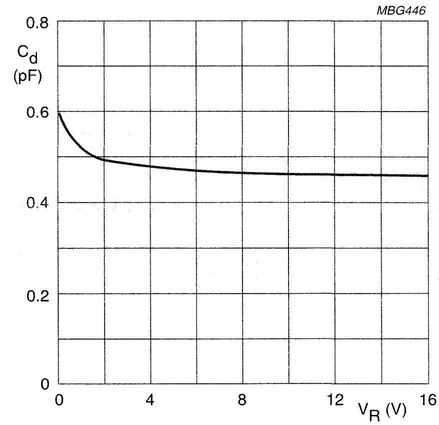
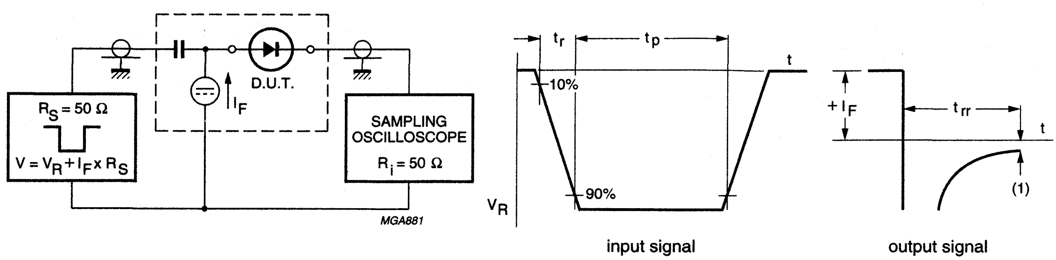


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

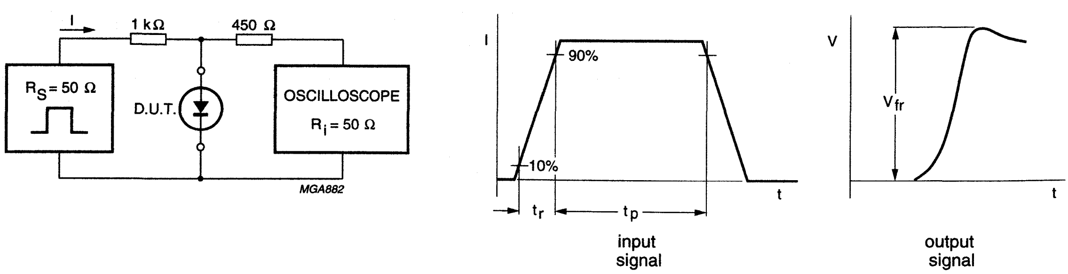


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode BAS15

FEATURES

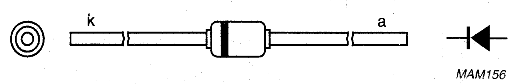
- Hermetically sealed leaded glass SOD68 (DO-34) package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 50 V
- Repetitive peak forward current: max. 225 mA.

APPLICATIONS

- High-speed switching
- Protection diodes in reed relays.

DESCRIPTION

The BAS15 is a high-speed switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD68 (DO-34) package.



The diode is type branded.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	50	V
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current	see Fig.2; note 1	–	100	mA
I_{FRM}	repetitive peak forward current		–	225	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	350	mW
T_{stg}	storage temperature		−65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	700	mV
		I_F = 10 mA	–	850	mV
		I_F = 100 mA	–	1.1	V
I_R	reverse current	see Fig.5			
		V_R = 30 V	–	50	nA
		V_R = 50 V	–	200	nA
		V_R = 30 V; T_j = 150 °C	–	75	μA
		V_R = 50 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 50 mA; t_r = 20 ns; see Fig.8	–	2.5	V

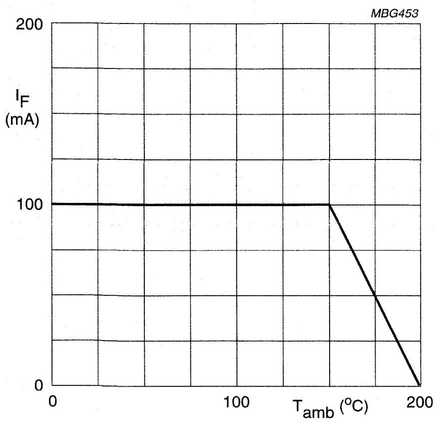
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

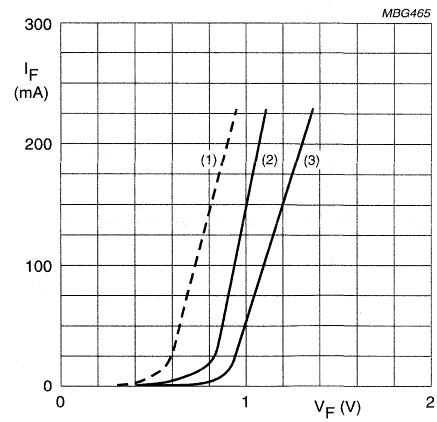
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



Device mounted on a FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.

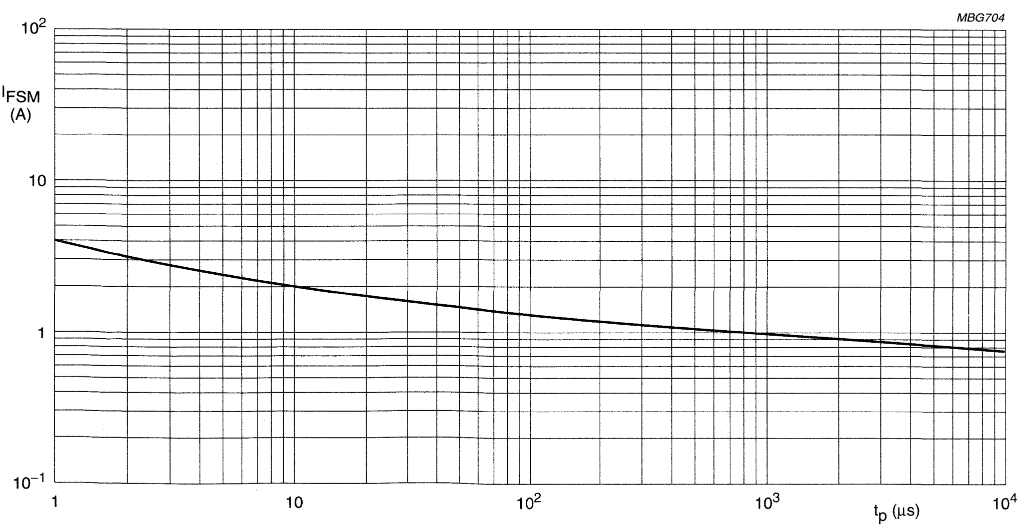


(1) T_j = 175 °C; typical values.

(2) T_j = 25 °C; typical values.

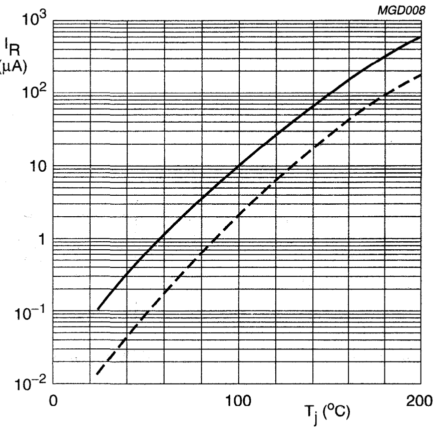
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



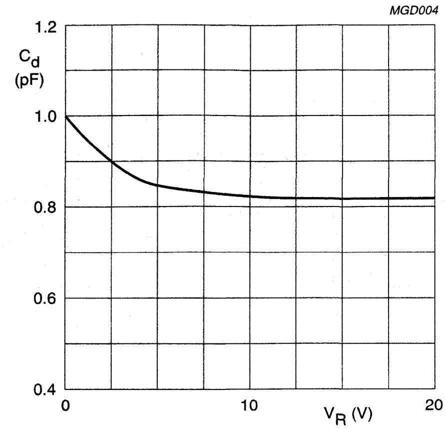
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



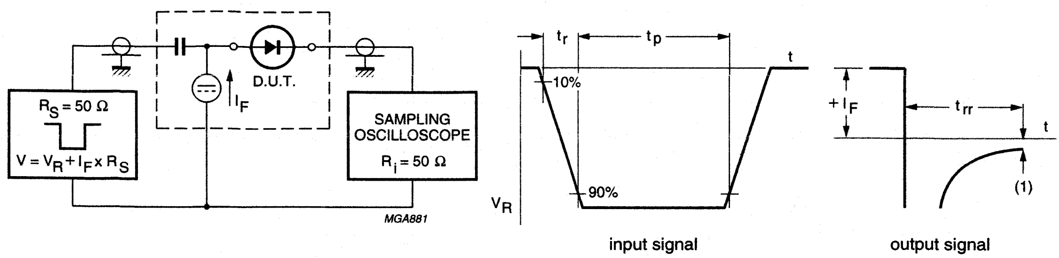
V_R = 50 V.
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

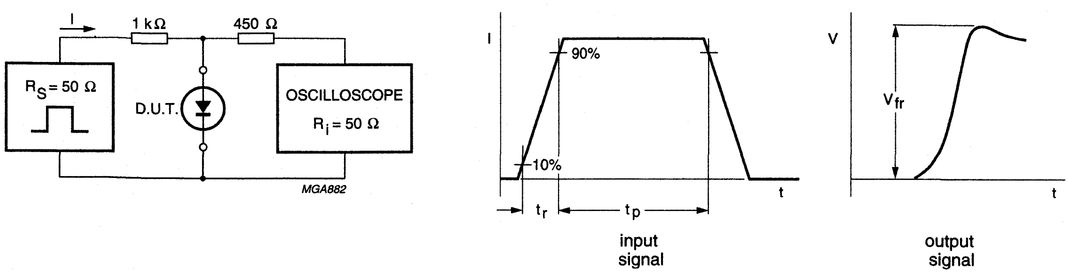


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode — BAS16

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

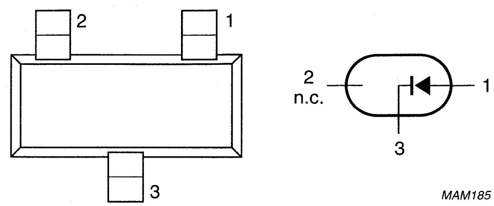
- High-speed switching in hybrid thick and thin-film circuits.d

DESCRIPTION

The BAS16 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: A6p.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

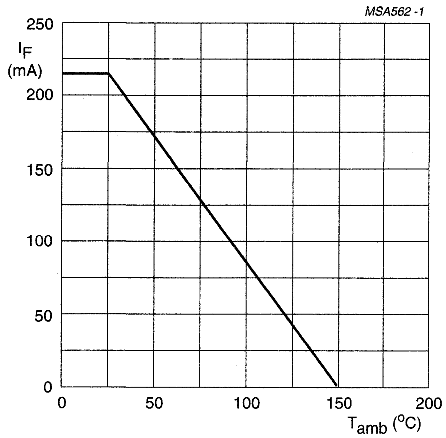
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

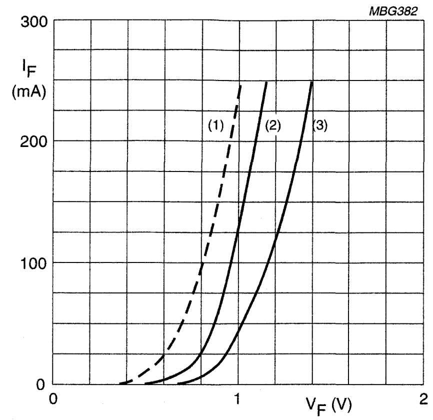
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



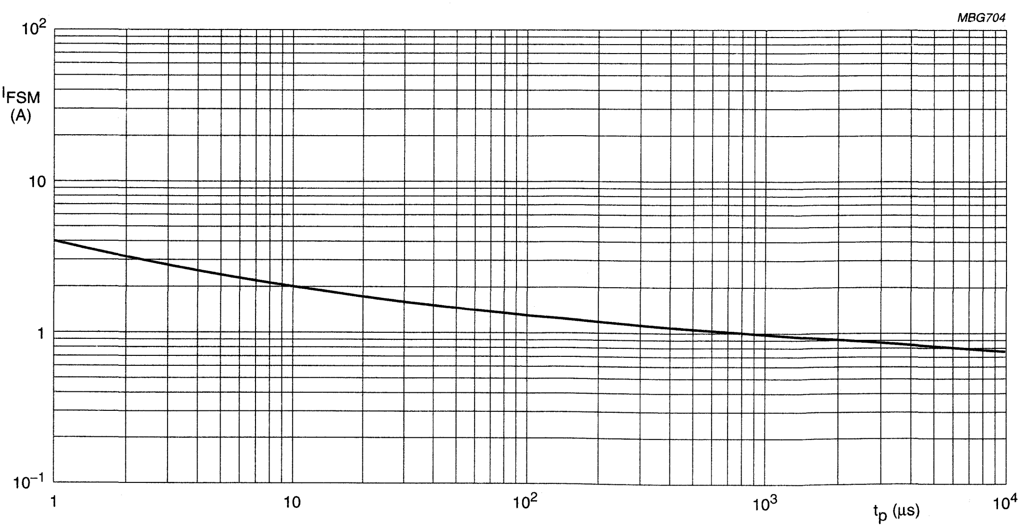
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

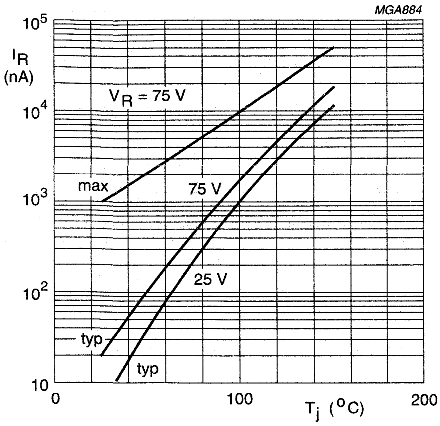
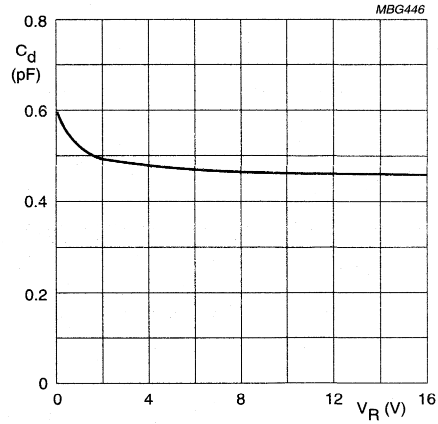
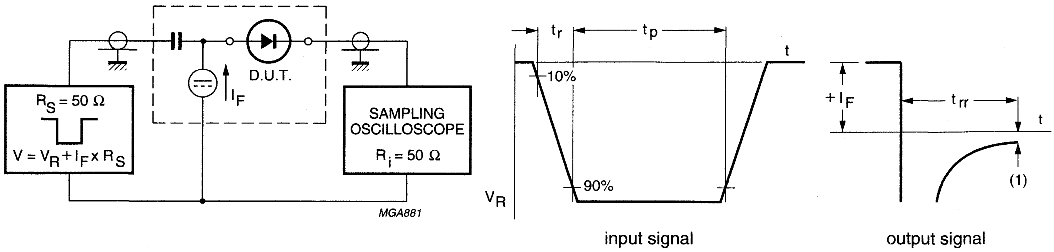


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

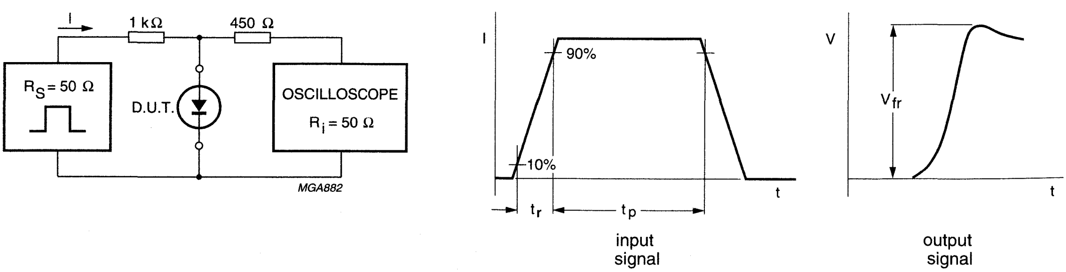


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode BAS16W

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

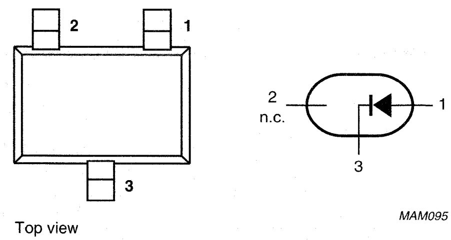
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAS16W is a high-speed switching diode fabricated in planar technology, and encapsulated in the very small plastic SMD SOT323 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: A6.

Fig.1 Simplified outline (SOT323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	175	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	200	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C;	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

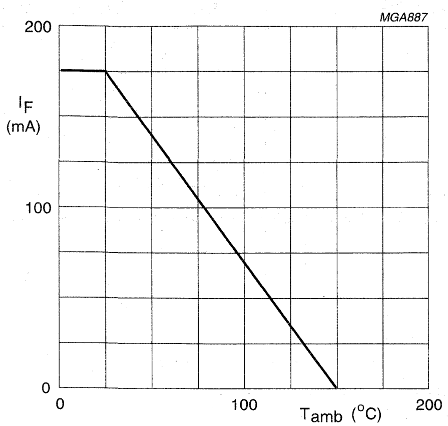
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

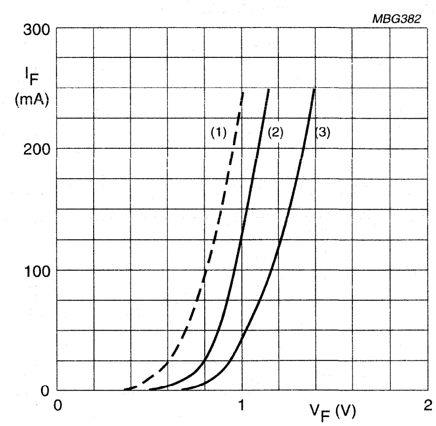
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



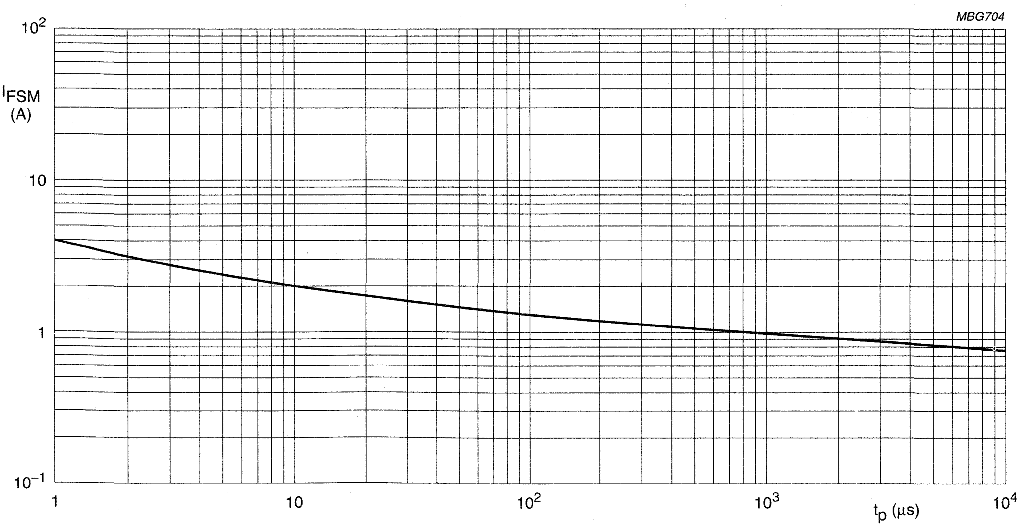
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

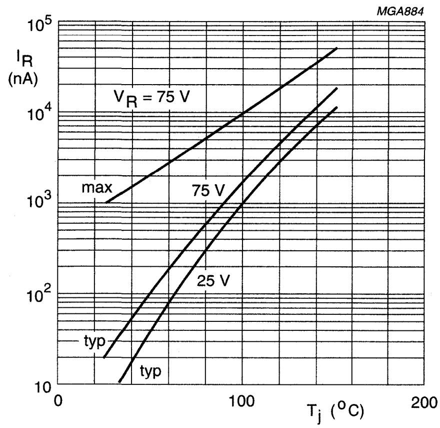
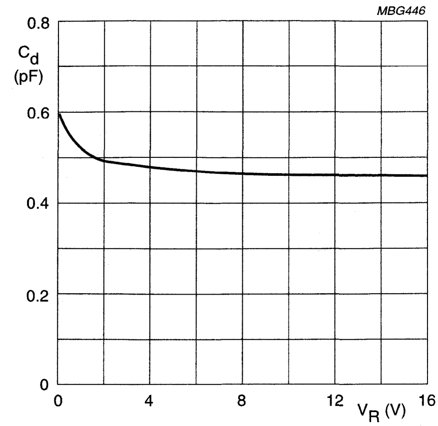
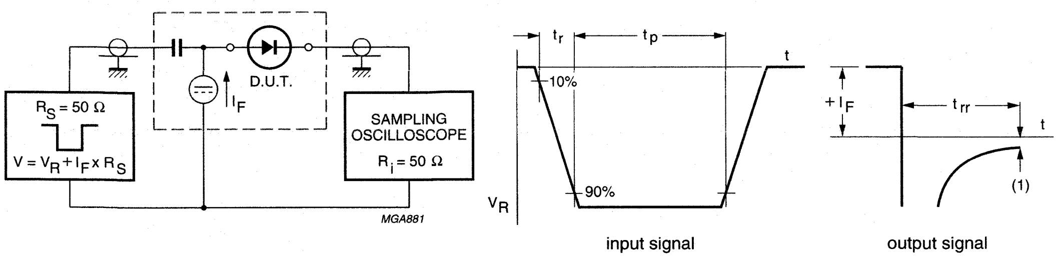


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

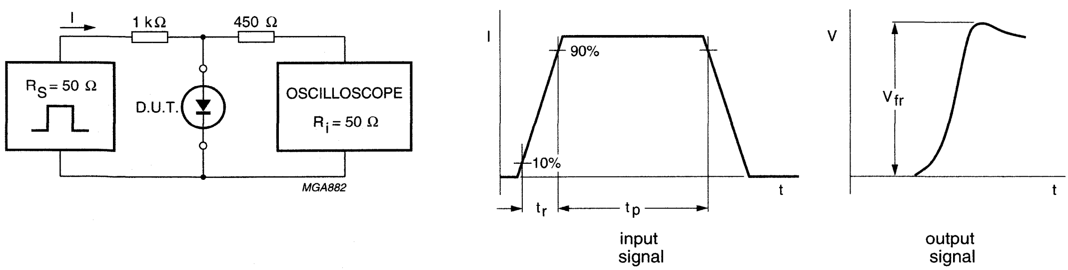


Fig.8 Forward recovery voltage test circuit and waveforms.

General purpose diodes BAS19; BAS20; BAS21

FEATURES

- Small plastic SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 100; 150; 200 V
- Repetitive peak reverse voltage: max. 120; 200; 250 V
- Repetitive peak forward current: max. 625 mA.

APPLICATIONS

- General purpose switching in e.g. surface mounted circuits.

DESCRIPTION

The BAS19, BAS20, BAS21 are general purpose diodes fabricated in planar technology, and encapsulated in small plastic SMD SOT23 packages.

MARKING

TYPE NUMBER	MARKING CODE
BAS19	JPp
BAS20	JRp
BAS21	JSp

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode

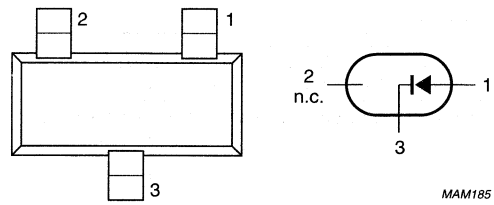


Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BAS19		–	120	V
	BAS20		–	200	V
	BAS21		–	250	V
V_R	continuous reverse voltage				
	BAS19		–	100	V
	BAS20		–	150	V
	BAS21		–	200	V
I_F	continuous forward current	see Fig.2; note 1	–	200	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 10 ms	–	1.7	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 100 mA	–	1.0	V
		I_F = 200 mA	–	1.25	V
I_R	reverse current	see Fig.5			
	BAS19	V_R = 100 V	–	100	nA
		V_R = 100 V; T_j = 150 °C	–	100	μA
	BAS20	V_R = 150 V	–	100	nA
		V_R = 150 V; T_j = 150 °C	–	100	μA
	BAS21	V_R = 200 V	–	100	nA
		V_R = 200 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	5	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.8	–	50	ns

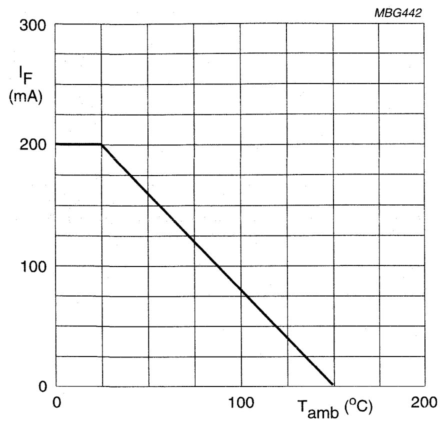
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

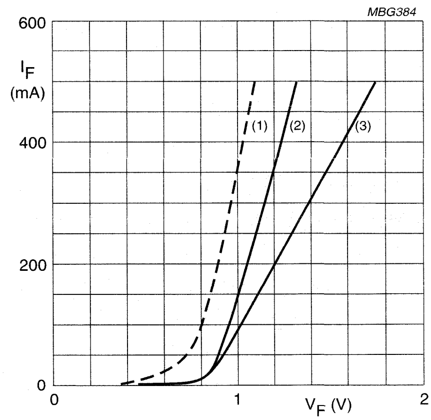
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



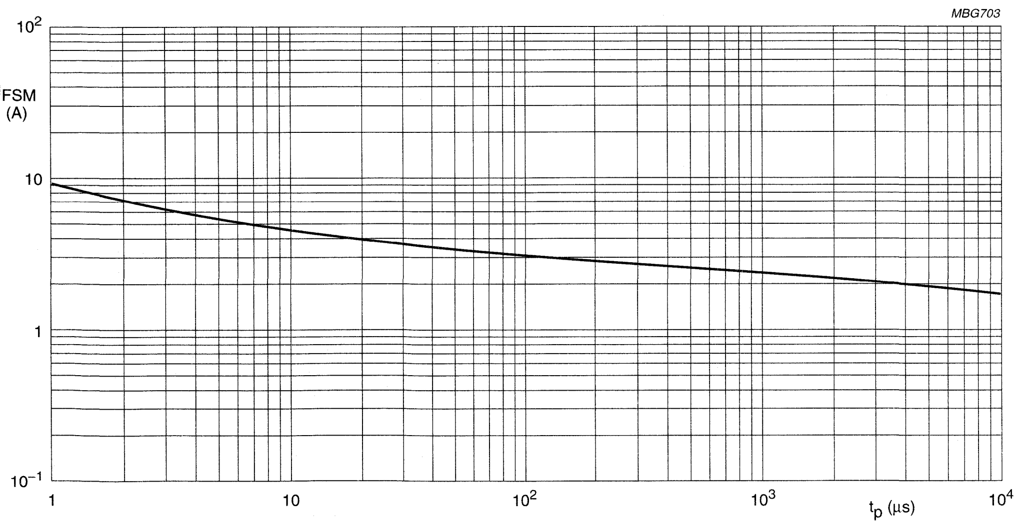
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.

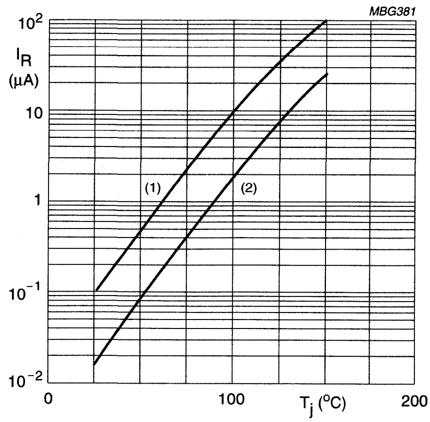


Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

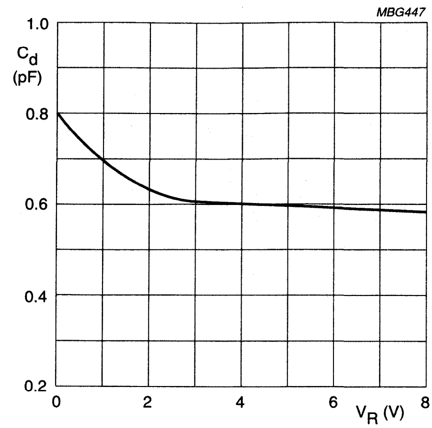
General purpose diodes

BAS19; BAS20; BAS21



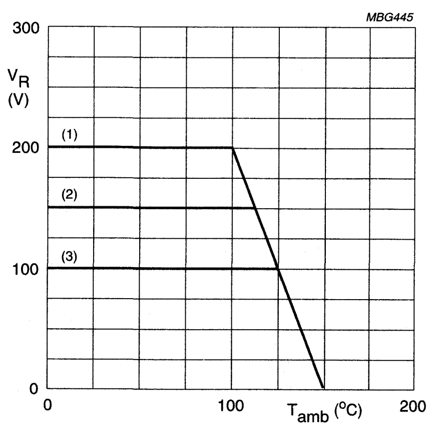
(1) $V_R = V_{Rmax}$; maximum values.
(2) $V_R = V_{Rmax}$; typical values.

Fig.5 Reverse current as a function of junction temperature.



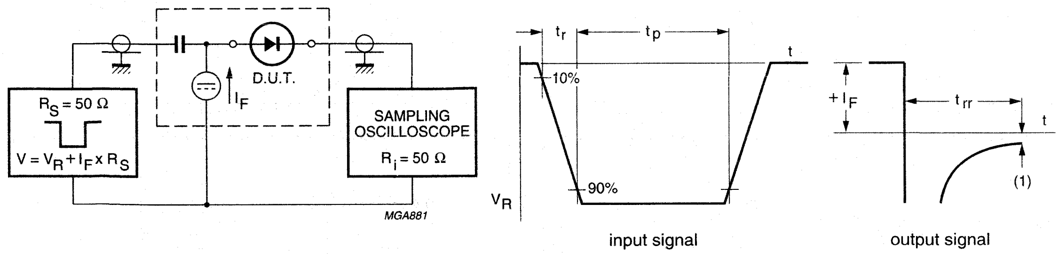
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) BAS21.
(2) BAS20.
(3) BAS19.

Fig.7 Maximum permissible continuous reverse voltage as a function of the ambient temperature.



(1) $I_R = 3$ mA.

Fig.8 Reverse recovery voltage test circuit and waveforms.

High-speed double diode | BAS28

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA .

APPLICATIONS

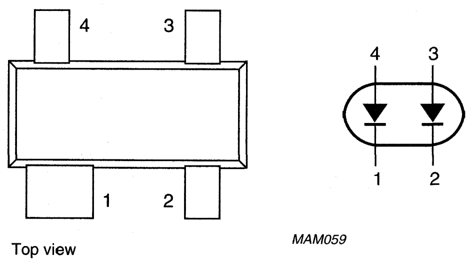
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAS28 consists of two high-speed switching diodes, fabricated in planar technology, and encapsulated in the small plastic SMD SOT143 package. The diodes are not connected.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	anode (a2)
4	anode (a1)



Marking code: JTp.

Fig.1 Simplified outline (SOT143) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

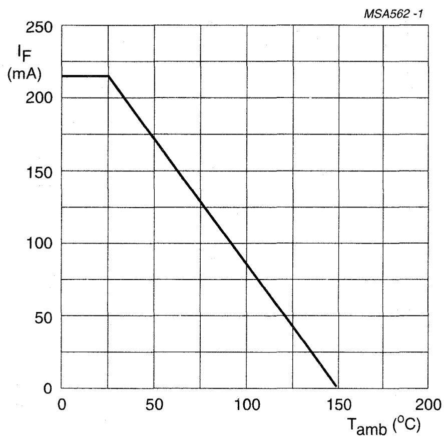
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

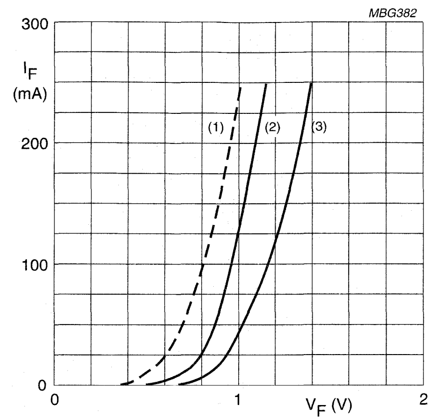
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



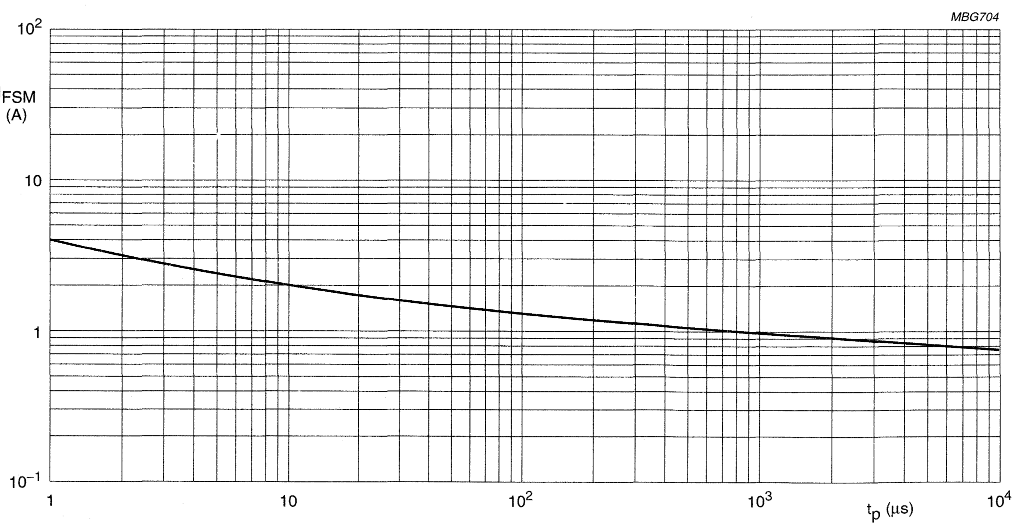
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

High-speed double diode BAS28

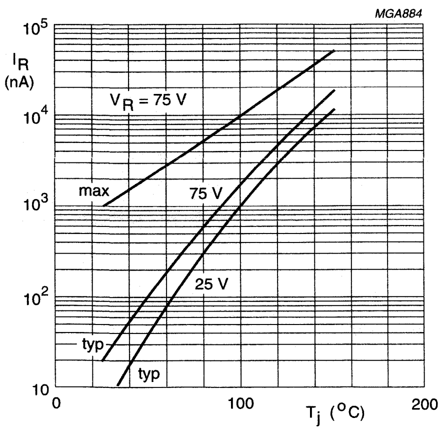
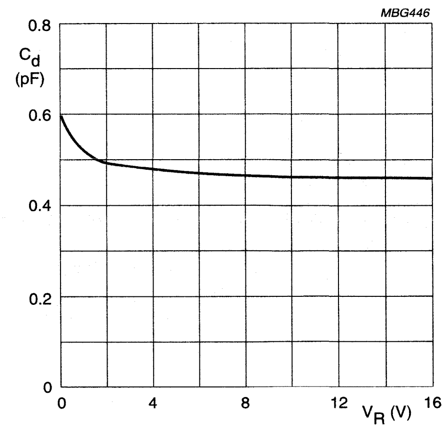
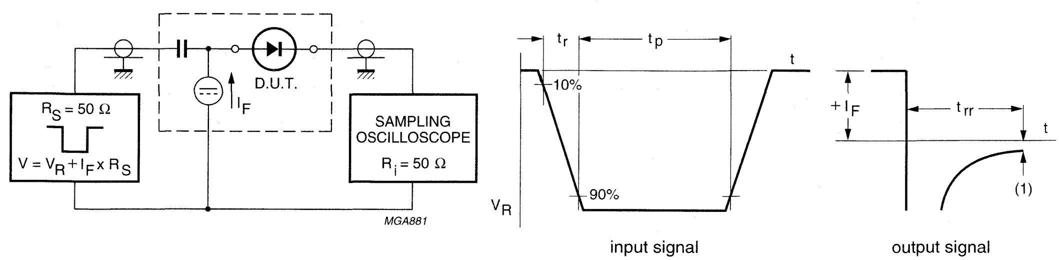


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

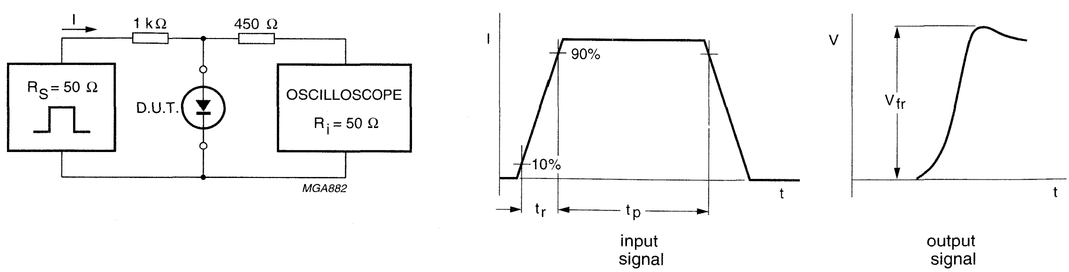


Fig.8 Forward recovery voltage test circuit and waveforms.

General purpose controlled avalanche (double) diodes

BAS29; BAS31; BAS35

FEATURES

- Small plastic SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 90 V
- Repetitive peak reverse voltage: max. 110 V
- Repetitive peak forward current: max. 600 mA
- Repetitive peak reverse current: max. 600 mA.

APPLICATIONS

- General purpose switching in e.g. surface mounted circuits.

DESCRIPTION

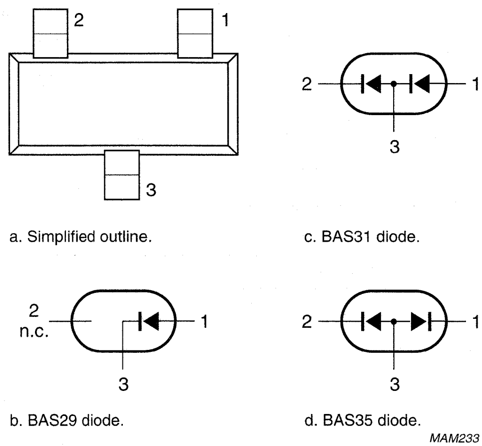
General purpose switching diodes fabricated in planar technology, and encapsulated in small rectangular plastic SMD SOT23 packages.
The BAS29 consists of a single diode.
The BAS31 has two diodes in series.
The BAS35 has two diodes with a common anode.

MARKING

TYPE NUMBER	MARKING CODE
BAS29	L20
BAS31	L21
BAS35	L22

PINNING

PIN	DESCRIPTION		
	BAS29	BAS31	BAS35
1	anode	anode	cathode (k1)
2	not connected	cathode	cathode (k2)
3	cathode	common connection	common anode



a. Simplified outline.

c. BAS31 diode.

b. BAS29 diode.

d. BAS35 diode.

Fig.1 Simplified outline (SOT23) and symbols.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	110	V
V_R	continuous reverse voltage		–	90	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	250	mA
		double diode loaded; see Fig.2; note 1	–	150	mA
I_{FRM}	repetitive peak forward current		–	600	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	10	A
		t = 100 μs	–	4	A
		t = 1 s	–	0.75	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
I_{RRM}	repetitive peak reverse current		–	600	mA
E_{RRM}	repetitive peak reverse energy	$t_p \geq 50$ μs; f ≤ 20 Hz; T_j = 25 °C	–	5.0	mJ
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 10 mA	–	750	mV
		I_F = 50 mA	–	840	mV
		I_F = 100 mA	–	900	mV
		I_F = 200 mA	–	1.0	V
		I_F = 400 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 90 V	–	100	nA
		V_R = 90 V; T_j = 150 °C	–	100	μA
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 1 mA	120	170	V
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	35	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.7	–	50	ns

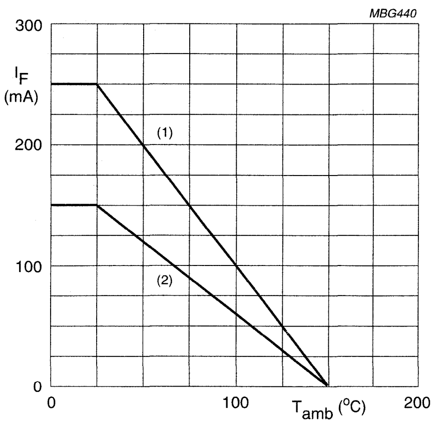
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA

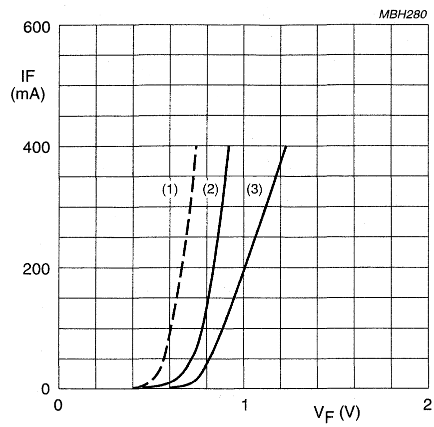


Device mounted on an FR4 printed-circuit board.

(1) Single diode loaded.

(2) Double diode loaded.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.

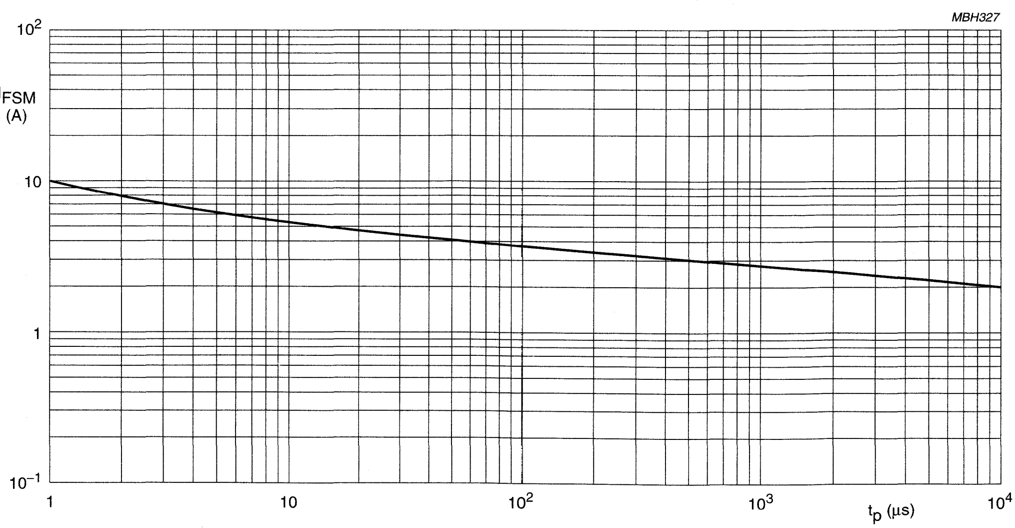


(1) T_j = 150 °C; typical values.

(2) T_j = 25 °C; typical values.

(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



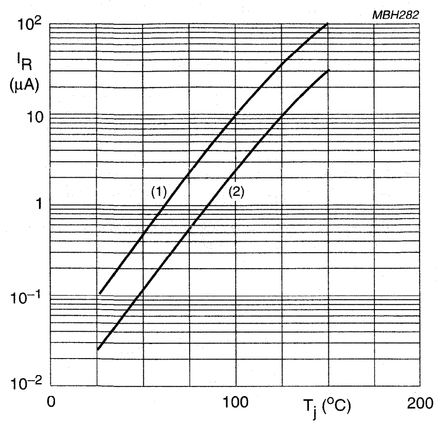
Based on square wave currents.

T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

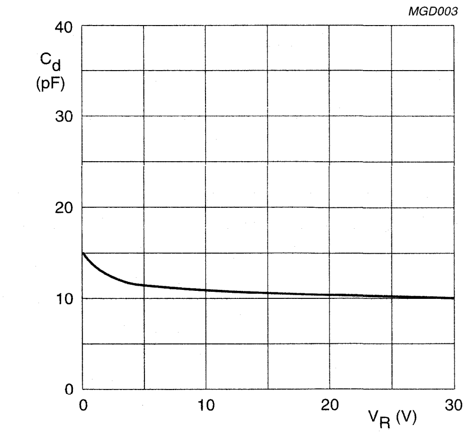
General purpose controlled avalanche (double) diodes

BAS29; BAS31; BAS35



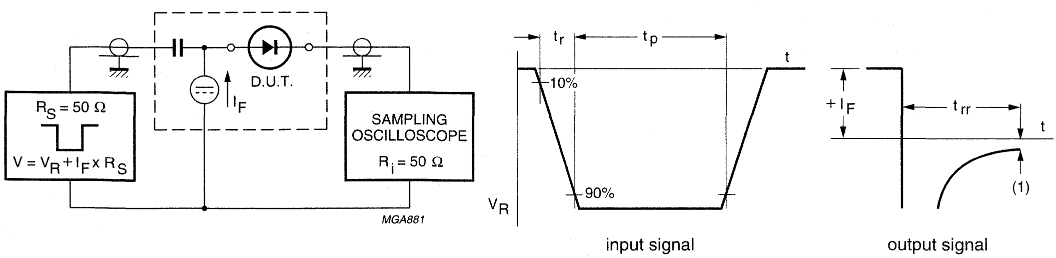
(1) V_R = 90 V; maximum values.
(2) V_R = 90 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 3 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

High-speed diode | BAS32L

FEATURES

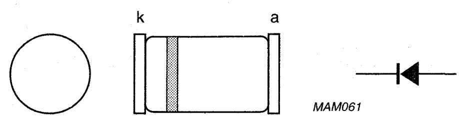
- Small hermetically sealed glass SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

- High-speed switching
- Fast logic applications.

DESCRIPTION

The BAS32L is a high-speed switching diode fabricated in planar technology, and encapsulated in the small hermetically sealed glass SOD80C SMD package.



Cathode indicated by black band.

Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	200	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 5 mA	620	750	mV
		I_F = 100 mA	–	1000	mV
		I_F = 100 mA; T_j = 100 °C	–	930	mV
I_R	reverse current	see Fig.5			
		V_R = 20 V	–	25	nA
		V_R = 75 V	–	5	μA
		V_R = 20 V; T_j = 150 °C	–	50	μA
		V_R = 75 V; T_j = 150 °C	–	100	μA
$V_{(BR)R}$	reverse breakdown voltage	I_R = 100 μA	100	–	V
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6		2	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7		4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 50 mA; t_r = 20 ns; see Fig.8	–	2.5	V

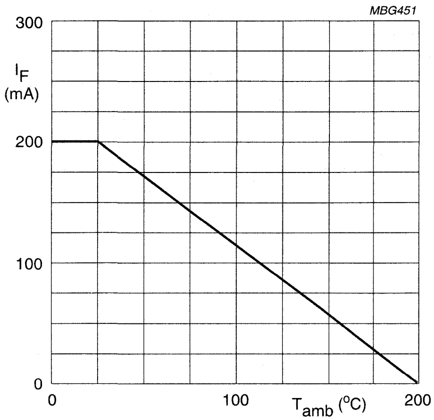
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	350	K/W

Note

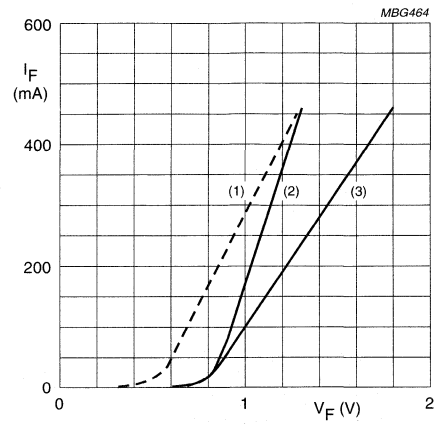
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



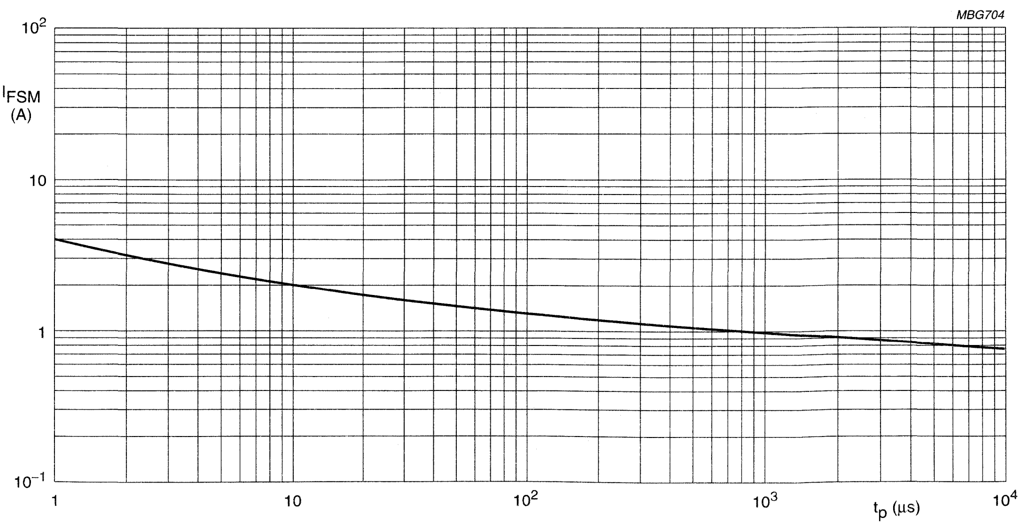
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



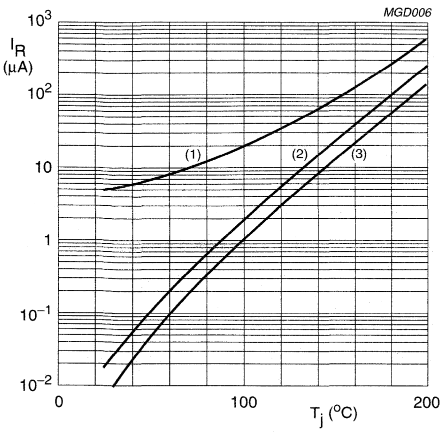
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



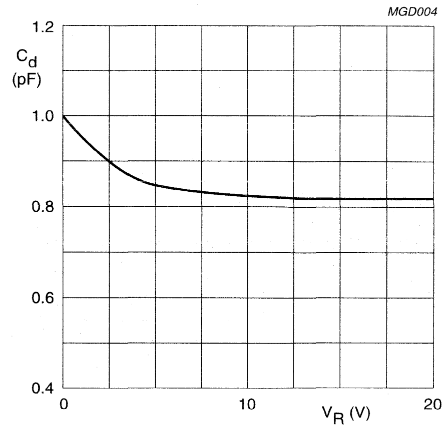
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



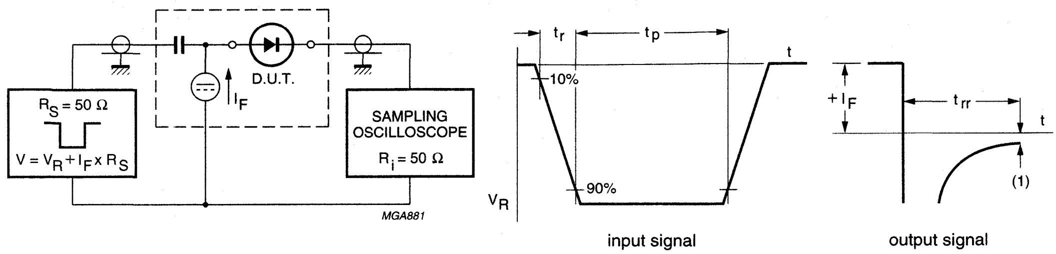
(1) V_R = 75 V; maximum values.
(2) V_R = 75 V; typical values.
(3) V_R = 20 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

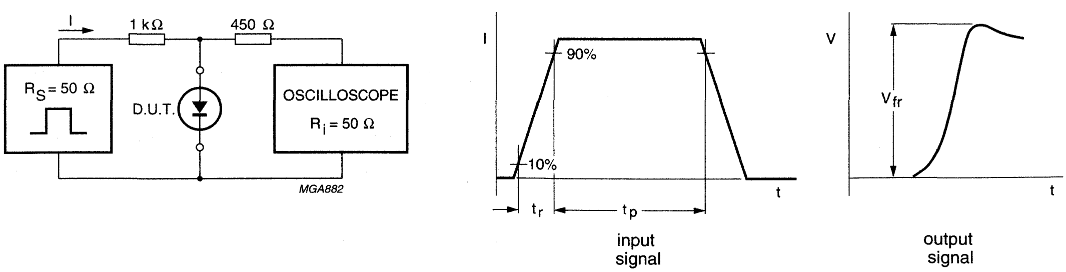


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode BAS55

FEATURES

- Small plastic SMD package
- High switching speed: max. 6 ns
- Continuous reverse voltage: max. 60 V
- Repetitive peak reverse voltage: max. 60 V
- Repetitive peak forward current: max. 600 mA.

APPLICATIONS

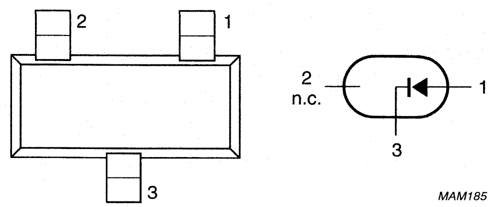
- High-speed switching in surface mounted circuits.

DESCRIPTION

The BAS55 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small rectangular plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: L5p.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	60	V
V_R	continuous reverse voltage		–	60	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	600	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 10 ms	–	1.7	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3; I_F = 200 mA; DC value; note 1	–	1.0	V
I_R	reverse current	see Fig.5			
		V_R = 60 V	–	100	nA
		V_R = 60 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 400 mA to I_R = 400 mA; R_L = 100 Ω; measured at I_R = 40 mA; see Fig.7	–	6	ns
V_{fr}	forward recovery voltage	when switched to I_F = 400 mA; t_r = 30 ns; see Fig.8	–	2	V
		when switched to I_F = 400 mA; t_r = 100 ns; see Fig.8	–	1.5	V

Note

1. T_{amb} = 25 °C; device has reached the thermal equilibrium when mounted on an FR4 printed-circuit board.

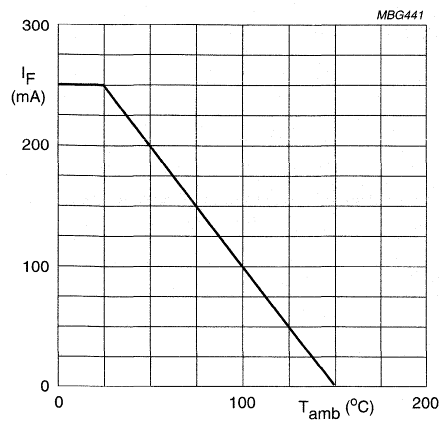
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

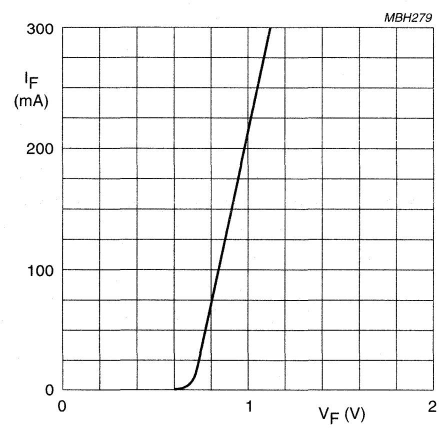
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



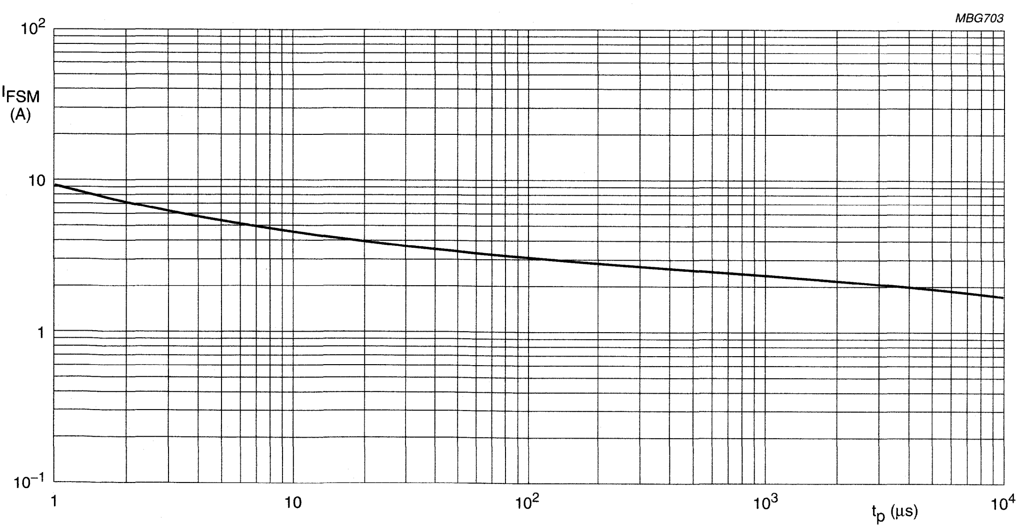
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



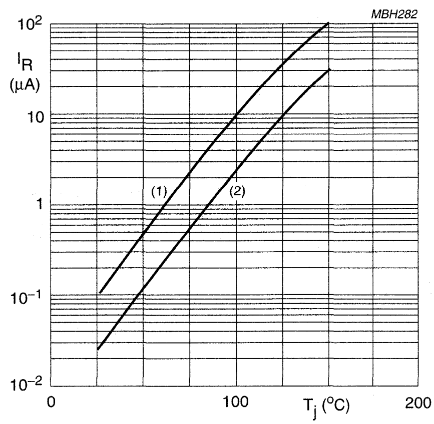
T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



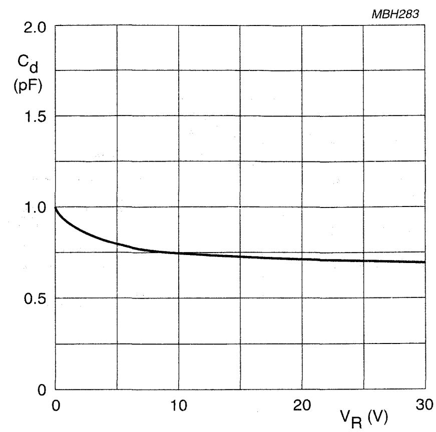
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



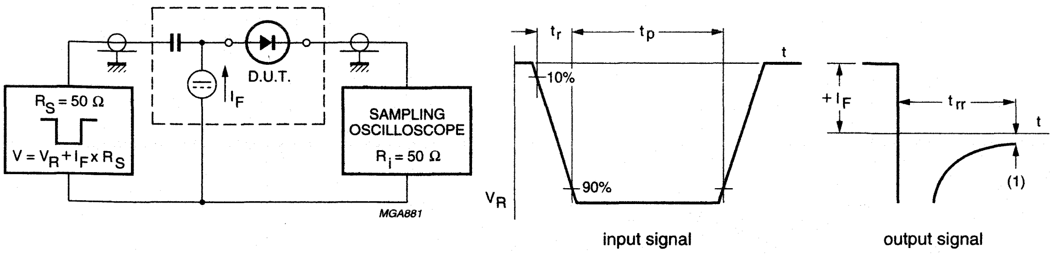
(1) V_R = 60 V; maximum values.
(2) V_R = 60 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



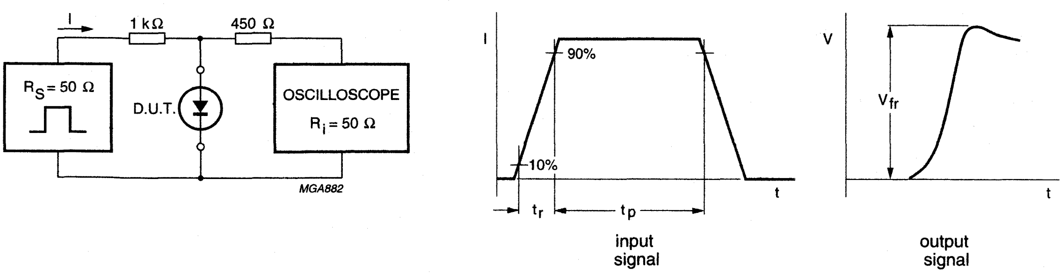
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 40$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse duration $t_p = 300$ ns; duty factor $\delta = 0.01$.

Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode

BAS56

FEATURES

- Small plastic SMD package
- High switching speed: max. 6 ns
- Continuous reverse voltage: max. 60 V
- Repetitive peak reverse voltage: max. 60 V
- Repetitive peak forward current: max. 600 mA.

APPLICATIONS

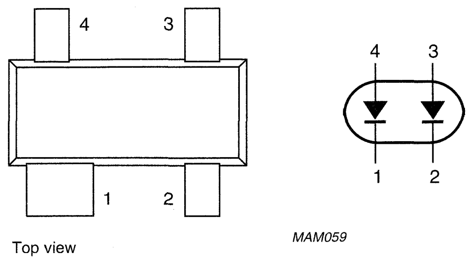
- High speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAS56 consists of two high-speed switching diodes fabricated in planar technology, and encapsulated in the small rectangular plastic SMD SOT143 package. The diodes are not connected.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	anode (a2)
4	anode (a1)



Marking code: L51.

Fig.1 Simplified outline (SOT143) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	60	V
V_{RRM}	repetitive peak reverse voltage	series connection		120	V
V_R	continuous reverse voltage		–	60	V
V_R	continuous reverse voltage	series connection	–	120	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	200	mA
		double diode loaded; see Fig.2; note 1	–	150	mA
I_{FRM}	repetitive peak forward current	single diode loaded	–	600	mA
		double diode loaded	–	430	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	9	A
		t = 100 µs	–	3	A
		t = 10 ms	–	1.7	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3; I_F = 200 mA; DC value; note 1	–	1.0	V
I_R	reverse current	see Fig.5			
		V_R = 60 V	–	100	nA
		V_R = 60 V; T_j = 150 °C	–	100	μA
I_R	reverse current	series connection	–		
		V_R = 120 V	–	100	nA
		V_R = 120 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 400 mA to I_R = 400 mA; R_L = 100 Ω; measured at I_R = 40 mA; see Fig.7	–	6	ns
V_{fr}	forward recovery voltage	when switched from I_F = 400 mA; t_r = 30 ns; see Fig.8	–	2.0	V
		when switched from I_F = 400 mA; t_r = 100 ns; see Fig.8	–	1.5	V

Note

1. T_{amb} = 25 °C; device has reached the thermal equilibrium when mounted on an FR4 printed-circuit board.

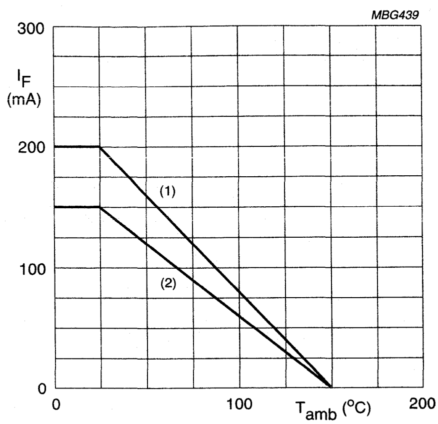
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

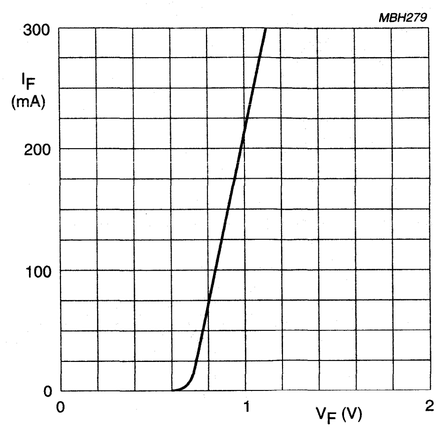
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



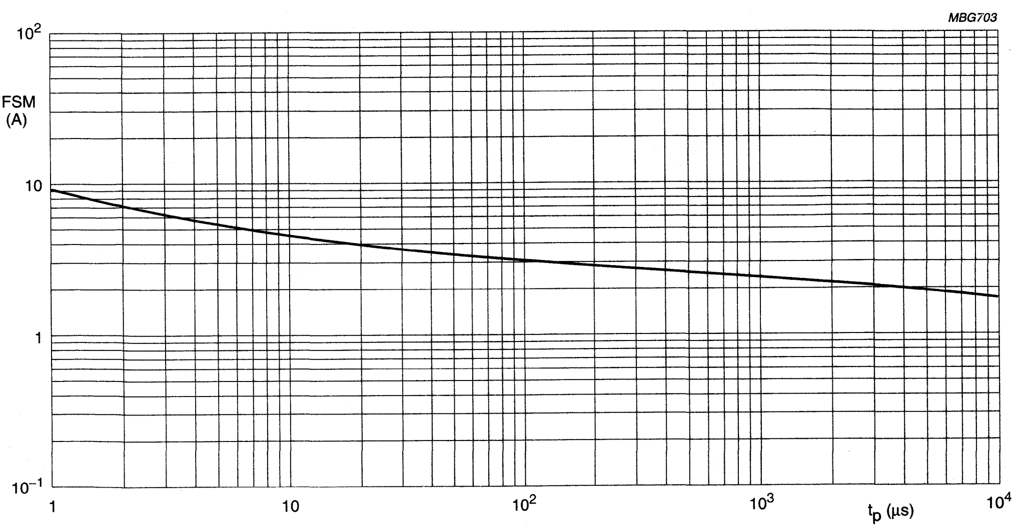
Device mounted on a FR4 printed-circuit board.
(1) Single diode loaded.
(2) Double diode loaded.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



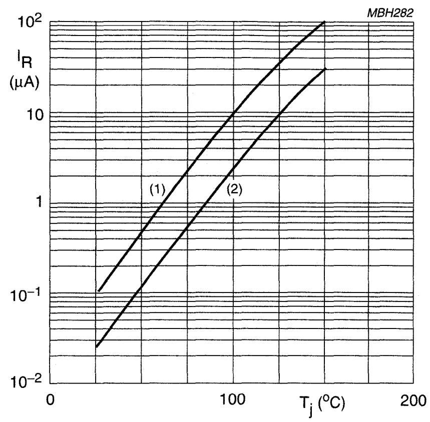
T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



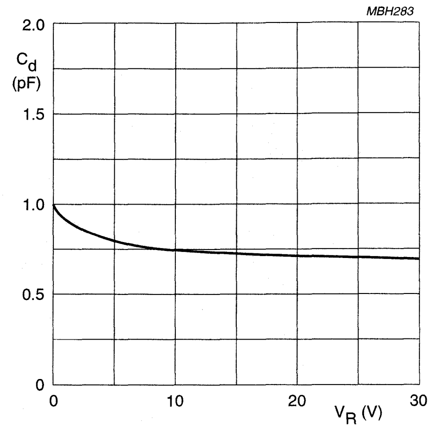
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



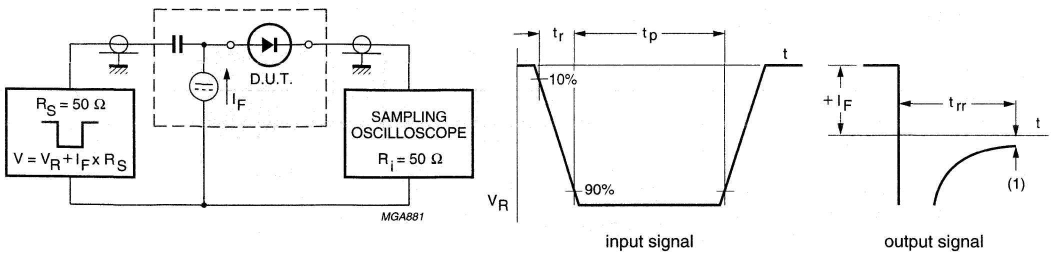
(1) V_R = 60 V; maximum values.
(2) V_R = 60 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



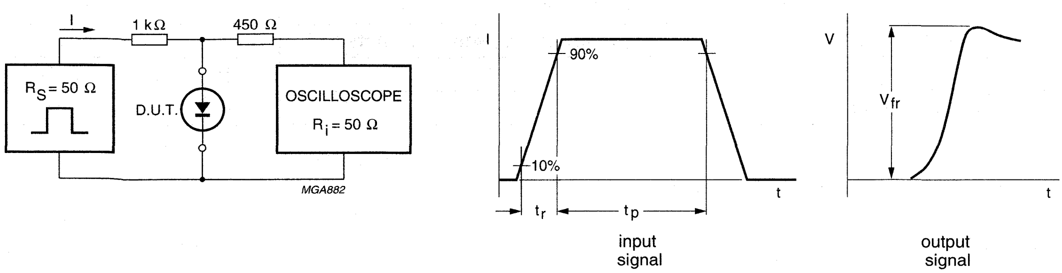
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 40 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse duration t_p = 300 ns; duty factor δ = 0.01.

Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed switching diode — BAS216

FEATURES

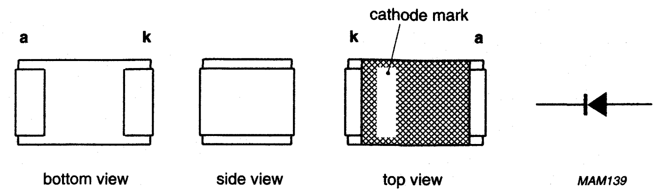
- Small ceramic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAS216 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small rectangular ceramic SMD SOD110 package.



Marking code: A6.

Fig.1 Simplified outline (SOD110) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; see Fig.2; note 1	–	400	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.1			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_R	reverse current	see Fig.5			
		$V_R = 25$ V	–	30	nA
		$V_R = 75$ V	–	1	μA
		$V_R = 25$ V; $T_j = 150$ °C	–	30	μA
		$V_R = 75$ V; $T_j = 150$ °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; $V_R = 0$; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from $I_F = 10$ mA; $t_r = 20$ ns; see Fig.8	–	1.75	V

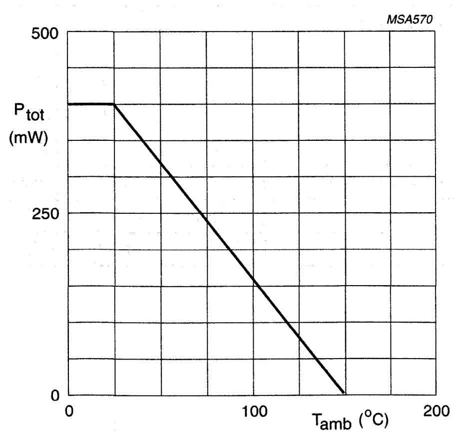
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		200	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	315	K/W

Note

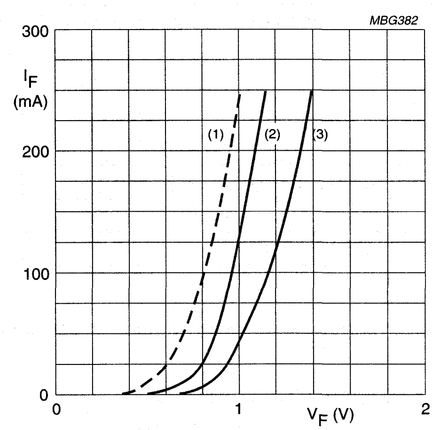
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



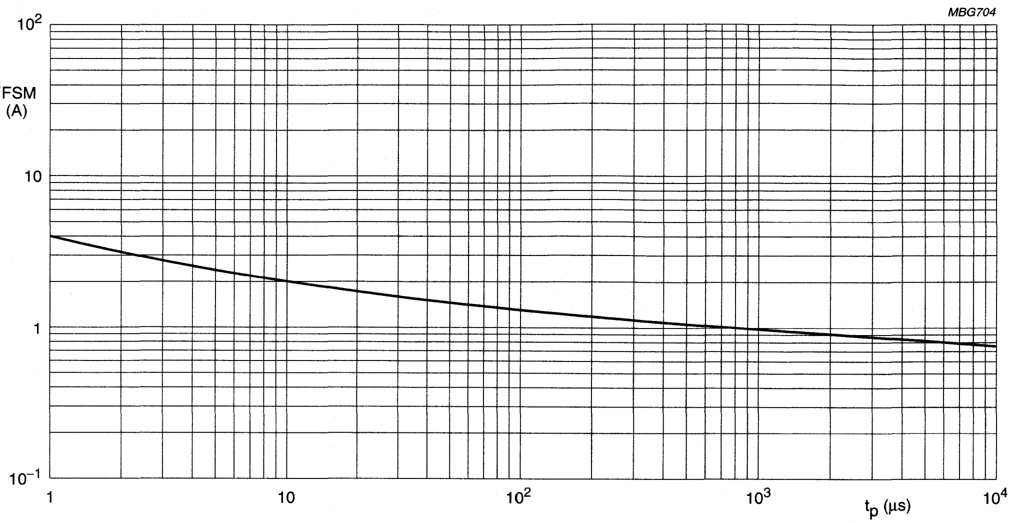
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible total power dissipation as a function of ambient temperature.



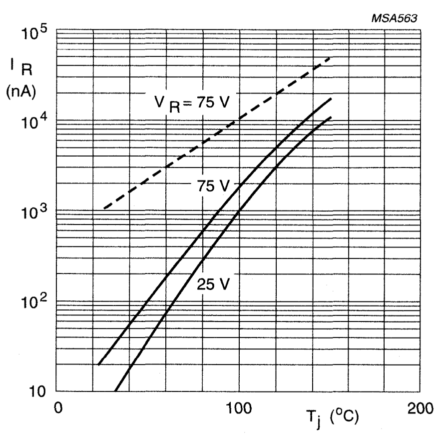
(1) $T_j = 150$ °C; typical values.
(2) $T_j = 25$ °C; typical values.
(3) $T_j = 25$ °C; maximum values.

Fig.1 Forward current as a function of forward voltage.



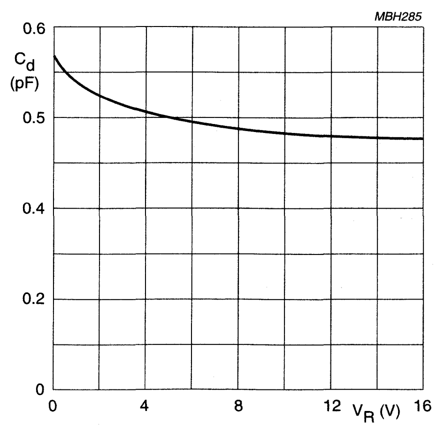
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



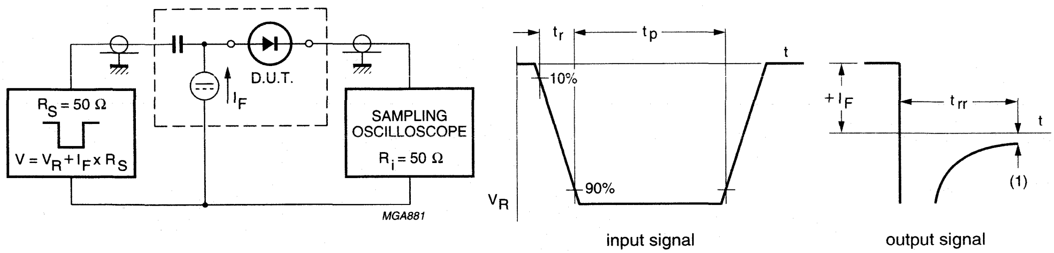
Dotted line: maximum values.
Solid line: typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

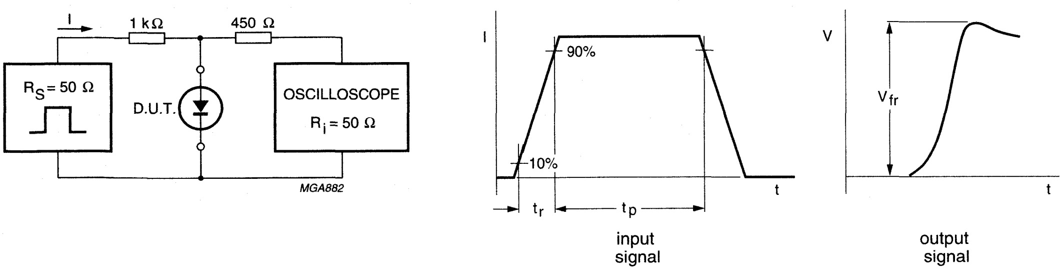


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode | BAS678

FEATURES

- Small plastic SMD package
- High switching speed: max. 6 ns
- Continuous reverse voltage: max. 80 V
- Repetitive peak reverse voltage: max. 100 V
- Repetitive peak forward current: max. 600 mA.

APPLICATIONS

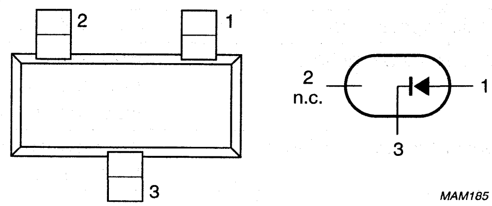
- High-speed switching in hybrid thick and thin-film circuits.

DESCRIPTION

The BAS678 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small rectangular plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: L52.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	100	V
V_R	continuous reverse voltage		–	80	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	600	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 10 ms	–	1.7	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see 3; I_F = 200 mA; d.c.; note 1	–	1.0	V
I_R	reverse current	see Fig.5			
		V_R = 10 V	–	15	nA
		V_R = 75 V	–	100	nA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2	pF
t_{rr}	reverse recovery time	when switched from I_F = 400 mA to I_R = 400 mA; R_L = 100 Ω; measured at I_R = 40 mA; see Fig.7	–	6	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	2	V

Note

1. T_{amb} = 25 °C; device has reached the thermal equilibrium when mounted on an FR4 printed-circuit board.

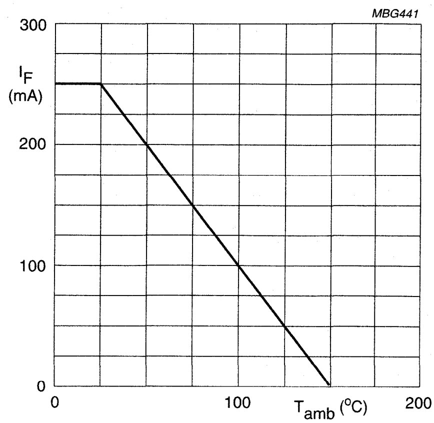
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

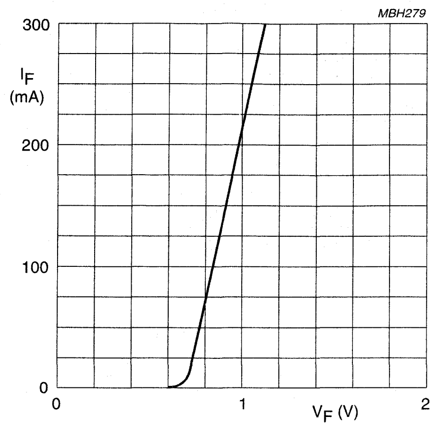
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



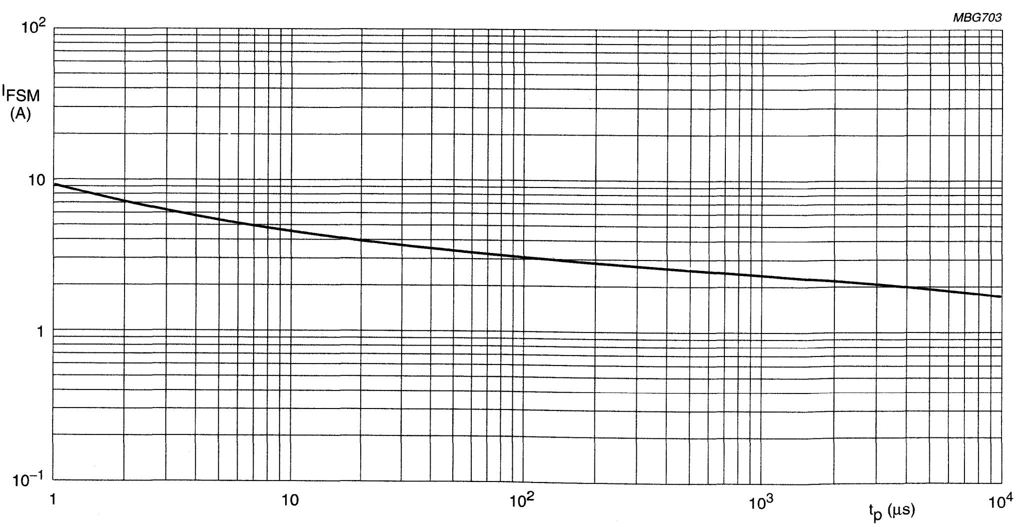
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



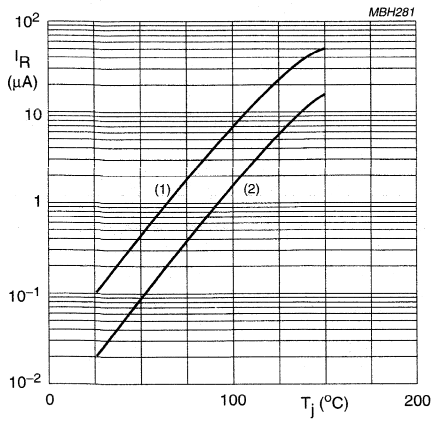
T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



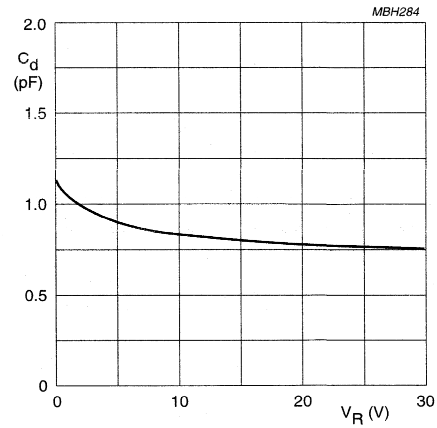
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



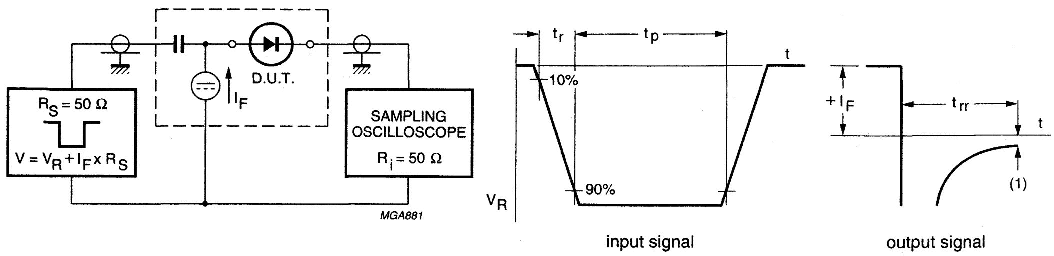
(1) V_R = 75 V; maximum values.
(2) V_R = 75 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 40$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

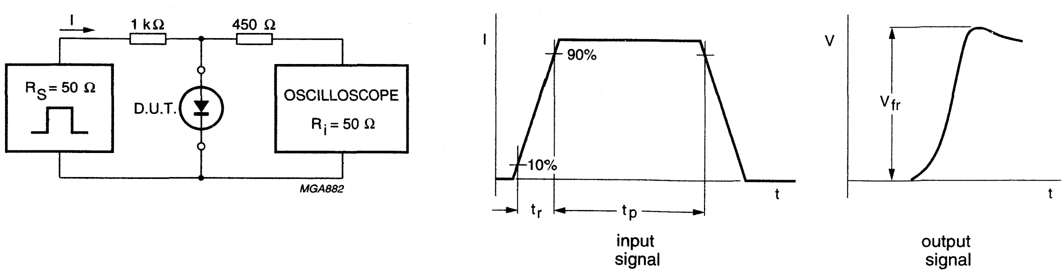


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode BAV10

FEATURES

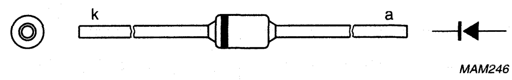
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 6 ns
- General application
- Continuous reverse voltage: max. 60 V
- Repetitive peak reverse voltage: max. 60 V
- Repetitive peak forward current: max. 600 mA.

APPLICATIONS

- High-speed switching.

DESCRIPTION

The BAV10 is a high-speed switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	60	V
V_R	continuous reverse voltage		–	60	V
I_F	continuous forward current	see Fig.2; note 1	–	300	mA
I_{FRM}	repetitive peak forward current		–	600	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	350	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 10 mA	–	750	mV
		I_F = 200 mA	–	1.0	V
		I_F = 500 mA	–	1.25	V
		I_F = 200 mA; T_j = 100 °C	–	950	mV
I_R	reverse current	see Fig.5			
		V_R = 60 V	–	100	nA
		V_R = 60 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 400 mA to I_R = 400 mA; R_L = 100 Ω; measured at I_R = 40 mA; see Fig.7	–	6	ns
V_{fr}	forward recovery voltage	when switched from I_F = 400 mA; t_r = 30 ns; see Fig.8	–	2	V
		when switched from I_F = 400 mA; t_r = 10 ns; see Fig.8	–	1.5	V

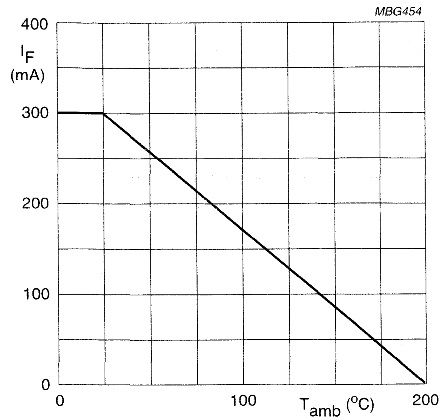
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

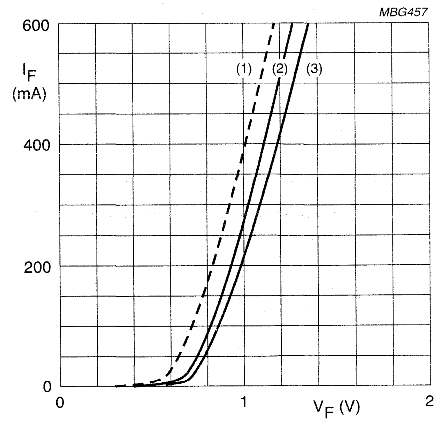
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



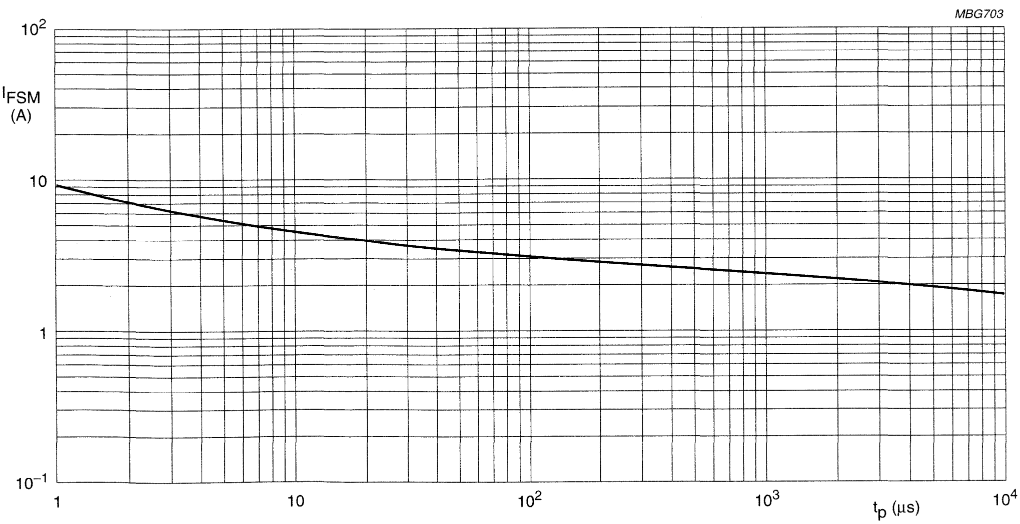
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



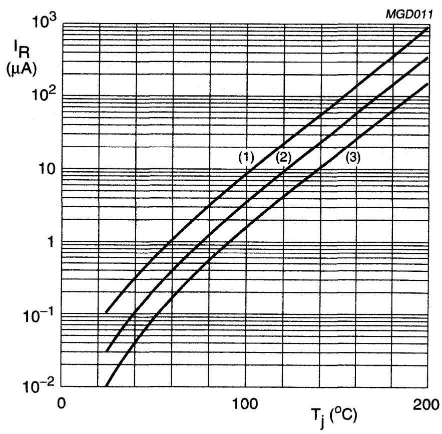
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



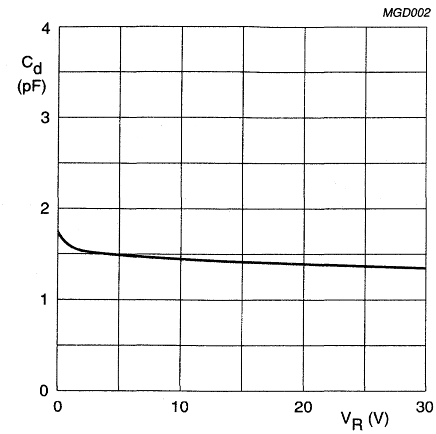
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



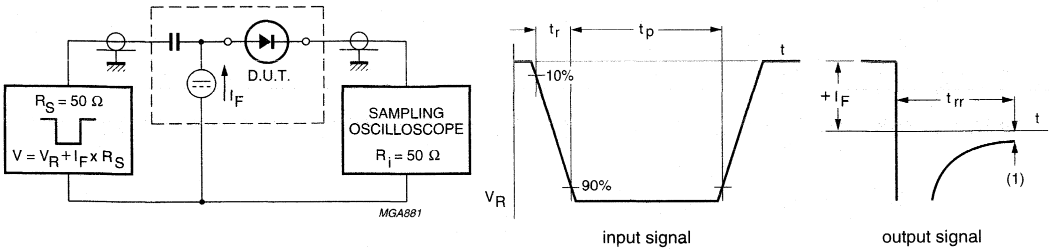
(1) V_R = 60 V; maximum values.
(2) V_R = 60 V; typical values.
(3) V_R = 30 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



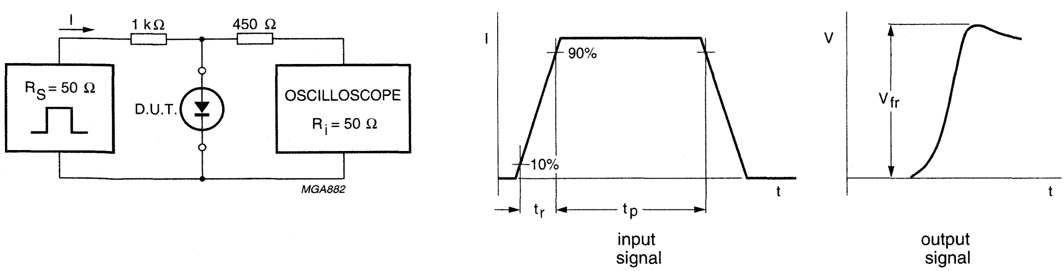
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 40 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse duration t_p = 300 ns; duty factor δ = 0.01.

Fig.8 Forward recovery voltage test circuit and waveforms.

General purpose diodes BAV18 to BAV21

FEATURES

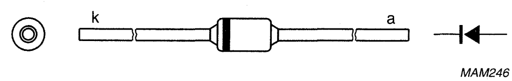
- Hermetically sealed leaded glass SOD27 (DO-35) package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 50 V, 100 V, 150 V, 200 V
- Repetitive peak reverse voltage: max. 60 V, 120 V, 200 V, 250 V
- Repetitive peak forward current: max. 625 mA.

APPLICATIONS

- General purposes in industrial equipment e.g. oscilloscopes, digital voltmeters and video output stages in colour television.

DESCRIPTION

The BAV18, BAV19, BAV20, BAV21 are switching diodes fabricated in planar technology, and encapsulated in hermetically sealed leaded glass SOD27 (DO-35) packages.



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BAV18		–	60	V
	BAV19		–	120	V
	BAV20		–	200	V
	BAV21		–	250	V
V_R	continuous peak reverse voltage				
	BAV18		–	50	V
	BAV19		–	100	V
	BAV20		–	150	V
	BAV21		–	200	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	400	mW
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		–	175	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 100 mA	–	1.0	V
		I_F = 200 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		$V_R = V_{Rmax}$	–	100	nA
		$V_R = V_{Rmax}$; T_j = 150 °C	–	100	µA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	5	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.8	–	50	ns

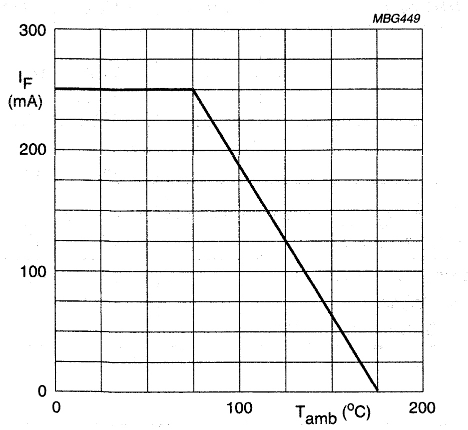
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	375	K/W

Note

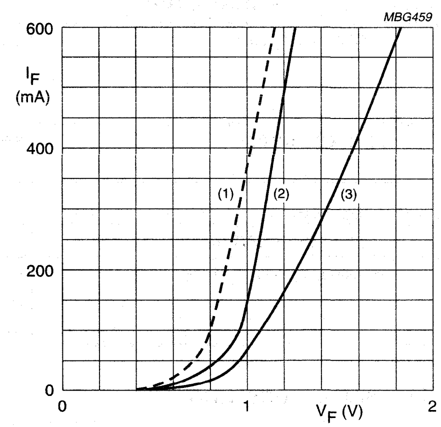
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



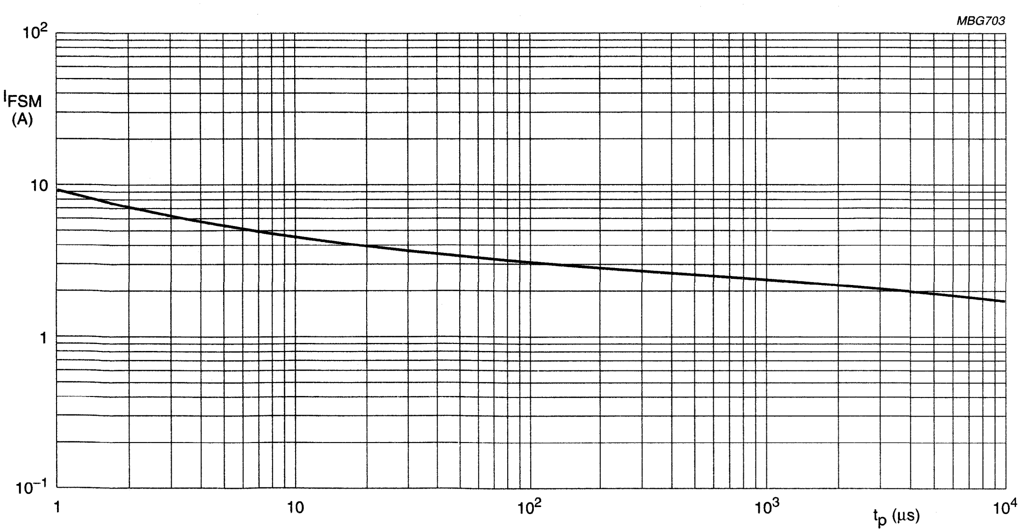
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

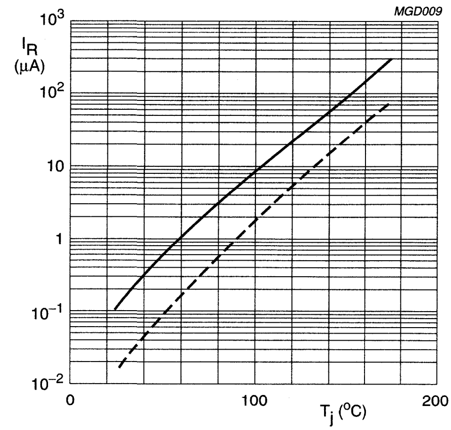
Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

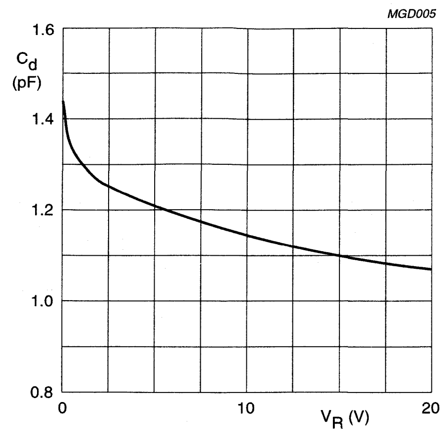
Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

General purpose diodes | BAV18 to BAV21



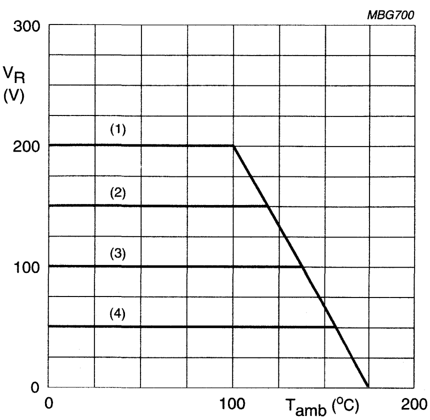
$V_R = V_{Rmax}$.
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



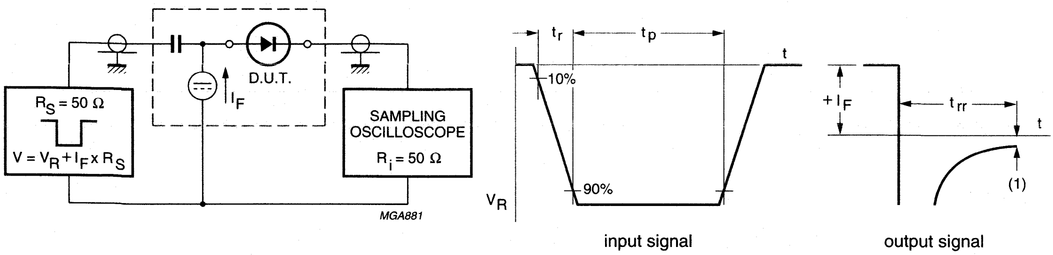
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) BAV21.
(2) BAV20.
(3) BAV19.
(4) BAV18.

Fig.7 Maximum permissible continuous reverse voltage as a function of ambient temperature.



(1) $I_R = 3$ mA.

Fig.8 Reverse recovery voltage test circuit and waveforms.

General purpose double diode | BAV23

FEATURES

- Small plastic SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 200 V
- Repetitive peak reverse voltage: max. 250 V
- Repetitive peak forward current: max. 625 mA.

APPLICATIONS

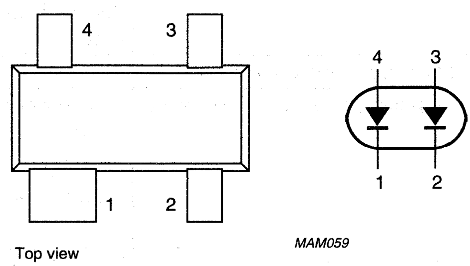
- General purpose where high breakdown voltages are required.

DESCRIPTION

The BAV23 consists of two general purpose diodes fabricated in planar technology, and encapsulated in the small plastic SMD SOT143 package. The diodes are not connected.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	anode (a2)
4	anode (a1)



Marking code: L30.

Fig.1 Simplified outline (SOT143) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	250	V
V_{RRM}	repetitive peak reverse voltage	series connection		500	V
V_R	continuous reverse voltage		–	200	V
V_R	continuous reverse voltage	series connection	–	400	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	225	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	9	A
		t = 100 µs	–	3	A
		t = 10 ms	–	1.7	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 100 mA	–	1.0	V
		I_F = 200 mA	–	1.25	V
V_F	forward voltage	series connection; see Fig.3			
		I_F = 100 mA	–	2.0	V
		I_F = 200 mA	–	2.5	V
I_R	reverse current	see Fig.5			
		V_R = 200 V	–	100	nA
		V_R = 200 V; T_j = 150 °C	–	100	μA
I_R	reverse current	series connection	–		
		V_R = 400 V	–	100	nA
		V_R = 400 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	5	pF
		series connection; f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.7	–	50	ns

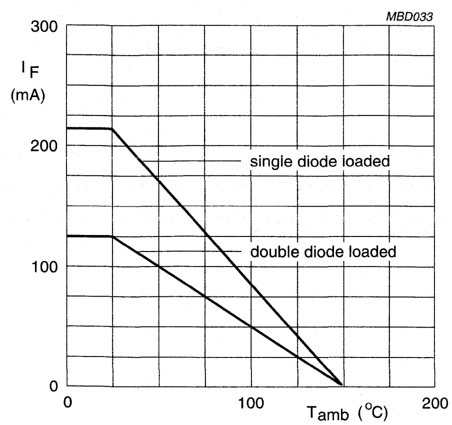
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

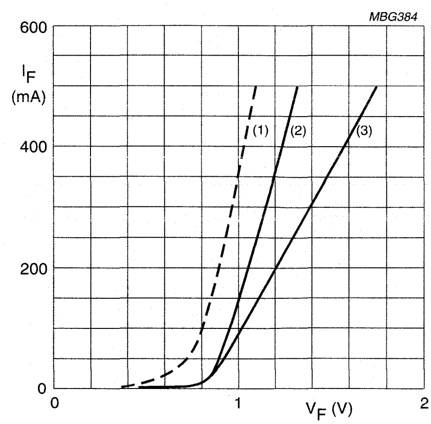
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



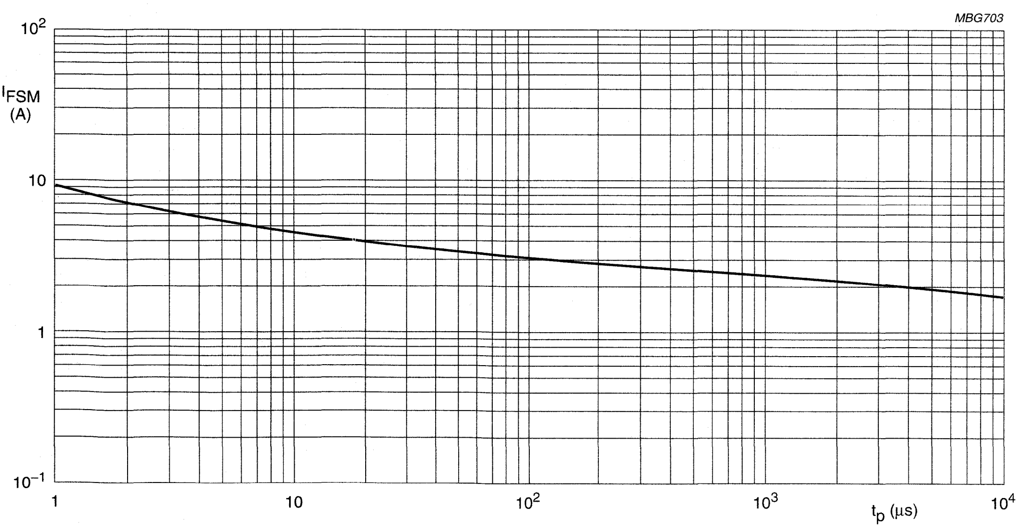
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

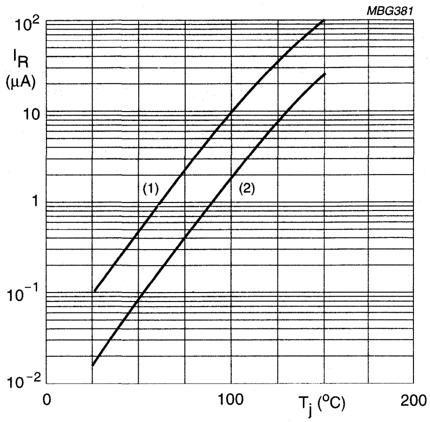
Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

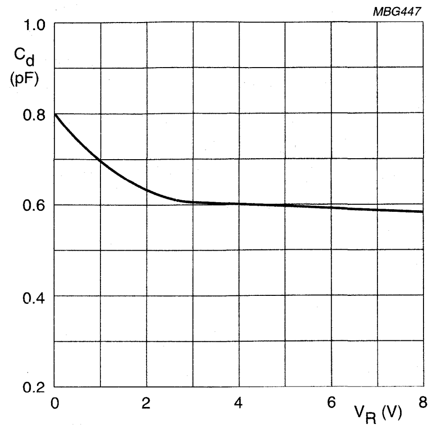
Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

General purpose double diode BAV23



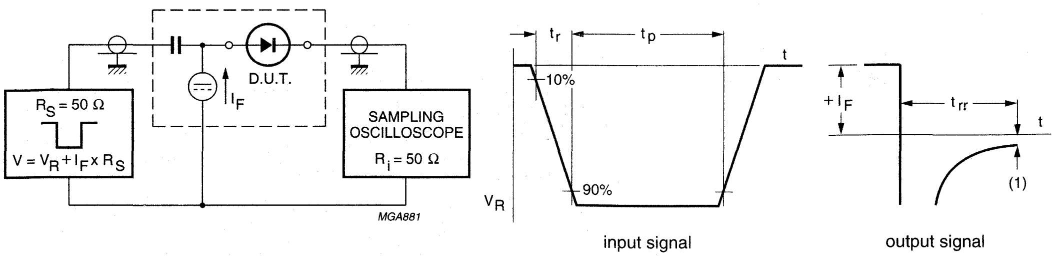
(1) V_R = 200 V; maximum values.
(2) V_R = 200 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 3 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

General purpose double diode — BAV23S

FEATURES

- Small plastic SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 200 V
- Repetitive peak reverse voltage: max. 250 V
- Repetitive peak forward current: max. 625 mA.

APPLICATIONS

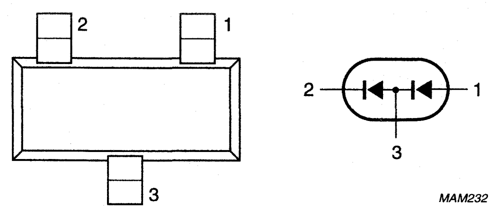
- General purpose where high breakdown voltages are required.

DESCRIPTION

The BAV23S consists of two general purpose diodes connected in series fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	common connection



Marking code:

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	250	V
V_{RRM}	repetitive peak reverse voltage	series connection		500	V
V_R	continuous reverse voltage		–	200	V
V_R	continuous reverse voltage	series connection	–	400	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	225	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	9	A
		t = 100 µs	–	3	A
		t = 10 ms	–	1.7	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 100 mA	–	1.0	V
		I_F = 200 mA	–	1.25	V
V_F	forward voltage	series connection; see Fig.3			
		I_F = 100 mA	–	2.0	V
		I_F = 200 mA	–	2.5	V
I_R	reverse current	see Fig.5			
		V_R = 200 V	–	100	nA
		V_R = 200 V; T_j = 150 °C	–	100	μA
I_R	reverse current	series connection	–		
		V_R = 400 V	–	100	nA
		V_R = 400 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	5	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.7	–	50	ns

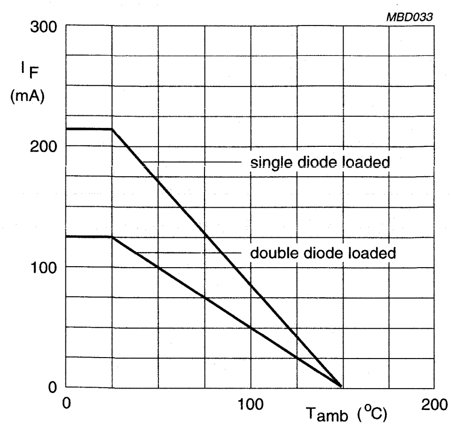
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

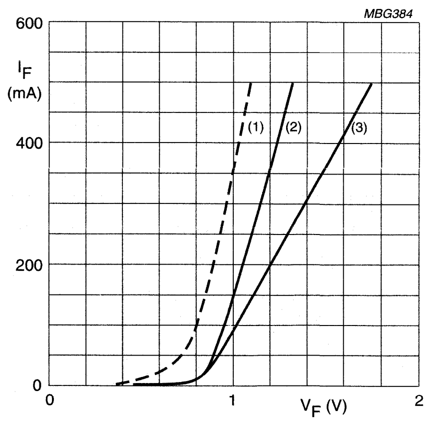
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



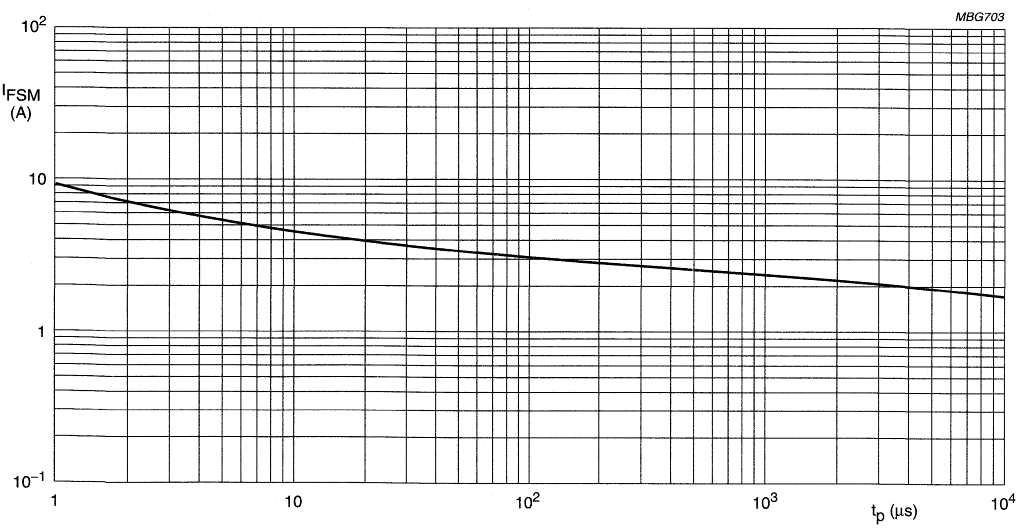
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



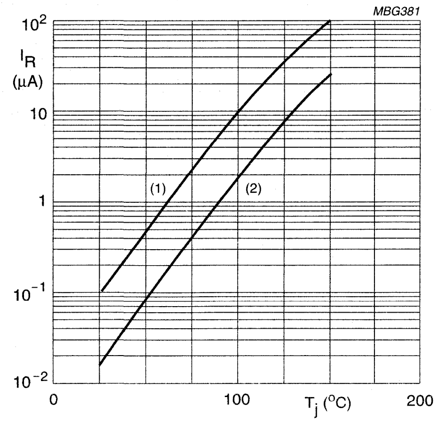
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



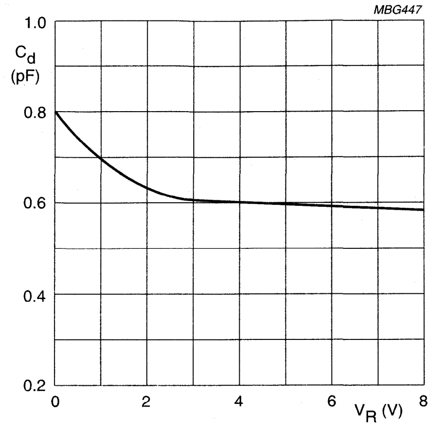
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



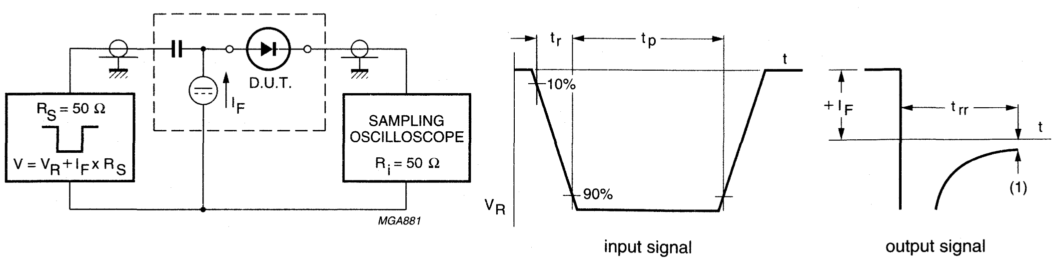
(1) V_R = 200 V; maximum values.
(2) V_R = 200 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 3 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

High-speed double diode — BAV70

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

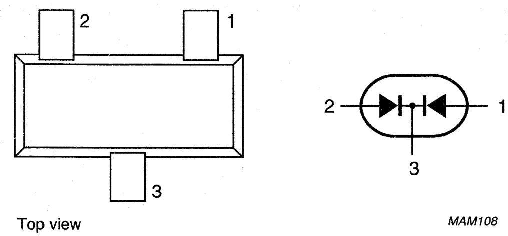
- High-speed switching in thick and thin-film circuits.

DESCRIPTION

The BAV70 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode



Marking code: A4p.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

High-speed double diode BAV70

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 70 V	–	2.5	μA
		V_R = 25 V; T_j = 150 °C	–	60	μA
		V_R = 70 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

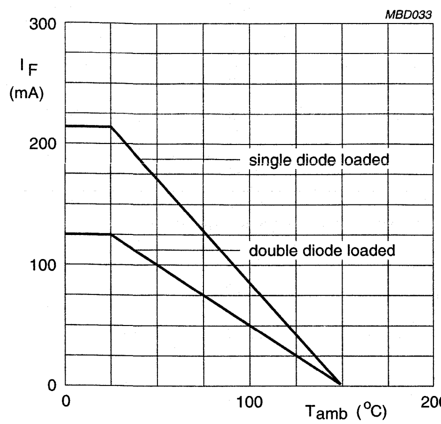
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

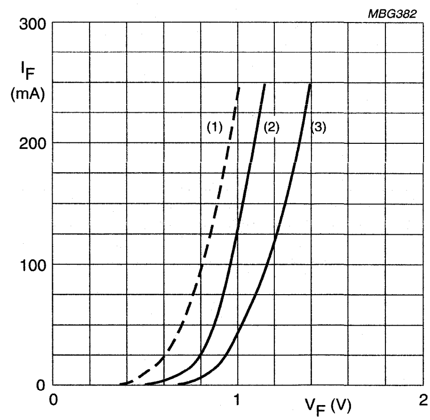
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



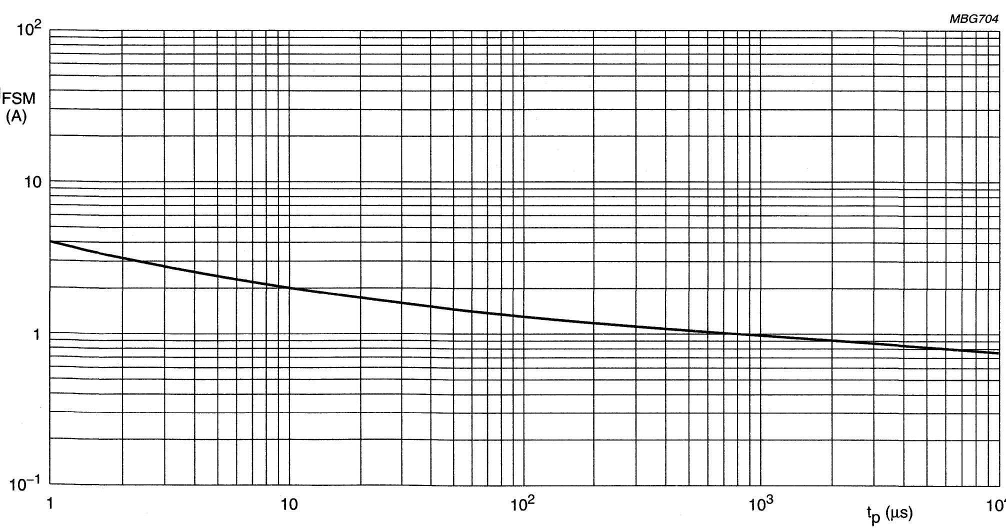
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

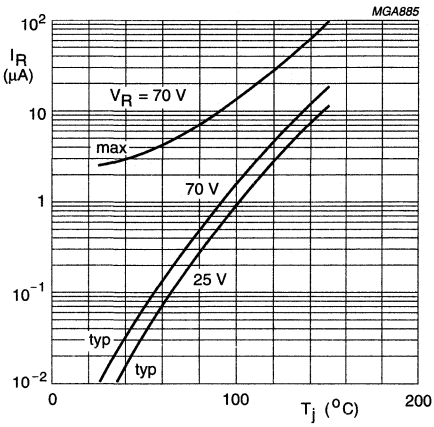
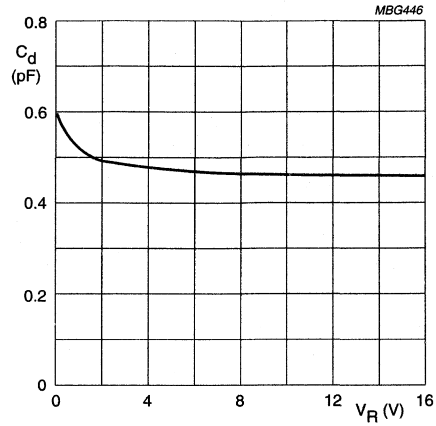
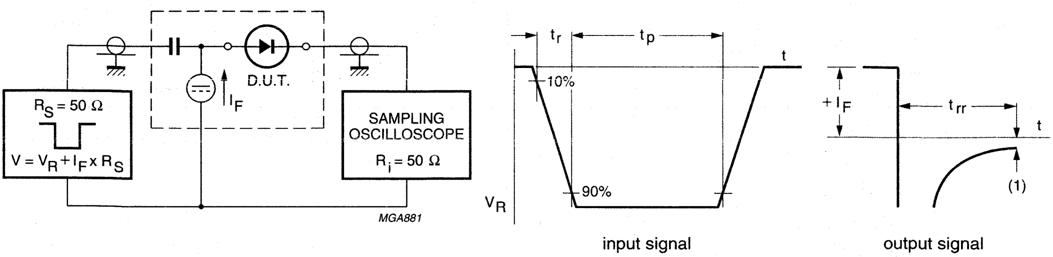


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

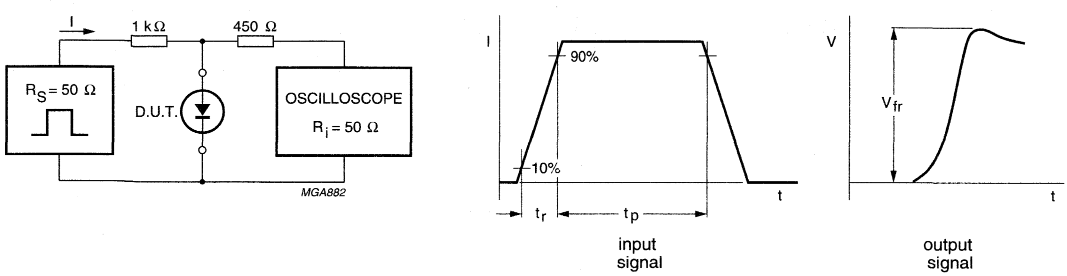


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode | BAV70W

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

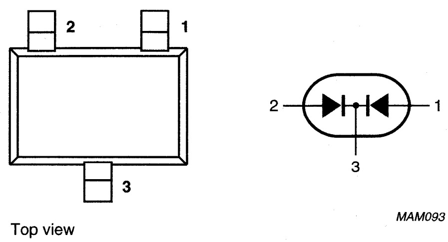
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAV70W consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in the very small plastic SMD SOT323 package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode



Marking code: A4.

Fig.1 Simplified outline (SOT323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	175	mA
		double diode loaded; see Fig.2; note 1	–	100	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 70 V	–	2.5	μA
		V_R = 25 V; T_j = 150 °C	–	60	μA
		V_R = 70 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

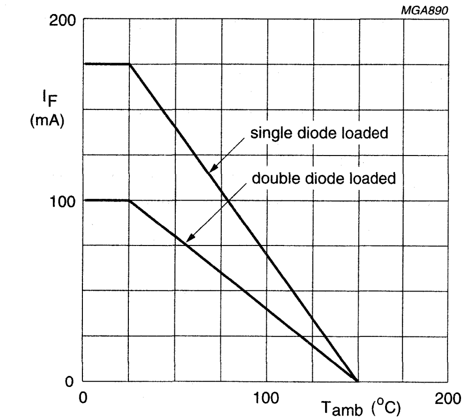
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

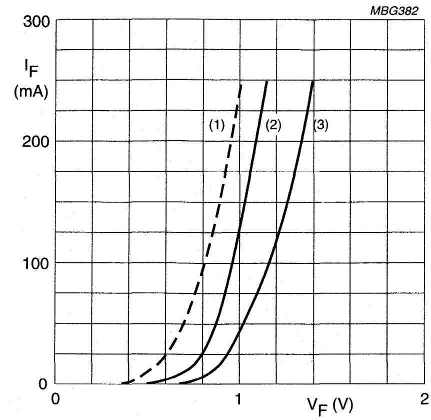
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



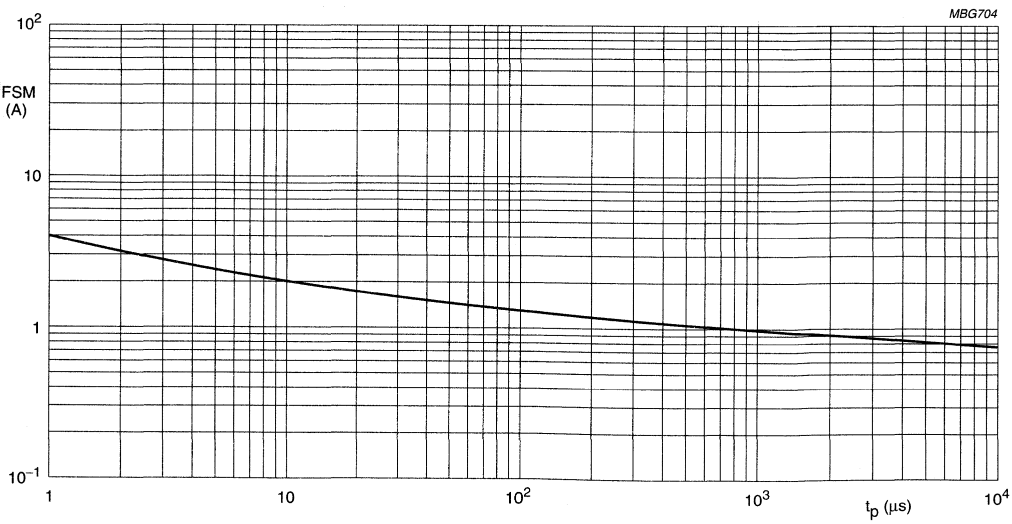
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

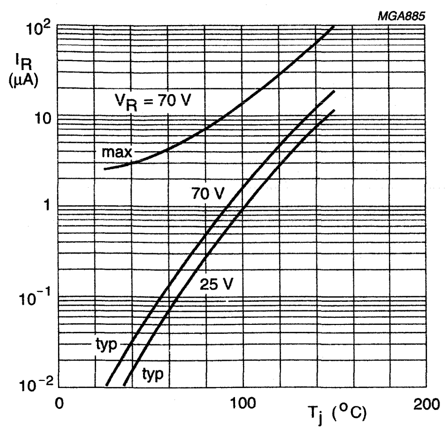
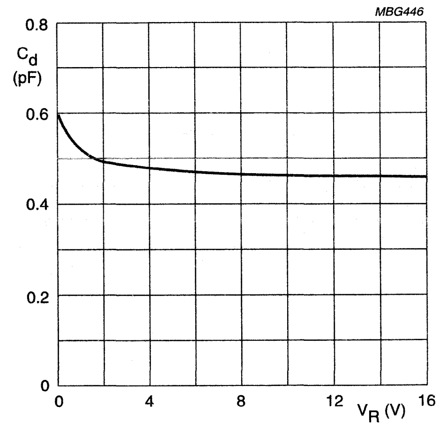
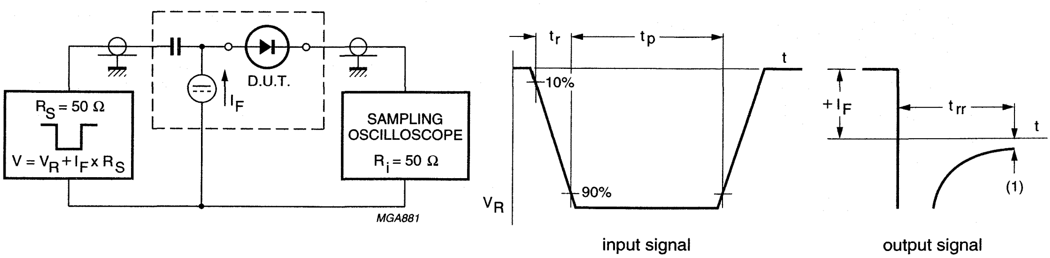


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

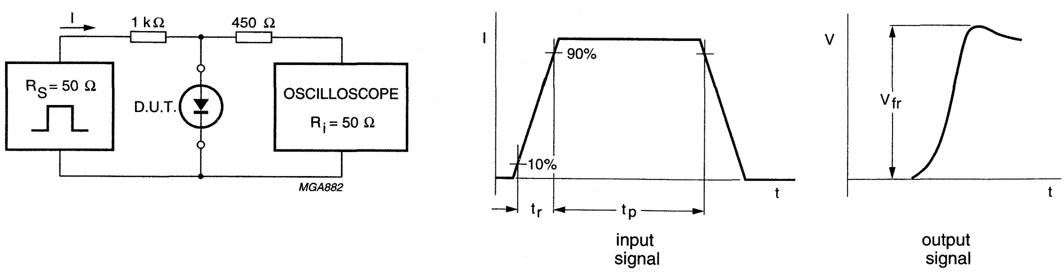


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode BAV74

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 60 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

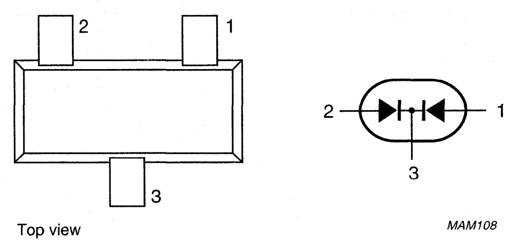
- High-speed switching in thick and thin-film circuits.

DESCRIPTION

The BAV74 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	cathode



Marking code: JAp

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	60	V
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 100 mA	–	1.0	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 50 V	–	0.1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 50 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

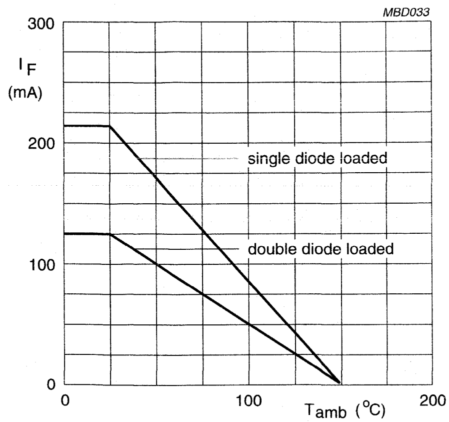
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

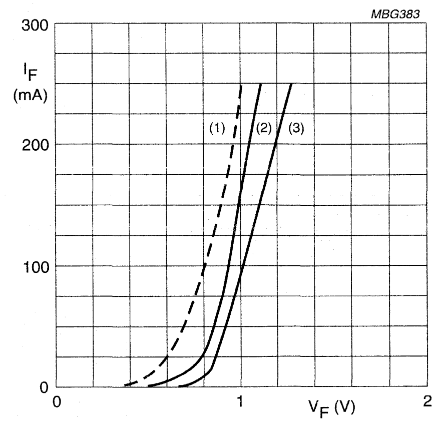
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



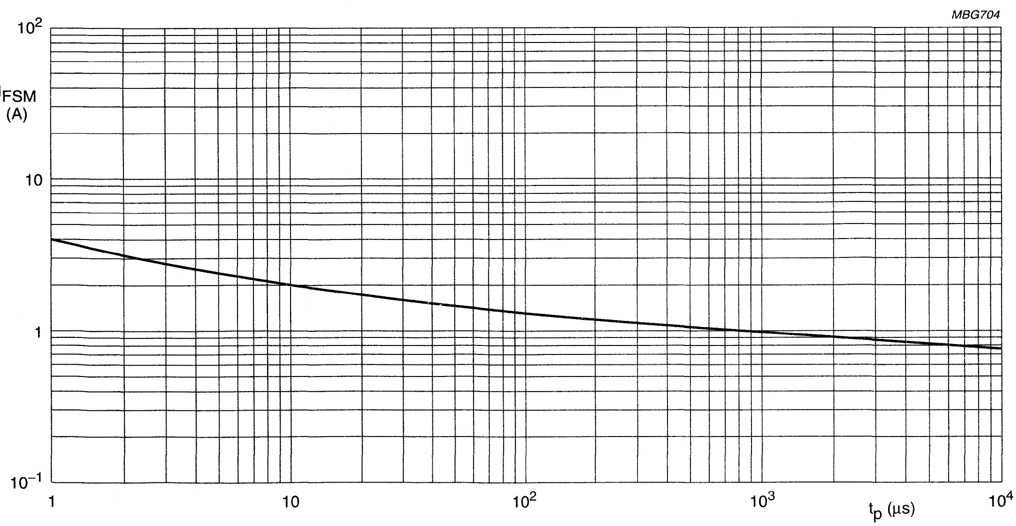
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



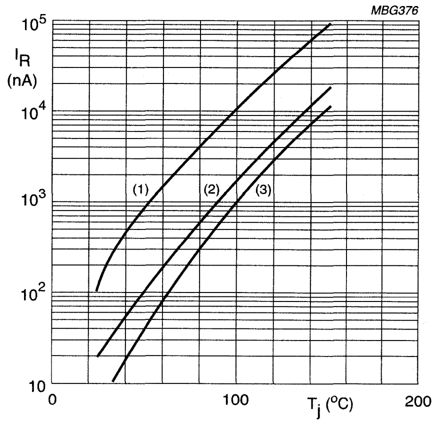
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



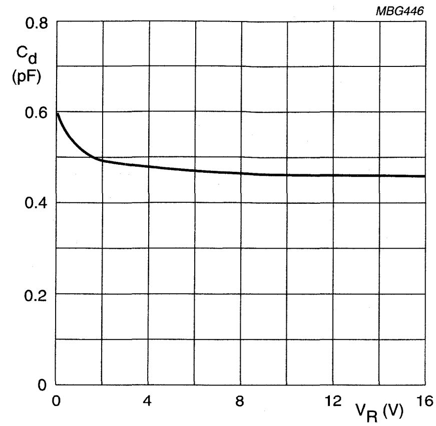
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



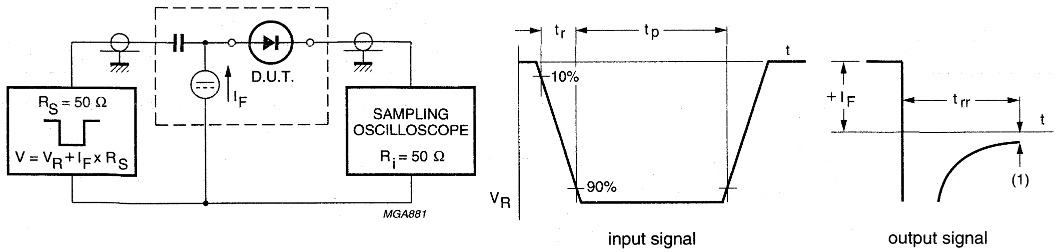
(1) V_R = 50 V; maximum values.
(2) V_R = 50 V; typical values.
(3) V_R = 25 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

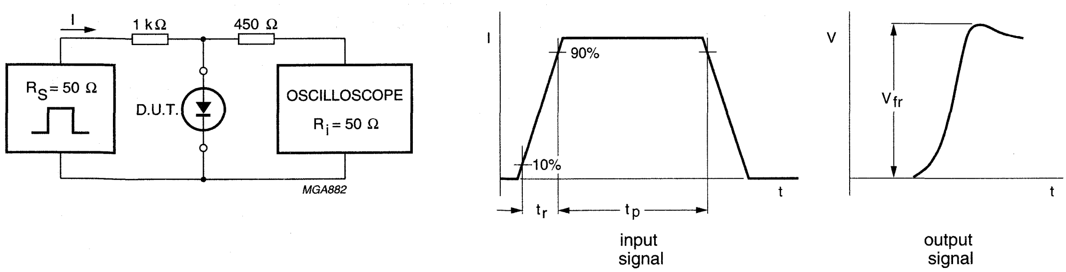


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode — BAV99

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

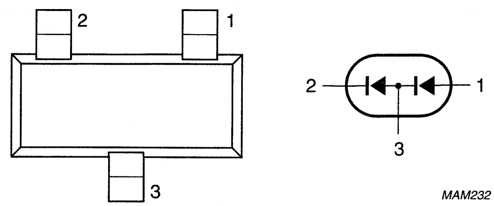
- High-speed switching in thick and thin-film circuits.

DESCRIPTION

The BAV99 consists of two high-speed switching diodes connected in series, fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	common connection



Marking code: A7p.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage			85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1		215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current			450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

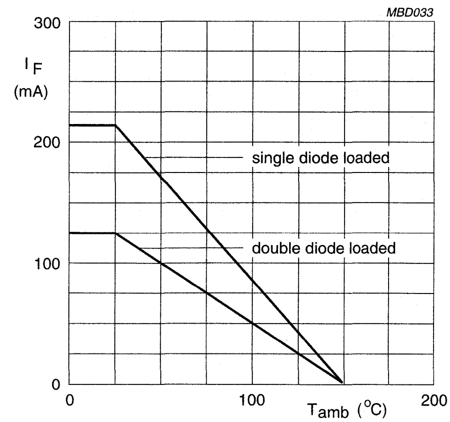
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

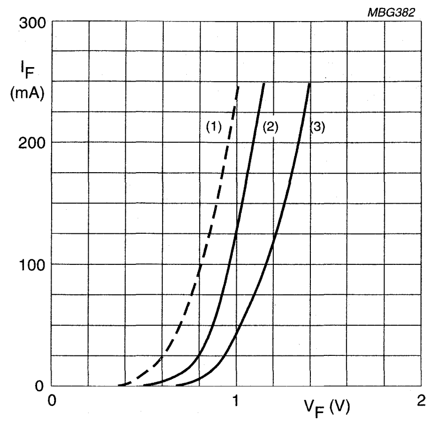
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



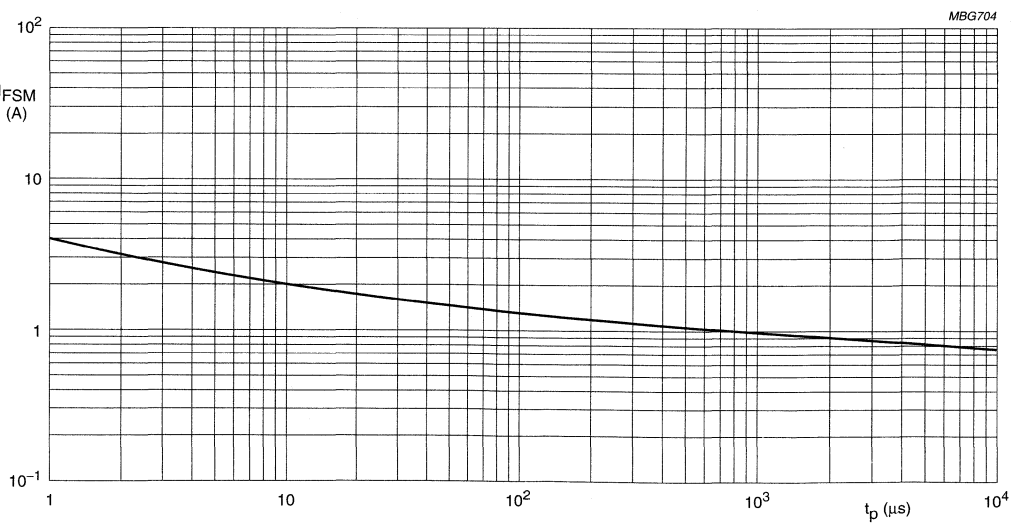
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

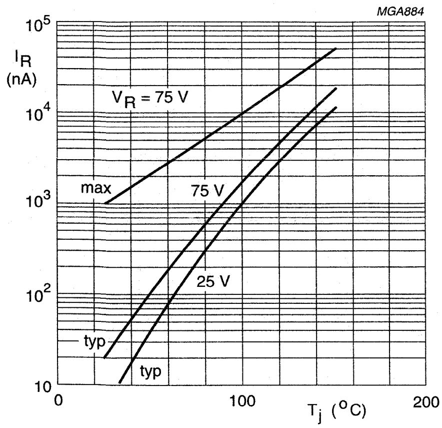
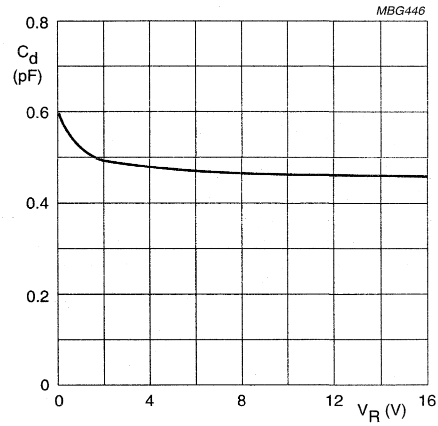
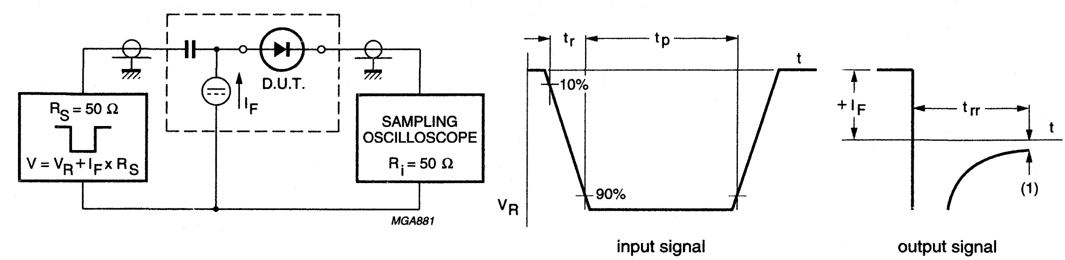


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

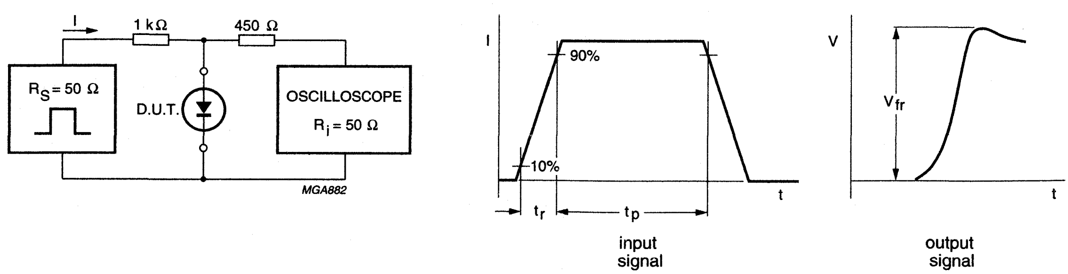


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode | BAV99W

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

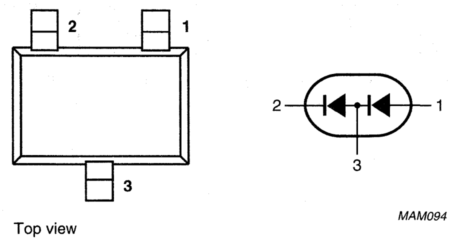
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAV99W consists of two high-speed switching diodes connected in series, fabricated in planar technology, and encapsulated in the very small plastic SMD SOT323 package.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	common connection



Marking code: A7.

Fig.1 Simplified outline (SOT323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	150	mA
		double diode loaded; see Fig.2; note 1	–	130	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

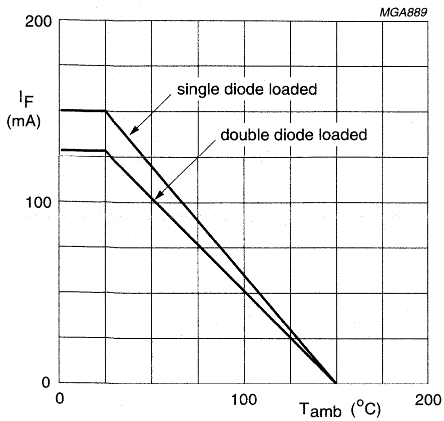
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

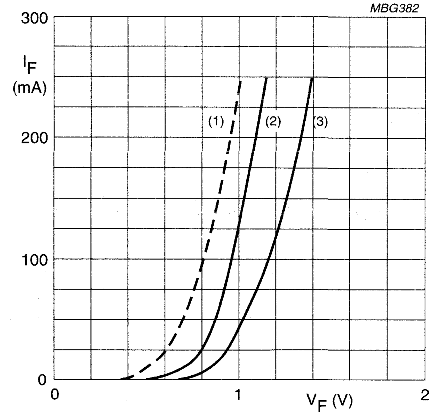
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



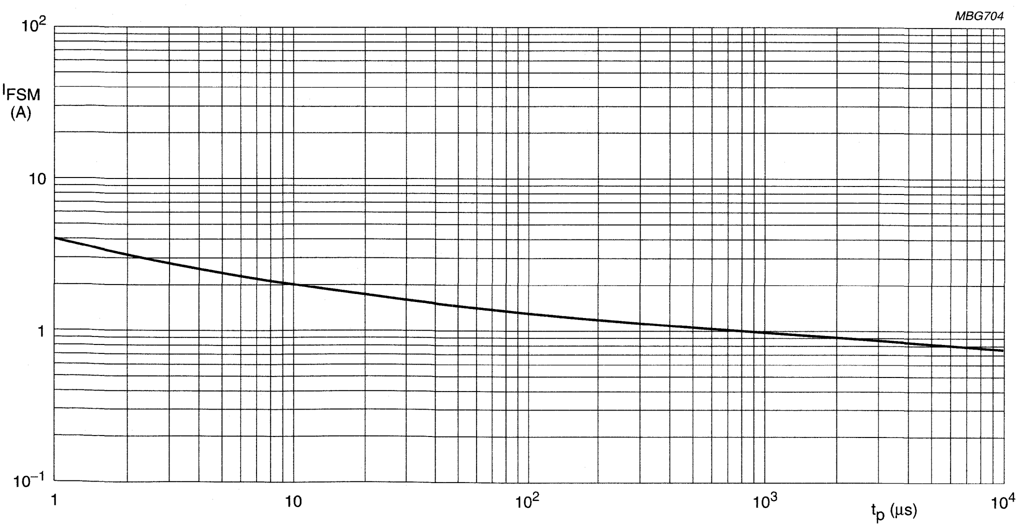
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

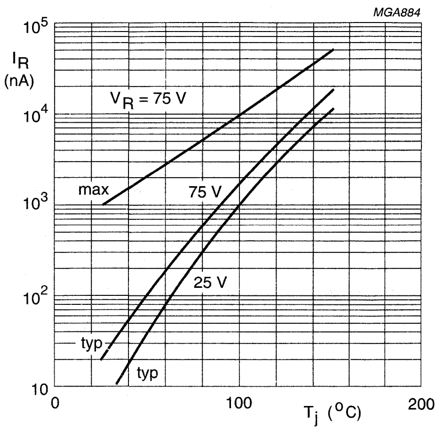
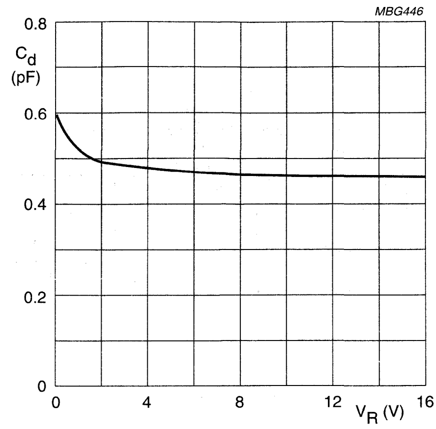
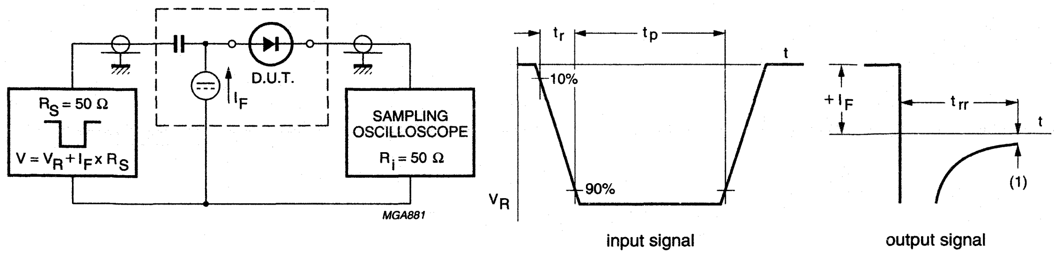


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 1 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

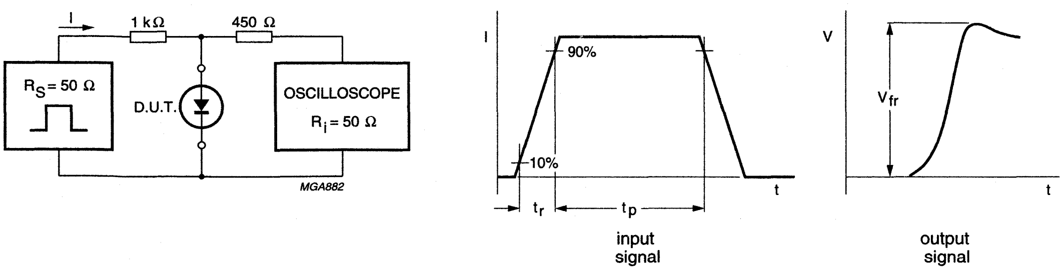


Fig.8 Forward recovery voltage test circuit and waveforms.

General purpose diodes

BAV100 to BAV103

FEATURES

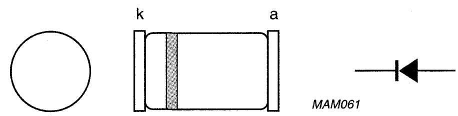
- Small hermetically sealed glass SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 50 V, 100 V, 150 V and 200 V respectively
- Repetitive peak reverse voltage: max. 60 V, 120 V, 200 V and 250 V respectively
- Repetitive peak forward current: max. 625 mA.

APPLICATIONS

- Switching in industrial equipment e.g. oscilloscopes, digital voltmeters and video output stages in colour television.

DESCRIPTION

The BAV100 to BAV103 are switching diodes fabricated in planar technology, and encapsulated in small hermetically sealed glass SOD80C SMD packages.



Cathode indicated by green band.

Fig.1 Simplified outline (SOD80C) and symbol.

General purpose diodes BAV100 to BAV103

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BAV100		–	60	V
	BAV101		–	120	V
	BAV102		–	200	V
	BAV103		–	250	V
V_R	continuous reverse voltage				
	BAV100		–	50	V
	BAV101		–	100	V
	BAV102		–	150	V
	BAV103		–	200	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	400	mW
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–	175	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 100 mA	–	1.0	V
		I_F = 200 mA	–	1.25	V
I_R	reverse current	see Fig.5			
	BAV100	V_R = 50 V	–	100	nA
		V_R = 50 V; T_j = 150 °C	–	100	µA
	BAV101	V_R = 100 V	–	100	nA
		V_R = 100 V; T_j = 150 °C	–	100	µA
	BAV102	V_R = 150 V	–	100	nA
		V_R = 150 V; T_j = 150 °C	–	100	µA
	BAV103	V_R = 200 V	–	100	nA
		V_R = 200 V; T_j = 150 °C	–	100	µA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	5	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.8	–	50	ns

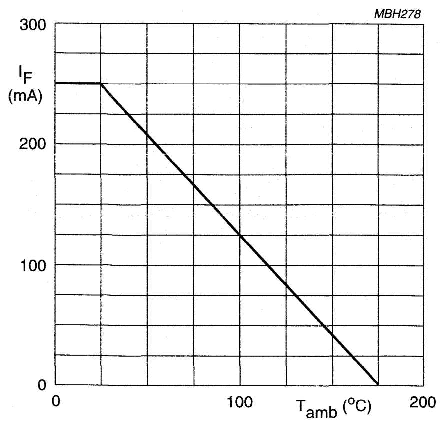
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	375	K/W

Note

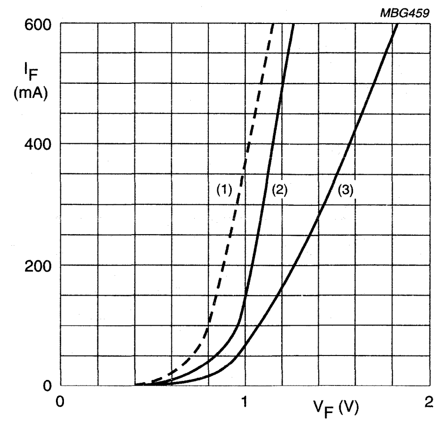
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



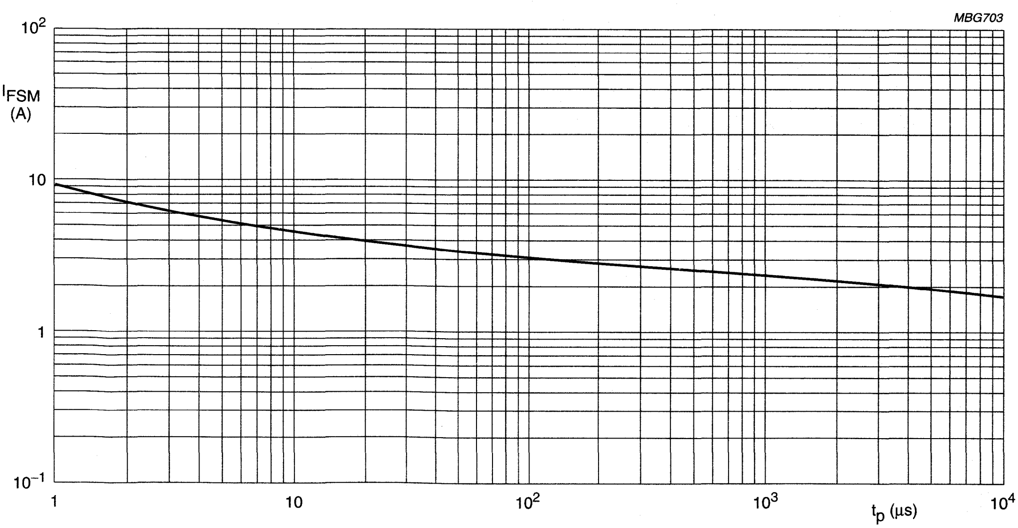
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



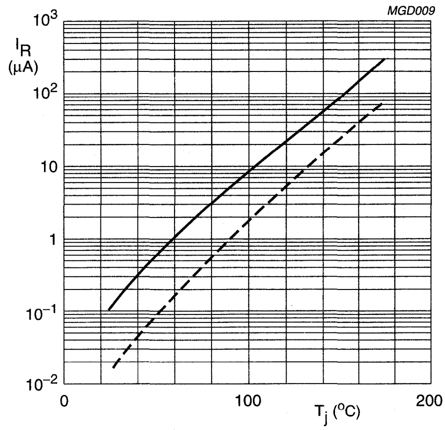
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



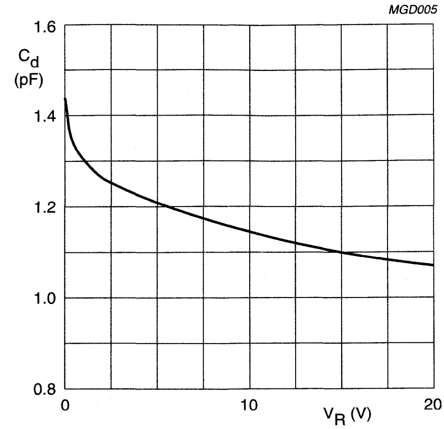
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



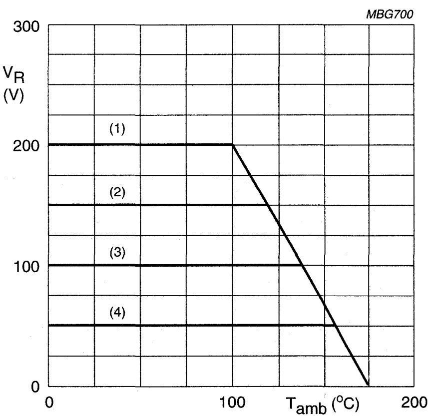
$V_R = V_{Rmax}$.
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



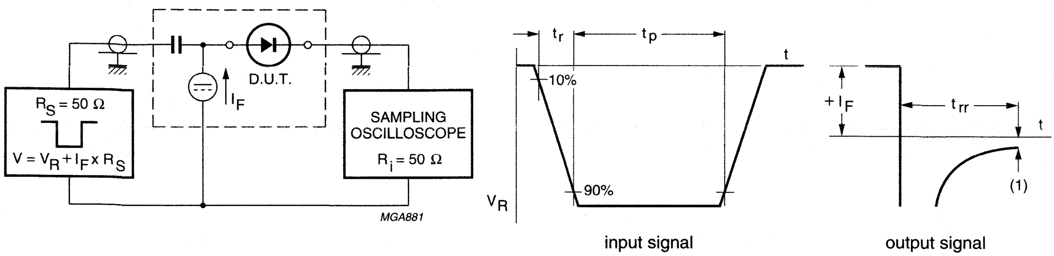
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) BAV103.
(2) BAV102.
(3) BAV101.
(4) BAV100.

Fig.7 Maximum permissible continuous reverse voltage as a function of ambient temperature.



(1) I_R = 1 mA.

Fig.8 Reverse recovery voltage test circuit and waveforms.

High-speed diode BAV105

FEATURES

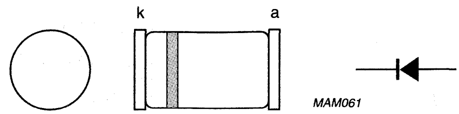
- Small hermetically sealed glass SMD package
- High switching speed: max. 6 ns
- General application
- Continuous reverse voltage: max. 60 V
- Repetitive peak reverse voltage: max. 60 V
- Repetitive peak forward current: max. 600 mA.

APPLICATIONS

- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAV105 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small hermetically sealed glass SOD80C SMD package.



Cathode indicated by black band.

Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	60	V
V_R	continuous reverse voltage		–	60	V
I_F	continuous forward current	see Fig.2; note 1	–	300	mA
I_{FRM}	repetitive peak forward current		–	600	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	9	A
		t = 100 µs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 10 mA	–	750	mV
		I_F = 200 mA	–	1000	mV
		I_F = 500 mA	–	1.25	V
		I_F = 200 mA; T_j = 100 °C	–	950	mV
I_R	reverse current	see Fig.5			
		V_R = 60 V	–	100	nA
		V_R = 60 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 400 mA to I_R = 400 mA; R_L = 100 Ω; measured at I_R = 40 mA; see Fig.7	–	6	ns
V_{fr}	forward recovery voltage	when switched from I_F = 400 mA; t_{r1} = 30 ns; see Fig.8	–	2	V
		when switched from I_F = 400 mA; t_{r2} = 100 ns; see Fig.8	–	1.5	V

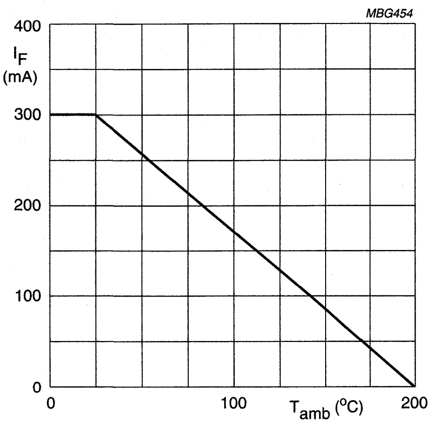
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	350	K/W

Note

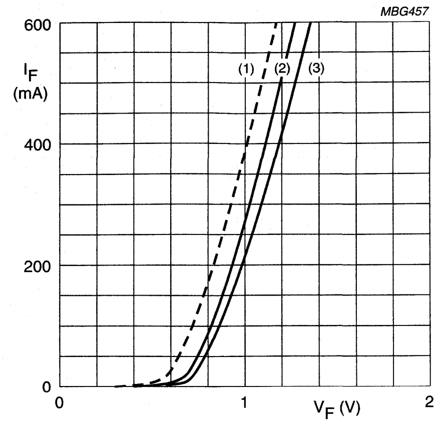
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



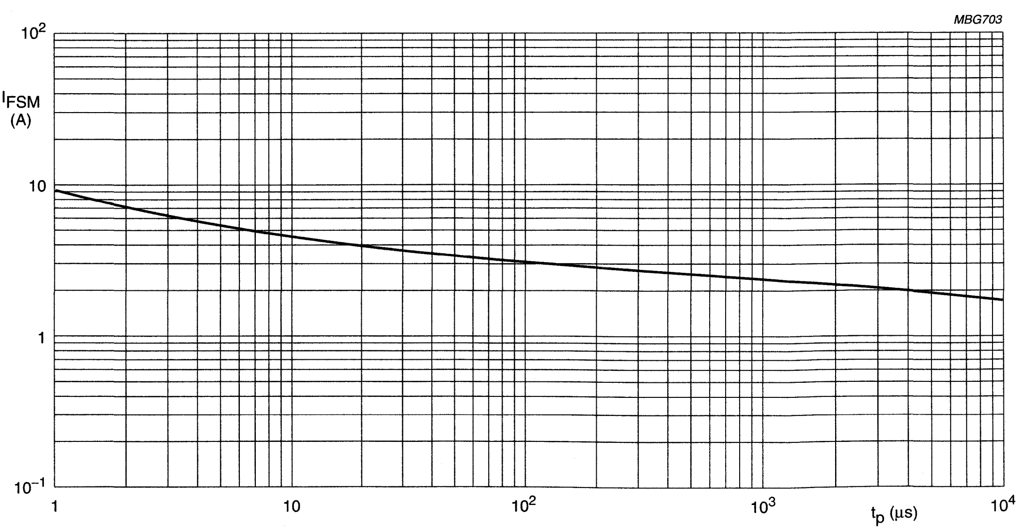
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

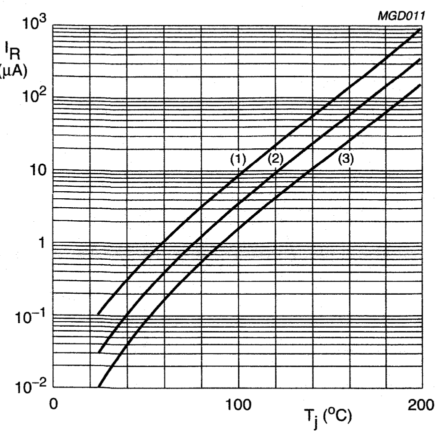
Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

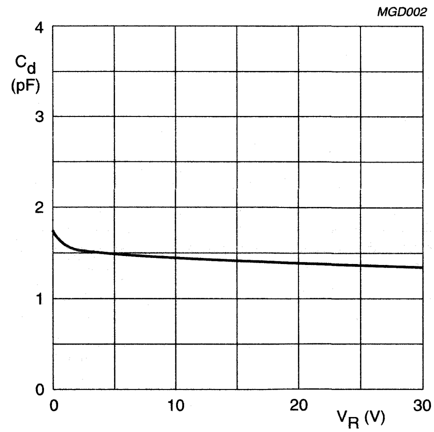
Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

High-speed diode BAV105



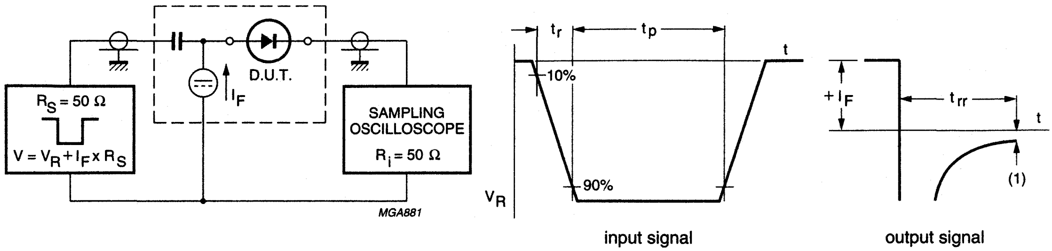
(1) V_R = 60 V; maximum values.
(2) V_R = 60 V; typical values.
(3) V_R = 30 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



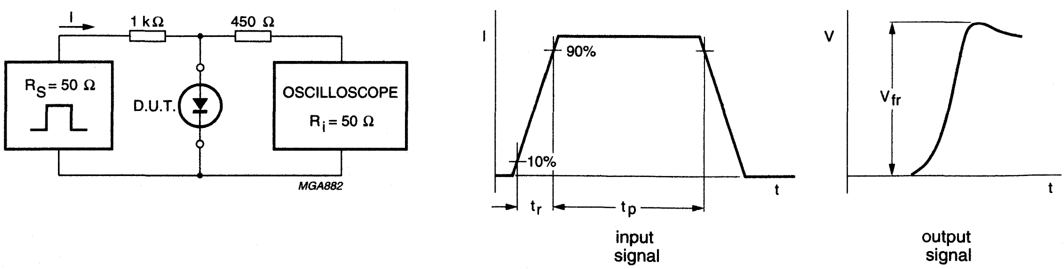
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 40$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse duration $t_p = 300$ ns; duty factor $\delta = 0.01$.

Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode — BAW56

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

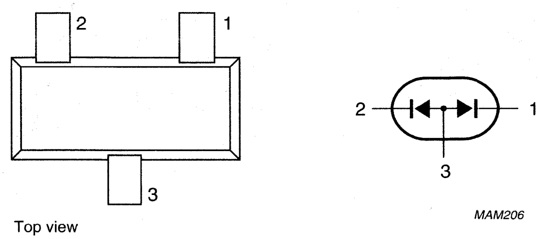
- High-speed switching in thick and thin-film circuits.

DESCRIPTION

The BAW56 consists of two high-speed switching diodes with common anodes, fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	common anode



Marking code: A1p.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

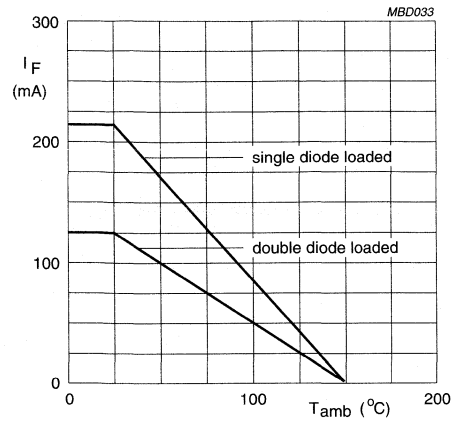
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

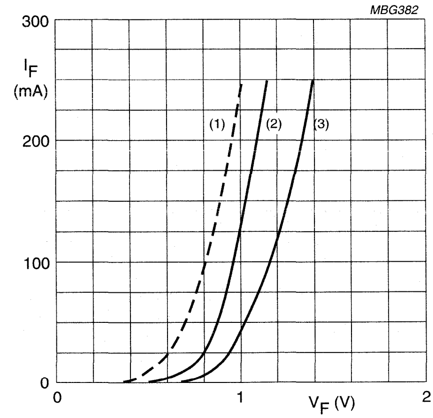
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



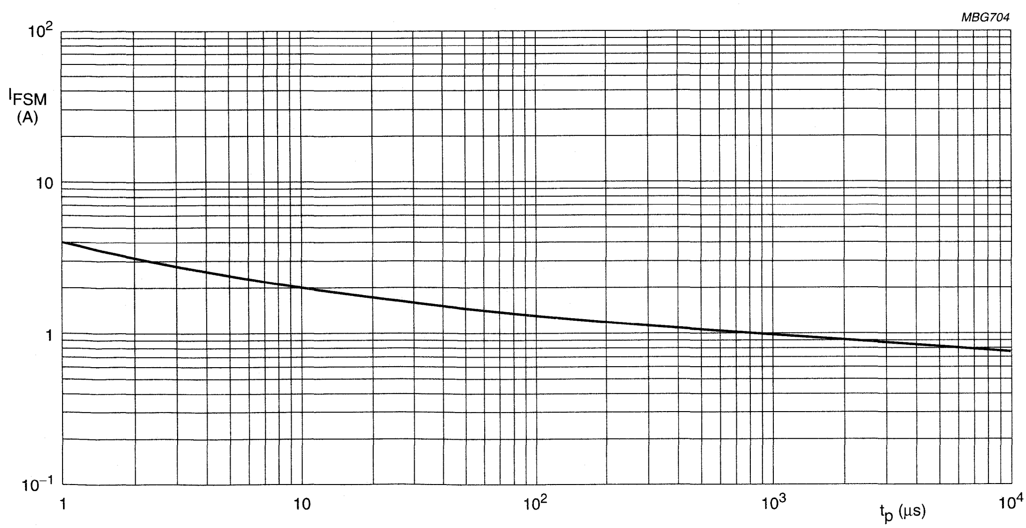
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

High-speed double diode

BAW56

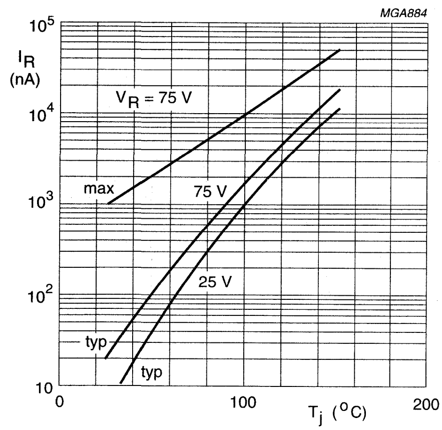
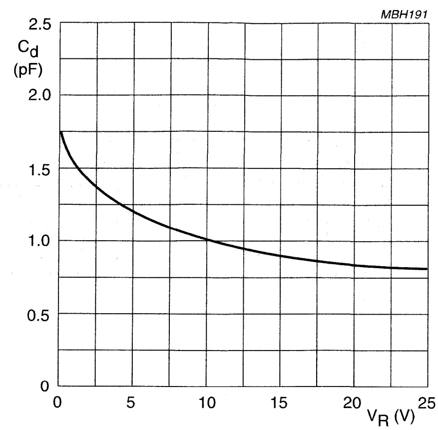
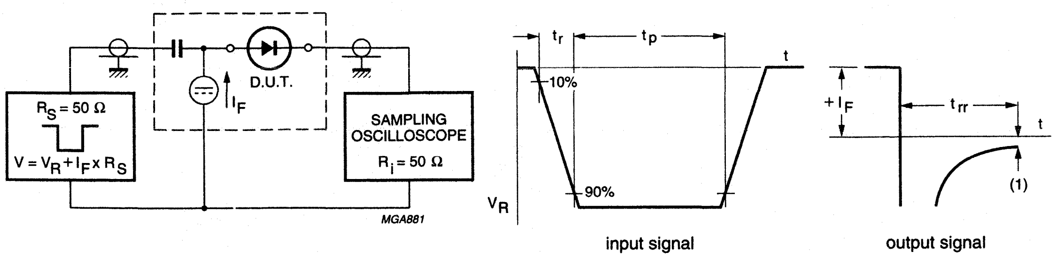


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

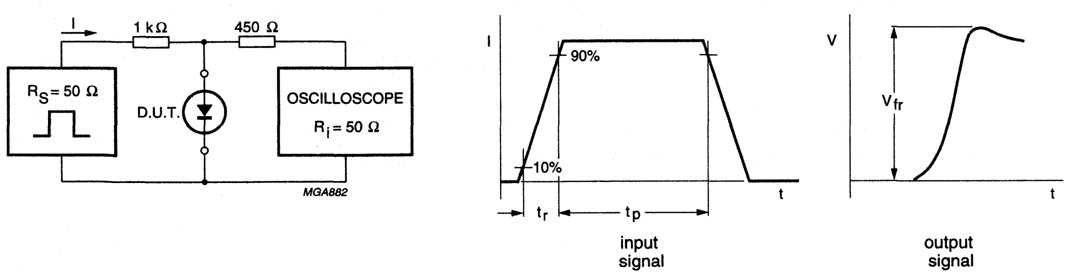


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode BAW56W

FEATURES

- Very small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

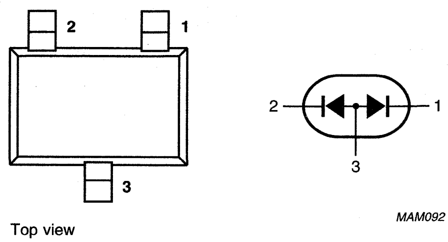
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAW56W consists of two high-speed switching diodes with common anodes, fabricated in planar technology, and encapsulated in the very small plastic SMD SOT323 package

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	common anode



Marking code: A1.

Fig.1 Simplified outline (SOT323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	150	mA
		double diode loaded; see Fig.2; note 1	–	130	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	200	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	30	nA
		V_R = 75 V	–	1	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.0	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

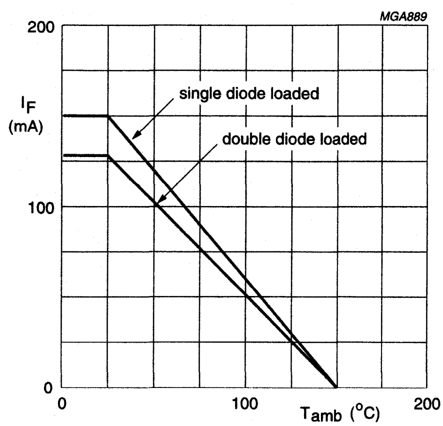
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

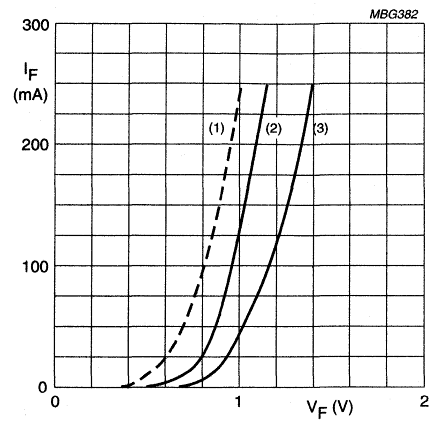
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



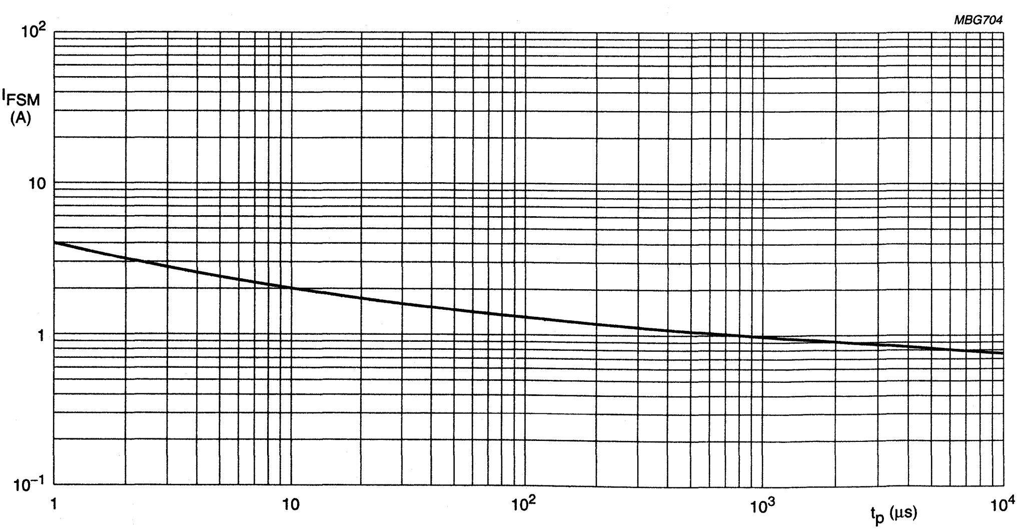
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

High-speed double diode BAW56W

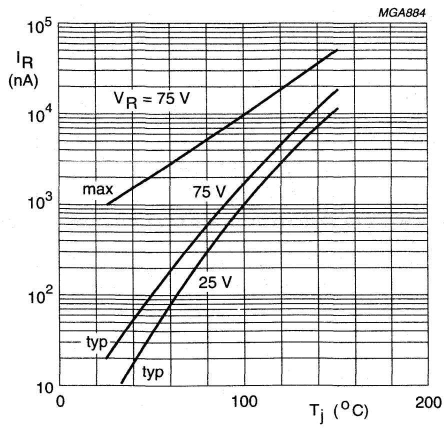
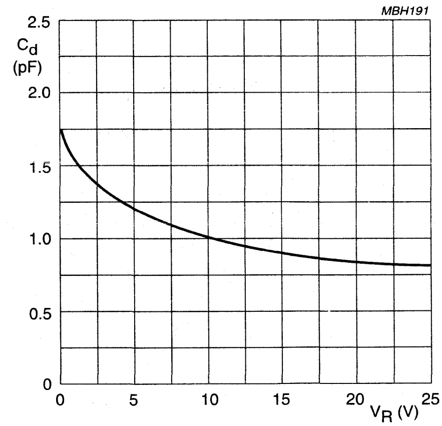
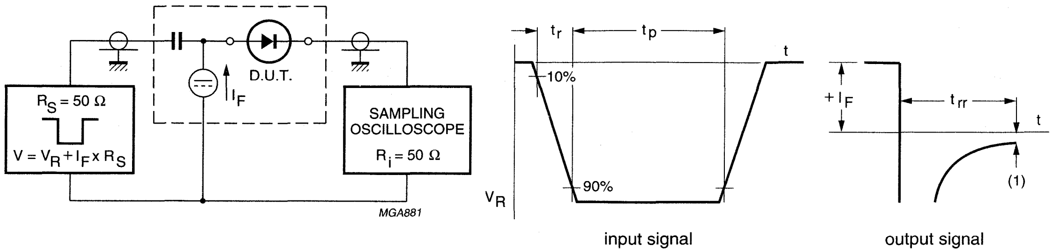


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

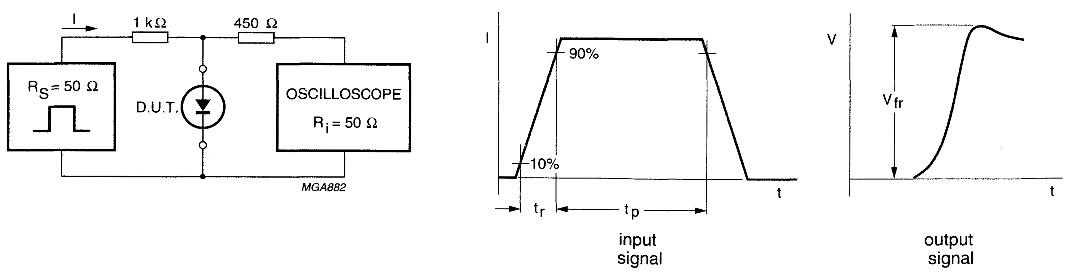


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode — BAW62

FEATURES

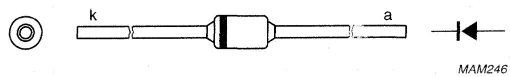
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

- High-speed switching
- Fast logic applications.

DESCRIPTION

The BAW62 is a high-speed switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	350	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 5 mA	620	750	mV
		I_F = 100 mA	–	1000	mV
		I_F = 100 mA; T_j = 100 °C	–	930	mV
I_R	reverse current	see Fig.5			
		V_R = 20 V	–	25	nA
		V_R = 50 V	–	200	nA
		V_R = 75 V	–	5	μA
		V_R = 20 V; T_j = 150 °C	–	50	μA
		V_R = 75 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 50 mA; t_r = 20 ns; see Fig.8	–	2.5	V

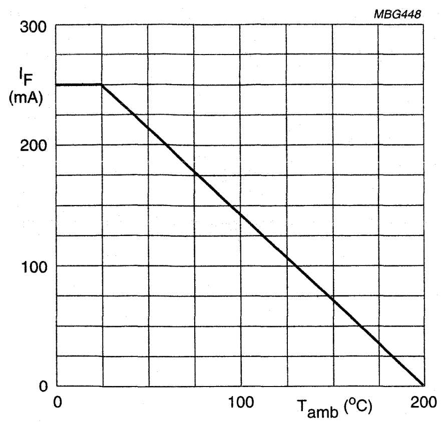
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

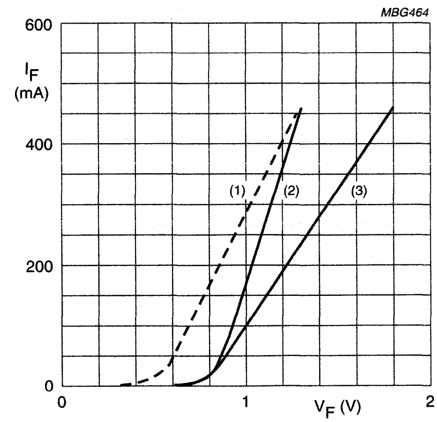
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



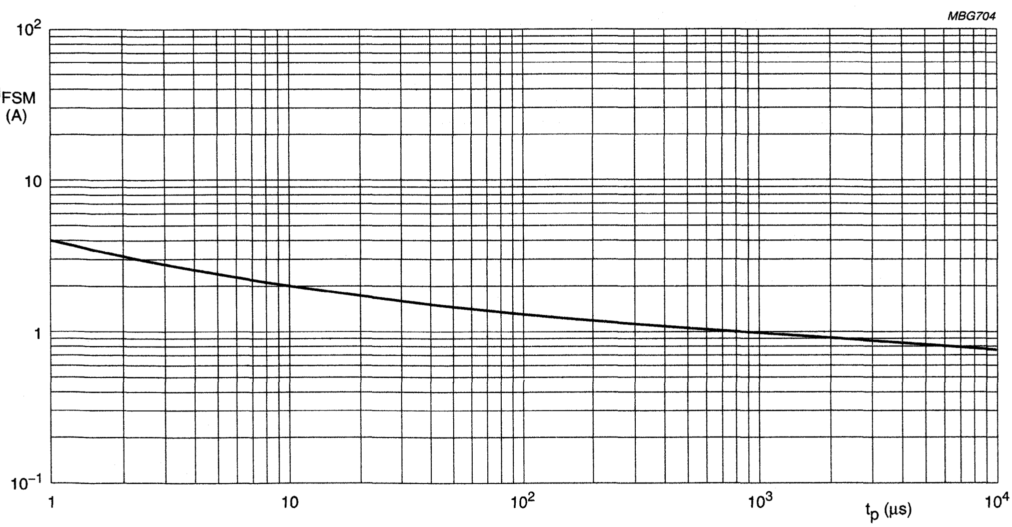
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



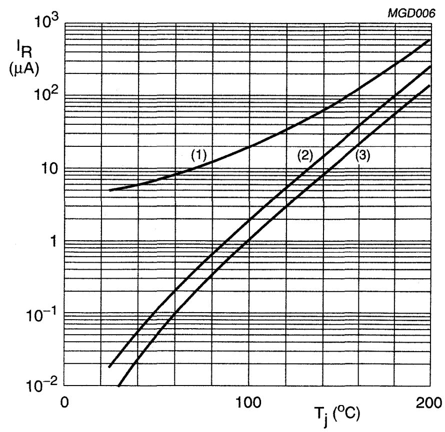
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



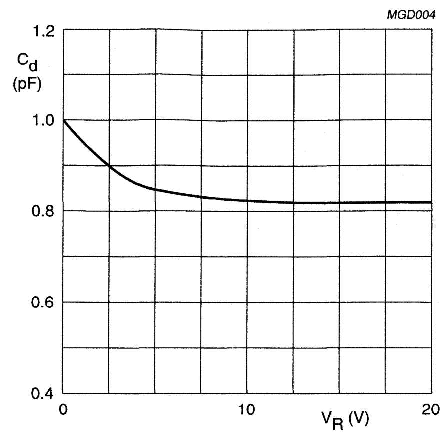
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



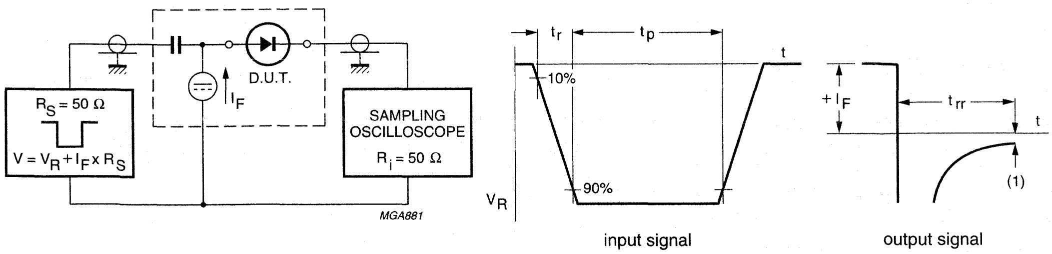
(1) V_R = 75 V; maximum values.
(2) V_R = 75 V; typical values.
(3) V_R = 20 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

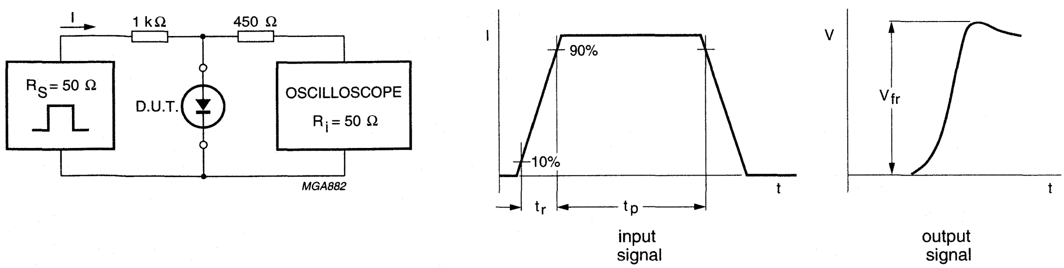


Fig.8 Forward recovery voltage test circuit and waveforms.

Controlled avalanche diode — BAX12

FEATURES

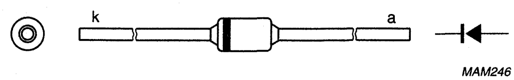
- Hermetically sealed leaded glass SOD27 (DO-35) package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 90 V
- Repetitive peak reverse voltage: max. 90 V
- Repetitive peak forward current: max. 800 mA
- Repetitive peak reverse current: max. 600 mA
- Capable of absorbing transients repetitively.

APPLICATIONS

- Switching of inductive loads in semi-electronic telephone exchanges.

DESCRIPTION

The BAX12 is a controlled avalanche diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



Marking code: BAX12.

Fig.1 Simplified outline (SOD27; DO35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage	note 1	–	90	V
V_R	continuous reverse voltage	note 1	–	90	V
I_F	continuous forward current	see Fig.2; note 2	–	400	mA
I_{FRM}	repetitive peak forward current		–	800	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	55	A
		t = 100 μs	–	15	A
		t = 10 ms	–	9	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 2	–	450	mW
I_{RRM}	repetitive peak reverse current		–	600	mA
E_{RRM}	repetitive peak reverse energy	$t_p \geq 50$ μs; f ≤ 20 Hz; T_j = 25 °C	–	5.0	mJ
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Notes

1. It is allowed to exceed this value; see Figs 8 and 9. Care should be taken not to exceed the I_{RRM} rating.
2. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 10 mA	–	750	mV
		I_F = 50 mA	–	840	mV
		I_F = 100 mA	–	900	mV
		I_F = 200 mA	–	1.0	V
		I_F = 400 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 90 V	–	100	nA
		V_R = 90 V; T_j = 150 °C	–	100	μA
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 1 mA	120	170	V
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	35	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.10	–	50	ns

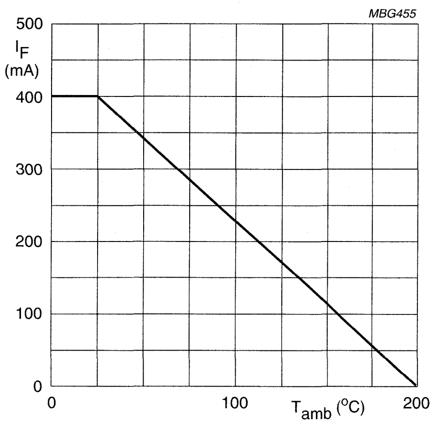
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	375	K/W

Note

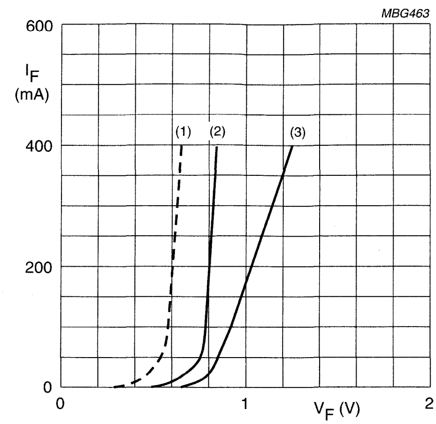
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



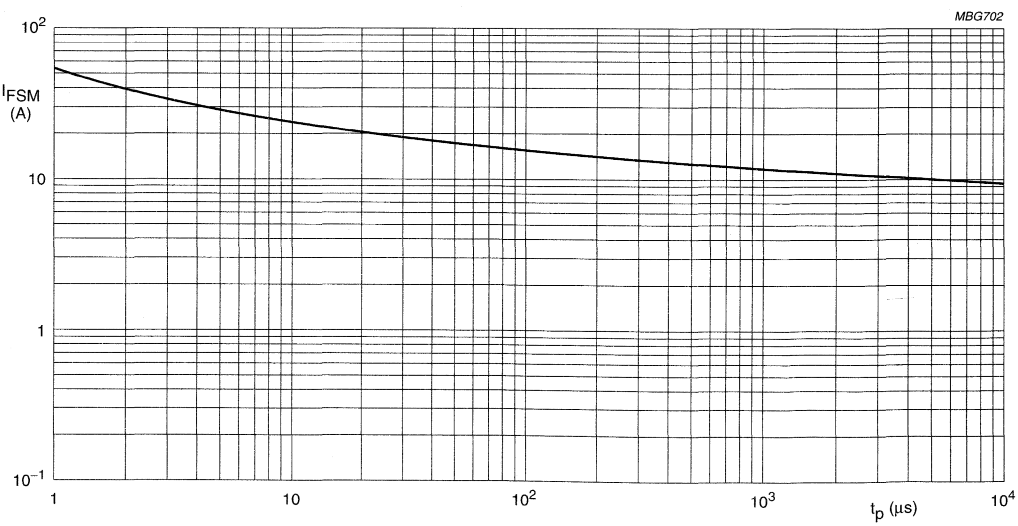
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



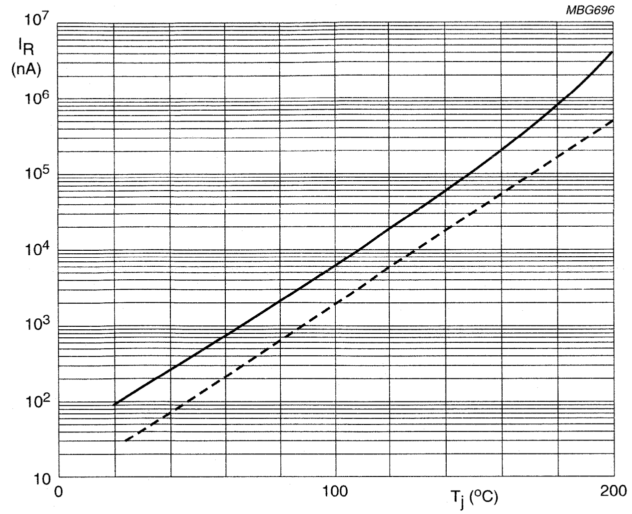
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



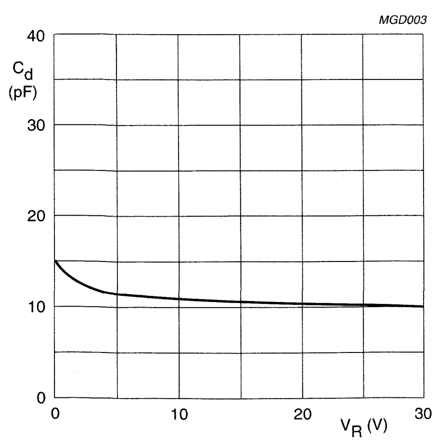
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



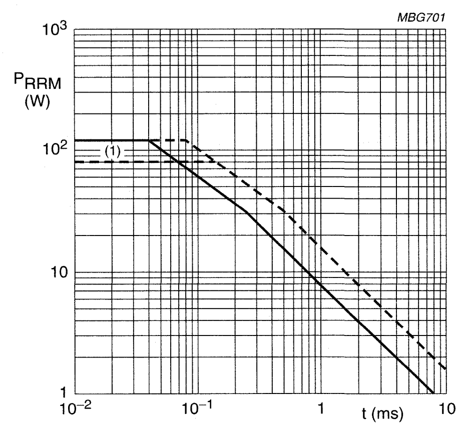
V_R = 90 V.
Solid line; maximum values. Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



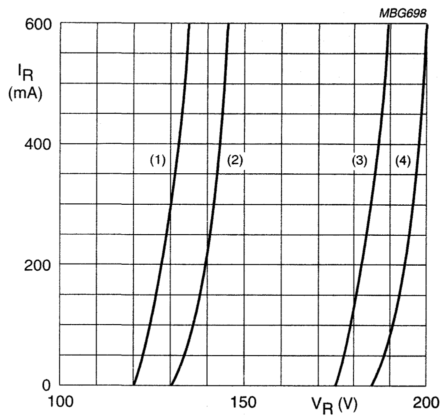
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



Solid line; rectangular waveform; $\delta \leq 0.01$.
Dotted line; triangular waveform; $\delta \leq 0.02$.
(1) Limited by I_{RMM} = 600 mA.

Fig.7 Maximum permissible repetitive peak reverse power as a function of the pulse duration T ≥ 50 ms; T_j = 25 °C.



Reverse voltages higher than the V_R ratings are allowed, provided:

a. The transient energy ≤ 7.5 mJ at P_{RRM} ≤30 W; T_j = 25 °C;
the transient energy ≤ 5 mJ at P_{RRM} = 120 W; T_j = 25 °C (see Fig.7).

b. T ≥ 50 ms; δ ≤0.01 (rectangular waveform) (see Fig.9).
δ ≤0.02 (triangular waveform) (see Fig.9).

With increasing temperature, the maximum permissible transient energy must be decreased by 0.03 mJ/K.

(1) T_j = 25 °C; minimum values.

(2) T_j = 175 °C; minimum values.

(3) T_j = 25 °C; maximum values.

(4) T_j = 175 °C; maximum values.

Fig.8 Reverse current as a function of continuous reverse voltage.

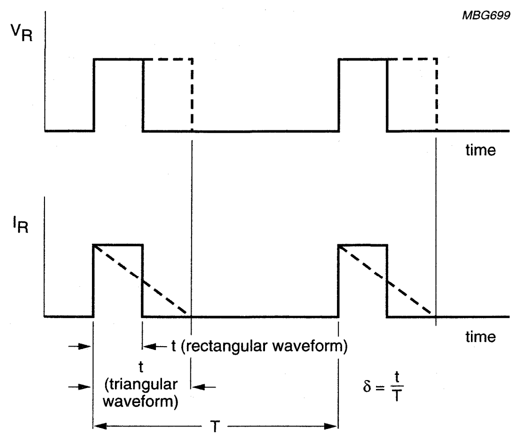
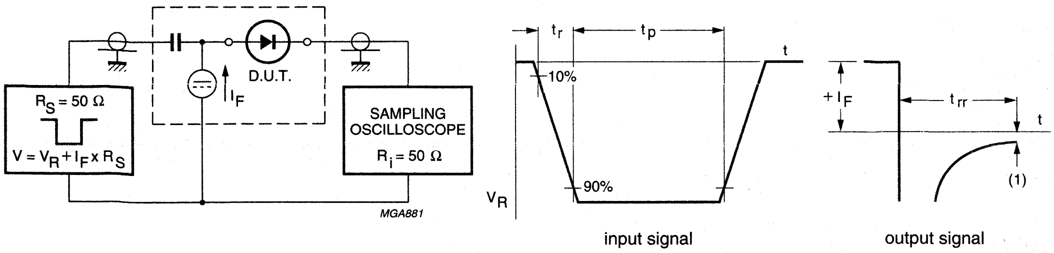


Fig.9 Peak reverse voltage and current test pulses.



Input signal: reverse pulse rise time t_r = 0.6 ns; reverse pulse duration t_p = 100 ns; duty factor δ = 0.05.
Oscilloscope: rise time t_r = 0.35 ns.
Circuit capacitance: C ≤ 1 pF (oscilloscope input capacitance + parasitic capacitance).
(1) I_R = 3 mA.

Fig.10 Reverse recovery voltage test circuit and waveforms.

General purpose diode — BAX14

FEATURES

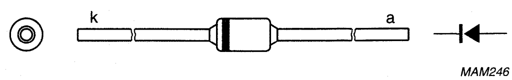
- Hermetically sealed leaded glass SOD27 (DO-35) package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 20 V
- Repetitive peak reverse voltage: max. 40 V
- Repetitive peak forward current: max. 2 A.

APPLICATIONS

- Low-voltage switching
- Rectifier applications
- Low-voltage stabilizing.

DESCRIPTION

The BAX14 is a general purpose switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	40	V
V_R	continuous reverse voltage		–	20	V
I_F	continuous forward current	see Fig.2; note 1	–	500	mA
I_{FRM}	repetitive peak forward current		–	2000	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	55	A
		t = 100 µs	–	15	A
		t = 10 ms	–	9	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	450	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

General purpose diode BAX14

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	520	600	mV
		I_F = 300 mA	750	1000	mV
I_R	reverse current	see Fig.5			
		V_R = 20 V	–	100	nA
		V_R = 20 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	35	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.7	–	50	ns

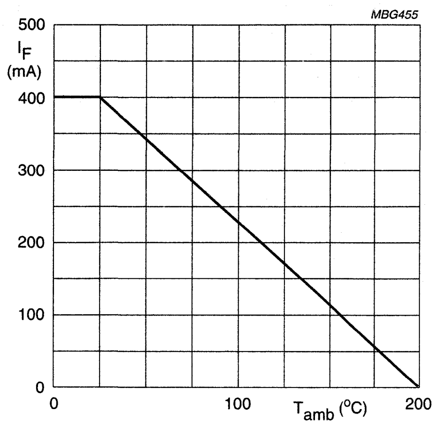
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	375	K/W

Note

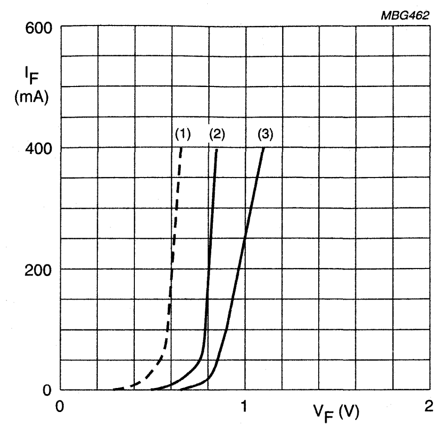
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



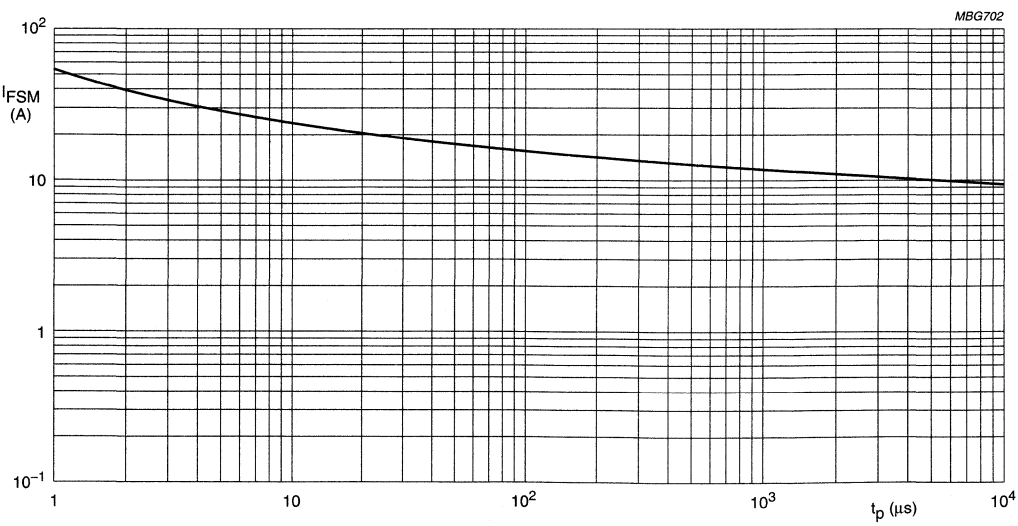
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.

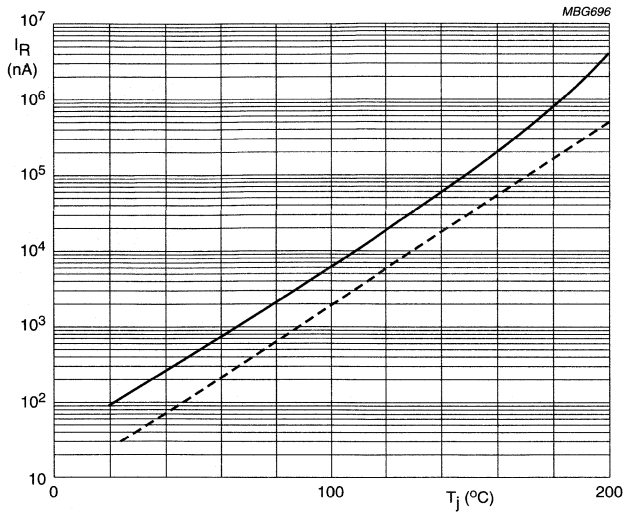


Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

General purpose diode

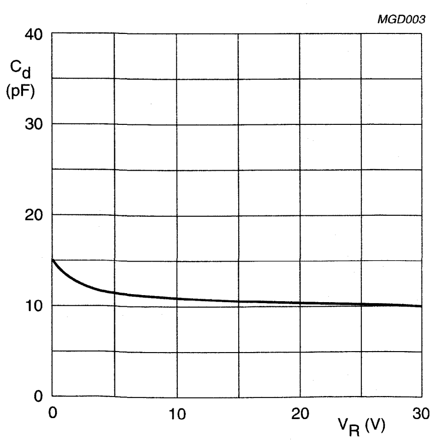
BAX14



V_R = 20 V.

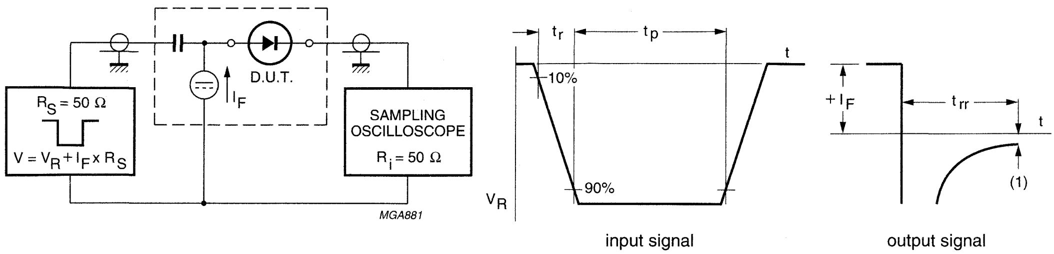
Solid line; maximum values. Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 3$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

General purpose diode BAX18

FEATURES

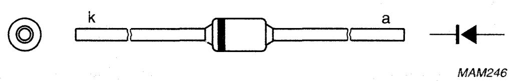
- Hermetically sealed leaded glass SOD27 (DO-35) package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 2 A.

APPLICATIONS

- Rectifier applications.

DESCRIPTION

The BAX18 is a general purpose diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	500	mA
I_{FRM}	repetitive peak forward current		–	2000	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	55	A
		t = 100 µs	–	15	A
		t = 10 ms	–	9	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	450	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

General purpose diode BAX18

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 300 mA	–	1.0	V
		I_F = 2 A; T_j = 150 °C	–	1.5	V
I_R	reverse current	see Fig.5			
		V_R = 75 V	–	5	μA
		V_R = 75 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	35	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.7	–	50	ns

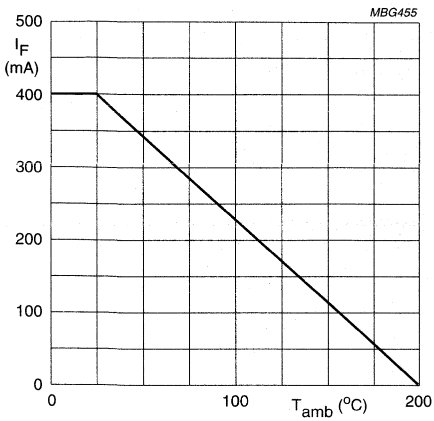
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	375	K/W

Note

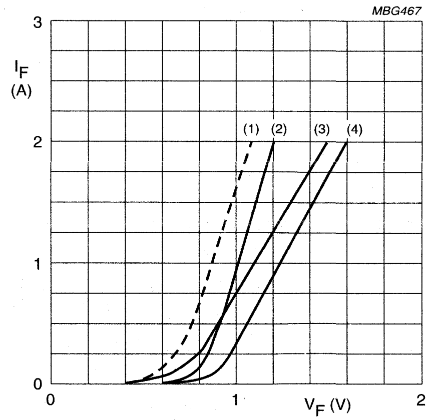
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



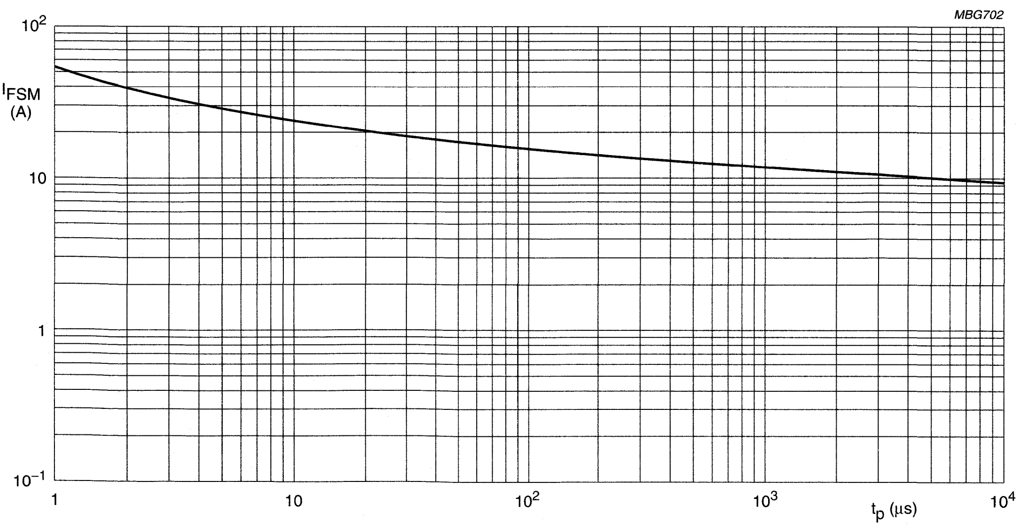
Device mounted on an FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



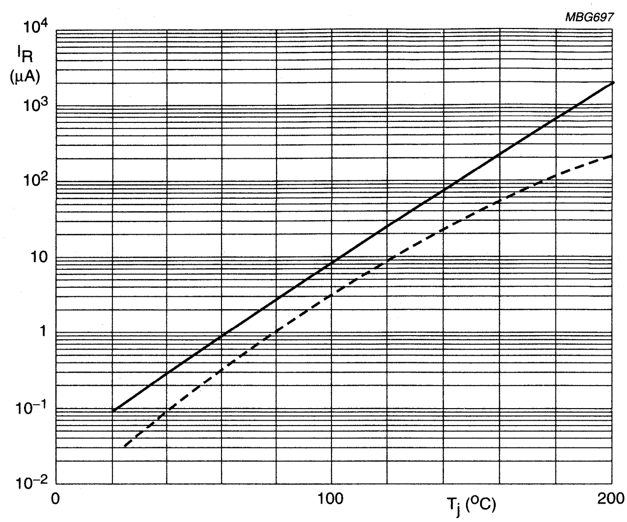
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 150 °C; maximum values.
(4) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



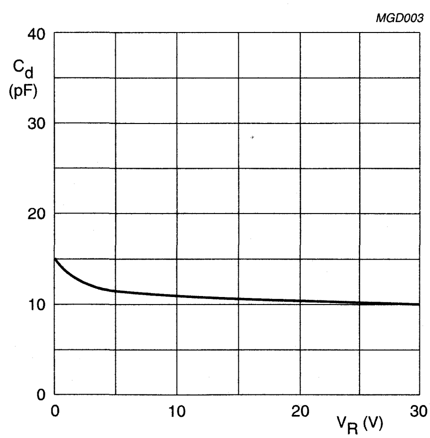
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



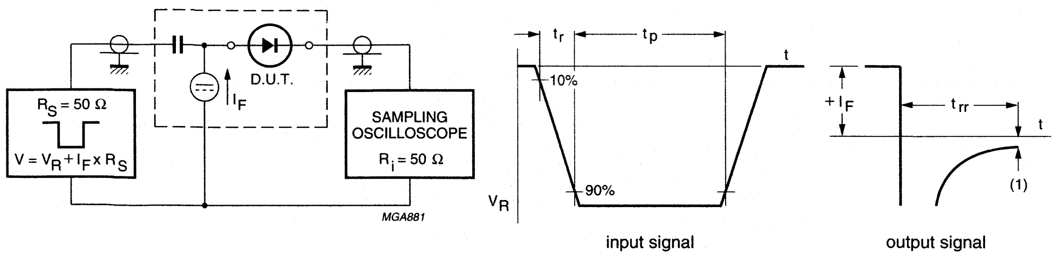
V_R = 75 V.
Solid line; maximum values. Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 3$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

General purpose diode — BAY80

FEATURES

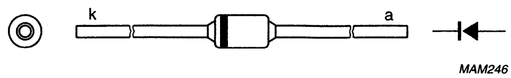
- Hermetically sealed leaded glass SOD27 (DO-35) package
- High switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 120 V
- Repetitive peak reverse voltage: max. 150 V
- Repetitive peak forward current: max. 625 mA.

APPLICATIONS

- Switching and general purposes in industrial equipment e.g. oscilloscopes, digital voltmeters and video output stages in colour television.

DESCRIPTION

The BAY80 is a switching diode fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.



The diode is type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	150	V
V_R	continuous reverse voltage		–	120	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	9	A
		t = 100 μs	–	3	A
		t = 1 s	–	1	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	400	mW
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–	175	°C

Note

1. Device mounted on an FR4 printed circuit-board; lead length 10 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 0.1 mA	450	550	mV
		I_F = 10 mA	650	800	mV
		I_F = 50 mA	730	920	mV
		I_F = 100 mA	780	1000	mV
		I_F = 150 mA	–	1.07	V
I_R	reverse current	see Fig.5			
		V_R = 120 V	–	100	nA
		V_R = 120 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	6	pF
t_{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA; see Fig.7	–	50	ns

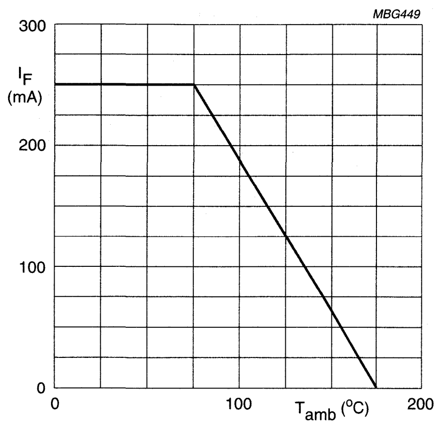
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	375	K/W

Note

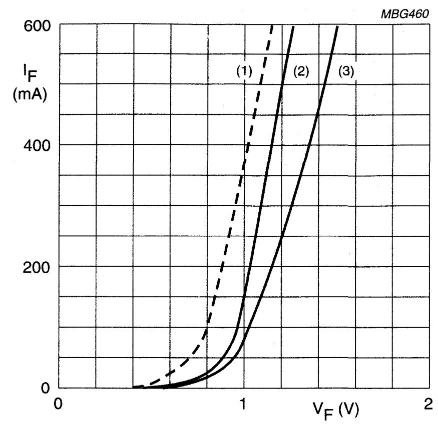
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



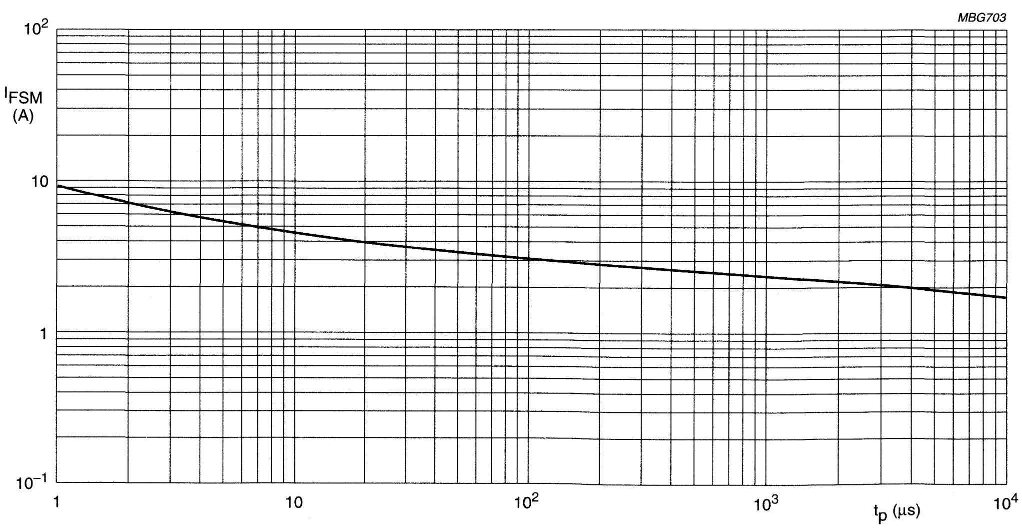
Device mounted on a FR4 printed-circuit board; lead length 10 mm.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

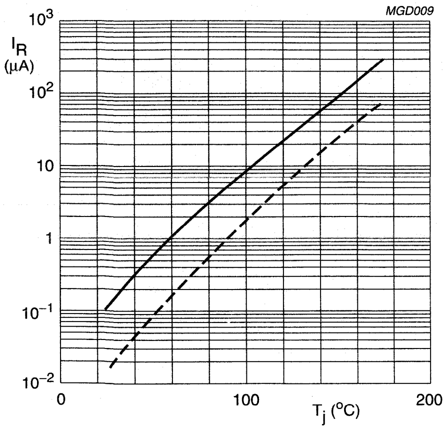
Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

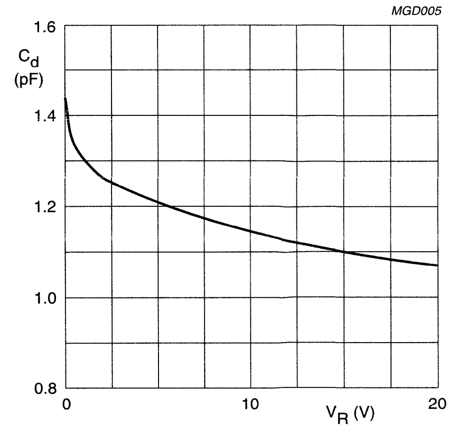
Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

General purpose diode | BAY80



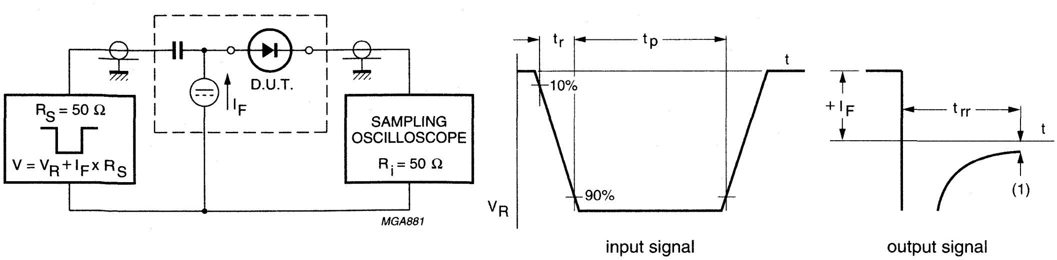
V_R = 120 V.
Solid line; maximum values.
Dotted line; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) I_R = 3 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

High-speed diode

PMBD914

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA
- Reverse recovery time: max. 4 ns.

APPLICATIONS

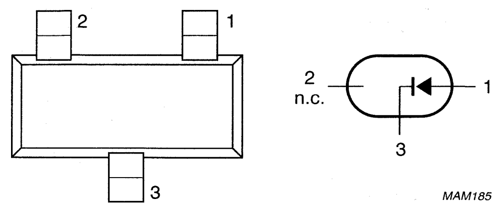
- High-speed switching in thick and thin-film circuits.

DESCRIPTION

The PMBD914 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: p5D.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1.0	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 25 V	–	25	nA
		V_R = 75 V	–	1.0	μA
		V_R = 25 V; T_j = 150 °C	–	30	μA
		V_R = 75 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

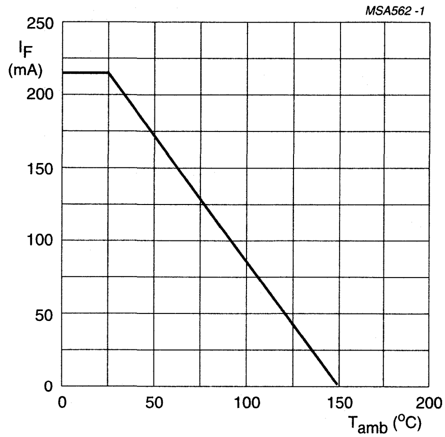
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

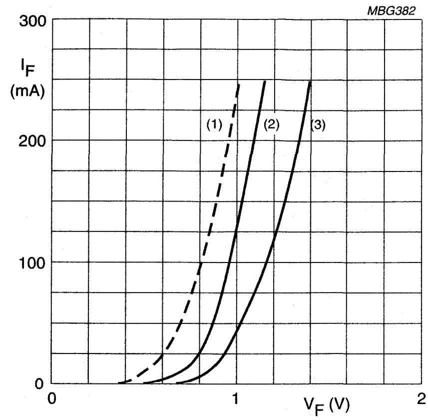
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



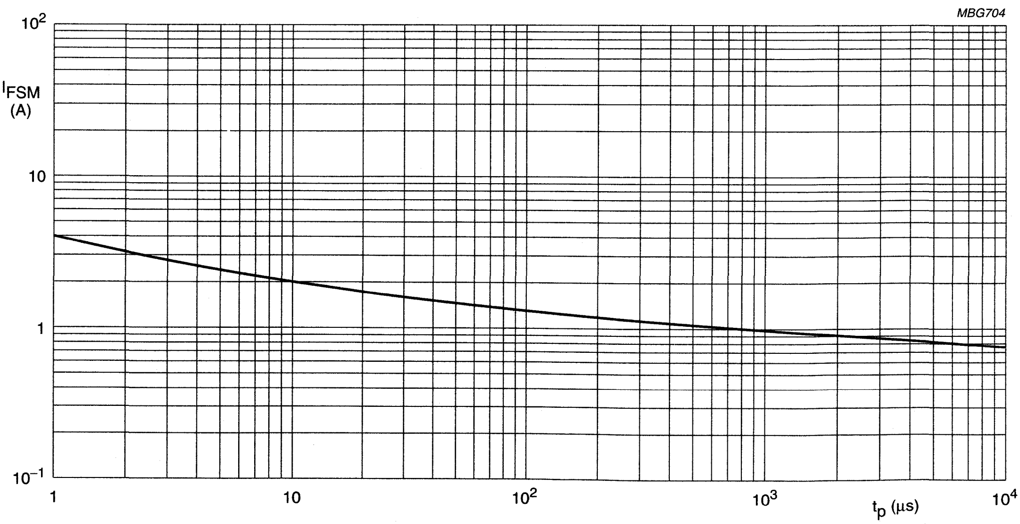
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

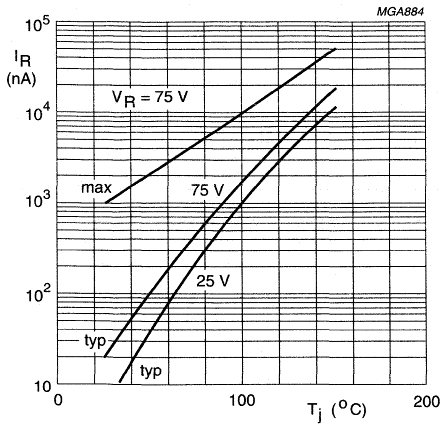
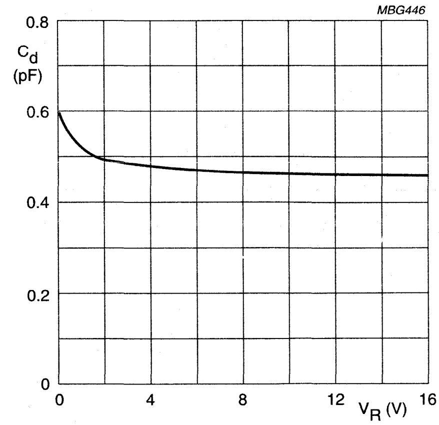
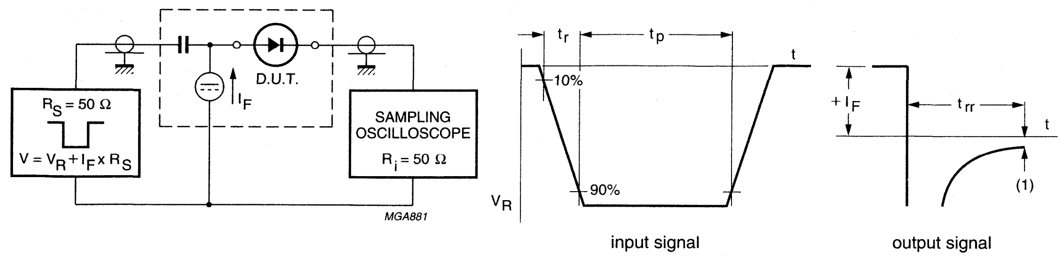


Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

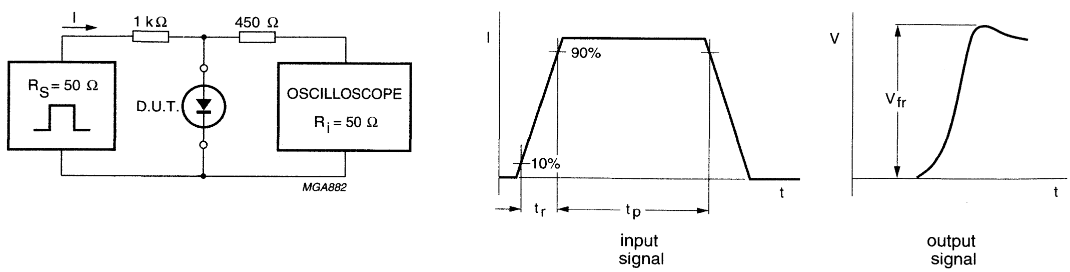


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diodes | PMBD2835; PMBD2836

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 35 V and 75 V respectively
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The PMD2835, PMD2836 consist of two high-speed switching diodes with common anodes, fabricated in planar technology, and encapsulated in small plastic SMD SOT23 packages.

MARKING

TYPE NUMBER	MARKING CODE
PMBD2835	pA3
PMBD2836	pA2

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	common anode

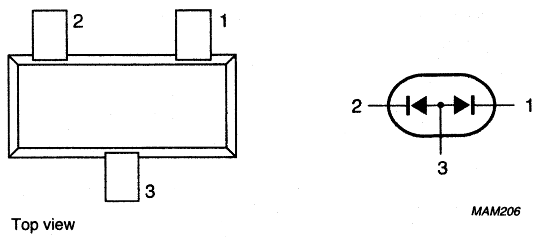


Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage				
	PMBD2835		–	85	V
	PMBD2836		–	85	V
V_R	continuous reverse voltage				
	PMBD2835		–	35	V
	PMBD2836		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current			450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
	PMBD2835	V_R = 30 V	–	100	nA
		V_R = 30 V; T_j = 150 °C;	–	40	μA
	PMBD2836	V_R = 50 V	–	100	nA
		V_R = 50 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

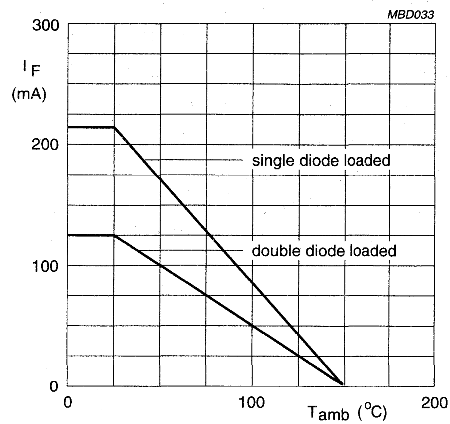
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

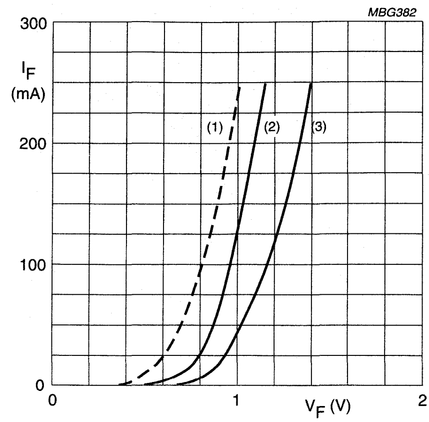
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



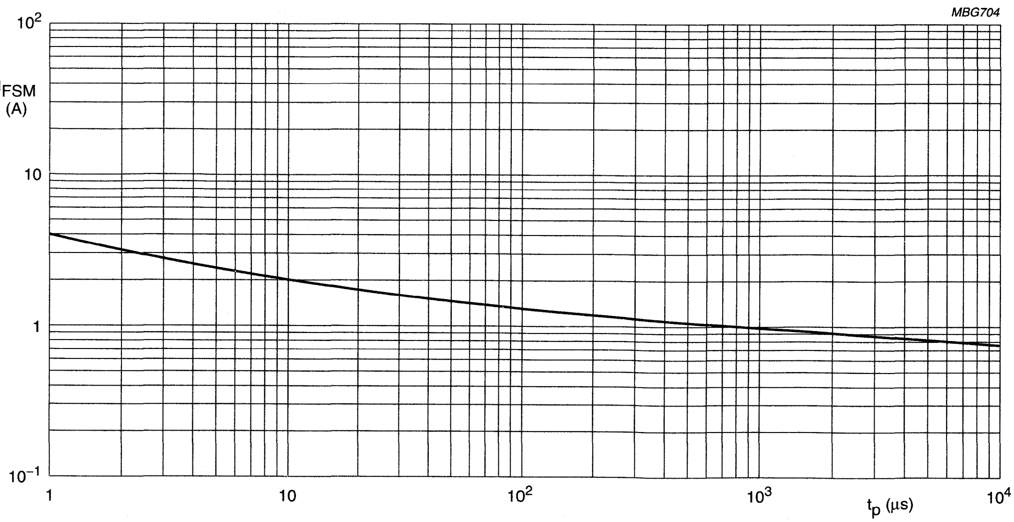
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



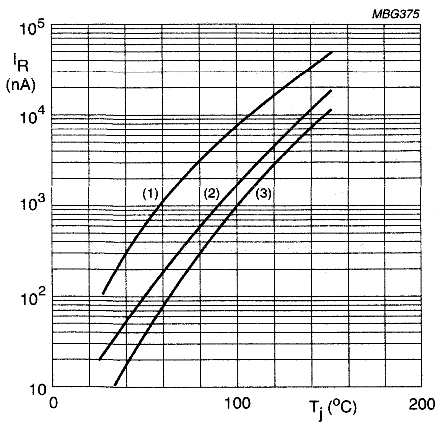
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



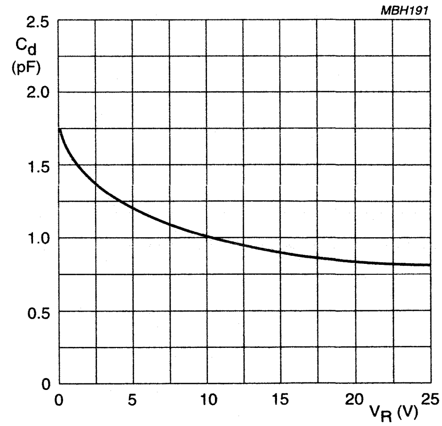
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



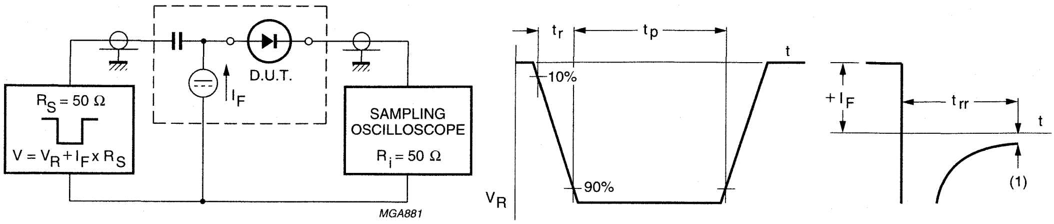
(1) V_R = 50 V; maximum values.
(2) V_R = 50 V; typical values.
(3) V_R = 30 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

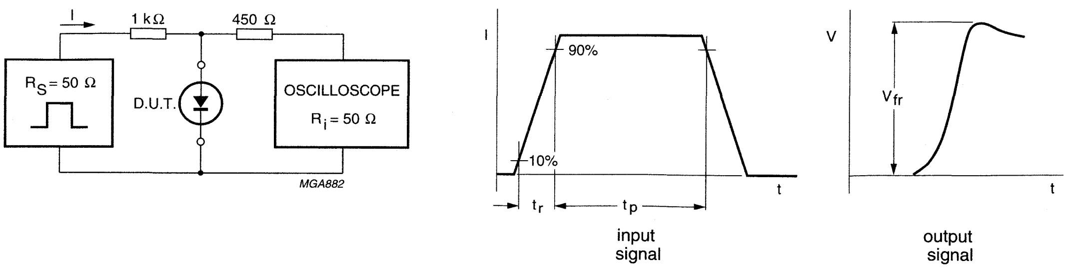


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diodes PMBD2837; PMBD2838

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 30 V and 50 V respectively
- Repetitive peak reverse voltage: max. 35 V and 75 V respectively
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The PMD2837, PMD2838 consist of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in small plastic SMD SOT23 packages.

MARKING

TYPE NUMBER	MARKING CODE
PMBD2837	pA5
PMBD2838	pA6

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode

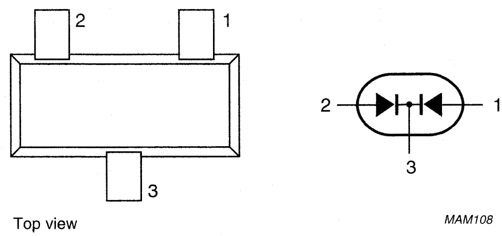


Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage				
	PMBD2837		–	35	V
	PMBD2838		–	75	V
V_R	continuous reverse voltage				
	PMBD2837		–	30	V
	PMBD2838		–	50	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current			450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
	PMBD2837	V_R = 30 V	–	100	nA
		V_R = 30 V; T_j = 150 °C	–	40	μA
	PMBD2838	V_R = 50 V	–	100	nA
		V_R = 50 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	2.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

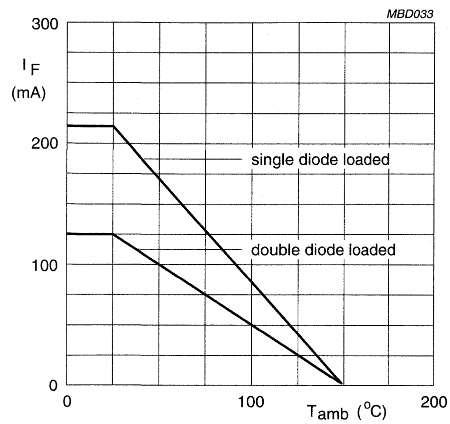
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

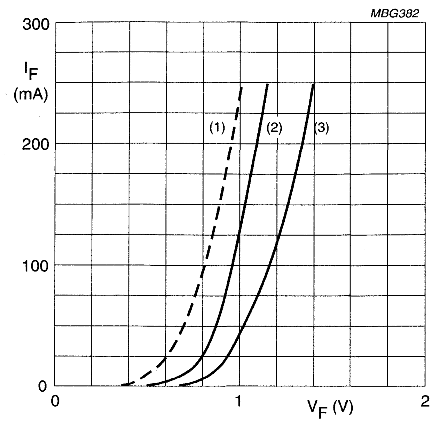
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



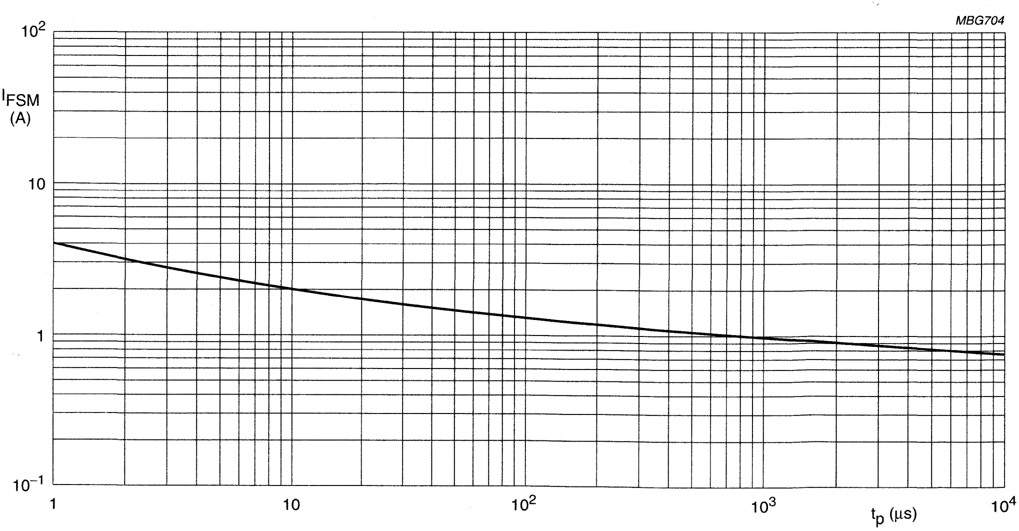
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



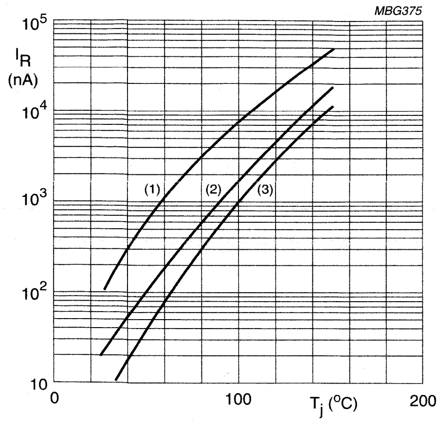
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



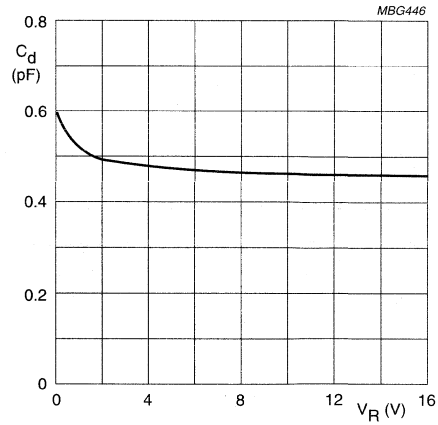
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



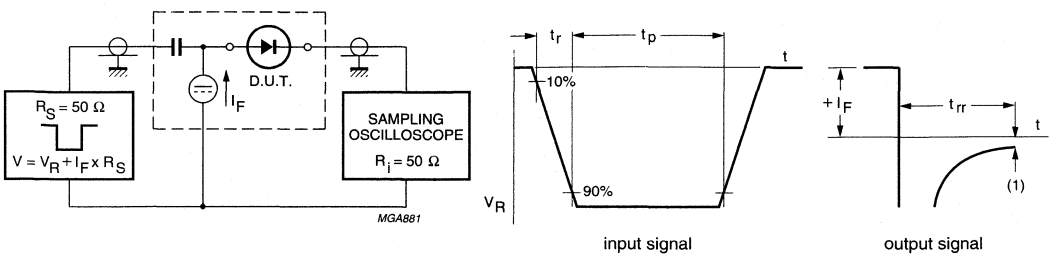
(1) V_R = 50 V; maximum values.
(2) V_R = 50 V; typical values.
(3) V_R = 30 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

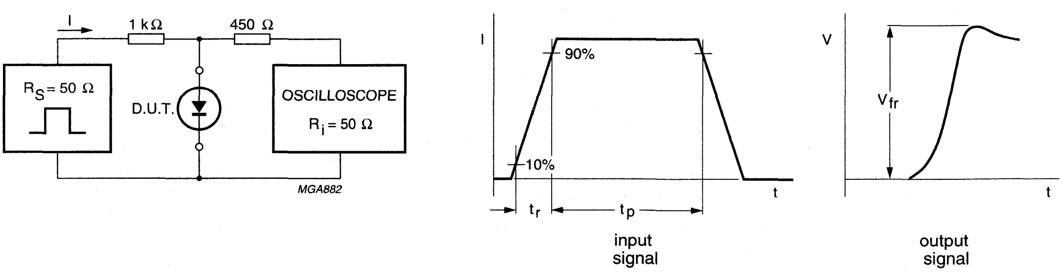


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diode PMBD6050

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

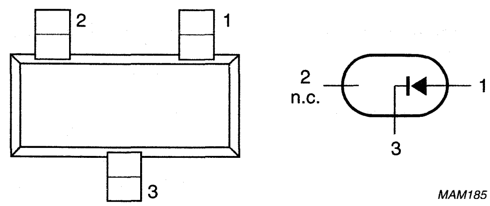
- High-speed switching in thick and thin-film circuits.

DESCRIPTION

The PMBD6050 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: p5A.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	715	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1.0	V
		I_F = 150 mA	–	1.25	V
I_R	reverse current	see Fig.5			
		V_R = 50 V	–	100	nA
		V_R = 50 V; T_j = 150 °C	–	50	µA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

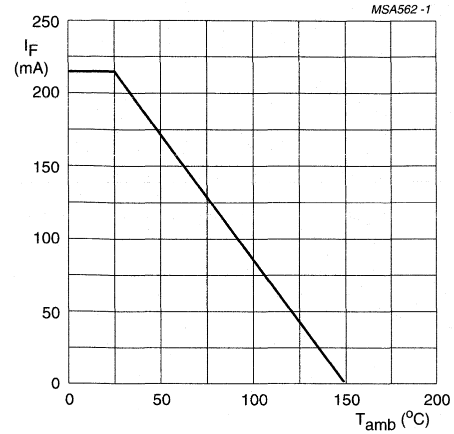
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

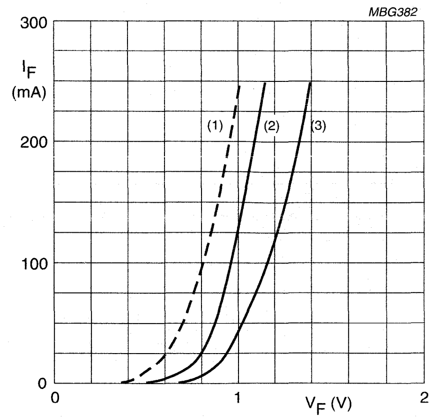
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



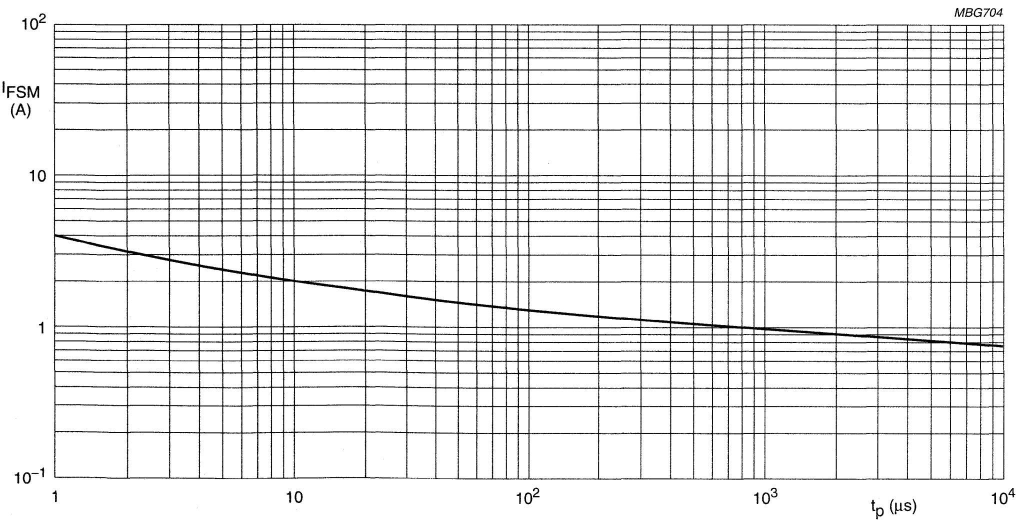
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



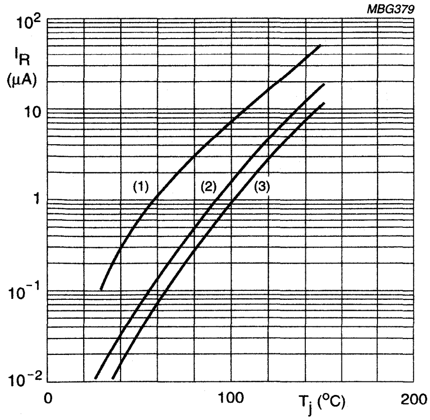
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



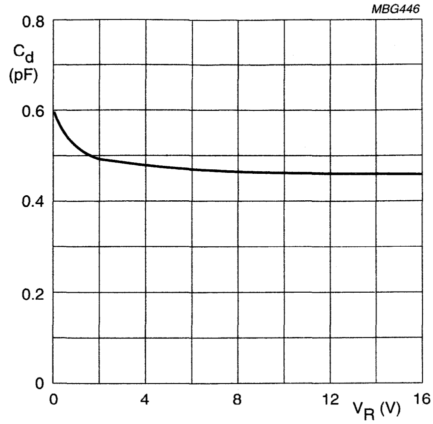
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



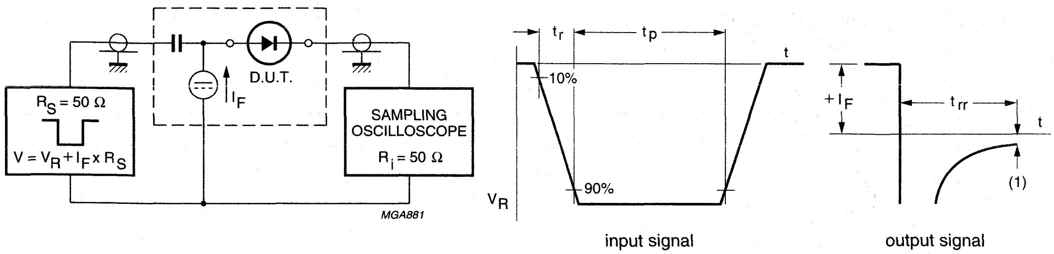
(1) V_R = 50 V; maximum values.
(2) V_R = 50 V; typical values.
(3) V_R = 30 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

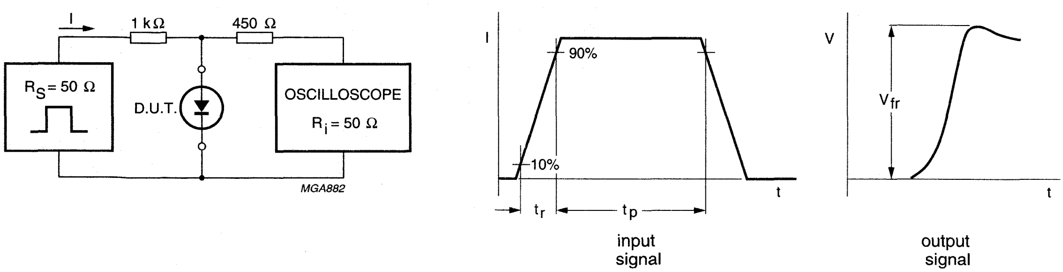


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode | PMBD6100

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

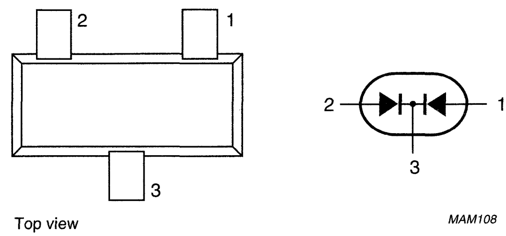
- High-speed switching in surface mounted circuits.

DESCRIPTION

The PMBD6100 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode



Marking code: p5B.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	550	700	mV
		I_F = 10 mA	–	855	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	0.85	1.1	V
I_R	reverse current	see Fig.5			
		V_R = 50 V	–	100	nA
		V_R = 50 V; T_j = 150 °C	–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

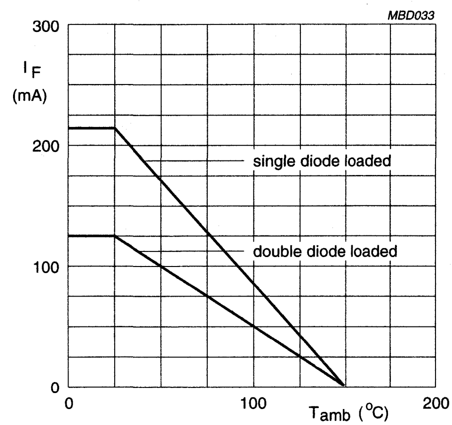
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

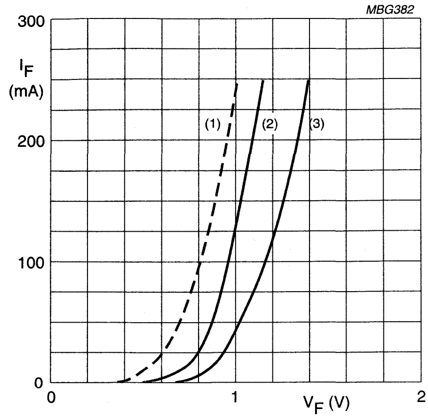
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



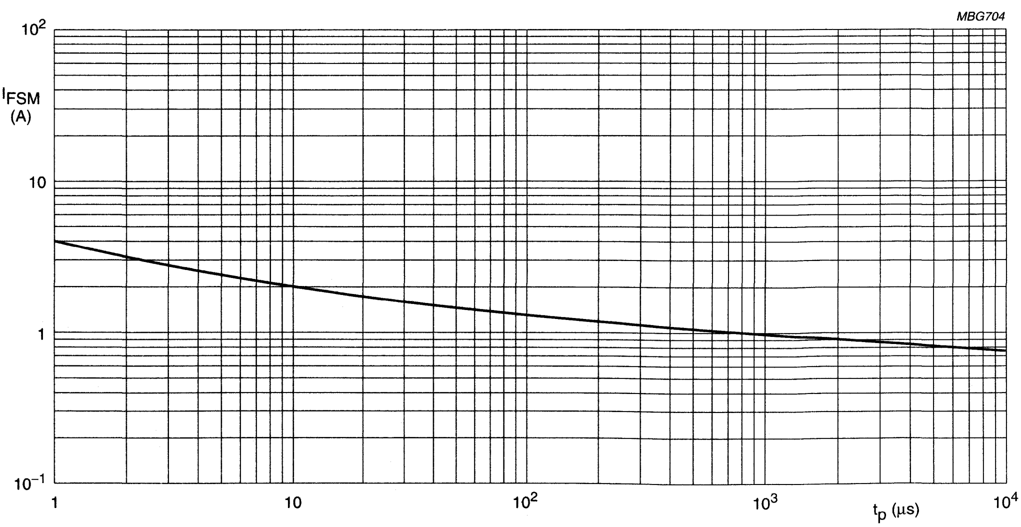
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



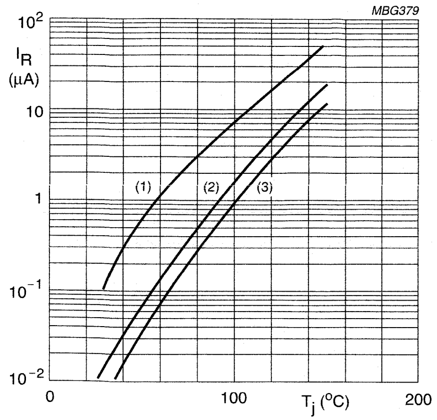
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



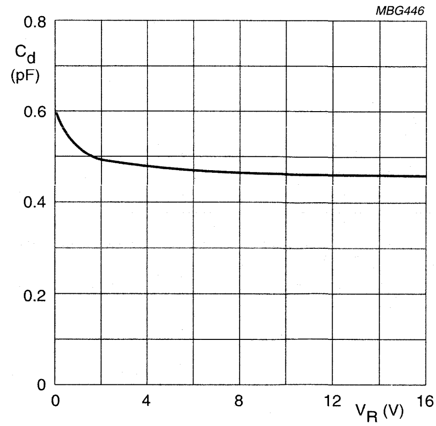
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



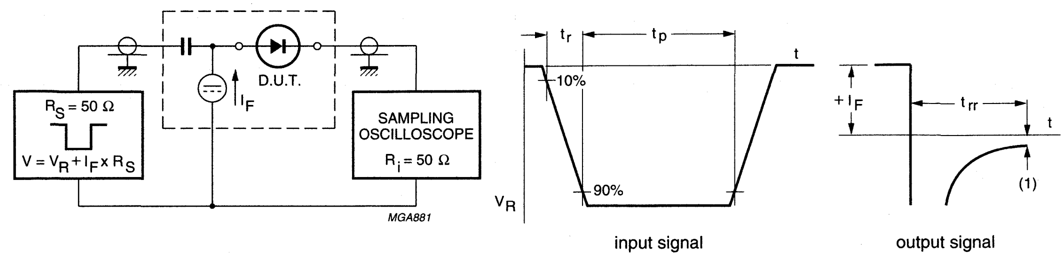
(1) V_R = 50 V; maximum values.
(2) V_R = 50 V; typical values.
(3) V_R = 30 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

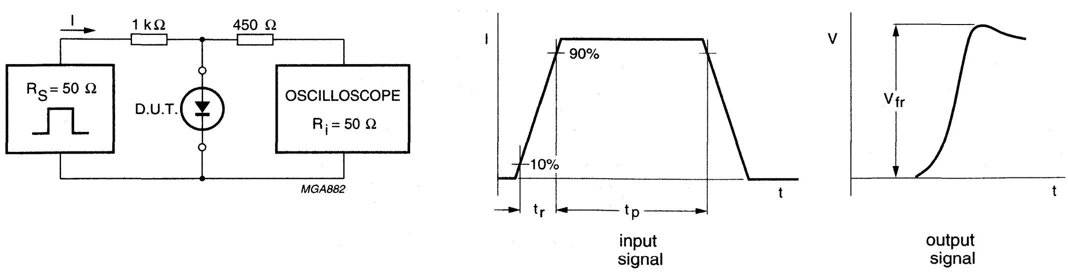


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed double diode | PMBD7000

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 100 V
- Repetitive peak reverse voltage: max. 100 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

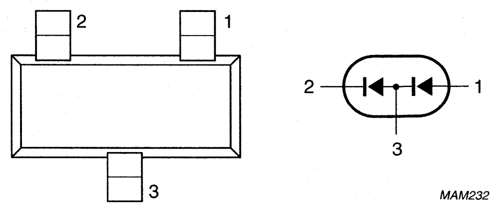
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The PMBD7000 consists of two high-speed switching diodes connected in series, fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	common connection



Marking code: p5C.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	100	V
V_R	continuous reverse voltage		–	100	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 μs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	550	700	mV
		I_F = 10 mA	670	820	mV
		I_F = 50 mA	–	1.0	V
		I_F = 100 mA	0.75	1.10	V
		I_F = 150 mA	–	1.25	mV
I_R	reverse current	see Fig.5			
		V_R = 50 V	–	300	nA
		V_R = 100 V	–	500	nA
		V_R = 50 V; T_j = 150 °C	–	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	1.5	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 10 mA; t_r = 20 ns; see Fig.8	–	1.75	V

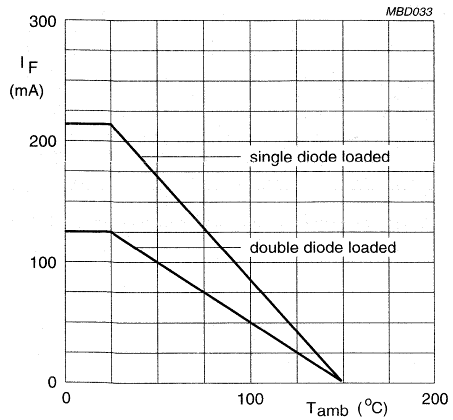
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

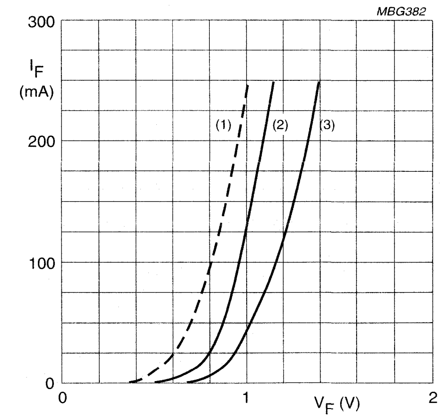
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



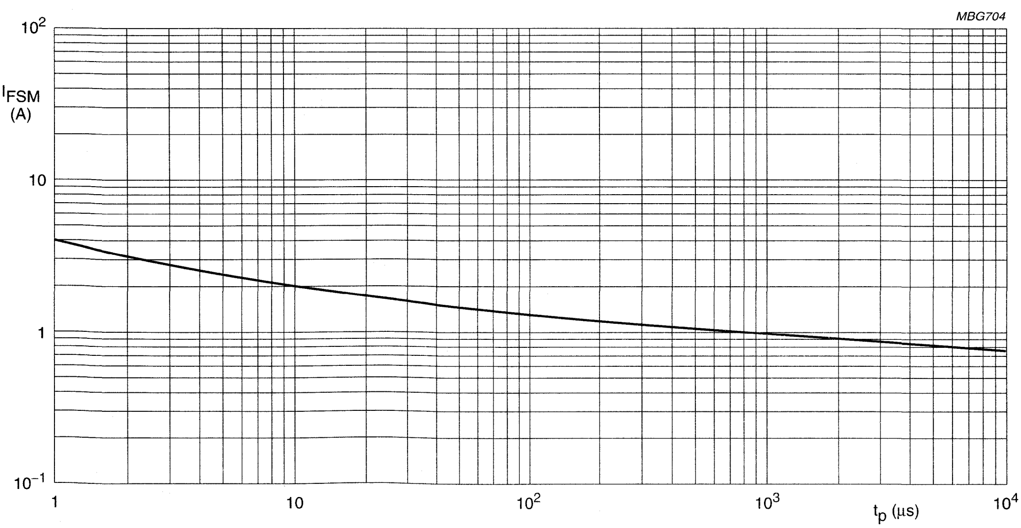
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



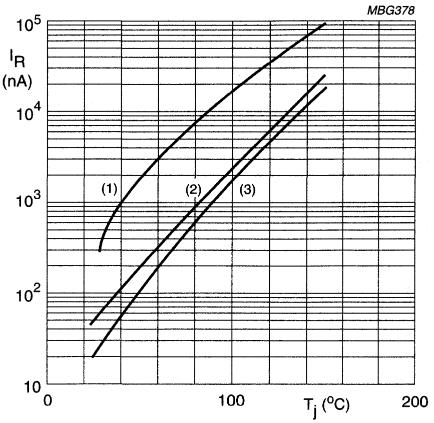
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



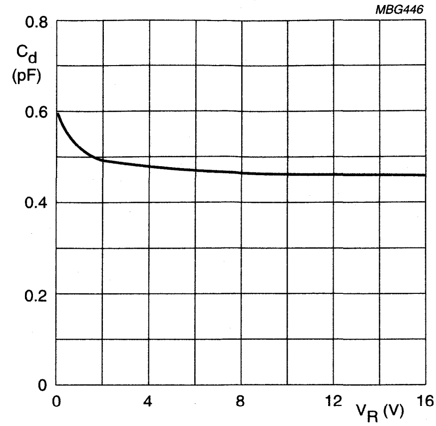
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



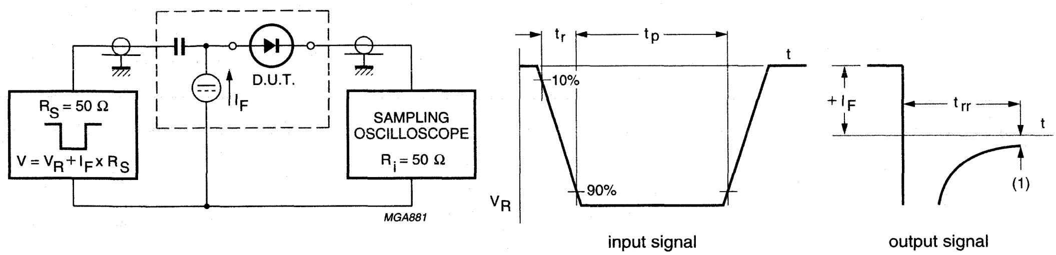
(1) V_R = 50 V; maximum values.
(2) V_R = 30 V; typical values.
(3) V_R = 50 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

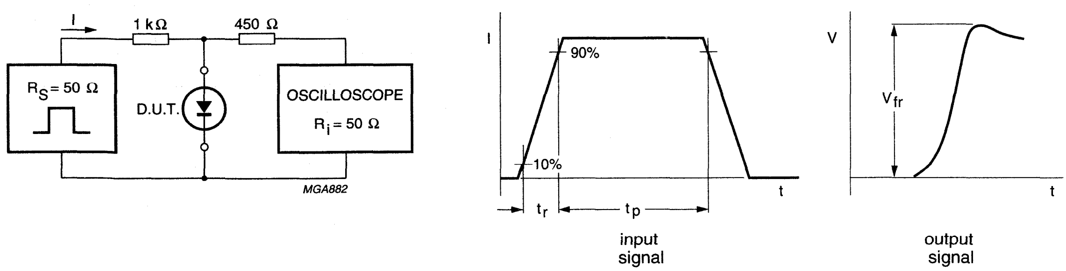


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diodes PMLL4148; PMLL4446; PMLL4448

FEATURES

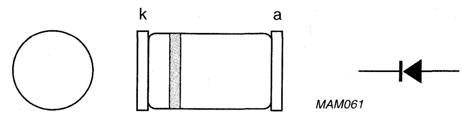
- Small hermetically sealed glass SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 450 mA.

APPLICATIONS

- High-speed switching
- Fast logic applications.

DESCRIPTION

The PMLL4148, PMLL4446, PMLL4448 are high-speed switching diodes fabricated in planar technology, and encapsulated in small hermetically sealed glass SOD80C SMD packages.



Cathode indicated by black band.

Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	75	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	200	mA
I_{FRM}	repetitive peak forward current		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
	PMLL4148	I_F = 10 mA	–	1.0	V
	PMLL4446	I_F = 20 mA	–	1.0	V
	PMLL4448	I_F = 5 mA	620	720	mV
		I_F = 100 mA	–	1.0	V
I_R	reverse current	V_R = 20 V; see Fig.5		25	nA
		V_R = 20 V; T_j = 150 °C; see Fig.5	–	50	μA
I_R	reverse current; PMLL4448	V_R = 20 V; T_j = 100 °C; see Fig.5	–	3	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6		4	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7		4	ns
V_{fr}	forward recovery voltage	when switched from I_F = 50 mA; t_r = 20 ns; see Fig.8	–	2.5	V

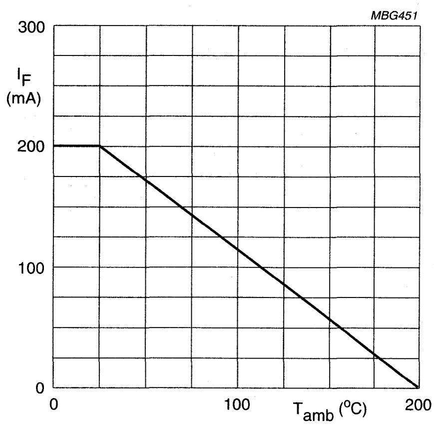
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	350	K/W

Note

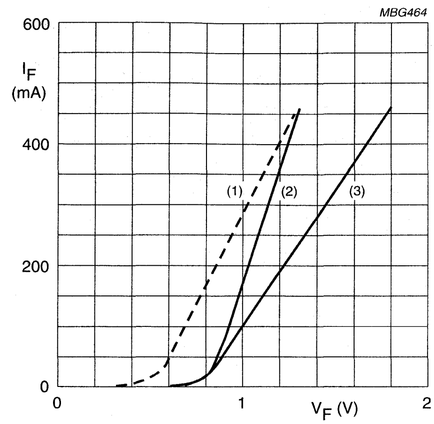
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



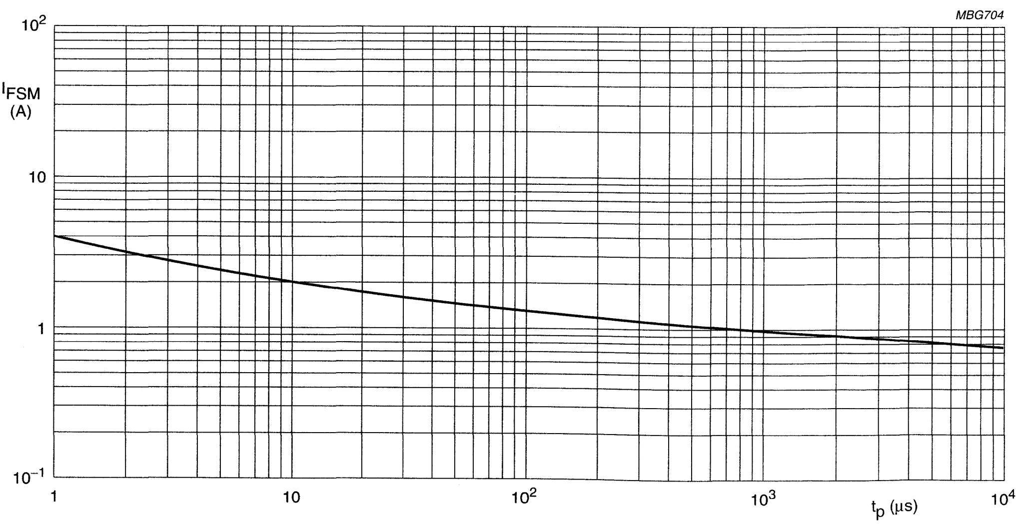
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



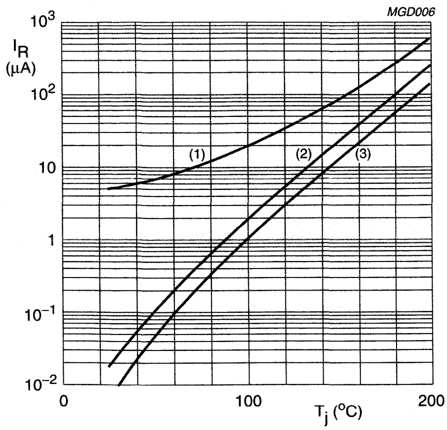
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



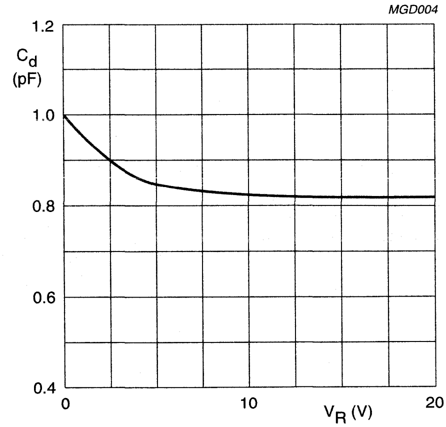
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



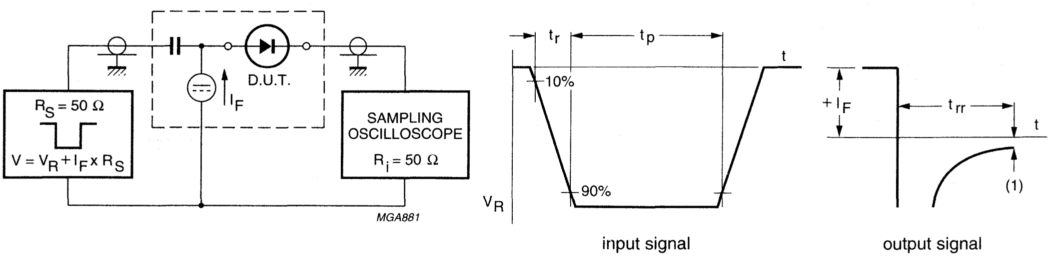
(1) V_R = 75 V; maximum values.
(2) V_R = 75 V; typical values.
(3) V_R = 20 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_R = 1$ mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

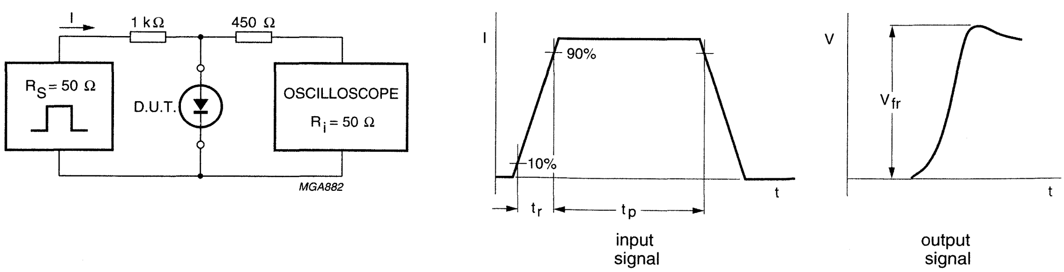


Fig.8 Forward recovery voltage test circuit and waveforms.

High-speed diodes | PMLL4150; PMLL4151; PMLL4153

FEATURES

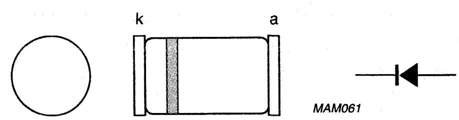
- Small hermetically sealed glass SMD package
- High switching speed: max. 4 ns
- General application
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 75 V
- Repetitive peak forward current: max. 600 mA and 450 mA respectively.

APPLICATIONS

- High-speed switching
- The PMLL4150 is primarily intended for general purpose use in computer and industrial applications.
- The PMLL4151 and PMLL4153 are intended for military and industrial applications.

DESCRIPTION

The PMLL4150, PMLL4151, PMLL4153 are high-speed switching diodes fabricated in planar technology, and encapsulated in small hermetically sealed glass SOD80C SMD packages.



Cathode indicated by black band.

Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	PMLL4151		–	75	V
	PMLL4153		–	75	V
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current	see Fig.0; note 1			
	PMLL4150		–	300	mA
	PMLL4151		–	200	mA
	PMLL4153		–	200	mA
I_{FRM}	repetitive peak forward current				
	PMLL4150		–	600	mA
	PMLL4151		–	450	mA
	PMLL4153		–	450	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t = 1 µs	–	4	A
		t = 1 ms	–	1	A
		t = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
	PMLL4150	I_F = 1 mA	540	620	mV
		I_F = 10 mA	660	740	mV
		I_F = 50 mA	760	860	mV
		I_F = 100 mA	820	920	mV
		I_F = 200 mA	870	1000	mV
	PMLL4151	I_F = 50 mA	–	1000	mV
	PMLL4153	I_F = 0.1 mA	490	550	mV
		I_F = 0.25 mA	530	590	mV
		I_F = 1 mA	590	670	mV
		I_F = 2 mA	620	700	mV
		I_F = 10 mA	700	810	mV
		I_F = 50 mA	740	880	mV
I_R	reverse current	V_R = 50 V; see Fig.5			
	PMLL4150		–	0.1	μA
	PMLL4151		–	0.05	μA
	PMLL4153		–	0.05	μA
I_R	reverse current	V_R = 50 V; T_j = 150 °C; see Fig.5			
	PMLL4150		–	100	μA
	PMLL4151		–	50	μA
	PMLL4153		–	50	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6			
	PMLL4150		–	2.5	pF
	PMLL4151		–	2	pF
	PMLL4153			2	pF

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
t_{rr}	reverse recovery time PMLL4150	when switched from I_F = 10 mA to I_R = 1 mA; R_L = 100 Ω; measured at I_R = 0.1 mA; see Fig.7	–	6	ns
		when switched from I_F = 10 mA to 200 mA to I_R = 10 mA to 200 mA; R_L = 100 Ω; measured at $I_R = 0.1 \times I_F$; see Fig.7	–	4	ns
		when switched from I_F = 200 mA to 400 mA to I_R = 200 mA to 400 mA; R_L = 100 Ω; measured at $I_R = 0.1 \times I_F$; see Fig.7	–	6	ns
t_{rr}	reverse recovery time PMLL4151	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
		when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	2	ns
t_{rr}	reverse recovery time PMLL4153	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	4	ns
		when switched from I_F = 10 mA to I_R = 60 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	–	2	ns
t_{fr}	forward recovery time	when switched to I_F = 200 mA; t_r = 0.4 ns; measured at V_F = 1 V; see Fig.8	–	10	ns

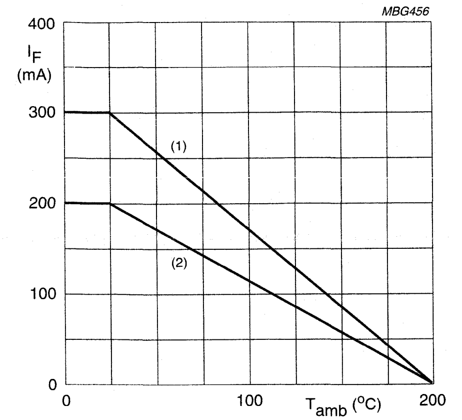
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	350	K/W

Note

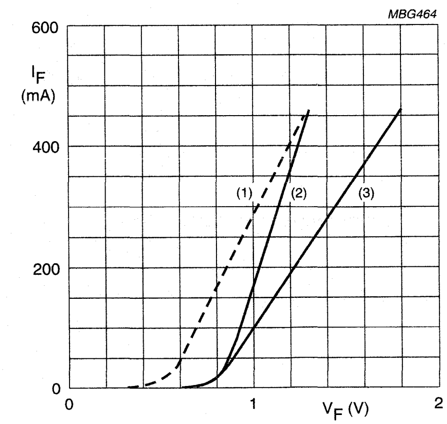
1. Device mounted on an FR4 printed-circuit board.

GRAPHICAL DATA



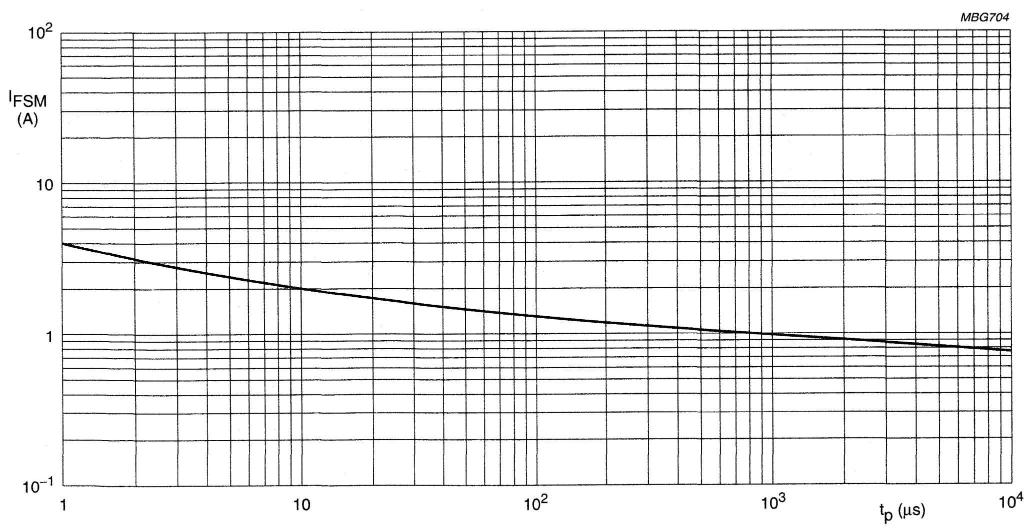
Device mounted on an FR4 printed-circuit board.
(1) PMLL4150.
(2) PMLL4151; PMLL4153.

Fig.0 Maximum permissible continuous forward current as a function of ambient temperature.



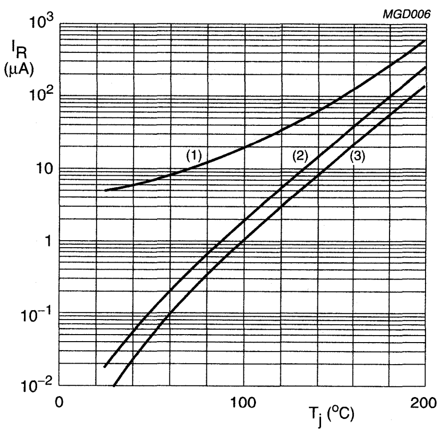
(1) T_j = 175 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



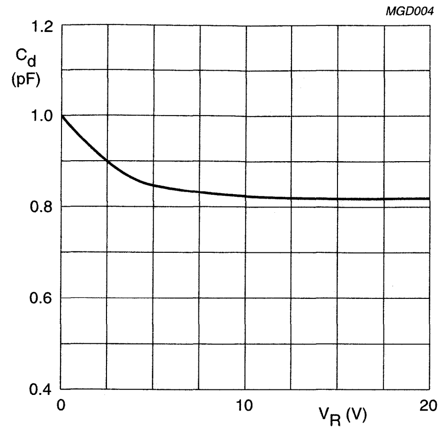
Based on square wave currents.
T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



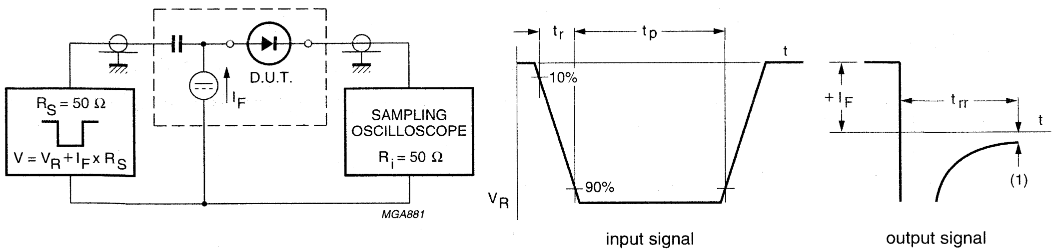
(1) V_R = 75 V; maximum values.
(2) V_R = 75 V; typical values.
(3) V_R = 20 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



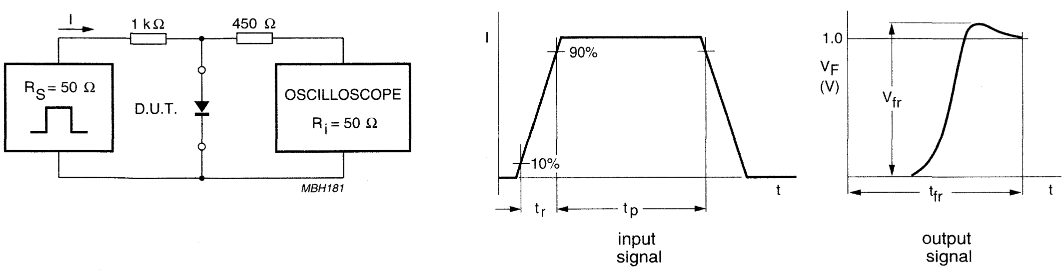
f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



(1) The value of I_R is dependent on product type.

Fig.7 Reverse recovery voltage test circuit and waveforms.



Input signal: forward pulse rise time t_r = 0.4 ns; forward pulse duration t_p = 100 ns; duty factor δ = 0.01.

Fig.8 Forward recovery time test circuit and waveforms.

SECTION 2

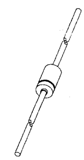
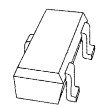
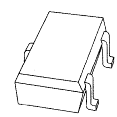
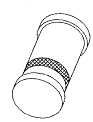
SMALL-SIGNAL SCHOTTKY-BARRIER DIODES

continued on next page

Small-signal Schottky-barrier diodes

Selection guide

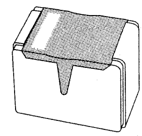
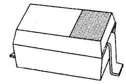
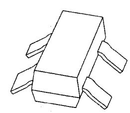
SMALL-SIGNAL SCHOTTKY-BARRIER DIODES

TYPE NUMBER	RATINGS V_R max. (V)	RATINGS I_F max. (mA)	CHARACTERISTICS V_F max. (mV)	@ I_F (mA)	C_d max. (pF)	@ V_R (V)	t_{rr} max. (ns)	DOUBLE DIODE	PACKAGE (not to scale)
LEADED TYPES									
BAT81	40	30	410	1	1.6	1	–	no	 SOD68 (DO34)
BAT82	50	30	410	1	1.6	1	–	no	
BAT83	60	30	410	1	1.6	1	–	no	
BAT85	30	200	320	1	10	1	4	no	
BAT86	50	200	380	1	8	1	4	no	
SURFACE-MOUNT TYPES									
1PS59SB10	30	200	320	1	10	1	5	no	 SC59
1PS59SB14	30	200	320	1	10	1	5	yes(1)	
1PS59SB15	30	200	320	1	10	1	5	yes(2)	
1PS59SB16	30	200	320	1	10	1	5	yes(3)	
1PS70SB40	40	120	380	1	5	0	0.1(4)	no	 SC70-3
1PS70SB44	40	120	380	1	5	0	0.1(4)	yes(1)	
1PS70SB45	40	120	380	1	5	0	0.1(4)	yes(2)	
1PS70SB46	40	120	380	1	5	0	0.1(4)	yes(3)	
BAS81	40	30	410	1	1.6	1	–	no	 SOD80C
BAS82	50	30	410	1	1.6	1	–	no	
BAS83	60	30	410	1	1.6	1	–	no	
BAS85	30	200	320	1	10	1	–	no	
BAS86	50	200	380	1	8	1	4	no	

Notes

1. Series connected.
2. Common cathode.
3. Common anode.
4. Charge carrier life time.

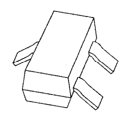
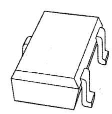
SMALL-SIGNAL SCHOTTKY-BARRIER DIODES (continued)

TYPE NUMBER	RATINGS		CHARACTERISTICS					DOUBLE DIODE	PACKAGE (not to scale)
	V_R max.	I_F max.	V_F max.	@ I_F	C_d max.	@ V_R	t_{rr} max.		
	(V)	(mA)	(mV)	(mA)	(pF)	(V)	(ns)		
SURFACE-MOUNT TYPES (continued)									
BAT254	30	200	320	1	10	1	5	no	 SOD110
1PS76SB10 1PS76SB17	30 4	200 30	320 450	1 1	10 1	1 0	– –	no no	 SOD323
BAS70-07 BAT74	70 30	70 200	410 320	1 1	2 10	0 1	0.1[4] 5	yes yes	 SOT143

Notes

1. Series connected.
2. Common cathode.
3. Common anode.
4. Charge carrier life time.

SMALL-SIGNAL SCHOTTKY-BARRIER DIODES (continued)

TYPE NUMBER	RATINGS		CHARACTERISTICS					DOUBLE DIODE	PACKAGE (not to scale)
	V_R max.	I_F max.	V_F max.	@ I_F	C_d max.	@ V_R	t_{rr} max.		
	(V)	(mA)	(mV)	(mA)	(pF)	(V)	(ns)		
SURFACE-MOUNT TYPES (continued)									
BAS40	40	120	380	1	5	0	0.1[4]	no	
BAS40-04	40	120	380	1	5	0	0.1[4]	yes[1]	
BAS40-05	40	120	380	1	5	0	0.1[4]	yes[2]	
BAS40-06	40	120	380	1	5	0	0.1[4]	yes[3]	
BAS70	70	70	410	1	2	0	0.1[4]	no	
BAS70-04	70	70	410	1	2	0	0.1[4]	yes[1]	
BAS70-05	70	70	410	1	2	0	0.1[4]	yes[2]	
BAS70-06	70	70	410	1	2	0	0.1[4]	yes[3]	
BAT17	4	30	450	1	1	0	–	no	
BAT54	30	200	320	1	10	1	5	no	
BAT54A	30	200	320	1	10	1	5	yes[3]	SOT23
BAT54C	30	200	320	1	10	1	5	yes[2]	
BAT54S	30	200	320	1	10	1	5	yes[1]	
PMBD352	4	30	450	1	1	0	–	yes[1]	
PMBD353	4	30	450	1	1	0	–	yes[1]	
BAS40W	40	120	380	1	5	0	0.1[4]	no	
BAS40-04W	40	120	380	1	5	0	0.1[4]	yes[1]	
BAS40-05W	40	120	380	1	5	0	0.1[4]	yes[2]	
BAS40-06W	40	120	380	1	5	0	0.1[4]	yes[3]	
BAS70W	70	70	410	1	2	0	0.1[4]	no	
BAS70-04W	70	70	410	1	2	0	0.1[4]	yes[1]	
BAS70-05W	70	70	410	1	2	0	0.1[4]	yes[2]	
BAS70-06W	70	70	410	1	2	0	0.1[4]	yes[3]	
BAT54W	30	200	320	1	10	1	5	no	
BAT54AW	30	200	320	1	10	1	5	yes[3]	SOT323
BAT54CW	30	200	320	1	10	1	5	yes[2]	
BAT54SW	30	200	320	1	10	1	5	yes[1]	

Notes

1. Series connected.
2. Common cathode.
3. Common anode.
4. Charge carrier life time.

Schottky barrier (double) diodes | 1PS59SB10 series

FEATURES

- Low forward voltage
- Guard ring protected
- Small SMD package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diodes encapsulated in a SC59 small plastic SMD package. Single diodes and double diodes with different pinning are available.

MARKING

TYPE NUMBER	MARKING CODE
1PS59SB10	10
1PS59SB14	14
1PS59SB15	15
1PS59SB16	16

PINNING

PIN	1PS59SB..			
	10	14	15	16
1	a	a_1	a_1	k_1
2	n.c.	k_2	a_2	k_2
3	k	k_1, a_2	k_1, k_2	a_1, a_2

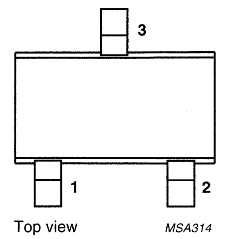


Fig.1 Simplified outline (SC59) and pin configuration.

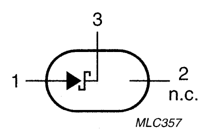


Fig.2 1PS59SB10 single diode configuration (symbol).

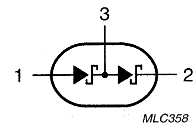


Fig.3 1PS59SB14 diode configuration (symbol).

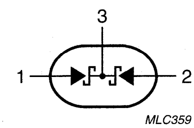


Fig.4 1PS59SB15 diode configuration (symbol).

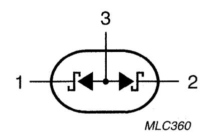


Fig.5 1PS59SB16 diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	300	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	600	mA
P_{tot}	total power dissipation (per package)	$T_{amb} \leq 25$ °C	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C

ELECTRICAL CHARACTERISTICS

$T_{amb} = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.6		
		$I_F = 0.1$ mA	240	mV
		$I_F = 1$ mA	320	mV
		$I_F = 10$ mA	400	mV
		$I_F = 30$ mA	500	mV
		$I_F = 100$ mA	800	mV
I_R	reverse current	$V_R = 25$ V; see Fig.7	2	μA
t_{rr}	reverse recovery time	when switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA; see Fig.9	5	ns
C_d	diode capacitance	f = 1 MHz; $V_R = 1$ V; see Fig.8	10	pF

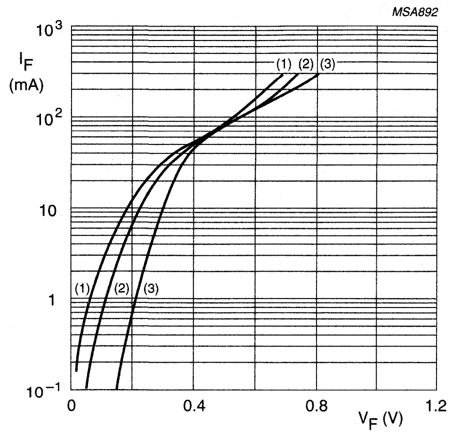
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

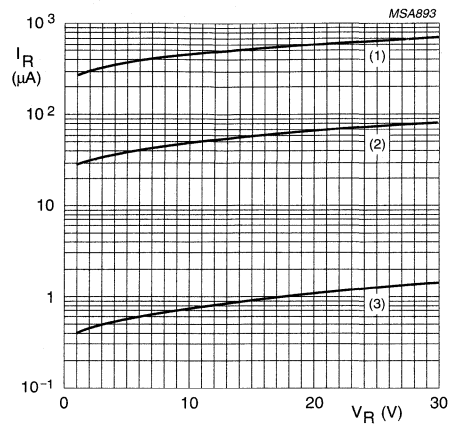
1. Refer to SC59 standard mounting conditions.

GRAPHICAL DATA



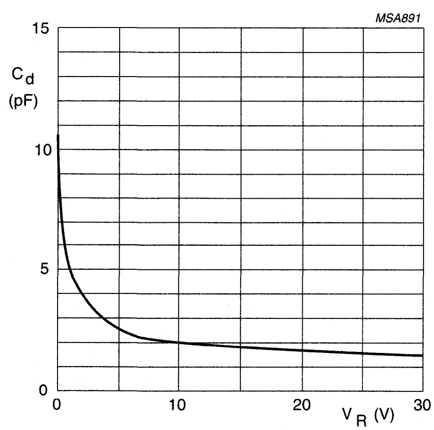
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.7 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.

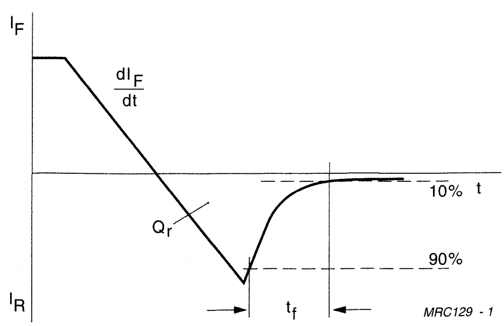


Fig.9 Reverse recovery definitions.

Schottky barrier (double) diodes — 1PS70SB40 series

FEATURES

- Low forward voltage
- Guard ring protected
- Very small SMD package
- Low diode capacitance.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diodes encapsulated in a SC70-3 very small plastic SMD package. Single diodes and double diodes with different pinning are available.

MARKING

TYPE NUMBER	MARKING CODE
1PS70SB40	6t3
1PS70SB44	6t4
1PS70SB45	6t5
1PS70SB46	6t6

PINNING

PIN	1PS70SB..			
	40	44	45	46
1	a_1	a_1	a_1	k_1
2	n.c.	k_2	a_2	k_2
3	k_1	k_1, a_2	k_1, k_2	a_1, a_2

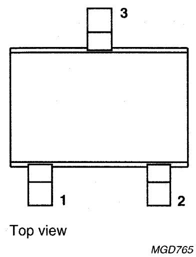


Fig.1 Simplified outline (SC70-3) and pin configuration.

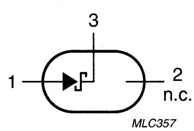


Fig.2 1PS70SB40 single diode configuration (symbol).

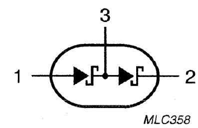


Fig.3 1PS70SB44 diode configuration (symbol).

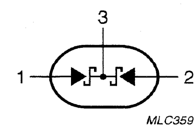


Fig.4 1PS70SB45 diode configuration (symbol).

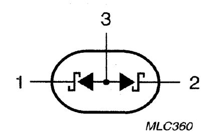


Fig.5 1PS70SB46 diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	40	V
I_F	continuous forward current		–	120	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	120	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	200	mA
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

$T_{amb} = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	continuous forward voltage	see Fig.6		
		$I_F = 1$ mA	380	mV
		$I_F = 10$ mA	500	mV
		$I_F = 15$ mA	1	V
I_R	continuous reverse current	$V_R = 30$ V; note 1; see Fig.7	1	μA
		$V_R = 40$ V; note 1; see Fig.7	10	μA
τ	charge carrier life time	$I_F = 5$ mA; Krakauer method	100	ps
C_d	diode capacitance	$V_R = 0$ V; f = 1 MHz; see Fig.9	5	pF

Note

1. Pulsed test: $t_p = 300$ μs; $\delta = 0.02$.

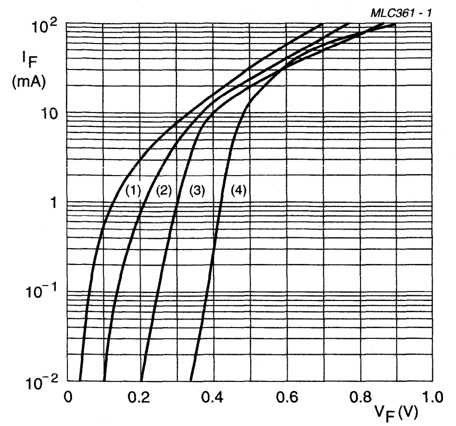
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

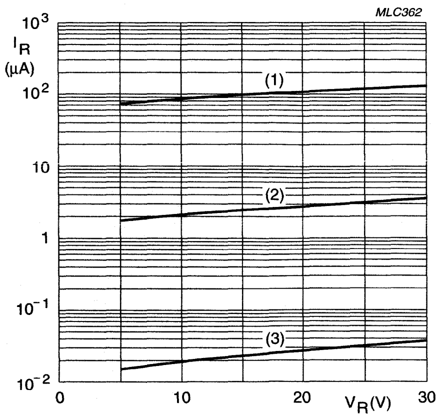
1. Refer to SC70-3 standard mounting conditions.

GRAPHICAL DATA



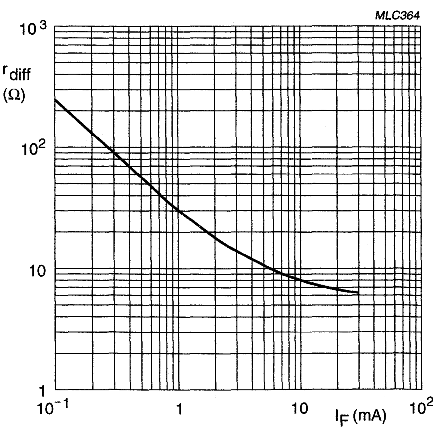
(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



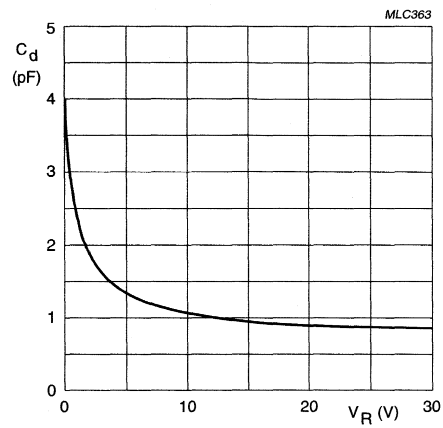
(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.7 Reverse current as a function of reverse voltage; typical values.



f = 10 KHz.

Fig.8 Differential forward resistance as a function of forward current; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier diode | 1PS76SB10

FEATURES

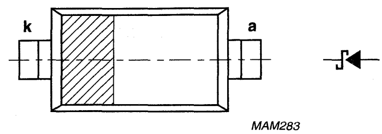
- Low forward voltage
- Guard ring protected
- Very small plastic SMD package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode encapsulated in a SOD323 very small plastic SMD package.



Marking code: S0.
The marking bar indicates the cathode.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	300	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	600	mA
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		–65	+125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.2		
		I_F = 0.1 mA	240	mV
		I_F = 1 mA	320	mV
		I_F = 10 mA	400	mV
		I_F = 30 mA	500	mV
		I_F = 100 mA	800	mV
I_R	reverse current	V_R = 25 V; note 1; see Fig.3	2	μA
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.4	10	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

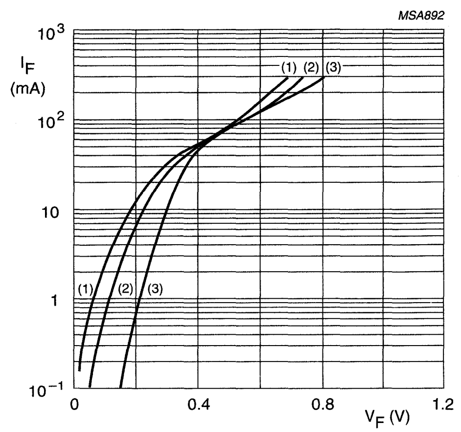
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	450	K/W

Note

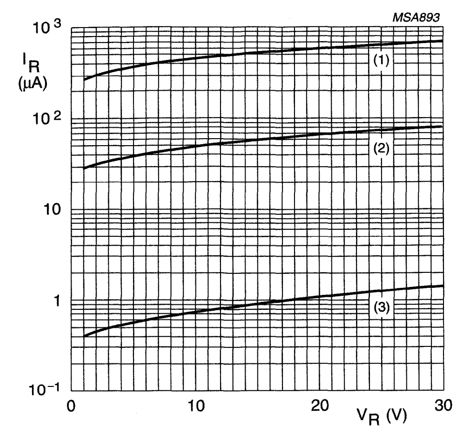
1. Refer to SOD323 standard mounting conditions.

GRAPHICAL DATA



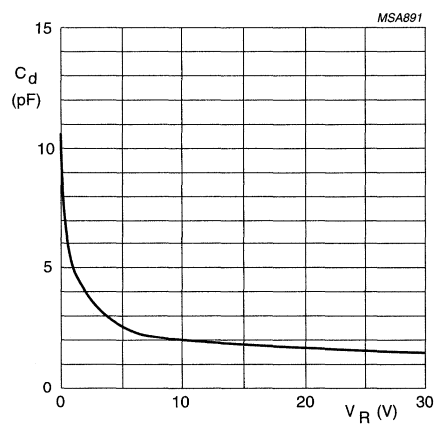
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier diode 1PS76SB17

FEATURES

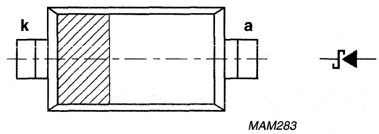
- Low forward voltage
- Low diode capacitance
- ESD > 500 V; Human body model
- Very small plastic SMD package.

APPLICATIONS

- UHF mixers
- Sampling circuits
- Modulators
- Phase detectors.

DESCRIPTION

Planar Schottky barrier diode encapsulated in a SOD323 very small plastic SMD package.



Marking code: S7.
The marking bar indicates the cathode.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	4	V
I_F	continuous forward current	–	30	mA
T_{stg}	storage temperature	–65	+150	°C
T_j	junction temperature	–	100	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.2			
		I_F = 0.1 mA	–	300	mV
		I_F = 1 mA	360	450	mV
		I_F = 10 mA	470	600	mV
I_R	reverse current	V_R = 3 V; see Fig.3	0.15	0.25	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.4	0.8	1	pF
		f = 1 MHz; V_R = 0.5 V; see Fig.4	0.65	–	pF

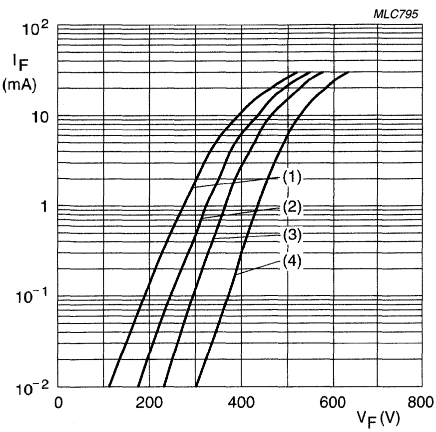
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	450	K/W

Note

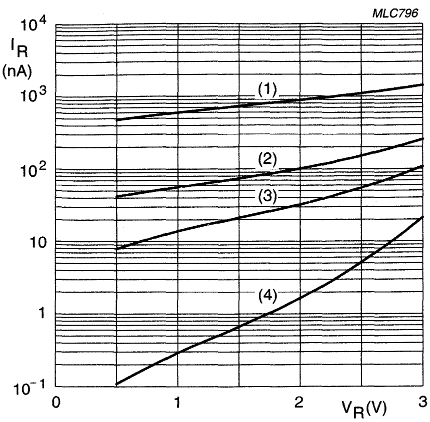
1. Refer to SOD323 standard mounting conditions.

GRAPHICAL DATA



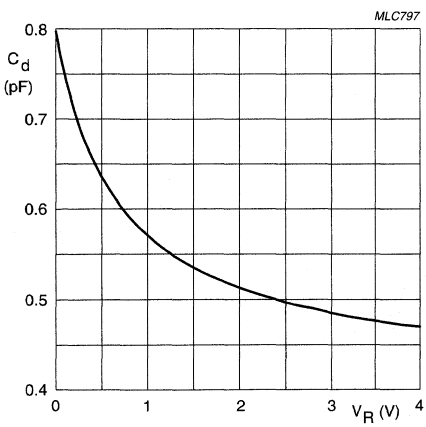
(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier (double) diodes — BAS40 series

FEATURES

- Low forward voltage
- Guard ring protected
- Small SMD package
- Low diode capacitance.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diodes encapsulated in a SOT23 small plastic SMD package. Single diodes and double diodes with different pinning are available.

MARKING

TYPE NUMBER	MARKING CODE
BAS40	43p
BAS40-04	44p
BAS40-05	45p
BAS40-06	46p

PINNING

PIN	BAS40			
		-04	-05	-06
1	a_1	a_1	a_1	k_1
2	n.c.	k_2	a_2	k_2
3	k_1	k_1, a_2	k_1, k_2	a_1, a_2

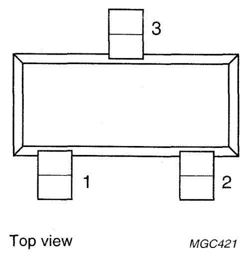


Fig.1 Simplified outline (SOT23) and pin configuration.

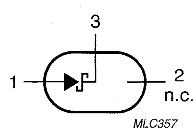


Fig.2 BAS40 single diode configuration (symbol).

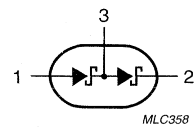


Fig.3 BAS40-04 diode configuration (symbol).

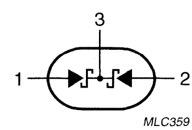


Fig.4 BAS40-05 diode configuration (symbol).

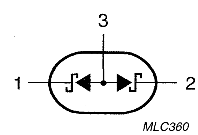


Fig.5 BAS40-06 diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	40	V
I_F	continuous forward current		–	120	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	120	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	200	mA
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

$T_{amb} = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	continuous forward voltage	see Fig.6		
		$I_F = 1$ mA	380	mV
		$I_F = 10$ mA	500	mV
		$I_F = 15$ mA	1	V
I_R	continuous reverse current	$V_R = 30$ V; note 1; see Fig.7	1	μA
		$V_R = 40$ V; note 1; see Fig.7	10	μA
τ	charge carrier life time	$I_F = 5$ mA; Krakauer method	100	ps
C_d	diode capacitance	$V_R = 0$ V; f = 1 MHz; see Fig.9	5	pF

Note

1. Pulsed test: $t_p = 300$ μs; $\delta = 0.02$.

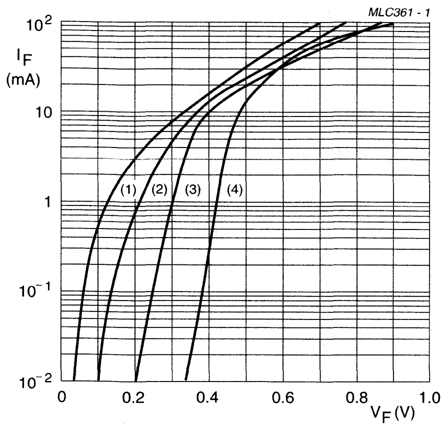
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

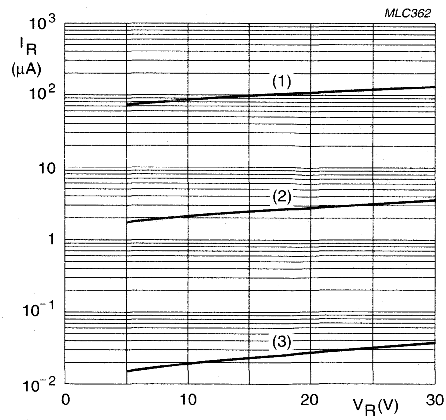
1. Refer to SOT23 standard mounting conditions.

GRAPHICAL DATA



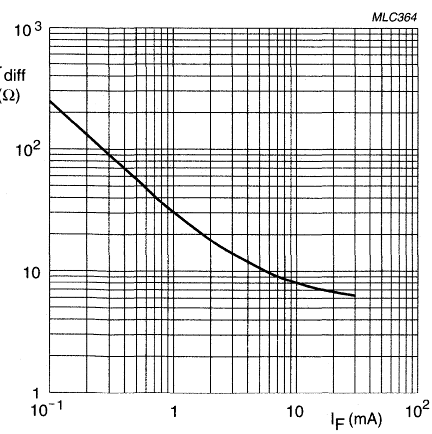
(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



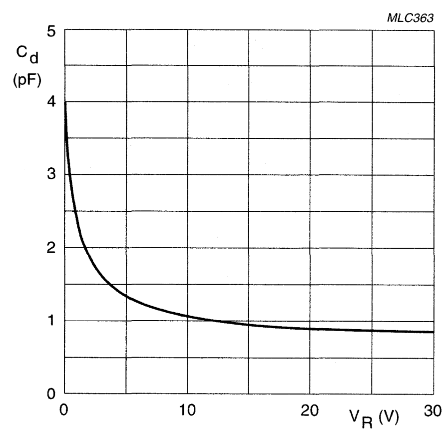
(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.7 Reverse current as a function of reverse voltage; typical values.



f = 10 KHz.

Fig.8 Differential forward resistance as a function of forward current; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier (double) diodes | BAS40W series

FEATURES

- Low forward voltage
- Guard ring protected
- Very small SMD package
- Low diode capacitance.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diodes encapsulated in a SOT323 very small plastic SMD package. Single diodes and double diodes with different pinning are available.

MARKING

TYPE NUMBER	MARKING CODE
BAS40W	63
BAS40-04W	64
BAS40-05W	65
BAS40-06W	66

PINNING

PIN	BAS40			
	W	-04W	-05W	-06W
1	a_1	a_1	a_1	k_1
2	n.c.	k_2	a_2	k_2
3	k_1	k_1, a_2	k_1, k_2	a_1, a_2

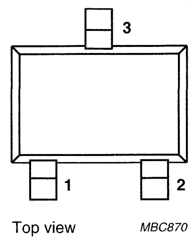


Fig.1 Simplified outline (SOT323) and pin configuration.

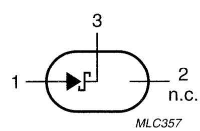


Fig.2 BAS40W single diode configuration (symbol).

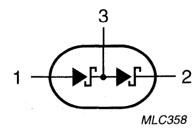


Fig.3 BAS40-04W diode configuration (symbol).

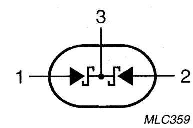


Fig.4 BAS40-05W diode configuration (symbol).

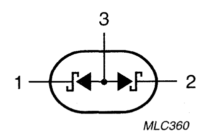


Fig.5 BAS40-06W diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	40	V
I_F	continuous forward current		–	120	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	120	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	200	mA
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		−65	+150	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	continuous forward voltage	see Fig.6		
		I_F = 1 mA	380	mV
		I_F = 10 mA	500	mV
		I_F = 15 mA	1	V
I_R	continuous reverse current	V_R = 30 V; note 1; see Fig.7	1	μA
		V_R = 40 V; note 1; see Fig.7	10	μA
τ	charge carrier life time	I_F = 5 mA; Krakauer method	100	ps
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.9	5	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

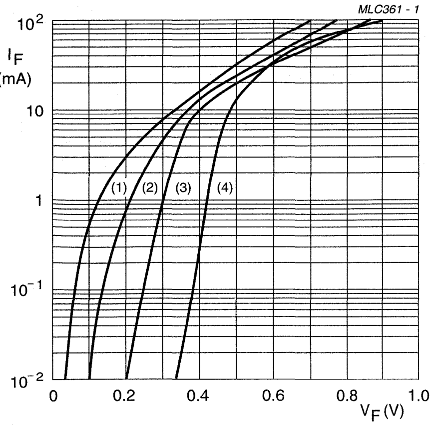
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

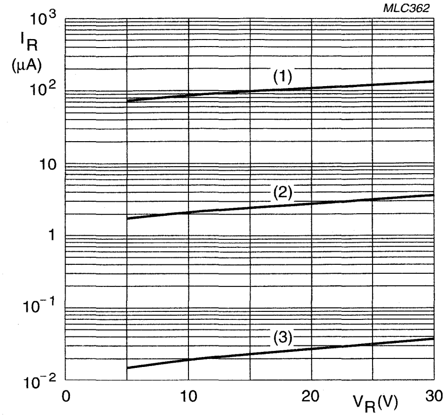
1. Refer to SOT323 standard mounting conditions.

GRAPHICAL DATA



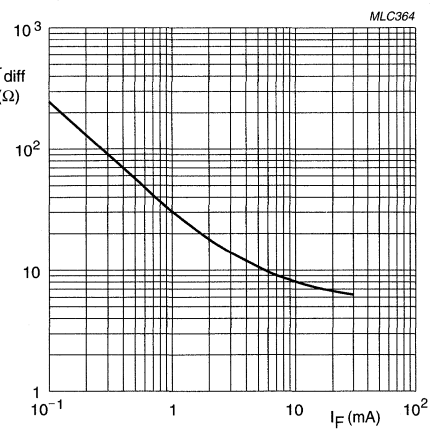
(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



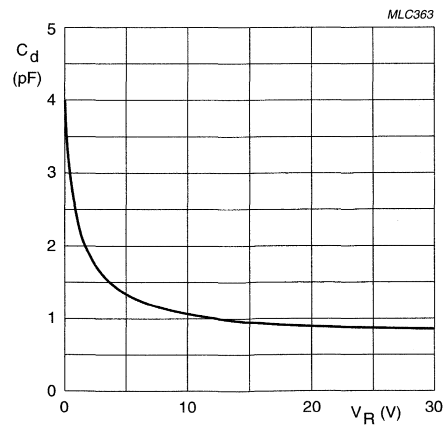
(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.7 Reverse current as a function of reverse voltage; typical values.



f = 10 KHz.

Fig.8 Differential forward resistance as a function of forward current; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.

FEATURES

- Low forward current
- High breakdown voltage
- Guard ring protected
- Small SMD package
- Low diode capacitance.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits.

DESCRIPTION

Planar Schottky barrier diodes with an integrated guard ring for stress protection. Single diodes and double diodes with different pinning are available.

The diodes BAS70, BAS70-04, BAS70-05 and BAS70-06 are encapsulated in a SOT23 small plastic SMD package. The BAS70-07 is encapsulated in a SOT143 small plastic SMD package.

MARKING

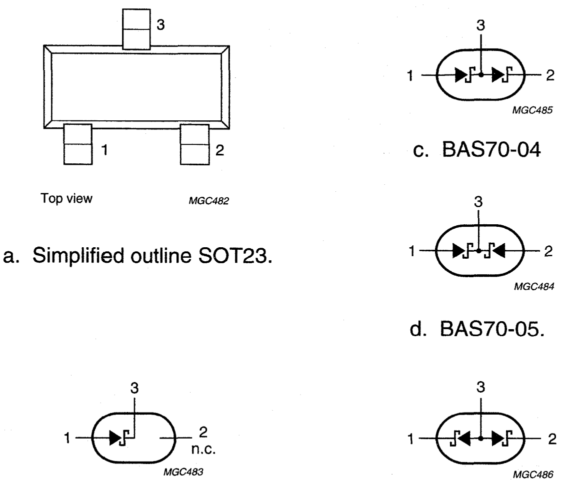
TYPE NUMBER	MARKING CODE
BAS70	73p
BAS70-04	74p
BAS70-05	75p
BAS70-06	76p
BAS70-07	77p

PINNING SOT143 (see Fig.2)

PIN	DESCRIPTION
BAS70-07	
1	k_1
2	k_2
3	a_2
4	a_1

PINNING SOT23 (see Fig.1a)

PIN	DESCRIPTION			
	BAS70 (see Fig.1b)	**BAS70-04** (see Fig.1c)	**BAS70-05** (see Fig.1d)	**BAS70-06** (see Fig.1e)
1	a_1	a_1	a_1	k_1
2	n.c.	k_2	a_2	k_2
3	k_1	k_1, a_2	k_1, k_2	a_1, a_2



a. Simplified outline SOT23.

b. BAS70 single diode.

c. BAS70-04

d. BAS70-05.

e. BAS70-06.

Fig.1 Simplified outline (SOT23) and symbols.

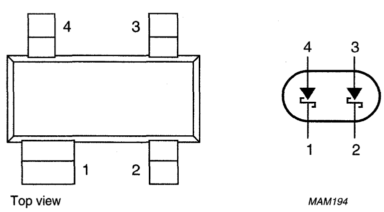


Fig.2 Simplified outline (SOT143) BAS70-07 and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current		–	70	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	70	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	100	mA
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

$T_{amb} = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.3		
		$I_F = 1$ mA	410	mV
		$I_F = 10$ mA	750	mV
		$I_F = 15$ mA	1	V
I_R	reverse current	$V_R = 50$ V; note 1; see Fig.4	100	nA
		$V_R = 70$ V; note 1; see Fig.4	10	μA
τ	charge carrier life time (Krakauer method)	$I_F = 5$ mA	100	ps
C_d	diode capacitance	f = 1 MHz; $V_R = 0$ V; see Fig.6	2	pF

Note

1. Pulsed test: $t_p = 300$ μs; $\delta = 0.02$.

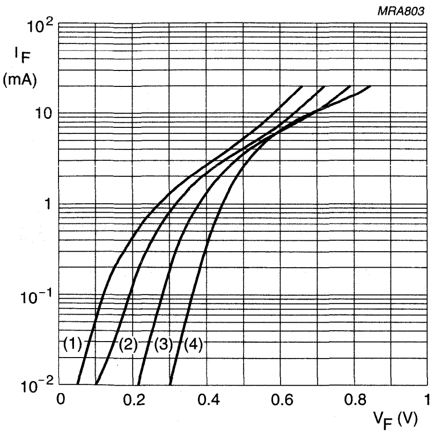
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

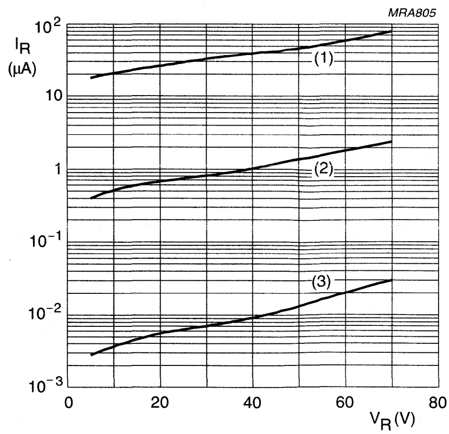
1. Refer to SOT23 or SOT143 standard mounting conditions.

GRAPHICAL DATA



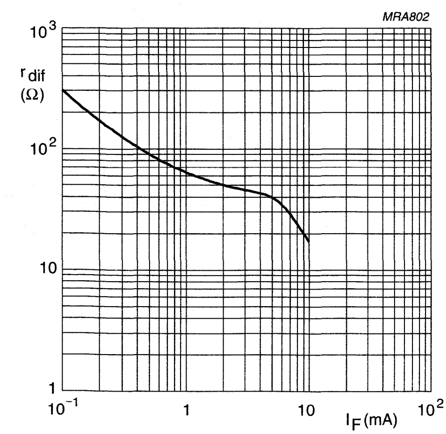
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



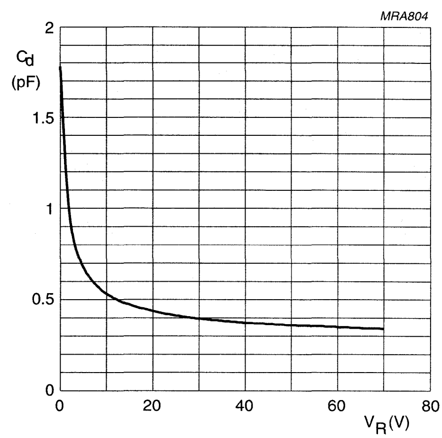
(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.4 Reverse current as a function of reverse voltage; typical values.



f = 10 kHz.

Fig.5 Differential forward resistance as a function of forward current; typical values.



f = 1 MHz.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier (double) diodes | BAS70W series

FEATURES

- Low forward voltage
- High breakdown voltage
- Guard ring protected
- Very small SMD package
- Low capacitance.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diodes. Single diodes (BAS70W) and double diodes with different pinning (BAS70-04W; -05W; -06W) are available.

The diodes are encapsulated in a SOT323 very small plastic SMD package.

MARKING

TYPE NUMBER	MARKING CODE
BAS70W	73-
BAS70-04W	74-
BAS70-05W	75-
BAS70-06W	76-

PINNING

PIN	BAS70			
	W	-04W	-05W	-06W
1	a_1	a_1	a_1	k_1
2	n.c.	k_2	a_2	k_2
3	k_1	k_1, a_2	k_1, k_2	a_1, a_2

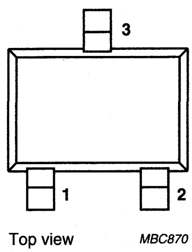


Fig.1 Simplified outline (SOT323) and pin configuration.

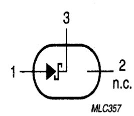


Fig.2 BAS70W single diode configuration (symbol).

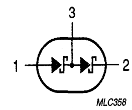


Fig.3 BAS70-04W diode configuration (symbol).

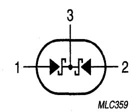


Fig.4 BAS70-05W diode configuration (symbol).

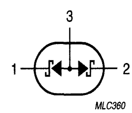


Fig.5 BAS70-06W diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	70	V
I_F	continuous forward current		–	70	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	70	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	100	mA
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

$T_{amb} = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.6		
		$I_F = 1$ mA	410	mV
		$I_F = 10$ mA	750	mV
		$I_F = 15$ mA	1	V
I_R	reverse current	$V_R = 50$ V; note 1; see Fig.7	100	nA
		$V_R = 70$ V; note 1; see Fig.7	10	μA
τ	charge carrier life time (Krakauer method)	$I_F = 5$ mA	100	ps
C_d	diode capacitance	f = 1 MHz; $V_R = 0$ V; see Fig.9	2	pF

Note

1. Pulsed test: $t_p = 300$ μs; $\delta = 0.02$.

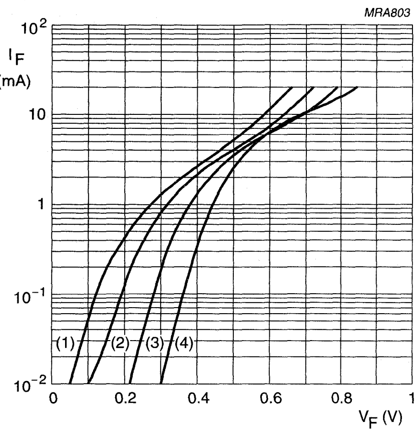
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

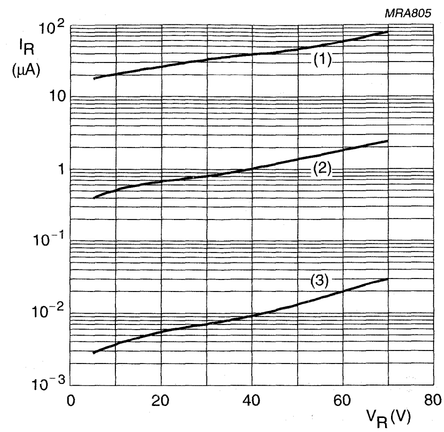
1. Refer to SOT323 standard mounting conditions.

GRAPHICAL DATA



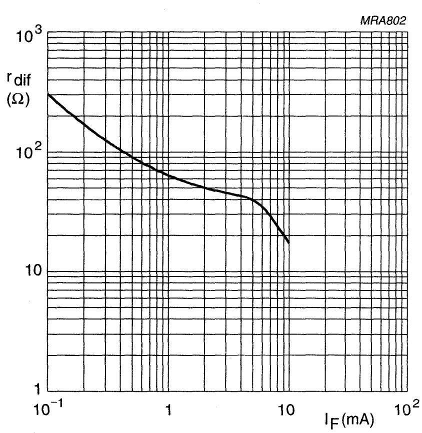
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



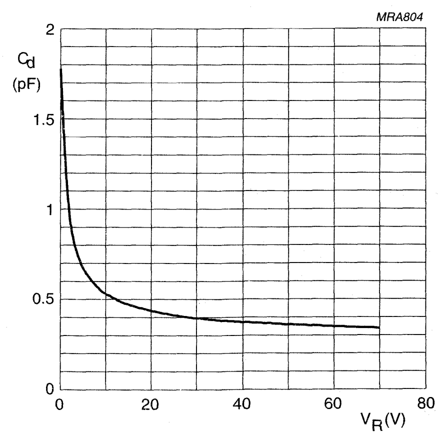
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.7 Reverse current as a function of reverse voltage; typical values.



f = 10 kHz.

Fig.8 Differential forward resistance as a function of forward current; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier diodes — BAS81; BAS82; BAS83

FEATURES

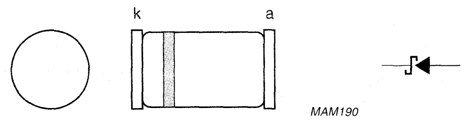
- Low forward voltage
- High breakdown voltage
- Guard ring protected
- Hermetically-sealed small SMD package
- Low diode capacitance.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode with an integrated protection ring against static discharges. This surface mounted diode is encapsulated in a hermetically sealed SOD80C glass SMD package with tin-plated metal discs at each end. It is suitable for "automatic placement" and as such it can withstand immersion soldering.



Cathode indicated by a grey band.

Fig.1 Simplified outline (SOD80C), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage				
	BAS81		–	40	V
	BAS82		–	50	V
	BAS83		–	60	V
I_F	continuous forward current		–	30	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	150	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1$ s		500	mA
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.2		
		I_F = 0.1 mA	330	mV
		I_F = 1 mA	410	mV
		I_F = 15 mA	1	V
I_R	reverse current	$V_R = V_{Rmax}$; see Fig.3	200	nA
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.4	1.6	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

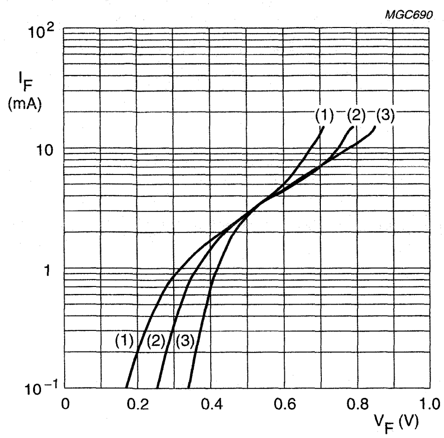
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	320	K/W

Note

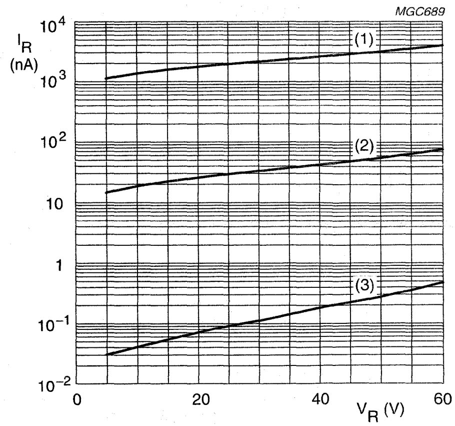
1. Refer to SOD80 standard mounting conditions.

GRAPHICAL DATA



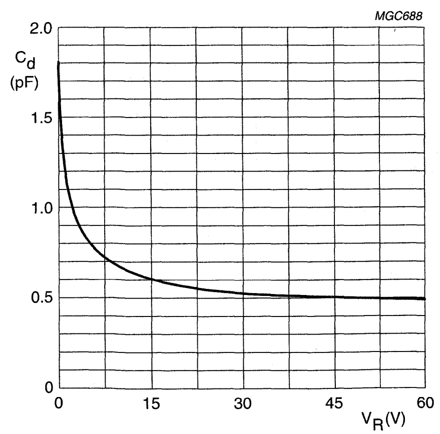
(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier diode — BAS85

FEATURES

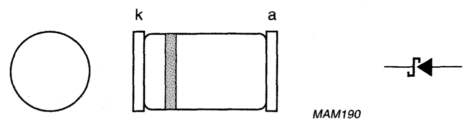
- Low forward voltage
- High breakdown voltage
- Guard ring protected
- Hermetically-sealed small SMD package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode with an integrated protection ring against static discharges.
This surface mounted diode is encapsulated in a hermetically sealed SOD80C glass SMD package with tin-plated metal discs at each end. It is suitable for "automatic placement" and as such it can withstand immersion soldering.



Cathode indicated by a grey band.

Fig.1 Simplified outline (SOD80C), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
$I_{F(AV)}$	average forward current	V_{RWM} = 25 V; a = 1.57; δ = 0.5; note 1; Fig.2	–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	300	mA
I_{FSM}	non-repetitive peak forward current	t_p = 10 ms	–	5	A
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		–65	+125	°C

Note

1. Refer to SOD80 standard mounting conditions.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.3		
		I_F = 0.1 mA	240	mV
		I_F = 1 mA	320	mV
		I_F = 10 mA	400	mV
		I_F = 30 mA	500	mV
		I_F = 100 mA	800	mV
I_R	reverse current	V_R = 25 V; note 1; see Fig.4	2.3	μA
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.5	10	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	320	K/W

Note

1. Refer to SOD80 standard mounting conditions.

GRAPHICAL DATA

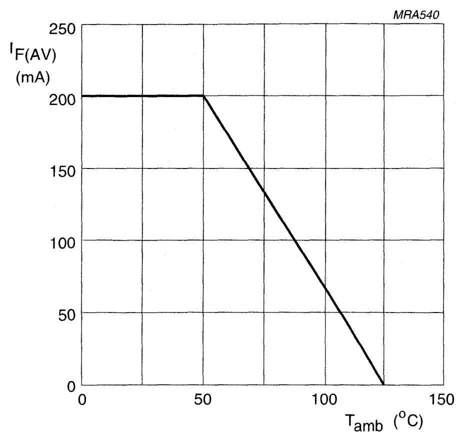
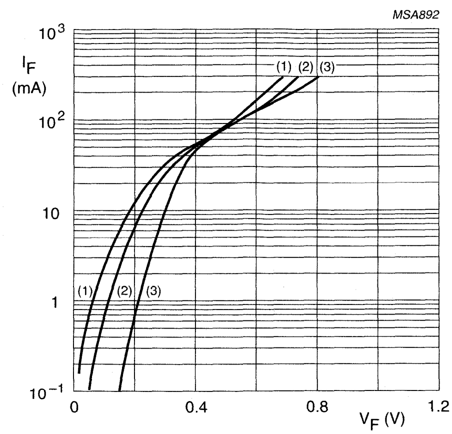
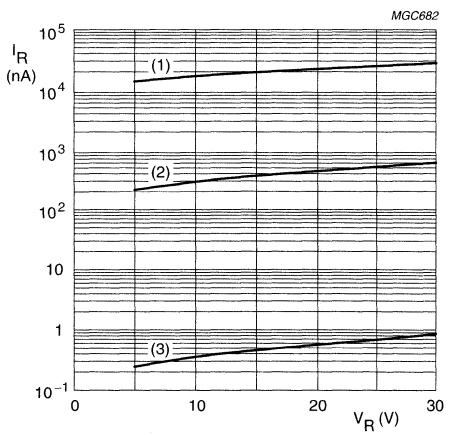


Fig.2 Derating curve.



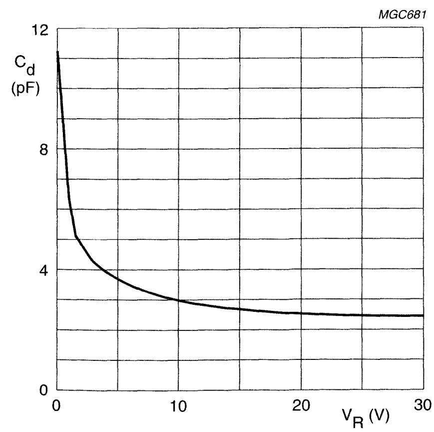
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.4 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier diode — BAS86

FEATURES

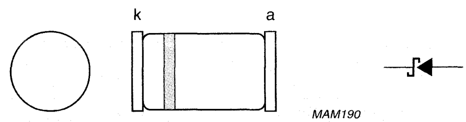
- Low forward voltage
- High breakdown voltage
- Guard ring protected
- Hermetically-sealed small SMD package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode with an integrated protection ring against static discharges.
This surface mounted diode is encapsulated in a hermetically sealed SOD80C glass SMD package with tin-plated metal discs at each end. It is suitable for "automatic placement" and as such it can withstand immersion soldering.



Cathode indicated by a grey band.

Fig.1 Simplified outline (SOD80C), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current		–	200	mA
$I_{F(AV)}$	average forward current	see Fig.2	–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ sec.; $\delta \leq 0.5$	–	500	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 10$ ms		5	A
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		−65	+125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.3		
		I_F = 0.1 mA	300	mV
		I_F = 1 mA	380	mV
		I_F = 10 mA	450	mV
		I_F = 30 mA	600	mV
		I_F = 100 mA	900	mV
I_R	reverse current	V_R = 40 V; see Fig.4; note 1	5	μA
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	4	ns
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.5	8	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	320	K/W

Note

1. Refer to SOD80 standard mounting conditions.

GRAPHICAL DATA

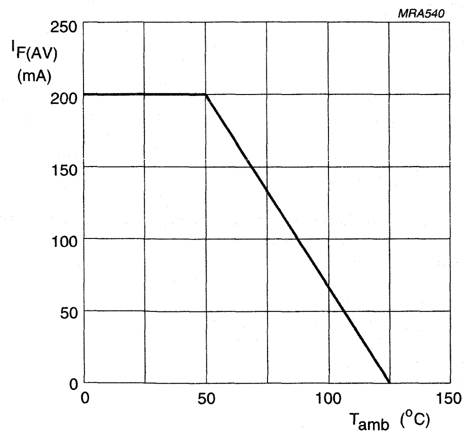
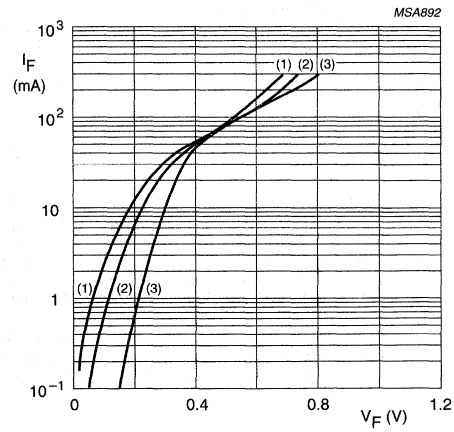
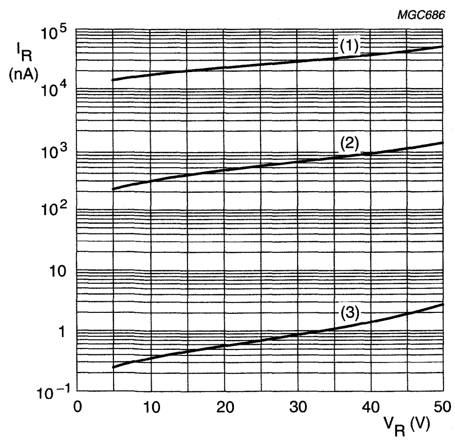


Fig.2 Derating curve.



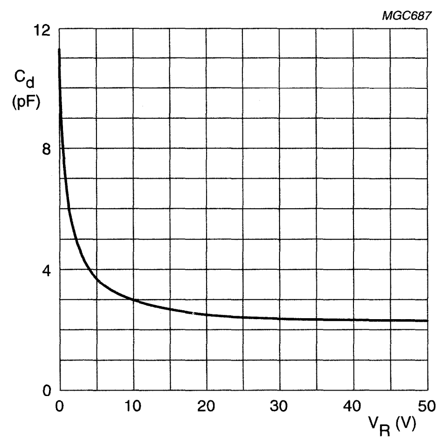
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.4 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

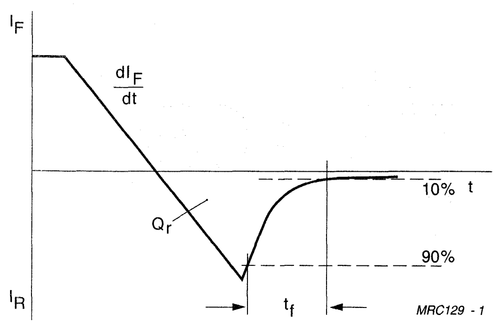


Fig.6 Reverse recovery definitions.

Schottky barrier diode BAT17

FEATURES

- Low forward voltage
- Small SMD package
- Low capacitance.

APPLICATIONS

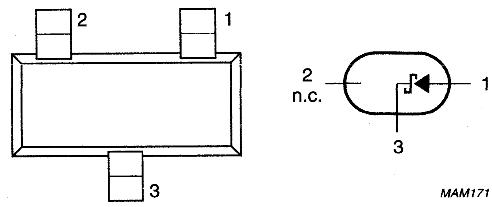
- UHF mixer
- Sampling circuits
- Modulators
- Phase detection.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode

DESCRIPTION

Planar Schottky barrier diode in a SOT23 small plastic SMD package.



Marking code: A3p.

Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	4	V
I_F	continuous forward current	–	30	mA
T_{stg}	storage temperature	–65	+150	°C
T_j	junction temperature	–	100	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.2		
		I_F = 0.1 mA	350	mV
		I_F = 1 mA	450	mV
		I_F = 10 mA	600	mV
I_R	reverse current	V_R = 3 V; see Fig.3	0.25	μA
		V_R = 3 V; T_{amb} = 60 °C; see Fig.3	1.25	μA
r_D	diode forward resistance	f = 1 kHz; I_F = 5 mA	15	Ω
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.4	1	pF
F	noise figure	f = 900 MHz; note 1	8	dB

Note

1. The local oscillator is adjusted for a diode current of 2 mA. IF amplifier noise F_{if} = 1.5 dB; f = 35 MHz.

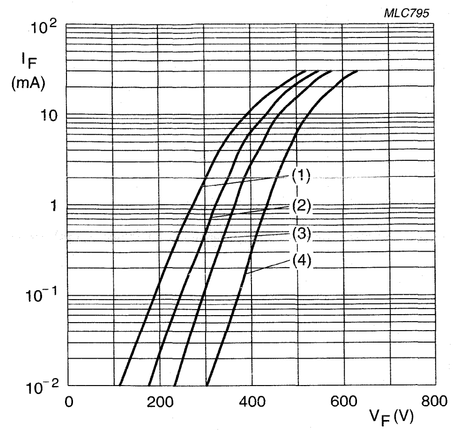
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

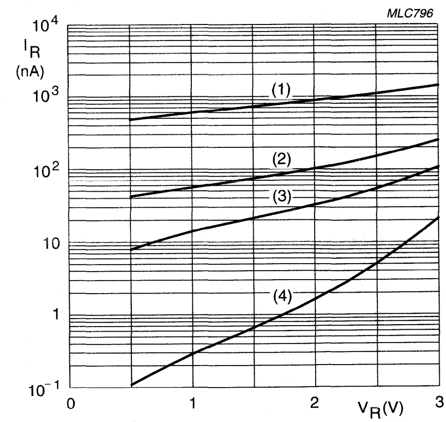
1. Refer to SOT23 standard mounting conditions.

GRAPHICAL DATA



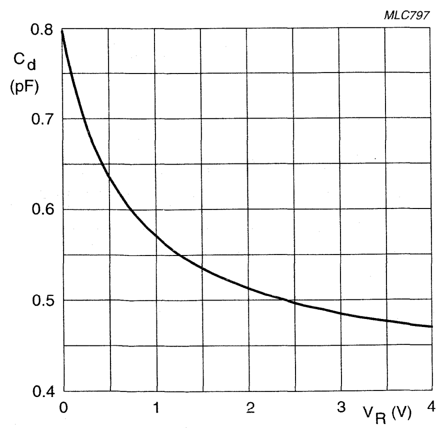
(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier (double) diodes BAT54 series

FEATURES

- Low forward voltage
- Guard ring protected
- Small SMD package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diodes encapsulated in a SOT23 small plastic SMD package. Single diodes and double diodes with different pinning are available.

MARKING

TYPE NUMBER	MARKING CODE
BAT54	L4p
BAT54A	L42
BAT54C	L43
BAT54S	L44

PINNING

PIN	BAT54			
		A	C	S
1	a	k_1	a_1	a_1
2	n.c.	k_2	a_2	k_2
3	k	a_1, a_2	k_1, k_2	k_1, a_2

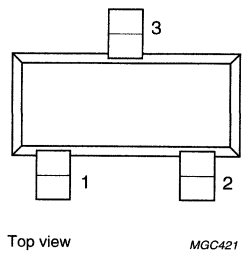


Fig.1 Simplified outline (SOT23) and pin configuration.

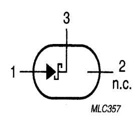


Fig.2 BAT54 single diode configuration (symbol).

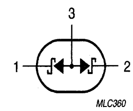


Fig.3 BAT54A diode configuration (symbol).

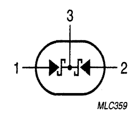


Fig.4 BAT54C diode configuration (symbol).

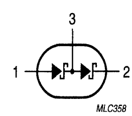


Fig.5 BAT54S diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	300	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	600	mA
P_{tot}	total power dissipation (per package)	$T_{amb} \leq 25$ °C	–	230	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C

ELECTRICAL CHARACTERISTICS

$T_{amb} = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.6		
		$I_F = 0.1$ mA	240	mV
		$I_F = 1$ mA	320	mV
		$I_F = 10$ mA	400	mV
		$I_F = 30$ mA	500	mV
		$I_F = 100$ mA	800	mV
I_R	reverse current	$V_R = 25$ V; see Fig.7	2	μA
t_{rr}	reverse recovery time	when switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA; see Fig.9	5	ns
C_d	diode capacitance	f = 1 MHz; $V_R = 1$ V; see Fig.8	10	pF

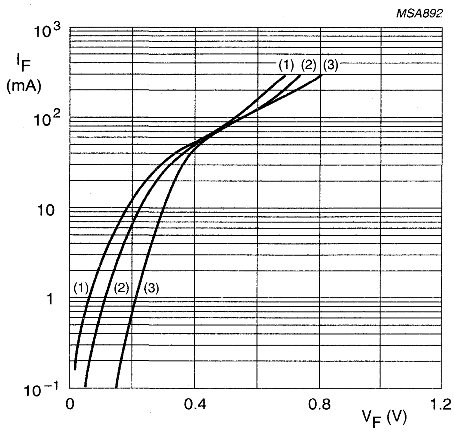
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

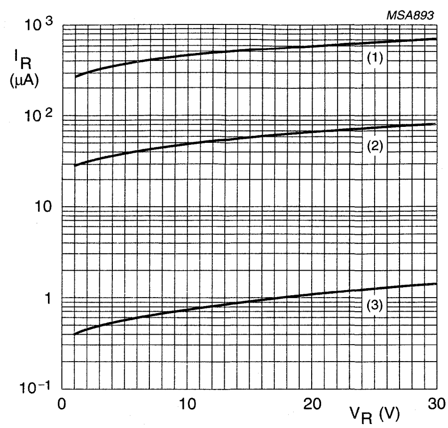
1. Refer to SOT23 standard mounting conditions.

GRAPHICAL DATA



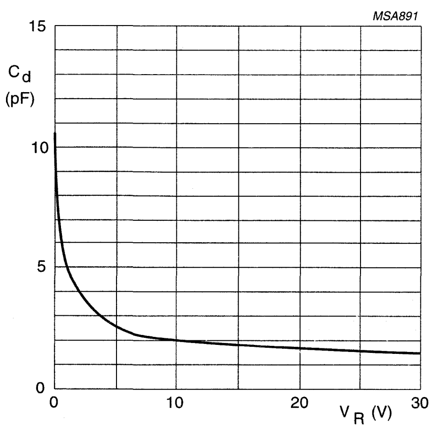
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.7 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.

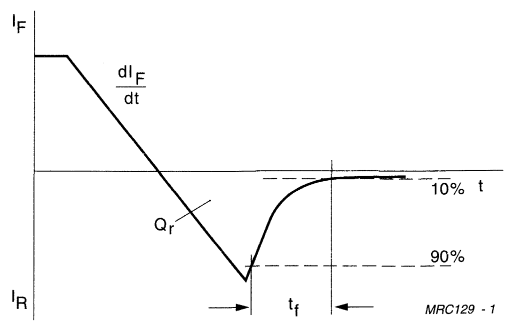


Fig.9 Reverse recovery definitions.

Schottky barrier (double) diodes | BAT54W series

FEATURES

- Low forward voltage
- Guard ring protected
- Very small SMD package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diodes encapsulated in a SOT323 very small plastic SMD package. Single diodes and double diodes with different pinning are available.

MARKING

TYPE NUMBER	MARKING CODE
BAT54W	L4
BAT54AW	42
BAT54CW	43
BAT54SW	44

PINNING

PIN	BAT54			
	W	AW	CW	SW
1	a	k_1	a_1	a_1
2	n.c.	k_2	a_2	k_2
3	k	a_1, a_2	k_1, k_2	k_1, a_2

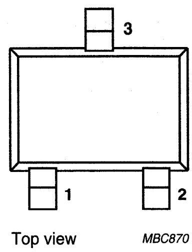


Fig.1 Simplified outline (SOT323) and pin configuration.

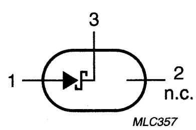


Fig.2 BAT54W single diode configuration (symbol).

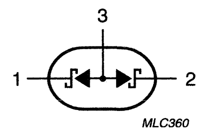


Fig.3 BAT54AW diode configuration (symbol).

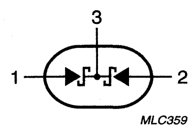


Fig.4 BAT54CW diode configuration (symbol).

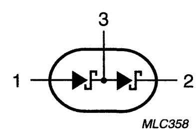


Fig.5 BAT54SW diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	300	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	600	mA
P_{tot}	total power dissipation (per package)	$T_{amb} \leq 25$ °C	–	200	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		−65	+125	°C

ELECTRICAL CHARACTERISTICS

$T_{amb} = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.5		
		$I_F = 0.1$ mA	240	mV
		$I_F = 1$ mA	320	mV
		$I_F = 10$ mA	400	mV
		$I_F = 30$ mA	500	mV
		$I_F = 100$ mA	800	mV
I_R	reverse current	$V_R = 25$ V; note 1; see Fig.6	2	µA
t_{rr}	reverse recovery time	when switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA: see Fig.9	5	ns
C_d	diode capacitance	f = 1 MHz; $V_R = 1$ V; see Fig.8	10	pF

Note

1. Pulsed test: $t_p = 300$ µs; $\delta = 0.02$.

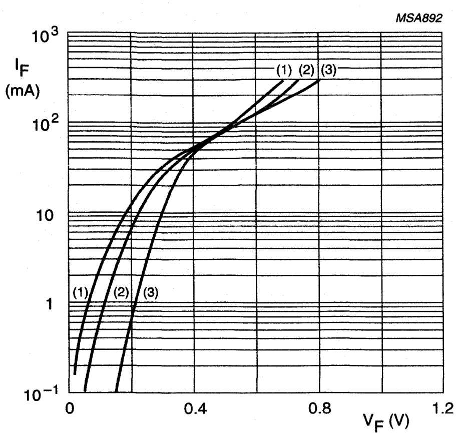
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	625	K/W

Note

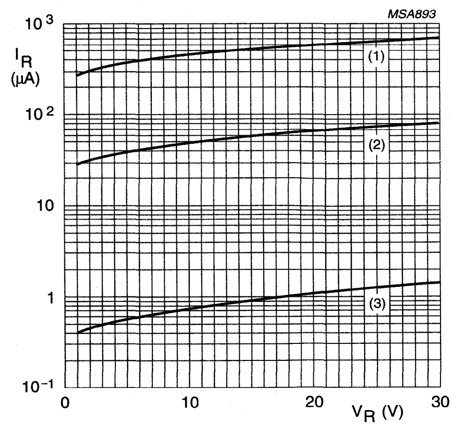
1. Refer to SOT323 standard mounting conditions.

GRAPHICAL DATA



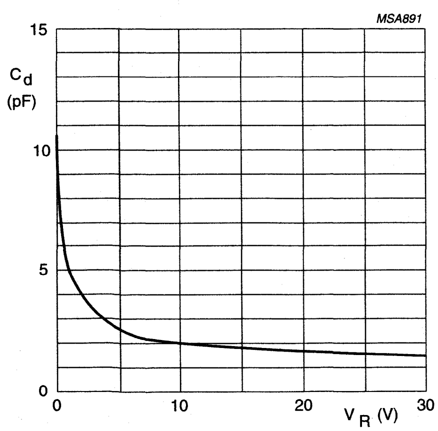
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.5 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.6 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.

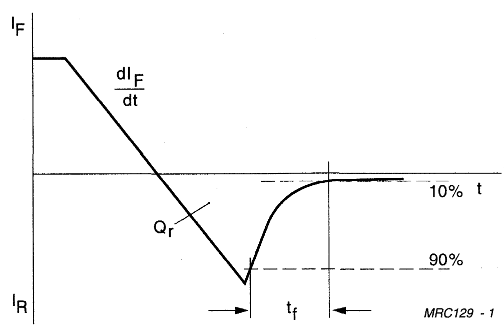


Fig.9 Reverse recovery definitions.

Schottky barrier double diode BAT74

FEATURES

- Low forward voltage
- Guard ring protected
- Small SMD package.

APPLICATIONS

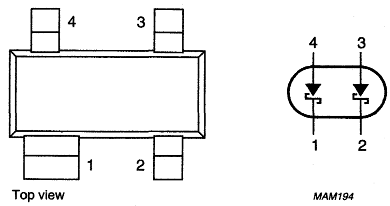
- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier double diode. Two separate dies encapsulated in a SOT143 small plastic SMD package.

PINNING

PIN	DESCRIPTION
1	cathode (k_1)
2	cathode (k_2)
3	anode (a_2)
4	anode (a_1)



Marking code: L41.

Fig.1 Simplified outline (SOT143), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	300	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms		600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; see Fig.2	–	230	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		−65	+125	°C
Double diode operation					
V_R	continuous reverse voltage		–	30	V
		series connection	–	60	V
I_F	continuous forward current		–	110[1]	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	200	mA

Note

1. If both diodes are in forward operation at the same moment, total device current is max. 110 mA. If one diode is in reverse and the other in forward operation at the same moment, total device current is max. 200 mA.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.3		
		I_F = 0.1 mA	240	mV
		I_F = 1 mA; note 1	320	mV
		I_F = 10 mA	400	mV
		I_F = 30 mA	500	mV
		I_F = 100 mA	800	mV
I_R	reverse current	V_R = 25 V; note 2; see Fig.4	2	μA
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	5	ns
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.5	10	pF

Note

1. Temperature coefficient of forward voltage −0.6%/K.
2. Pulsed test: t_p = 300μs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Refer to SOT143 standard mounting conditions .

GRAPHICAL DATA

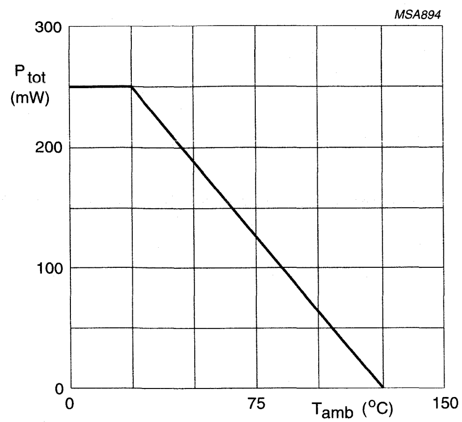
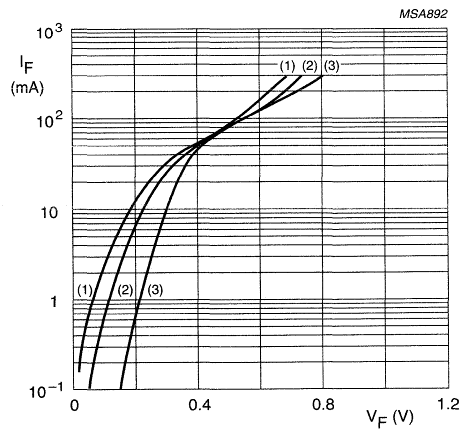
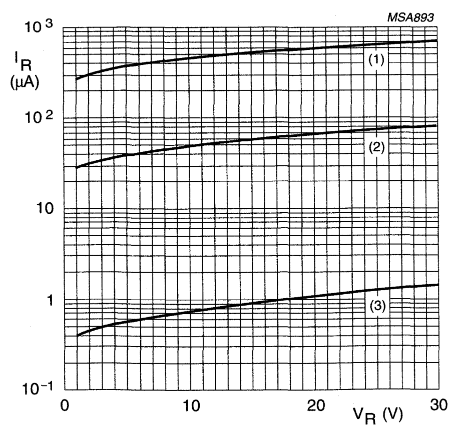


Fig.2 Power derating curve.



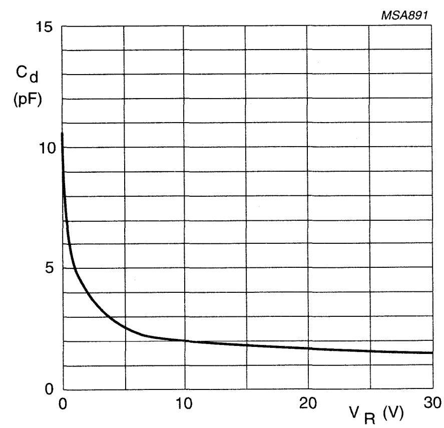
(1) $T_{amb} = 125$ °C.
(2) $T_{amb} = 85$ °C.
(3) $T_{amb} = 25$ °C.

Fig.3 Forward current as a function of forward voltage; typical values.



(1) $T_{amb} = 125$ °C.
(2) $T_{amb} = 85$ °C.
(3) $T_{amb} = 25$ °C.

Fig.4 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; $T_{amb} = 25$ °C.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier double diode

BAT74

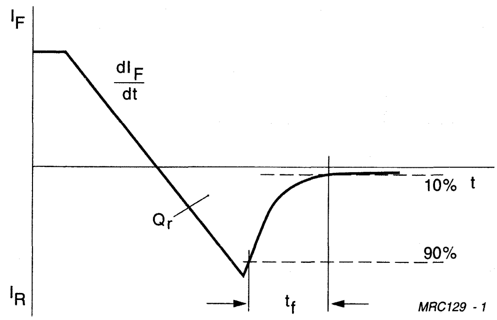


Fig.6 Reverse recovery definitions.

Schottky barrier diodes BAT81; BAT82; BAT83

FEATURES

- Low forward voltage
- High breakdown voltage
- Guard ring protected
- Hermetically-sealed leaded glass package
- Low diode capacitance.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode with an integrated protection ring against static discharges, encapsulated in a hermetically-sealed subminiature SOD68 (DO-34) package. The diode is suitable for mounting on a 2 E (5.08 mm) pitch.

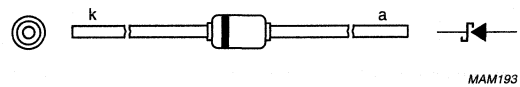


Fig.1 Simplified outline (SOD68; DO-34), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage				
	BAT81		–	40	V
	BAT82		–	50	V
	BAT83		–	60	V
I_F	continuous forward current		–	30	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	150	mA
I_{FSM}	non-repetitive peak forward current	$t_p \leq 10$ ms	–	500	mA
T_{stg}	storage temperature		–65	150	°C
T_j	junction temperature		–	125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.2		
		I_F = 0.1 mA	330	mV
		I_F = 1 mA	410	mV
		I_F = 15 mA	1	V
I_R	reverse current	$V_R = V_{Rmax}$; see Fig.3	200	nA
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.4	1.6	pF

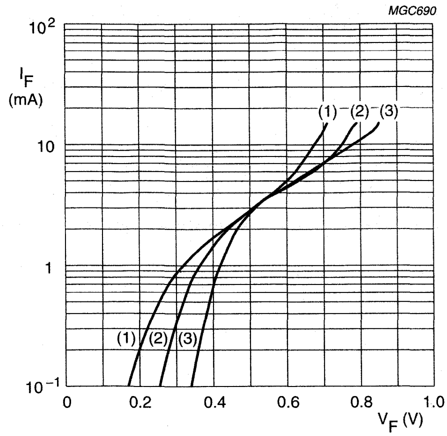
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	320	K/W

Note

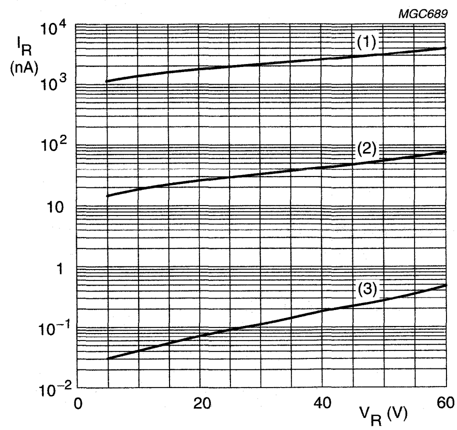
1. Refer to SOD68 standard mounting conditions.

GRAPHICAL DATA



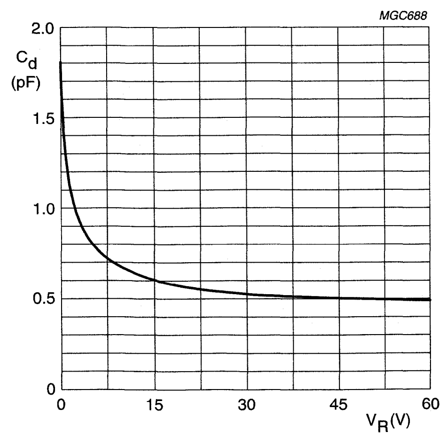
(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier diode BAT85

FEATURES

- Low forward voltage
- Guard ring protected
- Hermetically-sealed leaded glass package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode with an integrated protection ring against static discharges, encapsulated in a hermetically-sealed subminiature SOD68 (DO-34) package. The diode is suitable for mounting on a 2 E (5.08 mm) pitch.

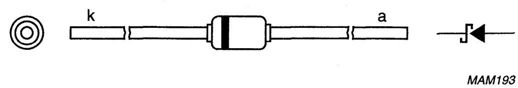


Fig.1 Simplified outline (SOD68; DO-34), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
$I_{F(AV)}$	average forward current	PCB mounting, lead length = 4 mm; V_{RWM} = 25 V; a = 1.57; δ = 0.5; T_{amb} = 50 °C; see Fig.2	–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; δ 0.5	–	300	mA
I_{FSM}	non-repetitive peak forward current	$t_p \leq 10$ ms	–	5	A
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		–65	+125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.3		
		I_F = 0.1 mA	240	mV
		I_F = 1 mA	320	mV
		I_F = 10 mA	400	mV
		I_F = 30 mA	500	mV
		I_F = 100 mA	800	mV
I_R	reverse current	V_R = 25 V; see Fig.4	2	μA
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	4	ns
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.5	10	pF

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	320	K/W

Note

1. Refer to SOD68 standard mounting conditions.

GRAPHICAL DATA

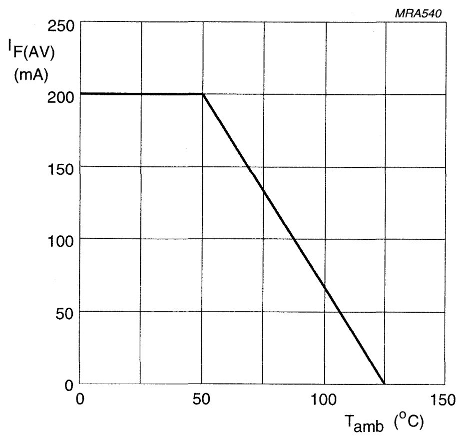
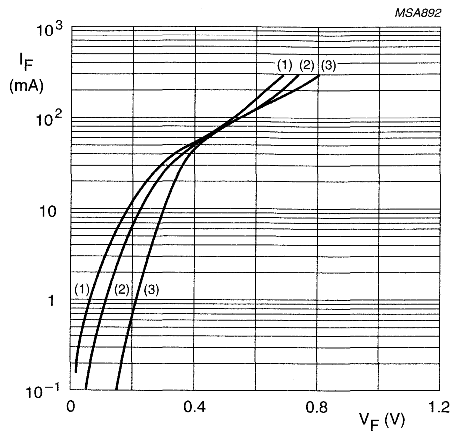
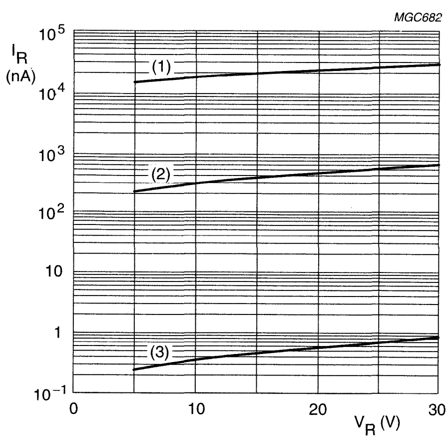


Fig.2 Derating curve.



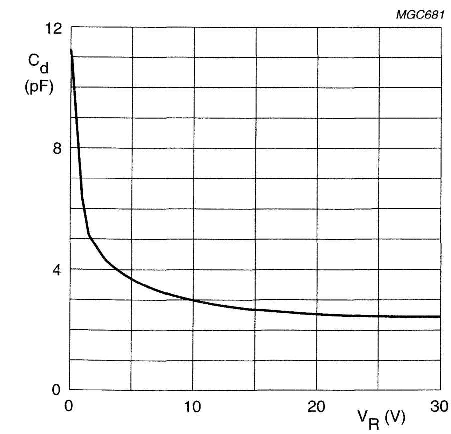
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.4 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

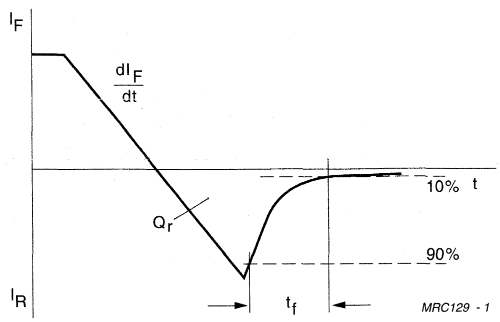


Fig.6 Reverse recovery definitions.

Schottky barrier diode BAT86

FEATURES

- Low forward voltage
- Guard ring protected
- Hermetically-sealed leaded glass package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode with an integrated protection ring against static discharges, encapsulated in a hermetically-sealed subminiature SOD68 (DO-34) package. The diode is suitable for mounting on a 2 E (5.08 mm) pitch.

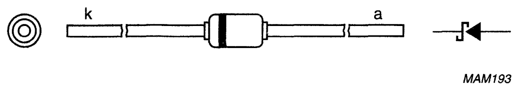


Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current		–	200	mA
$I_{F(AV)}$	average forward current	PCB mounting, lead length = 4 mm; V_{RWM} = 25 V; a = 1.57; δ = 0.5; T_{amb} = 50 °C; see Fig.2	–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	500	mA
I_{FSM}	non-repetitive peak forward current	$t_p \leq 10$ ms	–	5	A
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		–65	+125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.3		
		I_F = 0.1 mA	300	mV
		I_F = 1 mA	380	mV
		I_F = 10 mA	450	mV
		I_F = 30 mA	600	mV
		I_F = 100 mA	900	mV
I_R	reverse current	V_R = 40V; see Fig.4; note 1	5	μA
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.6	4	ns
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.5	8	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	320	K/W

Note

1. Refer to SOD68 standard mounting conditions.

GRAPHICAL DATA

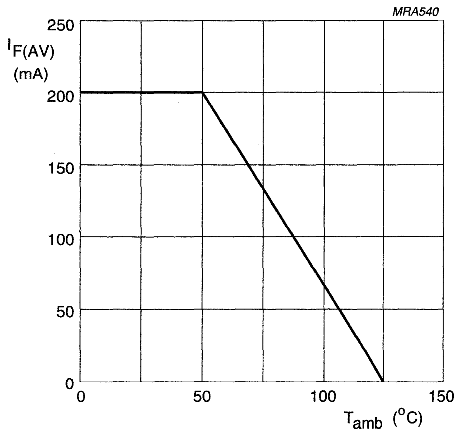
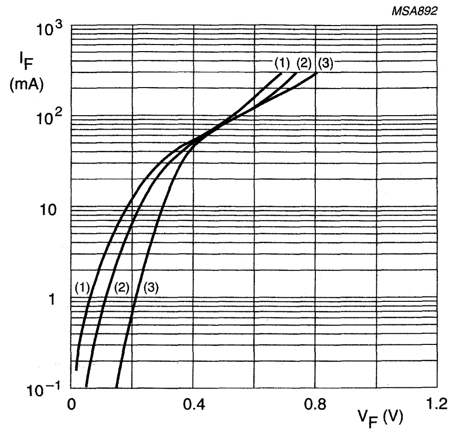
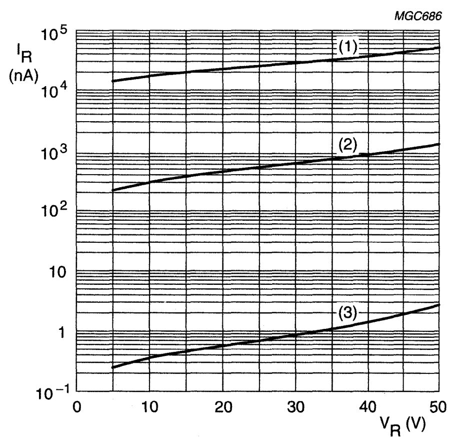


Fig.2 Derating curve.



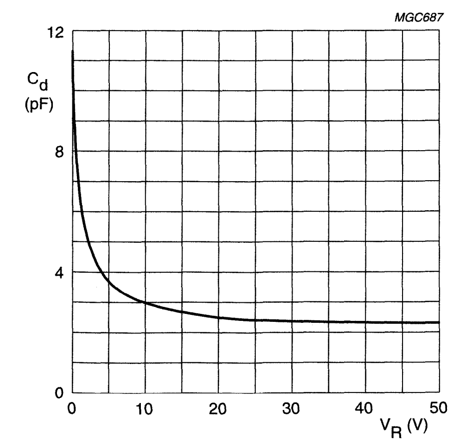
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 85 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −40 °C.

Fig.4 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

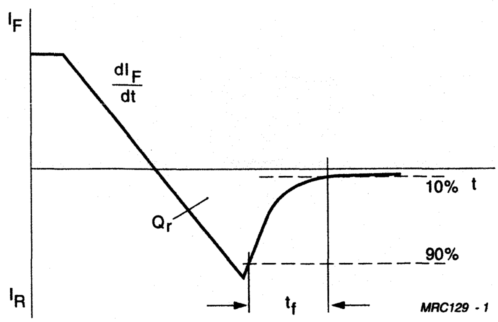


Fig.6 Reverse recovery definitions.

Schottky barrier diode | BAT254

FEATURES

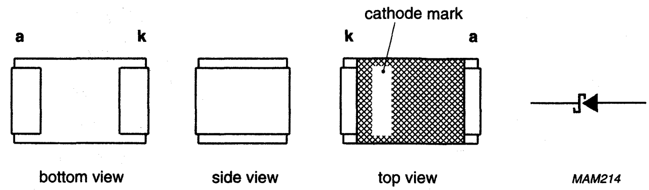
- Low forward voltage
- Guard ring protected
- Very small ceramic SMD package.

APPLICATIONS

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes.

DESCRIPTION

Planar Schottky barrier diode encapsulated in a SOD110 very small ceramic SMD package.



Marking code: L4.

Fig.1 Simplified outline (SOD110) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	30	V
I_F	continuous forward current		–	200	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	–	300	mA
I_{FSM}	non-repetitive peak forward current	$t_p < 10$ ms	–	600	mA
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C
T_{amb}	operating ambient temperature		–65	+125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.2		
		I_F = 0.1 mA	240	mV
		I_F = 1 mA	320	mV
		I_F = 10 mA	400	mV
		I_F = 30 mA	500	mV
		I_F = 100 mA	800	mV
I_R	reverse current	V_R = 25 V; note 1; see Fig.3	2	μA
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA: see Fig.5	5	ns
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.4	10	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

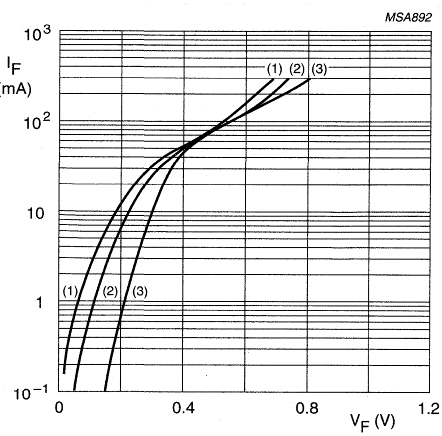
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	315	K/W

Note

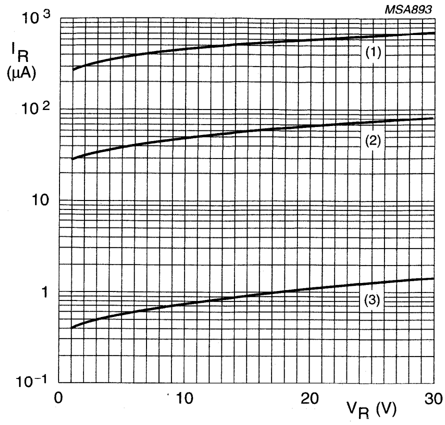
1. Refer to SOD110 standard mounting conditions.

GRAPHICAL DATA



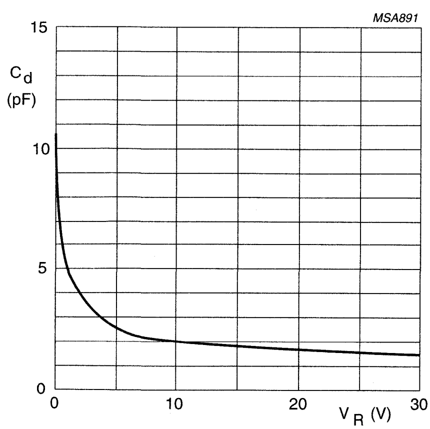
(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 125 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

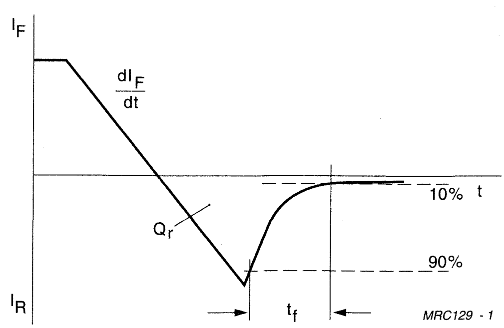


Fig.5 Reverse recovery definitions.

Schottky barrier double diodes | PMBD352; PMBD353

FEATURES

- Low forward voltage
- Small SMD package
- Low capacitance.

APPLICATIONS

- UHF mixer
- Sampling circuits
- Modulators
- Phase detection.

DESCRIPTION

Planar Schottky barrier double diodes in series connection with different pinning.

The diodes are encapsulated in a SOT23 small plastic SMD package.

MARKING

TYPE NUMBER	MARKING CODE
PMBD352	p5g
PMBD353	p4f

PINNING

PIN	DESCRIPTION
PMBD352 (see Fig.2)	
1	a_1
2	k_2
3	k_1, a_2
PMBD353 (see Fig.3)	
1	k_1
2	a_2
3	a_1, k_2

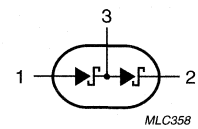


Fig.2 PMBD352 diode configuration (symbol).

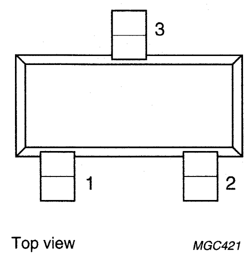


Fig.1 Simplified outline (SOT23) and pin configuration.

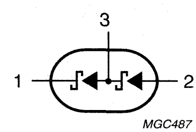


Fig.3 PMBD353 diode configuration (symbol).

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
Per diode				
V_R	continuous reverse voltage	–	4	V
I_F	continuous forward current	–	30	mA
T_{stg}	storage temperature	–65	+150	°C
T_j	junction temperature	–	100	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.4		
		I_F = 0.1 mA	350	mV
		I_F = 1 mA	450	mV
		I_F = 10 mA	600	mV
I_R	reverse current	V_R = 3 V; note 1; see Fig.5	0.25	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.6	1	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

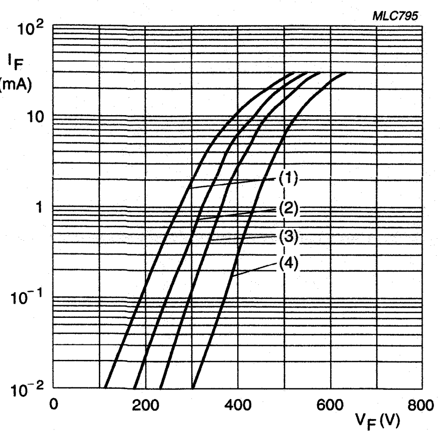
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

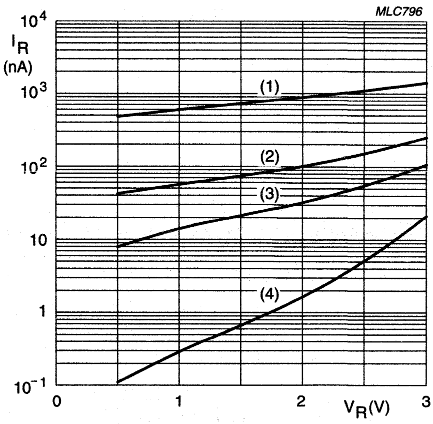
1. Refer to SOT23 standard mounting conditions.

GRAPHICAL DATA



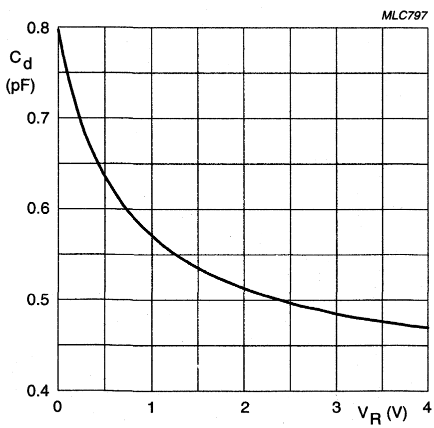
(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.4 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.5 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz; T_{amb} = 25 °C.

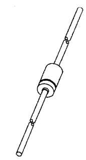
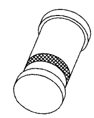
Fig.6 Diode capacitance as a function of reverse voltage; typical values.

SECTION 3

BAND-SWITCHING DIODES

BAND-SWITCHING DIODES

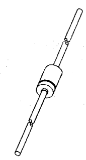
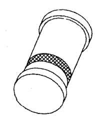
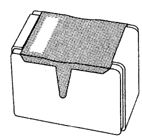
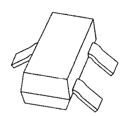
AM BAND-SWITCHING DIODES

TYPE NUMBER	RATINGS		CHARACTERISTICS						PACKAGE (not to scale)
	V_R max.	I_F max.	r_D @ max.	I_F and	f	C_d @ max.	V_R and	f	
	(V)	(mA)	(Ω)	(mA)	(MHz)	(pF)	(V)	(MHz)	
BA423A	20	50	1.2	10	1	2.5	3	1	 SOD68 (DO34)
BA423AL	20	50	1.2	10	1	2.5	3	1	 SOD80C

Band-switching diodes

Selection guide

RF BAND-SWITCHING DIODES

TYPE NUMBER	RATINGS: V_R max. (V)	RATINGS: I_F max. (mA)	CHARACTERISTICS: r_D max. (Ω)	@ I_F (mA)	and f (MHz)	C_d max. (pF)	@ V_R (V)	and f (MHz)	PACKAGE (not to scale)
LEADED TYPES									
BA482	35	100	0.7	3	200	1.2	3	100	 SOD68 (DO34)
BA483	35	100	1.2	3	200	1.0	3	100	
BA484	35	100	1.2	3	200	1.6	3	100	
SURFACE-MOUNT TYPES									
BA682	35	100	0.7	3	200	1.25	3	1	 SOD80
BA683	35	100	1.2	3	200	1.2	3	1	
BA792	35	100	0.7	3	200	1.1	3	100	 SOD110
BAT18	35	100	0.7	5	200	1.0	20	1	 SOT23

AM band-switching diode BA423A

FEATURES

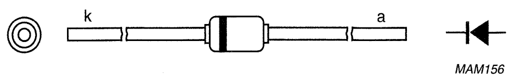
- Continuous reverse voltage: max. 20 V
- Continuous forward current: max. 50 mA
- Low diode capacitance: max. 2.5 pF
- Low diode forward resistance: max. 1.2 Ω.

APPLICATION

- Band switching in AM radio receivers.

DESCRIPTION

Planar band-switching diode in a hermetically sealed glass SOD68 (DO-34) package.



The diodes are type branded.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	20	V
I_F	continuous forward current	–	50	mA
T_{stg}	storage temperature	–65	+150	°C
T_j	junction temperature	–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 50 mA; see Fig.2	0.9	V
I_R	reverse current	see Fig.3		
		V_R = 20V	100	nA
		V_R = 20 V; T_j = 125 °C	5	μA
C_d	diode capacitance	f = 1 MHz; V_R = 3 V; see Fig.4	2.5	pF
r_D	diode forward resistance	I_F = 10 mA; f = 1 MHz; see Fig.5	1.2	Ω

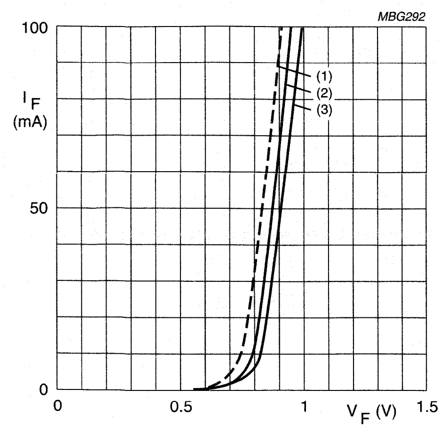
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	240	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

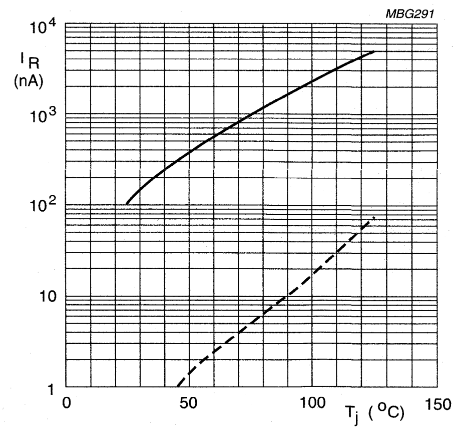
1. Device mounted on a FR4 printed-circuit board without metallization pad.

GRAPHICAL DATA



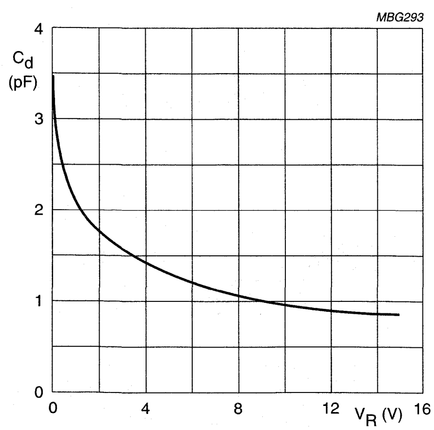
(1) T_j = 125 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.2 Forward current as a function of forward voltage.



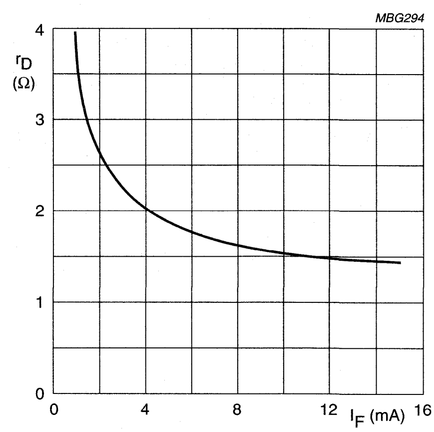
V_R = 20 V.
Solid line: maximum values.
Dotted line: typical values.

Fig.3 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode forward resistance as a function of forward current; typical values.

AM band-switching diode

BA423AL

FEATURES

- Continuous reverse voltage: max. 20 V
- Continuous forward current: max. 50 mA
- Low diode capacitance: max. 2.5 pF
- Low diode forward resistance: max. 1.2 Ω.

APPLICATION

- Band switching in AM radio receivers.

DESCRIPTION

Leadless diode in a hermetically-sealed glass SOD80C SMD package with lead/tin plated metal discs at each end.

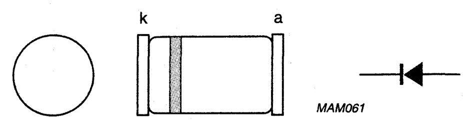


Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	20	V
I_F	continuous forward current	–	50	mA
T_{stg}	storage temperature	–65	+150	°C
T_j	junction temperature	–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 50 mA; see Fig.2	0.9	V
I_R	reverse current	see Fig.3		
		V_R = 20V	100	nA
		V_R = 20 V; T_j = 125 °C	5	µA
C_d	diode capacitance	f = 1 MHz; V_R = 3 V; see Fig.4	2.5	pF
r_D	diode forward resistance	I_F = 10 mA; f = 1 MHz; see Fig.5	1.2	Ω

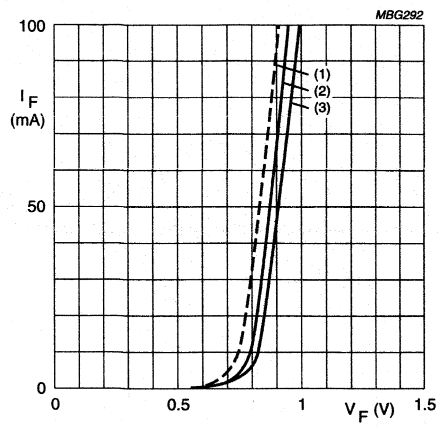
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	375	K/W

Note

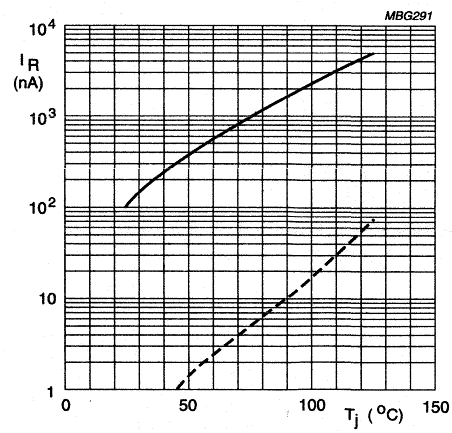
1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



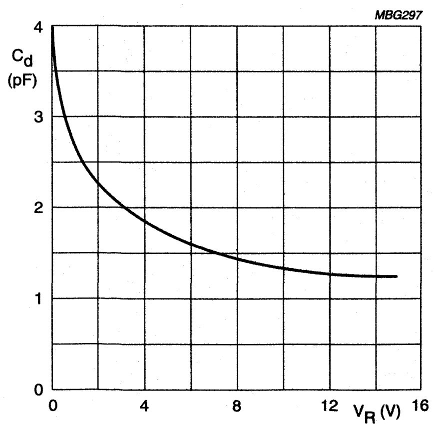
(1) T_j = 125 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.2 Forward current as a function of forward voltage.



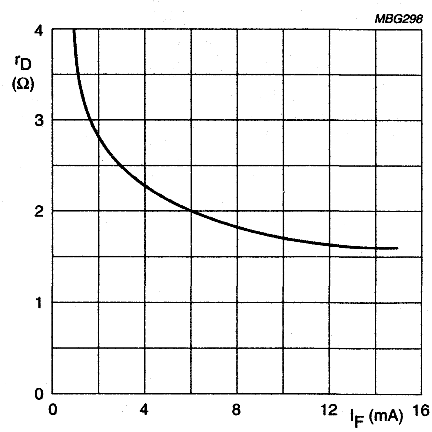
V_R = 20 V.
Solid line: maximum values.
Dotted line: typical values.

Fig.3 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.



f = 1 MHz; T_j = 25 °C.

Fig.5 Diode forward resistance as a function of forward current; typical values.

Band-switching diodes BA482; BA483; BA484

FEATURES

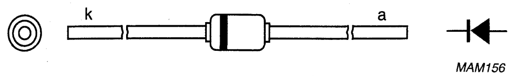
- Continuous reverse voltage: max. 35 V
- Continuous forward current: max. 100 mA
- Low diode capacitance: max. 1.0 to 1.6 pF
- Low diode forward resistance: max. 0.7 to 1.2 Ω.

APPLICATION

- VHF television tuners.

DESCRIPTION

Planar high performance band-switching diode in a hermetically sealed glass SOD68 (DO-34) package.



The diodes are type branded.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	35	V
I_F	continuous forward current	–	100	mA
T_{stg}	storage temperature	−65	+150	°C
T_j	junction temperature	–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; see Fig.2	–	1.2	V
I_R	reverse current	see Fig.3			
		V_R = 20V	–	100	nA
		V_R = 20 V; T_{amb} = 75 °C	–	1	μA
C_d	diode capacitance	f = 1 to 100 MHz; V_R = 3 V; see Fig.4			
	BA482		0.8	1.2	pF
	BA483		0.7	1.0	pF
	BA484		1.0	1.6	pF
r_D	diode forward resistance	I_F = 3 mA; f = 200 MHz; see Fig.5			
	BA482		0.6	0.7	Ω
	BA483		0.8	1.2	Ω
	BA484		0.8	1.2	Ω

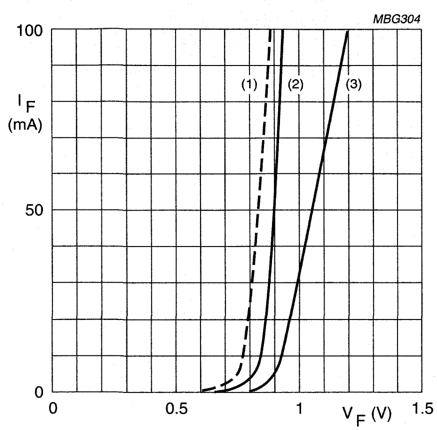
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

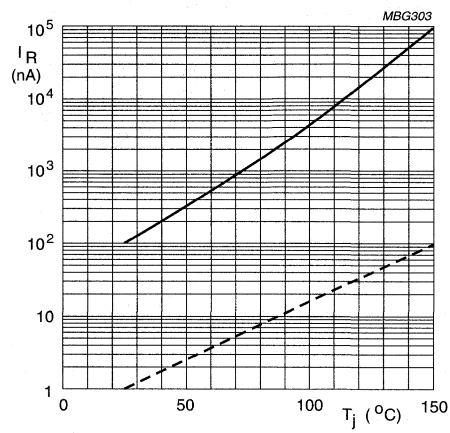
1. Device mounted on a FR4 printed-circuit board without metallization pad.

GRAPHICAL DATA



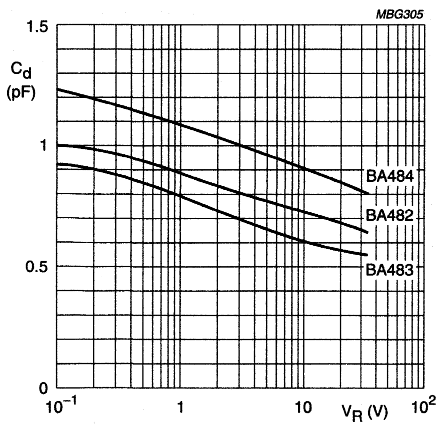
(1) T_j = 75 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.2 Forward current as a function of forward voltage.



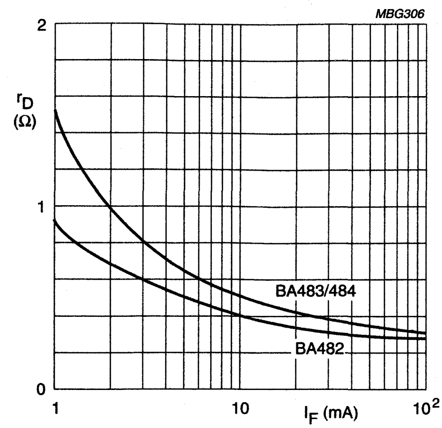
V_R = 20 V.
Solid line: maximum values.
Dotted line: typical values.

Fig.3 Reverse current as a function of junction temperature.



f = 1 to 100 MHz; T_j = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.



f = 200 MHz; T_j = 25 °C.

Fig.5 Diode forward resistance as a function of forward current; typical values.

Band-switching diodes

BA682; BA683

FEATURES

- Continuous reverse voltage: max. 35 V
- Continuous forward current: max. 100 mA
- Low diode capacitance: max. 1.5 pF
- Low diode forward resistance: max. 0.7 to 1.2 Ω.

APPLICATION

- Band-switching in VHF television tuners.

DESCRIPTION

Planar high performance band-switching diodes in a glass SOD80 SMD package.

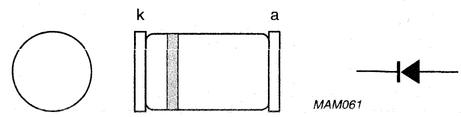


Fig.1 Simplified outline (SOD80) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	35	V
I_F	continuous forward current	–	100	mA
T_{stg}	storage temperature	−65	+150	°C
T_j	junction temperature	–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; see Fig.2	1.0	V
I_R	reverse current	see Fig.3		
		V_R = 20V	50	nA
		V_R = 20 V; T_j = 75 °C	1	μA
C_d	diode capacitance	f = 1 MHz; V_R = 1 V; see Fig.4	1.5	pF
C_d	diode capacitance	f = 1 MHz; V_R = 3 V; see Fig.4		
	BA682		1.25	pF
	BA683		1.20	pF
r_D	diode forward resistance	I_F = 3 mA; f = 200 MHz; see Fig.5		
	BA682		0.7	Ω
	BA683		1.2	Ω
r_D	diode forward resistance	I_F = 10 mA; f = 200 MHz; see Fig.5		
	BA682		0.5	Ω
	BA683		0.9	Ω

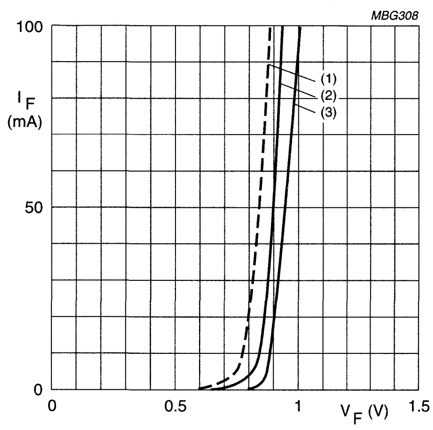
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	600	K/W

Note

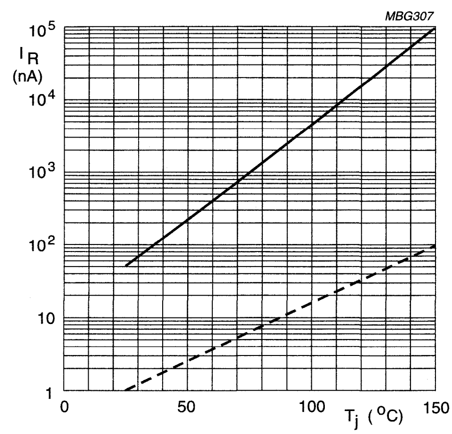
1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



(1) T_j = 75 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

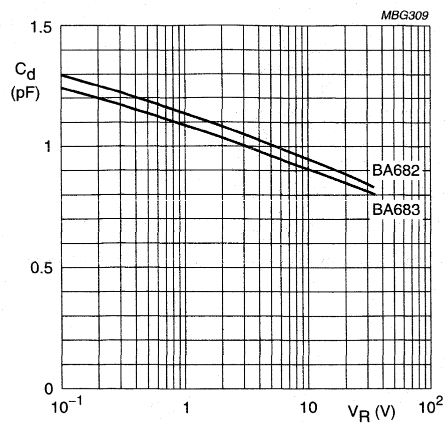
Fig.2 Forward current as a function of forward voltage.



V_R = 20 V.
Solid line: maximum values.
Dotted line: typical values.

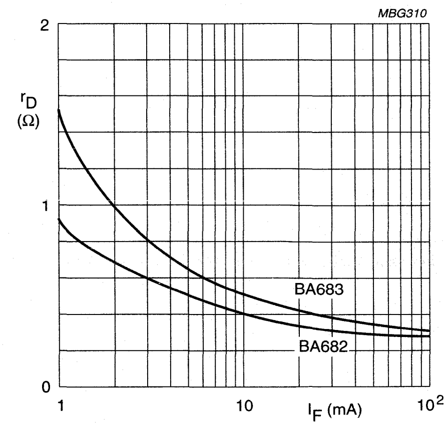
Fig.3 Reverse current as a function of junction temperature.

Band-switching diodes BA682; BA683



f = 1 MHz; T_j = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.



f = 200 MHz; T_j = 25 °C.

Fig.5 Diode forward resistance as a function of forward current; typical values.

Band-switching diode BA792

FEATURES

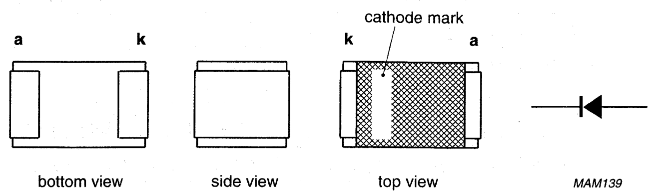
- Ceramic SMD package
- Low diode capacitance: max. 1.1 pF
- Low diode forward resistance: max. 0.7 Ω.

APPLICATIONS

- Low loss band-switching in VHF television tuners
- Surface mount high-speed switching circuits.

DESCRIPTION

Planar, high performance band-switching diode in a small ceramic SOD110 SMD package.



Marking code: L8.

Fig.1 Simplified outline (SOD110) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	35	V
I_F	continuous forward current	–	100	mA
T_{stg}	storage temperature	–65	+150	°C
T_j	junction temperature	–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA	1.1	V
I_R	reverse current	V_R = 20 V	10	nA
		V_R = 20 V; T_{amb} = 75 °C	1	µA
C_d	diode capacitance	V_R = 3 V; f = 1 to 100 MHz; note 1	1.1	pF
r_D	diode forward resistance	I_F = 3 mA; f = 200 MHz; note 1	0.7	Ω

Note

1. Guaranteed on AQL basis: inspection level S4, AQL 1.0.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	315	K/W

Note

1. Device mounted on a printed-circuit board measuring 11 × 25 × 1.6 mm.

Band-switching diode | BAT18

FEATURES

- Continuous reverse voltage: max. 35 V
- Continuous forward current: max. 100 mA
- Low diode capacitance: max. 1.0 pF
- Low diode forward resistance: max. 0.7 Ω.

APPLICATION

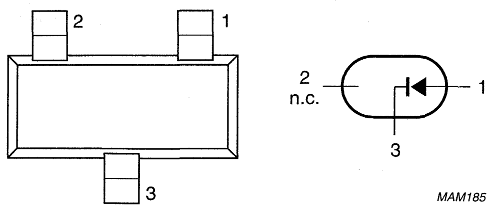
- Band switching.

DESCRIPTION

Planar high performance band-switching diode in a small rectangular plastic SOT23 SMD package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: A2.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	35	V
I_F	continuous forward current	–	100	mA
T_{stg}	storage temperature	–55	+125	°C
T_j	junction temperature	–	125	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; see Fig.2	–	1.2	V
I_R	reverse current	see Fig.3			
		V_R = 20V	–	100	nA
		V_R = 20 V; T_j = 60 °C	–	1	μA
C_d	diode capacitance	f = 1 MHz; V_R = 20 V; see Fig.4	0.8	1.0	pF
r_D	diode forward resistance	I_F = 5 mA; f = 200 MHz; see Fig.5	0.5	0.7	Ω

THERMAL CHARACTERISTICS

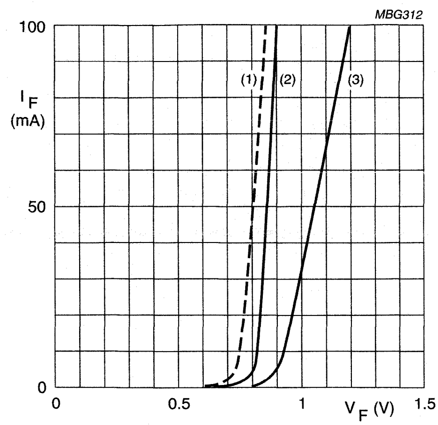
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Device mounted on a FR4 printed-circuit board.

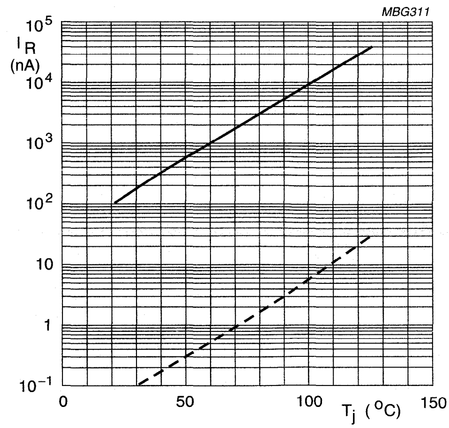
Band-switching diode BAT18

GRAPHICAL DATA



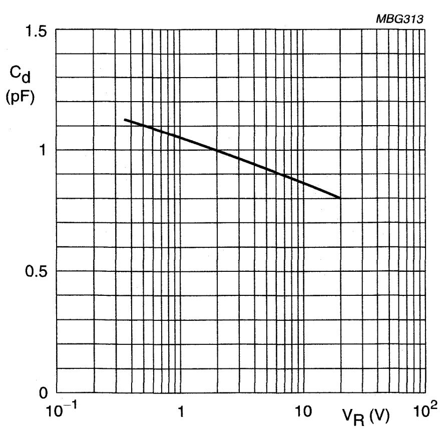
(1) T_j = 60 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.2 Forward current as a function of forward voltage.



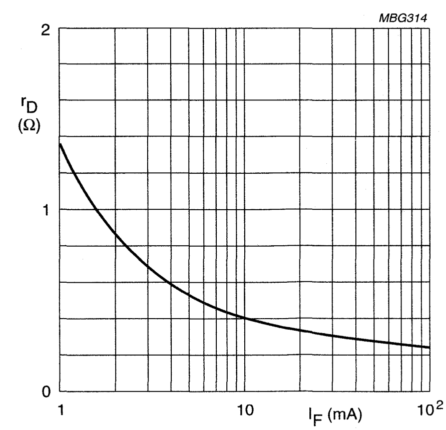
V_R = 20 V.
Solid line: maximum values.
Dotted line: typical values.

Fig.3 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.



f = 200 MHz; T_j = 25 °C.

Fig.5 Diode forward resistance as a function of forward current; typical values.

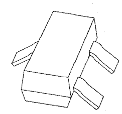
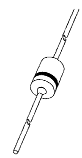
SECTION 4

VARICAP DIODES

continued on next page

VARICAP DIODES

RADIO VARICAP DIODES

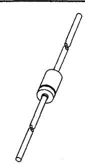
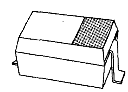
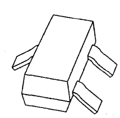
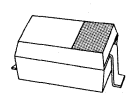
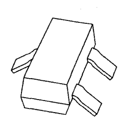
TYPE NUMBER	C_d @	V_R	TUNING RANGE C_d over voltage range ratio	V_1 to	V_2	r_s max	MATCHED SETS	DOUBLE DIODE	PACKAGE (not to scale)
	(pF)	(V)		(V)	(V)	(Ω)	(%)		
FM radio tuning									
BB804	26	8	1.7	2	8	0.2(2)	–	yes(1)	 SOT23
Automatic frequency control									
BB119	17	10	1.3	4	10	1.5	–	no	 SOD27 (DO35)

Note

1. Common cathode.
2. Typical value.

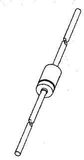
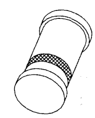
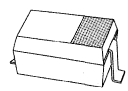
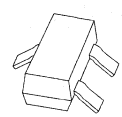
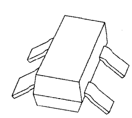
VARICAP DIODES (continued)

TV/SATELLITE VARICAP DIODES

TYPE NUMBER	C_d @ (pF)	V_R (V)	TUNING RANGE: C_d over voltage range, ratio	V_1 (V)	to V_2 (V)	r_s max. (Ω)	MATCHED SETS (%)	DOUBLE DIODE	PACKAGE (not to scale)
VHF tuning									
BB809	4.7	28	9	1	28	0.6	3	no	 SOD68 (DO34)
BB909A	>2.6	28	13.5	1	28	0.9	2.5	no	
BB909B	>2.8	28	13.5	1	28	0.9	2.5	no	
BB910	2.5	28	16	0.5	28	1	2.5	no	
BB911/A	2.7	28	25	0.5	28	2	2.5	no	
BB132	2.5	28	26	0.5	28	2	1	no	 SOD323
BB133	2.5	28	16	0.5	28	0.9	0.7	no	
BB147	2.6	28	40	0.5	28	2.8	2	no	
BB148	2.6	28	15	1	28	0.9	1	no	
BB150	2.5	28	16	0.5	28	0.9	–	no	
BB158	2.6	28	15	1	28	0.9	–	no	
BBY40	4.6	25	5.5	3	25	0.7	–	no	 SOT23
BBY42	2.7	28	14	1	28	1	–	no	
Coupling									
BB131	1	28	14	0.5	28	3	–	no	 SOD323
BB901	1	28	13.5	0.5	28	3	–	no	 SOT23

VARICAP DIODES (continued)

TV/SATELLITE VARICAP DIODES (continued)

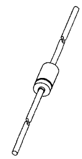
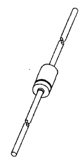
TYPE NUMBER	C_d @	V_R	TUNING RANGE C_d over voltage range ratio	V_1 to	V_2	r_s max.	MATCHED SETS	DOUBLE DIODE	PACKAGE (not to scale)
	(pF)	(V)		(V)	(V)	(Ω)	(%)		
UHF tuning									
BB405B	2	28	8.3	1	28	0.75	3	no	 SOD68 (DO34)
BB215	2	28	8.3	1	28	0.75	3	no	 SOD80
BB134	1.9	28	10	0.5	28	0.75	0.5	no	 SOD323
BB135	1.9	28	10	0.5	28	0.75	–	no	
BB146	1.9	28	20	0.5	28	1.4	1.6	no	
BB149	2.1	28	9	1	28	0.75	1	no	
BB159	2.1	28	9	1	28	0.75	–	no	
BBY31	1.9	28	8.3	1	28	1.2	–	no	 SOT23
BBY39	1.9	28	8.3	1	28	1.2	–	yes(1)	
BBY62	1.9	28	8.3	1	28	1.2	–	yes	 SOT143

Note

1. Common cathode.

VARICAP DIODES (continued)

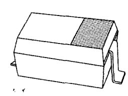
TV/SATELLITE VARICAP DIODES (continued)

TYPE NUMBER	C_d @	V_R	TUNING RANGE C_d over voltage range ratio	V_1 to	V_2	r_s max.	MATCHED SETS	DOUBLE DIODE	PACKAGE (not to scale)
	(pF)	(V)		(V)	(V)	(Ω)	(%)		
UHF mixing[1]									
BA481	1.1[2]	0	–	–	–	13	–	no	 SOD68 (DO34)
Automatic frequency control									
BB417	3	15	3.5	4	15	0.75	–	no	 SOD68 (DO34)

Notes

1. See also 1PS76SB17 and BAT17 in Section 2 for UHF mixer applications.
2. Maximum value.

VCO TUNING

TYPE NUMBER	TUNING RANGE C_d @ min./max.	V_R	C_d @ min./max.	V_R	r_s max.	MATCHED SETS	DOUBLE DIODE	PACKAGE (not to scale)
	(pF)	(V)	(pF)	(V)	(Ω)	(%)		
BB155	45.2/49.8	0.34	24.55/26.7	2.82	0.6	–	no	 SOD323

UHF mixer diode | BA481

FEATURES

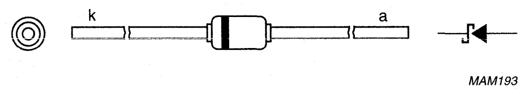
- Low forward voltage
- Hermetically-sealed leaded glass package
- Low diode capacitance.

APPLICATIONS

- UHF mixer
- Sampling circuits
- Modulators
- Phase detection.

DESCRIPTION

Planar Schottky barrier diode encapsulated in a hermetically-sealed subminiature SOD68 (DO-34) glass package. The diode is suitable for mounting on a 2 E (5.08 mm) pitch.



Cathode indicated by a grey band.

Fig.1 Simplified outline (SOD68; DO-34), and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	4	V
I_F	continuous forward current	–	30	mA
T_{stg}	storage temperature	–65	+125	°C
T_j	junction temperature	–	100	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.2		
		I_F = 1 mA	450	mV
		I_F = 10 mA	600	mV
I_R	reverse current	V_R = 4 V; see Fig.3	10	μA
		V_R = 4 V; T_{amb} = 60 °C; see Fig.3	100	μA
r_s	series resistance	f = 1 kHz; I_F = 5 mA	13	Ω
F	noise figure	f = 900 MHz; note 1	8	dB
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.4	1.1	pF

Note

1. The local oscillator is adjusted for a diode current of 2 mA.
   IF amplifier noise F_{if} = 1.5 dB; f = 35 MHz.

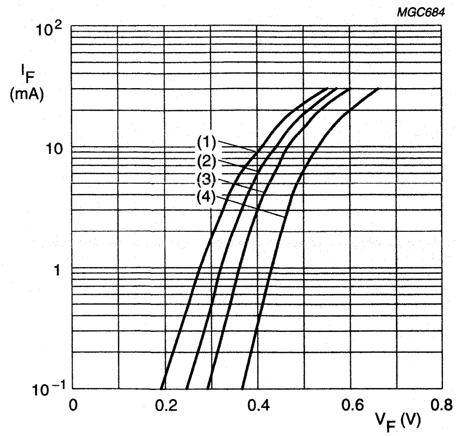
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	320	KW

Note

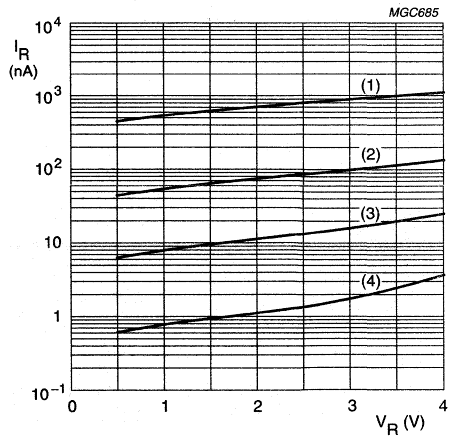
1. Refer to SOD68 standard mounting conditions.

GRAPHICAL DATA



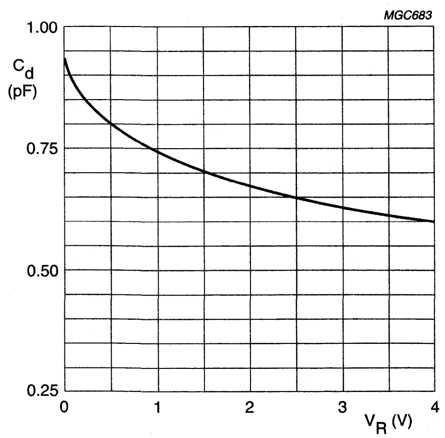
(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 100 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 25 °C.
(4) T_{amb} = −40 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Variable capacitance diode BB119

FEATURES

- Hermetically sealed leaded glass SOD27 (DO-35) package
- C10: 17 pF; ratio: 1.3.

APPLICATIONS

- Automatic frequency control.

DESCRIPTION

The BB119 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD27 (DO-35) package.

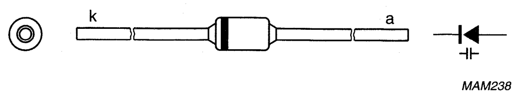


Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	15	V
I_F	continuous forward current	–	200	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 15 V; see Fig.3	–	–	50	nA
		V_R = 15 V; T_j = 150 °C; see Fig.3	–	–	2	μA
r_s	diode series resistance	f = 200 MHz; note 1	–	0.2	1.5	Ω
C_d	diode capacitance	V_R = 4 V; f = 1 MHz; see Figs 2 and 4	20	–	25	pF
		V_R = 10 V; f = 1 MHz; see Figs 2 and 4	–	17	–	pF
$\frac{C_{d(4V)}}{C_{d(10V)}}$	capacitance ratio	f = 1 MHz	1.3	–	–	

Note

1. V_R = 4 V.

GRAPHICAL DATA

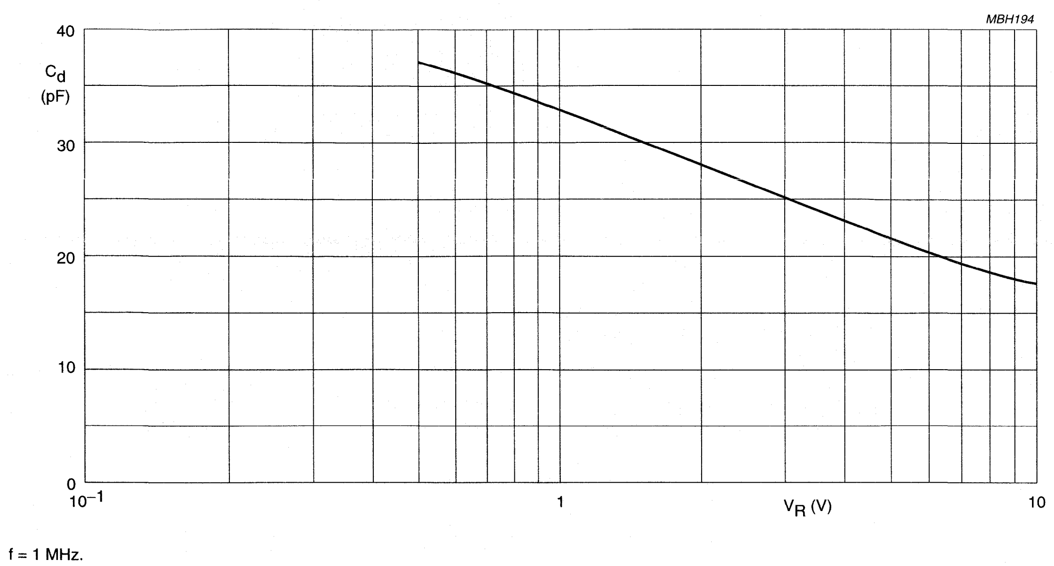


Fig.2 Diode capacitance as a function of reverse voltage; typical values.

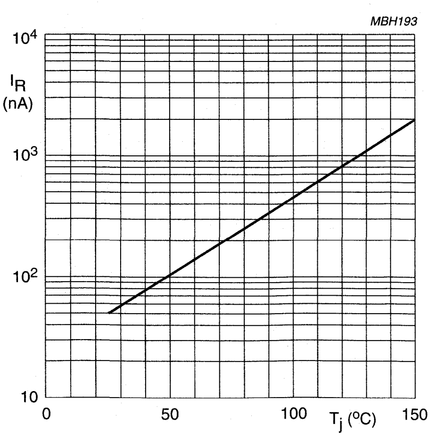


Fig.3 Reverse current as a function of junction temperature; maximum values.

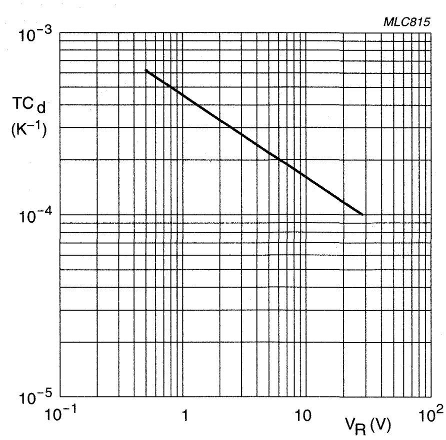


Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode — BB131

FEATURES

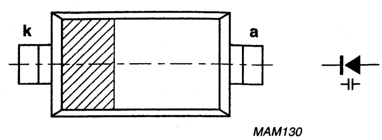
- Excellent linearity
- Very small plastic SMD package
- C28: 1 pF; ratio: 14.

APPLICATIONS

- Electronic tuning in satellite tuners
- Tunable coupling
- VCO.

DESCRIPTION

The BB131 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.



Marking code: P1.
Cathode side indicated by a green bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

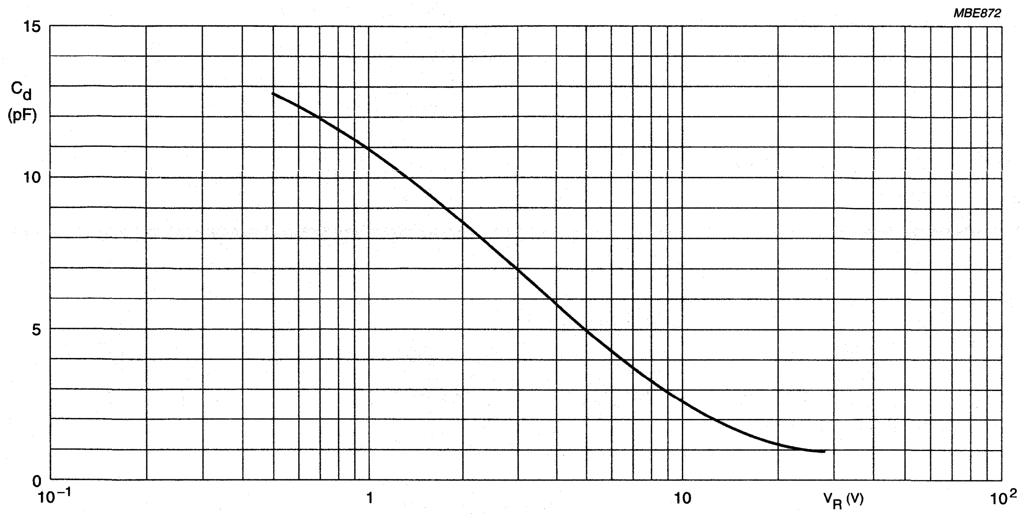
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	3	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	8	–	17	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	0.7	–	1.055	pF
$\frac{C_{d\,(0.5V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	12	–	16	

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

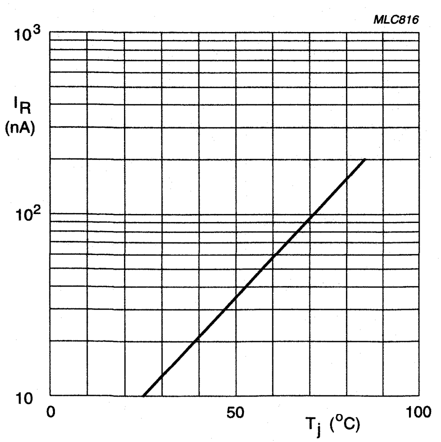
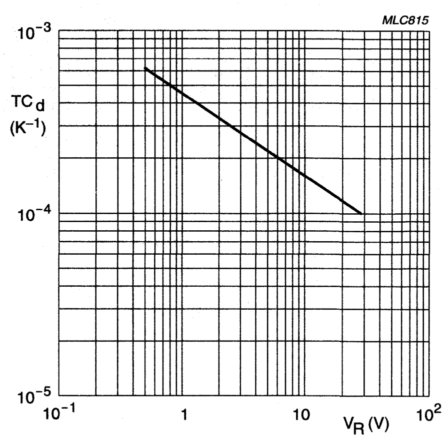


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode BB132

FEATURES

- High linearity
- Excellent matching to 1% DMA
- Very small plastic SMD package
- C28: 2.5 pF; ratio: 26.

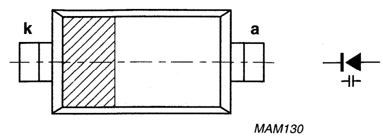
APPLICATIONS

- Electronic tuning in VHF television tuners, band A up to 160 MHz
- VCO.

DESCRIPTION

The BB132 is a variable capacitance diode fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by gliding matching and a direct matching assembly procedure.



Marking code: P2.
Cathode side indicated by a red bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

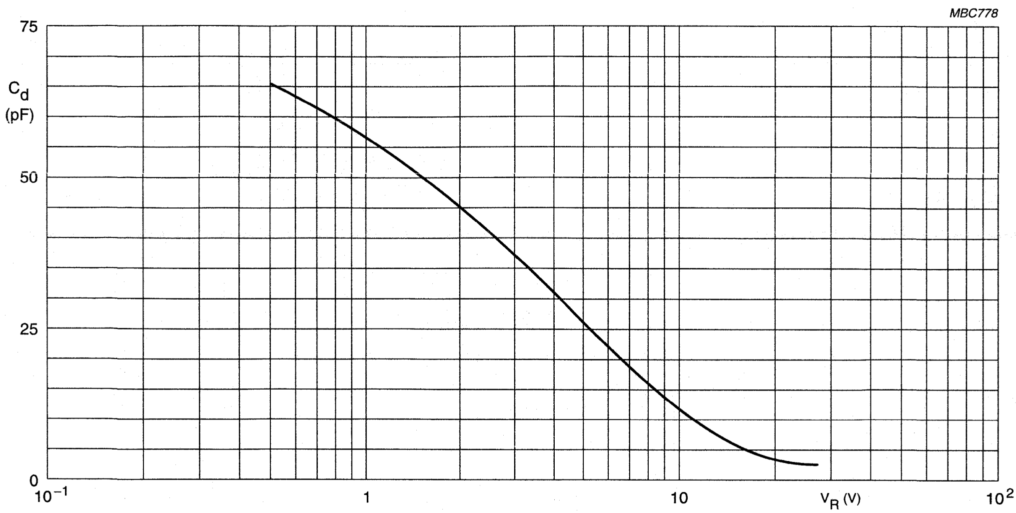
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	2	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	60	–	75	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.3	–	2.75	pF
$\frac{C_{d\,(0.5V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	24	–	30	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V; in a sequence of 4 diodes (gliding)	–	–	1	%
		V_R = 0.5 to 28 V; in a sequence of 15 diodes (gliding)	–	–	2	%

Note

1. V_R is the value at which C_d = 30 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

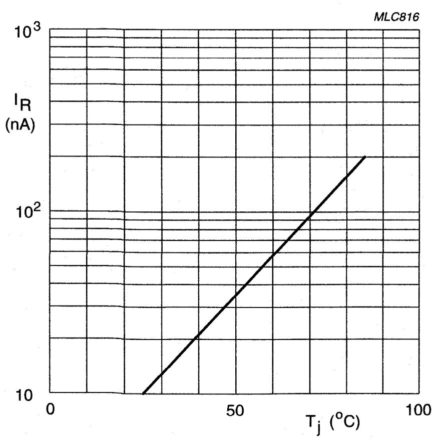
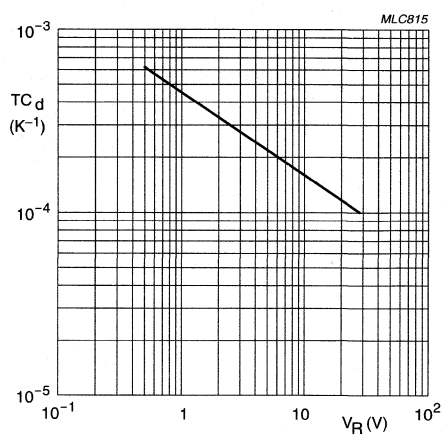


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode — BB133

FEATURES

- Excellent linearity
- Excellent matching to 0.7% DMA
- Very small plastic SMD package
- C28: 2.5 pF; ratio: 16
- Low series resistance.

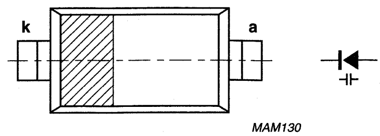
APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

DESCRIPTION

The BB133 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by gliding matching and a direct matching assembly procedure. The unmatched type, BB150 has the same specification.



Marking code: P3.
Cathode side indicated by a yellow bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

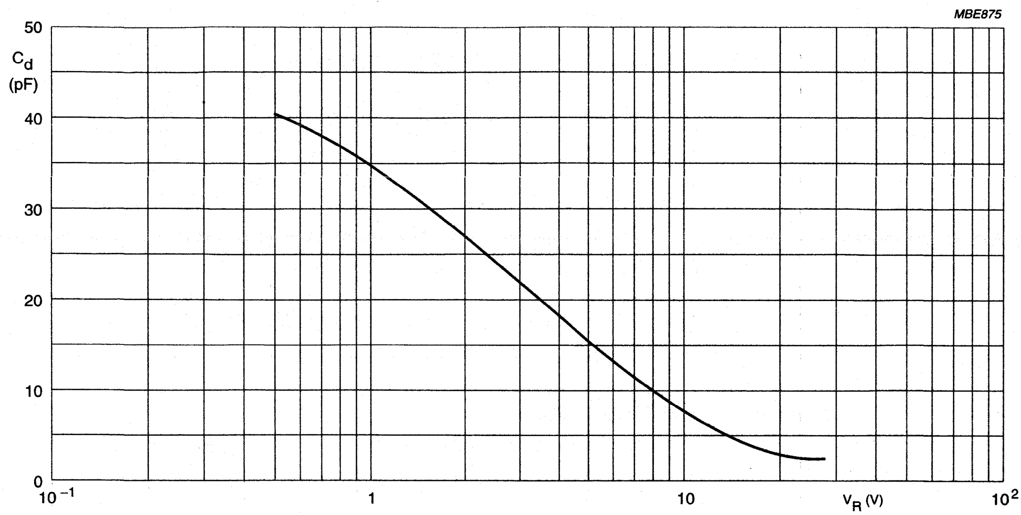
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	0.9	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	38	–	46	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.2	–	2.6	pF
$\frac{C_{d\,(0.5V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	14	–	21	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V; in a sequence of 4 diodes (gliding)	–	–	0.7	%
		V_R = 0.5 to 28 V; in a sequence of 15 diodes (gliding)	–	–	2	%

Note

1. V_R is the value at which C_d = 30 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

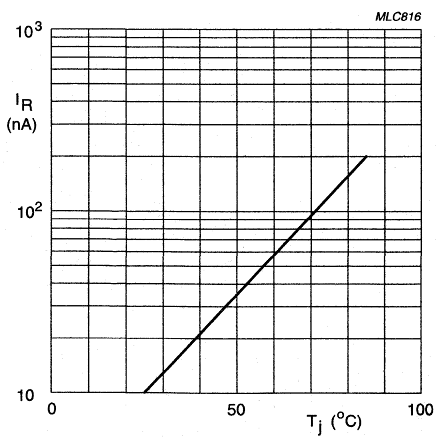
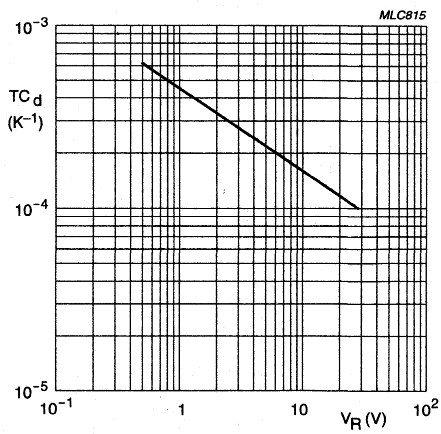


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode | BB134

FEATURES

- Excellent linearity
- Excellent matching to 0.5% DMA
- Very small plastic SMD package
- C28: 1.9 pF; ratio: 10
- Low series resistance.

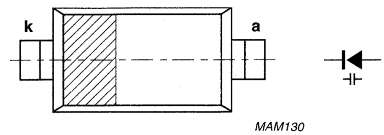
APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BB134 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by a direct matching assembly procedure. The unmatched type, BB135 has the same specification.



Marking code: P4.
Cathode side indicated by a white bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

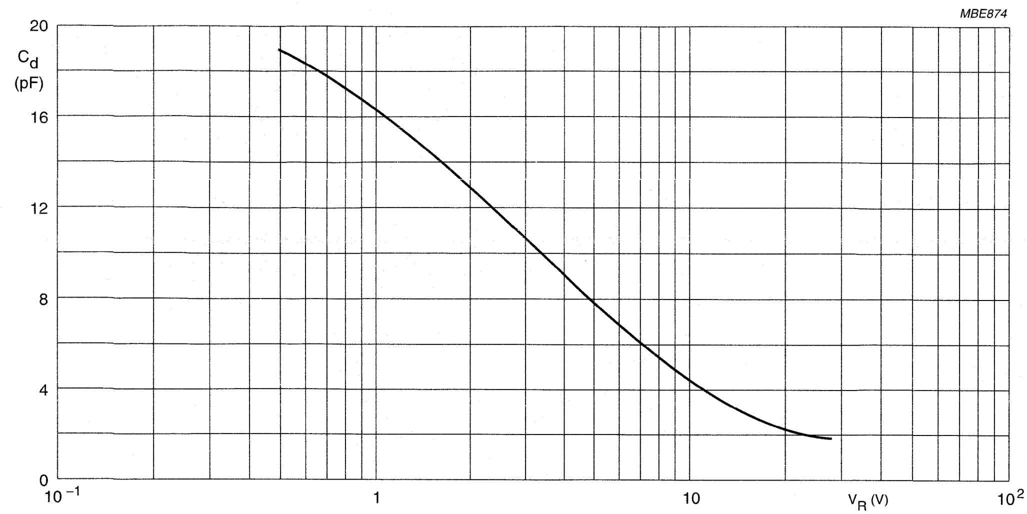
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	0.75	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	17.5	–	21	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.7	–	2.1	pF
$\frac{C_{d\,(0.5V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	8.9	–	12	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V; in a sequence of 4 diodes (gliding)	–	–	0.5	%
		V_R = 0.5 to 28 V; in a sequence of 15 diodes (gliding)	–	–	2	%

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

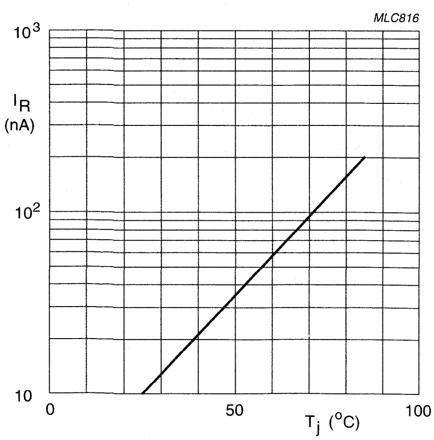
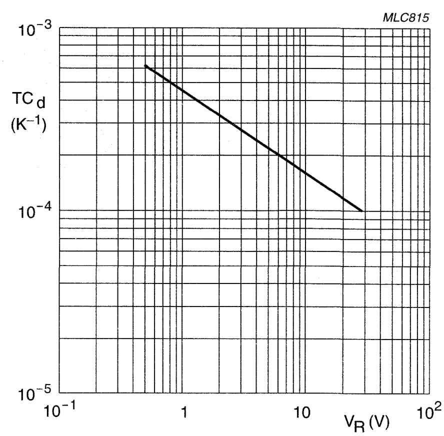


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode BB135

FEATURES

- Excellent linearity
- Very small plastic SMD package.
- C28: 1.9 pF; ratio: 10
- Low series resistance.

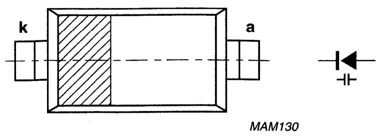
APPLICATIONS

- Electronic tuning in UHF television tuners.
- Radio upconversion concepts
- VCO.

DESCRIPTION

The BB135 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The matched type, BB134 has the same specification.



Marking code: P5.
Cathode side indicated by a white bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

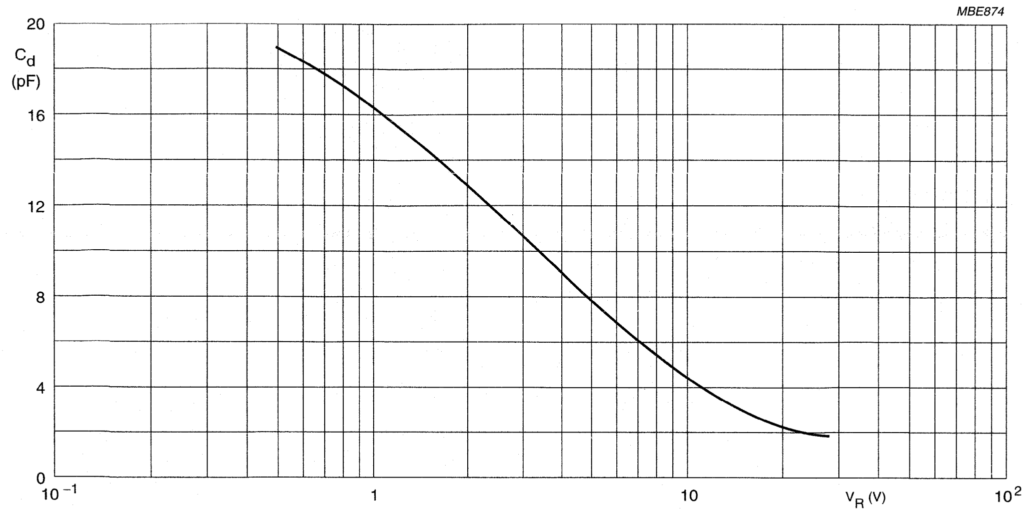
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	0.75	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	17.5	–	21	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.7	–	2.1	pF
$\frac{C_{d(0.5V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	8.9	–	12	

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

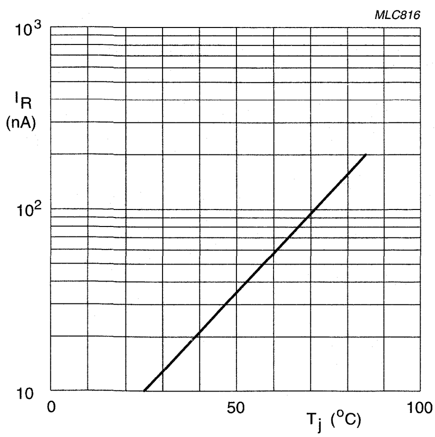
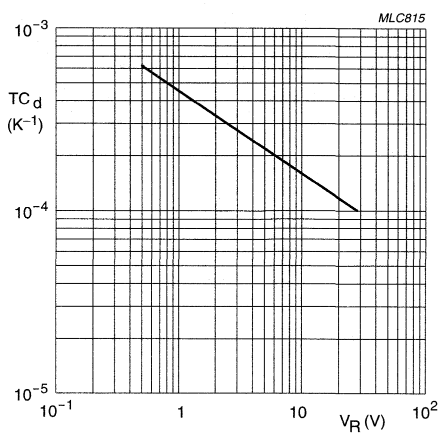


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode BB146

FEATURES

- Ultra high ratio
- Excellent matching to 1.6% DMA (Direct Matching Assembly)
- Very small plastic SMD package
- C28: 1.9 pF; ratio 20.

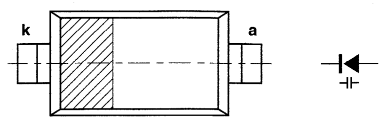
APPLICATIONS

- Electronic tuning in television tuners with extended UHF range
- Voltage controlled oscillators (VCO).

DESCRIPTION

The BB146 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by gliding matching and a direct matching assembly procedure.



Marking code: P6.
Cathode side indicated by a bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

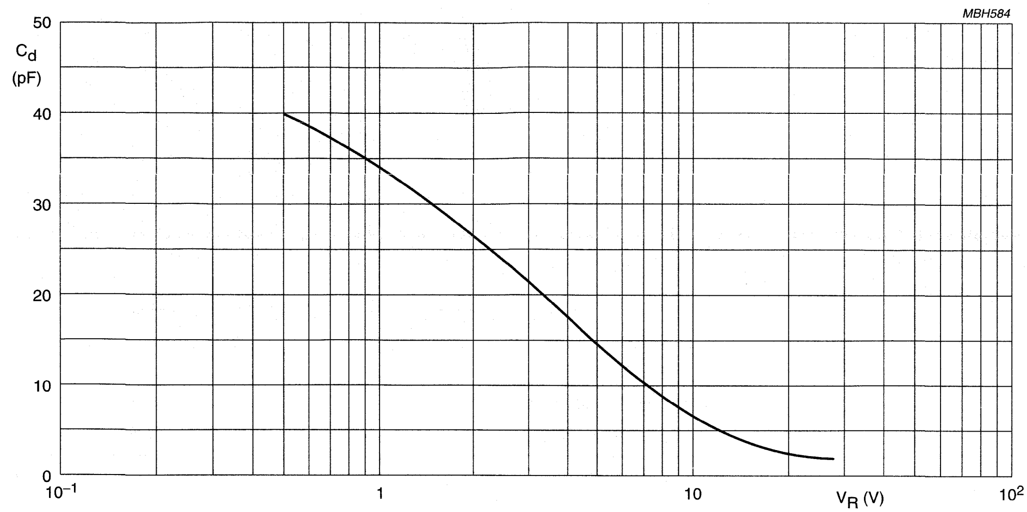
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	1.4	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	35	43	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.7	2.1	pF
$\frac{C_{d(0.5V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	17.5	23	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V; in a sequence of 8 diodes (gliding)	–	1.6	%

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

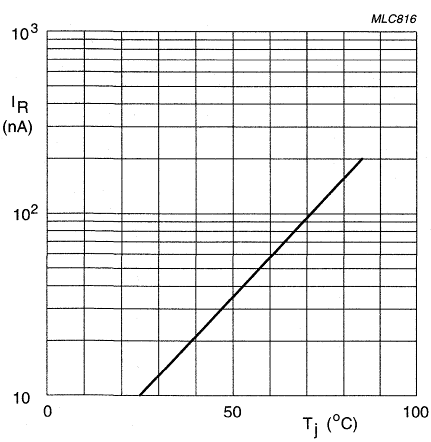
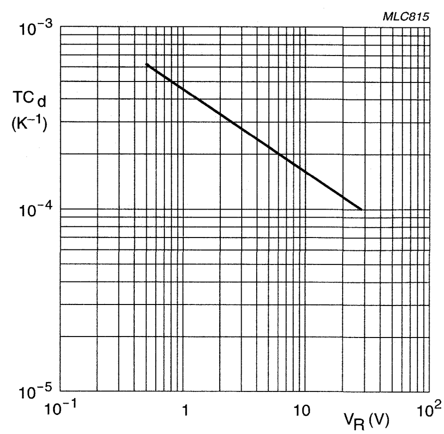


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

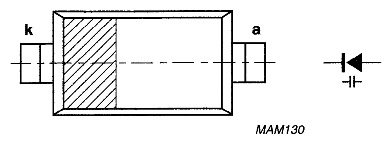
VHF variable capacitance diode — BB147

FEATURES

- Ultra high ratio
- Excellent matching to 2% DMA (Direct Matching Assembly)
- Very small plastic SMD package
- C28: 2.6 pF; ratio 40.

APPLICATIONS

- Electronic tuning in television tuners with extended VHF range
- Voltage controlled oscillators (VCO).



Marking code: P7.
Cathode side indicated by a bar.

Fig.1 Simplified outline (SOD323) and symbol.

DESCRIPTION

The BB147 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by gliding matching and a direct matching assembly procedure.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

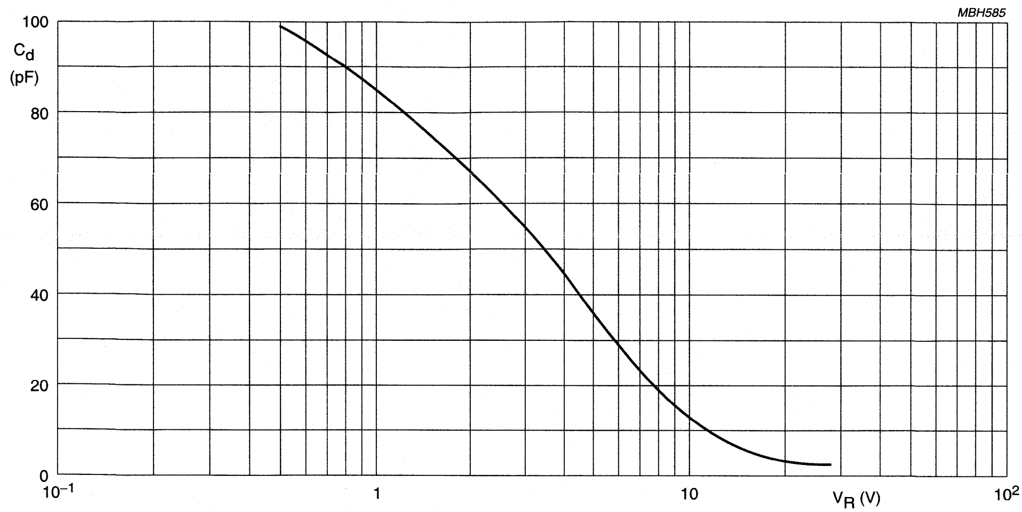
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	20	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	2.8	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	92	112	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.4	2.8	pF
$\frac{C_{d(0.5V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	35	43	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V; in a sequence of 8 diodes (gliding)	–	2	%

Note

1. V_R is the value at which C_d = 30 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

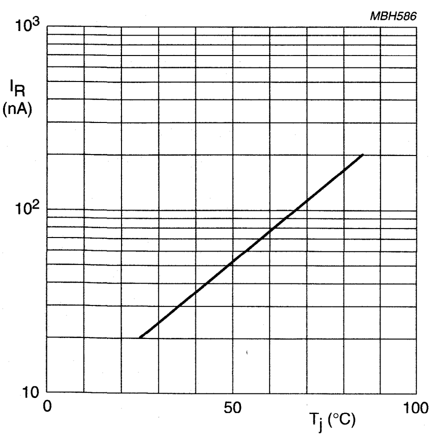
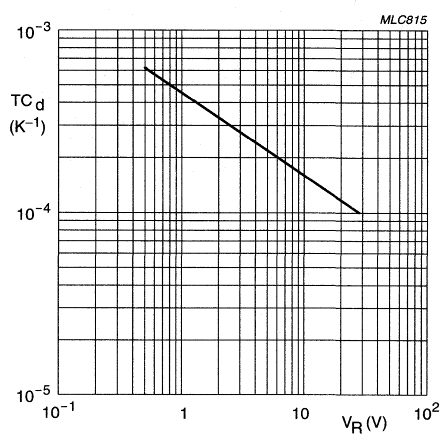


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode | BB148

FEATURES

- Excellent linearity
- Excellent matching to 1% DMA
- Very small plastic SMD package
- C28: 2.6 pF; ratio: 15
- Low series resistance.

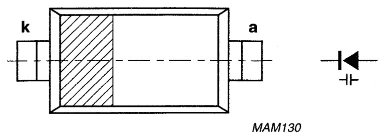
APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

DESCRIPTION

The BB148 is variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by gliding matching and a direct matching assembly procedure. The diodes are delivered on tape in several matched groups and are also available unmatched upon request. The unmatched type, BB158 has the same specification.



Marking code: P8.
Cathode side indicated by a yellow bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

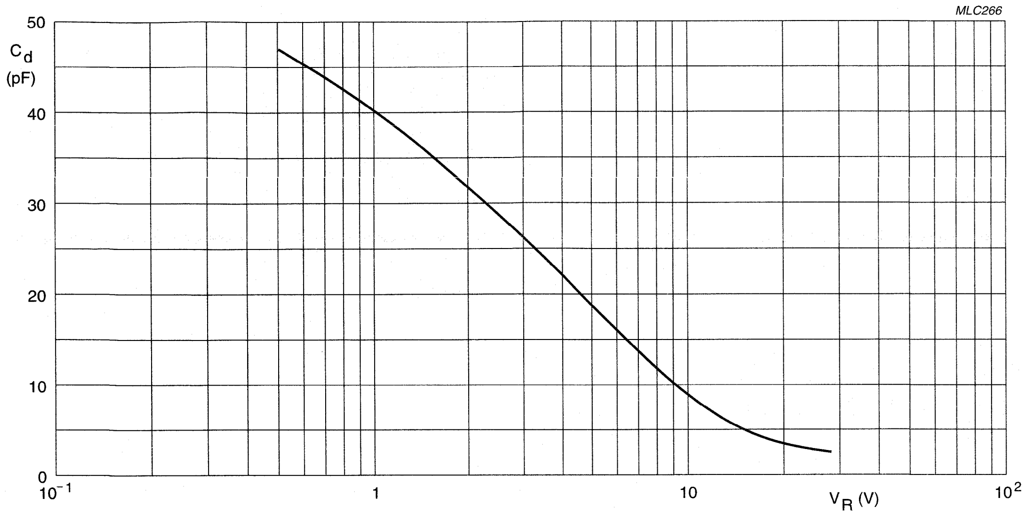
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	0.9	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	36.8	–	41.8	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.4	–	2.75	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	14.5	–	–	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V; in a sequence of 4 diodes (gliding)	–	–	1	%
		V_R = 0.5 to 28 V; in a sequence of 20 diodes (gliding)	–	–	2	%

Note

1. V_R is the value at which C_d = 12 pF.

VHF variable capacitance diode BB148

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

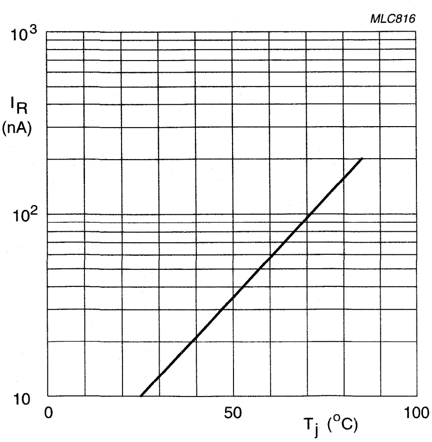
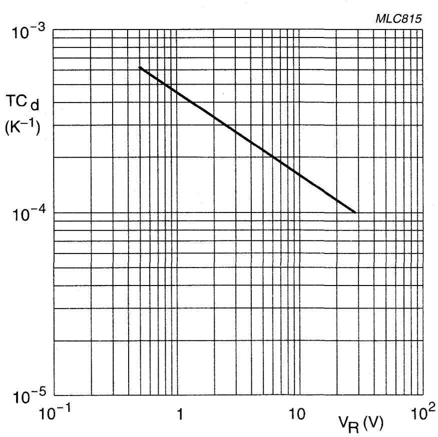


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode | BB149

FEATURES

- Excellent linearity
- Excellent matching to 1% DMA
- Very small plastic SMD package
- C28: 2.1 pF; ratio 9
- Low series resistance.

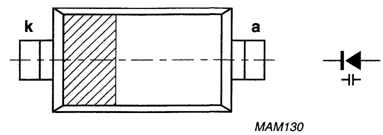
APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BB149 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The excellent matching performance is achieved by gliding matching and a direct matching assembly procedure. The unmatched type, BB159 has the same specification.



Marking code: P9.
Cathode side indicated by a white bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

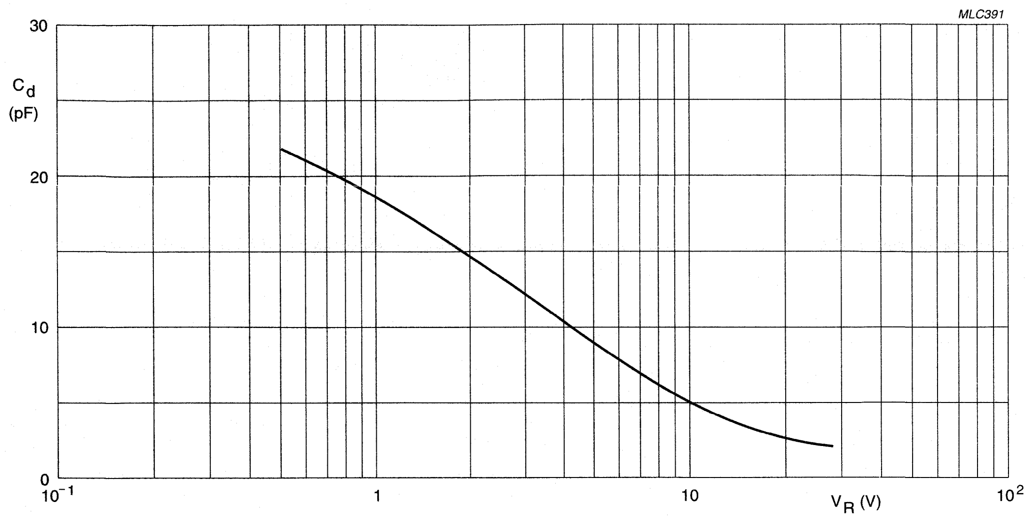
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	0.75	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	18	–	19.5	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.9	–	2.25	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	8.2	–	10	
$\frac{C_{d(19V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	1.2	–	–	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V; in a sequence of 4 diodes (gliding)	–	–	1	%
		V_R = 0.5 to 28 V; in a sequence of 15 diodes (gliding)	–	–	2	%

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

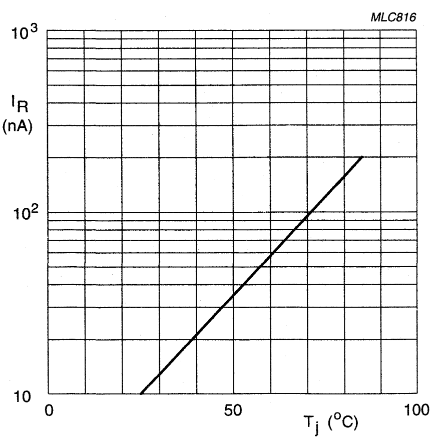
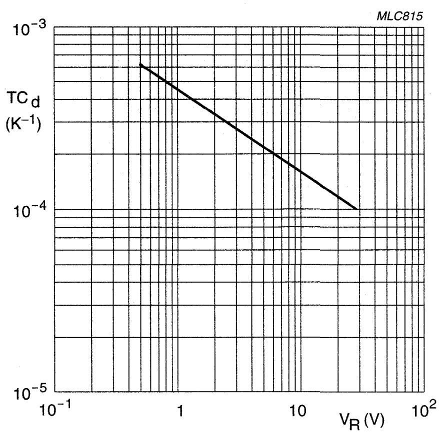


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode — BB150

FEATURES

- Excellent linearity
- Very small plastic SMD package
- C28: 2.5 pF; ratio: 16
- Low series resistance.

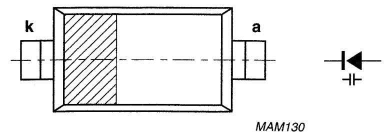
APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

DESCRIPTION

The BB150 is a double implanted variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small SMD package.

The matched type, BB133 has the same specification.



Marking code: P0.
Cathode side indicated by a yellow bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

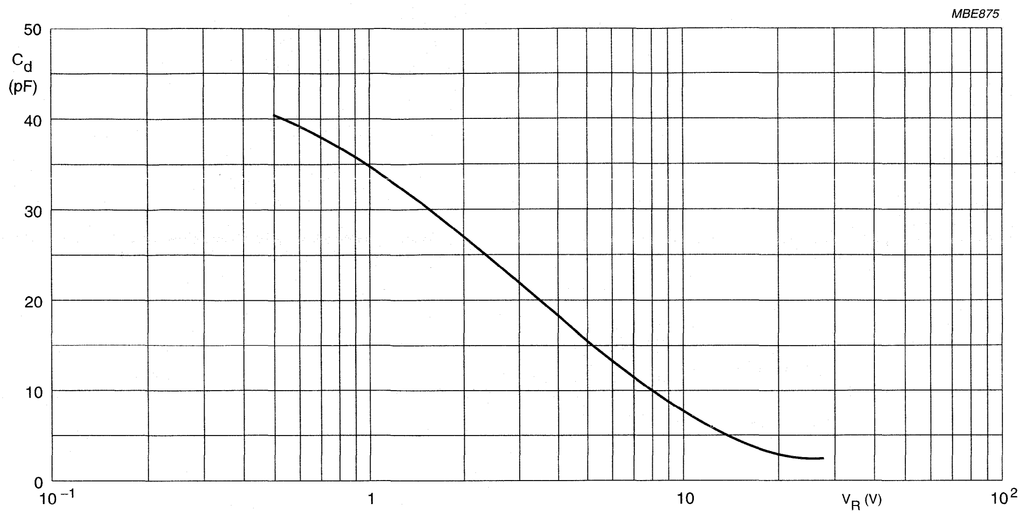
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	0.9	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	38	–	46	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.2	–	2.6	pF
$\frac{C_{d(0.5V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	14	–	21	

Note

1. V_R is the value at which C_d = 30 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

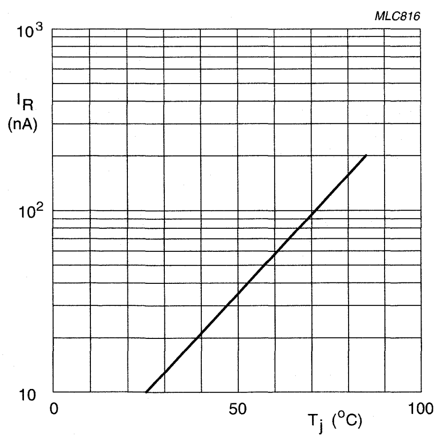
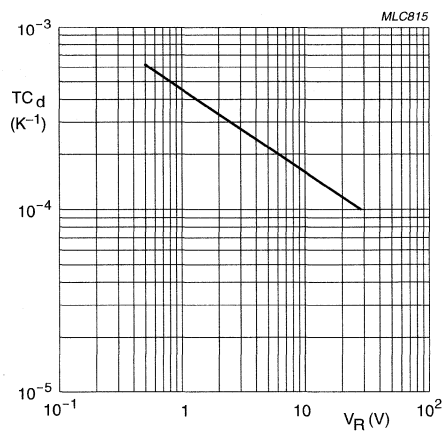


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

Low-voltage variable capacitance diode BB155

FEATURES

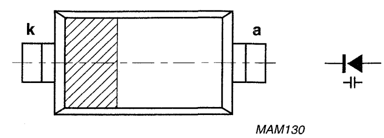
- Very low capacitance spread
- Excellent linearity
- Low series resistance
- Very small plastic SMD package.

APPLICATIONS

- Voltage controlled oscillators (VCO), especially in mobile communication equipment.

DESCRIPTION

The BB155 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.



Marking code: PE.
Cathode side indicated by a bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	10	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

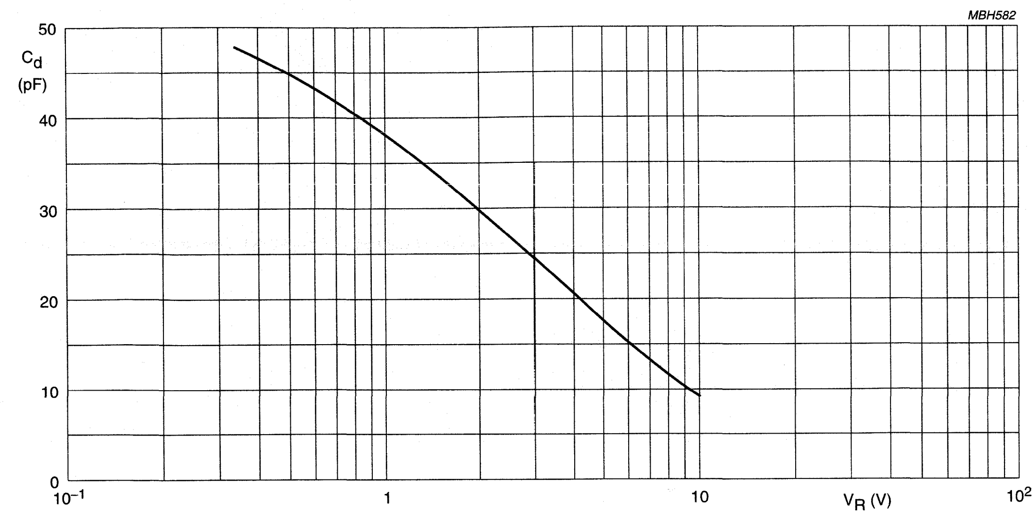
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 10 V; see Fig.3	–	–	10	nA
		V_R = 10 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	0.35	0.6	Ω
C_d	diode capacitance	V_R = 0.34 V; f = 1 MHz; see Figs 2 and 4	45.2	–	49.8	pF
		V_R = 2.82 V; f = 1 MHz; see Figs 2 and 4	24.55	–	26.7	pF

Note

1. V_R is the value at which C_d = 30 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

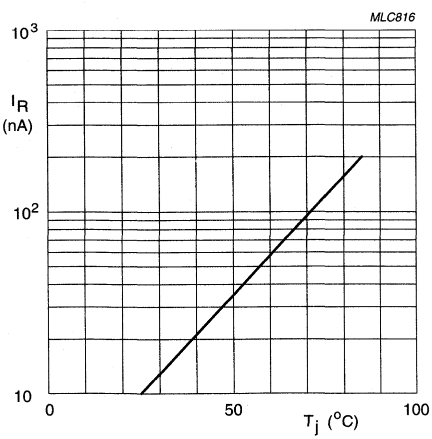
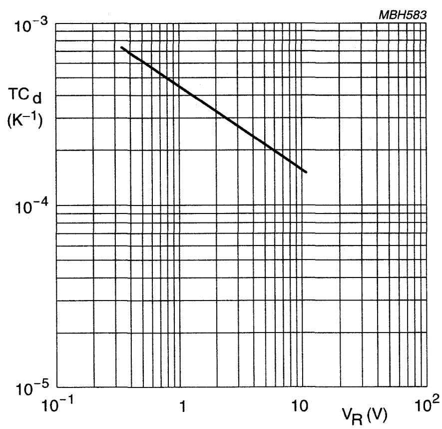


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode | BB158

FEATURES

- Excellent linearity
- Very small plastic SMD package
- C28: 2.6 pF; ratio: 15
- Low series resistance.

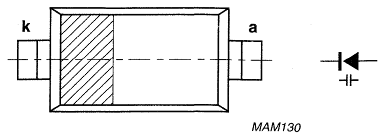
APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

DESCRIPTION

The BB158 is variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The matched type, BB148 has the same specification.



Marking code: PH.
Cathode side indicated by a bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

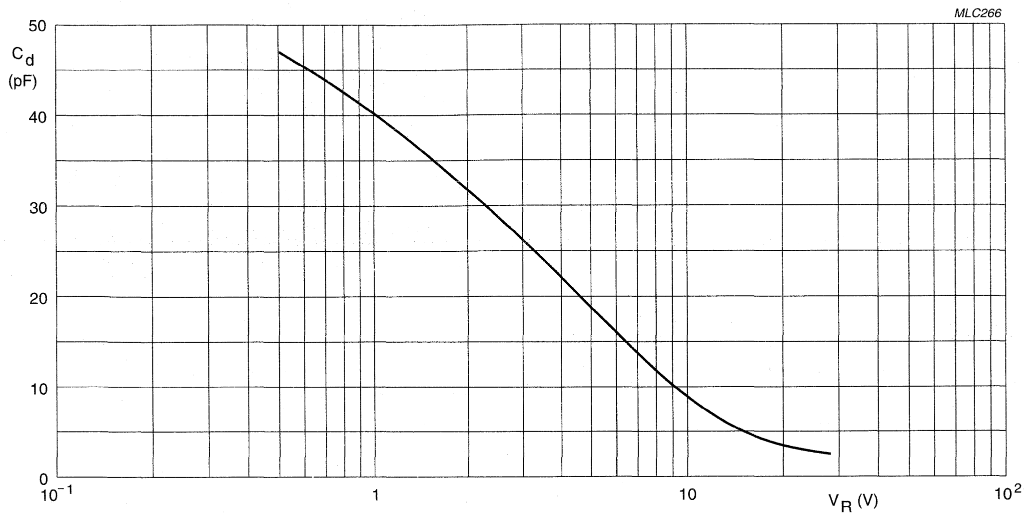
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note **1**	–	–	0.9	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	36.8	–	41.8	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.4	–	2.75	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	14.5	–	–	

Note

1. V_R is the value at which C_d = 12 pF.

VHF variable capacitance diode BB158

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

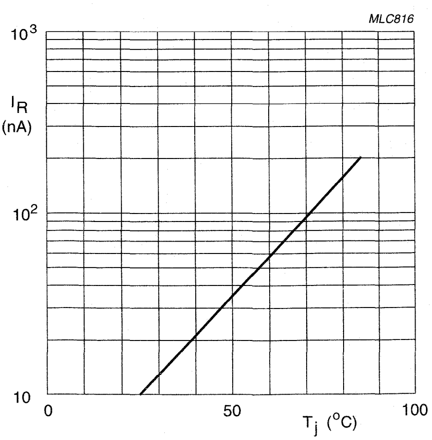
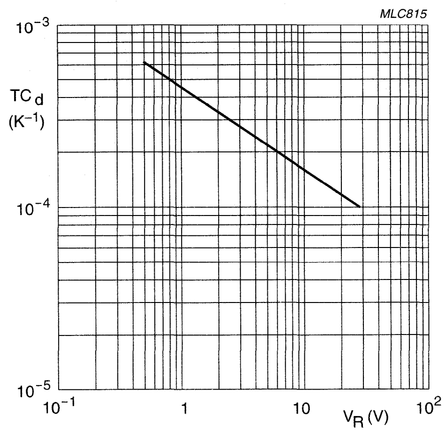


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode | BB159

FEATURES

- Excellent linearity
- Very small plastic SMD package
- C28: 2.1 pF; ratio 9
- Low series resistance.

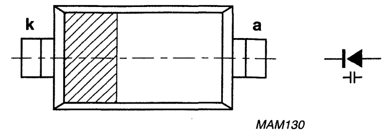
APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BB159 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The matched type, BB149 has the same specification.



Marking code: PJ.
Cathode side indicated by a bar.

Fig.1 Simplified outline (SOD323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

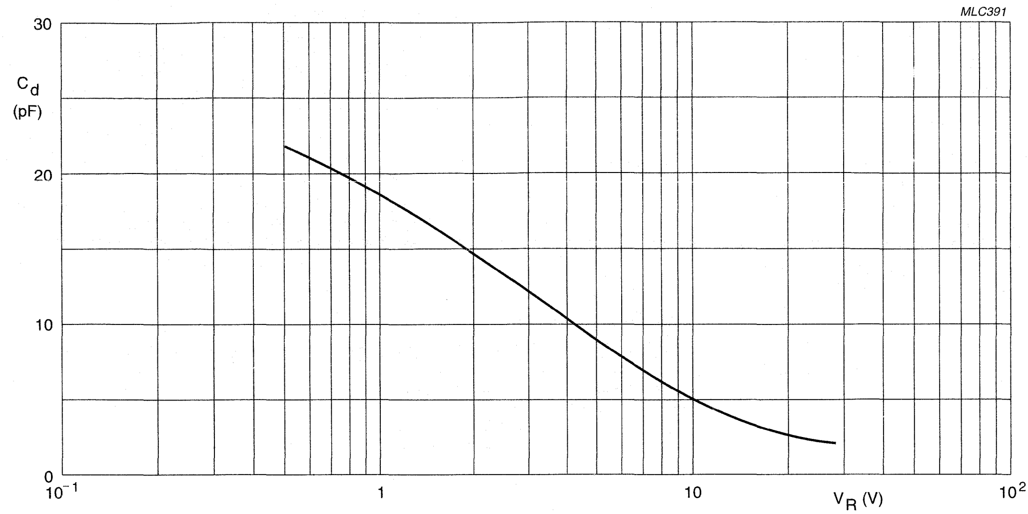
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	0.75	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	18	–	19.5	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.9	–	2.25	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	8.2	–	10	
$\frac{C_{d(19V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	1.2	–	–	

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

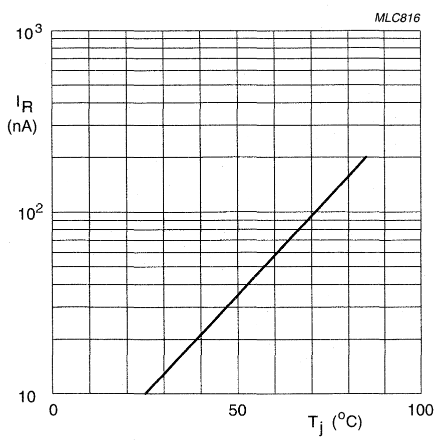
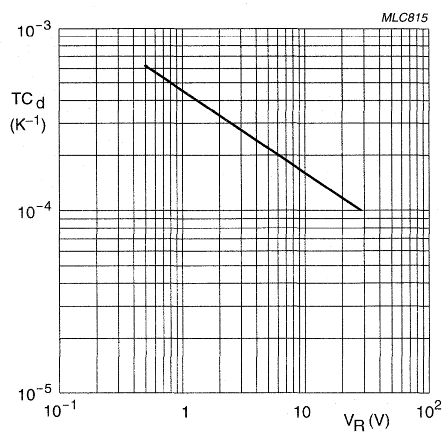


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode — BB215

FEATURES

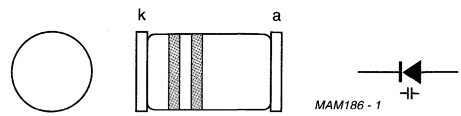
- Excellent linearity
- Matched to 3%
- Small hermetically sealed glass SMD package
- C28: 2 pF; ratio: 8.3
- Low series resistance.

APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BB215 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD80 glass SMD package.



Cathode side indicated by a white band.
Second green band for type identification.

Fig.1 Simplified outline (SOD80) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+100	°C

ELECTRICAL CHARACTERISTICS

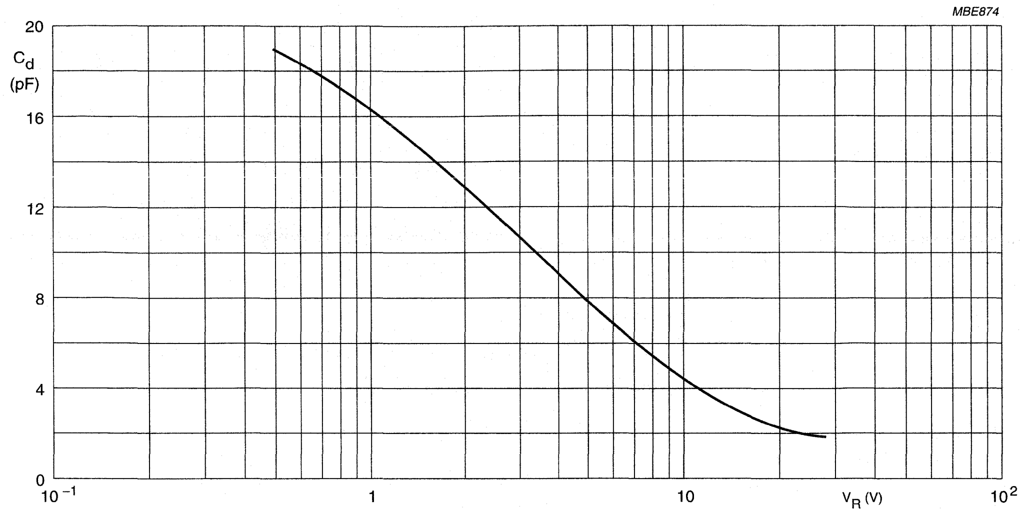
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	0.75	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	–	16.5	18	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.8	–	2.2	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	7.6	8.3	–	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V	–	–	3	%

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

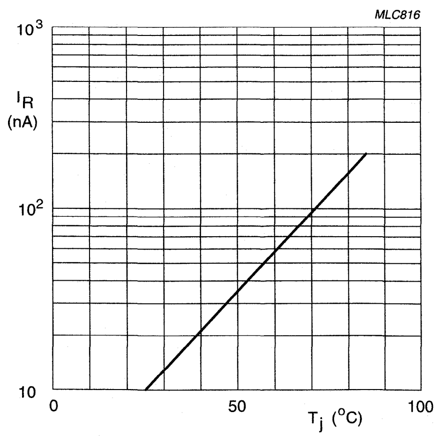
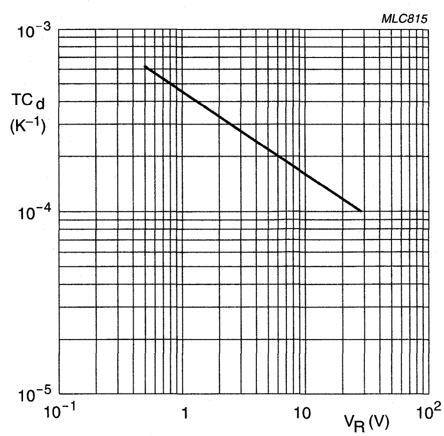


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode — BB405B

FEATURES

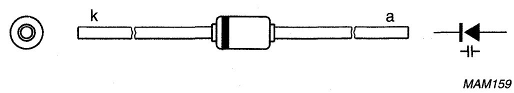
- Excellent linearity
- Matched to 3%
- Hermetically sealed leaded glass SOD68 (DO-34) package
- C28: 2 pF; ratio: 8.3
- Low series resistance.

APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BB405B is a variable capacitance diode, fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD68 (DO-34) package.



Cathode side indicated by a white band on a black body.

Fig.1 Simplified outline (SOD68; DO34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+100	°C

ELECTRICAL CHARACTERISTICS

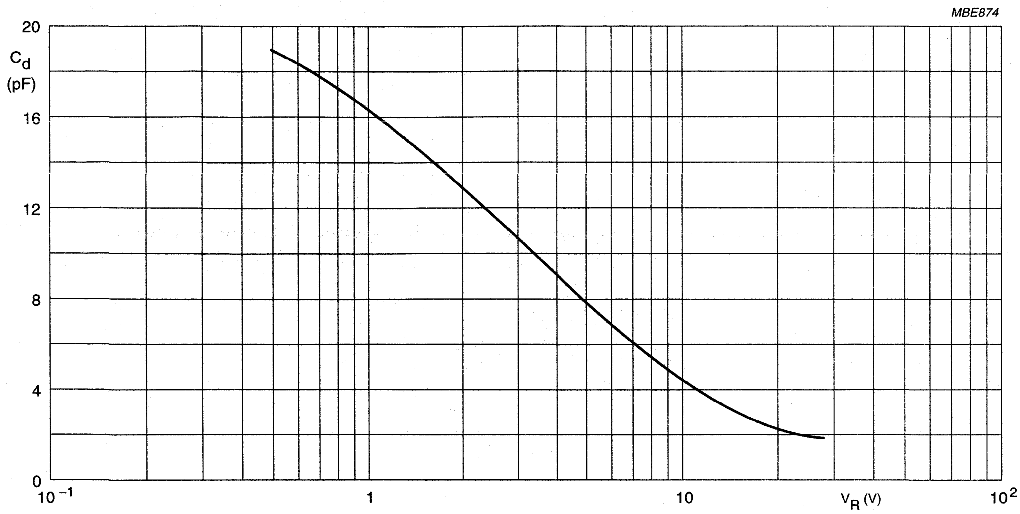
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	0.75	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	–	–	18	pF
		V_R = 3 V; f = 1 MHz; see Figs 2 and 4	–	11	–	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.8	–	2.2	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	7.6	–	–	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V	–	–	3	%

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

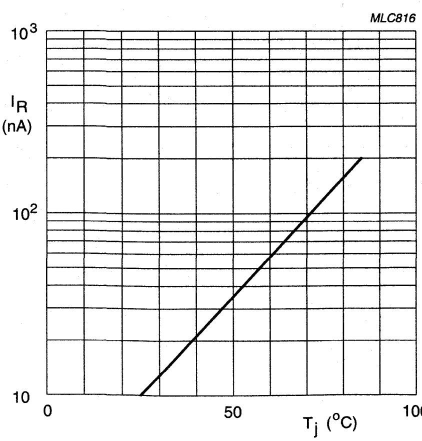
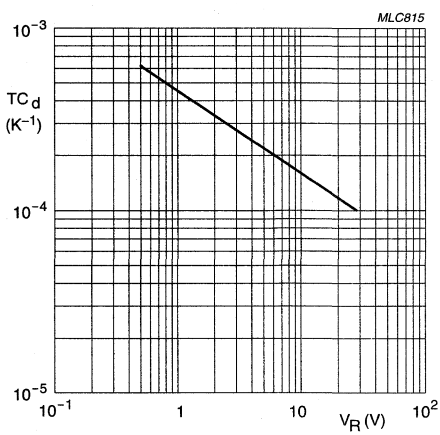


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode BB417

FEATURES

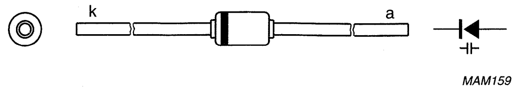
- Excellent linearity
- Hermetically sealed leaded glass SOD68 (DO-34) package
- C15: 3 pF; ratio: 3.5.

APPLICATIONS

- Automatic frequency control
- VCO.

DESCRIPTION

The BB417 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD68 (DO-34) package.



Cathode side indicated by a white band on a black body.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+100	°C

ELECTRICAL CHARACTERISTICS

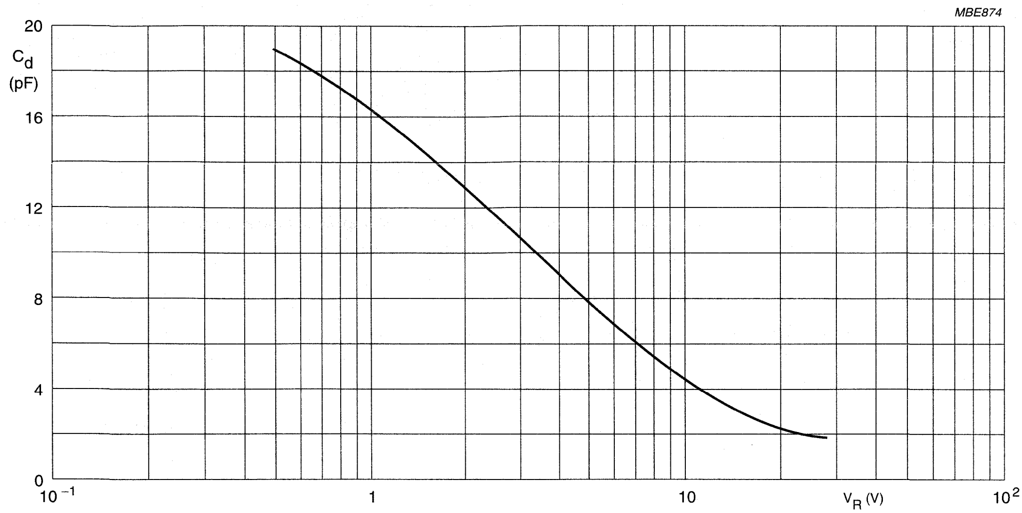
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	0.75	Ω
C_d	diode capacitance	V_R = 4 V; f = 1 MHz; see Figs 2 and 4	8	–	11	pF
		V_R = 15 V; f = 1 MHz; see Figs 2 and 4	2.2	–	4	pF
$\frac{C_{d(4V)}}{C_{d(15V)}}$	capacitance ratio	f = 1 MHz	2	–	5	

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

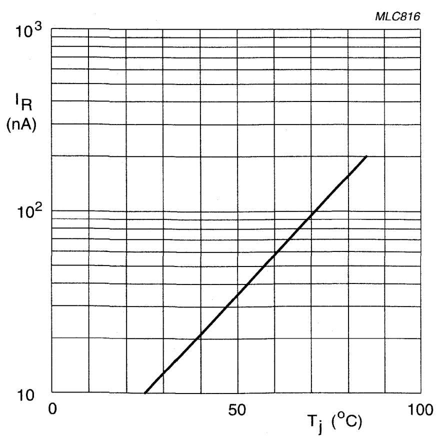
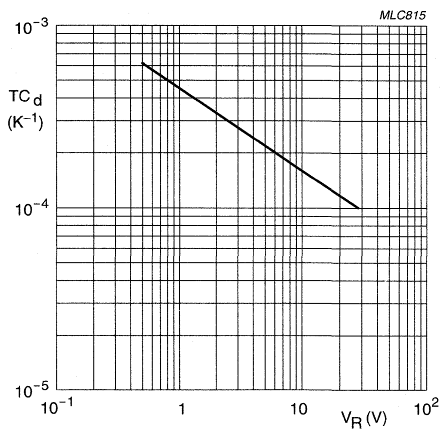


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance double diode — BB804

FEATURES

- Selected capacitance ranges
- Small plastic SMD package
- C8: 26 pF; ratio: 1.7
- Low series resistance.

APPLICATIONS

- Electronic tuning in FM radio applications.

DESCRIPTION

The BB804 is a variable capacitance double diode with a common cathode, fabricated in planar technology, and encapsulated in the SOT23 small plastic SMD package.

MARKING

TYPE NUMBER	CODE
BB804 R	SF 0
BB804 Y	SF 1
BB804 W	SF 2
BB804 G	SF 3

PINNING

PIN	DESCRIPTION
1	anode (a_1)
2	anode (a_2)
3	common cathode

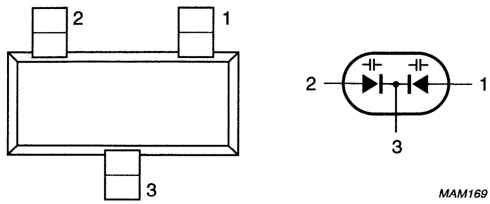


Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
Per diode				
V_R	continuous reverse voltage	–	18	V
I_F	continuous forward current	–	50	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per diode						
I_R	reverse current	V_R = 16 V; see Fig.3	–	–	20	nA
		V_R = 16 V; T_j = 60 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	0.2	–	Ω
C_d	diode capacitance	V_R = 2 V; f = 1 MHz; red 0; see Figs 2 and 4	42	–	43.5	pF
		V_R = 2 V; f = 1 MHz; yellow 1; see Figs 2 and 4	43	–	44.5	pF
		V_R = 2 V; f = 1 MHz; white 2; see Figs 2 and 4	44	–	45.5	pF
		V_R = 2 V; f = 1 MHz; green 3; see Figs 2 and 4	45	–	46.5	pF
$\frac{C_{d(2V)}}{C_{d(8V)}}$	capacitance ratio	f = 1 MHz	1.65	–	1.75	

Note

1. V_R is the value at which C_d = 38 pF.

GRAPHICAL DATA

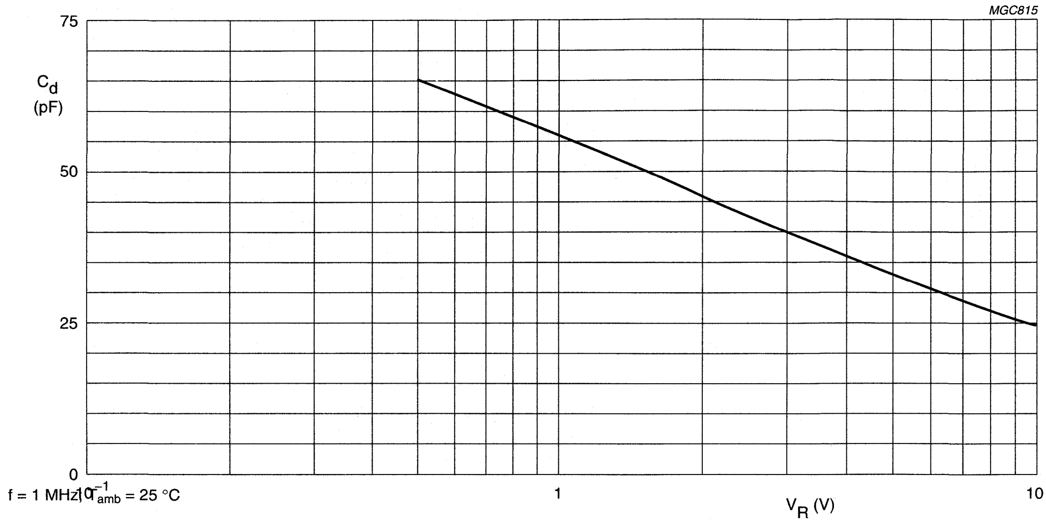


Fig.2 Diode capacitance as a function of reverse voltage; typical values.

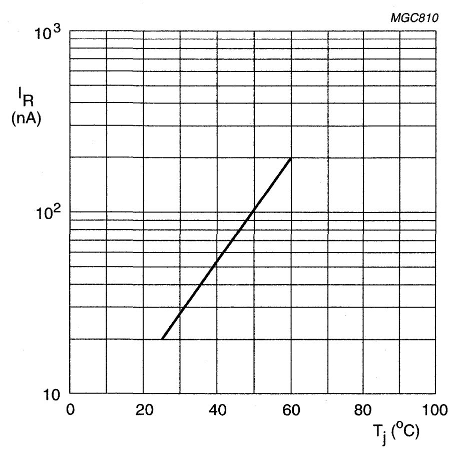


Fig.3 Reverse current as a function of junction temperature; maximum values.

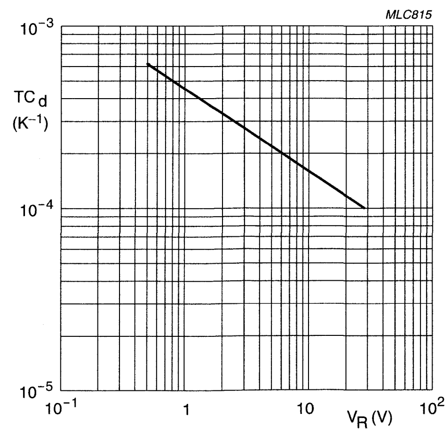


Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode — BB809

FEATURES

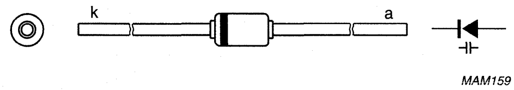
- High linearity
- Matched to 3%
- Hermetically sealed leaded glass SOD68 (DO-34) package
- C28: 4.7 pF; ratio: 9
- Low series resistance.

APPLICATIONS

- Electronic tuning in VHF television tuners, band A up to 160 MHz
- VCO.

DESCRIPTION

The BB809 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD68 (DO-34) package.



Cathode side indicated by a yellow band on a black body.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+100	°C

ELECTRICAL CHARACTERISTICS

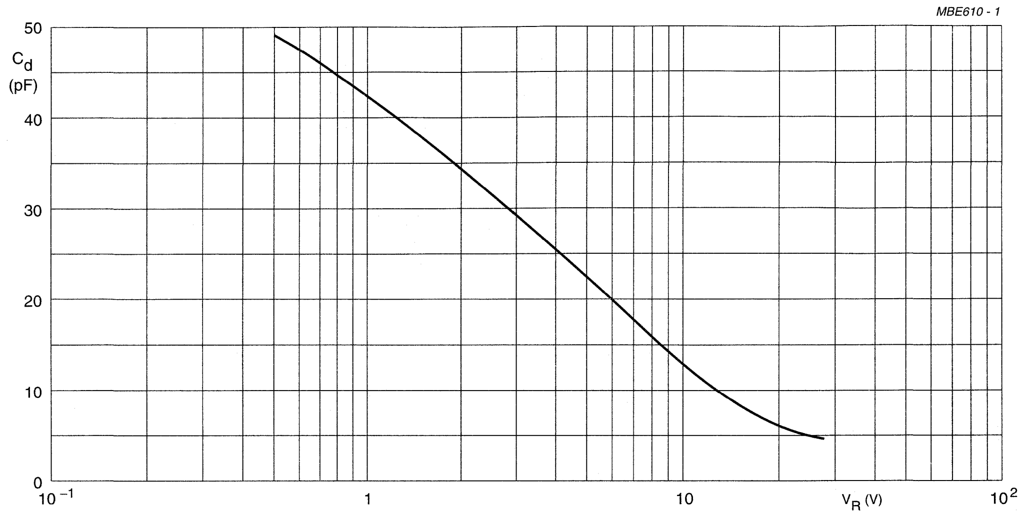
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 200 MHz; note 1	–	–	0.6	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	39	–	46	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	4	–	5	pF
$\frac{C_{d\,(1V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	8	–	10	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V	–	–	3	%

Note

1. V_R is the value at which C_d = 25 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

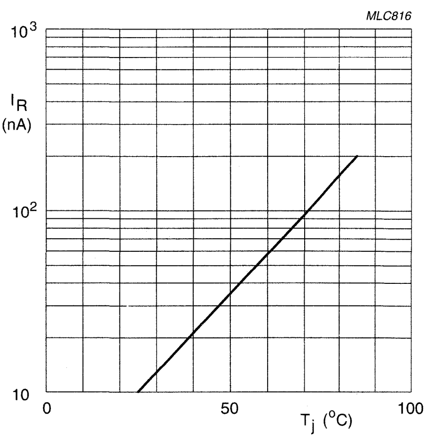
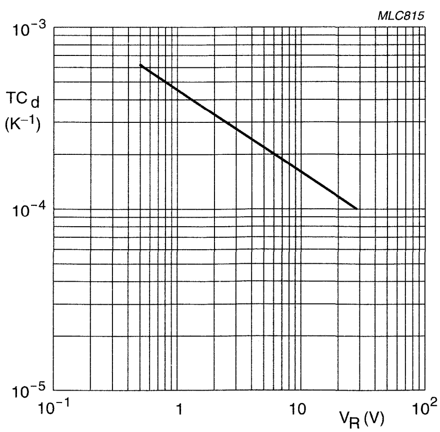


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode BB901

FEATURES

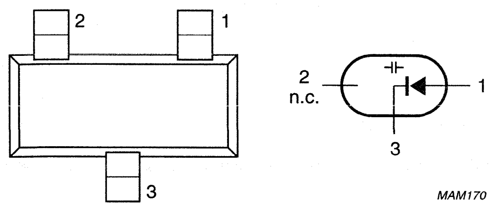
- Excellent linearity
- Small plastic SMD package
- C28: 1 pF; ratio: 13.5

APPLICATIONS

- Electronic tuning in satellite tuners
- Tunable coupling
- VCO.

DESCRIPTION

The BB901 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOT23 small plastic SMD package.



Marking code: S14.

Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	28	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

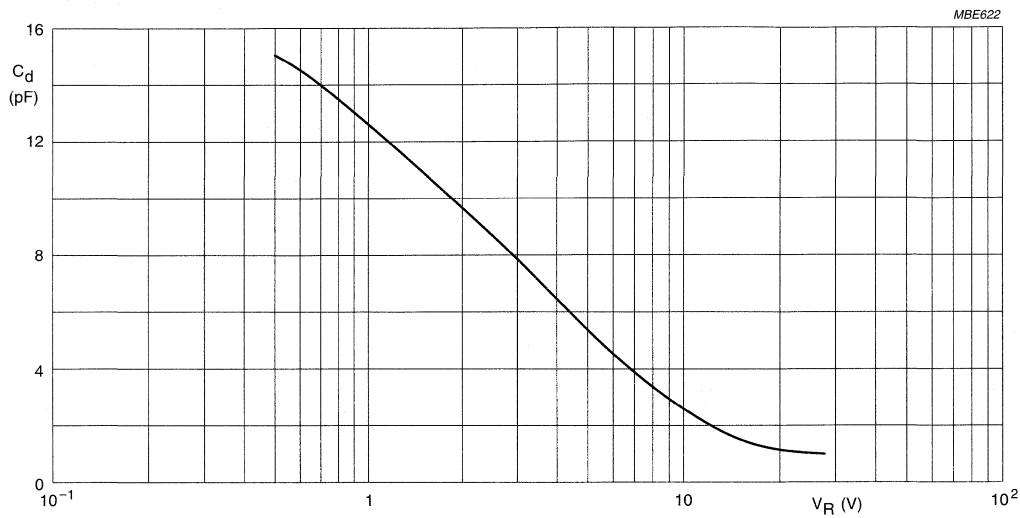
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	3	Ω
C_d	diode capacitance	V_R = 28 V; f = 1 MHz; see Figs 2 and 4	–	–	1.055	pF
$\frac{C_{d(0.5V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	12	–	–	

Note

1. V_R is the value at which C_d = 10 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

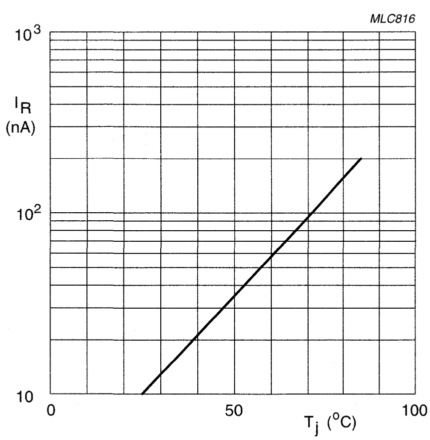
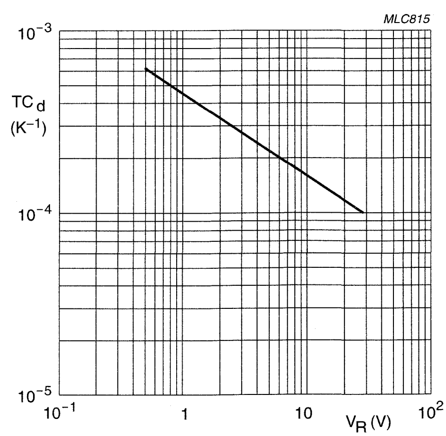


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diodes — BB909A; BB909B

FEATURES

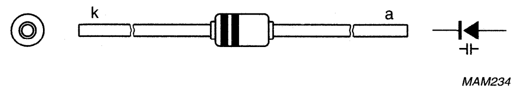
- Excellent linearity
- Matched to 2.5%
- Hermetically sealed leaded glass SOD68 (DO-34) package
- C28: 2.9 pF; ratio: 13.5
- Low series resistance.

APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

DESCRIPTION

The BB909A, BB909B are variable capacitance diodes, fabricated in planar technology, and encapsulated in hermetically sealed leaded glass SOD68 (DO-34) packages.



Cathode side indicated by a green band on a black body (BB909A and BB909B).
Additional red band (BB909A only).

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+100	°C

ELECTRICAL CHARACTERISTICS

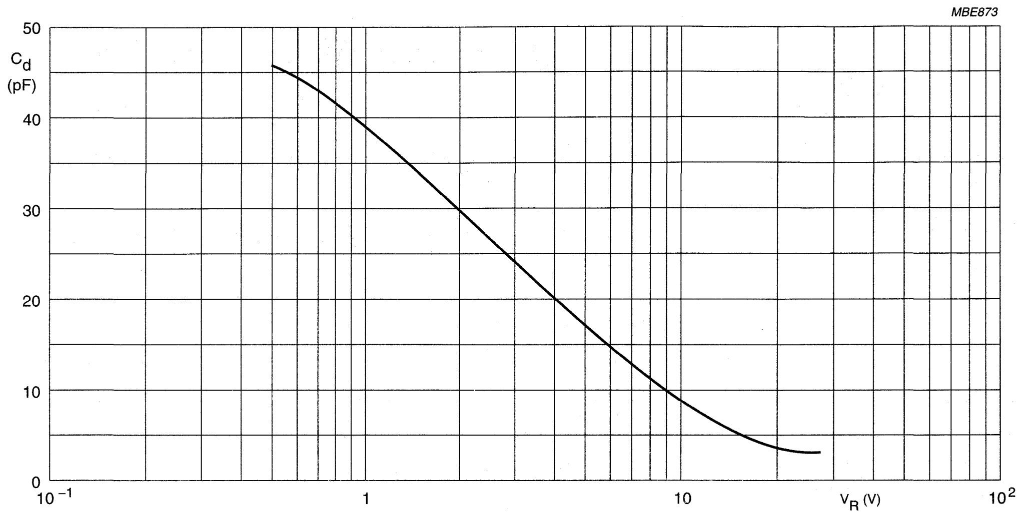
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	0.9	Ω
C_d	diode capacitance	see Figs 2 and 4				
	BB909A	V_R = 1 V; f = 1 MHz	31	–	–	pF
		V_R = 3 V; f = 1 MHz	–	23	–	pF
		V_R = 28 V; f = 1 MHz	2.6	–	3	pF
	BB909B	V_R = 1 V; f = 1 MHz	33.5	–	–	pF
		V_R = 3 V; f = 1 MHz	–	25	–	pF
		V_R = 28 V; f = 1 MHz	2.8	–	3.2	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	12	–	15	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 1 to 28 V	–	–	2.5	%

Note

1. V_R is the value at which C_d = 30 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

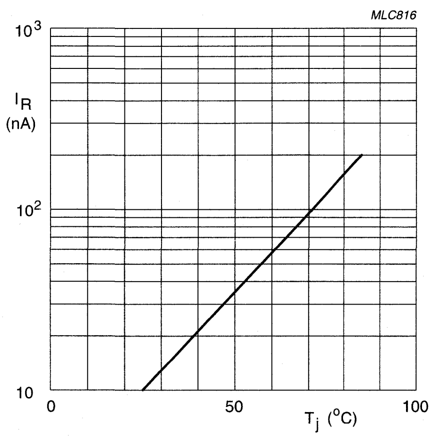
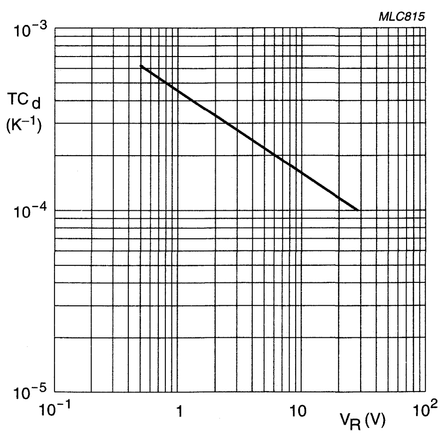


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode — BB910

FEATURES

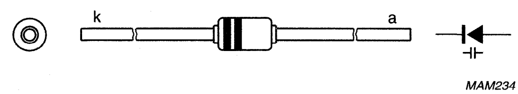
- Excellent linearity
- Matched to 2.5%
- Hermetically sealed leaded glass SOD68 (DO-34) package
- C28: 2.5; ratio: 16
- Low series resistance.

APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

DESCRIPTION

The BB910 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD68 (DO-34) package.



Cathode side indicated by a red band on a black body.
Additional green band.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+100	°C

ELECTRICAL CHARACTERISTICS

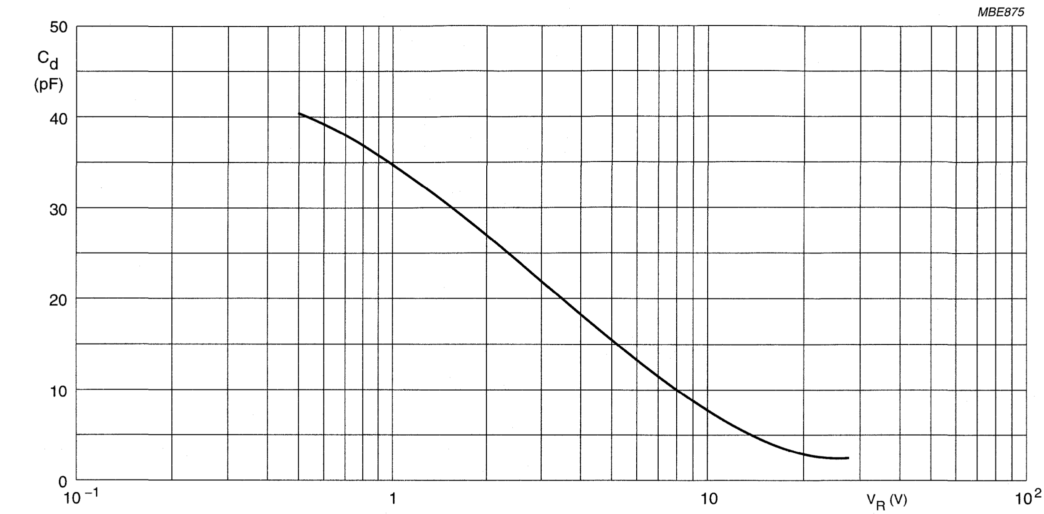
T_j= 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	1	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	38	–	–	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.3	–	2.7	pF
$\frac{C_{d\,(0.5V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	14	–	–	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V	–	–	2.5	%

Note

1. V_R is the value at which C_d = 40 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

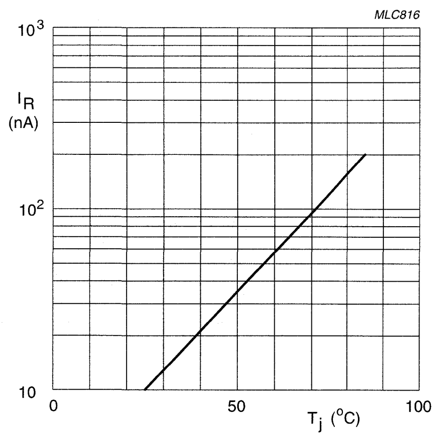
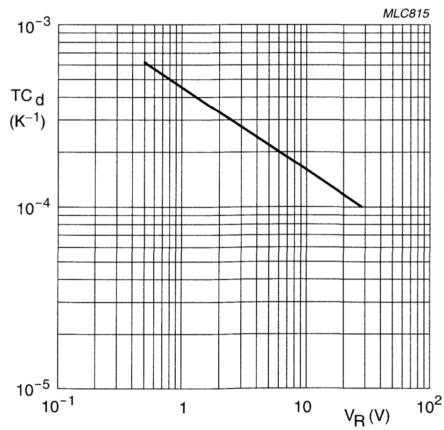


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode

BB911/A

FEATURES

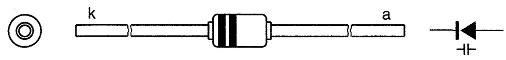
- High linearity
- Matched to 2.5%
- Hermetically sealed leaded glass SOD68 (DO-34) package
- C28: 2.7 pF; ratio: 25.

APPLICATIONS

- Electronic tuning in VHF television tuners, band A up to 160 MHz
- VCO.

DESCRIPTION

The BB911/A is a variable capacitance diode, fabricated in planar technology, and encapsulated in the hermetically sealed leaded glass SOD68 (DO-34) package.



MAM234

Cathode side indicated by a red band on a black body.
Additional white band.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+100	°C

ELECTRICAL CHARACTERISTICS

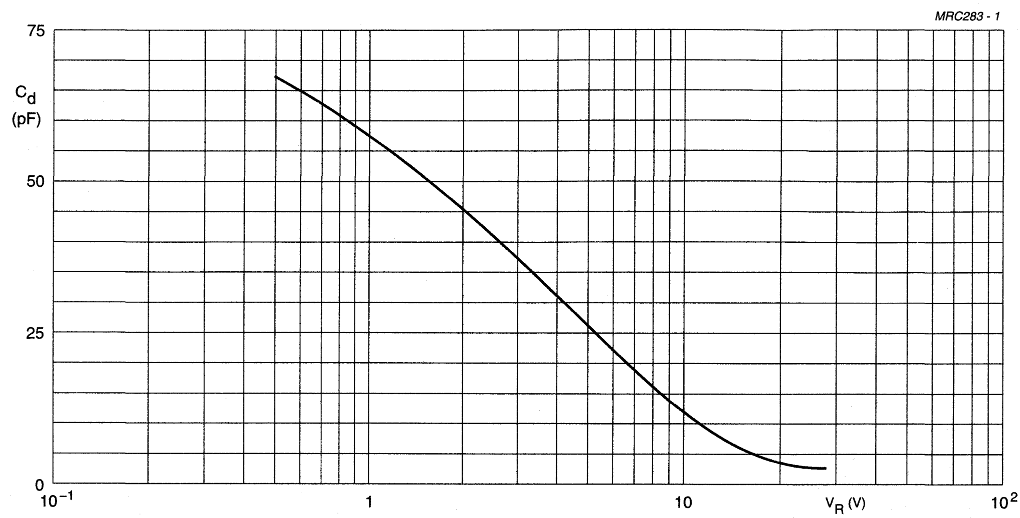
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 30 V; see Fig.3	–	–	10	nA
		V_R = 30 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 100 MHz; note 1	–	–	2	Ω
C_d	diode capacitance	V_R = 0.5 V; f = 1 MHz; see Figs 2 and 4	60	–	75	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.4	–	2.9	pF
$\frac{C_{d(0.5V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	23.3	–	28.4	
$\frac{\Delta C_d}{C_d}$	capacitance matching	V_R = 0.5 to 28 V	–	–	2.5	%

Note

1. V_R is the value at which C_d = 40 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

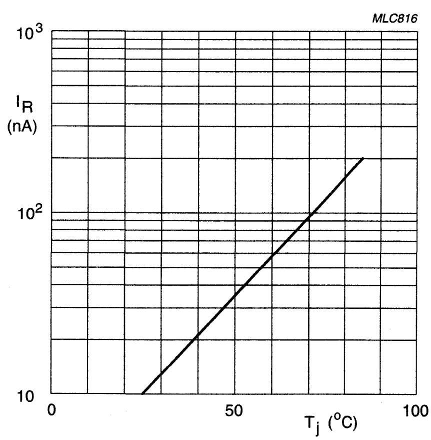
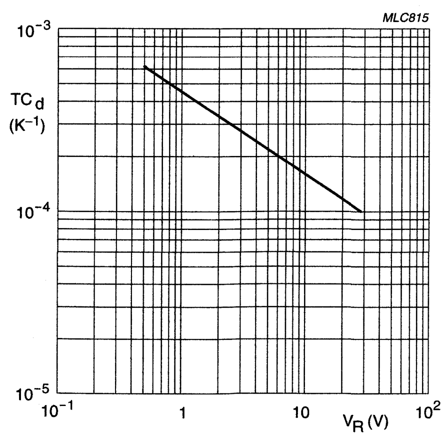


Fig.3 Reverse current as a function of junction temperature; maximum values.



T_j = 0 to 85 °C.

Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance diode | BBY31

FEATURES

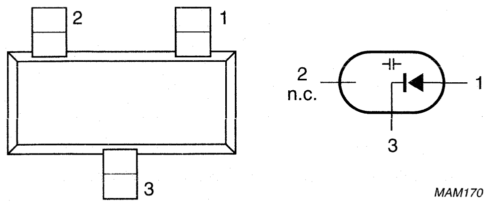
- Excellent linearity
- Small plastic SMD package
- C28: 1.9 pF; ratio: 8.3.

APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BBY31 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOT23 small plastic SMD package.



Marking code: S1.

Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

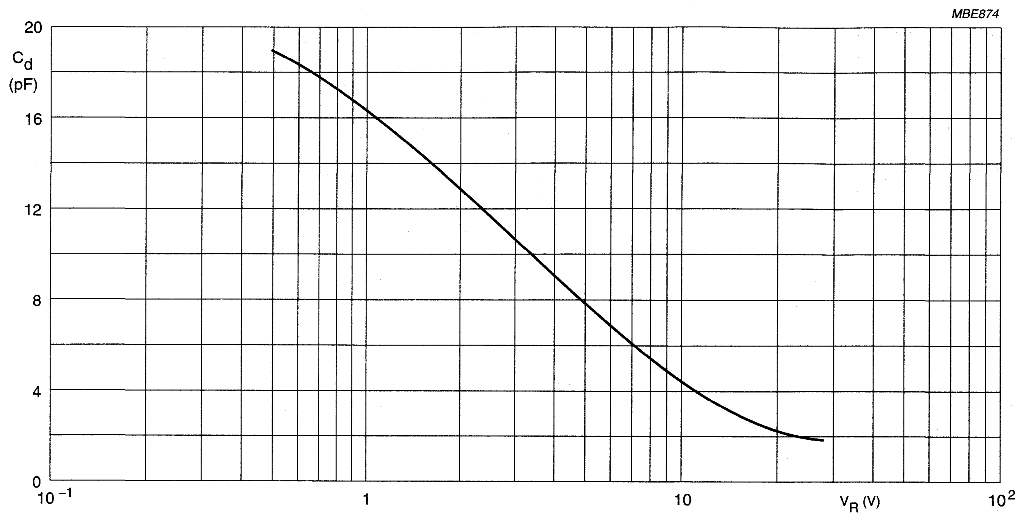
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	1.2	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	–	16.5	–	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.6	–	2	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	–	8.3	–	

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

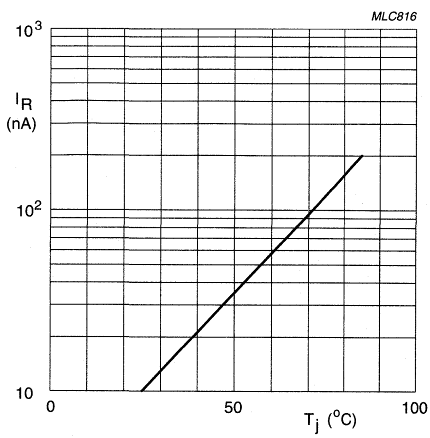


Fig.3 Reverse current as a function of junction temperature; maximum values.

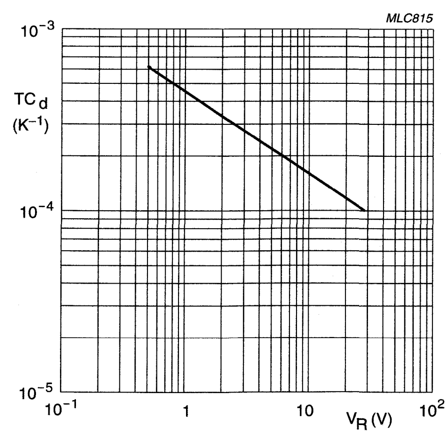


Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance double diode — BBY39

FEATURES

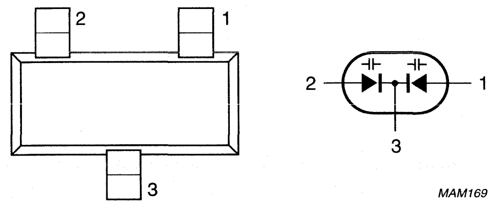
- Excellent linearity
- Small plastic SMD package
- C28: 1.9 pF; ratio: 8.3.

APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BBY39 is a variable capacitance double diode with a common cathode, fabricated in planar technology, and encapsulated in the SOT23 small plastic SMD package.



Marking code: S12.

Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

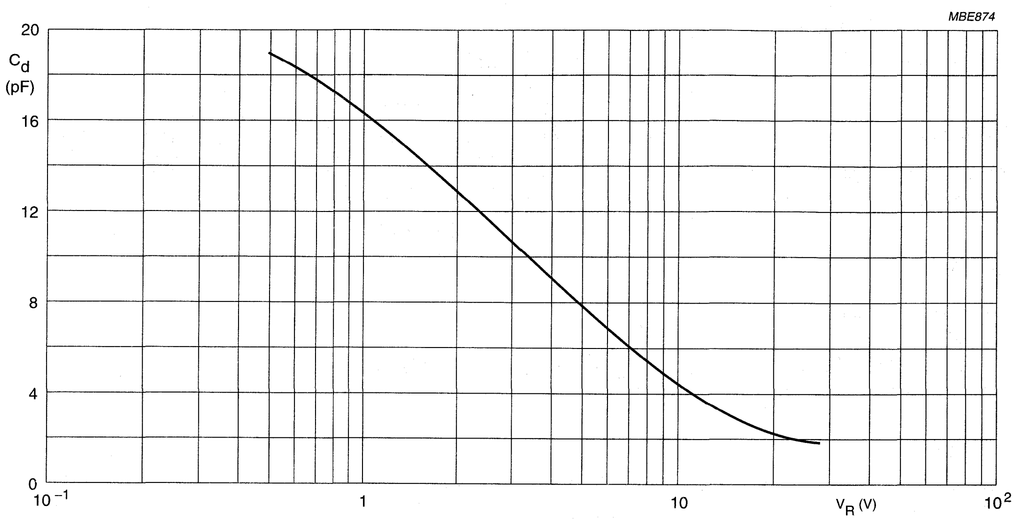
$T_j = 25$ °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	$V_R = 28$ V; see Fig.3	–	–	10	nA
		$V_R = 28$ V; $T_j = 85$ °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	1.2	Ω
C_d	diode capacitance	$V_R = 1$ V; f = 1 MHz; see Figs 2 and 4	–	16.5	–	pF
		$V_R = 28$ V; f = 1 MHz; see Figs 2 and 4	1.6	–	2	pF
$\frac{C_{d\,(1V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	8	–	–	

Note

1. V_R is the value at which $C_d = 9$ pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

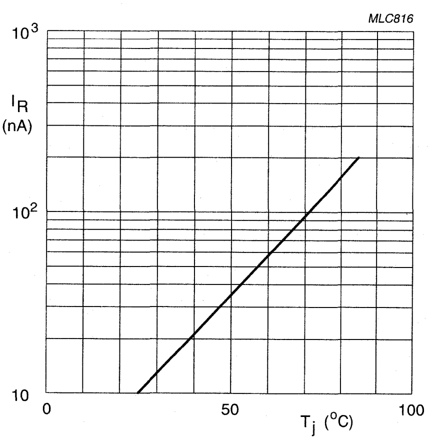


Fig.3 Reverse current as a function of junction temperature; maximum values.

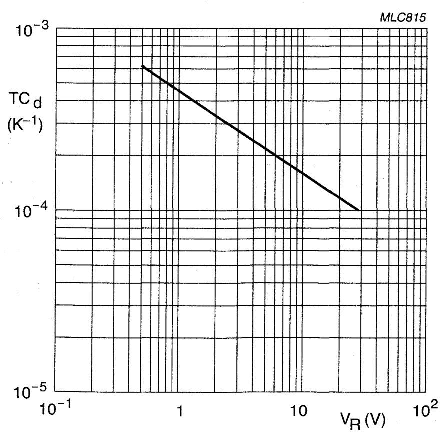


Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode BBY40

FEATURES

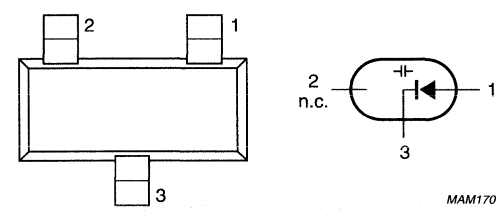
- Excellent linearity
- Small plastic SMD package
- C25: 4.6 pF; ratio: 5.5.

APPLICATIONS

- Electronic tuning in VHF television tuners, band A up to 160 MHz.

DESCRIPTION

The BBY40 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOT23 small plastic SMD package.



Marking code: S2.

Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

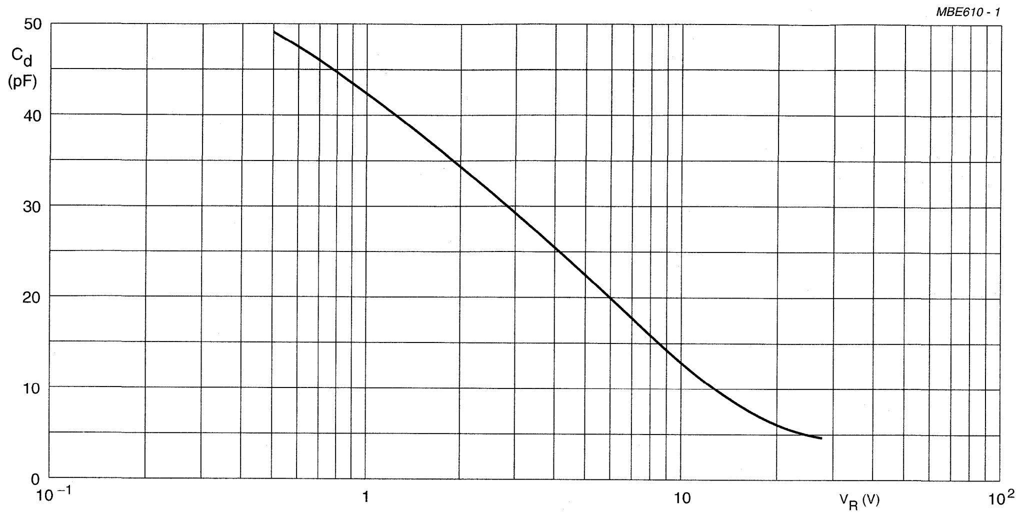
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 200 MHz; note 1	–	–	0.7	Ω
C_d	diode capacitance	V_R = 3 V; f = 1 MHz; see Figs 2 and 4	26	–	32	pF
		V_R = 25 V; f = 1 MHz; see Figs 2 and 4	4.3	–	6	pF
$\frac{C_{d\,(3V)}}{C_{d\,(25V)}}$	capacitance ratio	f = 1 MHz	5	–	6.5	

Note

1. V_R is the value at which C_d = 25 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

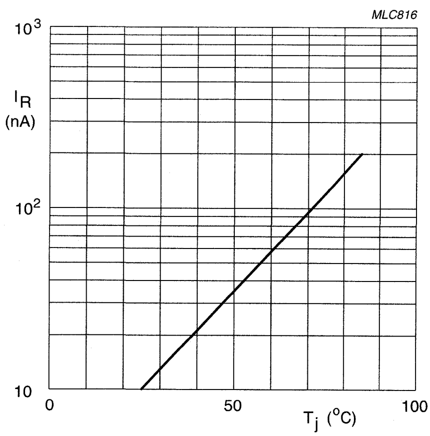


Fig.3 Reverse current as a function of junction temperature; maximum values.

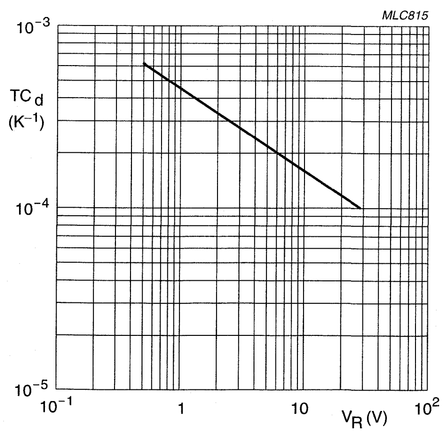


Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

VHF variable capacitance diode BBY42

FEATURES

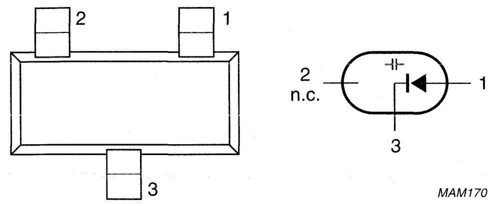
- Excellent linearity
- Small plastic SMD package
- C28: 2.7 pF; ratio: 14.

APPLICATIONS

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- VCO.

DESCRIPTION

The BBY42 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOT23 small plastic SMD package.



Marking code: S13.

Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

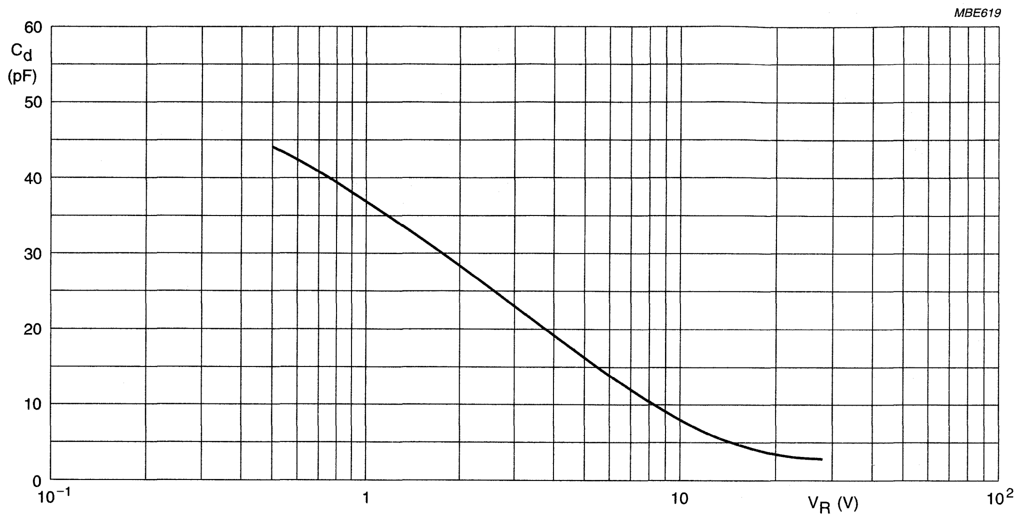
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f =100 MHz; note 1	–	–	1	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	31	–	–	pF
		V_R = 3 V; f = 1 MHz; see Figs 2 and 4	–	24	–	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	2.4	–	3	pF
$\frac{C_{d\,(1V)}}{C_{d\,(28V)}}$	capacitance ratio	f = 1 MHz	12	–	16	

Note

1. V_R is the value at which C_d = 30 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

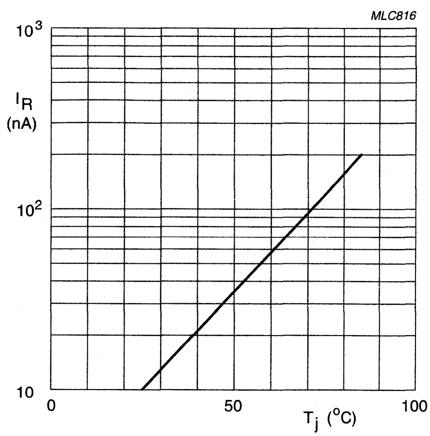


Fig.3 Reverse current as a function of junction temperature; maximum values.

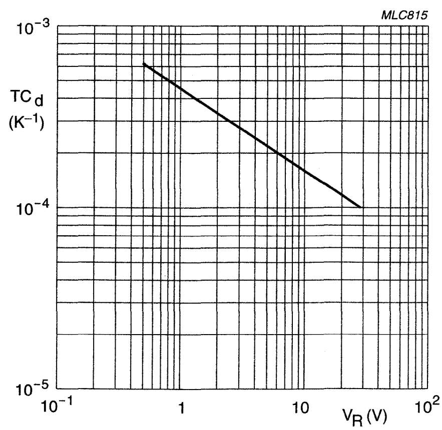


Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

UHF variable capacitance double diode — BBY62

FEATURES

- Excellent linearity
- Small plastic SMD package
- C28:1.9 pF; ratio: 8.3.

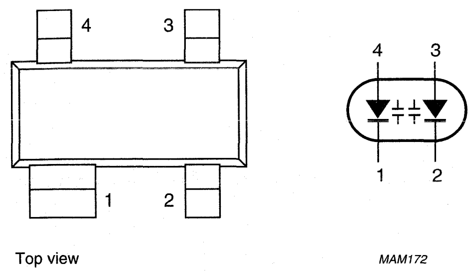
APPLICATIONS

- Electronic tuning in UHF television tuners
- VCO.

DESCRIPTION

The BBY62 is a variable capacitance double diode, fabricated in planar technology, and encapsulated in the SOT143 small plastic SMD package.

The diodes are not electrically connected to one another.



Marking code: S4.

Fig.1 Simplified outline (SOT143), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_R	continuous reverse voltage	–	30	V
I_F	continuous forward current	–	20	mA
T_{stg}	storage temperature	–55	+150	°C
T_j	operating junction temperature	–55	+125	°C

ELECTRICAL CHARACTERISTICS

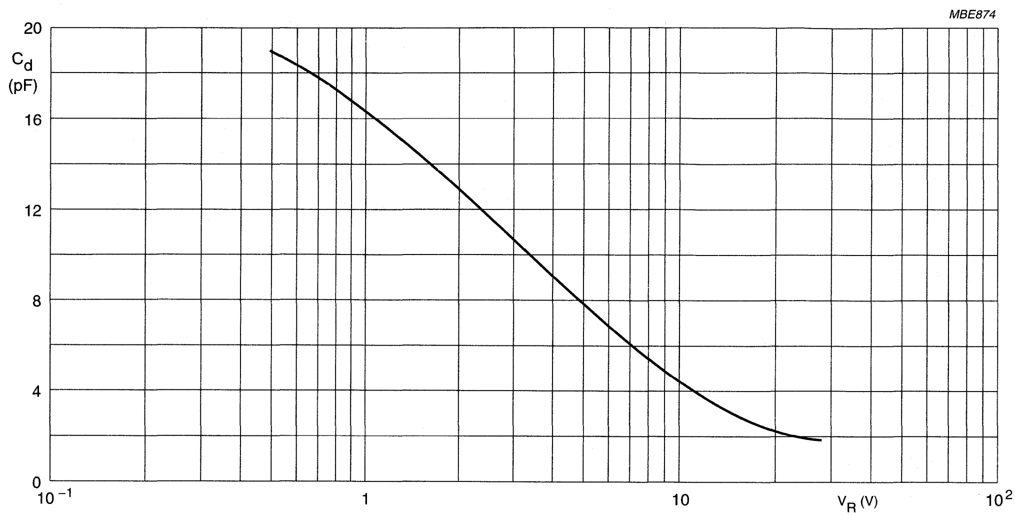
T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 28 V; see Fig.3	–	–	10	nA
		V_R = 28 V; T_j = 85 °C; see Fig.3	–	–	200	nA
r_s	diode series resistance	f = 470 MHz; note 1	–	–	1.2	Ω
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; see Figs 2 and 4	–	16.5	–	pF
		V_R = 28 V; f = 1 MHz; see Figs 2 and 4	1.6	–	2	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	f = 1 MHz	–	8.3	–	

Note

1. V_R is the value at which C_d = 9 pF.

GRAPHICAL DATA



f = 1 MHz; T_j = 25 °C.

Fig.2 Diode capacitance as a function of reverse voltage; typical values.

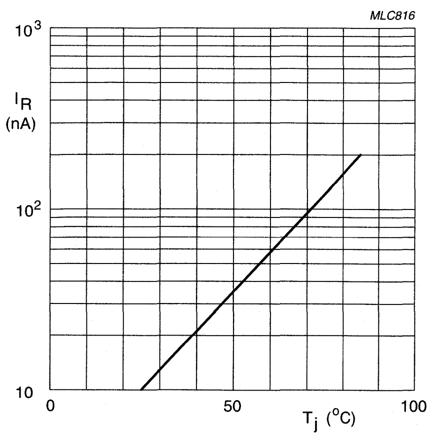


Fig.3 Reverse current as a function of junction temperature; maximum values.

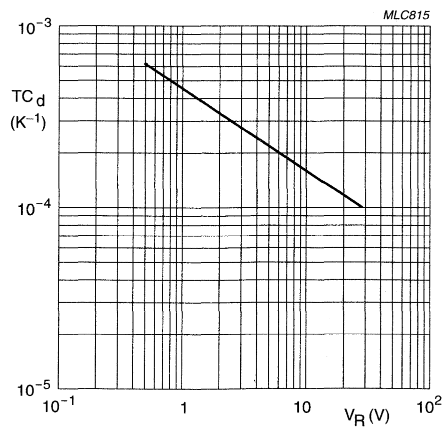


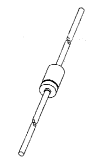
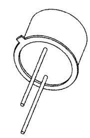
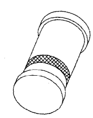
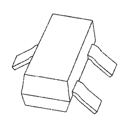
Fig.4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.

SECTION 5

LOW-LEAKAGE CURRENT DIODES

Low-leakage current diodes

LOW-LEAKAGE CURRENT DIODES

TYPE NUMBER	RATINGS				CHARACTERISTICS						DOUBLE DIODE	PACKAGE (not to scale)
	V_R max.	I_F max.	I_{FRM} max.	I_{FSM} max.	V_F max.	@ I_F	I_R max.	@ V_R	C_d max.	t_{rr} max.		
	(V)	(mA)	(mA)	(A)	(V)	(mA)	(nA)	(V)	(pF)	(ns)		
LEADED TYPES												
BAS45A	125	250	625	4	1.0	100	1	125	4	1.5(4)	no	 SOD68 (DO34)
BAV45	20	50	100	–	1.0	10	0.01	20	1.3	600	no	 SOT18/15
SURFACE-MOUNT TYPES												
BAS45AL	125	250	625	4	1.0	100	1	125	4	1.5(4)	no	 SOD80C
BAS116 BAV170 BAV199 BAW156	75 75 75 75	215 215 160 160	500 500 500 500	4 4 4 4	1.0 1.0 1.0 1.0	10 10 10 10	5 5 5 5	75 75 75 75	2(4) 2(4) 2(4) 3(4)	3000 3000 3000 3000	no yes(2) yes(3) yes(1)	 SOT23

Notes

1. Common anode.
2. Common cathode.
3. Series connected.
4. Typical value.

Low-leakage diode — BAS45A

FEATURES

- Continuous reverse voltage: max. 125 V
- Repetitive peak forward current: max. 625 mA
- Low reverse current: max. 1 nA
- Switching time: typ. 1.5 μs.

APPLICATION

- Low leakage current applications.

DESCRIPTION

Epitaxial medium-speed switching diode with a low leakage current in a hermetically-sealed glass SOD68 (DO-34) package.

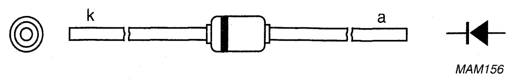


Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	125	V
V_R	continuous reverse voltage		–	125	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t_p = 1 μs	–	4	A
		t_p = 1 ms	–	1	A
		t_p = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	300	mW
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		–	175	°C

Note

1. Device mounted on a printed-circuit board without metallization pad.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	780	mV
		I_F = 10 mA	–	860	mV
		I_F = 100 mA	–	1000	mV
I_R	reverse current	see Fig.5			
		V_R = 125 V; E_{max} = 100 lx	–	1	nA
		V_R = 30 V; T_j = 125 °C; E_{max} = 100 lx	–	300	nA
		V_R = 125 V; T_j = 125 °C; E_{max} = 100 lx	–	500	nA
		V_R = 125 V; T_j = 150 °C; E_{max} = 100 lx	–	2	µA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	4	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	1.5	–	µs

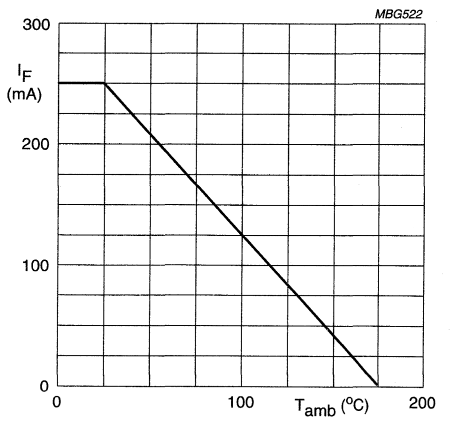
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	8 mm from the body	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm; note 1	500	K/W

Note

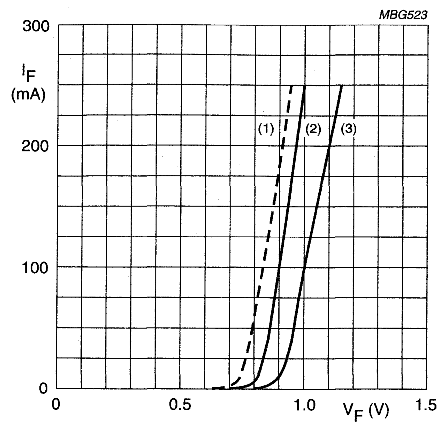
1. Device mounted on a printed-circuit board without metallization pad.

GRAPHICAL DATA



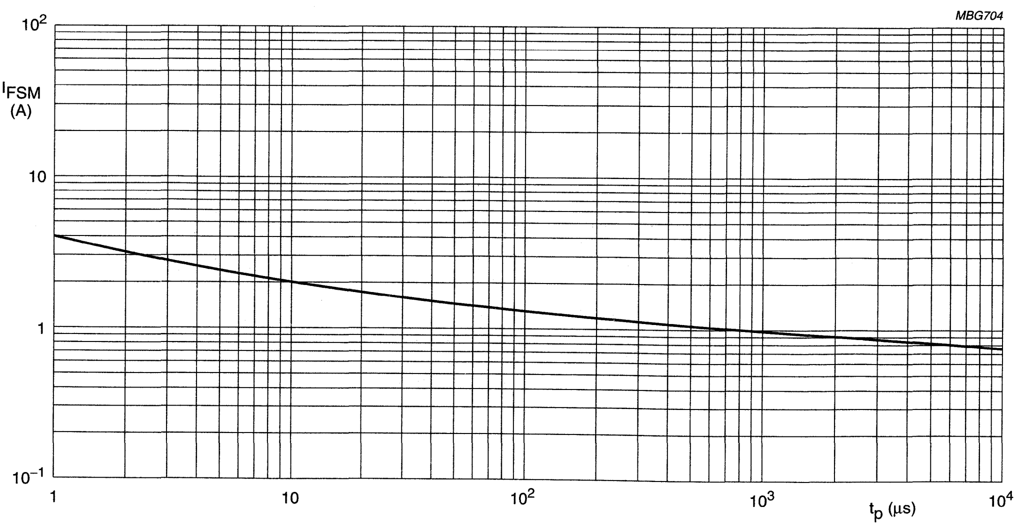
Device mounted on a printed-circuit board without metallization pad.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



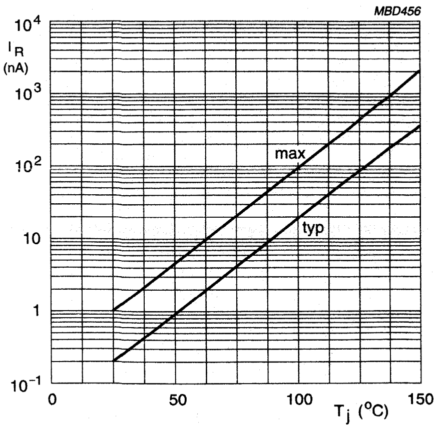
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



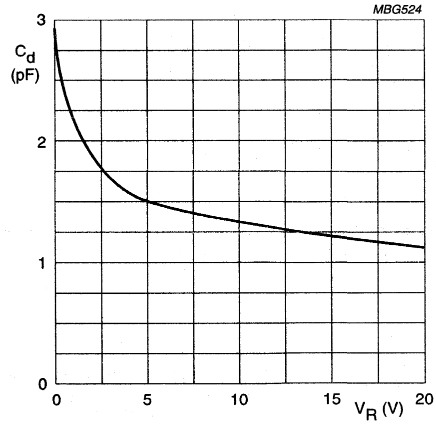
Based on square wave currents; T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



V_R = 125 V.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.

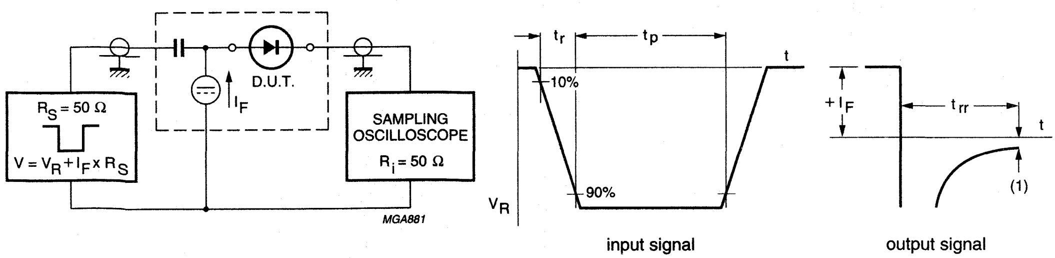


Fig.7 Reverse recovery time test circuit and waveforms.

Low-leakage diode

BAS45AL

FEATURES

- Continuous reverse voltage: max. 125 V
- Repetitive peak forward current: max. 625 mA
- Low reverse current: max. 1 nA
- Switching time: typ. 1.5 μs.

APPLICATION

- Low leakage current applications.

DESCRIPTION

Epitaxial medium-speed switching diode with a low leakage current in a small glass SOD80C SMD package.

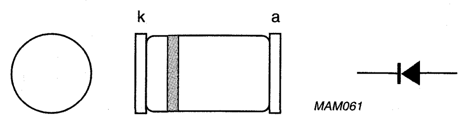


Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	125	V
V_R	continuous reverse voltage		–	125	V
I_F	continuous forward current	see Fig.2; note 1	–	250	mA
I_{FRM}	repetitive peak forward current		–	625	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t_p = 1 μs	–	4	A
		t_p = 1 ms	–	1	A
		t_p = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	400	mW
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–	175	°C

Note

1. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	780	mV
		I_F = 10 mA	–	860	mV
		I_F = 100 mA	–	1000	mV
I_R	reverse current	see Fig.5			
		V_R = 125 V; E_{max} = 100 lx	–	1	nA
		V_R = 30 V; T_j = 125 °C; E_{max} = 100 lx	–	300	nA
		V_R = 125 V; T_j = 125 °C; E_{max} = 100 lx	–	500	nA
		V_R = 125 V; T_j = 150 °C; E_{max} = 100 lx	–	2	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	–	4	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	1.5	–	μs

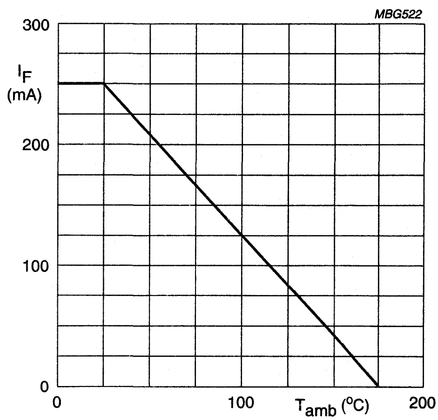
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	375	K/W

Note

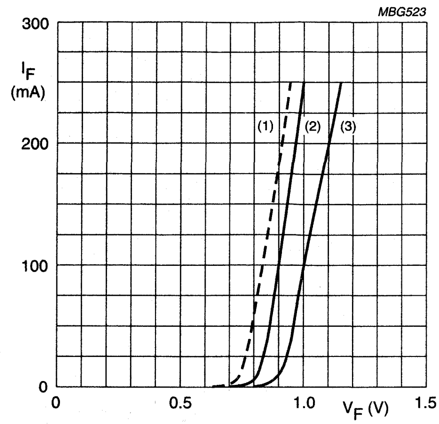
1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



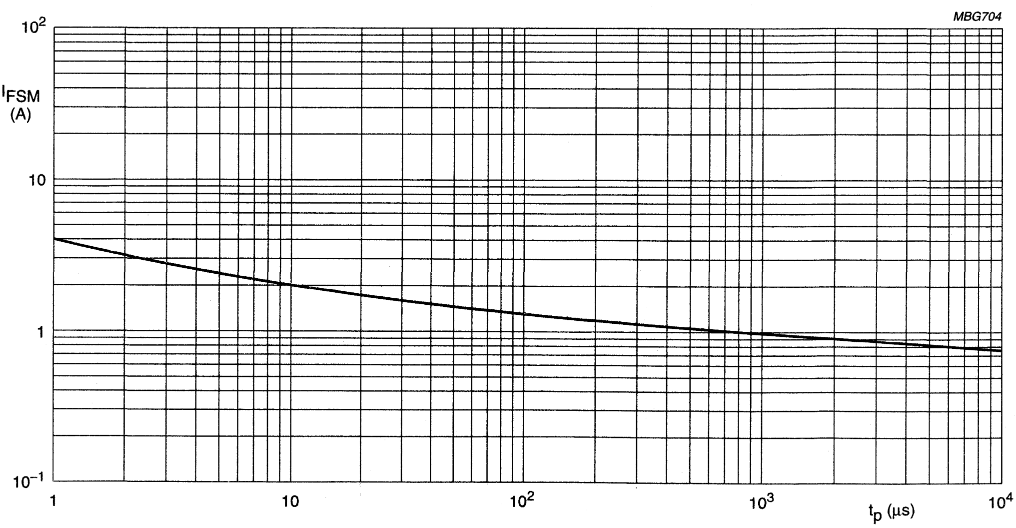
Device mounted on a FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



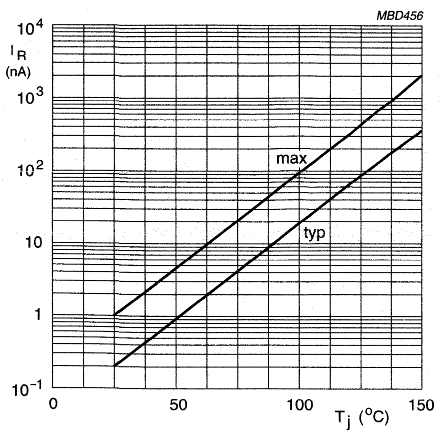
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage; typical values.



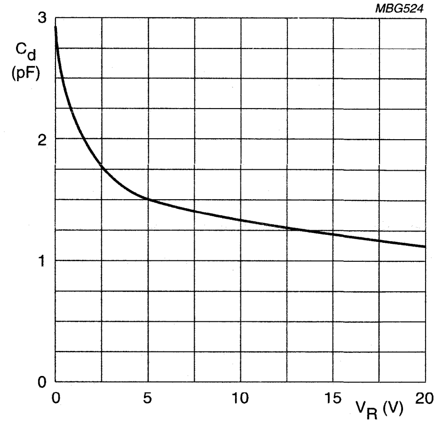
Based on square wave currents; T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



V_R = 125 V.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.

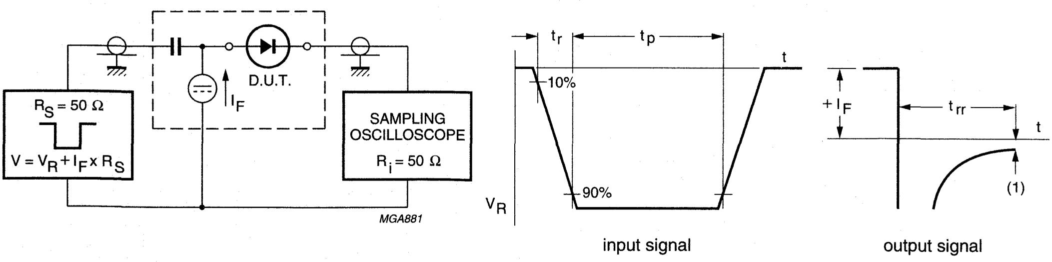


Fig.7 Reverse recovery time test circuit and waveforms.

Low-leakage diode BAS116

FEATURES

- Plastic SMD package
- Low leakage current: typ. 3 pA
- Switching time: typ. 0.8 μs
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATION

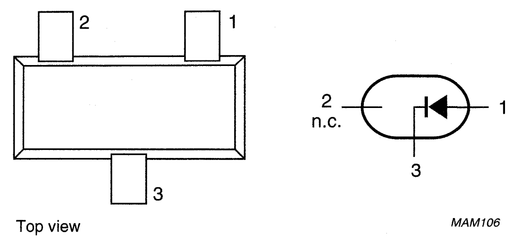
- Low leakage current applications in surface mounted circuits.

DESCRIPTION

Epitaxial medium-speed switching diode with a low leakage current in a small plastic SOT23 SMD package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: JVp.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t_p = 1 μs	–	4	A
		t_p = 1 ms	–	1	A
		t_p = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	900	mV
		I_F = 10 mA	–	1000	mV
		I_F = 50 mA	–	1100	mV
		I_F = 150 mA	–	1250	mV
I_R	reverse current	see Fig.5			
		V_R = 75 V	0.003	5	nA
		V_R = 75 V; T_j = 150 °C	3	80	nA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	2	–	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	0.8	3	μs

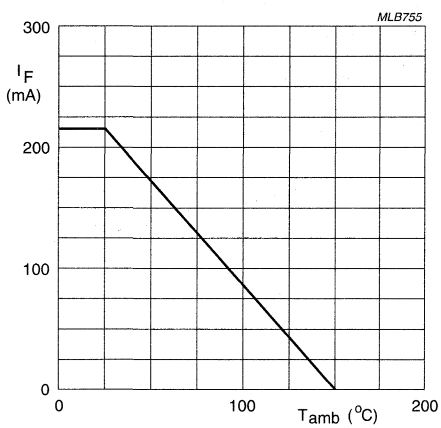
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

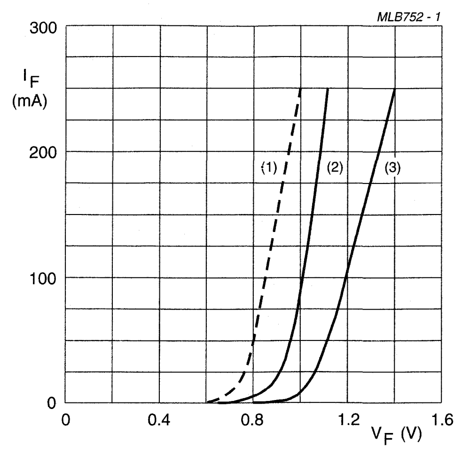
1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



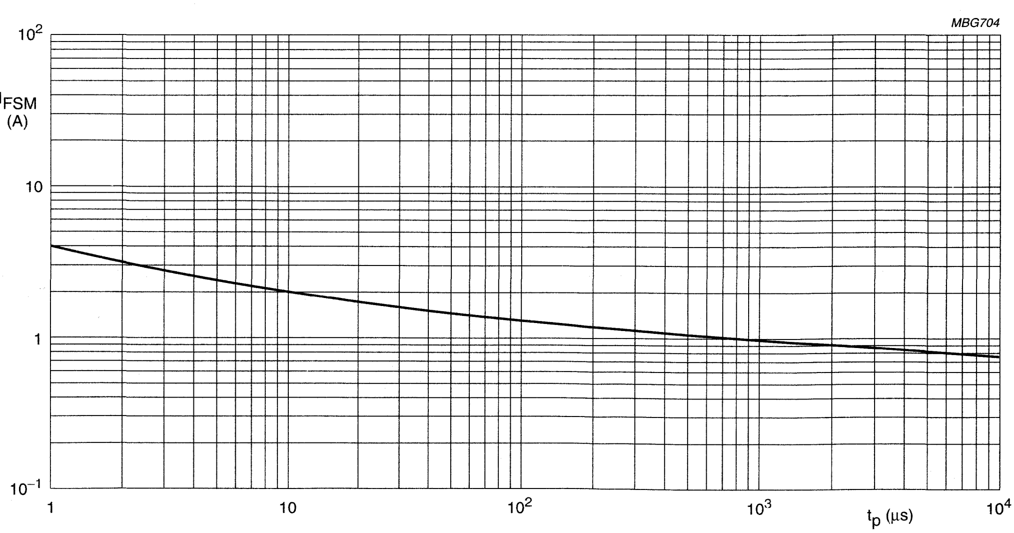
Device mounted on a FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



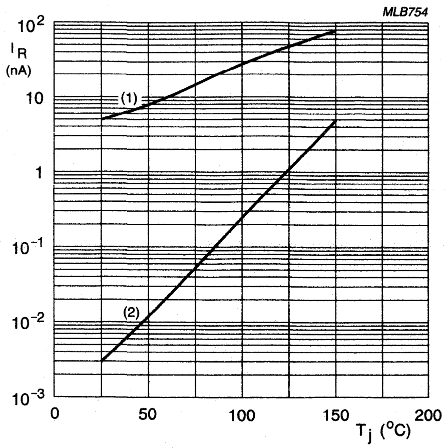
(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage.



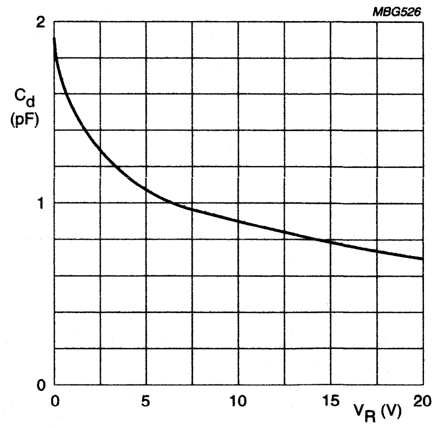
Based on square wave currents; T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



V_R = 75 V.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.

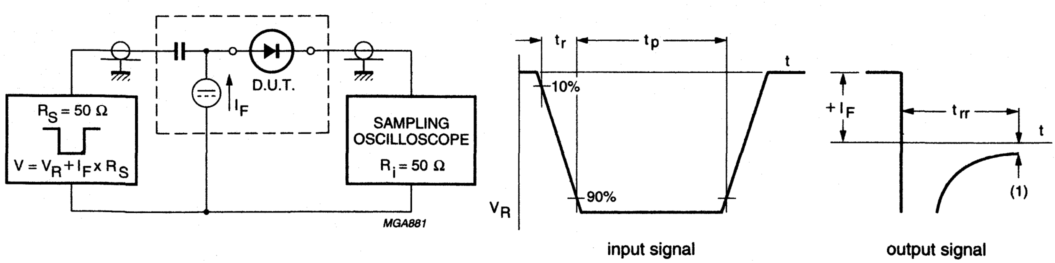


Fig.7 Reverse recovery time test circuit and waveforms.

Picoampere diode BAV45

FEATURES

- Extremely low leakage current: max. 5 pA
- Low diode capacitance
- Light insensitive.

APPLICATION

- Clamping
- Holding
- Peak follower
- Time delay circuits
- Logarithmic amplifiers
- Protection of insulated gate field-effect transistors.

DESCRIPTION

Silicon diode in a metal TO-18 can. It has an extremely low leakage current over a wide temperature range combined with a low capacitance and is not sensitive to light.

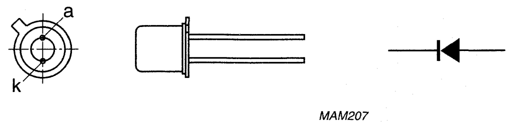


Fig.1 Simplified outline (SOT18/15; TO-18 except for the two leads) and symbol.

CAUTION
Handle the device with care whilst soldering into the circuit. The extremely low leakage current can only be guaranteed when the bottom is free from solder flux or other contaminations.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	35	V
V_R	continuous reverse voltage		–	20	V
I_F	continuous forward current	see Fig.2	–	50	mA
I_{FRM}	repetitive peak forward current		–	100	mA
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	200	mW
T_{stg}	storage temperature		–65	+125	°C
T_j	junction temperature		–	125	°C

Note

1. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Figs 3 and 3	1	V
I_R	reverse current	see Fig.5		
		V_R = 5 V	5	pA
		V_R = 5 V; T_j = 80 °C	250	pA
		V_R = 20 V	10	pA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	1.3	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	600	ns

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient; note 1	500	K/W

Note

1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA

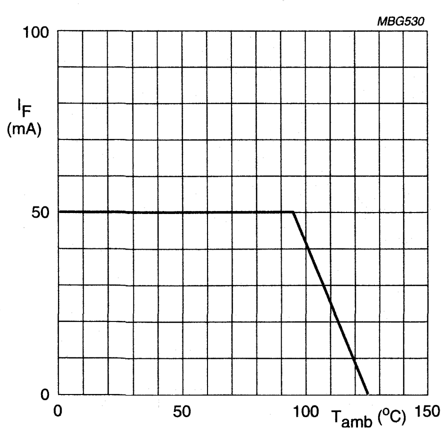
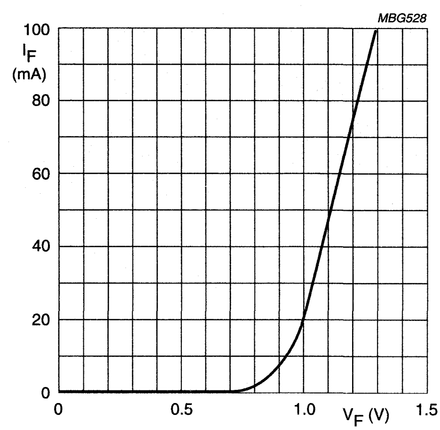
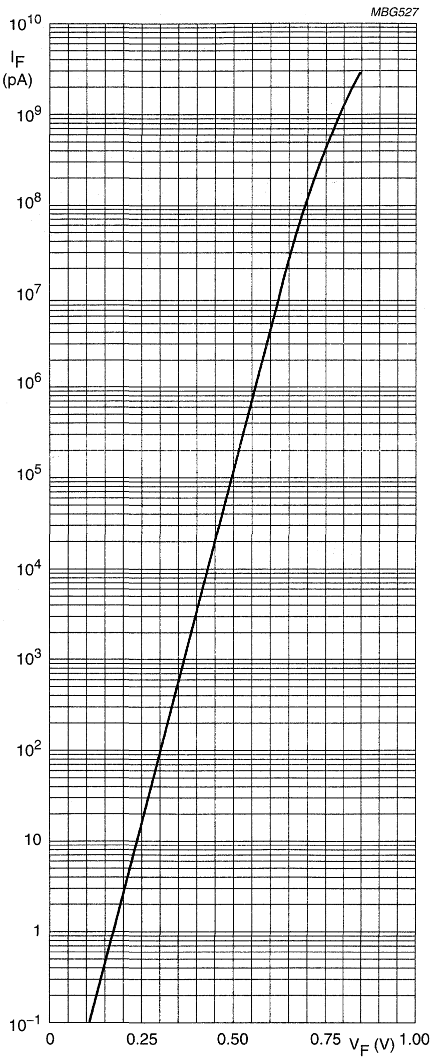


Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



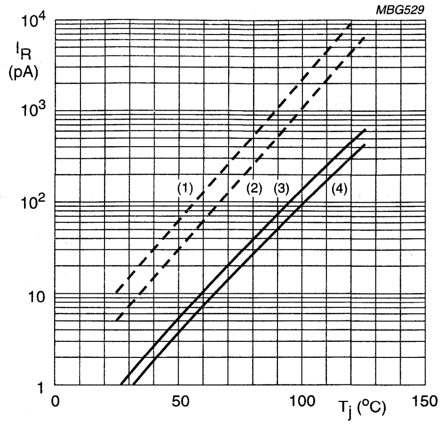
T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



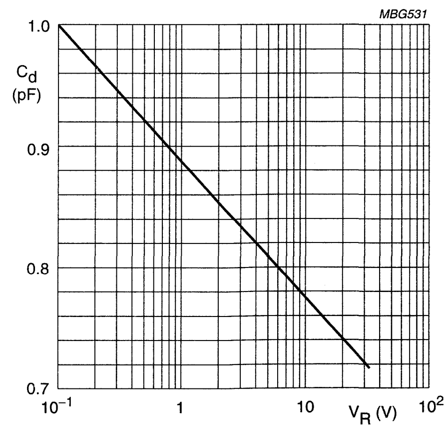
T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.



(1) V_R = 20 V; maximum values.
(2) V_R = 5 V; maximum values.
(3) V_R = 20 V; typical values.
(4) V_R = 5 V; typical values.

Fig.5 Reverse current as a function of junction temperature.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.

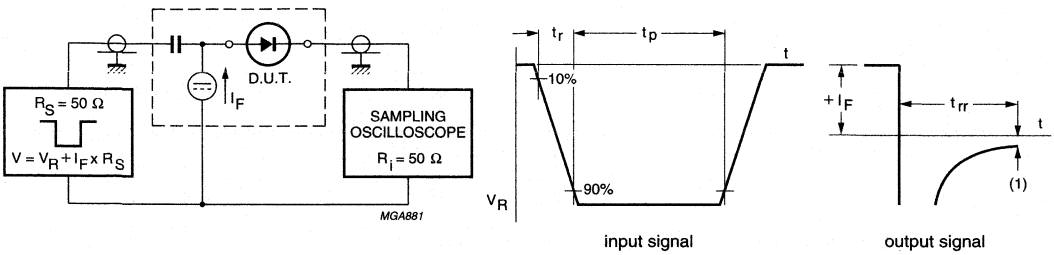


Fig.7 Reverse recovery time test circuit and waveforms.

Low-leakage double diode — BAV170

FEATURES

- Plastic SMD package
- Low leakage current: typ. 3 pA
- Switching time: typ. 0.8 μs
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATION

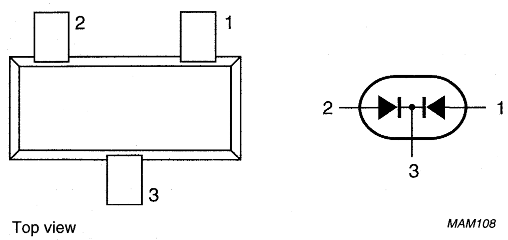
- Low-leakage current applications in surface mounted circuits.

DESCRIPTION

Epitaxial, medium-speed switching, double diode in a small plastic SOT23 SMD package. The diodes are in common cathode configuration.

PINNING

PIN	DESCRIPTION
1	anode
2	anode
3	common cathode



Marking code: JXp.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	215	mA
		double diode loaded; see Fig.2; note 1	–	125	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t_p = 1 μs	–	4	A
		t_p = 1 ms	–	1	A
		t_p = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	900	mV
		I_F = 10 mA	–	1000	mV
		I_F = 50 mA	–	1100	mV
		I_F = 150 mA	–	1250	mV
I_R	reverse current	see Fig.5			
		V_R = 75 V	0.003	5	nA
		V_R = 75 V; T_j = 150 °C	3	80	nA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	2	–	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	0.8	3	µs

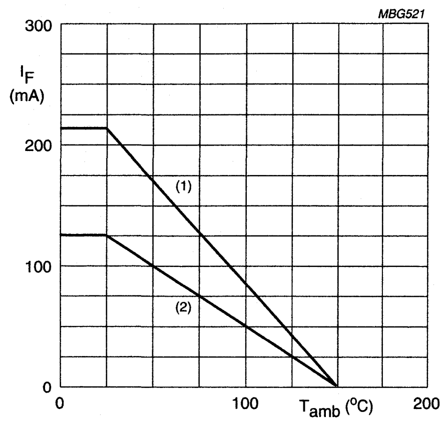
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

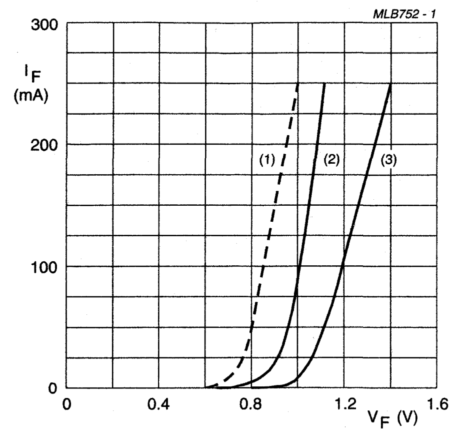
1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



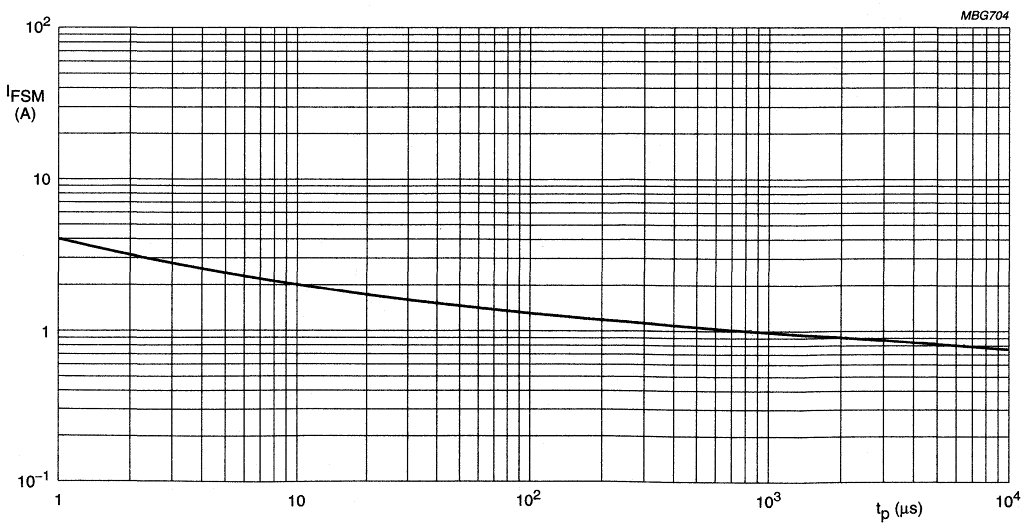
Device mounted on a FR4 printed-circuit board.
(1) Single diode loaded.
(2) Double diode loaded.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

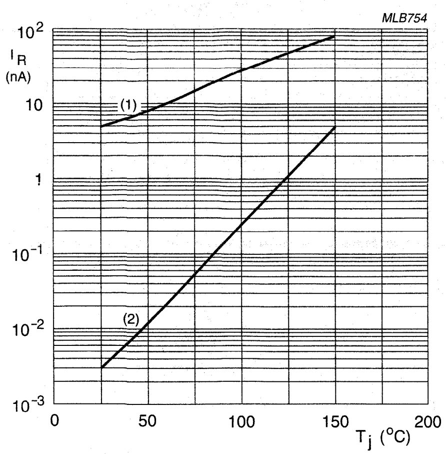
Fig.3 Forward current as a function of forward voltage; per diode.



Based on square wave currents; T_j = 25 °C prior to surge.

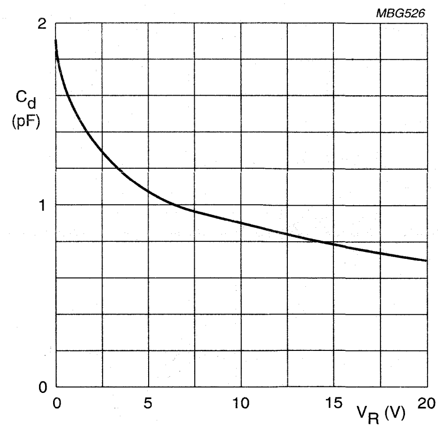
Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration per diode.

Low-leakage double diode BAV170



V_R = 75 V.
(1) Maximum values.
(2) Typical values.

Fig.5 Reverse current as a function of junction temperature; per diode.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; per diode; typical values.

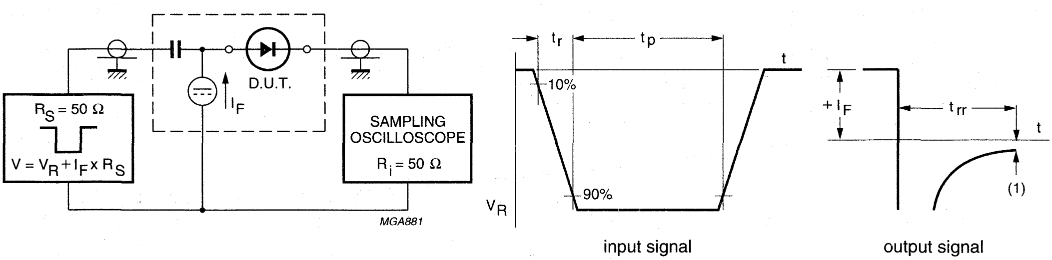


Fig.7 Reverse recovery time test circuit and waveforms.

Low-leakage double diode BAV199

FEATURES

- Plastic SMD package
- Low leakage current: typ. 3 pA
- Switching time: typ. 0.8 μs
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATION

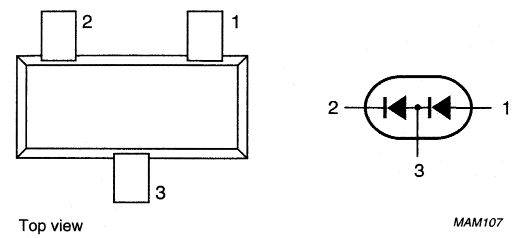
- Low-leakage current applications in surface mounted circuits.

DESCRIPTION

Epitaxial, medium-speed switching, double diode in a small plastic SOT23 SMD package. The diodes are connected in series.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	anode; cathode



Marking code: JYp.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	160	mA
		double diode loaded; see Fig.2; note 1	–	140	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t_p = 1 μs	–	4	A
		t_p = 1 ms	–	1	A
		t_p = 1 s	–	0.5	A
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		$I_F = 1$ mA	–	900	mV
		$I_F = 10$ mA	–	1000	mV
		$I_F = 50$ mA	–	1100	mV
		$I_F = 150$ mA	–	1250	mV
I_R	reverse current	see Fig.5			
		$V_R = 75$ V	0.003	5	nA
		$V_R = 75$ V; $T_j = 150$ °C	3	80	nA
C_d	diode capacitance	f = 1 MHz; $V_R = 0$; see Fig.6	2	–	pF
t_{rr}	reverse recovery time	when switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100\ \Omega$; measured at $I_R = 1$ mA; see Fig.7	0.8	3	µs

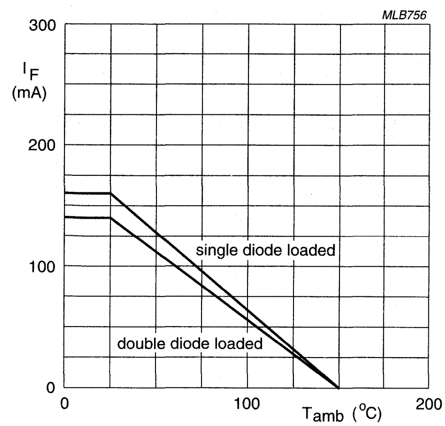
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

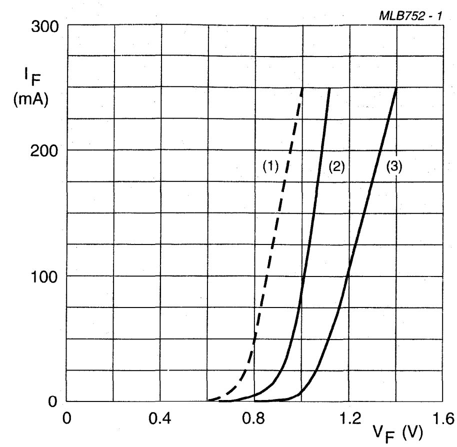
1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



Device mounted on a FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.

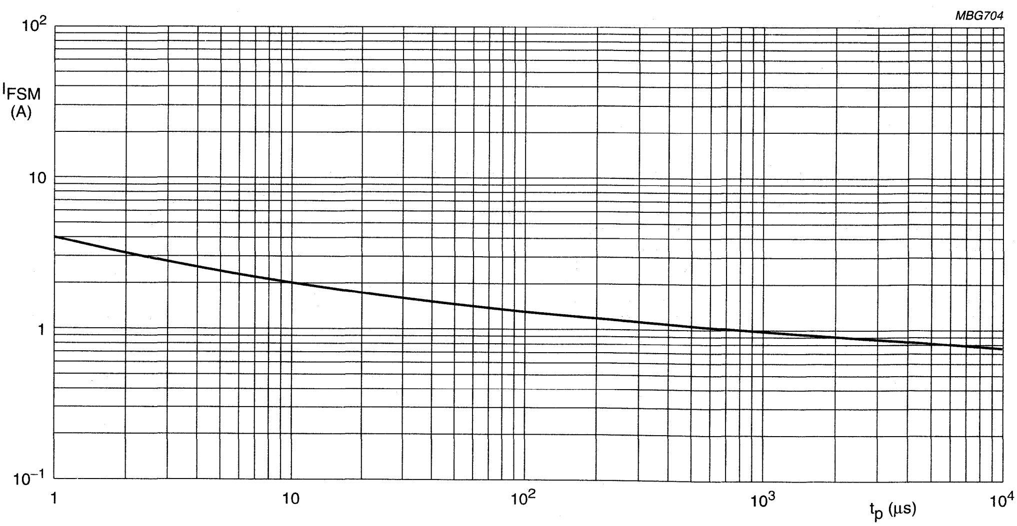


(1) T_j = 150 °C; typical values.

(2) T_j = 25 °C; typical values.

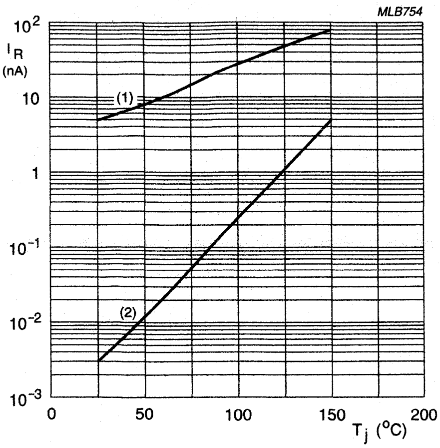
(3) T_j = 25 °C; maximum values.

Fig.3 Forward current as a function of forward voltage; per diode.



Based on square wave currents; T_j = 25 °C prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration per diode.

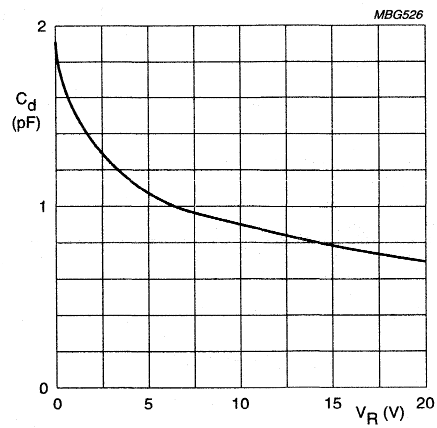


V_R = 75 V.

(1) Maximum values.

(2) Typical values.

Fig.5 Reverse current as a function of junction temperature; per diode.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; per diode; typical values.

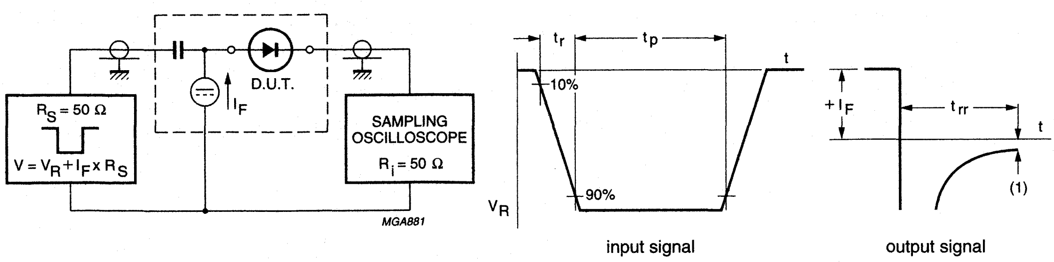


Fig.7 Reverse recovery time test circuit and waveforms.

Low-leakage double diode BAW156

FEATURES

- Plastic SMD package
- Low leakage current: typ. 3 pA
- Switching time: typ. 0.8 µs
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

APPLICATION

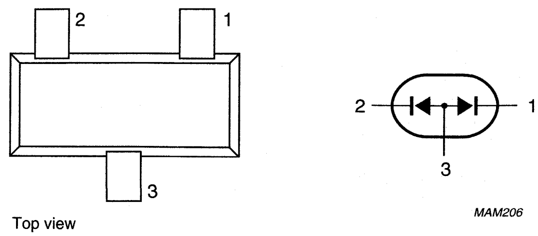
- Low-leakage current applications in surface mounted circuits.

DESCRIPTION

Epitaxial, medium-speed switching, double diode in a small plastic SOT23 SMD package. The diodes are in common anode configuration.

PINNING

PIN	DESCRIPTION
1	cathode
2	cathode
3	common anode



Marking code: JZp.

Fig.1 Simplified outline (SOT23) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	85	V
V_R	continuous reverse voltage		–	75	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	160	mA
		double diode loaded; see Fig.2; note 1	–	140	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; T_j = 25 °C prior to surge; see Fig.4			
		t_p = 1 µs	–	4	A
		t_p = 1 ms	–	1	A
		t_p = 1 s	–	0.5	A
P_{tot}	total power dissipation	up to T_{amb} = 25 °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3			
		I_F = 1 mA	–	900	mV
		I_F = 10 mA	–	1 000	mV
		I_F = 50 mA	–	1 100	mV
		I_F = 150 mA	–	1 250	mV
I_R	reverse current	see Fig.5			
		V_R = 75 V	0.003	5	nA
		V_R = 75 V; T_j = 150 °C	3	80	nA
C_d	diode capacitance	f = 1 MHz; V_R = 0; see Fig.6	3	–	pF
t_{rr}	reverse recovery time	when switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA; see Fig.7	0.8	3	µs

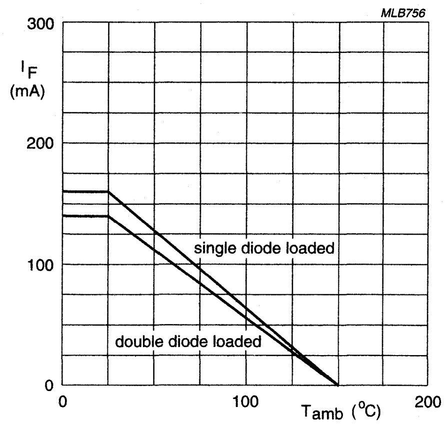
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

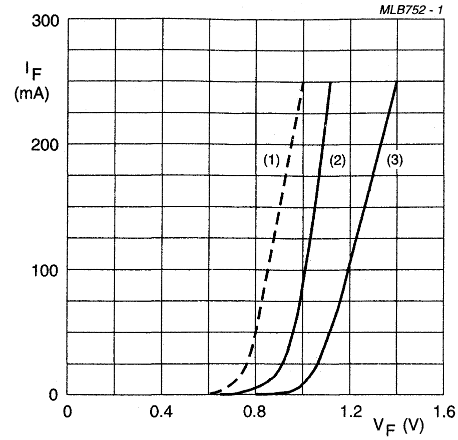
1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



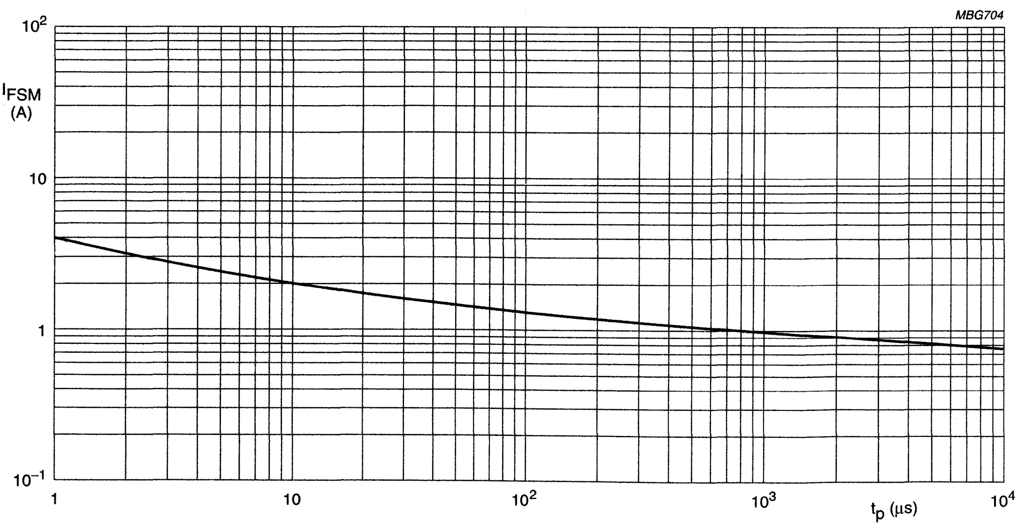
Device mounted on a FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



(1) T_j = 150 °C; typical values.
(2) T_j = 25 °C; typical values.
(3) T_j = 25 °C; maximum values.

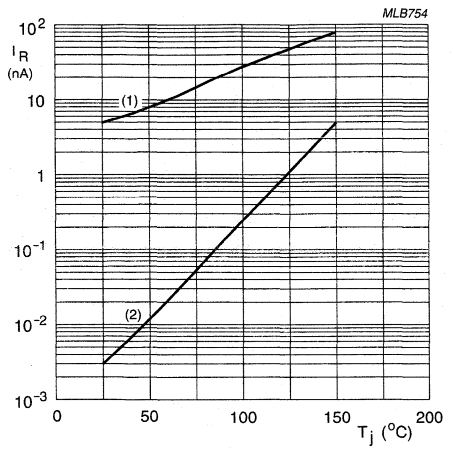
Fig.3 Forward current as a function of forward voltage; per diode.



Based on square wave currents; T_j = 25 °C prior to surge.

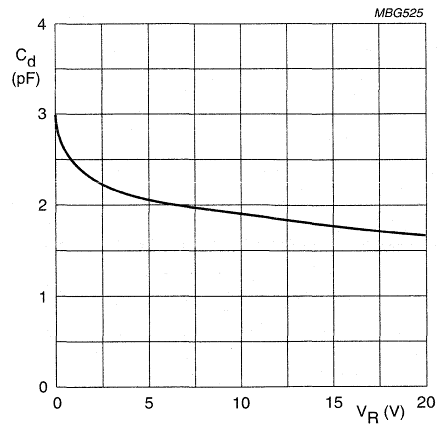
Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration per diode.

Low-leakage double diode BAW156



V_R = 75 V.

Fig.5 Reverse current as a function of junction temperature; per diode.



f = 1 MHz; T_j = 25 °C.

Fig.6 Diode capacitance as a function of reverse voltage; per diode; typical values.

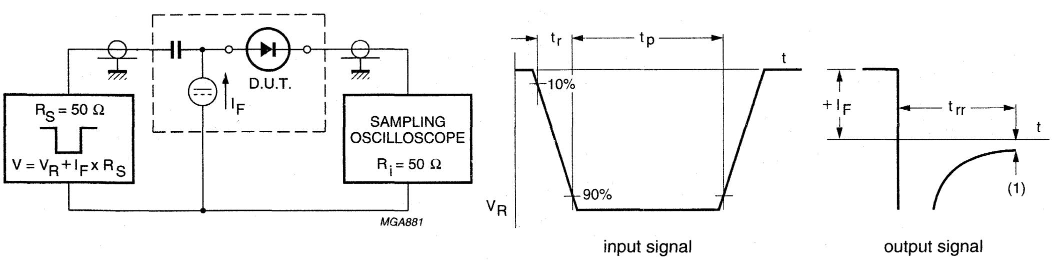
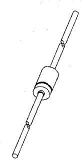
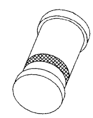


Fig.7 Reverse recovery time test circuit and waveforms.

SECTION 6

VOLTAGE REFERENCE DIODES

VOLTAGE REFERENCE DIODES

TYPE NUMBER	RATINGS	CHARACTERISTICS				PACKAGE (not to scale)
	I_Z max.	V_{ref} nom.	$\lvert S_Z \rvert$ max.	r_{dif} max.	@ I_Z	
	(mA)	(V)	(%/K)	(Ω)	(mA)	
LEADED TYPES						
1N821/1N821A	50	6.2	0.01	15/10	7.5	 SOD68 (DO34)
1N823/1N823A	50	6.2	0.005	15/10	7.5	
1N825/1N825A	50	6.2	0.002	15/10	7.5	
1N827/1N827A	50	6.2	0.001	15/10	7.5	
1N829/1N829A	50	6.2	0.0005	15/10	7.5	
BZV10	50	6.2	0.01	50	2.0	
BZV11	50	6.2	0.005	50	2.0	
BZV12	50	6.2	0.002	50	2.0	
BZV13	50	6.2	0.001	50	2.0	
BZV14	50	6.2	0.0005	50	2.0	
SURFACE-MOUNT TYPES						
BZV80	50	6.2	0.01	15	7.5	 SOD80
BZV81	50	6.2	0.005	15	7.5	

Voltage reference diodes

1N821 to 1N829
1N821A to 1N829A

FEATURES

- Temperature compensated
- Reference voltage range: 5.89 to 6.51 V (typ. 6.20 V)
- Low temperature coefficient range: max. 0.0005 to 0.01 %/K.

APPLICATION

- Voltage reference sources in measuring instruments such as digital voltmeters.

DESCRIPTION

Voltage reference diode in a hermetically-sealed SOD68 (DO-34) glass package.

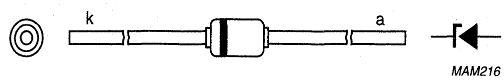


Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_Z	working current		–	50	mA
P_{tot}	total power dissipation	T_{amb} = 50 °C	–	400	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C
T_{amb}	operating ambient temperature		–55	+100	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{ref}	reference voltage	I_Z =7.5 mA	5.89	6.20	6.51	V
$\lvert\Delta V_{ref}\rvert$	reference voltage excursion	I_Z =7.5 mA; test points for T_{amb}: −55; +25; +75; +100 °C; see Fig.2; notes 1 and 2				
	1N821; 1N821A		−	−	96	mV
	1N823; 1N823A		−	−	48	mV
	1N825; 1N825A		−	−	19	mV
	1N827; 1N827A		−	−	9	mV
	1N829; 1N829A		−	−	5	mV
$\lvert S_Z\rvert$	temperature coefficient	I_Z = 7.5 mA: see Fig.3; notes 1 and 2				
	1N821; 1N821A		−	−	0.01	%/K
	1N823; 1N823A		−	−	0.005	%/K
	1N825; 1N825A		−	−	0.002	%/K
	1N827; 1N827A		−	−	0.001	%/K
	1N829; 1N829A		−	−	0.0005	%/K
r_{dif}	differential resistance	I_Z = 7.5 mA; see Fig.4				
	1N821 to 1N829		−	−	15	Ω
	1N821A to 1N829A		−	−	10	Ω

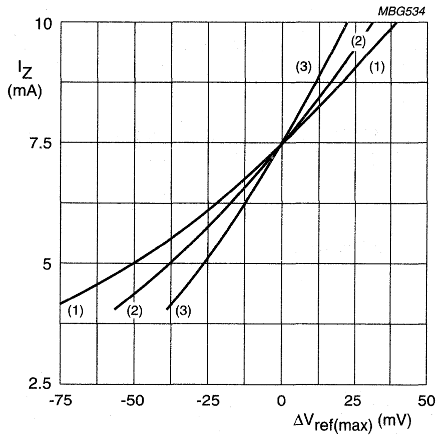
Notes

1. The quoted values of ΔV_{ref} are based on a constant current I_Z. Two factors can cause ΔV_{ref} to change, namely the differential resistance r_{dif} and the temperature coefficient S_Z.
   a) As the max. r_{dif} of the device can be 15 Ω, a change of 0.01 mA in the current through the reference diode will result in a ΔV_{ref} of 0.01 mA × 15 Ω = 0.15 mV. This level of ΔV_{ref} is not significant on a 1N821 (ΔV_{ref} < 96 mV), it is however very significant on a 1N829 (ΔV_{ref} < 5 mV).
   b) The temperature coefficient of the reference voltage S_Z is a function of I_Z. Reference diodes are classified at the specified test current and the S_Z of the reference diode will be different at different levels of I_Z. The absolute value of I_Z is important, however, the stability of I_Z, once the level has been set, is far more significant. This applies particularly to the 1N829. The effect of the stability of I_Z on S_Z is shown in Fig.3.
2. All reference diodes are characterized by the 'box method'. This guarantees a maximum voltage excursion (ΔV_{ref}) over the specified temperature range, at the specified test current (I_Z), verified by tests at indicated temperature points within the range. V_Z is measured and recorded at each temperature specified. The ΔV_{ref} between the highest and lowest values must not exceed the maximum ΔV_{ref} given. Therefore the temperature coefficient is only given as a reference. It may be derived from: $S_Z = \frac{V_{ref1} - V_{ref2}}{T_{amb2} - T_{amb1}} \times \frac{100}{V_{ref\ nom}}$ %/K

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	8 mm from the body	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm	375	K/W

GRAPHICAL DATA



Referenced to I_Z = 7.5 mA.
(1) T_j = 100 °C.
(2) T_j = 25 °C.
(3) T_j = −55 °C.

Fig.2 Working current as a function of the maximum reference voltage excursion.

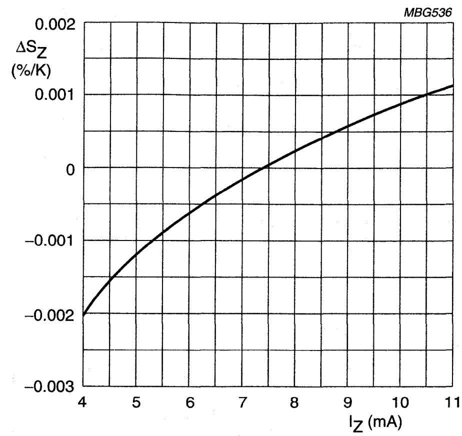
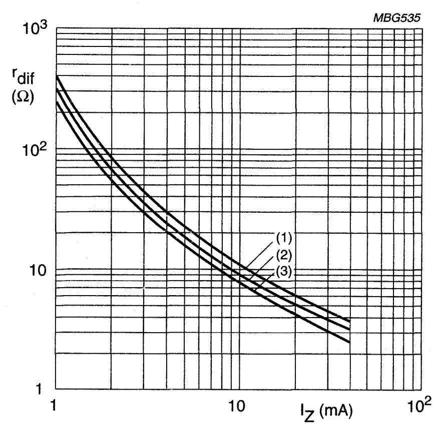


Fig.3 Temperature coefficient change as a function of working current; typical values.



(1) T_j = 100 °C.
(2) T_j = 25 °C.
(3) T_j = −55 °C.

Fig.4 Differential resistance as a function of working current; typical values.

Voltage reference diodes BZV10 to BZV14

FEATURES

- Temperature compensated
- Reference voltage range: 5.9 to 6.5 V (typ. 6.2 V)
- Low temperature coefficient range: max. 0.0005 to 0.01 %/K.

APPLICATION

- Voltage reference sources in measuring instruments such as digital voltmeters.

DESCRIPTION

Voltage reference diode in a hermetically-sealed SOD68 (DO-34) glass package.

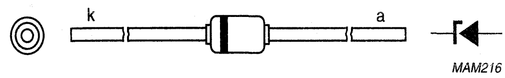


Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_Z	working current		–	50	mA
P_{tot}	total power dissipation	T_{amb} = 50 °C	–	400	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C
T_{amb}	operating ambient temperature		0	+70	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{ref}	reference voltage	I_Z =2 mA	5.9	6.2	6.5	V
$\lvert\Delta V_{ref}\rvert$	reference voltage excursion	I_Z =2 mA; test points for T_{amb}: 0; +25; +70 °C; notes 1 and 2				
	BZV10		–	–	46	mV
	BZV11		–	–	23	mV
	BZV12		–	–	9	mV
	BZV13		–	–	4.6	mV
	BZV14		–	–	2.3	mV
$\lvert S_Z\rvert$	temperature coefficient	I_Z = 2 mA: see Fig.2; notes 1 and 2				
	BZV10		–	–	0.01	%/K
	BZV11		–	–	0.005	%/K
	BZV12		–	–	0.002	%/K
	BZV13		–	–	0.001	%/K
	BZV14		–	–	0.0005	%/K
r_{dif}	differential resistance	I_Z = 2 mA; see Fig.3	–	20	50	Ω

Notes

1. The quoted values of ΔV_{ref} are based on a constant current I_Z. Two factors can cause ΔV_{ref} to change, namely the differential resistance r_{dif} and the temperature coefficient S_Z.
   a) As the max. r_{dif} of the device can be 50 Ω, a change of 0.01 mA in the current through the reference diode will result in a ΔV_{ref} of 0.01 mA × 50 Ω = 0.5 mV. This level of ΔV_{ref} is not significant on a BZV10 (ΔV_{ref} < 46 mV), it is however very significant on a BZV14 (ΔV_{ref} < 2.3 mV).
   b) The temperature coefficient of the reference voltage S_Z is a function of I_Z. Reference diodes are classified at the specified test current, and the S_Z of the reference diode will be different at different levels of I_Z. The absolute value of I_Z is important, however, the stability of I_Z, once the level has been set, is far more significant. This applies particularly to the BZV13 and BZV14. The effect of the stability of I_Z on S_Z is shown in Fig.2.
2. All reference diodes are characterized by the 'box method'. This guarantees a maximum voltage excursion (ΔV_{ref}) over the specified temperature range, at the specified test current (I_Z), verified by tests at indicated temperature points within the range. V_Z is measured and recorded at each temperature specified. The ΔV_{ref} between the highest and lowest values must not exceed the maximum ΔV_{ref} given. Therefore the temperature coefficient is only given as a reference. It may be derived from: $S_Z = \frac{V_{ref1} - V_{ref2}}{T_{amb2} - T_{amb1}} \times \frac{100}{V_{ref\,nom}}$ %/K

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	8 mm from the body	300	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm	375	K/W

GRAPHICAL DATA

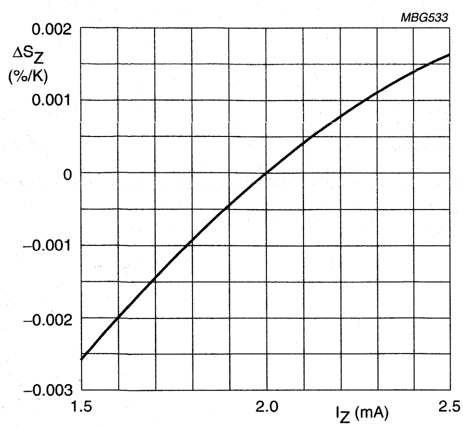


Fig.2 Temperature coefficient change as a function of working current; typical values.

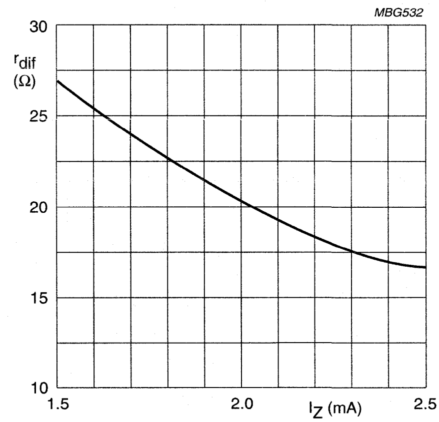


Fig.3 Differential resistance as a function of working current; typical values.

Voltage reference diodes BZV80; BZV81

FEATURES

- Reference voltage range: 5.89 to 6.51 V (nom. 6.20 V)
- Low temperature coefficient range: max. 0.005 to 0.01 %/K.

APPLICATION

- Voltage reference sources.

DESCRIPTION

Leadless voltage reference diode in a small glass SOD80 SMD package.

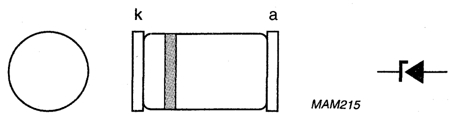


Fig.1 Simplified outline (SOD80) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_Z	working current		–	50	mA
P_{tot}	total power dissipation	T_{amb} = 50 °C; note 1	–	400	mW
T_{stg}	storage temperature		−65	+200	°C
T_j	junction temperature		–	200	°C
T_{amb}	operating ambient temperature		−20	+80	°C

Note

1. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	NOM.	MAX.	UNIT
V_{ref}	reference voltage	I_Z = 7.5 mA	5.89	6.20	6.51	V
$\lvert\Delta V_{ref}\rvert$	reference voltage excursion	I_Z = 7.5 mA; test points for T_{amb}: −20; +25; +55; +80 °C; notes 1 and 2				
	BZV80		−	−	62	mV
	BZV81		−	−	31	mV
$\lvert S_Z\rvert$	temperature coefficient	I_Z = 7.5 mA: notes 1 and 2				
	BZV80		−	−	0.01	%/K
	BZV81		−		0.005	%/K
r_{dif}	differential resistance	I_Z = 7.5 mA	−	−	15	Ω

Notes

1. The quoted values of ΔV_{ref} are based on a constant current I_Z. Two factors can cause ΔV_{ref} to change with I_Z, namely the differential resistance r_{dif} and the temperature coefficient S_Z.
   a) Each change of I_Z can result in a maximum change of ΔV_{ref} as follows: ΔV_{ref} (mV) = ΔI_Z (mA) × 15 Ω taking into account that r_{dif} is max. 15 Ω.
   b) The temperature coefficient of the reference voltage S_Z is also a function of I_Z. However, for these reference diodes S_Z varies max. ±0.05 mV/K or ±0.001%/K when I_Z is between 6 and 10 mA, so this effect can be neglected in practice for these types.
2. The temperature coefficient of the reference voltage is obtained from the following formula:

$$S_Z = \frac{V_{ref1} - V_{ref2}}{T_{amb2} - T_{amb1}} \times \frac{100}{V_{ref\ nom}} \ \%/K$$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	380	K/W

Note

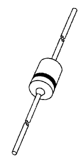
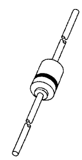
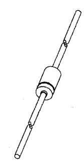
1. Device mounted on a FR4 printed-circuit board.

SECTION 7

ZENER DIODES

Zener diodes

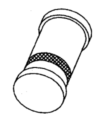
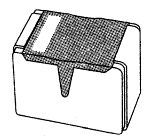
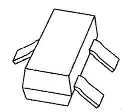
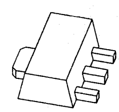
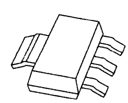
ZENER DIODES

TYPE NUMBER	RATINGS						CHARACTERISTICS		DOUBLE DIODE	PACKAGE (not to scale)
	I_F max.	P_{tot} @ max.	T_{tp}	P_{ZSM} @ max.	T_j and	t_p	V_Z nom. E24 range	tol.		
	(mA)	(mW)	(°C)	(W)	(°C)	(ms)	(V)	(±%)		
LEADED TYPES										
1N5225B to 67B BZX55 series BZX79 series PLVA400A ser.	250 250 250 250	500 500 500 400	75 50 50 55	10 40 40 30	55 25 25 150	8.3 0.1 0.1 0.1	3.0 to 75 2.4 to 75 2.4 to 75 5.0 to 6.8	5 5 1, 2, 3, 5 ±0.2 V	no no no no	 SOD27 (DO35)
1N4728A to 49A BZV85 series	500 500	1000 1300	50 55	– 60	– 25	– 0.1	3.3 to 24 3.6 to 75	5 5	no no	 SOD66 (DO41)
BZV37	50	400	25	40	25	0.1	6.5	5	yes[1]	 SOD68 (DO34)

Note

1. Bidirectional Zener diode.

ZENER DIODES (continued)

TYPE NUMBER	RATINGS						CHARACTERISTICS		DOUBLE DIODE	PACKAGE (not to scale)
	I_F max.	P_{tot} @ max.	T_{tp}	P_{ZSM} @ max.	T_j and	t_p	V_Z nom. E24 range	tol.		
	(mA)	(mW)	(°C)	(W)	(°C)	(ms)	(V)	(±%)		
SURFACE-MOUNT TYPES										
BZV55 series PMLL5225B to PMLL5267B	250 250	500 500	50 75	40 10	25 55	0.1 8.3	2.4 to 75 3.0 to 75	2, 3, 5 5	no no	 SOD80C
BZX284 series	250	400	25	–	–	–	2.4 to 75	2, 5	no	 SOD110
BZX84 series PLVA600A ser. PLVA2600A ser. PMBZ5226B to PMBZ5257B	200 250 250 250	250 250 250 250	25 25 25 25	40 30 30 10	25 150 150 55	0.1 0.1 0.1 8.3	2.4 to 75 5.0 to 6.8 5.0 to 6.8 3.3 to 33	1, 2, 5 ±0.2 V ±0.2 V 5	no no yes[(1)] no	 SOT23
BZV49 series	250	1000	25	40	25	0.1	2.4 to 75	5	no	 SOT89
BZV90 series	400	1500	25	40	25	0.1	2.4 to 75	5	no	 SOT223

Note

1. Common anode.

Voltage regulator diodes | 1N4728A to 1N4749A

FEATURES

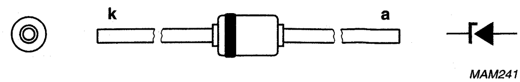
- Total power dissipation: max. 1 000 mW
- Tolerance series: ±5%
- Working voltage range: nom. 3.3 to 24 V.

APPLICATIONS

- Low voltage stabilizers.

DESCRIPTION

Low voltage regulator diodes in hermetically sealed SOD66 (DO-41) packages. The series consists of 22 types with nominal working voltages from 3.3 to 24 V.



The diodes are type branded.

Fig.1 Simplified outline (SOD66; DO-41) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	500	mA
I_{ZM}	working current		see Table "Per type"		
I_{ZSM}	non-repetitive peak reverse current		see Table "Per type"		
P_{tot}	total power dissipation	T_{amb} = 50 °C	–	1 000	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–65	+200	°C

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 200 mA; see Fig.3	–	1.2	V

Voltage regulator diodes 1N4728A to 1N4749A

Per type

T_j = 25 °C; unless otherwise specified.

TYPE No.	WORKING VOLTAGE V_Z (V)(1) at I_{Ztest}	TEST CURRENT I_{Ztest} (mA)	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z	I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	V_R (V)	WORKING CURRENT I_{ZM} (mA)	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (mA)(2)
	NOM.		MAX.	MAX.		MAX.		MAX.	MAX.
1N4728A	3.3	76	10	400	1	100	1	276	1380
1N4729A	3.6	69	10	400	1	100	1	252	1260
1N4730A	3.9	64	9	400	1	50	1	234	1190
1N4731A	4.3	58	9	400	1	10	1	217	1070
1N4732A	4.7	53	8	500	1	10	1	193	970
1N4733A	5.1	49	7	550	1	10	1	178	890
1N4734A	5.6	45	5	600	1	10	2	162	810
1N4735A	6.2	41	2	700	1	10	3	146	730
1N4736A	6.8	37	3.5	700	1	10	4	133	660
1N4737A	7.5	34	4	700	0.5	10	5	121	605
1N4738A	8.2	31	4.5	700	0.5	10	6	110	550
1N4739A	9.1	28	5	700	0.5	10	7	100	500
1N4740A	10	25	7	700	0.25	10	7.6	91	454
1N4741A	11	23	8	700	0.25	5	8.4	83	414
1N4742A	12	21	9	700	0.25	5	9.1	76	380
1N4743A	13	19	10	700	0.25	5	9.9	69	344
1N4744A	15	17	14	700	0.25	5	11.4	61	304
1N4745A	16	15.5	16	700	0.25	5	12.2	57	285
1N4746A	18	14	20	750	0.25	5	13.7	50	250
1N4747A	20	12.5	22	750	0.25	5	15.2	45	225
1N4748A	22	11.5	23	750	0.25	5	16.7	41	205
1N4749A	24	10.5	25	750	0.25	5	18.2	38	190

Notes

1. V_Z is measured with device at thermal equilibrium while held in clips at 10 mm from body in still air at 25 °C.
2. Half square wave or equivalent sinewave pulse $^1/_{120}$ second duration superimposed on I_{Ztest}.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 4 mm; see Fig.2	110	K/W

GRAPHICAL DATA

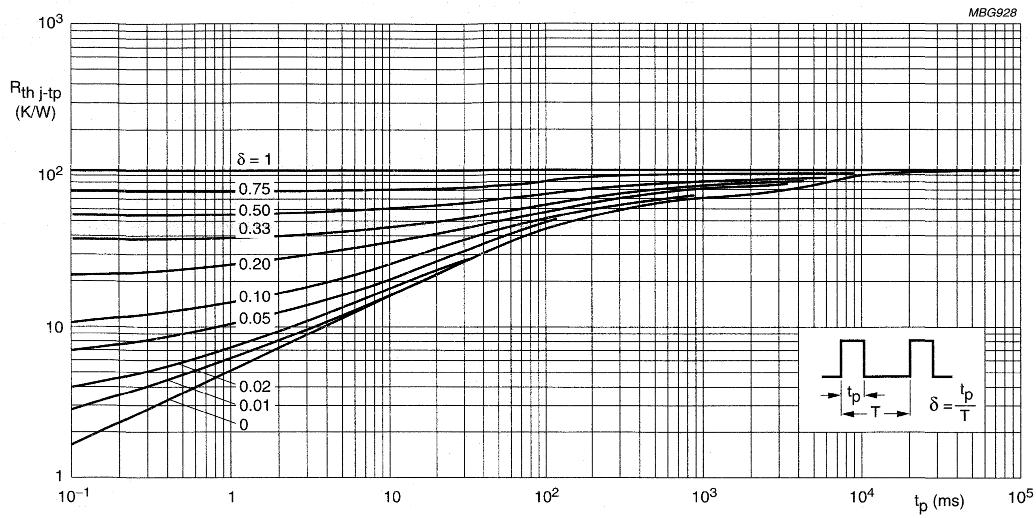
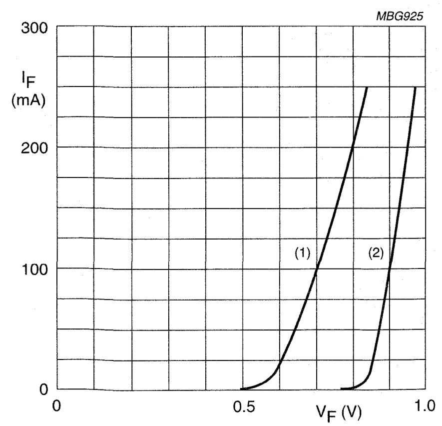


Fig.2 Thermal resistance from junction to tie-point; lead length 4 mm.



(1) T_j = 200 °C; typical values.
(2) T_j = 25 °C; typical values.

Fig.3 Forward current as a function of forward voltage.

Voltage regulator diodes — 1N5225B to 1N5267B

FEATURES

- Total power dissipation: max. 500 mW
- Tolerance series: ±5%
- Working voltage range: nom. 3.0 to 75 V
- Non-repetitive peak reverse power dissipation: max. 40 W.

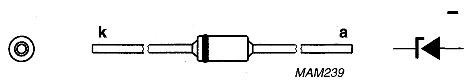
APPLICATIONS

- Low-power voltage stabilizers or voltage references.

DESCRIPTION

Low-power voltage regulator diodes in hermetically sealed leaded glass SOD27 (DO-35) packages.

The series consists of 43 types with nominal working voltages from 3.0 to 75 V.



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Table "Per type"		
P_{tot}	total power dissipation	T_{amb} = 50 °C; lead length max.; note 1	–	400	mW
		Lead length 8 mm; note 2	–	500	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.3	–	40	W
		t_p = 8.3 ms; square wave; $T_j \leq$ 55 °C prior to surge	–	10	W
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–65	+200	°C

Notes

1. Device mounted on a printed circuit-board without metallization pad.
2. Tie-point temperature ≤ 75 °C.

ELECTRICAL CHARACTERISTICS

Table 1

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 200 mA; see Fig.4	1.1	V

Per type

T_j = 25 °C; unless otherwise specified.

TYPE No.	WORKING VOLTAGE V_Z (V)(1) at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z(2)	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	V_R (V)	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) t_p = 100 μs; T_{amb} = 25 °C
	NOM.	MAX.	MAX.		MAX.	MAX.		MAX.
1N5225B	3.0	1600	−0.075	20	450	50	1.0	6.0
1N5226B	3.3	1600	−0.070	20	450	25	1.0	6.0
1N5227B	3.6	1700	−0.065	20	450	15	1.0	6.0
1N5228B	3.9	1900	−0.060	20	450	10	1.0	6.0
1N5229B	4.3	2000	±0.055	20	450	5	1.0	6.0
1N5230B	4.7	1900	±0.030	20	450	5	1.5	6.0
1N5231B	5.1	1600	±0.030	20	300	5	2.0	6.0
1N5232B	5.6	1600	+0.038	20	300	5	3.0	6.0
1N5233B	6.0	1600	+0.038	20	300	5	3.5	6.0
1N5234B	6.2	1000	+0.045	20	200	5	4.0	6.0
1N5235B	6.8	750	+0.050	20	200	3	5.0	6.0
1N5236B	7.5	500	+0.058	20	150	3	6.0	4.0
1N5237B	8.2	500	+0.062	20	150	3	6.5	4.0
1N5238B	8.7	600	+0.065	20	150	3	6.5	3.5
1N5239B	9.1	600	+0.068	20	150	3	7.0	3.0
1N5240B	10	600	+0.075	20	90	3	8.0	3.0
1N5241B	11	600	+0.076	20	85	2	8.4	2.5
1N5242B	12	600	+0.077	20	85	1	9.1	2.5
1N5243B	13	600	+0.079	9.5	80	0.5	9.9	2.5
1N5244B	14	600	+0.082	9.0	80	0.1	10.0	2.0
1N5245B	15	600	+0.082	8.5	75	0.1	11.0	2.0
1N5246B	16	600	+0.083	7.8	75	0.1	12.0	1.5
1N5247B	17	600	+0.084	7.4	75	0.1	13.0	1.5
1N5248B	18	600	+0.085	7.0	70	0.1	14.0	1.5
1N5249B	19	600	+0.086	6.6	70	0.1	14.0	1.5
1N5250B	20	600	+0.086	6.2	60	0.1	15.0	1.5

TYPE No.	WORKING VOLTAGE V_Z (V)[1] at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z[2]	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) t_p = 100 μs; T_{amb} = 25 °C
						I_R (μA)	V_R (V)	
	NOM.	MAX.	MAX.		MAX.	MAX.		MAX.
1N5251B	22	600	+0.087	5.6	60	0.1	17.0	1.25
1N5252B	24	600	+0.088	5.2	55	0.1	18.0	1.25
1N5253B	25	600	+0.089	5.0	55	0.1	19.0	1.25
1N5254B	27	600	+0.090	4.6	50	0.1	21.0	1.0
1N5255B	28	600	+0.091	4.5	50	0.1	21.0	1.0
1N5256B	30	600	+0.091	4.2	50	0.1	23.0	1.0
1N5257B	33	700	+0.092	3.8	45	0.1	25.0	0.9
1N5258B	36	700	+0.093	3.4	45	0.1	27.0	0.8
1N5259B	39	800	+0.094	3.2	45	0.1	30.0	0.7
1N5260B	43	900	+0.095	3.0	40	0.1	33.0	0.6
1N5261B	47	1000	+0.095	2.7	40	0.1	36.0	0.5
1N5262B	51	1100	+0.096	2.5	40	0.1	39.0	0.4
1N5263B	56	1300	+0.096	2.2	40	0.1	43.0	0.3
1N5264B	60	1400	+0.097	2.1	40	0.1	46.0	0.3
1N5265B	62	1400	+0.097	2.0	35	0.1	47.0	0.3
1N5266B	68	1600	+0.097	1.8	35	0.1	52.0	0.25
1N5267B	75	1700	+0.098	1.7	35	0.1	56.0	0.2

Notes

1. V_Z is measured with device at thermal equilibrium while held in clips at 10 mm from body in still air at 25 °C.
2. For types 1N5225B to 1N5242B the I_Z current is 7.5 mA; for 1N5243B and higher $I_Z = I_{Ztest}$. S_Z values valid between 25 °C and 125 °C.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length max.; see Fig.2 and note 1	380	K/W

Note

1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA

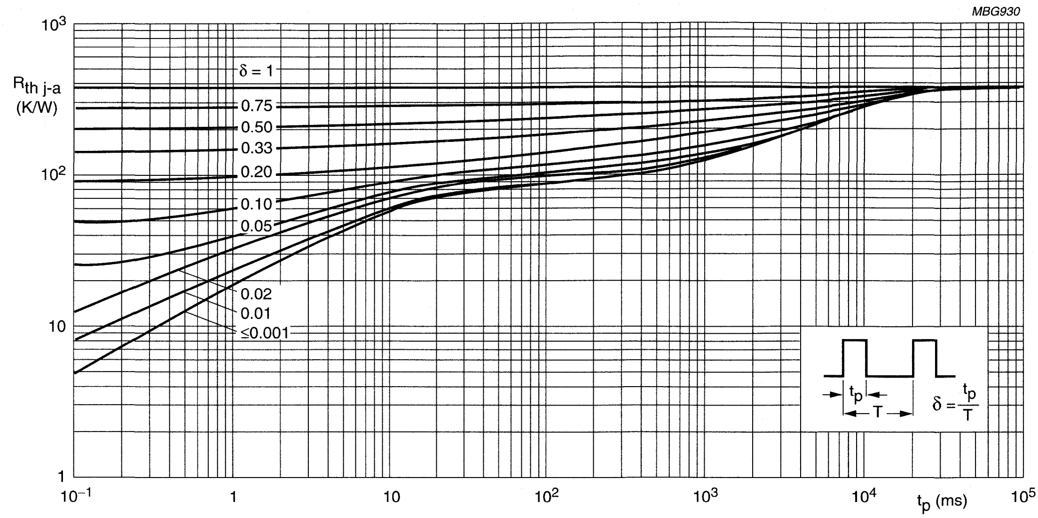
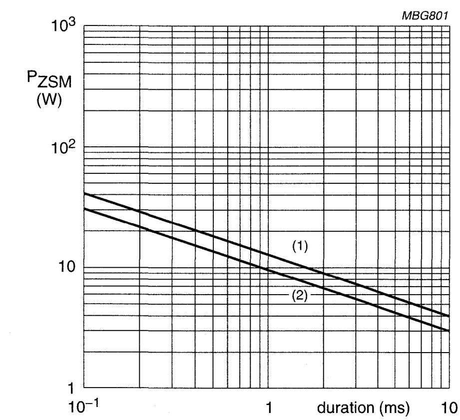
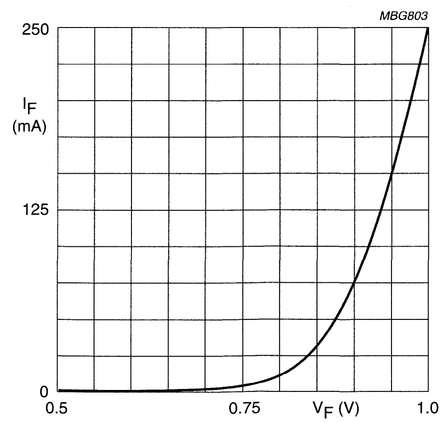


Fig.2 Thermal resistance from junction to ambient as a function of pulse duration.



(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.3 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.

Bidirectional voltage regulator diode BZV37

FEATURES

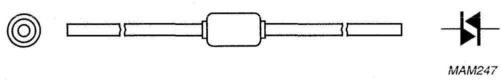
- Low total power dissipation: max. 400 mW
- Working voltage: nom. 6.5 V
- Non-repetitive peak reverse power dissipation: max. 40 W
- Bidirectional.

APPLICATIONS

- Voltage stabilizer and transient protection element.

DESCRIPTION

Low-power voltage regulator diode in an hermetically sealed leaded glass SOD68 (DO-34) package.



The diode is type branded.

Fig.1 Simplified outline (SOD68; DO-34) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_Z	continuous working current		–	50	mA
I_{ZSM}	non-repetitive peak reverse current	t = 30 s; t_1 = 8 μs; t_2 = 20 μs; T_j = 25 °C prior to surge; see Fig.3	–	7	A
		t = 30 s; t_1 = 10 μs; t_2 = 1000 μs; T_j = 25 °C prior to surge; see Fig.3	–	2	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	–	400	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs square wave; T_j = 25 °C prior to surge; see Fig.2	–	40	W
T_{stg}	storage temperature		−65	+200	°C
T_j	junction temperature		–	200	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	NOM.	MAX.	UNIT
V_Z	working voltage	I_{Ztest} = 5 mA	6.2	6.5	6.8	V
$V_{(CL)R}$	clamping voltage	I_{ZSM} = 7 A; t_1 = 8 µs; t_2 = 20 µs	–	–	25	V
		I_{ZSM} = 2 A; t_1 = 10 µs; t_2 = 1000 µs	–	–	15	V
r_{diff}	differential resistance	I_{Ztest} = 5 mA	–	–	20	Ω
S_Z	temperature coefficient	I_{Ztest} = 5 mA	–	–	0.1	%/K
C_d	diode capacitance	V_R = 0 V	–	–	150	pF
I_R	reverse current	V_R = 4 V	–	–	10	µA
		V_R = 4 V; T_j = 150 °C	–	–	30	µA
		V_R = 2 V	–	–	3	µA

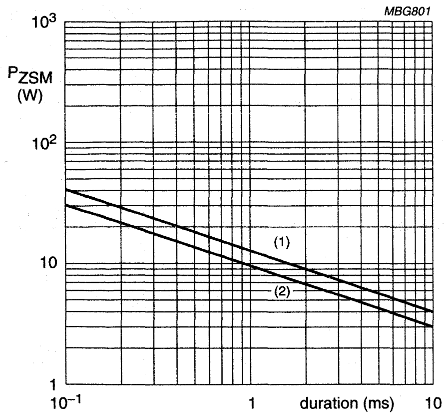
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 8 mm	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length max.; note 1	380	K/W

Note

1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.2 Maximum permissible non-repetitive peak reverse power dissipation versus duration.

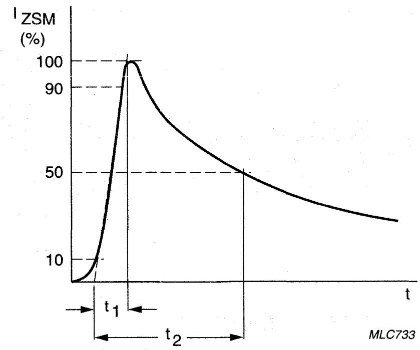


Fig.3 Current pulse according to IEC 60-2, Section 6.

Voltage regulator diodes | BZV49 series

FEATURES

- Total power dissipation: max. 1000 mW
- Tolerance series: ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- General regulation functions.

DESCRIPTION

Medium-power voltage regulator diodes in a plastic SMD SOT89 package.

The diodes are available in the normalized E24 ±5% tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V (BZV49-C2V4 to BZV49-C75).

PINNING

PIN	DESCRIPTION
1	anode
2	anode
3	cathode

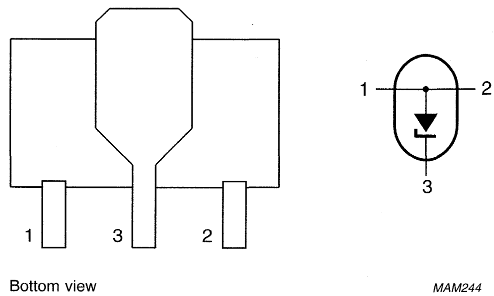


Fig.4 Simplified outline (SOT89) and symbol.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BZV49-C2V4	2Y4	BZV49-C6V2	6Y2	BZV49-C16	16Y	BZV49-C43	43Y
BZV49-C2V7	2Y7	BZV49-C6V8	6Y8	BZV49-C18	18Y	BZV49-C47	47Y
BZV49-C3V0	3Y0	BZV49-C7V5	7Y5	BZV49-C20	20Y	BZV49-C51	51Y
BZV49-C3Y3	3Y3	BZV49-C8V2	8Y2	BZV49-C22	22Y	BZV49-C56	56Y
BZV49-C3V6	3Y6	BZV49-C9V1	9Y1	BZV49-C24	24Y	BZV49-C62	62Y
BZV49-C3V9	3Y9	BZV49-C10	10Y	BZV49-C27	27Y	BZV49-C68	68Y
BZV49-C4V3	4Y3	BZV49-C11	11Y	BZV49-C30	30Y	BZV49-C75	75Y
BZV49-C4V7	4Y7	BZV49-C12	12Y	BZV49-C33	33Y	–	–
BZV49-C5V1	5Y1	BZV49-C13	13Y	BZV49-C36	36Y	–	–
BZV49-C5V6	5Y6	BZV49-C15	15Y	BZV49-C39	39Y	–	–

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Table "Per type"		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	1000	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.5	–	40	W
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a ceramic substrate; area = 2.5 cm^2; thickness = 0.7 mm.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 50 mA; see Fig.6	–	1.0	V

Per type

$T_j = 25$ °C; unless otherwise specified.

BZV49-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}		TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 7 and 8			TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.		MAX.	I_R (μA) MAX.	V_R (V)	MAX.
2V4	2.2	2.6	70	100	−3.5	−1.6	0	5	450	50	1.0	6.0
2V7	2.5	2.9	75	100	−3.5	−2.0	0	5	450	20	1.0	6.0
3V0	2.8	3.2	80	95	−3.5	−2.1	0	5	450	10	1.0	6.0
3V3	3.1	3.5	85	95	−3.5	−2.4	0	5	450	5	1.0	6.0
3V6	3.4	3.8	85	90	−3.5	−2.4	0	5	450	5	1.0	6.0
3V9	3.7	4.1	85	90	−3.5	−2.5	0	5	450	3	1.0	6.0
4V3	4.0	4.6	80	90	−3.5	−2.5	0	5	450	3	1.0	6.0
4V7	4.4	5.0	50	80	−3.5	−1.4	0.2	5	300	3	2.0	6.0
5V1	4.8	5.4	40	60	−2.7	−0.8	1.2	5	300	2	2.0	6.0
5V6	5.2	6.0	15	40	−2.0	1.2	2.5	5	300	1	2.0	6.0
6V2	5.8	6.6	6	10	0.4	2.3	3.7	5	200	3	4.0	6.0
6V8	6.4	7.2	6	15	1.2	3.0	4.5	5	200	2	4.0	6.0
7V5	7.0	7.9	6	15	2.5	4.0	5.3	5	150	1	5.0	4.0
8V2	7.7	8.7	6	15	3.2	4.6	6.2	5	150	0.7	5.0	4.0
9V1	8.5	9.6	6	15	3.8	5.5	7.0	5	150	0.5	6.0	3.0
10	9.4	10.6	8	20	4.5	6.4	8.0	5	90	0.2	7.0	3.0
11	10.4	11.6	10	20	5.4	7.4	9.0	5	85	0.1	8.0	2.5
12	11.4	12.7	10	25	6.0	8.4	10.0	5	85	0.1	8.0	2.5
13	12.4	14.1	10	30	7.0	9.4	11.0	5	80	0.1	8.0	2.5
15	13.8	15.6	10	30	9.2	11.4	13.0	5	75	0.05	10.5	2.0
16	15.3	17.1	10	40	10.4	12.4	14.0	5	75	0.05	11.2	1.5
18	16.8	19.1	10	45	12.4	14.4	16.0	5	70	0.05	12.6	1.5
20	18.8	21.2	15	55	14.4	16.4	18.0	5	60	0.05	14.0	1.5

BZV49-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}		TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 7 and 8			TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
										I_R (μA)	V_R (V)	
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.		MAX.	MAX.		MAX.
22	20.8	23.3	20	55	16.4	18.4	20.0	5	60	0.05	15.4	1.25
24	22.8	25.6	25	70	18.4	20.4	22.0	5	55	0.05	16.8	1.25
27	25.1	28.9	25	80	21.4	23.4	25.3	2	50	0.05	18.9	1.0
30	28.0	32.0	30	80	24.4	26.6	29.4	2	50	0.05	21.0	1.0
33	31.0	35.0	35	80	27.4	29.7	33.4	2	45	0.05	23.1	0.9
36	34.0	38.0	35	90	30.4	33.0	37.4	2	45	0.05	25.2	0.8
39	37.0	41.0	40	130	33.4	36.4	41.2	2	45	0.05	27.3	0.7
43	40.0	46.0	45	150	37.6	41.2	46.6	2	40	0.05	30.1	0.6
47	44.0	50.0	50	170	42.0	46.1	51.8	2	40	0.05	32.9	0.5
51	48.0	54.0	60	180	46.6	51.0	57.2	2	40	0.05	35.7	0.4
56	52.0	60.0	70	200	52.2	57.0	63.8	2	40	0.05	39.2	0.3
62	58.0	66.0	80	215	58.8	64.4	71.6	2	35	0.05	43.4	0.3
68	64.0	72.0	90	240	65.6	71.7	79.8	2	35	0.05	47.6	0.25
75	70.0	79.0	95	255	73.4	80.2	88.6	2	35	0.05	52.5	0.2

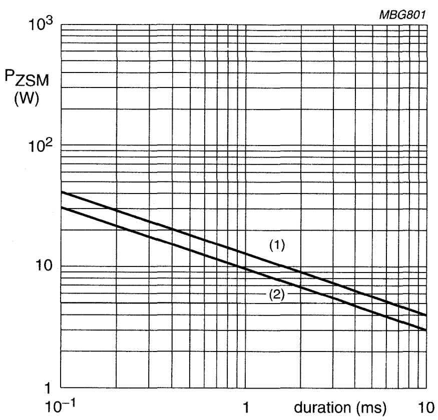
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		15	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	125	K/W

Note

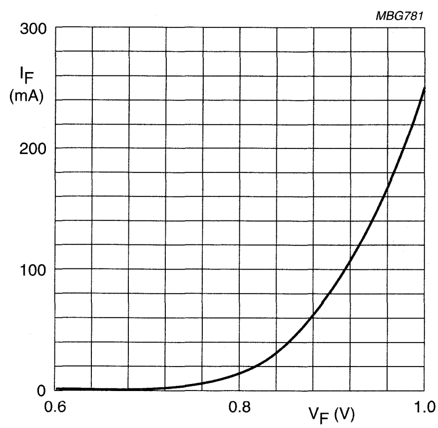
1. Device mounted on a ceramic substrate; area = 2.5 cm^2; thickness = 0.7 mm.

GRAPHICAL DATA



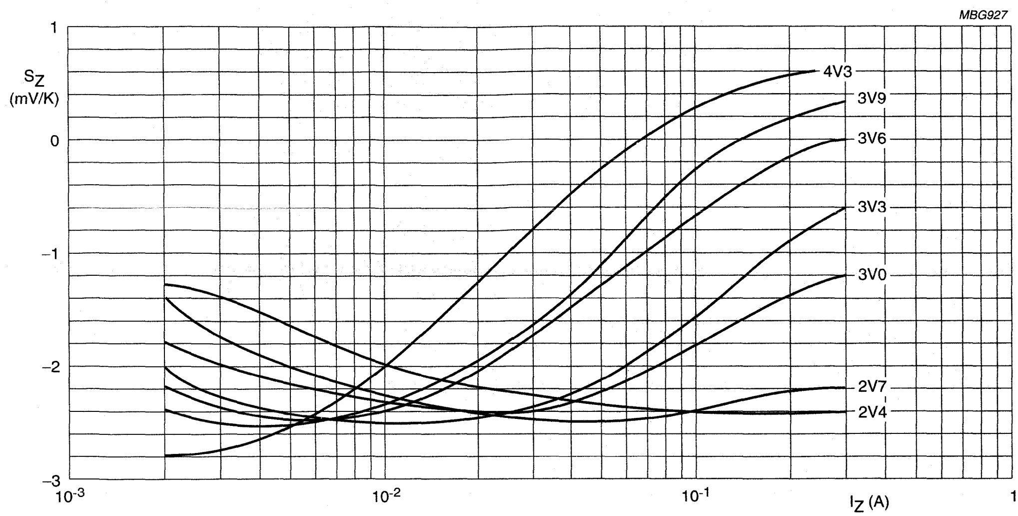
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.5 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



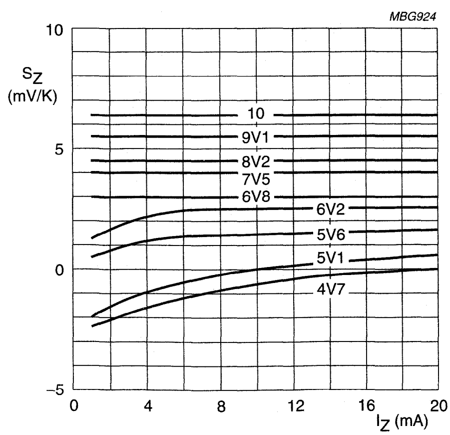
T_j = 25 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



BZV49-C2V4 to C4V3.
T_j = 25 to 150 °C.

Fig.7 Temperature coefficient as a function of working current; typical values.



BZV49-C4V7 to C10.
T_j = 25 to 150 °C.

Fig.8 Temperature coefficient as a function of working current; typical values.

Voltage regulator diodes

BZV55 series

FEATURES

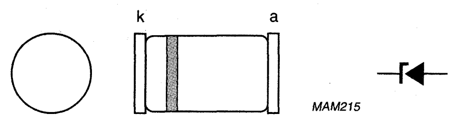
- Total power dissipation: max. 500 mW
- Three tolerance series: ±2%, ±3% and ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- Low-power voltage stabilizers or voltage references.

DESCRIPTION

Low-power voltage regulator diodes in small hermetically sealed glass SOD80C SMD packages. The diodes are available in the normalized E24 ±2% (BZV55-B), ±3% (BZV55-F) and ±5% (BZV55-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.



The cathode is indicated by a yellow band.

Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Tables 1 and 2		
P_{tot}	total power dissipation	T_{amb} ≤50 °C; note 1	–	400	mW
		tie-point ≤50 °C; note 1	–	500	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.3	–	40	W
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–65	+200	°C

Note

1. Device mounted on a ceramic substrate of 10 × 10 × 0.6 mm.

Voltage regulator diodes BZV55 series

ELECTRICAL CHARACTERISTICS

Total BZV55-B, F and C series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.4	0.9	V
I_R	reverse current			
	BZV55-B/F/C2V4	V_R = 1 V	50	μA
	BZV55-B/F/C2V7	V_R = 1 V	20	μA
	BZV55-B/F/C3V0	V_R = 1 V	10	μA
	BZV55-B/F/C3V3	V_R = 1 V	5	μA
	BZV55-B/F/C3V6	V_R = 1 V	5	μA
	BZV55-B/F/C3V9	V_R = 1 V	3	μA
	BZV55-B/F/C4V3	V_R = 1 V	3	μA
	BZV55-B/F/C4V7	V_R = 2 V	3	μA
	BZV55-B/F/C5V1	V_R = 2 V	2	μA
	BZV55-B/F/C5V6	V_R = 2 V	1	μA
	BZV55-B/F/C6V2	V_R = 4 V	3	μA
	BZV55-B/F/C6V8	V_R = 4 V	2	μA
	BZV55-B/F/C7V5	V_R = 5 V	1	μA
	BZV55-B/F/C8V2	V_R = 5 V	700	nA
	BZV55-B/F/C9V1	V_R = 6 V	500	nA
	BZV55-B/F/C10	V_R = 7 V	200	nA
	BZV55-B/F/C11	V_R = 8 V	100	nA
	BZV55-B/F/C12	V_R = 8 V	100	nA
	BZV55-B/F/C13	V_R = 8 V	100	nA
	BZV55-B/F/C15 to 75	V_R = 0.7V_{Znom}	50	nA

Table 1 Per type BZV55-**B/F/C2V4** to **B/F/C24**

T_j = 25 °C; unless otherwise specified.

BZV55-B or F or C XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 5 mA						DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 5 mA (see Figs 5 and 6)			DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	Tol. ±2% (B)		Tol. ±3% (F)		Tol. ±5% (C)		at I_{Ztest} = 1 mA		at I_{Ztest} = 5 mA						
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
2V4	2.35	2.45	2.33	2.47	2.2	2.6	275	600	70	100	−3.5	−1.6	0	450	6.0
2V7	2.65	2.75	2.62	2.78	2.5	2.9	300	600	75	100	−3.5	−2.0	0	450	6.0
3V0	2.94	3.06	2.91	3.09	2.8	3.2	325	600	80	95	−3.5	−2.1	0	450	6.0
3V3	3.23	3.37	3.20	3.40	3.1	3.5	350	600	85	95	−3.5	−2.4	0	450	6.0
3V6	3.53	3.67	3.49	3.71	3.4	3.8	375	600	85	90	−3.5	−2.4	0	450	6.0
3V9	3.82	3.98	3.78	4.02	3.7	4.1	400	600	85	90	−3.5	−2.5	0	450	6.0
4V3	4.21	4.39	4.17	4.43	4.0	4.6	410	600	80	90	−3.5	−2.5	0	450	6.0
4V7	4.61	4.79	4.56	4.84	4.4	5.0	425	500	50	80	−3.5	−1.4	0.2	300	6.0
5V1	5.00	5.20	4.95	5.25	4.8	5.4	400	480	40	60	−2.7	−0.8	1.2	300	6.0
5V6	5.49	5.71	5.43	5.77	5.2	6.0	80	400	15	40	−2.0	1.2	2.5	300	6.0
6V2	6.08	6.32	6.01	6.39	5.8	6.6	40	150	6	10	0.4	2.3	3.7	200	6.0
6V8	6.66	6.94	6.60	7.00	6.4	7.2	30	80	6	15	1.2	3.0	4.5	200	6.0
7V5	7.35	7.65	7.28	7.72	7.0	7.9	30	80	6	15	2.5	4.0	5.3	150	4.0
8V2	8.04	8.36	7.95	8.45	7.7	8.7	40	80	6	15	3.2	4.6	6.2	150	4.0
9V1	8.92	9.28	8.83	9.37	8.5	9.6	40	100	6	15	3.8	5.5	7.0	150	3.0
10	9.80	10.20	9.70	10.30	9.4	10.6	50	150	8	20	4.5	6.4	8.0	90	3.0
11	10.80	11.20	10.67	11.33	10.4	11.6	50	150	10	20	5.4	7.4	9.0	85	2.5
12	11.80	12.20	11.64	12.36	11.4	12.7	50	150	10	25	6.0	8.4	10.0	85	2.5
13	12.70	13.30	12.61	13.39	12.4	14.1	50	170	10	30	7.0	9.4	11.0	80	2.5
15	14.70	15.30	14.55	15.45	13.8	15.6	50	200	10	30	9.2	11.4	13.0	75	2.0
16	15.70	16.30	15.50	16.50	15.3	17.1	50	200	10	40	10.4	12.4	14.0	75	1.5
18	17.60	18.40	17.50	18.50	16.8	19.1	50	225	10	45	12.4	14.4	16.0	70	1.5
20	19.60	20.40	19.40	20.60	18.8	21.2	60	225	15	55	14.4	16.4	18.0	60	1.5
22	21.60	22.40	21.30	22.70	20.8	23.3	60	250	20	55	16.4	18.4	20.0	60	1.25
24	23.50	24.50	23.30	24.70	22.8	25.6	60	250	25	70	18.4	20.4	22.0	55	1.25

Table 2 Per type BZV55-**B/F/C27** to **B/F/C75**

$T_j = 25$ °C; unless otherwise specified.

BZV55-B or F or C XXX	WORKING VOLTAGE V_Z (V) at $I_{Ztest} = 2$ mA						DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at $I_{Ztest} = 2$ mA (see Figs 5 and 6)			DIODE CAP. C_d (pF) at f = 1 MHz; $V_R = 0$ V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at $t_p = 100$ µs; $T_{amb} = 25$ °C
	Tol. ±2% (B)		Tol. ±3% (F)		Tol. ±5% (C)		at $I_{Ztest} = 0.5$ mA		at $I_{Ztest} = 2$ mA						
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
27	26.50	27.50	26.20	27.80	25.1	28.9	65	300	25	80	21.4	23.4	25.3	50	1.0
30	29.40	30.60	29.10	30.90	28.0	32.0	70	300	30	80	24.4	26.6	29.4	50	1.0
33	32.30	33.70	32.00	34.00	31.0	35.0	75	325	35	80	27.4	29.7	33.4	45	0.9
36	35.30	36.70	34.90	37.10	34.0	38.0	80	350	35	90	30.4	33.0	37.4	45	0.8
39	38.20	39.80	37.80	40.20	37.0	41.0	80	350	40	130	33.4	36.4	41.2	45	0.7
43	42.10	43.90	41.70	44.30	40.0	46.0	85	375	45	150	37.6	41.2	46.6	40	0.6
47	46.10	47.90	45.60	48.40	44.0	50.0	85	375	50	170	42.0	46.1	51.8	40	0.5
51	50.00	52.00	49.50	52.50	48.0	54.0	90	400	60	180	46.6	51.0	57.2	40	0.4
56	54.90	57.10	54.30	57.70	52.0	60.0	100	425	70	200	52.2	57.0	63.8	40	0.3
62	60.80	63.20	60.10	63.90	58.0	66.0	120	450	80	215	58.8	64.4	71.6	35	0.3
68	66.60	69.40	66.00	70.00	64.0	72.0	150	475	90	240	65.6	71.7	79.8	35	0.25
75	73.50	76.50	72.80	77.20	70.0	79.0	170	500	95	255	73.4	80.2	88.6	35	0.2

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	see Fig.2 and note 1	380	K/W

Note

1. Device mounted on a ceramic substrate of 10 × 10 × 0.6 mm.

GRAPHICAL DATA

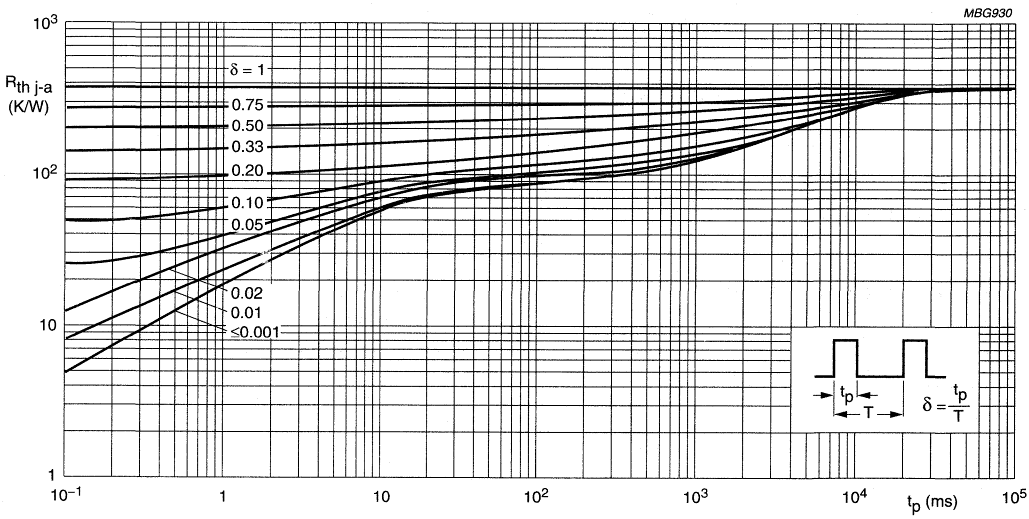
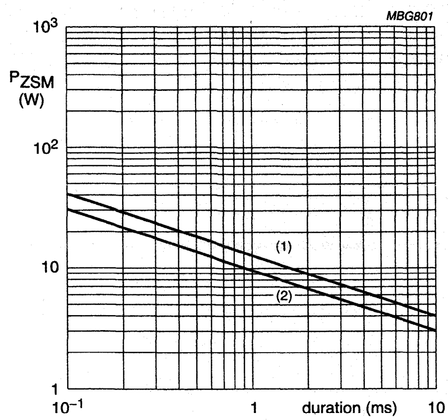
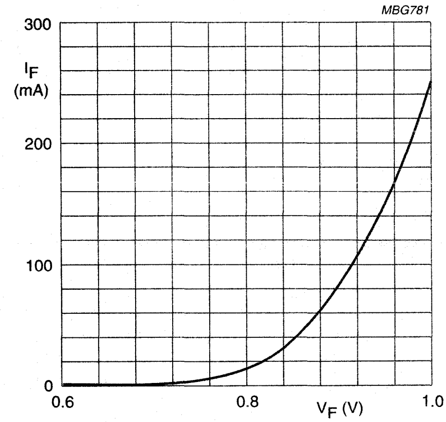


Fig.2 Thermal resistance from junction to ambient as a function of pulse duration.



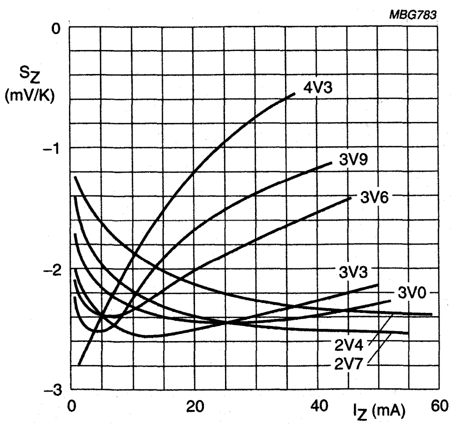
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.3 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



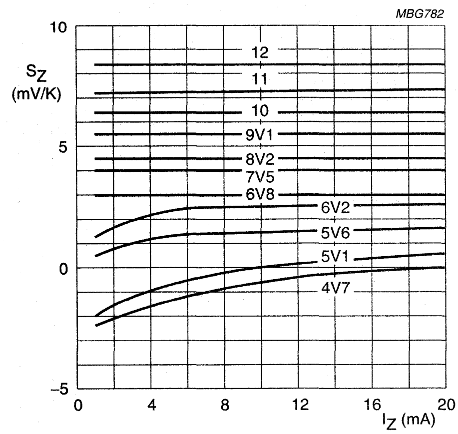
T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.



BZV55-B/F/C2V4 to B/F/C4V3.
T_j = 25 to 150 °C.

Fig.5 Temperature coefficient as a function of working current; typical values.



BZV55-B/F/C4V7 to B/F/C12.
T_j = 25 to 150 °C.

Fig.6 Temperature coefficient as a function of working current; typical values.

Voltage regulator diodes

BZV85 series

FEATURES

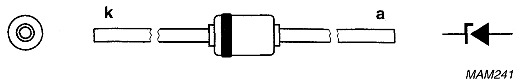
- Total power dissipation: max. 1.3 W
- Tolerance series: ±5%
- Working voltage range: nom. 3.6 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 60 W.

APPLICATIONS

- Stabilization purposes.

DESCRIPTION

Medium-power voltage regulator diodes in hermetically sealed leaded glass SOD66 (DO-41) packages. The diodes are available in the normalized E24 ±5% tolerance range. The series consists of 33 types with nominal working voltages from 3.6 to 75 V (BZV85-C3V6 to BZV85-C75).



The diodes are type branded.

Fig.1 Simplified outline (SOD66; DO-41) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	500	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.3	see Table "Per type"		
		t_p = 10 ms; half sinewave; T_j = 25 °C prior to surge	see Table "Per type"		
P_{tot}	total power dissipation	T_{amb} = 25 °C; lead length 10 mm; note 1	–	1.0	W
		note 2	–	1.3	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	–	60	W
T_{stg}	storage temperature		−65	+200	°C
T_j	junction temperature		–	200	°C

Notes

1. Device mounted on a printed circuit-board with 1 cm^2 copper area per lead.
2. If the leads are kept at T_{tp} = 55 °C at 4 mm from body.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 50 mA; see Fig.4	–	1.0	V

Per type

T_j = 25 °C; unless otherwise specified.

BZV85-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 5 and 6		TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM}	
								I_R (μA)	V_R (V)	at t_p = 100 μs; T_{amb} = 25 °C	at t_p = 10 ms; T_{amb} = 25 °C
	MIN.	MAX.	MAX.	MIN.	MAX.		MAX.	MAX.		MAX. (A)	MAX. (mA)
3V6	3.4	3.8	15	−3.5	−1.0	60	450	50	1.0	8.0	2000
3V9	3.7	4.1	15	−3.5	−1.0	60	450	10	1.0	8.0	1950
4V3	4.0	4.6	13	−2.7	0	50	450	5	1.0	8.0	1850
4V7	4.4	5.0	13	−2.0	0.7	45	300	3	1.0	8.0	1800
5V1	4.8	5.4	10	−0.5	2.2	45	300	3	2.0	8.0	1750
5V6	5.2	6.0	7	0	2.7	45	300	2	2.0	8.0	1700
6V2	5.8	6.6	4	0.6	3.6	35	200	2	3.0	7.0	1620
6V8	6.4	7.2	3.5	1.3	4.3	35	200	2	4.0	7.0	1550
7V5	7.0	7.9	3	2.5	5.5	35	150	1	4.5	5.0	1500
8V2	7.7	8.7	5	3.1	6.1	25	150	0.7	5.0	5.0	1400
9V1	8.5	9.6	5	3.8	7.2	25	150	0.7	6.5	4.0	1340
10	9.4	10.6	8	4.7	8.5	25	90	0.2	7.0	4.0	1200
11	10.4	11.6	10	5.3	9.3	20	85	0.2	7.7	3.0	1100
12	11.4	12.7	10	6.3	10.8	20	85	0.2	8.4	3.0	1000
13	12.4	14.1	10	7.4	12.0	20	80	0.2	9.1	3.0	900
15	13.8	15.6	15	8.9	13.6	15	75	0.05	10.5	2.5	760
16	15.3	17.1	15	10.7	15.4	15	75	0.05	11.0	1.75	700
18	16.8	19.1	20	11.8	17.1	15	70	0.05	12.5	1.75	600
20	18.8	21.2	24	13.6	19.1	10	60	0.05	14.0	1.75	540
22	20.8	23.3	25	16.6	22.1	10	60	0.05	15.5	1.5	500
24	22.8	25.6	30	18.3	24.3	10	55	0.05	17	1.5	450
27	25.1	28.9	40	20.1	27.5	8	50	0.05	19	1.2	400
30	28.0	32.0	45	22.4	32.0	8	50	0.05	21	1.2	380

BZV85-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 5 and 6		TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM}	
								I_R (μA)	V_R (V)	at t_p = 100 μs; T_{amb} = 25 °C	at t_p = 10 ms; T_{amb} = 25 °C
	MIN.	MAX.	MAX.	MIN.	MAX.		MAX.	MAX.		MAX. (A)	MAX. (mA)
33	31.0	35.0	45	24.8	35.0	8	45	0.05	23	1.0	350
36	34.0	38.0	50	27.2	39.9	8	45	0.05	25	0.9	320
39	37.0	41.0	60	29.6	43.0	6	45	0.05	27	0.8	296
43	40.0	46.0	75	34.0	48.3	6	40	0.05	30	0.7	270
47	44.0	50.0	100	37.4	52.5	4	40	0.05	33	0.6	246
51	48.0	54.0	125	40.8	56.5	4	40	0.05	36	0.5	226
56	52.0	60.0	150	46.8	63.0	4	40	0.05	39	0.4	208
62	58.0	66.0	175	52.2	72.5	4	35	0.05	43	0.4	186
68	64.0	72.0	200	60.5	81.0	4	35	0.05	48	0.35	171
75	70.0	80.0	225	66.5	88.0	4	35	0.05	53	0.3	161

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 4 mm; see Fig.2	110	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length10 mm; note 1	175	K/W

Note

1. Device mounted on a printed circuit-board with 1 cm^2 copper area per lead.

GRAPHICAL DATA

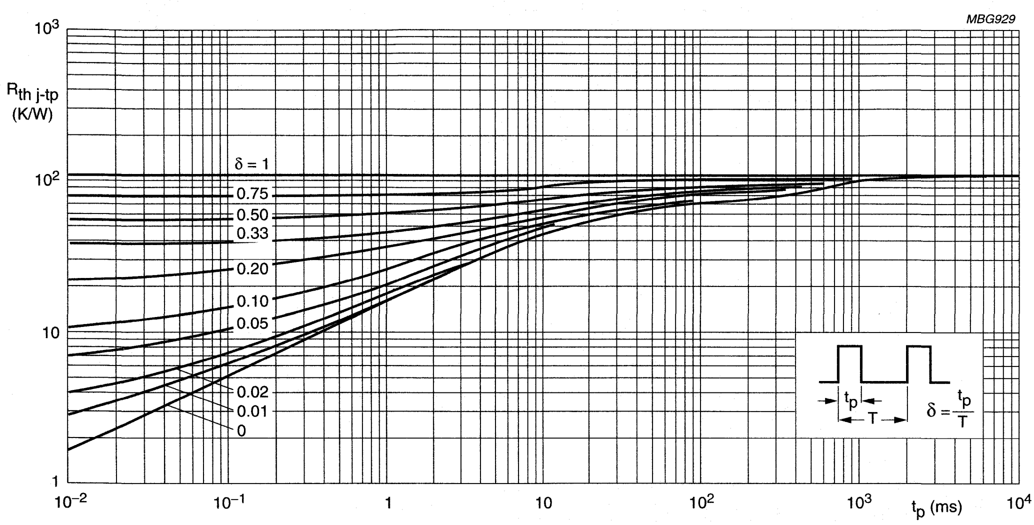
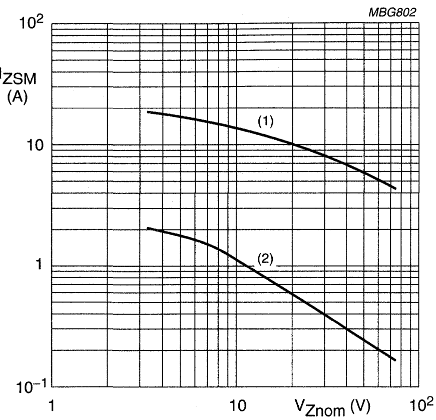


Fig.2 Thermal resistance from junction to tie-point with a lead length of 4 mm.

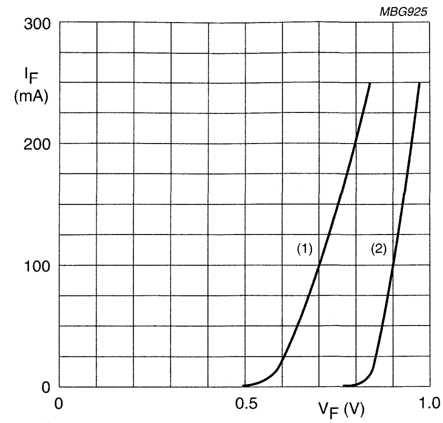
Voltage regulator diodes

BZV85 series



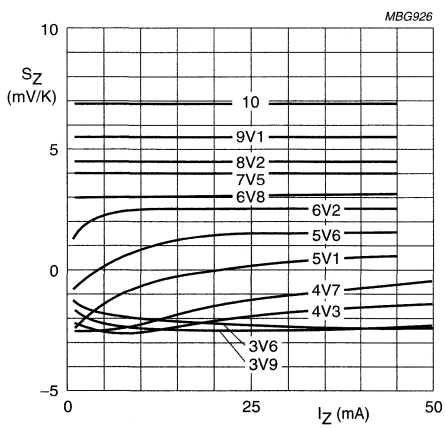
(1) t_p = 10 μs; half sinewave; T_{amb} = 25 °C.
(2) t_p = 10 ms; half sinewave; T_{amb} = 25 °C.

Fig.3 Non-repetitive peak reverse current as a function of the nominal working voltage.



(1) T_j = 200 °C.
(2) T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.

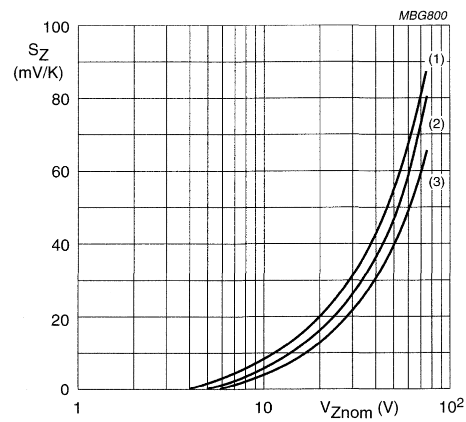


BZV85-C3V6 to C10.

T_j = 25 to 150 °C.

For types above 7.5 V the temperature coefficient is independent of current; see Table "Per type".

Fig.5 Temperature coefficient as a function of working current; typical values.



$I_Z = I_{Ztest}$; T_j = 25 to 150 °C.
(1) Maximum values.
(2) Typical values.
(3) Minimum values.

Fig.6 Temperature coefficient as a function of nominal working voltage.

Voltage regulator diodes — BZV90 series

FEATURES

- Total power dissipation: max. 1 500 mW
- Tolerance series: ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- General regulation functions.

DESCRIPTION

Medium-power voltage regulator diodes in plastic SMD SOT223 packages.

The diodes are available in the normalized E24 ±5% tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V (BZV90-C2V4 to C75).

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	anode
4	cathode

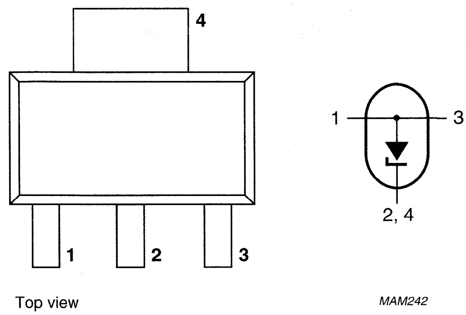


Fig.7 Simplified outline (SOT223) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	400	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Table "Per type"		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	1 500	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.8	–	40	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 double-sided copper-clad printed circuit-board; copper area = 2 cm^2.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 50 mA; see Fig.9	–	1.0	V

Per type

T_j = 25 °C; unless otherwise specified.

BZV90-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}		TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 10 and 11			TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
										I_R (μA)	V_R (V)	
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.		MAX.	MAX.		MAX.
2V4	2.2	2.6	70	100	−3.5	−1.6	0	5	450	50	1.0	6.0
2V7	2.5	2.9	75	100	−3.5	−2.0	0	5	450	20	1.0	6.0
3V0	2.8	3.2	80	95	−3.5	−2.1	0	5	450	10	1.0	6.0
3V3	3.1	3.5	85	95	−3.5	−2.4	0	5	450	5	1.0	6.0
3V6	3.4	3.8	85	90	−3.5	−2.4	0	5	450	5	1.0	6.0
3V9	3.7	4.1	85	90	−3.5	−2.5	0	5	450	3	1.0	6.0
4V3	4.0	4.6	80	90	−3.5	−2.5	0	5	450	3	1.0	6.0
4V7	4.4	5.0	50	80	−3.5	−1.4	0.2	5	300	3	2.0	6.0
5V1	4.8	5.4	40	60	−2.7	−0.8	1.2	5	300	2	2.0	6.0
5V6	5.2	6.0	15	40	−2.0	1.2	2.5	5	300	1	2.0	6.0
6V2	5.8	6.6	6	10	0.4	2.3	3.7	5	200	3	4.0	6.0
6V8	6.4	7.2	6	15	1.2	3.0	4.5	5	200	2	4.0	6.0
7V5	7.0	7.9	6	15	2.5	4.0	5.3	5	150	1	5.0	4.0
8V2	7.7	8.7	6	15	3.2	4.6	6.2	5	150	0.7	5.0	4.0
9V1	8.5	9.6	6	15	3.8	5.5	7.0	5	150	0.5	6.0	3.0
10	9.4	10.6	8	20	4.5	6.4	8.0	5	90	0.2	7.0	3.0
11	10.4	11.6	10	20	5.4	7.4	9.0	5	85	0.1	8.0	2.5
12	11.4	12.7	10	25	6.0	8.4	10.0	5	85	0.1	8.0	2.5
13	12.4	14.1	10	30	7.0	9.4	11.0	5	80	0.1	8.0	2.5
15	13.8	15.6	10	30	9.2	11.4	13.0	5	75	0.05	10.5	2.0
16	15.3	17.1	10	40	10.4	12.4	14.0	5	75	0.05	11.2	1.5
18	16.8	19.1	10	45	12.4	14.4	16.0	5	70	0.05	12.6	1.5
20	18.8	21.2	15	55	14.4	16.4	18.0	5	60	0.05	14.0	1.5

BZV90-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}		TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 10 and 11			TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
										I_R (μA)	V_R (V)	
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.		MAX.	MAX.		MAX.
22	20.8	23.3	20	55	16.4	18.4	20.0	5	60	0.05	15.4	1.25
24	22.8	25.6	25	70	18.4	20.4	22.0	5	55	0.05	16.8	1.25
27	25.0	28.9	25	80	21.4	23.4	25.3	2	50	0.05	18.9	1.0
30	28.0	32.0	30	80	24.4	26.6	29.4	2	50	0.05	21.0	1.0
33	31.0	35.0	35	80	27.4	29.7	33.4	2	45	0.05	23.1	0.9
36	34.0	38.0	35	90	30.4	33.0	37.4	2	45	0.05	25.2	0.8
39	37.0	41.0	40	130	33.4	36.4	41.2	2	45	0.05	27.3	0.7
43	40.0	46.0	45	150	37.6	41.2	46.6	2	40	0.05	30.1	0.6
47	44.0	50.0	50	170	42.0	46.1	51.8	2	40	0.05	32.9	0.5
51	48.0	54.0	60	180	46.6	51.0	57.2	2	40	0.05	35.7	0.4
56	52.0	60.0	70	200	52.2	57.0	63.8	2	40	0.05	39.2	0.3
62	58.0	66.0	80	215	58.8	64.4	71.6	2	35	0.05	43.4	0.3
68	64.0	72.0	90	240	65.6	71.7	79.8	2	35	0.05	47.6	0.25
75	70.0	79.0	95	255	73.4	80.2	88.6	2	35	0.05	52.5	0.2

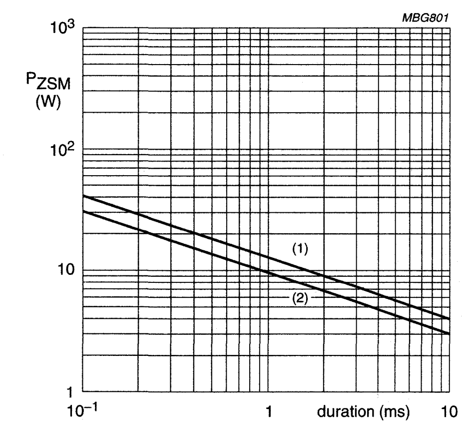
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length max.; note 1	83.3	K/W

Note

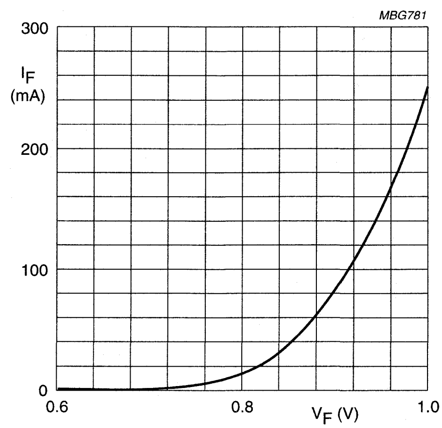
1. Device mounted on an FR4 double-sided copper-clad printed circuit-board; copper area = 2 cm^2.

GRAPHICAL DATA



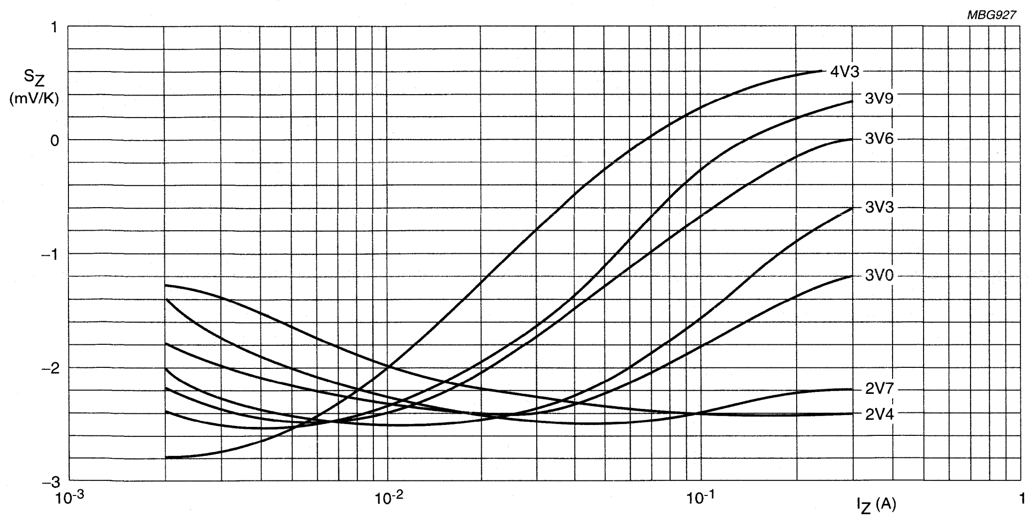
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.8 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



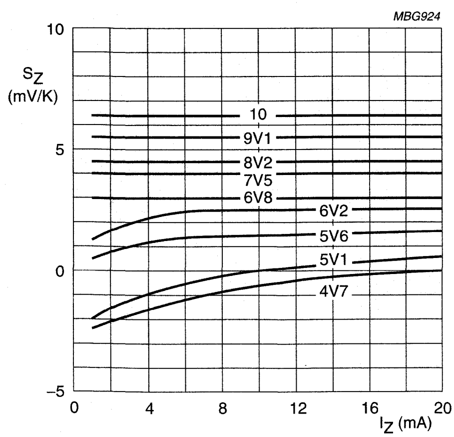
T_j = 25 °C.

Fig.9 Forward current as a function of forward voltage; typical values.



BZV90-C2V4 to C4V3.
T_j = 25 to 150 °C.

Fig.10 Temperature coefficient as a function of working current; typical values.



BZV90-C4V7 to C10.
T_j = 25 to 150 °C.

Fig.11 Temperature coefficient as a function of working current; typical values.

Voltage regulator diodes | BZX55 series

FEATURES

- Total power dissipation: max. 500 mW
- Tolerance series: ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

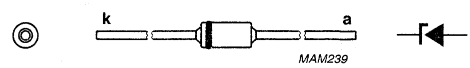
APPLICATIONS

- Low voltage stabilizers or voltage references.

DESCRIPTION

Low-power voltage regulator diodes in hermetically sealed leaded glass SOD27 (DO-35) packages.

The diodes are available in the normalized E24 ±5% tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V (BZX55-C2V4 to BZX55-C75).



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Table "Per type"		
P_{tot}	total power dissipation	T_{amb} = 50 °C; note 1	–	400	mW
		T_{amb} = 50 °C; note 2	–	500	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	–	40	W
		t_p = 8.3 ms; square wave; T_j ≤ 150 °C prior to surge	–	30	W
T_{stg}	storage temperature		−65	+200	°C
T_j	junction temperature		–	200	°C

Notes

1. Device mounted on a printed circuit-board without metallization pad; lead length max.
2. Tie-point temperature ≤ 50 °C; lead length 8 mm.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; see Fig.4	–	1.0	V

Per type

T_j = 25 °C; unless otherwise specified.

BZX55-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω)		TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 5 and 6	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)			NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
			at I_Z	at I_{Ztest}				at T_j = 25 °C	at T_j = 150 °C	V_R (V)	
	MIN.	MAX.	MAX.	MAX.	TYP.		MAX.	MAX.	MAX.		MAX.
2V4	2.28	2.56	600	85	−1.8	5	450	50	100	1.0	6.0
2V7	2.5	2.9	600	85	−1.9	5	450	10	50	1.0	6.0
3V0	2.8	3.2	600	85	−2.1	5	450	4	40	1.0	6.0
3V3	3.1	3.5	600	85	−2.2	5	450	2	40	1.0	6.0
3V6	3.4	3.8	600	85	−2.4	5	450	2	40	1.0	6.0
3V9	3.7	4.1	600	85	−2.4	5	450	2	40	1.0	6.0
4V3	4.0	4.6	600	80	−2.4	5	450	1	20	1.0	6.0
4V7	4.4	5.0	600	70	−1.4	5	300	0.5	10	1.0	6.0
5V1	4.8	5.4	550	50	−0.8	5	300	0.1	2	1.0	6.0
5V6	5.2	6.0	450	30	1.6	5	300	0.1	2	1.0	6.0
6V2	5.8	6.6	200	10	2.2	5	200	0.1	2	2.0	6.0
6V8	6.4	7.2	150	8	3.0	5	200	0.1	2	3.0	6.0
7V5	7.0	7.9	50	7	3.8	5	150	0.1	2	5.0	4.0
8V2	7.7	8.7	50	7	4.5	5	150	0.1	2	6.15	4.0
9V1	8.5	9.6	50	10	5.5	5	150	0.1	2	6.8	3.0
10	9.4	10.6	70	15	6.5	5	90	0.1	2	7.5	3.0
11	10.4	11.6	70	20	7.7	5	85	0.1	2	8.25	2.5
12	11.4	12.7	90	20	8.4	5	85	0.1	2	9.0	2.5
13	12.4	14.1	110	26	9.8	5	80	0.1	2	9.75	2.5
15	13.8	15.6	110	30	11.3	5	75	0.1	2	11.25	2.0
16	15.3	17.1	170	40	12.8	5	75	0.1	2	12.0	1.5
18	16.8	19.1	170	50	14.4	5	70	0.1	2	13.5	1.5
20	18.8	21.2	220	55	16.0	5	60	0.1	2	15.0	1.5

BZX55-CXXX	WORKING VOLTAGE V_Z (V) at I_{Ztest}		DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (mV/K) at I_{Ztest} see Figs 5 and 6	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA) at T_j = 25 °C	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA) at T_j = 150 °C	V_R (V)	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	MIN.	MAX.	MAX.	MAX.	TYP.		MAX.	MAX.	MAX.		MAX.
22	20.8	23.3	220	55	18.7	5	60	0.1	2	16.5	1.25
24	22.8	25.6	220	80	20.4	5	55	0.1	2	18.0	1.25
27	25.1	28.9	220	80	22.9	5	50	0.1	2	20.25	1.0
30	28.0	32.0	220	80	27.0	5	50	0.1	2	22.25	1.0
33	31.0	35.0	220	80	29.7	5	45	0.1	2	24.75	0.9
36	34.0	38.0	220	80	32.4	5	45	0.1	2	27.0	0.8
39	37.0	41.0	500	90	35.1	2.5	45	0.1	2	29.25	0.7
43	40.0	46.0	600	90	38.7	2.5	40	0.1	2	32.25	0.6
47	44.0	50.0	700	110	44.0	2.5	40	0.1	2	35.25	0.5
51	48.0	54.0	700	125	49.0	2.5	40	0.1	2	38.25	0.4
56	52.0	60.0	1000	135	55.0	2.5	40	0.1	2	42.0	0.3
62	58.0	66.0	1000	150	62.0	2.5	35	0.1	2	46.5	0.3
68	64.0	72.0	1000	200	70.0	2.5	35	0.1	2	51.0	0.25
75	70.0	79.0	1500	250	78.0	2.5	35	0.1	2	56.25	0.2

Note

1. For BZX55-C2V4 up to C36 I_Z = 1 mA; for C39 up to C75 I_Z = 0.5 mA.

Voltage regulator diodes BZX55 series

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 8 mm	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length max.; see Fig.2 and note 1	380	K/W

Note

1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA

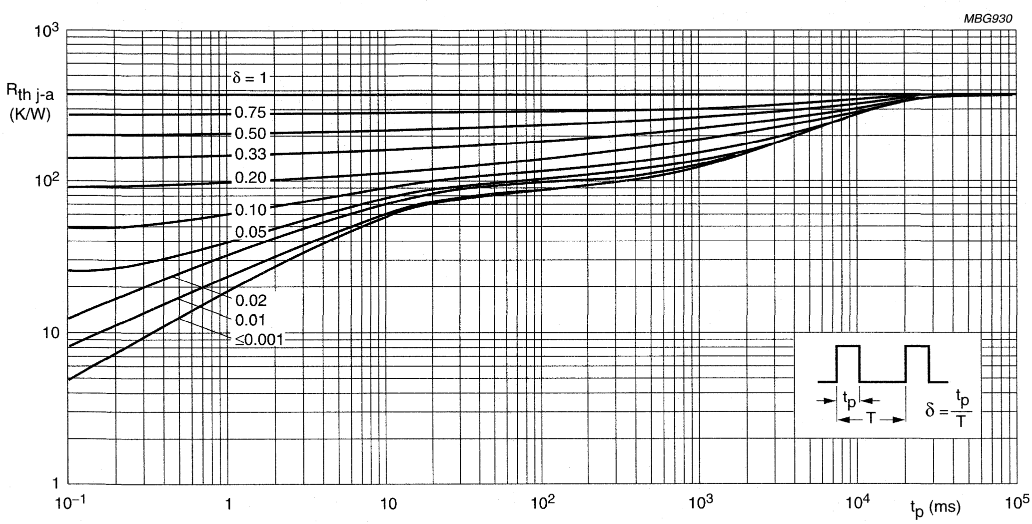
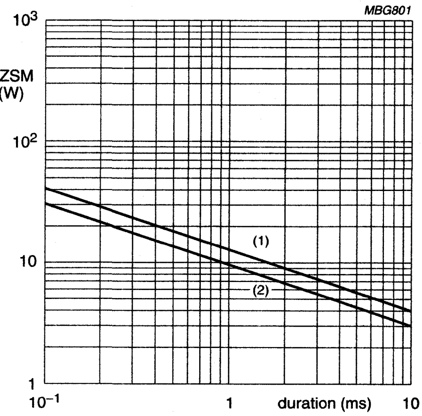


Fig.2 Thermal resistance from junction to ambient as a function of pulse duration.



(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.3 Maximum permissible non-repetitive peak reverse power dissipation versus duration.

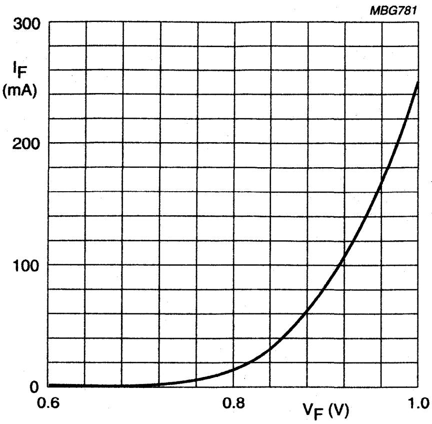
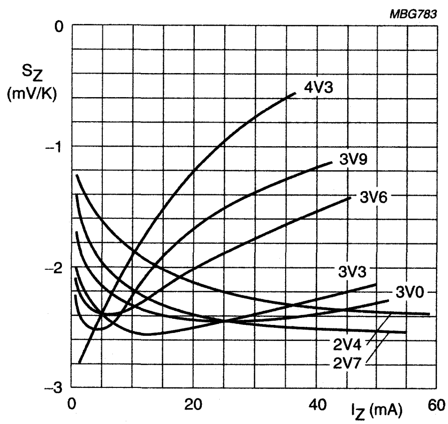
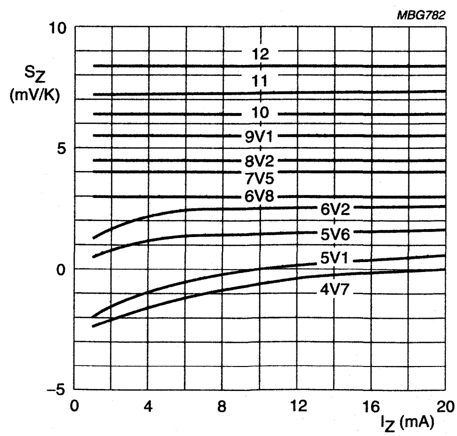


Fig.4 Forward current as a function of forward voltage; typical values.



BZX55-C2V4 to C4V3.
T_j = 25 to 150 °C.

Fig.5 Temperature coefficient as a function of working current; typical values.



BZX55-C4V7 to C12.
T_j = 25 to 150 °C.

Fig.6 Temperature coefficient as a function of working current; typical values.

Voltage regulator diodes BZX79 series

FEATURES

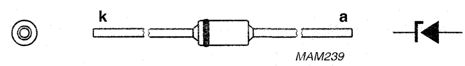
- Total power dissipation: max. 500 mW
- Four tolerance series: ±1%, ±2%, ±3% and ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- Low voltage stabilizers or voltage references.

DESCRIPTION

Low-power voltage regulator diodes in hermetically sealed leaded glass SOD27 (DO-35) packages. The diodes are available in the normalized E24 ±1% (BZX79-A), ±2% (BZX79-B), ±3% (BZX79-F) and ±5% (BZX79-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 µs; square wave; T_j = 25 °C prior to surge	see Tables 1, 2, 3 and 4		
P_{tot}	total power dissipation	T_{amb} = 50 °C; note 1	–	400	mW
		T_{amb} = 50 °C; note 2	–	500	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square wave; T_j = 25 °C prior to surge; see Fig.3	–	40	W
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–65	+200	°C

Notes

1. Device mounted on a printed circuit-board without metallization pad; lead length max.
2. Tie-point temperature ≤ 50 °C; max. lead length 8 mm.

ELECTRICAL CHARACTERISTICS

Total BZX79-A and B and F and C series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.4	0.9	V
I_R	reverse current			
	BZX79-A/B/F/C2V4	V_R = 1 V	50	μA
	BZX79-A/B/F/C2V7	V_R = 1 V	20	μA
	BZX79-A/B/F/C3V0	V_R = 1 V	10	μA
	BZX79-A/B/F/C3V3	V_R = 1 V	5	μA
	BZX79-A/B/F/C3V6	V_R = 1 V	5	μA
	BZX79-A/B/F/C3V9	V_R = 1 V	3	μA
	BZX79-A/B/F/C4V3	V_R = 1 V	3	μA
	BZX79-A/B/F/C4V7	V_R = 2 V	3	μA
	BZX79-A/B/F/C5V1	V_R = 2 V	2	μA
	BZX79-A/B/F/C5V6	V_R = 2 V	1	μA
	BZX79-A/B/F/C6V2	V_R = 4 V	3	μA
	BZX79-A/B/F/C6V8	V_R = 4 V	2	μA
	BZX79-A/B/F/C7V5	V_R = 5 V	1	μA
	BZX79-A/B/F/C8V2	V_R = 5 V	700	nA
	BZX79-A/B/F/C9V1	V_R = 6 V	500	nA
	BZX79-A/B/F/C10	V_R = 7 V	200	nA
	BZX79-A/B/F/C11	V_R = 8 V	100	nA
	BZX79-A/B/F/C12	V_R = 8 V	100	nA
	BZX79-A/B/F/C13	V_R = 8 V	100	nA
	BZX79-A/B/F/C15 to 75	$V_R = 0.7V_{Znom}$	50	nA

Table 1 Per type BZX79-**A/B2V4** to **A/B24**

T_j = 25 °C; unless otherwise specified.

BZX79- A or B XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 5 mA				DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 5 mA (see Figs 5 and 6)			DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 µs; T_{amb} = 25 °C
	Tol. ±1% (A)		Tol. ±2% (B)		at I_{Ztest} = 1 mA		at I_{Ztest} = 5 mA						
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
2V4	2.37	2.43	2.35	2.45	275	600	70	100	−3.5	−1.6	0	450	6.0
2V7	2.67	2.73	2.65	2.75	300	600	75	100	−3.5	−2.0	0	450	6.0
3V0	2.97	3.03	2.94	3.06	325	600	80	95	−3.5	−2.1	0	450	6.0
3V3	3.26	3.34	3.23	3.37	350	600	85	95	−3.5	−2.4	0	450	6.0
3V6	3.56	3.64	3.53	3.67	375	600	85	90	−3.5	−2.4	0	450	6.0
3V9	3.86	3.94	3.82	3.98	400	600	85	90	−3.5	−2.5	0	450	6.0
4V3	4.25	4.35	4.21	4.39	410	600	80	90	−3.5	−2.5	0	450	6.0
4V7	4.65	4.75	4.61	4.79	425	500	50	80	−3.5	−1.4	0.2	300	6.0
5V1	5.04	5.16	5.00	5.20	400	480	40	60	−2.7	−0.8	1.2	300	6.0
5V6	5.54	5.66	5.49	5.71	80	400	15	40	−2.0	1.2	2.5	300	6.0
6V2	6.13	6.27	6.08	6.32	40	150	6	10	0.4	2.3	3.7	200	6.0
6V8	6.73	6.87	6.66	6.94	30	80	6	15	1.2	3.0	4.5	200	6.0
7V5	7.42	7.58	7.35	7.65	30	80	6	15	2.5	4.0	5.3	150	4.0
8V2	8.11	8.29	8.04	8.36	40	80	6	15	3.2	4.6	6.2	150	4.0
9V1	9.00	9.20	8.92	9.28	40	100	6	15	3.8	5.5	7.0	150	3.0
10	9.90	10.10	9.80	10.20	50	150	8	20	4.5	6.4	8.0	90	3.0
11	10.89	11.11	10.80	11.20	50	150	10	20	5.4	7.4	9.0	85	2.5
12	11.88	12.12	11.80	12.20	50	150	10	25	6.0	8.4	10.0	85	2.5
13	12.87	13.13	12.70	13.30	50	170	10	30	7.0	9.4	11.0	80	2.5
15	14.85	15.15	14.70	15.30	50	200	10	30	9.2	11.4	13.0	75	2.0
16	15.84	16.16	15.70	16.30	50	200	10	40	10.4	12.4	14.0	75	1.5
18	17.82	18.18	17.60	18.40	50	225	10	45	12.4	14.4	16.0	70	1.5
20	19.80	20.20	19.60	20.40	60	225	15	55	14.4	16.4	18.0	60	1.5
22	21.78	22.22	21.60	22.40	60	250	20	55	16.4	18.4	20.0	60	1.25
24	23.76	24.24	23.50	24.50	60	250	25	70	18.4	20.4	22.0	55	1.25

Table 2 Per type BZX79-**A/B27** to **A/B75**

T_j = 25 °C; unless otherwise specified.

BZX79-A or B XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 2 mA				DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 2 mA (see Figs 5 and 6)			DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 µs; T_{amb} = 25 °C
	Tol. ±1% (A)		Tol. ±2% (B)		at I_{Ztest} = 0.5 mA		at I_{Ztest} = 2 mA						
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
27	26.73	27.27	26.50	27.50	65	300	25	80	21.4	23.4	25.3	50	1.0
30	29.70	30.30	29.40	30.60	70	300	30	80	24.4	26.6	29.4	50	1.0
33	32.67	33.33	32.30	33.70	75	325	35	80	27.4	29.7	33.4	45	0.9
36	35.64	36.36	35.30	36.70	80	350	35	90	30.4	33.0	37.4	45	0.8
39	38.61	39.39	38.20	39.80	80	350	40	130	33.4	36.4	41.2	45	0.7
43	42.57	43.43	42.10	43.90	85	375	45	150	37.6	41.2	46.6	40	0.6
47	46.53	47.47	46.10	47.90	85	375	50	170	42.0	46.1	51.8	40	0.5
51	50.49	51.51	50.00	52.00	90	400	60	180	46.6	51.0	57.2	40	0.4
56	55.44	56.56	54.90	57.10	100	425	70	200	52.2	57.0	63.8	40	0.3
62	61.38	62.62	60.80	63.20	120	450	80	215	58.8	64.4	71.6	35	0.3
68	67.32	68.68	66.60	69.40	150	475	90	240	65.6	71.7	79.8	35	0.25
75	74.25	75.75	73.50	76.50	170	500	95	255	73.4	80.2	88.6	35	0.2

Table 3 Per type BZX79-**F/C2V4** to **F/C24**

T_j = 25 °C; unless otherwise specified.

BZX79- F or C XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 5 mA Tol. ±3% (F) MIN.	Tol. ±3% (F) MAX.	Tol. ±5% (C) MIN.	Tol. ±5% (C) MAX.	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest} = 1 mA TYP.	at I_{Ztest} = 1 mA MAX.	at I_{Ztest} = 5 mA TYP.	at I_{Ztest} = 5 mA MAX.	TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 5 mA (see Figs 5 and 6) MIN.	TYP.	MAX.	DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V MAX.	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 µs; T_{amb} = 25 °C MAX.
2V4	2.33	2.47	2.2	2.6	275	600	70	100	−3.5	−1.6	0	450	6.0
2V7	2.62	2.78	2.5	2.9	300	600	75	100	−3.5	−2.0	0	450	6.0
3V0	2.91	3.09	2.8	3.2	325	600	80	95	−3.5	−2.1	0	450	6.0
3V3	3.20	3.40	3.1	3.5	350	600	85	95	−3.5	−2.4	0	450	6.0
3V6	3.49	3.71	3.4	3.8	375	600	85	90	−3.5	−2.4	0	450	6.0
3V9	3.78	4.02	3.7	4.1	400	600	85	90	−3.5	−2.5	0	450	6.0
4V3	4.17	4.43	4.0	4.6	410	600	80	90	−3.5	−2.5	0	450	6.0
4V7	4.56	4.84	4.4	5.0	425	500	50	80	−3.5	−1.4	0.2	300	6.0
5V1	4.95	5.25	4.8	5.4	400	480	40	60	−2.7	−0.8	1.2	300	6.0
5V6	5.43	5.77	5.2	6.0	80	400	15	40	−2.0	1.2	2.5	300	6.0
6V2	6.01	6.39	5.8	6.6	40	150	6	10	0.4	2.3	3.7	200	6.0
6V8	6.60	7.00	6.4	7.2	30	80	6	15	1.2	3.0	4.5	200	6.0
7V5	7.28	7.72	7.0	7.9	30	80	6	15	2.5	4.0	5.3	150	4.0
8V2	7.95	8.45	7.7	8.7	40	80	6	15	3.2	4.6	6.2	150	4.0
9V1	8.83	9.37	8.5	9.6	40	100	6	15	3.8	5.5	7.0	150	3.0
10	9.70	10.30	9.4	10.6	50	150	8	20	4.5	6.4	8.0	90	3.0
11	10.67	11.33	10.4	11.6	50	150	10	20	5.4	7.4	9.0	85	2.5
12	11.64	12.36	11.4	12.7	50	150	10	25	6.0	8.4	10.0	85	2.5
13	12.61	13.39	12.4	14.1	50	170	10	30	7.0	9.4	11.0	80	2.5
15	14.55	15.45	13.8	15.6	50	200	10	30	9.2	11.4	13.0	75	2.0
16	15.50	16.50	15.3	17.1	50	200	10	40	10.4	12.4	14.0	75	1.5
18	17.50	18.50	16.8	19.1	50	225	10	45	12.4	14.4	16.0	70	1.5
20	19.40	20.60	18.8	21.2	60	225	15	55	14.4	16.4	18.0	60	1.5
22	21.30	22.70	20.8	23.3	60	250	20	55	16.4	18.4	20.0	60	1.25
24	23.30	24.70	22.8	25.6	60	250	25	70	18.4	20.4	22.0	55	1.25

Table 4 Per type BZX79-**F/C27** to **F/C75**

T_j = 25 °C; unless otherwise specified.

BZX79- F or C XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 2 mA				DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 2 mA (see Figs 5 and 6)			DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 µs; T_{amb} = 25 °C
	Tol. ±3% (F)		Tol. ±5% (C)		at I_{Ztest} = 0.5 mA		at I_{Ztest} = 2 mA						
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
27	26.20	27.80	25.1	28.9	65	300	25	80	21.4	23.4	25.3	50	1.0
30	29.10	30.90	28.0	32.0	70	300	30	80	24.4	26.6	29.4	50	1.0
33	32.00	34.00	31.0	35.0	75	325	35	80	27.4	29.7	33.4	45	0.9
36	34.90	37.10	34.0	38.0	80	350	35	90	30.4	33.0	37.4	45	0.8
39	37.80	40.20	37.0	41.0	80	350	40	130	33.4	36.4	41.2	45	0.7
43	41.70	44.30	40.0	46.0	85	375	45	150	37.6	41.2	46.6	40	0.6
47	45.60	48.40	44.0	50.0	85	375	50	170	42.0	46.1	51.8	40	0.5
51	49.50	52.50	48.0	54.0	90	400	60	180	46.6	51.0	57.2	40	0.4
56	54.30	57.70	52.0	60.0	100	425	70	200	52.2	57.0	63.8	40	0.3
62	60.10	63.90	58.0	66.0	120	450	80	215	58.8	64.4	71.6	35	0.3
68	66.00	70.00	64.0	72.0	150	475	90	240	65.6	71.7	79.8	35	0.25
75	72.80	77.20	70.0	79.0	170	500	95	255	73.4	80.2	88.6	35	0.2

Voltage regulator diodes BZX79 series

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 8 mm.	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length max.; see Fig.2 and note 1	380	K/W

Note

1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA

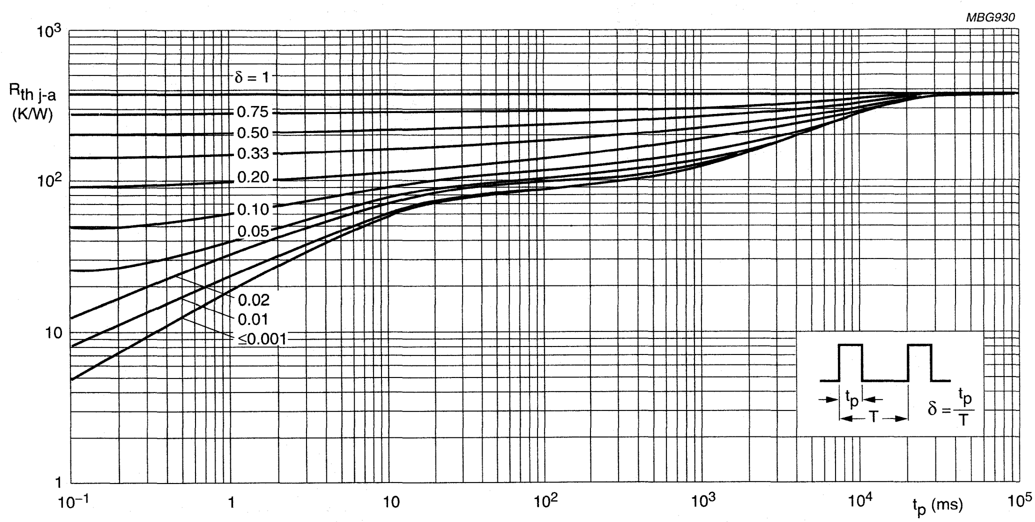
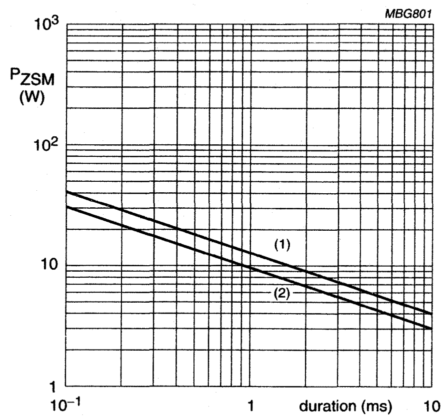
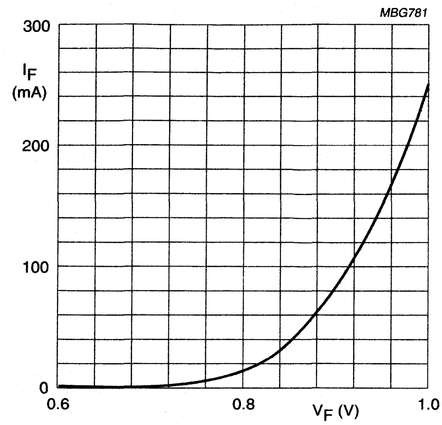


Fig.2 Thermal resistance from junction to ambient as a function of pulse duration.



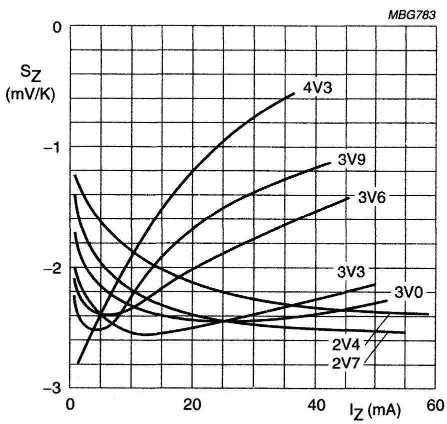
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.3 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



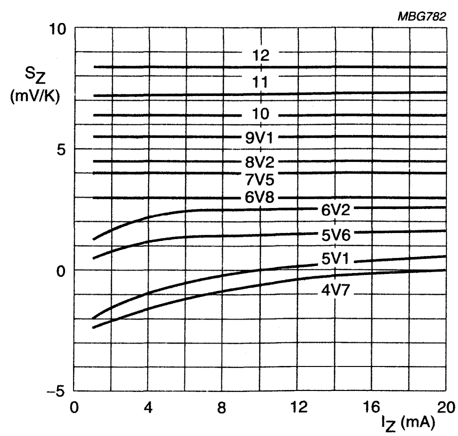
T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.



BZX79-A/B/F/C2V4 to A/B/F/C4V3.
T_j = 25 to 150 °C.

Fig.5 Temperature coefficient as a function of working current; typical values.



BZX79-A/B/F/C4V7 to A/B/F/C12.
T_j = 25 to 150 °C.

Fig.6 Temperature coefficient as a function of working current; typical values.

Voltage regulator diodes | BZX84 series

FEATURES

- Total power dissipation: max. 250 mW
- Three tolerance series: ±1%, ±2% and ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- General regulation functions.

DESCRIPTION

Low-power voltage regulator diodes in small plastic SMD SOT23 packages.

The diodes are available in the normalized E24 ±1% (BZX84-A), ±2% (BZX84-B) and ±5% (BZX84-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode

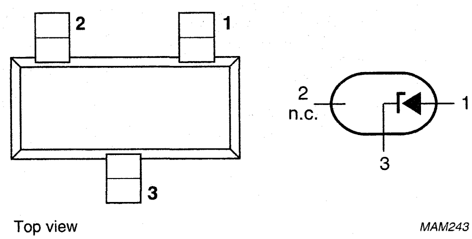


Fig.1 Simplified outline (SOT23) and symbol.

Voltage regulator diodes BZX84 series

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
Marking codes for BZX84-C2V4 to BZX84-C75							
BZX84-C2V4	Z11	BZX84-C6V2	Z4p	BZX84-C16	Y5p	BZX84-C43	Y15
BZX84-C2V7	Z12	BZX84-C6V8	Z5p	BZX84-C18	Y6p	BZX84-C47	Y16
BZX84-C3V0	Z13	BZX84-C7V5	Z6p	BZX84-C20	Y7p	BZX84-C51	Y17
BZX84-C3V3	Z14	BZX84-C8V2	Z7p	BZX84-C22	Y8p	BZX84-C56	Y18
BZX84-C3V6	Z15	BZX84-C9V1	Z8p	BZX84-C24	Y9p	BZX84-C62	Y19
BZX84-C3V9	Z16	BZX84-C10	Z9p	BZX84-C27	Y10	BZX84-C68	Y20
BZX84-C4V3	Z17	BZX84-C11	Y1p	BZX84-C30	Y11	BZX84-C75	Y21
BZX84-C4V7	Z1p	BZX84-C12	Y2p	BZX84-C33	Y12	–	–
BZX84-C5V1	Z2p	BZX84-C13	Y3p	BZX84-C36	Y13	–	–
BZX84-C5V6	Z3p	BZX84-C15	Y4p	BZX84-C39	Y14	–	–
Marking codes for BZX84-B2V4 to BZX84-B75							
BZX84-B2V4	Z50	BZX84-B6V2	Z60	BZX84--B16	Z70	BZX84-B43	Z80
BZX84-B2V7	Z51	BZX84-B6V8	Z61	BZX84-B18	Z71	BZX84-B47	Z81
BZX84-B3V0	Z52	BZX84-B7V5	Z62	BZX84-B20	Z72	BZX84-B51	Z82
BZX84-B3V3	Z53	BZX84-B8V2	Z63	BZX84-B22	Z73	BZX84-B56	Z83
BZX84-B3V6	Z54	BZX84-B9V1	Z64	BZX84-B24	Z74	BZX84-B62	Z84
BZX84-B3V9	Z55	BZX84-B10	Z65	BZX84-B27	Z75	BZX84-B68	Z85
BZX84-B4V3	Z56	BZX84-B11	Z66	BZX84-B30	Z76	BZX84-B75	Z86
BZX84-B4V7	Z57	BZX84-B12	Z67	BZX84-B33	Z77	–	–
BZX84-B5V1	Z58	BZX84-B13	Z68	BZX84-B36	Z78	–	–
BZX84-B5V6	Z59	BZX84-B15	Z69	BZX84-B39	Z79	–	–
Marking codes for BZX84-A2V4 to BZX84-A75							
BZX84-A2V4	Y50	BZX84-A6V2	Y60	BZX84-A16	Y70	BZX84-A43	Y80
BZX84-A2V7	Y51	BZX84-A6V8	Y61	BZX84-A18	Y71	BZX84-A47	Y81
BZX84-A3V0	Y52	BZX84-A7V5	Y62	BZX84-A20	Y72	BZX84-A51	Y82
BZX84-A3V3	Y53	BZX84-A8V2	Y63	BZX84-A22	Y73	BZX84-A56	Y83
BZX84-A3V6	Y54	BZX84-A9V1	Y64	BZX84-A24	Y74	BZX84-A62	Y84
BZX84-A3V9	Y55	BZX84-A10	Y65	BZX84-A27	Y75	BZX84-A68	Y85
BZX84-A4V3	Y56	BZX84-A11	Y66	BZX84-A30	Y76	BZX84-A75	Y86
BZX84-A4V7	Y57	BZX84-A12	Y67	BZX84-A33	Y77	–	–
BZX84-A5V1	Y58	BZX84-A13	Y68	BZX84-A36	Y78	–	–
BZX84-A5V6	Y59	BZX84-A15	Y69	BZX84-A39	Y79	–	–

Voltage regulator diodes BZX84 series

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	200	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Tables 1 and 2		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.2	–	40	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

Note

1. Device mounted on an FR4 printed circuit-board.

ELECTRICAL CHARACTERISTICS

Total BZX84-A and B and C series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.3	0.9	V
I_R	reverse current			
	BZX84-A/B/C2V4	V_R = 1 V	50	μA
	BZX84-A/B/C2V7	V_R = 1 V	20	μA
	BZX84-A/B/C3V0	V_R = 1 V	10	μA
	BZX84-A/B/C3V3	V_R = 1 V	5	μA
	BZX84-A/B/C3V6	V_R = 1 V	5	μA
	BZX84-A/B/C3V9	V_R = 1 V	3	μA
	BZX84-A/B/C4V3	V_R = 1 V	3	μA
	BZX84-A/B/C4V7	V_R = 2 V	3	μA
	BZX84-A/B/C5V1	V_R = 2 V	2	μA
	BZX84-A/B/C5V6	V_R = 2 V	1	μA
	BZX84-A/B/C6V2	V_R = 4 V	3	μA
	BZX84-A/B/C6V8	V_R = 4 V	2	μA
	BZX84-A/B/C7V5	V_R = 5 V	1	μA
	BZX84-A/B/C8V2	V_R = 5 V	700	nA
	BZX84-A/B/C9V1	V_R = 6 V	500	nA
	BZX84-A/B/C10	V_R = 7 V	200	nA
	BZX84-A/B/C11	V_R = 8 V	100	nA
	BZX84-A/B/C12	V_R = 8 V	100	nA
	BZX84-A/B/C13	V_R = 8 V	100	nA
	BZX84-A/B/C15 to 75	V_R = 0.7V_{Znom}	50	nA

Table 1 Per type BZX84-**A/B/C2V4** to **A/B/C24**

T_j = 25 °C; unless otherwise specified.

BZX84-A or B or C XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 5 mA						DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 5 mA (see Figs 4 and 5)			DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	Tol. ±1% (A)		Tol. ±2% (B)		Tol. ±5% (C)		at I_{Ztest} = 1 mA		at I_{Ztest} = 5 mA						
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
2V4	2.37	2.43	2.35	2.45	2.2	2.6	275	600	70	100	−3.5	−1.6	0	450	6.0
2V7	2.67	2.73	2.65	2.75	2.5	2.9	300	600	75	100	−3.5	−2.0	0	450	6.0
3V0	2.97	3.03	2.94	3.06	2.8	3.2	325	600	80	95	−3.5	−2.1	0	450	6.0
3V3	3.26	3.34	3.23	3.37	3.1	3.5	350	600	85	95	−3.5	−2.4	0	450	6.0
3V6	3.56	3.64	3.53	3.67	3.4	3.8	375	600	85	90	−3.5	−2.4	0	450	6.0
3V9	3.86	3.94	3.82	3.98	3.7	4.1	400	600	85	90	−3.5	−2.5	0	450	6.0
4V3	4.25	4.35	4.21	4.39	4.0	4.6	410	600	80	90	−3.5	−2.5	0	450	6.0
4V7	4.65	4.75	4.61	4.79	4.4	5.0	425	500	50	80	−3.5	−1.4	0.2	300	6.0
5V1	5.04	5.16	5.00	5.20	4.8	5.4	400	480	40	60	−2.7	−0.8	1.2	300	6.0
5V6	5.54	5.66	5.49	5.71	5.2	6.0	80	400	15	40	−2.0	1.2	2.5	300	6.0
6V2	6.13	6.27	6.08	6.32	5.8	6.6	40	150	6	10	0.4	2.3	3.7	200	6.0
6V8	6.73	6.87	6.66	6.94	6.4	7.2	30	80	6	15	1.2	3.0	4.5	200	6.0
7V5	7.42	7.58	7.35	7.65	7.0	7.9	30	80	6	15	2.5	4.0	5.3	150	4.0
8V2	8.11	8.29	8.04	8.36	7.7	8.7	40	80	6	15	3.2	4.6	6.2	150	4.0
9V1	9.00	9.20	8.92	9.28	8.5	9.6	40	100	6	15	3.8	5.5	7.0	150	3.0
10	9.90	10.10	9.80	10.20	9.4	10.6	50	150	8	20	4.5	6.4	8.0	90	3.0
11	10.80	11.11	10.80	11.20	10.4	11.6	50	150	10	20	5.4	7.4	9.0	85	2.5
12	11.88	12.12	11.80	12.20	11.4	12.7	50	150	10	25	6.0	8.4	10.0	85	2.5
13	12.87	13.13	12.70	13.30	12.4	14.1	50	170	10	30	7.0	9.4	11.0	80	2.5
15	14.85	15.15	14.70	15.30	13.8	15.6	50	200	10	30	9.2	11.4	13.0	75	2.0
16	15.84	16.16	15.70	16.30	15.3	17.1	50	200	10	40	10.4	12.4	14.0	75	1.5
18	17.82	18.18	17.60	18.40	16.8	19.1	50	225	10	45	12.4	14.4	16.0	70	1.5
20	19.80	20.20	19.60	20.40	18.8	21.2	60	225	15	55	14.4	16.4	18.0	60	1.5
22	21.78	22.22	21.60	22.40	20.8	23.3	60	250	20	55	16.4	18.4	20.0	60	1.25
24	23.76	24.24	23.50	24.50	22.8	25.6	60	250	25	70	18.4	20.4	22.0	55	1.25

Table 2 Per type BZX84-**A/B/C27** to **A/B/C75**

T_j = 25 °C; unless otherwise specified.

BZX84-A or B or C XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 2 mA						DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 2 mA (see Figs 4 and 5)			DIODE CAP. C_d (pF) at f = 1 MHz ; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	Tol. ±1% (A)		Tol. ±2% (B)		Tol. ±5% (C)		at I_{Ztest} = 0.5 mA		at I_{Ztest} = 2 mA						
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
27	26.73	27.27	26.50	27.50	25.1	28.9	65	300	25	80	21.4	23.4	25.3	50	1.0
30	29.70	30.30	29.40	30.60	28.0	32.0	70	300	30	80	24.4	26.6	29.4	50	1.0
33	32.67	33.33	32.30	33.70	31.0	35.0	75	325	35	80	27.4	29.7	33.4	45	0.9
36	35.64	36.36	35.30	36.70	34.0	38.0	80	350	35	90	30.4	33.0	37.4	45	0.8
39	38.61	39.39	38.20	39.80	37.0	41.0	80	350	40	130	33.4	36.4	41.2	45	0.7
43	42.57	43.43	42.10	43.90	40.0	46.0	85	375	45	150	37.6	41.2	46.6	40	0.6
47	46.53	47.47	46.10	47.90	44.0	50.0	85	375	50	170	42.0	46.1	51.8	40	0.5
51	50.49	51.51	50.00	52.00	48.0	54.0	90	400	60	180	46.6	51.0	57.2	40	0.4
56	55.44	56.56	54.90	57.10	52.0	60.0	100	425	70	200	52.2	57.0	63.8	40	0.3
62	61.38	62.62	60.80	63.20	58.0	66.0	120	450	80	215	58.8	64.4	71.6	35	0.3
68	67.32	68.68	66.60	69.40	64.0	72.0	150	475	90	240	65.6	71.7	79.8	35	0.25
75	74.25	75.75	73.50	76.50	70.0	79.0	170	500	95	255	73.4	80.2	88.6	35	0.2

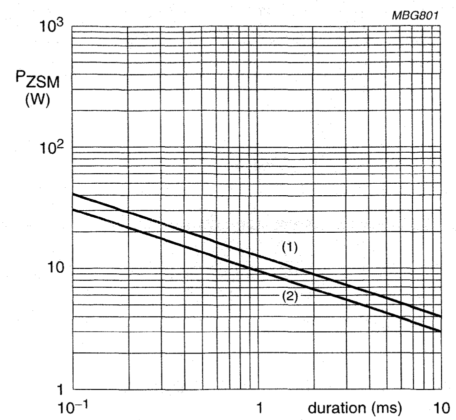
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

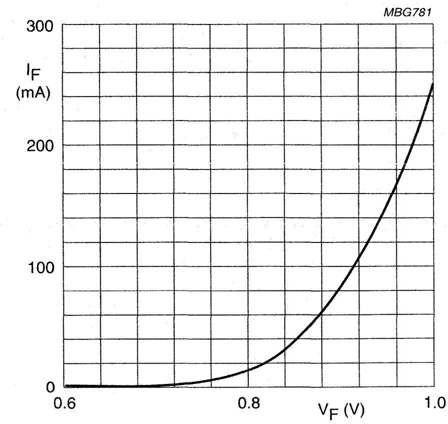
1. Device mounted on an FR4 printed circuit-board.

GRAPHICAL DATA



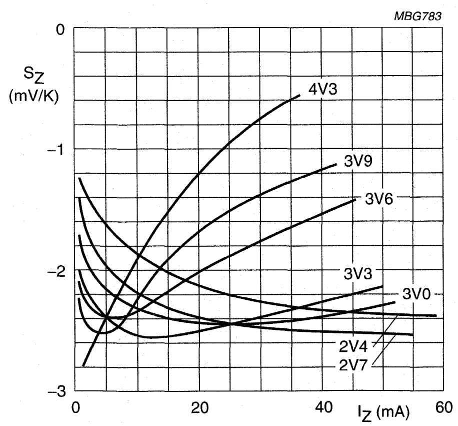
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.2 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



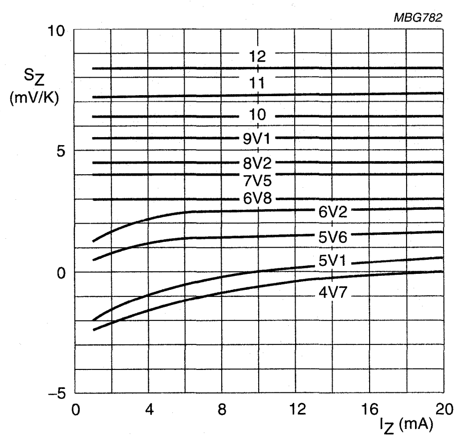
T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



BZX84-A/B/C2V4 to A/B/C4V3.
T_j = 25 to 150 °C.

Fig.4 Temperature coefficient as a function of working current; typical values.



BZX84-A/B/C4V7 to A/B/C12.
T_j = 25 to 150 °C.

Fig.5 Temperature coefficient as a function of working current; typical values.

Voltage regulator diodes | BZX284 series

FEATURES

- Total power dissipation: max. 400 mW
- Two tolerance series: ±2% and ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range).

APPLICATIONS

- General regulation functions.

DESCRIPTION

Low-power voltage regulator diodes in a small ceramic SMD SOD110 package. The diodes are available in the normalized E24 ±2% (BZX284-B) and ±5% (BZX284-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.

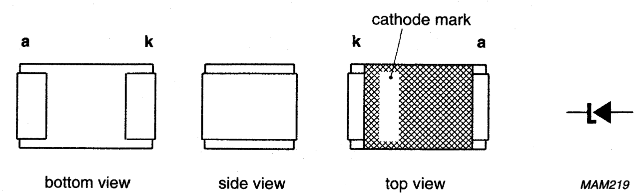


Fig.1 Simplified outline (SOD110) and symbol.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BZX284-B2V4	WO	BZX284-B15	XH	BZX284-C2V4	YO	BZX284-C15	ZH
BZX284-B2V7	WP	BZX284-B16	XI	BZX284-C2V7	YP	BZX284-C16	ZI
BZX284-B3V0	WQ	BZX284-B18	XJ	BZX284-C3V0	YQ	BZX284-C18	ZJ
BZX284-B3V3	WR	BZX284-B20	XK	BZX284-C3V3	YR	BZX284-C20	ZK
BZX284-B3V6	WS	BZX284-B22	XL	BZX284-C3V6	YS	BZX284-C22	ZL
BZX284-B3V9	WT	BZX284-B24	XM	BZX284-C3V9	YT	BZX284-C24	ZM
BZX284-B4V3	WU	BZX284-B27	XN	BZX284-C4V3	YU	BZX284-C27	ZN
BZX284-B4V7	WV	BZX284-B30	XO	BZX284-C4V7	YV	BZX284-C30	ZO
BZX284-B5V1	WW	BZX284-B33	XP	BZX284-C5V1	YW	BZX284-C33	ZP
BZX284-B5V6	WX	BZX284-B36	XQ	BZX284-C5V6	YX	BZX284-C36	ZQ
BZX284-B6V2	WY	BZX284-B39	XR	BZX284-C6V2	YY	BZX284-C39	ZR
BZX284-B6V8	WZ	BZX284-B43	XS	BZX284-C6V8	YZ	BZX284-C43	ZS
BZX284-B7V5	XA	BZX284-B47	XT	BZX284-C7V5	ZA	BZX284-C47	ZT
BZX284-B8V2	XB	BZX284-B51	XU	BZX284-C8V2	ZB	BZX284-C51	ZU
BZX284-B9V1	XC	BZX284-B56	XV	BZX284-C9V1	ZC	BZX284-C56	ZV
BZX284-B10	XD	BZX284-B62	XW	BZX284-C10	ZD	BZX284-C62	ZW
BZX284-B11	XE	BZX284-B68	XX	BZX284-C11	ZE	BZX284-C68	ZX
BZX284-B12	XF	BZX284-B75	XY	BZX284-C12	ZF	BZX284-C75	ZY
BZX284-B13	XG	–	–	BZX284-C13	ZG	–	–

Voltage regulator diodes BZX284 series

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 µs; square wave; T_{amb} = 25 °C prior to surge	see Tables 1 and 2		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	400	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a printed-circuit board: 11 × 25 × 1.6 mm.

ELECTRICAL CHARACTERISTICS

Total BZX284-B and C series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.2	0.9	V
		I_F = 100 mA; see Fig.2	1.1	V
I_R	reverse current			
	BZX284-B/C2V4	V_R = 1 V	50	µA
	BZX284-B/C2V7	V_R = 1 V	20	µA
	BZX284-B/C3V0	V_R = 1 V	10	µA
	BZX284-B/C3V3	V_R = 1 V	5	µA
	BZX284-B/C3V6	V_R = 1 V	5	µA
	BZX284-B/C3V9	V_R = 1 V	3	µA
	BZX284-B/C4V3	V_R = 1 V	3	µA
	BZX284-B/C4V7	V_R = 2 V	3	µA
	BZX284-B/C5V1	V_R = 2 V	2	µA
	BZX284-B/C5V6	V_R = 2 V	1	µA
	BZX284-B/C6V2	V_R = 4 V	3	µA
	BZX284-B/C6V8	V_R = 4 V	2	µA
	BZX284-B/C7V5	V_R = 5 V	1	µA
	BZX284-B/C8V2	V_R = 5 V	700	nA
	BZX284-B/C9V1	V_R = 6 V	500	nA
	BZX284-B/C10	V_R = 7 V	200	nA
	BZX284-B/C11	V_R = 8 V	100	nA
	BZX284-B/C12	V_R = 8 V	100	nA
	BZX284-B/C13	V_R = 8 V	100	nA
	BZX284-B/C15 to 75	V_R = 0.7V_{Znom}	50	nA

Table 1 Per type BZX284-**B/C2V4** to **B/C24**

T_j = 25 °C unless otherwise specified.

BZX284-B or C XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 5 mA				DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 5 mA (see Figs 3 and 4)	DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	Tol. ±2% (B)		Tol. ±5% (C)		at I_{Ztest} = 1 mA		at I_{Ztest} = 5 mA				
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	TYP.	MAX.	MAX.
2V4	2.35	2.45	2.2	2.6	275	400	70	100	−1.6	450	12.0
2V7	2.65	2.75	2.5	2.9	300	450	75	100	−2.0	440	12.0
3V0	2.94	3.06	2.8	3.2	325	500	80	95	−2.1	425	12.0
3V3	3.23	3.37	3.1	3.5	350	500	85	95	−2.4	410	12.0
3V6	3.53	3.67	3.4	3.8	375	500	85	90	−2.4	390	12.0
3V9	3.82	3.98	3.7	4.1	400	500	85	90	−2.5	370	12.0
4V3	4.21	4.39	4.0	4.6	410	600	80	90	−2.5	350	12.0
4V7	4.61	4.79	4.4	5.0	425	500	50	80	−1.4	325	12.0
5V1	5.00	5.20	4.8	5.4	400	480	40	60	−0.8	300	12.0
5V6	5.49	5.71	5.2	6.0	80	400	15	40	1.2	275	12.0
6V2	6.08	6.32	5.8	6.6	40	150	6	10	2.3	250	12.0
6V8	6.66	6.94	6.4	7.2	30	80	6	15	3.0	215	12.0
7V5	7.35	7.65	7.0	7.9	15	80	2	10	4.0	170	4.0
8V2	8.04	8.36	7.7	8.7	20	80	2	10	4.6	150	4.0
9V1	8.92	9.28	8.5	9.6	20	100	2	10	5.5	120	3.0
10	9.80	10.20	9.4	10.6	20	150	2	10	6.4	110	3.0
11	10.80	11.20	10.4	11.6	25	150	2	10	7.4	108	2.5
12	11.80	12.20	11.4	12.7	25	150	2	10	8.4	105	2.5
13	12.70	13.30	12.4	14.1	25	170	2	10	9.4	103	2.5
15	14.70	15.30	13.8	15.6	25	200	3	15	11.4	99	2.0
16	15.70	16.30	15.3	17.1	25	200	4	20	12.4	97	1.5
18	17.60	18.40	16.8	19.1	25	225	4	20	14.4	93	1.5
20	19.60	20.40	18.8	21.2	30	225	4	20	16.4	88	1.5
22	21.60	22.40	20.8	23.3	30	250	5	25	18.4	84	1.25
24	23.50	24.50	22.8	25.6	30	250	6	30	20.4	80	1.25

Table 2 Per type BZX284-**B/C27** to **B/C75**

T_j = 25 °C unless otherwise specified.

BZX284-B or C XXX	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 2 mA				DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 2 mA	DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 µs; T_{amb} = 25 °C
	Tol. ±2% (B)		Tol. ±5% (C)		at I_{Ztest} = 0.5 mA		at I_{Ztest} = 2 mA				
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	TYP.	MAX.	MAX.
27	26.50	27.50	25.1	28.9	35	250	8	40	23.4	73	1.0
30	29.40	30.60	28.0	32.0	35	250	10	40	26.6	66	1.0
33	32.30	33.70	31.0	35.0	40	275	11	40	29.7	60	0.9
36	35.30	36.70	34.0	38.0	40	300	15	60	33.0	59	0.8
39	38.20	39.80	37.0	41.0	40	300	25	75	36.4	58	0.7
43	42.10	43.90	40.0	46.0	45	325	30	80	41.2	56	0.6
47	46.10	47.90	44.0	50.0	45	325	30	90	46.1	55	0.5
51	50.00	52.00	48.0	54.0	45	350	35	110	51.0	52	0.4
56	54.90	57.10	52.0	60.0	50	375	40	120	57.0	49	0.3
62	60.80	63.20	58.0	66.0	60	400	50	140	64.4	44	0.3
68	66.60	69.40	64.0	72.0	75	400	55	160	71.7	40	0.25
75	73.50	76.50	70.0	79.0	85	400	70	175	80.2	35	0.2

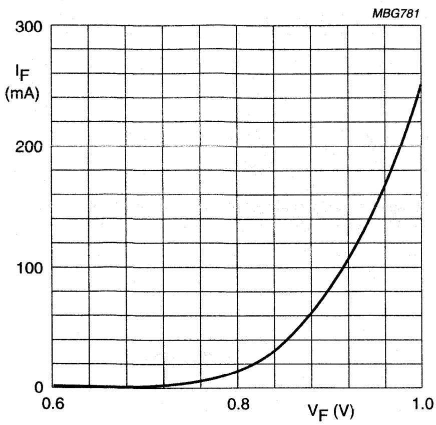
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	315	K/W

Note

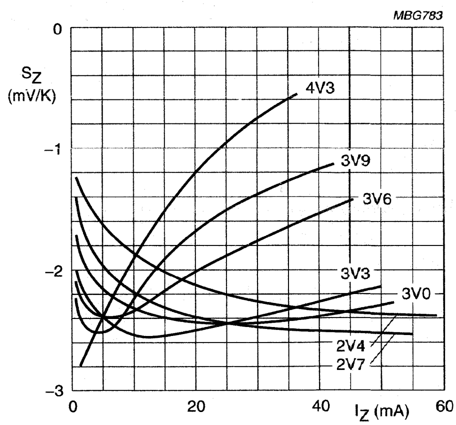
1. Device mounted on a printed-circuit board: $11 \times 25 \times 1.6$ mm.

GRAPHICAL DATA



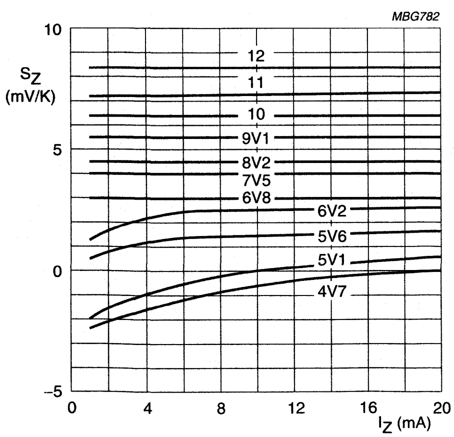
T_j = 25 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



BZX284-B/C2V4 to B/C4V3.
T_j = 25 to 150 °C.

Fig.3 Temperature coefficient as a function of working current; typical values.



BZX284-B/C4V7 to B/C12.
T_j = 25 to 150 °C.

Fig.4 Temperature coefficient as a function of working current; typical values.

Low-voltage avalanche regulator diodes | PLVA400A series

FEATURES

- Very low dynamic impedance at low currents: approximately 1⁄20 of conventional series
- Hard breakdown knee
- Low noise: approximately 1⁄10 of conventional series
- Total power dissipation: max. 400 mW
- Small tolerances of V_Z
- Working voltage range: nom. 5.0 to 6.8 V
- Non-repetitive peak reverse power dissipation: max. 30 W.

APPLICATIONS

- Low current, low power, low noise applications
- CMOS RAM back-up circuits
- Voltage stabilizers
- Voltage limiters
- Smoke detector relays.

DESCRIPTION

High performance voltage regulator diodes in hermetically sealed leaded glass SOD27 (DO-35) packages.

The series consists of PLVA450A to PLVA468A.

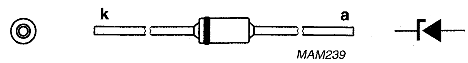


Fig.1 Simplified outline (SOD27; DO-35) and symbol.

MARKING

TYPE NUMBER	MARKING CODE
PLVA450A	450APH
PLVA453A	453APH
PLVA456A	456APH
PLVA459A	459APH
PLVA462A	462APH
PLVA465A	465APH
PLVA468A	468APH

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZRM}	repetitive peak working current	t_p = 100 μs; δ = 10%		250	mA
P_{tot}	total power dissipation	$T_{tp} \leq 55$ °C; note 1	–	400	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; T_j = 150 °C		30	W
T_{stg}	storage temperature		−65	+200	°C
T_j	junction temperature		–	175	°C

Note

1. Lead length 8 mm.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA	–	–	0.9	V
V_Z	working voltage	I_Z = 250 μA				
	PLVA450A		4.80	5.00	5.20	V
	PLVA453A		5.10	5.30	5.50	V
	PLVA456A		5.40	5.60	5.80	V
	PLVA459A		5.70	5.90	6.10	V
	PLVA462A		6.00	6.20	6.40	V
	PLVA465A		6.30	6.50	6.70	V
	PLVA468A		6.60	6.80	7.00	V
V_Z	working voltage	I_Z = 10 μA				
	PLVA450A		–	4.30	–	V
	PLVA453A		–	5.20	–	V
	PLVA456A		–	5.51	–	V
	PLVA459A		–	5.85	–	V
	PLVA462A		–	6.19	–	V
	PLVA465A		–	6.49	–	V
	PLVA468A		–	6.80	–	V
R_Z	dynamic resistance	1 kHz superimposed;				
	PLVA450A	I_{ZAC} is 10% of I_{ZDC}; I_Z = 250 μA	–	–	700	Ω
	PLVA453A		–	–	250	Ω
	PLVA456A to PLVA468A		–	–	100	Ω
S_Z	temperature coefficient	I_Z = 250 μA				
	PLVA450A		–	0.20	–	mV/K
	PLVA453A		–	1.60	–	mV/K
	PLVA456A		–	1.90	–	mV/K
	PLVA459A		–	2.40	–	mV/K
	PLVA462A		–	2.65	–	mV/K
	PLVA465A		–	2.90	–	mV/K
	PLVA468A		–	3.40	–	mV/K
I_R	reverse current	V_R = 80% V_Z nominal				
	PLVA450A		–	–	20000	nA
	PLVA453A		–	–	5000	nA
	PLVA456A		–	–	1000	nA
	PLVA459A		–	–	500	nA
	PLVA462A		–	–	100	nA
	PLVA465A		–	–	50	nA
	PLVA468A		–	–	10	nA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 50% V_Z nominal				
	PLVA450A		–	34	–	nA
	PLVA453A		–	22	–	nA
	PLVA456A		–	1.1	–	nA
	PLVA459A		–	0.9	–	nA
	PLVA462A		–	0.9	–	nA
	PLVA465A		–	0.9	–	nA
	PLVA468A		–	0.8	–	nA
I_R	reverse current	V_R = 90% V_Z nominal				
	PLVA450A		–	21	–	μA
	PLVA453A		–	3.5	–	μA
	PLVA456A		–	1.3	–	μA
	PLVA459A		–	1.0	–	μA
	PLVA462A		–	0.05	–	μA
	PLVA465A		–	0.04	–	μA
	PLVA468A		–	0.006	–	μA
ΔV_Z	line regulation					
	PLVA459A to PLVA468A	I_{LO} = 10 μA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA456A	I_{LO} = 50 μA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA450A	I_{LO} = 100 μA; I_{Hi} = 1 mA	–	–	0.4	V
	PLVA453A	I_{LO} = 100 μA; I_{Hi} = 1 mA	–	–	0.2	V
V_n	noise voltage density	f = 1 kHz; B = 1 kHz; I_Z = 250 μA	–	–	1.0	$\frac{\mu V}{\sqrt{Hz}}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 8 mm.	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length max.	380	K/W

Low-voltage avalanche regulator diodes — PLVA600A series

FEATURES

- Very low dynamic impedance at low currents: approximately 1⁄20 of conventional series
- Hard breakdown knee
- Low noise: approximately 1⁄10 of conventional series
- Total power dissipation: max. 250 mW
- Small tolerances of V_Z
- Working voltage range: nom. 5.0 to 6.8 V
- Non-repetitive peak reverse power dissipation: max. 30 W.

APPLICATIONS

- Low current, low power, low noise applications
- CMOS RAM back-up circuits
- Voltage stabilizers
- Voltage limiters
- Smoke detector relays.

DESCRIPTION

High performance voltage regulator diodes in small plastic SMD SOT23 packages.

The series consists of PLVA650A to PLVA668A.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode

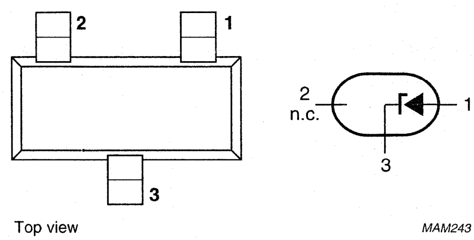


Fig.1 Simplified outline (SOT23) and symbol.

MARKING

TYPE NUMBER	MARKING CODE
PLVA650A	p9A
PLVA653A	p9B
PLVA656A	p9C
PLVA659A	p9D
PLVA662A	p9E
PLVA665A	p9F
PLVA668A	p9G

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZRM}	repetitive peak working current	$t_p = 100\ \mu s$; $\delta = 10\%$		250	mA
P_{ZSM}	non-repetitive peak reverse power dissipation	$t_p = 100\ \mu s$; $T_j = 150\ °C$		30	W
P_{tot}	total power dissipation	$T_{amb} = 25\ °C$; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed circuit-board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA	–	–	0.9	V
V_Z	working voltage	I_Z = 250 μA				
	PLVA650A		4.80	5.00	5.20	V
	PLVA653A		5.10	5.30	5.50	V
	PLVA656A		5.40	5.60	5.80	V
	PLVA659A		5.70	5.90	6.10	V
	PLVA662A		6.00	6.20	6.40	V
	PLVA665A		6.30	6.50	6.70	V
	PLVA668A		6.60	6.80	7.00	V
V_Z	working voltage	I_Z = 10 μA				
	PLVA650A		–	4.30	–	V
	PLVA653A		–	5.20	–	V
	PLVA656A		–	5.51	–	V
	PLVA659A		–	5.85	–	V
	PLVA662A		–	6.19	–	V
	PLVA665A		–	6.49	–	V
	PLVA668A		–	6.80	–	V
R_Z	dynamic resistance	1 kHz superimposed;				
	PLVA650A	I_{ZAC} is 10% of I_{ZDC}; I_Z = 250 μA	–	–	700	Ω
	PLVA653A		–	–	250	Ω
	PLVA656A to PLVA668A		–	–	100	Ω
S_Z	temperature coefficient	I_Z = 250 μA				
	PLVA650A		–	0.20	–	mV/K
	PLVA653A		–	1.60	–	mV/K
	PLVA656A		–	1.90	–	mV/K
	PLVA659A		–	2.40	–	mV/K
	PLVA662A		–	2.65	–	mV/K
	PLVA665A		–	2.90	–	mV/K
	PLVA668A		–	3.40	–	mV/K
I_R	reverse current	V_R = 80% V_Z nominal				
	PLVA650A		–	–	20000	nA
	PLVA653A		–	–	5000	nA
	PLVA656A		–	–	1000	nA
	PLVA659A		–	–	500	nA
	PLVA662A		–	–	100	nA
	PLVA665A		–	–	50	nA
	PLVA668A		–	–	10	nA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 50% V_Z nominal				
	PLVA650A		–	34	–	nA
	PLVA653A		–	22	–	nA
	PLVA656A		–	1.1	–	nA
	PLVA659A		–	0.9	–	nA
	PLVA662A		–	0.9	–	nA
	PLVA665A		–	0.9	–	nA
	PLVA668A		–	0.8	–	nA
I_R	reverse current	V_R = 90% V_Z nominal				
	PLVA650A		–	21	–	μA
	PLVA653A		–	3.5	–	μA
	PLVA656A		–	1.3	–	μA
	PLVA659A		–	1.0	–	μA
	PLVA662A		–	0.05	–	μA
	PLVA665A		–	0.04	–	μA
	PLVA668A		–	0.006	–	μA
ΔV_Z	line regulation					
	PLVA659A to PLVA668A	I_{LO} = 10 μA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA656A	I_{LO} = 50 μA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA650A	I_{LO} = 100 μA; I_{Hi} = 1 mA	–	–	0.4	V
	PLVA653A	I_{LO} = 100 μA; I_{Hi} = 1 mA	–	–	0.2	V
V_n	noise voltage density	f = 1 kHz; B = 1 kHz; I_Z = 250 μA	–	–	1.0	$\frac{\mu V}{\sqrt{Hz}}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Device mounted on an FR4 printed circuit-board.

Low-voltage avalanche regulator double diodes

PLVA2600A series

FEATURES

- Very low dynamic impedance at low currents: approximately $\frac{1}{20}$ of conventional series
- Hard breakdown knee
- Low noise: approximately $\frac{1}{10}$ of conventional series
- Total power dissipation: max. 250 mW
- Small tolerances of V_Z
- Working voltage range: nom. 5.0 to 6.8 V
- Non-repetitive peak reverse power dissipation: max. 30 W.

APPLICATIONS

- Low current, low power, low noise applications
- CMOS RAM back-up circuits
- Voltage stabilizers
- Voltage limiters
- Smoke detector relays.

DESCRIPTION

The PLVA2600A series consists of two high performance voltage regulator diodes with common anodes, in small plastic SMD SOT23 packages.

The series consists of PLVA2650A to PLVA2668A.

PINNING

PIN	DESCRIPTION
1	cathode (k1)
2	cathode (k2)
3	common anode

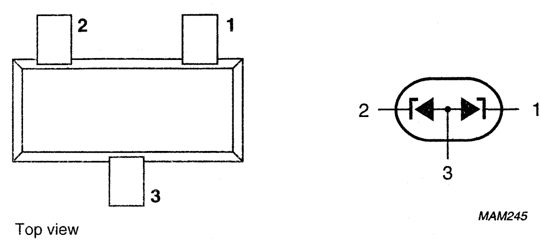


Fig.1 Simplified outline (SOT23) and symbol.

MARKING

TYPE NUMBER	MARKING CODE
PLVA2650A	p9J
PLVA2653A	p9K
PLVA2656A	p9L
PLVA2659A	p9M
PLVA2662A	p9N
PLVA2665A	p9O
PLVA2668A	p9P

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZRM}	repetitive peak working current	t_p = 100 μs; δ = 10%		250	mA
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; T_j = 150 °C		30	W
P_{tot}	total power dissipation	single diode loaded; T_{amb} = 25 °C; note 1	–	250	mW
		double diode loaded; T_{amb} = 25 °C; note 1	–	180	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed circuit-board.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA	–	–	0.9	V
V_Z	working voltage	I_Z = 250 μA				
	PLVA2650A		4.80	5.00	5.20	V
	PLVA2653A		5.10	5.30	5.50	V
	PLVA2656A		5.40	5.60	5.80	V
	PLVA2659A		5.70	5.90	6.10	V
	PLVA2662A		6.00	6.20	6.40	V
	PLVA2665A		6.30	6.50	6.70	V
	PLVA2668A		6.60	6.80	7.00	V
V_Z	working voltage	I_Z = 10 μA				
	PLVA2650A		–	4.30	–	V
	PLVA2653A		–	5.20	–	V
	PLVA2656A		–	5.51	–	V
	PLVA2659A		–	5.85	–	V
	PLVA2662A		–	6.19	–	V
	PLVA2665A		–	6.49	–	V
	PLVA2668A		–	6.80	–	V
R_Z	dynamic resistance	1 kHz superimposed;				
	PLVA2650A	I_{ZAC} is 10% of I_{ZDC}; I_Z = 250 μA	–	–	700	Ω
	PLVA2653A		–	–	250	Ω
	PLVA2656A to PLVA2668A		–	–	100	Ω
S_Z	temperature coefficient	I_Z = 250 μA				
	PLVA2650A		–	0.20	–	mV/K
	PLVA2653A		–	1.60	–	mV/K
	PLVA2656A		–	1.90	–	mV/K
	PLVA2659A		–	2.40	–	mV/K
	PLVA2662A		–	2.65	–	mV/K
	PLVA2665A		–	2.90	–	mV/K
	PLVA2668A		–	3.40	–	mV/K
I_R	reverse current	V_R = 80% V_Z nominal				
	PLVA2650A		–	–	20000	nA
	PLVA2653A		–	–	5000	nA
	PLVA2656A		–	–	1000	nA
	PLVA2659A		–	–	500	nA
	PLVA2662A		–	–	100	nA
	PLVA2665A		–	–	50	nA
	PLVA2668A		–	–	10	nA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_R	reverse current	V_R = 50% V_Z nominal				
	PLVA2650A		–	34	–	nA
	PLVA2653A		–	22	–	nA
	PLVA2656A		–	1.1	–	nA
	PLVA2659A		–	0.9	–	nA
	PLVA2662A		–	0.9	–	nA
	PLVA2665A		–	0.9	–	nA
	PLVA2668A		–	0.8	–	nA
I_R	reverse current	V_R = 90% V_Z nominal				
	PLVA2650A		–	21	–	μA
	PLVA2653A		–	3.5	–	μA
	PLVA2656A		–	1.3	–	μA
	PLVA2659A		–	1.0	–	μA
	PLVA2662A		–	0.05	–	μA
	PLVA2665A		–	0.04	–	μA
	PLVA2668A		–	0.006	–	μA
ΔV_Z	line regulation					
	PLVA2659A to PLVA2668A	I_{LO} = 10 μA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA2656A	I_{LO} = 50 μA; I_{Hi} = 1 mA	–	–	0.1	V
	PLVA2650A	I_{LO} = 100 μA; I_{Hi} = 1 mA	–	–	0.4	V
	PLVA2653A	I_{LO} = 100 μA; I_{Hi} = 1 mA	–	–	0.2	V
V_n	noise voltage density	f = 1 kHz; B = 1 kHz; I_Z = 250 μA	–	–	1.0	$\frac{\mu V}{\sqrt{Hz}}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Device mounted on an FR4 printed circuit-board.

Voltage regulator diodes — PMBZ5226B to PMBZ5257B

FEATURES

- Total power dissipation: max. 250 mW
- Tolerance series: ±5%
- Working voltage range: nom. 3.3 to 75 V
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- General regulation functions.

DESCRIPTION

Low-power voltage regulator diodes in small plastic SMD SOT23 packages.

The series consists of 32 types with nominal working voltages from 3.3 to 75 V.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode

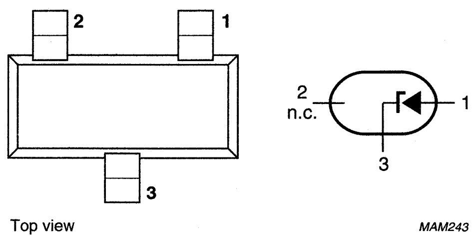


Fig.1 Simplified outline (SOT23) and symbol.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
PMBZ5226B	p8A	PMBZ5234B	p8J	PMBZ5242B	p8S	PMBZ5250B	81A
PMBZ5227B	p8B	PMBZ5235B	p8K	PMBZ5243B	p8T	PMBZ5251B	81B
PMBZ5228B	p8C	PMBZ5236B	p8L	PMBZ5244B	p8U	PMBZ5252B	81C
PMBZ5229B	p8D	PMBZ5237B	p8M	PMBZ5245B	p8V	PMBZ5253B	81D
PMBZ5230B	p8E	PMBZ5238B	p8N	PMBZ5246B	p8W	PMBZ5254B	81E
PMBZ5231B	p8F	PMBZ5239B	p8P	PMBZ5247B	p8X	PMBZ5255B	81F
PMBZ5232B	p8G	PMBZ5240B	p8Q	PMBZ5248B	p8Y	PMBZ5256B	81G
PMBZ5233B	p8H	PMBZ5241B	p8R	PMBZ5249B	p8Z	PMBZ5257B	81H

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	200	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 µs; square wave; T_j = 25 °C prior to surge	see Table "Per type"		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	300	mW
		T_{amb} = 25 °C; note 2	–	250	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square wave; T_j = 25 °C prior to surge; see Fig.2	–	40	W
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Notes

1. Device mounted on a ceramic substrate of 8 × 10 × 0.7 mm.
2. Device mounted on an FR4 printed circuit-board.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 200 mA; see Fig.3	1.1	V

Per type

T_j = 25 °C; unless otherwise specified.

TYPE No.	WORKING VOLTAGE V_Z (V)(1) at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z(2)	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
						I_R (μA)	V_R (V)	
	NOM.	MAX.	TYP.		MAX.	MAX.		MAX.
PMBZ5226B	3.3	1600	−0.064	20	450	25	1.0	6.0
PMBZ5227B	3.6	1700	−0.065	20	450	15	1.0	6.0
PMBZ5228B	3.9	1900	−0.063	20	450	10	1.0	6.0
PMBZ5229B	4.3	2000	−0.058	20	450	5	1.0	6.0
PMBZ5230B	4.7	2000	−0.047	20	450	5	1.0	6.0
PMBZ5231B	5.1	2000	−0.013	20	300	5	2.0	6.0
PMBZ5232B	5.6	1600	+0.023	20	300	5	3.0	6.0
PMBZ5233B	6.0	1600	+0.023	20	300	5	3.5	6.0
PMBZ5234B	6.2	1000	+0.039	20	200	5	4.0	6.0
PMBZ5235B	6.8	750	+0.040	20	200	3	5.0	6.0
PMBZ5236B	7.5	500	+0.047	20	150	3	6.0	4.0
PMBZ5237B	8.2	500	+0.052	20	150	3	6.5	4.0
PMBZ5238B	8.7	600	+0.053	20	150	3	6.5	3.5
PMBZ5239B	9.1	600	+0.055	20	150	3	7.0	3.0
PMBZ5240B	10	600	+0.055	20	90	3	8.0	3.0
PMBZ5241B	11	600	+0.058	20	85	2	8.4	2.5
PMBZ5242B	12	600	+0.062	20	85	1	9.1	2.5
PMBZ5243B	13	600	+0.065	9.5	80	0.5	9.9	2.5
PMBZ5244B	14	600	+0.067	9.0	80	0.1	10	2.0
PMBZ5245B	15	600	+0.073	8.5	75	0.1	11	2.0
PMBZ5246B	16	600	+0.073	7.8	75	0.1	12	1.5
PMBZ5247B	17	600	+0.073	7.4	75	0.1	13	1.5
PMBZ5248B	18	600	+0.078	7.0	70	0.1	14	1.5
PMBZ5249B	19	600	+0.078	6.6	70	0.1	14	1.5
PMBZ5250B	20	600	+0.080	6.2	60	0.1	15	1.5
PMBZ5251B	22	600	+0.080	5.6	60	0.1	17	1.25

TYPE No.	WORKING VOLTAGE V_Z (V)(1) at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z(2)	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
						I_R (μA)	V_R (V)	
	NOM.	MAX.	TYP.		MAX.	MAX.		MAX.
PMBZ5252B	24	600	+0.081	5.2	55	0.1	18	1.25
PMBZ5253B	25	600	+0.082	5.0	55	0.1	19	1.25
PMBZ5254B	27	600	+0.085	4.6	50	0.1	21	1.0
PMBZ5255B	28	600	+0.085	4.5	50	0.1	21	1.0
PMBZ5256B	30	600	+0.085	4.2	50	0.1	23	1.0
PMBZ5257B	33	700	+0.085	3.8	45	0.1	25	0.9

Notes

1. V_Z is measured with device at thermal equilibrium while mounted on a ceramic substrate of 8 × 10 × 0.7 mm.
2. For types PMBZ5226B to PMBZ5242B the I_Z current is 7.5 mA; for PMBZ5243B and higher $I_Z = I_{Ztest}$. S_Z values valid between 25 °C and 125 °C.

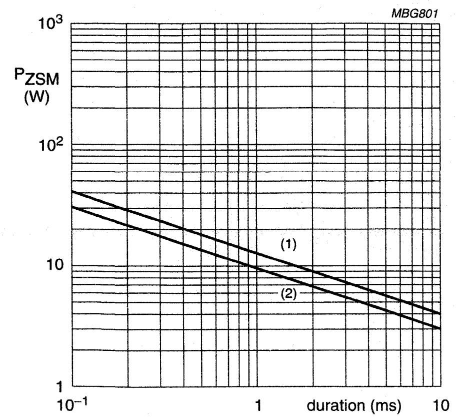
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Device mounted on a printed-circuit board.

GRAPHICAL DATA



(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.2 Maximum permissible non-repetitive peak reverse power dissipation versus duration.

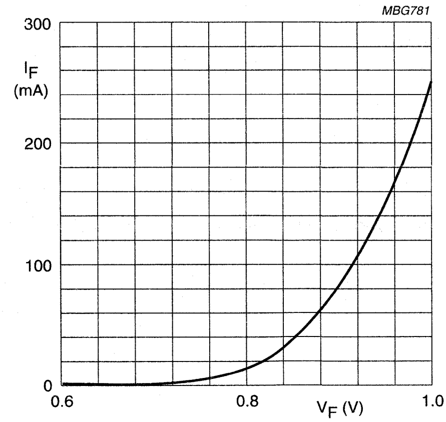


Fig.3 Forward current as a function of forward voltage; typical values.

Voltage regulator diodes
PMLL5225B to PMLL5267B

FEATURES

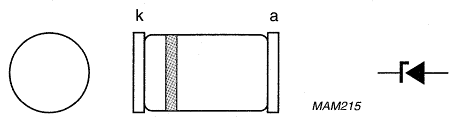
- Total power dissipation: max. 500 mW
- Tolerance series: ±5%
- Working voltage range: nom. 3.0 to 75 V
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- Low-power voltage stabilizers or voltage references.

DESCRIPTION

Low-power voltage regulator diodes in small hermetically sealed glass SOD80C SMD packages. The series consists of 43 types with nominal working voltages from 3.0 to 75 V.



The cathode is indicated by a yellow band.

Fig.1 Simplified outline (SOD80C) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 µs; square wave; T_j = 25 °C prior to surge	see Table “Per type”		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	500	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square wave; T_j = 25 °C prior to surge; see Fig.3	–	40	W
		t_p = 8.3 ms; square wave; $T_j \leq$ 55 °C prior to surge	–	10	W
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–65	+200	°C

Note

1. If flanges are kept at $T_{flange} \leq$ 75 °C.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 200 mA; see Fig.4	–	1.1	V

Per type

T_j = 25 °C; unless otherwise specified.

TYPE No.	WORKING VOLTAGE V_Z (V)(1) at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z(2)	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	V_R (V)	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	NOM.	MAX.	MAX.		MAX.	MAX.		MAX.
PMLL5225B	3.0	1600	−0.075	20	450	50	1.0	6.0
PMLL5226B	3.3	1600	−0.070	20	450	25	1.0	6.0
PMLL5227B	3.6	1700	−0.065	20	450	15	1.0	6.0
PMLL5228B	3.9	1900	−0.060	20	450	10	1.0	6.0
PMLL5229B	4.3	2000	±0.055	20	450	5	1.0	6.0
PMLL5230B	4.7	1900	±0.030	20	450	5	1.5	6.0
PMLL5231B	5.1	1600	±0.030	20	300	5	2.0	6.0
PMLL5232B	5.6	1600	+0.038	20	300	5	3.0	6.0
PMLL5233B	6.0	1600	+0.038	20	300	5	3.5	6.0
PMLL5234B	6.2	1000	+0.045	20	200	5	4.0	6.0
PMLL5235B	6.8	750	+0.050	20	200	3	5.0	6.0
PMLL5236B	7.5	500	+0.058	20	150	3	6.0	4.0
PMLL5237B	8.2	500	+0.062	20	150	3	6.5	4.0
PMLL5238B	8.7	600	+0.065	20	150	3	6.5	3.5
PMLL5239B	9.1	600	+0.068	20	150	3	7.0	3.0
PMLL5240B	10	600	+0.075	20	90	3	8.0	3.0
PMLL5241B	11	600	+0.076	20	85	2	8.4	2.5
PMLL5242B	12	600	+0.077	20	85	1	9.1	2.5
PMLL5243B	13	600	+0.079	9.5	80	0.5	9.9	2.5
PMLL5244B	14	600	+0.082	9.0	80	0.1	10.0	2.0
PMLL5245B	15	600	+0.082	8.5	75	0.1	11.0	2.0
PMLL5246B	16	600	+0.083	7.8	75	0.1	12.0	1.5
PMLL5247B	17	600	+0.084	7.4	75	0.1	13.0	1.5
PMLL5248B	18	600	+0.085	7.0	70	0.1	14.0	1.5
PMLL5249B	19	600	+0.086	6.6	70	0.1	14.0	1.5
PMLL5250B	20	600	+0.086	6.2	60	0.1	15.0	1.5

TYPE No.	WORKING VOLTAGE V_Z (V)(1) at I_{Ztest}	DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_{Ztest}	TEMP. COEFF. S_Z (%/K) at I_Z(2)	TEST CURRENT I_{Ztest} (mA)	DIODE CAP. C_d (pF) at f = 1 MHz; at V_R = 0 V	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	V_R (V)	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	NOM.	MAX.	MAX.		MAX.	MAX.		MAX.
PMLL5251B	22	600	+0.087	5.6	60	0.1	17.0	1.25
PMLL5252B	24	600	+0.088	5.2	55	0.1	18.0	1.25
PMLL5253B	25	600	+0.089	5.0	55	0.1	19.0	1.25
PMLL5254B	27	600	+0.090	4.6	50	0.1	21.0	1.0
PMLL5255B	28	600	+0.091	4.5	50	0.1	21.0	1.0
PMLL5256B	30	600	+0.091	4.2	50	0.1	23.0	1.0
PMLL5257B	33	700	+0.092	3.8	45	0.1	25.0	0.9
PMLL5258B	36	700	+0.093	3.4	45	0.1	27.0	0.8
PMLL5259B	39	800	+0.094	3.2	45	0.1	30.0	0.7
PMLL5260B	43	900	+0.095	3.0	40	0.1	33.0	0.6
PMLL5261B	47	1000	+0.095	2.7	40	0.1	36.0	0.5
PMLL5262B	51	1100	+0.096	2.5	40	0.1	39.0	0.4
PMLL5263B	56	1300	+0.096	2.2	40	0.1	43.0	0.3
PMLL5264B	60	1400	+0.097	2.1	40	0.1	46.0	0.3
PMLL5265B	62	1400	+0.097	2.0	35	0.1	47.0	0.3
PMLL5266B	68	1600	+0.097	1.8	35	0.1	52.0	0.25
PMLL5267B	75	1700	+0.098	1.7	35	0.1	56.0	0.2

Notes

1. V_Z is measured with device at thermal equilibrium while held in clips at 10 mm from body in still air at 25 °C.
2. For types PMLL5225B to PMLL5242B the I_Z current is 7.5 mA; for PMLL5243B and higher $I_Z = I_{Ztest}$. S_Z values valid between 25 °C and 125 °C.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length 10 mm	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length max.; see Fig.2 and note 1	380	K/W

Note

1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA

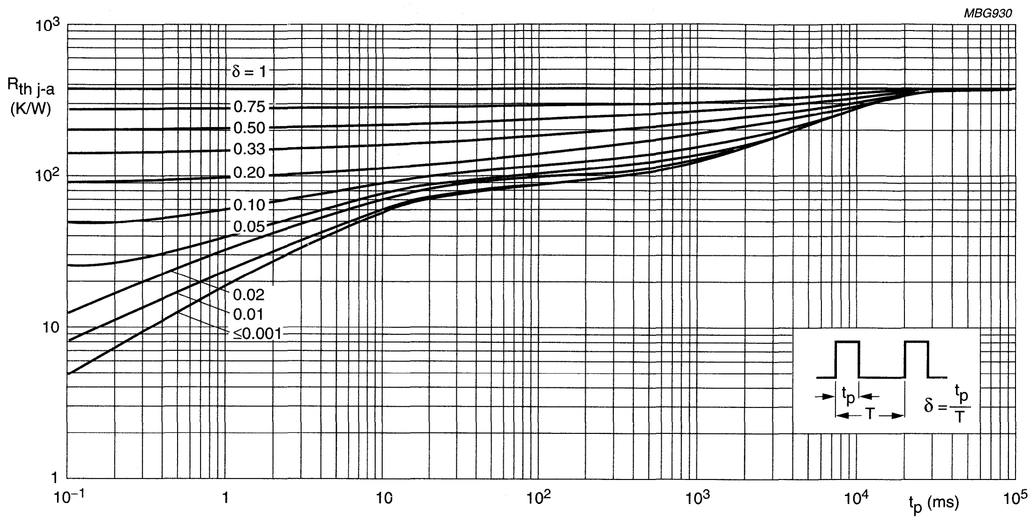
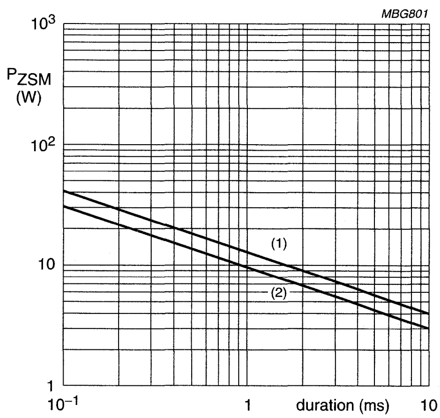
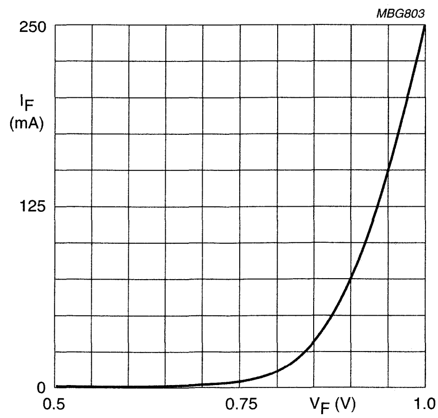


Fig.2 Thermal resistance from junction to ambient as a function of pulse duration.



(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.3 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



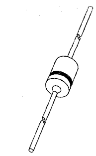
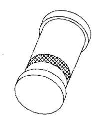
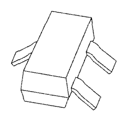
T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.

SECTION 8

LOW-VOLTAGE STABISTORS

LOW-VOLTAGE STABISTORS

TYPE NUMBER	RATINGS		CHARACTERISTICS							PACKAGE (not to scale)
	V_R	I_F	V_F @ I_F = 5 mA		S_F @	I_F	r_{dif} @ I_F and f = 1 kHz		C_d	
	max.	max.	min.	max.	typ.		max.		max.	
	(V)	(mA)	(mV)	(mV)	(mV/K)	(mA)	(mV/K)	(mA)	(pF)	
LEADED TYPES										
BA314	5	200	730	810	−1.8	1	6	10	140	
BA315	5	100	670	740	−2.1	1	7	10	3	
BZV86-1V4	10	200	1300	1500	−3.8	5	10	10	25	
BZV86-2V0	10	150	1850	2150	−6.0	5	15	10	25	
BZV86-2V6	10	125	2350	2800	−8.5	5	17.5	10	25	
BZV86-3V2	10	100	2850	3450	−11.5	5	20	10	25	SOD27 (DO35)
SURFACE-MOUNT TYPES										
BZV87-1V4	10	200	1300	1500	−3.8	5	10	10	25	
BZV87-2V0	10	150	1850	2150	−6.0	5	15	10	25	
BZV87-2V6	10	125	2350	2800	−8.5	5	17.5	10	25	
BZV87-3V2	10	100	2850	3450	−11.5	5	20	10	25	SOD80
BAS17	5	200	725	805	−1.8	1	80(1)	2	140	 SOT23

Note

1. Typical value.

Low-voltage stabistor BA314

FEATURES

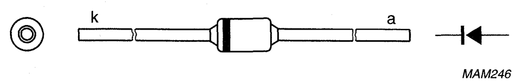
- Low-voltage stabilization
- Forward voltage range: 610 mV to 940 mV
- Total power dissipation: max. 400 mW.

APPLICATIONS

- Low-voltage stabilization e.g.
  - Bias stabilizer in class-B output stages
  - Clipping
  - Clamping
  - Meter protection.

DESCRIPTION

Low-voltage stabilization diode in a hermetically-sealed SOD27 (DO-35) glass package.



Diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	5	V
I_F	continuous forward current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} = 25$ °C	–	400	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

Low-voltage stabistor BA314

ELECTRICAL CHARACTERISTICS

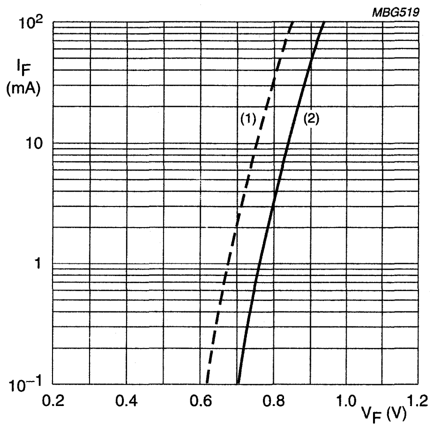
T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.2				
		I_F = 0.1 mA	610	–	690	mV
		I_F = 1 mA	680	–	760	mV
		I_F = 5 mA	730	–	810	mV
		I_F = 10 mA	750	–	830	mV
		I_F = 100 mA	850	–	940	mV
I_R	reverse current	V_R = 4 V	–	–	5	μA
r_{dif}	differential resistance	I_F = 1 mA; f = 1 kHz	–	30	–	Ω
		I_F = 10 mA; f = 1 kHz	–	3.5	6	Ω
S_F	temperature coefficient	I_F = 1 mA	–	−1.8	–	mV/K
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	–	140	pF

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	8 mm from the body	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm	380	K/W

GRAPHICAL DATA



T_j = 25 °C.

(1) Minimum values.

(2) Maximum values.

Fig.2 Forward current as a function of forward voltage.

Low-voltage stabistor — BA315

FEATURES

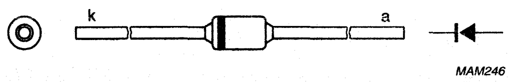
- Low-voltage stabilization
- Forward voltage range: 480 mV to 1 050 mV
- Total power dissipation: max. 350 mW.

APPLICATIONS

- Low-voltage stabilization e.g.
  - Bias stabilizer in class-B output stages
  - Clipping
  - Clamping
  - Meter protection.

DESCRIPTION

Low-voltage stabilization diode in a hermetically-sealed SOD27 (DO-35) glass package.



Diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	5	V
I_F	continuous forward current		–	100	mA
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	350	mW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature		–	200	°C

ELECTRICAL CHARACTERISTICS

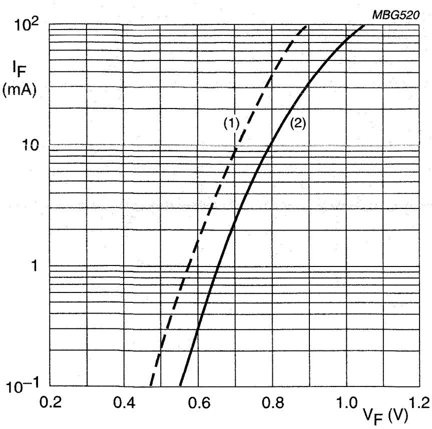
T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.2				
		I_F = 0.1 mA	480	–	540	mV
		I_F = 1 mA	590	–	660	mV
		I_F = 5 mA	670	–	740	mV
		I_F = 10 mA	710	–	790	mV
		I_F = 100 mA	875	–	1050	mV
I_R	reverse current	V_R = 5 V	–	–	1500	nA
r_{dif}	differential resistance	I_F = 1 mA; f = 1 kHz	–	50	–	Ω
		I_F = 10 mA; f = 1 kHz	–	6	7	Ω
S_F	temperature coefficient	I_F = 1 mA	–	−2.1	–	mV/K
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	–	3	pF

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	8 mm from the body	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	maximum lead length	600	K/W

GRAPHICAL DATA



T_j = 25 °C.
(1) Minimum values.
(2) Maximum values.

Fig.2 Forward current as a function of forward voltage.

Low-voltage stabistor | BAS17

FEATURES

- Low-voltage stabilization
- Forward voltage range: 580 to 960 mV
- Total power dissipation: max. 250 mW.

APPLICATIONS

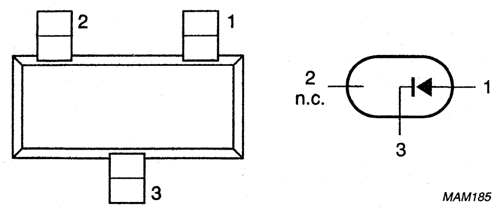
- Low-voltage stabilization e.g.
  - Bias stabilizer in class-B output stages
  - Clipping
  - Clamping
  - Meter protection.

DESCRIPTION

Low-voltage stabilization diode in a small plastic SOT23 package.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode



Marking code: A91.

Fig.1 Simplified outline (SOT23), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	5	V
I_F	continuous forward current		–	200	mA
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	250	mW
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.2				
		I_F = 0.1 mA	580	–	660	mV
		I_F = 1 mA	665	–	745	mV
		I_F = 5 mA	725	–	805	mV
		I_F = 10 mA	750	–	830	mV
		I_F = 100 mA	870	–	960	mV
I_R	reverse current	V_R = 4 V	–	–	5	μA
r_{dif}	differential resistance	I_F = 0.5 mA	–	120	–	Ω
		I_F = 2 mA	–	80	–	Ω
S_F	temperature coefficient	I_F = 1 mA	–	−1.8	–	mV/K
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	–	140	pF

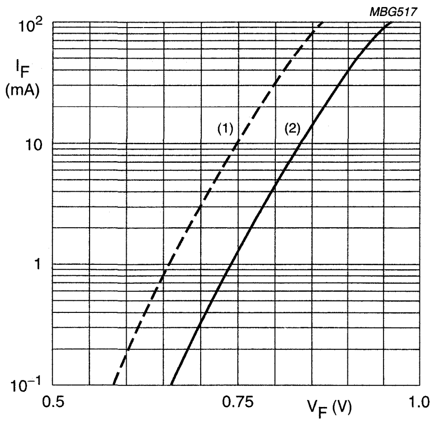
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



T_j = 25 °C.

(1) Minimum values.

(2) Maximum values.

Fig.2 Forward current as a function of forward voltage.

Low-voltage stabistors

BZV86 series

FEATURES

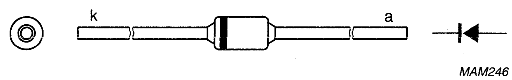
- Low-voltage stabilization
- Forward voltage range: 1.4 to 3.2 V
- Total power dissipation: max. 330 mW
- Differential resistance range: max. 20 to 35 Ω.

APPLICATIONS

- Power clipping
- Level shifting
- Low-voltage regulation
- Temperature stabilization.

DESCRIPTION

Low-voltage stabilization diode in a hermetically-sealed SOD27 (DO-35) glass package. The series consists of four types: BZV86-1V4 to BZV86-3V2.



The diodes are type branded.

Fig.1 Simplified outline (SOD27; DO-35) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	10	V
I_F	continuous forward current				
	BZV86-1V4		–	200	mA
	BZV86-2V0		–	150	mA
	BZV86-2V6		–	125	mA
	BZV86-3V2		–	100	mA
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	330	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

ELECTRICAL CHARACTERISTICS

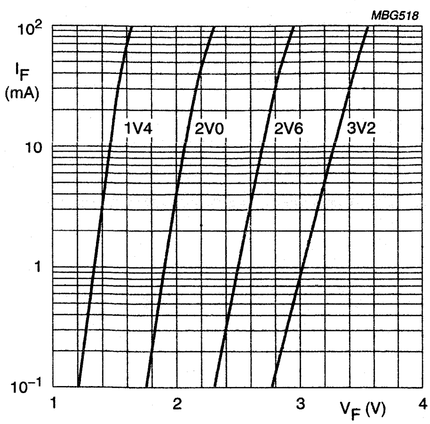
T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 5 mA; see Fig.2				
	BZV86-1V4		1.30	–	1.50	V
	BZV86-2V0		1.85	–	2.15	V
	BZV86-2V6		2.35	–	2.80	V
	BZV86-3V2		2.85	–	3.45	V
I_R	reverse current	V_R = 5 V	–	–	200	nA
r_{dif}	differential resistance	I_F = 1 mA; f = 1 kHz				
	BZV86-1V4		–	55	–	Ω
	BZV86-2V0		–	80	–	Ω
	BZV86-2V6		–	90	–	Ω
	BZV86-3V2		–	100	–	Ω
r_{dif}	differential resistance	I_F = 5 mA; f = 1 kHz				
	BZV86-1V4		–	10	20	Ω
	BZV86-2V0		–	15	30	Ω
	BZV86-2V6		–	18	32.5	Ω
	BZV86-3V2		–	20	35	Ω
r_{dif}	differential resistance	I_F = 10 mA; f = 1 kHz				
	BZV86-1V4		–	6	10	Ω
	BZV86-2V0		–	8	15	Ω
	BZV86-2V6		–	9	17.5	Ω
	BZV86-3V2		–	10	20	Ω
S_F	temperature coefficient	I_F = 5 mA				
	BZV86-1V4		–	–3.8	–	mV/K
	BZV86-2V0		–	–6.0	–	mV/K
	BZV86-2V6		–	–8.5	–	mV/K
	BZV86-3V2		–	–11.5	–	mV/K
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	15	25	pF

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	8 mm from the body	300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	lead length 10 mm	380	K/W

GRAPHICAL DATA



$T_j = 25$ °C.

Fig.2 Forward current as a function of forward voltage; typical values.

Low-voltage stabistors BZV87 series

FEATURES

- Low-voltage stabilization
- Forward voltage range: 1.4 to 3.2 V
- Total power dissipation: max. 330 mW
- Differential resistance range: max. 20 to 35 Ω.

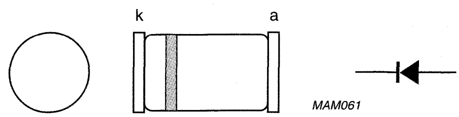
APPLICATIONS

- Power clipping
- Level shifting
- Low-voltage regulation
- Temperature stabilization.

DESCRIPTION

Low-voltage stabilization diode in a small glass SOD80 SMD package.

The series consists of four types: BZV87-1V4 to BZV87-3V2.



Cathode indicated by yellow marking band.
The diodes are type branded.

Fig.1 Simplified outline (SOD80) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	10	V
I_F	continuous forward current				
	BZV87-1V4		–	200	mA
	BZV87-2V0		–	150	mA
	BZV87-2V6		–	125	mA
	BZV87-3V2		–	100	mA
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	330	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 5 mA; see Fig.2				
	BZV87-1V4		1.30	–	1.50	V
	BZV87-2V0		1.85	–	2.15	V
	BZV87-2V6		2.35	–	2.80	V
	BZV87-3V2		2.85	–	3.45	V
I_R	reverse current	V_R = 5 V	–	–	200	nA
r_{dif}	differential resistance	I_F = 1 mA; f = 1 kHz				
	BZV87-1V4		–	55	–	Ω
	BZV87-2V0		–	80	–	Ω
	BZV87-2V6		–	90	–	Ω
	BZV87-3V2		–	100	–	Ω
r_{dif}	differential resistance	I_F = 5 mA; f = 1 kHz				
	BZV87-1V4		–	10	20	Ω
	BZV87-2V0		–	15	30	Ω
	BZV87-2V6		–	18	32.5	Ω
	BZV87-3V2		–	20	35	Ω
r_{dif}	differential resistance	I_F = 10 mA; f = 1 kHz				
	BZV87-1V4		–	6	10	Ω
	BZV87-2V0		–	8	15	Ω
	BZV87-2V6		–	9	17.5	Ω
	BZV87-3V2		–	10	20	Ω
S_F	temperature coefficient	I_F = 5 mA				
	BZV87-1V4		–	–3.8	–	mV/K
	BZV87-2V0		–	–6.0	–	mV/K
	BZV87-2V6		–	–8.5	–	mV/K
	BZV87-3V2		–	–11.5	–	mV/K
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	15	25	pF

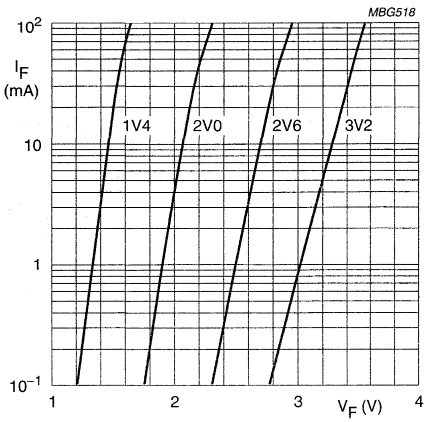
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		300	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	380	K/W

Note

1. Device mounted on a FR4 printed-circuit board.

GRAPHICAL DATA



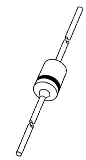
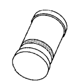
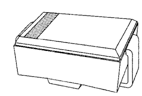
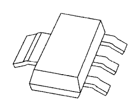
T_j = 25 °C.

Fig.2 Forward current as a function of forward voltage; typical values.

SECTION 9

MEDIUM-POWER SCHOTTKY-BARRIER DIODES

MEDIUM-POWER SCHOTTKY-BARRIER DIODES

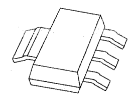
TYPE NUMBER	RATINGS				CHARACTERISTICS				DOUBLE DIODE	PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	C_d max.	@ V_R	V_F max.	@ I_F		
	(V)	(V)	(A)	(A)	(pF)	(V)	(mV)	(A)		
LEADED TYPES										
1N5817	20	20	1	25	80(1)	4	450	1	no	 SOD81
1N5818	30	30	1	25	50(1)	4	550	1	no	
1N5819	40	40	1	25	50(1)	4	600	1	no	
BYV10-20	20	–	1	–	220(1)	0	550	1	no	
BYV10-30	30	–	1	–	220(1)	0	550	1	no	
BYV10-40	40	–	1	–	220(1)	0	550	1	no	
SURFACE-MOUNT TYPES										
PRLL5817	20	20	1	25	70(1)	4	450	1	no	 SOD87
PRLL5818	30	30	1	25	50(1)	4	550	1	no	
PRLL5819	40	40	1	25	50(1)	4	600	1	no	
BYG90-20	20	20	1	30	75	4	550	1	no	 SOD106A
BYG90-30	30	30	1	30	75	4	550	1	no	
BYG90-40	40	40	1	30	75	4	550	1	no	
BYG90-90	90	90	1	30	100	4	790	1	no	
PBYR280CT	80	80	1	10	100	4	790	1	yes(2)	 SOT223
PBYR290CT	90	90	1	10	100	4	790	1	yes(2)	
PBYR2100CT	100	100	1	10	100	4	790	1	yes(2)	
PBYR2150CT	150	150	1	10	100	4	850	1	yes(2)	

Notes

1. Typical values.
2. Common cathode.

MEDIUM-POWER TRANSISTOR/SCHOTTKY-DIODE MODULES

Transistor section

TYPE NUMBER	RATINGS		CHARACTERISTICS					NPN or PNP MODULE	PACKAGE (not to scale)
	V_{CES} max.	I_C max.	h_{FE} min.	@ I_C	f_T min.	t_{on} / t_{off} max.	@ I_C		
	(V)	(mA)		(mA)	(MHz)	(ns)	(mA)		
PZTM1101	40	200	100	10	300	36/410	50	npn	 SOT223
PZTM1102	−40	−200	100	−10	250	30/460	50	pnp	

Schottky-barrier diode section

TYPE NUMBER	RATINGS		CHARACTERISTICS			
	V_R max.	$I_{F(AV)}$ max.	C_d max.	@ V_R	V_F max.	@ I_F
	(V)	(A)	(pF)	(V)	(mV)	(A)
PZTM1101	40	1	250	0	560	1
PZTM1102	40	1	250	0	560	1

Schottky barrier diodes 1N5817; 1N5818; 1N5819

FEATURES

- Low switching losses
- Fast recovery time
- Guard ring protected
- Hermetically sealed leaded glass package.

APPLICATIONS

- Low power, switched-mode power supplies
- Rectifying
- Polarity protection.

DESCRIPTION

The 1N5817 to 1N5819 types are Schottky barrier diodes fabricated in planar technology, and encapsulated in SOD81 hermetically sealed glass packages incorporating Implotec$^{TM(1)}$ technology.

(1) Implotec is a trademark of Philips.

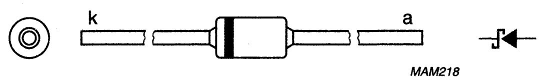


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage				
	1N5817		–	20	V
	1N5818		–	30	V
	1N5819		–	40	V
V_{RSM}	non-repetitive peak reverse voltage				
	1N5817		–	24	V
	1N5818		–	36	V
	1N5819		–	48	V
V_{RRM}	repetitive peak reverse voltage				
	1N5817		–	20	V
	1N5818		–	30	V
	1N5819		–	40	V
V_{RWM}	crest working reverse voltage				
	1N5817		–	20	V
	1N5818		–	30	V
	1N5819		–	40	V
$I_{F(AV)}$	average forward current	T_{amb} = 55 °C; $R_{th\ j\text{-}a}$ = 100 K/W; note 1; $V_{R(equiv)}$ = 0.2 V; note 2	–	1	A
I_{FSM}	non-repetitive peak forward current	t = 8.3 ms half sine wave; JEDEC method; $T_j = T_{j\ max}$ prior to surge: $V_R = 0$	–	25	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–	125	°C

Notes

1. Refer to SOD81 standard mounting conditions.
2. For Schottky barrier diodes thermal run-away has to be considered, as in some applications, the reverse power losses P_R are a significant part of the total power losses. Nomograms for determination of the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.2				
	1N5817	I_F = 0.1 A	–	–	320	mV
		I_F = 1 A	–	–	450	mV
		I_F = 3 A	–	–	750	mV
V_F	forward voltage	see Fig.2				
	1N5818	I_F = 0.1 A	–	–	330	mV
		I_F = 1 A	–	–	550	mV
		I_F = 3 A	–	–	875	mV
V_F	forward voltage	see Fig.2				
	1N5819	I_F = 0.1 A	–	–	340	mV
		I_F = 1 A	–	–	600	mV
		I_F = 3 A	–	–	900	mV
I_R	reverse current	$V_R = V_{RRMmax}$; note 1	–	–	1	mA
		$V_R = V_{RRMmax}$; T_j = 100 °C	–	–	10	mA
C_d	diode capacitance	V_R = 4 V; f = 1 MHz				
	1N5817		–	80	–	pF
	1N5818		–	50	–	pF
	1N5819		–	50	–	pF

Note

1. Pulsed test: t_p = 300 µs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

1. Refer to SOD81 standard mounting conditions.

GRAPHICAL DATA

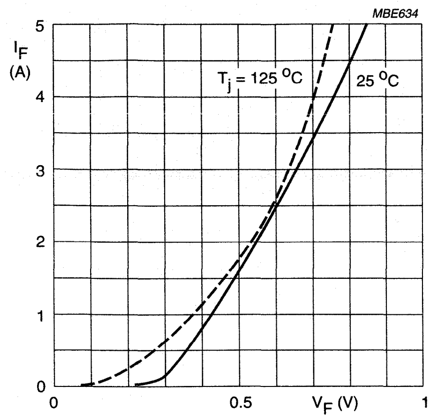


Fig.2 Typical forward voltage.

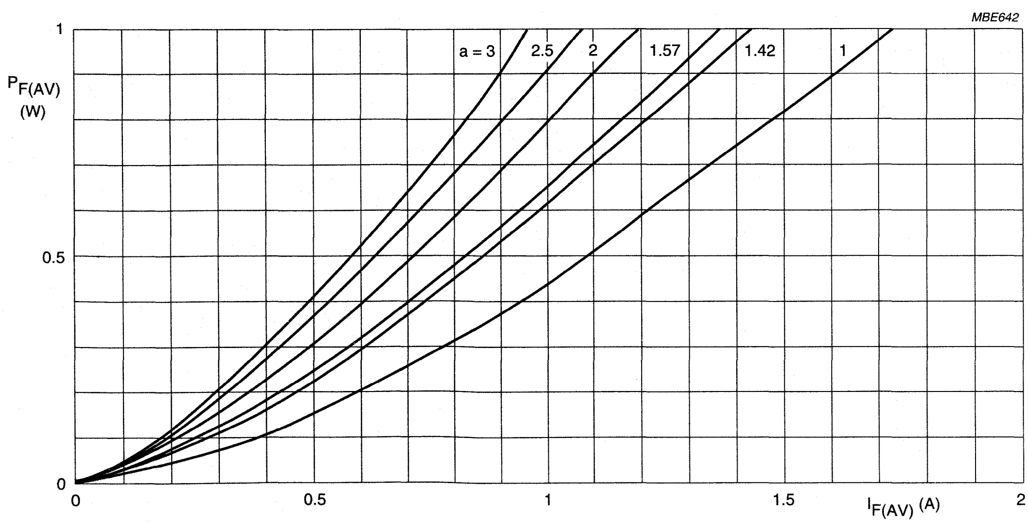


Fig.3 1N817. Maximum values steady state forward power dissipation as a function of the average forward current; $a = I_{F(RMS)}/I_{F(AV)}$.

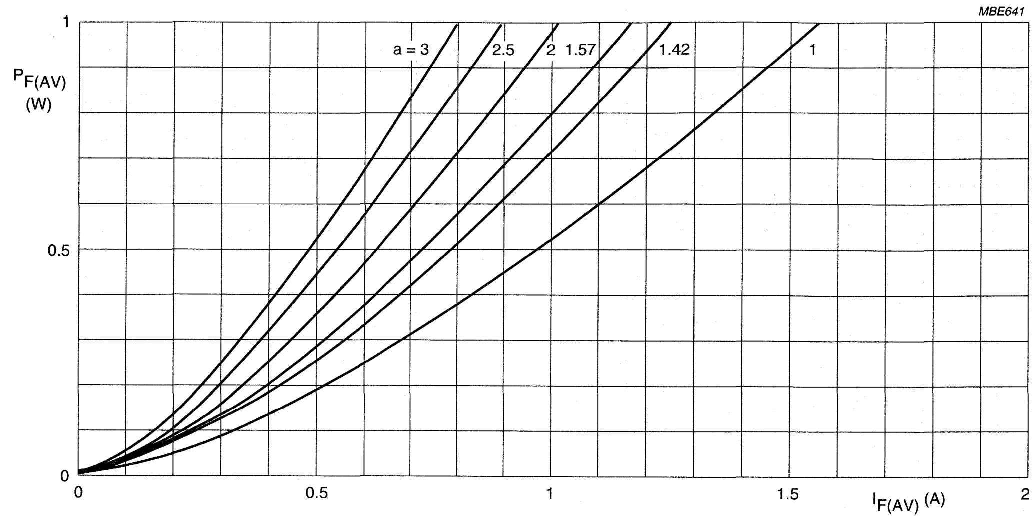


Fig.4 1N5818. Maximum values steady state forward power dissipation as a function of the average forward current; $a = I_{F(RMS)}/I_{F(AV)}$.

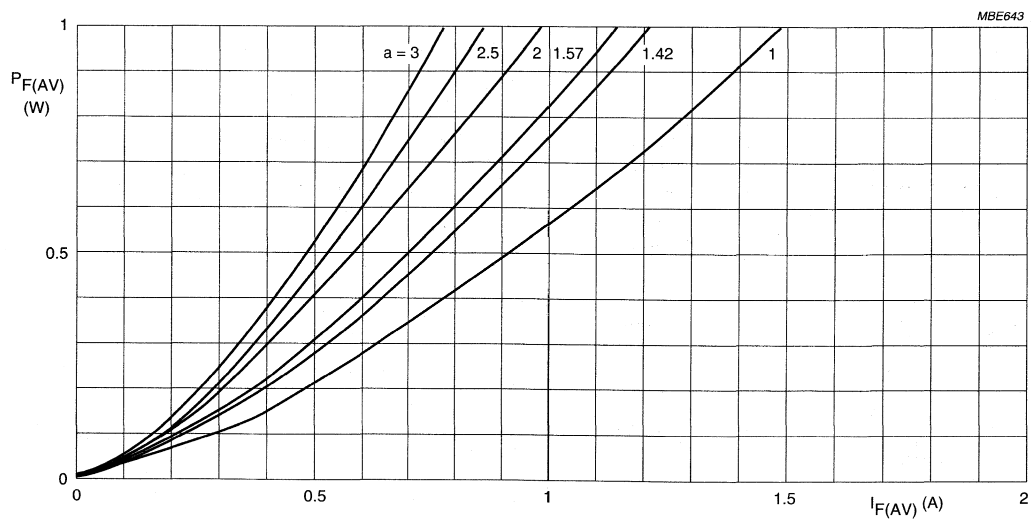


Fig.5 1N5819. Maximum values steady state forward power dissipation as a function of the average forward current; $a = I_{F(RMS)}/I_{F(AV)}$.

Schottky barrier diodes 1N5817; 1N5818; 1N5819

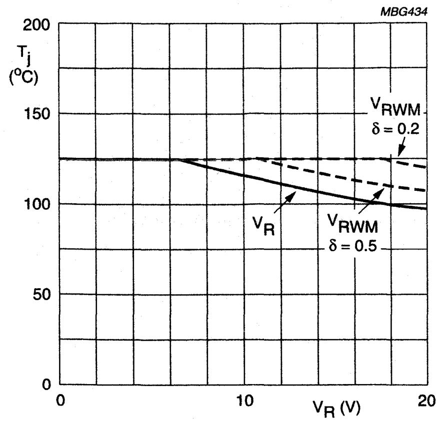


Fig.6 1N5817. Maximum permissible junction temperature as a function of reverse voltage; $R_{th\ j\text{-}a}$ = 100 K/W.

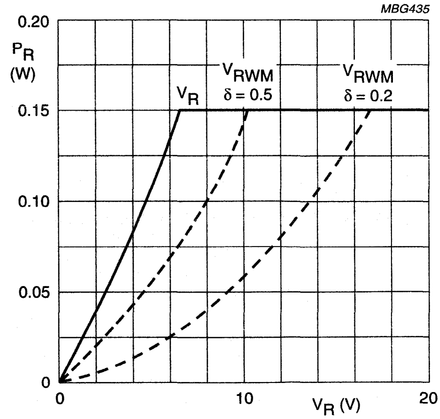


Fig.7 1N5817. Reverse power dissipation as a function of reverse voltage (max. values); $R_{th\ j\text{-}a}$ = 100 K/W.

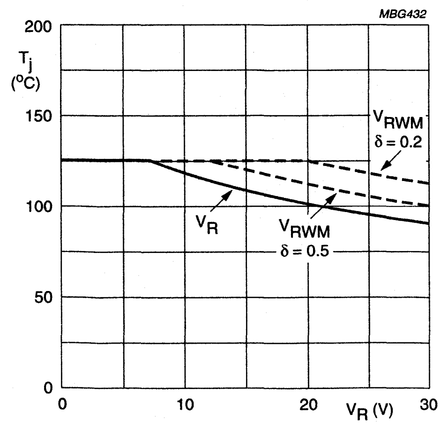


Fig.8 1N5818. Maximum permissible junction temperature as a function of reverse voltage; $R_{th\ j\text{-}a}$ = 100 K/W.

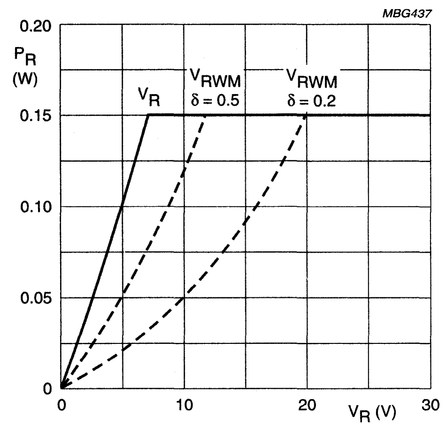


Fig.9 1N5818. Reverse power dissipation as a function of reverse voltage (max. values); $R_{th\ j\text{-}a}$ = 100 K/W.

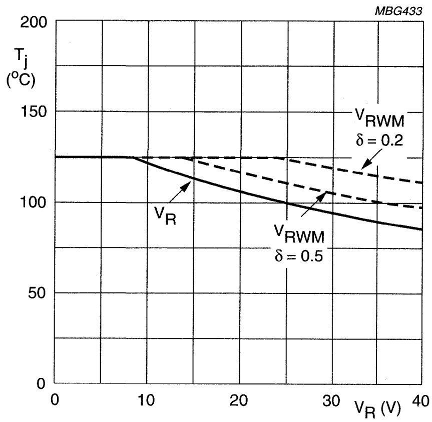


Fig.10 1N5819. Maximum permissible junction temperature as a function of reverse voltage; $R_{th\ j\text{-}a}$ = 100 K/W.

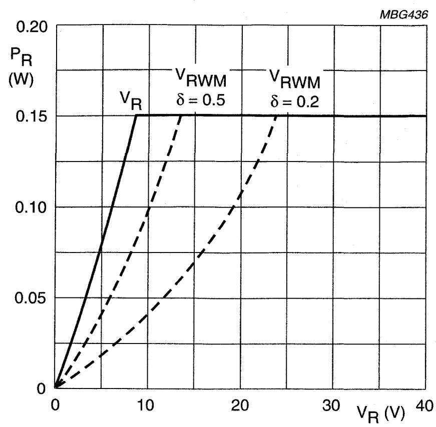


Fig.11 1N5819. Reverse power dissipation as a function of reverse voltage (max. values); $R_{th\ j\text{-}a}$ = 100 K/W.

Schottky barrier rectifier diodes BYG90-40 series

FEATURES

- Low switching losses
- Capability of absorbing very high surge current
- Fast recovery time
- Guard ring protected
- Plastic SMD package.

APPLICATIONS

- Low power switched-mode power supplies
- Rectifying
- Polarity protection.

DESCRIPTION

The BYG 90-40 series consists of Schottky barrier rectifier diodes, fabricated in planar technology, and encapsulated in rectangular SOD106A plastic SMD packages.

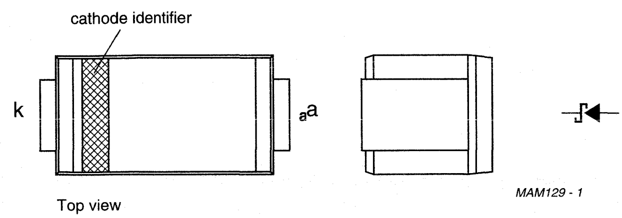


Fig.1 Simplified outline (SOD106A), pin configuration and symbol.

Schottky barrier rectifier diodes BYG90-40 series

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage				
	BYG90-20		–	20	V
	BYG90-30		–	30	V
	BYG90-40		–	40	V
V_{RRM}	repetitive peak reverse voltage				
	BYG90-20		–	20	V
	BYG90-30		–	30	V
	BYG90-40		–	40	V
V_{RWM}	crest working reverse voltage				
	BYG90-20		–	20	V
	BYG90-30		–	30	V
	BYG90-40		–	40	V
$I_{F(AV)}$	average forward current	T_{amb} = 65 °C; see Fig.2; $R_{th\ j\text{-}a}$ = 80 K/W; note 1; $V_{R(equiv)}$ = 0.2 V; note 2	–	1	A
I_{FSM}	non-repetitive peak forward current	t = 8.3 µs half sine wave; JEDEC method	–	30	A
I_{RSM}	non-repetitive peak reverse current	t_p = 100 µs	–	0.5	A
T_{stg}	storage temperature		–65	+125	°C
T_j	junction temperature		–	125	°C

Notes

1. Refer to SOD106A standard mounting conditions.
2. For Schottky barrier diodes thermal run-away has to be considered, as in some applications, the reverse power losses P_R are a significant part of the total power losses. Nomograms for determination of the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per diode						
V_F	forward voltage	see Fig.2; note 1				
		I_F = 1 A	–	–	550	mV
		I_F = 3 A	–	–	850	mV
		I_F = 1 A; T_j = 100 °C	–	–	450	mV
I_R	reverse current	$V_R = V_{RRMmax}$; note 1; see Fig.3	–	–	1	mA
		$V_R = V_{RRMmax}$; T_j = 100 °C; note 1; see Fig.3	–	–	10	mA
C_d	diode capacitance	V_R = 4 V; f = 1 MHz; see Fig.4	–	–	75	pF

Note

1. Pulsed test: t_p = 300 µs; δ = 0.02.

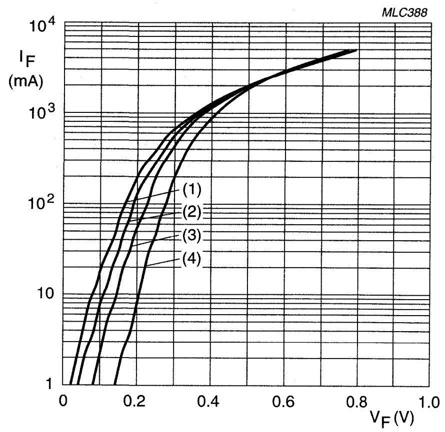
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	80	K/W

Note

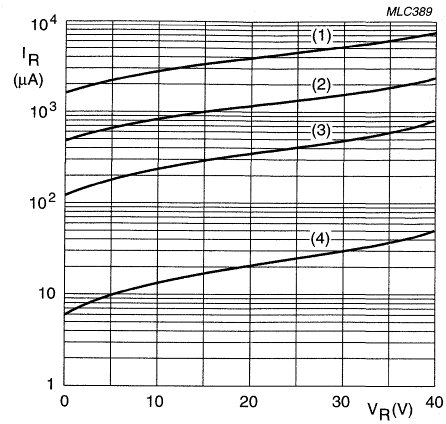
1. Refer to SOD106A standard mounting conditions.

GRAPHICAL DATA



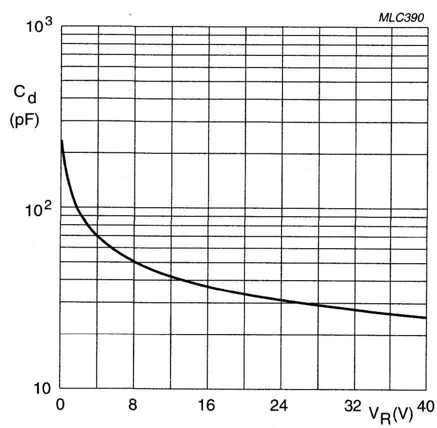
(1) T_{amb} = 125 °C.
(2) T_{amb} = 100 °C.
(3) T_{amb} = 75 °C.
(4) T_{amb} = 25 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 125 °C.
(2) T_{amb} = 100 °C.
(3) T_{amb} = 75 °C.
(4) T_{amb} = 25 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier rectifier diode — BYG90-90

FEATURES

- Low switching losses
- High breakdown voltage
- Capability of absorbing very high surge current
- Fast recovery time
- Guard ring protected
- Plastic SMD package.

APPLICATIONS

- Low power switched-mode power supplies
- Rectifying
- Polarity protection.

DESCRIPTION

The BYG 90-90 is a Schottky barrier rectifier diode, fabricated in planar technology, and encapsulated in the rectangular SOD106A plastic SMD package.

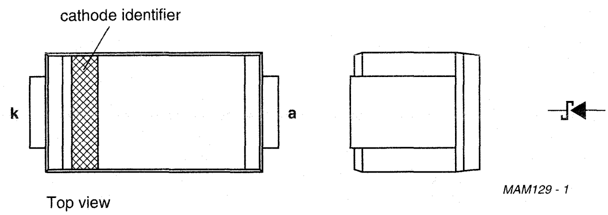


Fig.1 Simplified outline (SOD106A) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage			90	V
V_{RRM}	repetitive peak reverse voltage			90	V
V_{RWM}	crest working reverse voltage			90	V
$I_{F(AV)}$	average forward current	T_{amb} = 100 °C; see Fig.2; $R_{th\ j\text{-}a}$ = 13.5 K/W; note 1; $V_{R(equiv)}$ = 0.2 V; note 2	–	1	A
I_{FSM}	non-repetitive peak forward current	t = 8.3 ms half sine wave; JEDEC method	–	30	A
I_{RSM}	non-repetitive peak reverse current	t_p = 100 µs	–	0.5	A
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Notes

1. Refer to SOD106A standard mounting conditions.
2. For Schottky barrier diodes thermal run-away has to be considered, as in some applications, the reverse power losses P_R are a significant part of the total power losses. Nomograms for determination of the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.2; note 1				
		I_F = 0.06 A	–	–	360	mV
		I_F = 1 A	–	–	790	mV
		I_F = 1 A; T_j = 100 °C	–	–	690	mV
I_R	reverse current	$V_R = V_{RRMmax}$; note 1; see Fig.3	–	–	0.5	mA
		$V_R = V_{RRMmax}$; T_j = 100 °C; note 1; see Fig.3	–	–	5	mA
C_d	diode capacitance	V_R = 4 V; f = 1 MHz; see Fig.4	–	–	100	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

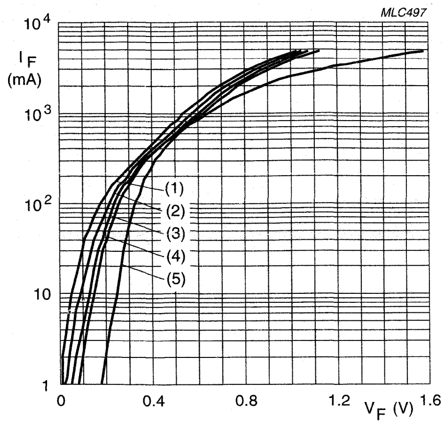
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	80	K/W

Note

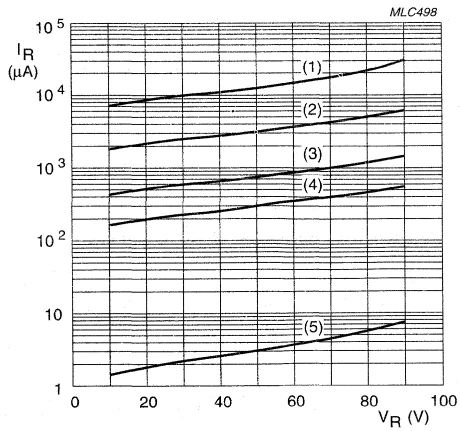
1. Refer to SOD106A standard mounting conditions.

GRAPHICAL DATA



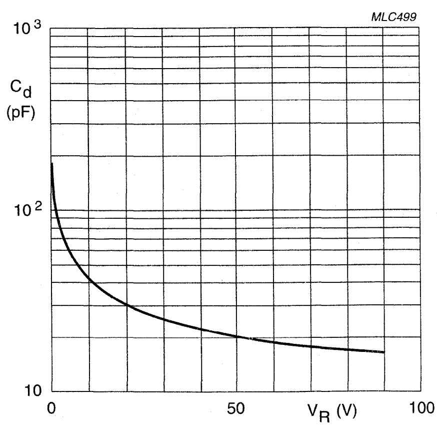
(1) T_{amb} = 150 °C.
(2) T_{amb} = 125 °C.
(3) T_{amb} = 100 °C.
(4) T_{amb} = 85 °C.
(5) T_{amb} = 25 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 150 °C.
(2) T_{amb} = 125 °C.
(3) T_{amb} = 100 °C.
(4) T_{amb} = 85 °C.
(5) T_{amb} = 25 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

FEATURES

- Low switching losses
- Fast recovery time
- Guard ring protected
- Hermetically sealed leaded glass package.

APPLICATIONS

- Low power, switched-mode power supplies
- Rectifying
- Polarity protection.

DESCRIPTION

The BYV10-20 to BYV10-40 types are Schottky barrier diodes fabricated in planar technology, and encapsulated in SOD81 hermetically sealed glass packages incorporating Implotec$^{TM(1)}$ technology.

(1) Implotec is a trademark of Philips.

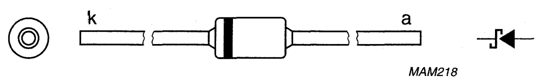


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV10-20		–	20	V
	BYV10-30		–	30	V
	BYV10-40		–	40	V
$I_{F(AV)}$	average forward current	note 1	–	1	A
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	125	°C

Note

1. Refer to SOD81 standard mounting conditions.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 0.1 A	–	–	390	mV
		I_F = 1 A	–	–	550	mV
		I_F = 3 A	–	–	850	mV
I_R	reverse current	$V_R = V_{RRMmax}$; note 1	–	–	1	mA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	220	–	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

1. Refer to SOD81 standard mounting conditions.

Schottky barrier double diodes PBYR2100CT series

FEATURES

- Low switching losses
- High breakdown voltage
- Fast recovery time
- Guard ring protected
- Plastic SMD package.

APPLICATIONS

- Low power, switched-mode power supplies
- Rectification
- Polarity protection.

DESCRIPTION

The PBYR2100CT series consists of Schottky barrier double diodes, fabricated in planar technology, and encapsulated in SOT223 plastic SMD packages.

PINNING

PIN	DESCRIPTION
1	anode (a_1)
2	common cathode
3	anode (a_2)
4	common cathode

MARKING

TYPE NUMBER	MARKING CODE
PBYR280CT	BYR28
PBYR290CT	BYR29
PBYR2100CT	BYR210

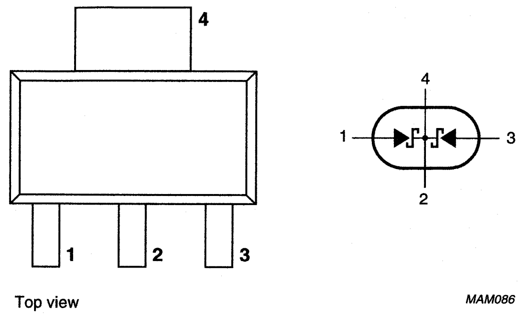


Fig.1 Simplified outline (SOT223), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage				
	PBYR280CT		–	80	V
	PBYR290CT		–	90	V
	PBYR2100CT		–	100	V
V_{RRM}	repetitive peak reverse voltage				
	PBYR280CT		–	80	V
	PBYR290CT		–	90	V
	PBYR2100CT		–	100	V
V_{RWM}	crest working reverse voltage				
	PBYR280CT		–	80	V
	PBYR290CT		–	90	V
	PBYR2100CT		–	100	V
$I_{F(AV)}$	average forward current	T_{amb} = 85 °C; see Fig.2; $R_{th\ j\text{-}a}$ = 70 K/W; note 1; $V_{R(equiv)}$ = 0.2 V; note 2	–	1	A
I_{FSM}	non-repetitive peak forward current	t = 8.3 ms half sine wave; JEDEC method	–	10	A
I_{RSM}	non-repetitive peak reverse current	t_p = 100 µs	–	0.5	A
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C
T_{amb}	operating ambient temperature		–	85	°C

Notes

1. Refer to SOT223 standard mounting conditions.
2. For Schottky barrier diodes thermal run-away has to be considered, as in some applications, the reverse power losses P_R are a significant part of the total power losses. Nomograms for determination of the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per diode						
V_F	forward voltage	see Fig.3				
		I_F = 1 A; note 1	–	–	790	mV
		I_F = 1 A; T_j = 100 °C; note 1	–	–	690	mV
I_R	reverse current	$V_R = V_{RRMmax}$; note 1; see Fig.4	–	–	0.5	mA
		$V_R = V_{RRMmax}$; T_j = 100 °C; note 1; see Fig.4	–	–	5	mA
C_d	diode capacitance	V_R = 4 V; f = 1 MHz; see Fig.5	–	–	100	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	70	K/W

Note

1. Refer to SOT223 standard mounting conditions.

GRAPHICAL DATA

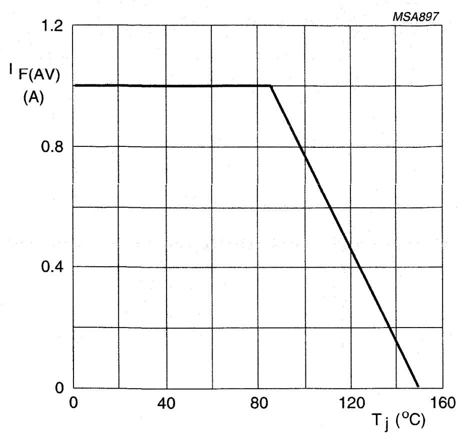
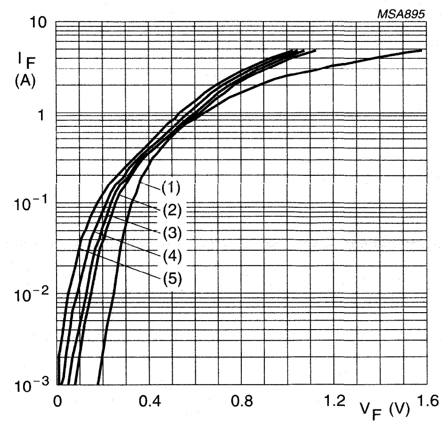
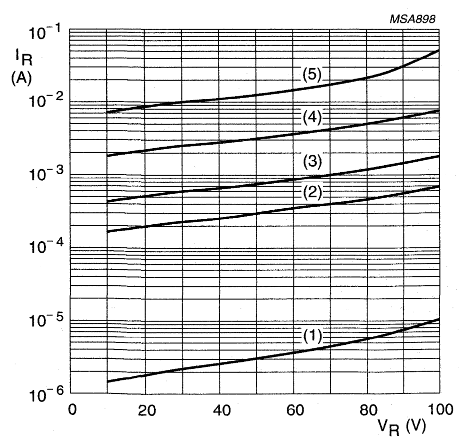


Fig.2 Average forward current derating curve.



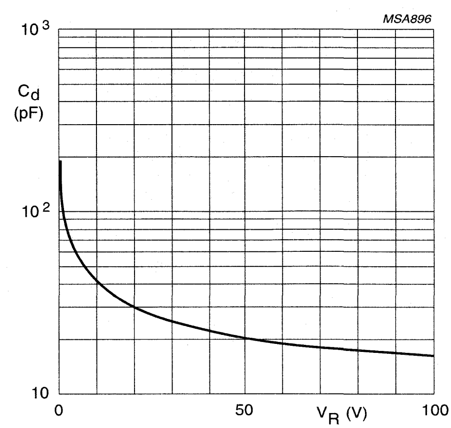
(1) T_{amb} = 25 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 100 °C.
(4) T_{amb} = 125 °C.
(5) T_{amb} = 150 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 25 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 100 °C.
(4) T_{amb} = 125 °C.
(5) T_{amb} = 150 °C.

Fig.4 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier double diode | PBYR2150CT

FEATURES

- Low switching losses
- Low forward voltage
- High breakdown voltage
- Fast recovery time
- Guard ring protected
- Plastic SMD package.

APPLICATIONS

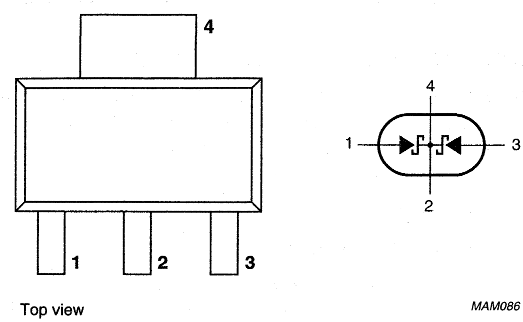
- Low power, switched-mode power supplies
- Rectification
- Polarity protection.

PINNING

PIN	DESCRIPTION
1	anode (a_1)
2	common cathode
3	anode (a_2)
4	common cathode

DESCRIPTION

The PBYR2150CT is a Schottky barrier double diode, fabricated in planar technology, and encapsulated in a SOT223 plastic SMD package.



Marking code: BYR215.

Fig.1 Simplified outline (SOT223), pin configuration and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	150	V
V_{RRM}	repetitive peak reverse voltage		–	150	V
V_{RWM}	crest working reverse voltage		–	150	V
$I_{F(AV)}$	average forward current	T_{amb} = 85 °C; $R_{th\ j\text{-}a}$ = 70 K/W; note 1; $V_{R(equiv)}$ = 0.2 V; note 2	–	1	A
I_{FSM}	non-repetitive peak forward current	t = 8.3 ms half sinewave; JEDEC method	–	10	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		−65	+150	°C
T_{amb}	operating ambient temperature		–	80	°C

Notes

1. Refer to SOT223 standard mounting conditions.
2. For Schottky barrier diodes thermal run-away has to be considered, as in some applications, the reverse power losses P_R are a significant part of the total power losses. Nomograms for determination of the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
Per diode				
V_F	forward voltage	see Fig.2		
		I_F = 0.1 A; note 1	400	mV
		I_F = 0.5 A; note 1	650	mV
		I_F = 1 A; note 1	850	mV
		I_F = 1 A; T_j = 100 °C; note 1	690	mV
I_R	reverse current	$V_R = V_{RRMmax}$; note 1; see Fig.3	1	mA
		$V_R = V_{RRMmax}$; T_j = 100 °C; note 1; see Fig.3	10	mA
C_d	diode capacitance	V_R = 4 V; f = 1 MHz; see Fig.4	100	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

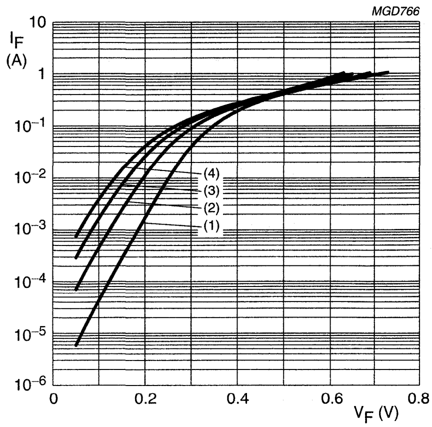
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	70	K/W

Note

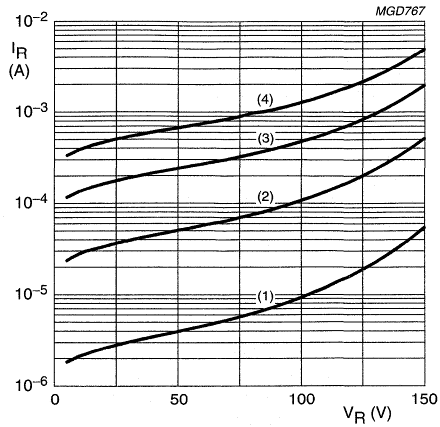
1. Refer to SOT223 standard mounting conditions.

GRAPHICAL DATA



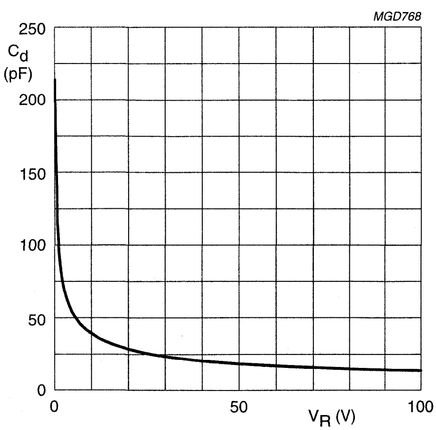
(1) T_{amb} = 25 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 80 °C.
(4) T_{amb} = 100 °C.

Fig.2 Forward current as a function of forward voltage; typical values.



(1) T_{amb} = 25 °C.
(2) T_{amb} = 60 °C.
(3) T_{amb} = 80 °C.
(4) T_{amb} = 100 °C.

Fig.3 Reverse current as a function of reverse voltage; typical values.



f = 1 MHz.

Fig.4 Diode capacitance as a function of reverse voltage; typical values.

Schottky barrier diodes | PRLL5817; PRLL5818; PRLL5819

FEATURES

- Low switching losses
- Fast recovery time
- Guard ring protected
- Hermetically sealed glass SMD package.

APPLICATIONS

- Low power, switched-mode power supplies
- Rectifying
- Polarity protection.

DESCRIPTION

The PRLL5817 to PRLL5819 types are Schottky barrier diodes fabricated in planar technology, and encapsulated in SOD87 hermetically sealed glass SMD packages incorporating Implotec™[(1)] technology.

(1) Implotec is a trademark of Philips.

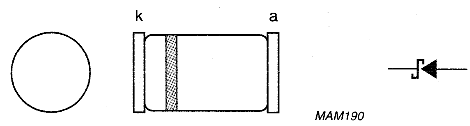


Fig.1 Simplified outline (SOD87) and symbol.

MARKING

TYPE NUMBER	MARKING CODE
PRLL5817	817 PH
PRLL5818	818 PH
PRLL5819	819 PH

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage				
	PRLL5817		–	20	V
	PRLL5818		–	30	V
	PRLL5819		–	40	V
V_{RSM}	non-repetitive peak reverse voltage				
	PRLL5817		–	24	V
	PRLL5818		–	36	V
	PRLL5819		–	48	V
V_{RRM}	repetitive peak reverse voltage				
	PRLL5817		–	20	V
	PRLL5818		–	30	V
	PRLL5819		–	40	V
V_{RWM}	crest working reverse voltage				
	PRLL5817		–	20	V
	PRLL5818		–	30	V
	PRLL5819		–	40	V
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C	–	1	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge: $V_R = 0$	–	25	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–	125	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	see Fig.2				
	PRLL5817	I_F = 0.1 A	–	–	320	mV
		I_F = 1 A	–	–	450	mV
		I_F = 3 A	–	–	750	mV
V_F	forward voltage	see Fig.2				
	PRLL5818	I_F = 0.1 A	–	–	330	mV
		I_F = 1 A	–	–	550	mV
		I_F = 3 A	–	–	875	mV
V_F	forward voltage	see Fig.2				
	PRLL5819	I_F = 0.1 A	–	–	340	mV
		I_F = 1 A	–	–	600	mV
		I_F = 3 A	–	–	900	mV
I_R	reverse current	$V_R = V_{RRMmax}$; note 1	–	0.5	1	mA
		$V_R = V_{RRMmax}$; T_j = 100 °C	–	5	10	mA
C_d	diode capacitance	V_R = 4 V; f = 1 MHz				
	PRLL5817		–	70	–	pF
	PRLL5818		–	50	–	pF
	PRLL5819		–	50	–	pF

Note

1. Pulsed test: t_p = 300 μs; δ = 0.02.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

1. Refer to SOD87 standard mounting conditions.

GRAPHICAL DATA

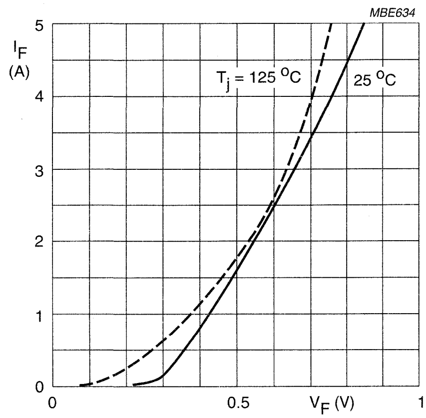


Fig.2 Typical forward voltage.

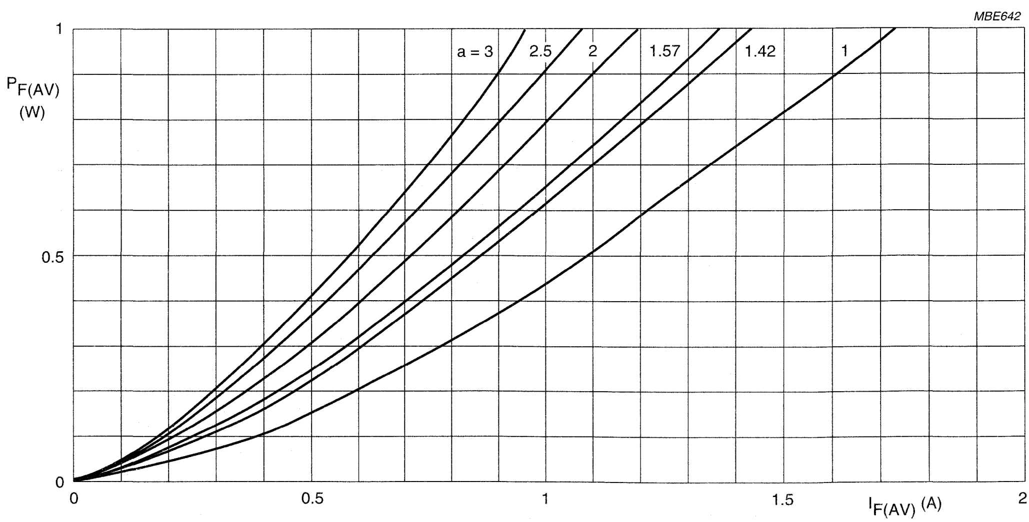


Fig.3 PRLL817. Maximum values steady state forward power dissipation as a function of the average forward current; $a = I_{F(RMS)}/I_{F(AV)}$.

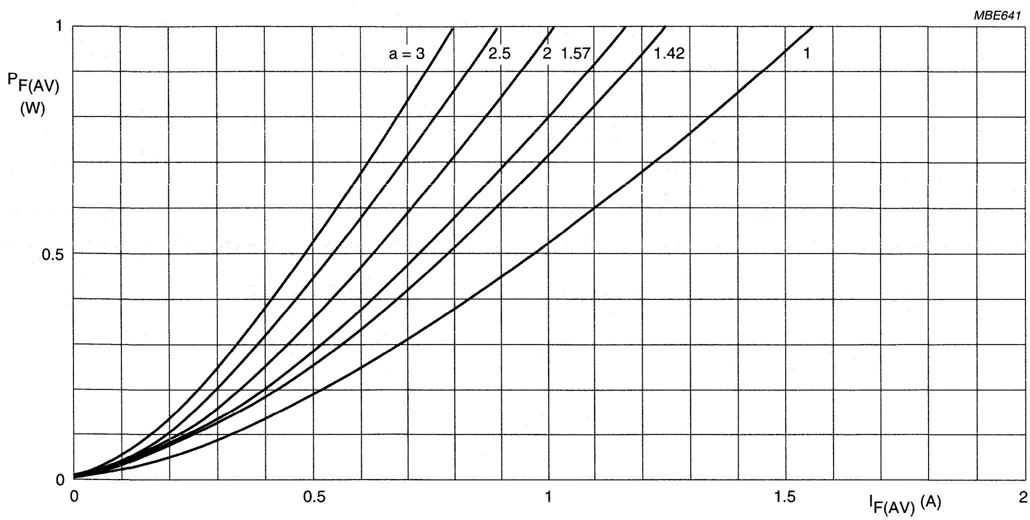


Fig.4 PRLL5818. Maximum values steady state forward power dissipation as a function of the average forward current; $a = I_{F(RMS)}/I_{F(AV)}$.

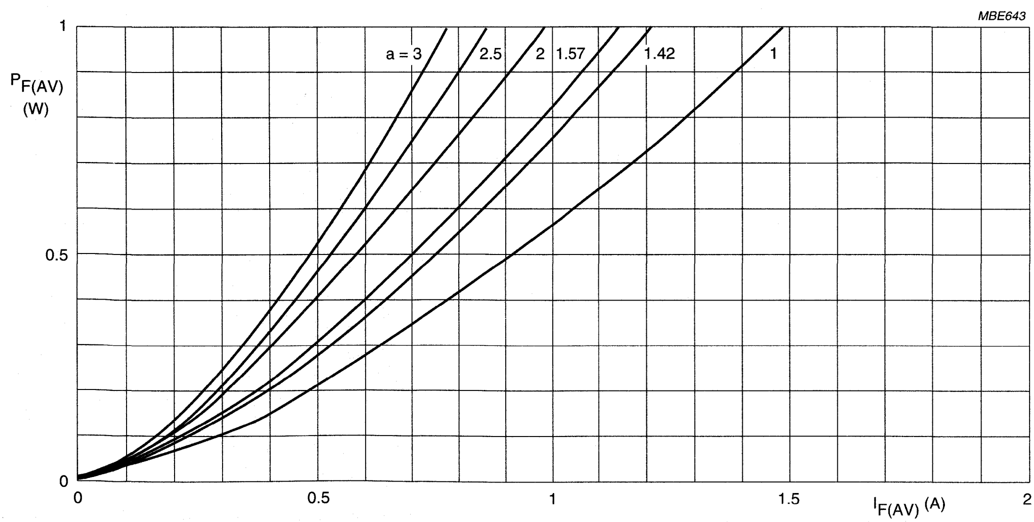


Fig.5 PRLL5819. Maximum values steady state forward power dissipation as a function of the average forward current; $a = I_{F(RMS)}/I_{F(AV)}$.

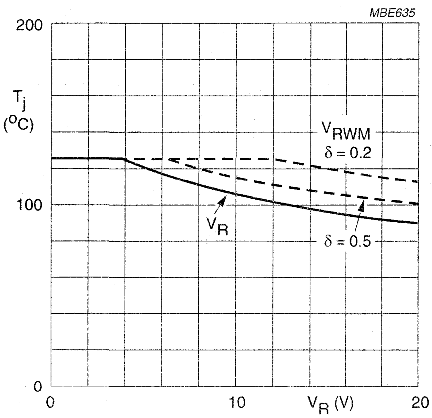


Fig.6 PRLL5817. Maximum permissible junction temperature as a function of reverse voltage; device mounted; refer to SOD87 standard mounting conditions.

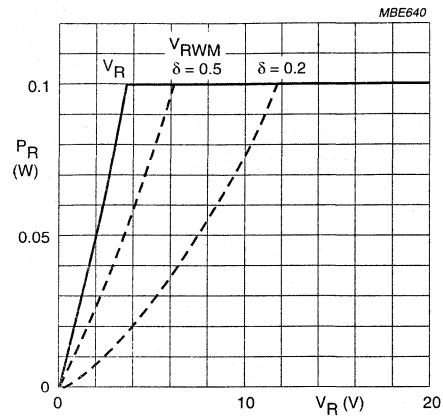


Fig.7 PRLL5817. Reverse power dissipation as a function of reverse voltage (max. values); device mounted; refer to SOD87 standard mounting conditions.

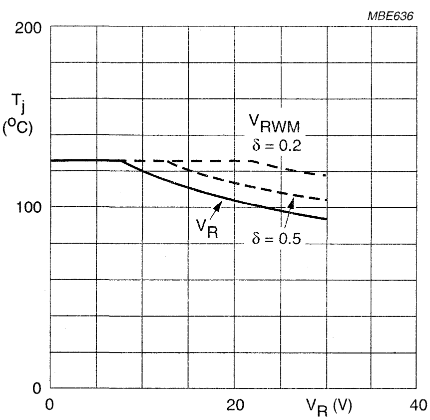


Fig.8 PRLL5818. Maximum permissible junction temperature as a function of reverse voltage; device mounted; refer to SOD87 standard mounting conditions.

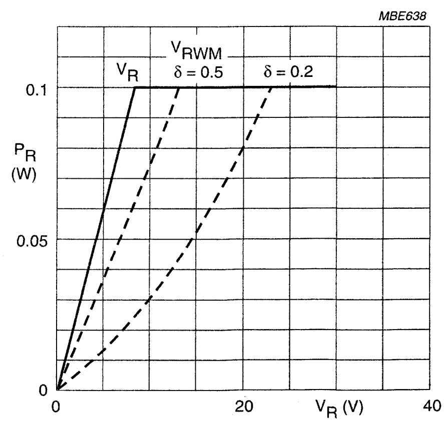


Fig.9 PRLL5818. Reverse power dissipation as a function of reverse voltage (max. values); device mounted; refer to SOD87 standard mounting conditions.

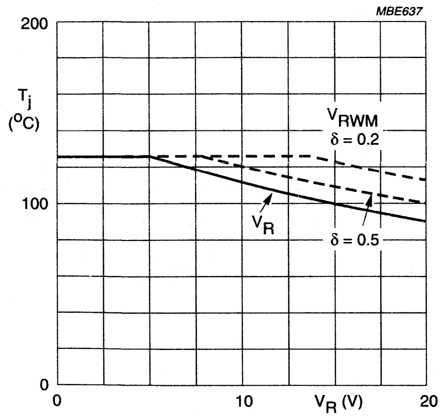


Fig.10 PRLL5819. Maximum permissible junction temperature as a function of reverse voltage; device mounted; refer to SOD87 standard mounting conditions.

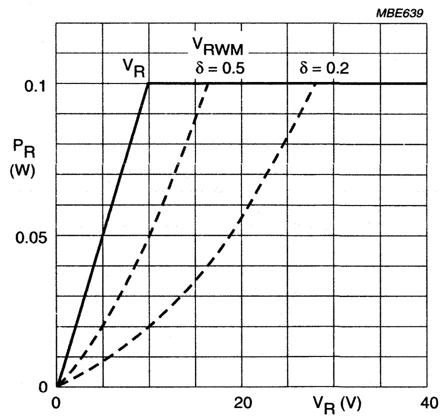


Fig.11 PRLL5819. Reverse power dissipation as a function of reverse voltage (max. values); device mounted; refer to SOD87 standard mounting conditions.

NPN transistor/Schottky-diode module | PZTM1101

FEATURES

- Low output capacitance
- Fast switching time
- Integrated Schottky protection diode.

APPLICATIONS

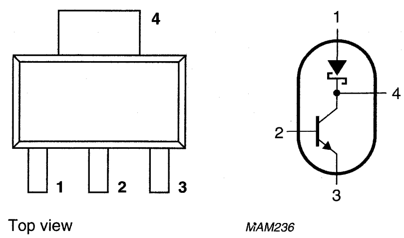
- High-speed switching for industrial applications.

PINNING

PIN	DESCRIPTION
1	anode Schottky
2	base
3	emitter
4	collector, cathode Schottky

DESCRIPTION

Combination of an NPN transistor and a Schottky barrier diode in a plastic SOT223 package. PNP complement: PZTM1102.



Marking code: TM1101.

Fig.1 Simplified outline (SOT223) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
NPN transistor					
V_{CBO}	collector-base voltage	open emitter	–	60	V
V_{CES}	collector-emitter voltage	$V_{BE} = 0$	–	40	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	200	mA
Schottky barrier diode					
V_R	continuous reverse voltage		–	40	V
I_F	forward current (DC)		–	1	A
$I_{F(AV)}$	average forward current		–	1	A
T_j	junction temperature	reverse current applied	–	125	°C
		forward current applied	–	150	°C
Combined device					
P_{tot}	total power dissipation	up to T_{amb} = 25 °C	–	1.2	W
T_{amb}	operating ambient temperature		–55	+150	°C
T_{stg}	storage temperature		–55	+150	°C
T_j	junction temperature		–	150	°C

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
NPN transistor					
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; I_C = 10 μA; I_E = 0; T_{amb} = −55 to +150 °C; note 1	60	–	V
$V_{(BR)CES}$	collector-emitter breakdown voltage	open base; I_C = 1 mA; V_{BE} = 0; T_{amb} = −55 to +150 °C; note 1	40	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; I_E = 10 μA; I_C = 0; T_{amb} = −55 to +150 °C; note 1	6	–	V
I_{CES}	collector-emitter cut-off current	V_{CE} = 20 V; V_{BE} = 0	–	100	nA
		V_{CE} = 20 V; V_{BE} = 0; T_{amb} = −55 to +150 °C	–	50	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = 6 V; I_C = 0	–	50	nA
		V_{EB} = 6 V; I_C = 0; T_{amb} = −55 to +150 °C	–	10	μA
V_{CEsat}	collector-emitter saturation voltage	note 1			
		I_C = 10 mA; I_B = 1 mA	–	200	mV
		I_C = 50 mA; I_B = 3.2 mA	–	300	mV
V_{CEsat}	collector-emitter saturation voltage	T_{amb} = −55 to +150 °C; note 1			
		I_C = 10 mA; I_B = 1 mA	–	250	mV
		I_C = 50 mA; I_B = 3.2 mA	–	350	mV
V_{BEsat}	base-emitter saturation voltage	note 1			
		I_C = 10 mA; I_B = 1 mA	–	850	mV
		I_C = 50 mA; I_B = 5 mA	–	950	mV
V_{BEsat}	base-emitter saturation voltage	T_{amb} = −55 to +150 °C; note 1			
		I_C = 10 mA; I_B = 1 mA	–	1000	mV
		I_C = 50 mA; I_B = 5 mA	–	1100	mV
C_{ob}	output capacitance	I_E = i_e = 0; V_{CB} = 5 V; f = 1 MHz	–	4	pF
C_{ib}	input capacitance	I_C = i_c = 0; V_{EB} = 0.5 V; f = 1 MHz	–	8	pF
f_T	transition frequency	I_C = 10 mA; V_{CE} = 20 V; f = 100 MHz	300	–	MHz
h_{FE}	DC current gain	V_{CE} = 1 V; note 1			
		I_C = 0.1 mA	40	–	
		I_C = 1 mA	70	–	
		I_C = 10 mA	100	300	
		I_C = 100 mA	30	–	
h_{FE}	DC current gain	V_{CE} = 1 V; T_{amb} = −55 to +150 °C; note 1			
		I_C = 10 mA	60	500	
		I_C = 100 mA	15	–	
SWITCHING TIMES (see Figs 2 and 3)					
t_d	delay time	V_{CC} = 5 V	1	5	ns
t_r	rise time	I_C = 50 mA	16	31	ns
t_s	storage time	V_i = 0 to 5 V	110	310	ns
t_f	fall time		70	100	ns

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Schottky barrier diode					
V_F	forward voltage	I_F = 100 mA; note 1	–	330	mV
		I_F = 100 mA; T_{amb} = –55 to +150 °C; note 1	–	400	mV
		I_F = 1 A; note 1	–	500	mV
		I_F = 1 A; T_{amb} = –55 to +150 °C; note 1	–	560	mV
I_R	reverse current	V_R = 40 V; note 1	–	300	μA
		V_R = 40 V; T_j = 125 °C; T_{amb} = –55 to +150 °C; note 1	–	35(2)	mA
I_R	reverse current	V_R = 10 V; note 1	–	40	μA
		V_R = 10 V; T_j = 125 °C; T_{amb} = –55 to +150 °C; note 1	–	15(2)	mA
C_j	junction capacitance	V_R = 0 V; f = 1 MHz	–	250	pF

Notes

1. Measured under pulsed conditions: $t_p \leq 300$ μs; $\delta \leq 0.01$.
2. Limiting value for T_j = 125 °C; T_j = 150 °C with reverse current applied is not allowed as this may cause thermal runaway leading to thermal destruction of the diode. A peak junction temperature of T_j = 150 °C is only allowed with forward voltage applied.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient (combined device)	note 1	100	K/W

Note

1. Refer to SOT223 standard mounting conditions.

GRAPHICAL DATA

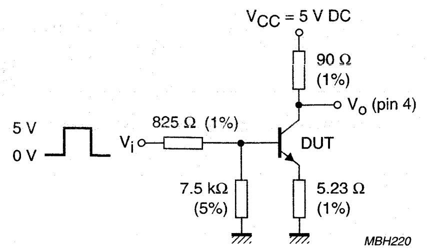
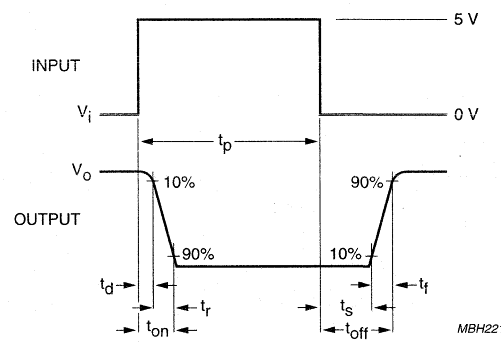


Fig.2 Switching times test circuit.



t_r < 5 ns (10% to 90%); t_p = 1 μs; δ = 0.02; Z_i = 50 Ω.
$t_{on} = t_d + t_r$; $t_{off} = t_s + t_f$.

Fig.3 Input and output waveforms.

PNP transistor/Schottky-diode module | PZTM1102

FEATURES

- Low output capacitance
- Fast switching time
- Integrated Schottky protection diode.

APPLICATIONS

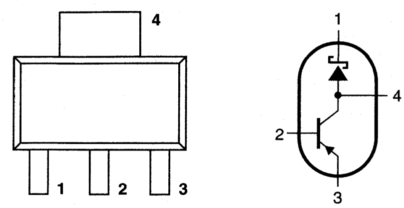
- High-speed switching for industrial applications.

PINNING

PIN	DESCRIPTION
1	cathode Schottky
2	base
3	emitter
4	collector, anode Schottky

DESCRIPTION

Combination of a PNP transistor and a Schottky barrier diode in a plastic SOT223 package. NPN complement: PZTM1101.



Marking code: TM1102.

Fig.1 Simplified outline (SOT223) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
PNP transistor					
V_{CBO}	collector-base voltage	open emitter	–	–40	V
V_{CES}	collector-emitter voltage	$V_{BE} = 0$	–	–40	V
V_{EBO}	emitter-base voltage	open collector	–	–6	V
I_C	collector current (DC)		–	–200	mA
Schottky barrier diode					
V_R	continuous reverse voltage		–	40	V
I_F	forward current (DC)		–	1	A
$I_{F(AV)}$	average forward current		–	1	A
P	power dissipation	up to T_{amb} = 25 °C; note 1	–	0.5	W
T_j	junction temperature	reverse current applied	–	125	°C
		forward current applied	–	150	°C
Combined device					
P_{tot}	total power dissipation	up to T_{amb} = 25 °C; note 2	–	1.2	W
T_{amb}	operating ambient temperature		–55	+150	°C
T_{stg}	storage temperature		–55	+150	°C
T_j	junction temperature		–	150	°C

Notes

1. An additional copper area of >20 mm^2 is required for pin 1, if power dissipation in the Schottky die is >0.5 W.
2. It is not allowed to dissipate the total power of 1.2 W in the Schottky die only.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
NPN transistor					
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; I_C = −10 μA; I_E = 0; T_{amb} = −55 to +150 °C; note 1	−40	−	V
$V_{(BR)CES}$	collector-emitter breakdown voltage	open base; I_C = −1 mA; V_{BE} = 0; T_{amb} = −55 to +150 °C; note 1	−40	−	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; I_E = −10 μA; I_C = 0; T_{amb} = −55 to +150 °C; note 1	−6	−	V
I_{CES}	collector-emitter cut-off current	V_{CE} = −20 V; V_{BE} = 0	−	100	nA
		V_{CE} = −20 V; V_{BE} = 0; T_{amb} = −55 to +150 °C	−	50	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = −6 V; I_C = 0	−	50	nA
		V_{EB} = −6 V; I_C = 0; T_{amb} = −55 to +150 °C	−	10	μA
V_{CEsat}	collector-emitter saturation voltage	note 1			
		I_C = −10 mA; I_B = −1 mA	−	−200	mV
		I_C = −50 mA; I_B = −3.2 mA	−	−300	mV
V_{CEsat}	collector-emitter saturation voltage	T_{amb} = −55 to +150 °C; note 1			
		I_C = −10 mA; I_B = −1 mA	−	−250	mV
		I_C = −50 mA; I_B = −3.2 mA	−	−350	mV
V_{BEsat}	base-emitter saturation voltage	note 1			
		I_C = −10 mA; I_B = −1 mA	−	−850	mV
		I_C = −50 mA; I_B = −5 mA	−	−950	mV
V_{BEsat}	base-emitter saturation voltage	T_{amb} = −55 to +150 °C; note 1			
		I_C = −10 mA; I_B = −1 mA	−	−1.0	V
		I_C = −50 mA; I_B = −5 mA	−	−1.1	V
C_{ob}	output capacitance	I_E = i_e = 0; V_{CB} = −5 V; f = 1 MHz	−	4.5	pF
C_{ib}	input capacitance	I_C = i_c = 0; V_{EB} = −0.5 V; f = 1 MHz	−	10	pF
f_T	transition frequency	I_C = −10 mA; V_{CE} = −20 V; f = 100 MHz	250	−	MHz
h_{FE}	DC current gain	V_{CE} = −1 V; note 1			
		I_C = −0.1 mA	40	−	
		I_C = −1 mA	70	−	
		I_C = −10 mA	100	300	
		I_C = −100 mA	30	−	
h_{FE}	DC current gain	V_{CE} = −1 V; T_{amb} = −55 to +150 °C; note 1			
		I_C = −10 mA	60	500	
		I_C = −100 mA	15	−	
SWITCHING TIMES (see Figs 2 and 3)					
t_d	delay time	V_{CC} = 5 V	3	7	ns
t_r	rise time	I_C = 50 mA	13	23	ns
t_s	storage time	V_i = 0 to 5 V	200	380	ns
t_f	fall time		50	80	ns

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Schottky barrier diode					
V_F	forward voltage	I_F = 100 mA; note 1	–	330	mV
		I_F = 100 mA; T_{amb} = –55 to +150 °C; note 1	–	400	mV
		I_F = 1 A; note 1	–	500	mV
		I_F = 1 A; T_{amb} = –55 to +150 °C; note 1	–	560	mV
I_R	reverse current	V_R = 40 V; note 1	–	300	μA
		V_R = 40 V; T_j = 125 °C; T_{amb} = –55 to +150 °C; note 1	–	35(2)	mA
I_R	reverse current	V_R = 10 V; note 1	–	40	μA
		V_R = 10 V; T_j = 125 °C; T_{amb} = –55 to +150 °C; note 1	–	15(2)	mA
C_j	junction capacitance	V_R = 0 V; f = 1 MHz	–	250	pF

Notes

1. Measured under pulsed conditions: $t_p \leq 300$ μs; $\delta \leq 0.01$.
2. Limiting value for T_j = 125 °C; T_j = 150 °C with reverse current applied is not allowed as this may cause thermal runaway leading to thermal destruction of the diode. A peak junction temperature of T_j = 150 °C is only allowed with forward voltage applied.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient (for the transistor)	note 1	100	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient (for the Schottky diode)	note 1	250	K/W

Note

1. Refer to SOT223 standard mounting conditions.

GRAPHICAL DATA

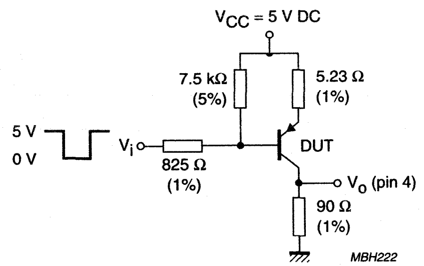
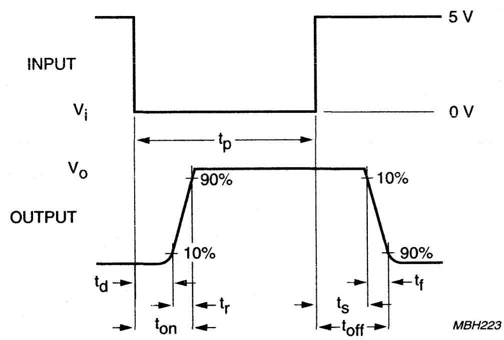


Fig.2 Switching times test circuit.



t_r < 5 ns (10% to 90%); t_p = 1 µs; δ = 0.02; Z_i = 50 Ω.
$t_{on} = t_d + t_r$; $t_{off} = t_s + t_f$.

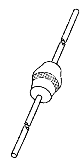
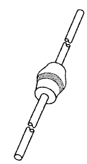
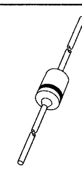
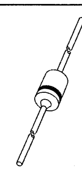
Fig.3 Input and output waveforms.

SECTION 10

GENERAL-PURPOSE RECTIFIERS

GENERAL-PURPOSE RECTIFIERS

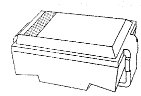
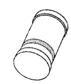
GENERAL-PURPOSE AVALANCHE RECTIFIERS

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RWM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F max.	@ I_F	$V_{(BR)R}$ min.	C_d typ.	t_{rr} typ.	
	(V)	(V)	(A)	(A)	(V)	(A)	(V)	(pF)	(µs)	
LEADED TYPES										
1N5059	200	200	2.0	50	1.0	1	225	50	3	
1N5060	400	400	2.0	50	1.0	1	450	50	3	
1N5061	600	600	2.0	50	1.0	1	650	50	3	
1N5062	800	800	2.0	50	1.0	1	900	50	3	
BY527	800	800	2.0	50	1.0	1	1250	50	3	
BYW54	600	600	2.0	50	1.0	1	650	50	3	
BYW55	800	800	2.0	50	1.0	1	900	50	3	
BYW56	1000	1000	2.0	50	1.0	1	1100	50	3	SOD57
BYM56A	200	200	3.5	80	1.15	3	225	90	3	
BYM56B	400	400	3.5	80	1.15	3	450	90	3	
BYM56C	600	600	3.5	80	1.15	3	650	90	3	
BYM56D	800	800	3.5	80	1.15	3	900	90	3	
BYM56E	1000	1000	3.5	80	1.15	3	1100	90	3	SOD64
BYD13D	200	200	1.4	20	1.05	1	225	21	3	
BYD13G	400	400	1.4	20	1.05	1	450	21	3	
BYD13J	600	600	1.4	20	1.05	1	650	21	3	
BYD13K	800	800	1.4	20	1.05	1	900	21	3	
BYD13M	1000	1000	1.4	20	1.05	1	1100	21	3	SOD81
BAS11[1]	300	300	0.35	4	1.1	0.3	330	20	1 [3]	
BAS12[1]	400	400	0.35	4	1.1	0.3	440	20	1 [3]	
BYD11D[2]	200	200	0.5	10	1.06	0.5	225	14	3	
BYD11G[2]	400	400	0.5	10	1.06	0.5	450	14	3	
BYD11J[2]	600	600	0.5	10	1.06	0.5	650	14	3	
BYD11K[2]	800	800	0.5	10	1.06	0.5	900	14	3	
BYD11M[2]	1000	1000	0.5	10	1.06	0.5	1100	14	3	SOD91

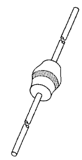
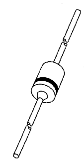
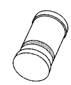
Notes

1. Not for new designs; recommended replacement: BYD33G.
2. Not for new designs; recommended replacement: BYD13 series.
3. Maximum value.

GENERAL-PURPOSE AVALANCHE RECTIFIERS (continued)

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RWM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F max.	@ I_F	$V_{(BR)R}$ min.	C_d max.	t_{rr} typ.	
	(V)	(V)	(A)	(A)	(V)	(A)	(V)	(pF)	(μs)	
SURFACE-MOUNT TYPES										
BYG50D	200	200	2.1	30	1.0	1	300	–	2	
BYG50G	400	400	2.1	30	1.0	1	500	–	2	
BYG50J	600	600	2.1	30	1.0	1	700	–	2	
BYG50K	800	800	2.1	30	1.0	1	900	–	2	
BYG50M	1000	1000	2.1	30	1.0	1	1100	–	2	SOD106
BYD17D	200	200	1.5	20	1.05	1	225	21	3	
BYD17G	400	400	1.5	20	1.05	1	450	21	3	
BYD17J	600	600	1.5	20	1.05	1	650	21	3	
BYD17K	800	800	1.5	20	1.05	1	900	21	3	
BYD17M	1000	1000	1.5	20	1.05	1	1100	21	3	SOD87

GENERAL-PURPOSE NON-AVALANCHE RECTIFIERS

TYPE NUMBER	RATINGS				CHARACTERISTICS				PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F max.	@ I_F	C_d typ.	t_{rr} typ.	
	(V)	(V)	(A)	(A)	(V)	(A)	(pF)	(μs)	
LEADED TYPES									
1N4001G	50	50	1.0	30	1.1	1	–	–	
1N4002G	100	100	1.0	30	1.1	1	–	–	
1N4003G	200	200	1.0	30	1.1	1	–	–	
1N4004G	400	400	1.0	30	1.1	1	–	–	
1N4005G	600	600	1.0	30	1.1	1	–	–	
1N4006G	800	800	1.0	30	1.1	1	–	–	
1N4007G	1000	1000	1.0	30	1.1	1	–	–	
BYX10G	1600	–	1.2	25	1.5	2	30	3	SOD57
1N4001ID	50	50	1.0	20	1.1	1	–	–	
1N4002ID	100	100	1.0	20	1.1	1	–	–	
1N4003ID	200	200	1.0	20	1.1	1	–	–	
1N4004ID	400	400	1.0	20	1.1	1	–	–	
1N4005ID	600	600	1.0	20	1.1	1	–	–	
1N4006ID	800	800	1.0	20	1.1	1	–	–	
1N4007ID	1000	1000	1.0	20	1.1	1	–	–	SOD81
SURFACE-MOUNT TYPES									
PRLL4001	50	50	1.6	20	1.1	1	–	–	
PRLL4002	100	100	1.6	20	1.1	1	–	–	SOD87

Rectifiers 1N4001G to 1N4007G

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

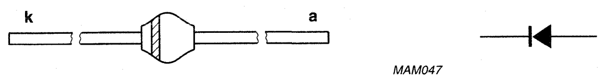


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	1N4001G		–	50	V
	1N4002G		–	100	V
	1N4003G		–	200	V
	1N4004G		–	400	V
	1N4005G		–	600	V
	1N4006G		–	800	V
	1N4007G		–	1000	V
V_R	continuous reverse voltage				
	1N4001G		–	50	V
	1N4002G		–	100	V
	1N4003G		–	200	V
	1N4004G		–	400	V
	1N4005G		–	600	V
	1N4006G		–	800	V
	1N4007G		–	1000	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{amb} = 75 °C; see Fig.2	–	1.00	A
		averaged over any 20 ms period; T_{amb} = 100 °C; see Fig.2	–	0.75	A
I_F	continuous forward current	T_{amb} = 75 °C; see Fig.2	–	1.00	A
I_{FRM}	repetitive peak forward current		–	10	A
I_{FSM}	non-repetitive peak forward current	half sinewave; 60 Hz	–	30	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; see Fig.3	1.1	V
$V_{F(AV)}$	full-cycle average forward voltage	$I_{F(AV)}$ = 1 A	0.8	V
I_R	reverse current	$V_R = V_{Rmax}$	10	μA
		$V_R = V_{Rmax}$; T_{amb} = 100 °C	50	μA
$I_{R(AV)}$	full-cycle average reverse current	$V_R = V_{RRMmax}$; T_{amb} = 75 °C	30	μA

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA

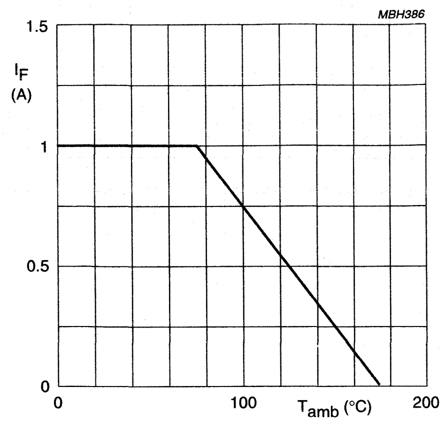
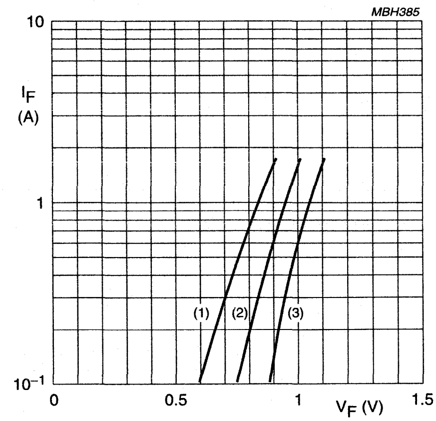
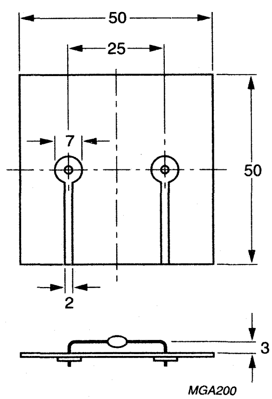


Fig.2 Maximum forward current as a function of ambient temperature.



(1) T_{amb} = 100 °C.
(2) T_{amb} = 20 °C.
(3) T_{amb} = –50 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.4 Device mounted on a printed-circuit board.

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™[(1)] technology.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

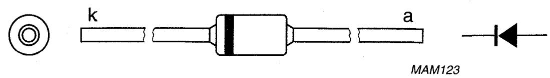


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	1N4001ID		–	50	V
	1N4002ID		–	100	V
	1N4003ID		–	200	V
	1N4004ID		–	400	V
	1N4005ID		–	600	V
	1N4006ID		–	800	V
	1N4007ID		–	1000	V
V_R	continuous reverse voltage				
	1N4001ID		–	50	V
	1N4002ID		–	100	V
	1N4003ID		–	200	V
	1N4004ID		–	400	V
	1N4005ID		–	600	V
	1N4006ID		–	800	V
	1N4007ID		–	1000	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{amb} = 75 °C; see Fig.2	–	1.00	A
		averaged over any 20 ms period; T_{amb} = 100 °C; see Fig.2	–	0.75	A
I_{FRM}	repetitive peak forward current		–	10	A
I_{FSM}	non-repetitive peak forward current	half sinewave; 60 Hz	–	20	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; see see Fig.3	1.1	V
$V_{F(AV)}$	full-cycle average forward voltage	$I_{F(AV)}$ = 1 A	0.8	V
I_R	reverse current	$V_R = V_{Rmax}$	10	μA
		$V_R = V_{Rmax}$; T_{amb} = 100 °C	50	μA
$I_{R(AV)}$	full-cycle average reverse current	$V_R = V_{RRMmax}$; T_{amb} = 75 °C	30	μA

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	120	K/W

Note

1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA

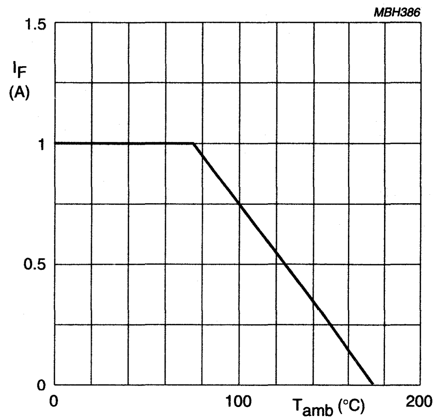
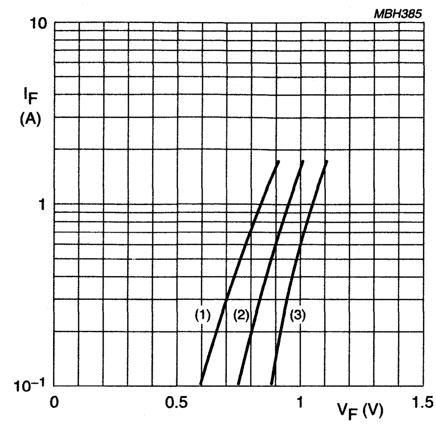
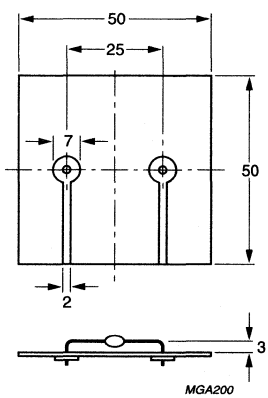


Fig.2 Maximum forward current as a function of ambient temperature.



(1) T_{amb} = 100 °C.
(2) T_{amb} = 20 °C.
(3) T_{amb} = −50 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.4 Device mounted on a printed-circuit board.

Controlled avalanche rectifiers 1N5059 to 1N5062

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

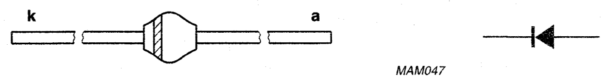


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	1N5059		–	200	V
	1N5060		–	400	V
	1N5061		–	600	V
	1N5062		–	800	V
V_{RWM}	crest working reverse voltage				
	1N5059		–	200	V
	1N5060		–	400	V
	1N5061		–	600	V
	1N5062		–	800	V
V_R	continuous reverse voltage				
	1N5059		–	200	V
	1N5060		–	400	V
	1N5061		–	600	V
	1N5062		–	800	V
$I_{F(AV)}$	average forward current	T_{tp} = 45 °C; lead length = 10 mm; averaged over any 20 ms period; see Figs 2 and 4	–	2.0	A
		T_{amb} = 80 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	0.8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave	–	50	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.5	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.6	–	–	0.8	V
		I_F = 1 A; see Fig.6	–	–	1.0	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	1N5059		225	–	–	V
	1N5060		450	–	–	V
	1N5061		650	–	–	V
	1N5062		900	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.7	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.7	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	50	–	pF

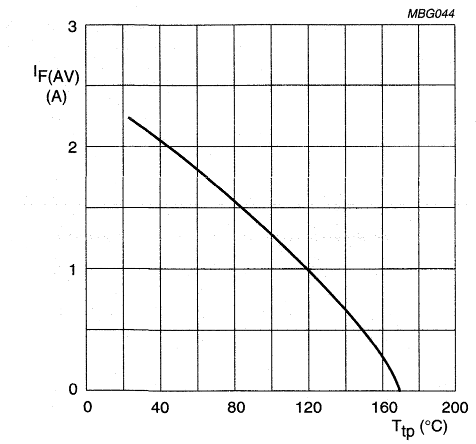
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

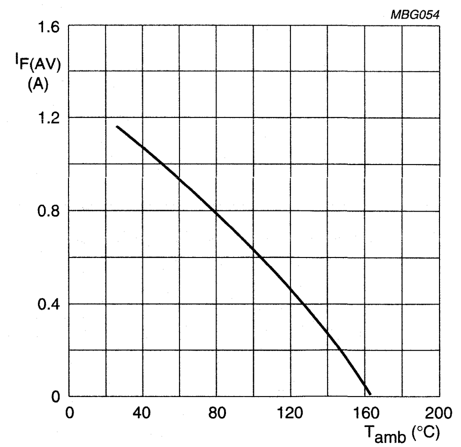
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



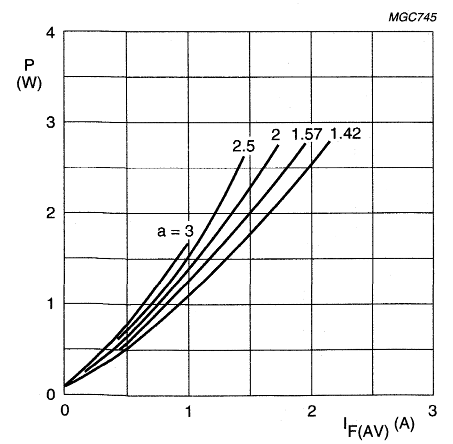
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Lead length 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



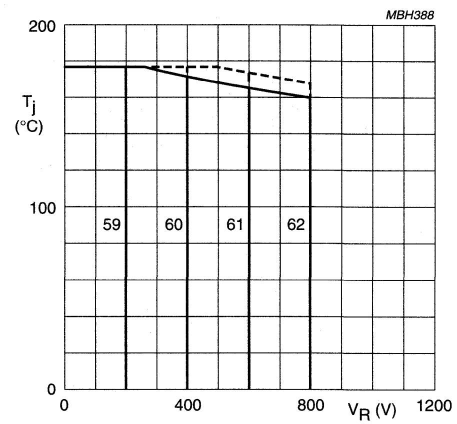
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



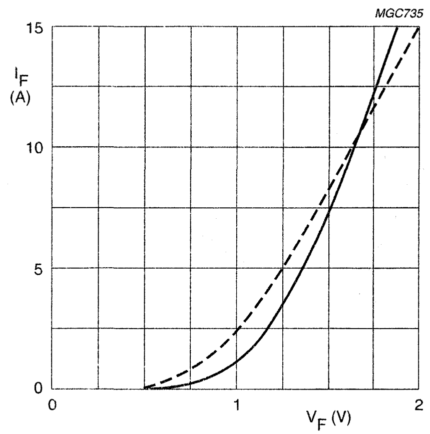
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



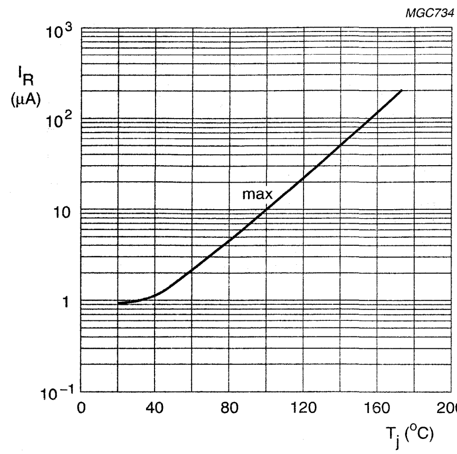
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.5 Maximum permissible junction temperature as a function of reverse voltage.



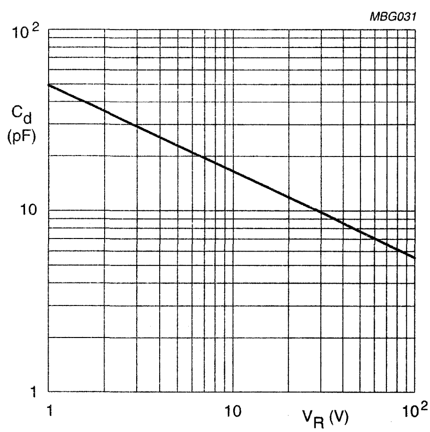
Solid line: $T_j = 25$ °C.
Dotted line: $T_j = 175$ °C.

Fig.6 Forward current as a function of forward voltage; maximum values.



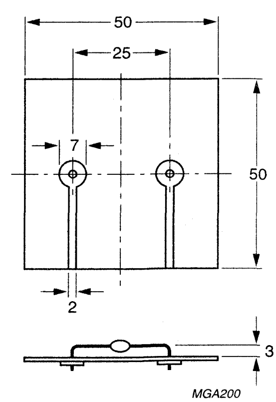
$V_R = V_{RRMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



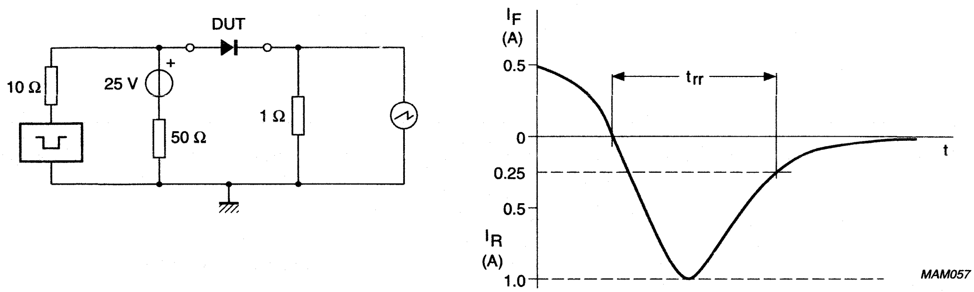
f = 1 MHz; $T_j = 25$ °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifiers — BAS11; BAS12

FEATURES

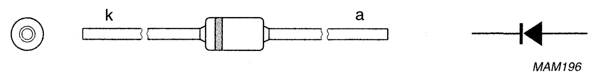
- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack.

DESCRIPTION

Rectifier diodes in cavity free cylindrical SOD91 glass packages, incorporating Implotec™(1) technology.

These packages are hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.



Marking code BAS11: S11.
Marking code BAS12: S12.

Fig.1 Simplified outline (SOD91) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BAS11		–	300	V
	BAS12		–	400	V
V_{RWM}	working reverse voltage				
	BAS11		–	300	V
	BAS12		–	400	V
V_R	continuous reverse voltage				
	BAS11		–	300	V
	BAS12		–	400	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 75 °C; lead length = 10 mm; see Figs 2 and 4	–	350	mA
		averaged over any 20 ms period; T_{amb} = 30 °C; PCB mounting (see Fig.8); see Figs 3 and 4	–	300	mA
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	4	A
P_{RRM}	repetitive peak reverse power dissipation	t = 10 μs square wave; f = 50 Hz; T_{amb} = 25 °C	–	75	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

FOR REPLACEMENT TYPE SEE INDEX SECTION OF HANDBOOK SC01

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 300 mA; $T_j = T_{jmax}$; see Fig.5	–	–	1.0	V
		I_F = 300 mA; see Fig.5	–	–	1.1	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BAS11		330	–	–	V
	BAS12		440	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.6	–	–	250	nA
		$V_R = V_{RRMmax}$; T_j = 125 °C; see Fig.6	–	–	10	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.9	–	–	1	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.7	–	20	–	pF

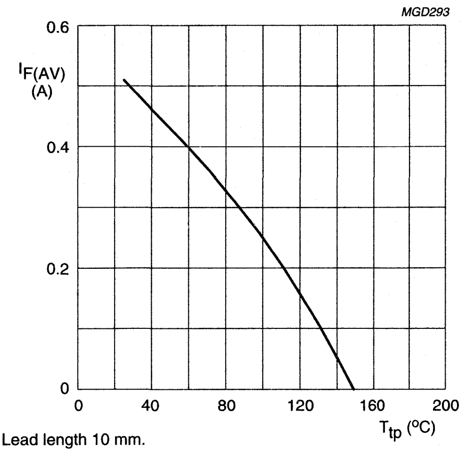
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	180	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	340	K/W

Note

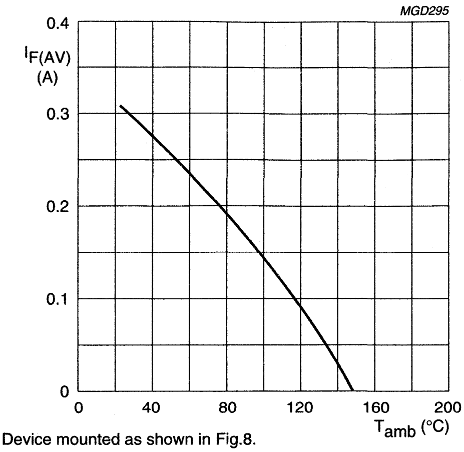
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.8. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



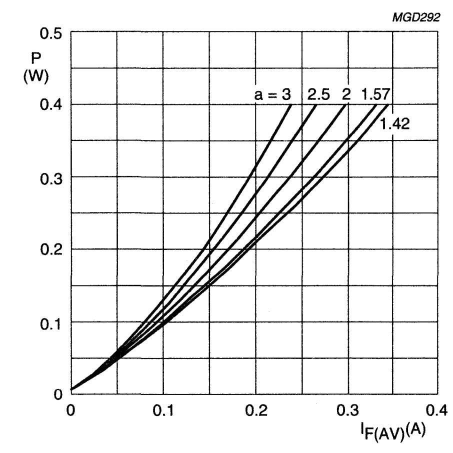
Lead length 10 mm.
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



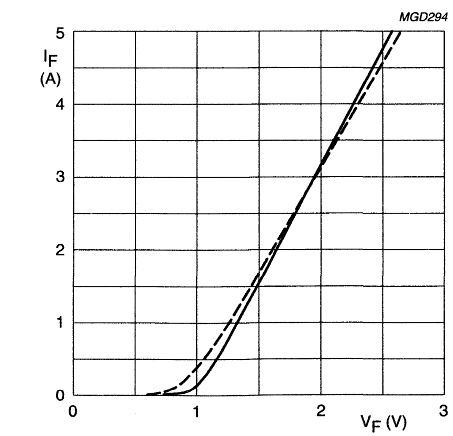
Device mounted as shown in Fig.8.
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

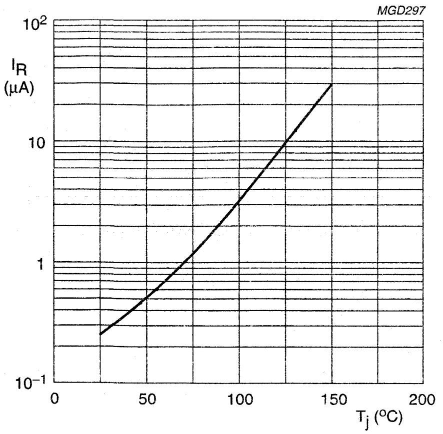


Solid line: T_j = 25 °C.
Dotted line: T_j = 150 °C.

Fig.5 Forward current as a function of forward voltage; maximum values.

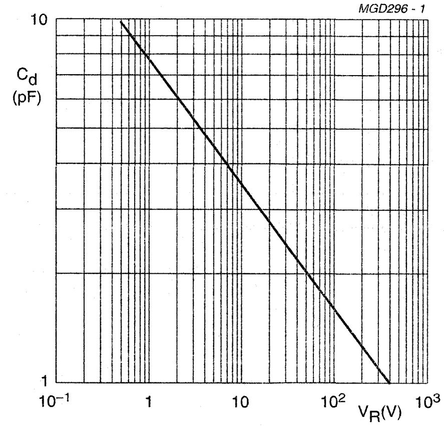
Controlled avalanche rectifiers

BAS11; BAS12



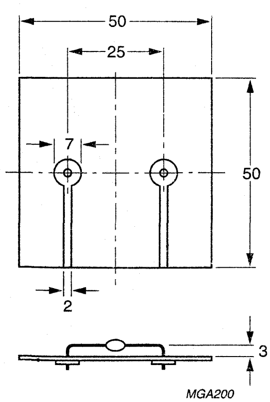
$V_R = V_{RRMmax}$.

Fig.6 Reverse current as a function of junction temperature; maximum values.



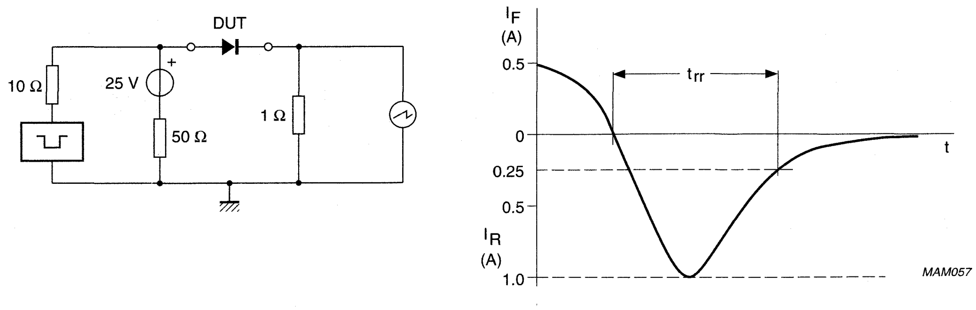
f = 1 MHz; T_j = 25 °C.

Fig.7 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.8 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.9 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifier — BY527

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

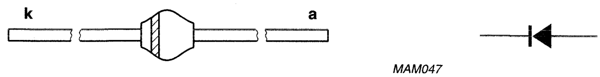


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	1250	V
V_{RWM}	crest working reverse voltage		–	800	V
V_R	continuous reverse voltage		–	800	V
$I_{F(AV)}$	average forward current	T_{tp} = 45 °C; lead length = 10 mm; averaged over any 20 ms period; see Figs 2 and 4	–	2.0	A
		T_{amb} = 80 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	0.8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave	–	50	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.5	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.6	–	–	0.8	V
		I_F = 1 A; see Fig.6	–	–	1.0	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	1250	–	–	V
I_R	reverse current	$V_R = V_{RWMmax}$; see Fig.7	–	–	1	µA
		$V_R = V_{RWMmax}$; T_j = 165 °C; see Fig.7	–	–	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	µs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	50	–	pF

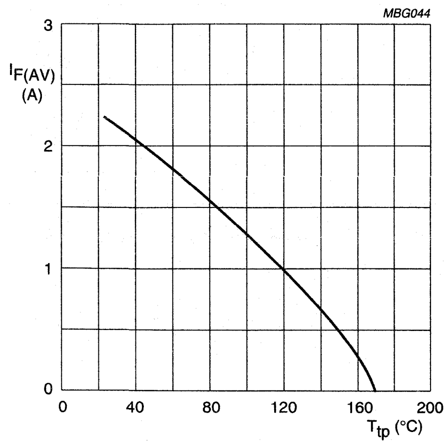
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

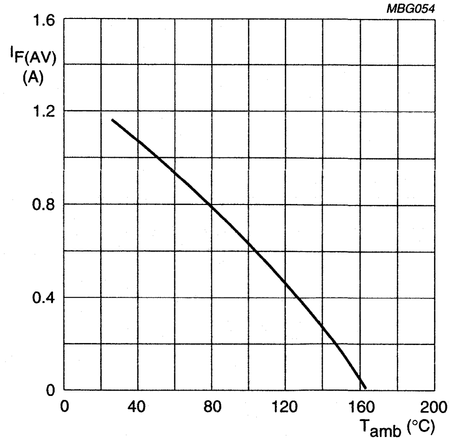
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 µm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



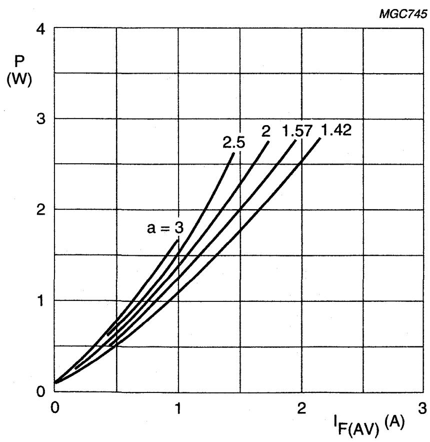
a = 1.57; $V_R = V_{RWMmax}$; $\delta = 0.5$.
Lead length 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



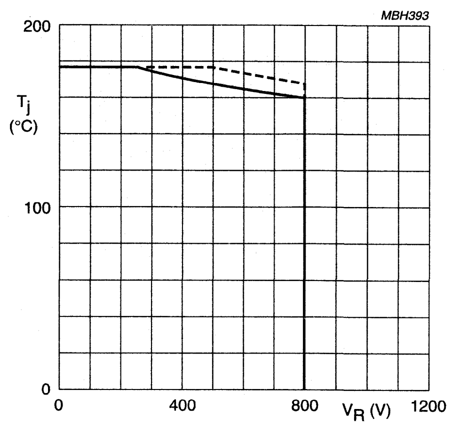
a = 1.57; $V_R = V_{RWMmax}$; $\delta = 0.5$.
Device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



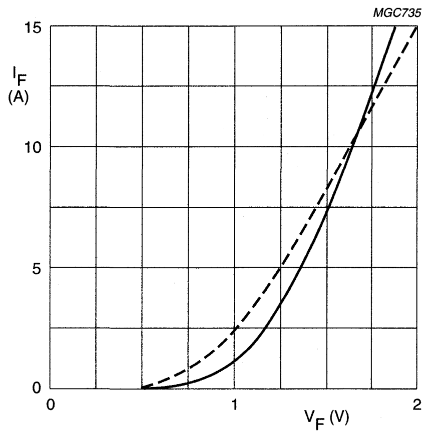
$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWMmax}$; $\delta = 0.5$.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



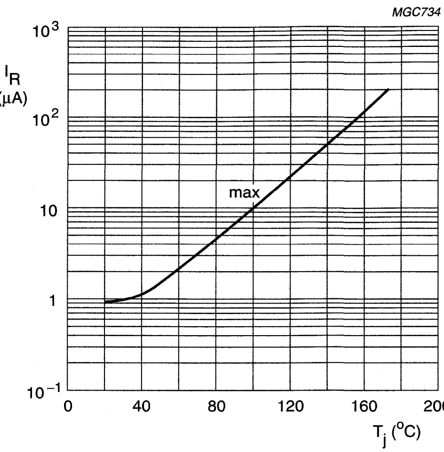
Solid line = V_R.
Dotted line = V_{RWM}; $\delta = 0.5$.

Fig.5 Maximum permissible junction temperature as a function of reverse voltage.



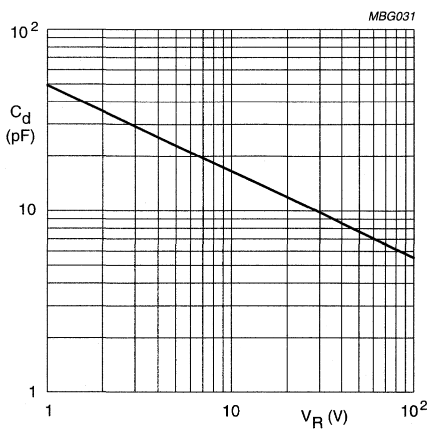
Solid line: T_j = 25 °C.
Dotted line: T_j = 175 °C.

Fig.6 Forward current as a function of forward voltage; maximum values.



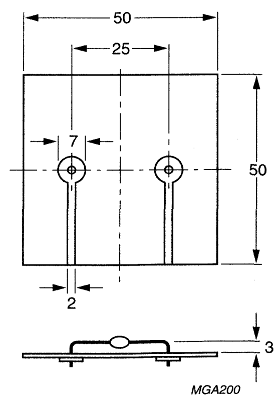
$V_R = V_{RWMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



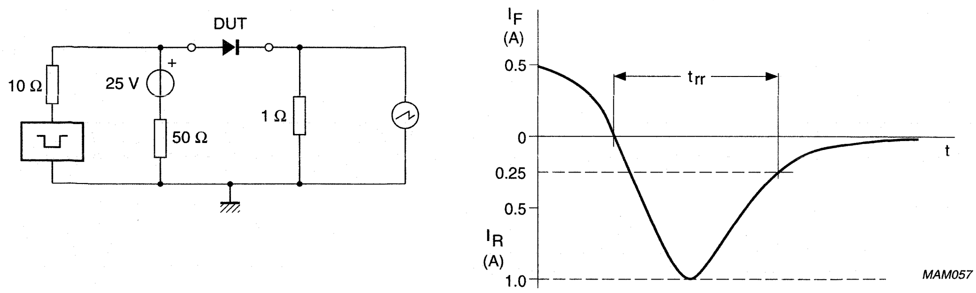
f = 1 MHz; T_j = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifiers BYD11 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

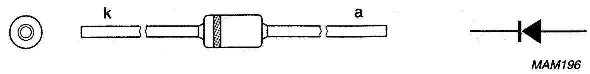


Fig.1 Simplified outline (SOD91) and symbol.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

MARKING

TYPE NUMBER	MARKING CODE
BYD11D	11D
BYD11G	11G
BYD11J	11J
BYD11K	11K
BYD11M	11M

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD11D		–	200	V
	BYD11G		–	400	V
	BYD11J		–	600	V
	BYD11K		–	800	V
	BYD11M		–	1000	V
V_{RWM}	crest working reverse voltage				
	BYD11D		–	200	V
	BYD11G		–	400	V
	BYD11J		–	600	V
	BYD11K		–	800	V
	BYD11M		–	1000	V
V_R	continuous reverse voltage				
	BYD11D		–	200	V
	BYD11G		–	400	V
	BYD11J		–	600	V
	BYD11K		–	800	V
	BYD11M		–	1000	V

FOR REPLACEMENT TYPE SEE INDEX SECTION OF HANDBOOK SC01

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; averaged over any 20 ms period; see Figs 2 and 4	–	0.50	A
		T_{amb} = 60 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	0.37	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	10	A
P_{RSM}	non-repetitive peak reverse power dissipation	t = 20 μs half sinewave; $T_j = T_{j\,max}$ prior to surge	–	200	W
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.5	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$tzt	forward voltage	I_F = 0.5 A; $T_j = T_{j\,max}$; see Fig.6	–	–	0.91	V
		I_F = 0.5 A; see Fig.6	–	–	1.06	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD11D		225	–	–	V
	BYD11G		450	–	–	V
	BYD11J		650	–	–	V
	BYD11K		900	–	–	V
	BYD11M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.7	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.7	–	–	75	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	14	–	pF

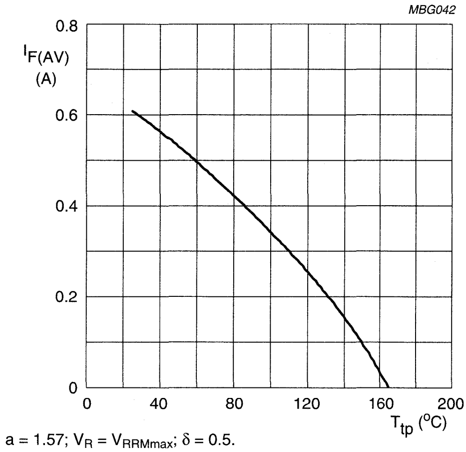
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	180	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	250	K/W

Note

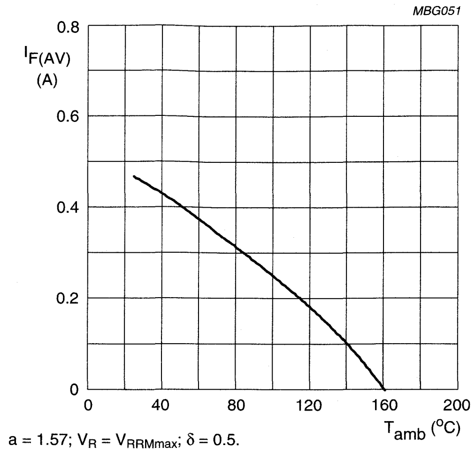
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



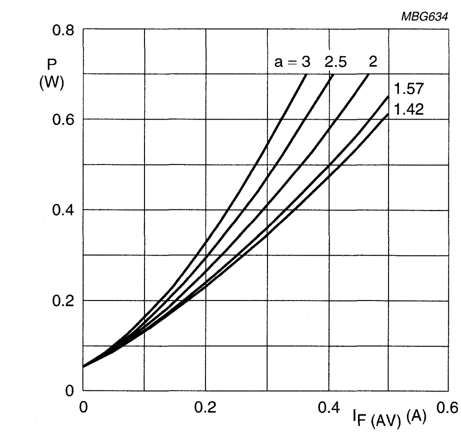
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Lead length 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



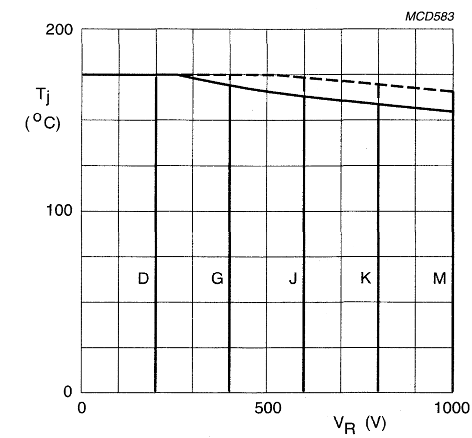
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



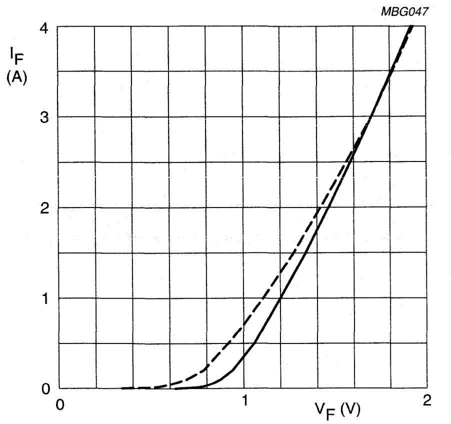
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



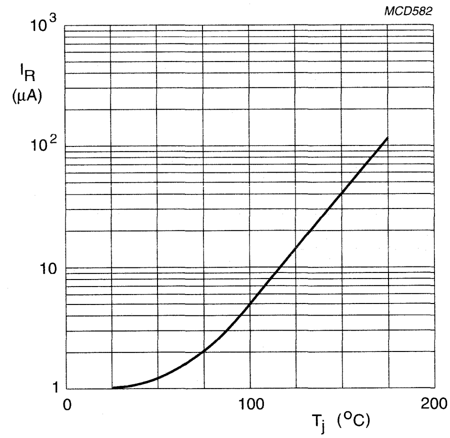
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.5 Maximum permissible junction temperature as a function of reverse voltage.



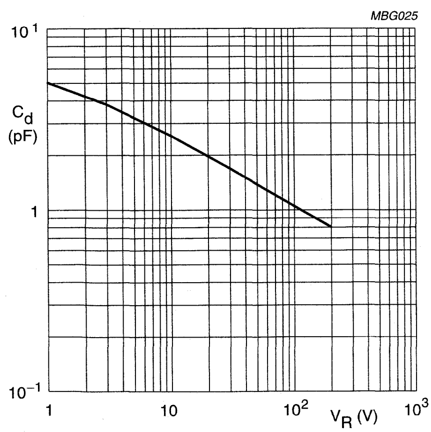
Solid line: T_j = 25 °C.
Dotted line: T_j = 175 °C.

Fig.6 Forward current as a function of forward voltage; maximum values.



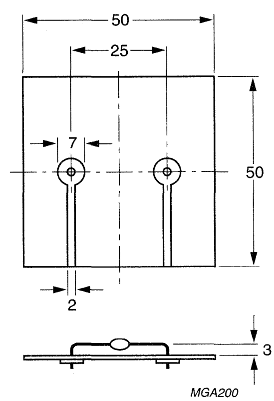
$V_R = V_{RRMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



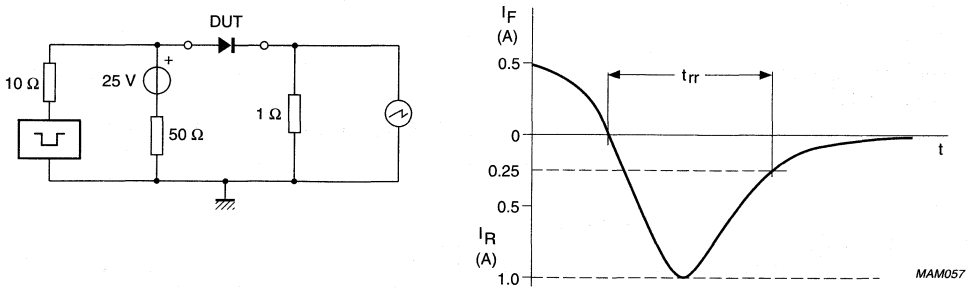
f = 1 MHz; T_j = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifiers — BYD13 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

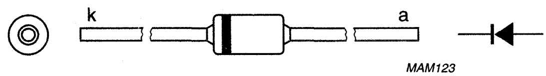


Fig.1 Simplified outline (SOD81) and symbol.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™[(1)] technology.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

MARKING

TYPE NUMBER	MARKING CODE
BYD13D	13D PH
BYD13G	13G PH
BYD13J	13J PH
BYD13K	13K PH
BYD13M	13M PH

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD13D		–	200	V
	BYD13G		–	400	V
	BYD13J		–	600	V
	BYD13K		–	800	V
	BYD13M		–	1000	V
V_{RWM}	crest working reverse voltage				
	BYD13D		–	200	V
	BYD13G		–	400	V
	BYD13J		–	600	V
	BYD13K		–	800	V
	BYD13M		–	1000	V
V_R	continuous reverse voltage				
	BYD13D		–	200	V
	BYD13G		–	400	V
	BYD13J		–	600	V
	BYD13K		–	800	V
	BYD13M		–	1000	V

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; averaged over any 20 ms period; see Figs 2 and 4	–	1.40	A
		T_{amb} = 65 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	0.75	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	20	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	7	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.5	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.6	–	–	0.93	V
		I_F = 1 A; see Fig.6	–	–	1.05	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD13D		225	–	–	V
	BYD13G		450	–	–	V
	BYD13J		650	–	–	V
	BYD13K		900	–	–	V
	BYD13M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.7	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.7	–	–	100	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	21	–	pF

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	120	K/W

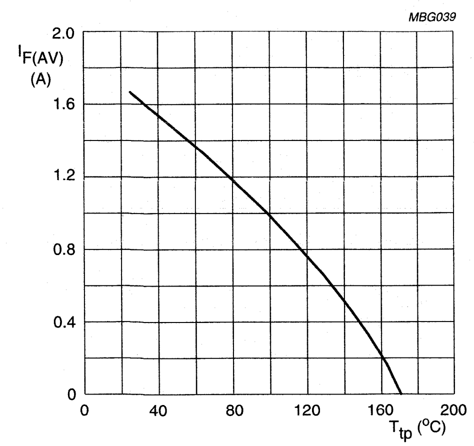
Note

1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

Controlled avalanche rectifiers

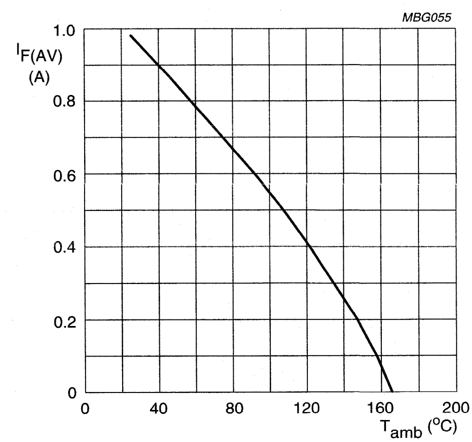
BYD13 series

GRAPHICAL DATA



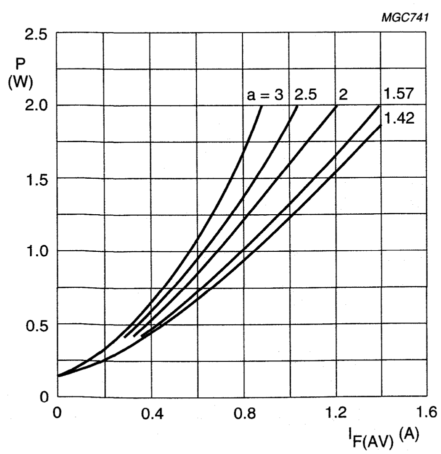
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Lead length 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



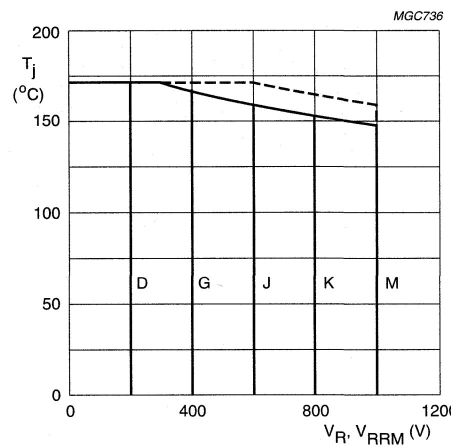
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



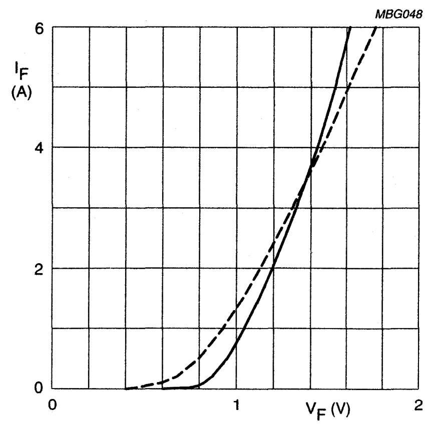
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



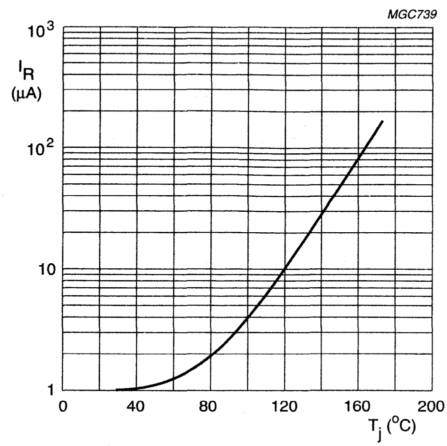
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.5 Maximum permissible junction temperature as a function of reverse voltage.



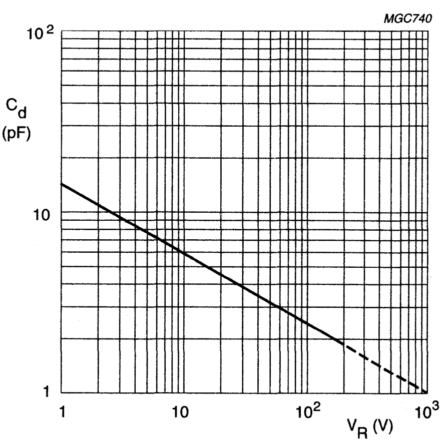
Solid line: $T_j = 25$ °C.
Dotted line: $T_j = 175$ °C.

Fig.6 Forward current as a function of forward voltage; maximum values.



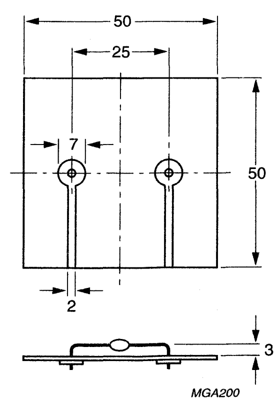
$V_R = V_{RRMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



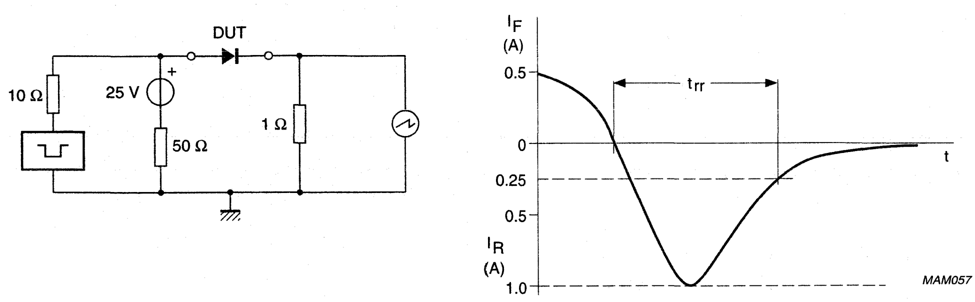
f = 1 MHz; $T_j = 25$ °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifiers | BYD17 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier outline.

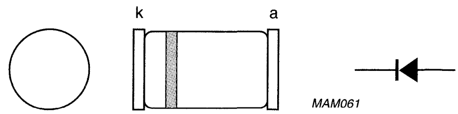


Fig.1 Simplified outline (SOD87) and symbol.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™[(1)] technology.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

MARKING

TYPE NUMBER	MARKING CODE
BYD17D	17D PH
BYD17G	17G PH
BYD17J	17J PH
BYD17K	17K PH
BYD17M	17M PH

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD17D		–	200	V
	BYD17G		–	400	V
	BYD17J		–	600	V
	BYD17K		–	800	V
	BYD17M		–	1000	V
V_{RWM}	crest working reverse voltage				
	BYD17D		–	200	V
	BYD17G		–	400	V
	BYD17J		–	600	V
	BYD17K		–	800	V
	BYD17M		–	1000	V
V_R	continuous reverse voltage				
	BYD17D		–	200	V
	BYD17G		–	400	V
	BYD17J		–	600	V
	BYD17K		–	800	V
	BYD17M		–	1000	V

Controlled avalanche rectifiers BYD17 series

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{F(AV)}$	average forward current	T_{tp} = 105 °C; averaged over any 20 ms period; see Figs 2 and 4	–	1.5	A
		T_{amb} = 65 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	0.6	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	20	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	7	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.5	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.6	–	–	0.93	V
		I_F = 1 A; see Fig.6	–	–	1.05	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD17D		225	–	–	V
	BYD17G		450	–	–	V
	BYD17J		650	–	–	V
	BYD17K		900	–	–	V
	BYD17M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.7	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.7	–	–	100	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	21	–	pF

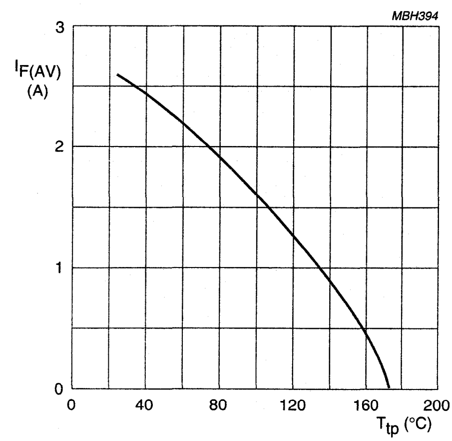
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

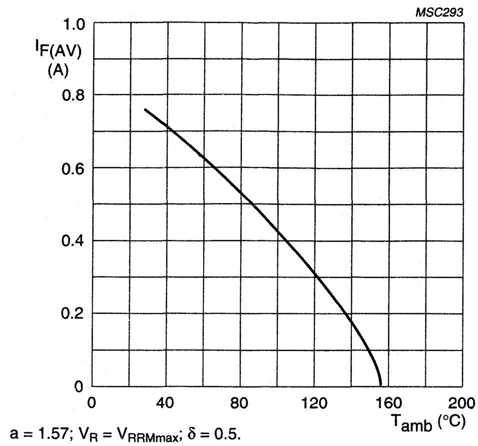
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



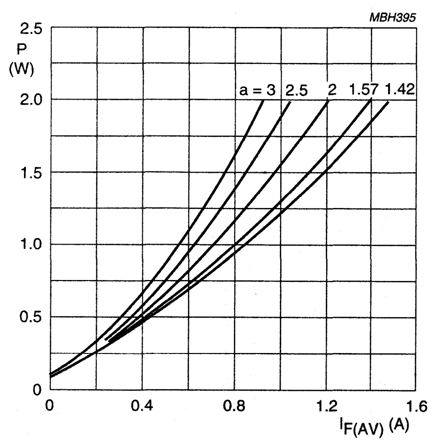
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



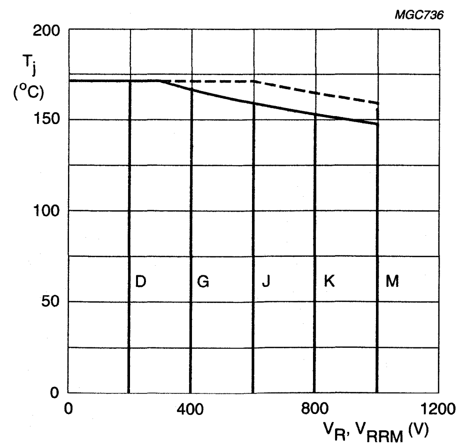
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



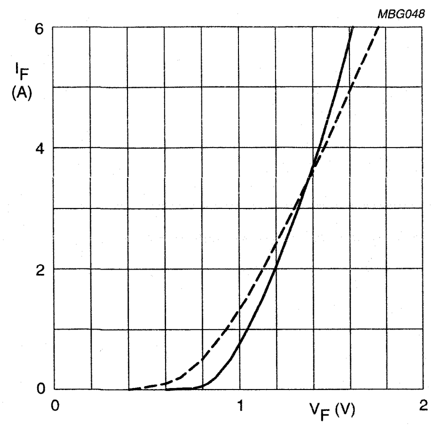
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



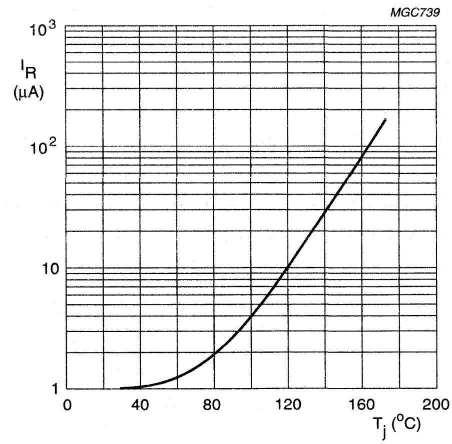
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.5 Maximum permissible junction temperature as a function of reverse voltage.



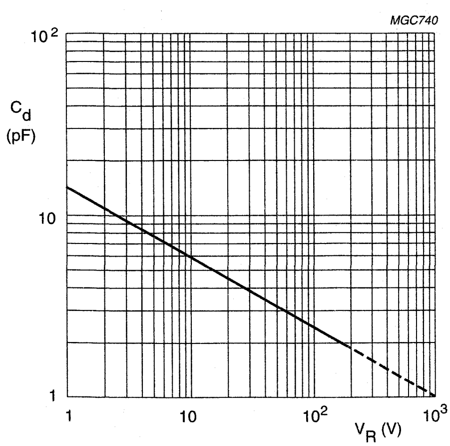
Solid line: $T_j = 25$ °C.
Dotted line: $T_j = 175$ °C.

Fig.6 Forward current as a function of forward voltage; maximum values.



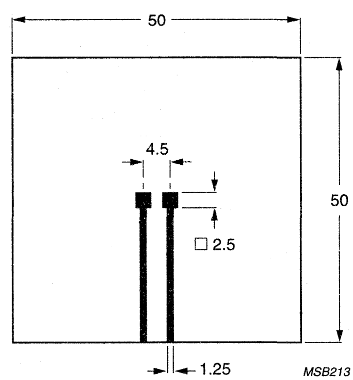
$V_R = V_{RRMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



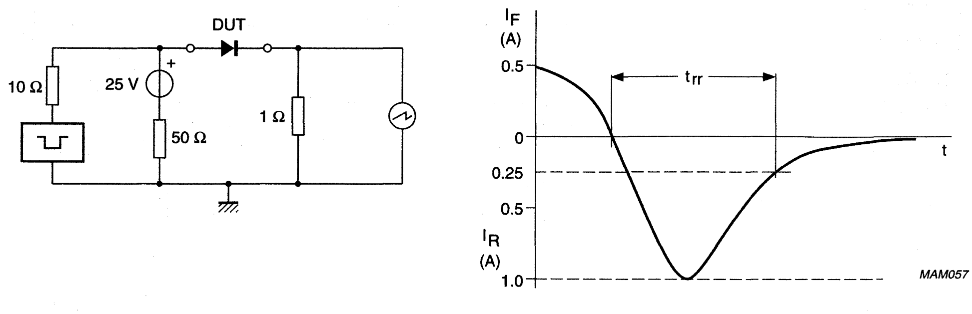
f = 1 MHz; $T_j = 25$ °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Printed-circuit board for surface mounting.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifiers — BYG50 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- UL 94V-O classified plastic package
- Shipped in 12 mm embossed tape.

DESCRIPTION

DO-214AC; SOD106 surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.

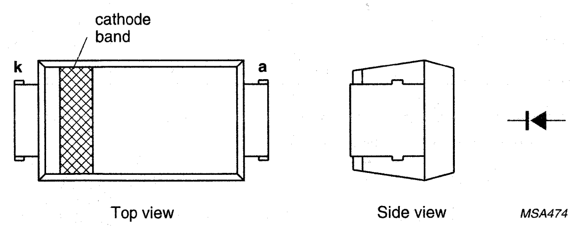


Fig.1 Simplified outline (DO-214AC; SOD106) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYG50D		–	200	V
	BYG50G		–	400	V
	BYG50J		–	600	V
	BYG50K		–	800	V
	BYG50M		–	1000	V
V_R	continuous reverse voltage				
	BYG50D		–	200	V
	BYG50G		–	400	V
	BYG50J		–	600	V
	BYG50K		–	800	V
	BYG50M		–	1000	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 100 °C; see Fig.2	–	2.1	A
		averaged over any 20 ms period; Al_2O_3 PCB mounting (see Fig.7); T_{amb} = 60 °C; see Fig.3	–	1.0	A
		averaged over any 20 ms period; epoxy PCB mounting (see Fig.7); T_{amb} = 60 °C; see Fig.3	–	0.7	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	30	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
E_{RSM}	non-repetitive peak reverse avalanche energy	$L = 120$ mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off			
	BYG50D to J		–	10	mJ
	BYG50K and M		–	7	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.4	−65	+175	°C

ELECTRICAL CHARACTERISTICS

$T_j = 25$ °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	$I_F = 1$ A; $T_j = T_{j\,max}$; see Fig.5	–	–	0.85	V
		$I_F = 1$ A; see Fig.5	–	–	1.00	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 0.1$ mA				
	BYG50D		300	–	–	V
	BYG50G		500	–	–	V
	BYG50J		700	–	–	V
	BYG50K		900	–	–	V
	BYG50M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.6	–	–	1	µA
		$V_R = V_{RRMmax}$; $T_j = 165$ °C; see Fig.6	–	–	100	µA
t_{rr}	reverse recovery time	when switched from $I_F = 0.5$ A to $I_R = 1$ A; measured at $I_R = 0.25$ A; see Fig.8	–	2	–	µs

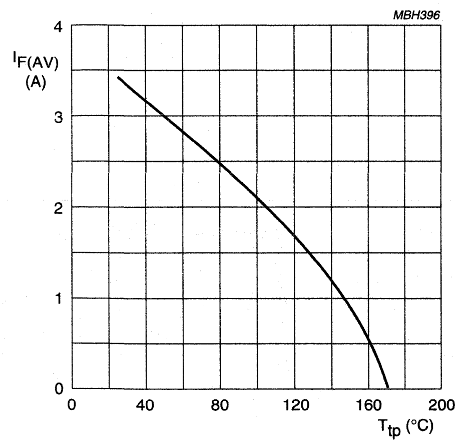
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

Notes

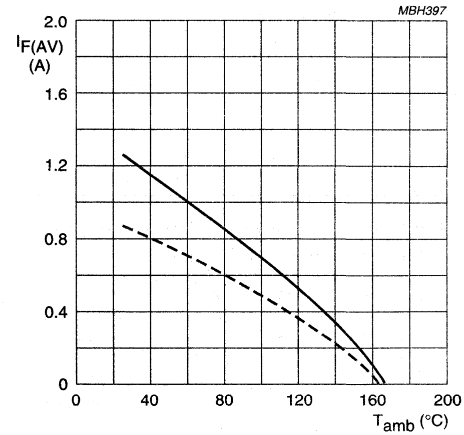
1. Device mounted on Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of copper ≥35 µm, see Fig.7.
2. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 µm, see Fig.7. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



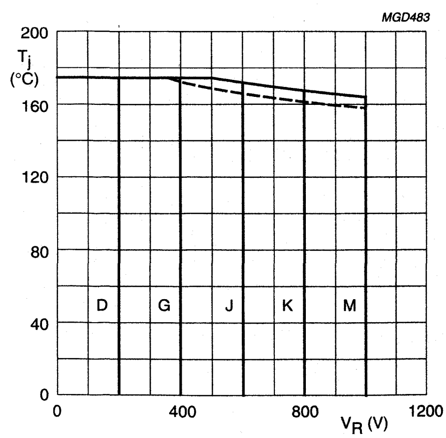
$V_R = V_{RRMmax}$; $\delta = 0.5$; a = 1.57.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



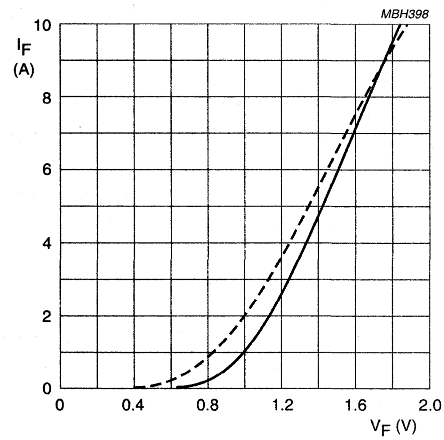
$V_R = V_{RRMmax}$; $\delta = 0.5$; a = 1.57.
Device mounted as shown in Fig.7
Solid line: Al_2O_3 PCB; dotted line: epoxy PCB.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



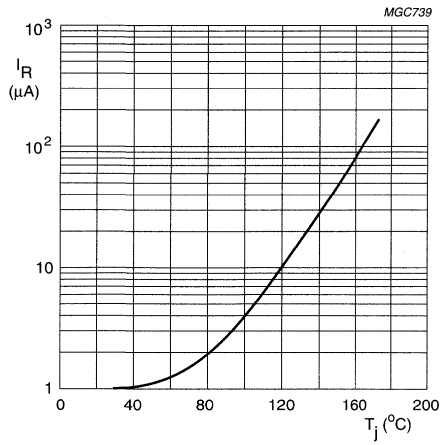
Device mounted as shown in Fig.7.
Solid line: Al_2O_3 PCB.
Dotted line: epoxy PCB.

Fig.4 Maximum permissible junction temperature as a function of reverse voltage.



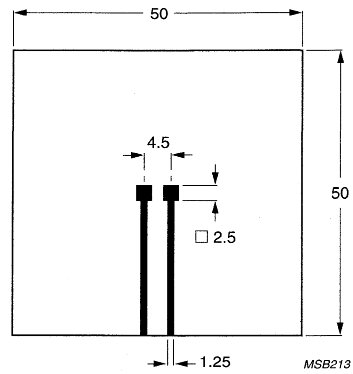
Solid line: T_j = 25 °C.
Dotted line: T_j = 175 °C.

Fig.5 Forward current as a function of forward voltage; maximum values.



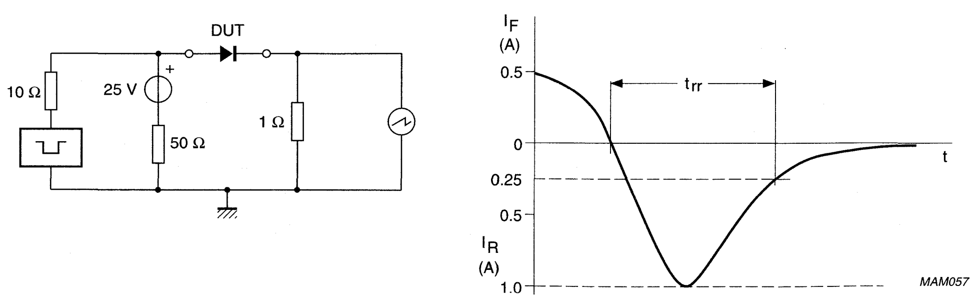
$V_R = V_{RMMmax}$.

Fig.6 Reverse current as a function of junction temperature; maximum values.



Dimensions in mm.

Fig.7 Printed-circuit board for surface mounting.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.8 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifiers — BYM56 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

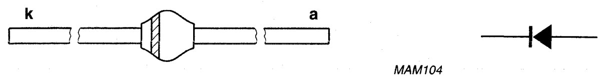


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYM56A		–	200	V
	BYM56B		–	400	V
	BYM56C		–	600	V
	BYM56D		–	800	V
	BYM56E		–	1000	V
V_{RWM}	crest working reverse voltage				
	BYM56A		–	200	V
	BYM56B		–	400	V
	BYM56C		–	600	V
	BYM56D		–	800	V
	BYM56E		–	1000	V
V_R	continuous reverse voltage				
	BYM56A		–	200	V
	BYM56B		–	400	V
	BYM56C		–	600	V
	BYM56D		–	800	V
	BYM56E		–	1000	V
$I_{F(AV)}$	average forward current	T_{tp} = 60 °C; lead length = 10 mm; averaged over any 20 ms period; see Figs 2 and 4	–	3.5	A
		T_{amb} = 65 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	1.4	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	80	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.5	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3 A; $T_j = T_{j\,max}$; see Fig.6	–	–	0.95	V
		I_F = 3 A; see Fig.6	–	–	1.15	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYM56A		225	–	–	V
	BYM56B		450	–	–	V
	BYM56C		650	–	–	V
	BYM56D		900	–	–	V
	BYM56E		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.7	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.7	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	90	–	pF

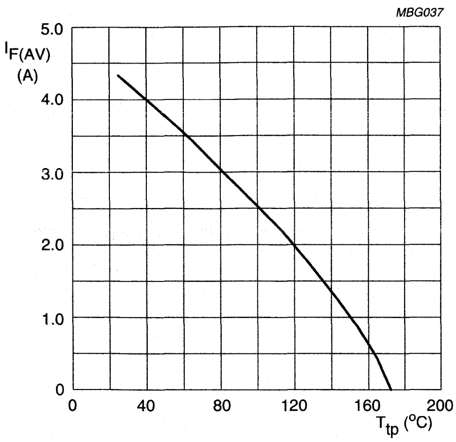
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

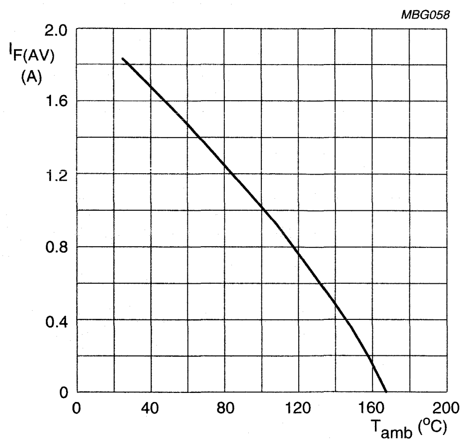
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



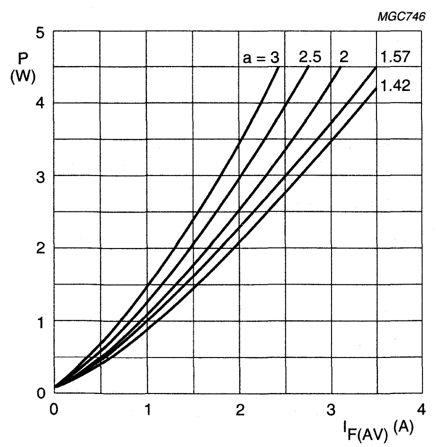
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Lead length 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



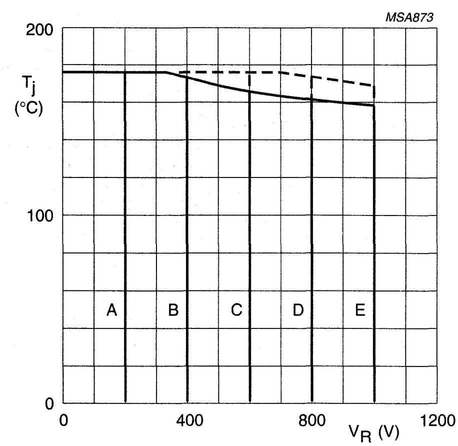
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



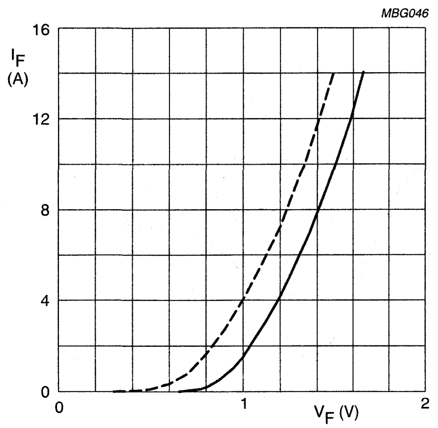
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



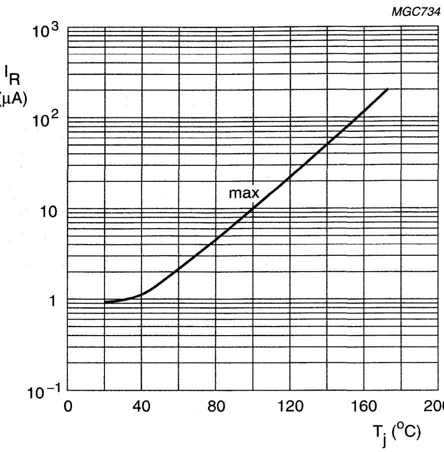
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.5 Maximum permissible junction temperature as a function of reverse voltage.



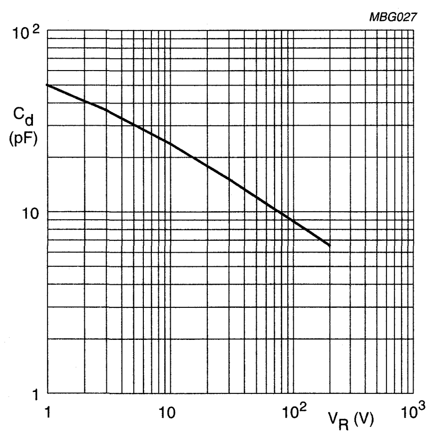
Solid line: T_j = 25 °C.
Dotted line: T_j = 175 °C.

Fig.6 Forward current as a function of forward voltage; maximum values.



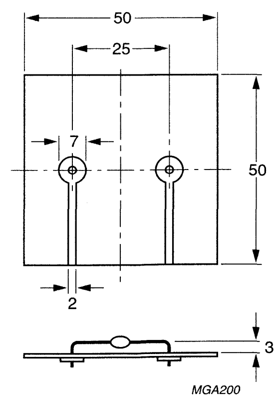
$V_R = V_{RRMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



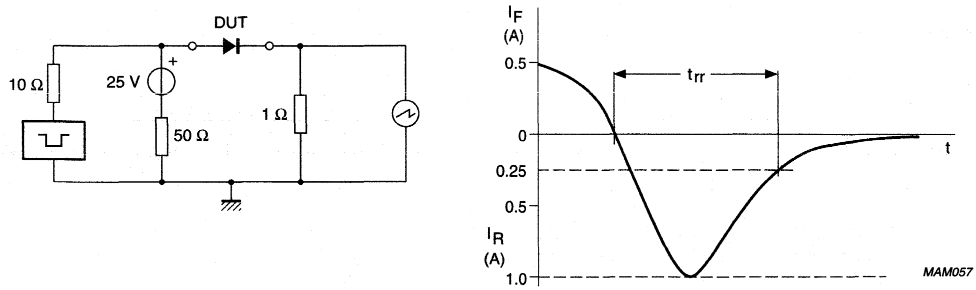
f = 1 MHz; T_j = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Controlled avalanche rectifiers | BYW54 to BYW56

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

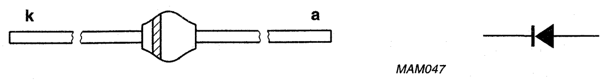


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYW54		–	600	V
	BYW55		–	800	V
	BYW56		–	1 000	V
V_{RWM}	crest working reverse voltage				
	BYW54		–	600	V
	BYW55		–	800	V
	BYW56		–	1 000	V
V_R	continuous reverse voltage				
	BYW54		–	600	V
	BYW55		–	800	V
	BYW56		–	1 000	V
$I_{F(AV)}$	average forward current	T_{tp} = 45 °C; lead length = 10 mm; averaged over any 20 ms period; see Figs 2 and 4	–	2.0	A
		T_{amb} = 80 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	0.8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave	–	50	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.5	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.6	–	–	0.8	V
		I_F = 1 A; see Fig.6	–	–	1.0	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYW54		650	–	–	V
	BYW55		900	–	–	V
	BYW56		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.7	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.7	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	50	–	pF

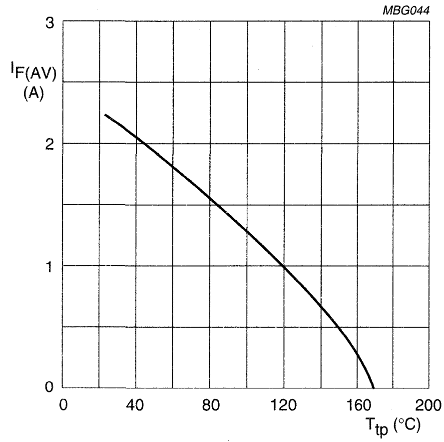
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

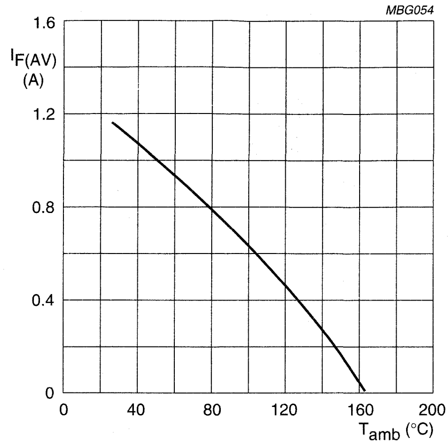
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



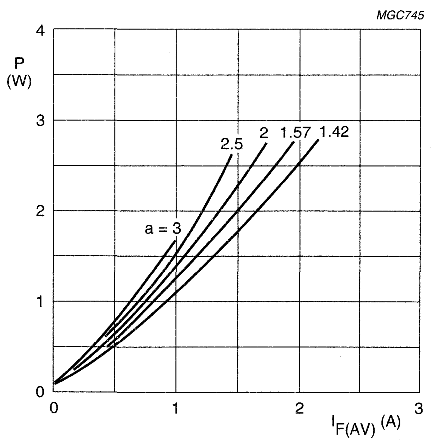
a = 1.57; $V_R = V_{RRMmax}$; $\delta = 0.5$; lead length 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



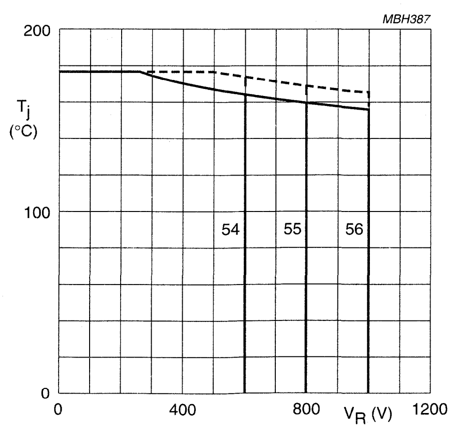
a = 1.57; $V_R = V_{RRMmax}$; $\delta = 0.5$; device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

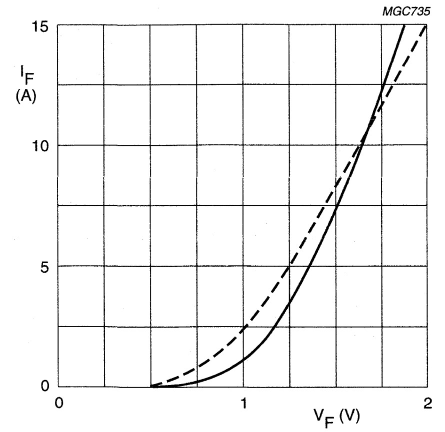
Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



Solid line = V_R.
Dotted line = V_{RRM}; $\delta = 0.5$.

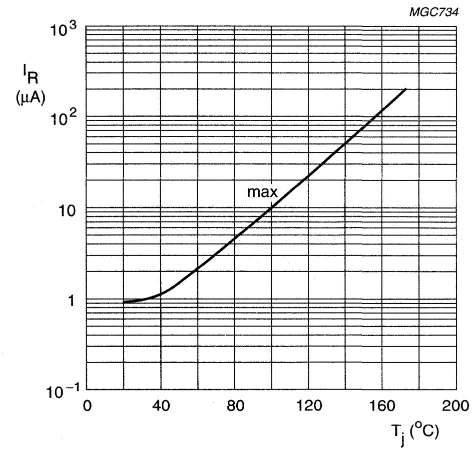
Fig.5 Maximum permissible junction temperature as a function of reverse voltage.

Controlled avalanche rectifiers | BYW54 to BYW56



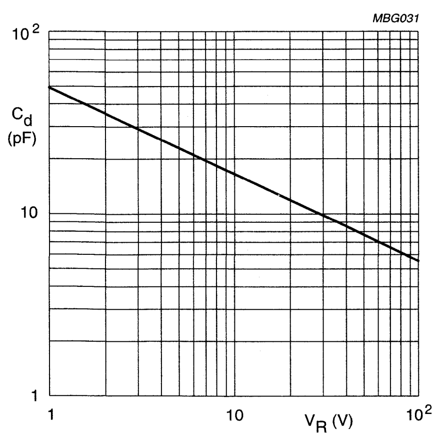
Solid line: T_j = 25 °C.
Dotted line: $T_j = T_{j\,max}$.

Fig.6 Forward current as a function of forward voltage; maximum values.



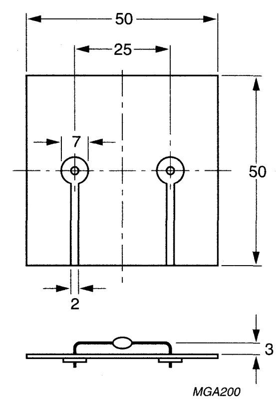
$V_R = V_{RRMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



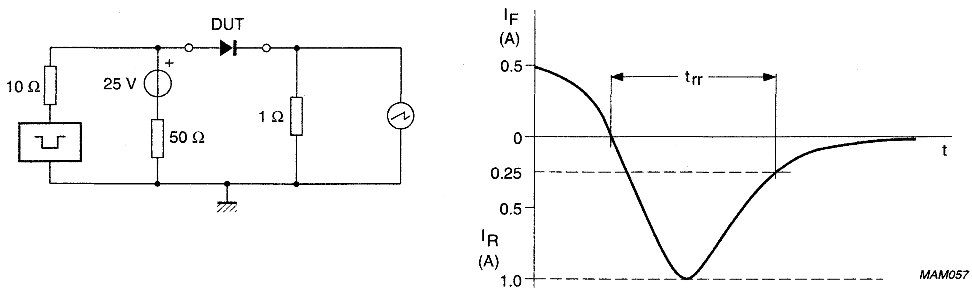
f = 1 MHz; T_j = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Rectifier BYX10G

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

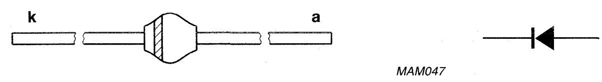


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1600	V
V_{RRM}	repetitive peak reverse voltage		–	1600	V
V_{RWM}	crest working reverse voltage		–	800	V
$I_{F(AV)}$	average forward current	T_{tp} = 50 °C; lead length = 10 mm; averaged over any 20 ms period; see Figs 2 and 4	–	1.2	A
		T_{amb} = 60 °C; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4	–	0.6	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RWMmax}$	–	25	A
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.5	−65	+175	°C

Rectifier BYX10G

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 2 A; $T_j = T_{j\,max}$; see Fig.6	–	–	1.5	V
		I_F = 2 A; see Fig.6	–	–	1.5	V
I_R	reverse current	$V_R = V_{RWMmax}$; see Fig.7	–	–	1	μA
		$V_R = V_{RWMmax}$; T_j = 150 °C; see Fig.7	–	–	200	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	3	–	μs
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; see Fig.8	–	30	–	pF

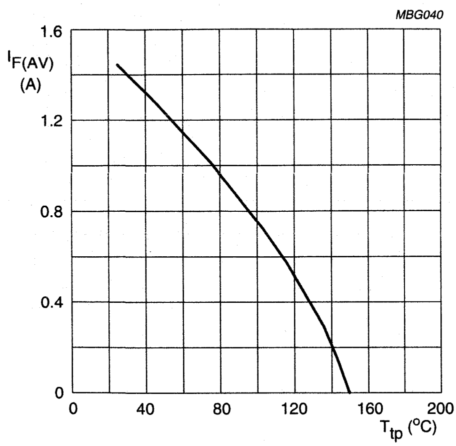
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

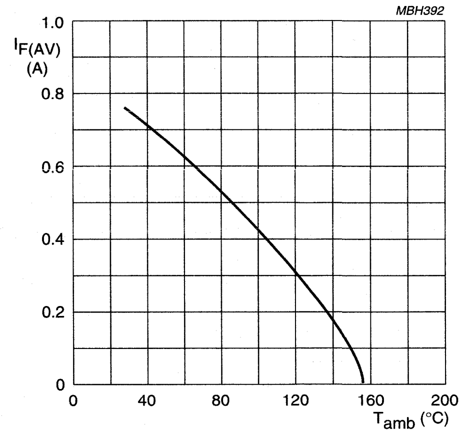
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.9. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



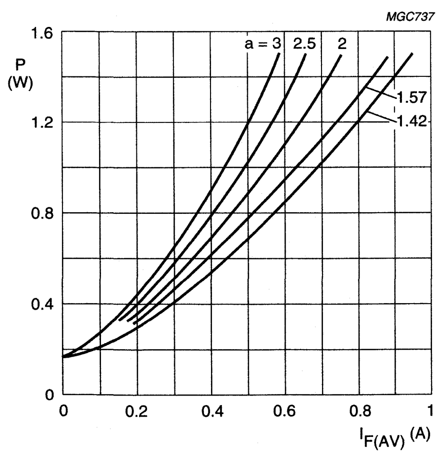
a = 1.57; $V_R = V_{RWMmax}$; δ = 0.5.
Lead length 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



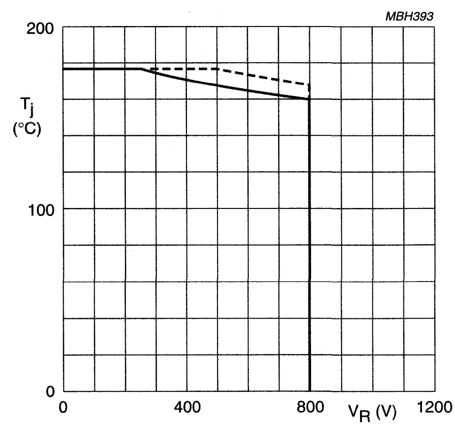
a = 1.57; $V_R = V_{RWMmax}$; δ = 0.5.
Device mounted as shown in Fig.9.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



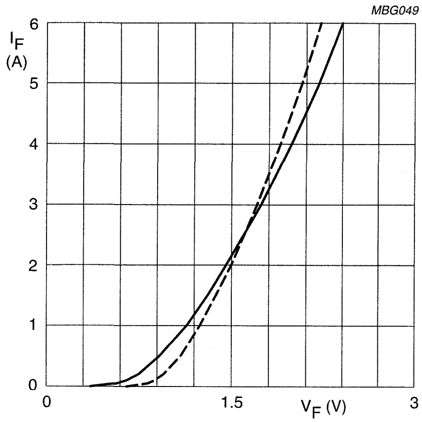
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



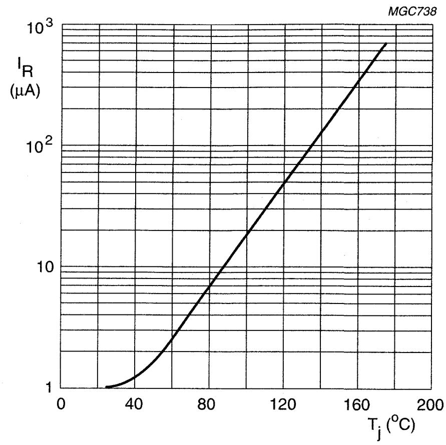
Solid line = V_R.
Dotted line = V_{RWM}; δ = 0.5.

Fig.5 Maximum permissible junction temperature as a function of reverse voltage.



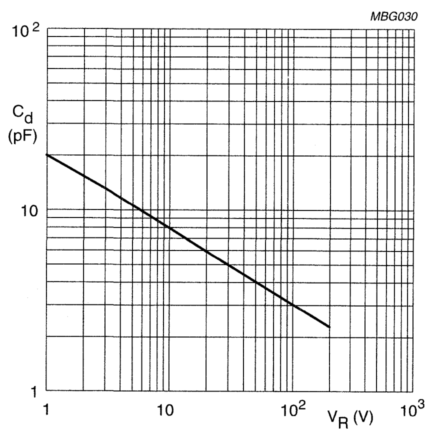
Solid line: T_j = 25 °C.
Dotted line: T_j = 175 °C.

Fig.6 Forward current as a function of forward voltage; maximum values.



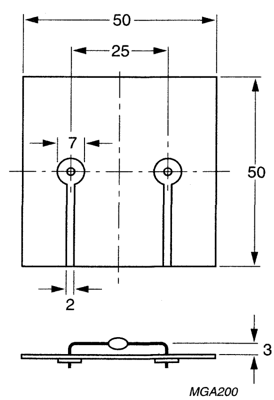
$V_R = V_{RWMmax}$.

Fig.7 Reverse current as a function of junction temperature; maximum values.



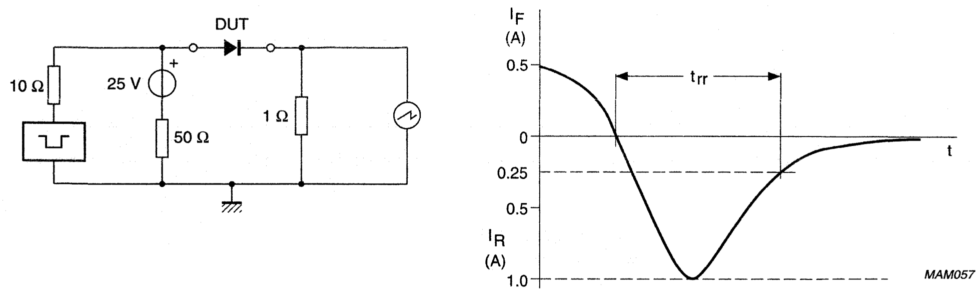
f = 1 MHz; T_j = 25 °C.

Fig.8 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.9 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

Rectifiers

PRLL4001; PRLL4002

FEATURES

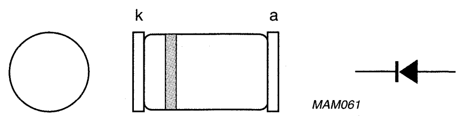
- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier outline.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology.

(1) Implotec is a trademark of Philips.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.



Marking code PRLL4001: 4001.
Marking code PRLL4002: 4002.

Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	PRLL4001		–	50	V
	PRLL4002		–	100	V
V_R	continuous reverse voltage				
	PRLL4001		–	50	V
	PRLL4002		–	100	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 105 °C	–	1.60	A
		averaged over any 20 ms period; T_{amb} = 65 °C; see Fig.2	–	0.68	A
I_{FRM}	repetitive peak forward current		–	10	A
I_{FSM}	non-repetitive peak forward current	half sinewave; 60 Hz	–	20	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; see Fig.3	1.1	V
$V_{F(AV)}$	full-cycle average forward voltage	$I_{F(AV)}$ = 1 A	0.8	V
I_R	reverse current	$V_R = V_{Rmax}$	10	μA
		$V_R = V_{Rmax}$; T_{amb} = 100 °C	50	μA
$I_{R(AV)}$	full-cycle average reverse current	$V_R = V_{RRMmax}$; T_{amb} = 75 °C	30	μA

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA

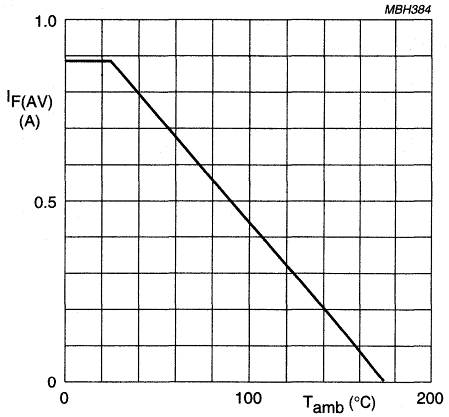
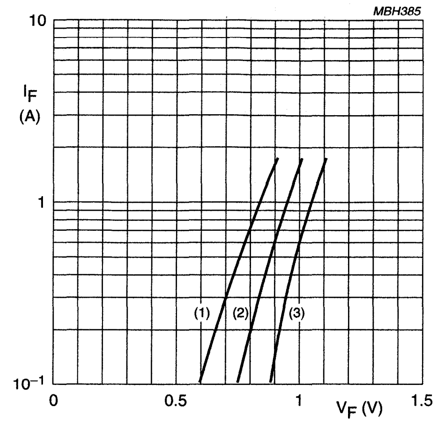
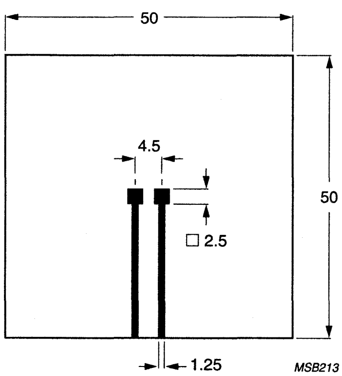


Fig.2 Maximum average forward current as a function of ambient temperature.



(1) T_{amb} = 100 °C.
(2) T_{amb} = 20 °C.
(3) T_{amb} = −50 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.4 Printed-circuit board for surface mounting.

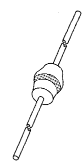
SECTION 11

FAST-RECOVERY RECTIFIERS

continued on next page

FAST-RECOVERY RECTIFIERS

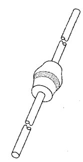
FAST SOFT-RECOVERY (CONTROLLED AVALANCHE) RECTIFIERS

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F @ max.	I_F	$V_{(BR)R}$ min.	C_d typ.	t_{rr} max.	
	(V)	(V)	(A)	(A)	(V)	(A)	(V)	(pF)	(ns)	
LEADED TYPES										
BYV26A	200	200	1.0	30	2.50	1	300	45	30	 SOD57
BYV26B	400	400	1.0	30	2.50	1	500	45	30	
BYV26C	600	600	1.0	30	2.50	1	700	45	30	
BYV26D	800	800	1.0	30	2.50	1	900	40	75	
BYV26E	1000	1000	1.0	30	2.50	1	1100	40	75	
BYV26F	1200	1200	1.05	30	2.15	1	1300	35	150	
BYV26G	1400	1400	1.05	30	2.15	1	1500	35	150	
BYV36A	200	200	1.6	30	1.35	1	300	45	100	
BYV36B	400	400	1.6	30	1.35	1	500	45	100	
BYV36C	600	600	1.6	30	1.35	1	700	45	100	
BYV36D	800	800	1.5	30	1.45	1	900	40	150	
BYV36E	1000	1000	1.5	30	1.45	1	1100	40	150	
BYV36F	1200	1200	1.5	30	1.45	1	1300	35	250	
BYV36G	1400	1400	1.5	30	1.45	1	1500	35	250	
BYV95A	200	200	1.5	35	1.60	3	300	45	250	
BYV95B	400	400	1.5	35	1.60	3	500	45	250	
BYV95C	600	600	1.5	35	1.60	3	700	45	250	
BYV96D	800	800	1.5	35	1.60	3	900	40	300	
BYV96E	1000	1000	1.5	35	1.60	3	1100	40	300	
BYV97F	1200	1200	1.6	20	1.65	3	1300	35	500	
BYV97G	1400	1400	1.6	20	1.65	3	1500	35	500	
BYV98	2000	–	1.0	15	2.4	2	(1)	30	300	

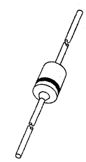
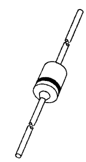
Note

1. No controlled avalanche performance.

FAST SOFT-RECOVERY (CONTROLLED AVALANCHE) RECTIFIERS (continued)

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RRM} max. (V)	V_R max. (V)	$I_{F(AV)}$ max. (A)	I_{FSM} max. (A)	V_F max. (V)	@ I_F (A)	$V_{(BR)R}$ min. (V)	C_d typ. (pF)	t_{rr} max. (ns)	
LEADED TYPES (continued)										
BYM26A	200	200	2.3	45	2.65	2	300	85	30	
BYM26B	400	400	2.3	45	2.65	2	500	85	30	
BYM26C	600	600	2.3	45	2.65	2	700	85	30	
BYM26D	800	800	2.3	45	2.65	2	900	75	75	
BYM26E	1000	1000	2.3	45	2.65	2	1100	75	75	
BYM26F	1200	1200	2.4	45	2.30	2	1300	65	150	
BYM26G	1400	1400	2.4	45	2.30	2	1500	65	150	
BYM36A	200	200	3.0	65	1.60	3	300	85	100	
BYM36B	400	400	3.0	65	1.60	3	500	85	100	
BYM36C	600	600	3.0	65	1.60	3	700	85	100	
BYM36D	800	800	2.9	65	1.78	3	900	75	150	
BYM36E	1000	1000	2.9	65	1.78	3	1100	75	150	
BYM36F	1200	1200	2.9	65	1.57	3	1300	65	250	
BYM36G	1400	1400	2.9	65	1.57	3	1500	65	250	SOD64
BYW95A	200	200	3.0	70	1.50	5	300	85	250	
BYW95B	400	400	3.0	70	1.50	5	500	85	250	
BYW95C	600	600	3.0	70	1.50	5	700	85	250	
BYW96D	800	800	3.0	70	1.50	5	900	75	300	
BYW96E	1000	1000	3.0	70	1.50	5	1100	75	300	
BYW97F	1200	1200	3.3	60	1.45	5	1300	65	500	
BYW97G	1400	1400	3.3	60	1.45	5	1500	65	500	

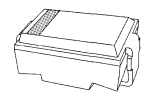
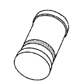
FAST SOFT-RECOVERY (CONTROLLED AVALANCHE) RECTIFIERS (continued)

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RRM} max. (V)	V_R max. (V)	$I_{F(AV)}$ max. (A)	I_{FSM} max. (A)	V_F max. (V)	@ I_F (A)	$V_{(BR)R}$ min. (V)	C_d typ. (pF)	t_{rr} max. (ns)	
LEADED TYPES (continued)										
BYD33D	200	200	1.3	20	1.3	1	300	20	250	 SOD81
BYD33G	400	400	1.3	20	1.3	1	500	20	250	
BYD33J	600	600	1.3	20	1.3	1	700	20	250	
BYD33K	800	800	1.3	20	1.3	1	900	20	300	
BYD33M	1000	1000	1.3	20	1.3	1	1100	20	300	
BYD33U	1200	1200	1.26	20	1.3	1	1300	20	500	
BYD33V	1400	1400	1.26	20	1.3	1	1500	20	500	
BYD43U	1200	–	1.2	6	1.5	1	(1)	20	250	
BYD43V	1400	–	1.2	6	1.5	1	(1)	20	250	
BYD43-16	1600	–	0.68	6	2.4	1	(1)	15	300	
BYD43-18	1800	–	0.68	6	2.4	1	(1)	15	300	
BYD43-20	2000	–	0.68	6	2.4	1	(1)	15	300	
BYD53U	1200	1200	0.85	5	2.3	1	1300	20	150	
BYD53V	1400	1400	0.85	5	2.3	1	1500	20	150	
BYD31D(2)	200	200	0.44	5	1.35	0.5	300	9	250	 SOD91
BYD31G(2)	400	400	0.44	5	1.35	0.5	500	9	250	
BYD31J(2)	600	600	0.44	5	1.35	0.5	700	9	250	
BYD31K(2)	800	800	0.44	5	1.35	0.5	900	8	300	
BYD31M(2)	1000	1000	0.44	5	1.35	0.5	1100	8	300	

Notes

1. No controlled avalanche performance.
2. Not for new designs; recommended replacement: BYD33 series.

FAST SOFT-RECOVERY (CONTROLLED AVALANCHE) RECTIFIERS (continued)

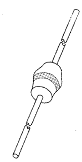
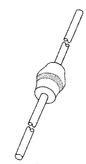
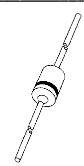
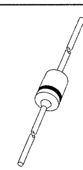
TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F @ max.	I_F	$V_{(BR)R}$ min.	C_d typ.	t_{rr} max.	
	(V)	(V)	(A)	(A)	(V)	(A)	(V)	(pF)	(ns)	
SURFACE-MOUNT TYPES										
BYG60D	200	200	1.9	25	1.2	1	300	30	250	
BYG60G	400	400	1.9	25	1.2	1	500	30	250	
BYG60J	600	600	1.9	25	1.2	1	700	30	250	
BYG60K	800	800	1.9	25	1.2	1	900	25	300	
BYG60M	1000	1000	1.9	25	1.2	1	1100	25	300	
BYG70D	200	200	1.0	20	3.6	1	300	30	30	
BYG70G	400	400	1.0	20	3.6	1	500	30	30	
BYG70J	600	600	1.0	20	3.6	1	700	30	30	SOD106
BYD37D	200	200	1.5	20	1.3	1	300	20	250	
BYD37G	400	400	1.5	20	1.3	1	500	20	250	
BYD37J	600	600	1.5	20	1.3	1	700	20	250	
BYD37K	800	800	1.5	20	1.3	1	900	20	300	
BYD37M	1000	1000	1.5	20	1.3	1	1100	20	300	
BYD47-16	1600	–	0.8	10	2.4	1	(1)	15	300	
BYD47-18	1800	–	0.8	10	2.4	1	(1)	15	300	
BYD47-20	2000	–	0.8	10	2.4	1	(1)	15	300	
BYD57D	200	200	1.0	5	3.6	1	300	20	30	
BYD57G	400	400	1.0	5	3.6	1	500	20	30	SOD87
BYD57J	600	600	1.0	5	3.6	1	700	20	30	
BYD57K	800	800	1.0	5	3.6	1	900	20	75	
BYD57M	1000	1000	1.0	5	3.6	1	1100	20	75	

Note

1. No controlled avalanche performance.

Fast-recovery rectifiers — Selection guide

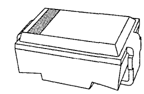
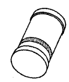
ULTRA FAST LOW-LOSS CONTROLLED AVALANCHE RECTIFIERS

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F max.	@ I_F	$V_{(BR)R}$ min.	C_d typ.	t_{rr} max.	
	(V)	(V)	(A)	(A)	(V)	(A)	(V)	(pF)	(ns)	
LEADED TYPES										
BYV27-50	50	50	2.0	50	0.98	2	55	100	25	
BYV27-100	100	100	2.0	50	0.98	2	110	100	25	
BYV27-150	150	150	2.0	50	0.98	2	165	100	25	
BYV27-200	200	200	2.0	50	0.98	2	220	100	25	
BYV27-300	300	300	1.9	50	1.05	2	330	80	50	
BYV27-400	400	400	1.9	50	1.05	2	440	80	50	
BYV27-600	600	600	1.6	40	1.05	2	675	–	50	
BYV99	600	600	1.0	20	2.7	1	700	75	15	SOD57
BYV2100	100	100	2.0	50	0.98	2	120	135	12.5	
BYM99	600	600	1.8	40	3.6	3	700	135	15	
BYV28-50	50	50	3.5	90	1.02	3.5	55	190	25	
BYV28-100	100	100	3.5	90	1.02	3.5	110	190	25	
BYV28-150	150	150	3.5	90	1.02	3.5	165	190	25	
BYV28-200	200	200	3.5	90	1.02	3.5	220	190	25	
BYV28-300	300	300	3.5	90	1.05	3.5	330	150	50	
BYV28-400	400	400	3.5	90	1.05	3.5	440	150	50	
BYV28-600	600	600	3.0	90	1.05	3.5	675	–	50	SOD64
BYV4100	100	100	1.9	90	0.98	3.5	120	245	15	
BYD73A	50	50	1.75	25	0.98	1	55	50	25	
BYD73B	100	100	1.75	25	0.98	1	110	50	25	
BYD73C	150	150	1.75	25	0.98	1	165	50	25	
BYD73D	200	200	1.75	25	0.98	1	220	50	25	
BYD73E	250	250	1.70	25	1.05	1	275	40	50	
BYD73F	300	300	1.70	25	1.05	1	330	40	50	
BYD73G	400	400	1.70	25	1.05	1	440	40	50	SOD81
BYD71A(1)	50	50	0.56	7	1.05	0.5	55	25	25	
BYD71B(1)	100	100	0.56	7	1.05	0.5	110	25	25	
BYD71C(1)	150	150	0.56	7	1.05	0.5	165	25	25	
BYD71D(1)	200	200	0.56	7	1.05	0.5	220	25	25	
BYD71E(1)	250	250	0.54	7	1.11	0.5	275	20	50	
BYD71F(1)	300	300	0.54	7	1.11	0.5	330	20	50	
BYD71G(1)	400	400	0.54	7	1.11	0.5	440	20	50	SOD91

Note

1. Not for new designs; recommended replacement: BYD73 series.

ULTRA FAST LOW-LOSS CONTROLLED AVALANCHE RECTIFIERS (continued)

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F max.	@ I_F	$V_{(BR)R}$ min.	C_d typ.	t_{rr} max.	
	(V)	(V)	(A)	(A)	(V)	(A)	(V)	(pF)	(ns)	
SURFACE-MOUNT TYPES										
BYG80D	200	200	1.6	36	0.93	1	–	–	25	 SOD106
BYG80G	400	400	1.5	32	0.98	1	–	–	50	
BYG80J	600	600	1.1	32	1.25	1	–	–	50	
BYD77A	50	50	2.0	25	0.98	1	55	50	25	 SOD87
BYD77B	100	100	2.0	25	0.98	1	110	50	25	
BYD77C	150	150	2.0	25	0.98	1	165	50	25	
BYD77D	200	200	2.0	25	0.98	1	220	50	25	
BYD77E	250	250	1.85	25	1.05	1	275	40	50	
BYD77F	300	300	1.85	25	1.05	1	330	40	50	
BYD77G	400	400	1.85	25	1.05	1	440	40	50	

Fast soft-recovery controlled avalanche rectifiers

BYD31 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

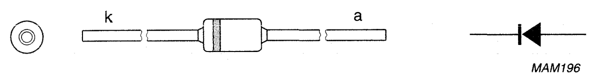


Fig.1 Simplified outline (SOD91) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD31D		–	200	V
	BYD31G		–	400	V
	BYD31J		–	600	V
	BYD31K		–	800	V
	BYD31M		–	1000	V
V_R	continuous reverse voltage				
	BYD31D		–	200	V
	BYD31G		–	400	V
	BYD31J		–	600	V
	BYD31K		–	800	V
	BYD31M		–	1000	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Fig.2; averaged over any 20 ms period; see also Fig.6	–	440	mA
		T_{amb} = 60 °C; PCB mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	320	mA
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Fig.4	–	4	A
		T_{amb} = 60 °C; see Fig.5	–	3	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	5	A

FOR REPLACEMENT TYPE SEE INDEX SECTION OF HANDBOOK SC01

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{RSM}	non-repetitive peak reverse power dissipation	t = 20 µs half sine wave; $T_j = T_{j\,max}$ prior to surge			
	BYD31D to J		–	100	W
	BYD31K and M		–	50	W
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.7	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 0.5 A; $T_j = T_{j\,max}$; see Fig.8	–	–	1.15	V
		I_F = 0.5 A; see Fig.8	–	–	1.35	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD31D		300	–	–	V
	BYD31G		500	–	–	V
	BYD31J		700	–	–	V
	BYD31K		900	–	–	V
	BYD31M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	1	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	75	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25A see Fig.12				
	BYD31D to J		–	–	250	ns
	BYD31K and M		–	–	300	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.10	–	9	–	pF
$\left\lvert \frac{dI_R}{dt} \right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/µs; see Fig.13				
	BYD31D to J		–	–	6	A/µs
	BYD31K and M		–	–	5	A/µs

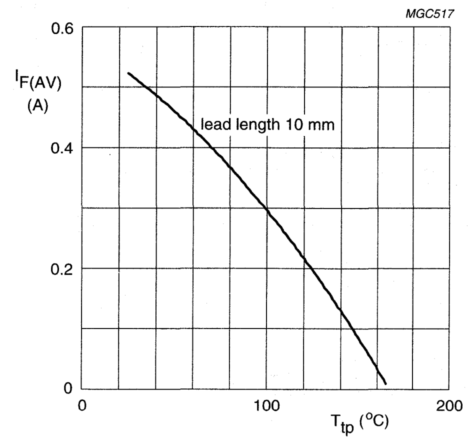
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	180	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	250	K/W

Note

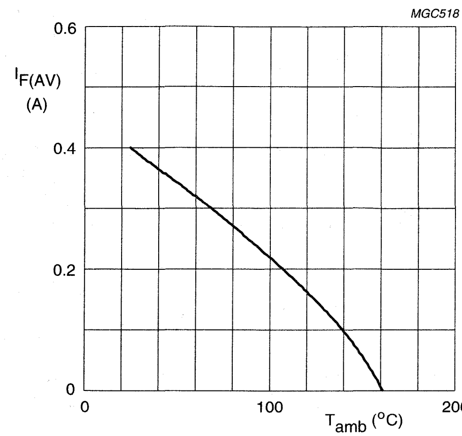
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



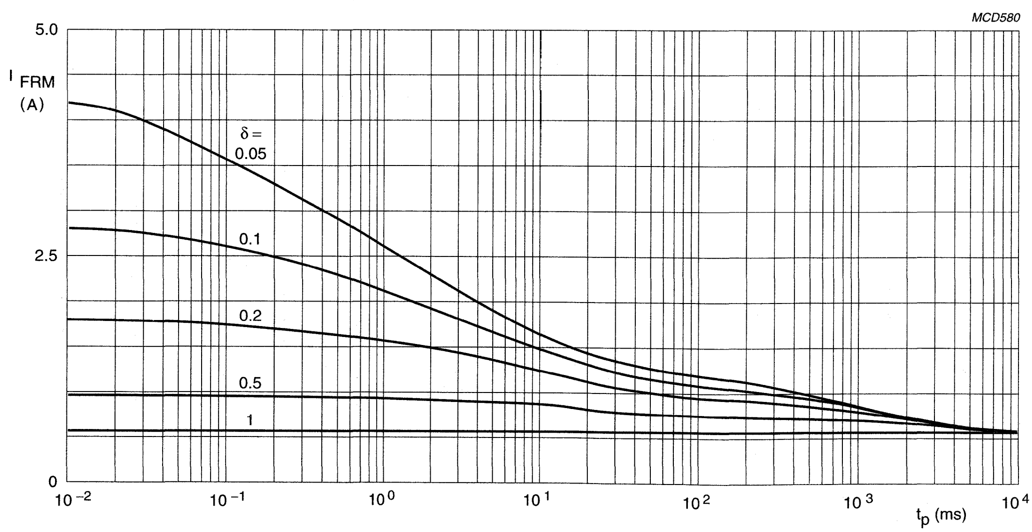
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



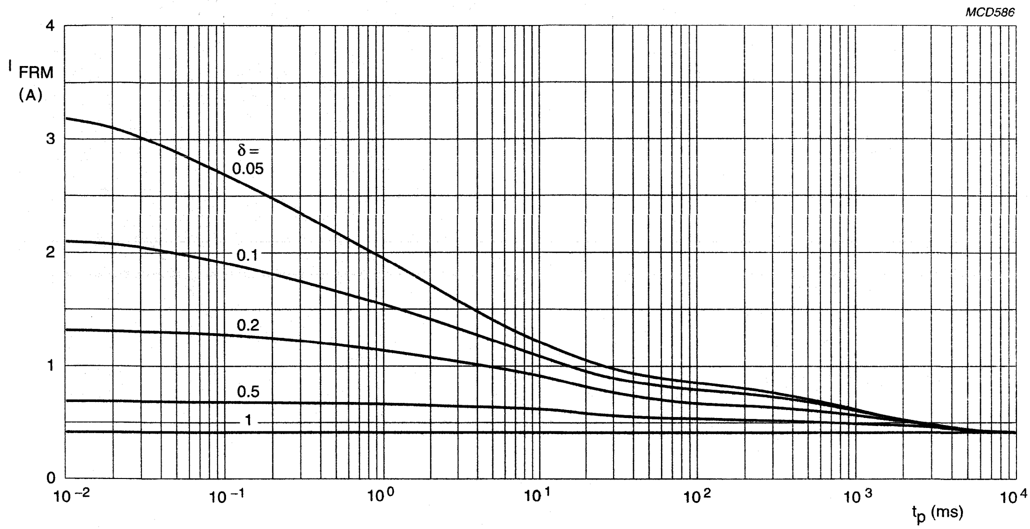
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



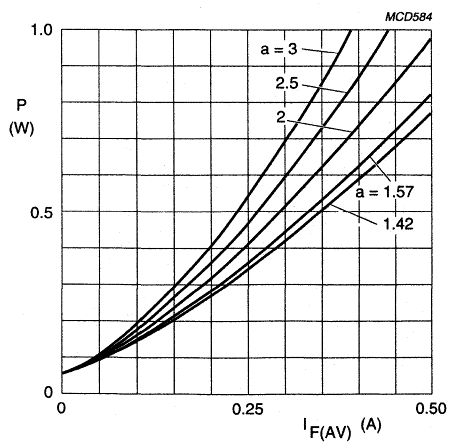
T_{tp} = 55 °C; $R_{th\ j\text{-}tp}$ = 180 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



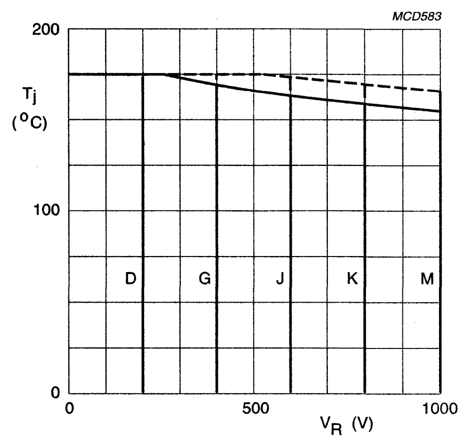
T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 250 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



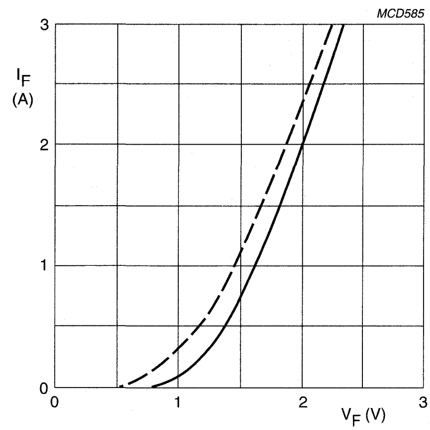
a = $I_{F(RMS)}/I_{F(AV)}$; V_R = V_{RRMmax}; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



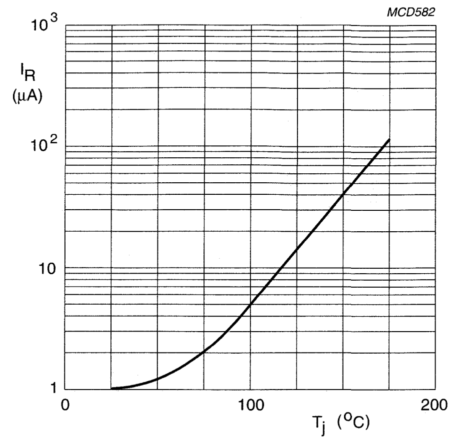
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



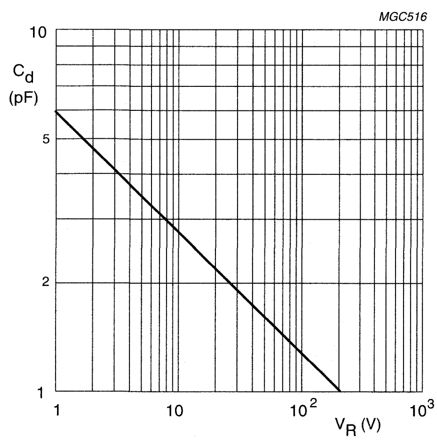
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



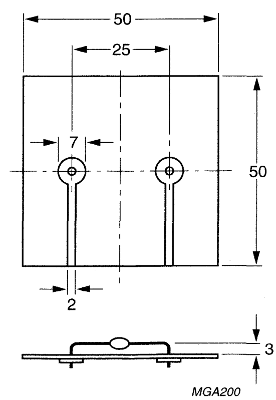
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



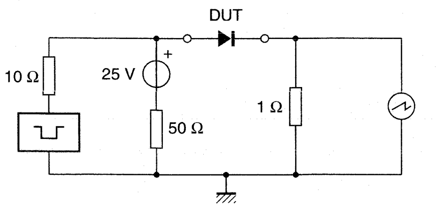
f = 1 MHz; T_j = 25 °C.

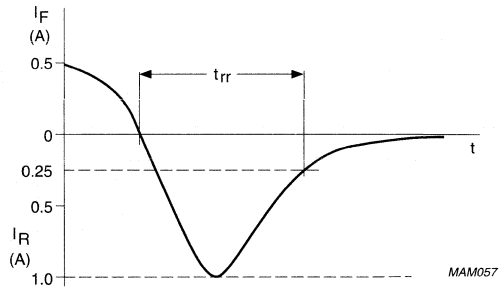
Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.





Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

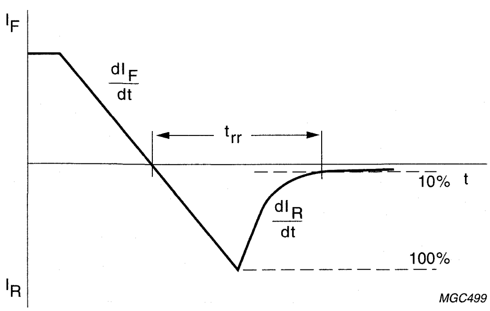


Fig.13 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYD33 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

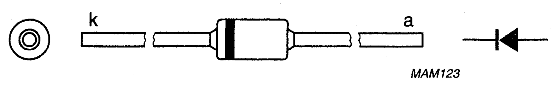


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD33D		–	200	V
	BYD33G		–	400	V
	BYD33J		–	600	V
	BYD33K		–	800	V
	BYD33M		–	1000	V
	BYD33U		–	1200	V
	BYD33V		–	1400	V
V_R	continuous reverse voltage				
	BYD33D		–	200	V
	BYD33G		–	400	V
	BYD33J		–	600	V
	BYD33K		–	800	V
	BYD33M		–	1000	V
	BYD33U		–	1200	V
	BYD33V		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD33D to M		–	1.30	A
	BYD33U and V		–	1.26	A
$I_{F(AV)}$	average forward current	T_{amb} = 65 °C; PCB mounting (see Fig.19); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD33D to M		–	0.70	A
	BYD33U and V		–	0.67	A
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Figs 6 and 7			
	BYD33D to M		–	12	A
	BYD33U and V		–	11	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{amb} = 65 °C; see Figs 8 and 9			
	BYD33D to M		–	7	A
	BYD33U and V		–	6	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	20	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off			
	BYD33D to J		–	10	mJ
	BYD33K to V		–	7	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Figs 12 and 13	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Figs 14 and 15	–	–	1.1	V
		I_F = 1 A; see Figs 14 and 15	–	–	1.3	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD33D		300	–	–	V
	BYD33G		500	–	–	V
	BYD33J		700	–	–	V
	BYD33K		900	–	–	V
	BYD33M		1 100	–	–	V
	BYD33U		1 300	–	–	V
	BYD33V		1 500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.16	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.16	–	–	100	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A see Fig.21				
	BYD33D to J		–	–	250	ns
	BYD33K and M		–	–	300	ns
	BYD33U and V		–	–	500	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Figs 17 and 18	–	20	–	pF

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$\left\lvert \frac{dI_R}{dt} \right\rvert$	maximum slope of reverse recovery current	when switched from $I_F = 1$ A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/µs; see Fig.20				
	BYD33D to J		–	–	6	A/µs
	BYD33K to V		–	–	5	A/µs

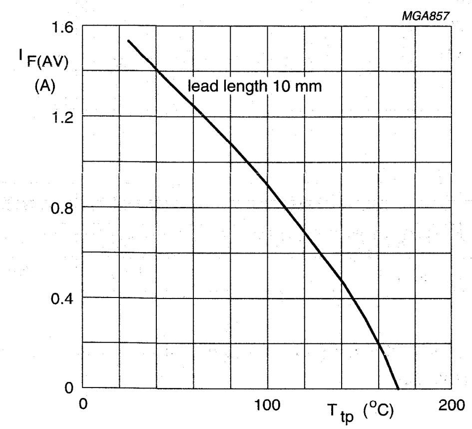
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	120	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.19. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

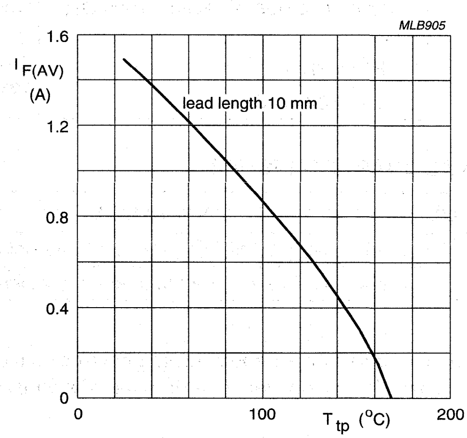


BYD33D to M

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).

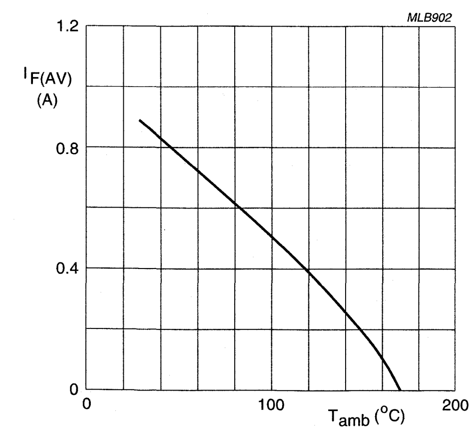


BYD33U and V

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.3 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



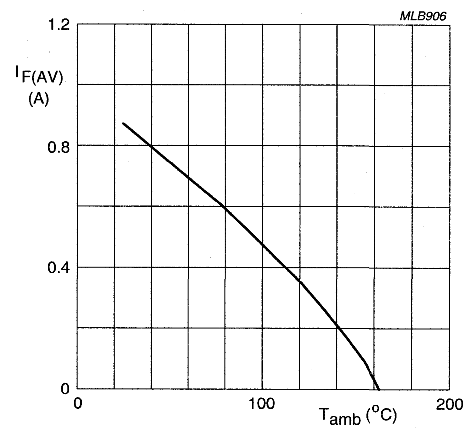
BYD33D to M

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.19.

Switched mode application.

Fig.4 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



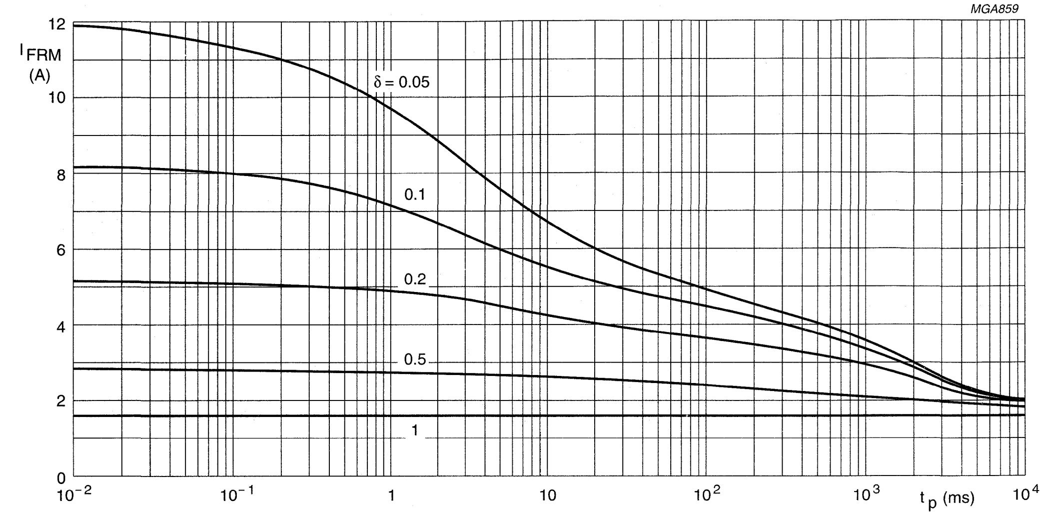
BYD33U and V

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.19.

Switched mode application.

Fig.5 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

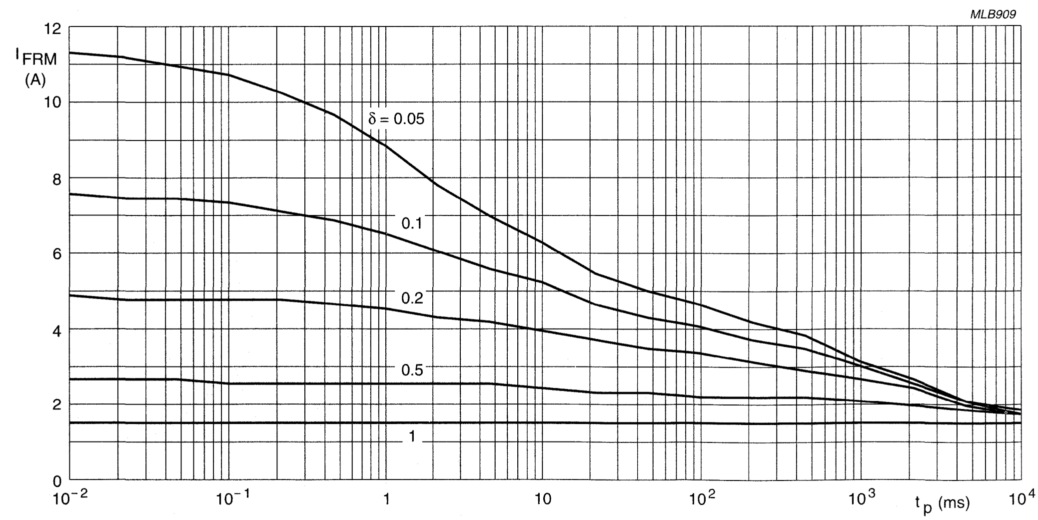


BYD33D to M

T_{tp} = 55 °C; $R_{th\ j\text{-}tp}$ = 60 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

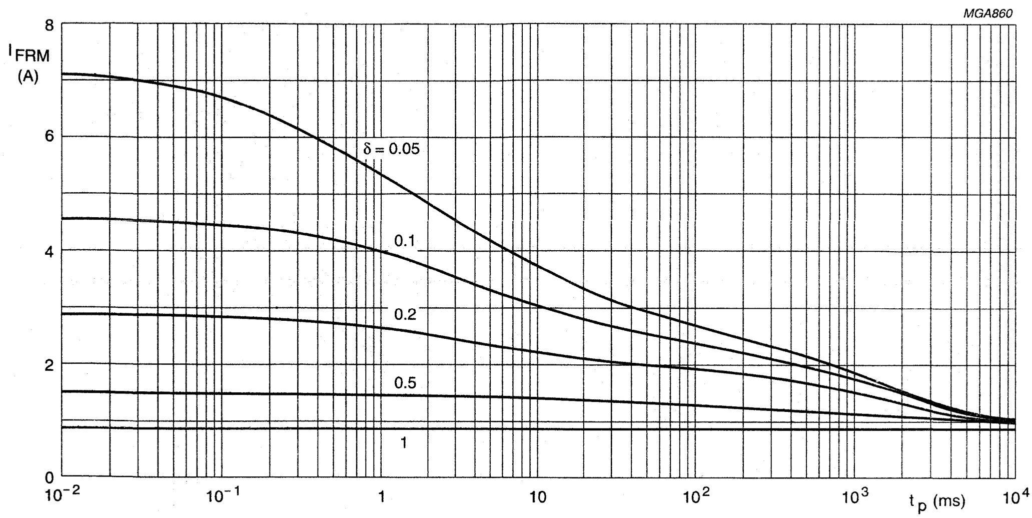


BYD33U and V

T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 60 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

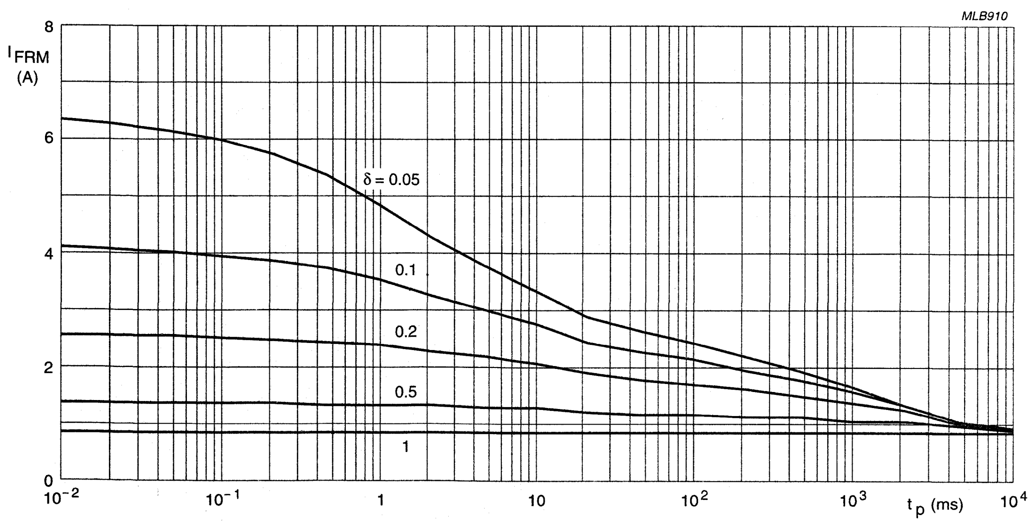


BYD33D to M

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 120 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

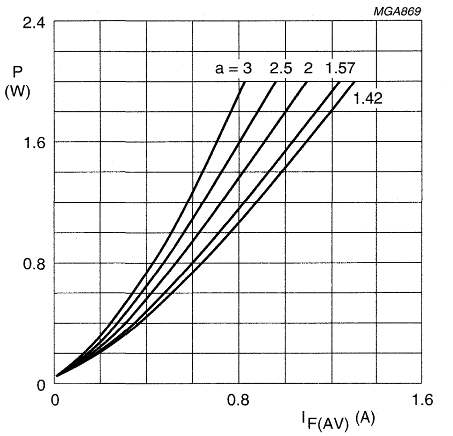


BYD33U and V

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 120 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

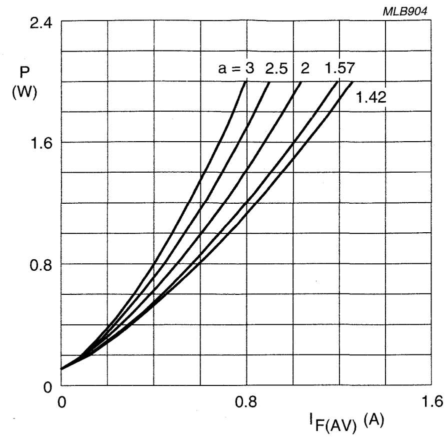
Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYD33D to M

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

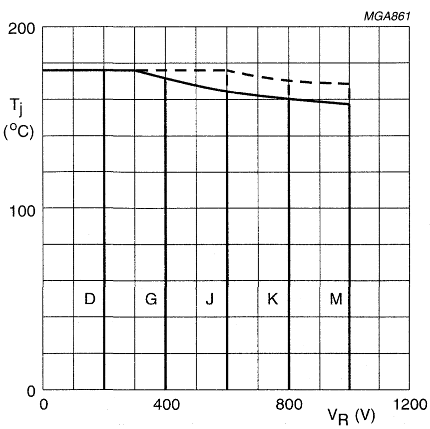
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYD33U and V

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

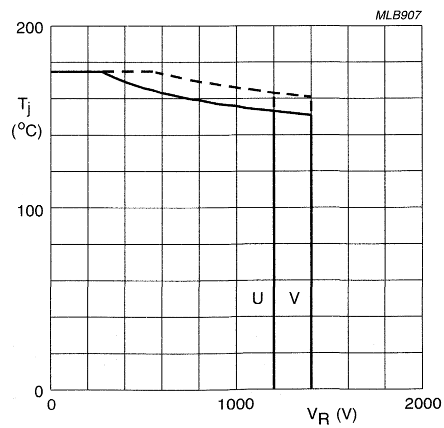


BYD33D to M

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.12 Maximum permissible junction temperature as a function of reverse voltage.

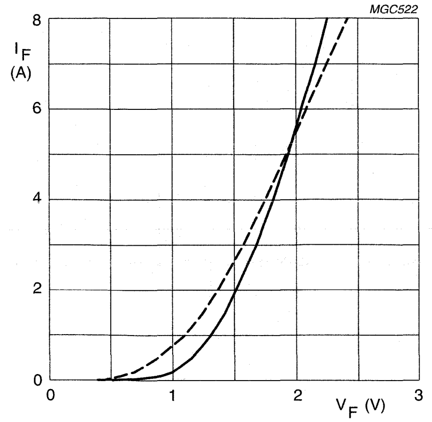


BYD33U and V

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.13 Maximum permissible junction temperature as a function of reverse voltage.

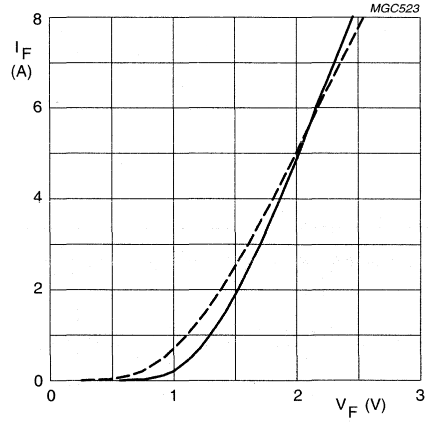


BYD33D to M

Solid line: T_j = 25 °C.

Dotted line: T_j = 175 °C.

Fig.14 Forward current as a function of forward voltage; maximum values.

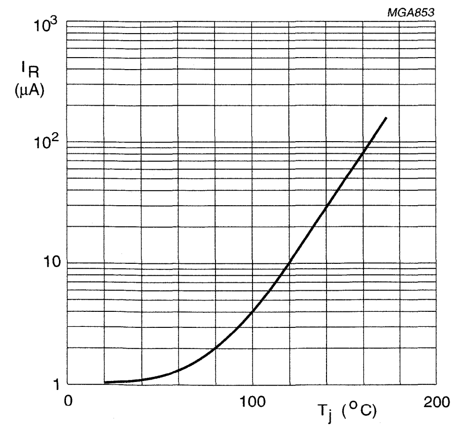


BYD33U and V

Solid line: T_j = 25 °C.

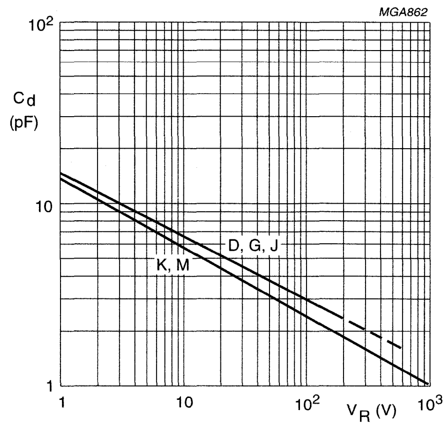
Dotted line: T_j = 175 °C.

Fig.15 Forward current as a function of forward voltage; maximum values.



$V_R = V_{RRMmax}$.

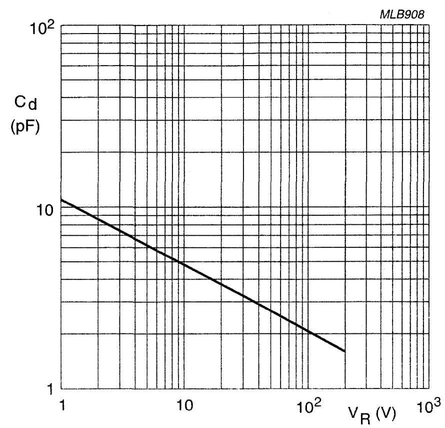
Fig.16 Reverse current as a function of junction temperature; maximum values.



BYD33D to M

f = 1 MHz; T_j = 25 °C.

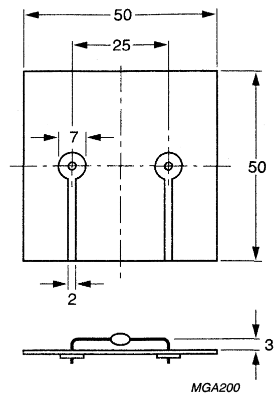
Fig.17 Diode capacitance as a function of reverse voltage; typical values.



BYD33U and V

f = 1 MHz; T_j = 25 °C.

Fig.18 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.19 Device mounted on a printed-circuit board.

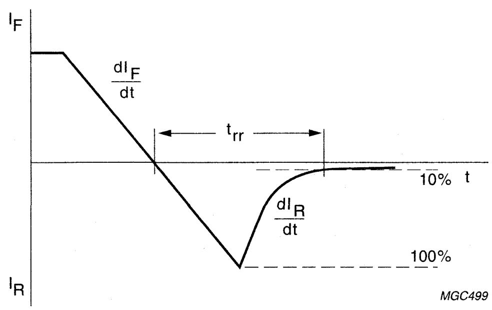
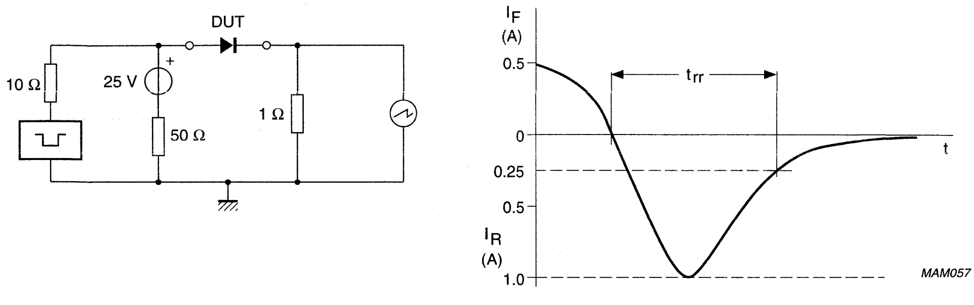


Fig.20 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.21 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery controlled avalanche rectifiers

BYD37 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Smallest surface mount rectifier outline
- Shipped in 8 mm embossed tape.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

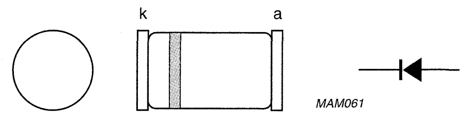


Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD37D		–	200	V
	BYD37G		–	400	V
	BYD37J		–	600	V
	BYD37K		–	800	V
	BYD37M		–	1000	V
V_R	continuous reverse voltage				
	BYD37D		–	200	V
	BYD37G		–	400	V
	BYD37J		–	600	V
	BYD37K		–	800	V
	BYD37M		–	1000	V
$I_{F(AV)}$	average forward current	T_{tp} = 105 °C; see Fig.2; averaged over any 20 ms period; see also Fig.6	–	1.5	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	0.6	A
I_{FRM}	repetitive peak forward current	T_{tp} = 105 °C; see Fig.4	–	13	A
		T_{amb} = 60 °C; see Fig.5	–	5.5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	20	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off			
	BYD37D to J		–	10	mJ
	BYD37K and M		–	7	mJ

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.7	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.8	–	–	1.1	V
		I_F = 1 A; see Fig.8	–	–	1.3	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD37D		300	–	–	V
	BYD37G		500	–	–	V
	BYD37J		700	–	–	V
	BYD37K		900	–	–	V
	BYD37M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	1	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	100	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25A; see Fig.12				
	BYD37D to J		–	–	250	ns
	BYD37K and M		–	–	300	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.10	–	20	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and dI_F/dt = −1 A/µs; see Fig.13				
	BYD37D to J		–	–	6	A/µs
	BYD37K and M		–	–	5	A/µs

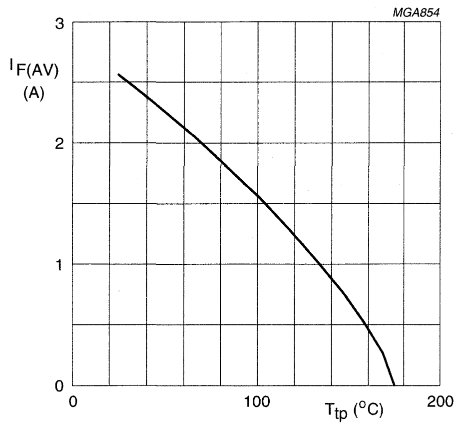
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

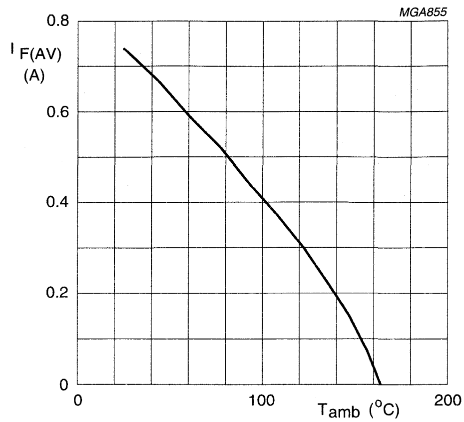
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



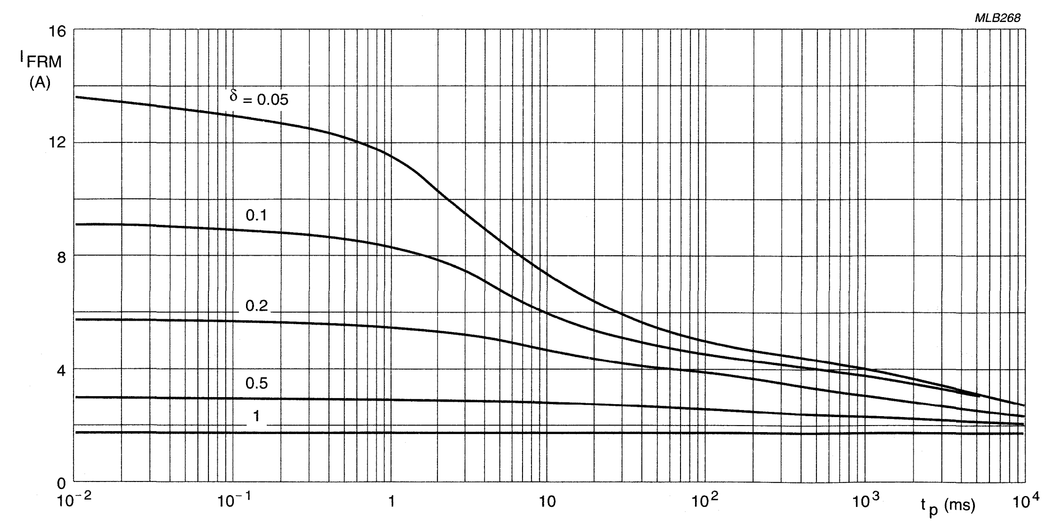
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



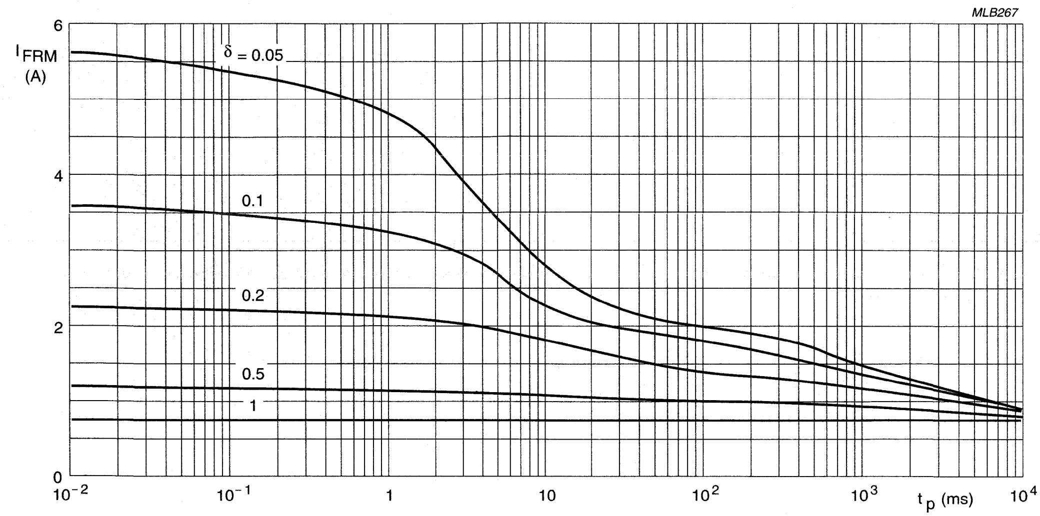
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



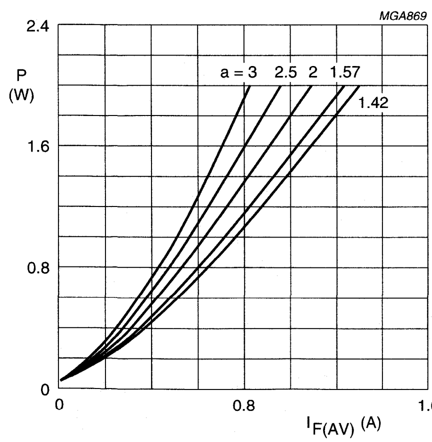
T_{tp} = 105 °C; $R_{th\ j\text{-}tp}$ = 30 K/W.
V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



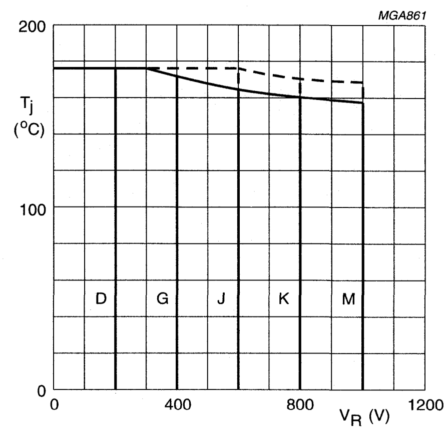
T_{amb} = 60 °C; $R_{th\,j\text{-}a}$ = 150 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\,max}$ at V_{RRM} = 1000 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



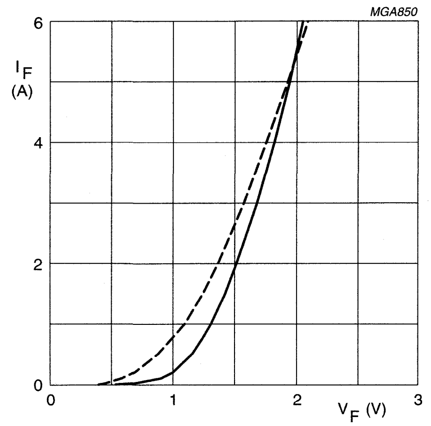
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



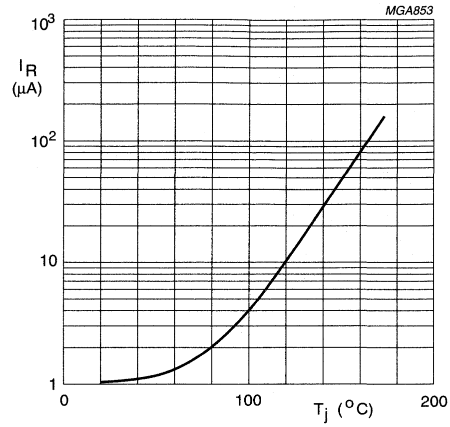
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



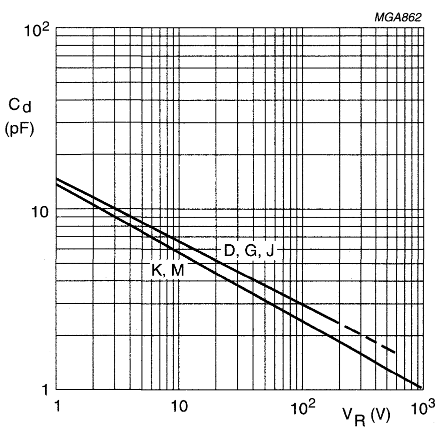
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



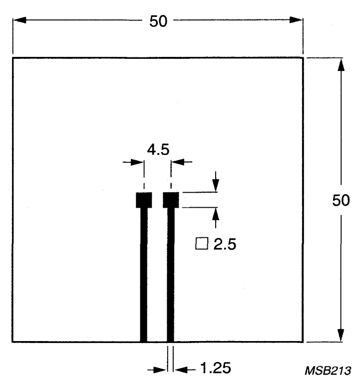
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



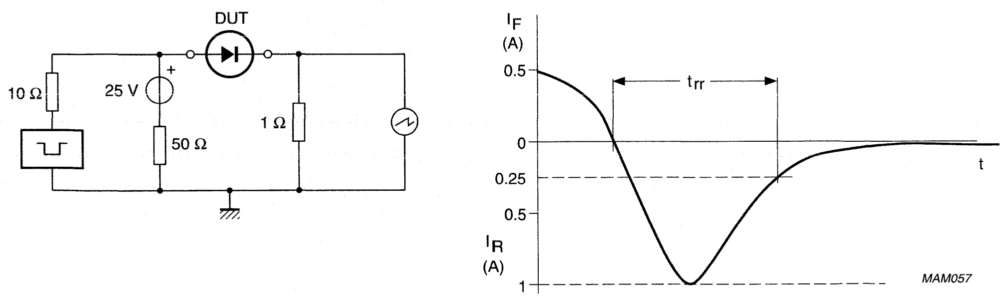
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Printed-circuit board for surface mounting.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

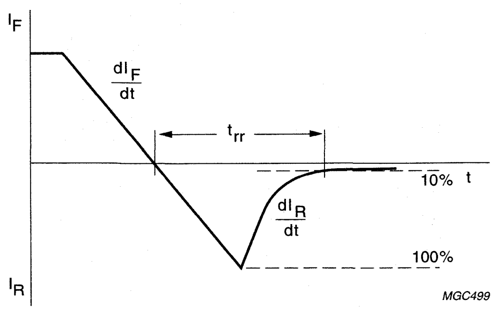


Fig.13 Reverse recovery definitions.

Fast soft-recovery rectifiers — BYD43 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

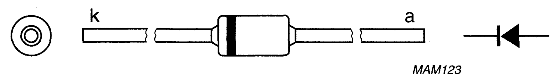


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage				
	BYD43U		–	1300	V
	BYD43V		–	1500	V
	BYD43-16		–	1700	V
	BYD43-18		–	1900	V
	BYD43-20		–	2100	V
V_{RRM}	repetitive peak reverse voltage				
	BYD43U		–	1200	V
	BYD43V		–	1400	V
	BYD43-16		–	1600	V
	BYD43-18		–	1800	V
	BYD43-20		–	2000	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD43U and V		–	1.20	A
	BYD43-16 to 20		–	0.68	A
$I_{F(AV)}$	average forward current	T_{amb} = 65 °C; PCB mounting (see Fig.20); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD43U and V		–	0.65	A
	BYD43-16 to 20		–	0.30	A
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Figs 6 and 7			
	BYD43U and V		–	11	A
	BYD43-16 to 20		–	6	A
I_{FRM}	repetitive peak forward current	T_{amb} = 65 °C; see Figs 8 and 9			
	BYD43U and V		–	6.0	A
	BYD43-16 to 20		–	3.2	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$			
	BYD43U and V		–	6	A
	BYD43-16 to 20		–	6	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Figs 12 and 13	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Figs 14 and 15				
	BYD43U and V		–	–	1.20	V
	BYD43-16 to 20		–	–	2.05	V
V_F	forward voltage	I_F = 1 A; see Figs 14 and 15				
	BYD43U and V		–	–	1.5	V
	BYD43-16 to 20		–	–	2.4	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Figs 16 and 17				
	BYD43U and V		–	–	1	μA
	BYD43-16 to 20		–	–	5	μA
I_R	reverse current	$V_R = V_{RRMmax}$				
	BYD43U and V	T_j = 165 °C; see Fig 16	–	–	100	μA
	BYD43-16 to 20	T_j = 125 °C; see Fig 17	–	–	50	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig 22				
	BYD43U and V		–	–	250	ns
	BYD43-16 to 20		–	–	300	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Figs 18 and 19				
	BYD43U and V		–	20	–	pF
	BYD43-16 to 20		–	15	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and dI_F/dt = –1 A/μs; see Fig.21				
	BYD43U and V		–	–	5	A/μs
	BYD43-16 to 20		–	–	5	A/μs

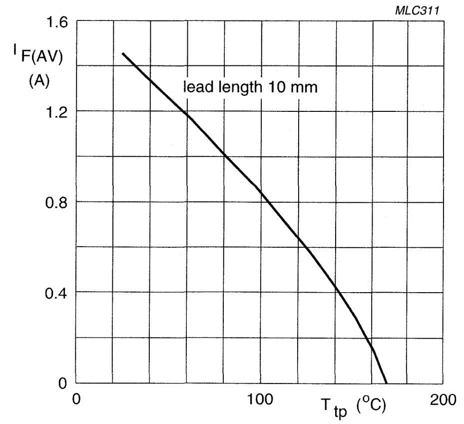
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	120	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.20. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

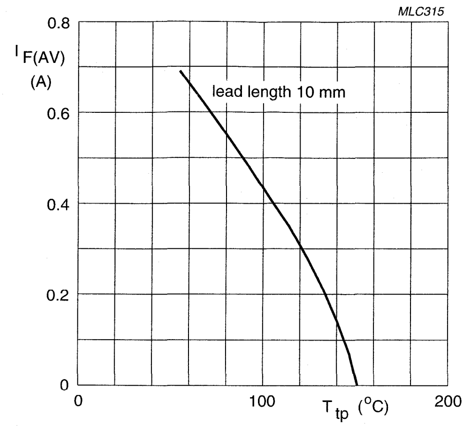


BYD43U and V

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).

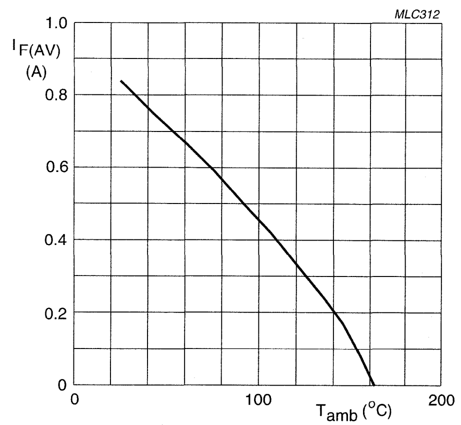


BYD43-16 to 20

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.3 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



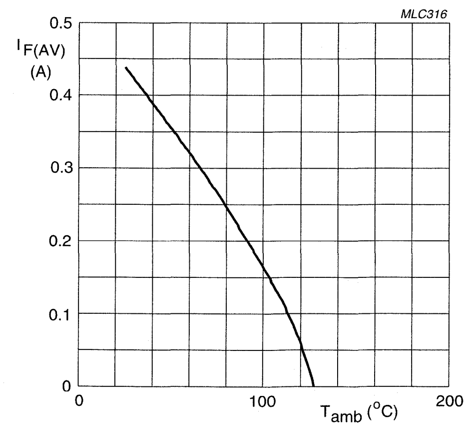
BYD43U and V

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Device mounted as shown in Fig.20.

Switched mode application.

Fig.4 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



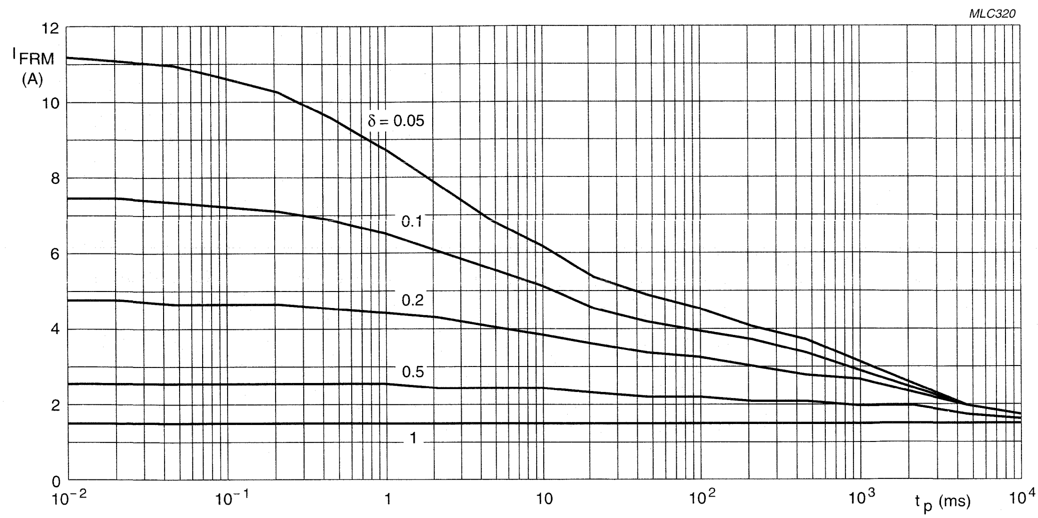
BYD43-16 to 20

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Device mounted as shown in Fig.20.

Switched mode application.

Fig.5 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

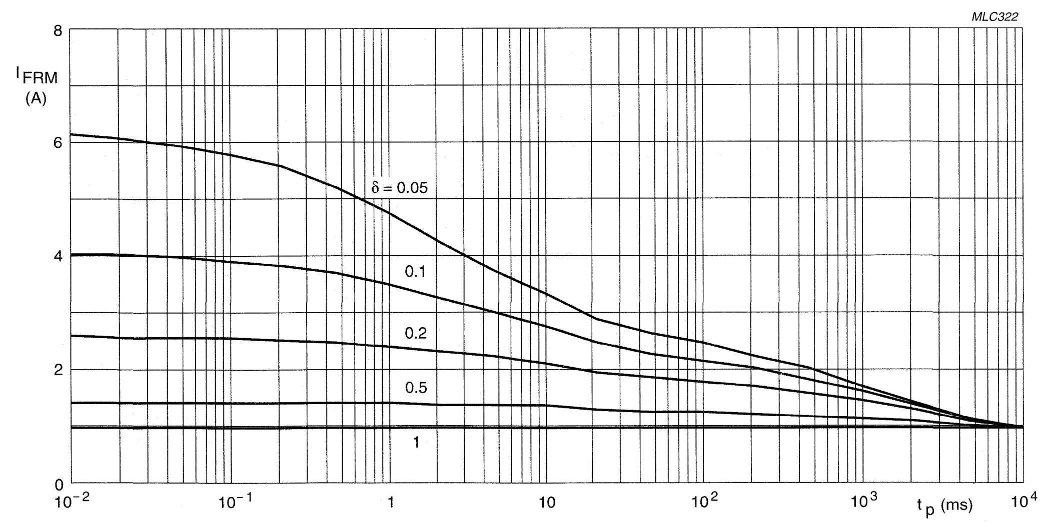


BYD43U and V

T_{tp} = 55 °C; $R_{th\ j\text{-}tp}$ = 60 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1 400 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

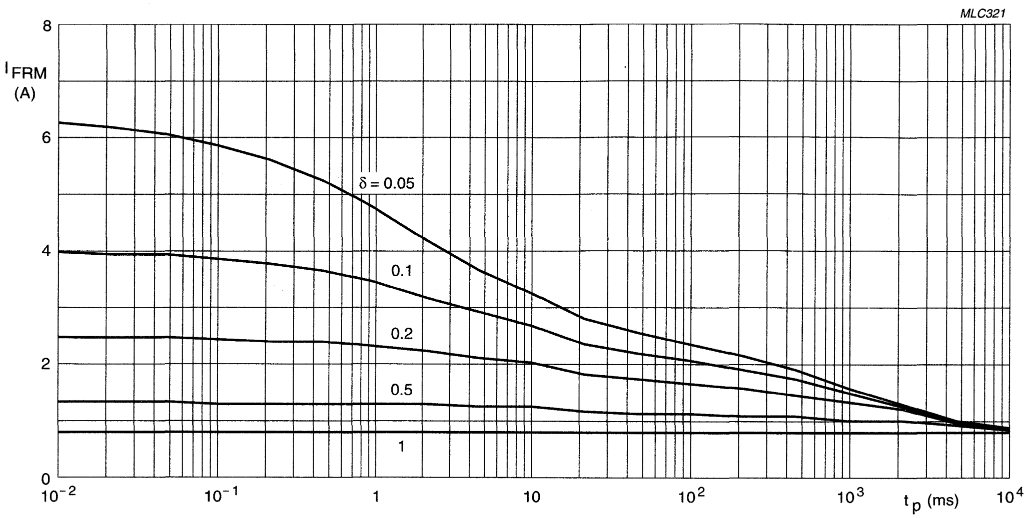


BYD43-16 to 20

T_{tp} = 55 °C; $R_{th\ j\text{-}tp}$ = 60 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 2000 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

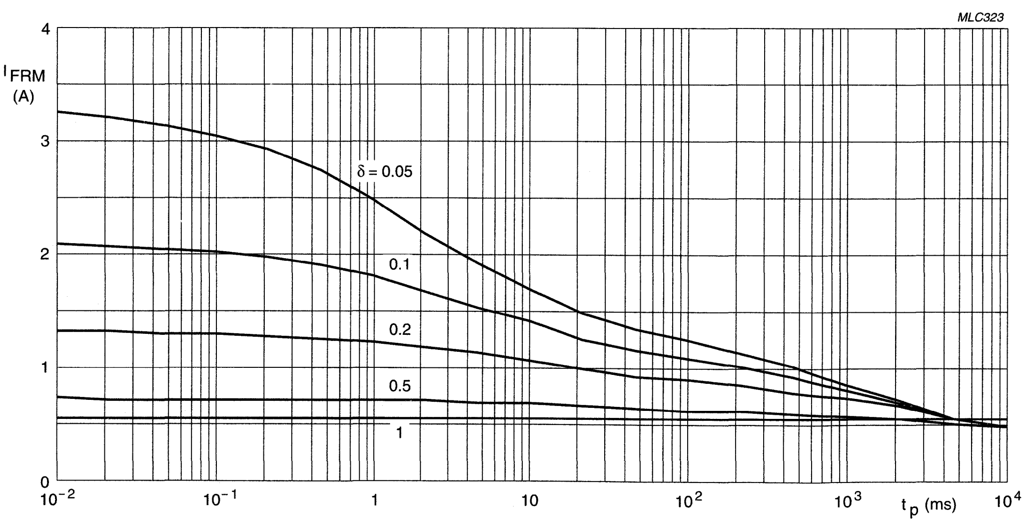


BYD43U and V

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 120 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

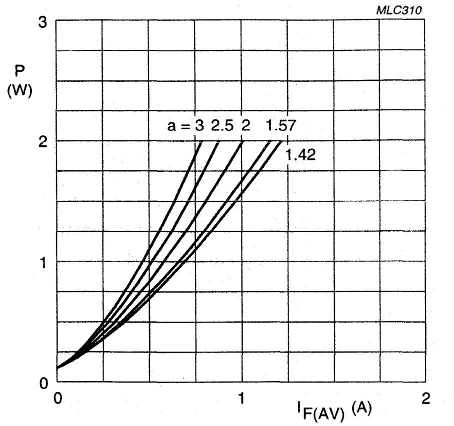


BYD43-16 to 20

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 120 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 2000 V.

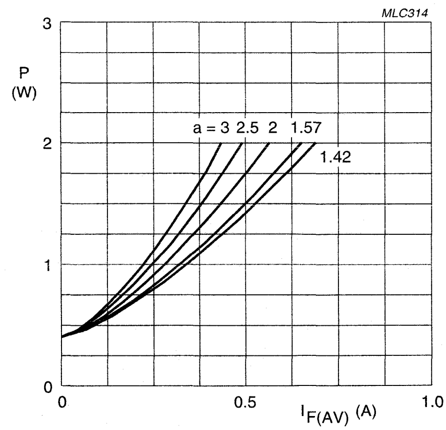
Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYD43U and V

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

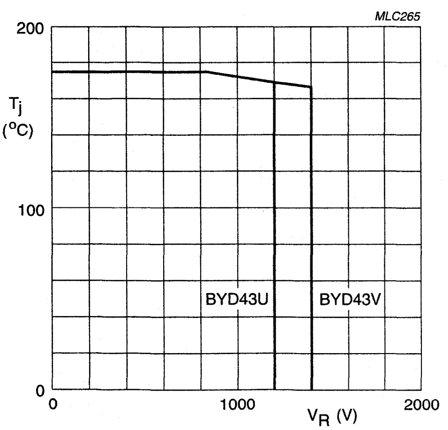
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYD43-16 to 20

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

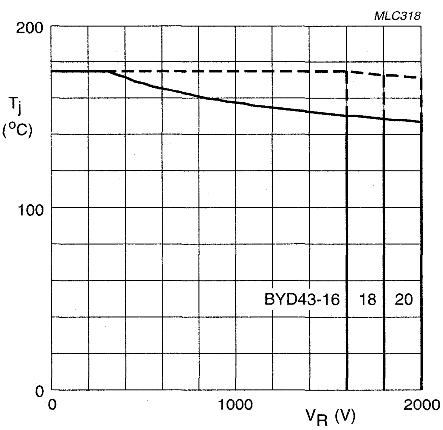
Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYD43U and V

V_{RRM}; $\delta = 0.5$.

Fig.12 Maximum permissible junction temperature as a function of reverse voltage.

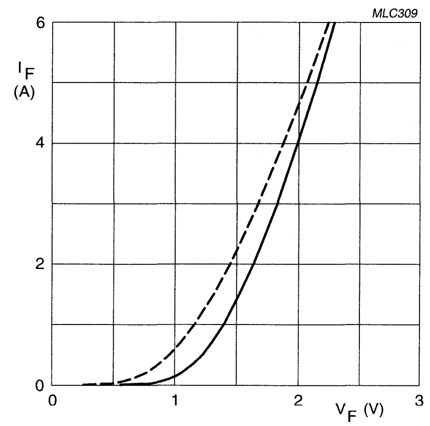


BYD43-16 to 20

Dotted line = V_{RRM}; $\delta = 0.1$.

Solid line = V_{RRM}; $\delta = 0.5$.

Fig.13 Maximum permissible junction temperature as a function of reverse voltage.

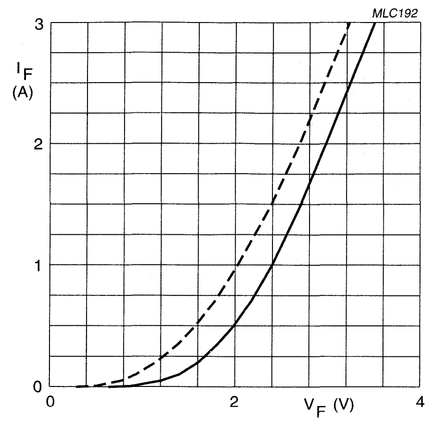


BYD43U and V

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.14 Forward current as a function of forward voltage; maximum values.

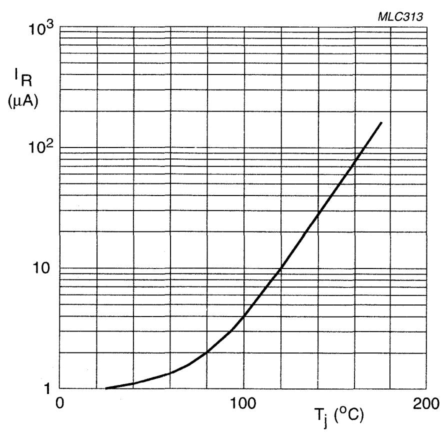


BYD43-16 to 20

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

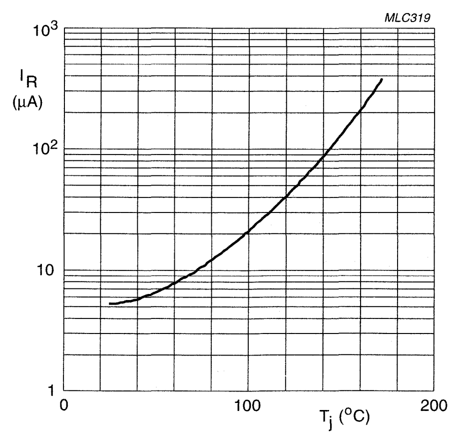
Fig.15 Forward current as a function of forward voltage; maximum values.



BYD43U and V

$V_R = V_{RRMmax}$.

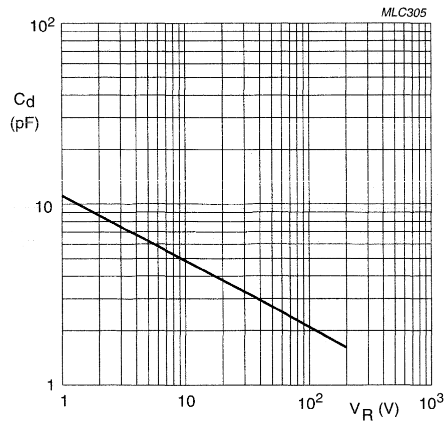
Fig.16 Reverse current as a function of junction temperature; maximum values.



BYD43-16 to 20

$V_R = V_{RRMmax}$.

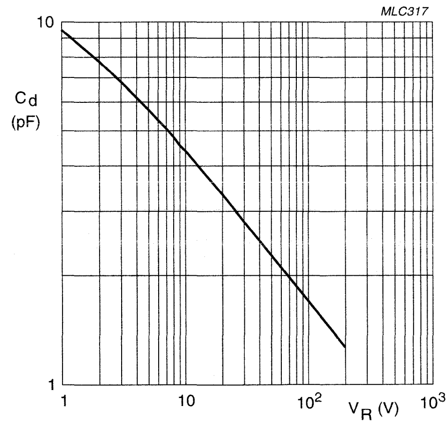
Fig.17 Reverse current as a function of junction temperature; maximum values.



BYD43U and V

f = 1 MHz; T_j = 25 °C.

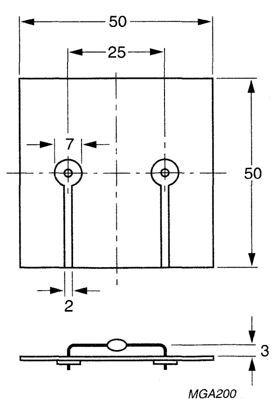
Fig.18 Diode capacitance as a function of reverse voltage; typical values.



BYD43-16 to 20

f = 1 MHz; T_j = 25 °C.

Fig.19 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.20 Device mounted on a printed-circuit board.

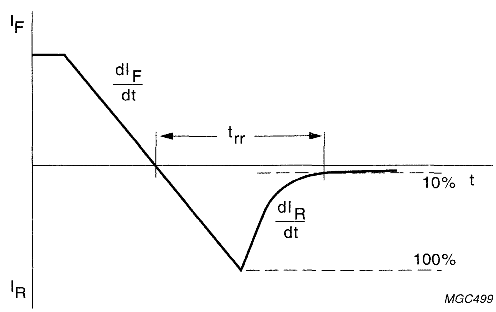
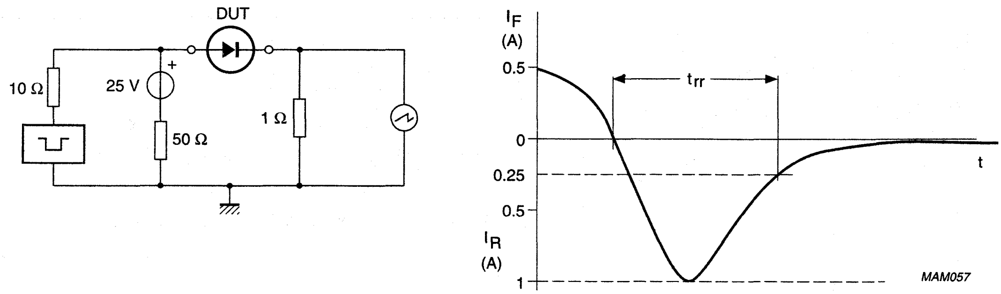


Fig.21 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.22 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery rectifiers BYD47 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier outline.

DESCRIPTION

Cavity free cylindrical glass SOD87 package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

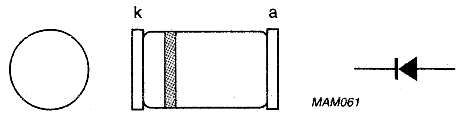


Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage				
	BYD47-16		–	1700	V
	BYD47-18		–	1900	V
	BYD47-20		–	2100	V
V_{RRM}	repetitive peak reverse voltage				
	BYD47-16		–	1600	V
	BYD47-18		–	1800	V
	BYD47-20		–	2000	V
$I_{F(AV)}$	average forward current	T_{tp} = 105 °C; see Fig. 2; averaged over any 20 ms period; see also Fig. 6	–	0.80	A
$I_{F(AV)}$	average forward current	T_{amb} = 25 °C; PCB mounting (see Fig.11); see Fig. 3; averaged over any 20 ms period; see also Fig. 6	–	0.34	A
I_{FRM}	repetitive peak forward current	T_{tp} = 85 °C; see Fig. 4	–	8.0	A
		T_{amb} = 65 °C; see Fig. 5	–	2.8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	10	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig. 7	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig. 8	–	2.05	V
		I_F = 1 A; see Fig. 8	–	2.40	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig. 9	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 125 °C; see Fig. 9	–	50	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig. 12	–	300	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig. 10	15	–	pF
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/μs; see Fig.13	–	5	A/μs

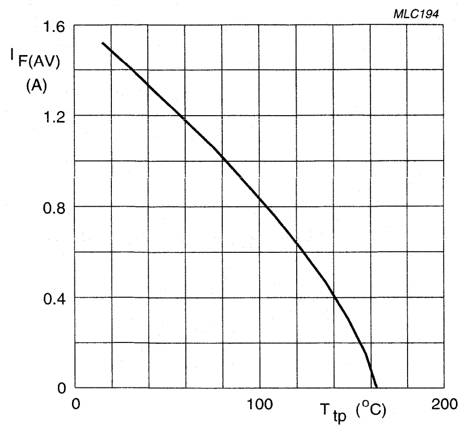
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

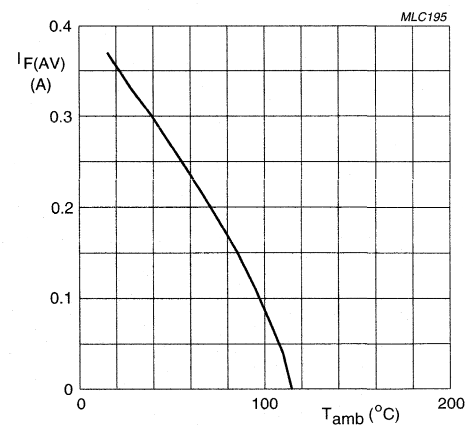
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01.'*

GRAPHICAL DATA



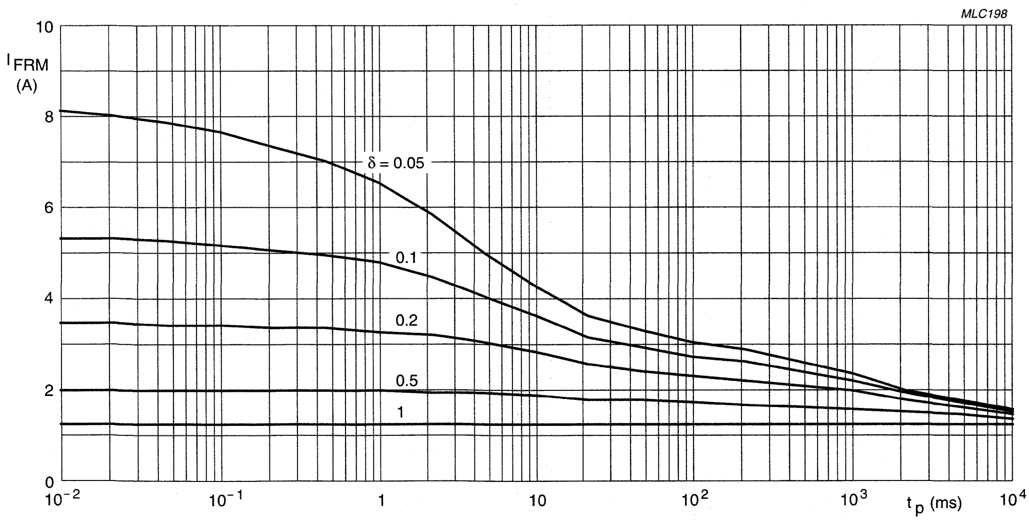
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



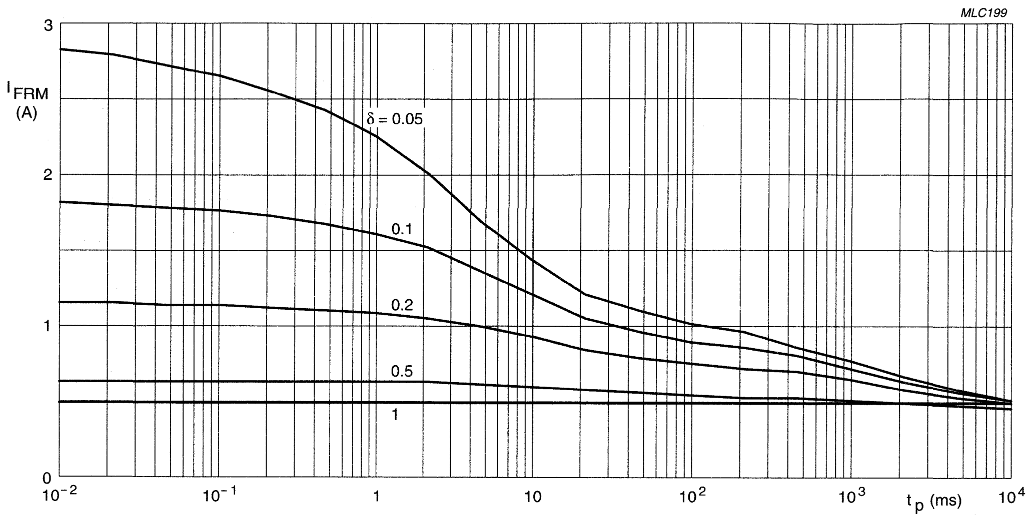
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



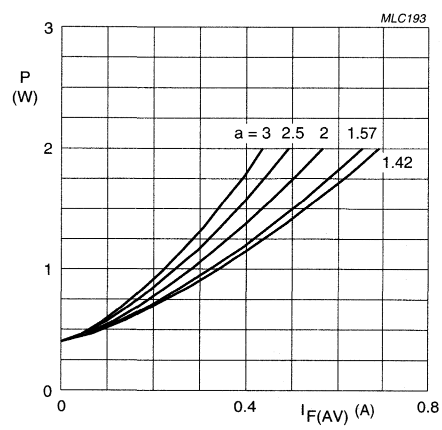
T_{tp} = 85 °C; $R_{th\ j\text{-}tp}$ = 30 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 2000 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



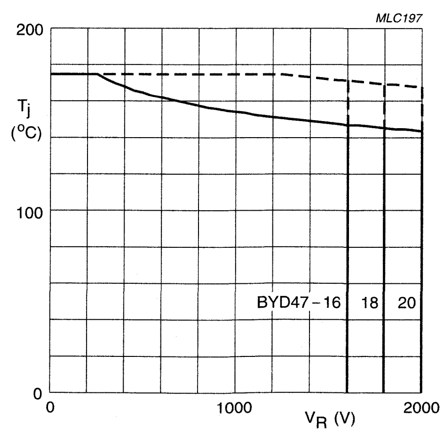
T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 150 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 2000 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



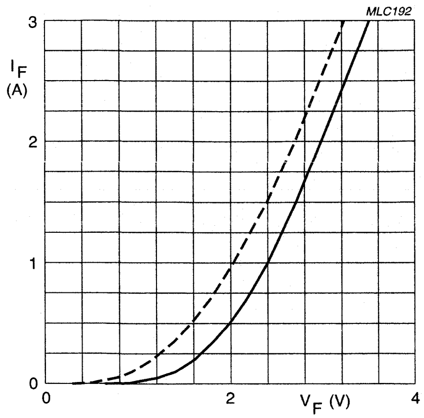
a = $I_{F(RMS)}/I_{F(AV)}$; V_R = V_{RRMmax}; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



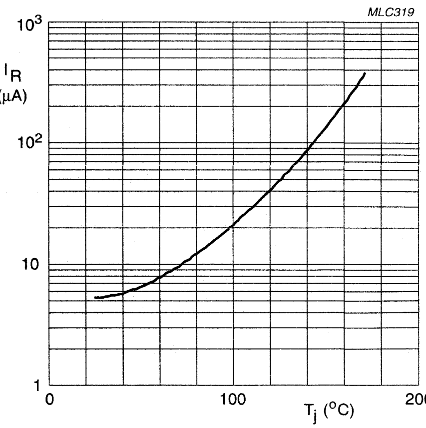
Solid line = V_{RRM}; δ = 0.5.
Dotted line = V_{RRM}; δ = 0.1.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



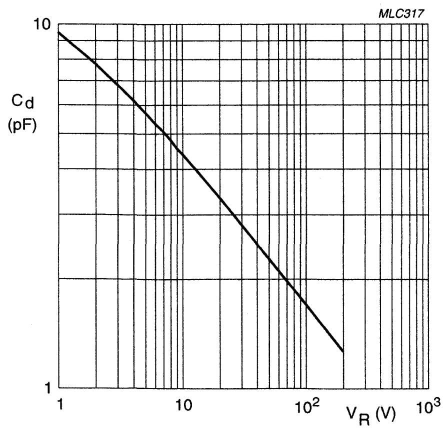
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



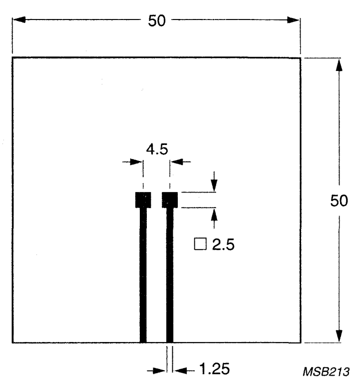
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



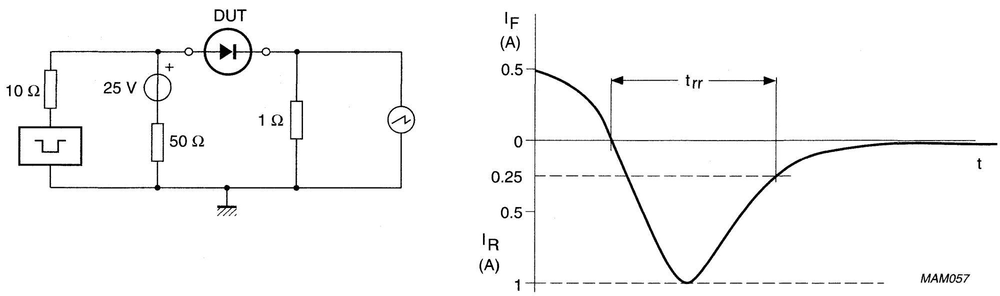
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Printed-circuit board for surface mounting.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

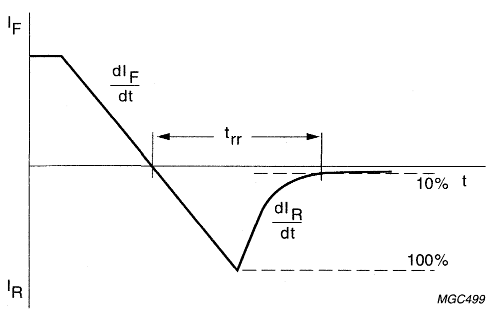


Fig.13 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYD53 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass SOD81 package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

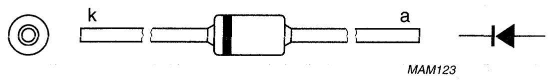


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD53U		–	1200	V
	BYD53V		–	1400	V
V_R	continuous reverse voltage				
	BYD53U		–	1200	V
	BYD53V		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm see Fig.2; averaged over any 20 ms period; see also Fig.6	–	0.85	A
		T_{amb} = 65 °C; PCB mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	0.45	A
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Fig.4	–	8.25	A
		T_{amb} = 65 °C; see Fig.5	–	4.45	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	5	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.7	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.8	–	–	1.7	V
		I_F = 1 A; see Fig.8	–	–	2.3	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD53U		1300	–	–	V
	BYD53V		1500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	100	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.12	–	–	150	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.10	–	20	–	pF
$\left\lvert \frac{dI_R}{dt} \right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and dI_F/dt = −1 A/μs; see Fig.13	–	–	5	A/μs

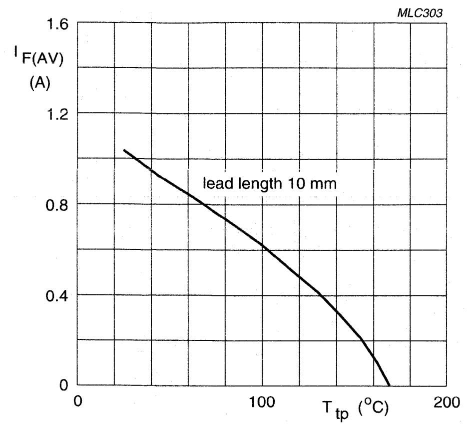
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	120	K/W

Note

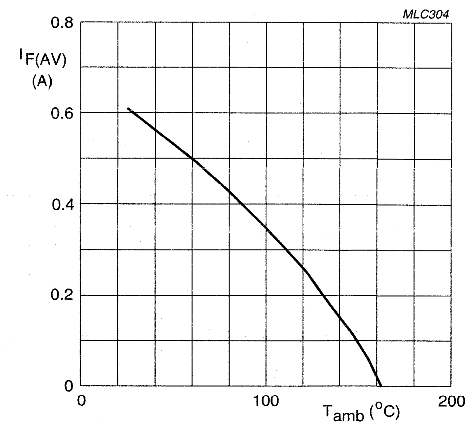
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



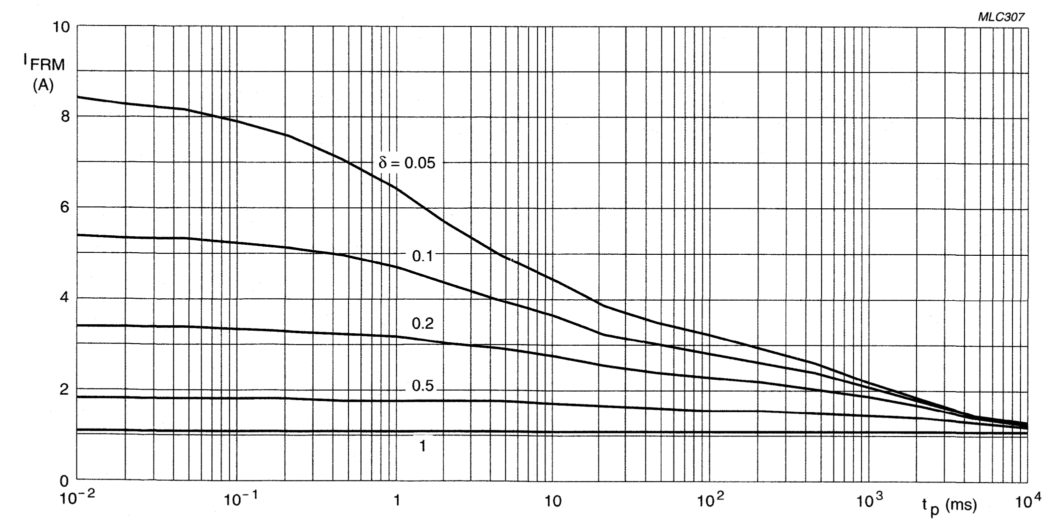
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



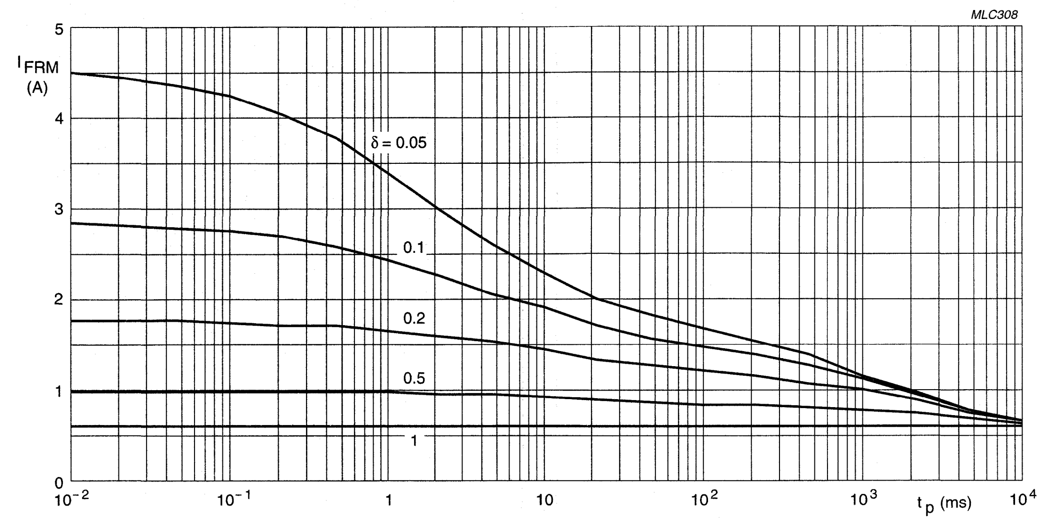
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



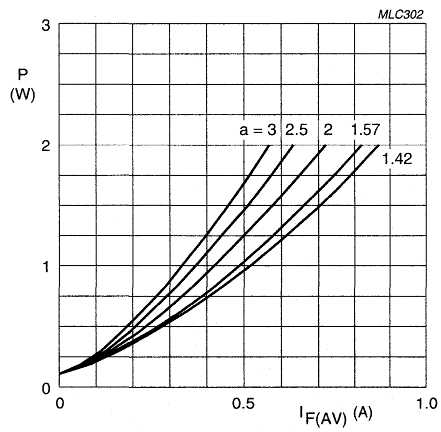
T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 60 K/W.
V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



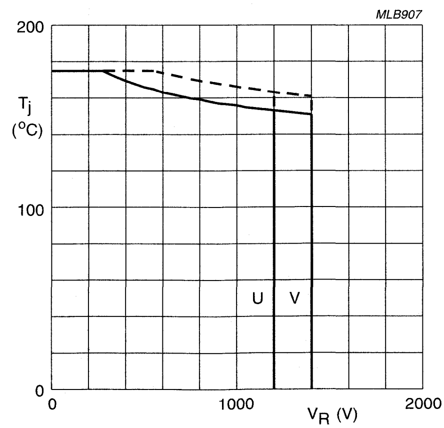
T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 120 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



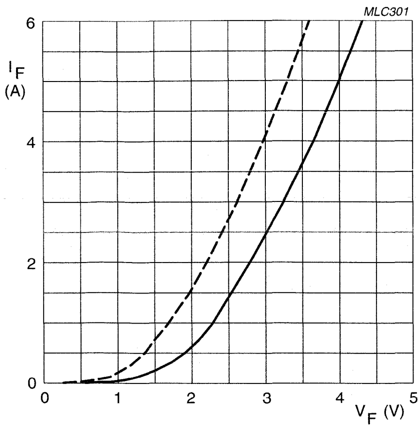
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



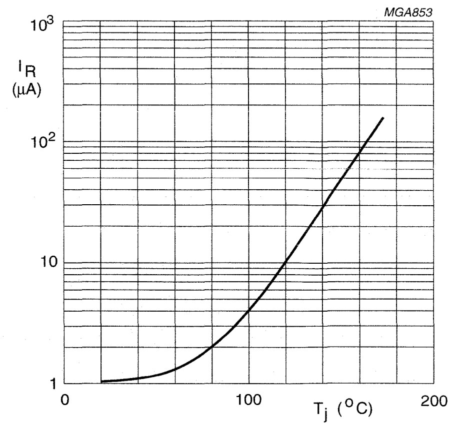
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



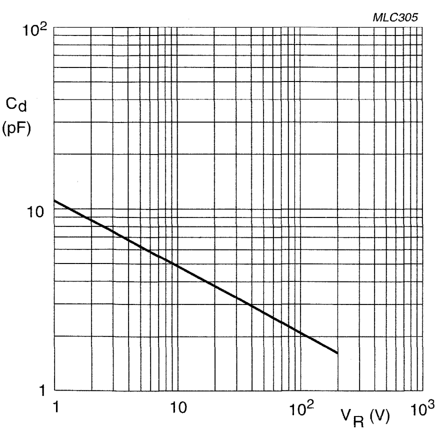
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



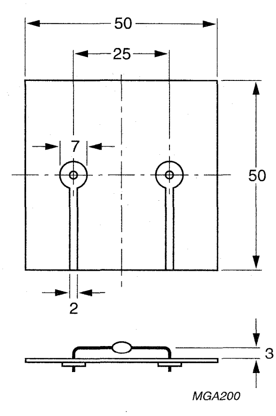
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



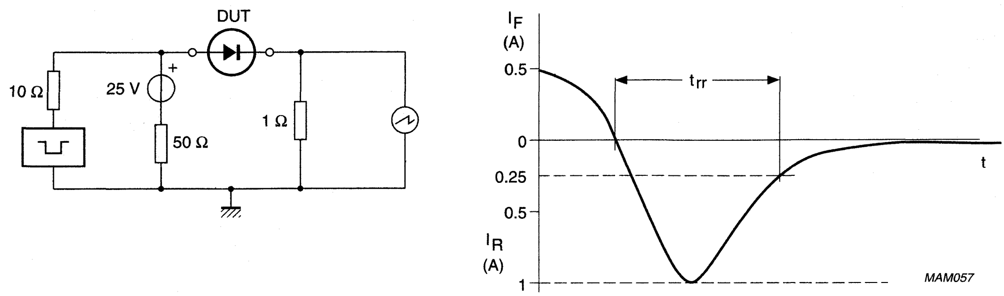
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

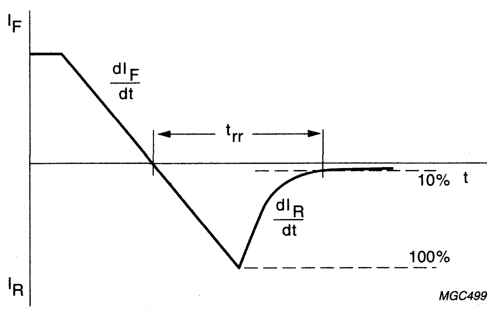


Fig.13 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYD57 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier outline.

DESCRIPTION

Cavity free cylindrical glass SOD87 package through Implotec™[1] technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

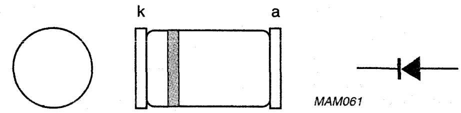


Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD57D		–	200	V
	BYD57G		–	400	V
	BYD57J		–	600	V
	BYD57K		–	800	V
	BYD57M		–	1000	V
V_R	continuous reverse voltage				
	BYD57D		–	200	V
	BYD57G		–	400	V
	BYD57J		–	600	V
	BYD57K		–	800	V
	BYD57M		–	1000	V
$I_{F(AV)}$	average forward current	T_{tp} = 85 °C; see Fig.2; averaged over any 20 ms period; see also Fig.6	–	1.0	A
		T_{amb} = 60 °C; PCB mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	0.4	A
I_{FRM}	repetitive peak forward current	T_{tp} = 85 °C; see Fig.4	–	8.5	A
		T_{amb} = 60 °C; see Fig.5	–	3.0	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; T_j = 25 °C prior to surge; $V_R = V_{RRMmax}$	–	5.0	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.7	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.8	–	–	2.1	V
		I_F = 1 A; see Fig.8	–	–	3.6	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD57D		300	–	–	V
	BYD57G		500	–	–	V
	BYD57J		700	–	–	V
	BYD57K		900	–	–	V
	BYD57M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	100	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.12				
	BYD57D to J		–	–	30	ns
	BYD57K and M		–	–	75	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.10	–	20	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/μs; see Fig.13				
	BYD57D to J		–	–	7	A/μs
	BYD57K and M		–	–	6	A/μs

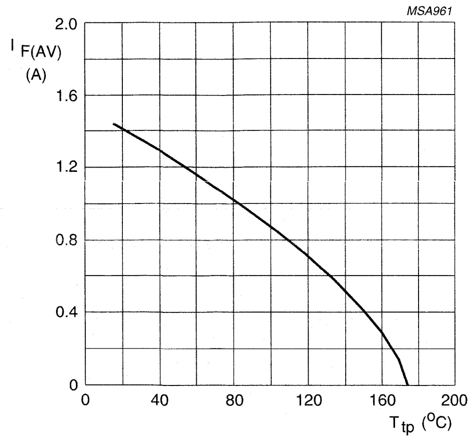
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

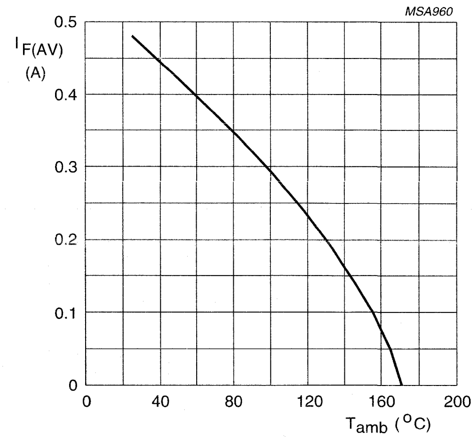
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



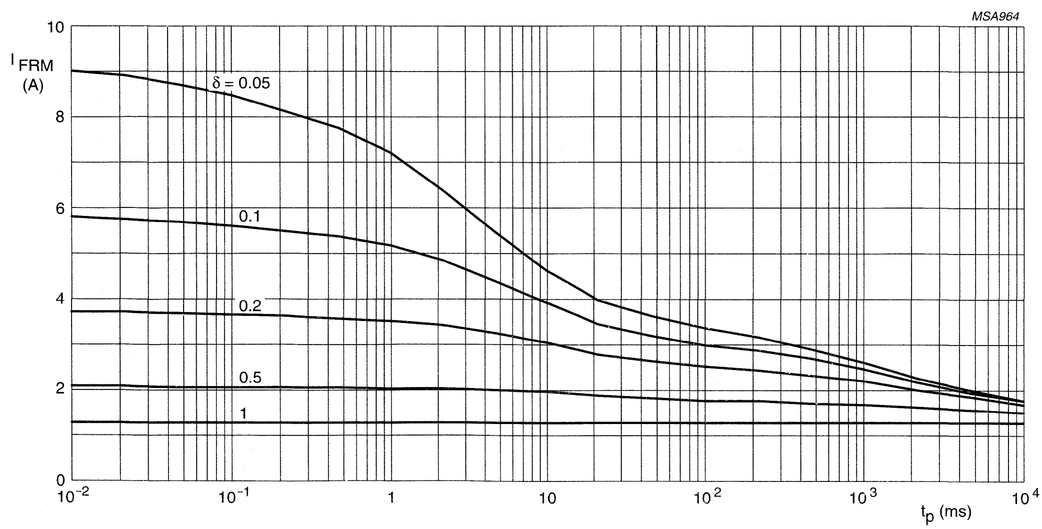
a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



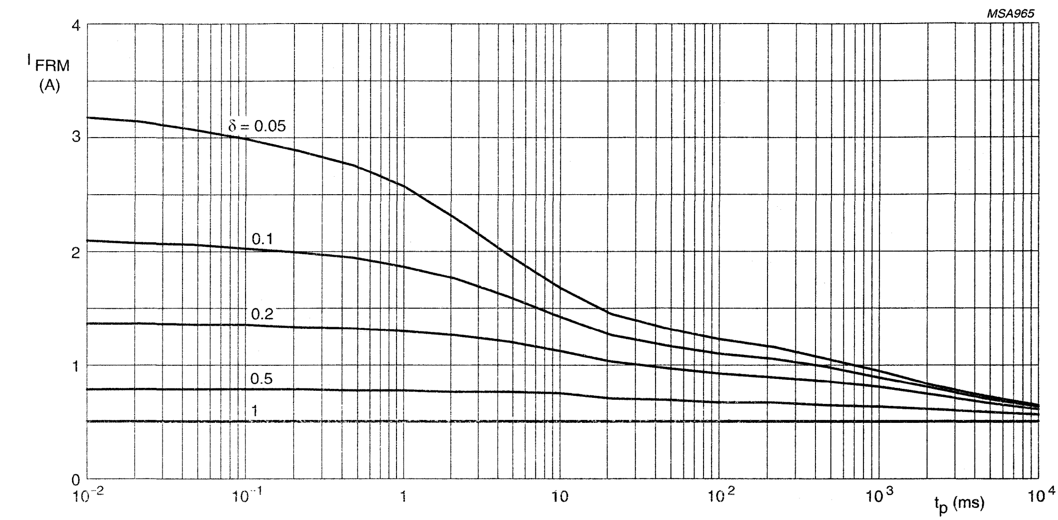
a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



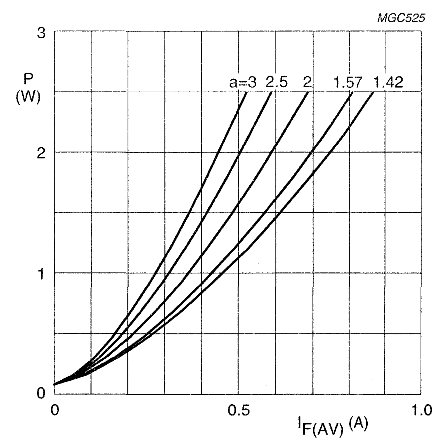
$T_{tp} = 85$ °C; $R_{th\ j\text{-}tp} = 30$ K/W.
V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1000$ V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



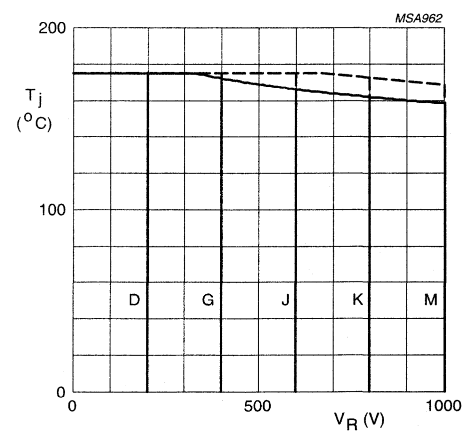
T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 150K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



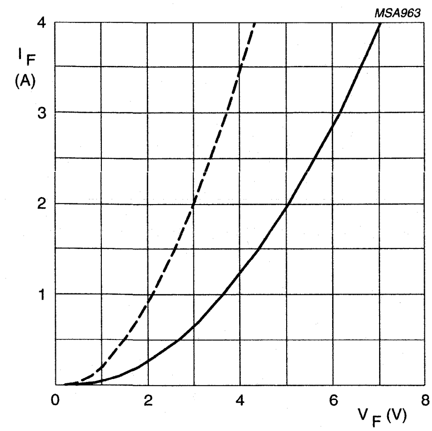
a = $I_{F(RMS)}/I_{F(AV)}$; V_R = V_{RRMmax}; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



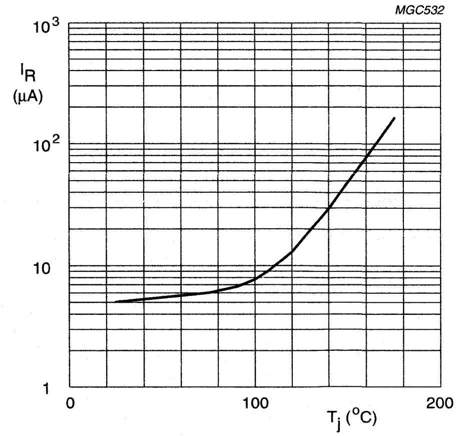
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



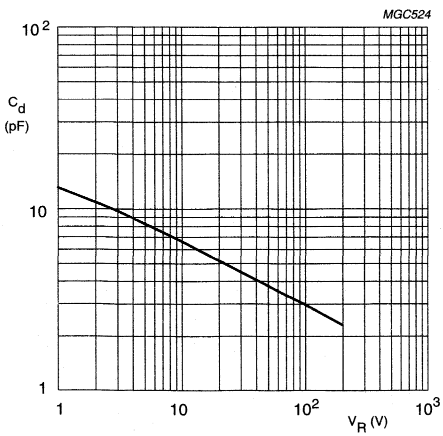
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



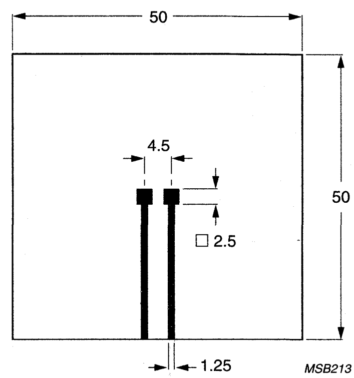
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



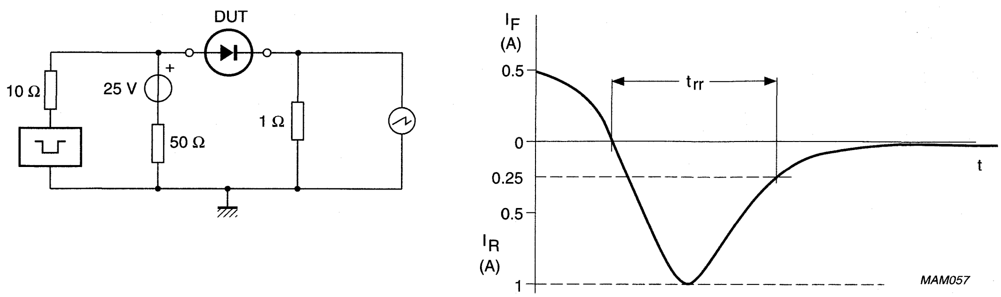
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Printed-circuit board for surface mounting.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

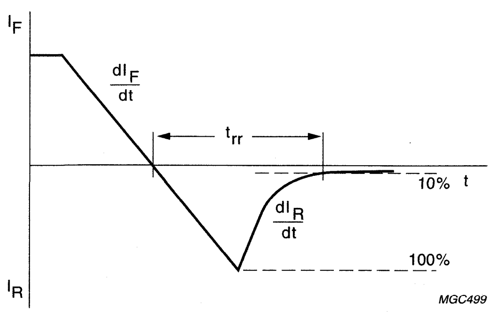


Fig.13 Reverse recovery definitions.

Ultra fast low-loss controlled avalanche rectifiers

BYD71 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical SOD91 glass package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

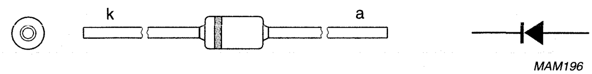


Fig.1 Simplified outline (SOD91) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD71A		–	50	V
	BYD71B		–	100	V
	BYD71C		–	150	V
	BYD71D		–	200	V
	BYD71E		–	250	V
	BYD71F		–	300	V
	BYD71G		–	400	V
V_R	continuous reverse voltage				
	BYD71A		–	50	V
	BYD71B		–	100	V
	BYD71C		–	150	V
	BYD71D		–	200	V
	BYD71E		–	250	V
	BYD71F		–	300	V
	BYD71G		–	400	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD71A to D		–	0.56	A
	BYD71E to G		–	0.54	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.16); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD71A to D		–	0.43	A
	BYD71E to G		–	0.41	A

FOR REPLACEMENT TYPE SEE INDEX SECTION OF HANDBOOK SC01

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Figs 6 and 7			
	BYD71A to D		–	4.7	A
	BYD71E to G		–	5.0	A
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Figs 8 and 9			
	BYD71A to D		–	3.7	A
	BYD71E to G		–	3.9	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	7	A
P_{RSM}	non-repetitive peak reverse power dissipation	t = 20 µs half sine wave; $T_j = T_{j\,max}$ prior to surge			
	BYD71A to D		–	250	W
	BYD71E to G		–	150	W
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 0.5 A; $T_j = T_{j\,max}$; see Figs 12 and 13				
	BYD71A to D		–	–	0.84	V
	BYD71E to G		–	–	0.90	V
V_F	forward voltage	I_F = 0.5 A; see Figs 12 and 13				
	BYD71A to D		–	–	1.05	V
	BYD71E to G		–	–	1.11	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD71A		55	–	–	V
	BYD71B		110	–	–	V
	BYD71C		165	–	–	V
	BYD71D		220	–	–	V
	BYD71E		275	–	–	V
	BYD71F		330	–	–	V
	BYD71G		440	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig 14	–	–	1	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig 14	–	–	75	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A see Fig 18				
	BYD71A to D		–	–	25	ns
	BYD71E to G		–	–	50	ns

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.15				
	BYD71A to D		–	25	–	pF
	BYD71E to G		–	20	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/μs; see Fig.17				
	BYD71A to D		–	–	4	A/μs
	BYD71E to G		–	–	5	A/μs

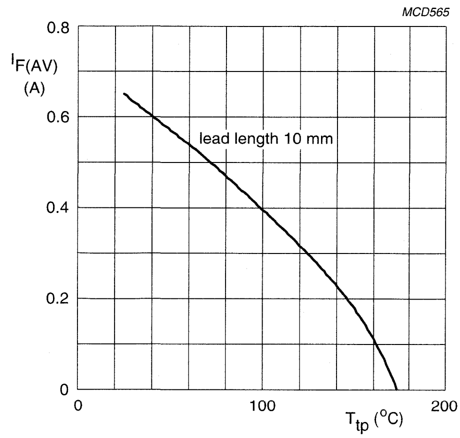
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	180	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	250	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.16. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

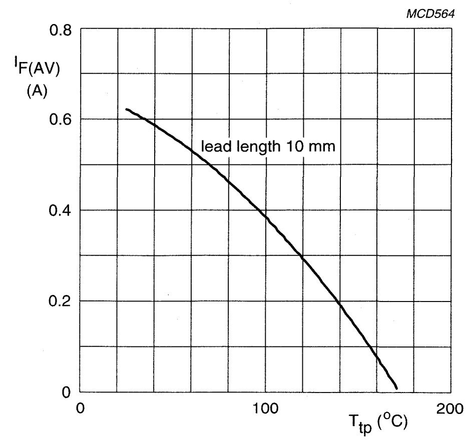


BYD71A to D

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).

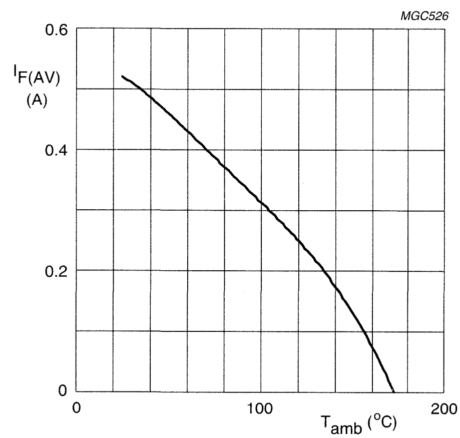


BYD71E to G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.3 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



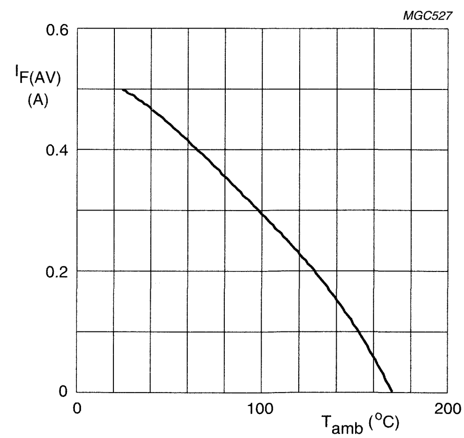
BYD71A to D

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.16.

Switched mode application.

Fig.4 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



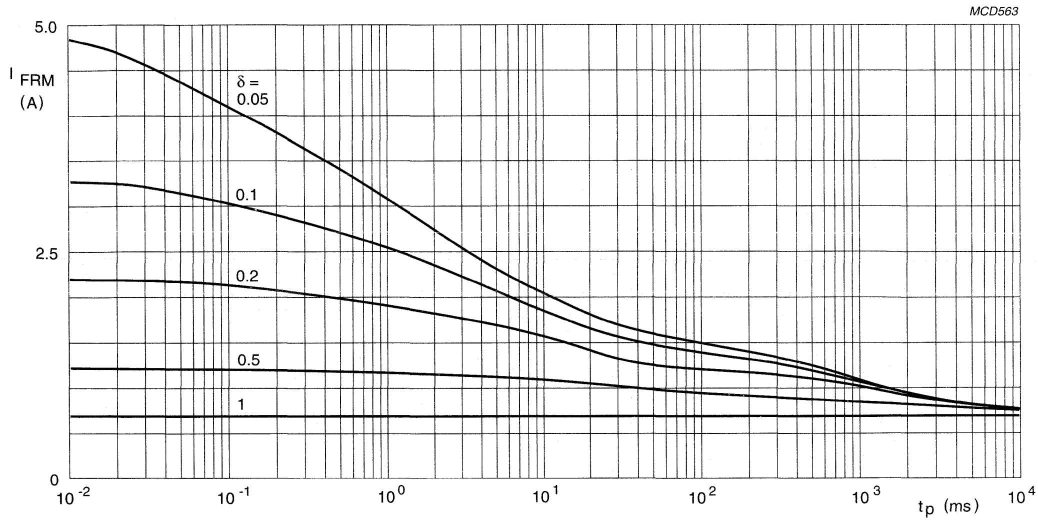
BYD71E to G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.16.

Switched mode application.

Fig.5 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

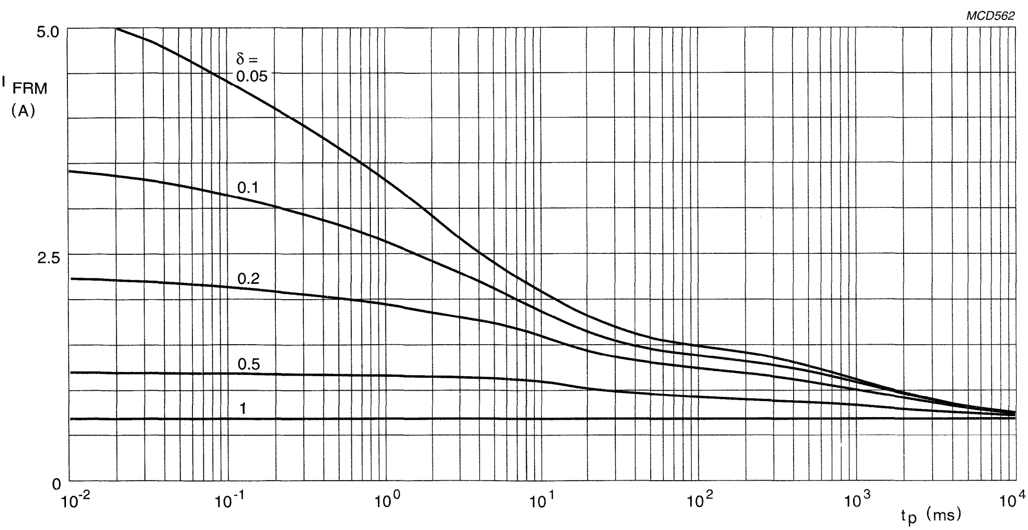


BYD71A to D

T_{tp} = 55 °C; $R_{th\ j\text{-}tp}$ = 180 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

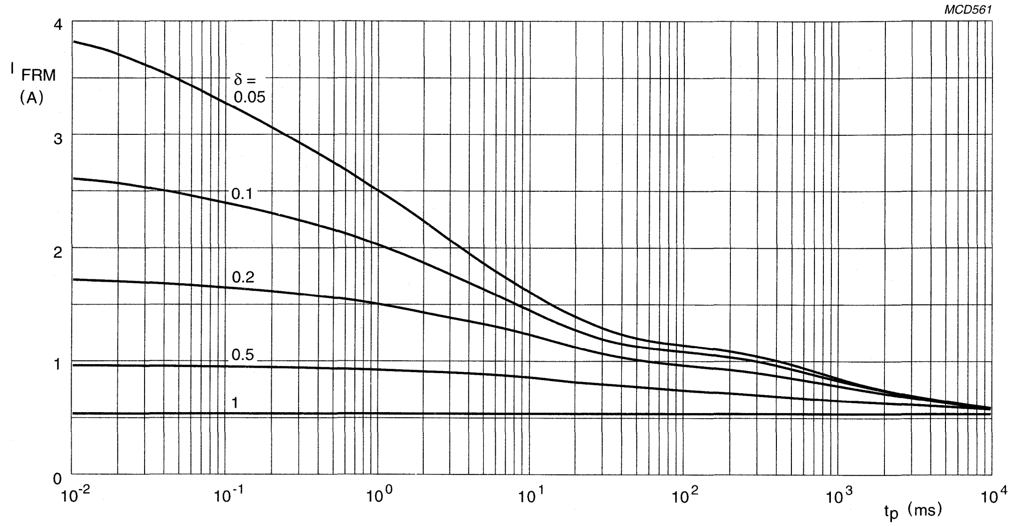


BYD71E to G

T_{tp} = 55 °C; $R_{th\ j\text{-}tp}$ = 180 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 400 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

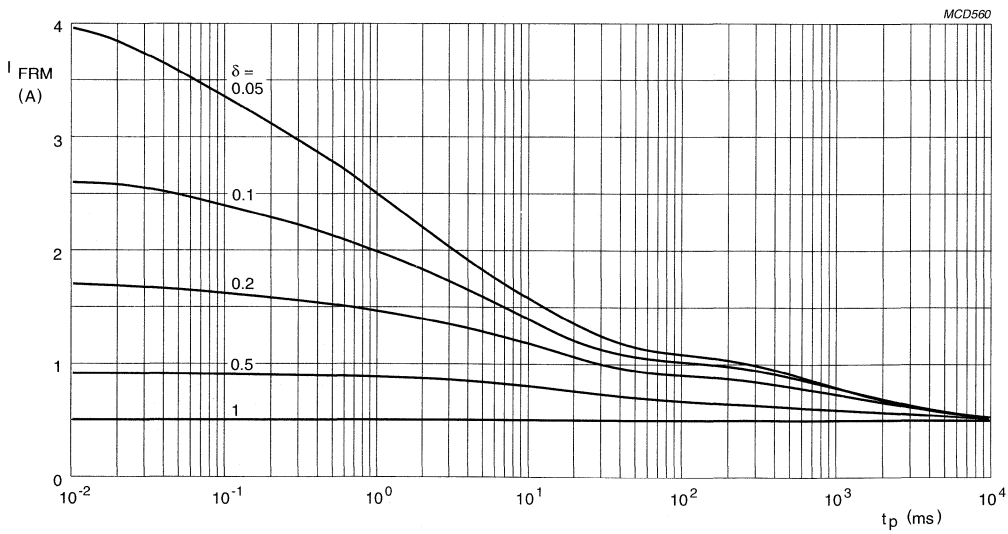


BYD71A to D

T_{amb} = 60 °C; $R_{th\,j\text{-}a}$ = 250 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\,max}$ at V_{RRM} = 200 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

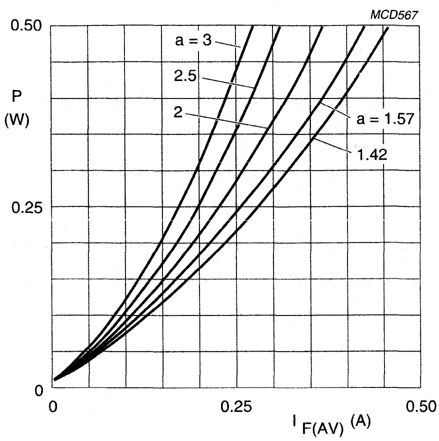


BYD71E to G

T_{amb} = 60 °C; $R_{th\,j\text{-}a}$ = 250 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\,max}$ at V_{RRM} = 400 V.

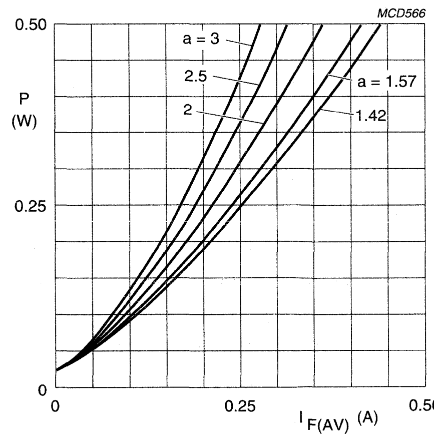
Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYD71A to D

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

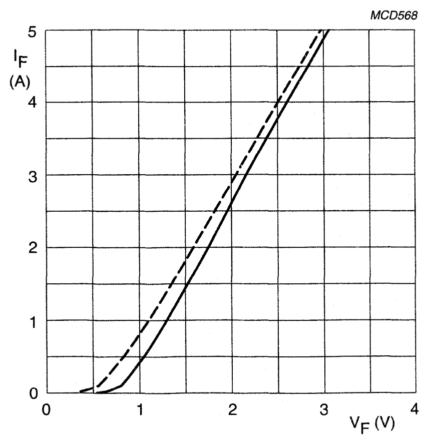
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYD71E to G

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

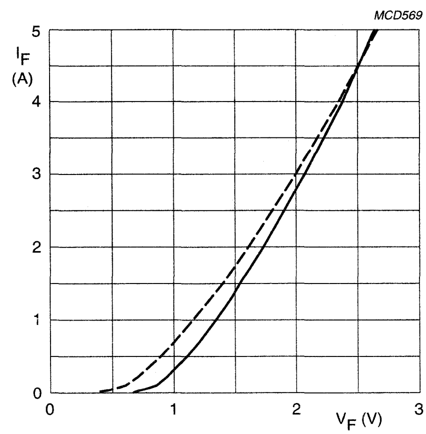


BYD71A to D

Dotted line: $T_j = 175$ °C.

Solid line: $T_j = 25$ °C.

Fig.12 Forward current as a function of forward voltage; maximum values.

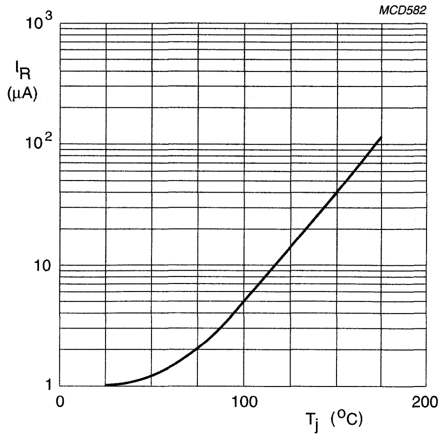


BYD71E to G

Dotted line: $T_j = 175$ °C.

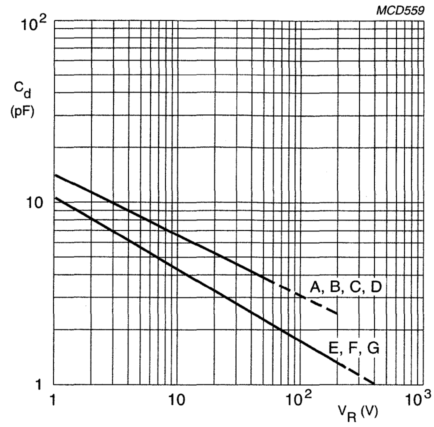
Solid line: $T_j = 25$ °C.

Fig.13 Forward current as a function of forward voltage; maximum values.



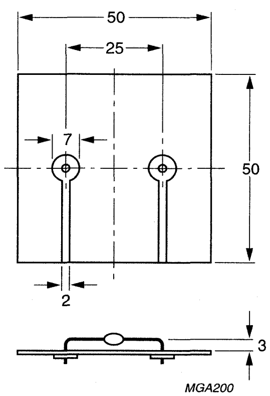
$V_R = V_{RRMmax}$.

Fig.14 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.15 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.16 Device mounted on a printed-circuit board.

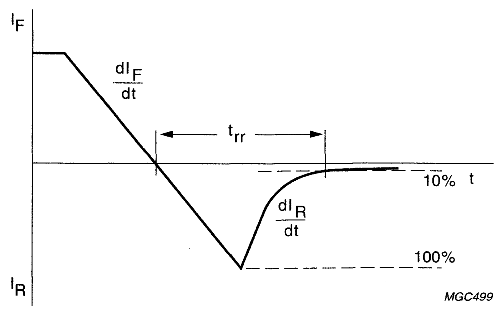
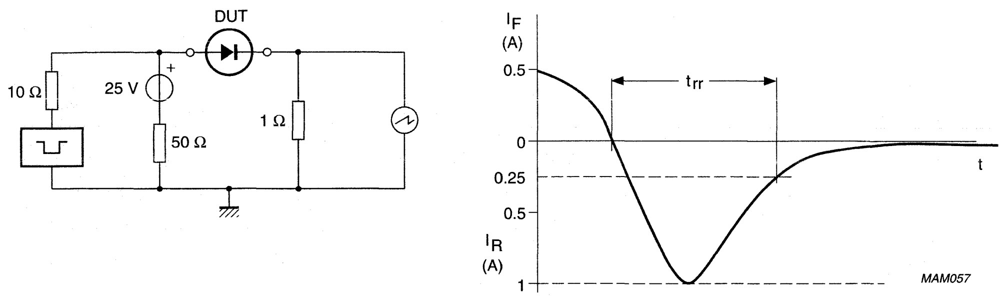


Fig.17 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.18 Test circuit and reverse recovery time waveform and definition.

Ultra fast low-loss controlled avalanche rectifiers

BYD73 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass SOD81 package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

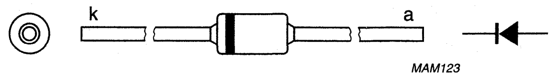


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD73A		–	50	V
	BYD73B		–	100	V
	BYD73C		–	150	V
	BYD73D		–	200	V
	BYD73E		–	250	V
	BYD73F		–	300	V
	BYD73G		–	400	V
V_R	continuous reverse voltage				
	BYD73A		–	50	V
	BYD73B		–	100	V
	BYD73C		–	150	V
	BYD73D		–	200	V
	BYD73E		–	250	V
	BYD73F		–	300	V
	BYD73G		–	400	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD73A to D		–	1.75	A
	BYD73E to G		–	1.70	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.16); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD73A to D		–	1.00	A
	BYD73E to G		–	0.95	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Figs 6 and 7			
	BYD73A to D		–	14	A
	BYD73E to G		–	15	A
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Figs 8 and 9			
	BYD73A to D		–	8.5	A
	BYD73E to G		–	9.5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	25	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Figs 12 and 13				
	BYD73A to D		–	–	0.75	V
	BYD73E to G		–	–	0.83	V
V_F	forward voltage	I_F = 1 A; see Figs 12 and 13				
	BYD73A to D		–	–	0.98	V
	BYD73E to G		–	–	1.05	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD73A		55	–	–	V
	BYD73B		110	–	–	V
	BYD73C		165	–	–	V
	BYD73D		220	–	–	V
	BYD73E		275	–	–	V
	BYD73F		330	–	–	V
	BYD73G		440	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.14	–	–	1	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.14	–	–	100	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.18				
	BYD73A to D		–	–	25	ns
	BYD73E to G		–	–	50	ns

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
C_d	diode capacitance	$f = 1$ MHz; $V_R = 0$ V; see Fig.15				
	BYD73A to D		–	50	–	pF
	BYD73E to G		–	40	–	pF
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from $I_F = 1$ A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/µs; see Fig.17				
	BYD73A to D		–	–	4	A/µs
	BYD73E to G		–	–	5	A/µs

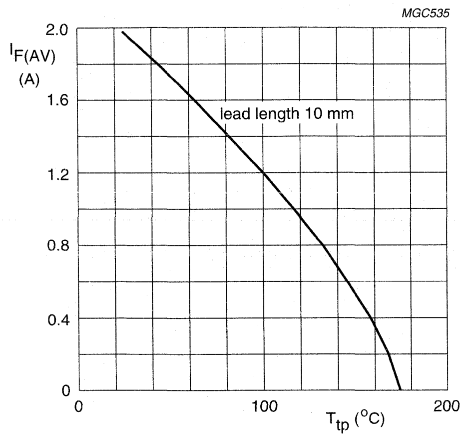
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	120	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.16. For more information please refer to the *'General Part of Handbook SC01.'*

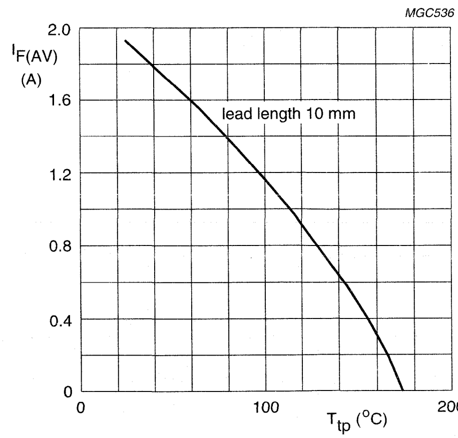
GRAPHICAL DATA



BYD73A to D

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

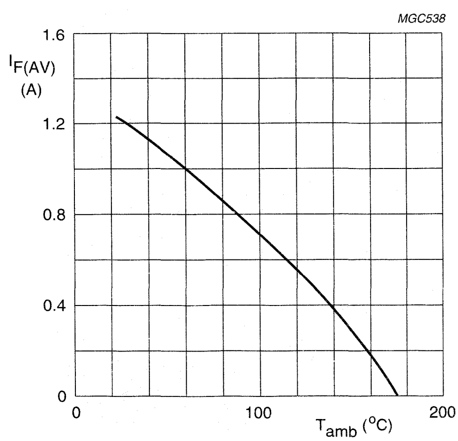
Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



BYD73E to G

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

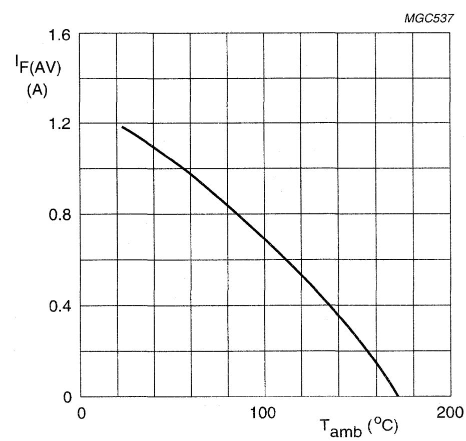
Fig.3 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



BYD73A to D

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.16.
Switched mode application.

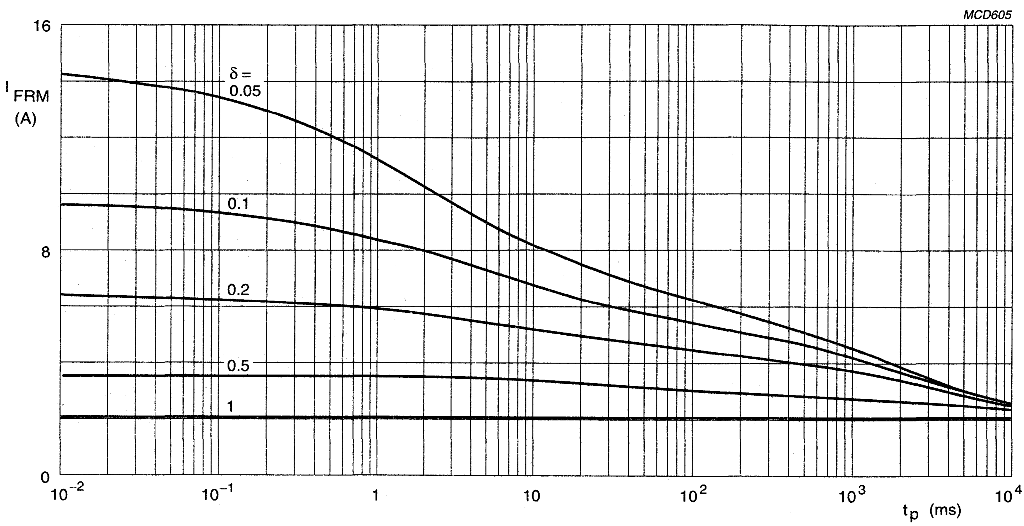
Fig.4 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYD73E to G

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.16.
Switched mode application.

Fig.5 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

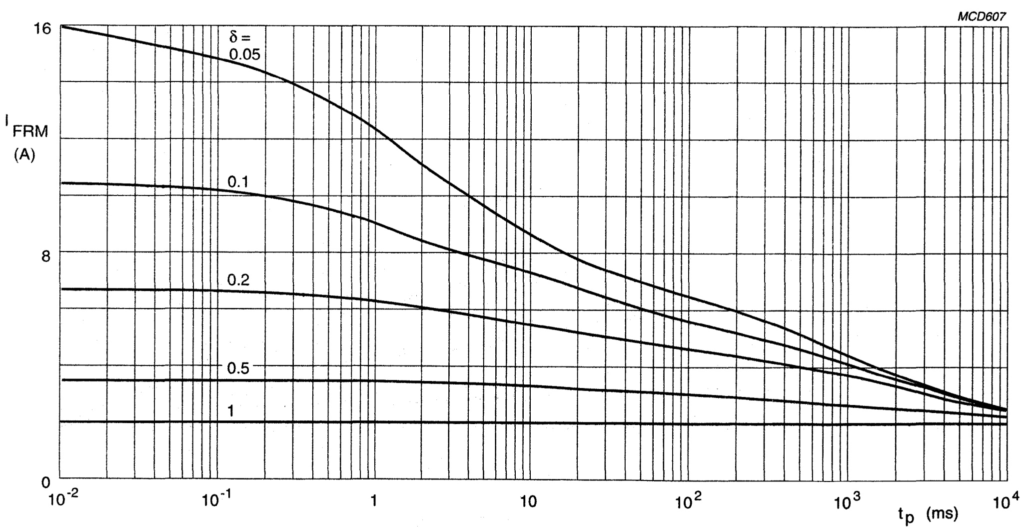


BYD73A to D

T_{tp} = 55 °C; $R_{th\ j\text{-}tp}$ = 60 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

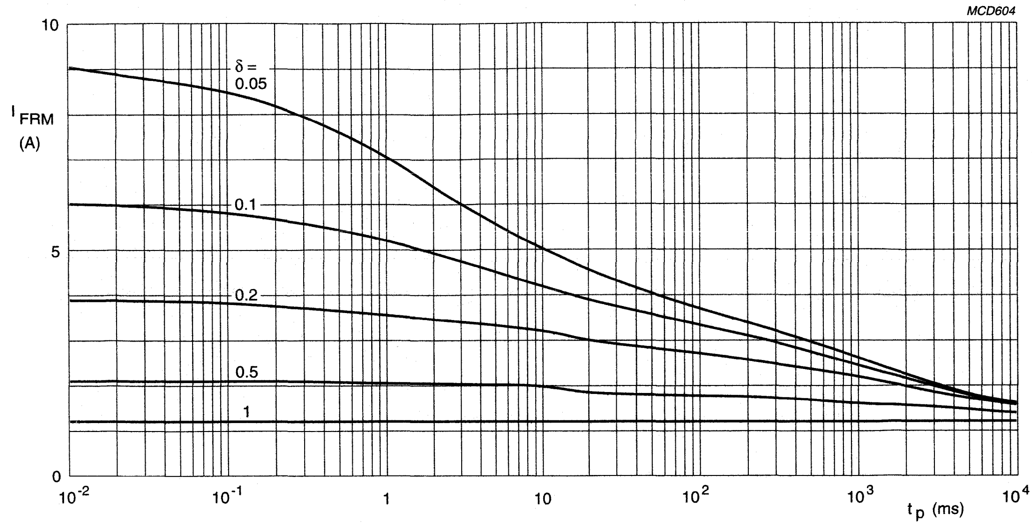


BYD73E to G

T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 60 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 400 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

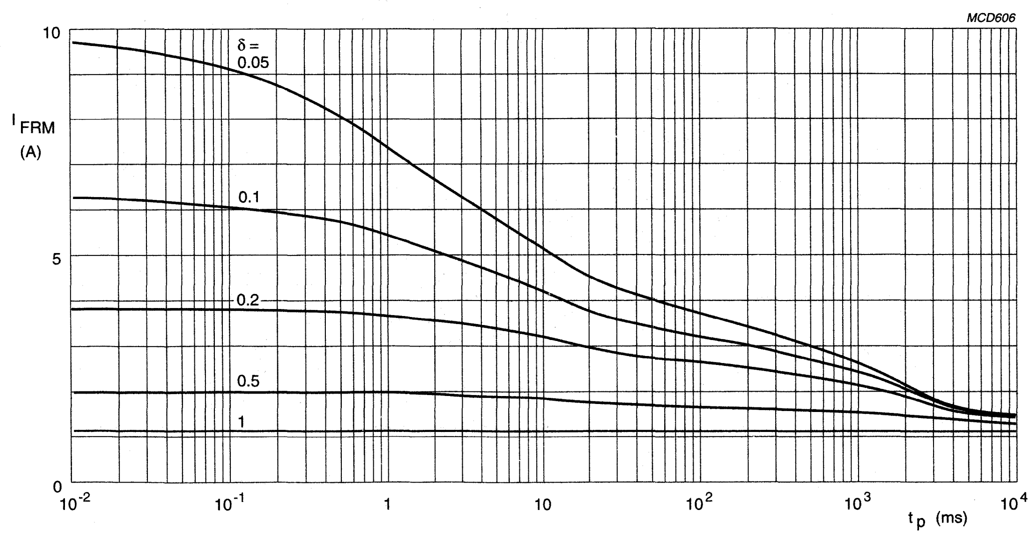


BYD73A to D

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 120 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

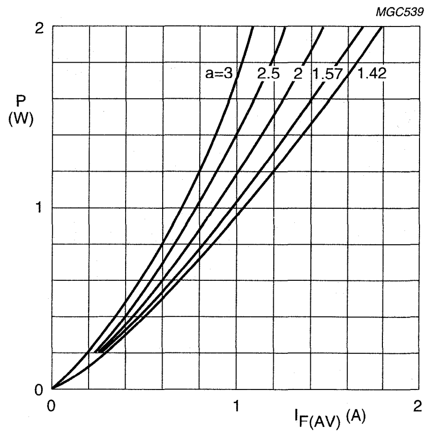


BYD73E to G

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 120 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 400 V.

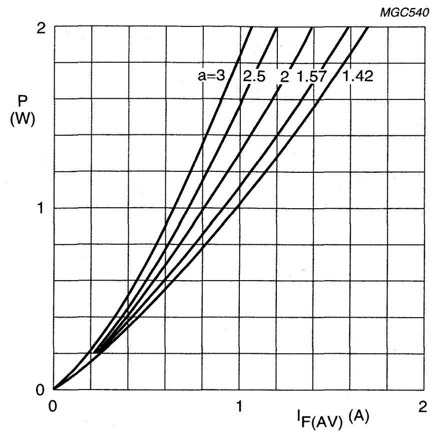
Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYD73A to D

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

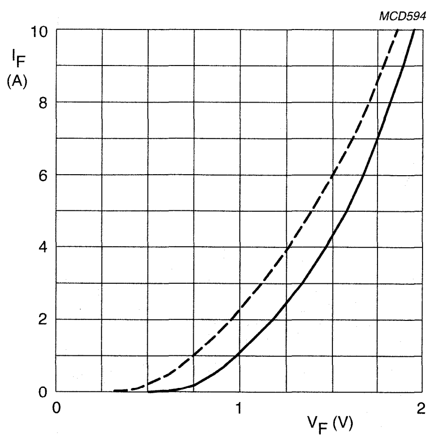
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYD73E to G

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

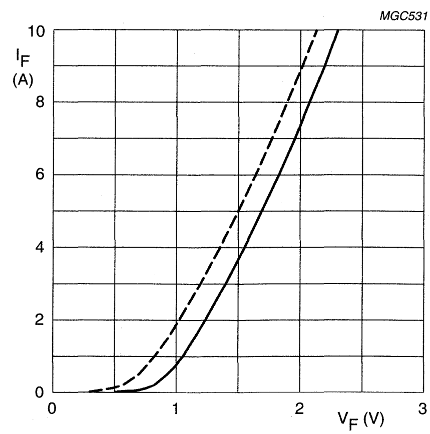


BYD73A to D

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.12 Forward current as a function of forward voltage; maximum values.



BYD73E to G

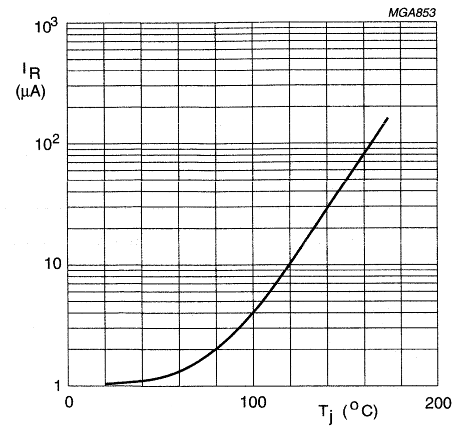
Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.13 Forward current as a function of forward voltage; maximum values.

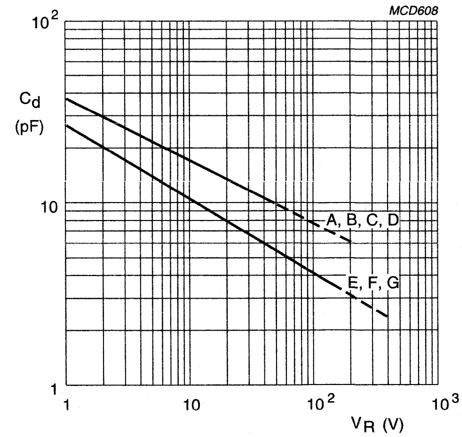
Ultra fast low-loss controlled avalanche rectifiers

BYD73 series



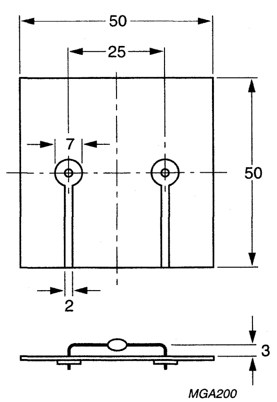
$V_R = V_{RRMmax}$.

Fig.14 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.15 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.16 Device mounted on a printed-circuit board.

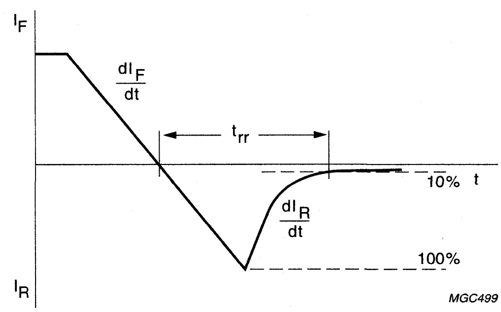
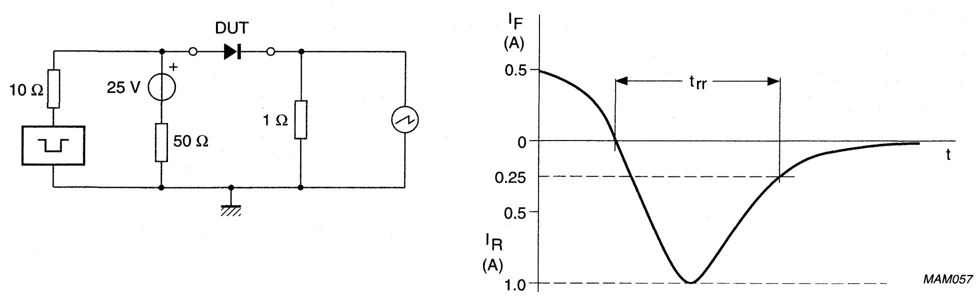


Fig.17 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.18 Test circuit and reverse recovery time waveform and definition.

Ultra fast low-loss controlled avalanche rectifiers

BYD77 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier outline.

DESCRIPTION

Cavity free cylindrical glass SOD87 package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

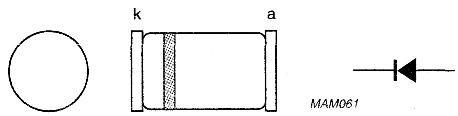


Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD77A		–	50	V
	BYD77B		–	100	V
	BYD77C		–	150	V
	BYD77D		–	200	V
	BYD77E		–	250	V
	BYD77F		–	300	V
	BYD77G		–	400	V
V_R	continuous reverse voltage				
	BYD77A		–	50	V
	BYD77B		–	100	V
	BYD77C		–	150	V
	BYD77D		–	200	V
	BYD77E		–	250	V
	BYD77F		–	300	V
	BYD77G		–	400	V
$I_{F(AV)}$	average forward current	T_{tp} = 105 °C; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD77A to D		–	2.00	A
	BYD77E to G		–	1.85	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.16); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD77A to D		–	0.85	A
	BYD77E to G		–	0.80	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{tp} = 105 °C; see Figs 6 and 7			
	BYD77A to D		–	15	A
	BYD77E to G		–	13	A
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Figs 8 and 9			
	BYD77A to D		–	8.5	A
	BYD77E to G		–	8.0	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	25	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; T_j = 25 °C prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Figs 12 and 13				
	BYD77A to D		–	–	0.75	V
	BYD77E to G		–	–	0.83	V
V_F	forward voltage	I_F = 1 A; see Figs 12 and 13				
	BYD77A to D		–	–	0.98	V
	BYD77E to G		–	–	1.05	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD77A		55	–	–	V
	BYD77B		110	–	–	V
	BYD77C		165	–	–	V
	BYD77D		220	–	–	V
	BYD77E		275	–	–	V
	BYD77F		330	–	–	V
	BYD77G		440	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.14	–	–	1	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.14	–	–	100	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.18				
	BYD77A to D		–	–	25	ns
	BYD77E to G		–	–	50	ns

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.15				
	BYD77A to D		–	50	–	pF
	BYD77E to G		–	40	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/µs; see Fig.17				
	BYD77A to D		–	–	4	A/µs
	BYD77E to G		–	–	5	A/µs

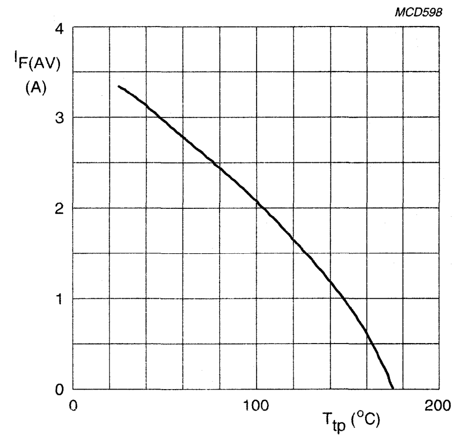
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		30	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	150	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.16. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

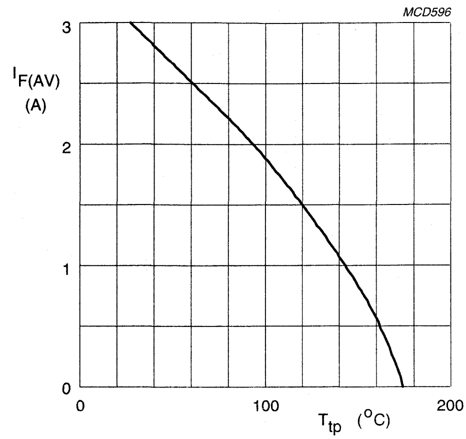


BYD77A to D

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).

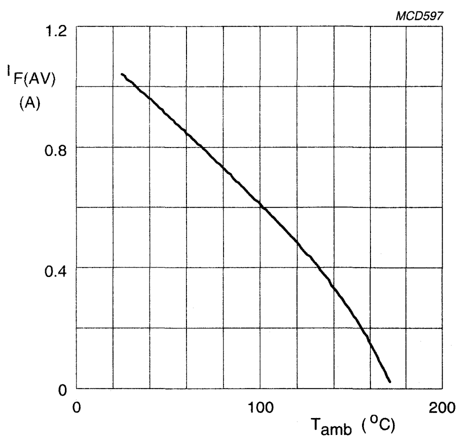


BYD77E to G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.3 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



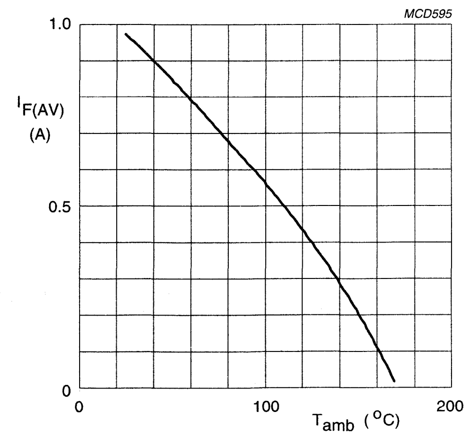
BYD77A to D

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.16.

Switched mode application.

Fig.4 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



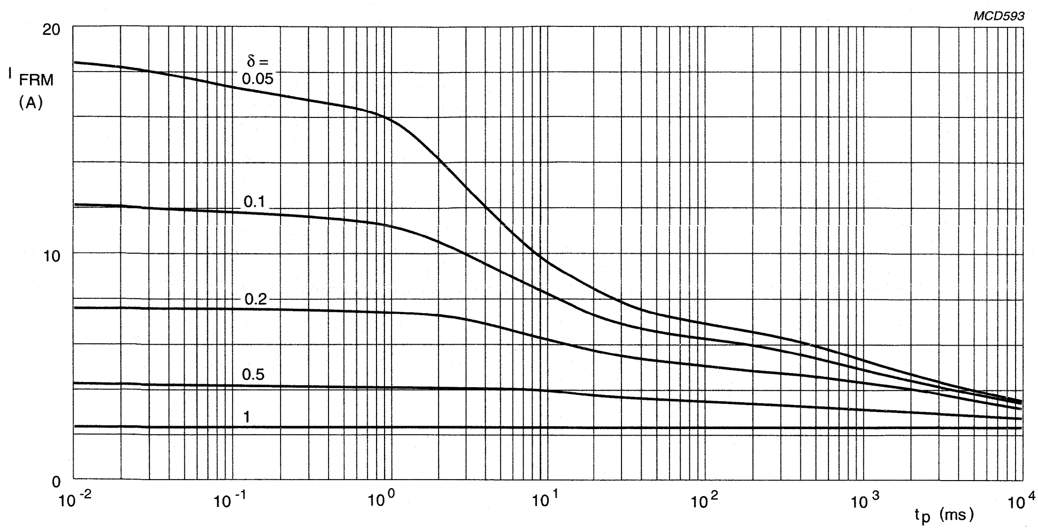
BYD77E to G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.16.

Switched mode application.

Fig.5 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

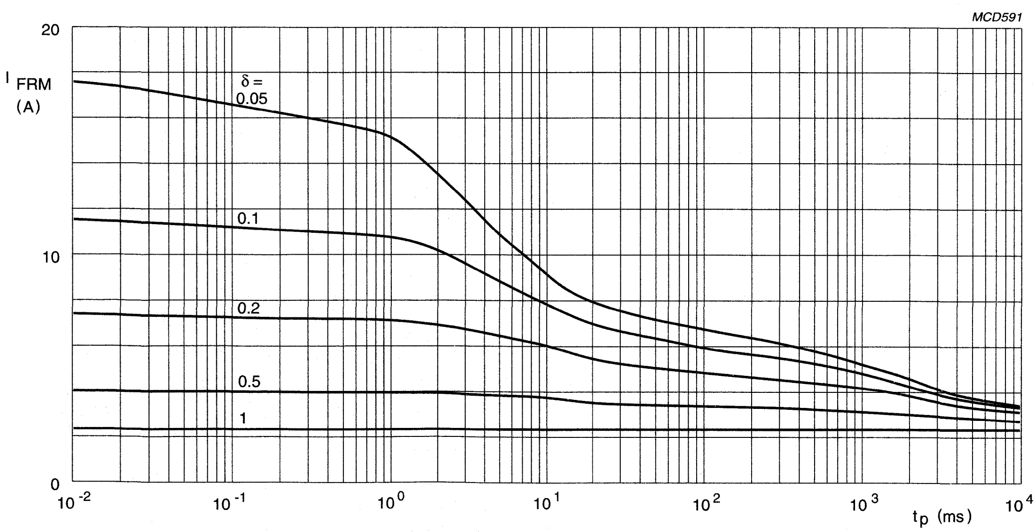


BYD77A to D

T_{tp} = 105 °C; $R_{th\ j\text{-}tp}$ = 30 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

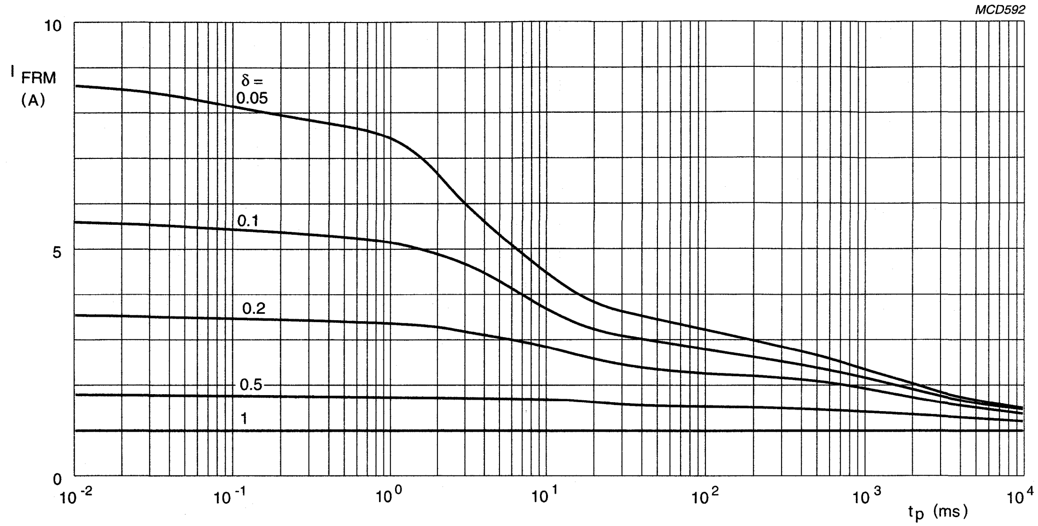


BYD77E to G

T_{tp} = 105°C; $R_{th\ j\text{-}tp}$ = 30 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 400 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

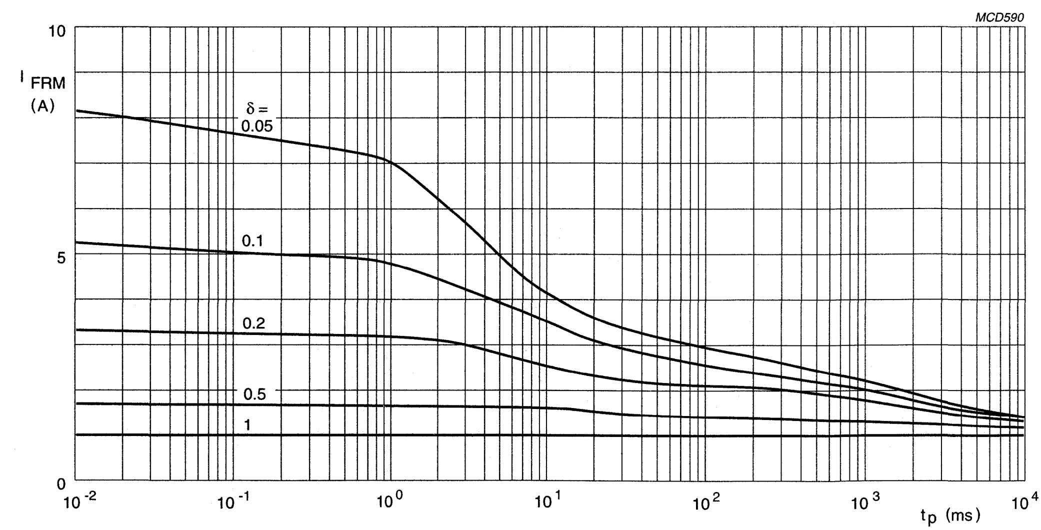


BYD77A to D

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 150 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

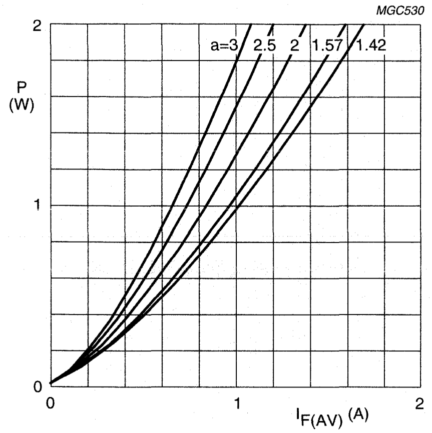


BYD77E to G

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 150 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 400 V.

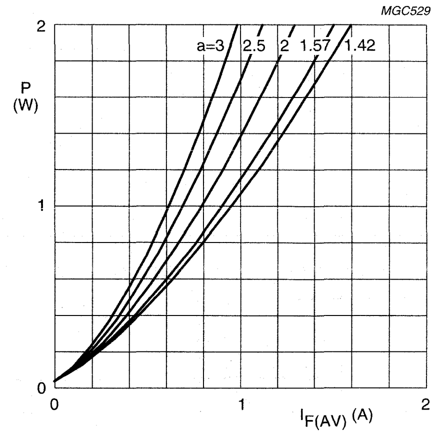
Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYD77A to D

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

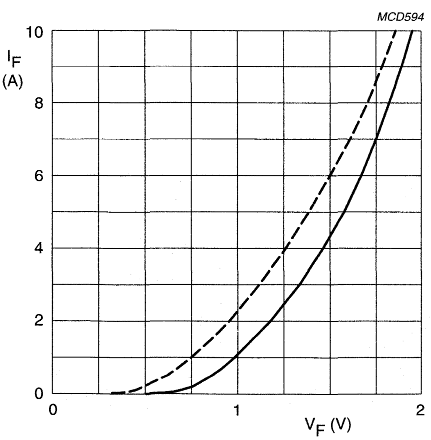
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYD77E to G

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

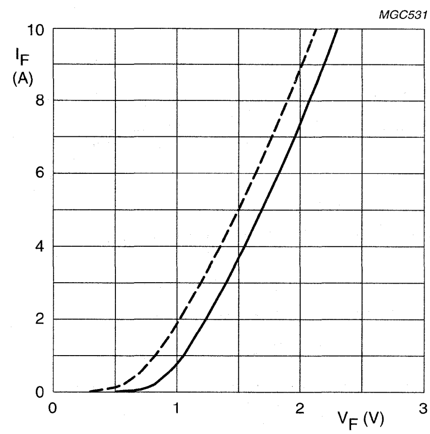


BYD77A to D

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.12 Forward current as a function of forward voltage; maximum values.

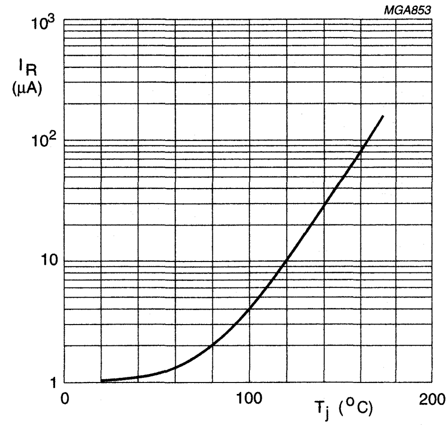


BYD77E to G

Dotted line: T_j = 175 °C.

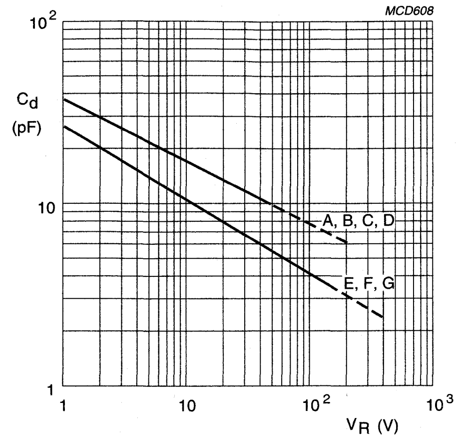
Solid line: T_j = 25 °C.

Fig.13 Forward current as a function of forward voltage; maximum values.



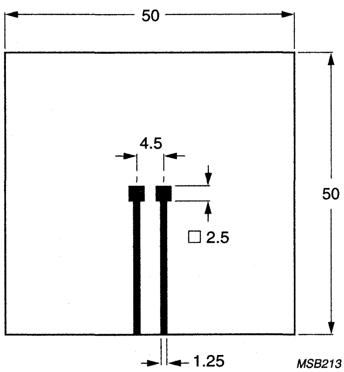
$V_R = V_{RRMmax}$.

Fig.14 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.15 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.16 Printed-circuit board for surface mounting.

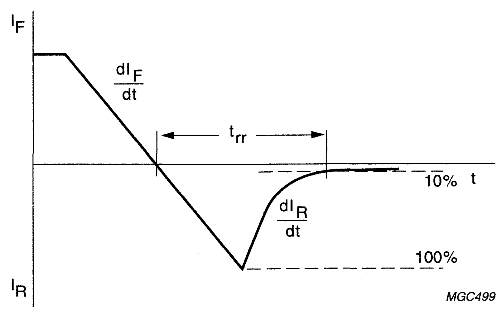
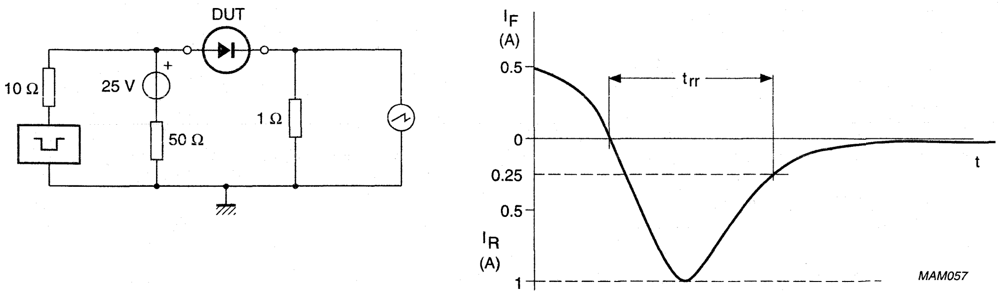


Fig.17 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.18 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery controlled avalanche rectifiers

BYG60 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- UL 94V-O classified plastic package
- Shipped in 12 mm embossed tape.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.

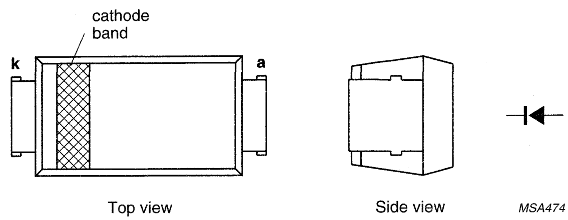


Fig.1 Simplified outline (DO-214AC; SOD106) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYG60D		–	200	V
	BYG60G		–	400	V
	BYG60J		–	600	V
	BYG60K		–	800	V
	BYG60M		–	1000	V
V_R	continuous reverse voltage				
	BYG60D		–	200	V
	BYG60G		–	400	V
	BYG60J		–	600	V
	BYG60K		–	800	V
	BYG60M		–	1000	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 100 °C; see Fig.2	–	1.90	A
		averaged over any 20 ms period; Al_2O_3 PCB mounting (see Fig.7); T_{amb} = 60 °C; see Fig.3	–	0.90	A
		averaged over any 20 ms period; epoxy PCB mounting (see Fig.7); T_{amb} = 60 °C; see Fig.3	–	0.65	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	25	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off			
	BYG60D to J		–	10	mJ
	BYG60K and M		–	7	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.4	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.5	–	–	0.98	V
		I_F = 1 A; see Fig.5	–	–	1.20	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYG60D		300	–	–	V
	BYG60G		500	–	–	V
	BYG60J		700	–	–	V
	BYG60K		900	–	–	V
	BYG60M		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.6	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.6	–	–	100	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.8				
	BYG60D to J		–	–	250	ns
	BYG60K and M		–	–	300	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz				
	BYG60D to J		–	30	–	pF
	BYG60K and M		–	25	–	pF

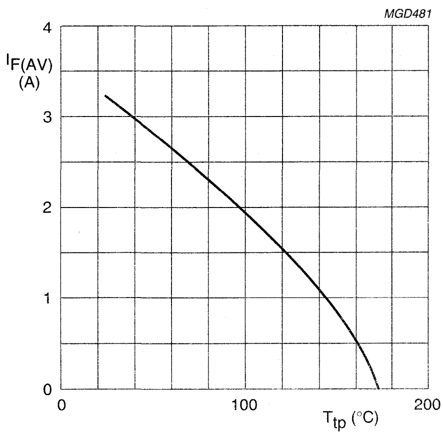
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

Notes

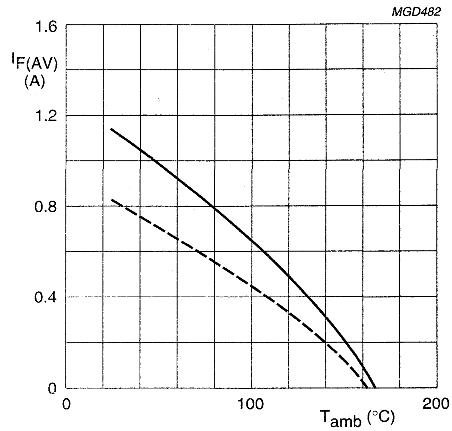
1. Device mounted on Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of copper ≥35 μm, see Fig.7.
2. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.7. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



$V_R = V_{RRMmax}$; $\delta = 0.5$; a = 1.57.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).

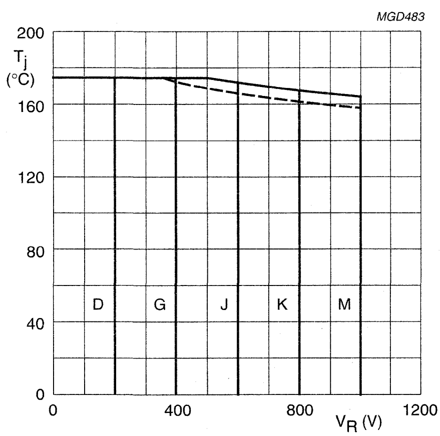


$V_R = V_{RRMmax}$; $\delta = 0.5$; a = 1.57

Device mounted as shown in Fig.7;

solid line: Al_2O_3 PCB; dotted line: epoxy PCB.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

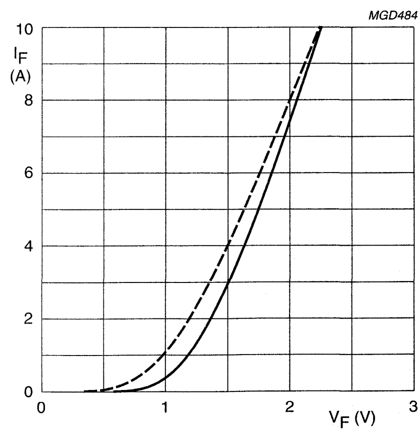


Device mounted as shown in Fig.7

Solid line: Al_2O_3 PCB

Dotted line: epoxy PCB.

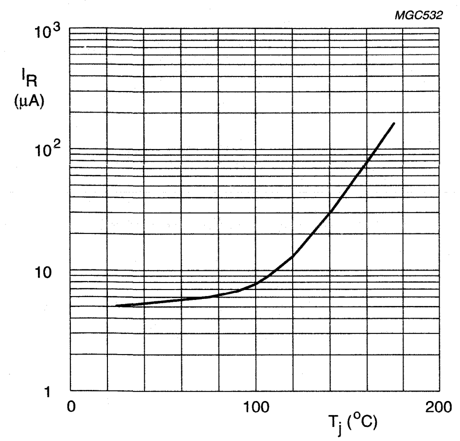
Fig.4 Maximum permissible junction temperature as a function of reverse voltage.



Solid line: T_j = 25 °C.

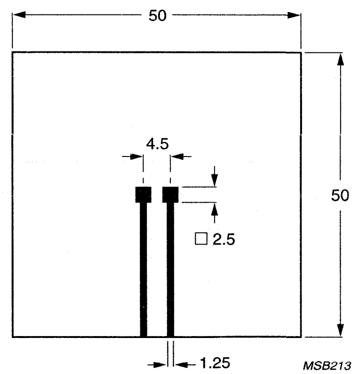
Dotted line: T_j = 175 °C.

Fig.5 Forward current as a function of forward voltage; maximum values.



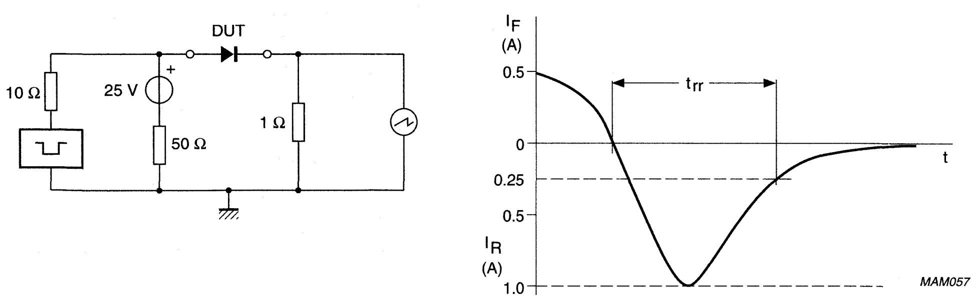
$V_R = V_{RMMmax}$.

Fig.6 Reverse current as a function of junction temperature; maximum values.



Dimensions in mm.
Material: AL_2O_3 or epoxy-glass.

Fig.7 Printed-circuit board for surface mounting.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \le 7$ ns.
Source impedance: 50 Ω; $t_r \le 15$ ns.

Fig.8 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery controlled avalanche rectifiers

BYG70 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- UL 94V-O classified plastic package
- Shipped in 12 mm embossed tape.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.

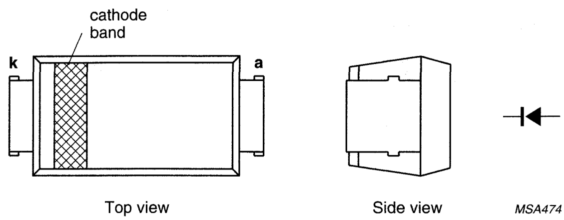


Fig.1 Simplified outline (DO-214AC; SOD106) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYG70D		–	200	V
	BYG70G		–	400	V
	BYG70J		–	600	V
V_R	continuous reverse voltage				
	BYG70D		–	200	V
	BYG70G		–	400	V
	BYG70J		–	600	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 100 °C; see Fig.2	–	1.00	A
		averaged over any 20 ms period; Al_2O_3 PCB mounting (see Fig.7); T_{amb} = 60 °C; see Fig.3	–	0.53	A
		averaged over any 20 ms period; epoxy PCB mounting (see Fig.7); T_{amb} = 60 °C; see Fig.3	–	0.39	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	20	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.4	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.5	–	–	2.1	V
		I_F = 1 A; see Fig.5	–	–	3.6	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYG70D		300	–	–	V
	BYG70G		500	–	–	V
	BYG70J		700	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.6	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.6	–	–	100	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.8	–	–	30	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	30	–	pF

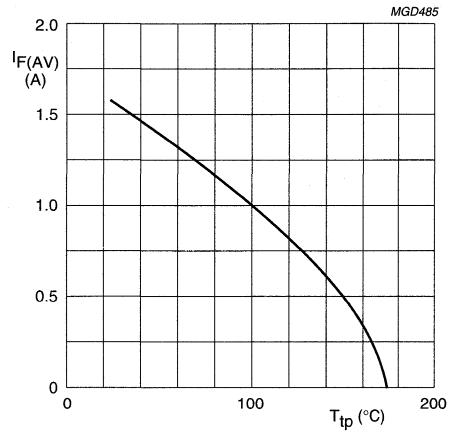
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point		25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

Notes

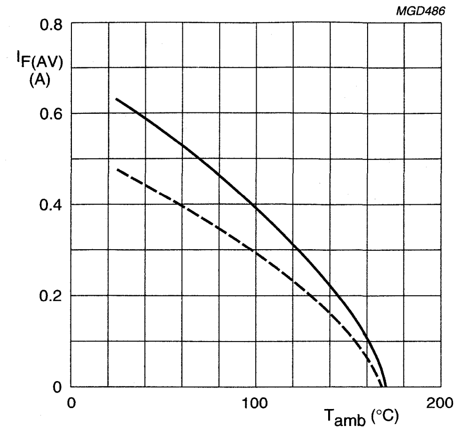
1. Device mounted on Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of copper ≥35 μm, see Fig.7.
2. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.7. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



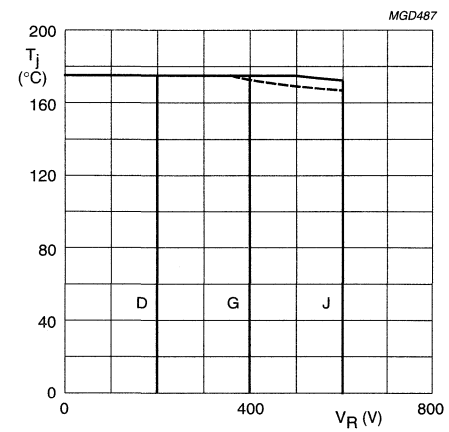
$V_R = V_{RRMmax}$; $\delta = 0.5$; a = 1.57.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



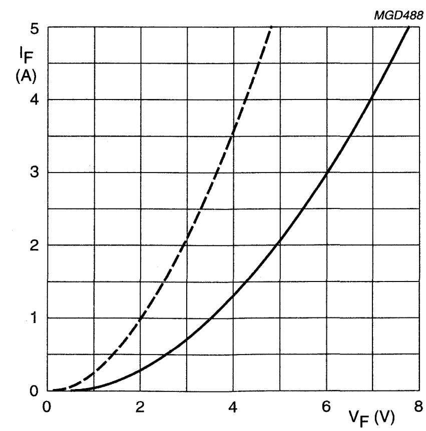
$V_R = V_{RRMmax}$; $\delta = 0.5$; a = 1.57.
Device mounted as shown in Fig.7;
solid line: Al_2O_3 PCB; dotted line: epoxy PCB.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



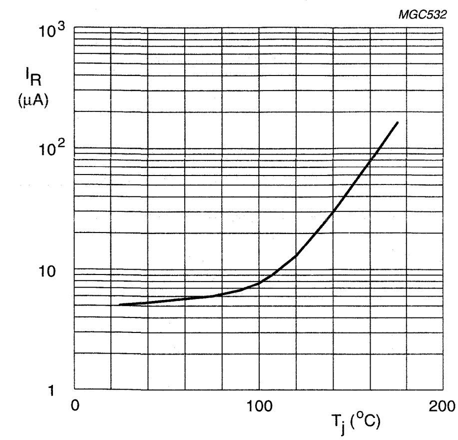
Device mounted as shown in Fig.7.
Solid line: Al_2O_3 PCB.
Dotted line: epoxy PCB.

Fig.4 Maximum permissible junction temperature as a function of reverse voltage.



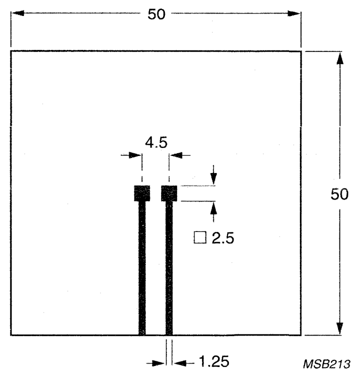
Solid line: T_j = 25 °C.
Dotted line: T_j = 175 °C.

Fig.5 Forward current as a function of forward voltage; maximum values.



$V_R = V_{RMMmax}$.

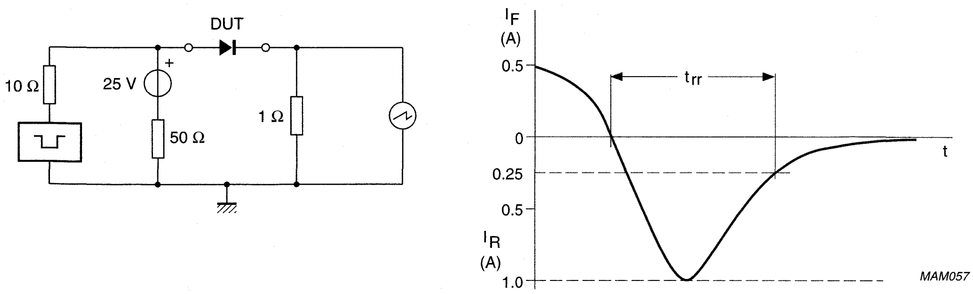
Fig.6 Reverse current as a function of junction temperature; maximum values.



Dimensions in mm.

Material: AL_2O_3 or epoxy-glass.

Fig.7 Printed-circuit board for surface mounting.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.

Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.8 Test circuit and reverse recovery time waveform and definition.

Ultra fast low-loss controlled avalanche rectifiers

BYG80 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- UL 94V-O classified plastic package
- Shipped in 12 mm embossed tape.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.

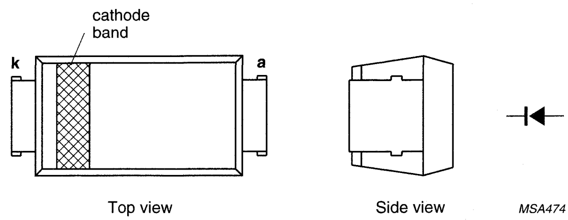


Fig.1 Simplified outline (DO-214AC; SOD106) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYG80D		–	200	V
	BYG80G		–	400	V
	BYG80J		–	600	V
V_R	continuous reverse voltage				
	BYG80D		–	200	V
	BYG80G		–	400	V
	BYG80J		–	600	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 135 °C			
	BYG80D		–	1.6	A
	BYG80G		–	1.5	A
	BYG80J		–	1.1	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$			
	BYG80D		–	36	A
	BYG80G		–	32	A
	BYG80J		–	32	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; T_j = 150 °C		
	BYG80D		0.71	V
	BYG80G		0.77	V
	BYG80J		1.05	V
V_F	forward voltage	I_F = 1 A		
	BYG80D		0.93	V
	BYG80G		0.98	V
	BYG80J		1.25	V
I_R	reverse current	$V_R = V_{RRMmax}$	1	μA
	BYG80D	$V_R = V_{RRMmax}$; T_j = 165 °C	100	μA
	BYG80G		150	μA
	BYG80J		150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.2		
	BYG80D		25	ns
	BYG80G		50	ns
	BYG80J		50	ns

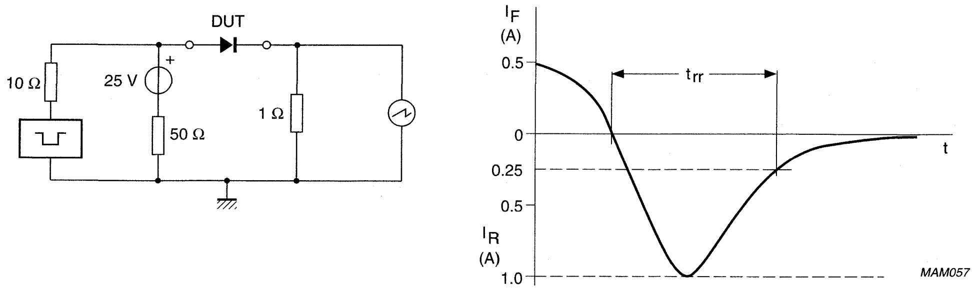
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

Notes

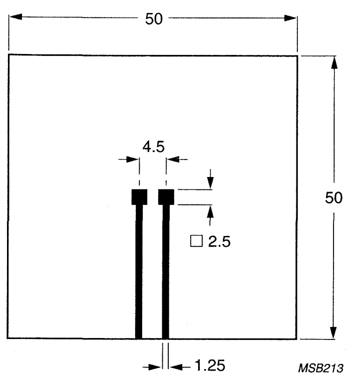
1. Device mounted on Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of copper ≥35 μm, see Fig.3.
2. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.3. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.2 Test circuit and reverse recovery time waveform and definition.



Dimensions in mm.
Material: AL_2O_3 or epoxy-glass.

Fig.3 Printed-circuit board for surface mounting.

Fast soft-recovery controlled avalanche rectifiers

BYM26 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

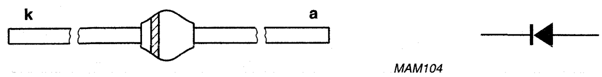


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYM26A		–	200	V
	BYM26B		–	400	V
	BYM26C		–	600	V
	BYM26D		–	800	V
	BYM26E		–	1000	V
	BYM26F		–	1200	V
	BYM26G		–	1400	V
V_R	continuous reverse voltage				
	BYM26A		–	200	V
	BYM26B		–	400	V
	BYM26C		–	600	V
	BYM26D		–	800	V
	BYM26E		–	1000	V
	BYM26F		–	1200	V
	BYM26G		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYM26A to E		–	2.30	A
	BYM26F and G		–	2.40	A
$I_{F(AV)}$	average forward current	T_{amb} = 65 °C; PCB mounting (see Fig.19); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYM26A to E		–	1.05	A
	BYM26F and G		–	1.00	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Figs 6 and 7			
	BYM26A to E		–	19	A
	BYM26F and G		–	21	A
I_{FRM}	repetitive peak forward current	T_{amb} = 65 °C; see Figs 8 and 9			
	BYM26A to E		–	8.0	A
	BYM26F and G		–	8.5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	45	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Figs 12 and 13	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 2 A; $T_j = T_{j\,max}$; see Figs 14 and 15				
	BYM26A to E		–	–	1.34	V
	BYM26F and G		–	–	1.34	V
V_F	forward voltage	I_F = 2 A; see Figs 14 and 15				
	BYM26A to E		–	–	2.65	V
	BYM26F and G		–	–	2.30	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYM26A		300	–	–	V
	BYM26B		500	–	–	V
	BYM26C		700	–	–	V
	BYM26D		900	–	–	V
	BYM26E		1100	–	–	V
	BYM26F		1300	–	–	V
	BYM26G		1500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.16	–	–	10	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.16	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.20				
	BYM26A to C		–	–	30	ns
	BYM26D and E		–	–	75	ns
	BYM26F and G		–	–	150	ns

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Figs 17 and 18				
	BYM26A to C		–	85	–	pF
	BYM26D and E		–	75	–	pF
	BYM26F and G		–	65	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/μs; see Fig.21				
	BYM26A to C		–	–	7	A/μs
	BYM26D and E		–	–	6	A/μs
	BYM26F and G		–	–	5	A/μs

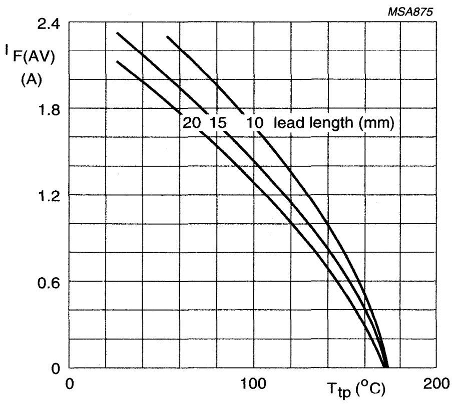
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.19. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

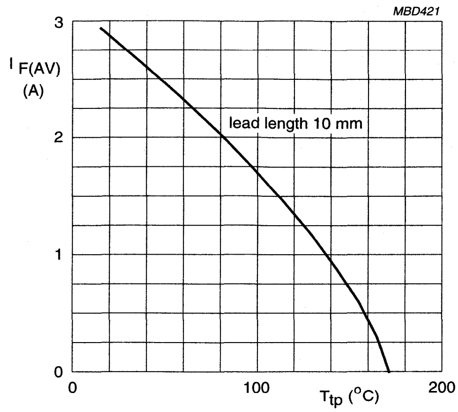


BYM26A to E

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.2 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).

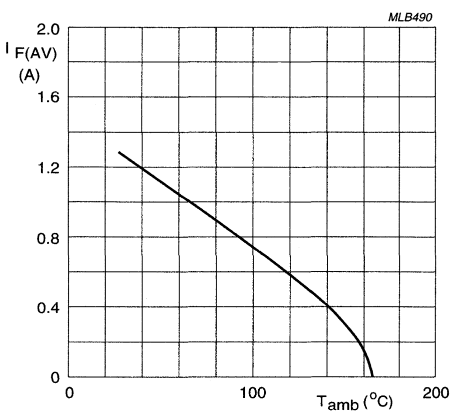


BYM26F and G

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.3 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).



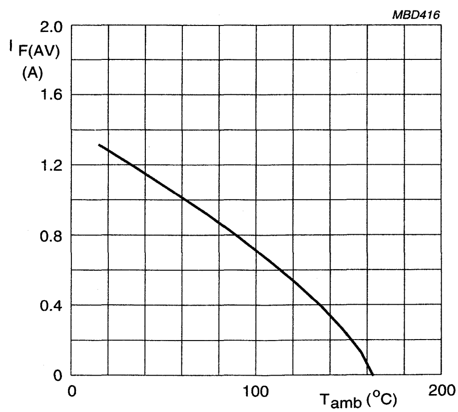
BYM26A to E

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Device mounted as shown in Fig.19.

Switched mode application.

Fig.4 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



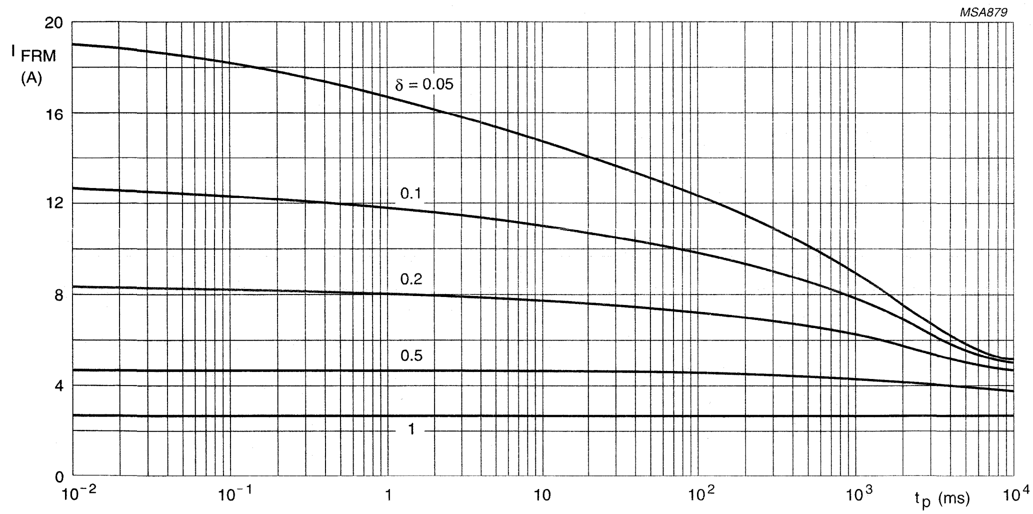
BYM26F and G

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Device mounted as shown in Fig.19.

Switched mode application.

Fig.5 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).

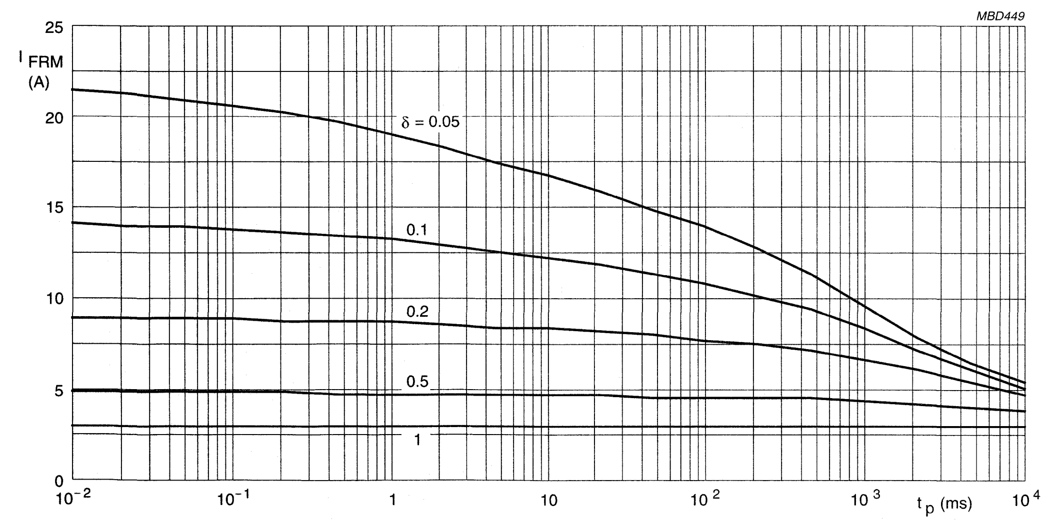


BYM26A to E

T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 25 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

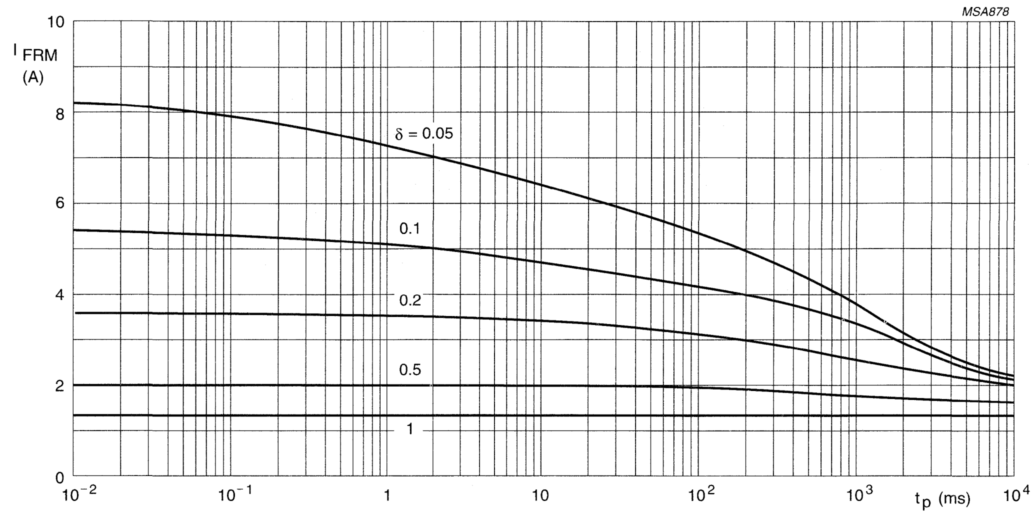


BYM26F and G

T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 25 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

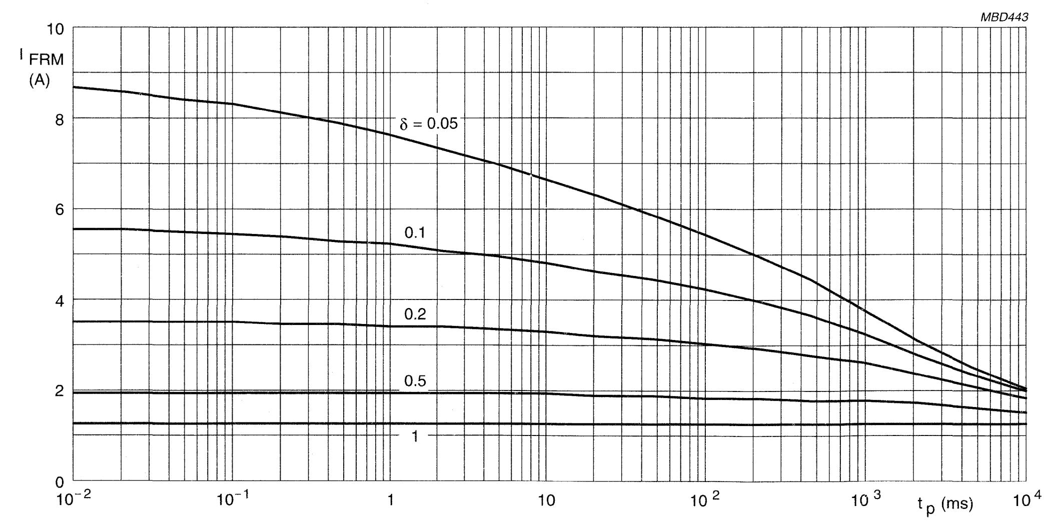


BYM26A to E

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 75 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

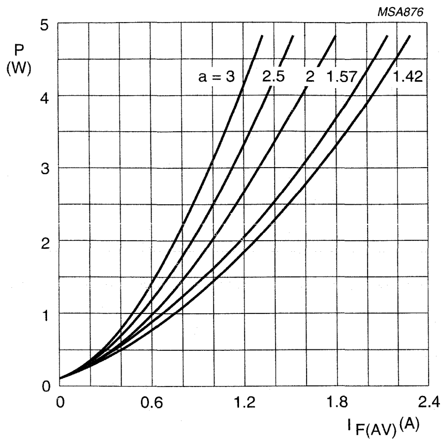


BYM26F and G

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 75 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

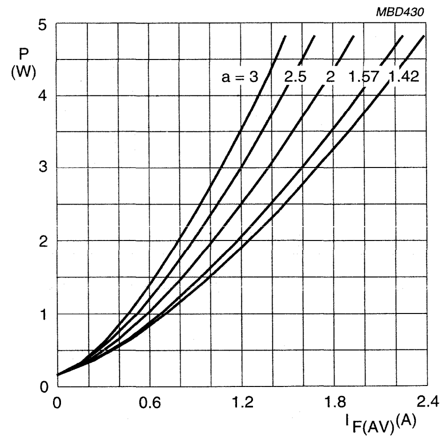
Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYM26A to E

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

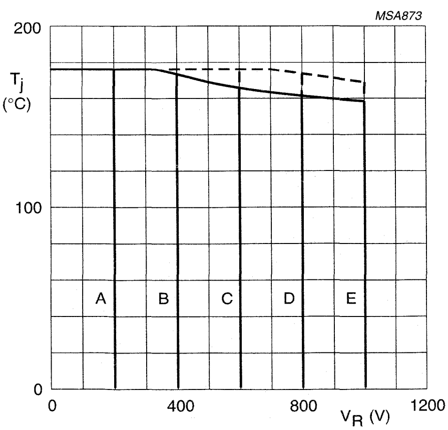
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYM26F and G

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

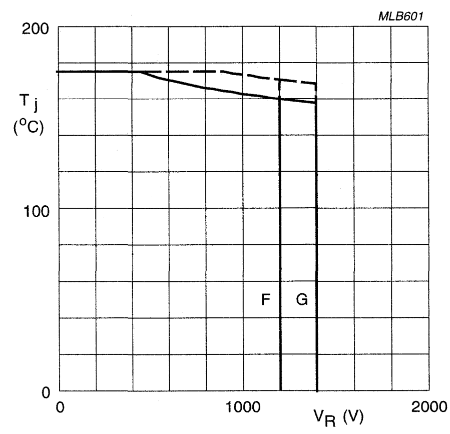


BYM26A to E

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.12 Maximum permissible junction temperature as a function of reverse voltage.

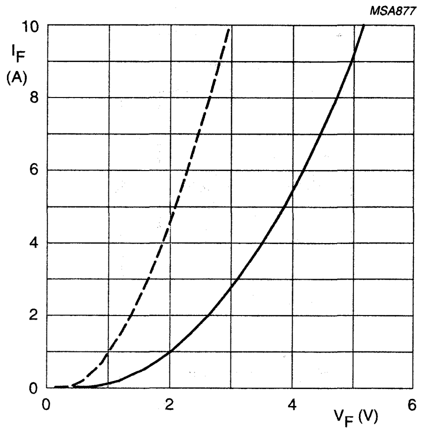


BYM26F and G

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.13 Maximum permissible junction temperature as a function of reverse voltage.

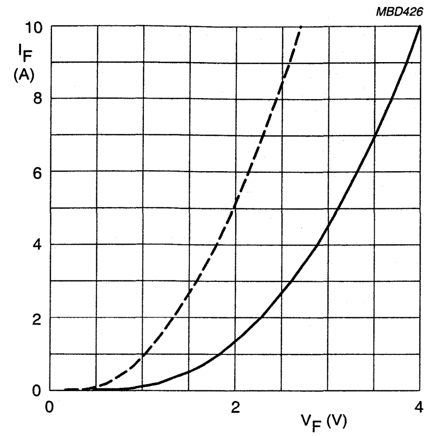


BYM26A to E

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.14 Forward current as a function of forward voltage; maximum values.

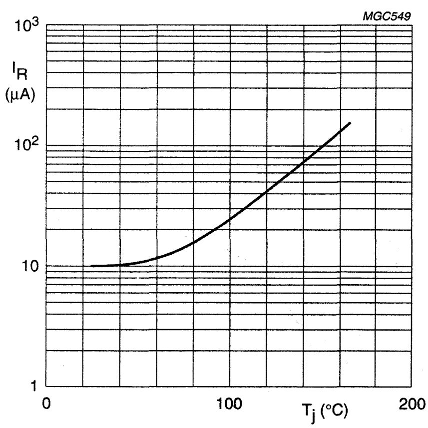


BYM26F and G

Dotted line: T_j = 175 °C.

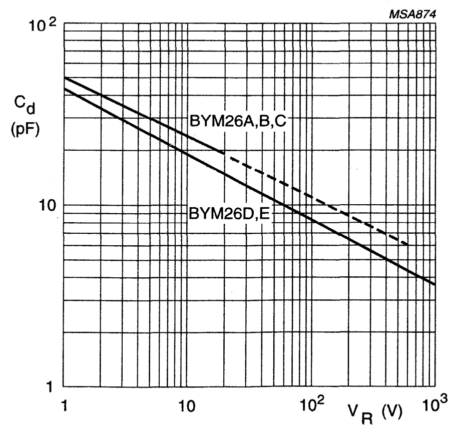
Solid line: T_j = 25 °C.

Fig.15 Forward current as a function of forward voltage; maximum values.



$V_R = V_{RRMmax}$.

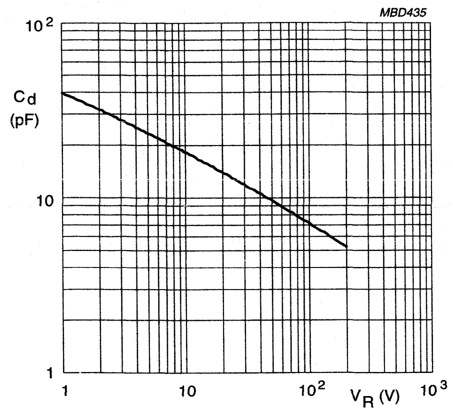
Fig.16 Reverse current as a function of junction temperature; maximum values.



BYM26A to E

f = 1 MHz; T_j = 25 °C.

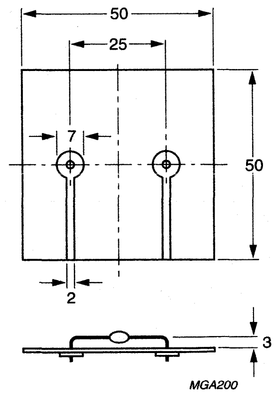
Fig.17 Diode capacitance as a function of reverse voltage; typical values.



BYM26F and G

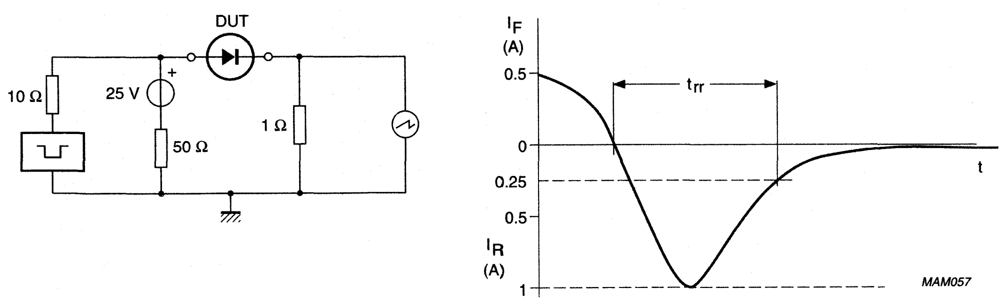
f = 1 MHz; T_j = 25 °C.

Fig.18 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.19 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.

Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.20 Test circuit and reverse recovery time waveform and definition.

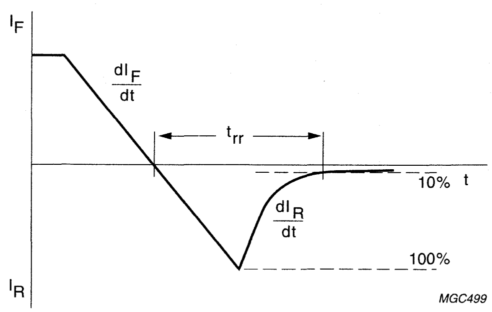


Fig.21 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYM36 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

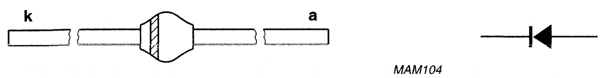


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYM36A		–	200	V
	BYM36B		–	400	V
	BYM36C		–	600	V
	BYM36D		–	800	V
	BYM36E		–	1000	V
	BYM36F		–	1200	V
	BYM36G		–	1400	V
V_R	continuous reverse voltage				
	BYM36A		–	200	V
	BYM36B		–	400	V
	BYM36C		–	600	V
	BYM36D		–	800	V
	BYM36E		–	1000	V
	BYM36F		–	1200	V
	BYM36G		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Figs 2; 3 and 4 averaged over any 20 ms period; see also Figs 14; 15 and 16			
	BYM36A to C		–	3.0	A
	BYM36D and E		–	2.9	A
	BYM36F and G		–	2.9	A
$I_{F(AV)}$	average forward current	T_{amb} = 65 °C; PCB mounting (see Fig.25); see Figs 5; 6 and 7 averaged over any 20 ms period; see also Figs 14; 15 and 16			
	BYM36A to C		–	1.25	A
	BYM36D and E		–	1.20	A
	BYM36F and G		–	1.15	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Figs 8; 9 and 10			
	BYM36A to C		–	37	A
	BYM36D and E		–	33	A
	BYM36F and G		–	27	A
I_{FRM}	repetitive peak forward current	T_{amb} = 65 °C; see Figs 11; 12 and 13			
	BYM36A to C		–	13	A
	BYM36D and E		–	11	A
	BYM36F and G		–	10	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	65	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Figs 17 and 18	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3 A; $T_j = T_{j\,max}$; see Figs 19; 20 and 21				
	BYM36A to C		–	–	1.22	V
	BYM36D and E		–	–	1.28	V
	BYM36F and G		–	–	1.24	V
V_F	forward voltage	I_F = 3 A; see Figs 19; 20 and 21				
	BYM36A to C		–	–	1.60	V
	BYM36D and E		–	–	1.78	V
	BYM36F and G		–	–	1.57	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYM36A		300	–	–	V
	BYM36B		500	–	–	V
	BYM36C		700	–	–	V
	BYM36D		900	–	–	V
	BYM36E		1100	–	–	V
	BYM36F		1300	–	–	V
	BYM36G		1500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.22	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.22	–	–	150	μA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
t_{rr}	reverse recovery time	when switched from $I_F = 0.5$ A to $I_R = 1$ A; measured at $I_R = 0.25$ A; see Fig. 26				
	BYM36A to C		–	–	100	ns
	BYM36D and E		–	–	150	ns
	BYM36F and G		–	–	250	ns
C_d	diode capacitance	f = 1 MHz; $V_R = 0$ V; see Figs 23 and 24				
	BYM36A to C		–	85	–	pF
	BYM36D and E		–	75	–	pF
	BYM36F and G		–	65	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from $I_F = 1$ A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/µs; see Fig.27				
	BYM36A to C		–	–	7	A/µs
	BYM36D and E		–	–	6	A/µs
	BYM36F and G		–	–	5	A/µs

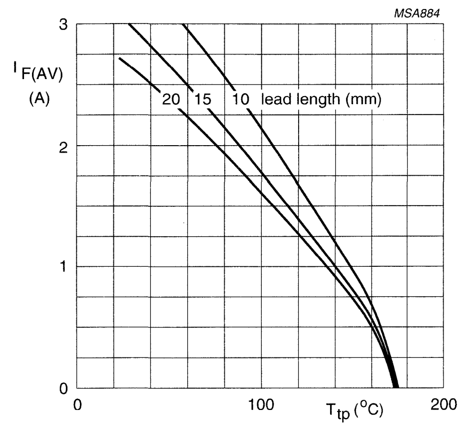
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.25. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

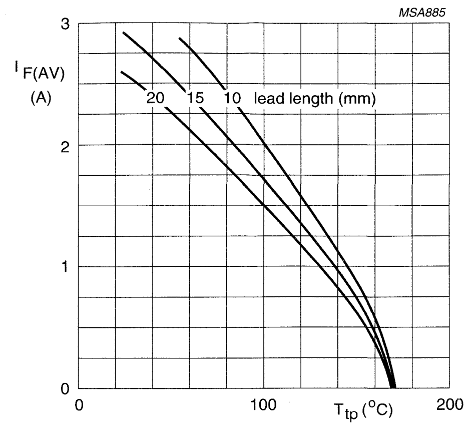


BYM36A to C

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.2 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).

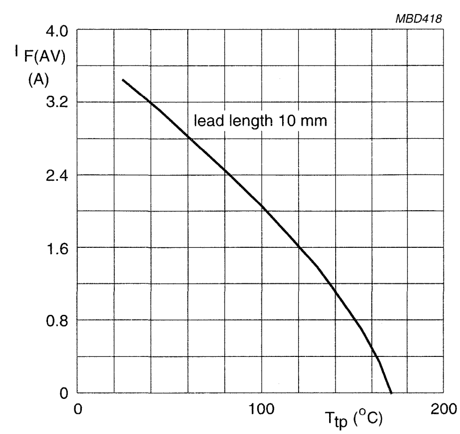


BYM36D and E

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.3 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).

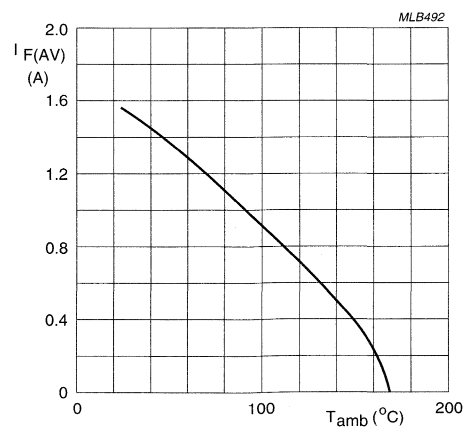


BYM36F and G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.4 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).



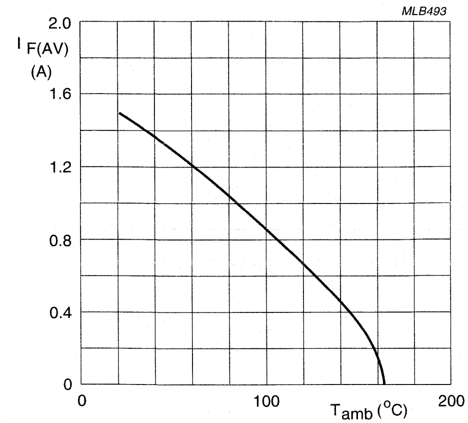
BYM36A to C

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.25.

Switched mode application.

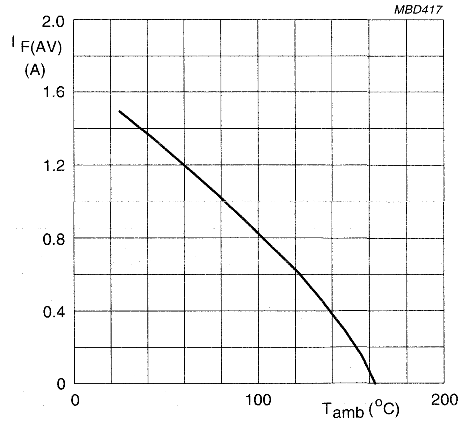
Fig.5 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYM36D and E

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.
Device mounted as shown in Fig.25.
Switched mode application.

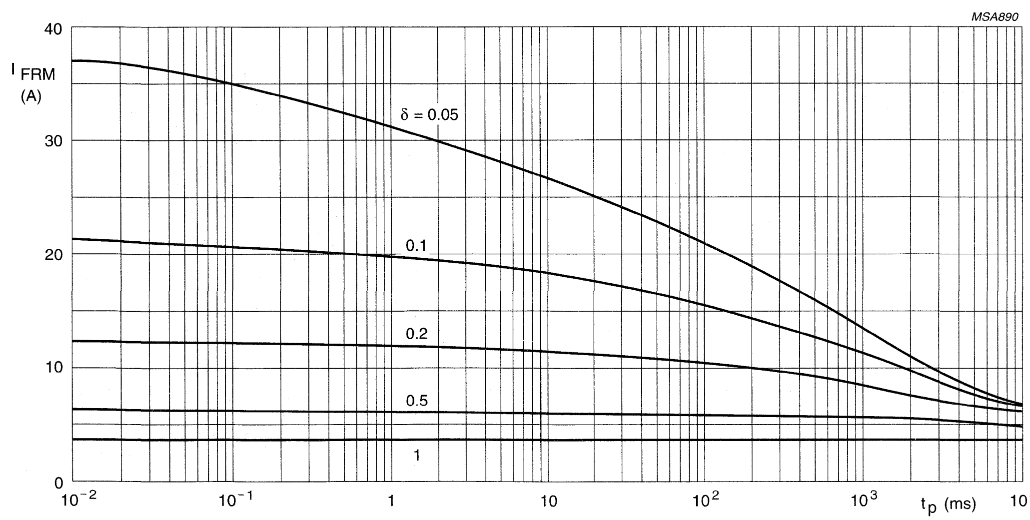
Fig.6 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYM36F and G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.
Device mounted as shown in Fig.25.
Switched mode application.

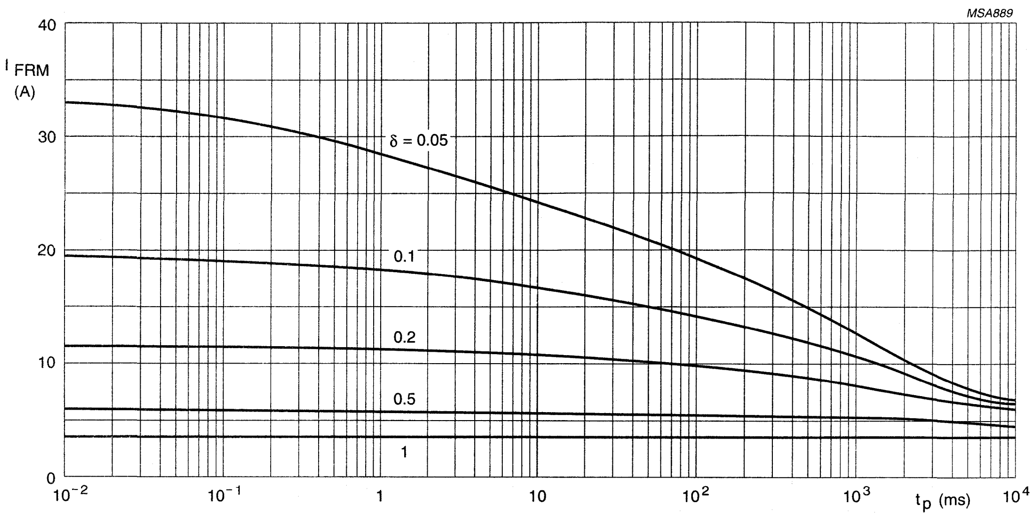
Fig.7 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYM36A to C

$T_{tp} = 55°C$; $R_{th\ j\text{-}tp} = 25$ K/W.
V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 600$ V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

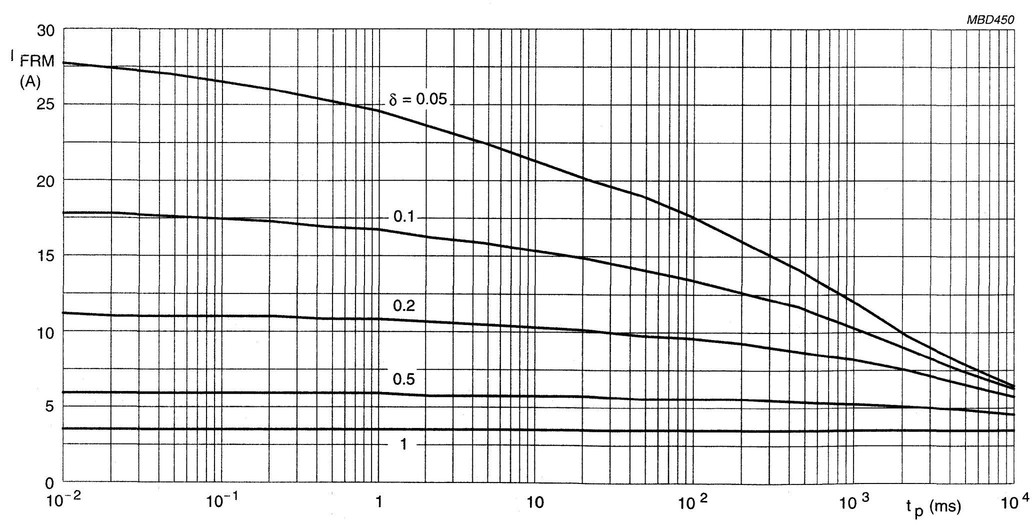


BYM36D and E

T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 25 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

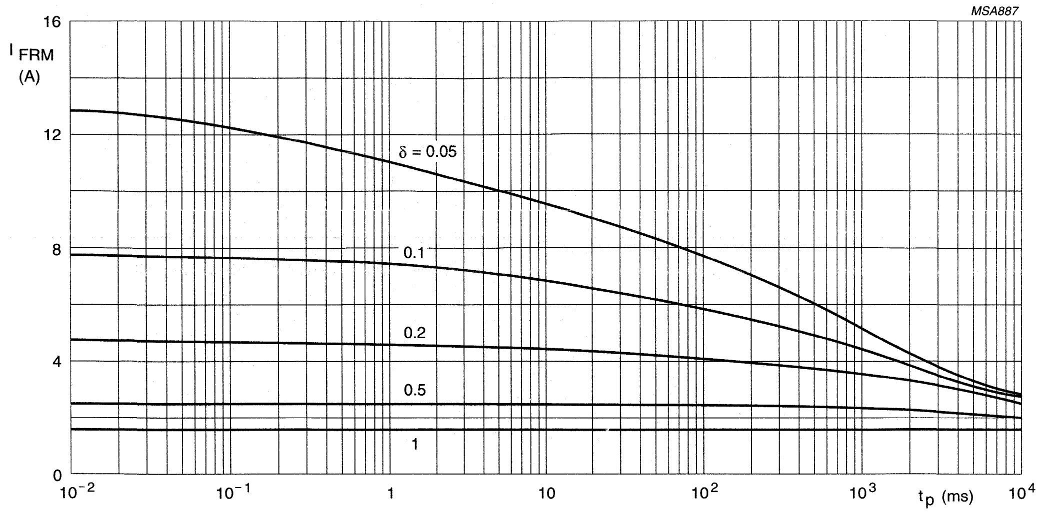


BYM36F and G

T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 25 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.10 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

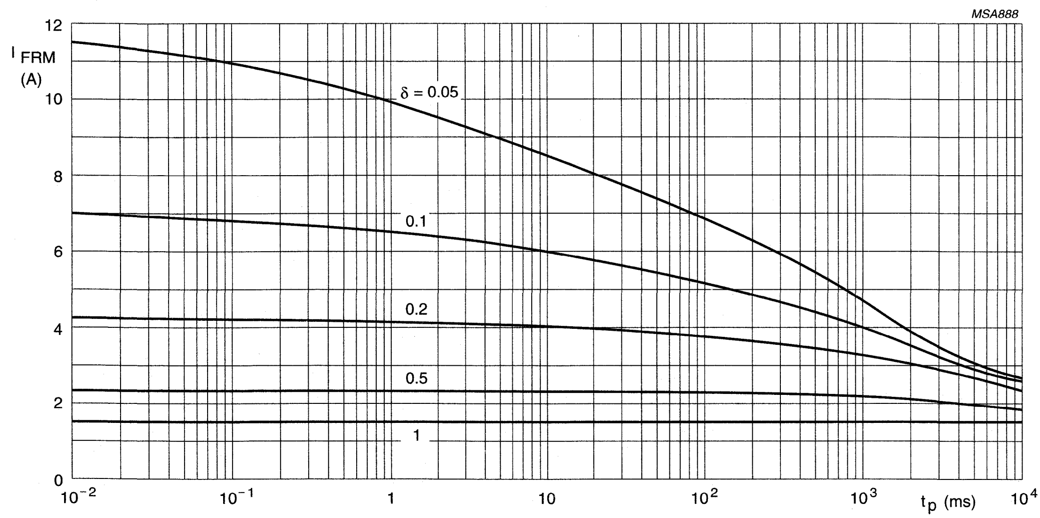


BYM36A to C

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 75 K/W.

V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.11 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

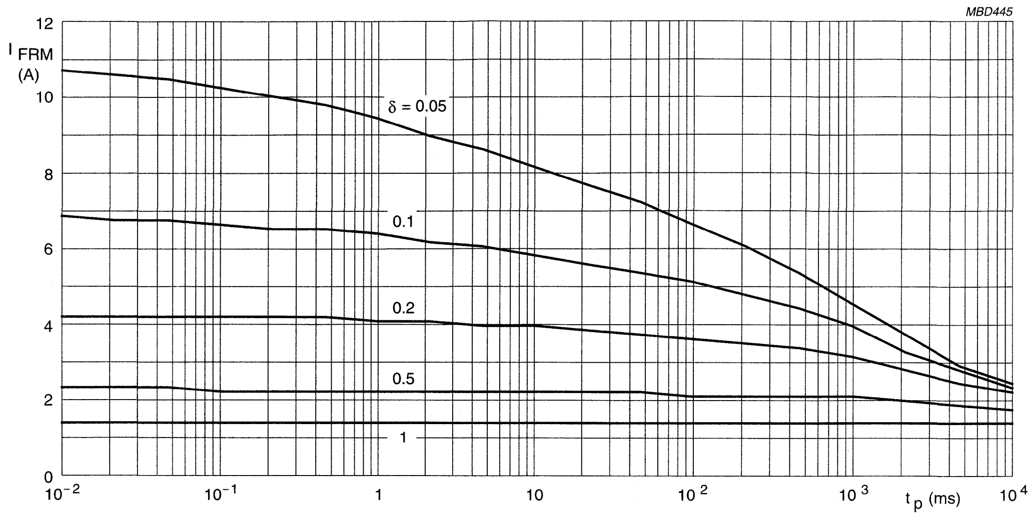


BYM36D and E

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 75 K/W.

V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.12 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

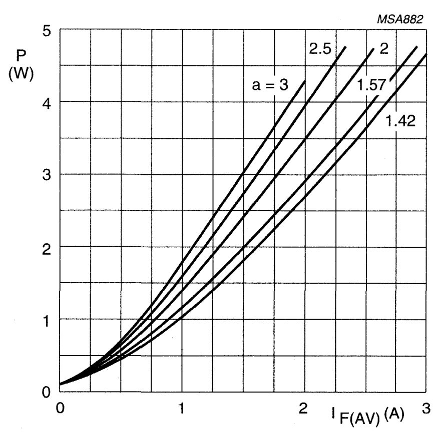


BYM36F and G

T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 75 K/W.

V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

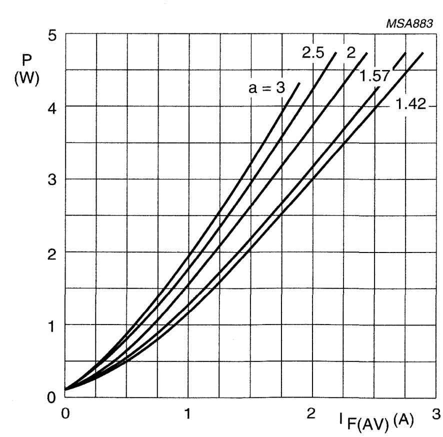
Fig.13 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYM36A to C

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.14 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



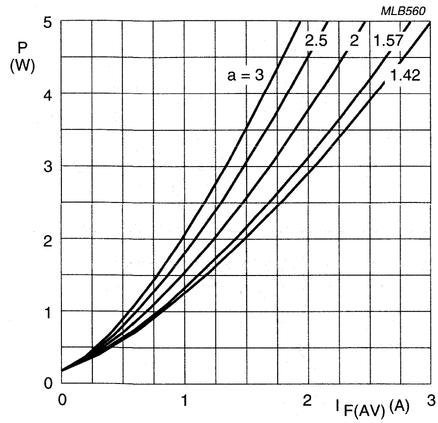
BYM36D and E

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.15 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

Fast soft-recovery controlled avalanche rectifiers

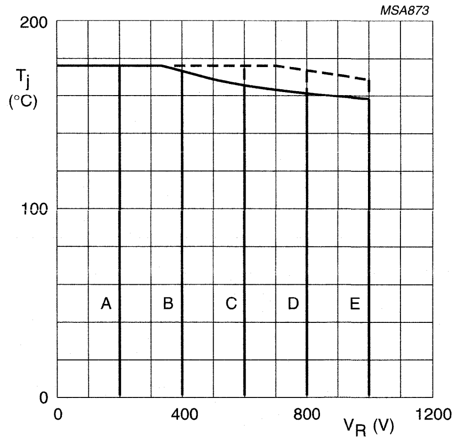
BYM36 series



BYM36F and G

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.16 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

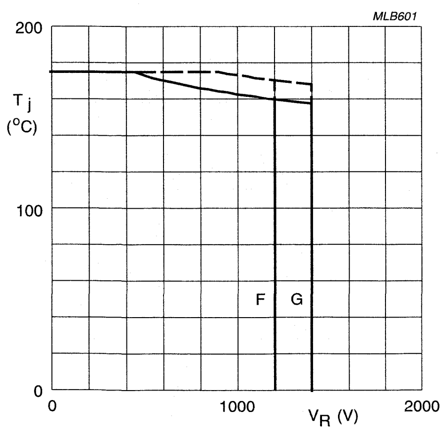


BYM36A to E

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.17 Maximum permissible junction temperature as a function of reverse voltage.

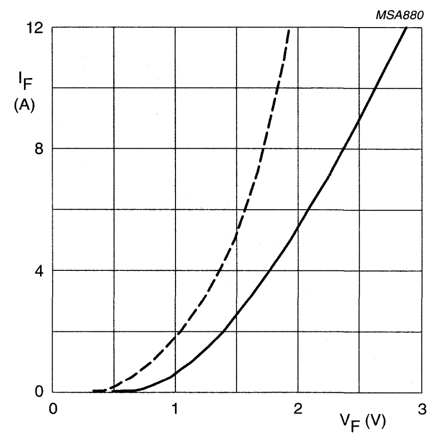


BYM36F and G

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.18 Maximum permissible junction temperature as a function of reverse voltage.

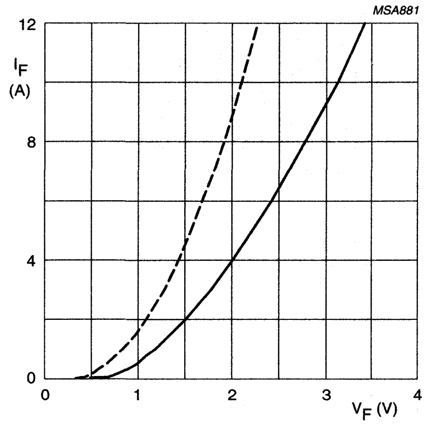


BYM36A to C

Dotted line: T_j = 175 °C.

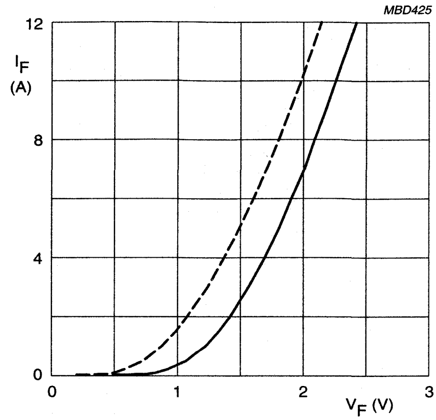
Solid line: T_j = 25 °C.

Fig.19 Forward current as a function of forward voltage; maximum values.



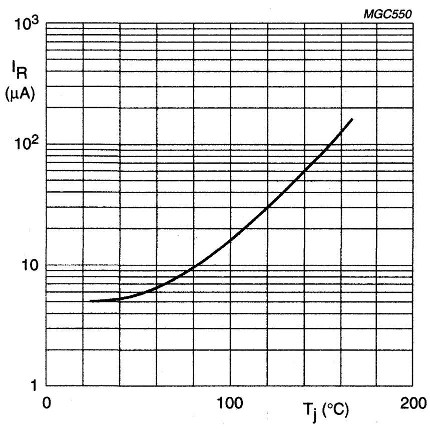
BYM36D and E.
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.20 Forward current as a function of forward voltage; maximum values.



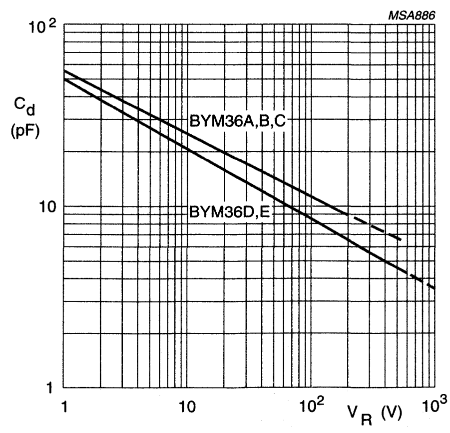
BYM36F and G.
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.21 Forward current as a function of forward voltage; maximum values.



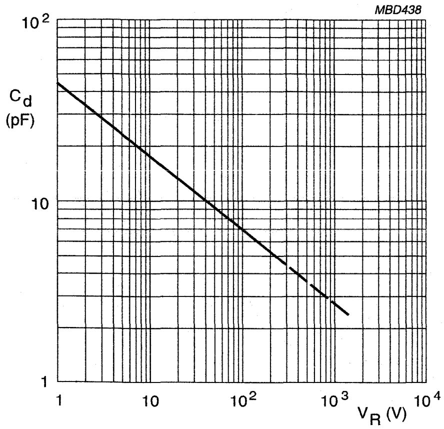
$V_R = V_{RRMmax}$.

Fig.22 Reverse current as a function of junction temperature; maximum values.



BYM36A to E
f = 1 MHz; T_j = 25 °C.

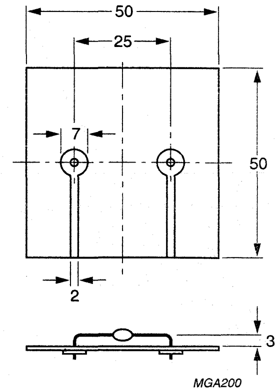
Fig.23 Diode capacitance as a function of reverse voltage, typical values.



BYM36F and G

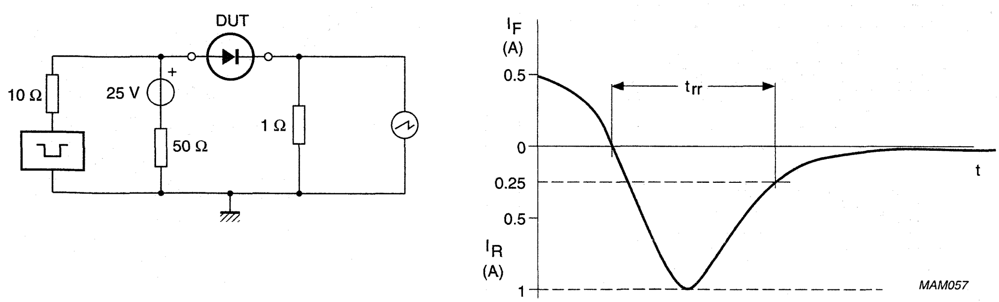
f = 1 MHz; T_j = 25 °C.

Fig.24 Diode capacitance as a function of reverse voltage, typical values.



Dimensions in mm.

Fig.25 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; t_r ≤< 7 ns.

Source impedance: 50 Ω; $t_r \leq$ 15 ns.

Fig.26 Test circuit and reverse recovery time waveform and definition.

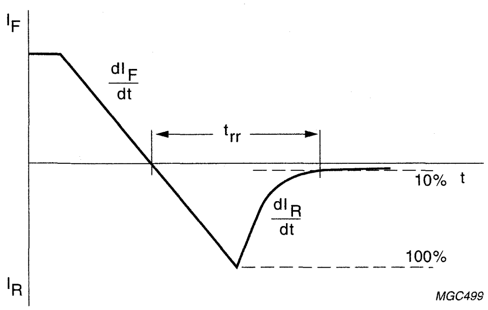


Fig.27 Reverse recovery definitions.

Ultra fast low-loss controlled avalanche rectifier

BYM99

FEATURES

- Glass passivated
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

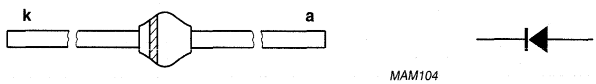


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	600	V
V_R	continuous reverse voltage		–	600	V
$I_{F(AV)}$	average forward current	T_{tp} = 50 °C; lead length = 10 mm see Fig. 2; averaged over any 20 ms period; see also Fig 6	–	1.8	A
		T_{amb} = 60 °C; PCB mounting (see Fig.10); see Fig. 3; averaged over any 20 ms period; see also Fig. 6	–	0.8	A
I_{FRM}	repetitive peak forward current	T_{tp} = 50 °C; see Fig. 4	–	15	A
		T_{amb} = 60 °C; see Fig. 5	–	7	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	40	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3 A; $T_j = T_{j\,max}$; see Fig. 7	–	–	1.95	V
		I_F = 3 A; see Fig. 7	–	–	3.60	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	700	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig. 8	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 150 °C; see Fig. 8	–	–	75	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig. 12	–	–	15	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig. 9	–	135	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and dI_F/dt = −1 A/μs; see Fig.11	–	–	3	A/μs

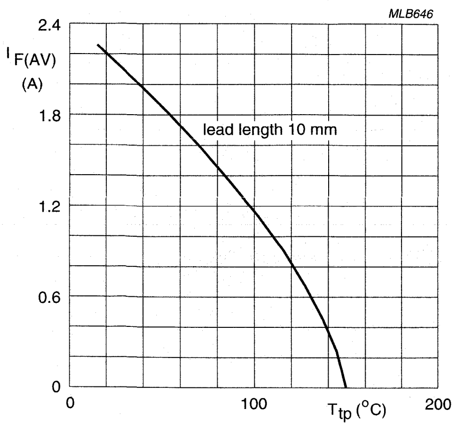
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

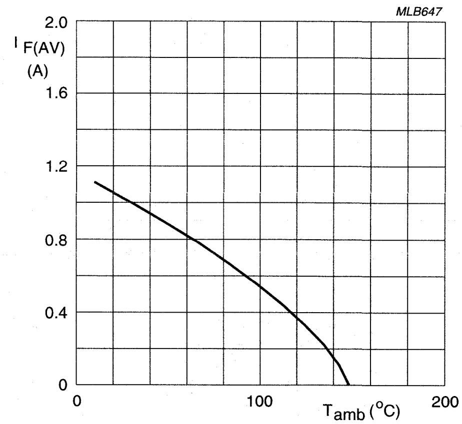
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.10. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



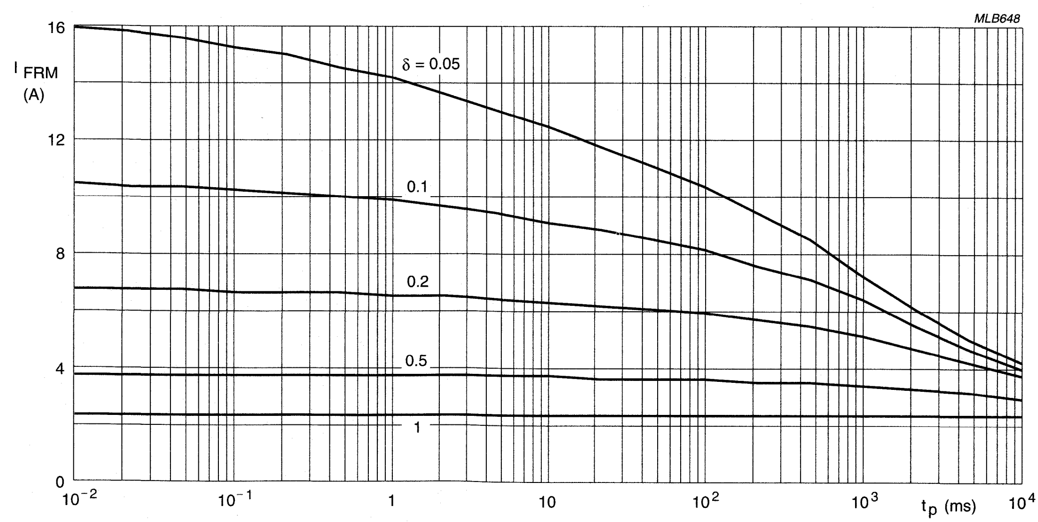
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



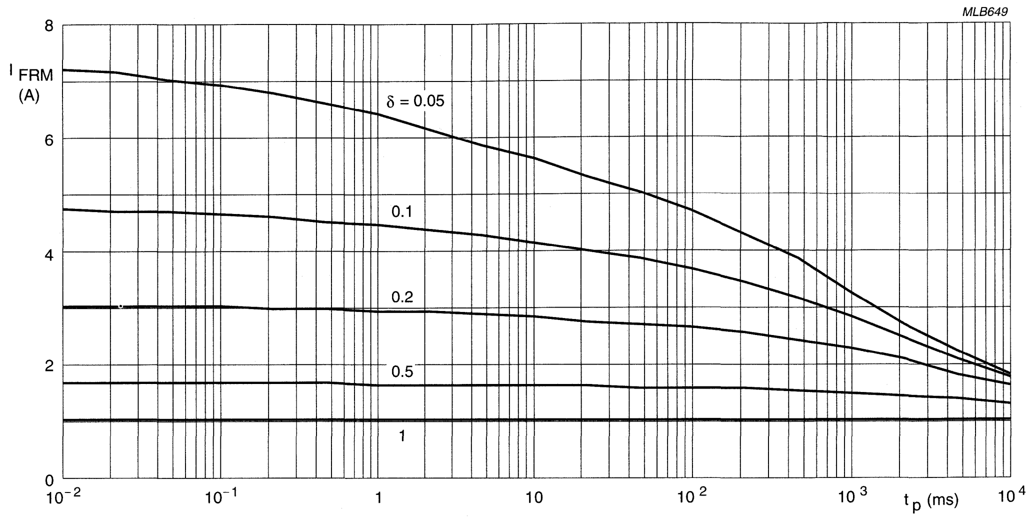
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.10.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



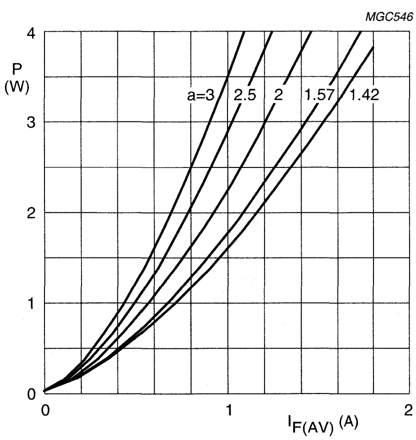
T_{tp} = 50°C; $R_{th\ j\text{-}tp}$ = 25 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



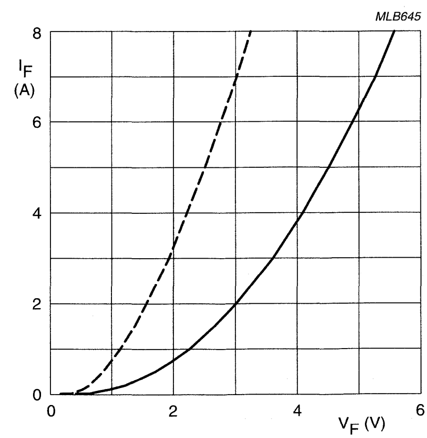
T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 75 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



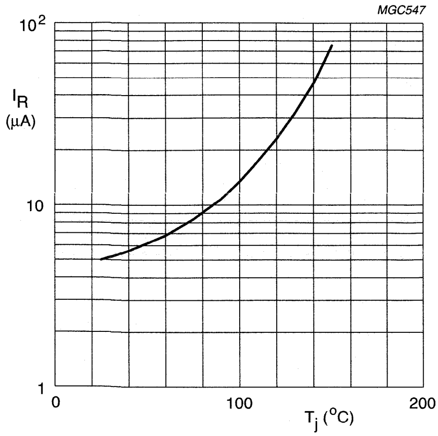
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



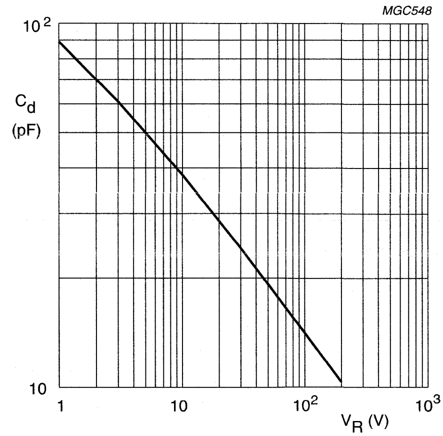
Dotted line: T_j = 150 °C.
Solid line: T_j = 25 °C.

Fig.7 Forward current as a function of forward voltage; maximum values.



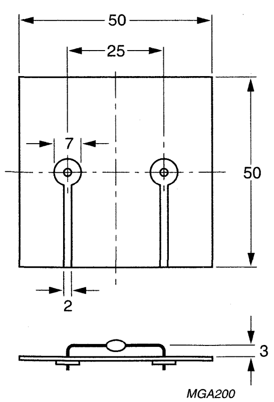
$V_R = V_{RRMmax}$.

Fig.8 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.10 Device mounted on a printed-circuit board.

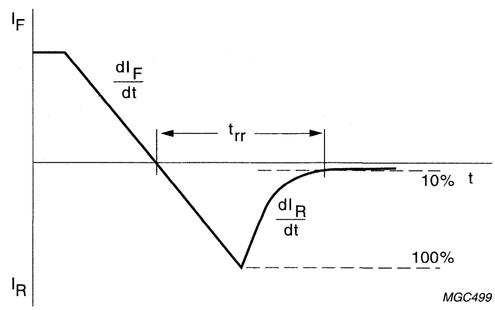
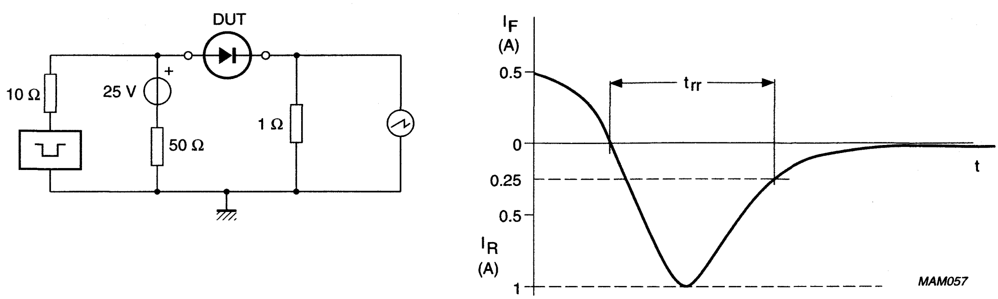


Fig.11 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery controlled avalanche rectifiers

BYV26 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

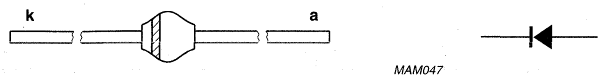


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV26A		–	200	V
	BYV26B		–	400	V
	BYV26C		–	600	V
	BYV26D		–	800	V
	BYV26E		–	1000	V
	BYV26F		–	1200	V
	BYV26G		–	1400	V
V_R	continuous reverse voltage				
	BYV26A		–	200	V
	BYV26B		–	400	V
	BYV26C		–	600	V
	BYV26D		–	800	V
	BYV26E		–	1000	V
	BYV26F		–	1200	V
	BYV26G		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 85 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYV26A to E		–	1.00	A
	BYV26F and G		–	1.05	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.19); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYV26A to E		–	0.65	A
	BYV26F and G		–	0.68	A
I_{FRM}	repetitive peak forward current	T_{tp} = 85 °C; see Figs 6 and 7			
	BYV26A to E		–	10.0	A
	BYV26F and G		–	9.6	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Figs 8 and 9			
	BYV26A to E		–	6.0	A
	BYV26F and G		–	6.4	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	30	A
E_{RSM}	non-repetitive peak reverse avalanche energy	I_R = 400 mA; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Figs 12 and 13	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Figs 14 and 15				
	BYV26A to E		–	–	1.3	V
	BYV26F and G		–	–	1.3	V
V_F	forward voltage	I_F = 1 A; see Figs 14 and 15				
	BYV26A to E		–	–	2.50	V
	BYV26F and G		–	–	2.15	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYV26A		300	–	–	V
	BYV26B		500	–	–	V
	BYV26C		700	–	–	V
	BYV26D		900	–	–	V
	BYV26E		1100	–	–	V
	BYV26F		1300	–	–	V
	BYV26G		1500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.16	–	–	5	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.16	–	–	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.20				
	BYV26A to C		–	–	30	ns
	BYV26D and E		–	–	75	ns
	BYV26F and G		–	–	150	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Figs 17 and 18				
	BYV26A to C		–	45	–	pF
	BYV26D and E		–	40	–	pF
	BYV26F and G		–	35	–	pF

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from $I_F = 1$ A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/μs; see Fig.21				
	BYV26A to C		–	–	7	A/μs
	BYV26D and E		–	–	6	A/μs
	BYV26F and G		–	–	5	A/μs

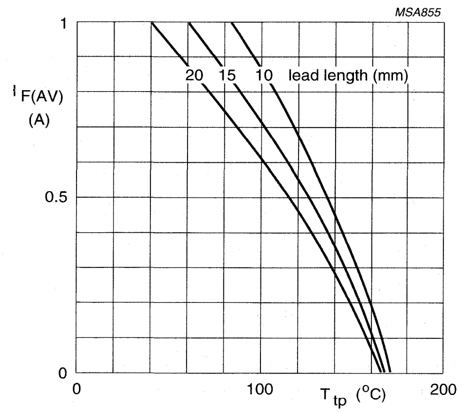
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.19. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

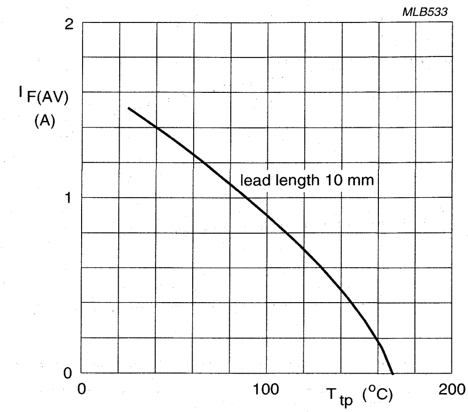


BYV26A to E

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.2 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).

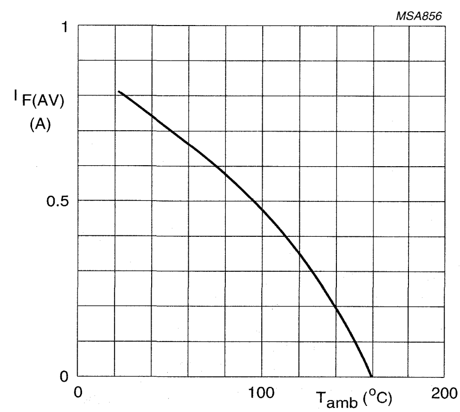


BYV26F and G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Switched mode application.

Fig.3 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).



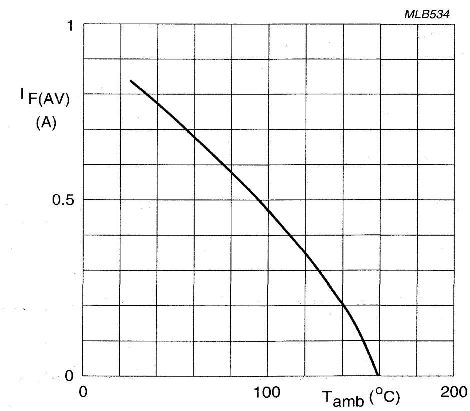
BYV26A to E

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.19.

Switched mode application.

Fig.4 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



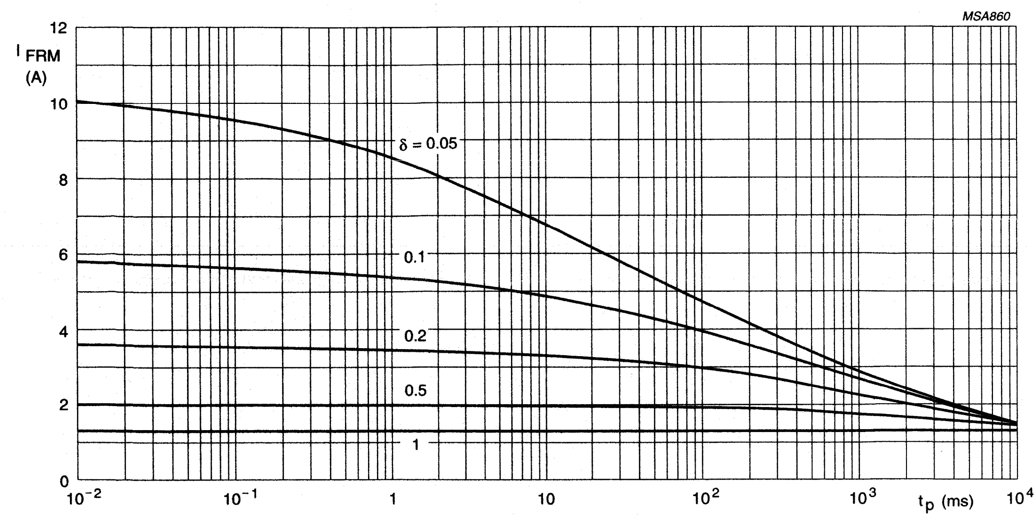
BYV26F and G

a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Device mounted as shown in Fig.19.

Switched mode application.

Fig.5 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).

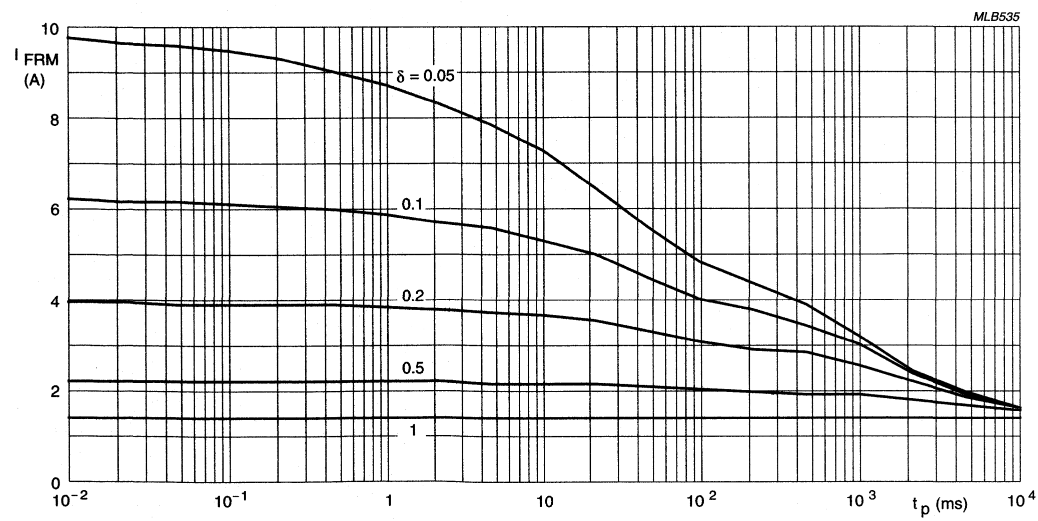


BYV26A to E.

$T_{tp} = 85°C$; $R_{th\ j\text{-}tp} = 46$ K/W.

V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1000$ V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

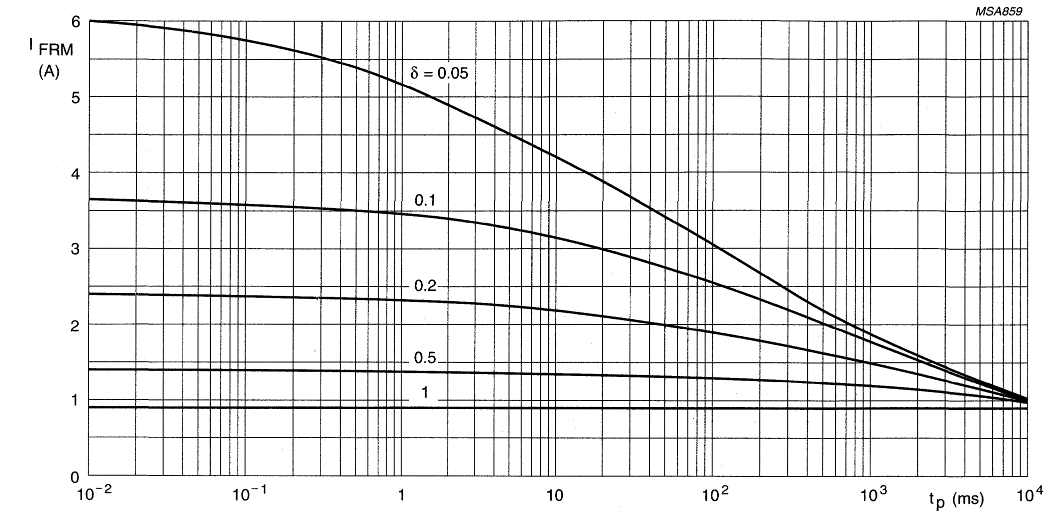


BYV26F and G.

$T_{tp} = 85°C$; $R_{th\ j\text{-}tp} = 46$ K/W.

V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1400$ V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

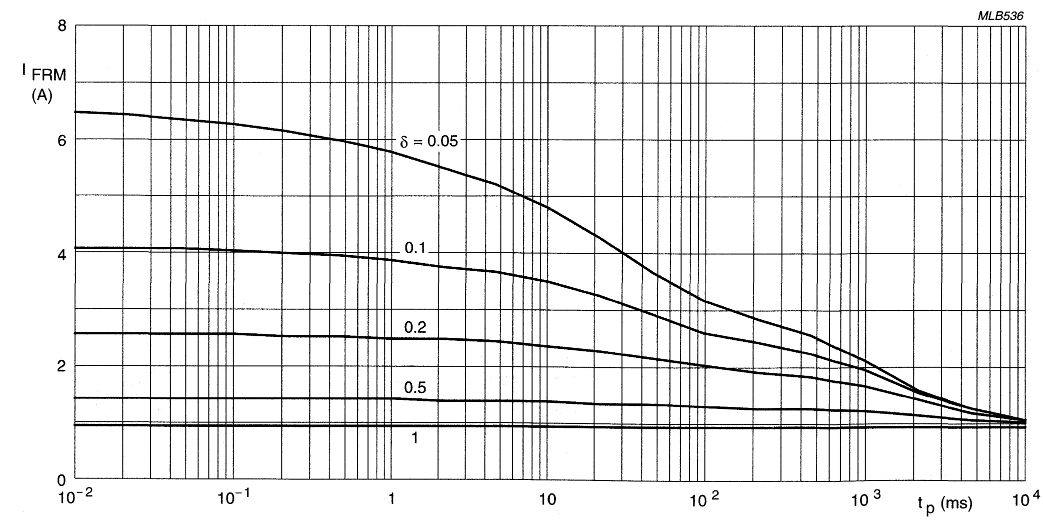


BYV26A to E

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

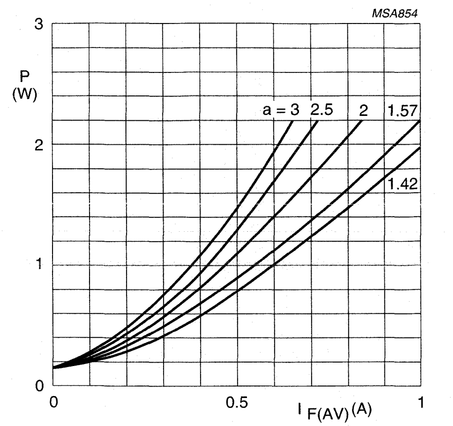


BYV26F and G

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.

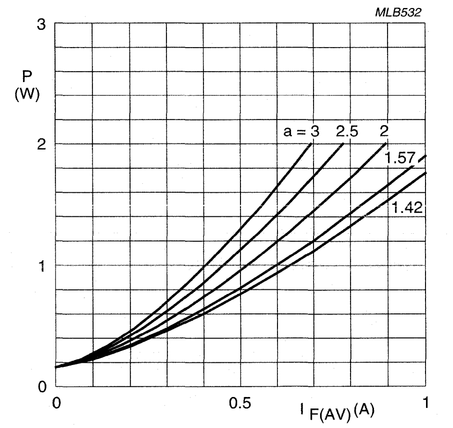
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



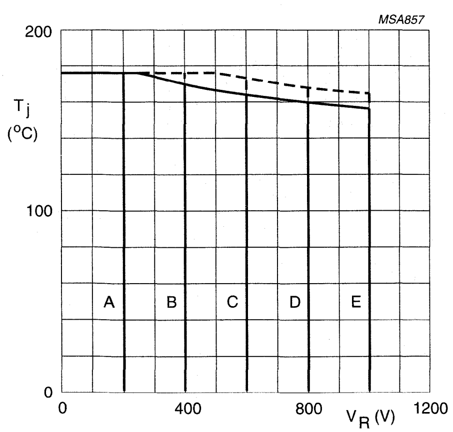
BYV26A to E
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



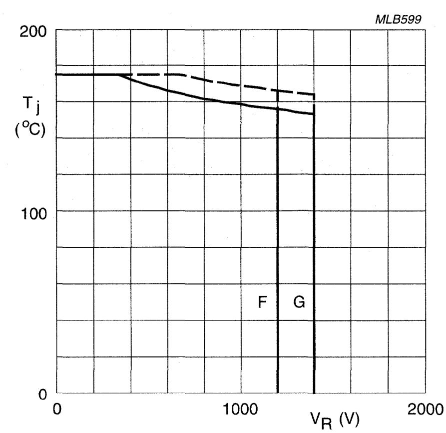
BYV26F and G
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



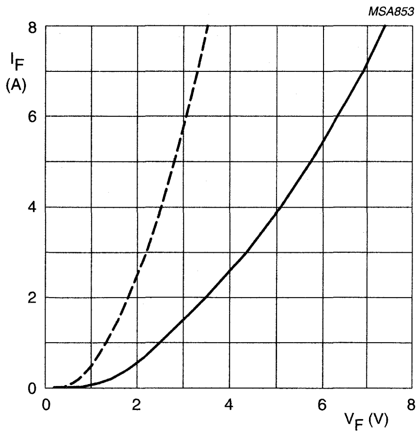
BYV26A to E
Solid line = V_R.
Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.12 Maximum permissible junction temperature as a function of reverse voltage.



BYV26F and G
Solid line = V_R.
Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.13 Maximum permissible junction temperature as a function of reverse voltage.

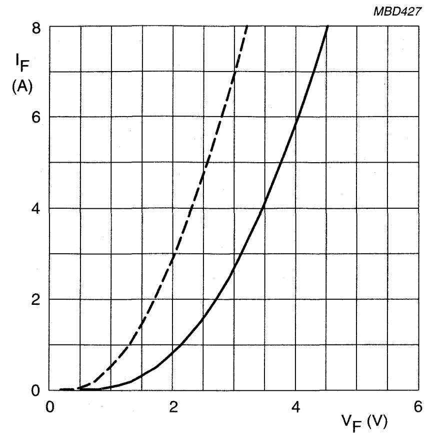


BYV26A to E

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.14 Forward current as a function of forward voltage; maximum values.

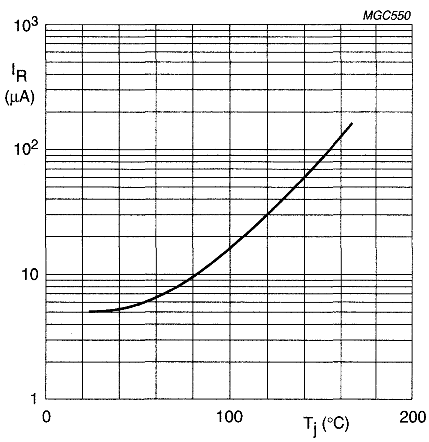


BYV26F and G

Dotted line: T_j = 175 °C.

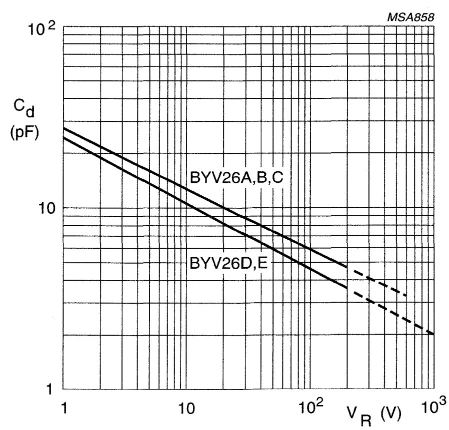
Solid line: T_j = 25 °C.

Fig.15 Forward current as a function of forward voltage; maximum values.



$V_R = V_{RRMmax}$.

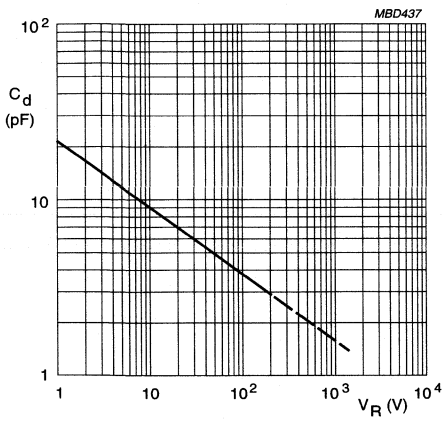
Fig.16 Reverse current as a function of junction temperature; maximum values.



BYV26A to E

f = 1 MHz; T_j = 25 °C.

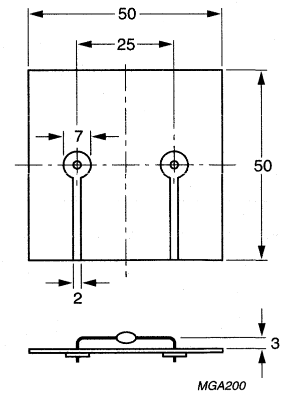
Fig.17 Diode capacitance as a function of reverse voltage, typical values.



BYV26F and G

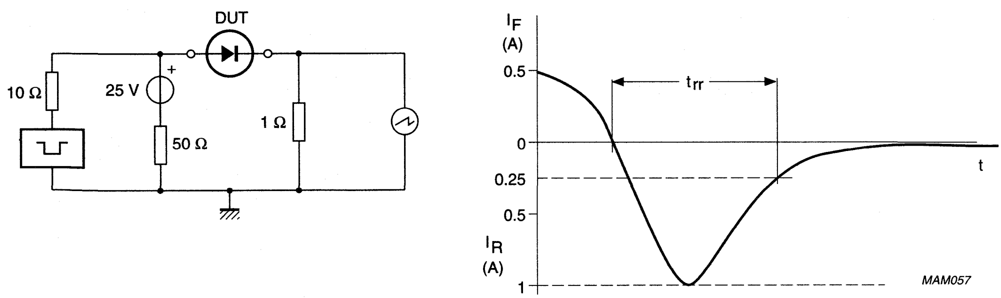
f = 1 MHz; T_j = 25 °C.

Fig.18 Diode capacitance as a function of reverse voltage, typical values.



Dimensions in mm.

Fig.19 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.

Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.20 Test circuit and reverse recovery time waveform and definition.

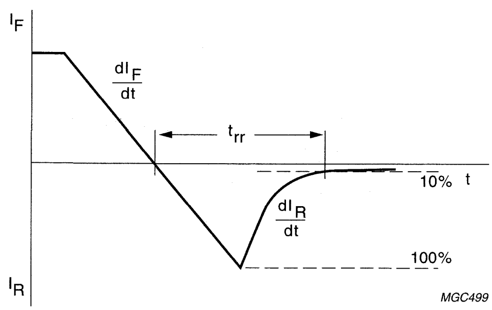


Fig.21 Reverse recovery definitions.

Ultra fast low-loss controlled avalanche rectifiers

BYV27 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

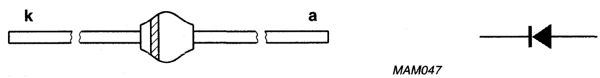


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV27-50		–	50	V
	BYV27-100		–	100	V
	BYV27-150		–	150	V
	BYV27-200		–	200	V
	BYV27-300		–	300	V
	BYV27-400		–	400	V
	BYV27-600		–	600	V
V_R	continuous reverse voltage				
	BYV27-50		–	50	V
	BYV27-100		–	100	V
	BYV27-150		–	150	V
	BYV27-200		–	200	V
	BYV27-300		–	300	V
	BYV27-400		–	400	V
	BYV27-600		–	600	V
$I_{F(AV)}$	average forward current	T_{tp} = 85 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYV27-50 to 200		–	2.0	A
	BYV27-300 and 400		–	1.9	A
	BYV27-600		–	1.6	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.18); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYV27-50 to 200		–	1.30	A
	BYV27-300 and 400		–	1.25	A
	BYV27-600		–	1.00	A
I_{FRM}	repetitive peak forward current	T_{tp} = 85 °C; see Figs 6 and 7			
	BYV27-50 to 400		–	20	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Figs 8 and 9			
	BYV27-50 to 200		–	14	A
	BYV27-300 and 400		–	13	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$			
	BYV27-50 to 400		–	50	A
	BYV27-600		–	40	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 2 A; $T_j = T_{j\,max}$; see Figs 12; 13 and 14				
	BYV27-50 to 200		–	–	0.78	V
	BYV27-300 and 400		–	–	0.82	V
	BYV27-600		–	–	1.05	V
V_F	forward voltage	I_F = 2 A; see Figs 12; 13 and 14				
	BYV27-50 to 200		–	–	0.98	V
	BYV27-300 and 400		–	–	1.05	V
	BYV27-600		–	–	1.25	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYV27-50		55	–	–	V
	BYV27-100		110	–	–	V
	BYV27-150		165	–	–	V
	BYV27-200		220	–	–	V
	BYV27-300		330	–	–	V
	BYV27-400		440	–	–	V
	BYV27-600		675	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.15	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.15	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.20				
	BYV27-50 to 200		–	–	25	ns
	BYV27-300 to 600		–	–	50	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Figs 16 and 17				
	BYV27-50 to 200		–	100	–	pF
	BYV27-300 and 400		–	80	–	pF

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$\left\lvert \frac{dI_R}{dt} \right\rvert$	maximum slope of reverse recovery current BYV27-50 to 400	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/µs; see Fig.19	–	–	4	A/µs

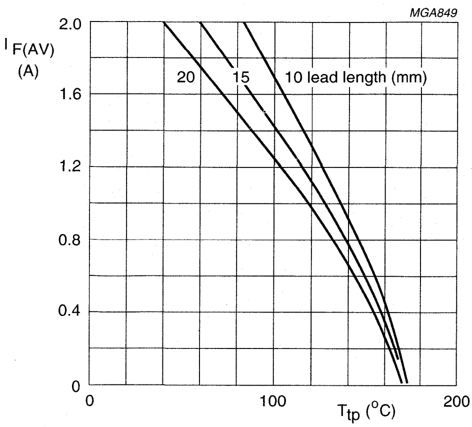
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.18. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

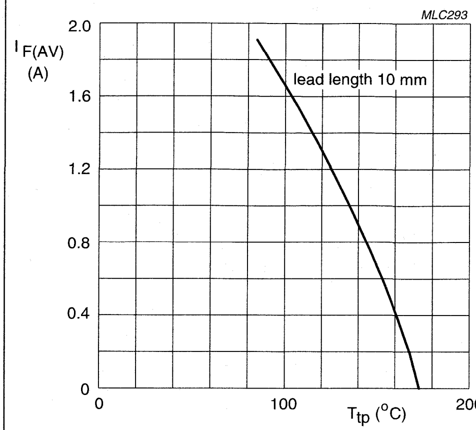


BYV27-50 to 200

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).

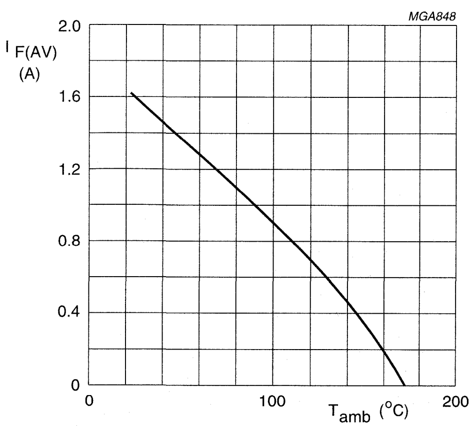


BYV27-300 and 400

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.3 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



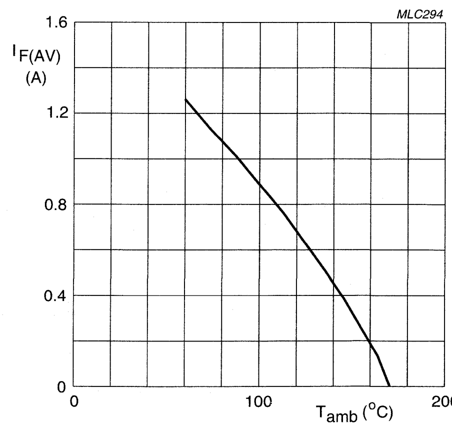
BYV27-50 to 200

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Device mounted as shown in Fig.18.

Switched mode application.

Fig.4 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



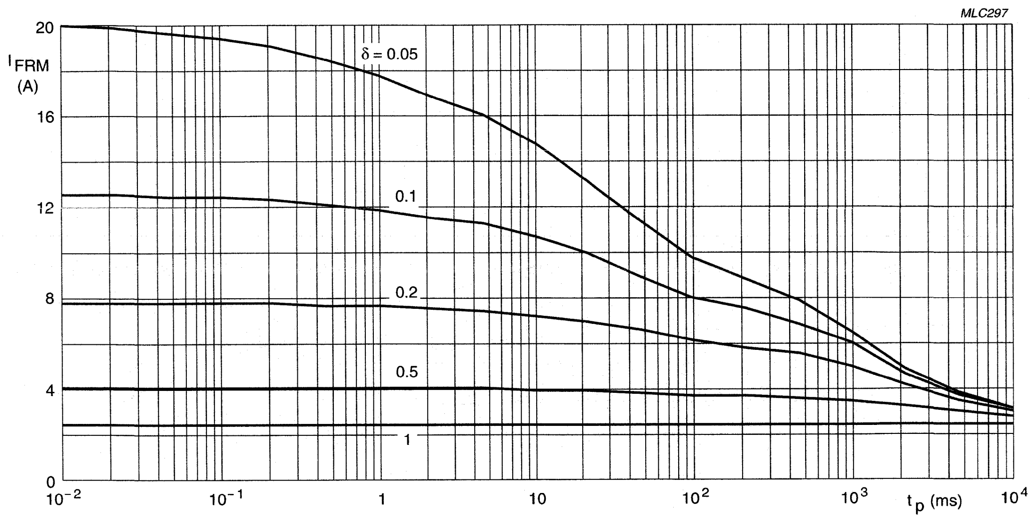
BYV27-300 and 400

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Device mounted as shown in Fig.18.

Switched mode application.

Fig.5 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

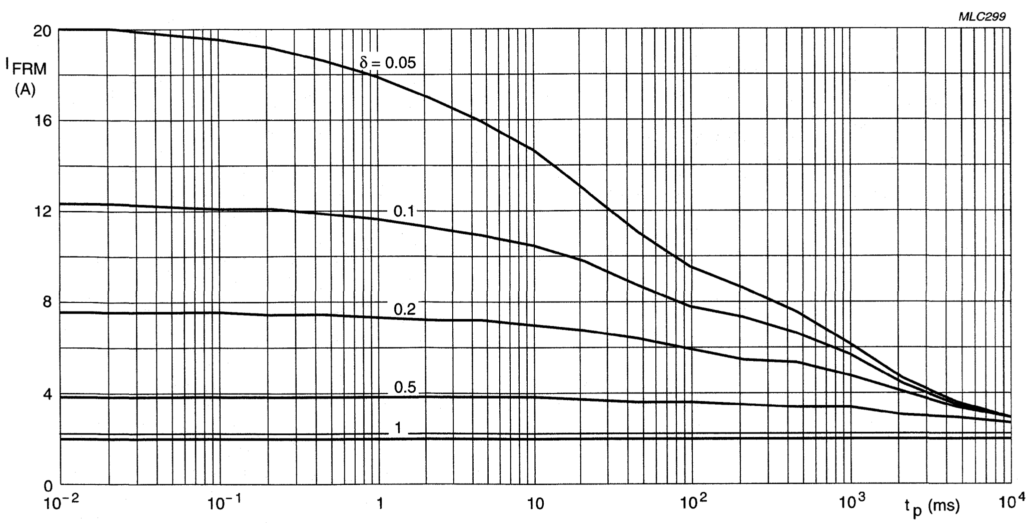


BYV27-50 to 200

T_{tp} = 85°C; $R_{th\ j\text{-}tp}$ = 46 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

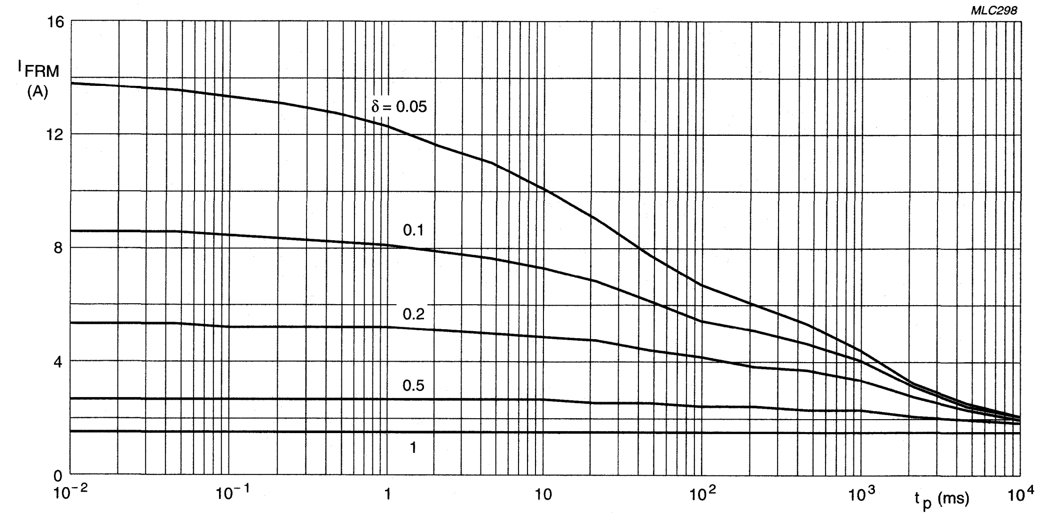


BYV27-300 and 400

T_{tp} = 85°C; $R_{th\ j\text{-}tp}$ = 46 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 400 V.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

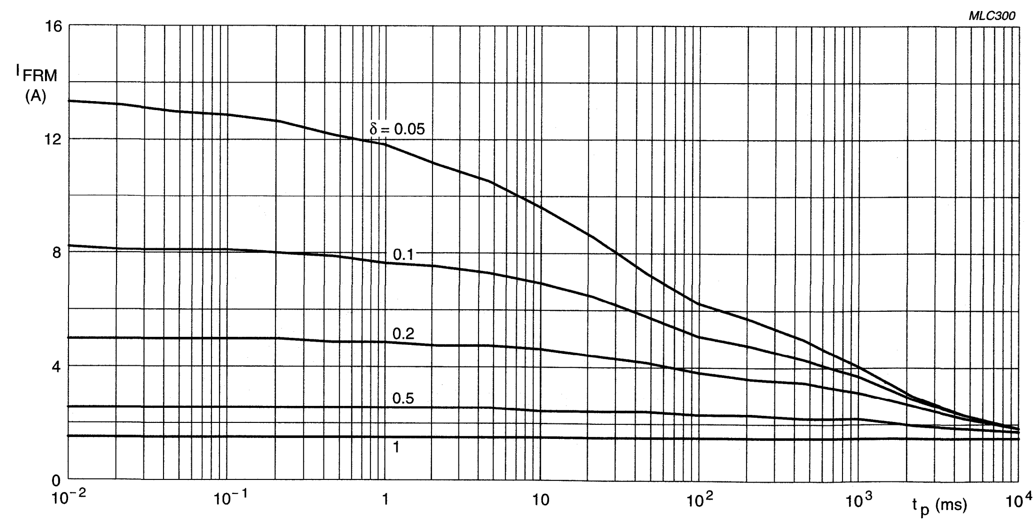


BYV27-50 to 200

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

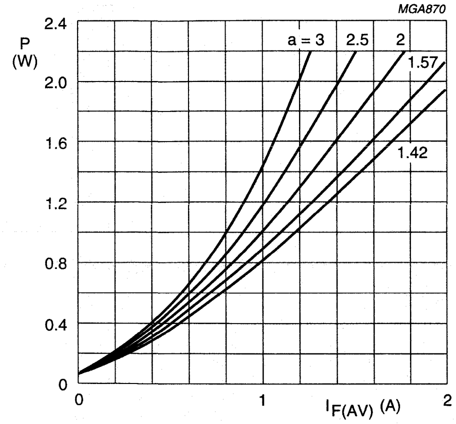


BYV27-300 and 400

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 400 V.

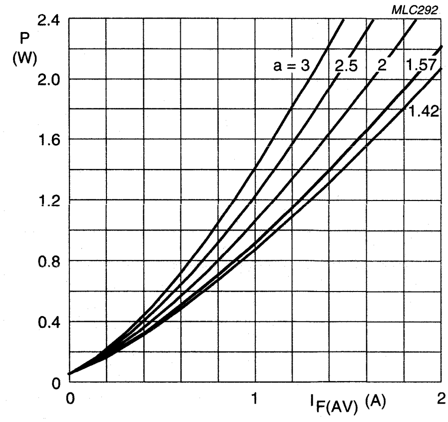
Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYV27-50 to 200

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

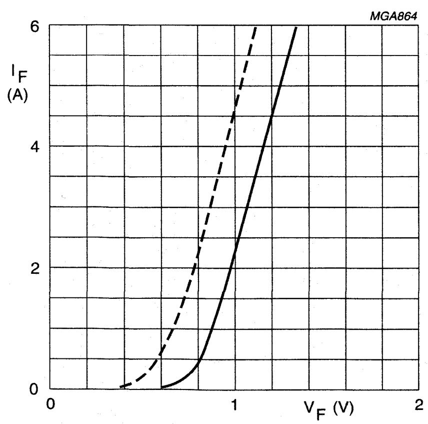
Fig.10 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYV27-300 and 400

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.11 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

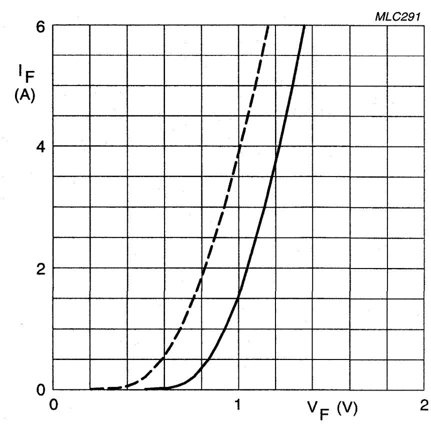


BYV27-50 to 200

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.12 Forward current as a function of forward voltage; maximum values.

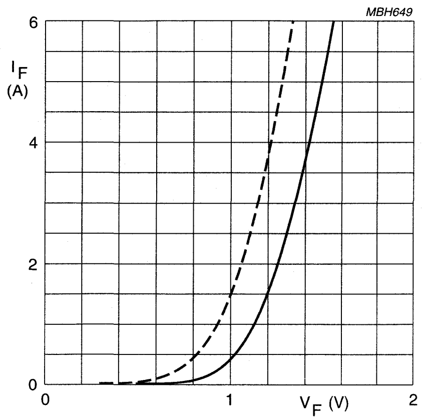


BYV27-300 and 400

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.13 Forward current as a function of forward voltage; maximum values.

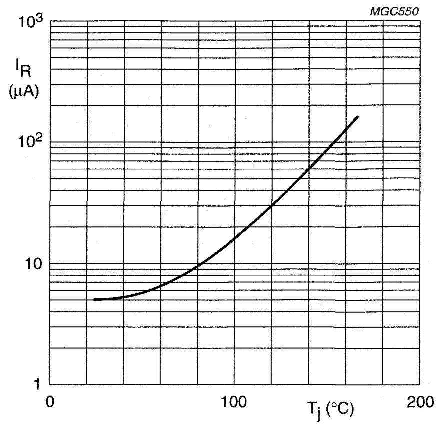


BYV27-600

Dotted line: T_j = 175 °C.

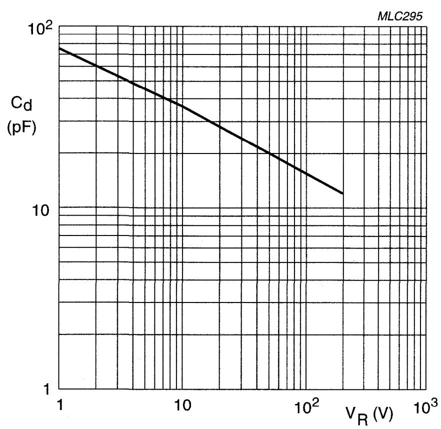
Solid line: T_j = 25 °C.

Fig.14 Forward current as a function of forward voltage; maximum values.



$V_R = V_{RRMmax}$.

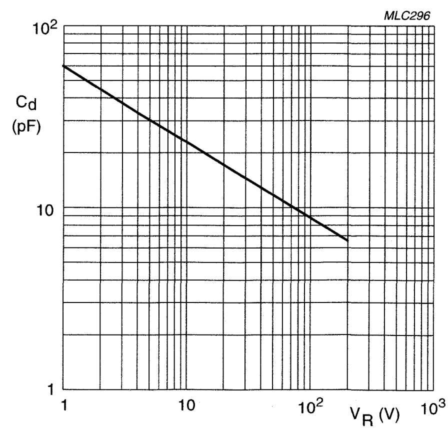
Fig.15 Reverse current as a function of junction temperature; maximum values.



BYV27-50 to 200

f = 1 MHz; T_j = 25 °C.

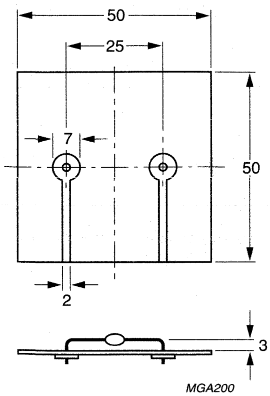
Fig.16 Diode capacitance as a function of reverse voltage; typical values.



BYV27-300 and 400

f = 1 MHz; T_j = 25 °C.

Fig.17 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.18 Device mounted on a printed-circuit board.

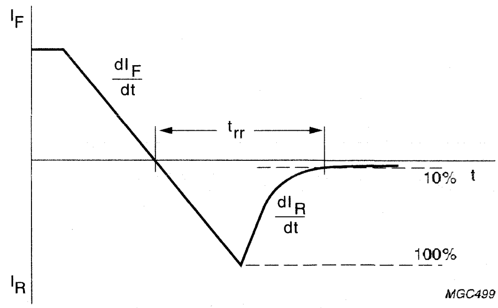
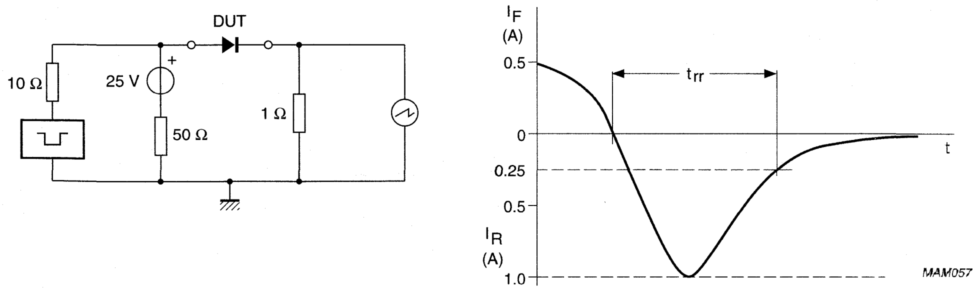


Fig.19 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.20 Test circuit and reverse recovery time waveform and definition.

Ultra fast low-loss controlled avalanche rectifiers

BYV28 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

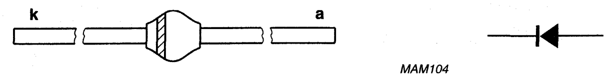


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV28-50		–	50	V
	BYV28-100		–	100	V
	BYV28-150		–	150	V
	BYV28-200		–	200	V
	BYV28-300		–	300	V
	BYV28-400		–	400	V
	BYV28-600		–	600	V
V_R	continuous reverse voltage				
	BYV28-50		–	50	V
	BYV28-100		–	100	V
	BYV28-150		–	150	V
	BYV28-200		–	200	V
	BYV28-300		–	300	V
	BYV28-400		–	400	V
	BYV28-600		–	600	V
$I_{F(AV)}$	average forward current	T_{tp} = 85 °C; lead length = 10 mm; see Fig.2; averaged over any 20 ms period; see also Fig.6			
	BYV28-50 to 400		–	3.5	A
	BYV28-600		–	3.0	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.13); see Fig.3; averaged over any 20 ms period; see also Fig.6			
	BYV28-50 to 400		–	1.90	A
	BYV28-600		–	1.45	A
I_{FRM}	repetitive peak forward current	T_{tp} = 85 °C; see Fig.4			
	BYV28-50 to 400		–	30	A
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Fig.5			
	BYV28-50 to 400		–	17	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	90	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3.5 A; $T_j = T_{j\,max}$; see Figs 7; 8 and 9				
	BYV28-50 to 200		–	–	0.80	V
	BYV28-300 and 400		–	–	0.83	V
	BYV28-600		–	–	1.05	V
V_F	forward voltage	I_F = 3.5 A; see Figs 7; 8 and 9				
	BYV28-50 to 200		–	–	1.02	V
	BYV28-300 and 400		–	–	1.05	V
	BYV28-600		–	–	1.25	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYV28-50		55	–	–	V
	BYV28-100		110	–	–	V
	BYV28-150		165	–	–	V
	BYV28-200		220	–	–	V
	BYV28-300		330	–	–	V
	BYV28-400		440	–	–	V
	BYV28-600		675	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.10	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig. 10	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.15				
	BYV28-50 to 200		–	–	25	ns
	BYV28-300 to 600		–	–	50	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Figs 11 and 12				
	BYV28-50 to 200		–	190	–	pF
	BYV28-300 and 400		–	150	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = –1 A/μs; see Fig.14				
	BYV28-50 to 400		–	–	4	A/μs

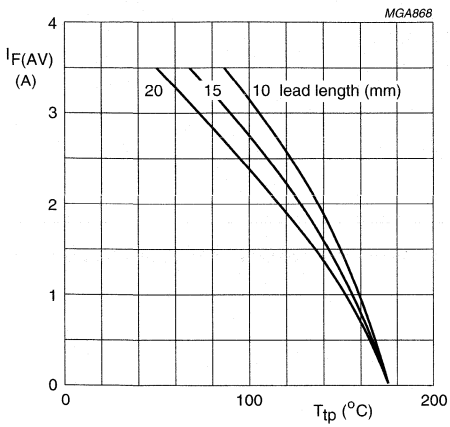
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.13. For more information please refer to the *'General Part of Handbook SC01'*.

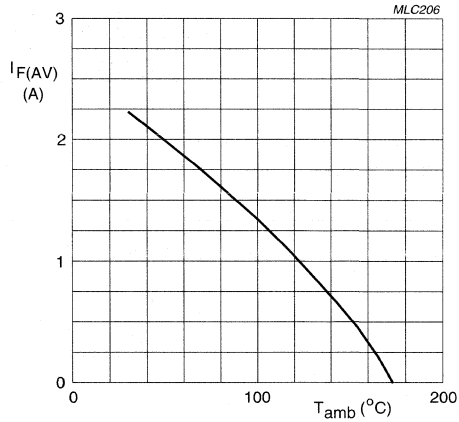
GRAPHICAL DATA



BYV28-50 to 400

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

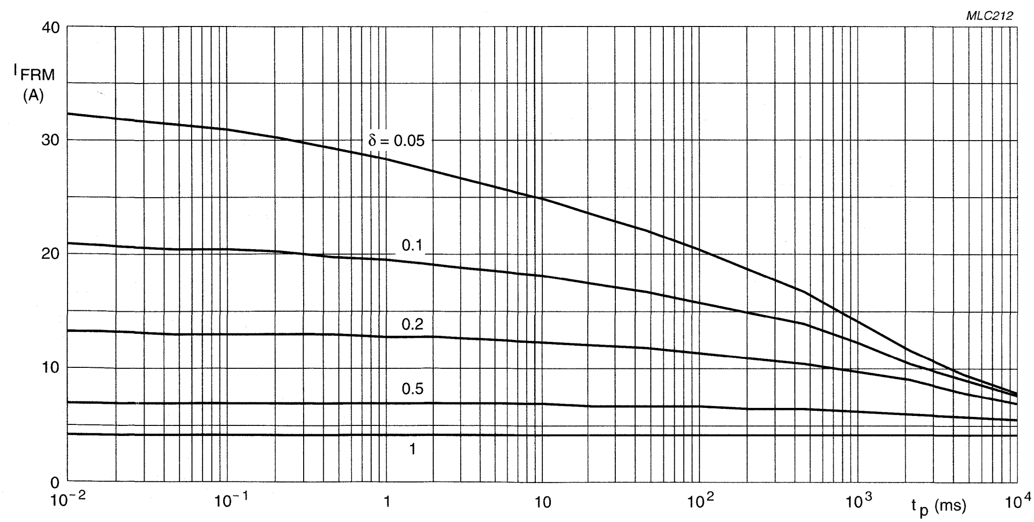
Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



BYV28-50 to 400

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5; switched mode application.
Device mounted as shown in Fig.13.

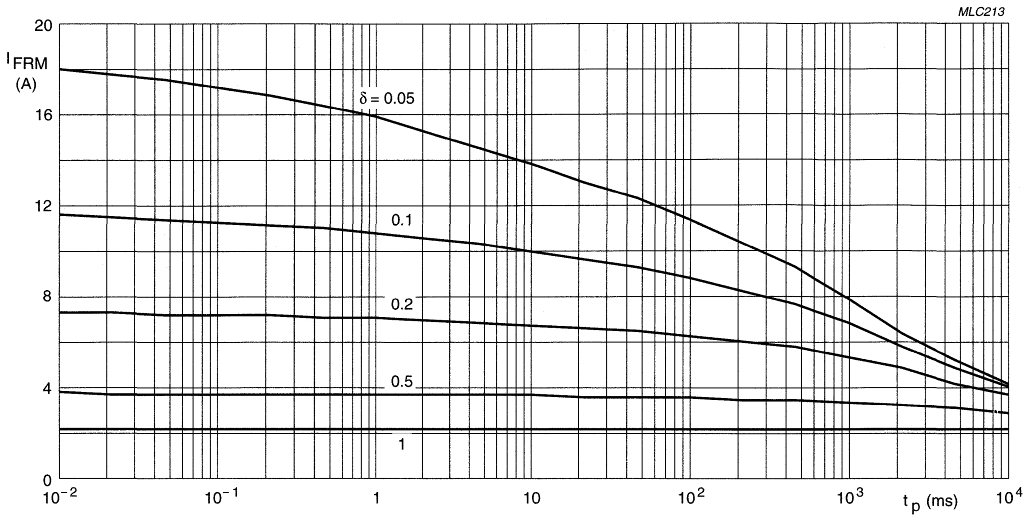
Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYV28-50 to 400

T_{tp} = 85°C; $R_{th\ j\text{-}tp}$ = 25 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

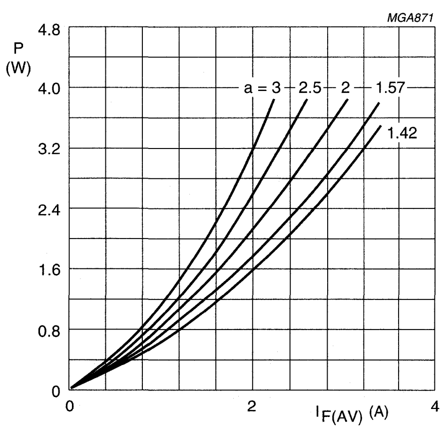


BYV28-50 to 400

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 75 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 200 V.

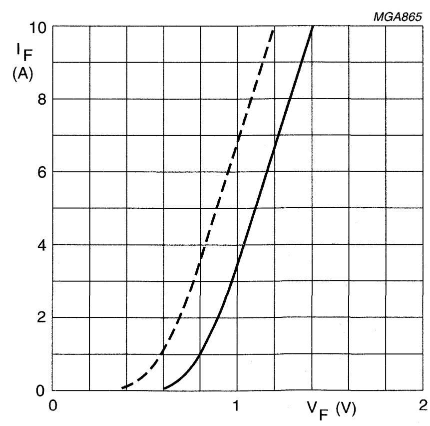
Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYV28-50 to 400

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

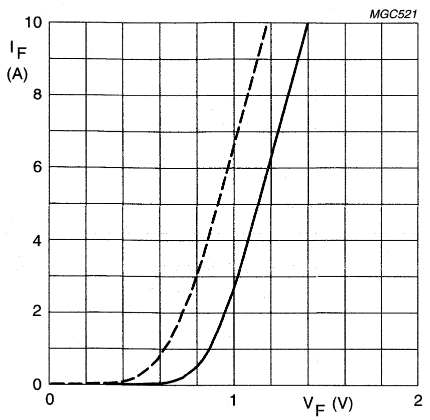


BYV28-50 to 200

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.7 Forward current as a function of forward voltage; maximum values.

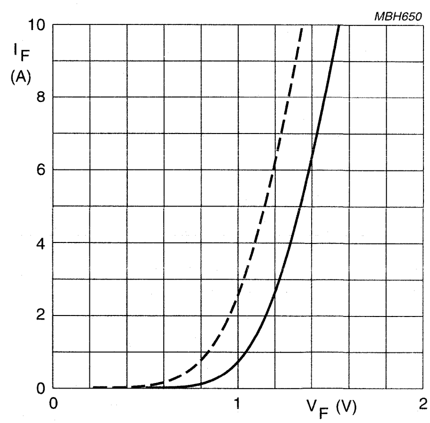


BYV28-300 and 400

Dotted line: T_j = 175 °C.

Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.

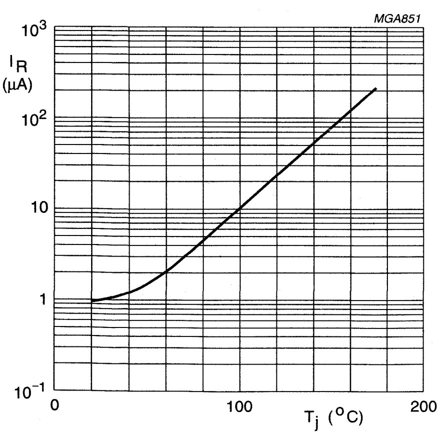


BYV28-600

Dotted line: T_j = 175 °C.

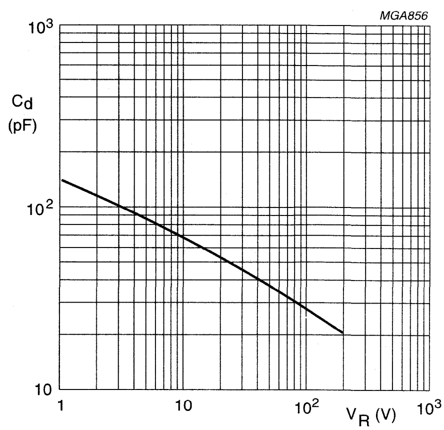
Solid line: T_j = 25 °C.

Fig.9 Forward current as a function of forward voltage; maximum values.



$V_R = V_{RRMmax}$.

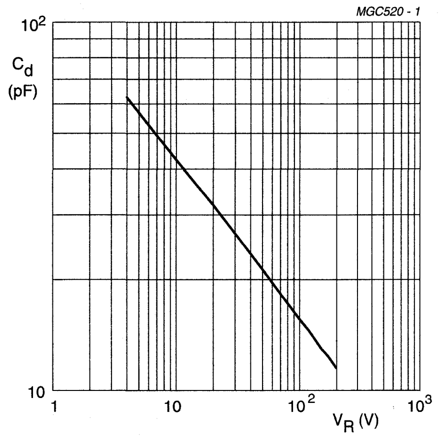
Fig.10 Reverse current as a function of junction temperature; maximum values.



BYV28-50 to 200

f = 1 MHz; T_j = 25 °C.

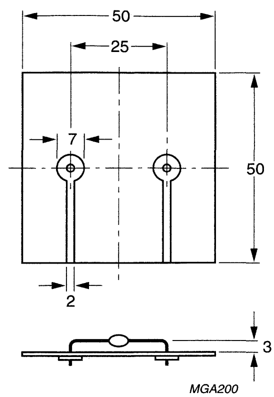
Fig.11 Diode capacitance as a function of reverse voltage; typical values.



BYV28-300 and 400

f = 1 MHz; T_j = 25 °C.

Fig.12 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.13 Device mounted on a printed-circuit board.

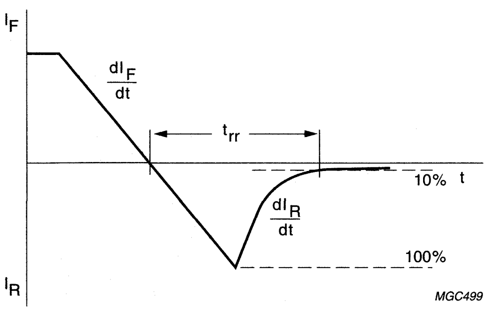
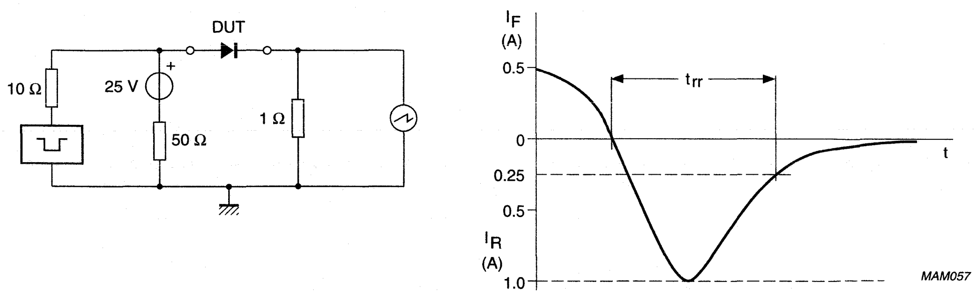


Fig.14 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.15 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery controlled avalanche rectifiers

BYV36 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

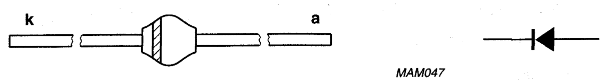


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV36A		–	200	V
	BYV36B		–	400	V
	BYV36C		–	600	V
	BYV36D		–	800	V
	BYV36E		–	1000	V
	BYV36F		–	1200	V
	BYV36G		–	1400	V
V_R	continuous reverse voltage				
	BYV36A		–	200	V
	BYV36B		–	400	V
	BYV36C		–	600	V
	BYV36D		–	800	V
	BYV36E		–	1000	V
	BYV36F		–	1200	V
	BYV36G		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 60 °C; lead length = 10 mm; see Figs 2; 3 and 4 averaged over any 20 ms period; see also Figs 14; 15 and 16			
	BYV36A to C		–	1.6	A
	BYV36D and E		–	1.5	A
	BYV36F and G		–	1.5	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.25); see Figs 5; 6 and 7 averaged over any 20 ms period; see also Figs 14; 15 and 16			
	BYV36A to C		–	0.87	A
	BYV36D and E		–	0.81	A
	BYV36F and G		–	0.81	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{tp} = 60 °C; see Figs 8; 9 and 10			
	BYV36A to C		–	18	A
	BYV36D and E		–	17	A
	BYV36F and G		–	15	A
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Figs 11; 12 and 13			
	BYV36A to C		–	9	A
	BYV36D and E		–	8	A
	BYV36F and G		–	8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	30	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Figs 17 and 18	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Figs 19; 20 and 21				
	BYV36A to C		–	–	1.00	V
	BYV36D and E		–	–	1.05	V
	BYV36F and G		–	–	1.05	V
V_F	forward voltage	I_F = 1 A; see Figs 19; 20 and 21				
	BYV36A to C		–	–	1.35	V
	BYV36D and E		–	–	1.45	V
	BYV36F and G		–	–	1.45	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYV36A		300	–	–	V
	BYV36B		500	–	–	V
	BYV36C		700	–	–	V
	BYV36D		900	–	–	V
	BYV36E		1100	–	–	V
	BYV36F		1300	–	–	V
	BYV36G		1500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.22	–	–	5	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.22	–	–	150	µA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
t_{rr}	reverse recovery time	when switched from $I_F = 0.5$ A to $I_R = 1$ A; measured at $I_R = 0.25$ A; see Fig. 26				
	BYV36A to C		–	–	100	ns
	BYV36D and E		–	–	150	ns
	BYV36F and G		–	–	250	ns
C_d	diode capacitance	f = 1 MHz; $V_R = 0$ V; see Figs 23 and 24				
	BYV36A to C		–	45	–	pF
	BYV36D and E		–	40	–	pF
	BYV36F and G		–	35	–	pF
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from $I_F = 1$ A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/µs; see Fig.27				
	BYV36A to C		–	–	7	A/µs
	BYV36D and E		–	–	6	A/µs
	BYV36F and G		–	–	5	A/µs

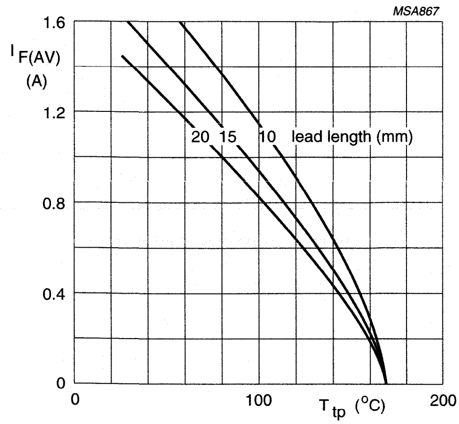
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.25. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

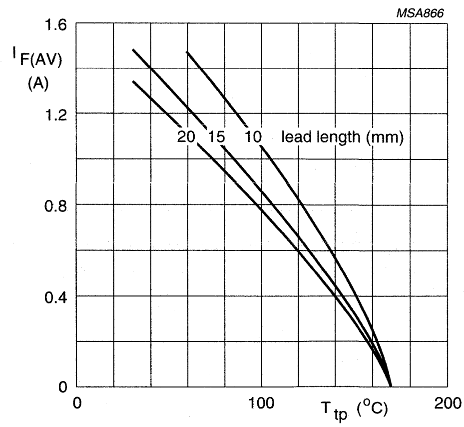


BYV36A to C

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.2 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).

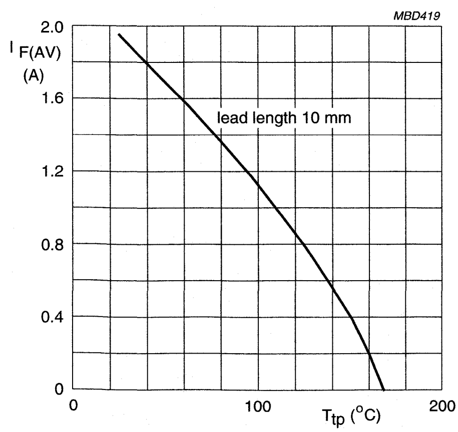


BYV36D and E

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.3 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).

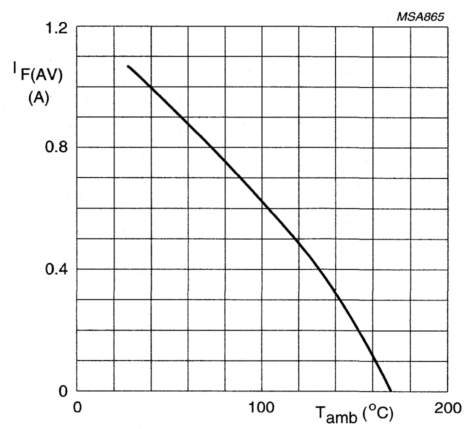


BYV36F and G

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Switched mode application.

Fig.4 Maximum average forward current as a function of tie-point temperature (including losses due to reverse leakage).



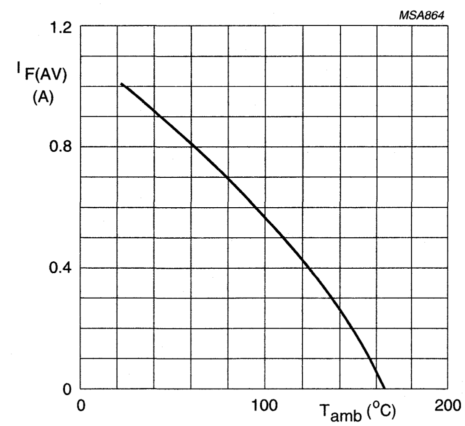
BYV36A to C

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.

Device mounted as shown in Fig.25.

Switched mode application.

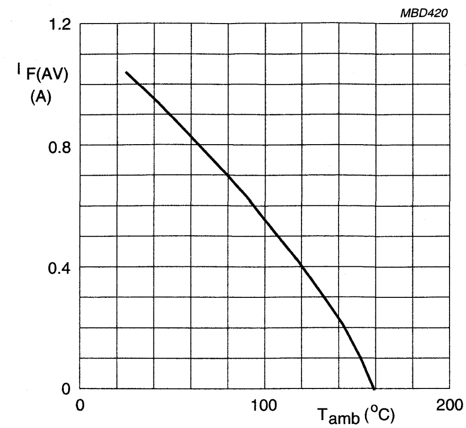
Fig.5 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYV36D and E

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.25.
Switched mode application.

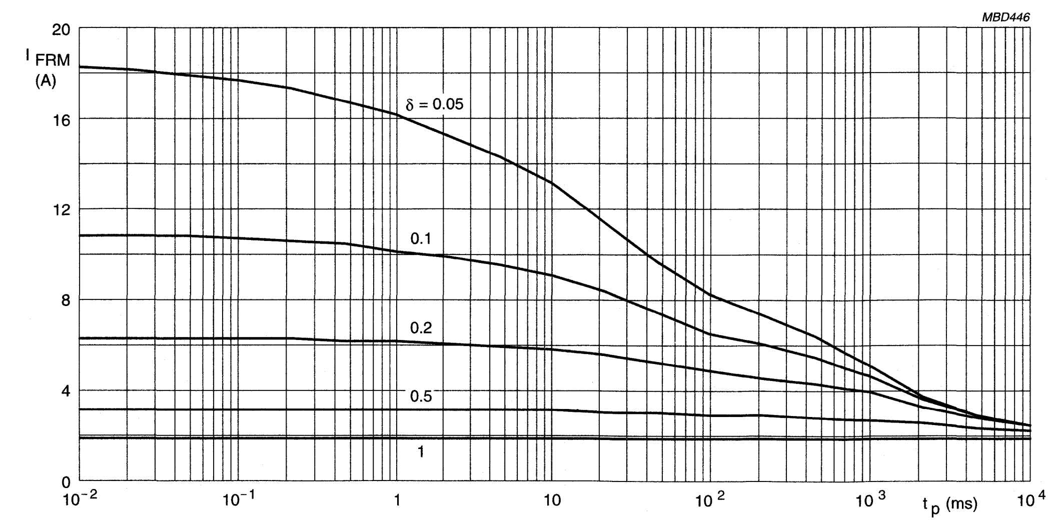
Fig.6 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYV36F and G

a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.25.
Switched mode application.

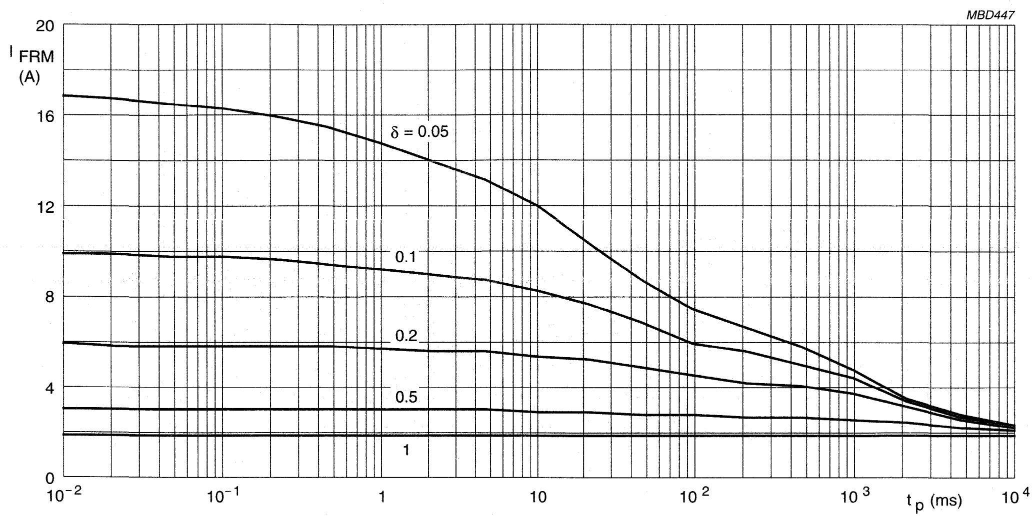
Fig.7 Maximum average forward current as a function of ambient temperature (including losses due to reverse leakage).



BYV36A to C

T_{tp} = 60°C; $R_{th\ j\text{-}tp}$ = 46 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.8 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

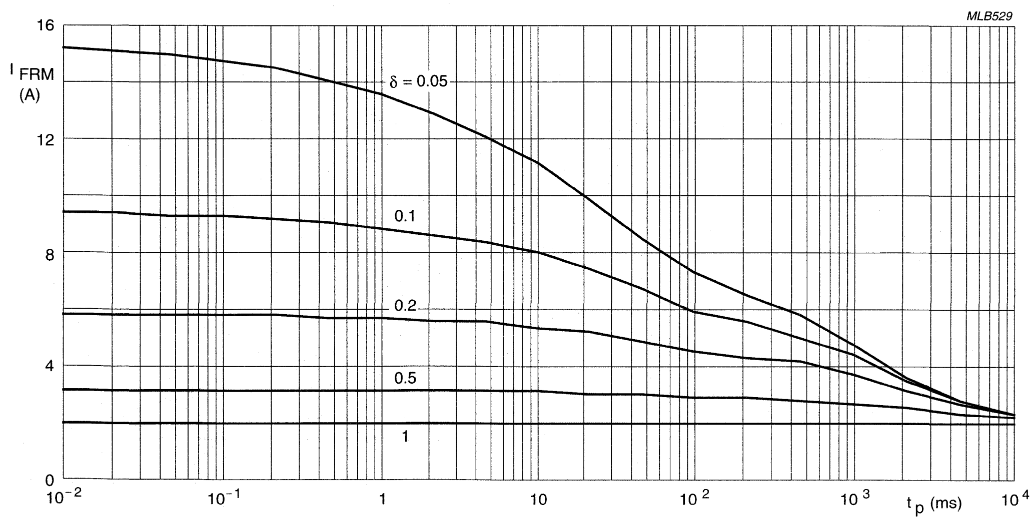


BYV36D and E

$T_{tp} = 60°C$; $R_{th\ j\text{-}tp} = 46$ K/W.

V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1000$ V.

Fig.9 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

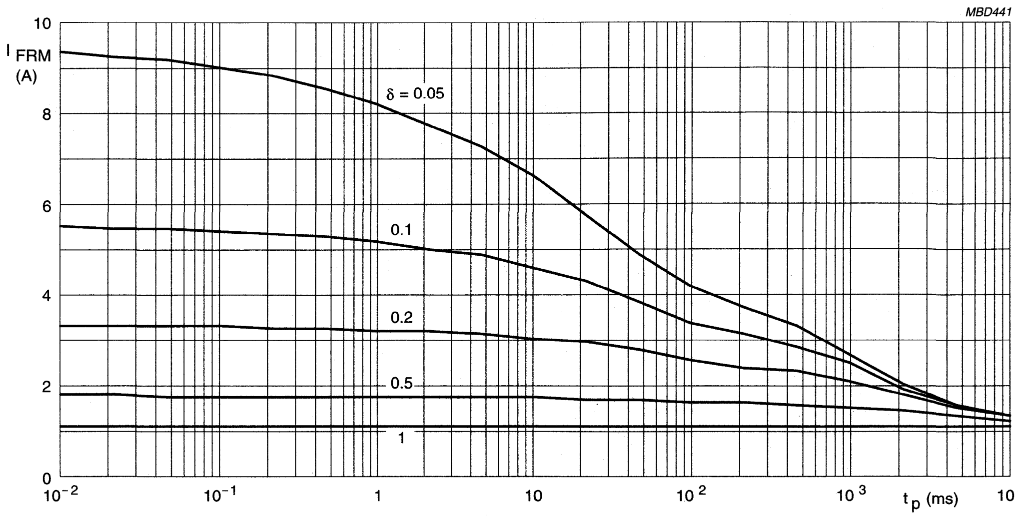


BYV36F and G

$T_{tp} = 60°C$; $R_{th\ j\text{-}tp} = 46$ K/W.

V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1400$ V.

Fig.10 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

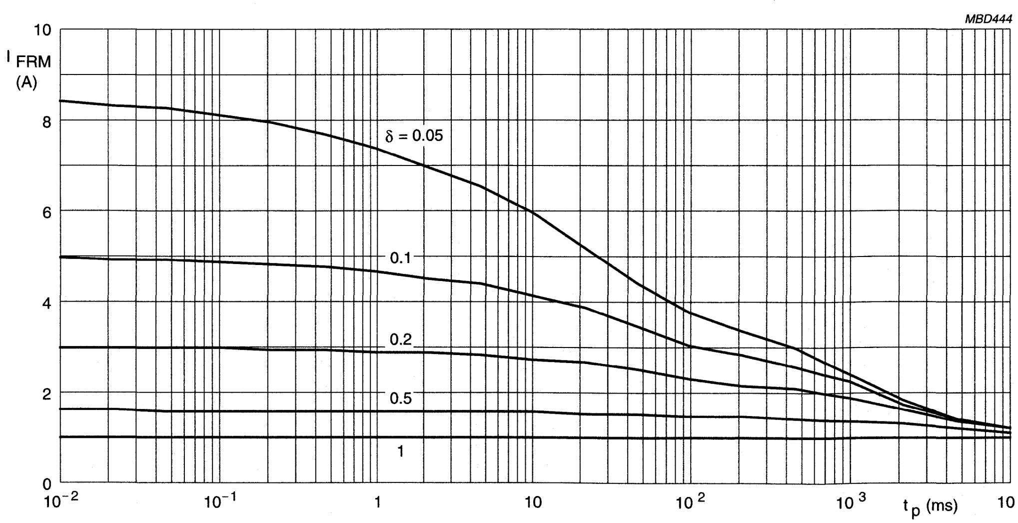


BYV36A to C

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.11 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

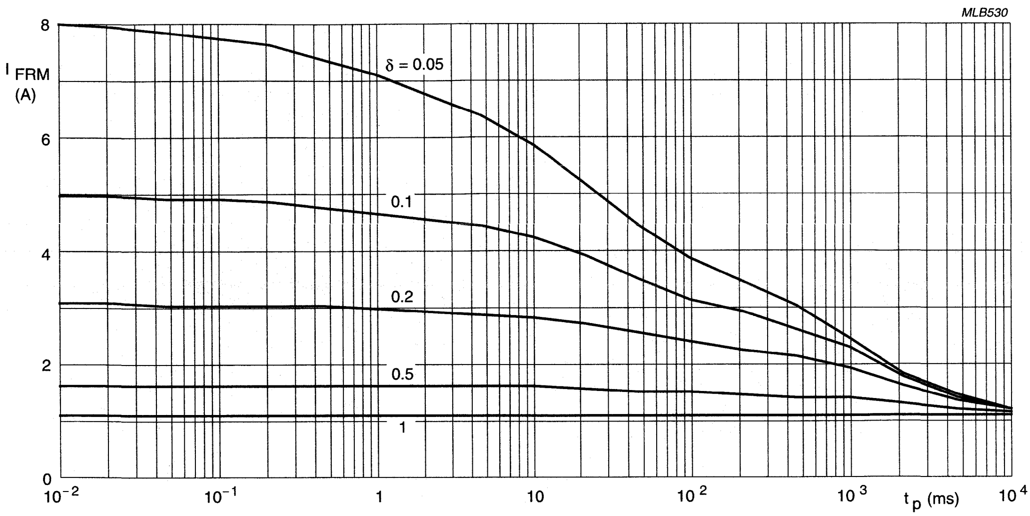


BYV36D and E

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.12 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

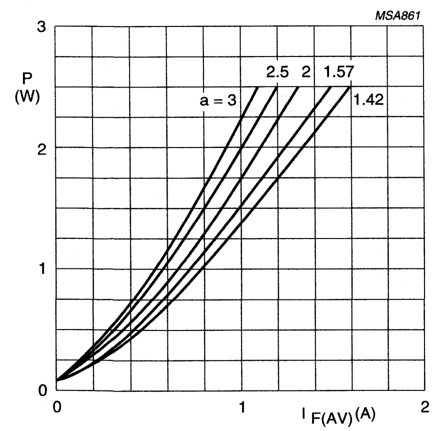


BYV36F and G

T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.

V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

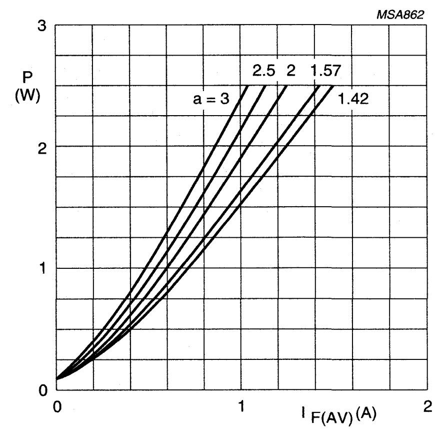
Fig.13 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



BYV36A to C

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

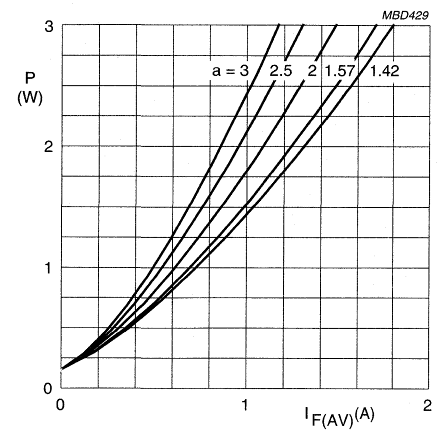
Fig.14 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYV36D and E

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

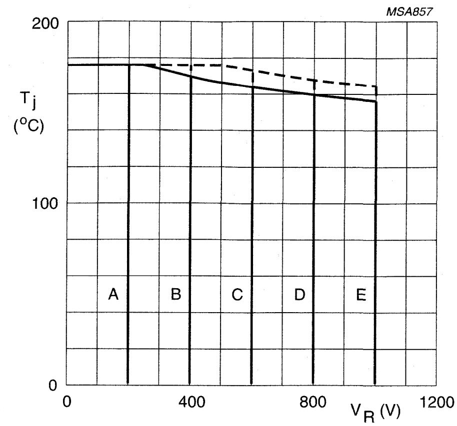
Fig.15 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



BYV36F and G

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.16 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

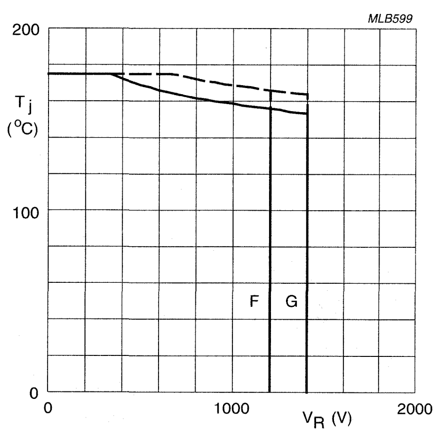


BYV36A to E

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.17 Maximum permissible junction temperature as a function of reverse voltage.

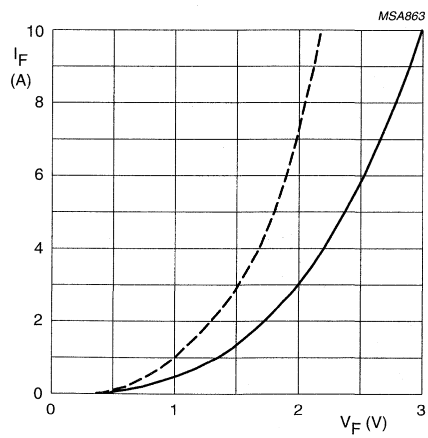


BYV36F and G

Solid line = V_R.

Dotted line = V_{RRM}; $\delta = 0.5$.

Fig.18 Maximum permissible junction temperature as a function of reverse voltage.

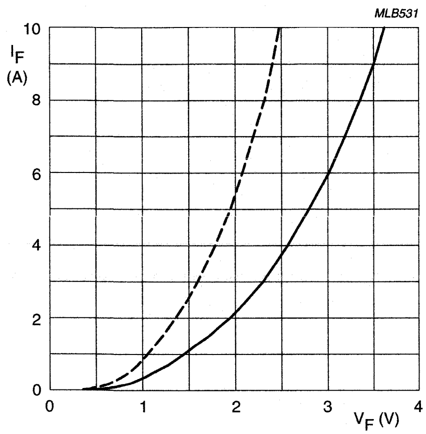


BYV36A to C

Dotted line: $T_j = 175$ °C.

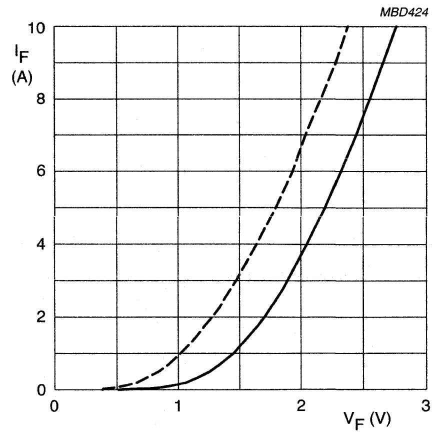
Solid line: $T_j = 25$ °C.

Fig.19 Forward current as a function of forward voltage; maximum values.



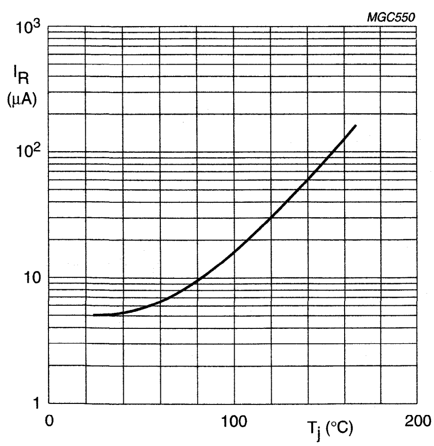
BYV36D and E
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.20 Forward current as a function of forward voltage; maximum values.



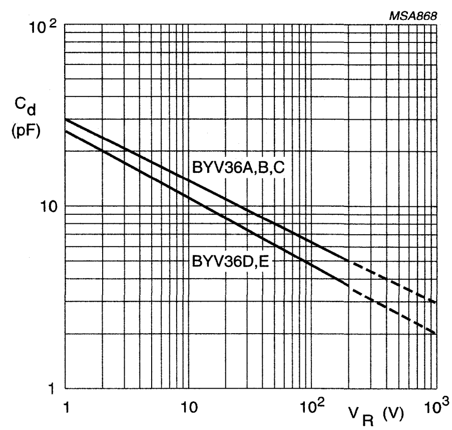
BYV36F and G
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.21 Forward current as a function of forward voltage; maximum values.



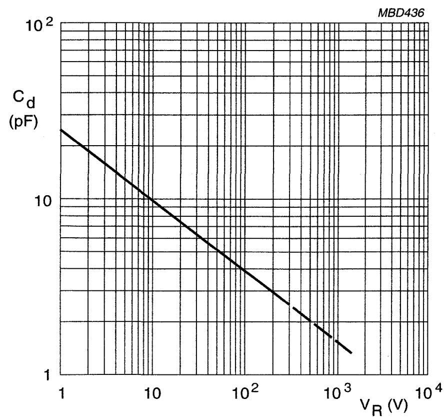
$V_R = V_{RRMmax}$.

Fig.22 Reverse current as a function of junction temperature; maximum values.



BYV36A to E.
f = 1 MHz; T_j = 25 °C.

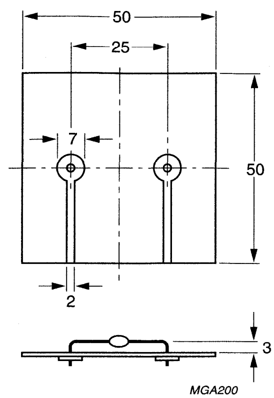
Fig.23 Diode capacitance as a function of reverse voltage, typical values.



BYV36F and G.

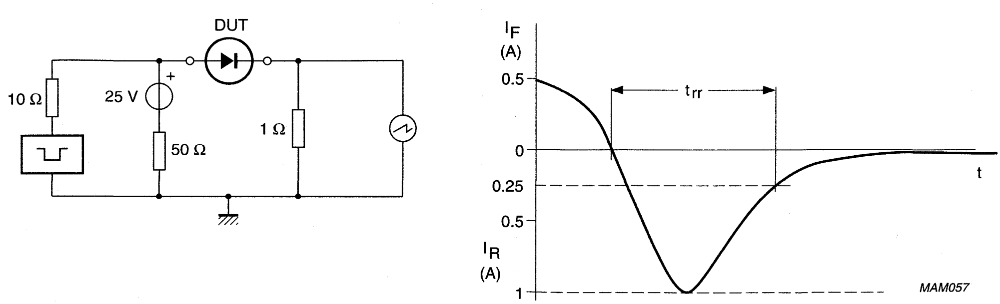
f = 1 MHz; T_j = 25 °C.

Fig.24 Diode capacitance as a function of reverse voltage, typical values.



Dimensions in mm.

Fig.25 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.

Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.26 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery controlled avalanche rectifiers

BYV36 series

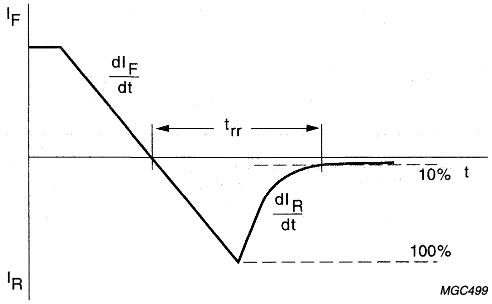


Fig.27 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYV95 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

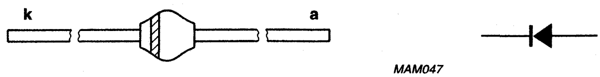


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV95A		–	200	V
	BYV95B		–	400	V
	BYV95C		–	600	V
V_R	continuous reverse voltage				
	BYV95A		–	200	V
	BYV95B		–	400	V
	BYV95C		–	600	V
$I_{F(AV)}$	average forward current	T_{tp} = 65 °C; lead length = 10 mm see Fig. 2; averaged over any 20 ms period; see also Fig. 6	–	1.5	A
		T_{amb} = 65 °C; PCB mounting (see Fig.11); see Fig. 3; averaged over any 20 ms period; see also Fig. 6	–	0.8	A
I_{FRM}	repetitive peak forward current	T_{tp} = 65 °C; see Fig. 4	–	17	A
		T_{amb} = 65 °C; see Fig. 5	–	9	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	35	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig. 7	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3 A; $T_j = T_{j\,max}$; see Fig. 8	–	–	1.35	V
		I_F = 3 A; see Fig. 8	–	–	1.60	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYV95A		300	–	–	V
	BYV95B		500	–	–	V
	BYV95C		700	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig. 9	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig. 9	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig. 12	–	–	250	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig. 10	–	45	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/μs; see Fig.13	–	–	7	A/μs

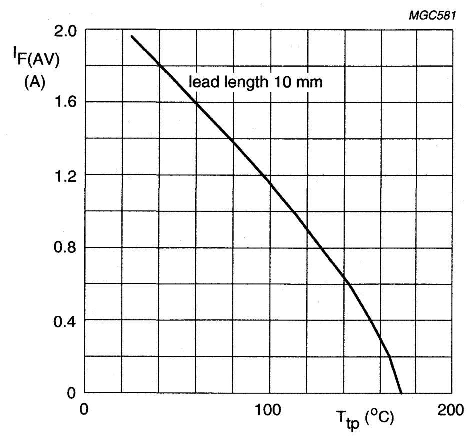
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

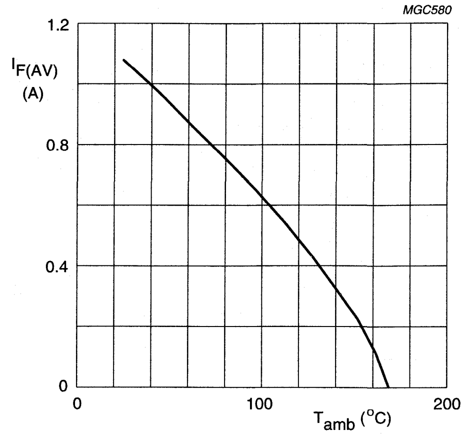
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



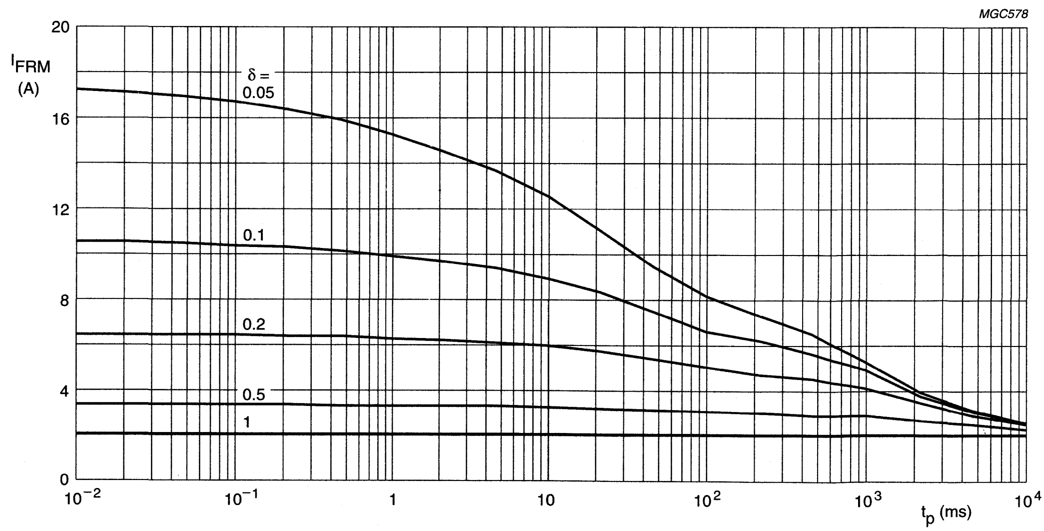
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).

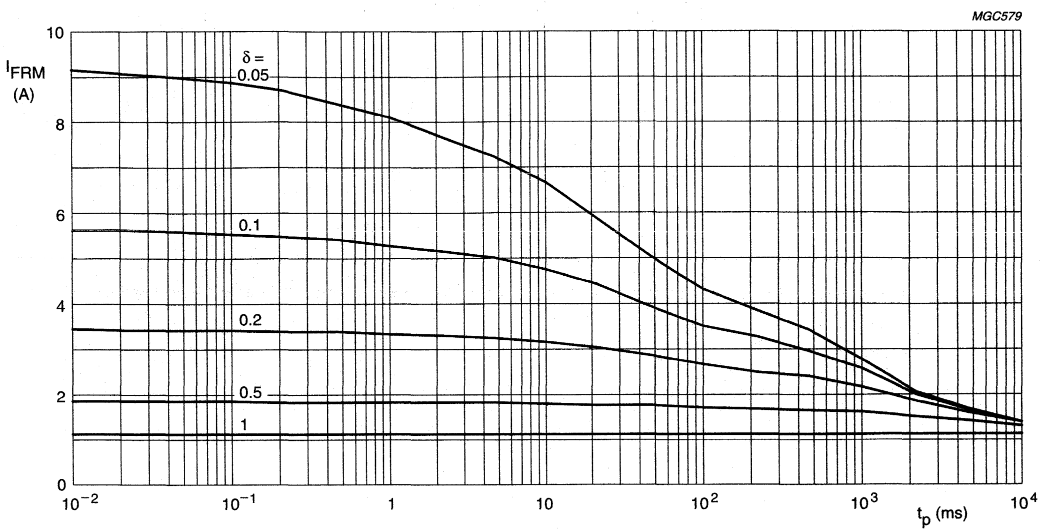


T_{tp} = 65 °C; $R_{th\,j\text{-}tp}$ = 46 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\,max}$ at V_{RRM} = 600 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

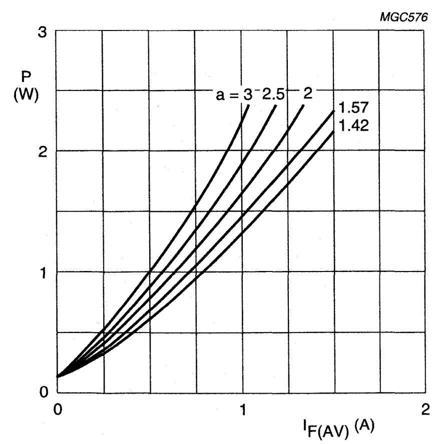
Fast soft-recovery controlled avalanche rectifiers

BYV95 series



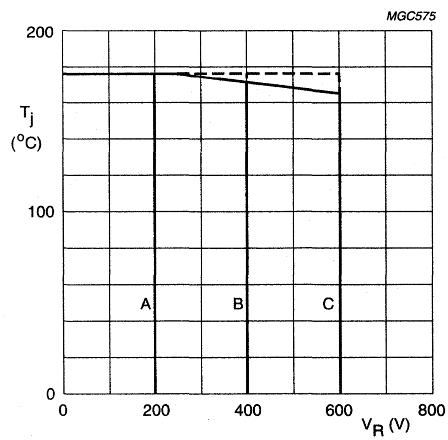
T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 100 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



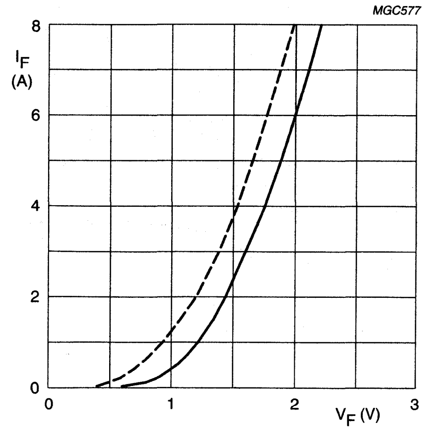
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



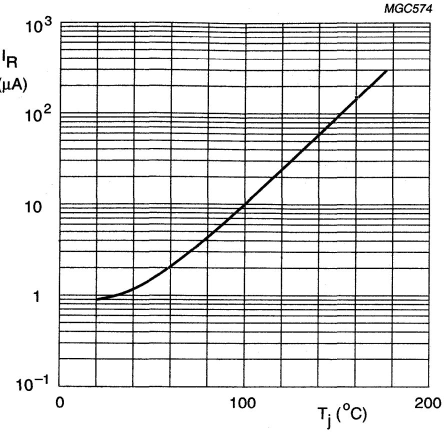
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



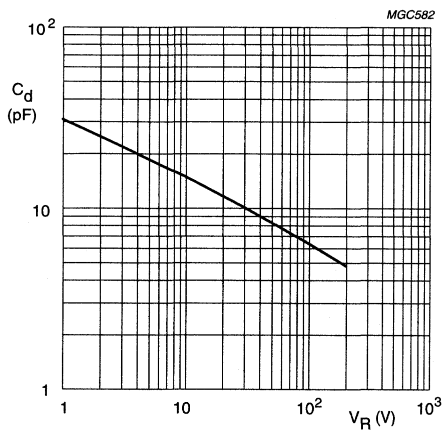
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



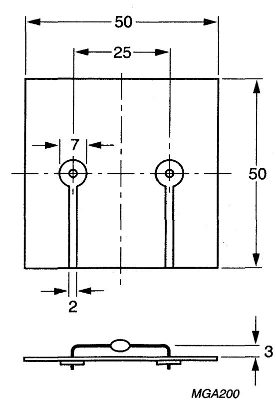
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



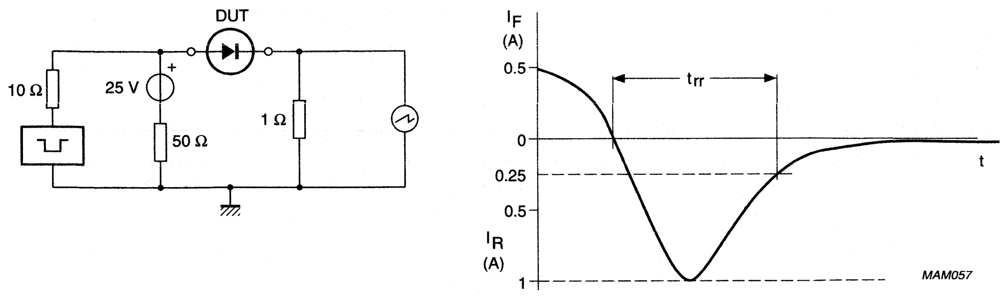
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

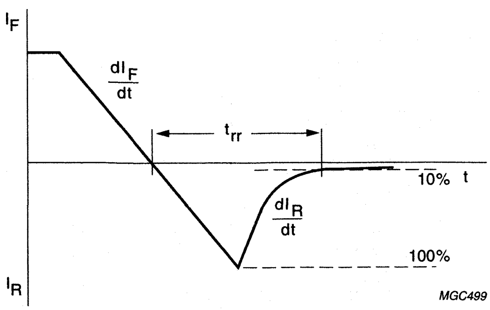


Fig.13 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYV96 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

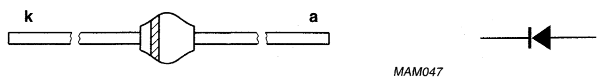


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV96D		–	800	V
	BYV96E		–	1000	V
V_R	continuous reverse voltage				
	BYV96D		–	800	V
	BYV96E		–	1000	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm see Fig 2; averaged over any 20 ms period; see also Fig 6	–	1.5	A
		T_{amb} = 55 °C; PCB mounting (see Fig.11); see Fig 3; averaged over any 20 ms period; see also Fig 6	–	0.8	A
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Fig 4	–	17	A
		T_{amb} = 55 °C; see Fig 5	–	9	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	35	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig 7	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3 A; $T_j = T_{j\,max}$; see Fig 8	–	–	1.35	V
		I_F = 3 A; see Fig 8	–	–	1.60	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYV96D		900	–	–	V
	BYV96E		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig 9	–	–	1	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig 9	–	–	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig 12	–	–	300	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig 10	–	40	–	pF
$\left\vert\frac{dI_R}{dt}\right\vert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/µs; see Fig.13	–	–	6	A/µs

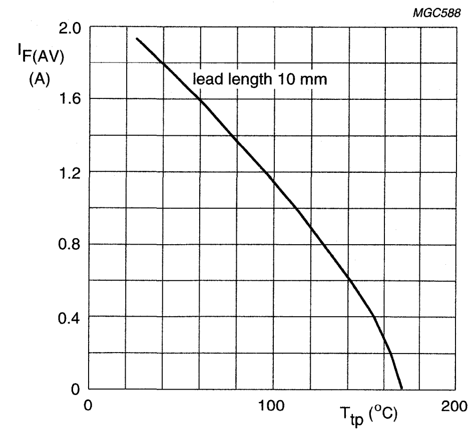
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

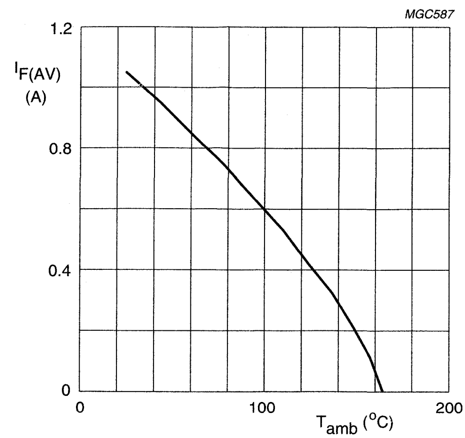
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*

GRAPHICAL DATA



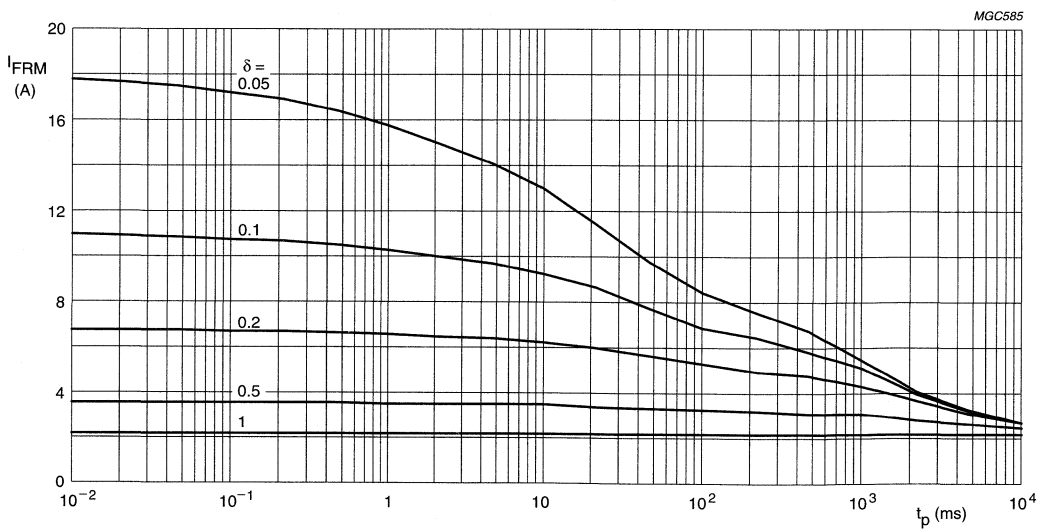
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



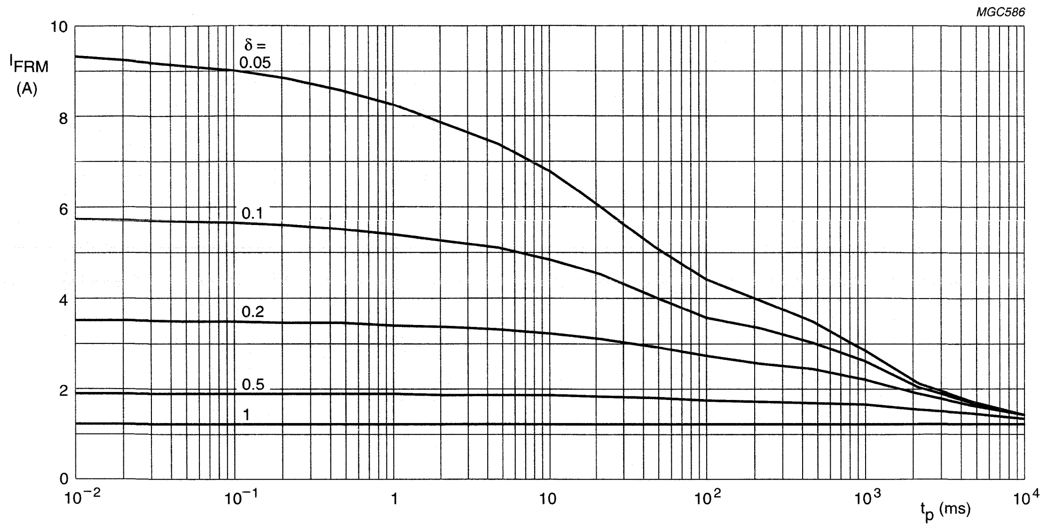
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



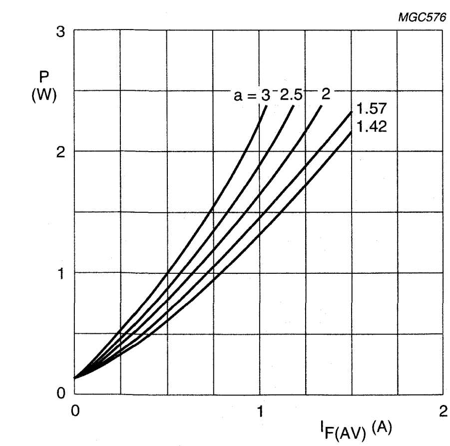
T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 46 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



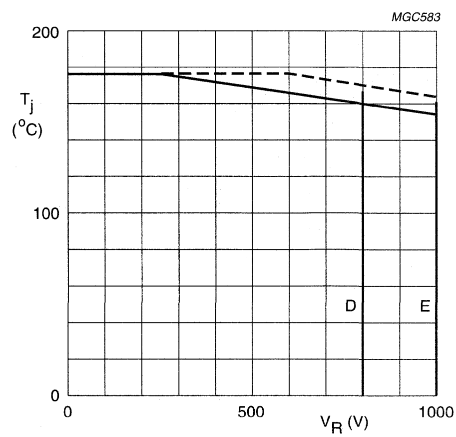
T_{amb} = 55 °C; $R_{th\ j\text{-}a}$ = 100 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



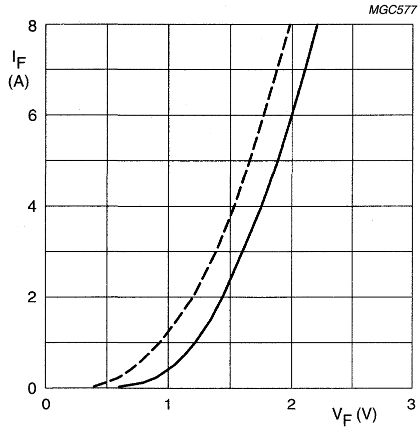
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



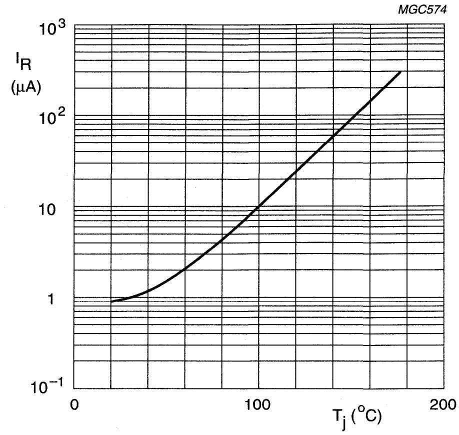
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



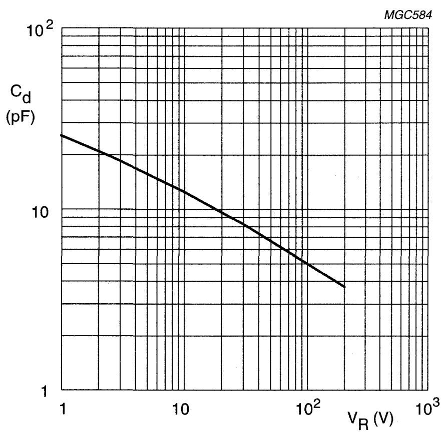
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



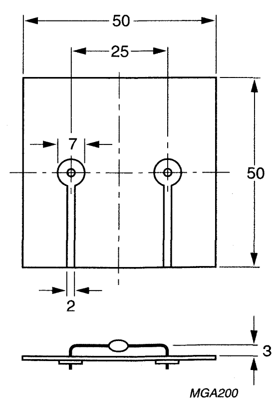
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



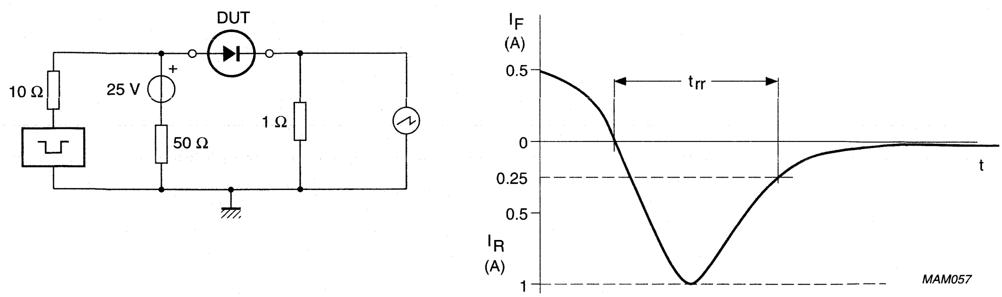
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

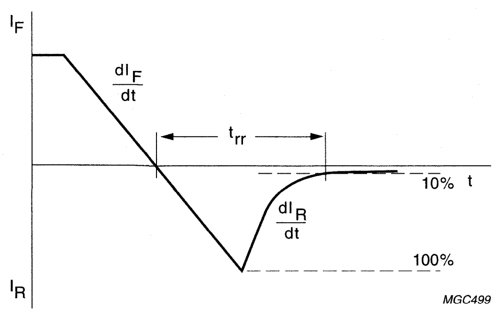


Fig.13 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYV97 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

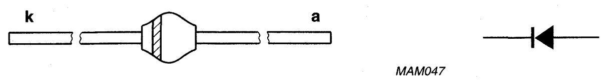


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYV97F		–	1200	V
	BYV97G		–	1400	V
V_R	continuous reverse voltage				
	BYV97F		–	1200	V
	BYV97G		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 60 °C; lead length = 10 mm see Fig.2; averaged over any 20 ms period; see also Fig.6	–	1.6	A
$I_{F(AV)}$	average forward current	T_{amb} = 50 °C; PCB mounting (see Fig. 12); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	0.9	A
I_{FRM}	repetitive peak forward current	T_{tp} = 65 °C; see Fig.4	–	15	A
		T_{amb} = 65 °C; see Fig.5	–	8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	20	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.7	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3 A; $T_j = T_{j\,max}$; see Fig.8			1.35	V
		I_F = 3 A; see Fig.8	–	–	1.65	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYV97F		1300	–	–	V
	BYV97G		1500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.14	–	–	500	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.11	–	35	–	pF
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = –1 A/μs; see Figs 10 and 13	–	–	5	A/μs

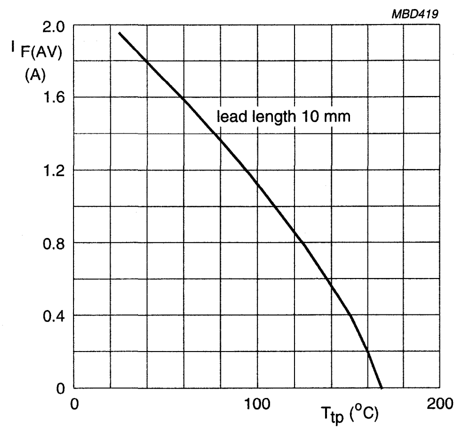
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

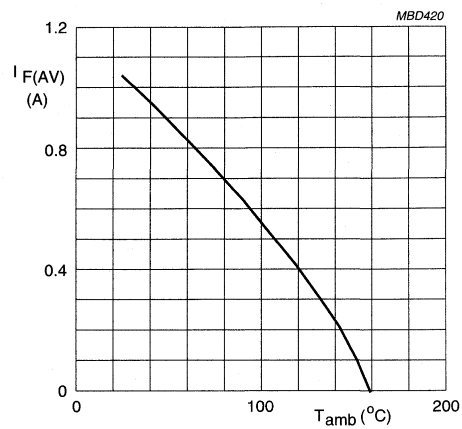
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig. 12. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



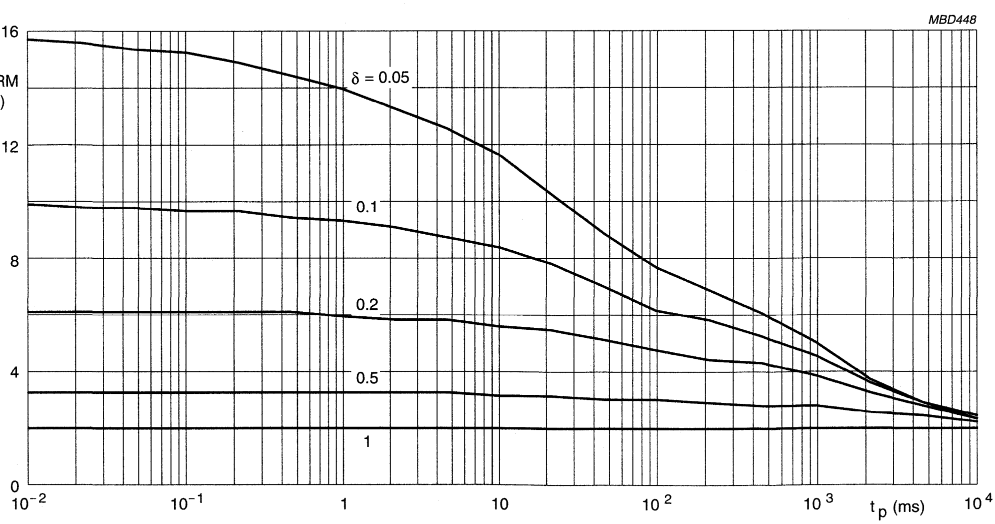
a = 1.57; $V_R = V_{RRMmax}$; $\delta = 0.5$.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



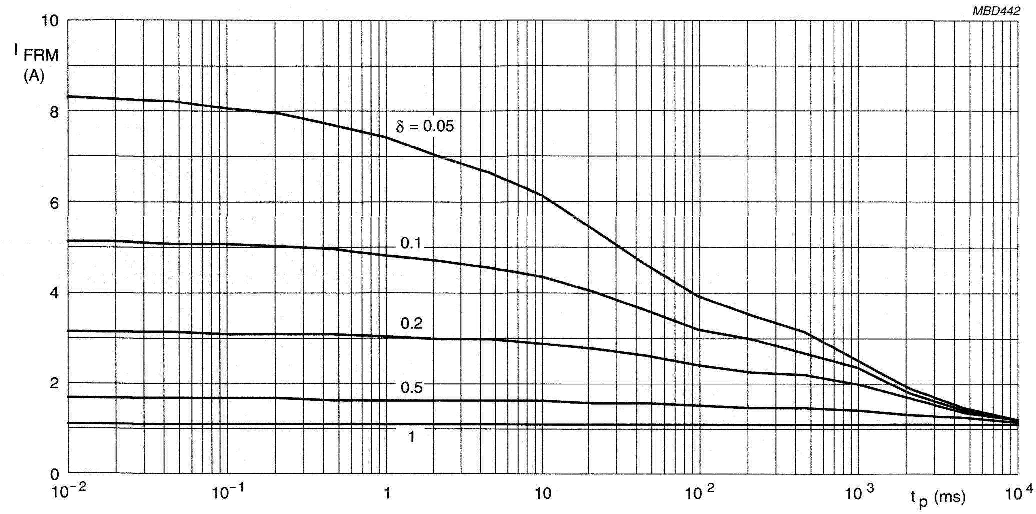
a = 1.57; $V_R = V_{RRMmax}$; $\delta = 0.5$.
Device mounted as shown in Fig.12.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



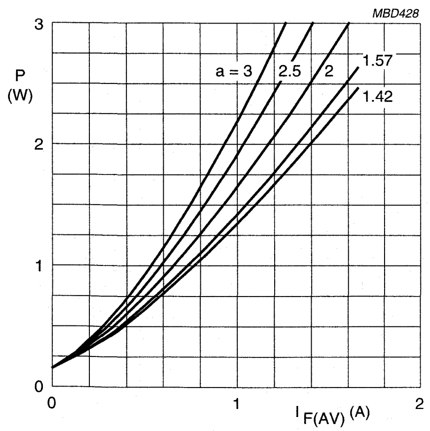
$T_{tp} = 65°C$; $R_{th\ j\text{-}tp} = 46$ K/W.
V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1400$ V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



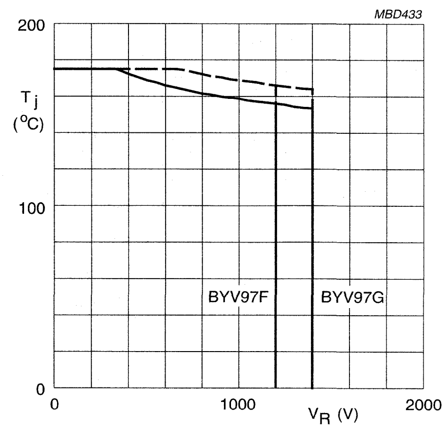
T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 100 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.

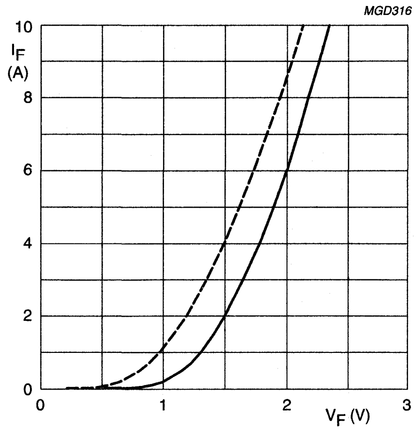


Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.

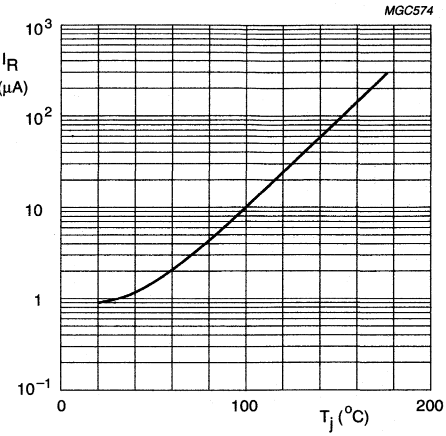
Fast soft-recovery controlled avalanche rectifiers

BYV97 series



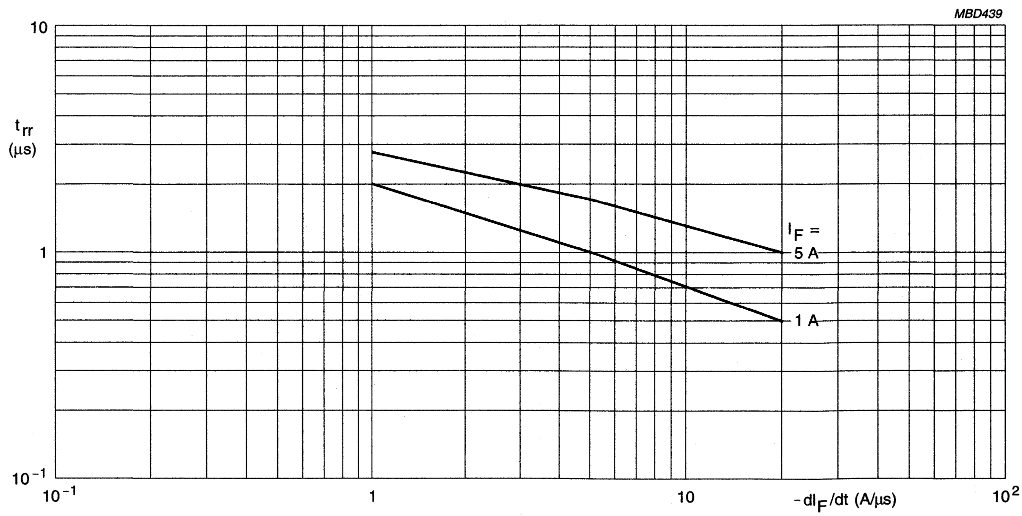
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



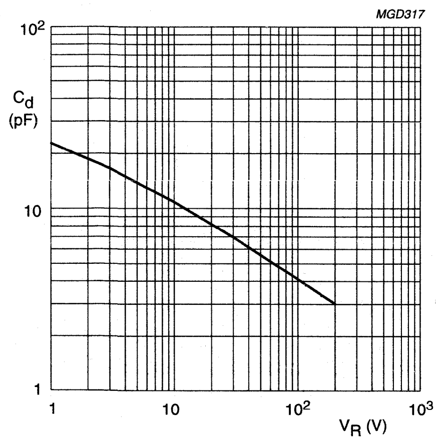
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



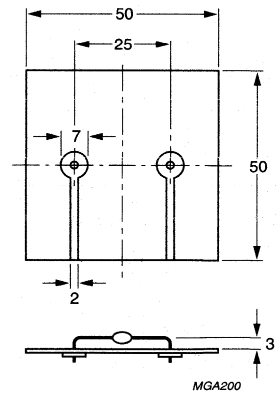
T_j = 25°C.
For definitions see Fig. 13.

Fig.10 Maximum reverse recovery time as a function of the rate of fall of forward current.



f = 1 MHz; T_j = 25 °C.

Fig.11 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.12 Device mounted on a printed-circuit board.

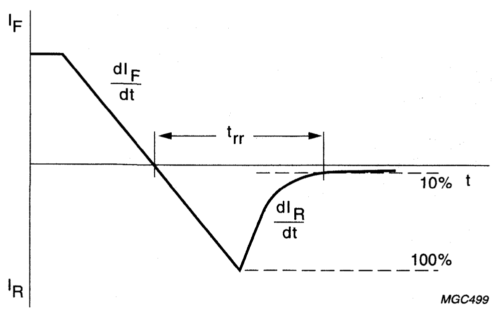
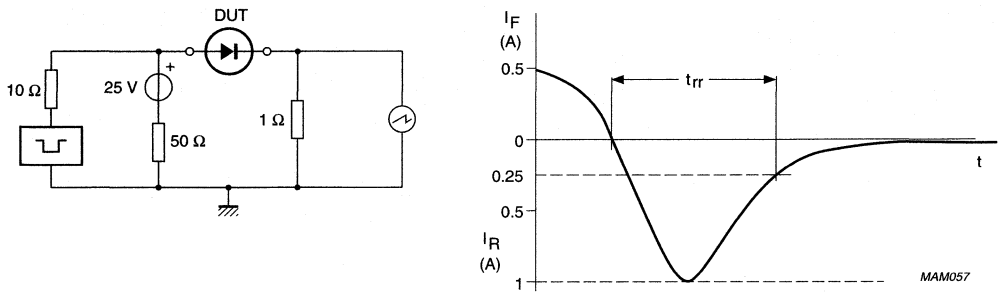


Fig.13 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; t_r < 7 ns.
Source impedance: 50 Ω; t_r < 15 ns.

Fig.14 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery rectifier BYV98

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

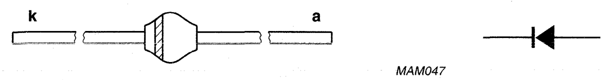


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	2100	V
V_{RRM}	repetitive peak reverse voltage		–	2000	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm see Fig. 2; averaged over any 20 ms period; see also Fig. 6	–	1.00	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.11); see Fig. 3; averaged over any 20 ms period; see also Fig. 6	–	0.43	A
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Fig. 4	–	9.0	A
		T_{amb} = 60 °C; see Fig. 5	–	4.5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	15	A
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.7	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 2 A; $T_j = T_{j\,max}$; see Fig. 8	–	–	2.2	V
		I_F = 2 A; see Fig. 8	–	–	2.4	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig. 9	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 125 °C; see Fig. 9	–	–	50	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig. 12	–	–	300	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig 10	–	30	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = –1 A/μs; see Fig.13	–	–	5	A/μs

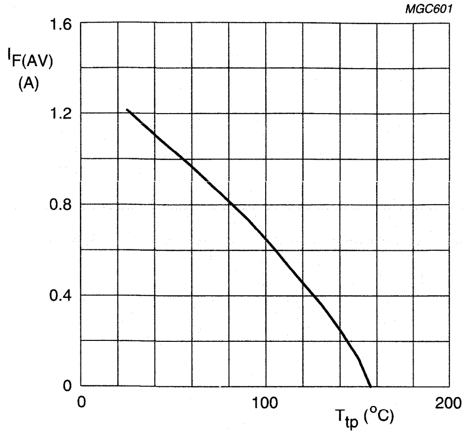
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

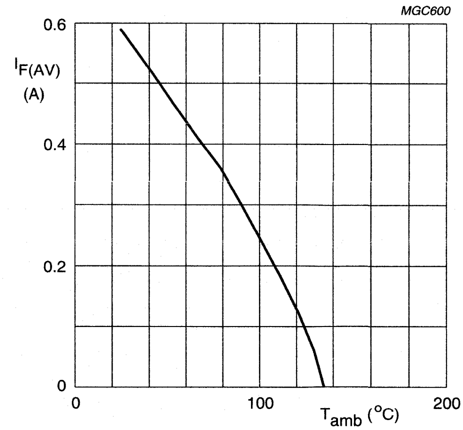
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



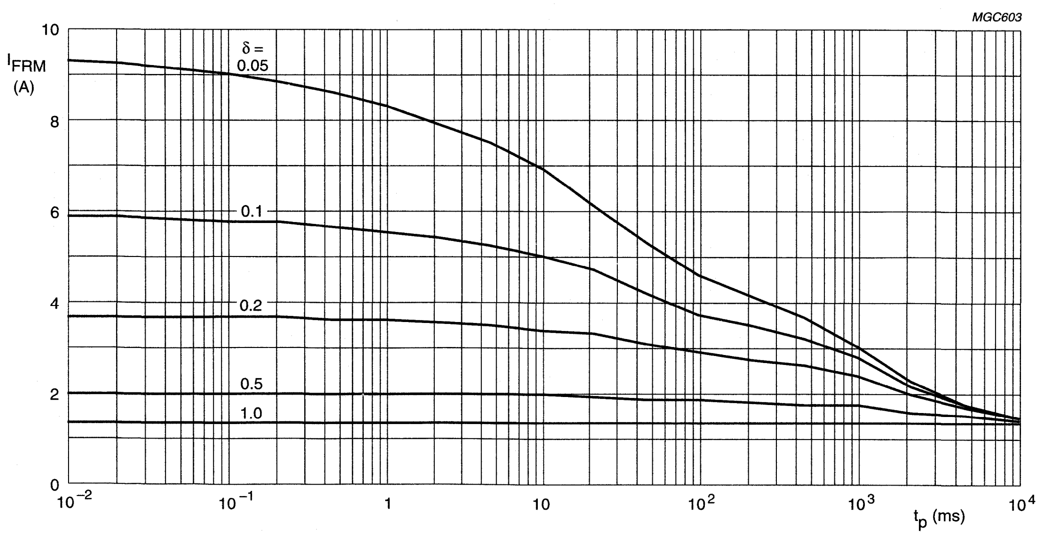
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



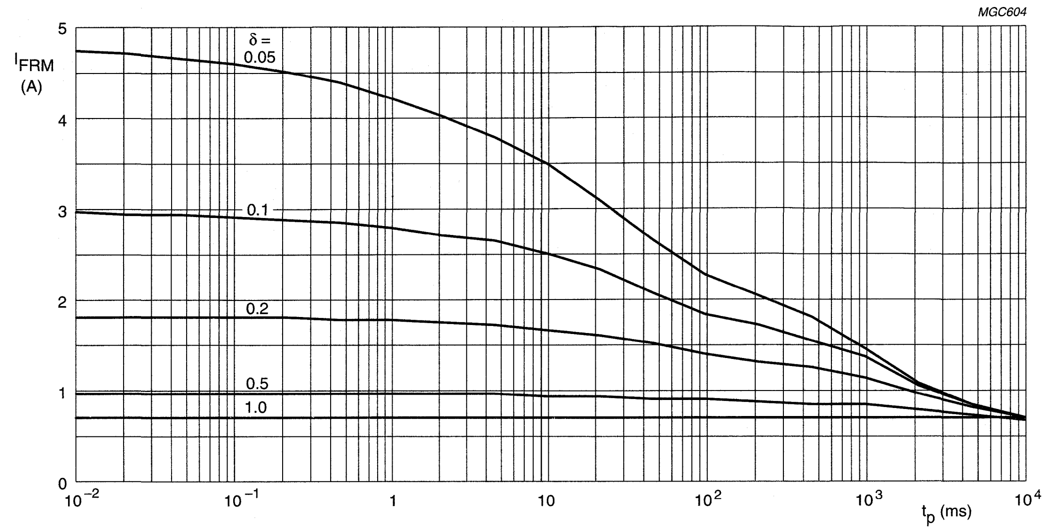
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



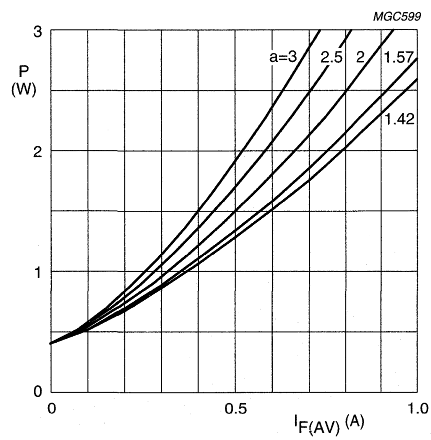
T_{tp} = 55°C; $R_{th\ j\text{-}tp}$ = 46 K/W.
V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 2000 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



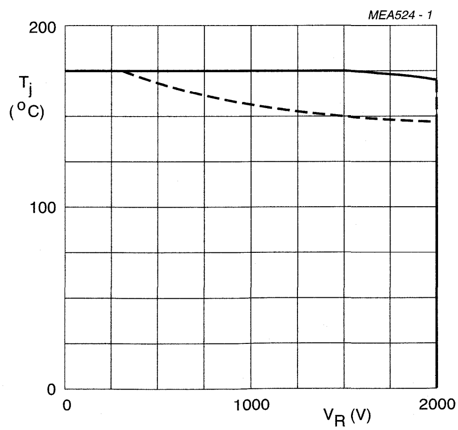
T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 2000 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



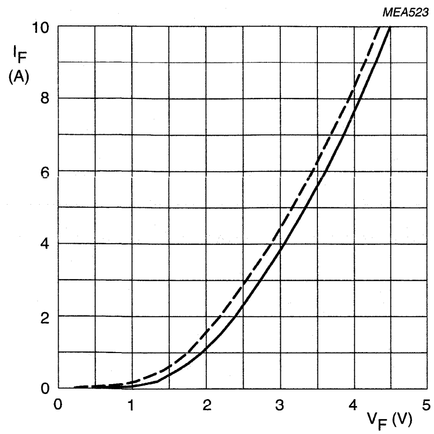
a = $I_{F(RMS)}/I_{F(AV)}$; V_R = V_{RRMmax}; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



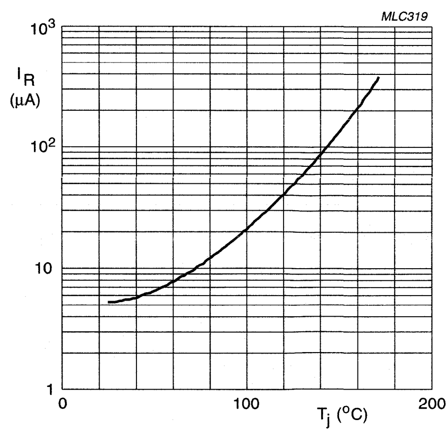
Solid line = V_{RRM}; δ = 0.1.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



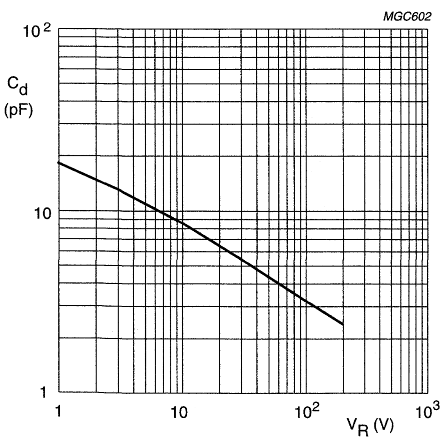
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



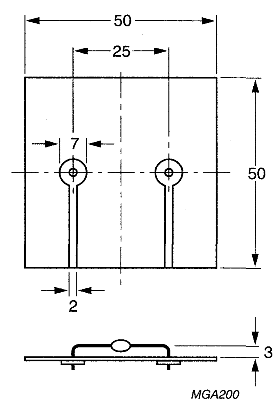
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



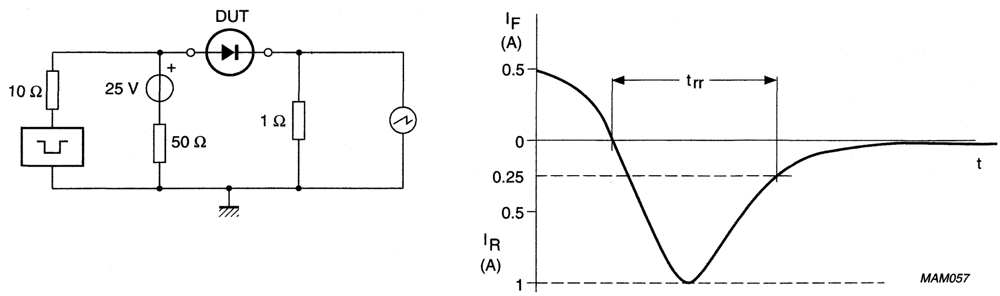
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

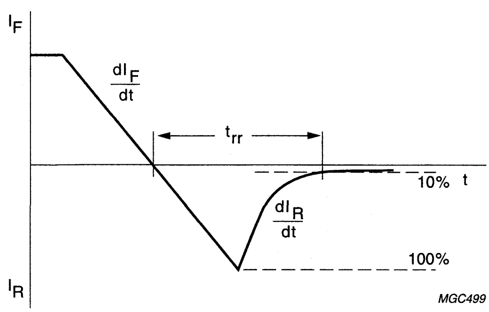


Fig.13 Reverse recovery definitions.

Ultra fast low-loss controlled avalanche rectifier

BYV99

FEATURES

- Glass passivated
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

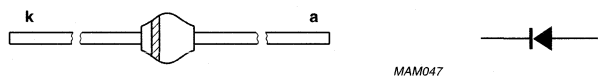


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	600	V
V_R	continuous reverse voltage		–	600	V
$I_{F(AV)}$	average forward current	T_{tp} = 50 °C; lead length = 10 mm see Fig. 2; averaged over any 20 ms period; see also Fig. 6	–	1.00	A
		T_{amb} = 60 °C; PCB mounting (see Fig.10); see Fig. 3; averaged over any 20 ms period; see also Fig. 6	–	0.55	A
I_{FRM}	repetitive peak forward current	T_{tp} = 50 °C; see Fig. 4	–	9	A
		T_{amb} = 60 °C; see Fig. 5	–	5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	20	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig. 7	–	–	1.5	V
		I_F = 1 A; see Fig. 7	–	–	2.7	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	700	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig. 8	–	–	5	µA
		$V_R = V_{RRMmax}$; T_j = 150 °C; see Fig. 8	–	–	75	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig. 12	–	–	15	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig. 9	–	75	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/µs; see Fig.11	–	–	3	A/µs

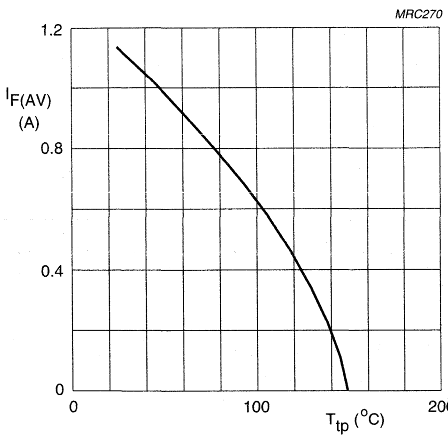
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

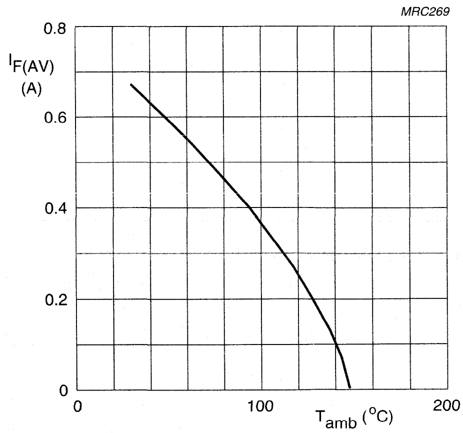
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.10. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



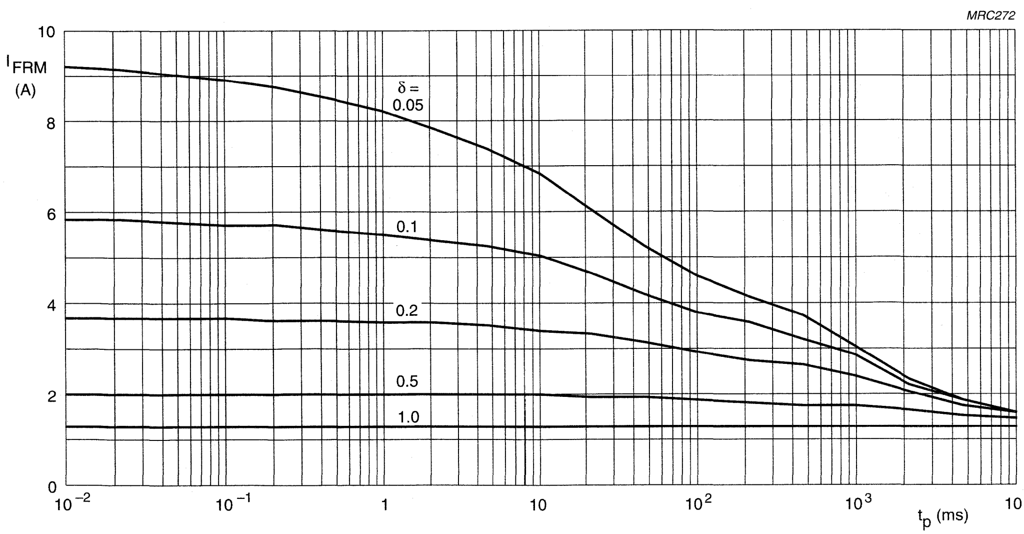
a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



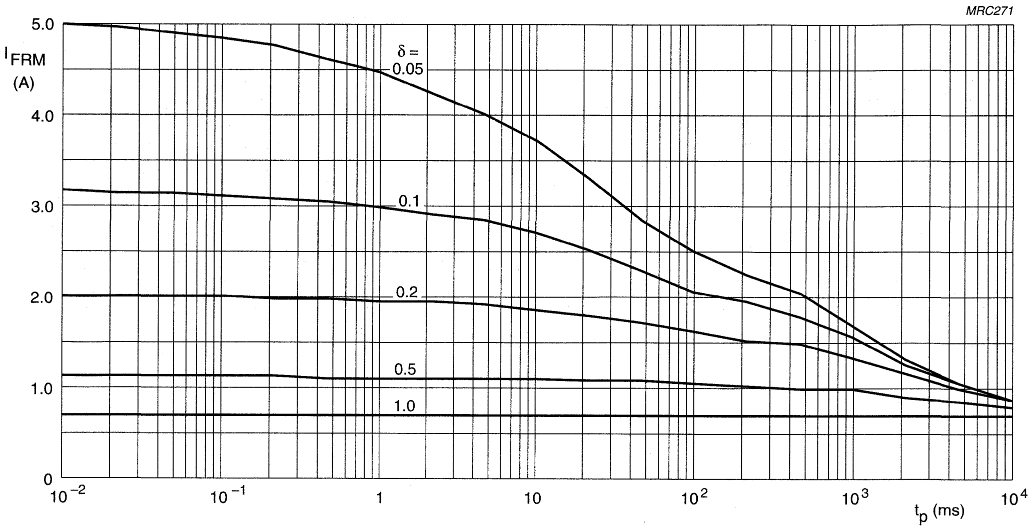
a = 1.42; $V_R = V_{RRMmax}$; $\delta = 0.5$.
Device mounted as shown in Fig.10.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



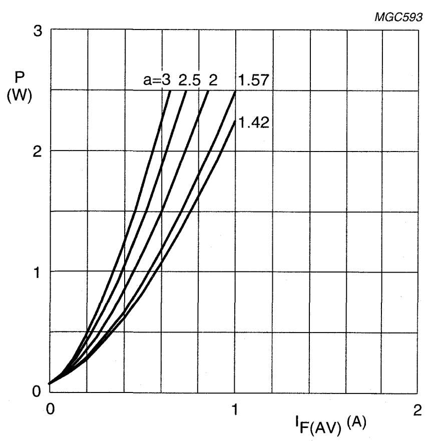
$T_{tp} = 50°C$; $R_{th\ j\text{-}tp} = 46$ K/W.
V_{RRMmax} during $1 - \delta$; curves include derating for $T_{j\ max}$ at $V_{RRM} = 600$ V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



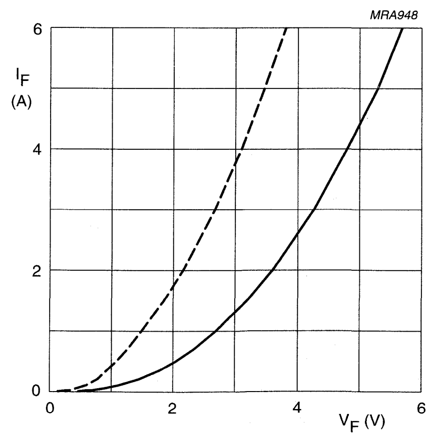
T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



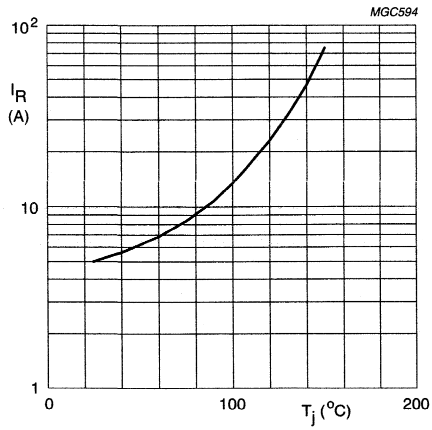
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



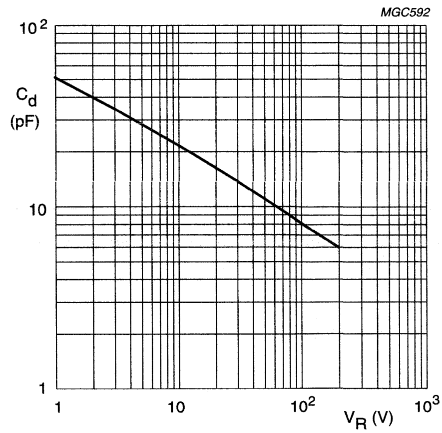
Dotted line: T_j = 150 °C.
Solid line: T_j = 25 °C.

Fig.7 Forward current as a function of forward voltage; maximum values.



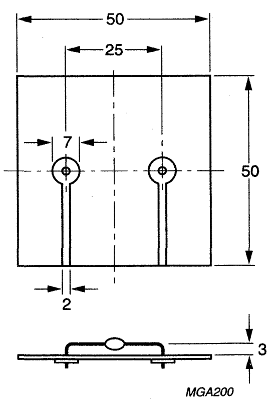
$V_R = V_{RRMmax}$.

Fig.8 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.10 Device mounted on a printed-circuit board.

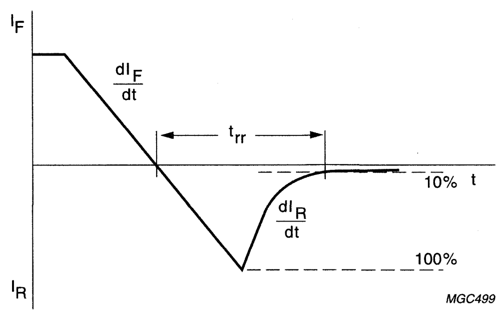
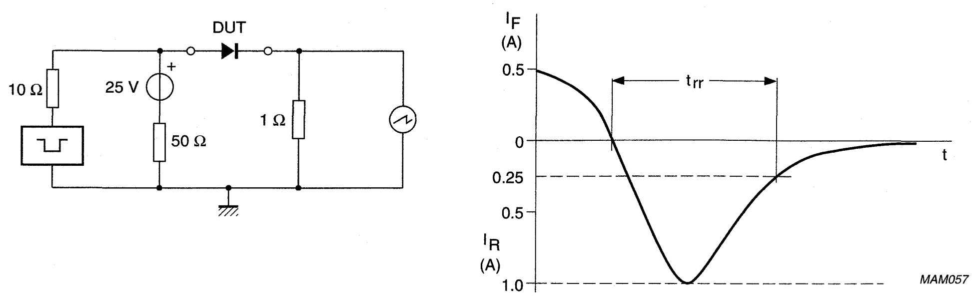


Fig.11 Reverse recovery definitions.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

Fast soft-recovery controlled avalanche rectifier

BYV2100

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

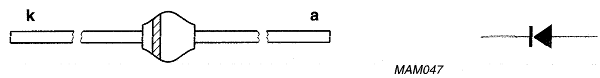


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	100	V
V_R	continuous reverse voltage		–	100	V
$I_{F(AV)}$	average forward current	T_{tp} = 80 °C; lead length = 10 mm; averaged over any 20 ms period; see Fig.2; see also Fig.4	–	2.0	A
		T_{amb} = 60 °C; PCB mounting (see Fig.12); averaged over any 20 ms period; see Fig.3; see also Fig.4	–	1.3	A
I_{FRM}	repetitive peak forward current	T_{tp} = 80 °C; see Fig.6	–	18	A
		T_{amb} = 60 °C; see Fig.7	–	12	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	50	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 2 A; $T_j = T_{j\,max}$; see Fig.5	–	–	0.78	V
		I_F = 2 A; see Fig.5	–	–	0.98	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	120	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.8	–	–	5	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.8	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	–	12.5	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.9	–	135	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/μs; see Fig.11	–	–	2	A/μs

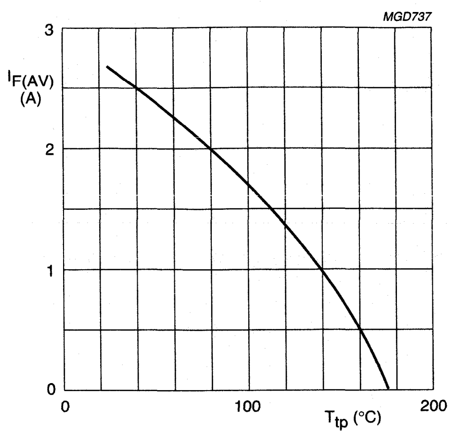
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

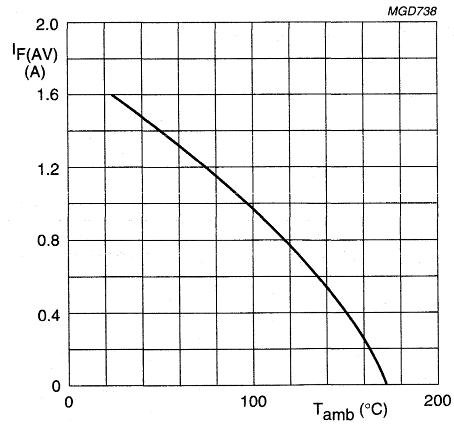
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.12. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



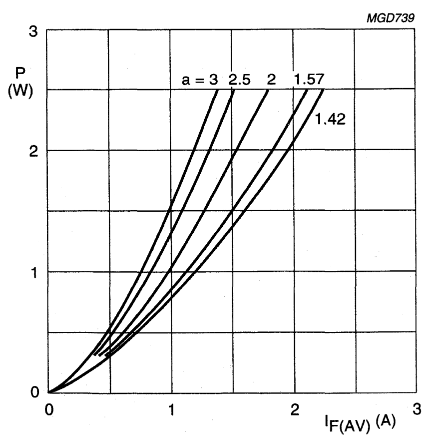
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RRMmax}$.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



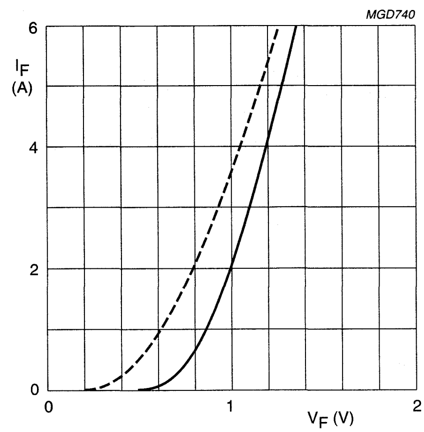
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RRMmax}$.
Device mounted as shown in Fig.12.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



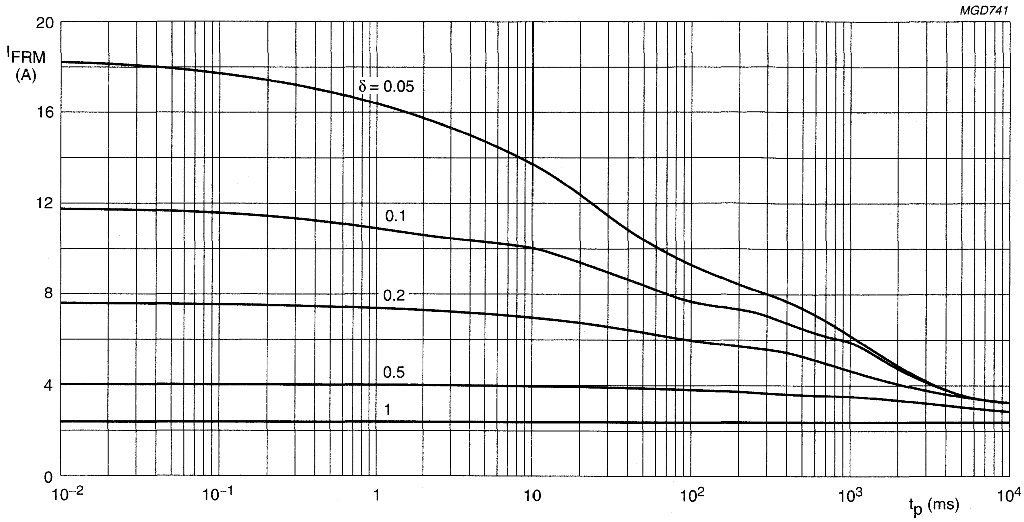
a = $I_{F(RMS)}/I_{F(AV)}$; δ = 0.5; $V_R = V_{RRMmax}$.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



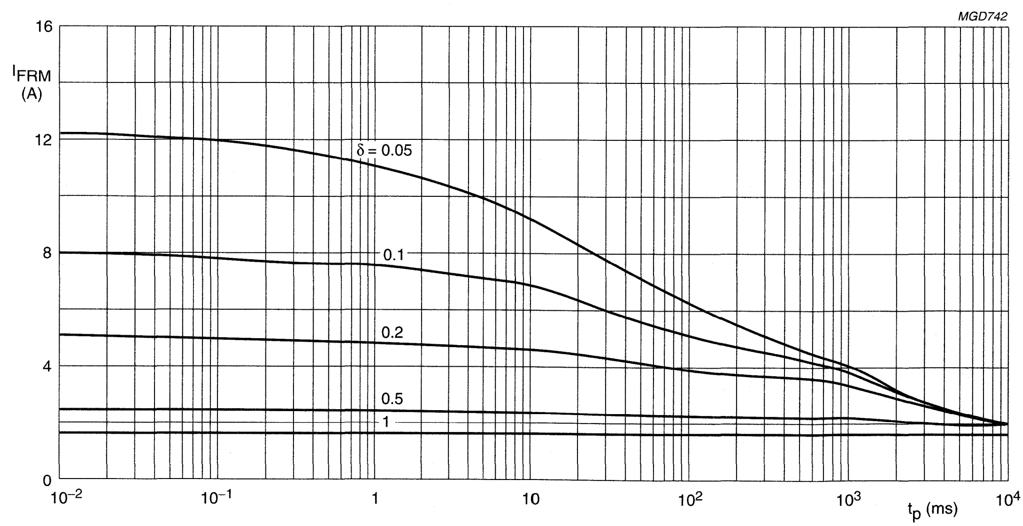
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.5 Maximum forward voltage as a function of forward current.



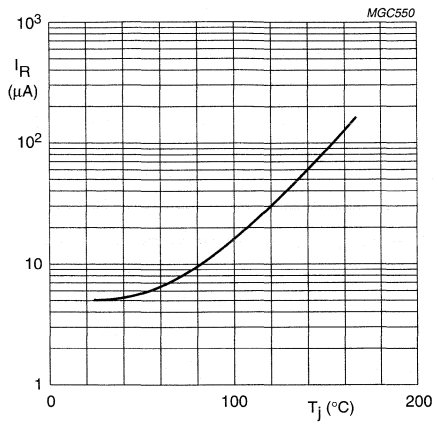
T_{tp} = 80 °C; $R_{th\ j\text{-}tp}$ = 46 K/W; $V_R = V_{RRMmax}$ during 1 – δ.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



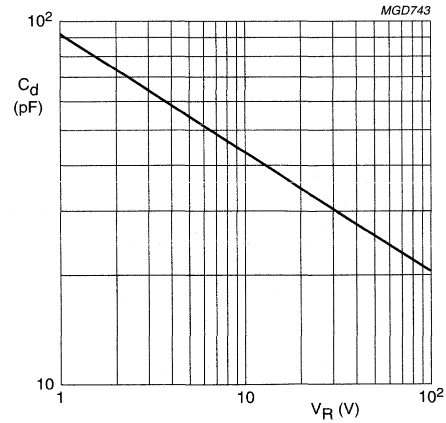
T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 100 K/W; $V_R = V_{RRMmax}$ during 1 – δ.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



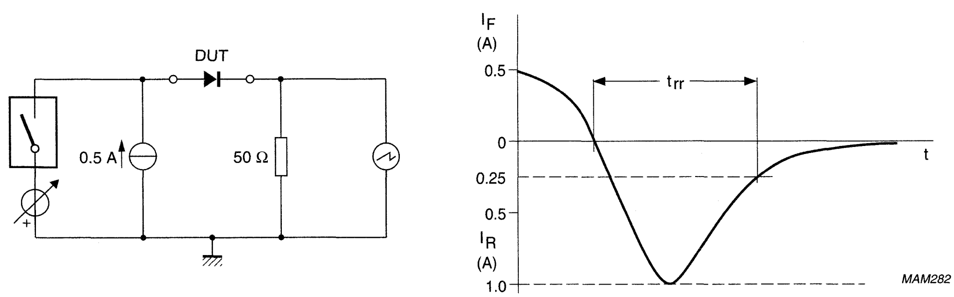
$V_R = V_{RRMmax}$.

Fig.8 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.



Rise time oscilloscope: $t_r \leq 2$ ns.
Turn-on time switch: $t \leq 3$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

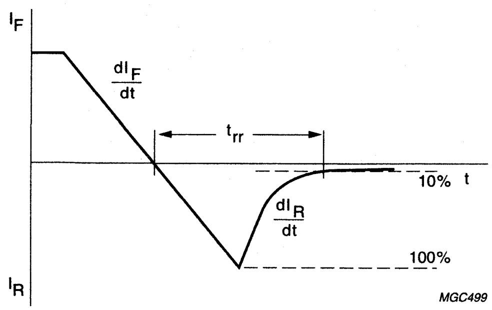
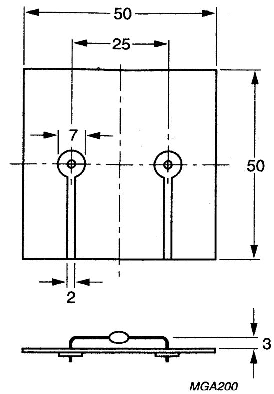


Fig.11 Reverse recovery definitions.



Dimensions in mm.

Fig.12 Device mounted on a printed-circuit board.

Fast soft-recovery controlled avalanche rectifier

BYV4100

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

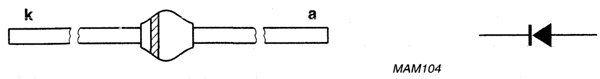


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	100	V
V_R	continuous reverse voltage		–	100	V
$I_{F(AV)}$	average forward current	T_{tp} = 65 °C; lead length = 10 mm; averaged over any 20 ms period; see Fig.2; see also Fig.4	–	4.0	A
		T_{amb} = 60 °C; PCB mounting (see Fig.12); averaged over any 20 ms period; see Fig.3; see also Fig.4	–	1.9	A
I_{FRM}	repetitive peak forward current	T_{tp} = 65 °C; see Fig.6	–	34	A
		T_{amb} = 60 °C; see Fig.7	–	17	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	90	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	20	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 3.5 A; $T_j = T_{j\,max}$; see Fig.5	–	–	0.78	V
		I_F = 3.5 A; see Fig.5	–	–	0.98	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	120	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.8	–	–	5	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.8	–	–	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.10	–	–	15	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.9	–	245	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and $dI_F/dt = -1$ A/µs; see Fig.11	–	–	2	A/µs

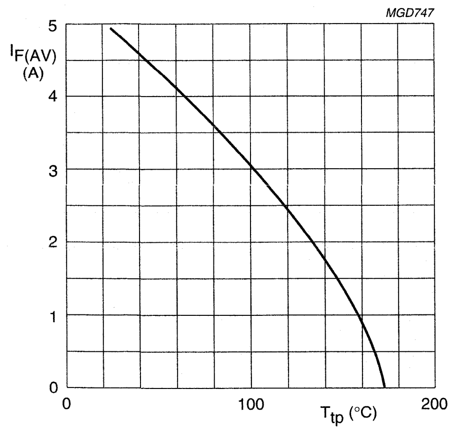
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

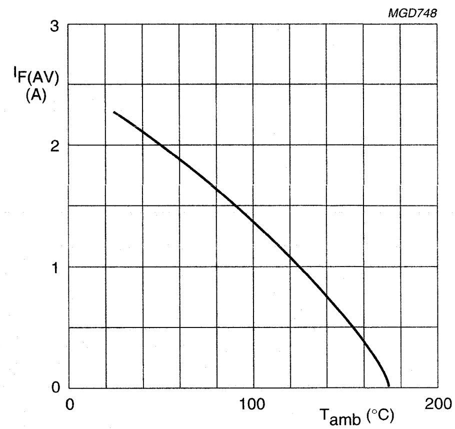
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.12. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



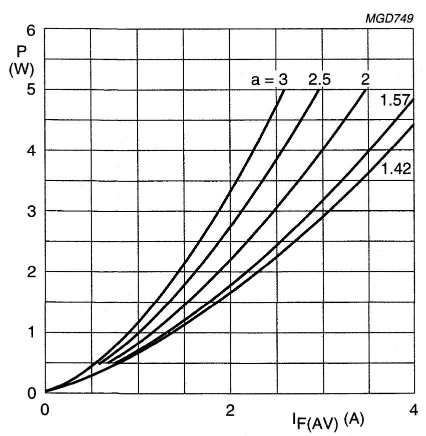
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RRMmax}$.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



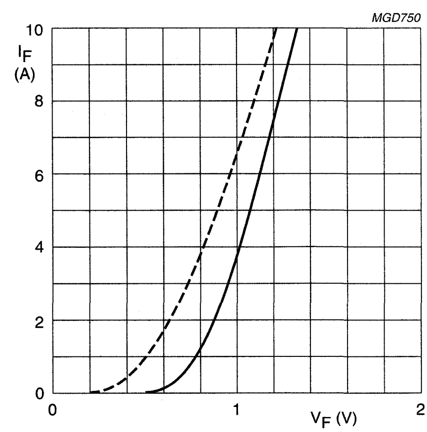
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RRMmax}$.
Device mounted as shown in Fig.12.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



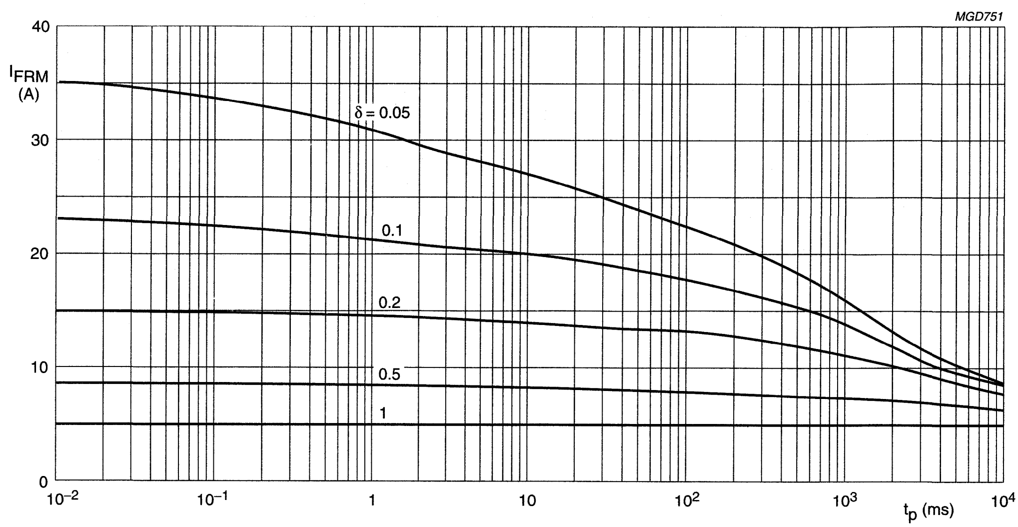
a = $I_{F(RMS)}/I_{F(AV)}$; δ = 0.5; $V_R = V_{RRMmax}$.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



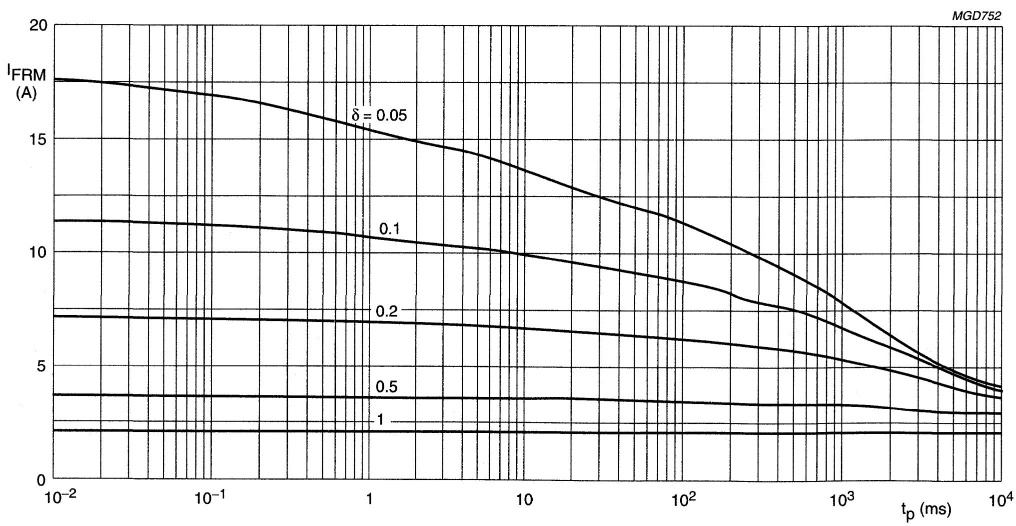
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.5 Maximum forward voltage as a function of forward current.



T_{tp} = 65 °C; $R_{th\ j\text{-}tp}$ = 25 K/W; $V_R = V_{RRMmax}$ during 1 – δ.

Fig.6 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

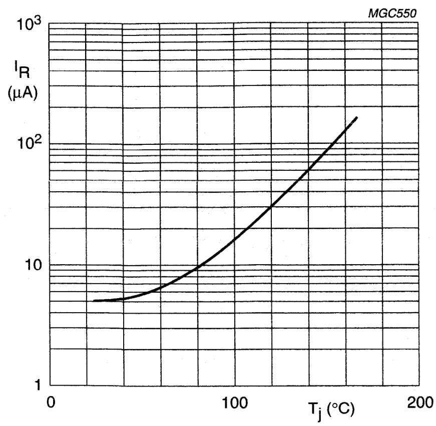


T_{amb} = 60 °C; $R_{th\ j\text{-}a}$ = 75 K/W; $V_R = V_{RRMmax}$ during 1 – δ.

Fig.7 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.

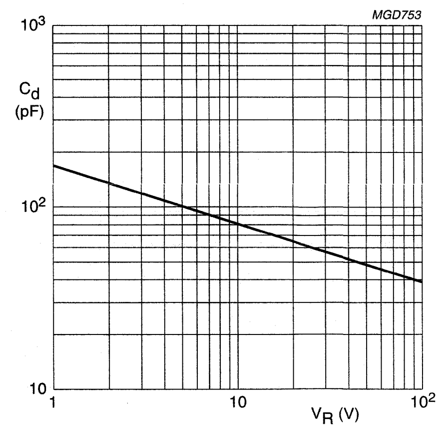
Fast soft-recovery controlled avalanche rectifier

BYV4100



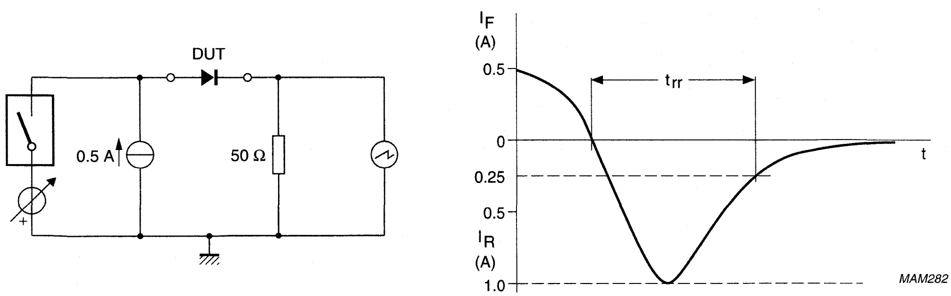
$V_R = V_{RRMmax}$.

Fig.8 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.9 Diode capacitance as a function of reverse voltage; typical values.



Rise time oscilloscope: $t_r \leq 2$ ns.
Turn-on time switch: $t \leq 3$ ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

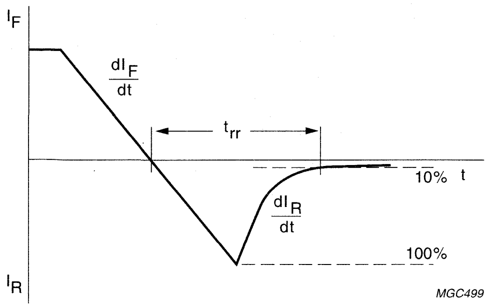
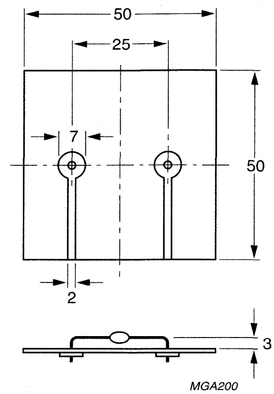


Fig.11 Reverse recovery definitions.



Dimensions in mm.

Fig.12 Device mounted on a printed-circuit board.

Fast soft-recovery controlled avalanche rectifiers

BYW95 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

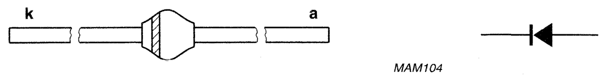


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYW95A		–	200	V
	BYW95B		–	400	V
	BYW95C		–	600	V
V_R	continuous reverse voltage				
	BYW95A		–	200	V
	BYW95B		–	400	V
	BYW95C		–	600	V
$I_{F(AV)}$	average forward current	T_{tp} = 60 °C; lead length = 10 mm see Fig.2; averaged over any 20 ms period; see also Fig.6	–	3.00	A
		T_{amb} = 65 °C; PCB mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	1.25	A
I_{FRM}	repetitive peak forward current	T_{tp} = 60 °C; see Fig.4	–	30	A
		T_{amb} = 65 °C; see Fig.5	–	13	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	70	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.7	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 5 A; $T_j = T_{j\,max}$; see Fig.8	–	–	1.25	V
		I_F = 5 A; see Fig.8	–	–	1.50	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYW95A		300	–	–	V
	BYW95B		500	–	–	V
	BYW95C		700	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.12	–	–	250	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.10	–	85	–	pF
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/μs; see Fig.13	–	–	7	A/μs

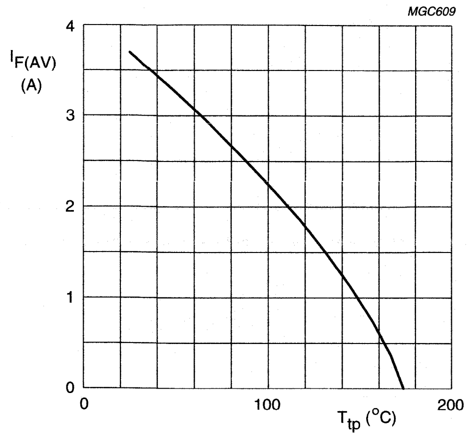
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

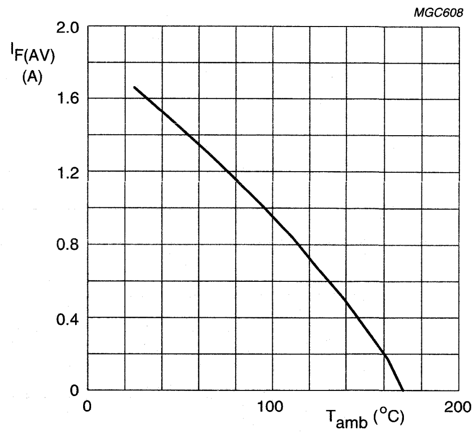
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01.'*

GRAPHICAL DATA



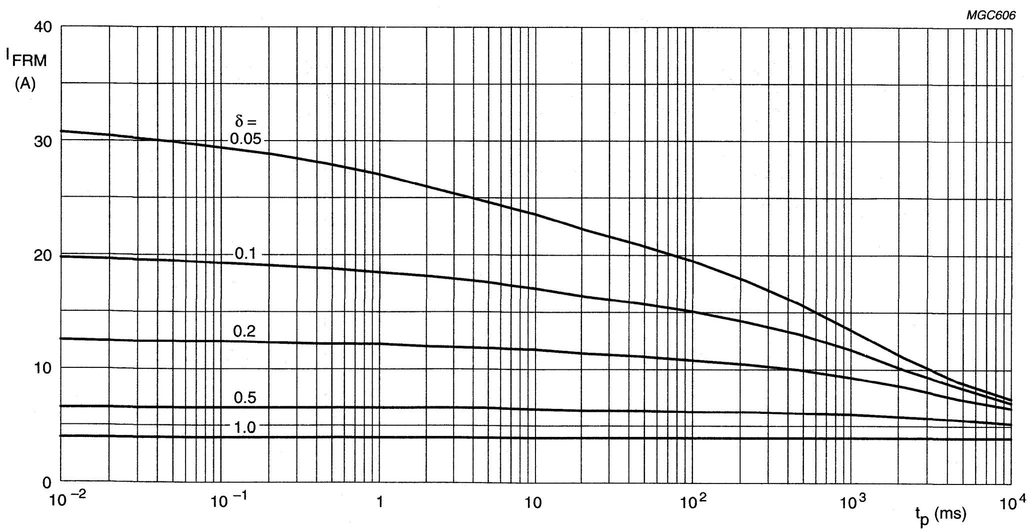
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



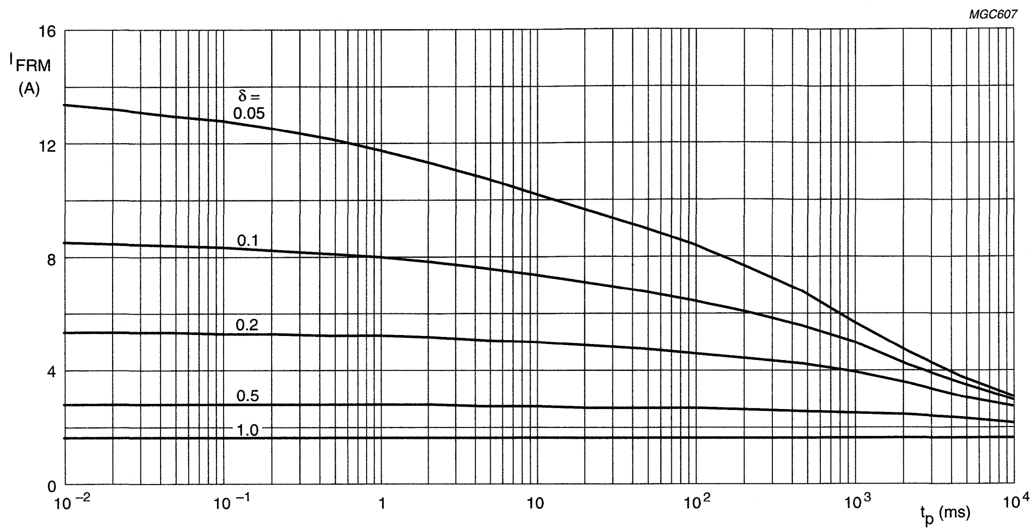
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



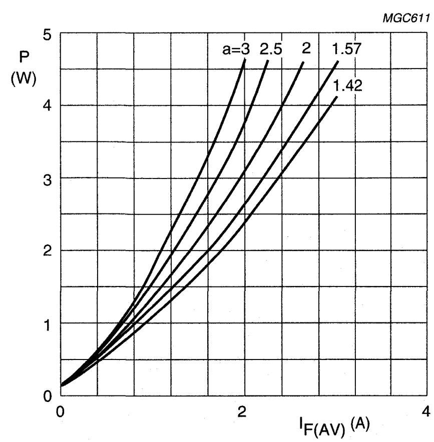
T_{tp} = 60 °C; $R_{th\ j\text{-}tp}$ = 25 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



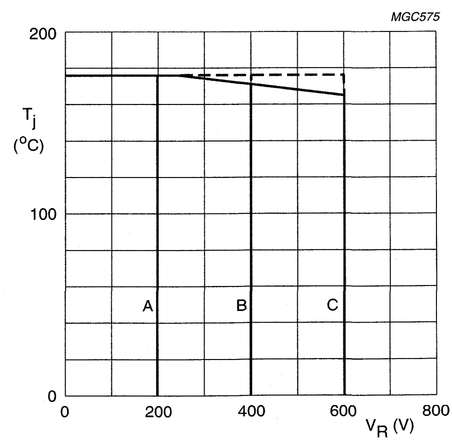
T_{amb} = 65 °C; $R_{th\ j\text{-}a}$ = 75 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 600 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



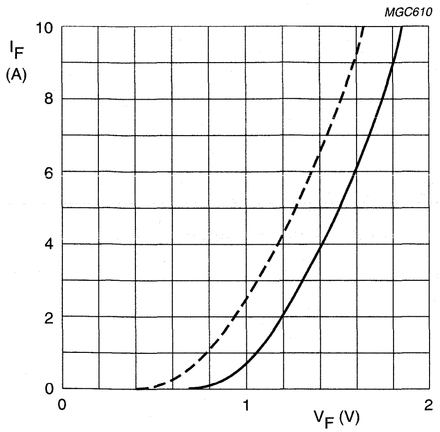
a = $I_{F(RMS)}/I_{F(AV)}$; V_R = V_{RRMmax}; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



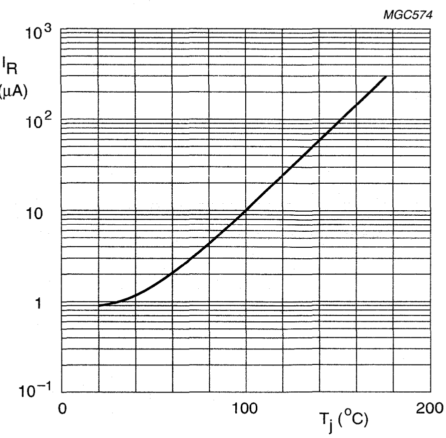
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



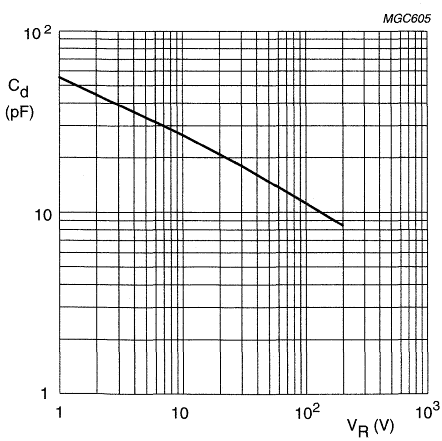
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



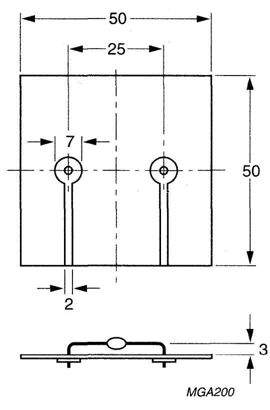
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



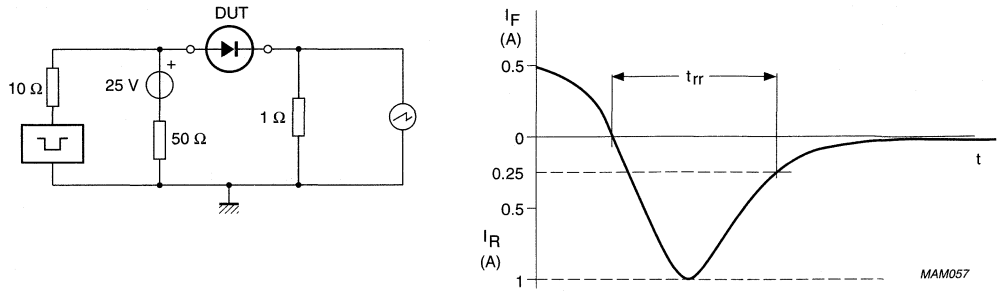
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

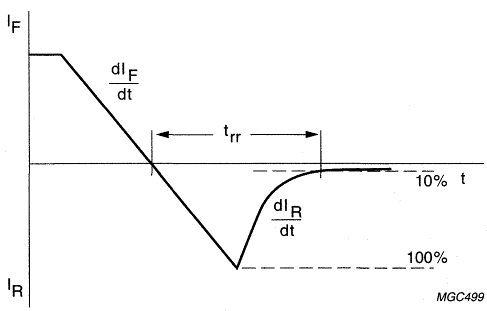


Fig.13 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYW96 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

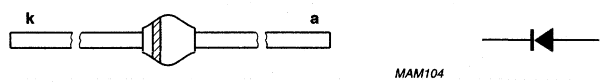


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYW96D		–	800	V
	BYW96E		–	1 000	V
V_R	continuous reverse voltage				
	BYW96D		–	800	V
	BYW96E		–	1 000	V
$I_{F(AV)}$	average forward current	T_{tp} = 50 °C; lead length = 10 mm see Fig.2; averaged over any 20 ms period; see also Fig.6	–	3	A
$I_{F(AV)}$	average forward current	T_{amb} = 55 °C; PCB mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	1.25	A
I_{FRM}	repetitive peak forward current	T_{tp} = 50 °C; see Fig.4	–	30	A
		T_{amb} = 55 °C; see Fig.5	–	13	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	70	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature	see Fig.7	−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 5 A; $T_j = T_{j\,max}$; see Fig.8	–	–	1.25	V
		I_F = 5 A; see Fig.8	–	–	1.50	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYW96D		900	–	–	V
	BYW96E		1100	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.12	–	–	300	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.10	–	75	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = −1 A/μs; see Fig.13	–	–	6	A/μs

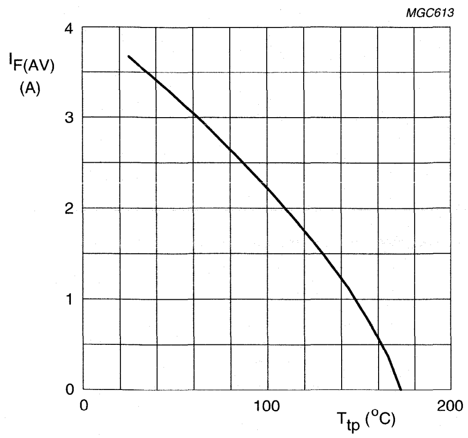
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

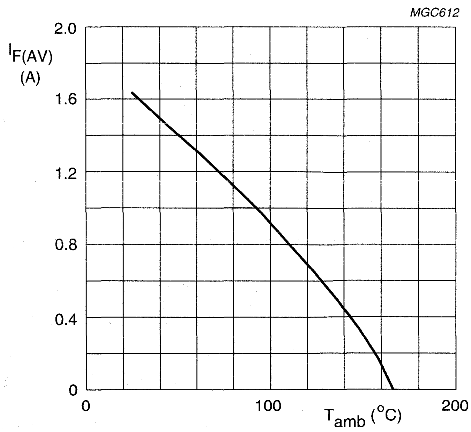
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



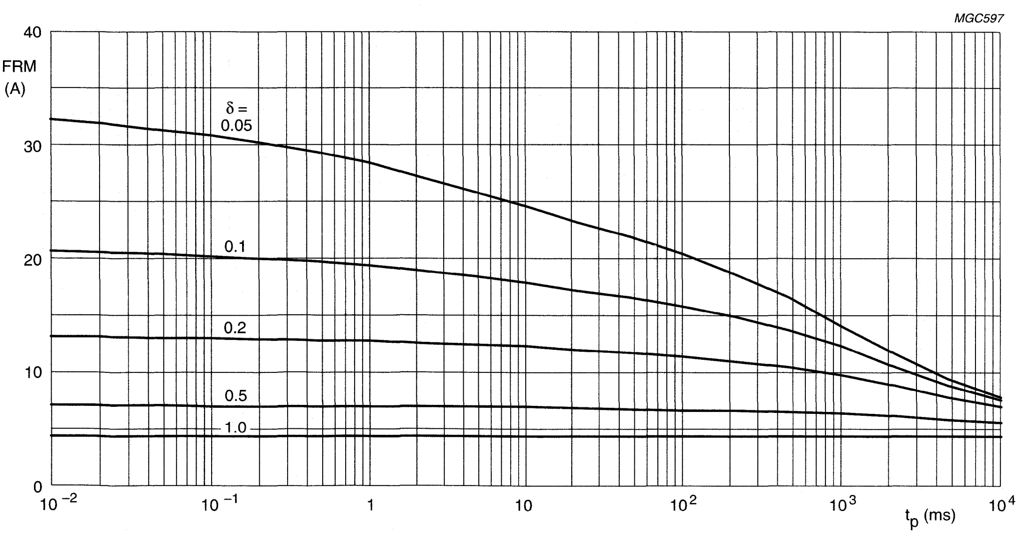
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



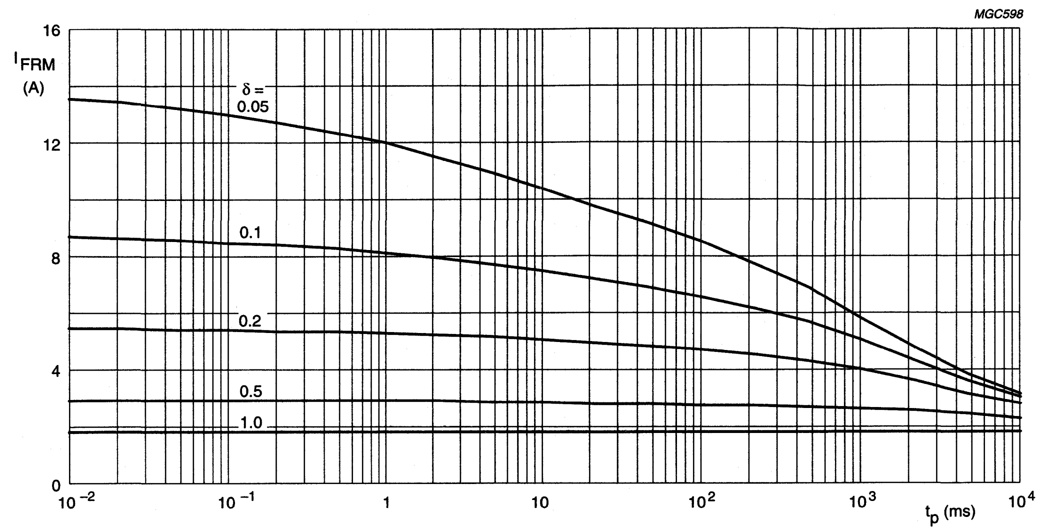
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



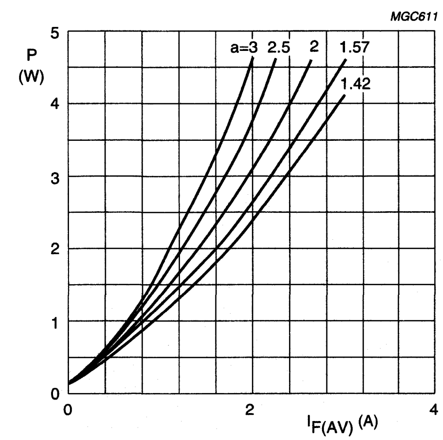
$T_{tp} = 50°C$; $R_{th\ j\text{-}tp} = 25$ K/W.
V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1000$ V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



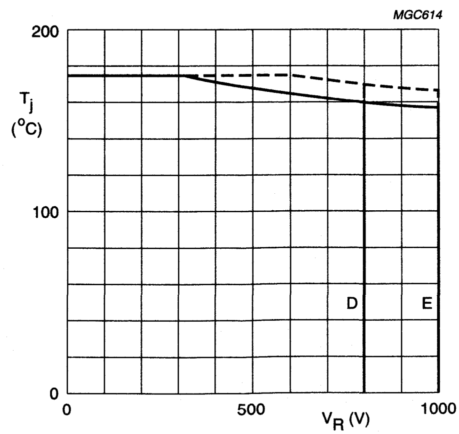
T_{amb} = 55 °C; $R_{th\ j\text{-}a}$ = 75 K/W.
V_{RRMmax} during 1 − δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1000 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



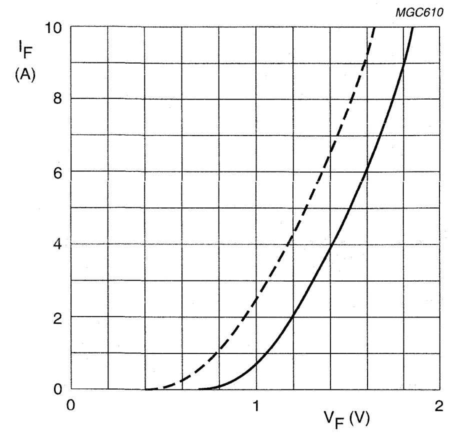
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



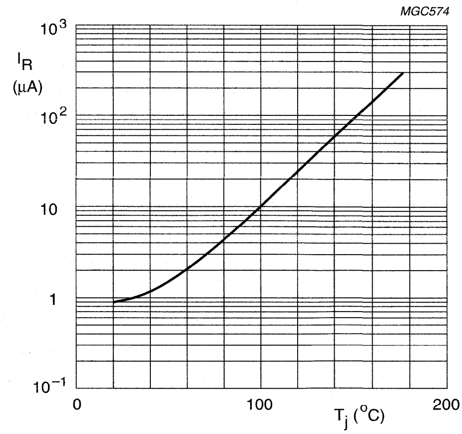
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissible junction temperature as a function of reverse voltage.



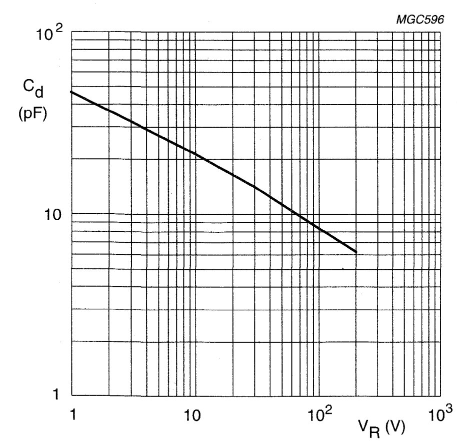
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



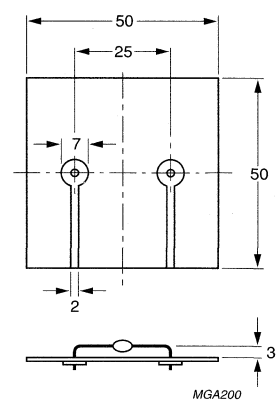
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



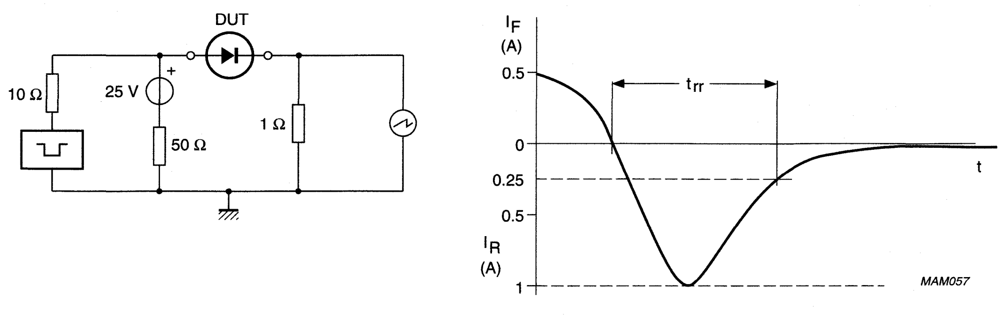
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; t_r < 7 ns.
Source impedance: 50 Ω; t_r < 15 ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

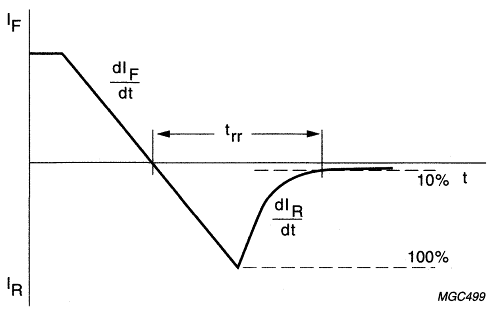


Fig.13 Reverse recovery definitions.

Fast soft-recovery controlled avalanche rectifiers

BYW97 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

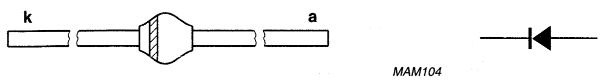


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYW97F		–	1200	V
	BYW97G		–	1400	V
V_R	continuous reverse voltage				
	BYW97F		–	1200	V
	BYW97G		–	1400	V
$I_{F(AV)}$	average forward current	T_{tp} = 50 °C; lead length = 10 mm see Fig.2; averaged over any 20 ms period; see also Fig.6	–	3.3	A
$I_{F(AV)}$	average forward current	T_{amb} = 55 °C; PCB mounting (see Fig.11); see Fig.3; averaged over any 20 ms period; see also Fig.6	–	1.3	A
I_{FRM}	repetitive peak forward current	T_{tp} = 50 °C; see Fig.4	–	33	A
		T_{amb} = 55 °C; see Fig.5	–	13	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	60	A
E_{RSM}	non-repetitive peak reverse avalanche energy	L = 120 mH; $T_j = T_{j\,max}$ prior to surge; inductive load switched off	–	10	mJ
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature	see Fig.7	–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 5 A; $T_j = T_{j\,max}$; see Fig.8	–	–	1.25	V
		I_F = 5 A; see Fig.8	–	–	1.45	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYW97F		1300	–	–	V
	BYW97G		1500	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.9	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.9	–	–	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.12	–	–	500	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.10	–	65	–	pF
$\left\lvert\frac{dI_R}{dt}\right\rvert$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq$ 30 V and dI_F/dt = –1 A/μs; see Fig.13	–	–	5	A/μs

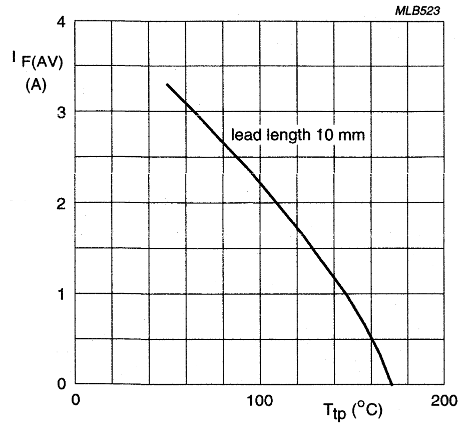
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

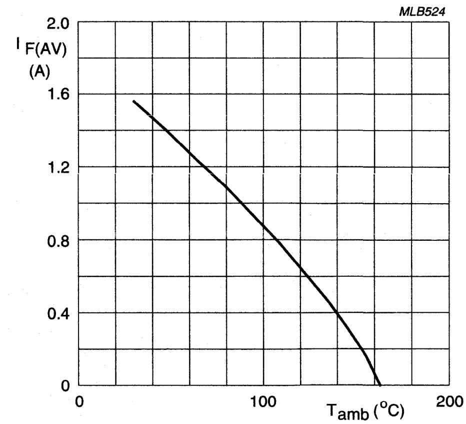
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.11. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



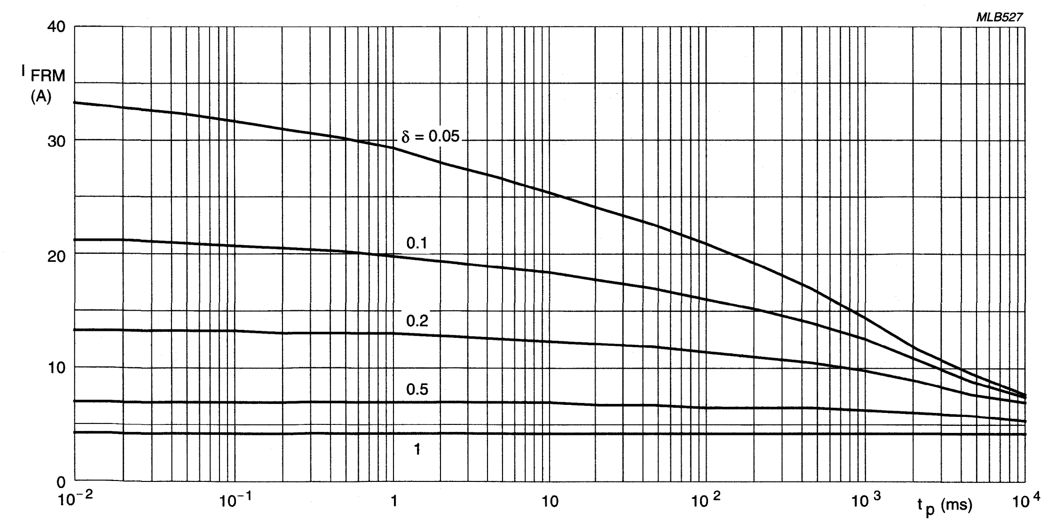
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



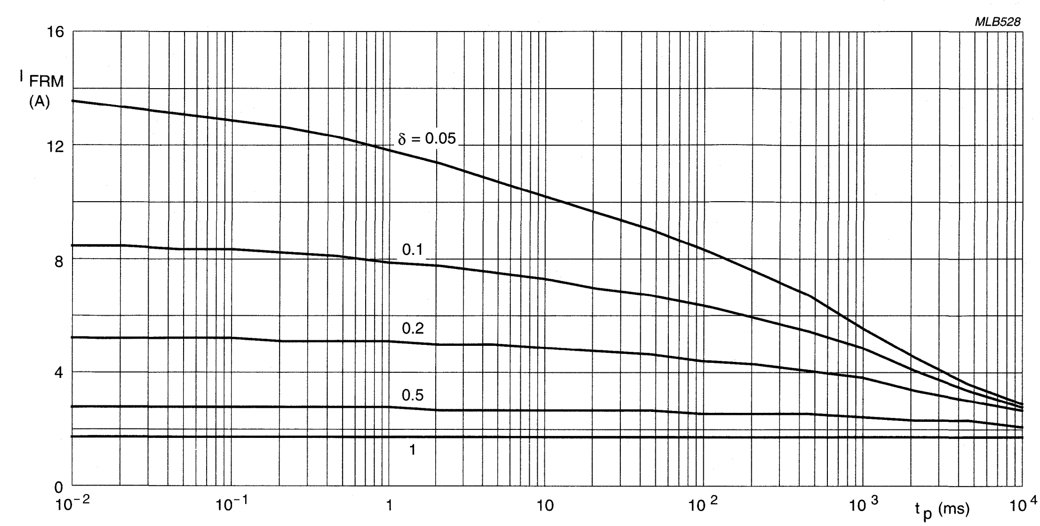
a = 1.57; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.11.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



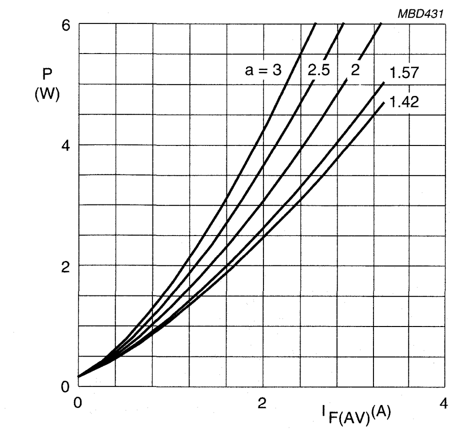
$T_{tp} = 50°C$; $R_{th\ j\text{-}tp} = 25$ K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at $V_{RRM} = 1400$ V.

Fig.4 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



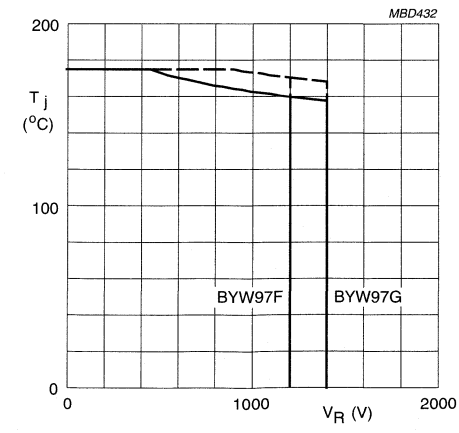
T_{amb} = 55 °C; $R_{th\ j\text{-}a}$ = 75 K/W.
V_{RRMmax} during 1 – δ; curves include derating for $T_{j\ max}$ at V_{RRM} = 1400 V.

Fig.5 Maximum repetitive peak forward current as a function of pulse time (square pulse) and duty factor.



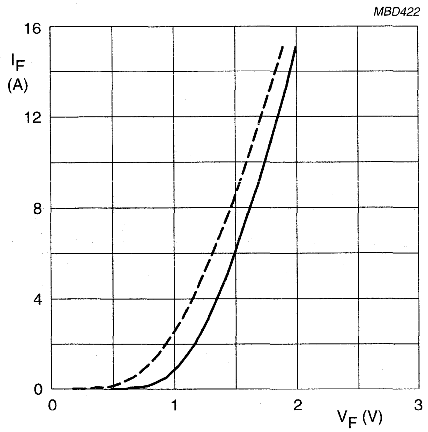
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.6 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



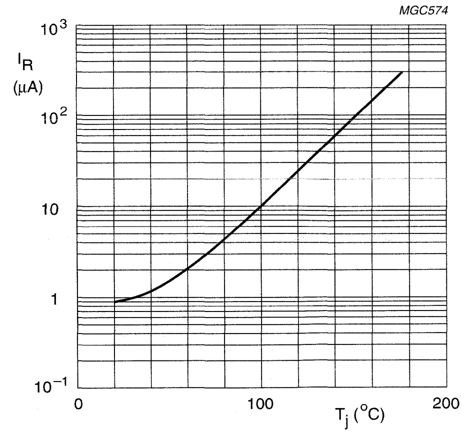
Solid line = V_R.
Dotted line = V_{RRM}; δ = 0.5.

Fig.7 Maximum permissib'le junction temperature as a function of reverse voltage.



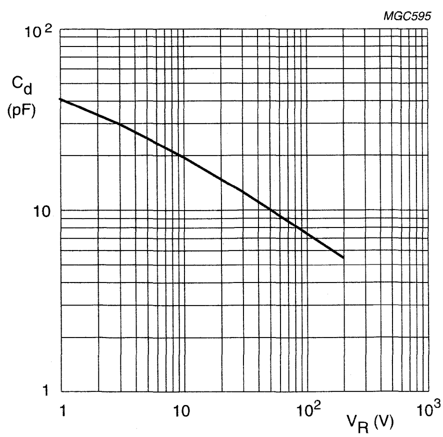
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of forward voltage; maximum values.



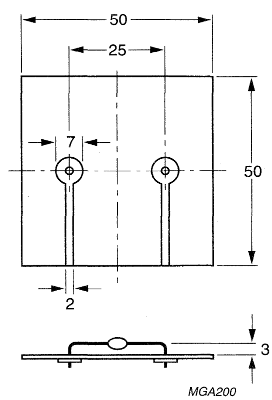
$V_R = V_{RRMmax}$.

Fig.9 Reverse current as a function of junction temperature; maximum values.



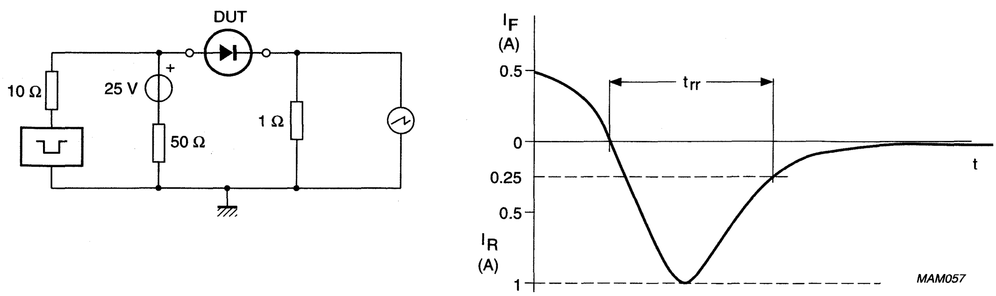
f = 1 MHz; T_j = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.11 Device mounted on a printed-circuit board.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.12 Test circuit and reverse recovery time waveform and definition.

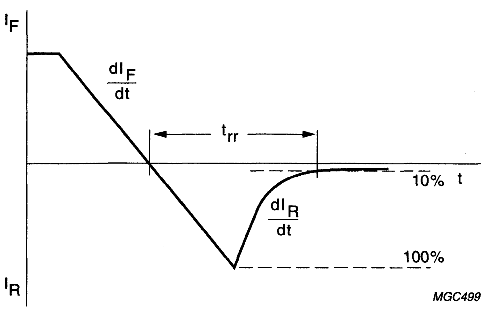


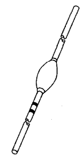
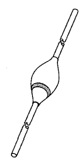
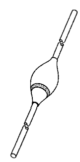
Fig.13 Reverse recovery definitions.

SECTION 12

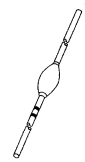
HIGH-VOLTAGE RECTIFIERS

HIGH-VOLTAGE RECTIFIERS

HIGH-VOLTAGE SOFT-RECOVERY CONTROLLED AVALANCHE RECTIFIERS

TYPE NUMBER	RATINGS				CHARACTERISTICS					PACKAGE (not to scale)
	V_{RRM}	V_{RW}	$I_{F(AV)}$	I_{FRM}	V_F @	I_F	$V_{(BR)R}$	C_d	t_{rr}	
	max.	max.	max.	max.	max.		min.	typ.	max.	
	(kV)	(kV)	(mA)	(mA)	(V)	(mA)	(kV)	(pF)	(ns)	
LEADED TYPES										
BY8004	5	4	20	500	20	100	–	0.90	100	
BY8006	8	6	10	500	25	100	–	0.65	100	
BY8008	10	8	5	500	30	100	–	0.55	100	
BY8010	12	10	5	500	38	100	–	0.45	100	
BY8012	14	12	5	500	50	100	–	0.35	100	
BY8014	17	14	5	500	55	100	–	0.30	100	
BY8016	19	16	3	500	63	100	–	0.25	100	
BY8104	5	4	20	500	26	100	–	0.90	60	
BY8106	8	6	10	500	36	100	–	0.65	60	
BY8108	10	8	5	500	44.5	100	–	0.55	60	SOD61
BY8110	12	10	5	500	54.5	100	–	0.45	60	
BY8112	14	12	5	500	75	100	–	0.35	60	
BY8114	17	14	5	500	82.5	100	–	0.30	60	
BY8116	19	16	3	500	94	100	–	0.25	60	
BYX90G	7.5	6	550	–	14.5	2000	8	–	350	 SOD83A
BYX101G	10	9	400	–	20.5	1000	–	–	600	
BYX102G	10	9	360	–	23.9	1000	–	–	350	
BYX103G	10	9	310	–	29.7	1000	–	–	175	
BYX104G	10	9	225	–	52.0	1000	–	–	50	
BYX105G	5	4.5	650	–	10.9	1000	–	–	600	
BYX106G	5	4.5	575	–	12.7	1000	–	–	350	
BYX107G	5	4.5	480	–	15.8	1000	–	–	175	
BYX108G	5	4.5	340	–	27.7	1000	–	–	50	SOD88A
BYX120G	3	3	100	–	5	250	3.5	–	–	

HIGH-VOLTAGE SOFT-RECOVERY NON-AVALANCHE RECTIFIERS

TYPE NUMBER	RATINGS				CHARACTERISTICS				PACKAGE (not to scale)
	V_{RRM} max. (kV)	V_{RW} max. (kV)	$I_{F(AV)}$ max. (mA)	I_{FRM} max. (mA)	V_F max. (V)	@ I_F (mA)	C_d typ. (pF)	t_{rr} max. (ns)	
LEADED TYPES									
BY505	2.2	2	85	800	8.5	100	2	200(1)	 SOD61
BY584	1.8	1.5	85	800	8.5	100	2	200(1)	
BY614	2.2	2	50	500	6	50	2	300	
BY8404	5	4	20	500	20	100	1.2	100	
BY8406	8	6	10	500	25	100	0.8	100	
BY8408	10	8	5	500	35	100	0.6	100	
BY8410	12	10	5	500	42	100	0.5	100	
BY8412	14	12	5	500	52	100	0.4	100	
BY8414	17	14	5	500	60	100	0.35	100	
BY8416	19	16	3	500	70	100	0.3	100	
BY8418	22	18	3	500	77	100	0.28	100	
BY8420	24	20	3	500	88	100	0.28	100	
BY8424	30	24	3	500	98	100	0.28	100	

Note

1. Typical value.

High-voltage soft-recovery rectifier — BY505

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

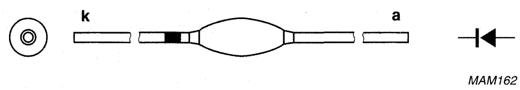
- High-voltage applications for:
  - High frequencies
  - Switching applications.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.



The cathode lead is marked by a black band.

Fig.1 Simplified outline (SOD61A) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	2200	V
V_{RRM}	repetitive peak reverse voltage		–	2200	V
V_{RW}	working reverse voltage		–	2000	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 25 °C; lead length = 10 mm; see Fig.2; see also Fig.4	–	85	mA
		averaged over any 20 ms period; T_{amb} = 60 °C; PCB mounting (see Fig.6); see Fig.3; see also Fig.4	–	50	mA
I_{FRM}	repetitive peak forward current		–	800	mA
I_{FSM}	non-repetitive peak forward current	$t \leq 10$ ms; half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RWmax}$	–	5	A
T_{stg}	storage temperature		–65	+120	°C
T_j	junction temperature		–65	+120	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; $T_j = T_{j\,max}$; see Fig.5	–	–	8.5	V
I_R	reverse current	$V_R = V_{RWmax}$; $T_j = T_{j\,max}$	–	–	3	μA
Q_r	recovery charge	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/μs; see Fig.7	–	–	1	nC
t_f	fall time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/μs; see Fig.7	100	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/μs; see Fig.7	–	200	–	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	2	–	pF

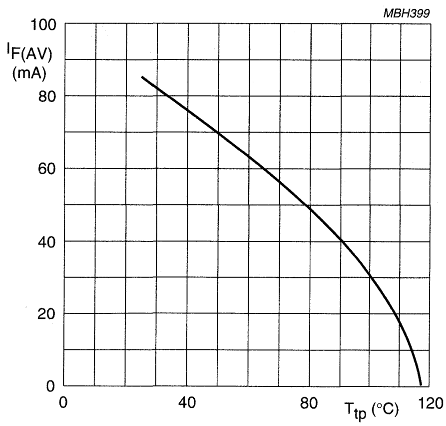
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	100	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	155	K/W

Note

1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.6. For more information please refer to the *"General Part of Handbook SC01"*.

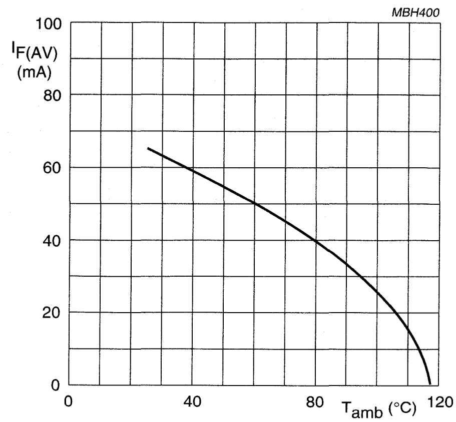
GRAPHICAL DATA



Switched mode application.

a = 1.42; δ = 0.5; $V_R = V_{RWmax}$; lead length = 10 mm.

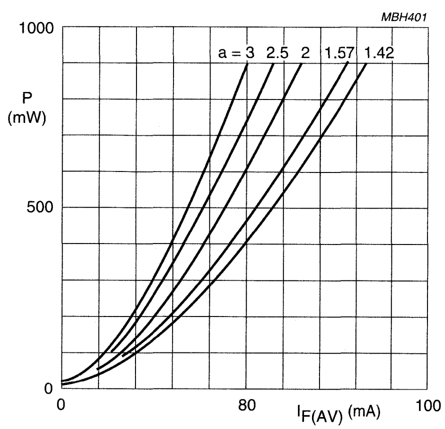
Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



Switched mode application.

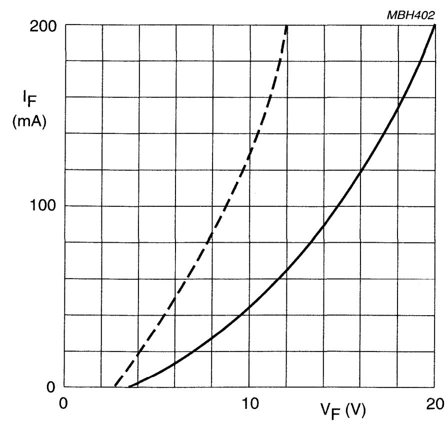
a = 1.42; δ = 0.5; $V_R = V_{RWmax}$; device mounted as shown in Fig.6.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



a = $I_{F(RMS)}/I_{F(AV)}$; δ = 0.5; $V_R = V_{RWmax}$.

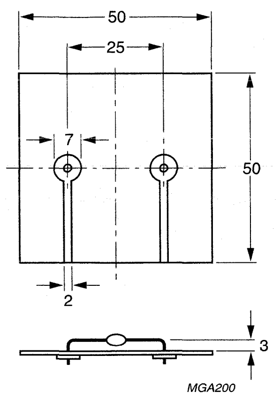
Fig.4 Maximum steady state power dissipation (forward plus leakage losses) as a function of average forward current.



Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.5 Forward current as a function of maximum forward voltage.



Dimensions in mm.

Fig.6 Device mounted on a printed-circuit board.

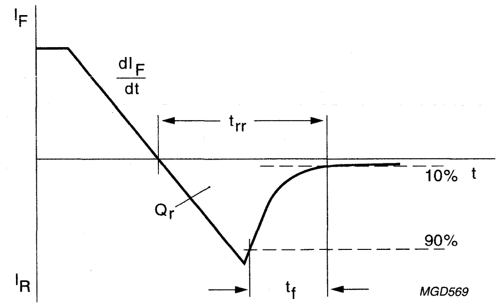


Fig.7 Reverse recovery definitions.

High-voltage soft-recovery rectifier — BY584

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

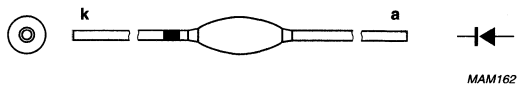
- Grid 2 supply in colour television picture tubes
- High-voltage applications for:
  - High frequencies
  - Switching applications.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.



The cathode lead is marked with an orange band.

Fig.1 Simplified outline (SOD61A) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1800	V
V_{RRM}	repetitive peak reverse voltage		–	1800	V
V_{RW}	working reverse voltage		–	1500	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 25 °C; lead length = 10 mm; see Fig.2; see also Fig.4	–	85	mA
		averaged over any 20 ms period; T_{amb} = 60 °C; PCB mounting (see Fig.6); see Fig.3; see also Fig.4	–	50	mA
I_{FRM}	repetitive peak forward current		–	800	mA
I_{FSM}	non-repetitive peak forward current	t ≤ 10 ms; half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RWmax}$	–	5	A
T_{stg}	storage temperature		–65	+120	°C
T_j	junction temperature		–65	+120	°C

ELECTRICAL CHARACTERISTICS

$T_j = 25\ °C$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	$I_F = 100$ mA; $T_j = T_{j\,max}$; see Fig.5	–	–	8.5	V
I_R	reverse current	$V_R = V_{RWmax}$; $T_j = T_{j\,max}$	–	–	3	μA
Q_r	recovery charge	when switched from $I_F = 100$ mA to $V_R \geq 100$ V and $dI_F/dt = -200$ mA/μs; see Fig.7	–	–	1	nC
t_f	fall time	when switched from $I_F = 100$ mA to $V_R \geq 100$ V and $dI_F/dt = -200$ mA/μs; see Fig.7	100	–	–	ns
t_{rr}	reverse recovery time	when switched from $I_F = 100$ mA to $V_R \geq 100$ V and $dI_F/dt = -200$ mA/μs; see Fig.7	–	200	–	ns
C_d	diode capacitance	$V_R = 0$ V; f = 1 MHz	–	2	–	pF

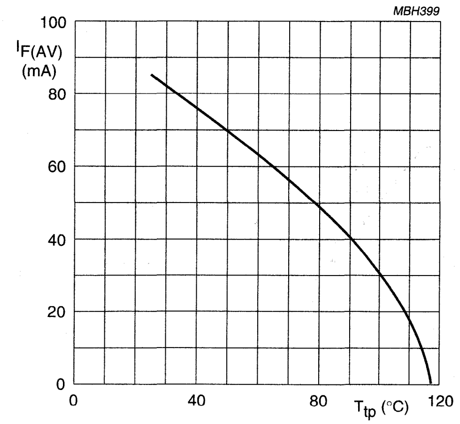
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	100	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	155	K/W

Note

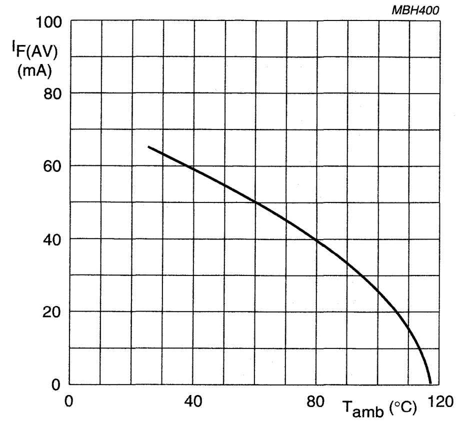
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 μm, see Fig.6. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



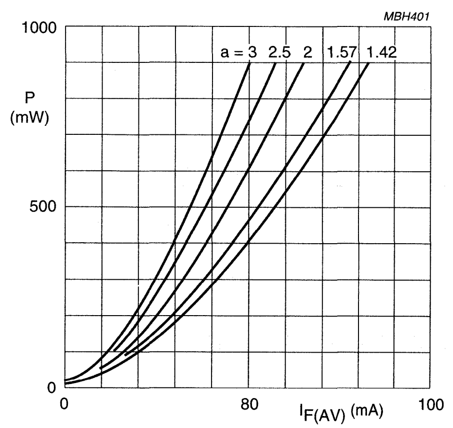
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RWmax}$; lead length = 10 mm.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



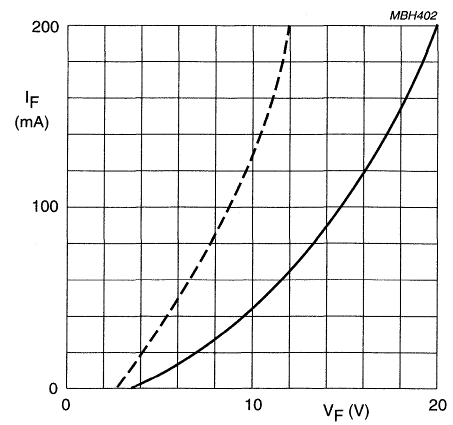
Switched mode application.
a = 1.42; δ = 0.5; $V_R = V_{RWmax}$; device mounted as shown in Fig.6.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



a = $I_{F(RMS)}/I_{F(AV)}$; δ = 0.5; $V_R = V_{RWmax}$.

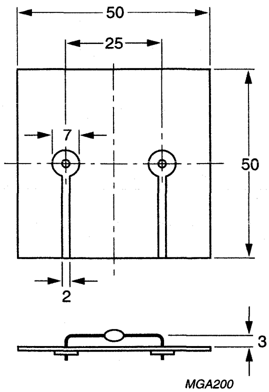
Fig.4 Maximum steady state power dissipation (forward plus leakage losses) as a function of average forward current.



Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.5 Forward current as a function of maximum forward voltage.

High-voltage soft-recovery rectifier | BY584



Dimensions in mm.

Fig.6 Device mounted on a printed-circuit board.

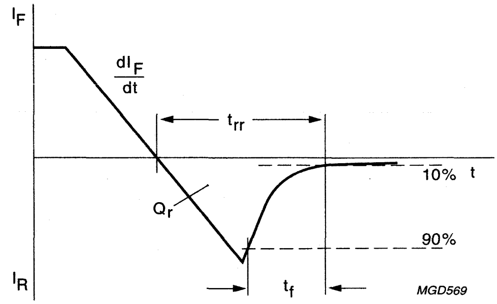
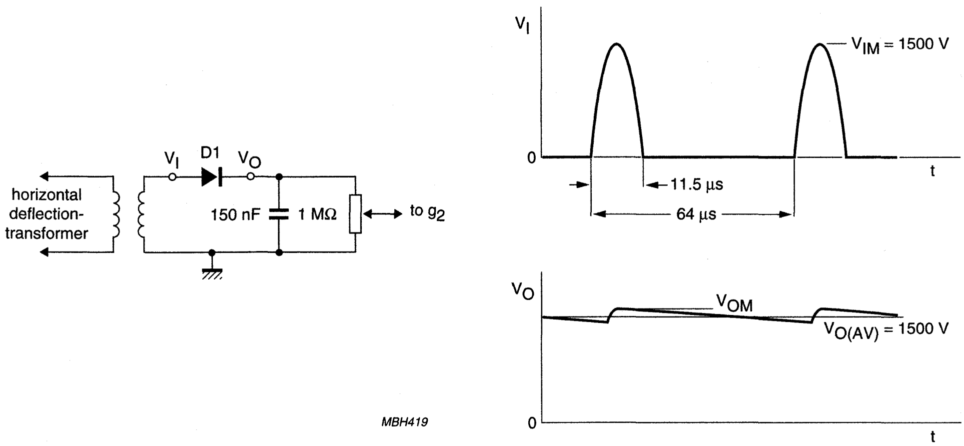


Fig.7 Reverse recovery definitions.

APPLICATION INFORMATION



D1 = BY584.

Stable continuous operation is ensured at ambient temperatures up to 70 °C.

Fig.8 Basic circuit and waveforms for grid 2 voltage supply in colour television picture tubes.

Miniature high-voltage soft-recovery rectifier

BY614

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Soft-recovery switching characteristics
- Very compact construction.

APPLICATIONS

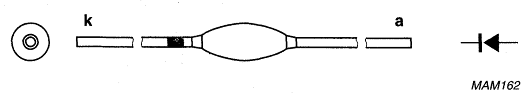
- Miniature high-voltage assemblies such as voltage multipliers.

DESCRIPTION

Miniature glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.



The cathode lead is marked with a black band.

Fig.1 Simplified outline (SOD61H2) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	2200	V
V_{RRM}	repetitive peak reverse voltage		–	2200	V
V_{RW}	working reverse voltage		–	2000	V
V_R	continuous reverse voltage		–	2000	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; PCB mounting (see Fig.5); T_{amb} = 65 °C; see Fig.2; see also Fig.3	–	50	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	$t \leq 10$ ms; half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RWmax}$	–	1	A
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		−65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 50 mA; $T_j = T_{j\,max}$; see Fig.4	–	–	6	V
I_R	reverse current	$V_R = V_{RWmax}$; T_j = 120 °C	–	–	3	µA
Q_r	recovery charge	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.6	–	–	1	nC
t_f	fall time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.6	100	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.6	–	–	300	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz	–	2	–	pF

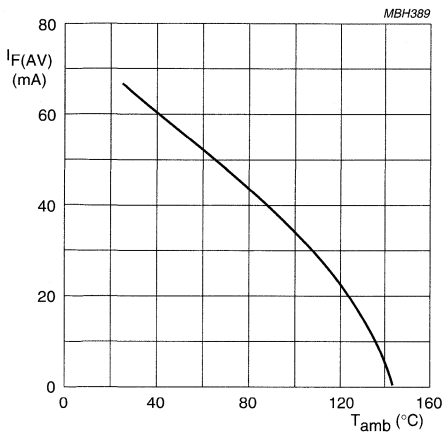
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	100	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	155	K/W

Note

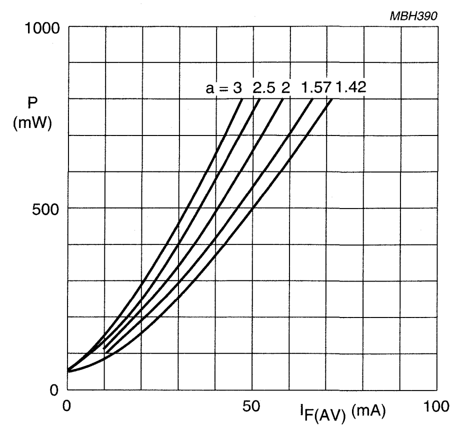
1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper ≥40 µm, see Fig.5. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



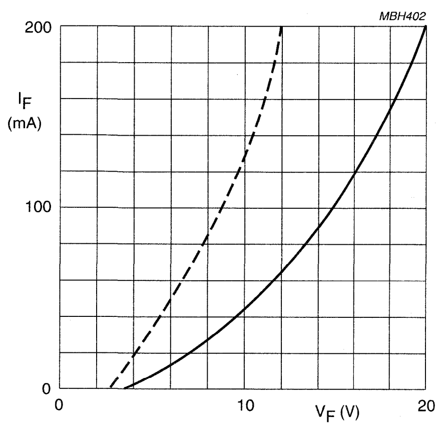
a = 1.57; δ = 0.5; $V_R = V_{RWmax}$; device mounted as shown in Fig.5.

Fig.2 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



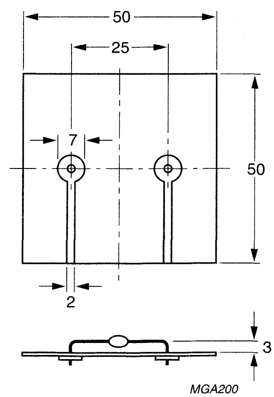
a = $I_{F(RMS)}/I_{F(AV)}$; δ = 0.5; $V_R = V_{RWmax}$.

Fig.3 Maximum steady state power dissipation (forward plus leakage losses) as a function of average forward current.



Dotted line: T_j = 150 °C.
Solid line: T_j = 25 °C.

Fig.4 Forward current as a function of maximum forward voltage.



Dimensions in mm.

Fig.5 Device mounted on a printed-circuit board.

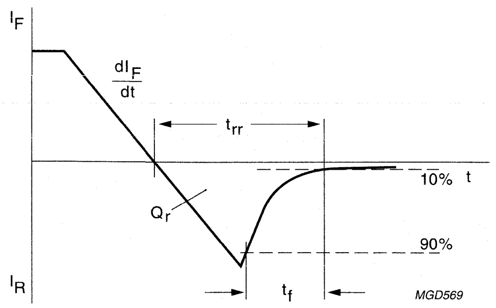


Fig.6 Reverse recovery definitions.

Fast high-voltage soft-recovery controlled avalanche rectifiers

BY8000 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

- For colour television and monitors up to 25 kHz
- High-voltage applications for:
  - Multipliers
  - Layer-wound diode-split-transformers where controlled avalanche is required.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

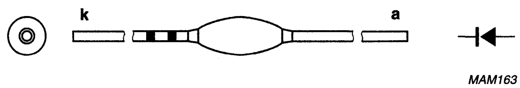


Fig.1 Simplified outline (SOD61) and symbol.

MARKING

Cathode band colour codes

TYPE NUMBER	PACKAGE CODE	INNER BAND	OUTER BAND
BY8004	SOD61AC	violet	black
BY8006	SOD61AD	violet	green
BY8008	SOD61AE	violet	red
BY8010	SOD61AF	violet	violet
BY8012	SOD61AH	violet	orange
BY8014	SOD61AI	violet	lilac
BY8016	SOD61AJ	violet	grey

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BY8004		–	5	kV
	BY8006		–	8	kV
	BY8008		–	10	kV
	BY8010		–	12	kV
	BY8012		–	14	kV
	BY8014		–	17	kV
	BY8016		–	19	kV
V_{RW}	working reverse voltage				
	BY8004		–	4	kV
	BY8006		–	6	kV
	BY8008		–	8	kV
	BY8010		–	10	kV
	BY8012		–	12	kV
	BY8014		–	14	kV
	BY8016		–	16	kV
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; see Figs 2 to 8			
	BY8004		–	20	mA
	BY8006		–	10	mA
	BY8008		–	5	mA
	BY8010		–	5	mA
	BY8012		–	5	mA
	BY8014		–	5	mA
	BY8016		–	3	mA
I_{FRM}	repetitive peak forward current	note 1	–	500	mA
P_{RSM}	non-repetitive peak reverse power dissipation	t = 20 µs half sinewave; $T_j = T_{j\,max}$ prior to surge			
	BY8004		–	2.5	kW
	BY8006		–	3.5	kW
	BY8008		–	4.2	kW
	BY8010		–	5.2	kW
	BY8012		–	7.0	kW
	BY8014		–	7.8	kW
	BY8016		–	9.1	kW
T_{stg}	storage temperature		−65	+120	°C
T_j	junction temperature		−65	+120	°C

Note

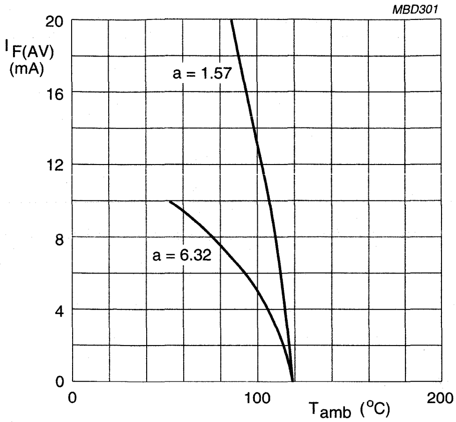
1. Withstands peak currents during flash-over in a picture tube.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; $T_j = T_{j\,max}$; see Figs 9 to 15				
	BY8004		–	–	20	V
	BY8006		–	–	25	V
	BY8008		–	–	30	V
	BY8010		–	–	38	V
	BY8012		–	–	50	V
	BY8014		–	–	55	V
	BY8016		–	–	63	V
I_R	reverse current	$V_R = V_{RWmax}$; T_j = 120 °C	–	–	3	µA
Q_r	recovery charge	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.16	–	–	1	nC
t_f	fall time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.16	80	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 2 mA to I_R = 4 mA; measured at I_R = 1 mA; see Fig.17	–	–	100	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz				
	BY8004		–	0.90	–	pF
	BY8006		–	0.65	–	pF
	BY8008		–	0.55	–	pF
	BY8010		–	0.45	–	pF
	BY8012		–	0.35	–	pF
	BY8014		–	0.30	–	pF
	BY8016		–	0.25	–	pF

GRAPHICAL DATA



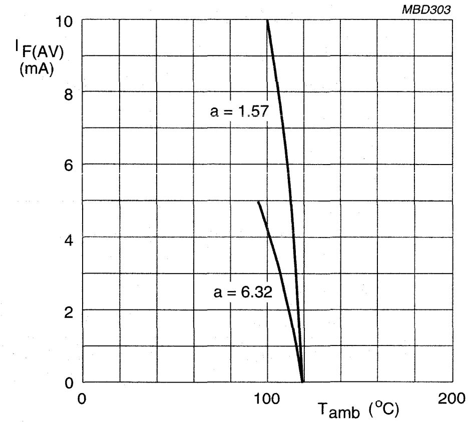
BY8004.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.2 Maximum permissible average forward current as a function of ambient temperature.



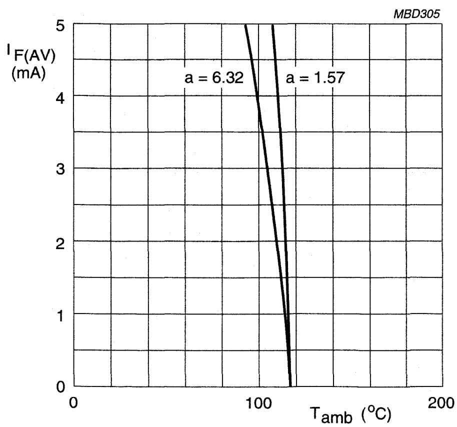
BY8006.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.3 Maximum permissible average forward current as a function of ambient temperature.



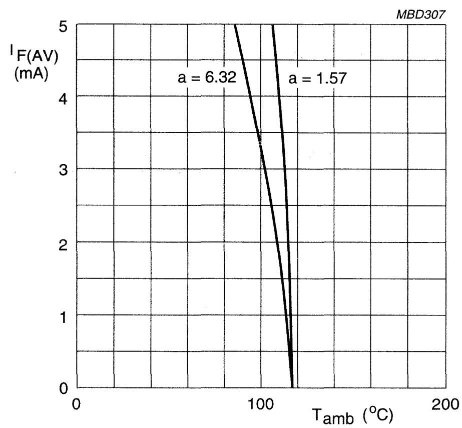
BY8008.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.4 Maximum permissible average forward current as a function of ambient temperature.



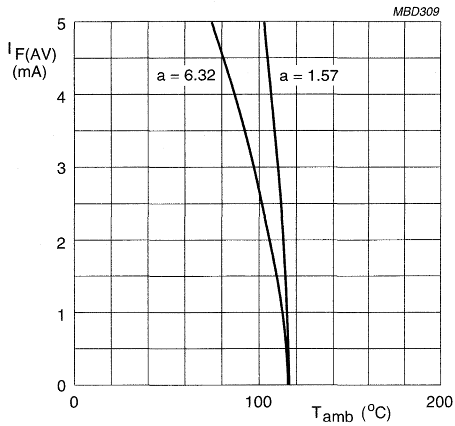
BY8010.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.5 Maximum permissible average forward current as a function of ambient temperature.



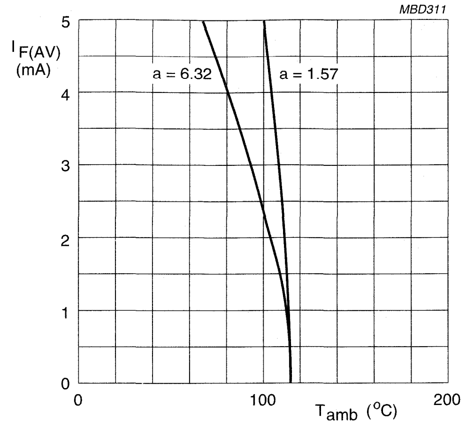
BY8012.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see see Fig.18.

Fig.6 Maximum permissible average forward current as a function of ambient temperature.



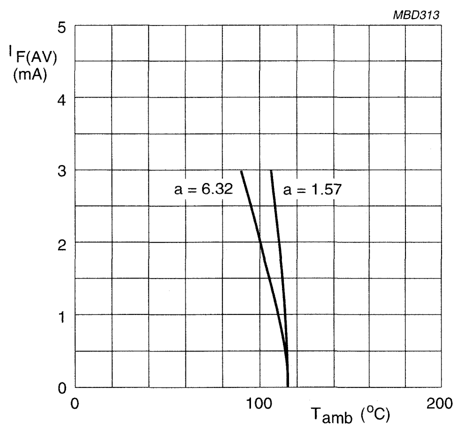
BY8014.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.7 Maximum permissible average forward current as a function of ambient temperature.



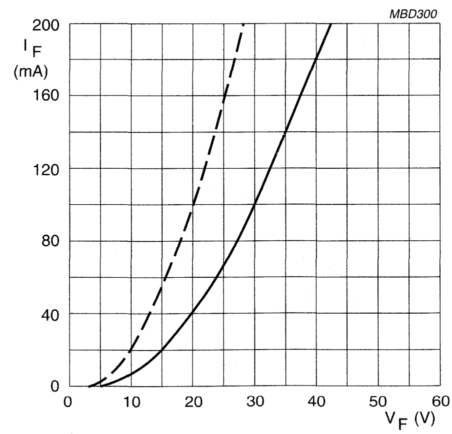
BY8016.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.8 Maximum permissible average forward current as a function of ambient temperature.

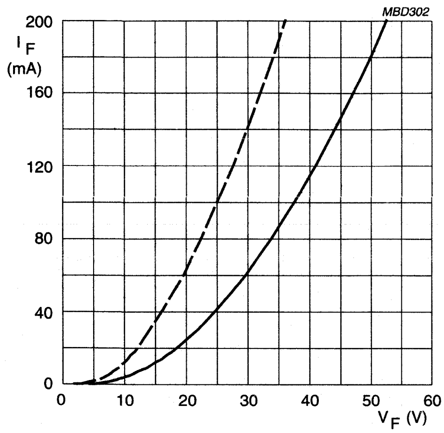


BY8004.

Dotted line: $T_j = 120$ °C.

Solid line: $T_j = 25$ °C.

Fig.9 Forward current as a function of maximum forward voltage.

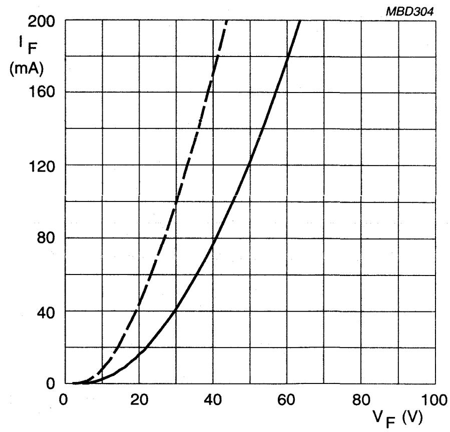


BY8006.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.10 Forward current as a function of maximum forward voltage.

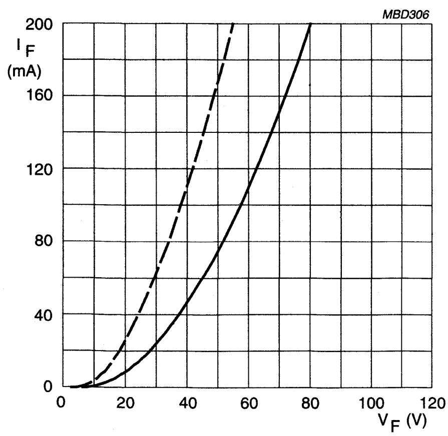


BY8008.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.11 Forward current as a function of maximum forward voltage.

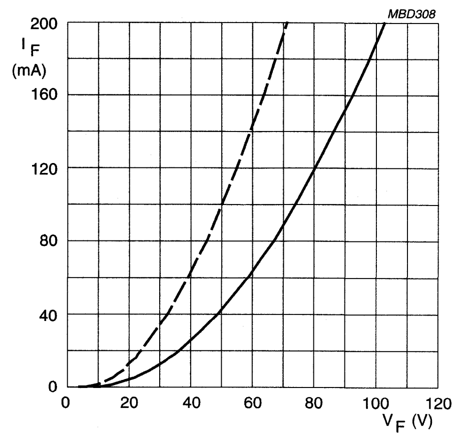


BY8010.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.12 Forward current as a function of maximum forward voltage.

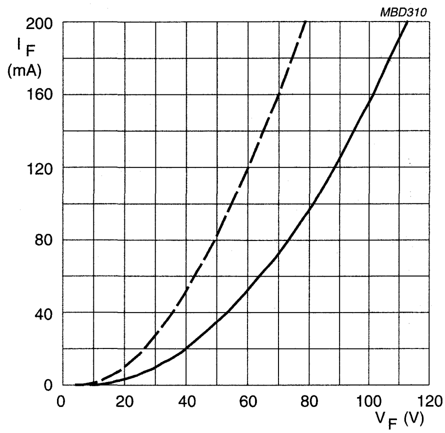


BY8012.

Dotted line: T_j = 120 °C.

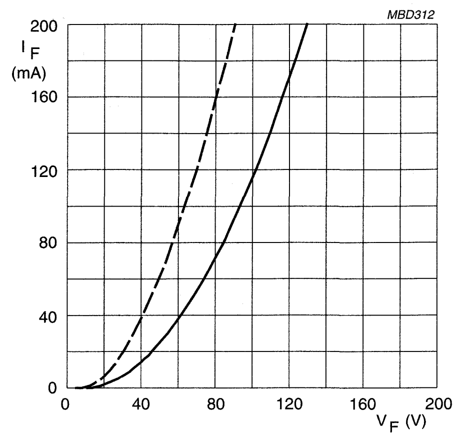
Solid line: T_j = 25 °C.

Fig.13 Forward current as a function of maximum forward voltage.



BY8014.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.14 Forward current as a function of maximum forward voltage.



BY8016.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.15 Forward current as a function of maximum forward voltage.

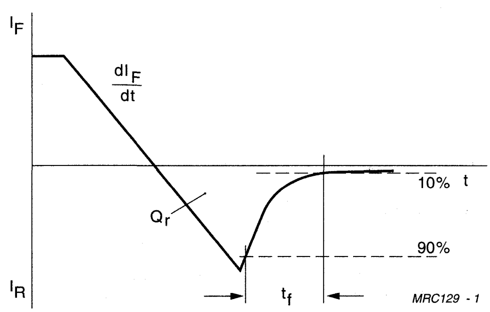
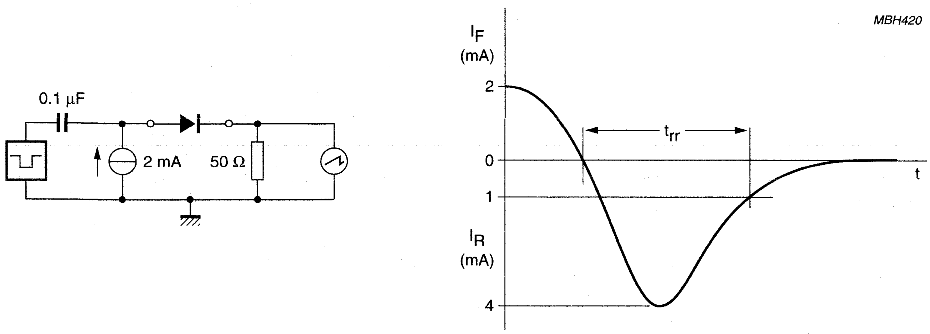


Fig.16 Reverse recovery definitions.



Rise time oscilloscope: t_r < 7 ns.
Generator pulse width: 1.0 μs.

Fig.17 Test circuit and reverse recovery time waveform and definition.

APPLICATION INFORMATION

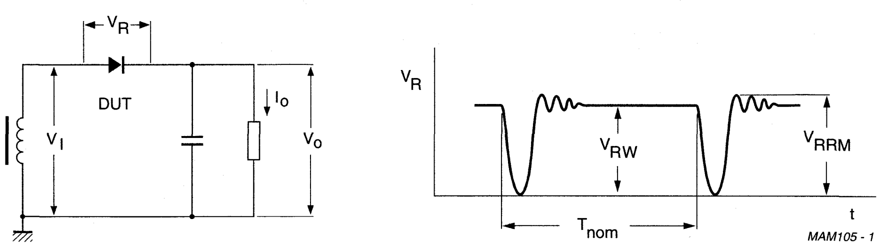


Fig.18 Typical operation circuit and voltage waveform.

Very fast high-voltage soft-recovery controlled avalanche rectifiers

BY8100 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

- For colour television and monitors up to 128 kHz
- High-voltage applications for:
  - Multipliers
  - Layer-wound diode-split-transformers where controlled avalanche is required.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

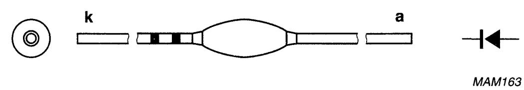


Fig.1 Simplified outline (SOD61) and symbol.

MARKING

Cathode band colour codes

TYPE NUMBER	PACKAGE CODE	INNER BAND	OUTER BAND
BY8104	SOD61AC	orange	black
BY8106	SOD61AD	orange	green
BY8108	SOD61AE	orange	red
BY8110	SOD61AF	orange	violet
BY8112	SOD61AH	orange	orange
BY8114	SOD61AI	orange	lilac
BY8116	SOD61AJ	orange	grey

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BY8104		–	5	kV
	BY8106		–	8	kV
	BY8108		–	10	kV
	BY8110		–	12	kV
	BY8112		–	14	kV
	BY8114		–	17	kV
	BY8116		–	19	kV
V_{RW}	working reverse voltage				
	BY8104		–	4	kV
	BY8106		–	6	kV
	BY8108		–	8	kV
	BY8110		–	10	kV
	BY8112		–	12	kV
	BY8114		–	14	kV
	BY8116		–	16	kV
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; see Figs 2 to 8			
	BY8104		–	20	mA
	BY8106		–	10	mA
	BY8108		–	5	mA
	BY8110		–	5	mA
	BY8112		–	5	mA
	BY8114		–	5	mA
	BY8116		–	3	mA
I_{FRM}	repetitive peak forward current	note 1	–	500	mA
P_{RSM}	non-repetitive peak reverse power dissipation	t = 20 µs half sinewave; $T_j = T_{j\,max}$ prior to surge			
	BY8104		–	1.7	kW
	BY8106		–	2.5	kW
	BY8108		–	3.0	kW
	BY8110		–	3.8	kW
	BY8112		–	5.0	kW
	BY8114		–	5.5	kW
	BY8116		–	6.5	kW
T_{stg}	storage temperature		–65	+120	°C
T_j	junction temperature		–65	+120	°C

Note

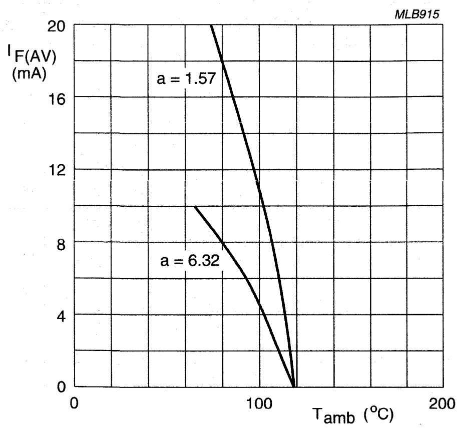
1. Withstands peak currents during flash-over in a picture tube.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; $T_j = T_{j\,max}$; see Figs 9 to 15				
	BY8104		–	–	26	V
	BY8106		–	–	36	V
	BY8108		–	–	44.5	V
	BY8110		–	–	54.5	V
	BY8112		–	–	75	V
	BY8114		–	–	82.5	V
	BY8116		–	–	94	V
I_R	reverse current	$V_R = V_{RWmax}$; T_j = 120 °C	–	–	3	μA
Q_r	recovery charge	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/μs; see Fig.16	–	–	0.4	nC
t_f	fall time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/μs; see Fig.16	40	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 2 mA to I_R = 4 mA; measured at I_R = 1 mA; see Fig.17	–	–	60	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz				
	BY8104		–	0.90	–	pF
	BY8106		–	0.65	–	pF
	BY8108		–	0.55	–	pF
	BY8110		–	0.45	–	pF
	BY8112		–	0.35	–	pF
	BY8114		–	0.30	–	pF
	BY8116		–	0.25	–	pF

GRAPHICAL DATA



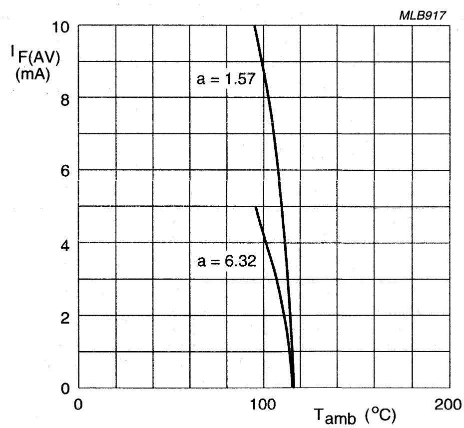
BY8104.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.2 Maximum permissible average forward current as a function of ambient temperature.



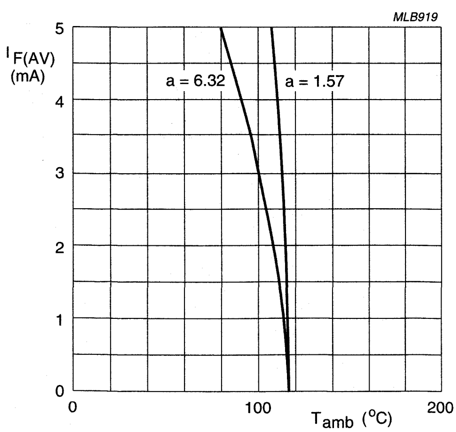
BY8106.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.3 Maximum permissible average forward current as a function of ambient temperature.



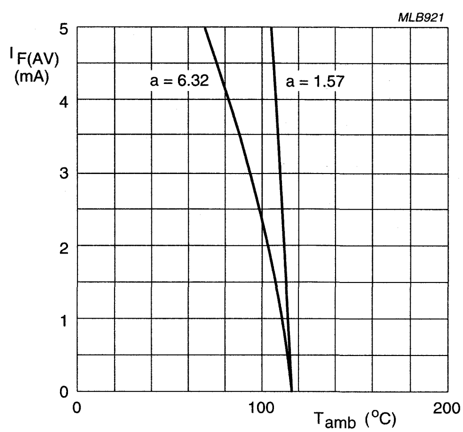
BY8108.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

a = 6.32: line output transformer application; see Fig.18.

Fig.4 Maximum permissible average forward current as a function of ambient temperature.



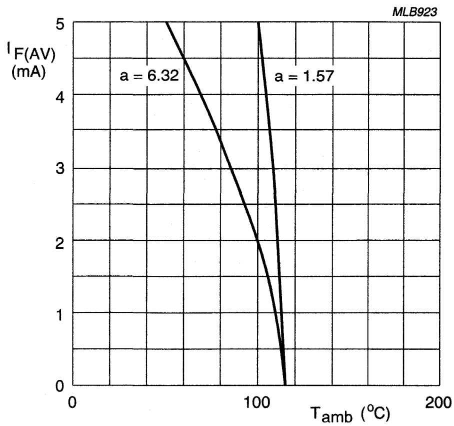
BY8110.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.

a = 1.57: half sinewave.

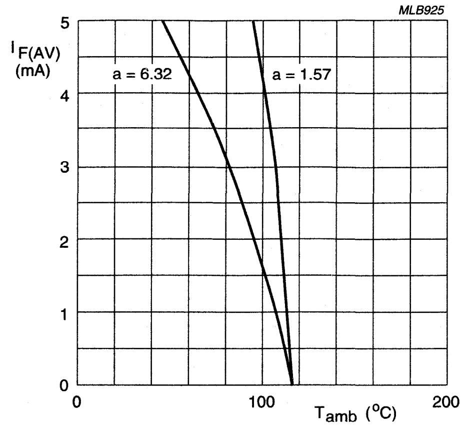
a = 6.32: line output transformer application; see Fig.18.

Fig.5 Maximum permissible average forward current as a function of ambient temperature.



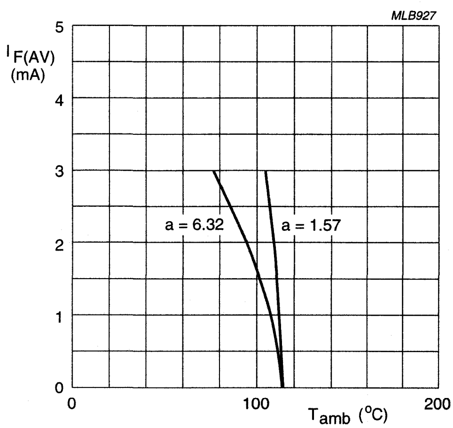
BY8112.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.18.

Fig.6 Maximum permissible average forward current as a function of ambient temperature.



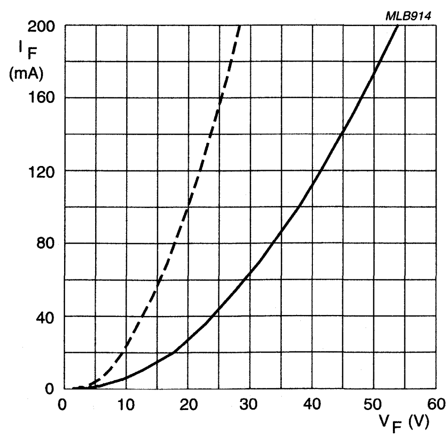
BY8114.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.18.

Fig.7 Maximum permissible average forward current as a function of ambient temperature.



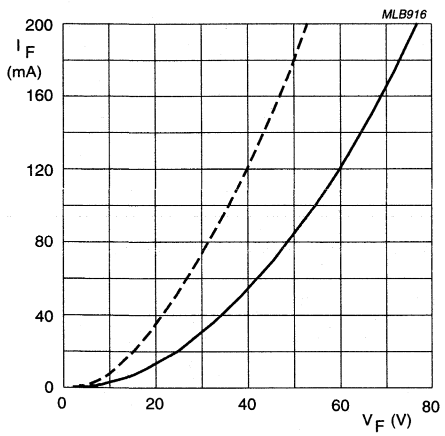
BY8116.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.18.

Fig.8 Maximum permissible average forward current as a function of ambient temperature.



BY8104.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.9 Forward current as a function of maximum forward voltage.

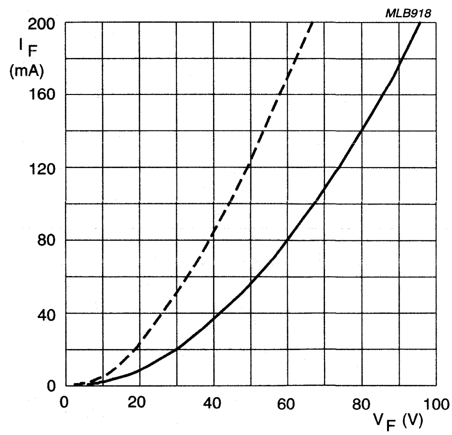


BY8106.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.10 Forward current as a function of maximum forward voltage.

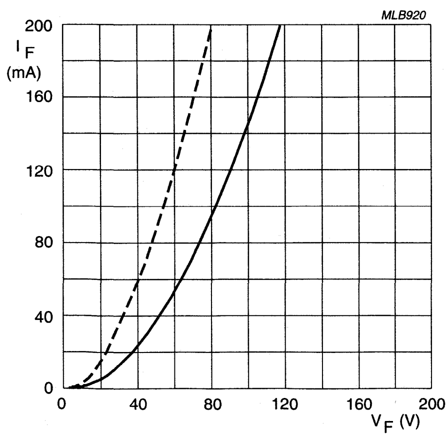


BY8108.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.11 Forward current as a function of maximum forward voltage.

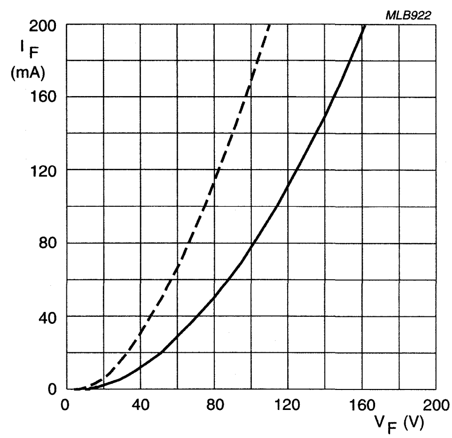


BY8110.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.12 Forward current as a function of maximum forward voltage.

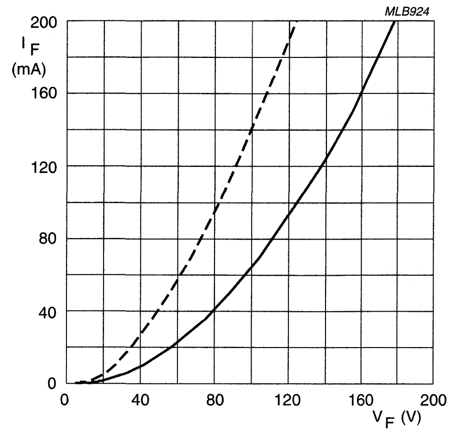


BY8112.

Dotted line: T_j = 120 °C.

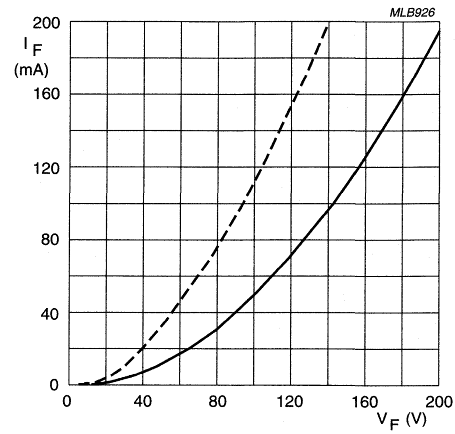
Solid line: T_j = 25 °C.

Fig.13 Forward current as a function of maximum forward voltage.



BY8114.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.14 Forward current as a function of maximum forward voltage.



BY8116.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.15 Forward current as a function of maximum forward voltage.

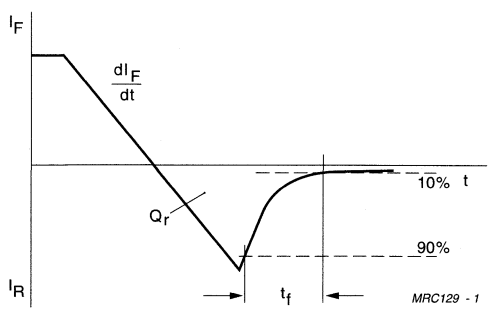
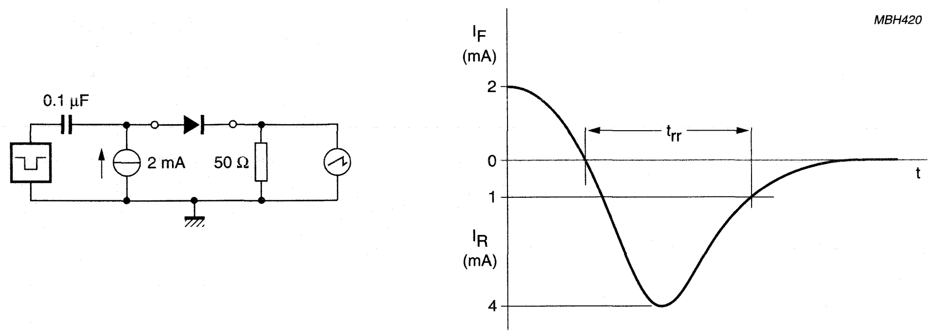


Fig.16 Reverse recovery definitions.



Rise time oscilloscope: t_r < 7 ns.
Generator pulse width: 1.0 μs.

Fig.17 Test circuit and reverse recovery time waveform and definition.

APPLICATION INFORMATION

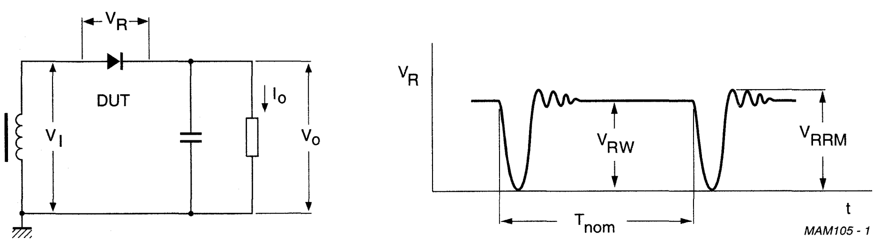


Fig.18 Typical operation circuit and voltage waveform.

Fast high-voltage soft-recovery rectifiers

BY8400 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

- For colour television and monitors up to 25 kHz
- High-voltage applications for:
  - Multipliers
  - Slot-wound diode-split-transformers.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

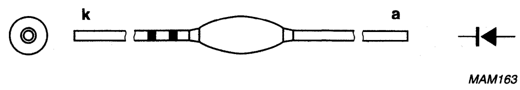


Fig.1 Simplified outline (SOD61) and symbol.

MARKING

Cathode band colour codes

TYPE NUMBER	PACKAGE CODE	INNER BAND	OUTER BAND
BY8404	SOD61AB	black	black
BY8406	SOD61AC	black	green
BY8408	SOD61AD	black	red
BY8410	SOD61AE	black	violet
BY8412	SOD61AF	black	orange
BY8414	SOD61AG	black	lilac
BY8416	SOD61AH	black	grey
BY8418	SOD61AI	black	brown
BY8420	SOD61AJ	black	dark blue
BY8424	SOD61AK	black	no band

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage				
	BY8404		–	5	kV
	BY8406		–	8	kV
	BY8408		–	10	kV
	BY8410		–	12	kV
	BY8412		–	14	kV
	BY8414		–	17	kV
	BY8416		–	19	kV
	BY8418		–	22	kV
	BY8420		–	24	kV
	BY8424		–	30	kV
V_{RRM}	repetitive peak reverse voltage				
	BY8404		–	5	kV
	BY8406		–	8	kV
	BY8408		–	10	kV
	BY8410		–	12	kV
	BY8412		–	14	kV
	BY8414		–	17	kV
	BY8416		–	19	kV
	BY8418		–	22	kV
	BY8420		–	24	kV
	BY8424		–	30	kV
V_{RW}	working reverse voltage				
	BY8404		–	4	kV
	BY8406		–	6	kV
	BY8408		–	8	kV
	BY8410		–	10	kV
	BY8412		–	12	kV
	BY8414		–	14	kV
	BY8416		–	16	kV
	BY8418		–	18	kV
	BY8420		–	20	kV
	BY8424		–	24	kV

Fast high-voltage soft-recovery rectifiers BY8400 series

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; see Figs 2 to 11			
	BY8404		–	20	mA
	BY8406		–	10	mA
	BY8408		–	5	mA
	BY8410		–	5	mA
	BY8412		–	5	mA
	BY8414		–	5	mA
	BY8416		–	3	mA
	BY8418		–	3	mA
	BY8420		–	3	mA
	BY8424		–	3	mA
I_{FRM}	repetitive peak forward current	note 1	–	500	mA
T_{stg}	storage temperature		−65	+120	°C
T_j	junction temperature		−65	+120	°C

Note

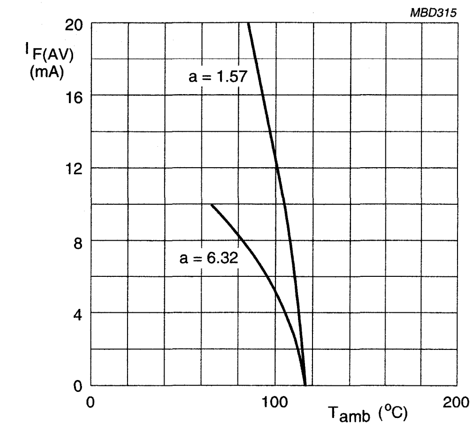
1. Withstands peak currents during flash-over in a picture tube.

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; $T_j = T_{j\,max}$; see Figs 12 to 21				
	BY8404		–	–	20	V
	BY8406		–	–	25	V
	BY8408		–	–	35	V
	BY8410		–	–	42	V
	BY8412		–	–	52	V
	BY8414		–	–	60	V
	BY8416		–	–	70	V
	BY8418		–	–	77	V
	BY8420		–	–	88	V
	BY8424		–	–	98	V
I_R	reverse current	$V_R = V_{RWmax}$; T_j = 120 °C	–	–	3	µA
Q_r	recovery charge	when switched from I_F = 100 mA to V_R ≥ 100 V and dI_F/dt = –200 mA/µs; see Fig.22	–	–	1	nC
t_f	fall time	when switched from I_F = 100 mA to V_R ≥ 100 V and dI_F/dt = –200 mA/µs; see Fig.22	100	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 2 mA to I_R = 4 mA; measured at I_R = 1 mA; see Fig.23	–	–	100	ns
C_d	diode capacitance	V_R = 0 V; f = 1 MHz				
	BY8404		–	1.20	–	pF
	BY8406		–	0.80	–	pF
	BY8408		–	0.60	–	pF
	BY8410		–	0.50	–	pF
	BY8412		–	0.40	–	pF
	BY8414		–	0.35	–	pF
	BY8416		–	0.30	–	pF
	BY8418		–	0.28	–	pF
	BY8420		–	0.28	–	pF
	BY8424		–	0.28	–	pF

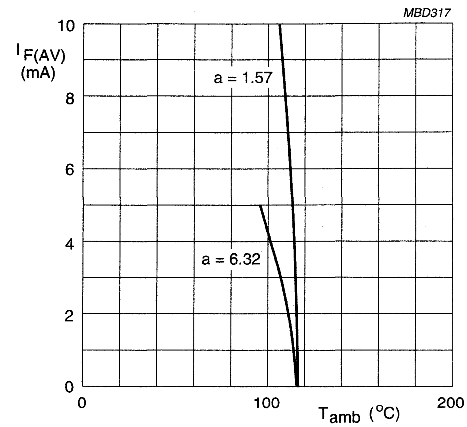
GRAPHICAL DATA



BY8404.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

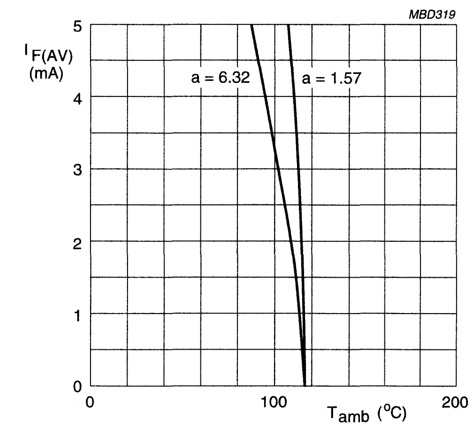
Fig.2 Maximum permissible average forward current as a function of ambient temperature.



BY8406.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see see Fig.24.

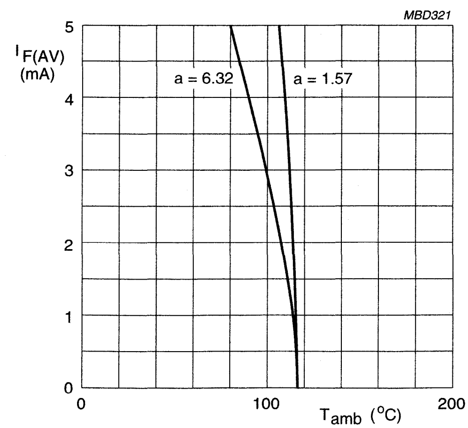
Fig.3 Maximum permissible average forward current as a function of ambient temperature.



BY8408.

a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

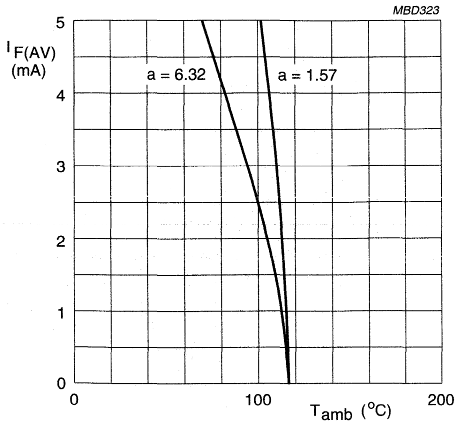
Fig.4 Maximum permissible average forward current as a function of ambient temperature.



BY8410.

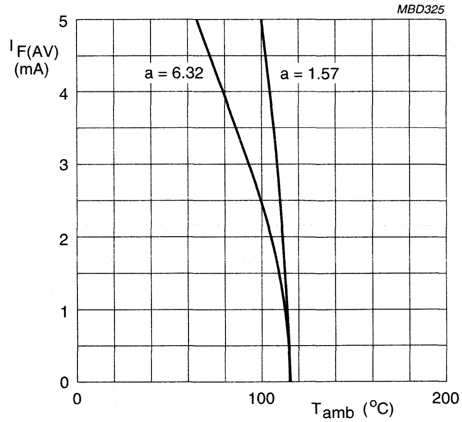
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see see Fig.24.

Fig.5 Maximum permissible average forward current as a function of ambient temperature.



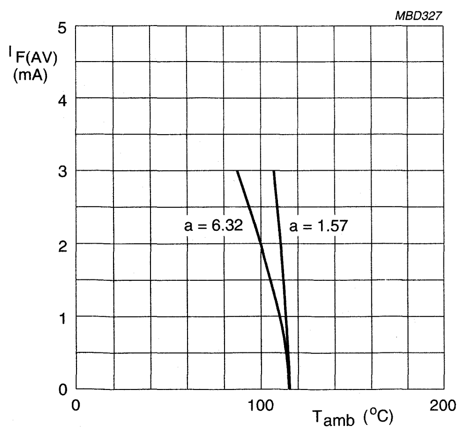
BY8412.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

Fig.6 Maximum permissible average forward current as a function of ambient temperature.



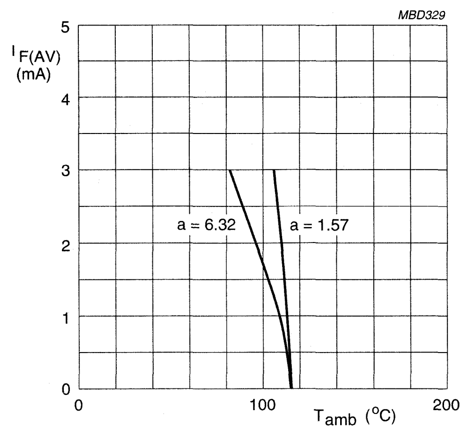
BY8414.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

Fig.7 Maximum permissible average forward current as a function of ambient temperature.



BY8416.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

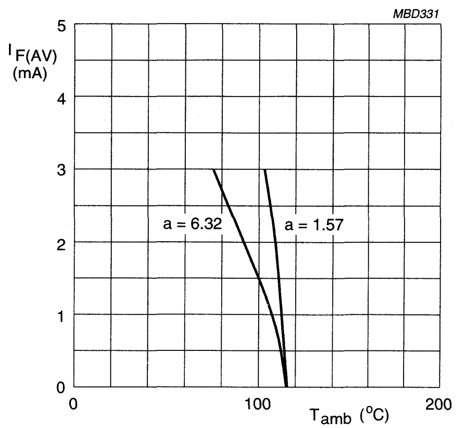
Fig.8 Maximum permissible average forward current as a function of ambient temperature.



BY8418.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

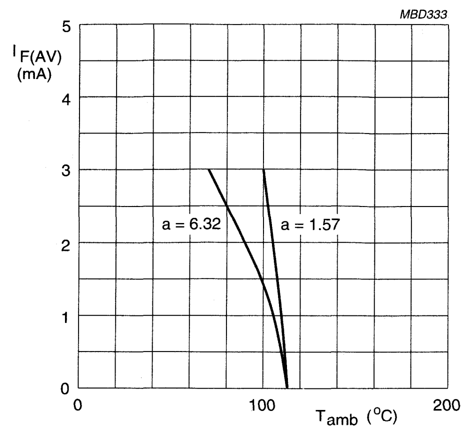
Fig.9 Maximum permissible average forward current as a function of ambient temperature.

Fast high-voltage soft-recovery rectifiers BY8400 series



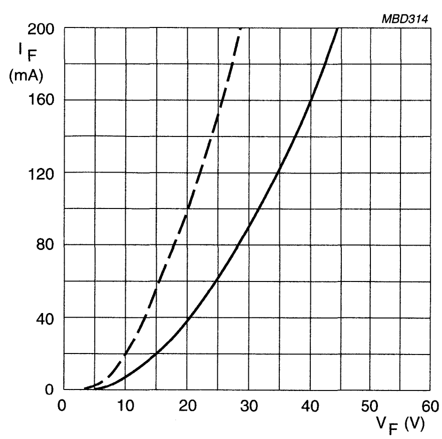
BY8420.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

Fig.10 Maximum permissible average forward current as a function of ambient temperature.



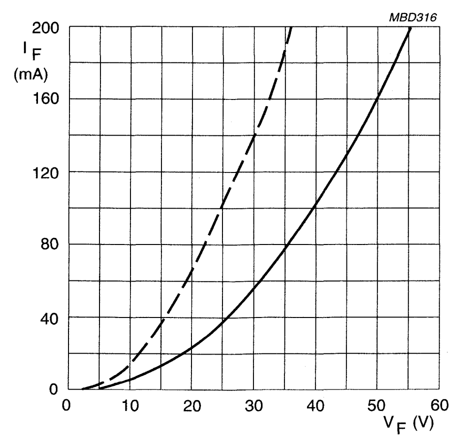
BY8424.
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.
a = 6.32: line output transformer application; see Fig.24.

Fig.11 Maximum permissible average forward current as a function of ambient temperature.



BY8404.
Dotted line: $T_j = 120$ °C.
Solid line: $T_j = 25$ °C.

Fig.12 Forward current as a function of maximum forward voltage.

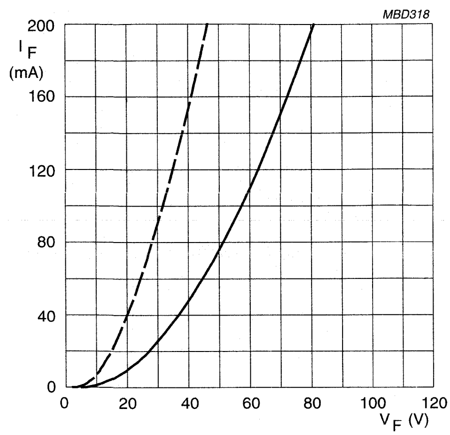


BY8406.
Dotted line: $T_j = 120$ °C.
Solid line: $T_j = 25$ °C.

Fig.13 Forward current as a function of maximum forward voltage.

Fast high-voltage soft-recovery rectifiers

BY8400 series

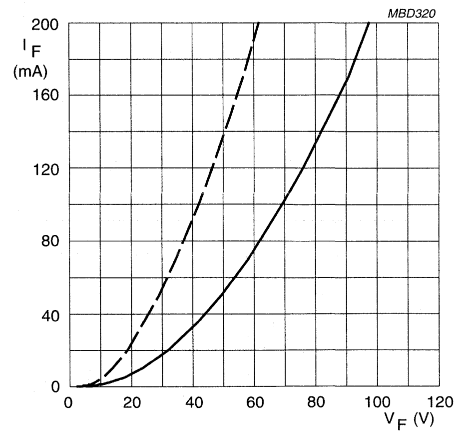


BY8408.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.14 Forward current as a function of maximum forward voltage.

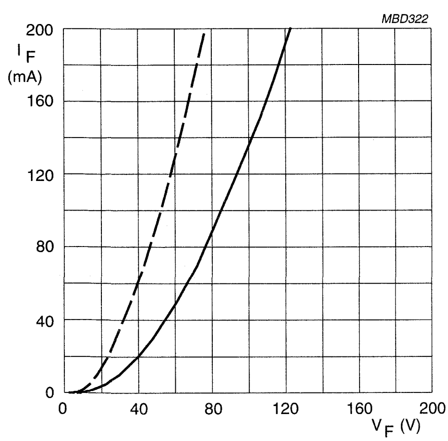


BY8410.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.15 Forward current as a function of maximum forward voltage.

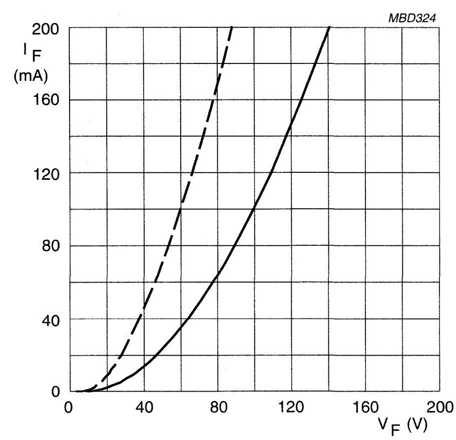


BY8412.

Dotted line: T_j = 120 °C.

Solid line: T_j = 25 °C.

Fig.16 Forward current as a function of maximum forward voltage.

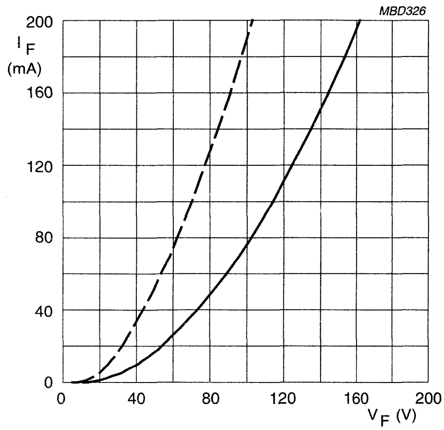


BY8414.

Dotted line: T_j = 120 °C.

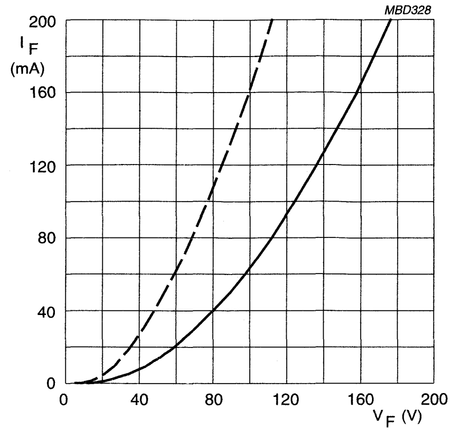
Solid line: T_j = 25 °C.

Fig.17 Forward current as a function of maximum forward voltage.



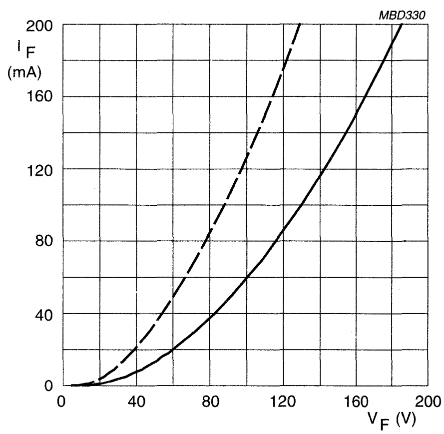
BY8416.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.18 Forward current as a function of maximum forward voltage.



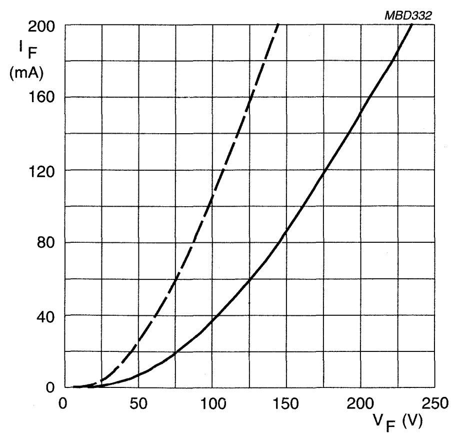
BY8418.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.19 Forward current as a function of maximum forward voltage.



BY8420.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.20 Forward current as a function of maximum forward voltage.



BY8424.
Dotted line: T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.21 Forward current as a function of maximum forward voltage.

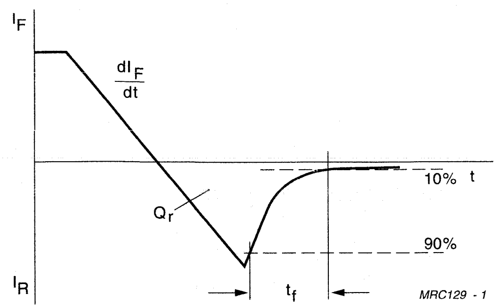
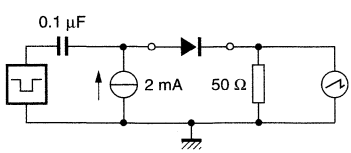
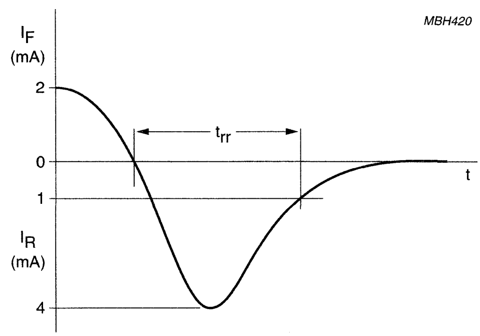


Fig.22 Reverse recovery definitions.





Rise time oscilloscope: t_r < 7 ns.
Generator pulse width: 1.0 µs.

Fig.23 Test circuit and reverse recovery time waveform and definition.

APPLICATION INFORMATION

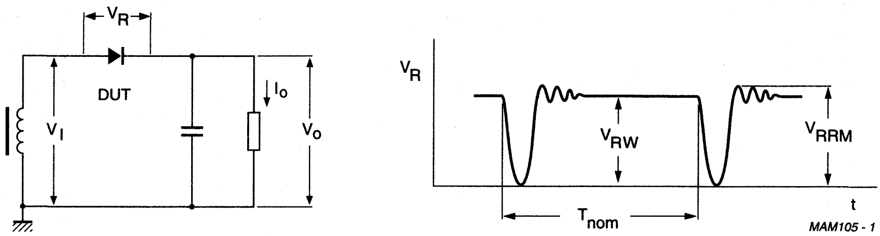


Fig.24 Typical operation circuit and voltage waveform.

High-voltage soft-recovery controlled avalanche rectifier

BYX90G

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Soft-recovery switching characteristics
- Guaranteed avalanche energy absorption capability.

APPLICATIONS

- High-voltage rectification at high frequencies
- Sub-component for very high voltage rectifiers, for example, in X-ray and radar equipment.

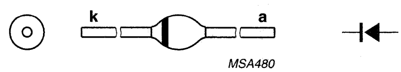
DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

See also the chapter on custom made high-voltage rectifiers in the *"General Part of Handbook SC01"*.



The cathode is marked by a black band on the body.

Fig.1 Simplified outline (SOD83A) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	7.5	kV
V_{RWM}	crest working reverse voltage		–	6	kV
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{oil} = 45 °C; see Fig.2; see also Fig.3	–	550	mA
I_{FRM}	repetitive peak forward current		–	5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RWMmax}$; see Fig.4	–	20	A
P_{RSM}	non-repetitive peak reverse power dissipation	t = 10 µs; triangular pulse; $T_j = T_{j\,max}$ prior to surge	–	5	kW
T_{stg}	storage temperature		–65	+165	°C
T_j	junction temperature		–65	+165	°C

High-voltage soft-recovery controlled avalanche rectifier

BYX90G

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 2 A; see Fig.5	–	–	14.5	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	8	–	–	kV
I_R	reverse current	$V_R = V_{RWMmax}$; $T_j = T_{j\,max}$	–	–	50	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.7	–	–	350	ns

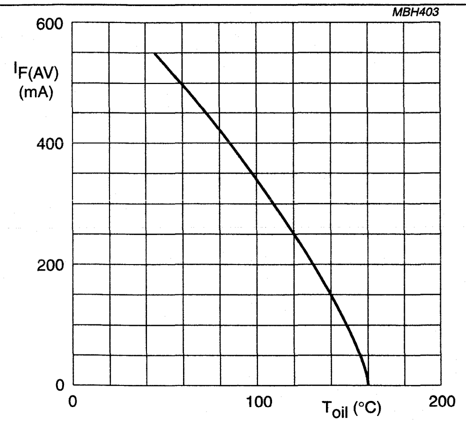
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}o}$	thermal resistance from junction to oil	note 1; see also Fig.6	20	K/W

Note

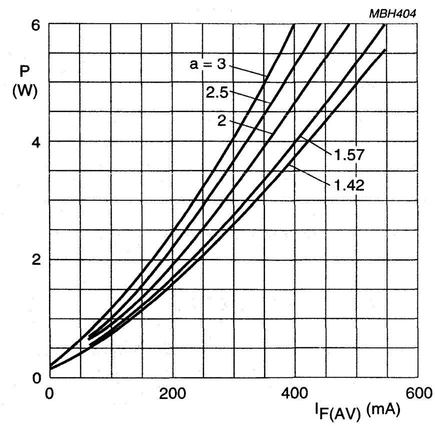
1. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



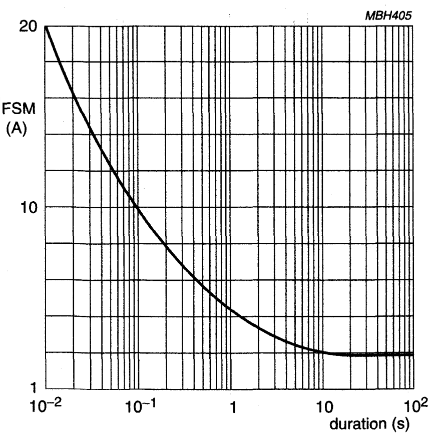
a = 1.57; δ = 0.5; $V_R = V_{RWMmax}$.

Fig.2 Maximum permissible average forward current as a function of oil temperature (including losses due to reverse leakage).



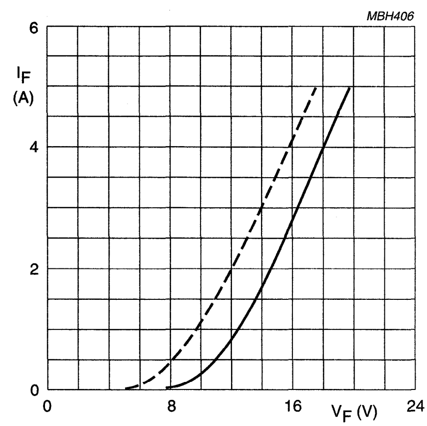
a = $I_{F(RMS)}/I_{F(AV)}$; δ = 0.5; $V_R = V_{RWMmax}$.

Fig.3 Maximum steady state power dissipation (forward plus leakage losses) as a function of average forward current.



50 Hz half sinewave current burst.
T_j = 165 °C prior to surge.
$V_R = V_{RWMmax}$.

Fig.4 Maximum non-repetitive peak forward current as a function of burst duration.



Dotted lines: T_j = 165 °C.
Solid line: T_j = 25 °C.

Fig.5 Forward current as a function of maximum forward voltage.

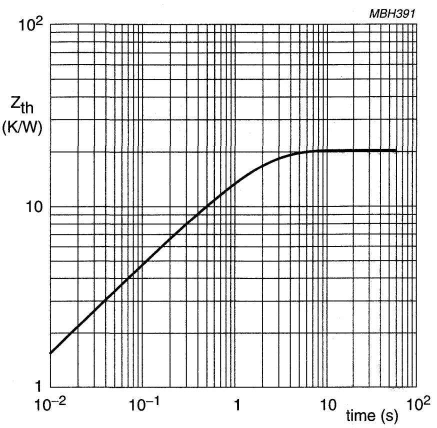
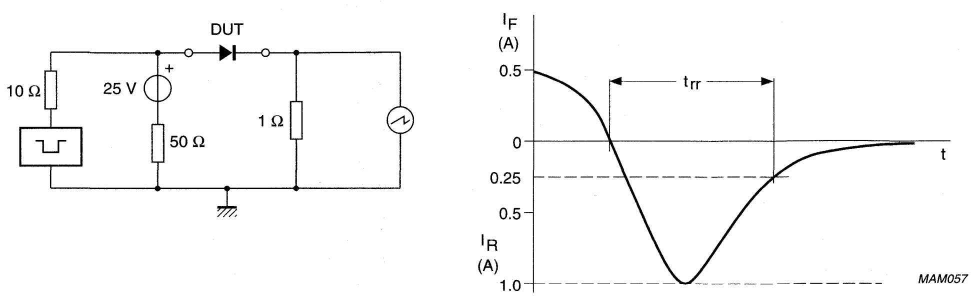


Fig.6 Thermal impedance in oil as a function of time.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.7 Test circuit and reverse recovery time waveform and definition.

APPLICATION INFORMATION

Typical 3-phase bridge application information

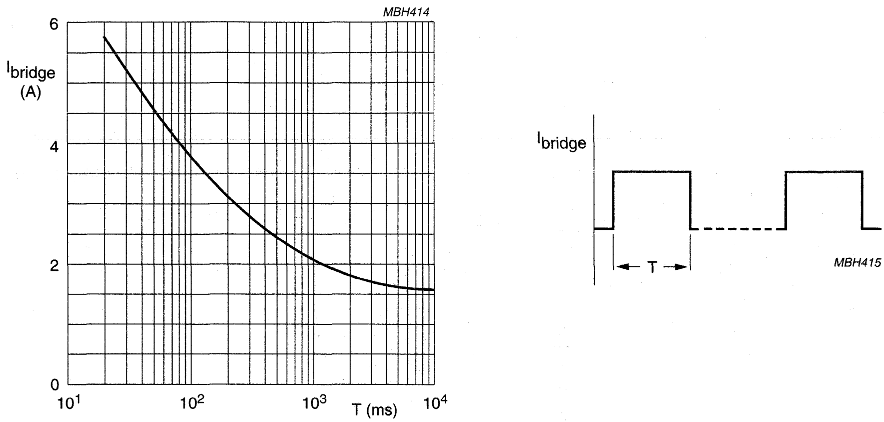


Fig.8 Maximum permissible output current in a 3-phase rectifier bridge with a minimum time between exposures of 20 s; T_{oil} = 50 °C.

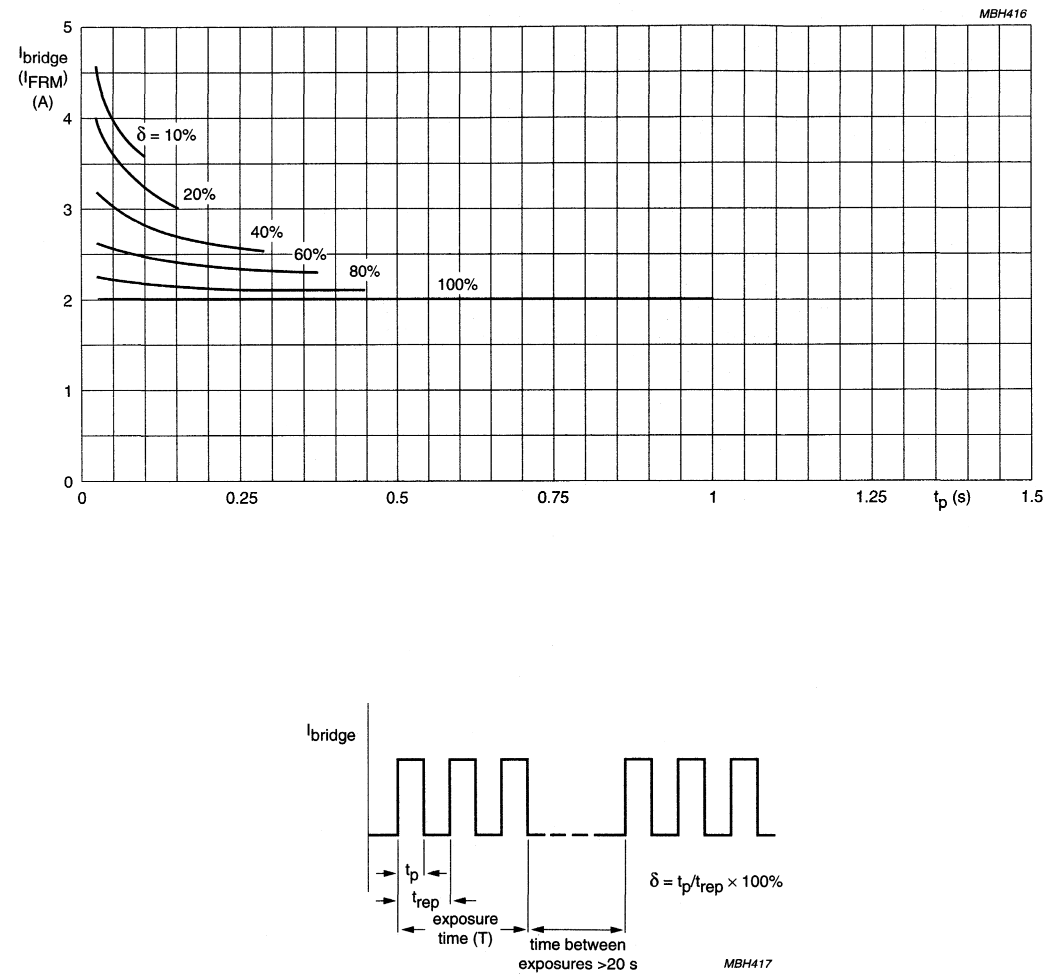
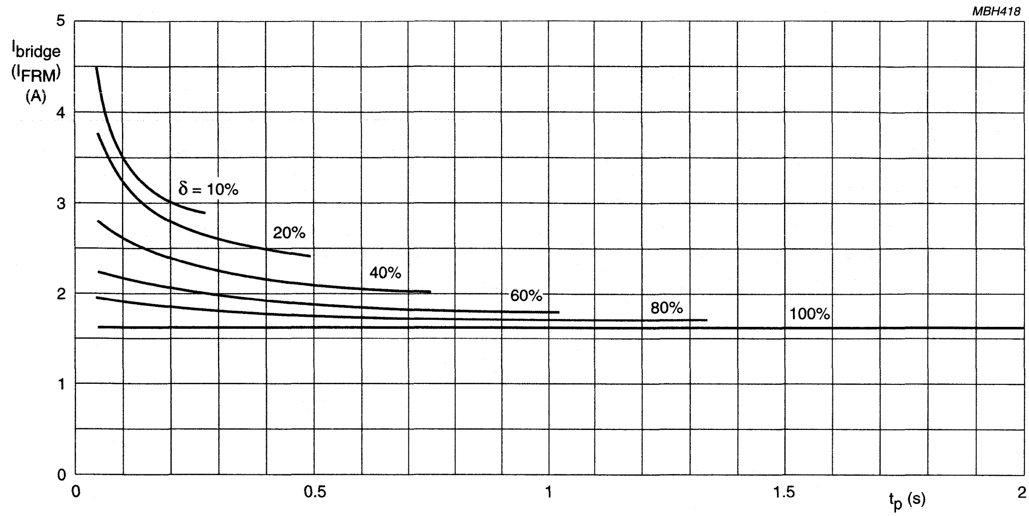


Fig.9 Maximum current through a 3-phase bridge rectifier versus pulse duration; exposure time T = 1 s; T_{oil} = 50 °C.



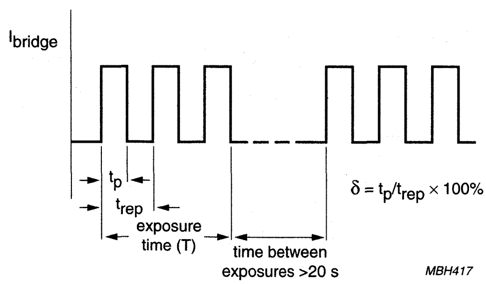


Fig.10 Maximum current through a 3-phase bridge rectifier versus pulse duration; exposure time T = 3 s; T_{oil} = 50 °C.

High-voltage soft-recovery controlled avalanche rectifiers

BYX101G to BYX104G

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Recovery times ranging from 600 to 50 ns
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

- High-voltage power supply units in, for example, X-ray or radar systems.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

See also the chapter on custom made high-voltage rectifiers in the *"General Part of Handbook SC01"*.

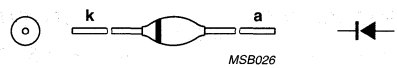


Fig.1 Simplified outline (SOD88A) and symbol.

MARKING

TYPE NUMBER	CATHODE BAND
BYX101G	black
BYX102G	red
BYX103G	green
BYX104G	violet

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	10	kV
V_{RW}	working reverse voltage		–	9	kV
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{oil} = 25 °C			
	BYX101G		–	400	mA
	BYX102G		–	360	mA
	BYX103G		–	310	mA
	BYX104G		–	225	mA
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{oil} = 70 °C			
	BYX101G		–	285	mA
	BYX102G		–	255	mA
	BYX103G		–	220	mA
	BYX104G		–	160	mA
I_{FSM}	non-repetitive peak forward current	t = 10 ms; half sinewave; T_j = 45 °C prior to surge			
	BYX101G		–	20	A
	BYX102G		–	15	A
	BYX103G		–	14	A
	BYX104G		–	14	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{RSM}	non-repetitive peak reverse power dissipation	t = 10 µs; triangular pulse; $T_j = T_{j\,max}$ prior to surge	–	4	kW
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; T_j = 165 °C				
	BYX101G		–	–	17.5	V
	BYX102G		–	–	19.5	V
	BYX103G		–	–	22.5	V
	BYX104G		–	–	31.0	V
V_F	forward voltage	I_F = 1 A				
	BYX101G		–	–	20.5	V
	BYX102G		–	–	23.9	V
	BYX103G		–	–	29.7	V
	BYX104G		–	–	52.0	V
I_R	reverse current	$V_R = V_{RWmax}$	–	–	15	µA
		$V_R = V_{RWmax}$; T_j = 165 °C	–	–	50	µA
t_{rr}	reverse recovery time	when switched from I_F = 50 mA to I_R = 100 mA; measured at I_R = 25 mA				
	BYX101G		–	–	600	ns
	BYX102G		–	–	350	ns
	BYX103G		–	–	175	ns
	BYX104G		–	–	50	ns

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}oil}$	thermal resistance from junction to oil	note 1	20	K/W

Note

1. For more information please refer to the *"General Part of Handbook SC01"*.

High-voltage soft-recovery controlled avalanche rectifiers

BYX105G to BYX108G

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Recovery times ranging from 600 to 50 ns
- Soft-recovery switching characteristics
- Compact construction.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

See also the chapter on custom made high-voltage rectifiers in the *"General Part of Handbook SC01"*.

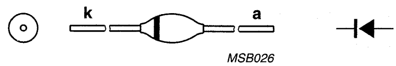


Fig.1 Simplified outline (SOD88A) and symbol.

APPLICATIONS

- High-voltage power supply units in, for example, X-ray or radar systems.

MARKING

TYPE NUMBER	CATHODE BAND
BYX105G	black
BYX106G	red
BYX107G	green
BYX108G	violet

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	5	kV
V_{RW}	working reverse voltage		–	4.5	kV
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{oil} = 25 °C			
	BYX105G		–	650	mA
	BYX106G		–	575	mA
	BYX107G		–	480	mA
	BYX108G		–	340	mA
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{oil} = 70 °C			
	BYX105G		–	460	mA
	BYX106G		–	400	mA
	BYX107G		–	340	mA
	BYX108G		–	240	mA
I_{FSM}	non-repetitive peak forward current	t = 10 ms; half sinewave; T_j = 45 °C prior to surge			
	BYX105G		–	20	A
	BYX106G		–	15	A
	BYX107G		–	14	A
	BYX108G		–	14	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{RSM}	non-repetitive peak reverse power dissipation	t = 10 µs; triangular pulse; $T_j = T_{j\,max}$ prior to surge	–	2	kW
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; T_j = 165 °C				
	BYX105G		–	–	9.3	V
	BYX106G		–	–	10.4	V
	BYX107G		–	–	12.0	V
	BYX108G		–	–	16.5	V
V_F	forward voltage	I_F = 1 A				
	BYX105G		–	–	10.9	V
	BYX106G		–	–	12.7	V
	BYX107G		–	–	15.8	V
	BYX108G		–	–	27.7	V
I_R	reverse current	$V_R = V_{RWmax}$	–	–	15	µA
		$V_R = V_{RWmax}$; T_j = 165 °C	–	–	50	µA
t_{rr}	reverse recovery time	when switched from I_F = 50 mA to I_R = 100 mA; measured at I_R = 25 mA				
	BYX105G		–	–	600	ns
	BYX106G		–	–	350	ns
	BYX107G		–	–	175	ns
	BYX108G		–	–	50	ns

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}oil}$	thermal resistance from junction to oil	note 1	20	K/W

Note

1. For more information please refer to the *"General Part of Handbook SC01"*.

High-voltage soft-recovery controlled avalanche rectifier

BYX120G

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability.

APPLICATIONS

- Car ignition systems
- Automotive applications with extreme temperature requirements.

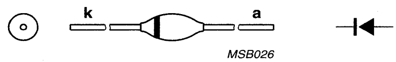
DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

See also the chapter on custom made high-voltage rectifiers in the *"General Part of Handbook SC01"*.



The cathode is marked by an orange band on the body.

Fig.1 Simplified outline (SOD88A) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.
V_{RRM}	repetitive peak reverse voltage		–	3	kV
V_{RWM}	crest working reverse voltage		–	3	kV
$I_{F(AV)}$	average forward current		–	100	mA
I_{FRM}	repetitive peak forward current		–	5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RWMmax}$	–	15	A
P_{RSM}	non-repetitive peak reverse power dissipation	t = 10 µs; triangular pulse; $T_j = T_{j\,max}$ prior to surge	–	3	kW
T_{stg}	storage temperature		–65	+200	°C
T_j	junction temperature	continuous	–65	+180	°C
		maximum 30 mins	–65	+200	°C

High-voltage soft-recovery controlled avalanche rectifier

BYX120G

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 250 mA	–	–	5	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA	3.5	–	–	kV
I_R	reverse current	$V_R = V_{RWMmax}$; T_j = 180 °C	–	–	75	μA

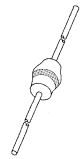
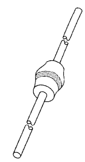
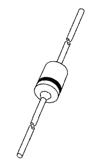
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	$T_{amb} = T_{leads}$	55	K/W

SECTION 13

ZENER DIODES AND TRANSIENT VOLTAGE SUPPRESSORS

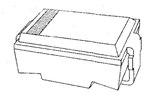
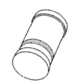
ZENER DIODES AND TRANSIENT VOLTAGE SUPPRESSOR DIODE

TYPE NUMBER	RATINGS						CHARACTERISTICS		PACKAGE (not to scale)
	P_{tot} max.	@ T_{tp}	P_{ZSM} max.	@ T_j	and t_p	P_{RSM} max.	V_Z nom. E24 range	V_R[1] min.	
	(W)	(°C)	(W)	(°C)	(ms)	(W)	(V)	(V)	
LEADED TYPES									
BZT03 series	3.25	25	600	25	0.1	300	7.5 to 270	6.2 to 430	 SOD57
BZW03 series	6.0	25	1000	25	0.1	500	7.5 to 270	6.2 to 430	 SOD64
BZD23 series									 SOD81
C3V6 to C6V8	2.0	25	300	25	0.1	–	3.6 to 6.8	–	
C7V5 to C510	2.5	25	300	25	0.1	150	7.5 to 270	6.2 to 430	

Note

1. Device used as a voltage suppressor diode.

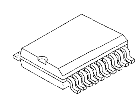
ZENER DIODES AND TRANSIENT VOLTAGE SUPPRESSOR DIODES (continued)

TYPE NUMBER	RATINGS						CHARACTERISTICS		PACKAGE (not to scale)
	P_{tot} @ max.	T_{tp}	P_{ZSM} @ max.	T_j and	t_p	P_{RSM} max.	V_Z nom. E24 range	V_R(1) min.	
	(W)	(°C)	(W)	(°C)	(ms)	(W)	(V)	(V)	
SURFACE-MOUNT TYPES									
BZG03 series	3.0	100	600	25	0.1	–	10 to 270	–	 SOD106
BZG04 series	–	–	–	–	–	300	–	8.2 to 220	
BZD27 series									 SOD87
C3V6 to C6V8	1.7	105	300	25	0.1	–	3.6 to 6.8	–	
C7V5 to C510	2.3	105	300	25	0.1	150	7.5 to 270	6.2 to 430	

Note

1. Device used as a voltage suppressor diode.

TRANSIENT-VOLTAGE SUPPRESSOR ARRAYS

TYPE NUMBER	RATINGS					CHARACTERISTICS				NUMBER OF DIODES	PACKAGE (not to scale)
	I_F max.	I_{FSM} max.	I_{ZSM} max.	P_{ZSM} @ max.	t_p	V_Z nom.	r_{dif} max.	S_Z @ typ.	I_Z		
	(mA)	(A)	(A)	(W)	(ms)	(V)	(Ω)	(mV/K)	(mA)		
SURFACE-MOUNT TYPE											
BZA100	200	4	2.5	27.5	1	6.8	8	3	5	18(1)	 SO20

Note

1. Common anode.

18-fold ESD transient voltage suppressor BZA100

FEATURES

- SO20 SMD package allows 18 separate voltage regulator diodes in a common anode configuration
- Working voltage: typ. 6.8 V
- Forward voltage: max. 1.3 V
- Maximum reverse peak power dissipation: 27.5 W at t_p = 1 ms
- Maximum clamping voltage at peak pulse current: 11 V at 2.5 A
- Low leakage current: max. 2 μA
- ESD rating >8 kV, according IEC 801-2.

APPLICATIONS

- Where transient overvoltage protection in voltage and ESD sensitive equipment is required such as:
  - Computers
  - Printers
  - Business machines
  - Communication systems
  - Medical equipment.

DESCRIPTION

18-fold monolitic transient voltage suppressor. Its 18-fold junction common anode design protects 18 separate lines using only one package. This device is ideal for situations where board space is a premium.

PINNING

PIN	DESCRIPTION
1 to 5	cathode (k_1 to k_5)
6 and 16	common anode (a_1; a_2)
7 to 15	cathode (k_6 to k_{14})
17 to 20	cathode (k_{15} to k_{18})

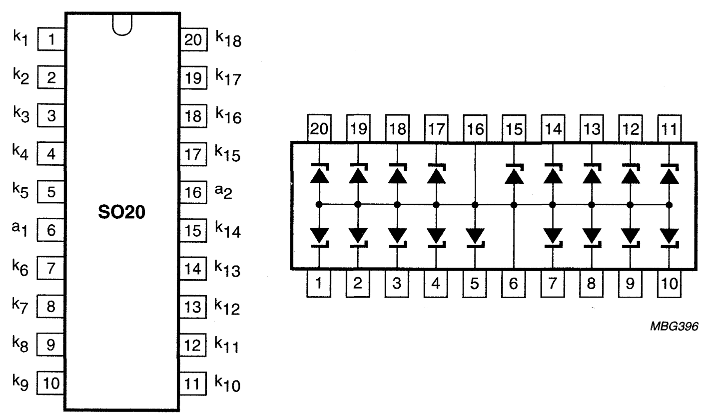


Fig.1 Pin configuration for SO20 (SOT163-1) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_Z	working current		–	note 1	mA
I_F	continuous forward current		–	200	mA
I_{FSM}	non-repetitive peak forward current	t_p = 1 ms; square pulse	–	4	A
I_{ZSM}	non-repetitive peak reverse current	t_p = 1 ms; square pulse; see Fig.2	–	2.5	A
P_{tot}	total power dissipation	see Fig.3			
		up to T_s = 60 °C; note 2	–	1.6	W
		up to T_{amb} = 25 °C; note 3	–	1.25	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 1 ms; square pulse; see Fig.4	–	27.5	W
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	150	°C

Notes

1. DC working current limited by $P_{tot\ max}$.
2. One or more diodes loaded; T_s is the temperature at the soldering point.
3. One or more diodes loaded; device mounted on a PCB with $R_{th\ a\text{-}s}$ = 43.5 K/W.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	one or more diodes loaded	56.5	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient		100	K/W

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per diode						
V_Z	working voltage	I_Z = 5 mA	6.4	6.8	7.2	V
V_F	forward voltage	I_F = 200 mA	–	–	1.3	V
V_{ZSM}	non-repetitive peak reverse voltage	t_p = 1 ms; I_{ZSM} = 2.5 A	–	–	11	V
I_R	reverse current	V_R = 5.25 V	–	–	2	μA
r_{dif}	differential resistance	I_Z = 1 mA	–	–	40	Ω
		I_Z = 5 mA	–	–	8	Ω
S_Z	temperature coefficient of working voltage	I_Z = 5mA	–	3	–	mV/K
C_d	diode capacitance	see Fig.5				
		V_R = 0; f = 1 MHz	–	–	120	pF
		V_R = 5.25 V; f = 1 MHz	–	–	60	pF

18-fold ESD transient voltage suppressor — BZA100

GRAPHICAL DATA

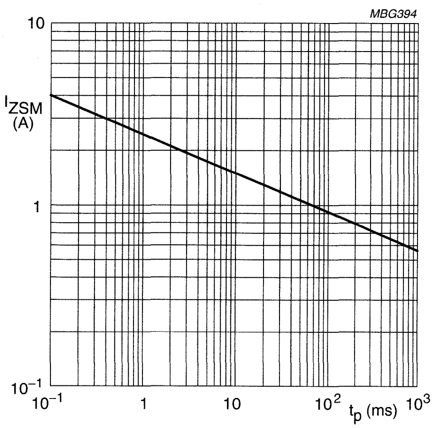
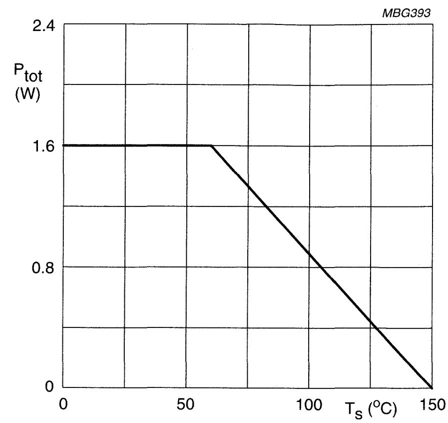
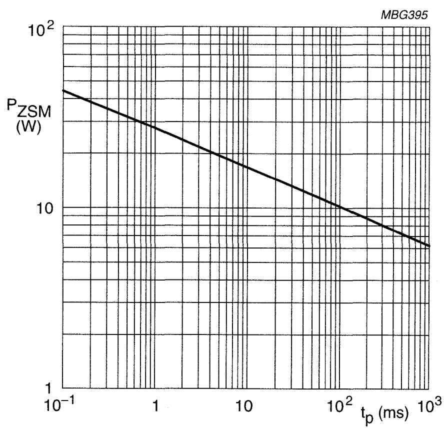


Fig.2 Maximum non-repetitive peak reverse current as a function of pulse time.



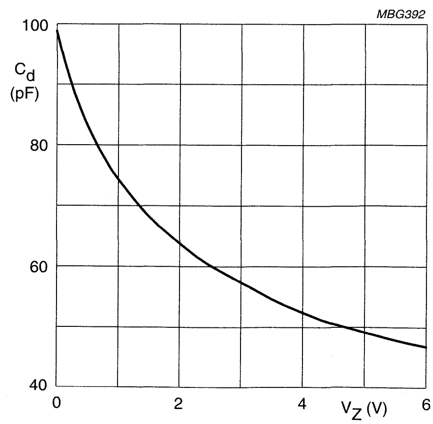
All diodes loaded.

Fig.3 Power derating curve.



$P_{ZSM} = V_{ZSM} \times I_{ZSM}$.
V_{ZSM} is the non-repetitive peak reverse voltage at I_{ZSM}.

Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



T_j = 25 °C; f = 1 MHz.

Fig.5 Diode capacitance as a function of working voltage; typical values.

Voltage regulator diodes BZD23 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Zener working voltage range: 3.6 to 270 V for 46 types
- Transient suppressor stand-off voltage range: 6.2 to 430 V for 45 types
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™[1] technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

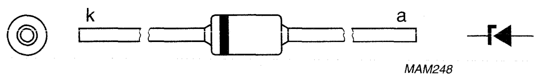


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{tot}	total power dissipation	T_{tp} = 25 °C; lead length 10 mm; see Figs 2 and 3			
	BZD23-C3V6 to -C6V8		–	2.0	W
	BZD23-C7V5 to -C510		–	2.5	W
P_{tot}	total power dissipation	T_{amb} = 55 °C; see Figs 2 and 3; PCB mounted (see Fig.7)			
	BZD23-C3V6 to -C6V8		–	1.0	W
	BZD23-C7V5 to -C510		–	1.0	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square pulse; T_j = 25 °C prior to surge; see Figs 4 and 5			
	BZD23-C3V6 to -C6V8		–	300	W
	BZD23-C7V5 to -C510		–	300	W
P_{RSM}	non-repetitive peak reverse power dissipation	10/1000 µs exponential pulse (see Fig.8); T_j = 25 °C prior to surge			
	BZD23-C7V5 to -C510		–	150	W
T_{stg}	storage temperature				
	BZD23-C3V6 to -C6V8		–65	+200	°C
	BZD23-C7V5 to -C510		–65	+175	°C
T_j	junction temperature				
	BZD23-C3V6 to -C6V8		–65	+200	°C
	BZD23-C7V5 to -C510		–65	+175	°C

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 0.2 A; see Fig.6	1.2	V

Per type when used as voltage regulator diodes

T_j = 25 °C unless otherwise specified.

TYPE No. SUFFIX (1)	WORKING VOLTAGE V_Z (V) at I_Z			DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z		TEMPERATURE COEFFICIENT S_Z (%/K) at I_Z		TEST CURRENT I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE	
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		I_R (μA) MAX.	V_R (V)
C3V6	3.4	3.6	3.8	4	8	−0.14	−0.04	100	100	1
C3V9	3.7	3.9	4.1	4	8	−0.14	−0.04	100	50	1
C4V3	4.0	4.3	4.6	4	7	−0.12	−0.02	100	25	1
C4V7	4.4	4.7	5.0	3	7	−0.10	0.00	100	10	1
C5V1	4.8	5.1	5.4	3	6	−0.08	−0.02	100	5	1
C5V6	5.2	5.6	6.0	2	4	−0.04	0.04	100	10	2
C6V2	5.8	6.2	6.6	2	3	−0.01	0.06	100	5	2
C6V8	6.4	6.8	7.2	1	3	0.00	0.07	100	10	3
C7V5	7.0	7.5	7.9	1	2	0.00	0.07	100	50	3
C8V2	7.7	8.2	8.7	1	2	0.03	0.08	100	10	3
C9V1	8.5	9.1	9.6	2	4	0.03	0.08	50	10	5
C10	9.4	10	10.6	2	4	0.05	0.09	50	7	7.5
C11	10.4	11	11.6	4	7	0.05	0.10	50	4	8.2
C12	11.4	12	12.7	4	7	0.05	0.10	50	3	9.1
C13	12.4	13	14.1	5	10	0.05	0.10	50	2	10
C15	13.8	15	15.6	5	10	0.05	0.10	50	1	11
C16	15.3	16	17.1	6	15	0.06	0.11	25	1	12
C18	16.8	18	19.1	6	15	0.06	0.11	25	1	13
C20	18.8	20	21.2	6	15	0.06	0.11	25	1	15
C22	20.8	22	23.3	6	15	0.06	0.11	25	1	16
C24	22.8	24	25.6	7	15	0.06	0.11	25	1	18
C27	25.1	27	28.9	7	15	0.06	0.11	25	1	20
C30	28	30	32	8	15	0.06	0.11	25	1	22
C33	31	33	35	8	15	0.06	0.11	25	1	24
C36	34	36	38	21	40	0.06	0.11	10	1	27
C39	37	39	41	21	40	0.06	0.11	10	1	30
C43	40	43	46	24	45	0.07	0.12	10	1	33
C47	44	47	50	24	45	0.07	0.12	10	1	36

Voltage regulator diodes BZD23 series

TYPE No. SUFFIX (1)	WORKING VOLTAGE V_Z (V) at I_Z			DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z		TEMPERATURE COEFFICIENT S_Z (%/K) at I_Z		TEST CURRENT I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C51	48	51	54	25	60	0.07	0.12	10	1	39
C56	52	56	60	25	60	0.07	0.12	10	1	43
C62	58	62	66	25	80	0.08	0.13	10	1	47
C68	64	68	72	25	80	0.08	0.13	10	1	51
C75	70	75	79	30	100	0.08	0.13	10	1	56
C82	77	82	87	30	100	0.08	0.13	10	1	62
C91	85	91	96	60	200	0.09	0.13	5	1	68
C100	94	100	106	60	200	0.09	0.13	5	1	75
C110	104	110	116	80	250	0.09	0.13	5	1	82
C120	114	120	127	80	250	0.09	0.13	5	1	91
C130	124	130	141	110	300	0.09	0.13	5	1	100
C150	138	150	156	130	300	0.09	0.13	5	1	110
C160	153	160	171	150	350	0.09	0.13	5	1	120
C180	168	180	191	180	400	0.09	0.13	5	1	130
C200	188	200	212	200	500	0.09	0.13	5	1	150
C220	208	220	233	350	750	0.09	0.13	2	1	160
C240	228	240	256	400	850	0.09	0.13	2	1	180
C270	251	270	289	450	1000	0.09	0.13	2	1	200

Note

1. To complete the type number the suffix is added to the basic type number, e.g. BZD23-C51.

Per type when used as transient suppressor diodes

T_j = 25 °C unless otherwise specified.

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE $V_{(BR)R}$ (V) at I_{test}	TEMPERATURE COEFFICIENT S_Z (%/K) at I_{test}		TEST CURRENT I_{test} (mA)	CLAMPING VOLTAGE $V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	REVERSE CURRENT at STAND-OFF VOLTAGE I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZD23-C7V5	7.0	0.00	0.07	100	11.3	13.3	1500	6.2
BZD23-C8V2	7.7	0.03	0.08	100	12.3	12.2	1200	6.8
BZD23-C9V1	8.5	0.03	0.08	50	13.3	11.3	100	7.5
BZD23-C10	9.4	0.05	0.09	50	14.8	10.1	20	8.2
BZD23-C11	10.4	0.05	0.10	50	15.7	9.6	5	9.1
BZD23-C12	11.4	0.05	0.10	50	17.0	8.8	5	10
BZD23-C13	12.4	0.05	0.10	50	18.9	7.9	5	11
BZD23-C15	13.8	0.05	0.10	50	20.9	7.2	5	12
BZD23-C16	15.3	0.06	0.11	25	22.9	6.6	5	13
BZD23-C18	16.8	0.06	0.11	25	25.6	5.9	5	15
BZD23-C20	18.8	0.06	0.11	25	28.4	5.3	5	16
BZD23-C22	20.8	0.06	0.11	25	31.0	4.8	5	18
BZD23-C24	22.8	0.06	0.11	25	33.8	4.4	5	20
BZD23-C27	25.1	0.06	0.11	25	38.1	3.9	5	22
BZD23-C30	28	0.06	0.11	25	42.2	3.6	5	24
BZD23-C33	31	0.06	0.11	25	46.2	3.2	5	27
BZD23-C36	34	0.06	0.11	10	50.1	3.0	5	30
BZD23-C39	37	0.06	0.11	10	54.1	2.8	5	33
BZD23-C43	40	0.07	0.12	10	60.7	2.5	5	36
BZD23-C47	44	0.07	0.12	10	65.5	2.3	5	39
BZD23-C51	48	0.07	0.12	10	70.8	2.1	5	43
BZD23-C56	52	0.07	0.12	10	78.6	1.9	5	47
BZD23-C62	58	0.08	0.13	10	86.5	1.7	5	51
BZD23-C68	64	0.08	0.13	10	94.4	1.6	5	56
BZD23-C75	70	0.08	0.13	10	103.5	1.5	5	62
BZD23-C82	77	0.08	0.13	10	114	1.3	5	68
BZD23-C91	85	0.09	0.13	5	126	1.2	5	75
BZD23-C100	94	0.09	0.13	5	139	1.1	5	82
BZD23-C110	104	0.09	0.13	5	152	1.0	5	91
BZD23-C120	114	0.09	0.13	5	167	0.90	5	100
BZD23-C130	124	0.09	0.13	5	185	0.81	5	110
BZD23-C150	138	0.09	0.13	5	204	0.73	5	120
BZD23-C160	153	0.09	0.13	5	224	0.67	5	130

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE	TEMPERATURE COEFFICIENT		TEST CURRENT	CLAMPING VOLTAGE		REVERSE CURRENT at STAND-OFF VOLTAGE	
	$V_{(BR)R}$ (V) at I_{test}	S_Z (%/K) at I_{test}		I_{test} (mA)	$V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZD23-C180	168	0.09	0.13	5	249	0.60	5	150
BZD23-C200	188	0.09	0.13	5	276	0.54	5	160
BZD23-C220	208	0.09	0.13	2	305	0.50	5	180
BZD23-C240	228	0.09	0.13	2	336	0.45	5	200
BZD23-C270	251	0.09	0.13	2	380	0.40	5	220
BZD23-C300	280	0.09	0.13	2	419	0.36	5	240
BZD23-C330	310	0.09	0.13	2	459	0.33	5	270
BZD23-C360	340	0.09	0.13	2	498	0.30	5	300
BZD23-C390	370	0.09	0.13	2	537	0.28	5	330
BZD23-C430	400	0.09	0.13	2	603	0.25	5	360
BZD23-C470	440	0.09	0.13	2	655	0.23	5	390
BZD23-C510	480	0.09	0.13	2	707	0.21	5	430

Note

1. Non-repetitive peak reverse current in accordance with *"IEC 60-1, Section 8"* (10/1 000 μs pulse); see Fig.8.

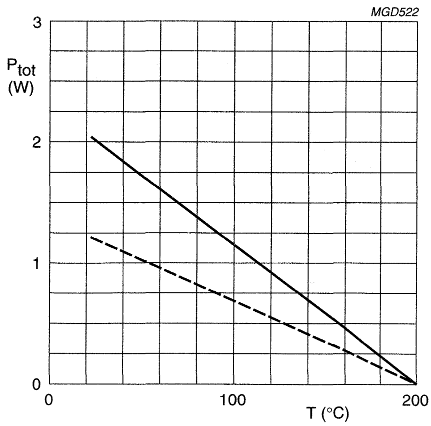
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm		
	BZD23-C3V6 to -C6V8		87	K/W
	BZD23-C7V5 to -C510		60	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1		
	BZD23-C3V6 to -C6V8		145	K/W
	BZD23-C7V5 to -C510		120	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.7. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

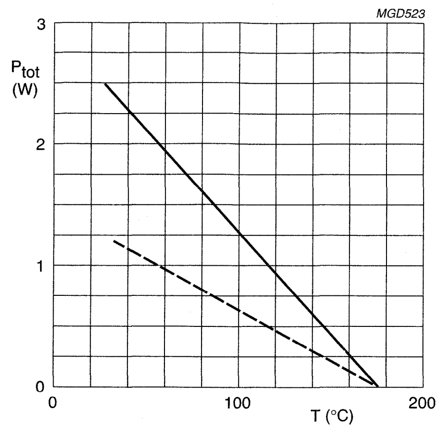


Types BZD23-C3V6 to -C6V8

Solid line: tie-point temperature; lead length = 10 mm.

Dotted line: ambient temperature; PCB mounted as shown in Fig.7.

Fig.2 Maximum total power dissipation as a function of temperature.

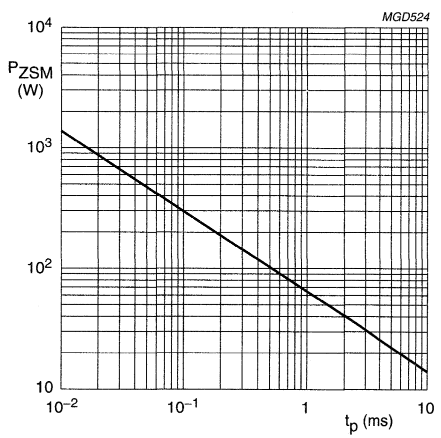


Types BZD23-C7V5 to -C510

Solid line: tie-point temperature; lead length = 10 mm.

Dotted line: ambient temperature; PCB mounted as shown in Fig.7.

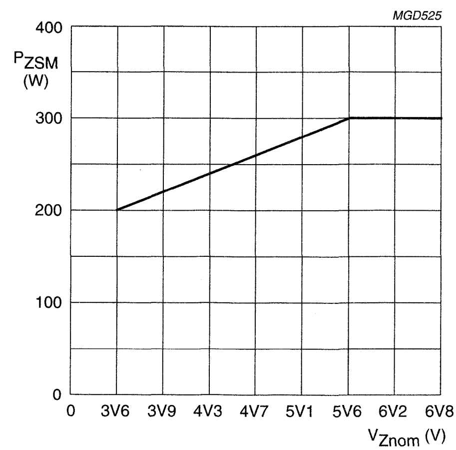
Fig.3 Maximum total power dissipation as a function of temperature.



T_j = 25 °C prior to surge.

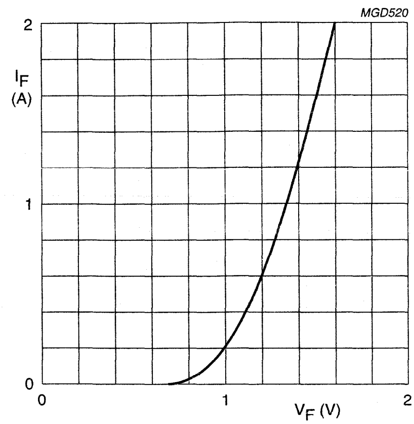
See also Fig.5.

Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



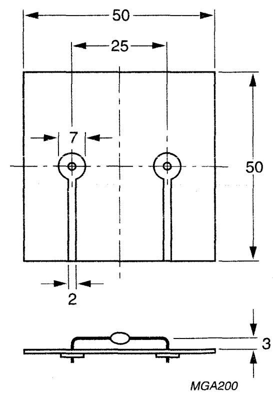
T_j = 25 °C prior to surge.

Fig.5 Maximum non-repetitive peak reverse power dissipation as a function of nominal working voltage.



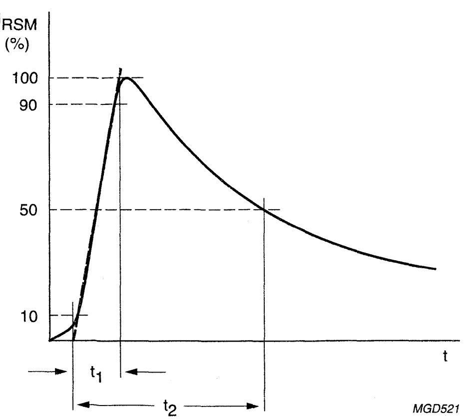
T_j = 25 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.7 Device mounted on a printed-circuit board.



In accordance with *"IEC 60-1, Section 8"*.

t_1 = 10 μs.

t_2 = 1000 μs.

Fig.8 Non-repetitive peak reverse current pulse definition.

Voltage regulator diodes BZD27 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Zener working voltage range: 3.6 to 270 V for 46 types
- Transient suppressor stand-off voltage range: 6.2 to 430 V for 45 types
- Supplied in 8 mm embossed tape.

DESCRIPTION

Cavity free cylindrical glass SOD87 package through Implotec™[1] technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

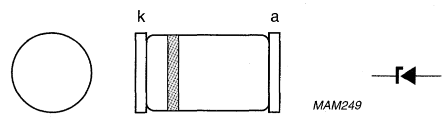


Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{tot}	total power dissipation	T_{tp} = 105 °C; see Figs 2 and 3			
	BZD27-C3V6 to -C6V8		–	1.7	W
	BZD27-C7V5 to -C510		–	2.3	W
P_{tot}	total power dissipation	PCB mounted (see Fig.7)			
	BZD27-C3V6 to -C6V8	T_{amb} = 60 °C; see Fig.2	–	0.8	W
	BZD27-C7V5 to -C510	T_{amb} = 55 °C; see Fig.3	–	0.8	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square pulse; T_j = 25 °C prior to surge; see Figs.4 and 5			
	BZD27-C3V6 to -C6V8		–	300	W
	BZD27-C7V5 to -C510		–	300	W
P_{RSM}	non-repetitive peak reverse power dissipation	10/1 000 µs exponential pulse (see Fig.8); T_j = 25 °C prior to surge			
	BZD27-C7V5 to -C510		–	150	W
T_{stg}	storage temperature				
	BZD27-C3V6 to -C6V8		−65	+200	°C
	BZD27-C7V5 to -C510		−65	+175	°C
T_j	junction temperature				
	BZD27-C3V6 to -C6V8		−65	+200	°C
	BZD27-C7V5 to -C510		−65	+175	°C

Voltage regulator diodes BZD27 series

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 0.2 A; see Fig.6	–	1.2	V

Per type when used as voltage regulator diodes

T_j = 25 °C unless otherwise specified.

TYPE No. SUFFIX (1)	WORKING VOLTAGE V_Z (V) at I_Z			DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z		TEMPERATURE COEFFICIENT S_Z (%/K) at I_Z		TEST CURRENT I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C3V6	3.4	3.6	3.8	4	8	−0.14	−0.04	100	100	1
C3V9	3.7	3.9	4.1	4	8	−0.14	−0.04	100	50	1
C4V3	4.0	4.3	4.6	4	7	−0.12	−0.02	100	25	1
C4V7	4.4	4.7	5.0	3	7	−0.10	0.00	100	10	1
C5V1	4.8	5.1	5.4	3	6	−0.08	−0.02	100	5	1
C5V6	5.2	5.6	6.0	2	4	−0.04	0.04	100	10	2
C6V2	5.8	6.2	6.6	2	3	−0.01	0.06	100	5	2
C6V8	6.4	6.8	7.2	1	3	0.00	0.07	100	10	3
C7V5	7.0	7.5	7.9	1	2	0.00	0.07	100	50	3
C8V2	7.7	8.2	8.7	1	2	0.03	0.08	100	10	3
C9V1	8.5	9.1	9.6	2	4	0.03	0.08	50	10	5
C10	9.4	10	10.6	2	4	0.05	0.09	50	7	7.5
C11	10.4	11	11.6	4	7	0.05	0.10	50	4	8.2
C12	11.4	12	12.7	4	7	0.05	0.10	50	3	9.1
C13	12.4	13	14.1	5	10	0.05	0.10	50	2	10
C15	13.8	15	15.6	5	10	0.05	0.10	50	1	11
C16	15.3	16	17.1	6	15	0.06	0.11	25	1	12
C18	16.8	18	19.1	6	15	0.06	0.11	25	1	13
C20	18.8	20	21.2	6	15	0.06	0.11	25	1	15
C22	20.8	22	23.3	6	15	0.06	0.11	25	1	16
C24	22.8	24	25.6	7	15	0.06	0.11	25	1	18
C27	25.1	27	28.9	7	15	0.06	0.11	25	1	20
C30	28	30	32	8	15	0.06	0.11	25	1	22
C33	31	33	35	8	15	0.06	0.11	25	1	24
C36	34	36	38	21	40	0.06	0.11	10	1	27
C39	37	39	41	21	40	0.06	0.11	10	1	30
C43	40	43	46	24	45	0.07	0.12	10	1	33
C47	44	47	50	24	45	0.07	0.12	10	1	36

Voltage regulator diodes BZD27 series

TYPE No. SUFFIX (1)	WORKING VOLTAGE V_Z (V) at I_Z			DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z		TEMPERATURE COEFFICIENT S_Z (%/K) at I_Z		TEST CURRENT I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE	
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		I_R (μA) MAX.	V_R (V)
C51	48	51	54	25	60	0.07	0.12	10	1	39
C56	52	56	60	25	60	0.07	0.12	10	1	43
C62	58	62	66	25	80	0.08	0.13	10	1	47
C68	64	68	72	25	80	0.08	0.13	10	1	51
C75	70	75	79	30	100	0.08	0.13	10	1	56
C82	77	82	87	30	100	0.08	0.13	10	1	62
C91	85	91	96	60	200	0.09	0.13	5	1	68
C100	94	100	106	60	200	0.09	0.13	5	1	75
C110	104	110	116	80	250	0.09	0.13	5	1	82
C120	114	120	127	80	250	0.09	0.13	5	1	91
C130	124	130	141	110	300	0.09	0.13	5	1	100
C150	138	150	156	130	300	0.09	0.13	5	1	110
C160	153	160	171	150	350	0.09	0.13	5	1	120
C180	168	180	191	180	400	0.09	0.13	5	1	130
C200	188	200	212	200	500	0.09	0.13	5	1	150
C220	208	220	233	350	750	0.09	0.13	2	1	160
C240	228	240	256	400	850	0.09	0.13	2	1	180
C270	251	270	289	450	1000	0.09	0.13	2	1	200

Note

1. To complete the type number the suffix is added to the basic type number, e.g. BZD27-C51.

Per type when used as transient suppressor diodes

T_j = 25 °C unless otherwise specified.

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE	TEMPERATURE COEFFICIENT		TEST CURRENT	CLAMPING VOLTAGE		REVERSE CURRENT at STAND-OFF VOLTAGE	
	$V_{(BR)R}$ (V) at I_{test}	S_Z (%/K) at I_{test}		I_{test} (mA)	$V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZD27-C7V5	7.0	0.00	0.07	100	11.3	13.3	1500	6.2
BZD27-C8V2	7.7	0.03	0.08	100	12.3	12.2	1200	6.8
BZD27-C9V1	8.5	0.03	0.08	50	13.3	11.3	100	7.5
BZD27-C10	9.4	0.05	0.09	50	14.8	10.1	20	8.2
BZD27-C11	10.4	0.05	0.10	50	15.7	9.6	5	9.1
BZD27-C12	11.4	0.05	0.10	50	17.0	8.8	5	10
BZD27-C13	12.4	0.05	0.10	50	18.9	7.9	5	11
BZD27-C15	13.8	0.05	0.10	50	20.9	7.2	5	12
BZD27-C16	15.3	0.06	0.11	25	22.9	6.6	5	13
BZD27-C18	16.8	0.06	0.11	25	25.6	5.9	5	15
BZD27-C20	18.8	0.06	0.11	25	28.4	5.3	5	16
BZD27-C22	20.8	0.06	0.11	25	31.0	4.8	5	18
BZD27-C24	22.8	0.06	0.11	25	33.8	4.4	5	20
BZD27-C27	25.1	0.06	0.11	25	38.1	3.9	5	22
BZD27-C30	28	0.06	0.11	25	42.2	3.6	5	24
BZD27-C33	31	0.06	0.11	25	46.2	3.2	5	27
BZD27-C36	34	0.06	0.11	10	50.1	3.0	5	30
BZD27-C39	37	0.06	0.11	10	54.1	2.8	5	33
BZD27-C43	40	0.07	0.12	10	60.7	2.5	5	36
BZD27-C47	44	0.07	0.12	10	65.5	2.3	5	39
BZD27-C51	48	0.07	0.12	10	70.8	2.1	5	43
BZD27-C56	52	0.07	0.12	10	78.6	1.9	5	47
BZD27-C62	58	0.08	0.13	10	86.5	1.7	5	51
BZD27-C68	64	0.08	0.13	10	94.4	1.6	5	56
BZD27-C75	70	0.08	0.13	10	103.5	1.5	5	62
BZD27-C82	77	0.08	0.13	10	114	1.3	5	68
BZD27-C91	85	0.09	0.13	5	126	1.2	5	75
BZD27-C100	94	0.09	0.13	5	139	1.1	5	82
BZD27-C110	104	0.09	0.13	5	152	1.0	5	91
BZD27-C120	114	0.09	0.13	5	167	0.90	5	100
BZD27-C130	124	0.09	0.13	5	185	0.81	5	110
BZD27-C150	138	0.09	0.13	5	204	0.73	5	120
BZD27-C160	153	0.09	0.13	5	224	0.67	5	130

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE	TEMPERATURE COEFFICIENT		TEST CURREN T	CLAMPING VOLTAGE		REVERSE CURRENT at STAND-OFF VOLTAGE	
	$V_{(BR)R}$ (V) at I_{test}	S_Z (%/K) at I_{test}		I_{test} (mA)	$V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZD27-C180	168	0.09	0.13	5	249	0.60	5	150
BZD27-C200	188	0.09	0.13	5	276	0.54	5	160
BZD27-C220	208	0.09	0.13	2	305	0.50	5	180
BZD27-C240	228	0.09	0.13	2	336	0.45	5	200
BZD27-C270	251	0.09	0.13	2	380	0.40	5	220
BZD27-C300	280	0.09	0.13	2	419	0.36	5	240
BZD27-C330	310	0.09	0.13	2	459	0.33	5	270
BZD27-C360	340	0.09	0.13	2	498	0.30	5	300
BZD27-C390	370	0.09	0.13	2	537	0.28	5	330
BZD27-C430	400	0.09	0.13	2	603	0.25	5	360
BZD27-C470	440	0.09	0.13	2	655	0.23	5	390
BZD27-C510	480	0.09	0.13	2	707	0.21	5	430

Note

1. Non-repetitive peak reverse current in accordance with *"IEC 60-1, Section 8"* (10/1 000 μs pulse); see Fig.8.

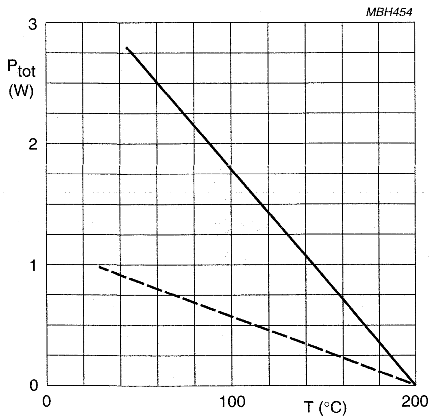
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point			
	BZD27-C3V6 to -C6V8		55	K/W
	BZD27-C7V5 to -C510		30	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1		
	BZD27-C3V6 to -C6V8		175	K/W
	BZD27-C7V5 to -C510		150	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.7. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA

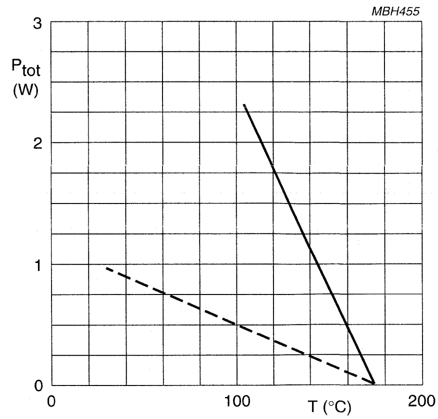


Types BZD27-C3V6 to -C6V8

Solid line: tie-point temperature.

Dotted line: ambient temperature; device mounted as shown in Fig.7.

Fig.2 Maximum total power dissipation as a function of temperature.

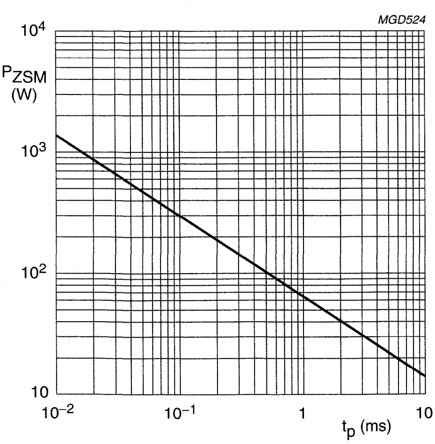


Types BZD27-C7V5 to -C510

Solid line: tie-point temperature.

Dotted line: ambient temperature; device mounted as shown in Fig.7.

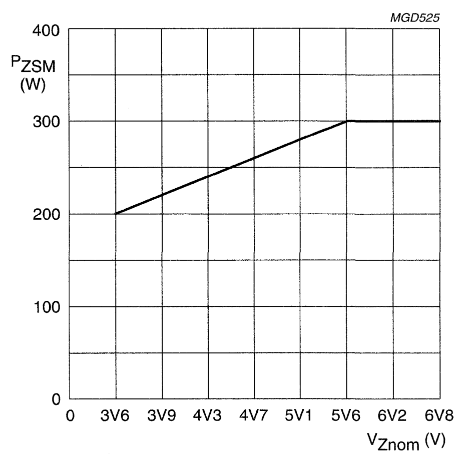
Fig.3 Maximum total power dissipation as a function of temperature.



T_j = 25 °C prior to surge.

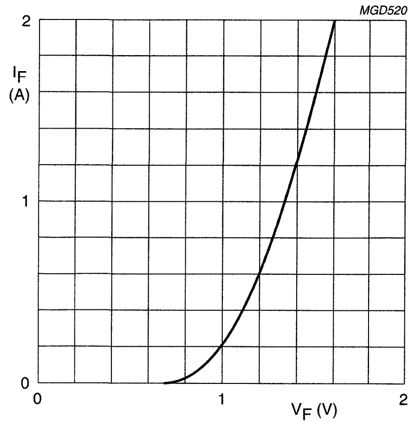
See also Fig 5.

Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



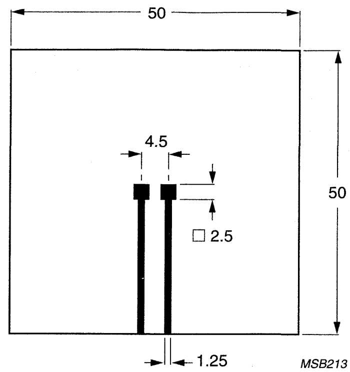
T_j = 25 °C prior to surge.

Fig.5 Maximum non-repetitive peak reverse power dissipation as a function of nominal working voltage.



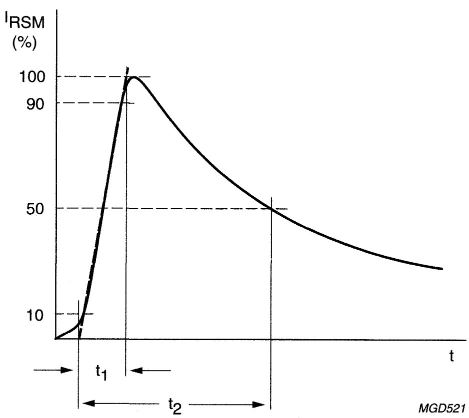
T_j = 25 °C.

Fig.6 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.7 Printed-circuit board for surface mounting.



In accordance with *"IEC 60-1, Section 8"*.

t_1 = 10 µs.

t_2 = 1000 µs.

Fig.8 Non-repetitive peak reverse current pulse definition.

Voltage regulator diodes | BZG03 series

FEATURES

- Glass passivatedb
- High maximum operating temperature
- Low leakage current
- Excellent stability
- UL 94V-O classified plastic package
- Zener working voltage range: 10 to 270 V for 35 types
- Supplied in 12 mm embossed tape.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.

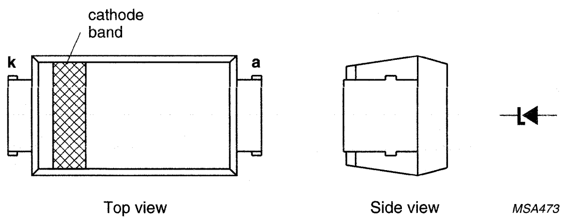


Fig.1 Simplified outline (DO-214AC; SOD106) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{tot}	total power dissipation	T_{tp} = 100 °C; see Fig.2	–	3.00	W
P_{tot}	total power dissipation	T_{amb} = 50 °C; see Fig.2; device mounted on an Al_2O_3 PCB (see Fig.5)	–	1.25	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square pulse; T_j = 25 °C prior to surge; see Fig.3	–	600	W
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+175	°C

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 0.5 A; see Fig.4	1.2	V

Per type

T_j = 25 °C unless otherwise specified.

TYPE No. SUFFIX (1)	WORKING VOLTAGE			DIFFERENTIAL RESISTANCE		TEMPERATURE COEFFICIENT		TEST CURRENT	REVERSE CURRENT at REVERSE VOLTAGE	
	V_Z (V) at I_Z			r_{dif} (Ω) at I_Z		S_Z (%/K) at I_Z		I_Z (mA)	I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C10	9.4	10	10.6	2	4	0.05	0.09	50	7	7.5
C11	10.4	11	11.6	4	7	0.05	0.10	50	4	8.2
C12	11.4	12	12.7	4	7	0.05	0.10	50	3	9.1
C13	12.4	13	14.1	5	10	0.05	0.10	50	2	10
C15	13.8	15	15.6	5	10	0.05	0.10	50	1	11
C16	15.3	16	17.1	6	15	0.06	0.11	25	1	12
C18	16.8	18	19.1	6	15	0.06	0.11	25	1	13
C20	18.8	20	21.2	6	15	0.06	0.11	25	1	15
C22	20.8	22	23.3	6	15	0.06	0.11	25	1	16
C24	22.8	24	25.6	7	15	0.06	0.11	25	1	18
C27	25.1	27	28.9	7	15	0.06	0.11	25	1	20
C30	28	30	32	8	15	0.06	0.11	25	1	22
C33	31	33	35	8	15	0.06	0.11	25	1	24
C36	34	36	38	21	40	0.06	0.11	10	1	27
C39	37	39	41	21	40	0.06	0.11	10	1	30
C43	40	43	46	24	45	0.07	0.12	10	1	33
C47	44	47	50	24	45	0.07	0.12	10	1	36
C51	48	51	54	25	60	0.07	0.12	10	1	39
C56	52	56	60	25	60	0.07	0.12	10	1	43
C62	58	62	66	25	80	0.08	0.13	10	1	47
C68	64	68	72	25	80	0.08	0.13	10	1	51
C75	70	75	79	30	100	0.08	0.13	10	1	56
C82	77	82	87	30	100	0.08	0.13	10	1	62
C91	85	91	96	60	200	0.09	0.13	5	1	68
C100	94	100	106	60	200	0.09	0.13	5	1	75
C110	104	110	116	80	250	0.09	0.13	5	1	82
C120	114	120	127	80	250	0.09	0.13	5	1	91

TYPE No. SUFFIX (1)	WORKING VOLTAGE			DIFFERENTIAL RESISTANCE		TEMPERATURE COEFFICIENT		TEST CURRENT	REVERSE CURRENT at REVERSE VOLTAGE	
	V_Z (V) at I_Z			r_{dif} (Ω) at I_Z		S_Z (%/K) at I_Z		I_Z (mA)	I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C130	124	130	141	110	300	0.09	0.13	5	1	100
C150	138	150	156	130	300	0.09	0.13	5	1	110
C160	153	160	171	150	350	0.09	0.13	5	1	120
C180	168	180	191	180	400	0.09	0.13	5	1	130
C200	188	200	212	200	500	0.09	0.13	5	1	150
C220	208	220	233	350	750	0.09	0.13	2	1	160
C240	228	240	256	400	850	0.09	0.13	2	1	180
C270	251	270	289	450	1000	0.09	0.13	2	1	200

Note

1. To complete the type number the suffix is added to the basic type number, e.g. BZG03-C130.

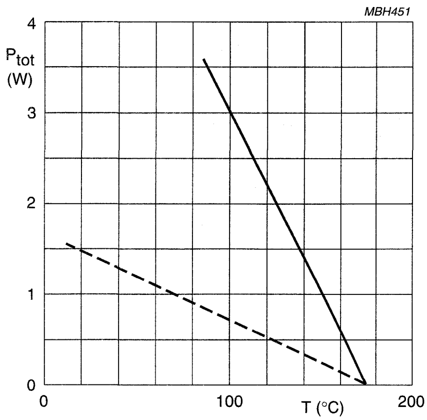
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

Notes

1. Device mounted on an Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of Cu-layer ≥35 μm, see Fig.5.
2. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.5.
   For more information please refer to the *'General Part of Handbook SC01'*.

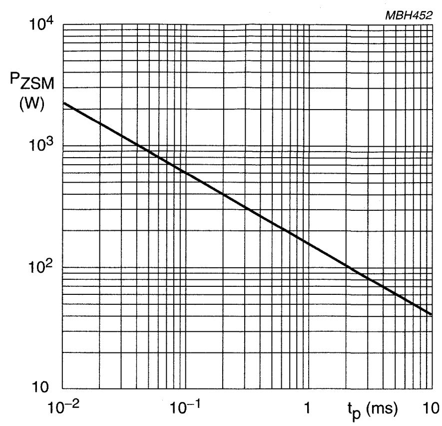
GRAPHICAL DATA



Solid line: tie-point temperature.

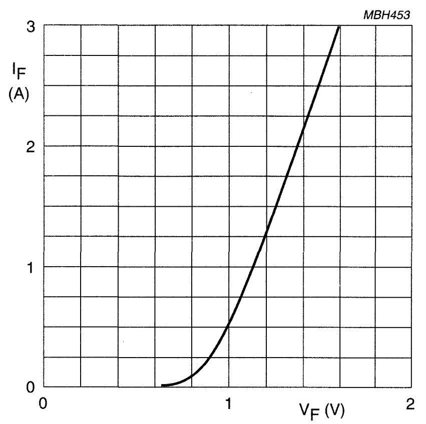
Dotted line: ambient temperature; device mounted on an Al_2O_3 PCB as shown in Fig.5.

Fig.2 Maximum total power dissipation as a function of temperature.



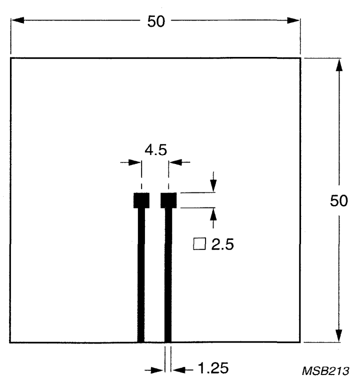
T_j = 25 °C prior to surge.

Fig.3 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



T_j = 25 °C.

Fig.4 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.5 Printed-circuit board for surface mounting.

Transient voltage suppressor diodes — BZG04 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- UL 94V-O classified plastic package
- Transient suppressor stand-off voltage range: 8.2 to 220 V for 32 types
- Shipped in 12 mm embossed tape.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.

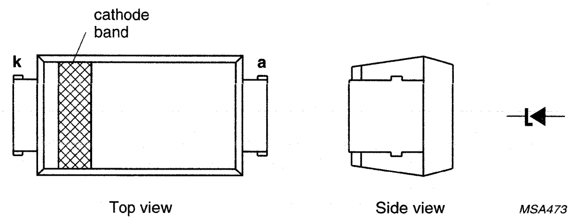


Fig.1 Simplified outline (DO-214AC; SOD106) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{RSM}	non-repetitive peak reverse power dissipation	10/1 000 μs exponential pulse (see Fig.4); T_j = 25 °C prior to surge; see also Fig.2	–	300	W
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_F	forward voltage	I_F = 0.5 A; see Fig.3	–	1.2	V

Per type

T_j = 25 °C unless otherwise specified.

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE $V_{(BR)R}$ (V) at I_{test}	TEMPERATURE COEFFICIENT S_Z (%/K) at I_{test}		TEST CURRENT I_{test} (mA)	CLAMPING VOLTAGE $V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	REVERSE CURRENT at STAND-OFF VOLTAGE I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZG04-8V2	9.4	0.05	0.09	50	14.8	20.3	20	8.2
BZG04-9V1	10.4	0.05	0.10	50	15.7	19.1	5	9.1
BZG04-10	11.4	0.05	0.10	50	17.0	17.7	5	10
BZG04-11	12.4	0.05	0.10	50	18.9	15.9	5	11
BZG04-12	13.8	0.05	0.10	50	20.9	14.4	5	12
BZG04-13	15.3	0.06	0.11	25	22.9	13.1	5	13
BZG04-15	16.8	0.06	0.11	25	25.6	11.7	5	15
BZG04-16	18.8	0.06	0.11	25	28.4	10.6	5	16
BZG04-18	20.8	0.06	0.11	25	31.0	9.7	5	18
BZG04-20	22.8	0.06	0.11	25	33.8	8.9	5	20
BZG04-22	25.1	0.06	0.11	25	38.1	7.9	5	22
BZG04-24	28	0.06	0.11	25	42.2	7.1	5	24
BZG04-27	31	0.06	0.11	25	46.2	6.5	5	27
BZG04-30	34	0.06	0.11	10	50.1	6.0	5	30
BZG04-33	37	0.06	0.11	10	54.1	5.5	5	33
BZG04-36	40	0.07	0.12	10	60.7	4.9	5	36
BZG04-39	44	0.07	0.12	10	65.5	4.6	5	39
BZG04-43	48	0.07	0.12	10	70.8	4.2	5	43
BZG04-47	52	0.07	0.12	10	78.6	3.8	5	47
BZG04-51	58	0.08	0.13	10	86.5	3.5	5	51
BZG04-56	64	0.08	0.13	10	94.4	3.2	5	56
BZG04-62	70	0.08	0.13	10	103.5	2.9	5	62
BZG04-68	77	0.08	0.13	10	114	2.6	5	68
BZG04-75	85	0.09	0.13	5	126	2.4	5	75
BZG04-82	94	0.09	0.13	5	139	2.2	5	82
BZG04-91	104	0.09	0.13	5	152	2.0	5	91
BZG04-100	114	0.09	0.13	5	167	1.8	5	100

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE	TEMPERATURE COEFFICIENT		TEST CURRENT	CLAMPING VOLTAGE		REVERSE CURRENT at STAND-OFF VOLTAGE	
	$V_{(BR)R}$ (V) at I_{test}	S_Z (%/K) at I_{test}		I_{test} (mA)	$V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZG04-110	124	0.09	0.13	5	185	1.6	5	110
BZG04-120	138	0.09	0.13	5	204	1.5	5	120
BZG04-130	153	0.09	0.13	5	224	1.3	5	130
BZG04-150	168	0.09	0.13	5	249	1.2	5	150
BZG04-160	188	0.09	0.13	5	276	1.1	5	160
BZG04-180	208	0.09	0.13	2	305	1.0	5	180
BZG04-200	228	0.09	0.13	2	336	0.9	5	200
BZG04-220	251	0.09	0.13	2	380	0.8	5	220

Note

1. Non-repetitive peak reverse current in accordance with *"IEC 60-1, Section 8"* (10/1000 μs pulse); see Fig.4.

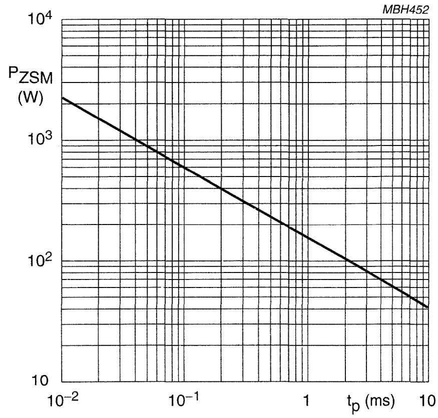
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

Notes

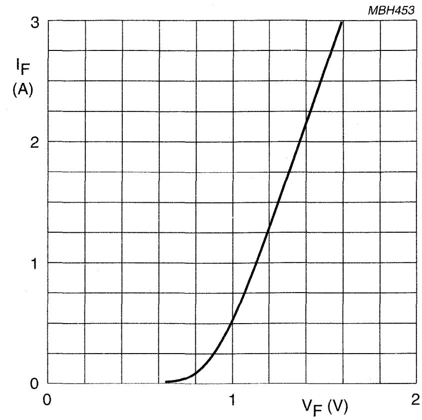
1. Device mounted on an Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of Cu-layer ≥35 μm, see Fig.5.
2. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.5. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



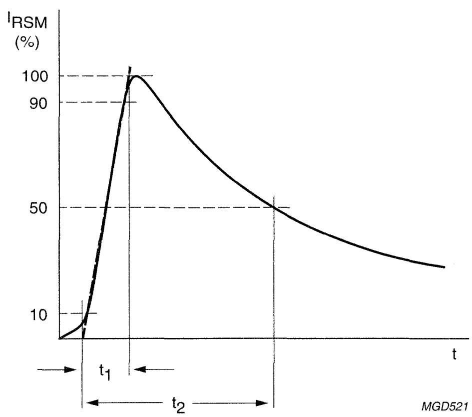
T_j = 25 °C prior to surge.

Fig.2 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.

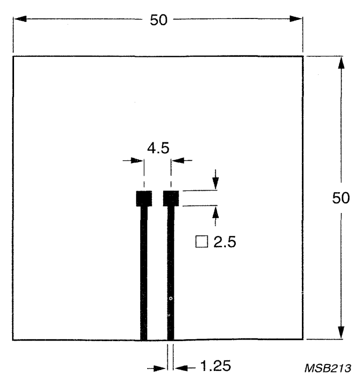


In accordance with *"IEC 60-1, Section 8"*.

t_1 = 10 µs.

t_2 = 1000 µs.

Fig.4 Non-repetitive peak reverse current pulse definition.



Dimensions in mm.

Fig.5 Printed-circuit board for surface mounting.

Voltage regulator diodes

BZT03 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Zener working voltage range: 7.5 to 270 V for 38 types
- Transient suppressor stand-off voltage range: 6.2 to 430 V for 45 types
- Available in ammo-pack.

DESCRIPTION

Rugged glass SOD57 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

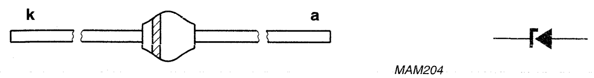


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{tot}	total power dissipation	T_{tp} = 25 °C; lead length 10 mm; see Fig.2	–	3.25	W
		T_{amb} = 45 °C; see Fig.2; PCB mounted (see Fig.6)	–	1.30	W
P_{ZRM}	repetitive peak reverse power dissipation		–	10	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square pulse; T_j = 25 °C prior to surge; see Fig.3	–	600	W
P_{RSM}	non-repetitive peak reverse power dissipation	10/1 000 µs exponential pulse (see Fig.4); T_j = 25 °C prior to surge	–	300	W
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+175	°C

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 0.5 A; see Fig.5	1.2	V

Per type when used as voltage regulator diodes

T_j = 25 °C unless otherwise specified.

TYPE No. SUFFIX (1)	WORKING VOLTAGE V_Z (V) at I_Z			DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z		TEMPERATURE COEFFICIENT S_Z (%/K) at I_Z		TEST CURRENT I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C7V5	7.0	7.5	7.9	1	2	0.00	0.07	100	750	5.6
C8V2	7.7	8.2	8.7	1	2	0.03	0.08	100	600	6.2
C9V1	8.5	9.1	9.6	2	4	0.03	0.08	50	20	6.8
C10	9.4	10	10.6	2	4	0.05	0.09	50	10	7.5
C11	10.4	11	11.6	4	7	0.05	0.10	50	4	8.2
C12	11.4	12	12.7	4	7	0.05	0.10	50	3	9.1
C13	12.4	13	14.1	5	10	0.05	0.10	50	2	10
C15	13.8	15	15.6	5	10	0.05	0.10	50	1	11
C16	15.3	16	17.1	6	15	0.06	0.11	25	1	12
C18	16.8	18	19.1	6	15	0.06	0.11	25	1	13
C20	18.8	20	21.2	6	15	0.06	0.11	25	1	15
C22	20.8	22	23.3	6	15	0.06	0.11	25	1	16
C24	22.8	24	25.6	7	15	0.06	0.11	25	1	18
C27	25.1	27	28.9	7	15	0.06	0.11	25	1	20
C30	28	30	32	8	15	0.06	0.11	25	1	22
C33	31	33	35	8	15	0.06	0.11	25	1	24
C36	34	36	38	21	40	0.06	0.11	10	1	27
C39	37	39	41	21	40	0.06	0.11	10	1	30
C43	40	43	46	24	45	0.07	0.12	10	1	33
C47	44	47	50	24	45	0.07	0.12	10	1	36
C51	48	51	54	25	60	0.07	0.12	10	1	39
C56	52	56	60	25	60	0.07	0.12	10	1	43
C62	58	62	66	25	80	0.08	0.13	10	1	47
C68	64	68	72	25	80	0.08	0.13	10	1	51
C75	70	75	79	30	100	0.08	0.13	10	1	56
C82	77	82	87	30	100	0.08	0.13	10	1	62
C91	85	91	96	60	200	0.09	0.13	5	1	68

Voltage regulator diodes BZT03 series

TYPE No. SUFFIX (1)	WORKING VOLTAGE			DIFFERENTIAL RESISTANCE		TEMPERATURE COEFFICIENT		TEST CURRENT	REVERSE CURRENT at REVERSE VOLTAGE	
	V_Z (V) at I_Z			r_{dif} (Ω) at I_Z		S_Z (%/K) at I_Z		I_Z (mA)	I_R (μA)	V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C100	94	100	106	60	200	0.09	0.13	5	1	75
C110	104	110	116	80	250	0.09	0.13	5	1	82
C120	114	120	127	80	250	0.09	0.13	5	1	91
C130	124	130	141	110	300	0.09	0.13	5	1	100
C150	138	150	156	130	300	0.09	0.13	5	1	110
C160	153	160	171	150	350	0.09	0.13	5	1	120
C180	168	180	191	180	400	0.09	0.13	5	1	130
C200	188	200	212	200	500	0.09	0.13	5	1	150
C220	208	220	233	350	750	0.09	0.13	2	1	160
C240	228	240	256	400	850	0.09	0.13	2	1	180
C270	251	270	289	450	1000	0.09	0.13	2	1	200

Note

1. To complete the type number the suffix is added to the basic type number, e.g. BZT03-C100.

Per type when used as transient suppressor diodes

T_j = 25 °C unless otherwise specified.

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE	TEMPERATURE COEFFICIENT		TEST CURRENT	CLAMPING VOLTAGE		REVERSE CURRENT at STAND-OFF VOLTAGE	
	$V_{(BR)R}$ (V) at I_{test}	S_Z (%/K) at I_{test}		I_{test} (mA)	$V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZT03-C7V5	7.0	0.00	0.07	100	11.3	26.5	1500	6.2
BZT03-C8V2	7.7	0.03	0.08	100	12.3	24.4	1200	6.8
BZT03-C9V1	8.5	0.03	0.08	50	13.3	22.7	100	7.5
BZT03-C10	9.4	0.05	0.09	50	14.8	20.3	20	8.2
BZT03-C11	10.4	0.05	0.10	50	15.7	19.1	5	9.1
BZT03-C12	11.4	0.05	0.10	50	17.0	17.7	5	10
BZT03-C13	12.4	0.05	0.10	50	18.9	15.9	5	11
BZT03-C15	13.8	0.05	0.10	50	20.9	14.4	5	12
BZT03-C16	15.3	0.06	0.11	25	22.9	13.1	5	13
BZT03-C18	16.8	0.06	0.11	25	25.6	11.7	5	15
BZT03-C20	18.8	0.06	0.11	25	28.4	10.6	5	16
BZT03-C22	20.8	0.06	0.11	25	31.0	9.7	5	18
BZT03-C24	22.8	0.06	0.11	25	33.8	8.9	5	20
BZT03-C27	25.1	0.06	0.11	25	38.1	7.9	5	22
BZT03-C30	28	0.06	0.11	25	42.2	7.1	5	24
BZT03-C33	31	0.06	0.11	25	46.2	6.5	5	27
BZT03-C36	34	0.06	0.11	10	50.1	6.0	5	30
BZT03-C39	37	0.06	0.11	10	54.1	5.5	5	33
BZT03-C43	40	0.07	0.12	10	60.7	4.9	5	36
BZT03-C47	44	0.07	0.12	10	65.5	4.6	5	39
BZT03-C51	48	0.07	0.12	10	70.8	4.2	5	43
BZT03-C56	52	0.07	0.12	10	78.6	3.8	5	47
BZT03-C62	58	0.08	0.13	10	86.5	3.5	5	51
BZT03-C68	64	0.08	0.13	10	94.4	3.2	5	56
BZT03-C75	70	0.08	0.13	10	103.5	2.9	5	62
BZT03-C82	77	0.08	0.13	10	114.0	2.6	5	68
BZT03-C91	85	0.09	0.13	5	126	2.4	5	75
BZT03-C100	94	0.09	0.13	5	139	2.2	5	82
BZT03-C110	104	0.09	0.13	5	152	2.0	5	91
BZT03-C120	114	0.09	0.13	5	167	1.8	5	100
BZT03-C130	124	0.09	0.13	5	185	1.6	5	110
BZT03-C150	138	0.09	0.13	5	204	1.5	5	120
BZT03-C160	153	0.09	0.13	5	224	1.3	5	130

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE	TEMPERATURE COEFFICIENT		TEST CURRENT	CLAMPING VOLTAGE		REVERSE CURRENT at STAND-OFF VOLTAGE	
	$V_{(BR)R}$ (V) at I_{test}	S_Z (%/K) at I_{test}		I_{test} (mA)	$V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZT03-C180	168	0.09	0.13	5	249	1.2	5	150
BZT03-C200	188	0.09	0.13	5	276	1.1	5	160
BZT03-C220	208	0.09	0.13	2	305	1.0	5	180
BZT03-C240	228	0.09	0.13	2	336	0.9	5	200
BZT03-C270	251	0.09	0.13	2	380	0.8	5	220
BZT03-C300	280	0.09	0.13	2	419	0.72	5	240
BZT03-C330	310	0.09	0.13	2	459	0.65	5	270
BZT03-C360	340	0.09	0.13	2	498	0.60	5	300
BZT03-C390	370	0.09	0.13	2	537	0.56	5	330
BZT03-C430	400	0.09	0.13	2	603	0.50	5	360
BZT03-C470	440	0.09	0.13	2	655	0.45	5	390
BZT03-C510	480	0.09	0.13	2	707	0.42	5	430

Note

1. Non-repetitive peak reverse current in accordance with *"IEC 60-1, Section 8"* (10/1000 μs pulse); see Fig.4.

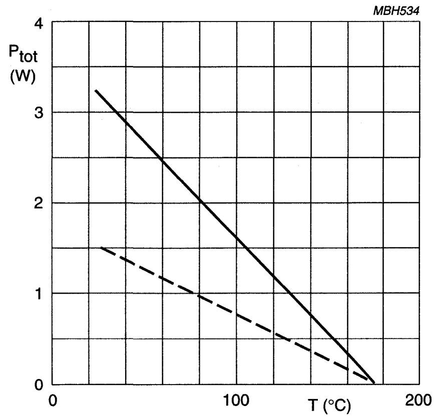
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.6.
For more information please refer to the *'General Part of Handbook SC01'*.

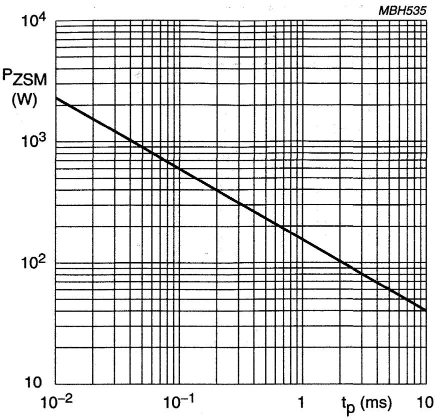
GRAPHICAL DATA



Solid line: tie-point temperature; lead length = 10 mm.

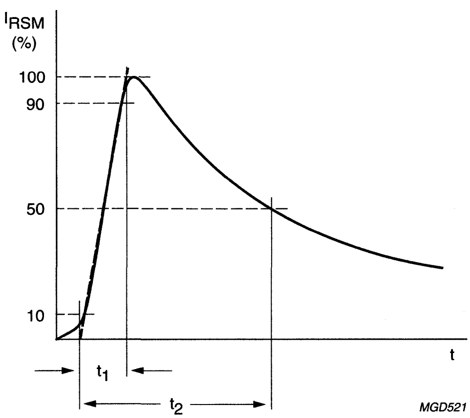
Dotted line: ambient temperature; PCB mounted as shown in Fig 6.

Fig.2 Maximum total power dissipation as a function of temperature.



T_j = 25 °C prior to surge.

Fig.3 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).

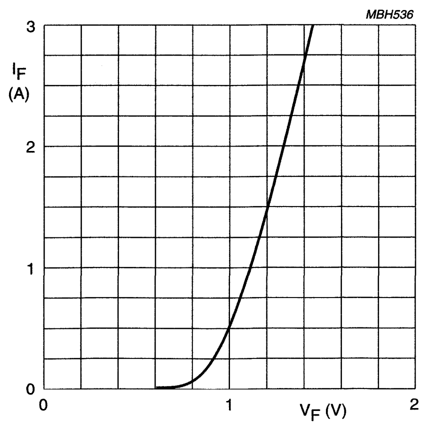


In accordance with *"IEC 60-1, Section 8"*.

t_1 = 10 μs.

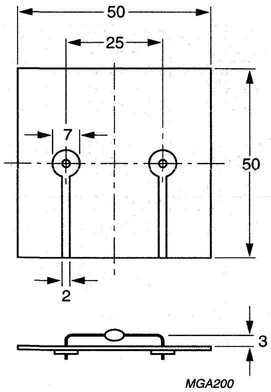
t_2 = 1000 μs.

Fig.4 Non-repetitive peak reverse current pulse definition.



T_j = 25 °C.

Fig.5 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.6 Device mounted on a printed-circuit board.

Voltage regulator diodes BZW03 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Zener working voltage range: 7.5 to 270 V for 38 types
- Transient suppressor stand-off voltage range: 6.2 to 430 V for 45 types
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

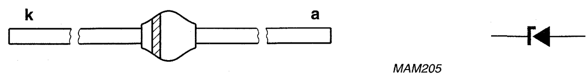


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
P_{tot}	total power dissipation	T_{tp} = 25 °C; lead length 10 mm; see Fig.2	–	6.00	W
		T_{amb} = 45 °C; see Fig.2; PCB mounted (see Fig.6)	–	1.75	W
P_{ZRM}	repetitive peak reverse power dissipation		–	20	W
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square pulse; T_j = 25 °C prior to surge; see Fig.3	–	1000	W
P_{RSM}	non-repetitive peak reverse power dissipation	10/1 000 µs exponential pulse (see Fig.7); T_j = 25 °C prior to surge; see Fig.4	–	500	W
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; see Fig.5	1.2	V

Per type when used as voltage regulator diodes

T_j = 25 °C unless otherwise specified.

TYPE No. SUFFIX (1)	WORKING VOLTAGE V_Z (V) at I_Z			DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z		TEMPERATURE COEFFICIENT S_Z (%/K) at I_Z		TEST CURRENT I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	at V_R (V)
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	
C7V5	7.0	7.5	7.9	0.7	1.5	0.00	0.07	175	1500	5.6
C8V2	7.7	8.2	8.7	0.8	1.5	0.03	0.08	150	1200	6.2
C9V1	8.5	9.1	9.6	0.9	2.0	0.03	0.08	150	40	6.8
C10	9.4	10	10.6	1.0	2.0	0.05	0.09	125	20	7.5
C11	10.4	11	11.6	1.1	2.5	0.05	0.10	125	15	8.2
C12	11.4	12	12.7	1.1	2.5	0.05	0.10	100	10	9.1
C13	12.4	13	14.1	1.2	2.5	0.05	0.10	100	4	10
C15	13.8	15	15.6	1.2	2.5	0.05	0.10	75	2	11
C16	15.3	16	17.1	1.3	2.5	0.06	0.11	75	2	12
C18	16.8	18	19.1	1.3	2.5	0.06	0.11	65	2	13
C20	18.8	20	21.2	1.5	3.0	0.06	0.11	65	2	15
C22	20.8	22	23.3	1.6	3.5	0.06	0.11	50	2	16
C24	22.8	24	25.6	1.8	3.5	0.06	0.11	50	2	18
C27	25.1	27	28.9	2.5	5	0.06	0.11	50	2	20
C30	28	30	32	4	8	0.06	0.11	40	2	22
C33	31	33	35	5	10	0.06	0.11	40	2	24
C36	34	36	38	6	11	0.06	0.11	30	2	27
C39	37	39	41	7	14	0.06	0.11	30	2	30
C43	40	43	46	10	20	0.07	0.12	30	2	33
C47	44	47	50	12	25	0.07	0.12	25	2	36
C51	48	51	54	14	27	0.07	0.12	25	2	39
C56	52	56	60	18	35	0.07	0.12	20	2	43
C62	58	62	66	20	42	0.08	0.13	20	2	47
C68	64	68	72	22	44	0.08	0.13	20	2	51
C75	70	75	79	25	45	0.08	0.13	20	2	56
C82	77	82	87	30	65	0.08	0.13	15	2	62
C91	85	91	96	40	75	0.09	0.13	15	2	68

TYPE No. SUFFIX (1)	WORKING VOLTAGE V_Z (V) at I_Z			DIFFERENTIAL RESISTANCE r_{dif} (Ω) at I_Z		TEMPERATURE COEFFICIENT S_Z (%/K) at I_Z		TEST CURRENT I_Z (mA)	REVERSE CURRENT at REVERSE VOLTAGE I_R (μA)	
	MIN.	NOM.	MAX.	TYP.	MAX.	MIN.	MAX.		MAX.	at V_R (V)
C100	94	100	106	45	90	0.09	0.13	12	2	75
C110	104	110	116	65	125	0.09	0.13	12	2	82
C120	114	120	127	90	170	0.09	0.13	10	2	91
C130	124	130	141	100	190	0.09	0.13	10	2	100
C150	138	150	156	150	330	0.09	0.13	8	2	110
C160	153	160	171	180	350	0.09	0.13	8	2	120
C180	168	180	191	210	430	0.09	0.13	5	2	130
C200	188	200	212	250	500	0.09	0.13	5	2	150
C220	208	220	233	350	700	0.09	0.13	5	2	160
C240	228	240	256	450	900	0.09	0.13	5	2	180
C270	251	270	289	600	1200	0.09	0.13	5	2	200

Note

1. To complete the type number the suffix is added to the basic type number, e.g. BZW03-C100.

Per type when used as transient suppressor diodes

T_j = 25 °C unless otherwise specified.

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE $V_{(BR)R}$ (V) at I_{test}	TEMPERATURE COEFFICIENT S_Z (%/K) at I_{test}		TEST CURRENT I_{test} (mA)	CLAMPING VOLTAGE $V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	REVERSE CURRENT at STAND-OFF VOLTAGE I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZW03-C7V5	7.0	0.00	0.07	175	11.3	44.2	3000	6.2
BZW03-C8V2	7.7	0.03	0.08	150	12.3	40.6	2400	6.8
BZW03-C9V1	8.5	0.03	0.08	150	13.3	37.6	100	7.5
BZW03-C10	9.4	0.05	0.09	125	14.8	34.0	40	8.2
BZW03-C11	10.4	0.05	0.10	125	15.7	31.8	30	9.1
BZW03-C12	11.4	0.05	0.10	100	17.0	29.4	20	10
BZW03-C13	12.4	0.05	0.10	100	18.9	26.4	10	11
BZW03-C15	13.8	0.05	0.10	75	20.9	23.9	10	12
BZW03-C16	15.3	0.06	0.11	75	22.9	21.8	10	13
BZW03-C18	16.8	0.06	0.11	65	25.6	19.5	10	15
BZW03-C20	18.8	0.06	0.11	65	28.4	17.6	10	16
BZW03-C22	20.8	0.06	0.11	50	31.0	16.1	10	18
BZW03-C24	22.8	0.06	0.11	50	33.8	14.8	10	20
BZW03-C27	25.1	0.06	0.11	50	38.1	13.1	10	22
BZW03-C30	28	0.06	0.11	40	42.2	11.8	10	24
BZW03-C33	31	0.06	0.11	40	46.2	10.8	10	27
BZW03-C36	34	0.06	0.11	30	50.1	10.0	10	30
BZW03-C39	37	0.06	0.11	30	54.1	9.2	10	33
BZW03-C43	40	0.07	0.12	30	60.7	8.2	10	36
BZW03-C47	44	0.07	0.12	25	65.5	7.6	10	39
BZW03-C51	48	0.07	0.12	25	70.8	7.0	10	43
BZW03-C56	52	0.07	0.12	20	78.6	6.3	10	47
BZW03-C62	58	0.08	0.13	20	86.5	5.8	10	51
BZW03-C68	64	0.08	0.13	20	94.4	5.3	10	56
BZW03-C75	70	0.08	0.13	20	103.5	4.8	10	62
BZW03-C82	77	0.08	0.13	15	114.0	4.3	10	68
BZW03-C91	85	0.09	0.13	15	126	3.9	10	75
BZW03-C100	94	0.09	0.13	12	139	3.6	10	82
BZW03-C110	104	0.09	0.13	12	152	3.3	10	91
BZW03-C120	114	0.09	0.13	10	167	3.0	10	100
BZW03-C130	124	0.09	0.13	10	185	2.7	10	110
BZW03-C150	138	0.09	0.13	8	204	2.4	10	120
BZW03-C160	153	0.09	0.13	8	224	2.2	10	130

TYPE NUMBER	REVERSE BREAKDOWN VOLTAGE	TEMPERATURE COEFFICIENT		TEST CURRENT	CLAMPING VOLTAGE		REVERSE CURRENT at STAND-OFF VOLTAGE	
	$V_{(BR)R}$ (V) at I_{test}	S_Z (%/K) at I_{test}		I_{test} (mA)	$V_{(CL)R}$ (V)	at I_{RSM} (A) note 1	I_R (μA)	at V_R (V)
	MIN.	MIN.	MAX.		MAX.		MAX.	
BZW03-C180	168	0.09	0.13	5	249	2.0	10	150
BZW03-C200	188	0.09	0.13	5	276	1.8	10	160
BZW03-C220	208	0.09	0.13	5	305	1.6	10	180
BZW03-C240	228	0.09	0.13	5	336	1.5	10	200
BZW03-C270	251	0.09	0.13	5	380	1.3	10	220
BZW03-C300	280	0.09	0.13	5	419	1.2	10	240
BZW03-C330	310	0.09	0.13	5	459	1.1	10	270
BZW03-C360	340	0.09	0.13	5	498	1.0	10	300
BZW03-C390	370	0.09	0.13	5	537	0.93	10	330
BZW03-C430	400	0.09	0.13	5	603	0.83	10	360
BZW03-C470	440	0.09	0.13	5	655	0.76	10	390
BZW03-C510	480	0.09	0.13	5	707	0.71	10	430

Note

1. Non-repetitive peak reverse current in accordance with *"IEC 60-1, Section 8"* (10/1 000 μs pulse); see Fig.7.

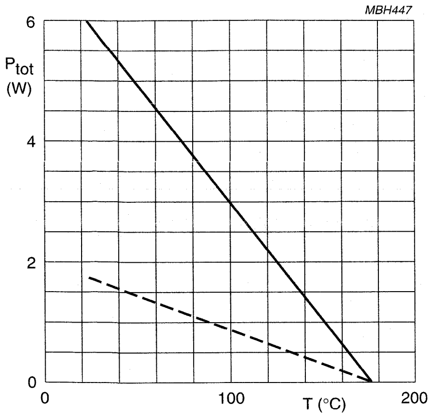
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

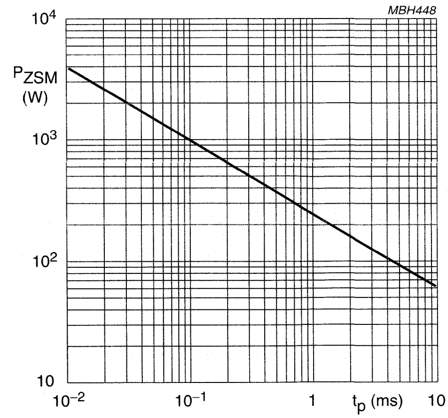
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.6. For more information please refer to the *'General Part of Handbook SC01'*.

GRAPHICAL DATA



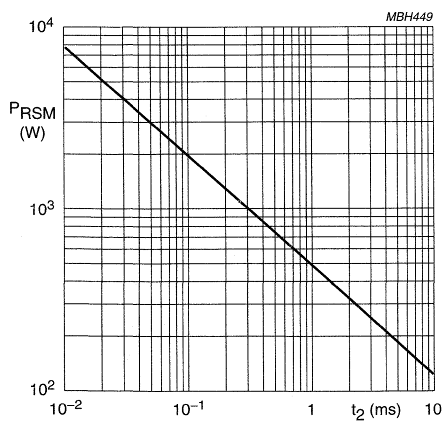
Solid line: tie-point temperature; lead length = 10 mm.
Dotted line: ambient temperature; device mounted as shown in Fig.6.

Fig.2 Maximum total power dissipation as a function of temperature.



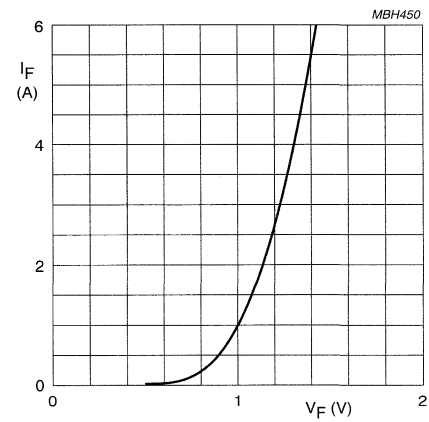
T_j = 25 °C prior to surge.

Fig.3 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).



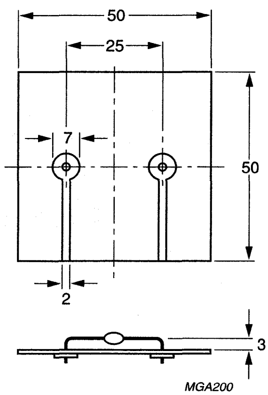
T_j = 25 °C prior to surge.
For definition of exponential pulse see Fig.7.

Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (exponential pulse).



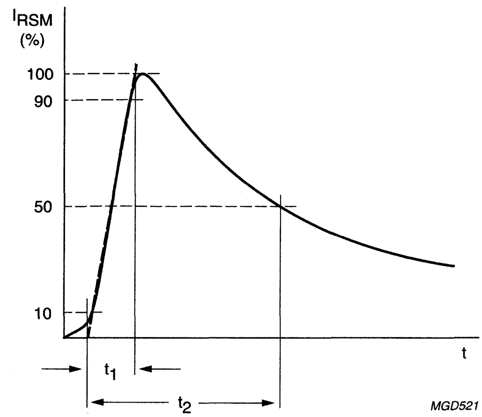
T_j = 25 °C.

Fig.5 Forward current as a function of forward voltage; typical values.



Dimensions in mm.

Fig.6 Device mounted on a printed-circuit board.



In accordance with *"IEC 60-1, Section 8"*.

t_1 = 10 μs.

t_2 = 1000 μs.

Fig.7 Non-repetitive peak reverse current pulse definition.

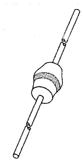
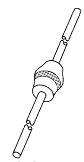
SECTION 14

DAMPER DIODES

Damper diodes

Selection guide

DAMPER DIODES

TYPE NUMBER	RATINGS				CHARACTERISTICS				PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	I_{FWM} max.	I_{FSM} max.	V_F max.	@ I_F	C_d typ.	t_{rr} max.	
	(V)	(V)	(A)	(A)	(V)	(A)	(pF)	(μs)	
LEADED TYPES									
BY448	1650	1500	4	30	1.6	3	–	1	 SOD57
BY228	1650	1500	5	50	1.5	5	–	1	 SOD64
BY278	1700	1650	5	50	1.5	5	–	1	
BY328	1500	1400	6	60	1.45	5	–	0.5	
BY428	1500	1400	4	50	1.95	4	–	0.25	

Damper diode BY228

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

APPLICATIONS

- Damper diode in high frequency horizontal deflection circuits up to 16 kHz.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

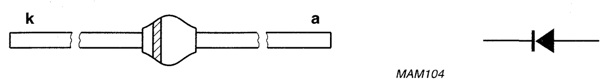


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1650	V
V_{RRM}	repetitive peak reverse voltage		–	1650	V
V_R	continuous reverse voltage		–	1500	V
I_{FWM}	working peak forward current	T_{amb} = 75 °C; PCB mounting (see Fig.4); see Fig.2	–	5	A
I_{FRM}	repetitive peak forward current		–	10	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	50	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 5 A; $T_j = T_{j\,max}$; see Fig.3	1.4	V
		I_F = 5 A; see Fig.3	1.5	V
I_R	reverse current	$V_R = V_{Rmax}$; T_j = 150 °C	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.6	1	µs
t_{fr}	forward recovery time	when switched to I_F = 5 A in 50 ns; $T_j = T_{j\,max}$; Fig.7	1	µs

Damper diode BY228

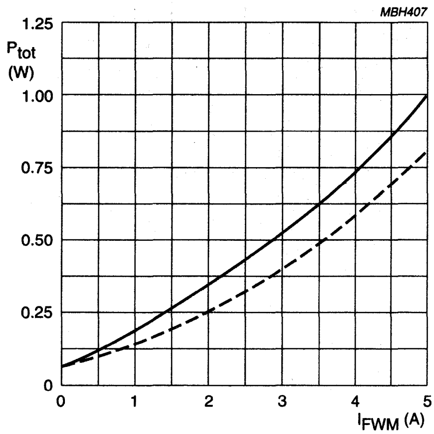
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W
		mounted as shown in Fig.5	40	K/W

Note

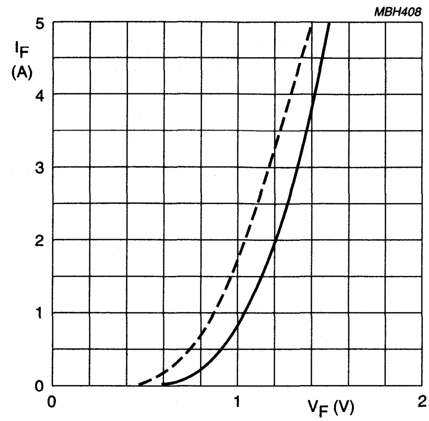
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



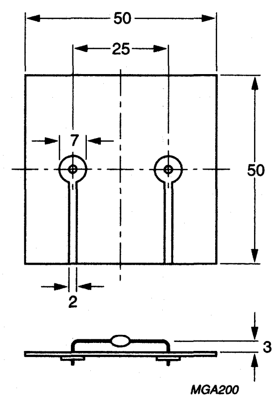
Solid line: basic high-voltage E/W modulator circuit; see Fig.8.
Dotted line: basic conventional horizontal deflection circuit; see Fig.9.
Curves include power dissipation due to switching losses.

Fig.2 Maximum total power dissipation as a function of working peak forward current.



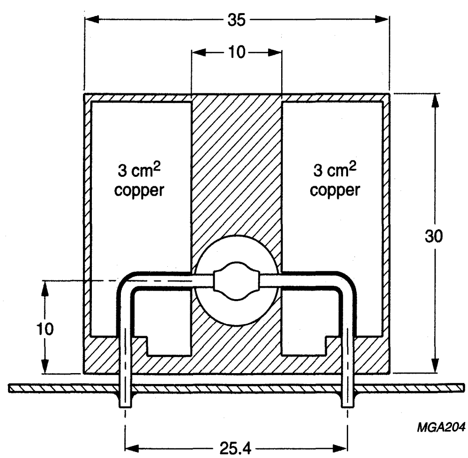
Dotted line: T_j = 150 °C.
Solid line: T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; maximum values.



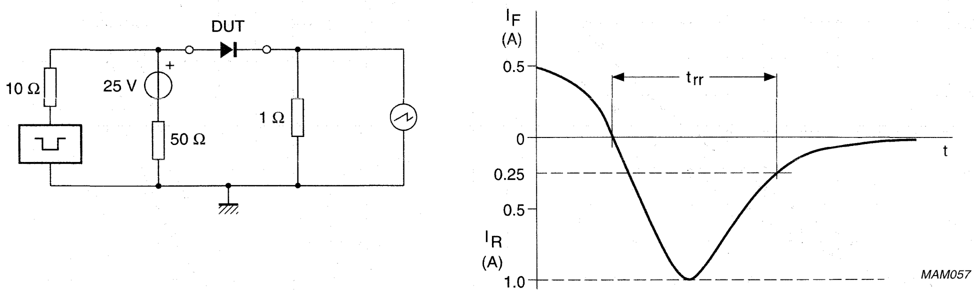
Dimensions in mm.

Fig.4 Device mounted on a printed-circuit board.



Dimensions in mm.

Fig.5 Mounting with additional printed circuit board for heat sink purposes.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.6 Test circuit and reverse recovery time waveform and definition.

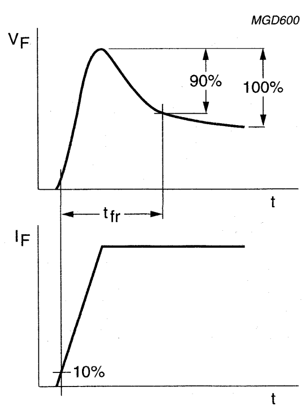


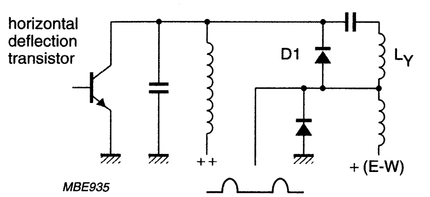
Fig.7 Forward recovery time definition.

APPLICATION INFORMATION

For horizontal deflection circuits, two basic applications are shown in Figs 8 and 9.

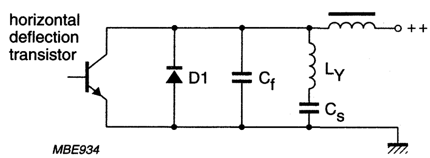
The maximum allowable total power dissipation for the diode can be calculated from the thermal resistance $R_{th\ j\text{-}a}$ and the difference between $T_{j\ max}$ and $T_{amb\ max}$ in the application. The maximum I_{FWM} can then be taken from Fig.2.

The basic application waveforms in Fig.10 relate to the circuit in Fig.8. In the circuit in Fig.9 the forward conduction time of the diode is shorter, allowing a higher I_{FWM} (see Fig.2).



D1 = BY228.

Fig.8 Application in basic high-voltage E/W modulator circuit.



D1 = BY228.

Fig.9 Application in basic horizontal deflection circuit.

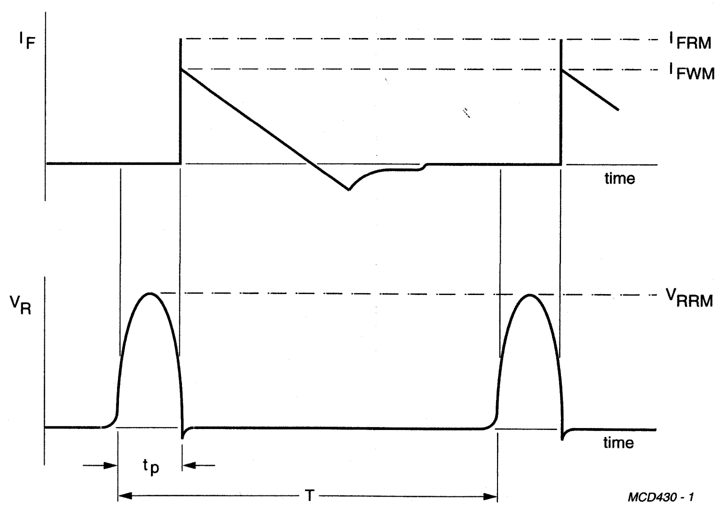


Fig.10 Basic application waveforms.

Damper diode BY278

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

APPLICATIONS

- Damper diode in high frequency horizontal deflection circuits up to 16 kHz.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

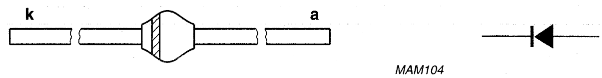


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1700	V
V_{RRM}	repetitive peak reverse voltage		–	1700	V
V_R	continuous reverse voltage		–	1650	V
I_{FWM}	working peak forward current	T_{amb} = 75 °C; PCB mounting (see Fig.4); see Fig.2	–	5	A
I_{FRM}	repetitive peak forward current		–	10	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	50	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 5 A; $T_j = T_{j\,max}$; see Fig.3	1.4	V
		I_F = 5 A; see Fig.3	1.5	V
I_R	reverse current	$V_R = V_{Rmax}$; T_j = 150 °C	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.6	1	μs
t_{fr}	forward recovery time	when switched to I_F = 5 A in 50 ns; $T_j = T_{j\,max}$; Fig.7	1	μs

THERMAL CHARACTERISTICS

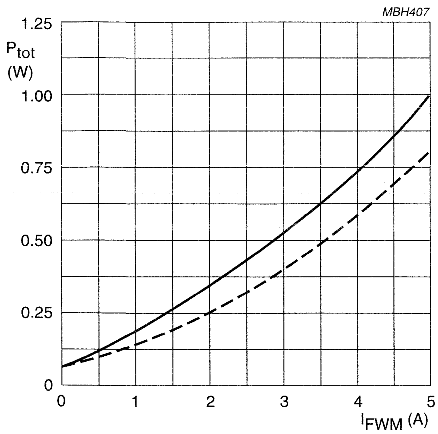
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W
		mounted as shown in Fig.5	40	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

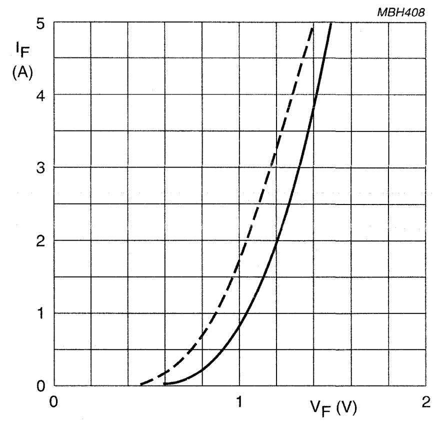
Damper diode BY278

GRAPHICAL DATA



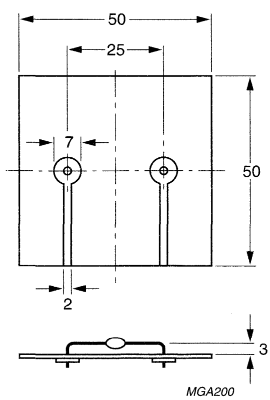
Solid line: basic high-voltage E/W modulator circuit; see Fig.8.
Dotted line: basic conventional horizontal deflection circuit; see Fig.9.
Curves include power dissipation due to switching losses.

Fig.2 Maximum total power dissipation as a function of working peak forward current.



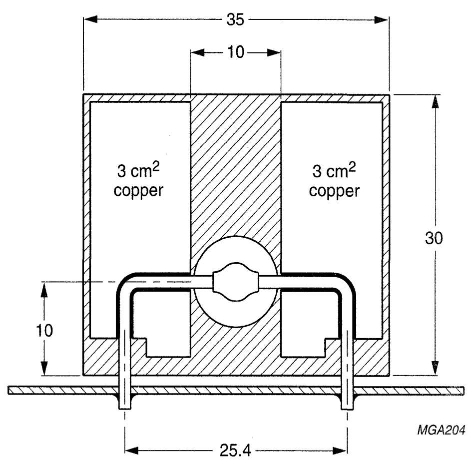
Dotted line: T_j = 150 °C.
Solid line: T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; maximum values.



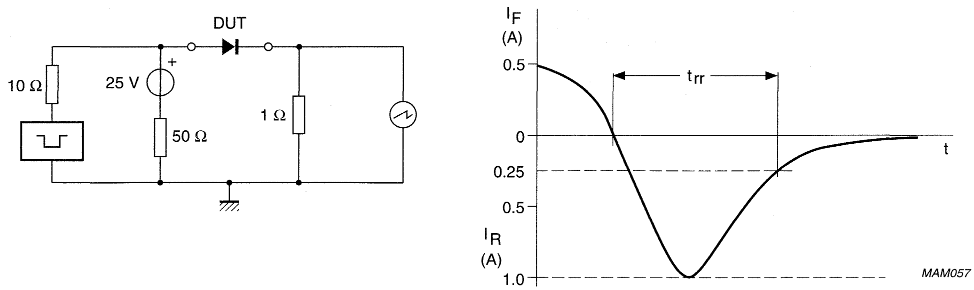
Dimensions in mm.

Fig.4 Device mounted on a printed-circuit board.



Dimensions in mm.

Fig.5 Mounting with additional printed-circuit board for heat sink purposes.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.6 Test circuit and reverse recovery time waveform and definition.

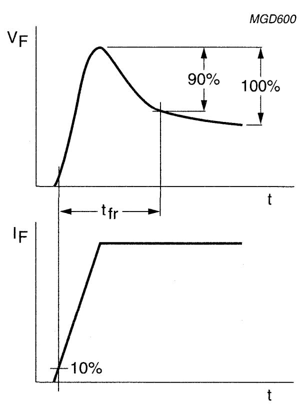


Fig.7 Forward recovery time definition.

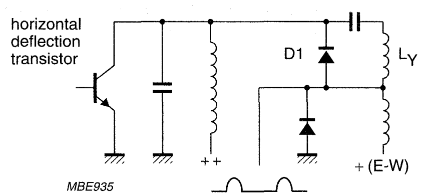
Damper diode BY278

APPLICATION INFORMATION

For horizontal deflection circuits, two basic applications are shown in Figs 8 and 9.

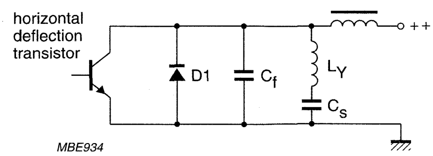
The maximum allowable total power dissipation for the diode can be calculated from the thermal resistance $R_{th\ j\text{-}a}$ and the difference between $T_{j\ max}$ and $T_{amb\ max}$ in the application. The maximum I_{FWM} can then be taken from Fig.2.

The basic application waveforms in Fig.10 relate to the circuit in Fig.8. In the circuit in Fig.9 the forward conduction time of the diode is shorter, allowing a higher I_{FWM} (see Fig.2).



D1 = BY278.

Fig.8 Application in basic high-voltage E/W modulator circuit.



D1 = BY278.

Fig.9 Application in basic horizontal deflection circuit.

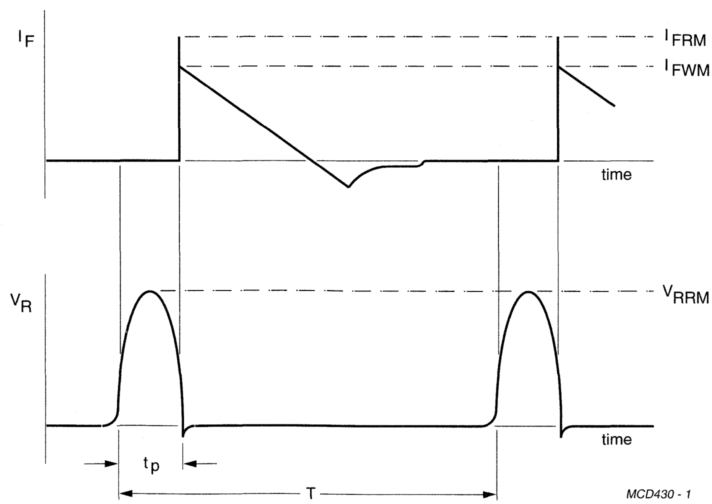


Fig.10 Basic application waveforms.

Damper diode | BY328

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

APPLICATIONS

- Damper diode in high frequency horizontal deflection circuits up to 38 kHz.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

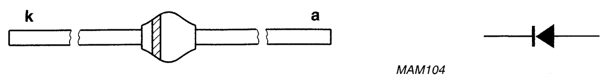


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1500	V
V_{RRM}	repetitive peak reverse voltage		–	1500	V
V_R	continuous reverse voltage		–	1400	V
I_{FWM}	working peak forward current	T_{tp} = 55 °C; lead length = 10 mm see Fig.2	–	6.0	A
		T_{amb} = 55 °C; PCB mounting (see Fig.5); see Fig.2	–	4.7	A
		T_{amb} = 55 °C; PCB mounting (see Fig.4); see Fig 2	–	3.0	A
I_{FRM}	repetitive peak forward current		–	10	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	60	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 5 A; $T_j = T_{j\,max}$; see Fig.3	1.35	V
		I_F = 5 A; see Fig.3	1.45	V
I_R	reverse current	$V_R = V_{Rmax}$; T_j = 150 °C	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.6	500	ns
t_{fr}	forward recovery time	when switched to I_F = 5 A in 50 ns; $T_j = T_{j\,max}$; see Fig.7	500	ns

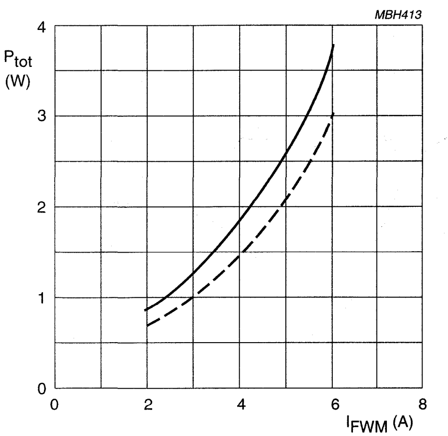
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W
		mounted as shown in Fig.5	40	K/W

Note

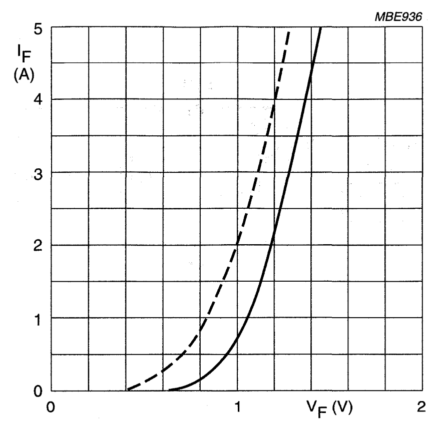
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



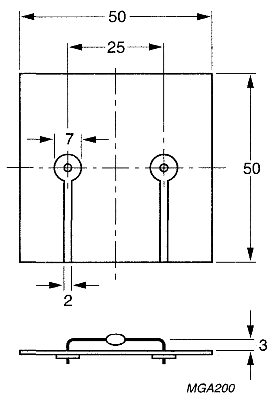
Solid line: basic high-voltage E/W modulator circuit; see Fig.8.
Dotted line: basic conventional horizontal deflection circuit; see Fig.9.
Curves include power dissipation due to switching losses.

Fig.2 Maximum total power dissipation as a function of working peak forward current.



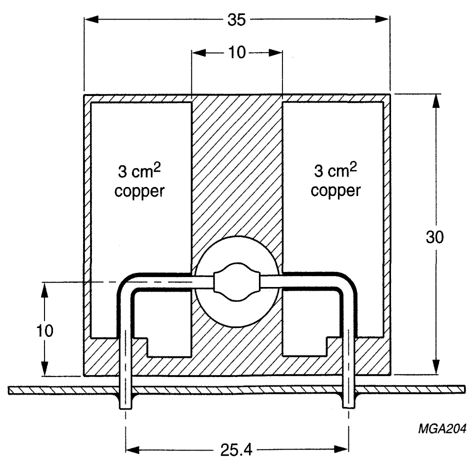
Dotted line: T_j = 150 °C; solid line: T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; maximum values.



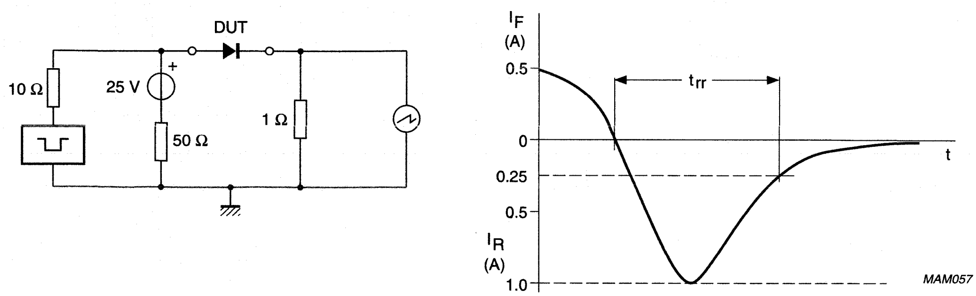
Dimensions in mm.

Fig.4 Device mounted on a printed-circuit board.



Dimensions in mm.

Fig.5 Mounting with additional printed circuit board for heat sink purposes.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.6 Test circuit and reverse recovery time waveform and definition.

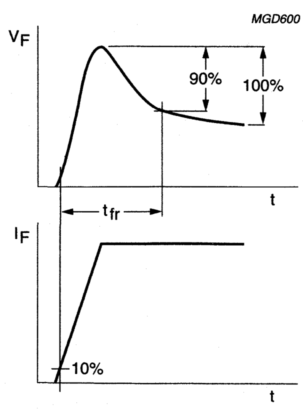


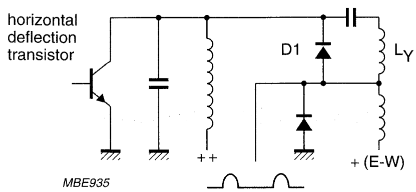
Fig.7 Forward recovery time definition.

APPLICATION INFORMATION

For horizontal deflection circuits, two basic applications are shown in Figs 8 and 9.

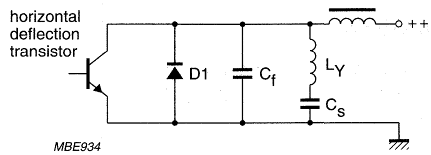
The maximum allowable total power dissipation for the diode can be calculated from the thermal resistance $R_{th\ j\text{-}a}$ and the difference between $T_{j\ max}$ and $T_{amb\ max}$ in the application. The maximum I_{FWM} can then be taken from Fig.2.

The basic application waveforms in Fig.10 relate to the circuit in Fig.8. In the circuit in Fig.9 the forward conduction time of the diode is shorter, allowing a higher I_{FWM} (see Fig.2).



D1 = BY328.

Fig.8 Application in basic high-voltage E/W modulator circuit.



D1 = BY328.

Fig.9 Application in basic horizontal deflection circuit.

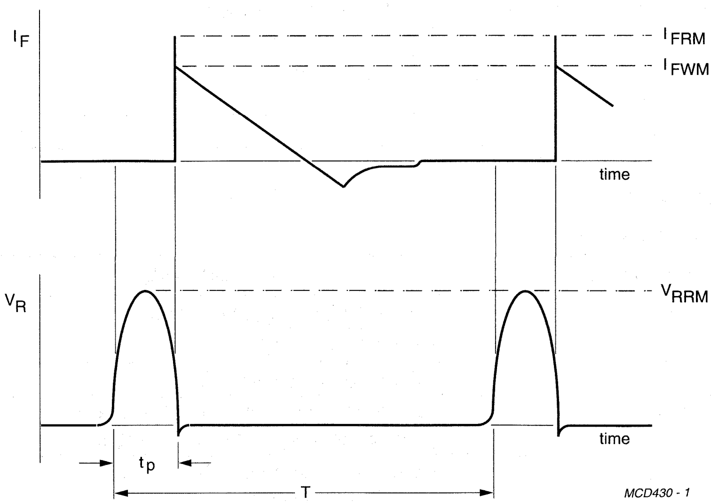


Fig.10 Basic application waveforms.

Damper diode BY428

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack
- Also available with preformed leads for easy insertion.

APPLICATIONS

- Damper diode in high frequency horizontal deflection circuits up to 64 kHz.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

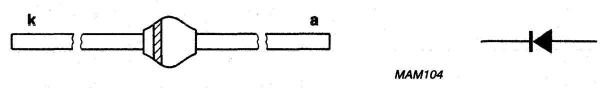


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1500	V
V_{RRM}	repetitive peak reverse voltage		–	1500	V
V_R	continuous reverse voltage		–	1400	V
I_{FWM}	working peak forward current	T_{tp} = 80 °C; lead length = 10 mm; see Fig.2	–	4	A
I_{FRM}	repetitive peak forward current		–	8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	50	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 4 A; $T_j = T_{j\,max}$; see Fig.3	1.60	V
		I_F = 4 A; see Fig.3	1.95	V
I_R	reverse current	$V_R = V_{Rmax}$; T_j = 150 °C	150	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.6	250	ns
t_{fr}	forward recovery time	when switched to I_F = 5 A in 50 ns; $T_j = T_{j\,max}$; see Fig.7	250	ns

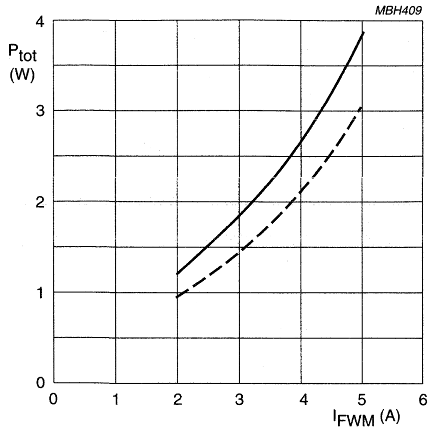
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W
		mounted as shown in Fig.5	40	K/W

Note

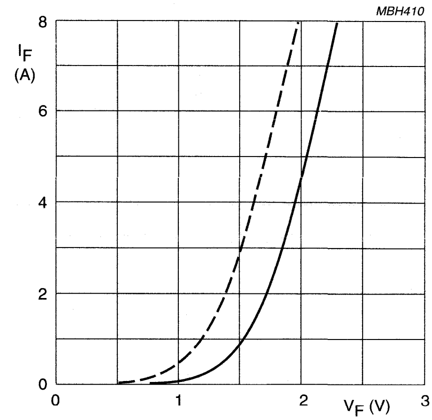
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



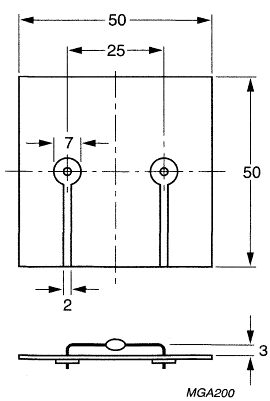
Solid line: basic high-voltage E/W modulator circuit; see Fig.8.
Dotted line: basic conventional horizontal deflection circuit; see Fig.9.
Curves include power dissipation due to switching losses.

Fig.2 Maximum total power dissipation as a function of working peak forward current.



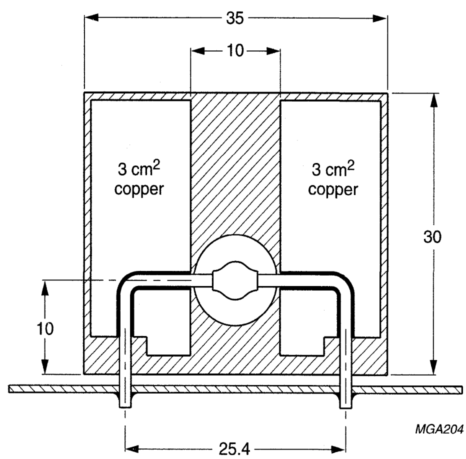
Dotted line: T_j = 150 °C.
Solid line: T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; maximum values.



Dimensions in mm.

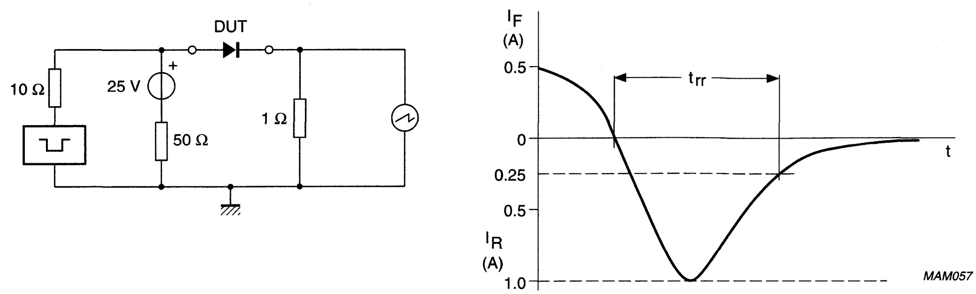
Fig.4 Device mounted on a printed-circuit board.



Dimensions in mm.

Fig.5 Mounting with additional printed-circuit board for heat sink purposes.

Damper diode BY428



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.6 Test circuit and reverse recovery time waveform and definition.

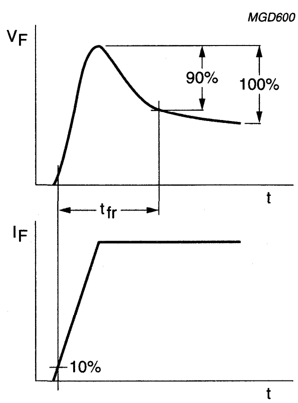


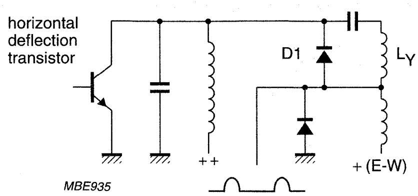
Fig.7 Forward recovery time definition.

APPLICATION INFORMATION

For horizontal deflection circuits, two basic applications are shown in Figs 8 and 9.

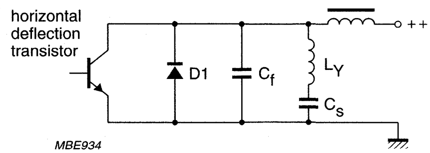
The maximum allowable total power dissipation for the diode can be calculated from the thermal resistance $R_{th\ j-a}$ and the difference between $T_{j\ max}$ and $T_{amb\ max}$ in the application. The maximum I_{FWM} can then be taken from Fig.2.

The basic application waveforms in Fig.10 relate to the circuit in Fig.8. In the circuit in Fig.9 the forward conduction time of the diode is shorter, allowing a higher I_{FWM} (see Fig.2).



D1 = BY428.

Fig.8 Application in basic high-voltage E/W modulator circuit.



D1 = BY428.

Fig.9 Application in basic horizontal deflection circuit.

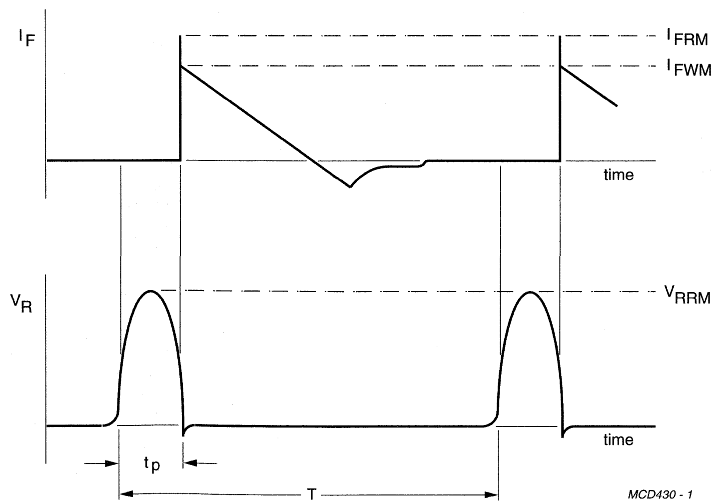


Fig.10 Basic application waveforms.

Damper diode BY448

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Available in ammo-pack.

APPLICATIONS

- Damper diode in high frequency horizontal deflection circuits up to 16 kHz.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

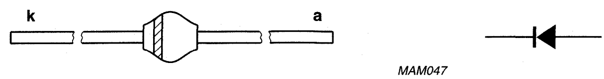


Fig.1 Simplified outline (SOD57) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak reverse voltage		–	1650	V
V_{RRM}	repetitive peak reverse voltage		–	1650	V
V_R	continuous reverse voltage		–	1500	V
I_{FWM}	working peak forward current	T_{amb} = 50 °C; PCB mounting (see Fig 4); see Fig.2	–	4	A
I_{FRM}	repetitive peak forward current		–	8	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sinewave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	30	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 3 A; $T_j = T_{j\,max}$; see Fig.3	1.45	V
		I_F = 3 A; see Fig.3	1.60	V
I_R	reverse current	$V_R = V_{Rmax}$; T_j = 150 °C	150	μA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.6	1	μs
t_{fr}	forward recovery time	when switched to I_F = 4 A in 50 ns; $T_j = T_{j\,max}$; see Fig.7	1	μs

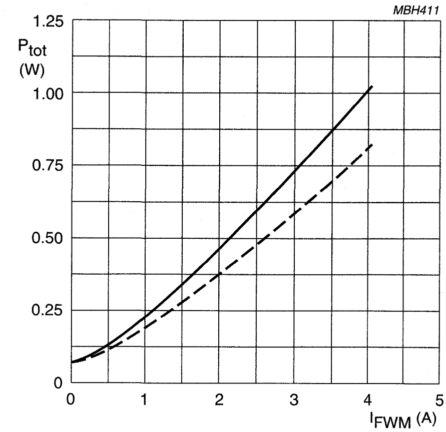
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	46	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	100	K/W
		mounted as shown in Fig.5	55	K/W

Note

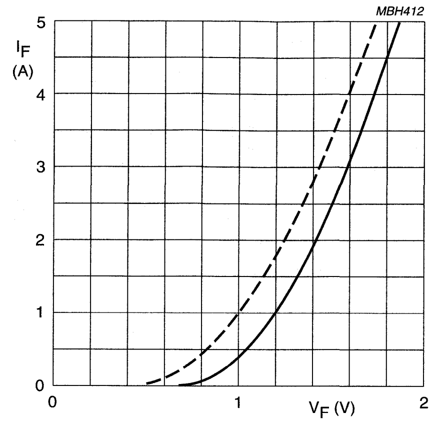
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 µm, see Fig.4. For more information please refer to the *"General Part of Handbook SC01"*.

GRAPHICAL DATA



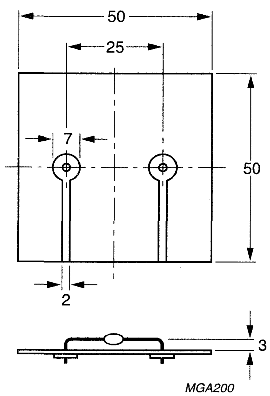
Solid line: basic high-voltage E/W modulator circuit; see Fig.8.
Dotted line: basic conventional horizontal deflection circuit; see Fig.9.
Curves include power dissipation due to switching losses.

Fig.2 Maximum total power dissipation as a function of the working peak forward current.



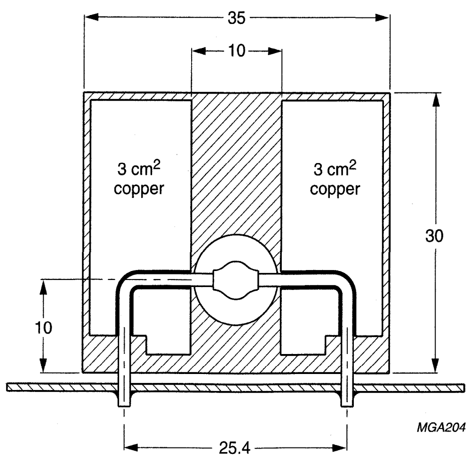
Dotted line: $T_j = 150$ °C.
Solid line: $T_j = 25$ °C.

Fig.3 Forward current as a function of forward voltage; maximum values.



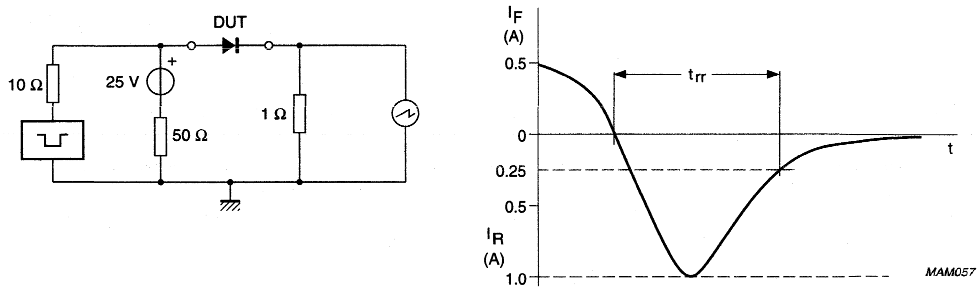
Dimensions in mm.

Fig.4 Device mounted on a printed-circuit board.



Dimensions in mm.

Fig.5 Mounting with additional printed circuit board for heat sink purposes.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.6 Test circuit and reverse recovery time waveform and definition.

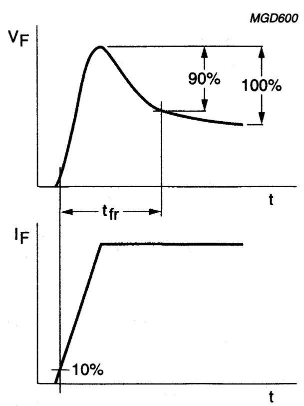


Fig.7 Forward recovery time definition.

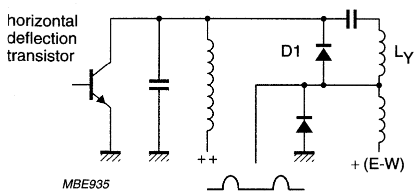
Damper diode BY448

APPLICATION INFORMATION

For horizontal deflection circuits, two basic applications are shown in Figs 8 and 9.

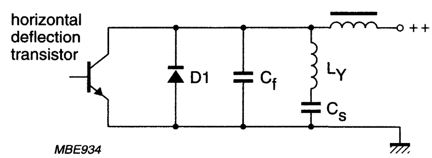
The maximum allowable total power dissipation for the diode can be calculated from the thermal resistance $R_{th\ j\text{-}a}$ and the difference between $T_{j\ max}$ and $T_{amb\ max}$ in the application. The maximum I_{FWM} can then be taken from Fig.2.

The basic application waveforms in Fig.10 relate to the circuit in Fig.8. In the circuit in Fig.9 the forward conduction time of the diode is shorter, allowing a higher I_{FWM} (see Fig.2).



D1 = BY448.

Fig.8 Application in basic high-voltage E/W modulator circuit.



D1 = BY448.

Fig.9 Application in basic horizontal deflection circuit.

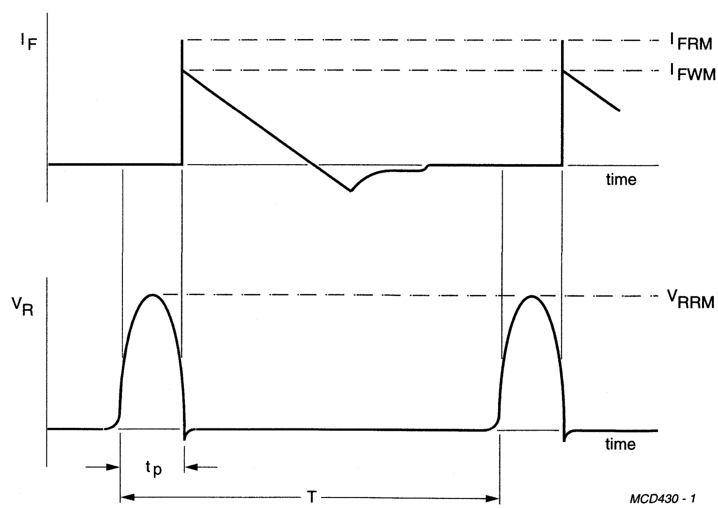
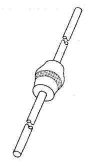
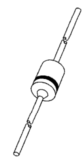


Fig.10 Basic application waveforms.

SECTION 15

RIPPLE BLOCKING DIODES

RIPPLE BLOCKING DIODES

TYPE NUMBER	RATINGS				CHARACTERISTICS				PACKAGE (not to scale)
	V_{RRM} max.	V_R max.	$I_{F(AV)}$ max.	I_{FSM} max.	V_F max.	@ I_F	C_d typ.	t_{rr} max.	
	(V)	(V)	(A)	(A)	(V)	(A)	(pF)	(ns)	
LEADED TYPES									
BYM63	300	300	2.4	45	2.3	2	65	150	 SOD64
BYD63	300	300	0.85	5	2.3	1	17	150	 SOD81

Ripple blocking diode

BYD63

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed minimum turn-on time for absorbing forward current transients and oscillations
- Specially designed as rectifier in the auxiliary power supply in e.g. switched mode power supplies
- Available in ammo-pack.

DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology. This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

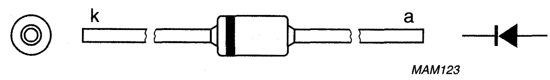


Fig.1 Simplified outline (SOD81) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	300	V
V_R	continuous reverse voltage		–	300	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 55 °C; lead length = 10 mm; see Fig.2; see also Fig.4	–	0.85	A
		averaged over any 20 ms period; T_{amb} = 65 °C; PCB mounting (Fig.8); see Fig.3; see also Fig.4	–	0.45	A
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C	–	8.25	A
		T_{amb} = 65 °C	–	4.45	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	5	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 1 A; $T_j = T_{j\,max}$; see Fig.5	–	–	1.7	V
		I_F = 1 A; see Fig.5	–	–	2.3	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.6	–	–	1	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.6	–	–	100	μA
t_{fr}	forward recovery time	when switched to I_F = 1 A in 50 ns; see Fig.9	–	–	350	ns
t_{on}	turn-on time	when switched from V_F = 0 V to V_F = 3 V; measured between 10% and 90% of $I_{F\,max}$; see Fig.11	500	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.11	–	–	150	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.7	–	17	–	pF

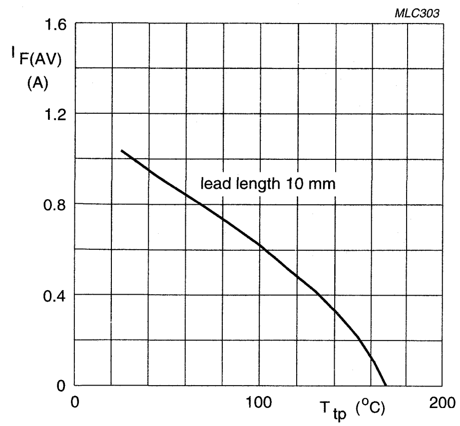
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	60	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	120	K/W

Note

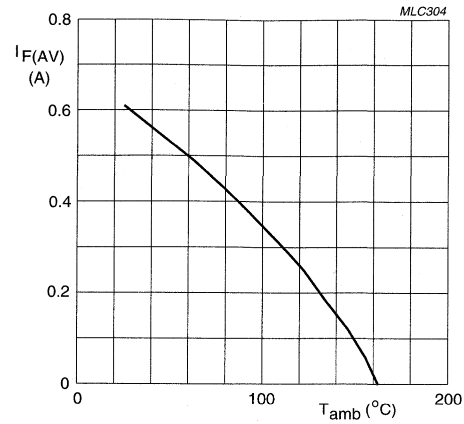
1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.8. For more information please refer to the *'General Part of Handbook SC01.'*

GRAPHICAL DATA



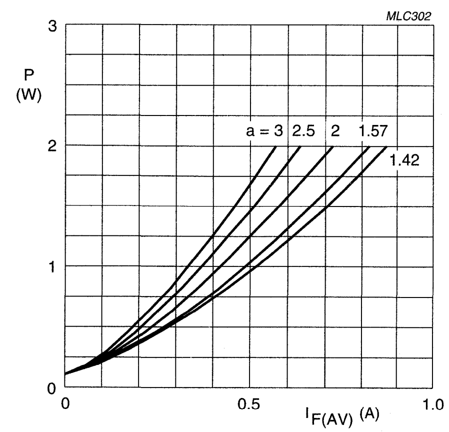
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



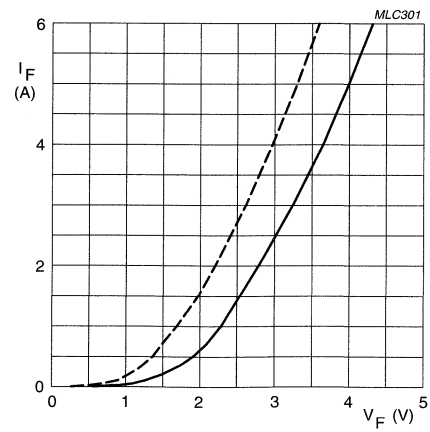
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.8.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

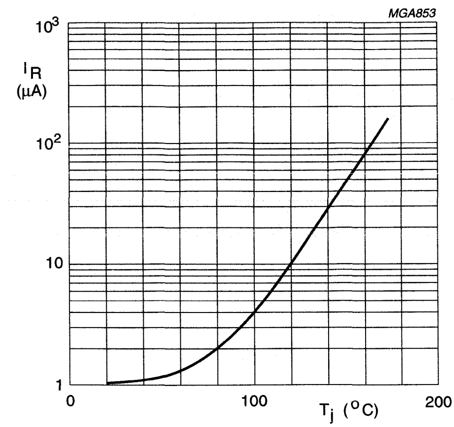
Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

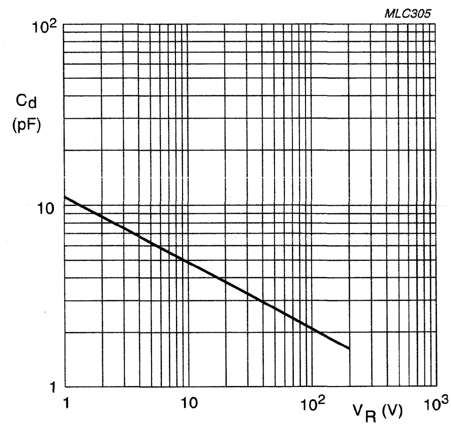
Fig.5 Forward current as a function of forward voltage; maximum values.

Ripple blocking diode BYD63



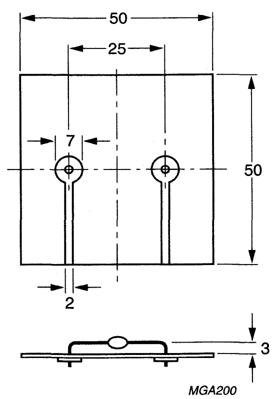
$V_R = V_{RRMmax}$.

Fig.6 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.7 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.8 Device mounted on a printed-circuit board.

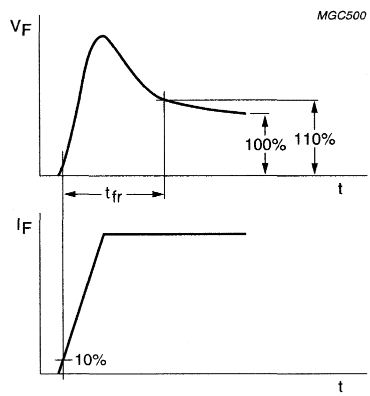
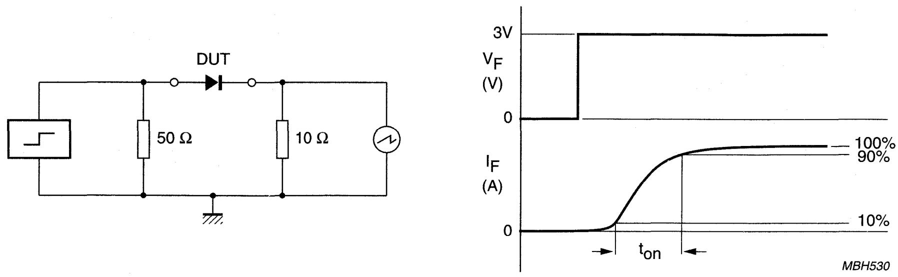
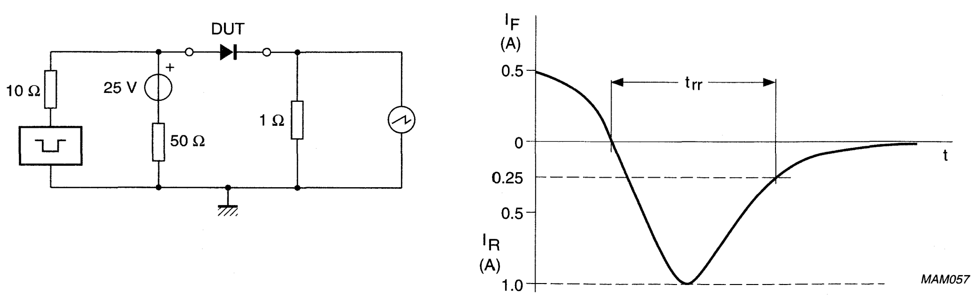


Fig.9 Forward recovery time definition.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 10$ ns.

Fig.10 Test circuit and turn-on time waveform and definition.



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.11 Test circuit and reverse recovery time waveform and definition.

Ripple blocking diode BYM63

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed minimum turn-on time for absorbing forward current transients and oscillations
- Specially designed as rectifier in the auxiliary power supply in e.g. switched mode power supplies
- Available in ammo-pack.
- Also available with preformed leads for easy insertion.

DESCRIPTION

Rugged glass SOD64 package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

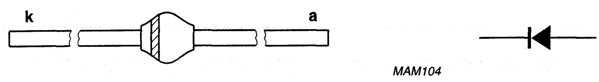


Fig.1 Simplified outline (SOD64) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	300	V
V_R	continuous reverse voltage		–	300	V
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; T_{tp} = 55 °C; lead length = 10 mm; see Fig.2; see also Fig.4	–	2.4	A
		averaged over any 20 ms period; T_{amb} = 65 °C; PCB mounting (Fig.8); see Fig.3; see also Fig.4	–	1.0	A
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C	–	21	A
		T_{amb} = 65 °C	–	8.5	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	45	A
T_{stg}	storage temperature		–65	+175	°C
T_j	junction temperature		–65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 2 A; $T_j = T_{j\,max}$; see Fig.5	–	–	1.34	V
		I_F = 2 A; see Fig.5	–	–	2.30	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig.6	–	–	10	μA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig.6	–	–	150	μA
t_{fr}	forward recovery time	when switched to I_F = 5 A in 50 ns; see Fig.9	–	–	1.5	μs
t_{on}	turn-on time	when switched from V_F = 0 V to V_F = 3 V; measured between 10% and 90% of $I_{F\,max}$; see Fig.11	400	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A; see Fig.11	–	–	150	ns
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.7	–	65	–	pF

THERMAL CHARACTERISTICS

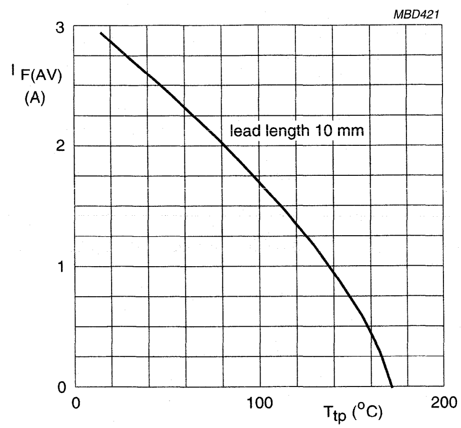
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\,j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	25	K/W
$R_{th\,j\text{-}a}$	thermal resistance from junction to ambient	note 1	75	K/W

Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer ≥40 μm, see Fig.8. For more information please refer to the *'General Part of Handbook SC01.'*

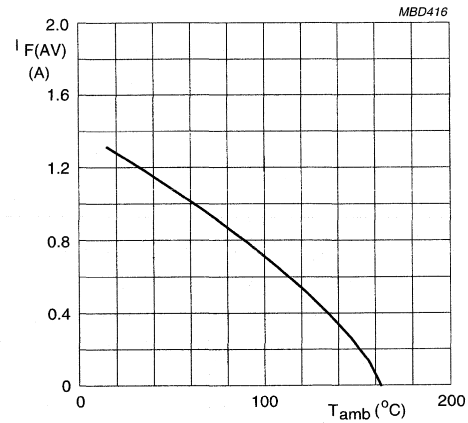
Ripple blocking diode BYM63

GRAPHICAL DATA



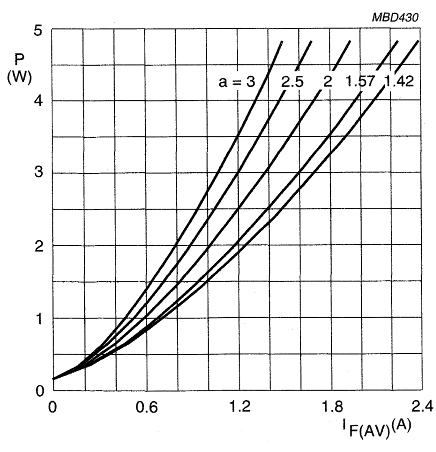
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Switched mode application.

Fig.2 Maximum permissible average forward current as a function of tie-point temperature (including losses due to reverse leakage).



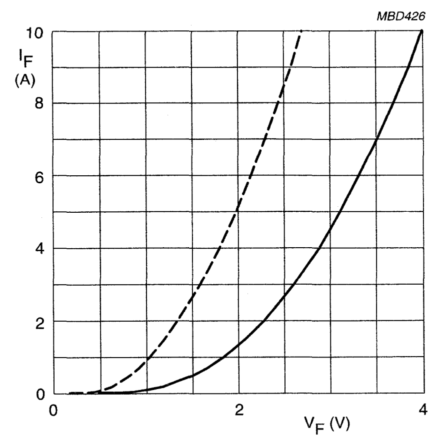
a = 1.42; $V_R = V_{RRMmax}$; δ = 0.5.
Device mounted as shown in Fig.8.
Switched mode application.

Fig.3 Maximum permissible average forward current as a function of ambient temperature (including losses due to reverse leakage).



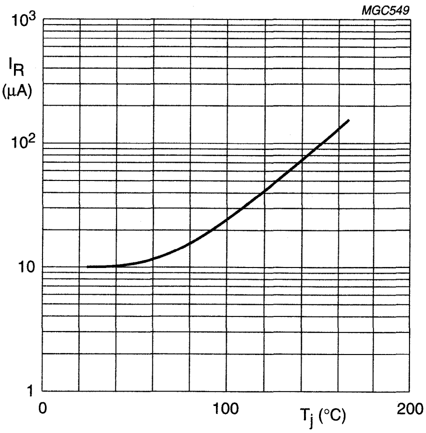
a = $I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$; δ = 0.5.

Fig.4 Maximum steady state power dissipation (forward plus leakage current losses, excluding switching losses) as a function of average forward current.



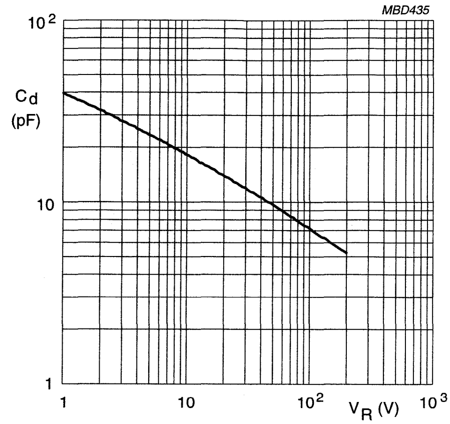
Dotted line: T_j = 175 °C.
Solid line: T_j = 25 °C.

Fig.5 Forward current as a function of forward voltage; maximum values.



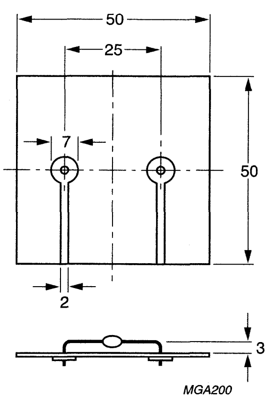
$V_R = V_{RRMmax}$.

Fig.6 Reverse current as a function of junction temperature; maximum values.



f = 1 MHz; T_j = 25 °C.

Fig.7 Diode capacitance as a function of reverse voltage; typical values.



Dimensions in mm.

Fig.8 Device mounted on a printed-circuit board.

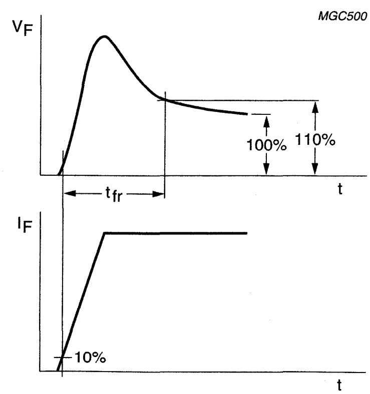
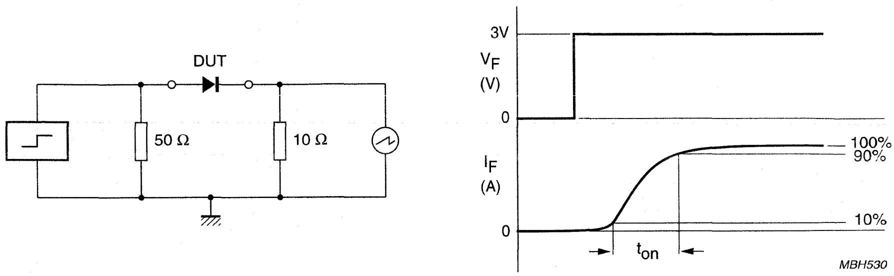


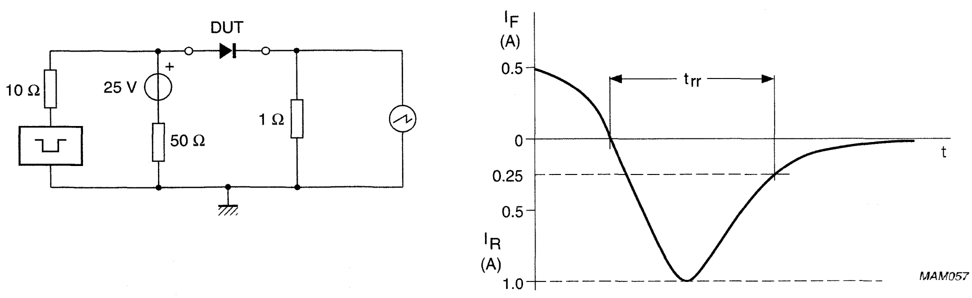
Fig.9 Forward recovery time definition.

Ripple blocking diode BYM63



Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 10$ ns.

Fig.10 Test circuit and turn-on time waveform and definition.

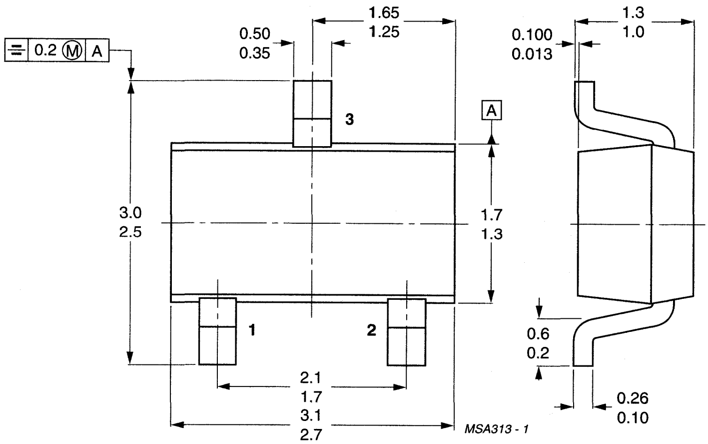


Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

Fig.11 Test circuit and reverse recovery time waveform and definition.

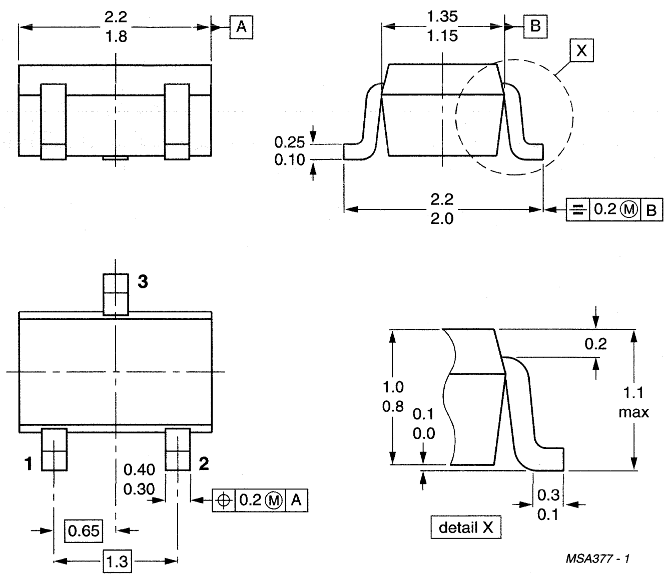
SECTION 16

PACKAGE OUTLINES



Dimensions in mm.

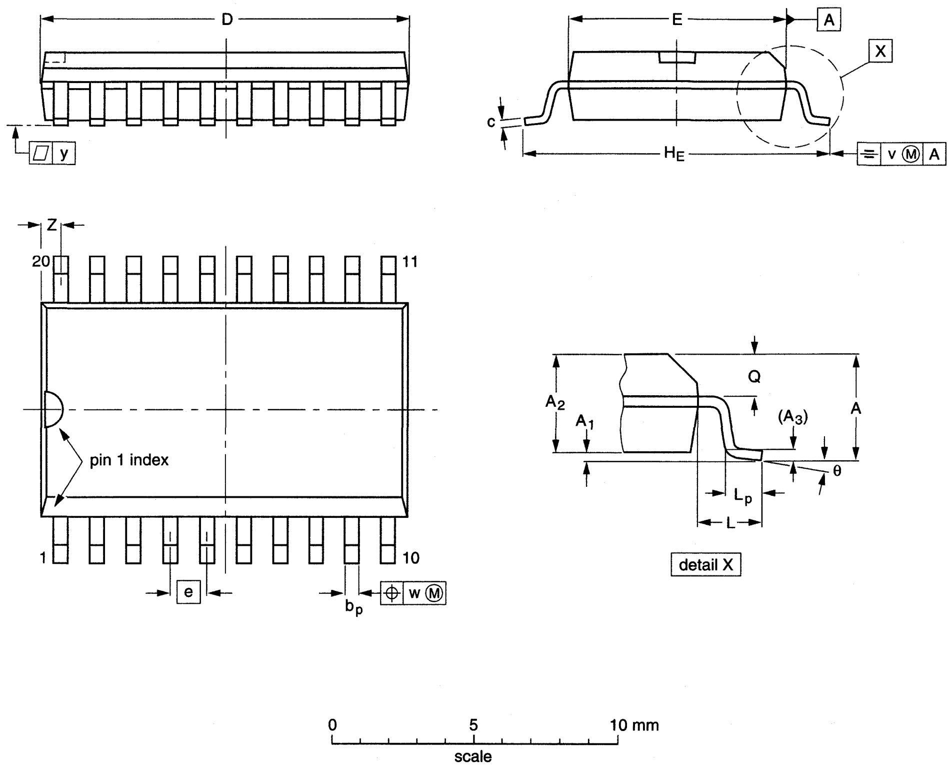
Fig.1 SC59 (SOT346).



Dimensions in mm.

Fig.2 SC70-3 (SOT323).

SO20: plastic small outline package; 20 leads; body width 7.5 mm | SOT163-1



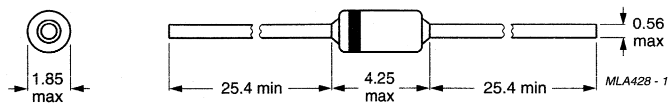
DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	2.65	0.30 0.10	2.45 2.25	0.25	0.49 0.36	0.32 0.23	13.0 12.6	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8° 0°
inches	0.10	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.51 0.49	0.30 0.29	0.050	0.42 0.39	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

Note

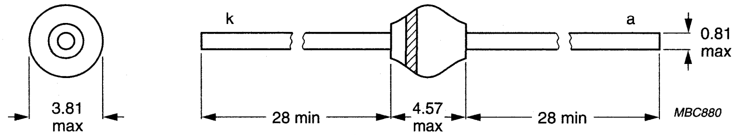
1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT163-1	075E04	MS-013AC				~~92-11-17~~ 95-01-24



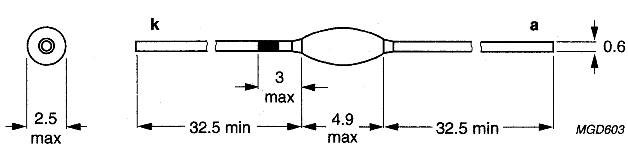
The marking band indicates the cathode.
Dimensions in mm.

Fig.3 SOD27 (DO-35).



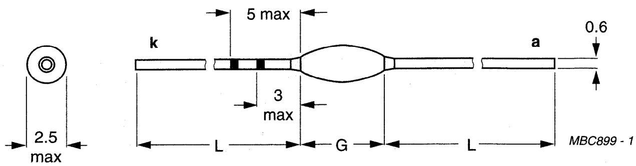
The marking band indicates the cathode.
Dimensions in mm.

Fig.4 SOD57.



The marking band indicates the cathode.
Dimensions in mm.

Fig.5 SOD61A.

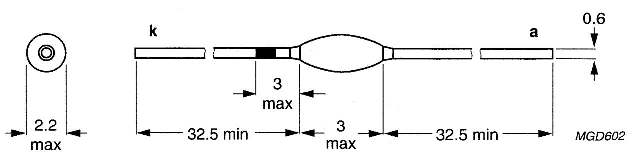


The marking bands indicates the cathode.
Dimensions in mm; see table below.

Fig.6 SOD61AB to AK.

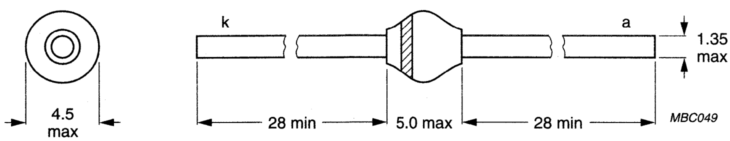
SOD61 package specifications

PACKAGE CODE	L_{min} (mm)	G_{max} (mm)
SOD61AB	31.8	5.5
SOD61AC	30.4	8.3
SOD61AD	30.2	8.7
SOD61AE	30.0	9.1
SOD61AF	29.8	9.5
SOD61AG	29.6	9.9
SOD61AH	29.3	10.5
SOD61AI	28.8	11.5
SOD61AJ	28.3	12.5
SOD61AK	27.8	13.5



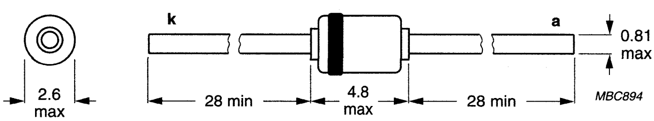
The marking band indicates the cathode.
Dimensions in mm.

Fig.7 SOD61H2.



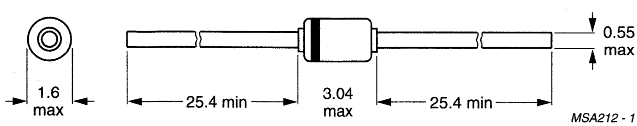
The marking band indicates the cathode.
Dimensions in mm.

Fig.8 SOD64.



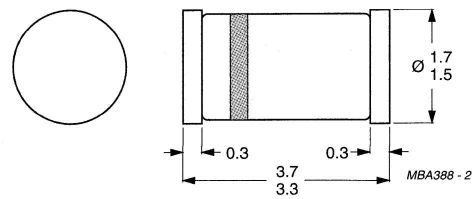
The marking band indicates the cathode.
Dimensions in mm.

Fig.9 SOD66 (DO-41).



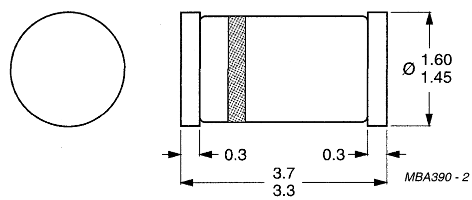
The marking band indicates the cathode.
Dimensions in mm.

Fig.10 SOD68 (DO-34).



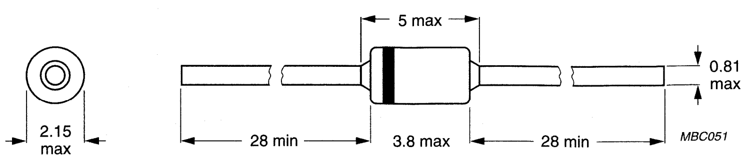
The marking band indicates the cathode.
Dimensions in mm.

Fig.11 SOD80.



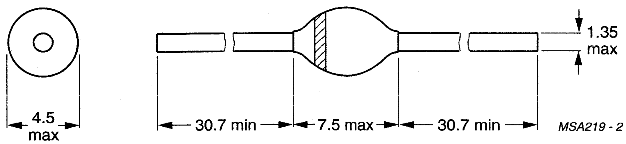
The marking band indicates the cathode.
Dimensions in mm.

Fig.12 SOD80C.



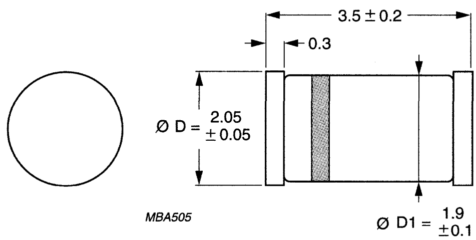
The marking band indicates the cathode.
Dimensions in mm.

Fig.13 SOD81.



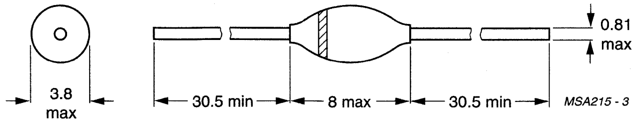
The marking band indicates the cathode.
Dimensions in mm.

Fig.14 SOD83A.



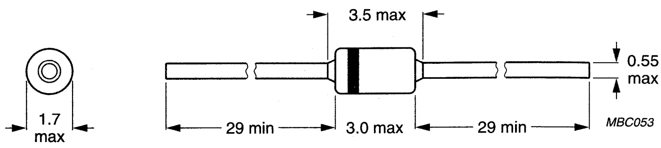
The marking band indicates the cathode.
Dimensions in mm.

Fig.15 SOD87.



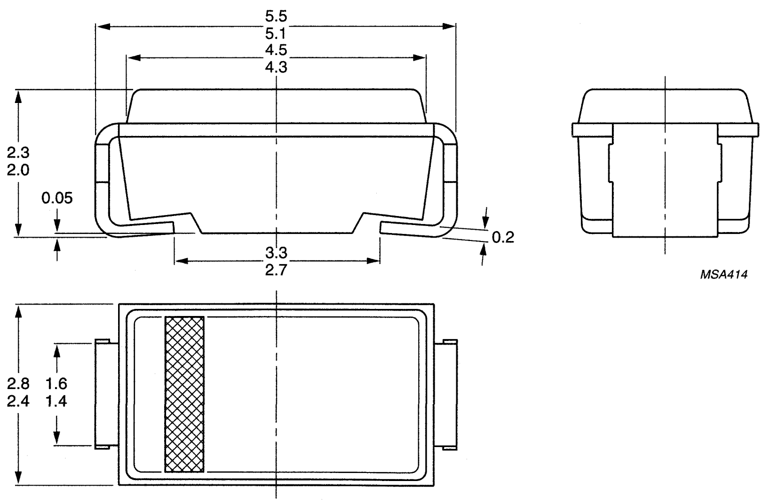
The marking band indicates the cathode.
Dimensions in mm.

Fig.16 SOD88A.



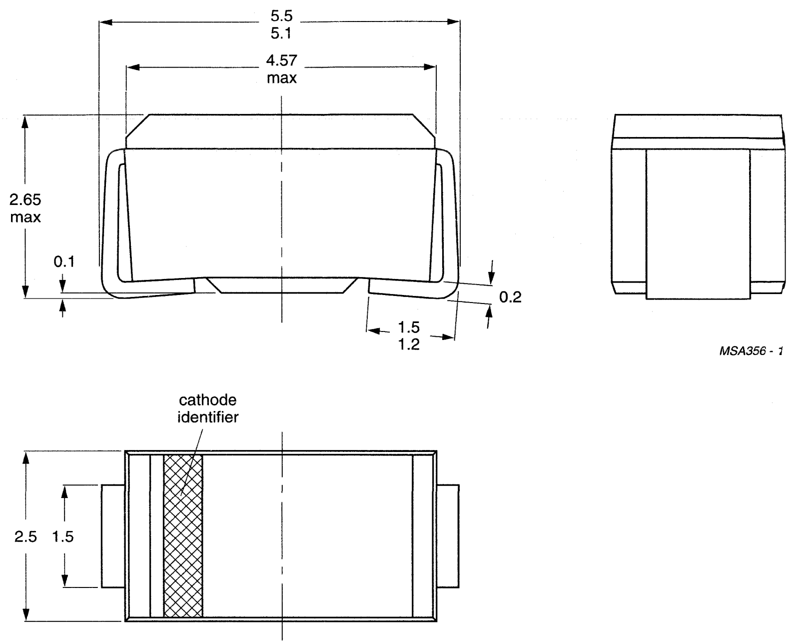
The marking band indicates the cathode.
Dimensions in mm.

Fig.17 SOD91.



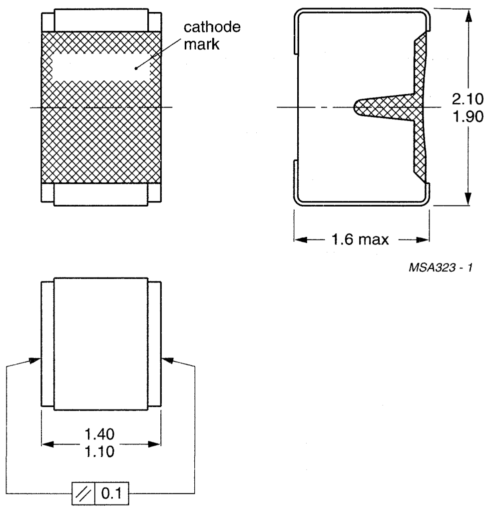
The marking band indicates the cathode.
Dimensions in mm.

Fig.18 SOD106 (DO-214AC).



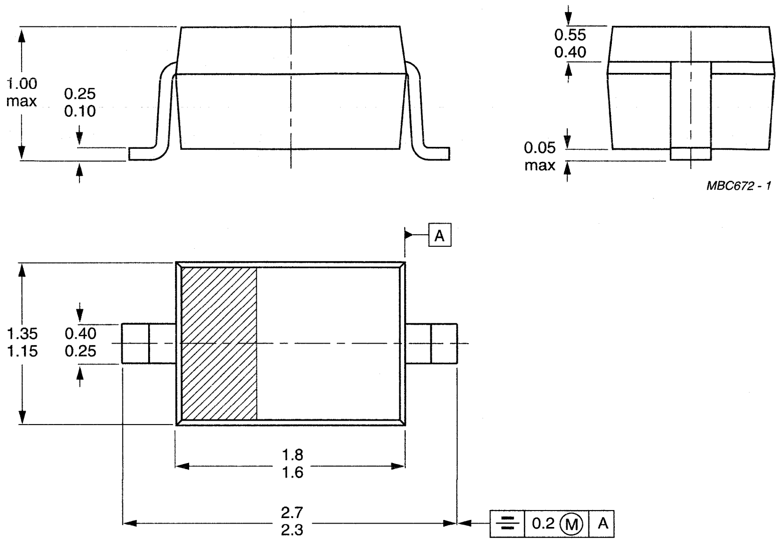
Dimensions in mm.

Fig.19 SOD106A.



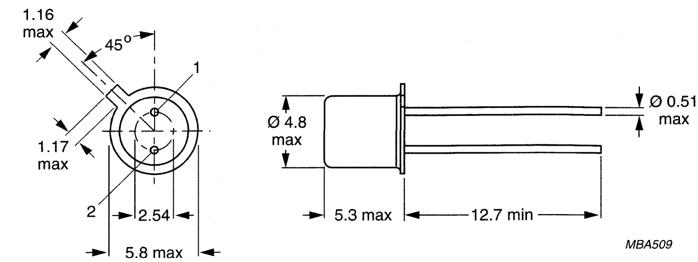
Dimensions in mm.

Fig.20 SOD110.



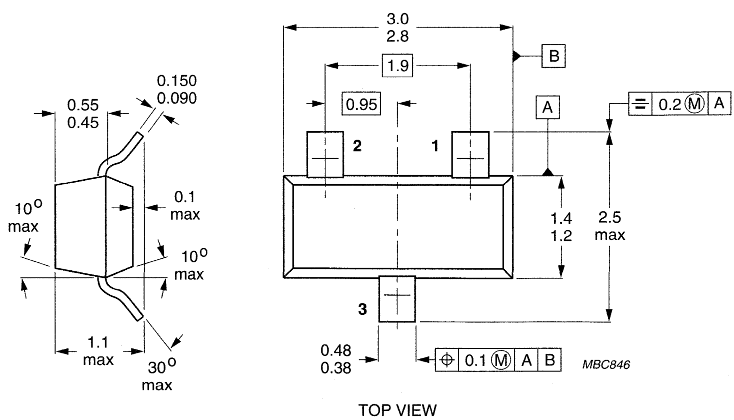
The marking band indicates the cathode.
Dimensions in mm.

Fig.21 SOD323.



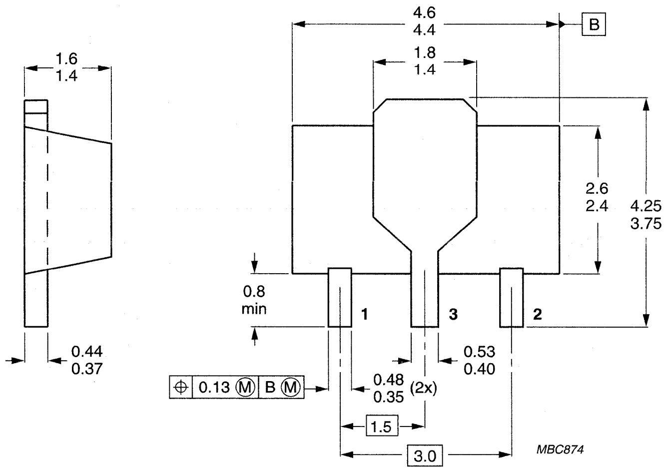
Dimensions in mm.

Fig.22 SOT18/15 (TO-18 except for the two leads).



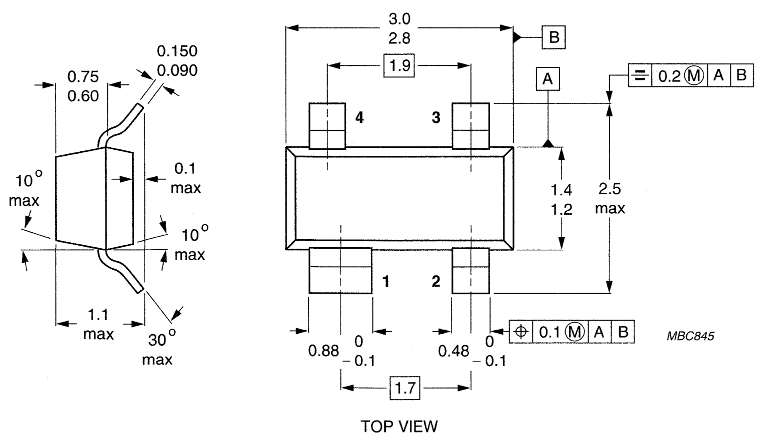
Dimensions in mm.

Fig.23 SOT23.



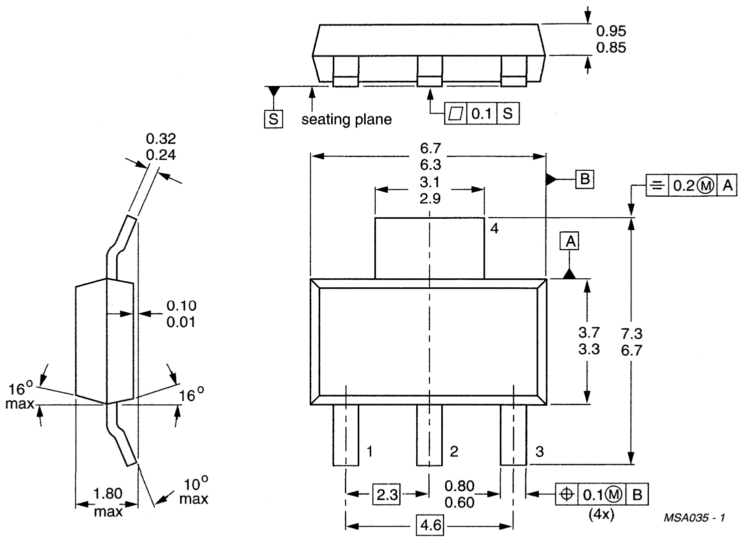
Dimensions in mm.

Fig.24 SOT89.



Dimensions in mm.

Fig.25 SOT143.



Dimensions in mm.

Fig.26 SOT223.

SECTION 17

MOUNTING AND SOLDERING

contents page

INTRODUCTION

There are two basic forms of electronic component construction, those with leads for through-hole mounting and microminiature types for surface mounting. Through-hole mounting gives a very rugged construction and uses well established soldering methods. Surface mounting has the advantages of high packing density plus high-speed automated assembly.

AXIAL AND RADIAL LEADED DEVICES

The following general rules are for the save handling and soldering of axial and radial leaded diodes. Special rules for particular types may apply and, for these, instructions are given in the individual data sheets. With all components, excessive forces or heat can cause serious damage and should always be avoided.

Handling

- Avoid perpendicular forces on the body of the diode
- Avoid sudden forces on the leads or body. These forces are often much greater than allowed
- Avoid high acceleration as a result of any shock, e.g. dropping the device on a hard surface
- During bending, support the leads between body or stud and the bending point
- During the bending process, axial forces on the body must not exceed 20 N
- Bending the leads through 90° is allowed at any distance from the body when it is possible to support the leads during bending without contacting the body or weldings
- Bending close to the body or stud without supporting the leads is only allowed if the bend radius is greater than 0.5 mm
- Twisting the leads is allowed at any distance from the body or stud only if the lead is properly clamped between body or stud and the twisting point
- Without clamping, twisting the leads is allowed only at a distance of greater than 3 mm from the body; the torque angle must not exceed 30°
- Straightening bent leads is allowed only if the applied pulling force in the axial direction does not exceed 20 N and the total pull duration is not longer than 5 s.

Soldering

- Avoid any force on the body or leads during or immediately after soldering
- Do not correct the position of an already soldered device by pushing, pulling or twisting the body
- Avoid fast cooling after soldering.

The maximum allowable soldering time is determined by:

- Package type
- Mounting environment
- Soldering method
- Soldering temperature
- Distance between the point of soldering and the seal of the diode body.

Table 1 shows the minimum distances from soldering point to body seal for components that are mounted on a printed-wiring board with soldering performed by hand-held soldering tool, dip, wave or other solder bath method. The maximum soldering temperature is 300 °C, and the maximum soldering time is 5 s.

Table 1 Distance from soldering point to body seal

PACKAGE	MINIMUM DISTANCE (mm)
SOD27 (DO-35)	0.5
SOD57	0.5
SOD61	2.0
SOD64	0.5
SOD66 (DO-41)	3.0
SOD68 (DO-34)	0.5
SOD81	0.5
SOD83A	0.5
SOD88A	0.5
SOD91	0.5
SOT18/15 (TO-18)	0.5

When soldering is performed by a hand-held soldering tool on components mounted on anything other than a printed-wiring board, the minimum distance from body seal to the soldering point at a maximum soldering temperature of 300 °C is stated in Table 1 but the maximum soldering time must be reduced to 3 s.

Mounting

If the rules for handling and soldering are observed, the following mounting or process methods are allowed:

- Preheating of the printed-wiring board before soldering up to a maximum of 100 °C
- Flat mounting with the diode body in direct contact with the printed-wiring board with or without metal tracks on both sides and/or plated-through holes
- Flat mounting with the diode body in direct contact with hot spots or hot tracks during soldering
- Upright mounting with the diode body in direct contact with the printed-wiring board if the body is not in contact with metal tracks or plated-through holes.

SURFACE-MOUNT DEVICES

Since the introduction of Surface Mount Devices (SMDs), component design and manufacturing techniques have changed almost beyond recognition. Smaller pitch, minimum footprint area and reduced component volume all contribute to a more compact circuit assembly. As a consequence, when designing printed circuit boards (PCBs), the dimensions of the footprints are perhaps more crucial than ever before.

One of the first steps in this design process is to consider which soldering method, either wave or reflow, will be used during production. This determines not only the solder footprint dimensions, but also the minimum spacing between components, the available area underneath the component where tracks may be laid, and possibly the required component orientation during soldering.

Although reflow soldering is recommended for SMDs, many manufacturers use, and will continue to use for some time to come, a mixture of surface-mount and through-hole components on one substrate (a mixed print).

The mix of components affects the soldering methods that can be applied. A substrate having SMDs mounted on one or both sides but no through-hole components is likely to be suitable for reflow or wave soldering. A double sided mixed print that has through-hole components and some SMDs on one side and densely packed SMDs on the other normally undergoes a sequential combination of reflow and wave soldering. When the mixed print has only through-hole components on one side and all SMDs on the other, wave soldering is usually applied.

To help with your circuit board design, this guideline gives an overview of both reflow and wave soldering methods, and is followed by some useful hints on hand soldering for repair purposes, and the recommended footprints for our SMD discrete semiconductor packages.

Reflow soldering process

There are three basic process steps for single-sided PCB reflow soldering, these are:

1. Applying solder paste to the PCB
2. Component placement
3. Reflow soldering.

APPLYING SOLDER PASTE TO THE PCB

Solder paste can be applied to the PCBs solder lands by one of either three methods: dispensing, screen or stencil printing.

Dispensing is flexible but is slow, and only suitable for pitches of 0.65 mm and above.

With screen printing, a fine-mesh screen is placed over the PCB and the solder paste is forced through the mesh onto the solder lands of the PCB. However, because of mesh aperture limitations (emulsion resolution), this method is only suitable for solder paste deposits of 300 μm and wider.

Stencil printing is similar to screen printing, except that a metal stencil is used instead of a fine-mesh screen. The stencil is usually made of stainless steel or bronze and should be 150 to 200 μm thick. A squeegee is passed across the stencil to force solder paste through the apertures in the stencil and onto the solder lands on the PCB (see Fig.1). It does not suffer from the same limitations as the other two printing methods and so is the preferred method currently available.

It is recommended that for solder paste printing, the equipment is located in a controlled environment maintained at a temperature of 23 ±2 °C, and a relative humidity between 45% and 75%.

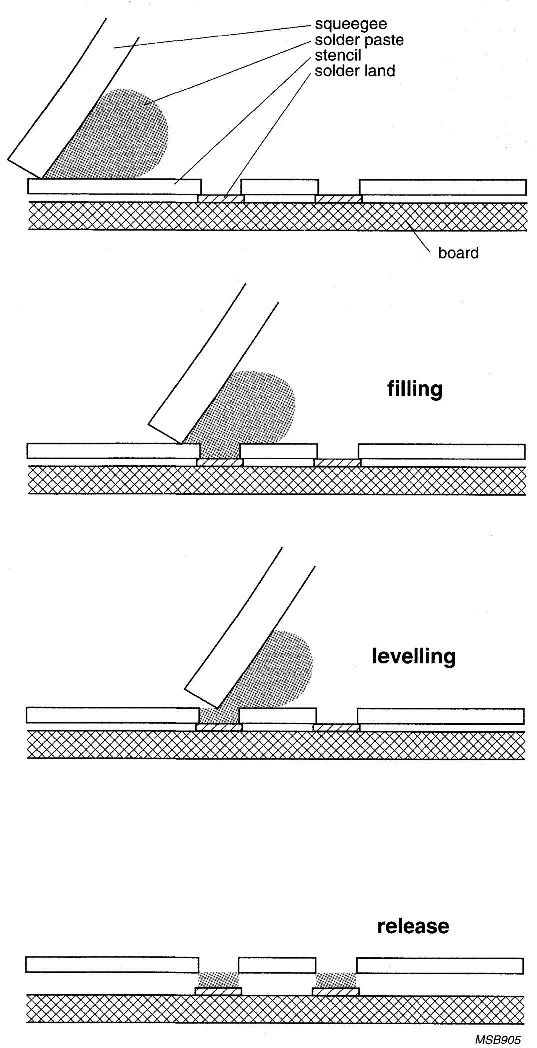


Fig.1 Applying solder paste by stencilling.

Stencil printing

The printing process must be able to apply the solder paste deposits to the PCB:

- In the correct amounts
- At the correct position on the lands
- With an acceptable height and shape.

The amount of solder paste used must be sufficient to give reliable soldered joints. This amount is controlled by the stencil thickness, aperture dimensions, process settings, and the volume of paste pressed through the apertures by the squeegee.

The downward force of the squeegee is counteracted by the hydrodynamic pressure of the paste, and so the machine should be set to ensure that the stencil is just 'cleaned' by the squeegee.

Suitable aperture dimensions depend on the stencil thickness. The solder paste deposits must have a flat part on the top (Fig.2, examples 4 and 5), which can be achieved by correct process settings. The footprints given in this book were designed for these correct deposit types. Stencil apertures that are too small result in irregular dots on the lands (Fig.2, examples 1 to 3). If the apertures are too large, solder paste can be scooped out, particularly if a rubber squeegee is used (Fig.2, example 6).

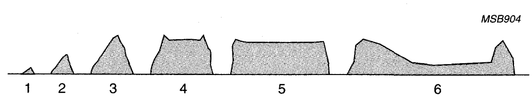


Fig.2 Shapes of solder deposits for increasing stencil apertures (left to right).

Ideally, the deposited solder paste should sit entirely on the solder land. The tolerated misplacement of solder paste with respect to the solder land is determined by the most critical component. The solder paste deposit must be deposited within 100 μm with respect to the solder land.

Furthermore, the tackiness (tack strength) of the solder paste must be sufficient to hold surface-mount devices on the PCB during assembly and during transport to the reflow oven. Tack strength depends on factors such as paste composition, drying conditions, placement pressure, dwell time and contact area. As a general rule, component placement should be within four hours after the paste printing process.

Squeegee

The squeegee can be either metal or rubber. A metal squeegee gives better overall results and so is recommended, however with step stencils, a rubber squeegee has to be used. The footprints given in this chapter were designed for application by both types of squeegee.

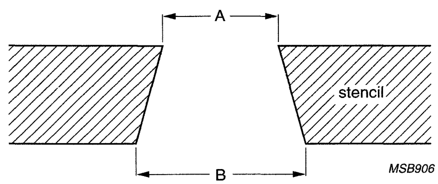
Stencil apertures

Stencil apertures can be made by either:

- Etching
- Laser cutting
- Electroforming.

Of the three methods, etching is less accurate as the deviation in aperture dimensions with respect to the target is relatively large (target is +50 μm at squeegee side and 0 μm at PCB side).

Laser-cut and electroformed stencils have smaller deviations in dimensions and are therefore more suitable for small and fine-pitch components (see Fig.3).



A = B +0/−30 (μm).
B = X ±30 (μm).
X = nominal apertures size.

Fig.3 Specifications of laser-cut stencil apertures for discrete and passive components.

A useful method of controlling the stencil printing process during production is by monitoring the weight of solder paste on the board which may vary between 80% and 110% of the theoretical amount according to the target (designed) apertures. Smearing and clogging of a small aperture cannot be detected with this method.

Solder paste

Reflow soldering uses a paste consisting of small nodules of solder and a flux with binder, solvents and additives to control rheological properties. The flux in the solder paste can be rosin mildly activated or rosin activated.

The requirements of the solder paste are:

- Good rolling behaviour
- No slump during heat-up
- Low viscosity during printing
- High viscosity after printing
- Sufficient tackiness to hold the components
- Removal of oxides during reflow soldering.

Suitable solder paste types have the following compositions:

- Sn62Pb36Ag2
- Sn63Pb37
- Sn60Pb40.

COMPONENT PLACEMENT

The position of the component with respect to the solder lands is an important factor in the final result of the assembly process. A misaligned component can lead to unreliable joints, open circuits and/or bridges between leads.

The placement accuracy is defined as the maximum permissible deviation of the component outline or component leads, with respect to the actual position of the solder land pattern belonging to that component or component leads on the circuit board (see Fig.4).

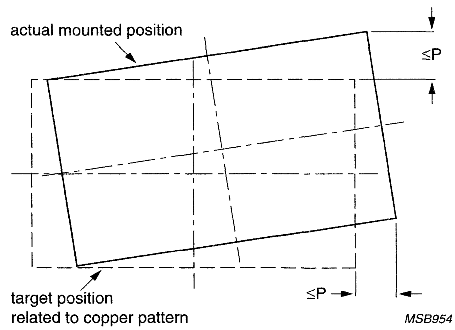


Fig.4 Component placement tolerances.

A maximum placement deviation (P) of 0.25 mm is used in these guidelines, which relates to the accuracy of a low-end placement machine. A higher placement accuracy is required for components with a fine pitch. This is given in the footprint description for the components concerned.

Besides the position in x- and y-directions, the z-position with respect to the solder paste, which is determined by the placement force, is also important. If the placement force is too high, solder paste will be squeezed out and solder balls or bridges will be formed. If the force is too low, physical contact will be insufficient, leads will not be soldered properly and the component may shift.

REFLOW SOLDERING

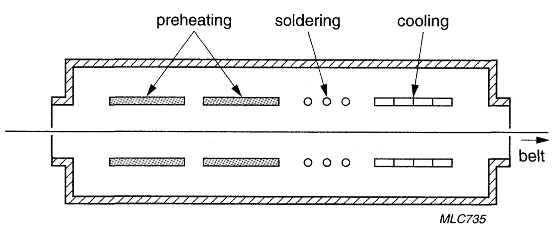
There are several methods available to provide the heat to reflow the solder paste, such as convection, hot belt, hot gas, vapour phase and resistance soldering. The preferred method is, however, convection reflow.

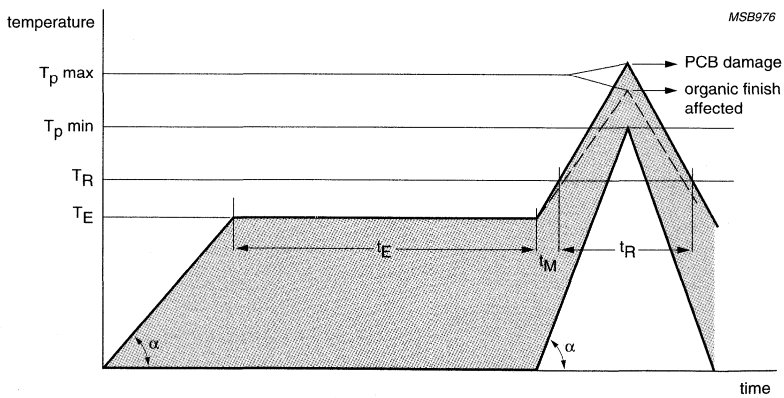
Convection reflow

With this method, the PCBs passes through an oven where it is preheated, reflow soldered and cooled (see Fig.5). If the heating rate of the board and components are similar, however, preheating is not necessary.

During the reflow soldering process, all parts of the board must be subjected to an accurate temperature/ time profile. Figure 5 shows a suitable profile framework for single-sided reflow soldering and the first side of double-sided print boards. It's important to note that this profile is for discrete semiconductor packages. The actual framework for the entire PCB could be smaller than the one shown, as other components on the board may have different process requirements.

Reflow soldering can be done in either air or a nitrogen atmosphere. If soldering in air, the temperature (T_p) must not exceed 240 °C on the first side of a double-sided print board with organic coated solder lands. This is because peak temperatures greater than 240 °C reduce the solderability of the lands on the second side to be soldered. This peak temperature can rise to 280 °C when soldering the second side with organic coated solder lands in air.





α	≤ 10 °C/s.	t_E	≤ 1 min, if possible (else ≤ 5 min).
T_E	≤ 160 °C.	t_M	= 2 to 30 s.
T_R	= 180 °C.	t_R	≤ 70 s.
$T_p$min	= 205 °C.		
$T_p$max	= 240 °C		for soldering the first side of a double-sided board with organic finish.
$T_p$max	= 280 °C		for all other cases.

Fig.5 Convection reflow soldering method (top), process requirements for reflow soldering (bottom).

If soldering in a nitrogen atmosphere, a peak temperature of 280 °C is allowed for double-sided print boards or single-sided reflow soldering. Soldering in a nitrogen atmosphere results in smoother joint meniscus, smaller contact angles, and better wetting of the copper solder lands.

The profile can be achieved by correct combinations of conveyor speed and heater temperature. To check whether the profile is within specification, the coldest and hottest spots on the board have to be located.

To do this, you should dispense solder paste deposits regularly over the surface of a test board and on the component leads. Set the oven to a moderate temperature with maximum conveyor velocity and pass the test board through. If too many solder paste dots melt, lower the oven's temperature. Continue passing test boards through the oven, while lowering the speed of the belt in small steps.

The deposit that melts first indicates the warmest location, the one that melts last indicates the coldest location. Paste dots not reflowed after two runs must be replaced by fresh dots. Thermocouples have to be mounted at the coldest and warmest location and temperature profiles measured.

Double-wave soldering process

There are four basic process steps for double-wave soldering, these are:

1. Applying adhesive
2. Component placement
3. Curing adhesive
4. Wave soldering process.

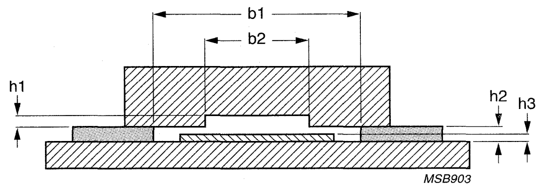
APPLYING ADHESIVE

To hold SMDs on the board during wave soldering, it is necessary to bond the component to the PCB with one or more adhesive dots. This is done either by dispensing, stencilling or pin transfer. Dispensing is currently the most popular technique. It is flexible and allows a controlled amount of adhesive to be applied at each position. Stencil printing and pin transfer are less flexible and are mainly used for mass production. The component-specific requirements for an adhesive dot are:

- Shape (volume) of the adhesive dot
- Number of dots per component
- Position of the dots.

Volume of adhesive

There must be enough adhesive to keep components in their correct positions while being transported to the curing oven. This means that the deposited adhesive must be higher than the gap between the component and the board surface. Nevertheless, there should not be too much deposit as it may smear onto the solder lands, where it can affect their solderability. The gap between a component and printed board depends on the geometry of the board and component (see Fig.6).



h1 = component stand-off height.
h2 = solder resist (and track) height on PCB.
h3 = copper height on PCB.
b1 = gap between solder lands on the PCB.
b2 = gap between metallization of the component.

Fig.6 Available space for adhesive between component and PCB (unmarked area).

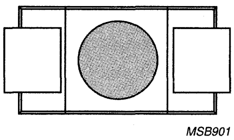
Table 2 gives guidelines for volumes of adhesive dots per package. The spreading in volumes should be within ±15%.

Table 2 Guidelines for volumes of adhesive dots

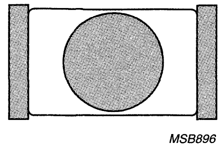
COMPONENT	NUMBER OF DOTS	VOLUME PER DOT (mm^3)
SOD106(A)	1	0.65
SOD80(C), SOD87	1 2	0.5 0.08
SOD110, SOD323	2	0.065
SOT323 (SC70-3)	2	0.045
SOT23, SOT143, SOT 346 (SC59)	2	0.06
SOT89	2	0.3
SOT223	2	0.70

Number, position and volume of dots per component

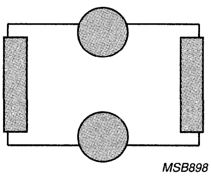
Figure 7 shows the recommended positions and numbers of adhesive dots for a variety of packages. SOD106(A), SOT89 and SOT223 packages require much larger adhesive dots compared with those for other components. SOD80(C) and SOD87 packages can have one large adhesive dot (recommended) or two smaller adhesive dots.



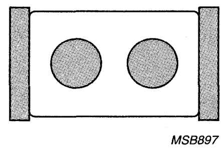
a. SOD106(A).



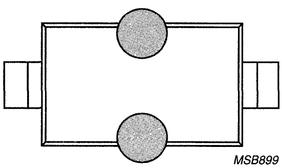
b. SOD80(C), SOD87.



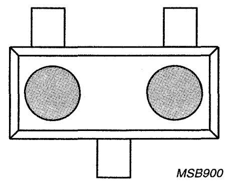
c. SOD110.



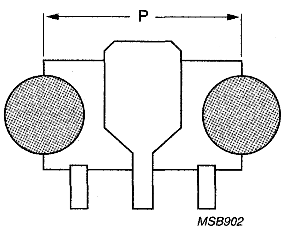
d. SOD80(C), SOD87.



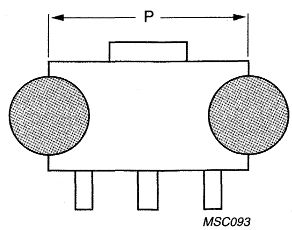
e. SOD323.



f. SOT23, SOT143, SOT323 (SC70-3) SOT346 (SC59).



g. SOT89 (P = 4.4 mm).



h. SOT223 (P = 6.0 mm).

For optimum power dissipation, the SOT89 requires a good thermal contact (i.e. good solder joint) between the package and the solder land. During wave-soldering, however, flux may not always reach the total soldering area beneath the component body, which in turn can lead to an incomplete solder joint. If the SOT89 is double-wave soldered, therefore, power derating must be applied.

Fig.7 Position of adhesive dots. Pitch between two small dots is 1.0 mm.

Nozzle outlet diameter

Depending on adhesive type and component size, the nozzle outlet diameter of the dispenser can vary between 0.6 and 0.7 mm for the larger dots, and between 0.3 and 0.5 mm for the smaller dots.

As the rheology of the adhesive is temperature dependent, the temperature in the nozzle must be carefully controlled before dispensing. The required temperature depends on the adhesive type, but is usually between 26 °C and 32 °C to maintain the adhesive's rheology within specification during dispensing. Thermally curing epoxy adhesives are normally used.

Adhesives

Beside the nozzle diameters, different adhesive types are also used for different component sizes.
Small components can be secured during assembly and wave soldering with a thin (low green strength) adhesive, which can be dispensed at high speeds. For larger components (such as QFP and SO packages), a higher green strength adhesive is required.

COMPONENT PLACEMENT

Positioning components on the PCB is similar in practice to that of reflow soldering.

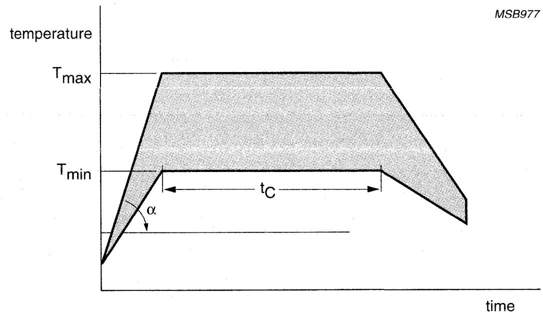
To prevent component shift and smearing of the adhesive, board support is important while placing components. This is particularly important when placing the SOD106(A) package.

CURING THE ADHESIVE

To provide sufficient bonding strength between component and board, the adhesive must be properly cured. Figure 8 gives general process requirements for curing most thermosetting epoxy adhesives with latent hardeners. The temperature profile of all adhesive dots on the PCB must be within this framework. It's important to note that this profile is for discrete semiconductor packages. The actual framework for the entire PCB could be smaller than the one shown, as other components on the board may have different process requirements.

To check whether the profile is within specification, the temperature of coldest and hottest spots must be measured. The coldest spot is usually under the largest package: the hottest spot is usually under the smallest package.

The adhesive can be cured either by infrared or hot-air convection.



T_{max} ≤ 160 °C.
T_{min} ≥ 110 °C.
t_C ≥ 3 minutes.
α ≤ 100 °C/min (some adhesives allow higher heating rates).
If T_{min} > 125 °C, t_C may be <3 min, depending on adhesive specification.

Fig.8 Process requirements for curing thermosetting adhesives.

Bonding strength

The bonding strength of glued components on the board can be checked by measuring the torque force. For small components the requirements are given in Table 3.
No values are specified for larger packages.

Table 3 Bonding strength requirements

COMPONENT	MINIMUM BONDING STRENGTH (cNcm)	TARGET BONDING STRENGTH (cNcm)
SOD323, SOD110, SOT323 (SC70-3)	110	250
SOD80(C), SOD87	200	350
SOT23, SOT346 (SC59), SOT143	150	250

WAVE SOLDERING PROCESS

After applying adhesive, placing the component on the PCB and curing, the PCB can be wave soldered. The wave soldering process is basically built up from three sub-processes. These are:

1. Fluxing
2. Preheating
3. (Double) wave soldering.

Although listed here as sub-process they are in practice combined in one machine. All are served by one transport mechanism, which guides the PCBs at an incline through the soldering machine. It's important to note that the PCB must be loaded into the machine so that the SMDs on the board come into direct contact with the solder wave (see Fig.9).

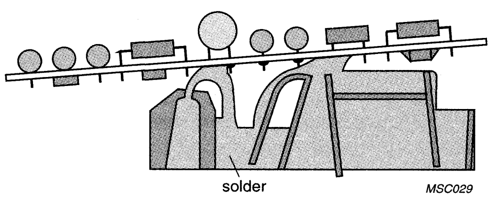


Fig.9 Double-wave soldering.

In principle, two different systems of PCB transports are available for wave soldering:

- Carrier transport

  PCBs are mounted on a soldering carrier, which moves through the soldering machine, taking it from one sub-process to the next. The advantage of carrier mounting is that the board is fixed and warpage during soldering is reduced.
- Carrierless transport

  PCBs are guided through the soldering machine by a chain with grips. This method is more convenient for mass production.

Fluxing

Fluxing is necessary to promote wetting both of the PCB and the mounted components. This ensures a good and even solder joint.

During the fluxing process, the solder side of the PCB (including the components) are covered with a thin layer of solder flux, which can be applied to the PCB either by spraying or as a foam. Although several types of solder flux are available for this purpose, they can be categorized into three main groups:

- Non-activated flux (e.g. rosin-based fluxes)
- Mildly activated flux (e.g. rosin-based or synthetic fluxes)
- Highly activated flux (e.g. water-soluble fluxes).

The choice for a particular flux type depends mainly on the products to be soldered.

Although there is always some flux residue left on the PCB after soldering, it's not always necessary to wash the boards to remove it. Whether to clean the board can depend on:

- The type of flux used (highly activated fluxes are corrosive and so should always be removed).
- The required appearance of the board after soldering.
- Customer requirements.

Preheating

After the flux is applied, the PCB needs to be preheated. This serves several purposes: it evaporates the flux solvents, it accelerates the activity of the flux and it heats the PCB and components to reduce thermal shock.

The required pre-heat temperature depends on the type of flux used. For example, the more common low-residue fluxes require a pre-heat temperature of 120 °C (measured on the wave solder side of the PCB).

(Double) wave soldering

The PCB first passes over a highly intensive (jet) solder wave with a carefully controlled constant height. This ensures good contact with the PCB, the edges of SMDs and the leads of components near to high non-wetted bodies. The greater the board's immersion depth into this first wave, the fewer joints will be missed.

If the PCB is carrier mounted, the first wave's height, and thus the board's immersion depth, can be greater. Carrierless soldering is more convenient for mass production, but the height of the wave must be lower to avoid solder overflowing to the top side of the board. The height of the jet wave is given in Table 4 along with an indication of soldering process window. This information is based on a 1.6 mm thick PCB.

Table 4 Process ranges for carrierless and carrier double wave soldering

	CARRIERLESS	CARRIER
Preheat temperature of board at wave solder side (°C)	120 ±10	
Heating rate preheating (°C/s)	$\Delta T/\Delta t \leq 3$	
First (jet) wave: wave height with respect to bottom side of board (mm)	1.6 +0.5/–0	3.0 +0.5/–0
Second (laminar) wave (double sided overflow): height with respect to underside of the board (mm) relative stream velocity with respect to the board	 0.8 +0.5/–0 0	
Solder temperature (°C)	250 ±3	
Contact times (s): first (jet) wave second (laminar) wave	 0.5 +0.5/–0 2.0 ±0.2 (plain holes); 2.5 ±0.2 (plated holes)	
PCB transport angle (°)	7 ±0.5	
Solder alloys	Sn60Pb40; Sn60Pb38Bi2	

The second, smoother laminar solder wave completes formation of the solder fillet, giving an optimal soldered connection between component and PCB. It also reduces the possibility of solder bridging by taking up excessive solder.

To reduce lead/tin oxides and possibly other solder imperfection forming during soldering, the complete wave configuration can be encapsulated by an inert atmosphere such as nitrogen.

Hand soldering microminiature components

It is possible to solder microminiature components with a light-weight hand-held soldering iron, but this method has obvious drawbacks and should be restricted to laboratory use and/or incidental repairs on production circuits:

- Hand-soldering is time-consuming and therefore expensive
- The component cannot be positioned accurately and the connecting tags may come into contact with the substrate and damage it
- There is a risk of breaking the substrate and internal connections in the component could be damaged
- The component package could be damaged by the iron.

Assessment of soldered joint quality

The quality of a soldered joint is assessed by inspecting the shape and appearance of the joint. This inspection is normally done with either a low-powered magnifier or microscope, however where ultra-high reliability is required, video, X-ray or laser inspection equipment may be considered.

Both sides of the PCB should be carefully examined: there should be no misaligned, missing or damaged components, soldered joints should be clean and have a similar appearance, there should be no solder bridging or residue, and the PCB should be assessed for general cleanliness.

Unlike leaded component joints where the lead also provides added mechanical strength, the SMD relies on the quality of the soldering for both electrical and mechanical integrity. It is therefore necessary that the inspector is trained to make a visual assessment with regard to long-term reliability.

Criteria used to assess the quality of an SMD solder joint include:

- Correct position of the component on the solder lands
- Good wetting of the surfaces
- Correct amount of solder
- A sound, smooth joint surface.

POSITIONING

If a lead projects over the solder land too far an unreliable joint is obtained. Figures 10 to 12 show the maximum shift allowed for various components. The dimensions of these solder lands guarantee that, in the statistically extreme situation, a reliable soldered joint can be made.

GOOD WETTING

This produces an even flow of solder over the surface land and component lead, and thinning towards the edges of the joint. The metallic interaction that takes place during soldering should give a smooth, unbroken, adherent layer of solder on the joint.

CORRECT AMOUNT OF SOLDER

A good soldered joint should have neither too much nor too little solder: there should be enough solder to ensure electrical and mechanical integrity, but not so much that it causes solder bridging.

SOUND, SMOOTH JOINT SURFACE

The surface of the solder should be smooth and continuous. Small irregularities on the solder surface are acceptable, but cracks are unacceptable.

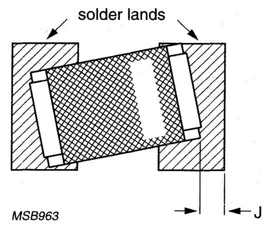


Fig.10 $J \geq 0.3$ mm.

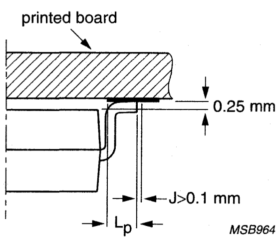


Fig.11 $J \geq 0.1$ mm; solder land > L_p.

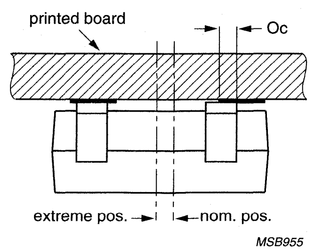


Fig.12 Oc > half lead width.

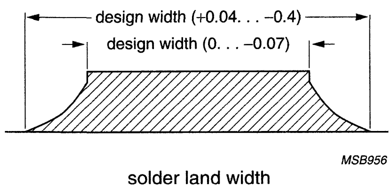
Footprint definitions

A typical SMD footprint, is composed of:

- Solder lands (conductive pattern)
- Solder resist pattern
- Occupied area of the component
- Solder paste pattern (for reflow soldering only)
- Area underneath the SMD available for tracks
- Component orientation during wave soldering.

SOLDER LANDS (CONDUCTIVE PATTERN)

The dimensions of the solder lands given in these guidelines are the actual dimensions of the conductive pattern on the printed board (see Fig.13).
These dimensions are more crucial for fine-pitch components.



The solder land dimensions are designed to give optimum soldering results. They do not take into account the copper area for optimum power dissipation. If an extra area is required to improve power dissipation, it should be coated with solder resist. This is especially important for power packages such as SOD106(A), SOT89 and SOT223.

Fig.13 Requirements of solder land dimensions.

SOLDER RESIST PATTERN

The solder resist on the circuit board prevents short circuits during soldering, increases the insulation resistance between adjacent circuit details and stops solder flowing away from solder lands during reflow soldering.

In contrast to the tracks, which must be entirely covered, solder lands must be free of solder resist. Because of this, the cut-outs in the solder resist pattern should be at least 0.15 mm or 0.3 mm larger than the relevant solder lands (for a photo-defined and screen printed solder resist pattern respectively). The solder resist cut-outs given with the footprints in these guidelines are sketched and their dimensions can be calculated by using the above rule. Consult your printed board supplier for agreement with these solder resist cut-outs.

OCCUPIED AREA OF THE COMPONENT

A minimum spacing between components is necessary to avoid component placement problems, short circuits during wave or reflow soldering and dry solder joints during wave soldering caused by non-wettable component bodies. These problems can be avoided by placing the components so the occupied areas do not overlap (see Fig.14).

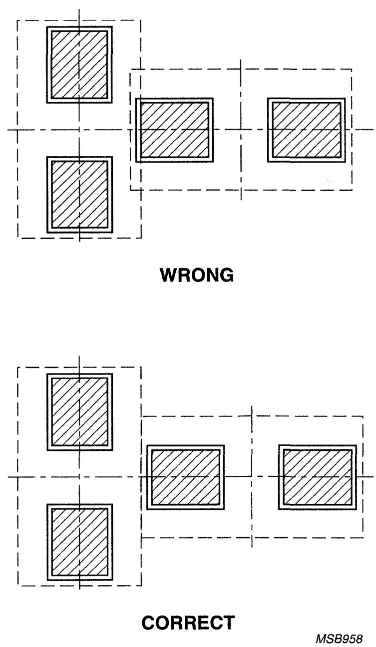


Fig.14 Minimum spacing required (bottom) between components.

SOLDER PASTE PATTERN

It is important to use a solder paste printer which is optical aligned with the PCBs copper pattern for the reflow footprints presented here. This is because, for these footprints, the solder paste deposit must be within a 0.1 mm tolerance with respect to the copper pattern.

To ensure the right amount of solder for each solder joint, the stencil apertures must be equal to the solder paste areas given by the footprints.

AREA AVAILABLE FOR TRACKS (CONDUCTIVE PATTERN)

Tracks underneath leadless SMDs must be covered with solder resist. However, as solder resist can sometimes be thin or have pin holes at the edges of tracks (especially when applied by screen printing), an additional clearance for tracks with respect to the actual metallization position of the mounted component should be taken into account (see Fig.15).

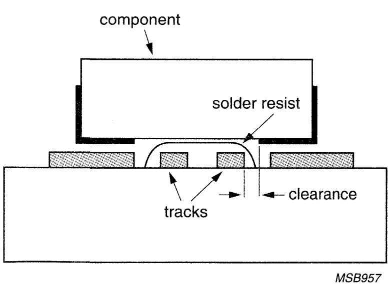


Fig.15 Clearance required underneath component between metallization and tracks.

For components that need the additional clearance, the footprints on the following pages give the maximum space for tracks not connected to the solder lands (clearance ≥ 0.1 mm), for low-voltage applications.
The number of tracks in this space is determined by the specified line resolution of the printed board.

COMPONENT ORIENTATION DURING WAVE SOLDERING

Where applicable, footprints for wave soldering are given with the transport direction of the PCB. This is given as either a 'preferred transport direction during soldering' or 'transport direction during soldering'.

Components with small terminals and non-wettable bodies, have a smaller risk of dry joints, especially when using carrierless soldering as the components are placed according to the 'preferred orientation'.

Components have no orientation preference for reflow soldering.

Recommended footprints

The recommended footprints for our discrete semiconductor packages are given on the following pages. For their dimensional outline drawings, see the 'Package outlines' section at the end of this book.

In addition to its standard footprints, SOD110 has a reflow footprint for high thermal cycling load applications (see Fig.16). This footprint has larger solder lands to give a fatter solder fillet and, therefore, longer solder fatigue life. A SOD110 mounted on this footprint has a lower self-aligning ability, and has a higher risk of displacement when soldered in a nitrogen atmosphere.

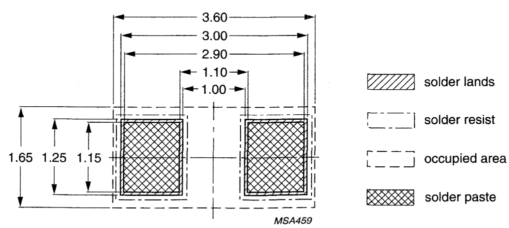


Fig.16 Reflow soldering footprint for SOD110 (high thermal cycling load).

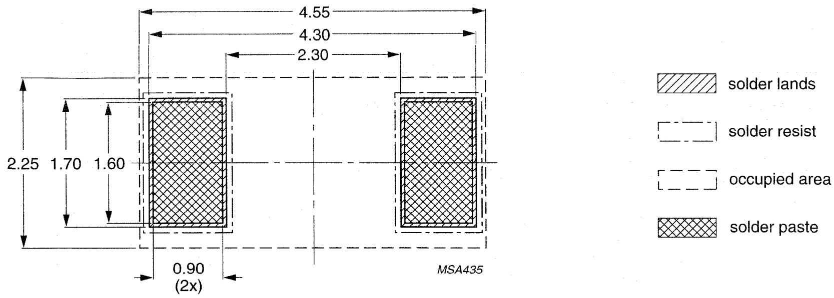


Fig.17 Reflow soldering footprint for SOD80(C).

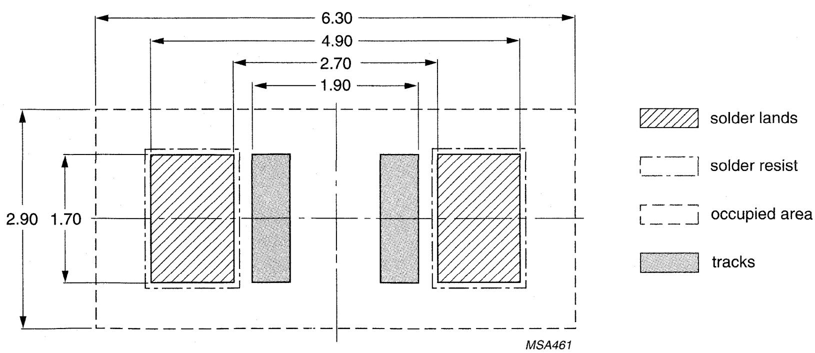


Fig.18 Wave soldering footprint for SOD80(C).

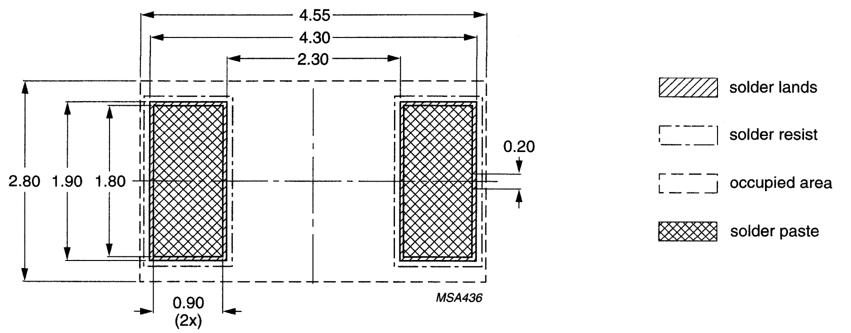


Fig.19 Reflow soldering footprint for SOD87.

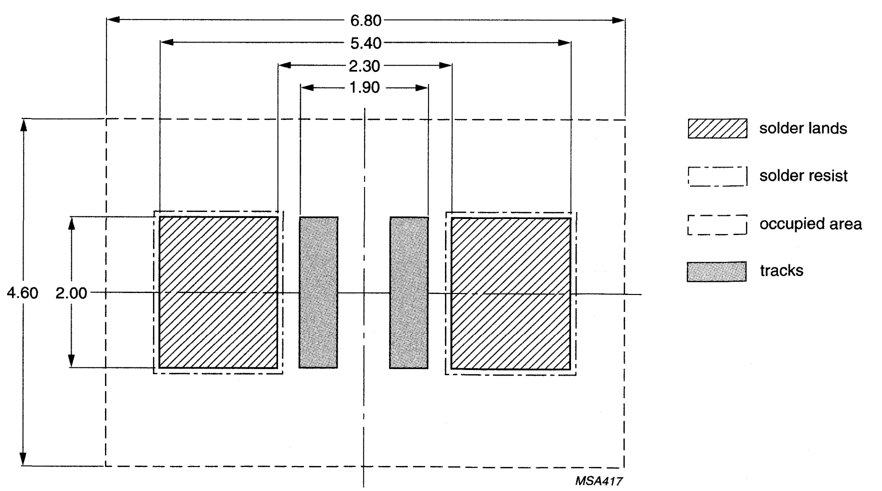


Fig.20 Wave soldering footprint for SOD87.

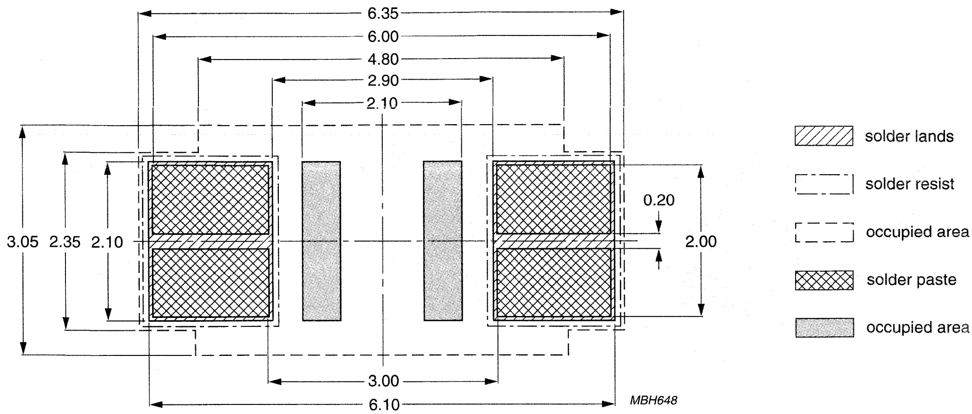


Fig.21 Reflow soldering footprint for SOD106.

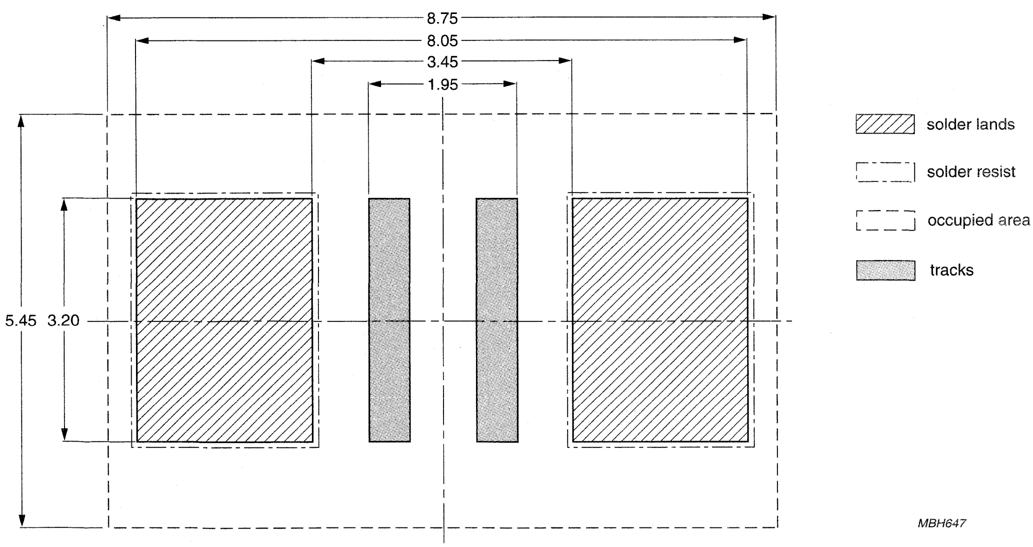


Fig.22 Wave soldering footprint for SOD106.

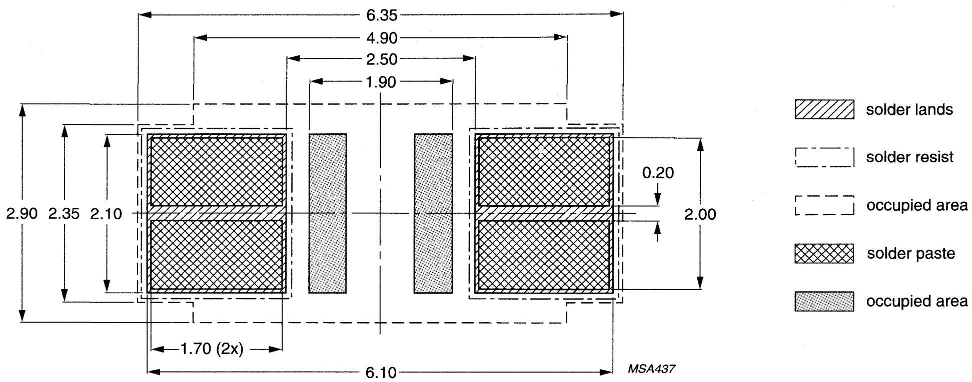


Fig.23 Reflow soldering footprint for SOD106(A).

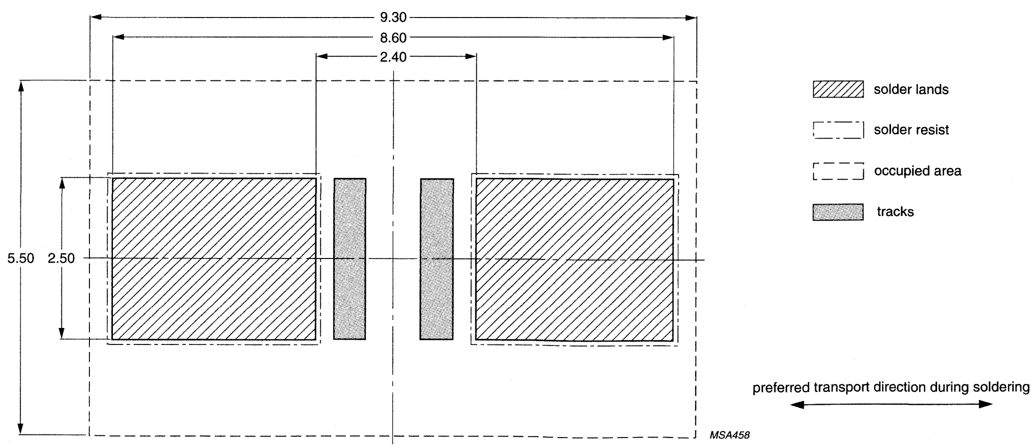


Fig.24 Wave soldering footprint for SOD106(A).

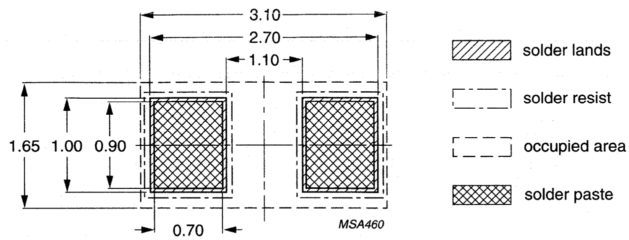


Fig.25 Reflow soldering footprint for SOD110.

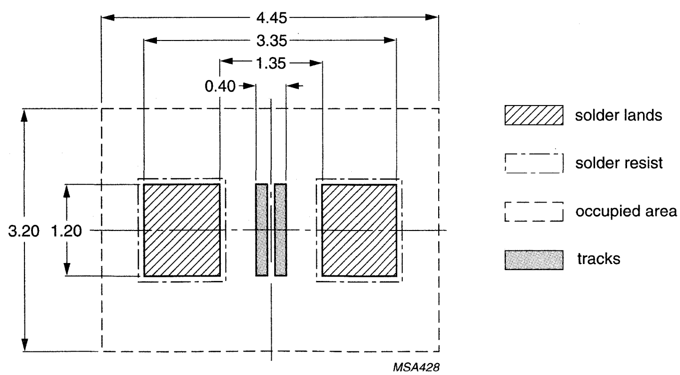


Fig.26 Wave soldering footprint for SOD 110.

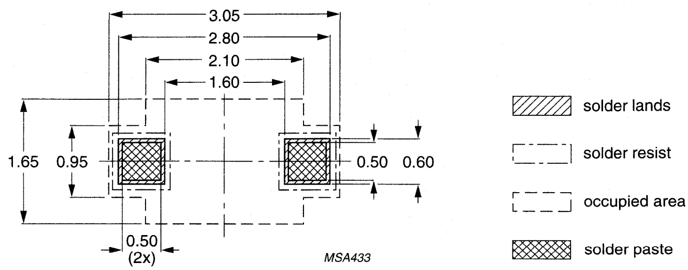


Fig.27 Reflow soldering footprint for SOD323.

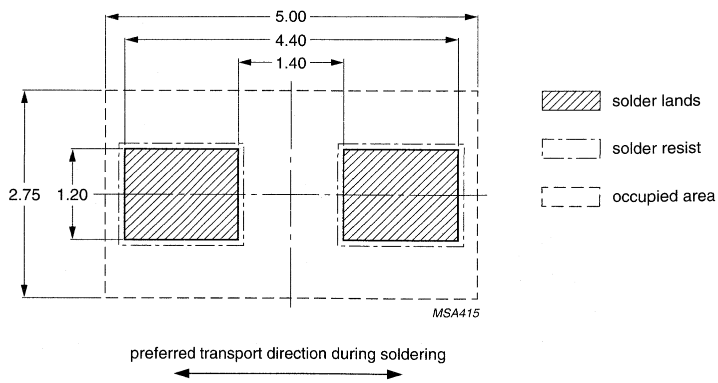


Fig.28 Wave soldering footprint for SOD323.

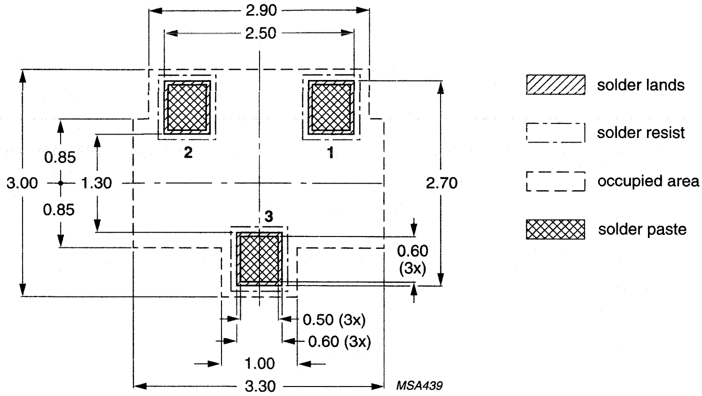


Fig.29 Reflow soldering footprint for SOT23.

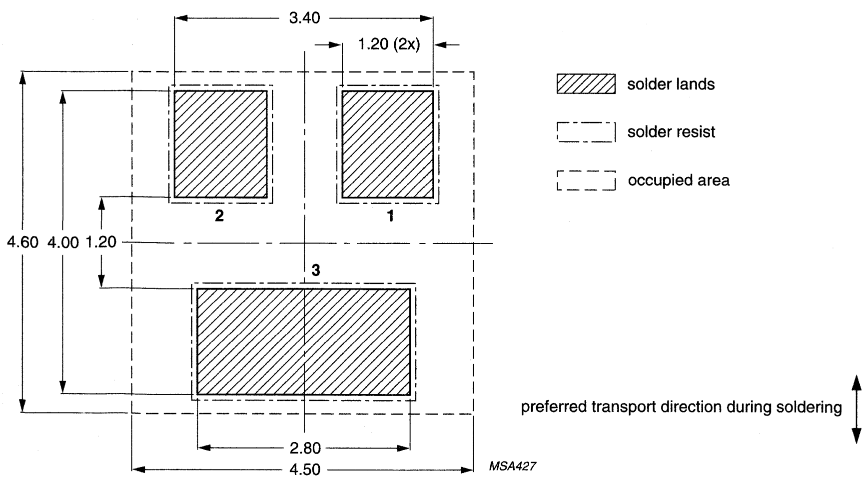


Fig.30 Wave soldering footprint for SOT23.

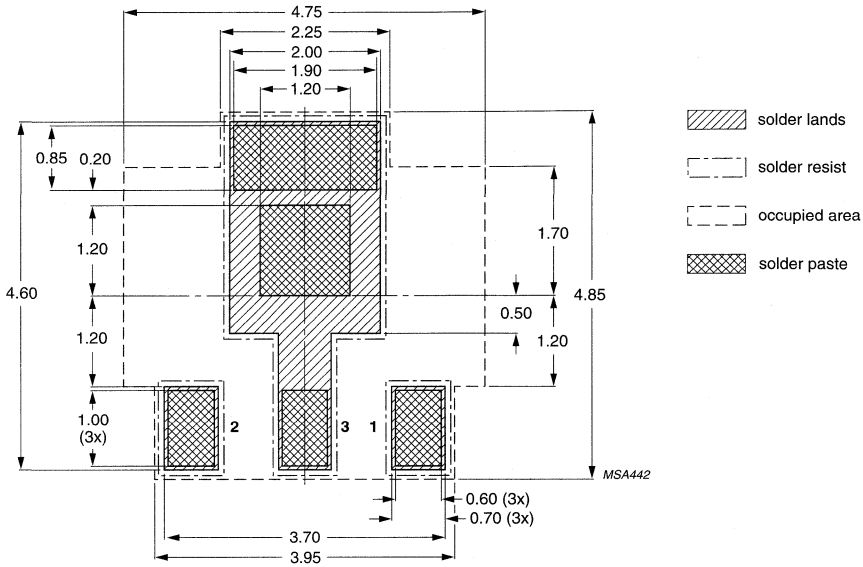
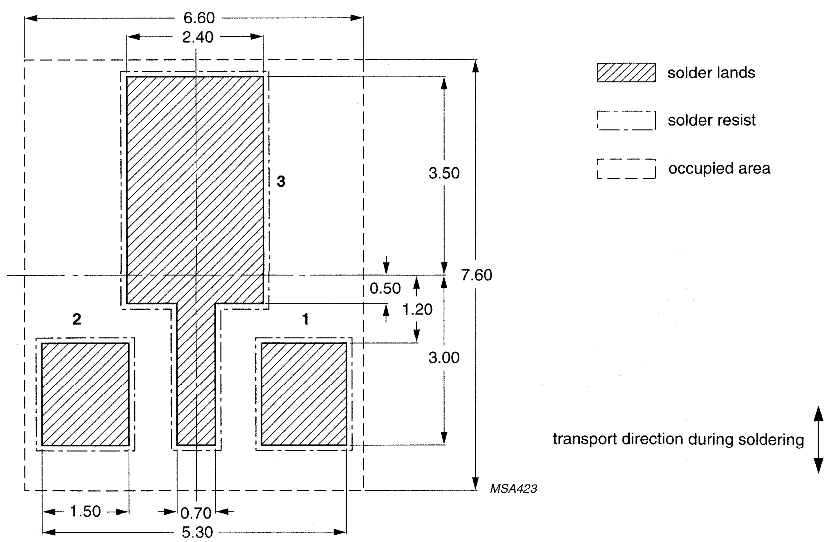


Fig.31 Reflow soldering footprint for SOT89.



Not recommended for wave soldering (see Fig.7).

Fig.32 Wave soldering footprint for SOT89.

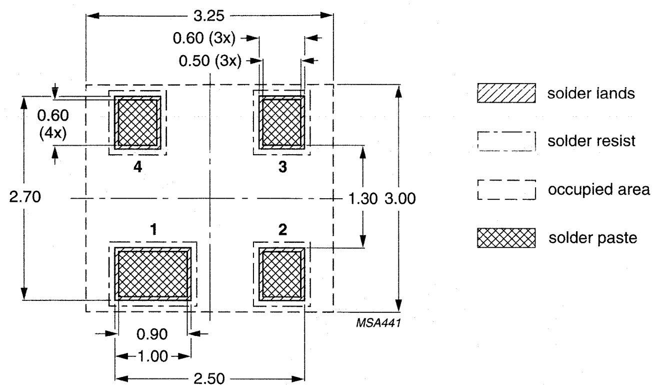


Fig.33 Reflow soldering footprint for SOT143 (footprint for SOT143R is mirror image).

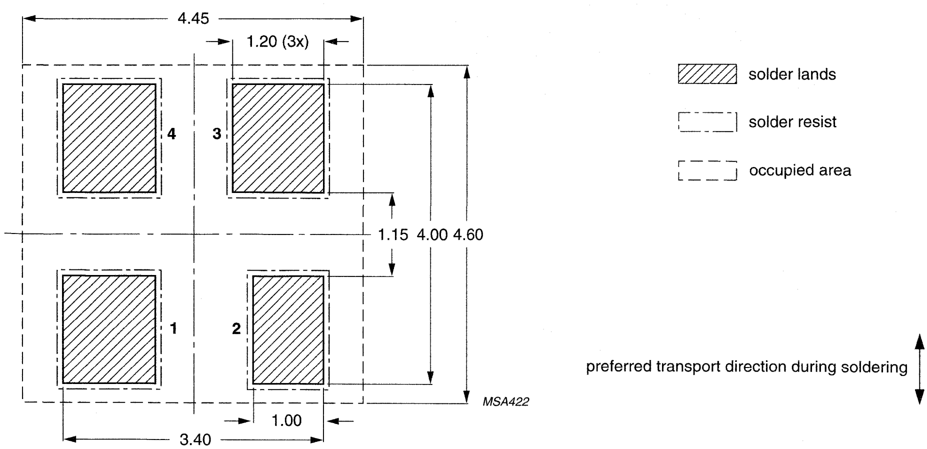


Fig.34 Wave soldering footprint for SOT143 (footprint for SOT143R is mirror image).

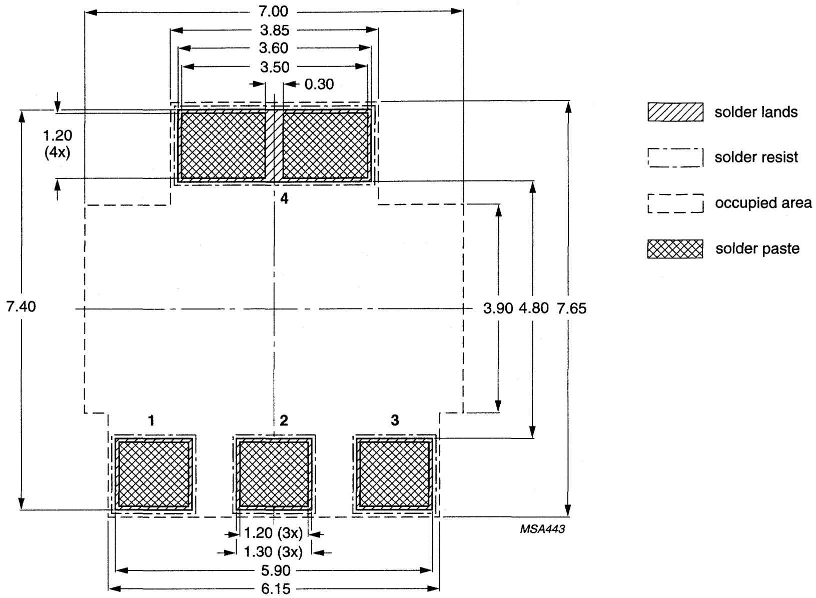


Fig.35 Reflow soldering footprint for SOT223.

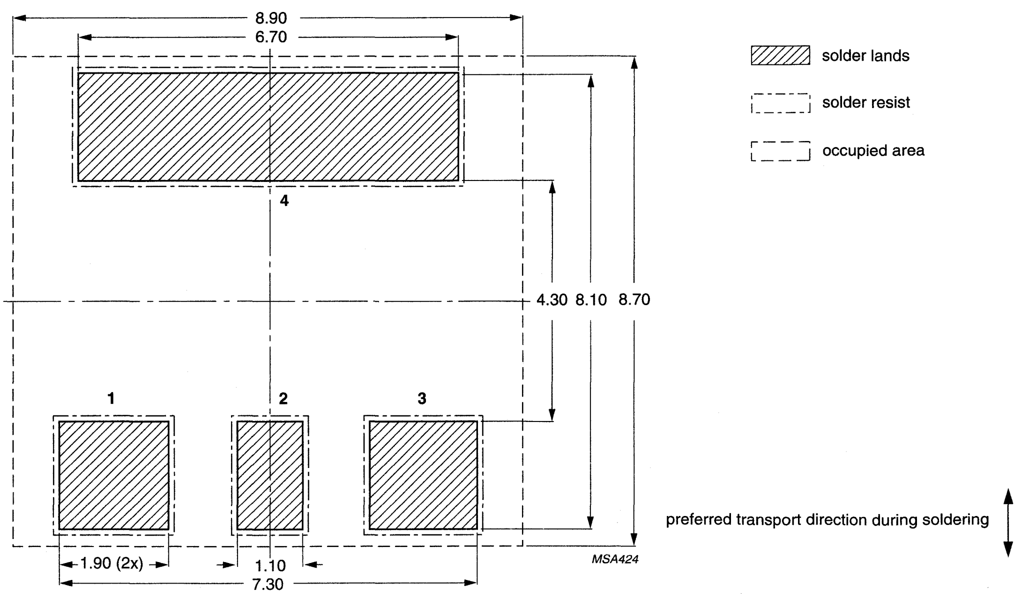


Fig.36 Wave soldering footprint for SOT223.

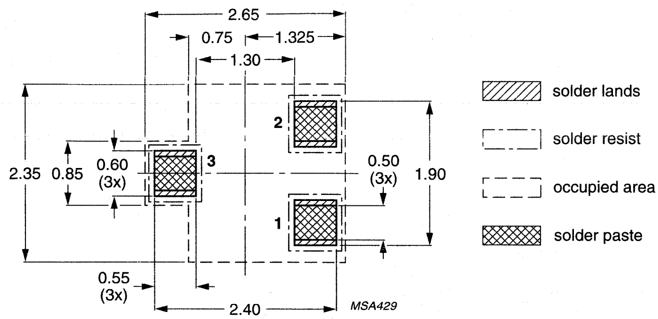


Fig.37 Reflow soldering footprint for SOT323 and SC70-3.

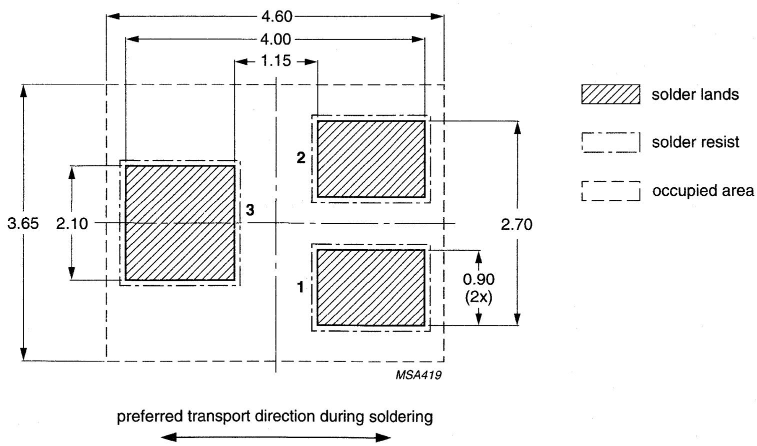


Fig.38 Wave soldering footprint for SOT323 and SC70-3.

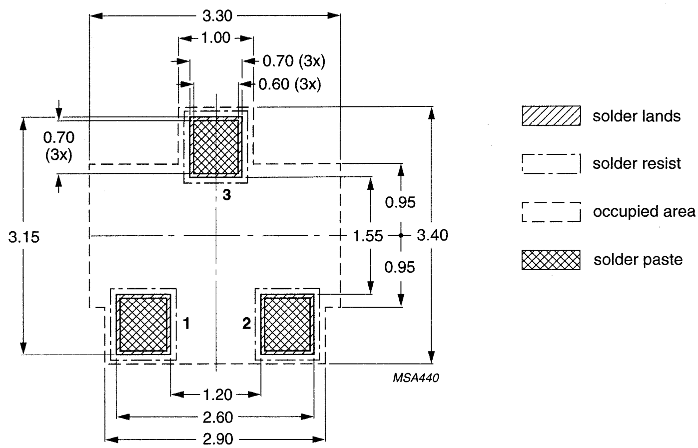


Fig.39 Reflow soldering footprint for SOT346 (SC59).

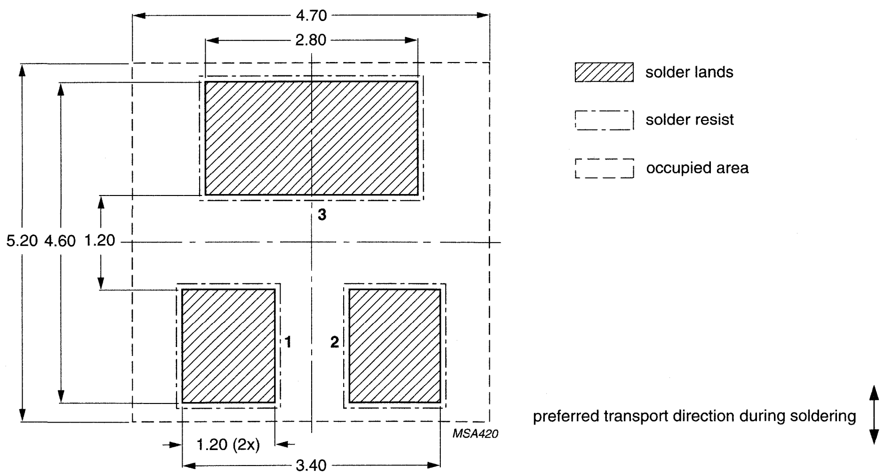


Fig.40 Wave soldering footprint for SOT346 (SC59).

Dimensions:
A = 11.00 mm
B = 8.00 mm
C = 1.50 mm
F = 11.40 mm
G = 13.40 mm
placement accuracy = 0.25 mm

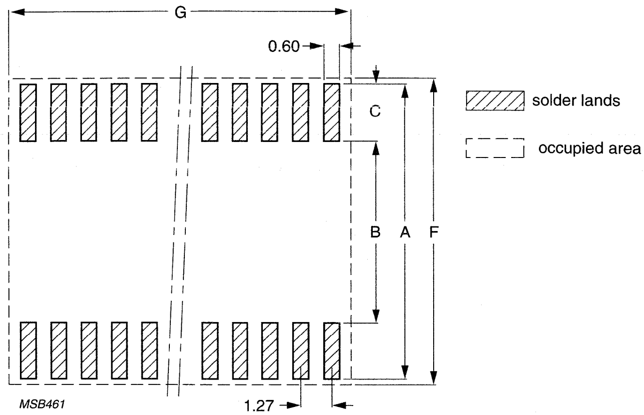


Fig.41 Reflow soldering footprint for SO20 (SOT163-1)

Dimensions:
A = 11.50 mm
B = 7.90 mm
C = 1.80 mm
F = 13.00 mm
G = 15.90 mm
N = 20
placement accuracy = 0.25 mm

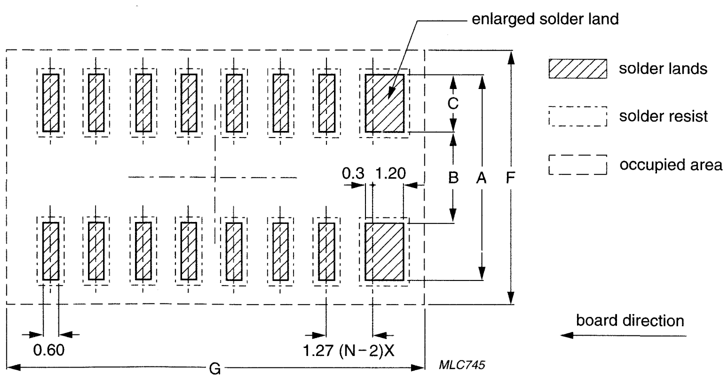


Fig.42 Wave soldering footprint for SO20 (SOT163-1)

SECTION 18

PACKING AND PACKING QUANTITIES

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SCOPE

This chapter covers packing and packing quantity details for surface-mount and leaded diodes in the following packages:

Table 1 Survey of packages

PACKAGE	
SURFACE-MOUNT	**THROUGH-HOLE**
SC59 (SOT346)	SOD27 (DO-35)
SC70-3 (SOT323)	SOD57
SOD80(C)	SOD61
SOD87	SOD64
SOD106 (DO-214AC)	SOD66 (DO-41)
SOD106A	SOD68 (DO-34)
SOD110	SOD81
SOD323	SOD83A
SOT23	SOD88A
SOT89	SOD91
SOT143	SOT18/15 (TO-18)
SOT223	
SO20 (SOT163-1)	

SURFACE-MOUNT DEVICES

Tape and reel packing for surface-mount devices meets the feed requirements for automatic pick and place equipment (packing conforms to IEC publication 286-3). Tape is an ideal shipping container making handling easy and providing secure blister cavities in which the devices are sealed with peel-off cover tape.

Tape specification

Tape dimensions are specified in Tables 3 and 4 and in Figs.1 through 7 for 8, 12 and 24 mm tape respectively. For diodes with only two terminations, the cathode side of the device is adjacent to the sprocket holes in the tape.

Table 2 Carrier tape widths

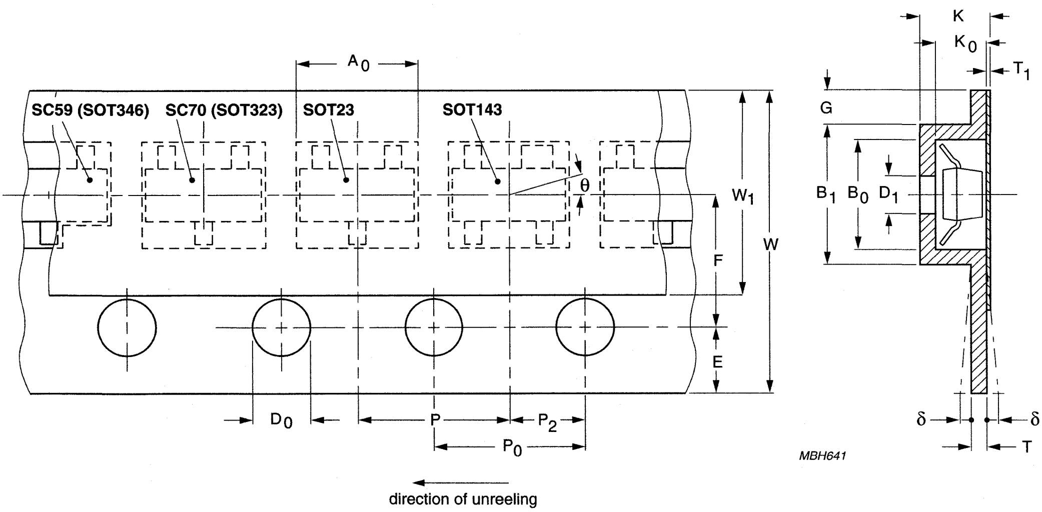
8 mm	12 mm	24 mm
SC59 (SOT346)	SOD106(A)	SO20
SC70 (SOT323)	SOT89	
SOD80(C)	SOT223	
SOD87		
SOD110		
SOD323		
SOT23		
SOT143		

Table 3 Variable tape dimensions

PACKAGE	SYMBOL					
	W (mm)	F (mm)	P (mm)	K (mm)	B_1 (mm)	D_1 (mm)
SO20	24.0	11.5	12.0	3.6	14.1	1.5
Tolerance	±0.3	±0.1	±0.1	max.	max.	min.
SC59 (SOT346)	8.0	3.5	4.0	1.5	4.2	1.0
SC70 (SOT323)	8.0	3.5	4.0	1.5	4.2	1.0
SOD80(C)	8.0	3.5	4.0	2.0	4.2	1.0
SOD87	8.0	3.5	4.0	2.5	4.2	1.0
SOD106(A)	12.0	5.5	4.0	3.0	6.0	1.5
SOD110	8.0	3.5	4.0	2.5	4.2	1.0
SOD323	8.0	3.5	4.0	1.5	4.2	1.0
SOT23	8.0	3.5	4.0	1.5	4.2	1.0
SOT89	12.0	5.5	8.0	2.3	8.2	1.5
SOT143	8.0	3.5	4.0	1.5	4.2	1.0
SOT223	12.0	5.5	8.0	2.4	8.2	1.5
Tolerance	±0.2	0.05	±0.1	max.	max.	min.

Table 4 Fixed tape dimensions

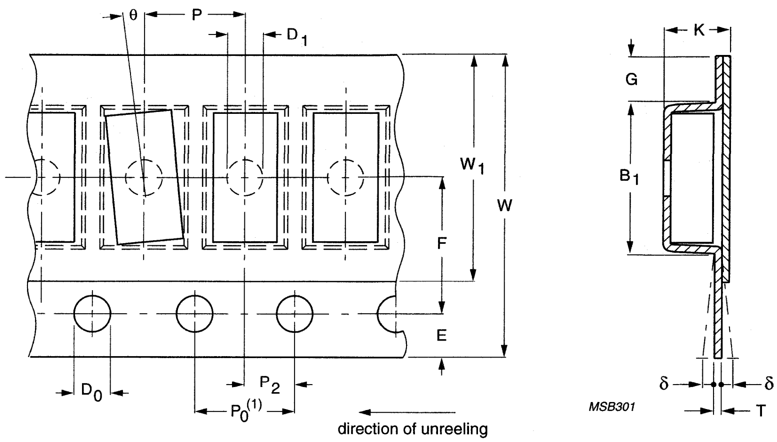
PACKAGE	SYMBOL							
	E (mm)	**D_0 (mm)**	**P_0 (mm)**	**P_2 (mm)**	**G (mm)**	**T (mm)**	**δ (mm)**	**θ (deg)**
SO20	1.75	1.5	4.0	2.0	3.7	0.4	0.3	10
Tolerance	±0.1	−0/+0.1	±0.1	±0.1	±0.1	max.	max.	max.
All other	1.75	1.5	4.0	2.0	0.75	0.4	0.3	15
Tolerance	±0.1	−0/+0.1	±0.1	±0.05	min.	max.	max.	max.



For dimensions see Tables 3 and 4.

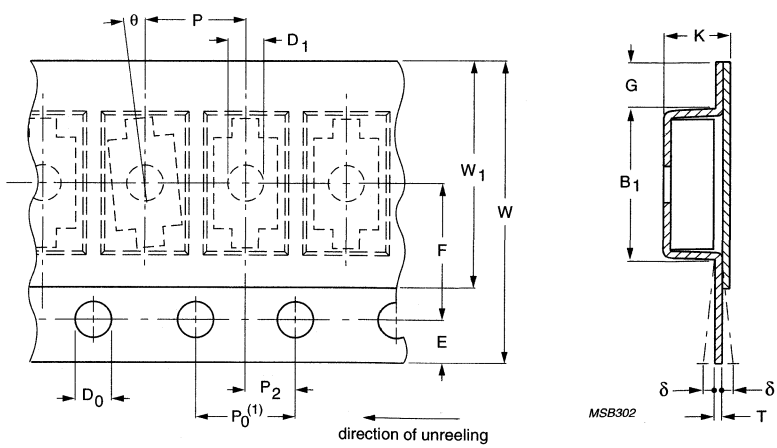
(1) Tolerance over any 10 pitches is ±0.2 mm.

Fig.1 Specification for 8 mm tape (SC59, SC70, SOT23, SOT143 and SOT323).



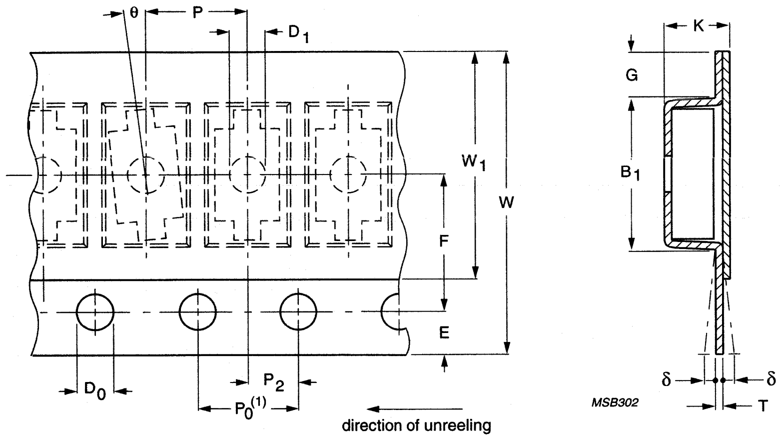
For dimensions see Tables 3 and 4.
(1) Tolerance over any 10 pitches is 0.2 mm.

Fig.2 Specification for 8 mm tape (SOD80, SOD80C, SOD87 and SOD110).



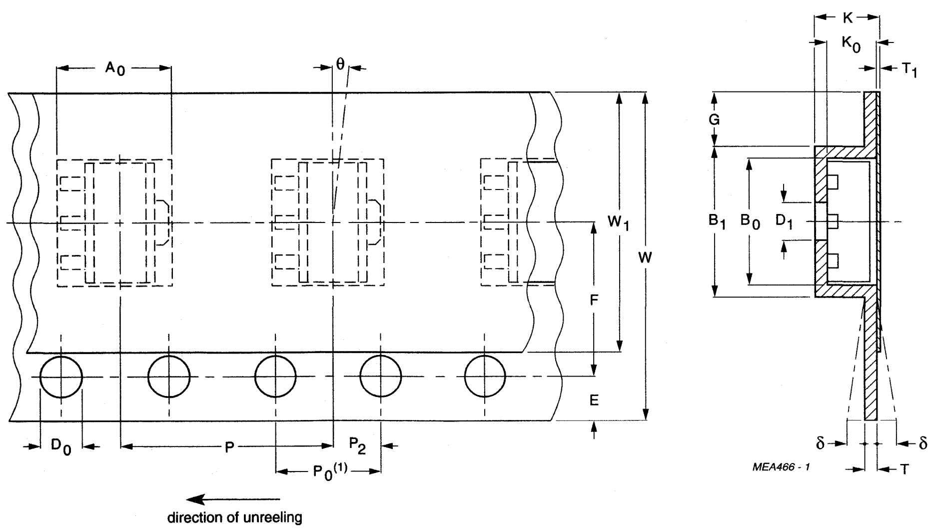
For dimensions see Tables 3 and 4.
(1) Tolerance over any 10 pitches is 0.2 mm.

Fig.3 Specification for 8 mm tape (SOD323).



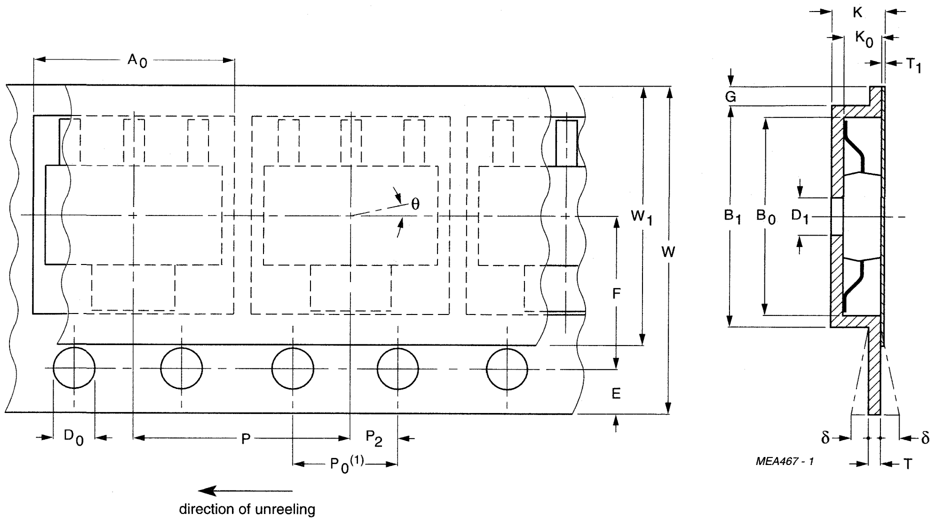
For dimensions see Tables 3 and 4.
(1) Tolerance over any 10 pitches is 0.2 mm.

Fig.4 Specification for 12 mm tape (SOD106 and SOD106A).



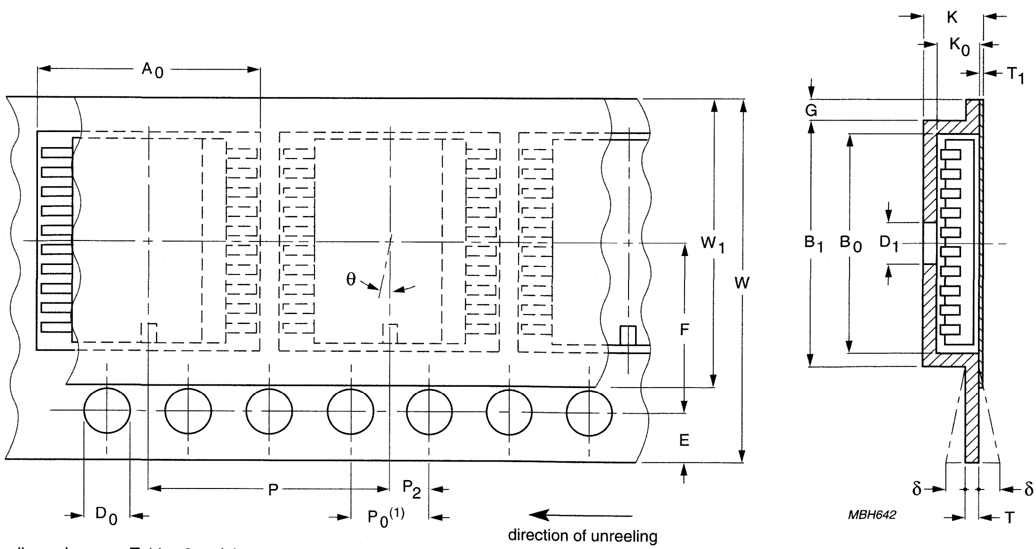
For dimensions see Tables 3 and 4.
(1) Tolerance over any 10 pitches is 0.2 mm.

Fig.5 Specification for 12 mm tape (SOT89).



For dimensions see Tables 3 and 4.
(1) Tolerance over any 10 pitches is 0.2 mm.

Fig.6 Specification for 12 mm tape (SOT223).

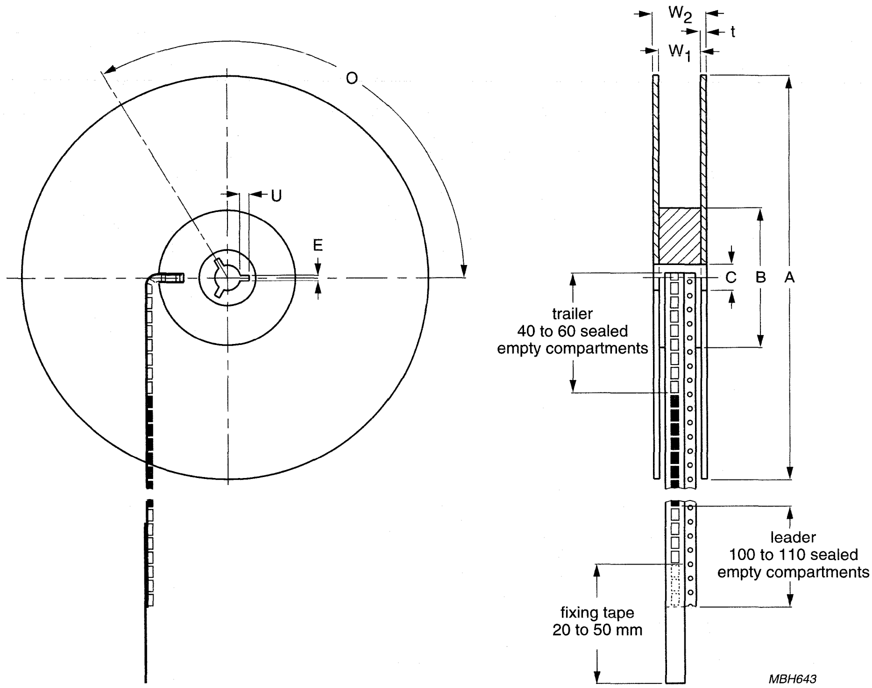


For dimensions see Tables 3 and 4.
(1) Tolerance over any 10 pitches is 0.2 mm.

Fig.7 Specification for 24 mm tape (SO20).

Reel specification

Reel dimensions are specified in Fig.8 and Table 5 for 8, 12 and 24 mm tape.



For dimensions see Table 5.

Fig.8 Reel specification.

Table 5 Reel dimensions

TAPE WIDTH	SYMBOL							
	A (mm)	**B (mm)**	**C (mm)**	**W_1 (mm)**	**W_2 (mm)**	**E (mm)**	**U (mm)**	**O (deg)**
8 mm	180/286 or 180/330	62	12.75	8.4	14.4	1.5	3.6	120
12 mm	180/330	62	12.75	12.4	18.4	1.5	3.6	120
Tolerance	±0.5	±1.5	−0/+0.15	−0/+1.5	max.	min.	min.	−
24 mm	180/330	62	12.75	24.4	30.4	1.5	3.6	120
Tolerance	±0.5	±1.5	−0/+0.15	−0/+2	max.	min.	min.	−

Packing quantities

Table 6 shows the packing quantities for a single box for each package style.

Table 6 Packing quantities per package with relevant ordering code

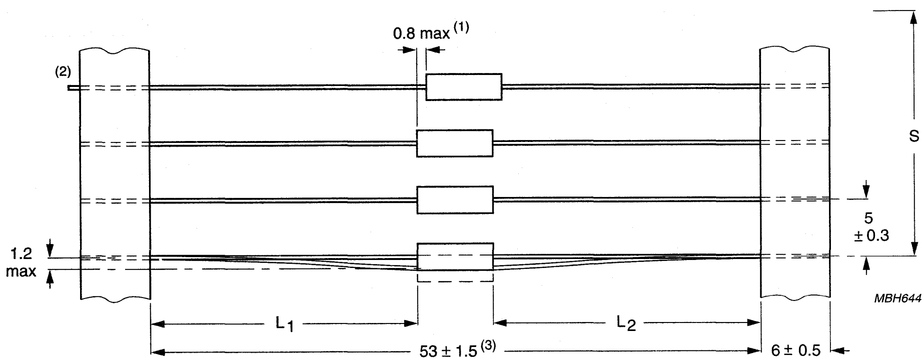
PACKAGE	PACKING QUANTITY	ORDERING CODE ENDING	KIND OF PACKING	REEL DIAMETER (mm/inch)	REMARKS
SC59 (SOT346)	3000 10000	115 135	8 mm tape and reel 8 mm tape and reel	180/7 286/11¼	
SC70-3 (SOT323)	3000 10000	115 135	8 mm tape and reel 8 mm tape and reel	180/7 286/11¼	
SOD80(C)	1000 2500 10000	112 115 135	bulk 8 mm tape and reel 8 mm tape and reel	– 180/7 330/13	BB215 only
SOD87	2000 8000	115 135	8 mm tape and reel 8 mm tape and reel	180/7 330/13	
SOD106(A)	1500	115	12 mm tape and reel	180/7	
SOD110	3000 10000	115 135	8 mm tape and reel 8 mm tape and reel	180/7 330/13	
SOD323	3000 10000	115 135	8 mm tape and reel 8 mm tape and reel	180/7 286/11¼	
SOT23	500 3000 10000	212 215 235	bulk 8 mm tape and reel 8 mm tape and reel	– 180/7 286/11¼	
SOT89	250 1000 4000	112 115 135	bulk 12 mm tape and reel 12 mm tape and reel	– 180/7 330/13	
SOT143	500 3000 10000	212 215 235	bulk 8 mm tape and reel 8 mm tape and reel	– 180/7 286/11¼	
SOT223	1000 4000	115 135	12 mm tape and reel 12 mm tape and reel	180/7 330/13	
SO20	1000	118	24 mm tape and reel	330/13	BZA100 only

LEADED DEVICES

Axial diodes

Axial diodes are available on tape according to IEC 286-1. They are most suitable for use in automatic insertion machines, cutting and forming tools, and are supplied on reels or in boxes (ammopacks).

TAPE SPECIFICATION



Dimensions in mm.

The red tape indicates the cathode terminal of the diode.

The cumulative space (S) measured over ten spacings is 50 ±2 mm; for 26 mm tape, this is 100 ±2 mm for 20 spaces.

The diodes are centered so that $L_1 - L_2 \leq 1.2$ mm.

A black marker is printed on the white tape of the bandolier to mark every 50 diodes.

The axial tape specification is compatible with automatic insertion equipment from Universal, U.S.M. (Dynapert) and M.E.I. (Panasert).

Notes

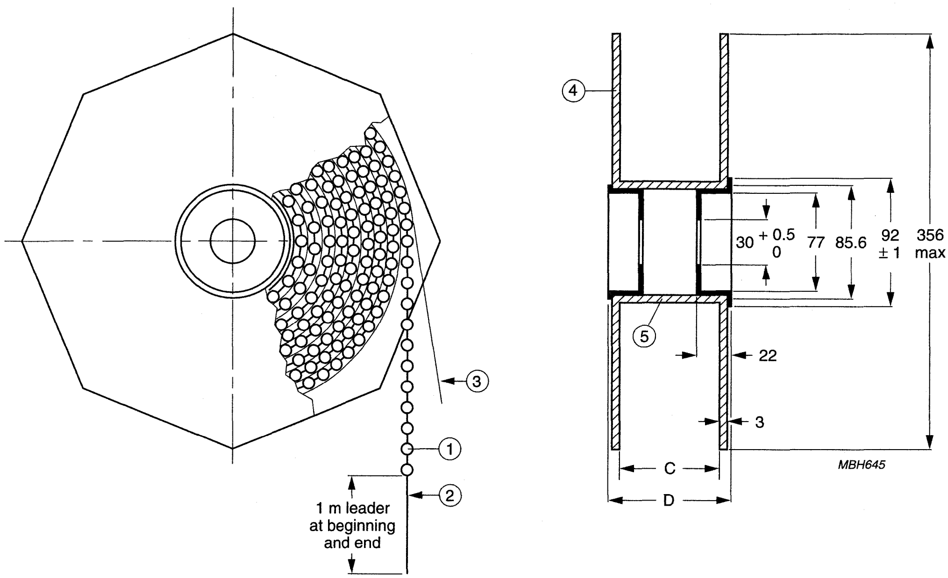
(1) Displacement between any two diodes: maximum 0.4 mm for SOD68 (DO-34).

(2) No protruding leads.

(3) For 26 mm tape, this dimension is 26 +1.5/–0 mm; for SOD61, SOD83A and SOD88A packages, this dimension is 58 ±2 mm.

Fig.9 Tape specification for axial diodes.

REEL SPECIFICATION



Dimensions in mm.

For reel width see Table 7.

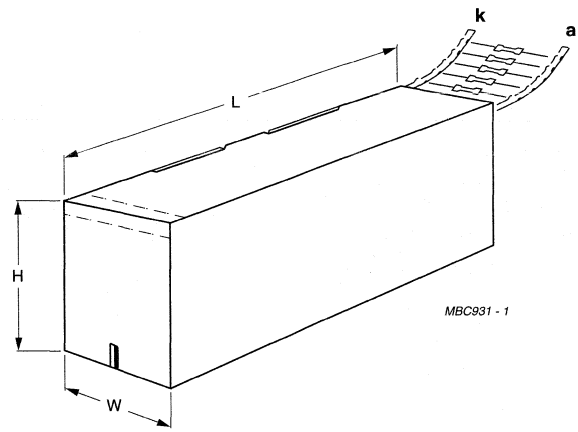
(1) Diode.
(2) Tape.
(3) Paper.
(4) Flange.
(5) Cylinder.

Fig.10 Reel specification for axial diodes.

Table 7 Reel width

TAPE WIDTH (mm)	SYMBOL C (mm)	SYMBOL D (mm)
26	40	50
53	70	80
58	75	85

AMMOPACK SPECIFICATION



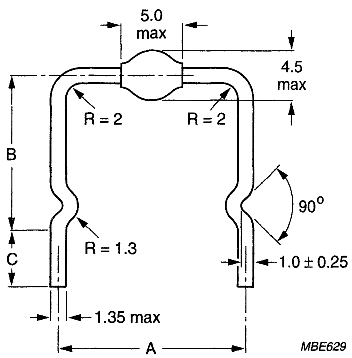
For dimensions see Table 10.

Fig.11 Ammopack specification for axial diodes.

SOD64 WITH PREFORMED LEADS

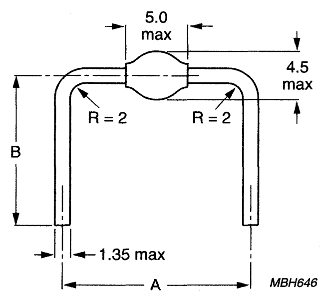
Some types of automatic insertion machines have problems in bending the relatively thick leads of the SOD64 package. To overcome this, diodes in SOD64 are also available with preformed leads. They can be ordered by adding a slash number to the type number, e.g. BY228/20. Diodes with preformed leads are supplied in bulk quantities of 1500 pieces. The available preforms are depicted in Figs.12 and 13. Dimensions and ordering codes are in Table 8.

The preferred preforms are /20, /21 and /40.



Dimensions in mm.

Fig.12 SOD64 with long preformed leads.



Dimensions in mm.

Fig.13 SOD64 with short preformed leads.

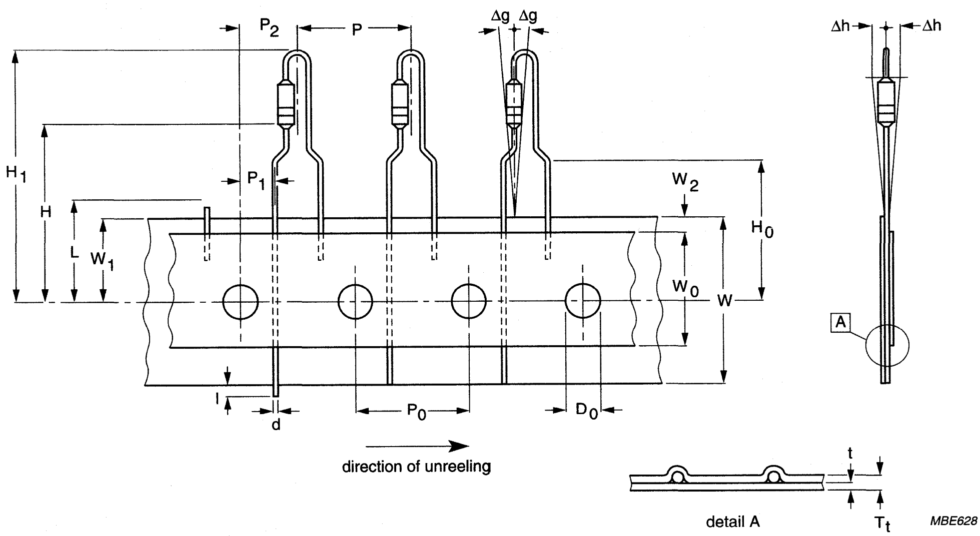
Table 8 SOD64 with preformed leads

PITCH	SYMBOL A (mm)	SYMBOL B (mm)	SYMBOL C (mm)	FIGURE	ORDERING CODE SUFFIX
6e	15.24 ±1	10.0 ±1	5.0 ±1	12	/20
6e	15.24 ±1	5.5 ±0.5	–	13	/21
6e	15.24 ±1	8.0 ±1	3.0 +1/–0	12	/22
7e	17.8 ±1	10.0 ±1	5.0 ±1	12	/30
7e	17.8 ±1	10.0 ±1	3.0 +1/–0	12	/31
7e	17.5 ±0.3	7.0 ±0.5	5.0 ±0.5	12	/33
8e	20.32 ±1	10.0 ±1	5.0 ±1	12	/40
8e	20.32 ±1	15.0 ±1	–	13	/41
10e	25.4 ±1	7.0 ±1	5.0 ±1	12	/50

Radial diodes

Radial diodes (diodes with unidirectional leads) are available on tape according to IEC 286-2. They are most suitable for use on automatic insertion machines, and are supplied on reels. The specification below only applies to radial diodes in SOD27 (DO-35) and SOD68 (DO-34) packages. They are available in anode-leading ('+'-ve leading, see Fig.16) and cathode-leading ('–'-ve leading, see Fig.17) configurations.

TAPE SPECIFICATION

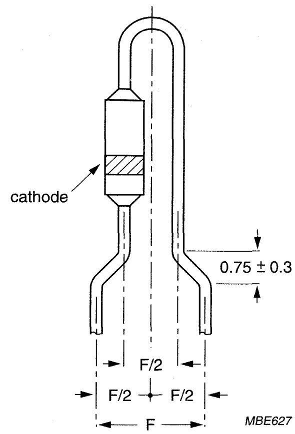


For dimensions see Table 9.
Cumulative space ΣP_0 over 20 spaces is ±1 mm.

Fig.14 Tape specification for radial diodes.

Table 9 Tape dimensions for radial diodes (see Figures 14 and 15)

SYMBOL	VALUE	TOLERANCE	UNIT
F	5.08	+0.6/–0.1	mm
H_1	27.5	max.	mm
H	19	±1	mm
H_0	16	±0.5	mm
L	11	max.	mm
I	0	max.	mm
P	12.7	±1	mm
P_2	6.35	±1	mm
P_1	3.81	±0.7	mm
P_0	12.7	±0.3	mm
T_t	1.5	max.	mm
t	0.7	±0.2	mm
D_0	4	±0.2	mm
W_2	0	+1.5	mm
W_0	3.5	min.	mm
W_1	9	±0.5	mm
W	18	+1.0/–0.5	mm
Δg	0	+5	deg
Δh	0	±2	mm



For dimensions see Table 9.

Fig.15 Detail of component shape.

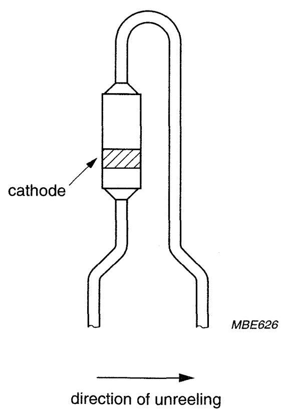


Fig.16 Anode-leading configuration.

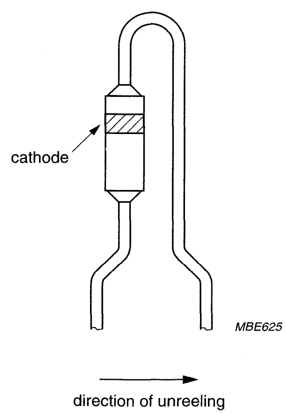
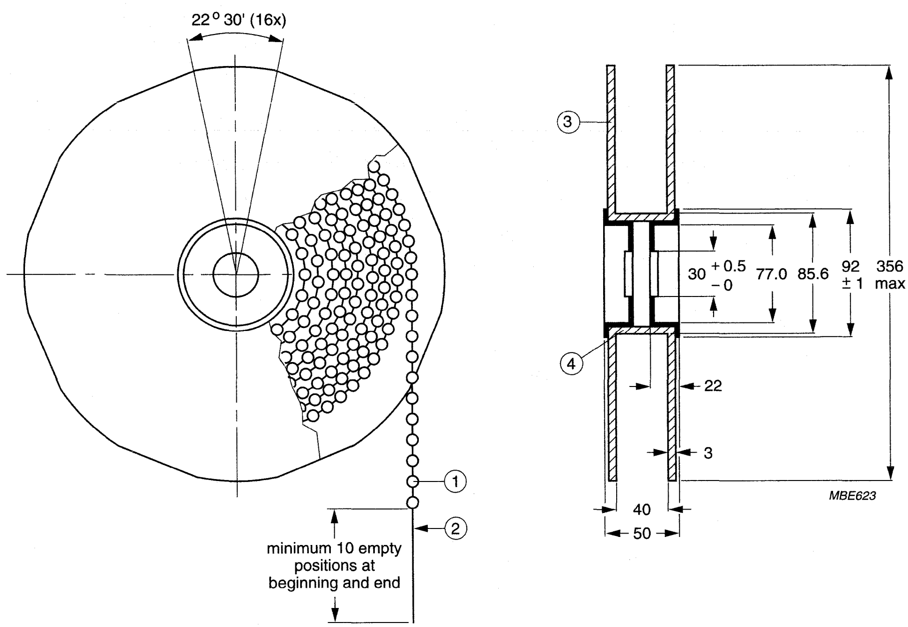


Fig.17 Cathode-leading configuration.

REEL SPECIFICATION



Dimensions in mm.

(1) Diode.

(2) Tape.

(3) Flange.

(4) Cylinder.

Fig.18 Reel specification for radial diodes.

Packing quantities

Table 10 Packing quantities per package with relevant ordering code

PACKAGE	PACKING QUANTITY	ORDERING CODE ENDING	KIND OF PACKING	REEL DIAM. or BOX SIZE (mm/inch)	REMARKS
SOD27 (DO-35)	10000	113	53 mm tape and reel	356/14	
	5000	116	37 mm radial tape and reel	356/14	+ leading
	10000	133	53 mm tape, ammopack	263 × 73 × 122	
	5000	136	37 mm radial, tape and reel	356/14	– leading
	5000	143	26 mm tape, ammopack	263 × 47 × 72	
	1000	153	53 mm tape, ammopack	138 × 73 × 29	small quantities
SOD57	5000	113	53 mm tape and reel	356/14	
	2500	133	53 mm tape, ammopack	263 × 73 × 87	
SOD61	5000	113	58 mm tape and reel	356/14	
	500	153	58 mm tape, blister	304 × 118 × 65	small quantities
SOD64	1500	112	bulk	304 × 118 × 65	preformed leads
	4000	113	53 mm tape and reel	356/14	
	2000	133	53 mm tape, ammopack	263 × 73 × 87	
SOD66 (DO-41)	5000	113	53 mm tape and reel	356/14	
	5000	133	53 mm tape, ammopack	263 × 73 × 122	
	500	153	53 mm tape, ammopack	138 × 73 × 29	small quantities
SOD68 (DO-34)	10000	113	53 mm tape and reel	356/14	
	5000	116	37 mm radial, tape and reel	356/14	+ leading
	10000	133	53 mm tape, ammopack	263 × 73 × 102	
	5000	136	37 mm radial, tape and reel	356/14	– leading
	5000	143	26 mm tape, ammopack	263 × 47 × 59	
	1000	153	53 mm tape, ammopack	138×73×29	small quantities
SOD81	5000	113	53 mm tape and reel	356/14	
	5000	133	53 mm tape, ammopack	263 × 73 × 87	
	5000	143	26 mm tape, ammopack	263 × 47 × 87	
SOD83A	2000	113	58 mm tape and reel	356/14	
	500	153	58 mm tape, blister	304 × 118 × 65	small quantities
SOD88A	5000	113	58 mm tape and reel	356/14	
	500	153	58 mm tape, blister	304 × 118 × 65	small quantities
SOD91	10000	113	53 mm tape and reel	356/14	
	10000	133	53 mm tape, ammopack	263 × 73 × 102	
	5000	143	26 mm tape, ammopack	263 × 47 × 72	
SOT18/15	5000	112	bulk, 1000 pieces per bag	not applicable	BAV45 only

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