

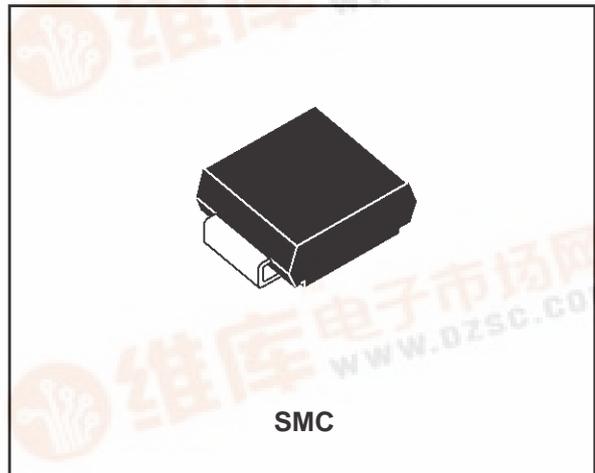


# SMTHBT200

## TRISIL™ FOR LINE CARD PROTECTION

### FEATURES

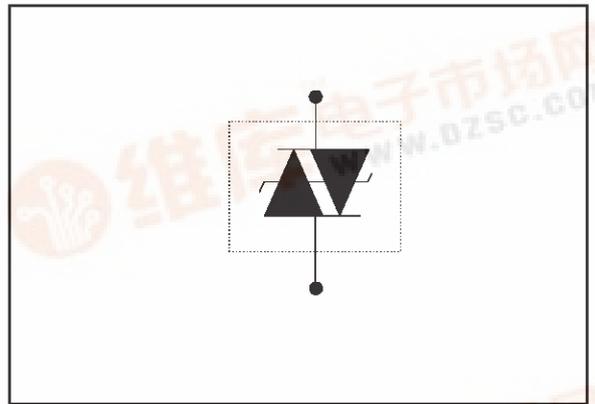
- BIDIRECTIONAL CROWBAR PROTECTION
- REPETITIVE PEAK PULSE CURRENT:  
I<sub>PP</sub> = 100 A (10/1000µs)
- HOLDING CURRENT: I<sub>H</sub> = 150 mA
- BREAKDOWN VOLTAGE : 200V min
- BREAKOVER VOLTAGE : 265V max



### DESCRIPTION

This protection device has been especially designed to protect subscriber line cards using SLICS without integrated ring generators. The SMTHBT200 device protects ring generator relays against transient

### SCHEMATIC DIAGRAM



### IN ACCORDANCE WITH THE FOLLOWING STANDARDS :

- CCITT K20:	10/700 µs	4 kV
	5/310 µs	100 A
- VDE 0433:	10/700 µs	4 kV
	5/310 µs	100 A
- VDE 0878:	1.2/50 µs	4 kV
	1/20 µs	100 A
- FCC Part 68:	2/10 µs	2.5 kV
BELL CORE TR-NWT-001089:	2/10 µs	500 A
- BELL CORE TR-NWT-000974:	10/1000 µs	1 kV
	10/1000 µs	100 A

## SMTHBT200

### THERMAL RESISTANCES

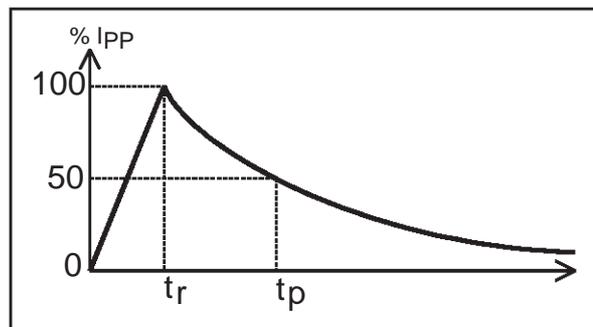
Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads	10	$^{\circ}\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient on printed circuit (with standard footprint dimensions)	75	$^{\circ}\text{C}/\text{W}$

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

Symbol	Parameter	Value	Unit
$I_{pp}$	Peak pulse current: 10/1000 $\mu\text{s}$ (open circuit voltage waveform 10/1000 $\mu\text{s}$ ) 8/20 $\mu\text{s}$ (open circuit voltage waveform 4kV 1.2/50 $\mu\text{s}$ )	100 250	A A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 20\text{ms}$ 55	A
$dV/dt$	Critical rate of rise of off-state voltage	$V_{RM}$ 5	$\text{KV}/\mu\text{s}$
$T_L$	Maximum lead temperature for soldering during 10s	260	$^{\circ}\text{C}$
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature	- 55 to + 150 150	$^{\circ}\text{C}$ $^{\circ}\text{C}$

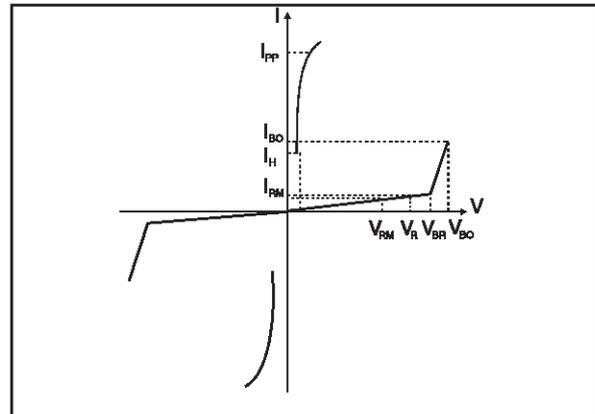
#### Note 1: Pulse waveform

10 / 1000 $\mu\text{s}$	$t_r = 10 \mu\text{s}$	$t_p = 1000 \mu\text{s}$
8 / 20 $\mu\text{s}$	$t_r = 8 \mu\text{s}$	$t_p = 20 \mu\text{s}$
5 / 310 $\mu\text{s}$	$t_r = 5 \mu\text{s}$	$t_p = 310 \mu\text{s}$
1 / 20 $\mu\text{s}$	$t_r = 1 \mu\text{s}$	$t_p = 20 \mu\text{s}$
2 / 10 $\mu\text{s}$	$t_r = 2 \mu\text{s}$	$t_p = 10 \mu\text{s}$



**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



**STATIC PARAMETERS**

Type	$I_{RM} @ V_{RM}$ max.		$I_R @ V_R$ max. note 1		$V_{BO}$ max.	@ $I_{BO}$ min. note 2		$I_H$ min. note 3	$C$ max. note 4
	$\mu A$	V	$\mu A$	V	V	mA	mA	mA	pF
SMTHBT200	10	180	50	200	265	150	800	150	150

**Note 2 :**  $I_R$  measured at  $V_R$  guarantees  $V_{BR} > V_R$

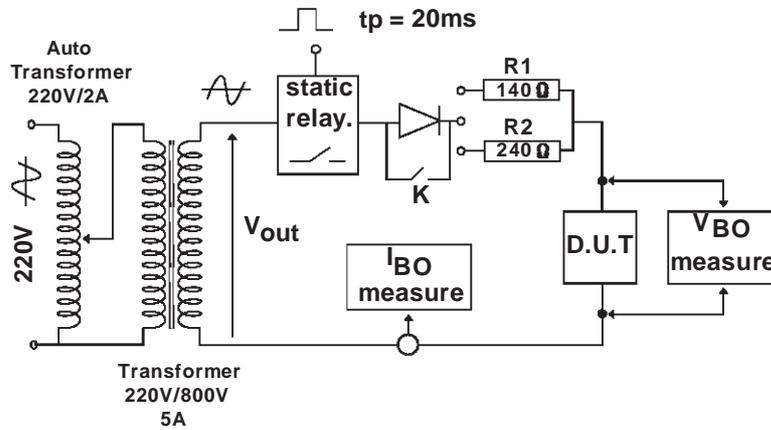
**Note 2 :** Measured at 50Hz, see test circuit 1.

**Note 3 :** See functional holding current test circuit 2.

**Note 4 :**  $V_R=1V$  bias,  $V_{RMS}=1V$ ,  $F=1MHz$ .

## SMTHBT200

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



#### TEST PROCEDURE :

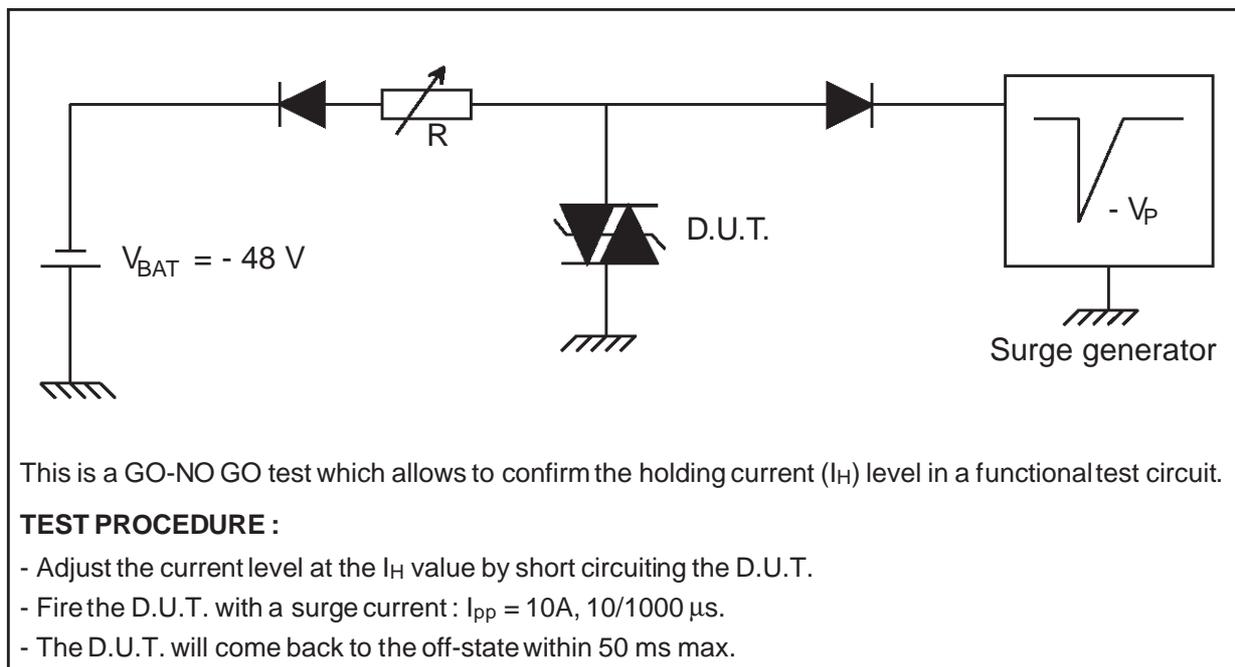
Pulse Test duration ( $t_p = 20\text{ms}$ ):

- 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.

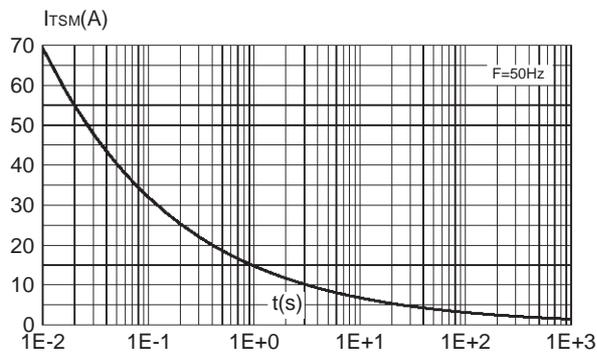


This is a GO-NO GO test which allows to confirm the holding current ( $I_H$ ) level in a functional test circuit.

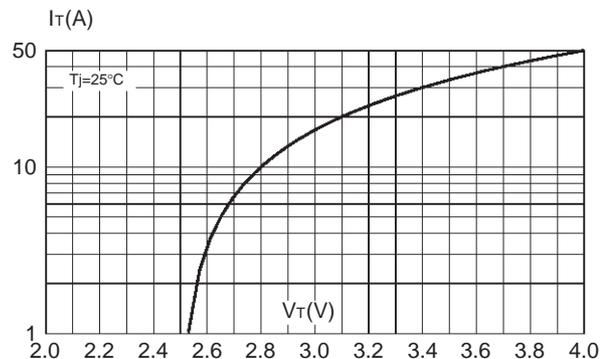
#### TEST PROCEDURE :

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

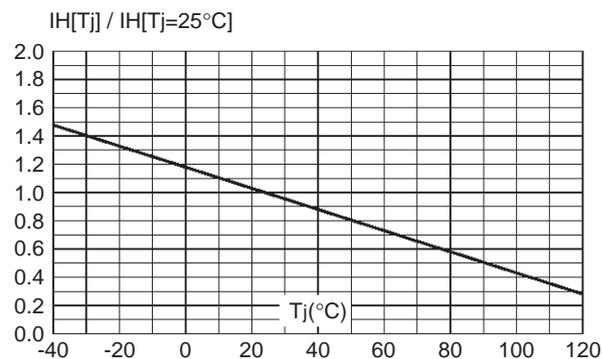
**Fig 1 :** Non repetitive surge peak on-state current versus overload duration ( $T_j$  initial = 25 °C).



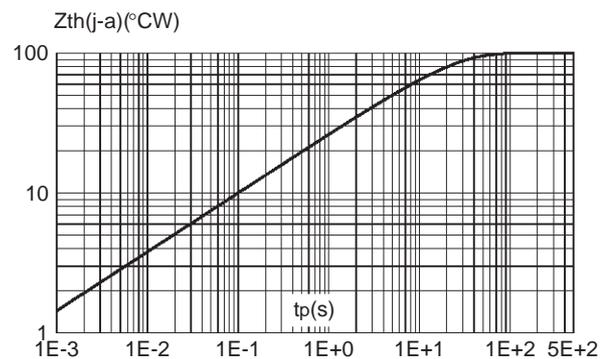
**Fig 2 :** On-state voltage versus on-state current (typical values).



**Fig 3 :** Relative variation of holding current versus junction temperature.

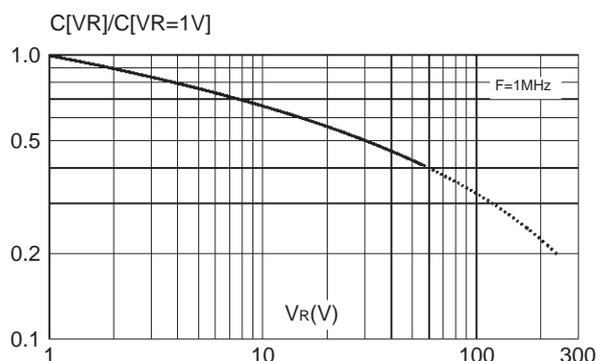


**Fig 4 :** Variation of thermal impedance junction to ambient versus pulse duration.



**Fig 5 :** Relative variation of junction capacitance versus reverse voltage applied (typical values).

**Note :** For VBR upper than 62 V, the curve can be extrapolated (dotted line)



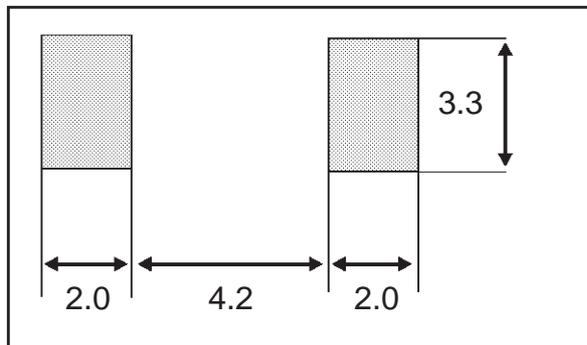
## SMTHBT200

### PACKAGE MECHANICAL DATA

SMC (Plastic)

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

FOOT PRINT (in millimeters)



Packaging : tape and reel

### MARKING

Package	Type	Marking
SMC	SMTHBT200	WO4

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