



# SMTPB SERIES

TRISIL™

## MAIN APPLICATIONS

Any sensitive equipment requiring protection against lightning strikes:

- ANALOG AND DIGITAL LINE CARDS
- MAIN DISTRIBUTION FRAMES
- TERMINALS AND TRANSMISSION EQUIPMENT
- GMS-TUBE REPLACEMENT

## DESCRIPTION

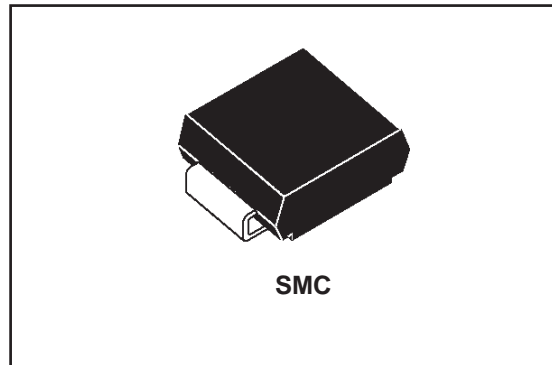
The SMTPBxx series has been designed to protect telecommunication equipment against lightning and transient induced by AC power lines.

## FEATURES

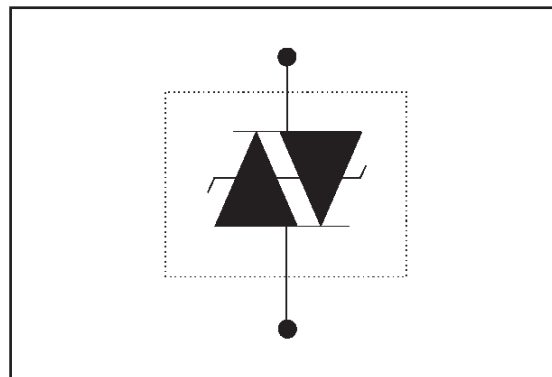
- BIDIRECTIONAL CROWBAR PROTECTION.
- BREAKDOWN VOLTAGE RANGE:  
From 62 V To 270 V.
- HOLDING CURRENT:  $I_H = 150 \text{ mA min}$
- REPETITIVE PEAK PULSE CURRENT :  
 $I_{PP} = 100 \text{ A}, 10/1000 \mu\text{s}$ .

## BENEFITS

- NO AGEING AND NO NOISE
- IF DESTROYED, THE SMTPB FALLS INTO SHORT CIRCUIT, STILL ENSURING PROTECTION



## SCHEMATIC DIAGRAM



COMPLIES WITH THE FOLLOWING STANDARDS:	Peak Surge Voltage (V)	Voltage Waveform ( $\mu\text{s}$ )	Current Waveform ( $\mu\text{s}$ )	Admissible $I_{pp}$ (A)	Necessary Resistor ( $\Omega$ )
CCITT K20	4000	10/700	5/310	100	-
VDE0433	4000	10/700	5/310	100	-
VDE0878	4000	1.2/50	1/20	100	-
IEC-1000-4-5	level 4 level 4	10/700 1.2/50	5/310 8/20	100 100	- -
FCC Part 68, lightning surge type A	1500 800	10/160 10/560	10/160 10/560	200 100	- -
FCC Part 68, lightning surge type B	100	5/320	5/320	25	-
BELLCORE TR-NWT-001089 First level	2500 1000	2/10 10/1000	2/10 10/1000	500 100	- -
BELLCORE TR-NWT-001089 Second level	500	2/10	2/10	500	-
CNET I31-24	4000	0.5/700	0.8/310	100	-

## SMTPBxxx

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25°C)

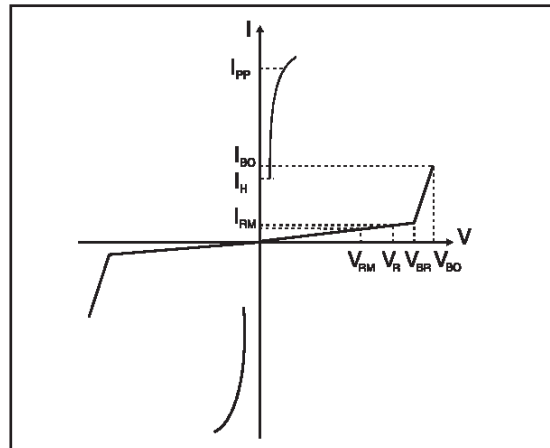
Symbol	Parameter		Value	Unit
P	Power dissipation	T <sub>lead</sub> = 50 °C	5	W
I <sub>PP</sub>	Peak pulse current	10/1000 μs 8/20 μs 2/10 μs	100 250 500	A
I <sub>TSM</sub>	Non repetitive surge peak on-state current	tp = 20 ms	50	A
dV/dt	Critical rate of rise of off-state voltage	V <sub>RM</sub>	5	KV/μs
T <sub>stg</sub> T <sub>j</sub>	Storage temperature range Maximum junction temperature		- 55 to + 150 + 150	°C °C
T <sub>L</sub>	Maximum lead temperature for soldering during 10 s.		+ 260	°C

### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R <sub>th</sub> (j-l)	Junction to leads	20	°C/W
R <sub>th</sub> (j-a)	Junction to ambient. On printed circuit with standard footprint dimensions.	75	°C/W

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

Symbol	Parameter
V <sub>RM</sub>	Stand-off voltage
I <sub>RM</sub>	Leakage current at stand-off voltage
V <sub>R</sub>	Continuous Reverse voltage
V <sub>BR</sub>	Breakdown voltage
V <sub>BO</sub>	Breakover voltage
I <sub>H</sub>	Holding current
I <sub>BO</sub>	Breakover current
I <sub>PP</sub>	Peak pulse current
C	Capacitance



Type	Marking	I <sub>RM</sub> @ V <sub>RM</sub>		I <sub>R</sub> @ V <sub>R</sub>		V <sub>BO</sub> @ I <sub>BO</sub>		I <sub>H</sub>	C
		max.		max. note1		max. note2		min. note3	typ. note4
	Laser	μA	V	μA	V	V	mA	mA	pF
SMTPB62	W07	2	56	50	62	82	800	150	160
SMTPB68	W11	2	61	50	68	90	800	150	160
SMTPB120	W21	2	108	50	120	160	800	150	140
SMTPB200	W31	2	180	50	200	267	800	150	130
SMTPB270	W43	2	243	50	270	360	800	150	120

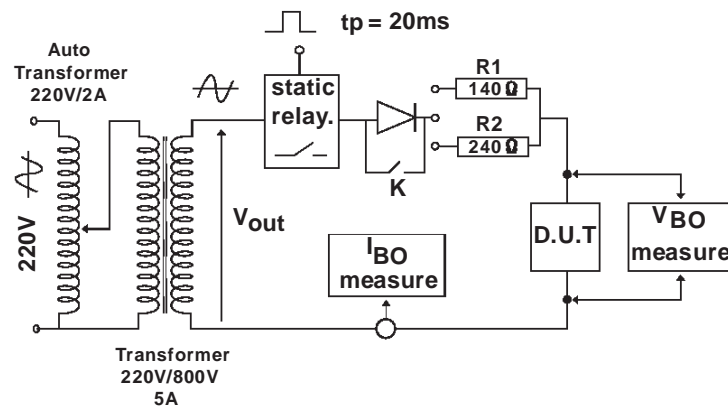
All parameters tested at 25°C, except where indicated.

**Note 1:** I<sub>R</sub> measured at V<sub>R</sub> guarantees V<sub>BRmin</sub> ≥ V<sub>R</sub>

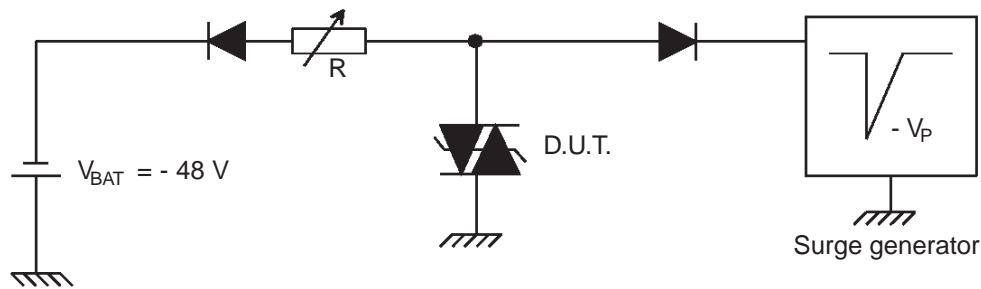
**Note 2:** Measured at 50 Hz (1 cycle) - See test circuit 1.

**Note 3:** See test circuit 2.

**Note 4:** V<sub>R</sub> = 1V, F = 1MHz. Refer to fig 3 for C versus V<sub>R</sub>.

**TEST CIRCUIT 1 FOR  $I_{BO}$  and  $V_{BO}$  parameters :****TEST PROCEDURE :**

- Pulse Test duration ( $t_p = 20\text{ms}$ ):
  - For Bidirectional devices = Switch K is closed
  - For Unidirectional devices = Switch K is open.
- $V_{OUT}$  Selection
  - Device with  $V_{BO} < 200$  Volt
    - $V_{OUT} = 250 V_{RMS}$ ,  $R_1 = 140 \Omega$ .
  - Device with  $V_{BO} \geq 200$  Volt
    - $V_{OUT} = 480 V_{RMS}$ ,  $R_2 = 240 \Omega$ .

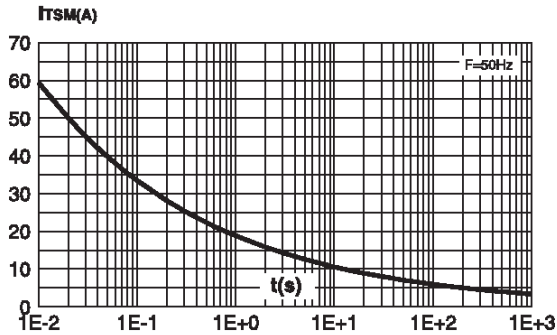
**TEST CIRCUIT 2 for  $I_H$  parameter.**

This is a GO-NOGO Test which allows to confirm the holding current ( $I_H$ ) level in a functional test circuit.

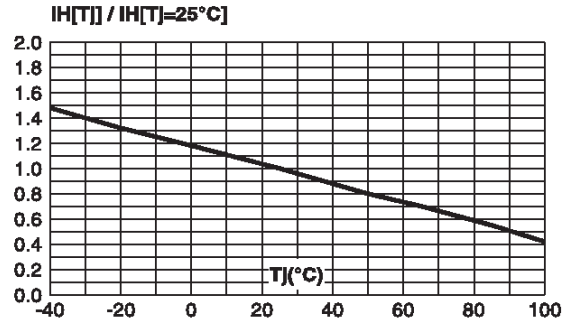
**TEST PROCEDURE :**

- 1) Adjust the current level at the  $I_H$  value by short circuiting the AK of the D.U.T.
- 2) Fire the D.U.T with a surge Current :  $I_{pp} = 10A$  ,  $10/1000\mu\text{s}$ .
- 3) The D.U.T will come back off-state within 50 ms max.

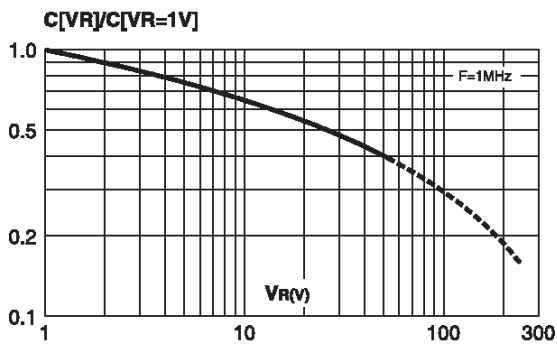
**Fig. 1:** Non repetitive surge peak on-state current versus overload duration ( $T_j$  initial=25°C).



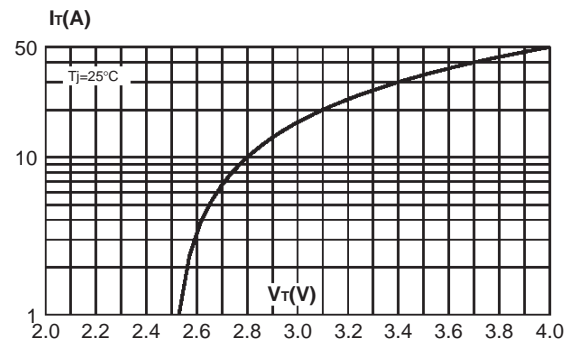
**Fig. 2:** Relative variation of holding current versus junction temperature.



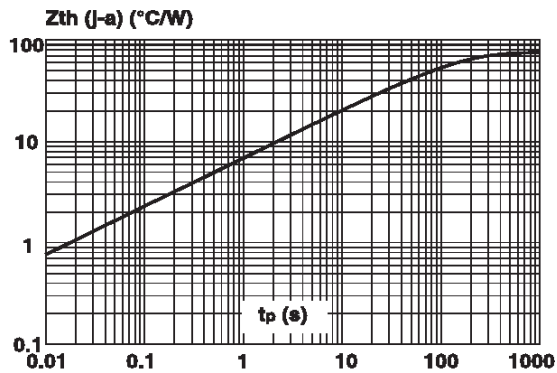
**Fig. 3:** Relative variation of junction capacitance versus reverse applied voltage (typical values). Note: For  $V_{RM}$  upper than 56V, the curve is extrapolated (dotted line).



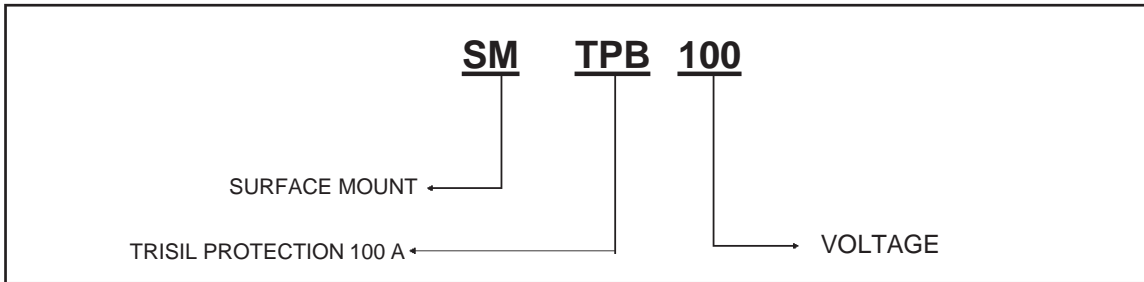
**Fig. 4:** On-state voltage versus on-state current (typical values).



**Fig. 5:** Transient thermal impedance junction to ambient versus pulse duration (for FR4 PC Board with recommended pad layout).



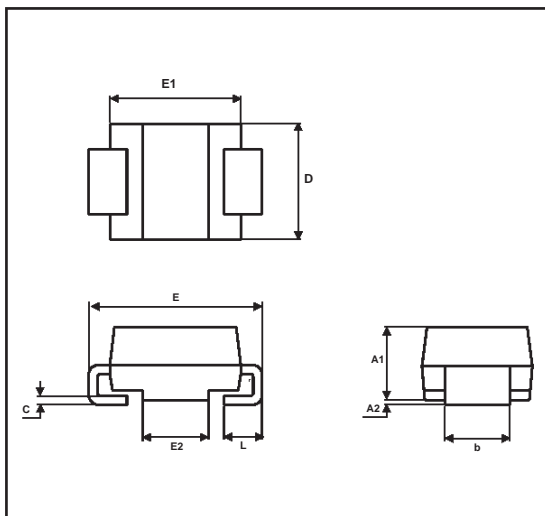
**ORDER CODE**



**Marking :** Logo, date code, type code.

**PACKAGE MECHANICAL DATA.**

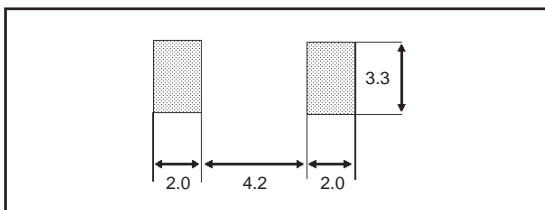
SMC



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	2.90	3.2	0.114	0.126
c	0.15	0.41	0.006	0.016
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
D	5.55	6.25	0.218	0.246
L	0.75	1.60	0.030	0.063

**FOOTPRINT DIMENSIONS (in millimeters)**

SMC



**Packaging :** Standard packaging is in tape and reel  
**Weight :** 0.25g.

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