

UNI-AND BIDIRECTIONAL TRANSIENT VOLTAGE SUPPRESSORS

- HIGH SURGE CAPABILITY :
700 W / 1 ms EXPO
- VERY FAST CLAMPING TIME :
1 ps FOR UNIDIRECTIONAL TYPES
5 ns FOR BIDIRECTIONAL TYPES
- LARGE VOLTAGE RANGE :
10 V → 110 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.

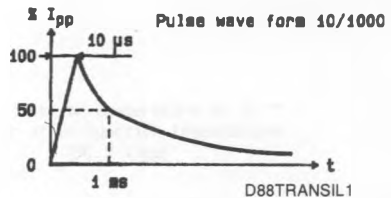
ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value	Unit
P_p	Peak Pulse Power for 1 ms Exponential Pulse	T_j Initial = 25 °C See note 1	700 W
P	Power Dissipation on Infinite Heatsink	$T_{amb} = 50$ °C	5 W
I_{FSM}	Non Repetitive Surge Peak Forward Current for Unidirectional Types	T_j Initial = 25 °C $t = 10$ ms	120 A
T_{stg} T_j	Storage and Operating Junction Temperature Range	- 55 to 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	20	°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		
α_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. 1 ms expo		$V_{(CL)}$ @ I_{pp} max. 8-20 μ s expo		α_T max.	C^{**} typ. $V_R=0$ f=1 MHz	
Unidirectional	Bidirectional	(μ A)	(V)	min.	nom.	max.	(mA)	(V)	(A)	(V)	(A)	($10^{-4}/^\circ\text{C}$)	(pF)
P7T-10	P7T-10B	5	10	13	18	20	5	25	30	32	265	8.4	2600
P7T-27	P7T-27B	5	27	29.6	36	43.5	5	53	13	68	125	9.6	1100
P7T-43	P7T-43B	5	43	50	62	75	5	90	8	115	74	10.3	620
P7T-110	P7T-110B	5	110	130	160	200	5	235	3	300	28	10.8	370

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

** Divide these values by 2 for bidirectional types.

For bidirectional types, electrical characteristics apply in both directions.

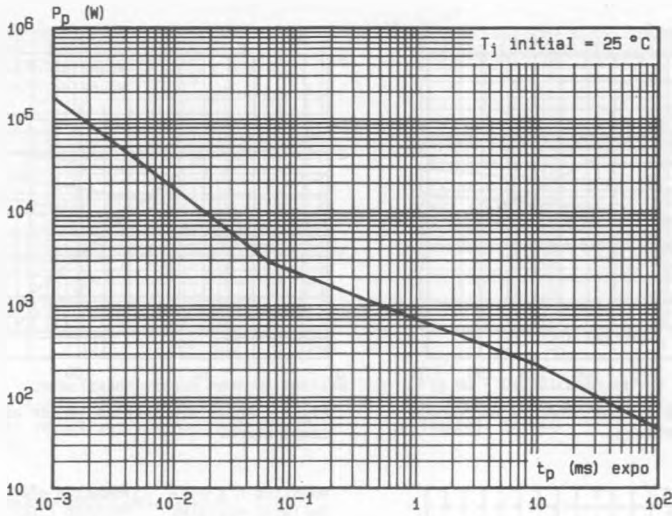


Fig.1 - Peak pulse power versus exponential pulse duration.

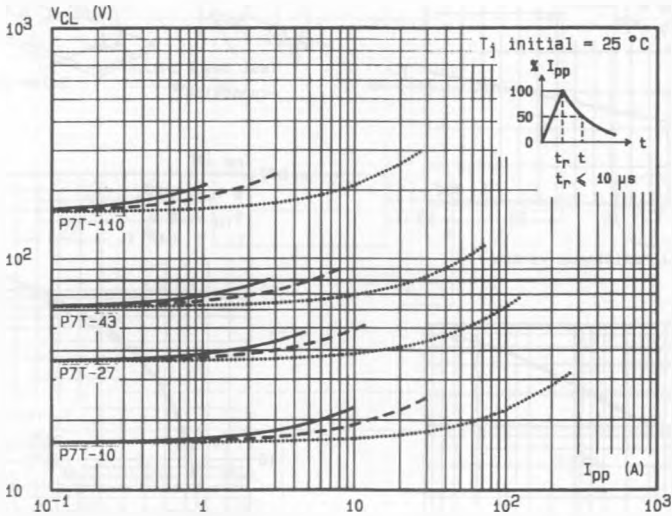


Fig.2 - Clamping voltage versus peak pulse current.
 exponential waveform $t = 20 \mu s$
 $t = 1 ms$ ----
 $t = 10 ms$ ———

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.

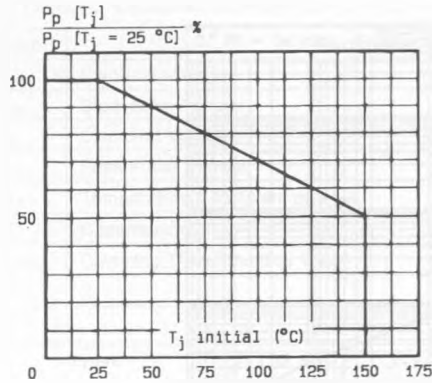


Fig. 3 - Allowable power dissipation versus junction temperature.

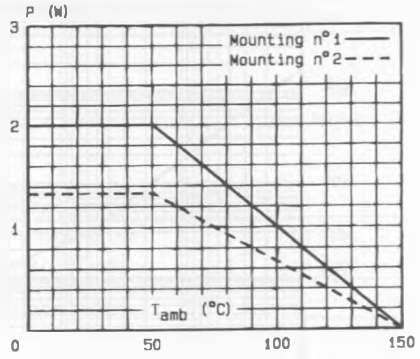


Fig. 4 - Power dissipation versus ambient temperature.

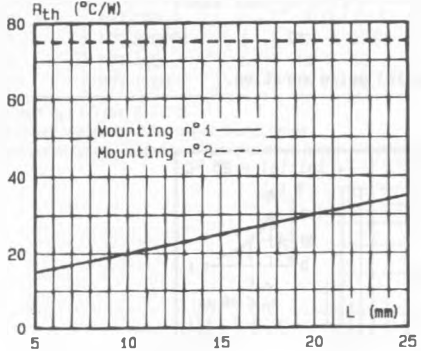


Fig. 5 - Thermal resistance versus lead length.

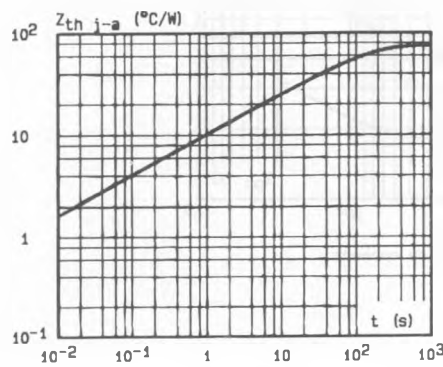
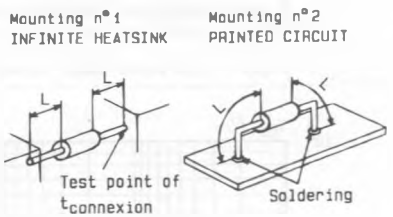


Fig. 6 - Transient thermal impedance junction-ambient for mounting n°2 versus pulse duration ($L = 10 \text{ mm}$).

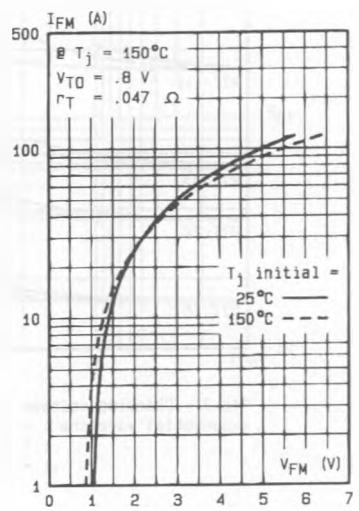


Fig. 7 - Peak forward current versus peak forward voltage drop (typical values for unidirectional types).

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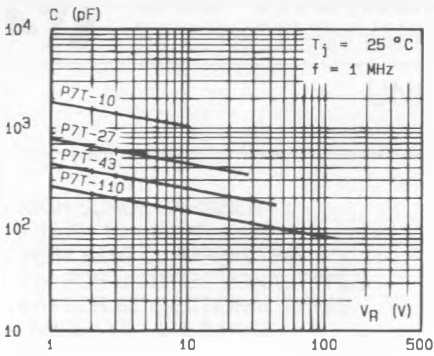


Fig.8a - Capacitance versus reverse applied voltage for unidirectional types (typical values).

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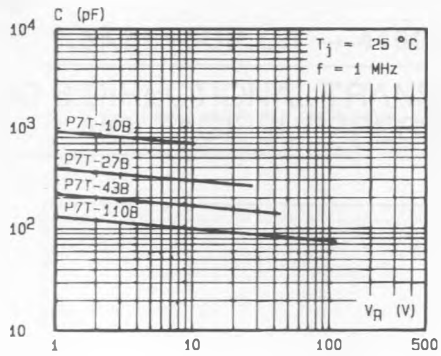
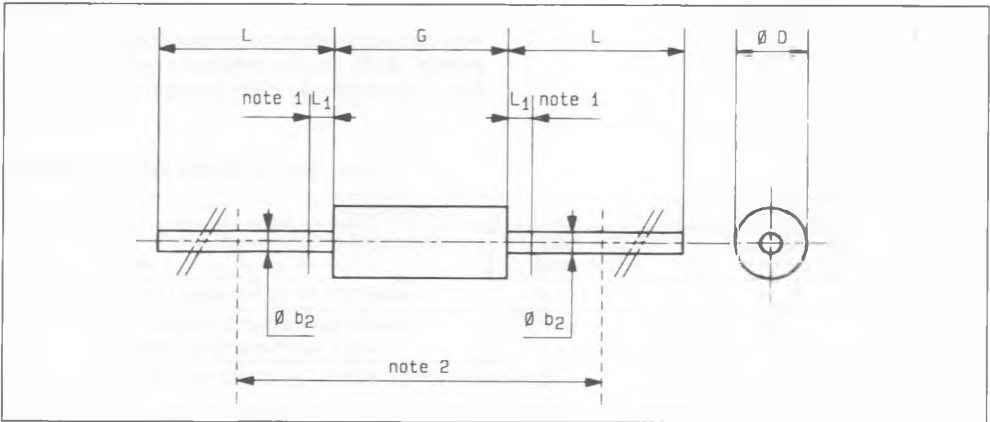


Fig.8b - Capacitance versus reverse applied voltage for bidirectional types (typical values).

PACKAGE MECHANICAL DATA

CB-417 Plastic



Ref.	Millimeters		Inches		Notes
	Min.	Max.	Min.	Max.	
Ø b ₂	-	1.092	-	0.043	1 - The lead diameter Ø b ₂ is not controlled over zone L ₁ .
Ø D	-	3.683	-	0.145	
G	-	8.89	-	0.350	2 - The minimum axial length within which the device may be placed with its leads bent at right angles is 0.59" (15 mm).
L	25.4	-	1.000	-	
L ₁	-	1.25	-	0.049	

Cooling method : by convection (method A).

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

Weight : 0.6 g