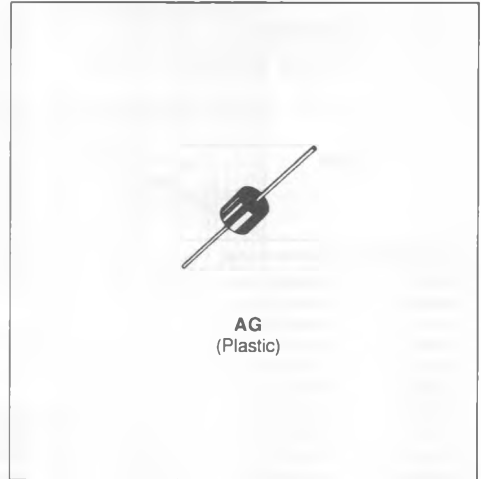


## UNI-AND BIDIRECTIONAL TRANSIENT VOLTAGE SUPPRESSORS

- HIGH SURGE CAPABILITY :  
5 kW / 1 ms EXPO
- VERY FAST CLAMPING TIME :  
1 ps FOR UNIDIRECTIONAL TYPES  
5 ns FOR BIDIRECTIONAL TYPES
- LARGE VOLTAGE RANGE :  
10 V → 180 V
- ORDER CODE :  
TYPE NUMBER FOR UNIDIRECTIONAL  
TYPES, TYPE NUMBER + SUFFIX B FOR  
BIDIRECTIONAL TYPES



### DESCRIPTION

Transient voltage suppressor diodes especially useful in protecting integrated circuits, MOS, hybrids and other voltage-sensitive semiconductors and components.

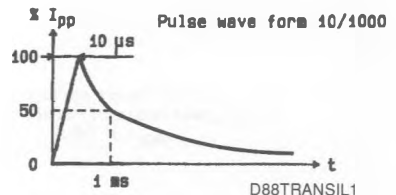
### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$P_p$	Peak Pulse Power for 1 ms Exponential Pulse	$T_j$ Initial = 25 °C See note 1	5	kW
$P$	Power Dissipation on Infinite Heatsink	$T_{amb} = 75$ °C	5	W
$I_{FSM}$	Non Repetitive Surge Peak Forward Current for Unidirectional Types	$T_j$ Initial = 25 °C $t = 10$ ms	500	A
$T_{stg}$ $T_j$	Storage and Operating Junction Temperature Range		- 65 to 150 150	°C °C
$T_L$	Maximum Lead Temperature for Soldering During 10 s at 4 mm from Case		230	°C

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction-leads on Infinite Heatsink for $L_{lead} = 10$ mm	15	°C/W

**Note :** 1. For surges upper than the maximum values, the diode will present a short-circuit anode-cathode.



**ELECTRICAL CHARACTERISTICS** ( $T_J = 25\text{ }^\circ\text{C}$ )

Symbol	Parameter	Value	
$V_{RM}$	Stand-off Voltage	See tables	
$V_{(BR)}$	Breakdown Voltage		
$V_{(CL)}$	Clamping Voltage		
$I_{PP}$	Peak Pulse Current		
$\alpha_T$	Temperature Coefficient of $V_{(BR)}$		
C	Capacitance		
$t_{clamping}$	Clamping Time (0 volt to $V_{(BR)}$ )	Unidirectional Types	1 ps max.
		Bidirectional Types	5 ns max.

Types		$I_{RM}$ @ $V_{RM}$ max.		$V_{(BR)}^*$ @ $I_R$ (V)				$V_{(CL)}$ @ $I_{PP}$ max.		$V_{(CL)}$ @ $I_{PP}$ max.		$\alpha_T$ max.	$C^{**}$ typ. $V_R=0$ $f=1\text{ MHz}$
Unidirectional	Bidirectional	( $\mu\text{A}$ )	(V)	min.	nom.	max.	(mA)	(V)	(A)	(V)	(A)	( $10^{-4}/^\circ\text{C}$ )	(pF)
BZW50-10	BZW50-10B	5	10	11.1	12.4	13.6	1	18.8	266	23.4	2564	7.8	24000
BZW50-12	BZW50-12B	5	12	13.3	14.8	16.3	1	22	227	28	2143	8.4	18500
BZW50-15	BZW50-15B	5	15	16.6	18.5	20.4	1	26.9	186	35	1714	8.8	13500
BZW50-18	BZW50-18B	5	18	20	22.2	24.4	1	32.2	155	41.5	1446	9.2	11500
BZW50-22	BZW50-22B	5	22	24.4	27.1	29.8	1	39.4	127	51	1177	9.6	8500
BZW50-27	BZW50-27B	5	27	30	33.3	36.6	1	48.3	103	62	968	9.8	7000
BZW50-33	BZW50-33B	5	33	36.6	40.7	44.7	1	59	85	76	789	10	5750
BZW50-39	BZW50-39B	5	39	43.3	48.1	53	1	69.4	72	90	667	10.1	4800
BZW50-47	BZW50-47B	5	47	52	57.8	63.6	1	83.2	60.1	108	556	10.3	4100
BZW50-56	BZW50-56B	5	56	62.2	69.1	76	1	99.6	50	129	465	10.4	3400
BZW50-68	BZW50-68B	5	68	75.6	84	92.4	1	121	41	157	382	10.5	3000
BZW50-82	BZW50-82B	5	82	91	101.2	111	1	145	34	189	317	10.6	2600
BZW50-100	BZW50-100B	5	100	111	123.5	136	1	179	28	228	263	10.7	2300
BZW50-120	BZW50-120B	5	120	133	148.1	163	1	215	23	274	219	10.8	1900
BZW50-150	BZW50-150B	5	150	166	185.2	204	1	269	19	343	175	10.8	1700
BZW50-180	BZW50-180B	5	180	200	222	244	1	322	16	410	146	10.8	1500

\* Pulse test  $t_p \leq 50\text{ ms}$   $\delta < 2\%$ .

\*\* Divide these values by 2 for bidirectional types.

For bidirectional types, electrical characteristics apply in both directions.

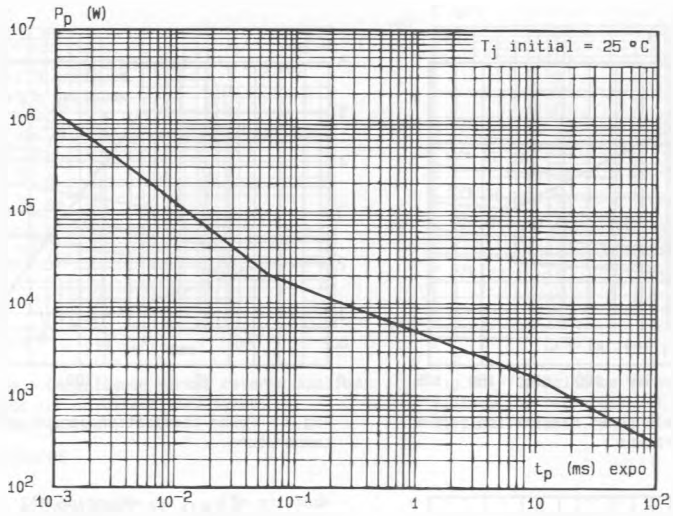


Fig.1 - Peak pulse power versus exponential pulse duration.

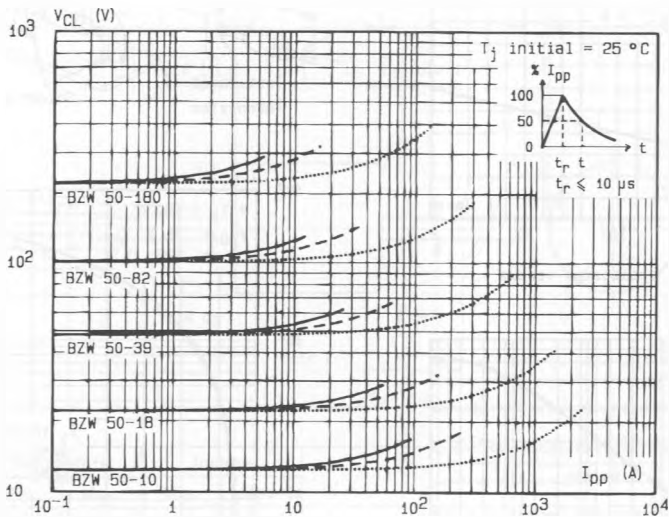


Fig.2 - Clamping voltage versus peak pulse current.  
 exponential waveform  $t = 20 \mu s$  ·  
 $t = 1 ms$  - - - -  
 $t = 10 ms$  ———

Note : The curves of the figure 2 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 :  $\Delta V (BR) = \alpha T (V (BR)) \times [T_j - 25] \times V (BR)$   
 For intermediate voltages, extrapolate the given results.

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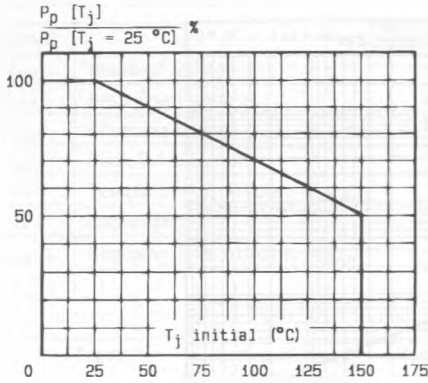


Fig. 3 - Allowable power dissipation versus junction temperature.

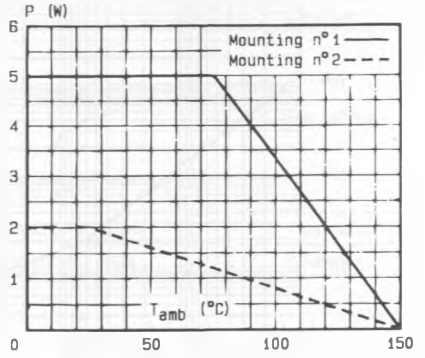


Fig. 4 - Power dissipation versus ambient temperature.

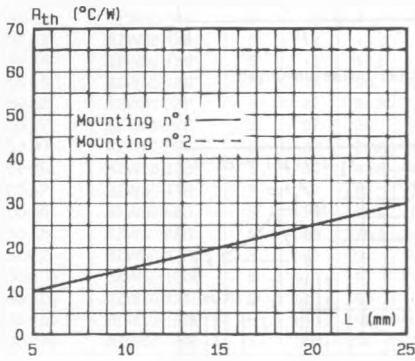


Fig. 5 - Thermal resistance versus lead length.

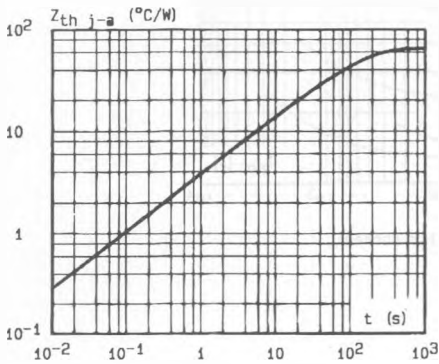


Fig. 6 - Transient thermal impedance junction-ambient for mounting n°2 versus pulse duration (L = 10 mm).

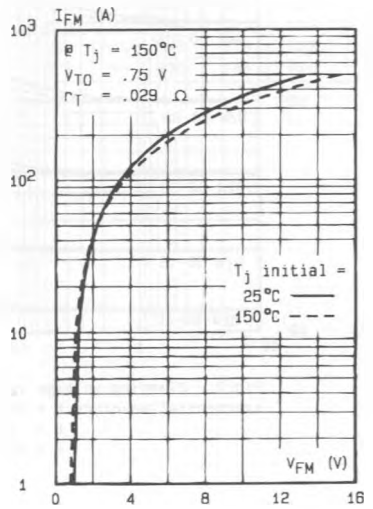
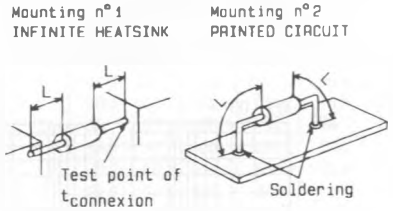


Fig. 7 - Peak forward current versus peak forward voltage drop (typical values for unidirectional types).

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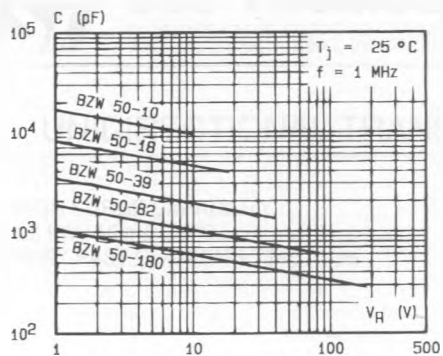


Fig.8a - Capacitance versus reverse applied voltage for unidirectional types (typical values).

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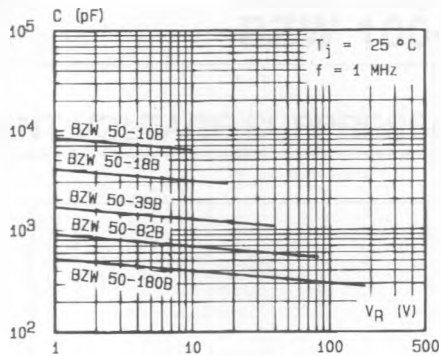
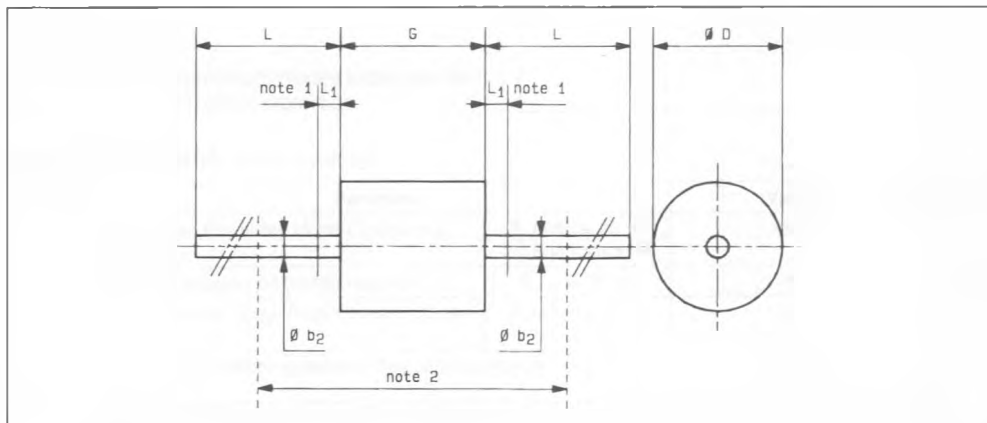


Fig.8b - Capacitance versus reverse applied voltage for bidirectional types (typical values).

**PACKAGE MECHANICAL DATA**

AG Plastic



Ref.	Millimeters		Inches		Notes
	Min.	Max.	Min.	Max.	
$\varnothing b_2$	1.35	1.45	0.053	0.057	1 - The lead diameter $\varnothing b_2$ is not controlled over zone $L_1$ . 2 - The minimum axial length within which the device may be placed with its leads bent at right angles is 0.79" (20 mm).
$\varnothing D$	-	8	-	0.315	
G	-	9	-	0.354	
L	20	-	0.787	-	
$L_1$	-	1.27	-	0.050	

Cooling method : by convection (method A).

Marking : type number ; white band indicates cathode for unidirectional types.

Weight : 1 g.