



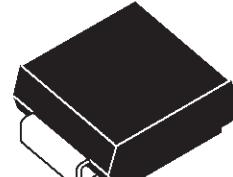
**SGS-THOMSON**  
MICROELECTRONICS

## SMTPA SERIES

TRISIL™

### FEATURES

- BIDIRECTIONAL CROWBAR PROTECTION.
- BREAKDOWN VOLTAGE RANGE:  
From 62 V To 270 V.
- HOLDING CURRENT = 150 mA min
- REPETITIVE PEAK PULSE CURRENT:  
 $I_{PP} = 50 \text{ A}, 10/1000 \mu\text{s}$ .

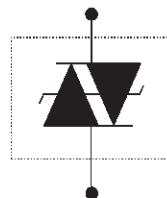


**SMB**  
(JEDEC DO-214AA)

### DESCRIPTION

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

### 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 K17	1500	10/700	5/310	38	-
CCITT K20	1000	10/700	5/310	25	-
VDE0433	2000	10/700	5/310	50	-
FCC Part 68	1500 800	10/160 10/560	10/160 10/560	75 55	12.5 6.5
BELLCORE TR-NWT-001089	2500 1000	2/10 10/1000	2/10 10/1000	150 50	11.5 10

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ )

Symbol	Parameter	Value	Unit
P	Power dissipation	4	W
$I_{PP}$	Peak pulse current	50 100	A
$I_{TSM}$	Non repetitive surge peak on-state current	30	A
dV/dt	Critical rate of rise of off-state voltage	5	KV/ $\mu\text{s}$
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature	- 55 to + 150 150	$^\circ\text{C}$ $^\circ\text{C}$
$T_L$	Maximum lead temperature for soldering during 10 s.	260	$^\circ\text{C}$

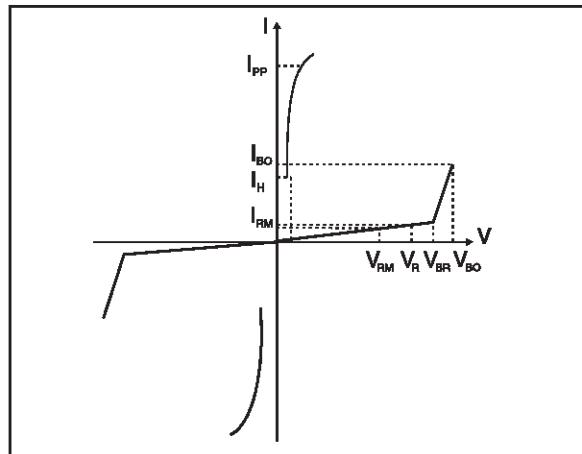
## SMTPA xxx

### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th} (j-l)$	Junction to leads.	25	°C/W
$R_{th} (j-a)$	Junction to ambient on printed circuit with standard footprint dimensions.	100	°C/W

### ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25^\circ C$ )

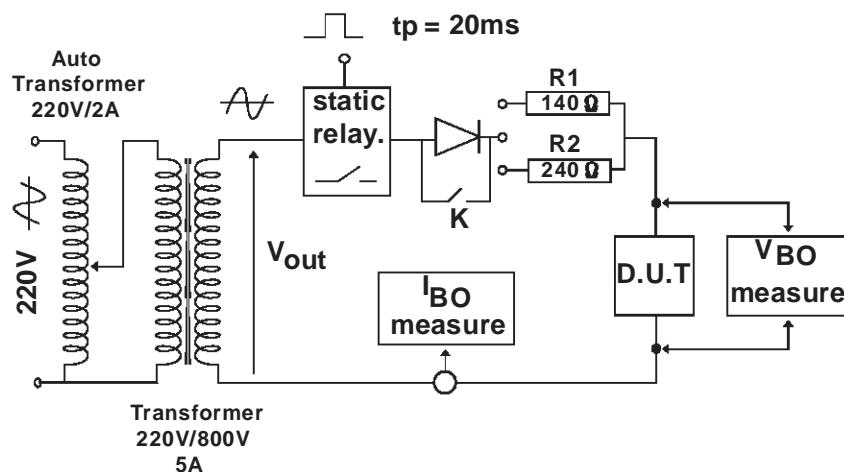
Symbol	Parameter
$V_{RM}$	Stand-off voltage
$I_{RM}$	Leakage current at stand-off voltage
$V_R$	Continuous Reverse voltage
$V_{BR}$	Breakdown voltage
$V_{BO}$	Breakover voltage
$I_H$	Holding current
$I_{BO}$	Breakover current
$I_{PP}$	Peak pulse current
$C$	Capacitance



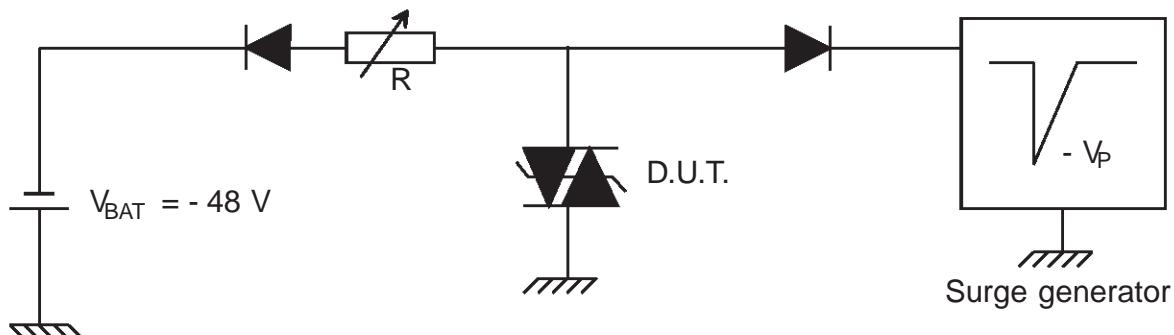
Type	Marking	$I_{RM} @ V_{RM}$		$I_R @ V_R$		$V_{BO} @ I_{BO}$		$I_H$	$C$
		max.	note 1	max.	note 2	max.	note 3		
	Laser	$\mu A$	V	$\mu A$	V	V	mA	mA	pF
SMTPA62	U01	2	56	50	62	82	800	150	150
SMTPA68	U05	2	61	50	68	90	800	150	150
SMTPA100	U13	2	90	50	100	133	800	150	100
SMTPA120	U17	2	108	50	120	160	800	150	100
SMTPA130	U19	2	117	50	130	173	800	150	100
SMTPA180	U25	2	162	50	180	240	800	150	100
SMTPA200	U27	2	180	50	200	267	800	150	100
SMTPA220	U31	2	198	50	220	293	800	150	100
SMTPA240	U35	2	216	50	240	320	800	150	100
SMTPA270	U39	2	243	50	270	360	800	150	100

All parameters tested at  $25^\circ C$ , except where indicated.

- Note 1:  $I_R$  measured at  $V_R$  guarantee  $V_{BRmin} \geq V_R$
- Note 2: Measured at 50 Hz (1 cycle) - See test circuit 1.
- Note 3: See test circuit 2.
- Note 4:  $V_R = 1V$ ,  $F = 1MHz$ . Refer to fig.3 for  $C$  versus  $V_R$ .

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

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

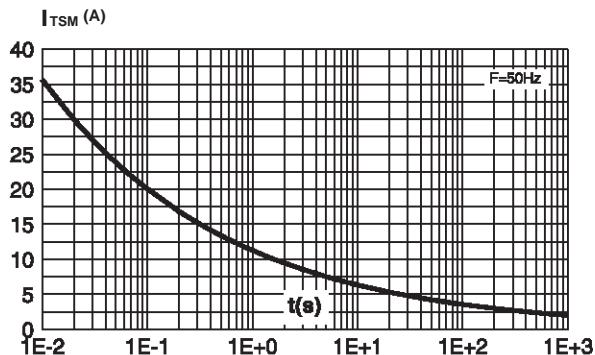
**TEST CIRCUIT 2 for  $I_H$  parameter.**

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

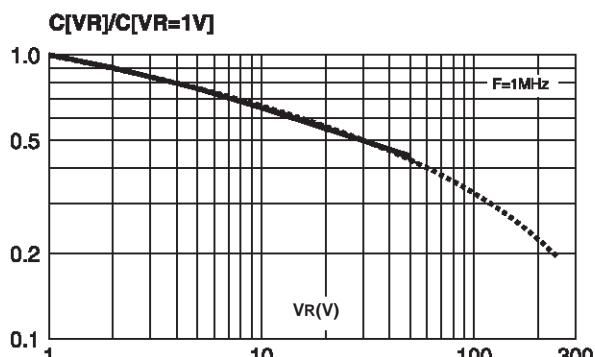
**TEST PROCEDURE :**

- 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 :  $I_{pp} = 10\text{A}$  ,  $10/1000\ \mu\text{s}$ .
- 3) The D.U.T will come back off-state within 50 ms max.

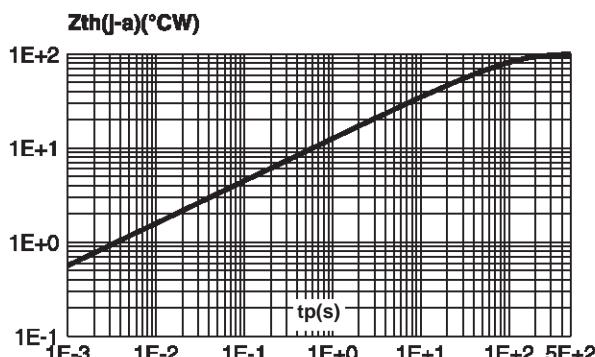
**Fig. 1:** Non repetitive surge peak on-state current versus overload duration ( $T_j$  initial=25°C).



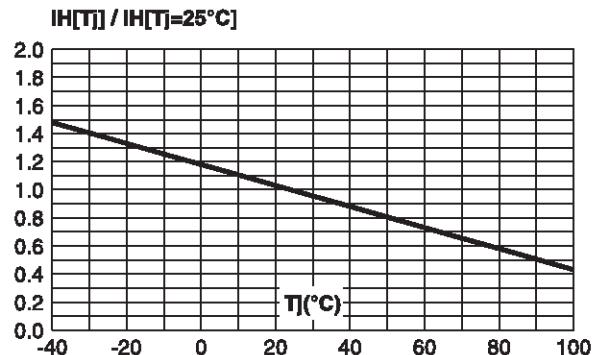
**Fig. 3:** Relative variation of junction capacitance versus reverse applied voltage (typical values).  
**Note:** For  $V_{RM}$  upper than 56V, the curve is extrapolated (dotted line).



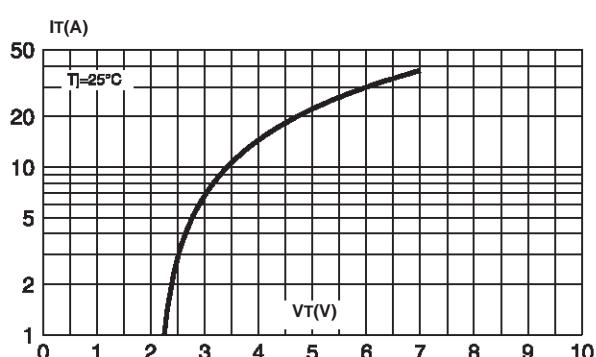
**Fig. 5:** Transient thermal impedance junction to ambient versus pulse duration (for FR4 PC Board with  $T_{lead} = 10\text{ mm}$ ).

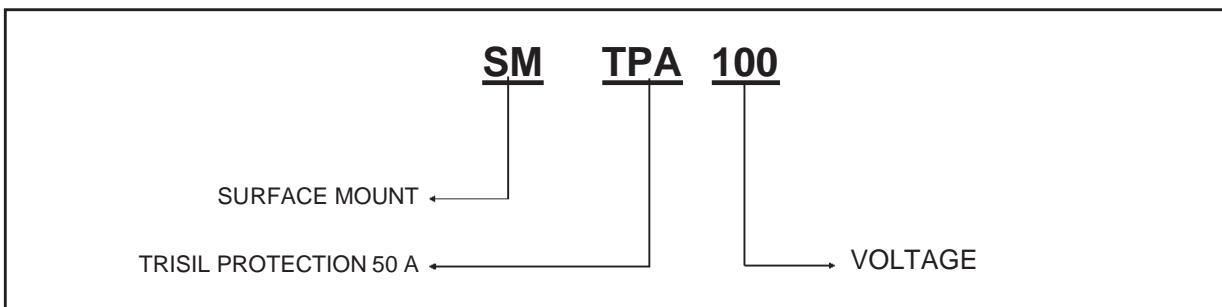


**Fig. 2:** Relative variation of holding current versus junction temperature.



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

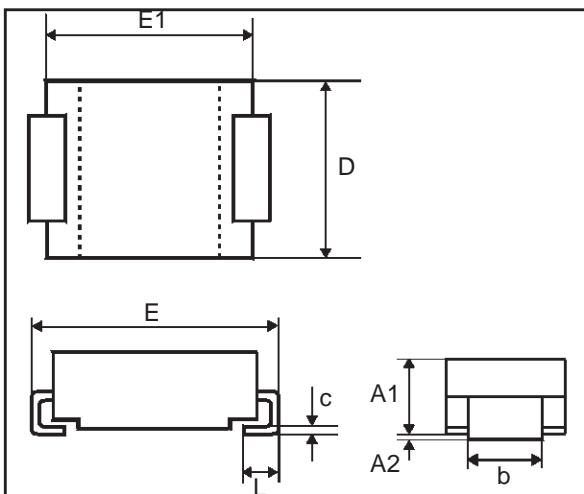




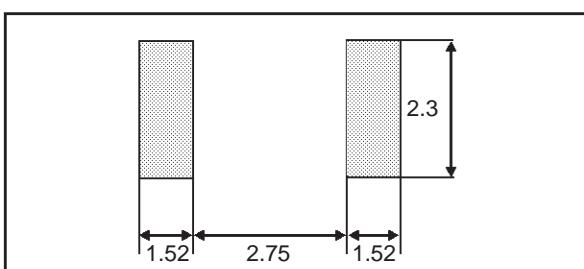
**MARKING :** Logo, date code, type code.

#### PACKAGE MECHANICAL DATA.

SMB (JEDEC DO-214AA)



**FOOT PRINT DIMENSION** (in millimeters)  
SMB



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A1	1.90	2.15	2.45	0.075	0.085	0.096
A2	0.05	0.15	0.20	0.002	0.006	0.008
b	1.95			2.20	0.077	
c	0.15			0.41	0.006	
E	5.10	5.40	5.60	0.201	0.213	0.220
E1	4.05	4.30	4.60	0.159	0.169	0.181
E2	1.65	1.90	2.15	0.065	0.075	0.085
D	3.30	3.60	3.95	0.130	0.142	0.156
L	0.75	1.15	1.60	0.030	0.045	0.063

#### Packaging :

Standard packaging is in tape and reel

**Weight :** 0.12g

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