SGS-THOMSON MICROELECTRONICS

THBT200SD

Application Specific Discretes A.S.D.™   DUAL TRANSIENT VOLTAGE SUPPRESSOR FOR LINE CARD PROTECTION

FEATURES

■ DUAL BIDIRECTIONAL CROWBAR PROTEC-TION BETWEEN TIP and GND, RING and GND.

■ PEAK PULSE CURRENT :
$I_{PP} = 75A$ for 10/1000µs surge

■ HOLDING CURRENT :
$I_H = 150mA$

■ EXCELLENT DYNAMIC BEHAVIOUR WITH PARAMETERS SPECIFIED FOR DIFFERENT KINDS OF SURGES.

DESCRIPTION

The THBT200SD is a dual symmetrical transient voltage suppressor device. Offered in a SIP3 package, it ensures an excellent protection of telecommunication equipments against transient overvoltages caused by lightning strikes.

Dynamic characteristics have been defined for several types of surges, in order to meet the SLIC maximum ratings.

SIP3
(Plastic)
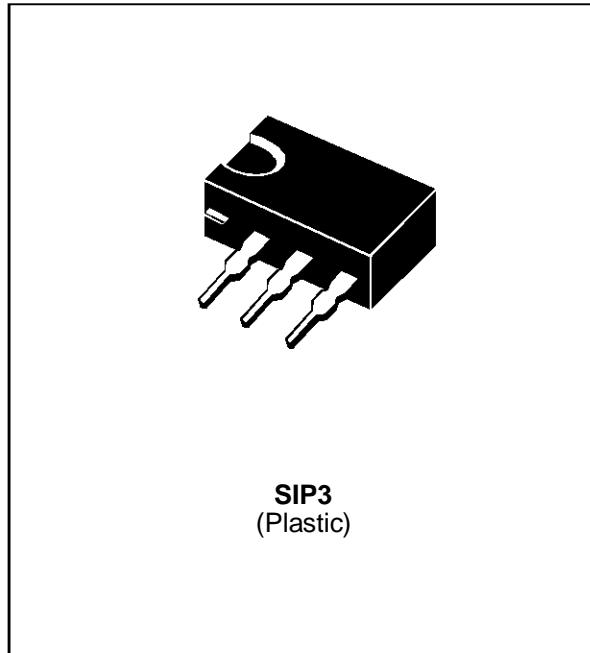
COMPLIES WITH FOLLOWING STANDARDS :

CCITT K20 :	10/700 µs	1.5kV
	5/310 µs	
VDE 0433 :	10/700 µs	2kV
	5/310 µs	
VDE 0878 :	1.2/50 µs	1.5kV
	1/20 µs	
FCC part 68 :	2/10 µs	2.5kV
BELLCORE		
TR-NWT-001089 :	2/10 µs	

FUNCTIONAL DIAGRAM
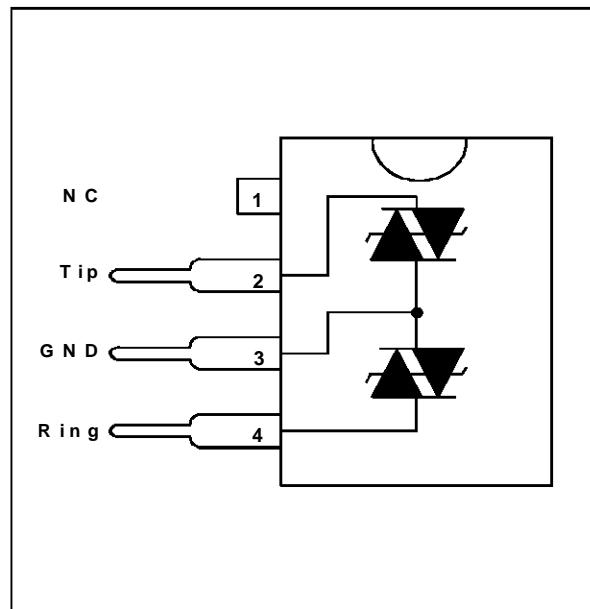
ABSOLUTE MAXIMUM RATINGS (-40°C ≤ T_{amb} ≤ 85°C)

Symbol	Parameter		Value	Unit
I_{PP}	Peak pulse current	10/1000 µs 5/310 µs 8/20 µs 2/10 µs	75 125 150 225	A
I_{TSM}	Non repetitive surge peak on-state current (F = 50Hz)	t_p = 10ms t_p = 20ms t_p = 1s	35 30 12	A
di/dt	Critical rate of rise of on-state current	Non repetitive	100	A/µs
T_{stg} T_j	Storage temperature range Maximum junction temperature		- 40 to + 150 150	°C

Note 1 : Pulse waveform :

10/1000 µs	t_r=10 µs	t_p=1000 µs
5/310 µs	tr=5 µs	tp=310 µs
8/20 µs	t_r=8 µs	tp=20 µs
2/10 µs	t_r=2 µs	tp=10 µs
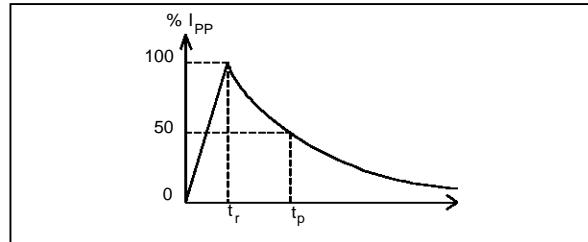
THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th (j-a)}$	Junction to ambient	70	°C/W

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ELECTRICAL CHARACTERISTICS
($T_{amb} = 25°C$, unless otherwise specified)

Symbol	Parameter
V_{RM}	Stand-off voltage
V_R	Reverse voltage
V_{BO}	Breakover voltage
I_H	Holding current
V_T	On-state voltage
I_{BO}	Breakover current
I_{RM}	Leakage current at VRM
I_{PP}	Peak pulse current
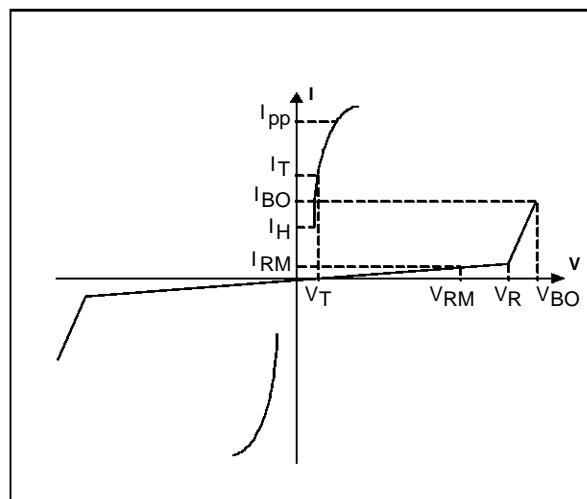
STATIC PARAMETERS

Type	I_{RM} @ V_{RM} max		I_R @ V_R max		V_{BO} @ I_{BO} max min max note 1			I_H min note 2	VT max note 3	C max note 4
	μA	V	μA	V	V	mA	mA	mA	V	pF
THBT200SD	5	180	50	200	290	150	800	150	5	200

Note 1 :   Measured at 50Hz.
Note 2 :   See the functional holding current (I_H) test circuit.
Note 3 :   Square pulse $t_p = 500$ μs, $I_T = 5A$.
Note 4 : $V_R = 1V$, F = 1MHz, 30mV bias.

DYNAMIC PARAMETERS

Symbol	Test conditions (see note 1)				Maximum	Unit
V_{BO}	10/700 μs	1.5kV	$R_p=10Ω$	$I_{PP}=30A$	300	V
	1.2/50 μs	1.5kV	$R_p=10Ω$	$I_{PP}=30A$	330	
	2/10 μs	2.5kV	$R_p=62Ω$	$I_{PP}=38A$	380	

Note 1 : R_p is the protection resistor located on the line card.

FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT : GO-NO GO TEST
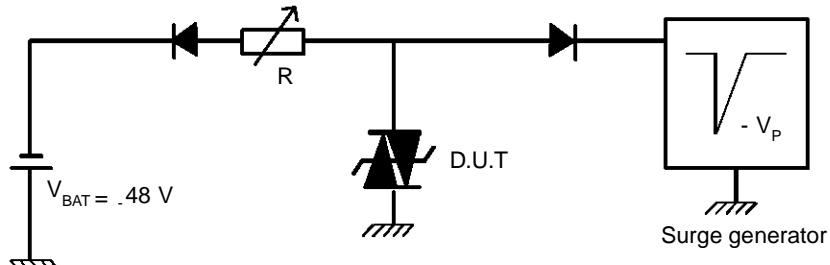
This is a GO-NO GO test which allows to confirm the holding current (I_H) level in a functional test circuit.

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} = 10A, 10/1000µs.
- The D.U.T. will come back to the OFF-state within a duration of 50ms max.

TEST CIRCUIT FOR V_{BO} DYNAMIC PARAMETERS

(V_P is defined in unload condition)
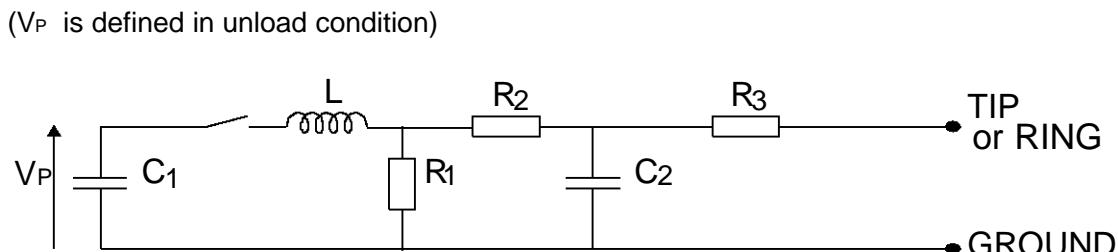
Pulse (µs)		V_p	C_1	C_2	L	R_1	R_2	R_3	I_{PP}	R_p
t_r	t_p	(V)	(µF)	(nF)	(µH)	(Ω)	(Ω)	(Ω)	(A)	(Ω)
10	700	1500	20	200	0	50	15	25	30	10
1.2	50	1500	1	33	0	76	13	25	30	10
2	10	2500	10	0	1.1	1.3	0	3	38	62

R_p is the protection resistor located on the line card.

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MAXIMUM NON REPETITIVE SURGE PEAK ON-STATE CURRENT

I_{TSM} (A)

with sinusoidal pulse : F=50Hz
Tj=25°C

tp (s)
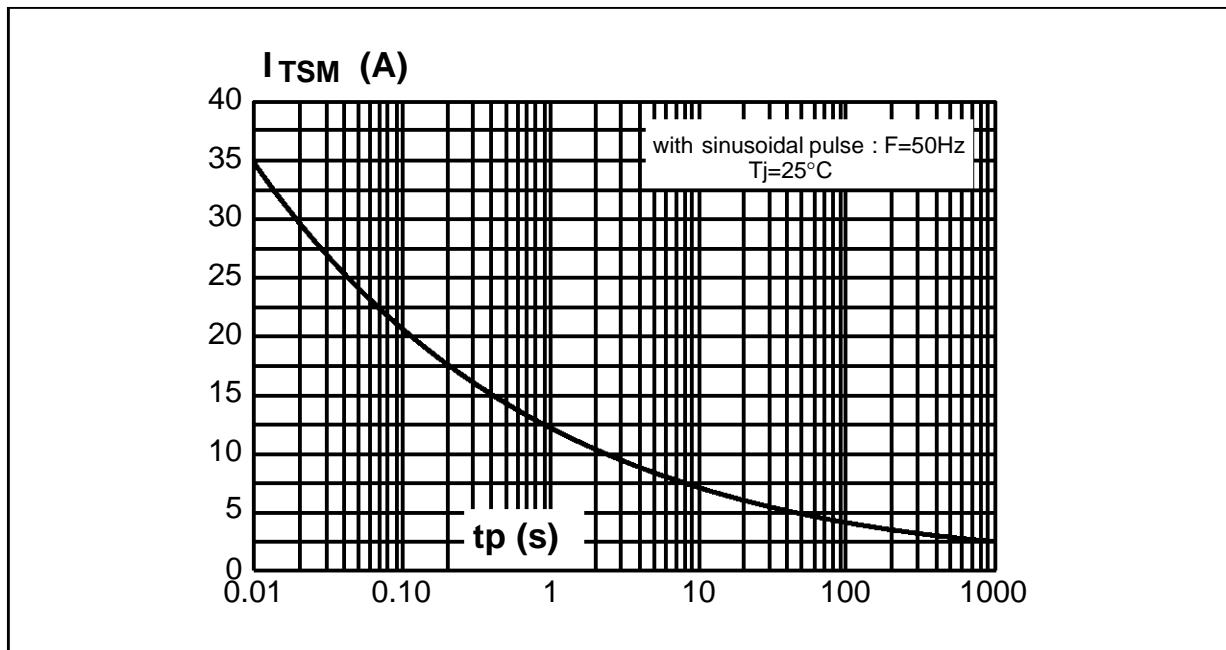
APPLICATION CIRCUIT : typical SLIC protection concept

RING GENERATOR

- V_{bat}

LINE A

PTC

TEST RELAY

RING RELAY

Integrated SLIC

220 nF

LINE B

PTC

THBT200SD

LCP150S
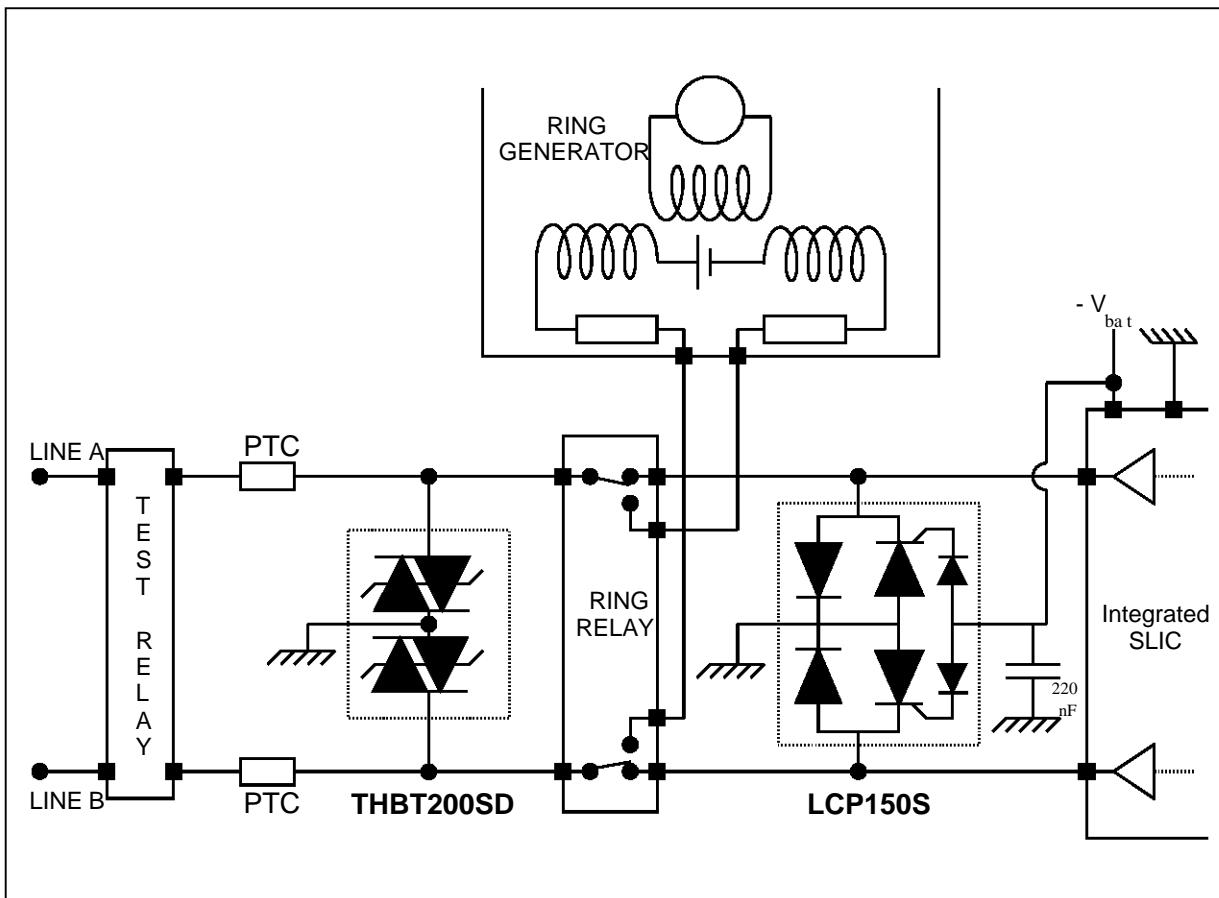
PACKAGE MECHANICAL DATA
SIP3 Plastic
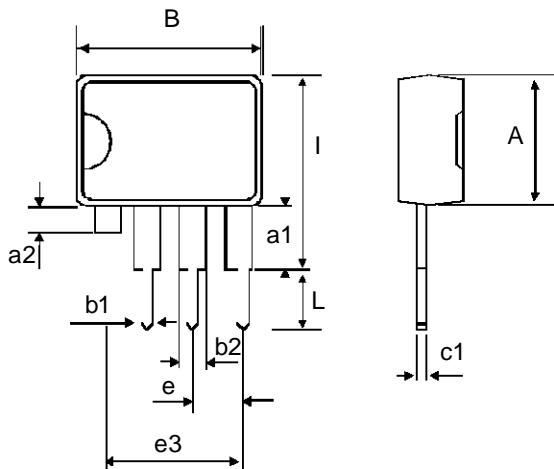
REF.	DIMENSIONS					
	Millimetres			**Inches**		
	Min.	**Typ.**	**Max.**	**Min.**	**Typ.**	**Max.**
A			7.10			0.280
a1	2.80			0.110		
a2	1.50		1.90	0.059		0.075
B			10.15			0.400
b1		0.50			0.020	
d2		1.35	1.75		0.053	0.069
c1	0.38		0.50	0.015		0.020
e		2.54			0.100	
e3		7.62			0.300	
l			10.50			0.413
L		3.30			0.130	

MARKING :

Package	Types	Marking
SIP3	THBT200SD	TBT200SD

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