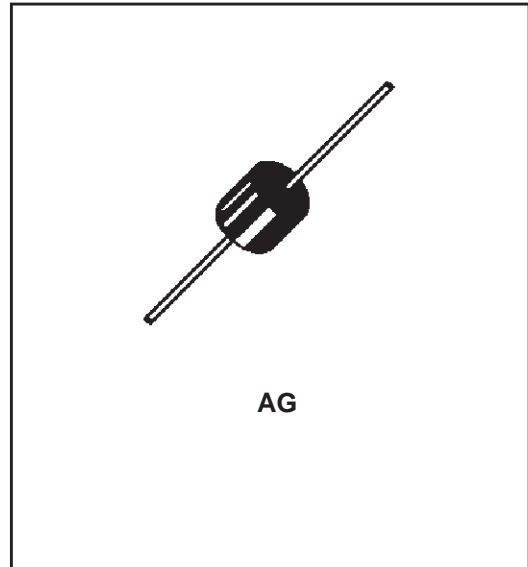


**FEATURES**

- PEAK PULSE POWER : 5000 W (10/1000µs)
- STAND-OFF VOLTAGE RANGE :  
From 10V to 180V
- UNI AND BIDIRECTIONAL TYPES
- LOW CLAMPING FACTOR
- FAST RESPONSE TIME
- UL RECOGNIZED

**DESCRIPTION**

Transil diodes provide high overvoltage protection by clamping action. Their instantaneous response to transient overvoltages makes them particularly suited to protect voltage sensitive devices such as MOS Technology and low voltage supplied IC's.



**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25^{\circ}\text{C}$ )

Symbol	Parameter		Value	Unit
$P_{PP}$	Peak pulse power dissipation (see note 1)	$T_j \text{ initial} = T_{amb}$	5000	W
$P$	Power dissipation on infinite heatsink	$T_{amb} = 75^{\circ}\text{C}$	6.5	W
$I_{FSM}$	Non repetitive surge peak forward current for unidirectional types	$t_p = 10\text{ms}$ $T_j \text{ initial} = T_{amb}$	500	A
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature		- 65 to + 175 175	$^{\circ}\text{C}$ $^{\circ}\text{C}$
$T_L$	Maximum lead temperature for soldering during 10s at 5mm from case		230	$^{\circ}\text{C}$

**Note 1 :** For a surge greater than the maximum values, the diode will fail in short-circuit.

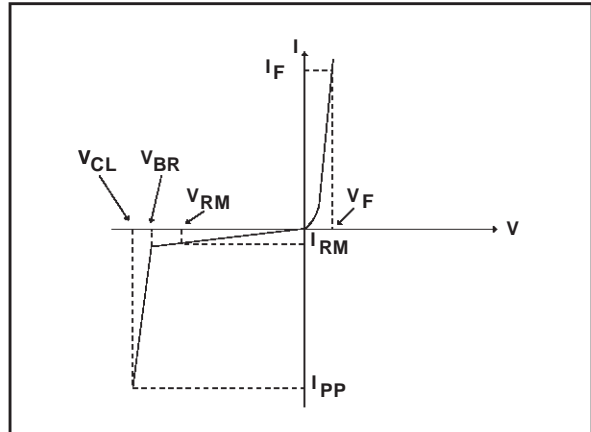
**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to leads		15	$^{\circ}\text{C/W}$
$R_{th(j-a)}$	Junction to ambient on printed circuit.	$L_{lead} = 10\text{mm}$	65	$^{\circ}\text{C/W}$

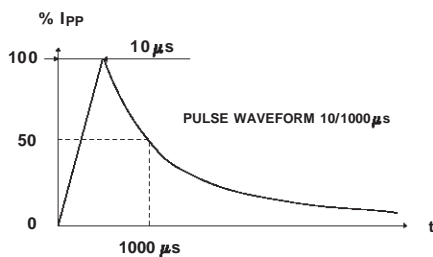
# BZW50-10,B/180,B

## ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25°C)

Symbol	Parameter
V <sub>RM</sub>	Stand-off voltage
V <sub>BR</sub>	Breakdown voltage
V <sub>CL</sub>	Clamping voltage
I <sub>RM</sub>	Leakage current @ V <sub>RM</sub>
I <sub>PP</sub>	Peak pulse current
αT	Voltage temperature coefficient
V <sub>F</sub>	Forward voltage drop



Types		I <sub>RM</sub> @ V <sub>RM</sub> max		V <sub>BR</sub> @ I <sub>R</sub> min note2		V <sub>CL</sub> @ I <sub>PP</sub> max 10/1000μs		V <sub>CL</sub> @ I <sub>PP</sub> max 8/20μs		αT max note3	C typ note4
Unidirectional	Bidirectional	μA	V	V	mA	V	A	V	A	10 <sup>-4</sup> /°C	pF
BZW50-10	BZW50-10B	5	10	11.1	1	18.8	266	23.4	2564	7.8	24000
BZW50-12	BZW50-12B	5	12	13.3	1	22	227	28	2143	8.4	18500
BZW50-15	BZW50-15B	5	15	16.6	1	26.9	186	35	1714	8.8	13500
BZW50-18	BZW50-18B	5	18	20	1	32.2	155	41.5	1446	9.2	11500
BZW50-22	BZW50-22B	5	22	24.4	1	39.4	127	51	1177	9.6	8500
BZW50-27	BZW50-27B	5	27	30	1	48.3	103	62	968	9.8	7000
BZW50-33	BZW50-33B	5	33	36.6	1	59	85	76	789	10	5750
BZW50-39	BZW50-39B	5	39	43.3	1	69.4	72	90	667	10.1	4800
BZW50-47	BZW50-47B	5	47	52	1	83.2	60.1	108	556	10.3	4100
BZW50-56	BZW50-56B	5	56	62.2	1	99.6	50	129	465	10.4	3400
BZW50-68	BZW50-68B	5	68	75.6	1	121	41	157	382	10.5	3000
BZW50-82	BZW50-82B	5	82	91	1	145	34	189	317	10.6	2600
BZW50-100	BZW50-100B	5	100	111	1	179	28	228	263	10.7	2300
BZW50-120	BZW50-120B	5	120	133	1	215	23	274	219	10.8	1900
BZW50-150	BZW50-150B	5	150	166	1	269	19	343	175	10.8	1700
BZW50-180	BZW50-180B	5	180	200	1	322	16	410	146	10.8	1500



**Note 2 :** Pulse test: t<sub>p</sub> < 50 ms.

**Note 3 :** ΔV<sub>BR</sub> = αT \* (T<sub>amb</sub> - 25) \* V<sub>BR</sub>(25°C)

**Note 4 :** V<sub>R</sub> = 0 V, F = 1 MHz. For bidirectional types, capacitance value is divided by 2.

**Fig. 1:** Peak pulse power dissipation versus initial junction temperature (printed circuit board).

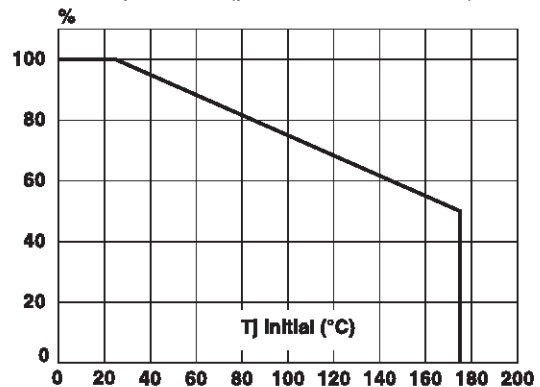


Fig. 2 : Peak pulse power versus exponential pulse duration.

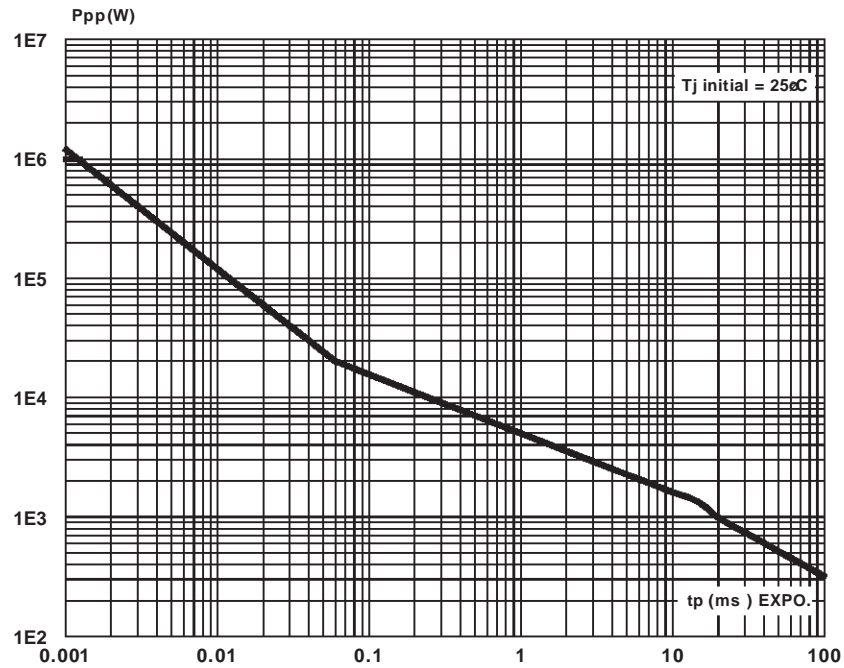
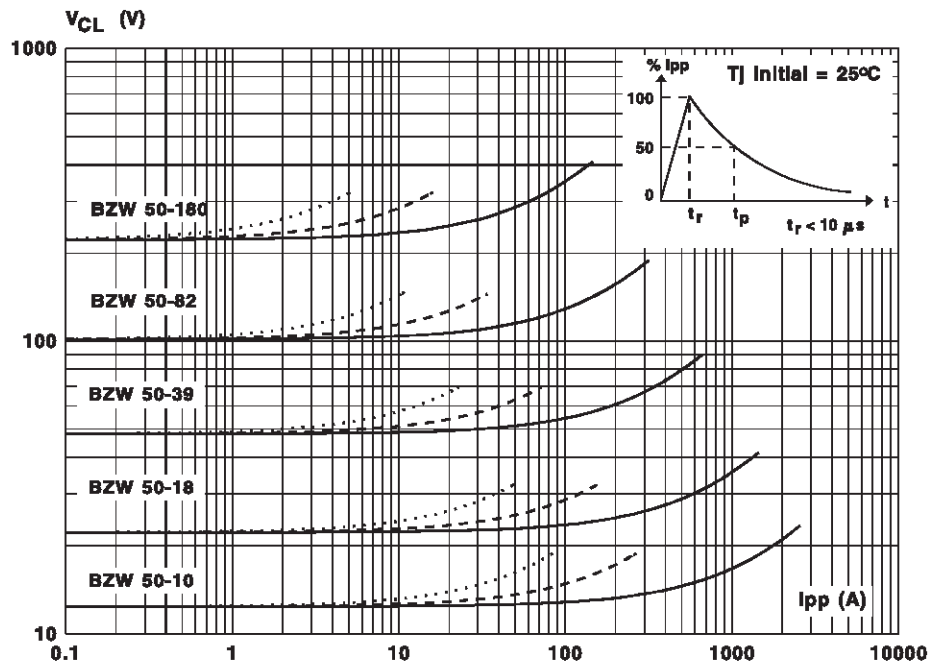


Fig. 3 : Clamping voltage versus peak pulse current.  
 Exponential waveform  $t_p = 20 \mu s$  \_\_\_\_\_  
 $t_p = 1 ms$  - - - - -  
 $t_p = 10 ms$  .....  
 $t_r < 10 \mu s$



**Note :** The curves of the figure 3 are specified for a junction temperature of 25 °C before surge.  
 The given results may be extrapolated for other junction temperatures by using the following formula :  
 $\Delta V_{BR} = \alpha T \cdot (T_{amb} - 25) \cdot V_{BR} (25^\circ C)$ .  
 For intermediate voltages, extrapolate the given results.

## BZW50-10,B/180,B

Fig. 4a : Capacitance versus reverse applied voltage for unidirectional types (typical values).

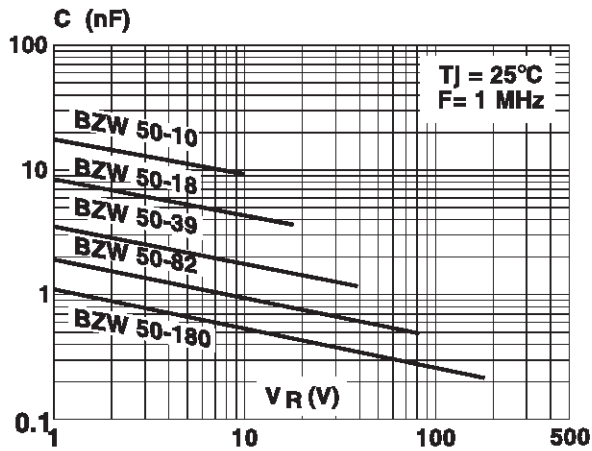


Fig. 4b : Capacitance versus reverse applied voltage for bidirectional types (typical values).

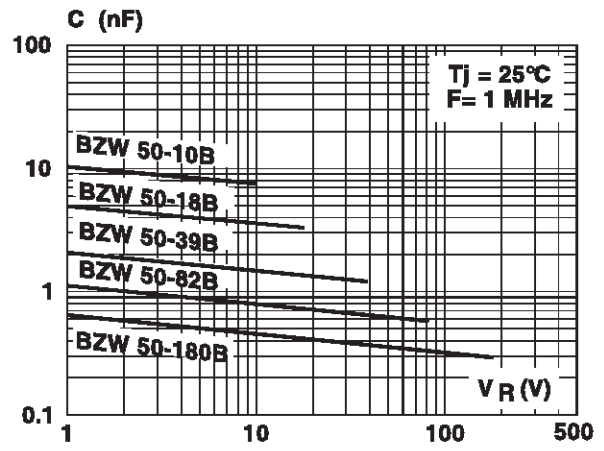


Fig. 5 : Peak forward voltage drop versus peak forward current (typical values for unidirectional types).

Note : Multiply by 2 for units with  $V_{BR} > 220V$ .

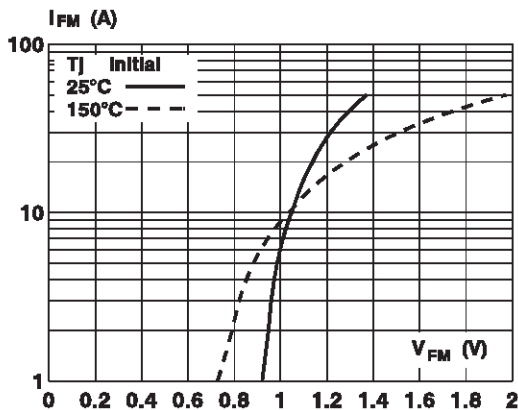


Fig. 6 : Transient thermal impedance junction-ambient versus pulse duration (For FR4 PC Board with  $L_{lead} = 10mm$ ).

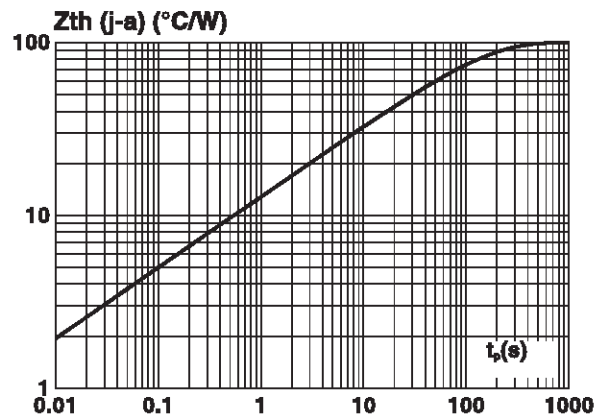
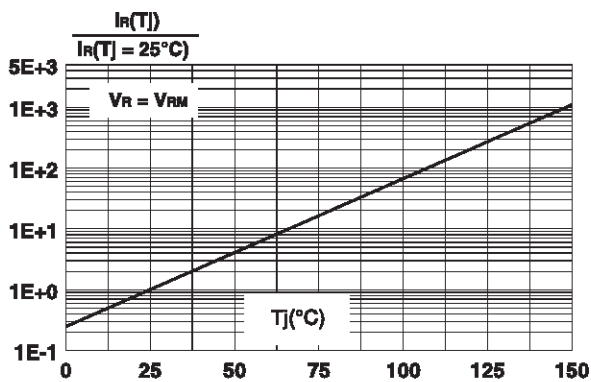
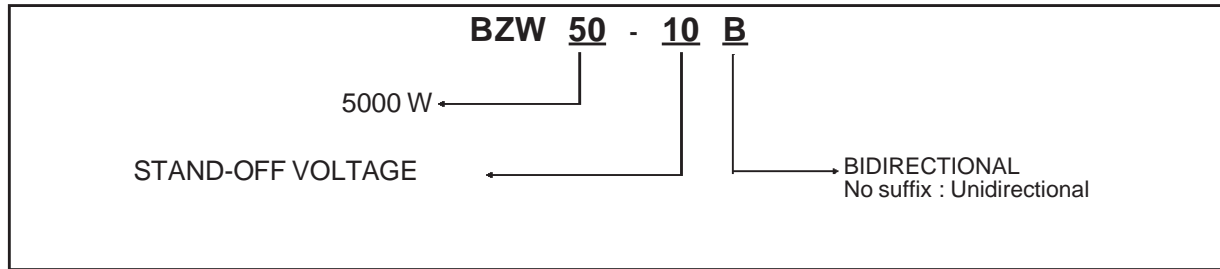


Fig. 7 : Relative variation of leakage current versus junction temperature.



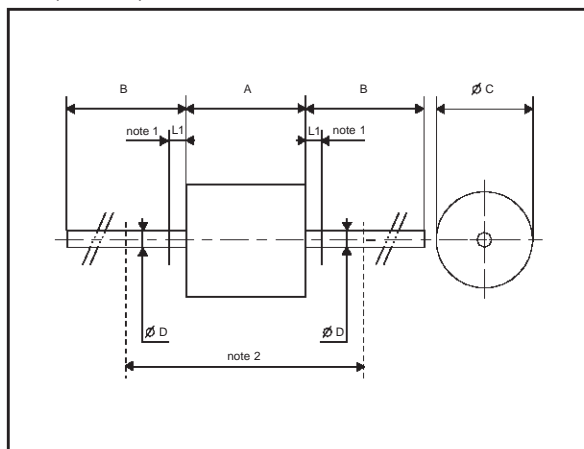
**ORDER CODE**



**MARKING** : Logo, Date Code, Type Code, Cathode Band (for unidirectional types only).

**PACKAGE MECHANICAL DATA**

AG (Plastic)



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		9		0.354
B	20		0.787	
Ø C		8		0.315
Ø D	1.35	1.45	0.053	0.057
L1		1.27		0.050
Note 1 : The lead is not controlled within zone L1				
Note 2 : The minimum axial length within which the device can be bent at right angles is 0.79" (20 mm).				

**Packaging** : standard packaging is tape and reel.

**Weight** = 1.6 g.

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1998 SGS-THOMSON Microelectronics - Printed in Italy - All rights reserved.

SGS-THOMSON Microelectronics GROUP OF COMPANIES  
 Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Morocco  
 The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.