SGS-THOMSON MICROELECTRONICS

P7T-10, B → 110, B

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

CB-417
(Plastic)

DESCRIPTION

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

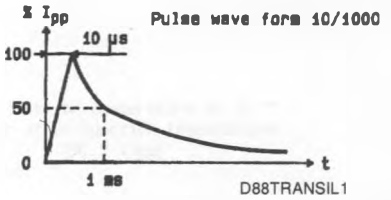
ABSOLUTE RATINGS (limiting values)

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 150 150	°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 °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 µs expo		α_T max.	C** typ. V_R=0 f=1 MHz
Unidirectional	Bidirectional	(µA)	(V)	min.	nom.	max.	(mA)	(V)	(A)	(V)	(A)	(10^{-4}/°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.

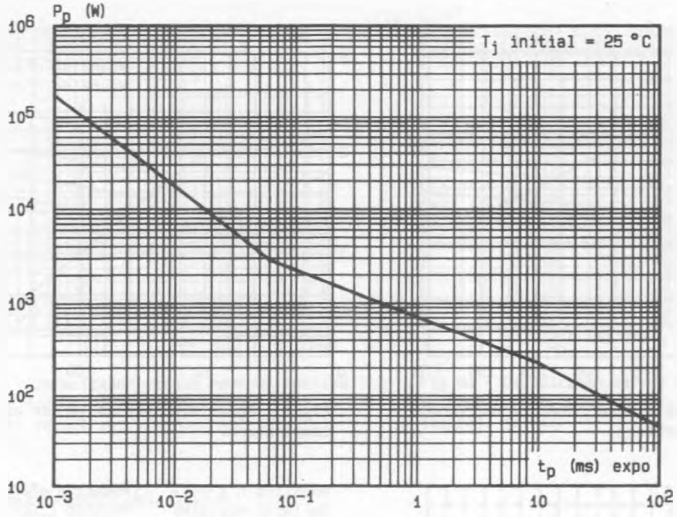


Fig.1 - Peak pulse power versus exponential pulse duration.

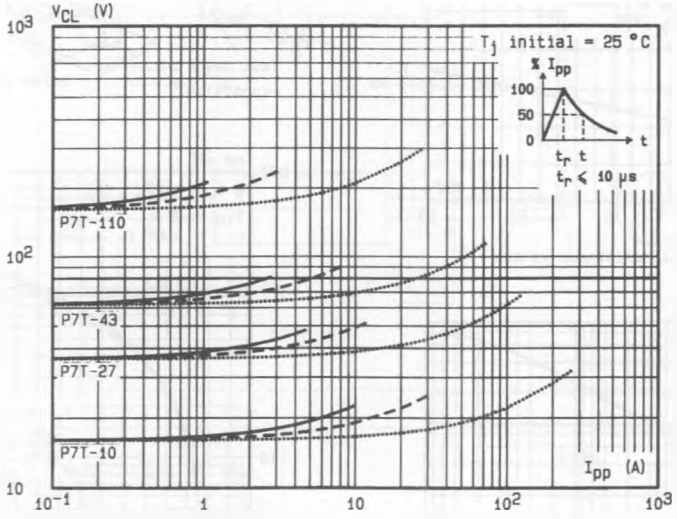


Fig.2 - Clamping voltage versus peak pulse current.
exponential waveform t = 20 µs ——
t = 1 ms – – –
t = 10 ms ——

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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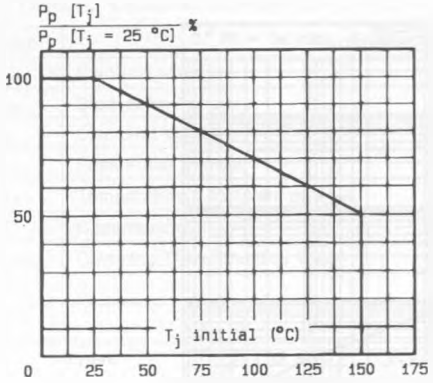


Fig.3 - Allowable power dissipation versus junction temperature.

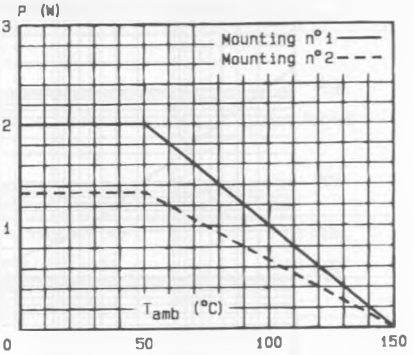


Fig.4 - Power dissipation versus ambient temperature.

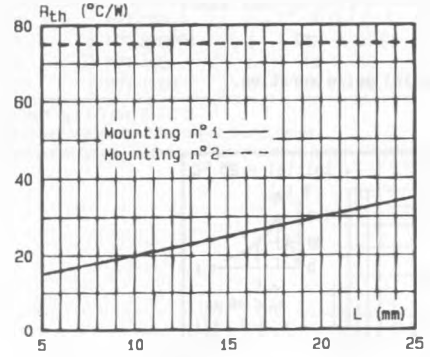
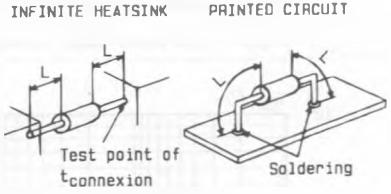


Fig.5 - Thermal resistance versus lead length.



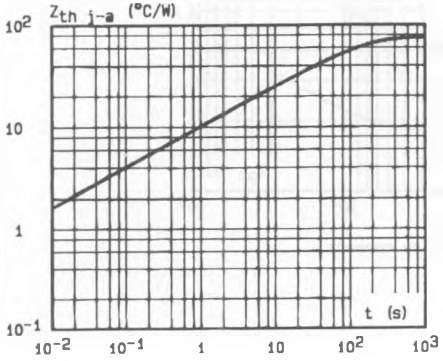


Fig.6 - Transient thermal impedance junction-ambient for mounting n°2 versus pulse duration (L = 10 mm).

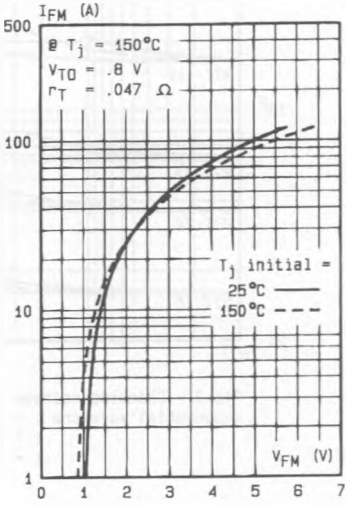


Fig.7 - Peak forward current versus peak forward voltage drop (typical values for unidirectional types).

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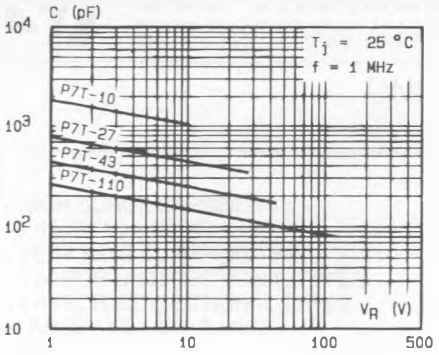

Fig.8a - Capacitance versus reverse applied voltage for unidirectional types (typical values).

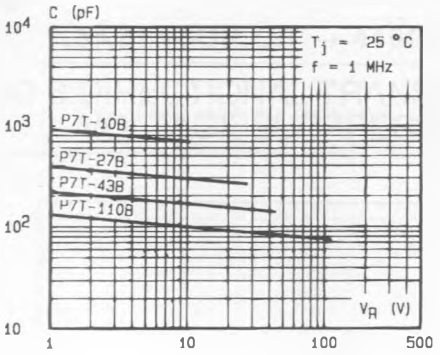

Fig.8b - Capacitance versus reverse applied voltage for bidirectional types (typical values).

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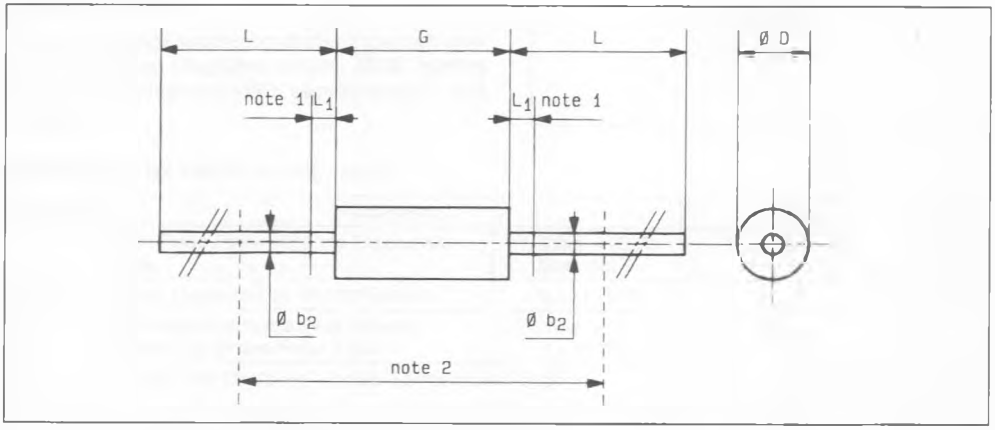
PACKAGE MECHANICAL DATA

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 lengh 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.