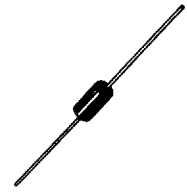
SGS-THOMSON MICROELECTRONICS

P7T-10,B/110,B

TRANSIL

FEATURES

- PEAK PULSE POWER= 700 W @ 1ms.
- STAND-OFF VOLTAGE RANGE : From 10 V to 110 V.
- UNI AND BIDIRECTIONAL TYPES.
- LOW CLAMPING FACTOR.
- FAST RESPONSE TIME: Tclamping : 1ps (0 V to VBR).



CB417
(Plastic)

DESCRIPTION

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

MECHANICAL CHARACTERISTICS

- Body marked with : Logo, Date Code, Type Code and Cathode Band (for unidirectional types only).
- Tinned copper leads.
- High temperature soldering.

ABSOLUTE RATINGS (limiting values)

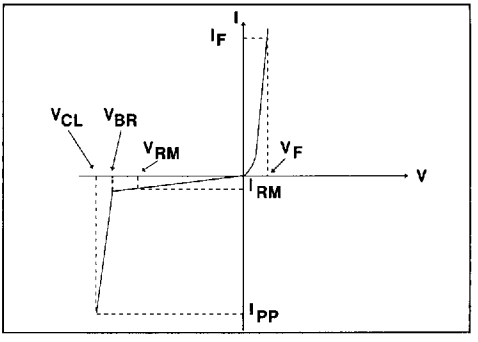
Symbol	Parameter		Value	Unit
P_p	Peak pulse power dissipation See note 1 and derating curve Fig 1.	Tamb = 25°C	700	W
P	Power dissipation on infinite heatsink See note 1 and derating curve Fig 1.	Tlead = 75°C	5	W
I_{FSM}	Non repetitive surge peak forward current For Unidirectional types.	Tamb = 25°C t =10 ms	120	A
T_{stg} T_j	Storage and junction temperature range		- 65 to + 175 175	°C °C
T_L	Maximum lead temperature for soldering during 10 s.		230	°C

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R_{th} (j-l)	Junction-leads on infinite heatsink	20	°C/W
R_{th} (j-a)	Junction to ambient. on printed circuit. L_{lead} = 10 mm	85	°C/W

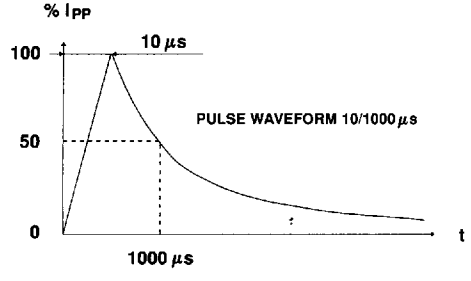
ELECTRICAL CHARACTERISTICS

Symbol	Parameter
V_{RM}	Stand-off voltage.
V_{BR}	Breakdown voltage.
V_{CL}	Clamping voltage.
I_{RM}	Leakage current @ VRM.
I_{PP}	Surge current.
αT	Voltage temperature coefficient.



TYPES		I_{RM} @ V_{RM} max		V_{BR} @ I_R min nom max note2				V_{CL} @ I_{PP} max 10/1000µs		V_{CL} @ I_{PP} max 8/20µs		αT max note3	C typ note4
Unidirectional	**Bidirectional**	**µA**	**V**	**V**	**V**	**V**	**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

All parameters tested at 25 °C, except where indicated.



Note 1 : For surges greater than the maximum values, the diode will present a short-circuit Anode - Cathode
Note 2 : Pulse test. T_P < 50 ms
Note 3 : $\Delta V_{BR} = \alpha T \cdot (Ta - 25) \cdot V_{BR(25°C)}$
Note 4 : VR = 0 V, F = 1 MHz. For bidirectional types, capacitance value is divided by 2

Figure 1: Power dissipation derating versus ambient temperature

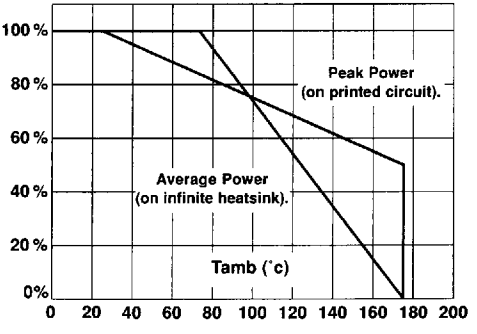


Figure 2 : Peak pulse power versus exponential pulse duration.

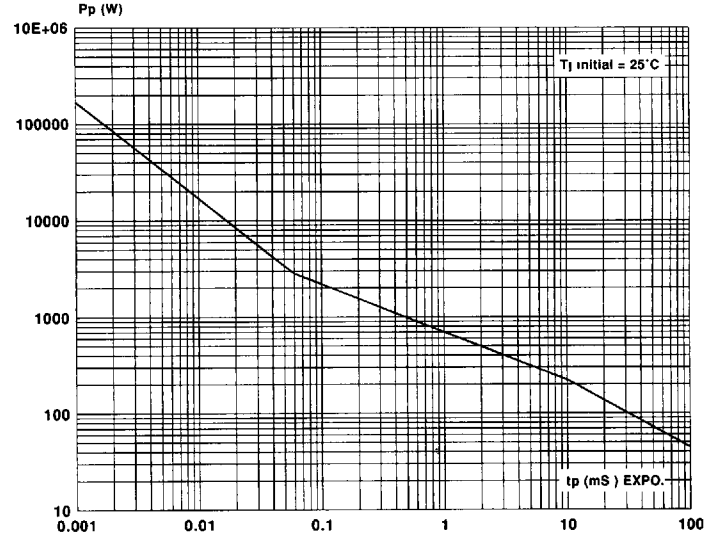
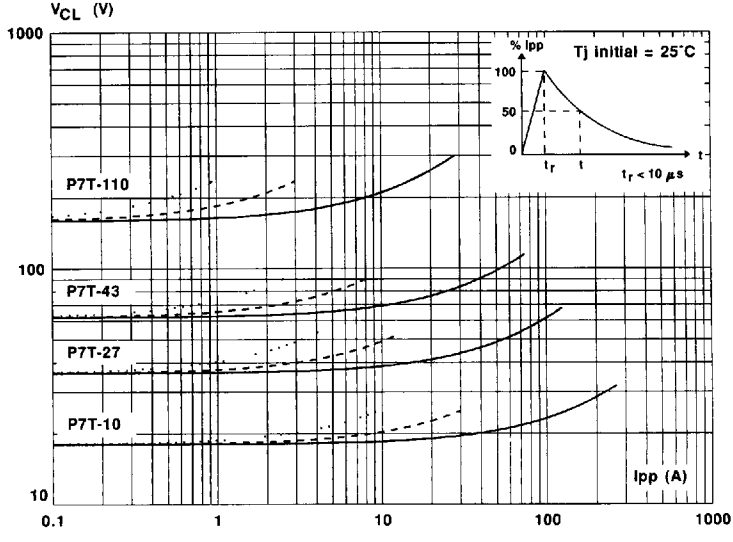


Figure 3 : Clamping voltage versus peak pulse current.
exponential waveform t = 20 µs _____
t = 1 ms ----------
t =10 ms .....



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 .
$\Delta V_{(BR)} = \alpha T_{(V(BR))} \cdot [T_a - 25] \cdot V_{(BR)}$
For intermediate voltages, extrapolate the given results

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

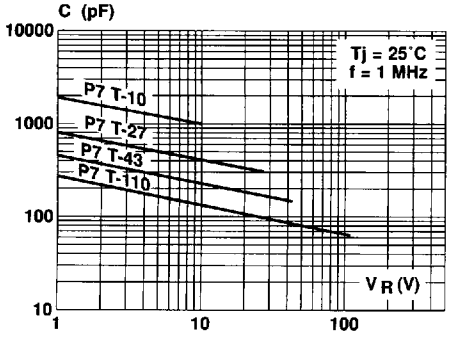


Figure 4b : Capacitance versus reverse applied voltage for bidirectional types (typical values)

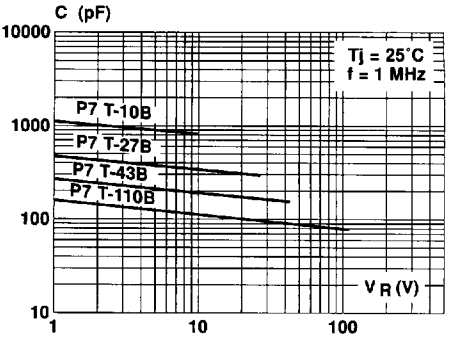


Figure 5 : Peak forward voltage drop versus peak forward current (typical values for unidirectional types).

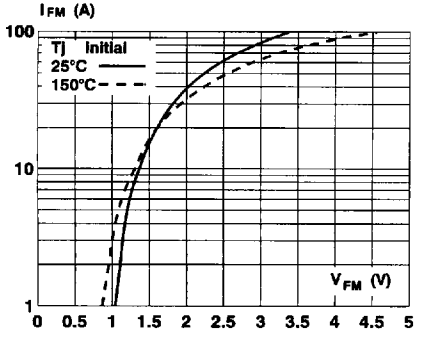
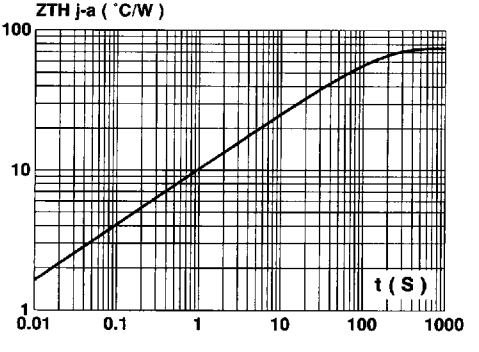
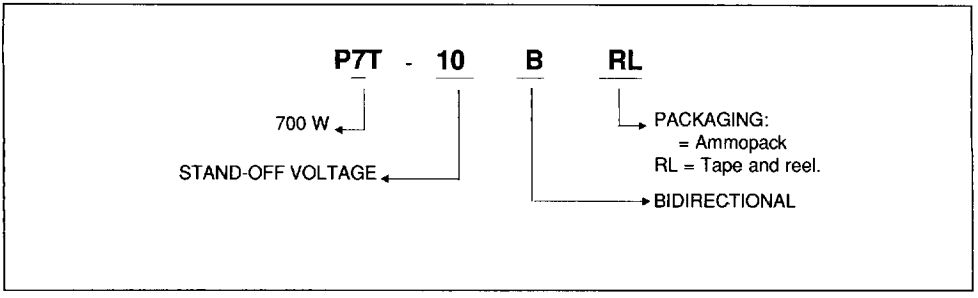


Figure 6 : Transient thermal impedance junction-ambient versus pulse duration. For a mounting on PC Board with L_{lead} = 10mm.



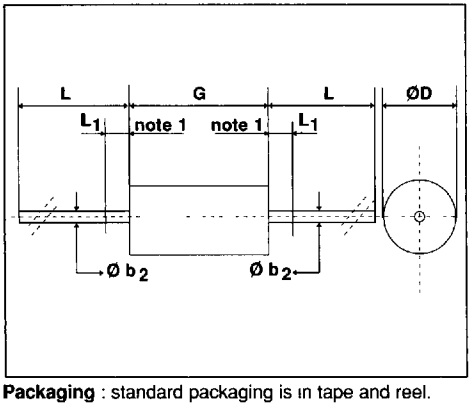
ORDER CODE



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

PACKAGE MECHANICAL DATA

CB417



Ref	Millimeters		Inches	
	min	max	min	max
Ø b_2	-	1.092	-	0.043
Ø D	-	3.683	-	0.145
G	-	8.89	-	0.350
L	25.4	-	1.000	-
L_1	-	1.25	-	0.049

note 1 : The diameter Ø b_2 is not controlled over zone L_1

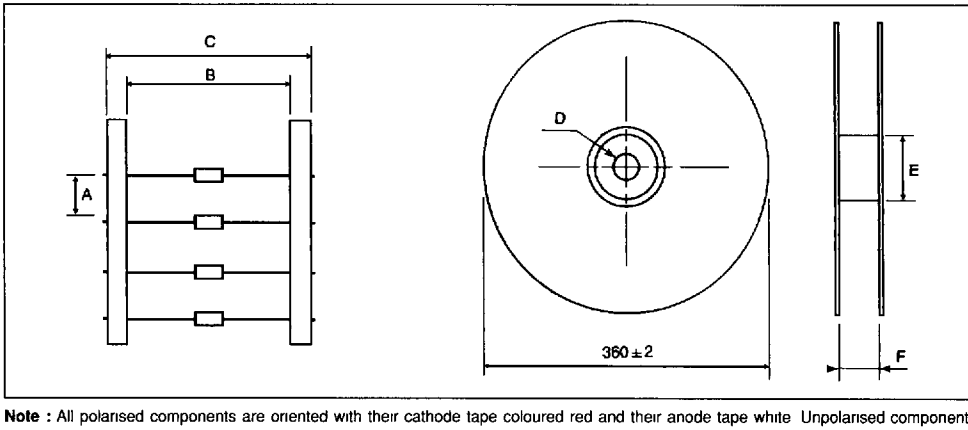
Weight = 0.65 g.

Packaging : standard packaging is in tape and reel.

TAPE AND REEL PACKAGING

Case	Base QTY	Component Spacing	Tape Spacing		Reel Dimensions		
		A	B	C	D	E	F
F126	6000	5 ± 0.5	53 ± 2	65 ± 2	31.5	86	75 min
CB417	5000	5 ± 0.5	53 ± 2	65 ± 2	31.5	86	75 min
CB429	1900	10 ± 0.5	53 ± 2	65 ± 2	31.5	86	75 min
DO13	1000	10 ± 0.5	53 ± 2	65 ± 2	31.5	86	81 min
AG	1000	10 ± 0.5	43 ± 2	55 ± 2	31.5	86	75 min

All dimensions are in millimetres

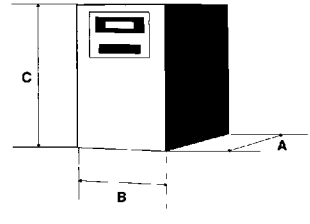


Note : All polarised components are oriented with their cathode tape coloured red and their anode tape white Unpolarised components have both tapes coloured red.

MATCHBOX PACKAGING

Case	Base QTY	Box Dimensions		
		A	B	C
DO13	100	149	62	80
AG	100	149	62	80

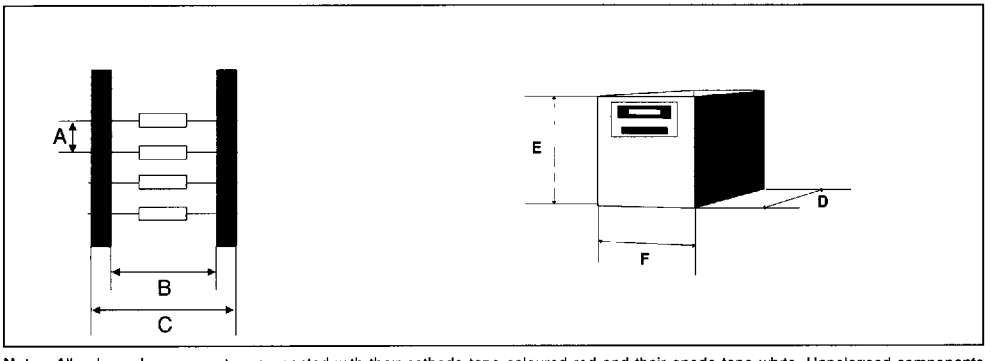
All dimensions are in millimetres



FAN FOLD BOX PACKAGING

Case	Base QTY	Component Spacing	Tape Spacing		Reel Dimensions		
		A	B	C	D	E	F
F126	1000	5 ± 0.5	53 ± 2	65 ± 2	255	85	82
CB417	1000	5 ± 0.5	53 ± 2	65 ± 2	255	85	82
CB429	600	10 ± 0.5	53 ± 2	65 ± 2	255	85	82

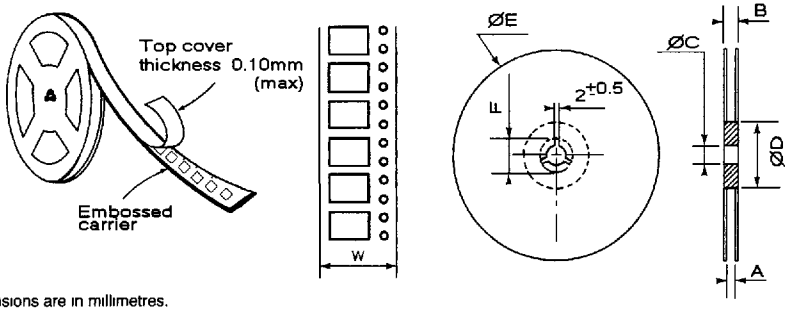
All dimensions are in millimetres



Note : All polarised components are oriented with their cathode tape coloured red and their anode tape white. Unpolarised components have both tapes coloured red

SURFACE MOUNT PACKAGING (FILM AND REEL)

Case	Base QTY	Film Width	Reel Dimensions					
		W	A	B	C	D	E	F
SOD6 (1)	2500	12 ± 0.2	12.4 ± 2	18.4 Max	13	60 ± 2	330	20.2
SOD15 (1)	2500	16 ± 0.2	16.4 ± 2	22.4 Max	13	60 ± 2	330	20.2
SO8	2500	12 ± 0.2	12.4 ± 2	18.4 Max	13	50 Min	330	20.2
SO20	1000	24 ± 0.2	24.4 ± 2	30.4 Max	13	50 Min	330	20.2



All dimensions are in millimetres.
(1) Also known as *CB472*.
(1) Also known as *CB473*.

Note : Polarized devices have their cathode lead oriented toward the perforated side of the film

TUBE PACKAGING

Case	Base QTY	Tube Dimensions			
		L	A	B	C
SO8	100	532 ± 1	7.80 ± 0.1	7.80 ± 0.1	3.80 ± 0.1
SO20	40	532 ± 1	15 ± 0.1	15 ± 0.1	4.70 ± 0.1
DIL8	50	532 ± 1	8.40 ± 0.15	15.20 ± 0.25	11.20 ± 0.25
DIL20	20	532 ± 1	8.40 ± 0.15	15.20 ± 0.25	11.20 ± 0.25
SIL3	50	532 ± 1	28.9 ± 0.1	28.9 ± 0.1	5.55 ± 0.1
SIL4	50	532 ± 1	28.9 ± 0.1	28.9 ± 0.1	5.55 ± 0.1
TO220AB	50	532 ± 1	31.4 ± 0.1	31.4 ± 0.1	5.5 ± 0.2

All dimensions are in millimetres