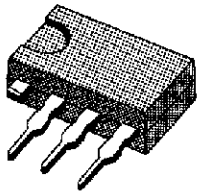
SGS-THOMSON MICROELECTRONICS

THBT200S

TRISIL FOR LINE CARD PROTECTION

FEATURES

- DUAL BIDIRECTIONAL CROWBAR PROTECTION.
- PEAK PULSE CURRENT :
  - I_{PP} = 75 A, 10/1000 µs.
- HOLDING CURRENT = 150 mA min
- BREAKDOWN VOLTAGE = 200 V min.
- BREAKOVER VOLTAGE = 290 V max.

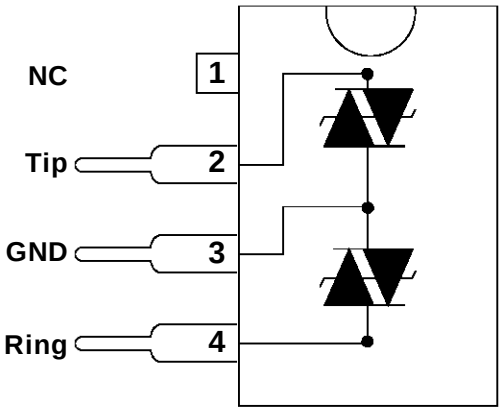


SIP 3
(Plastic)

DESCRIPTION

This protection device has been especially designed to protect subscriber line cards using SLICS without integrated ring generator. THBT200 device protects ring generator relays against transient overvoltages.

SCHEMATIC DIAGRAM

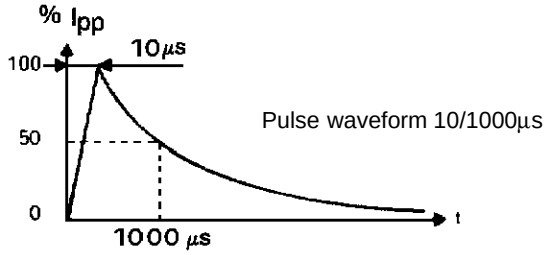


IN ACCORDANCE WITH FOLLOWING STANDARDS :

CCITT K17 - K20	10/700 µs	1.5 kV
	5/310 µs	38 A
VDE 0433	10/700 µs	2 kV
	5/200 µs	50 A
CNET	0.5/700 µs	1.5 kV
	0.2/310 µs	38 A

ABSOLUTE RATINGS (limiting values) (-40°C ≤ T_{amb} ≤ + 85°C)

Symbol	Parameter		Value	Unit
I_{PP}	Peak pulse current	10/1000 µs 8/20 µs	75 150	A
I_{TSM}	Non repetitive surge peak on-state current	tp = 20 ms	30	A
di/dt	Critical rate of rise of on-state current	Non repetitive	100	A/µs
dv/dt	Critical rate of rise of off-state voltage	67% V_{BR}	5	KV/µs
T_{stg} T_j	Storage and operating junction temperature range		- 40 to + 150 + 150	°C °C
T_L	Maximum lead temperature for soldering during 10 s.		260	°C



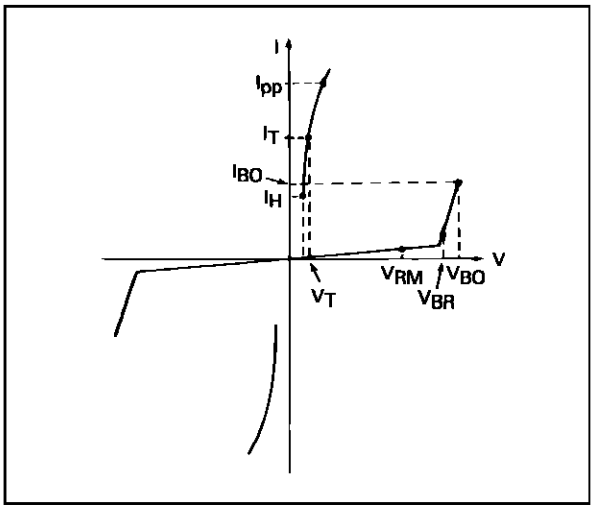
Pulse waveform 10/1000µs

THERMAL RESISTANCE

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

ELECTRICAL CHARACTERISTICS

Symbol	Parameter
V_{RM}	Stand-off voltage
V_{BR}	Breakdown voltage
V_{BO}	Breakover voltage
I_H	Holding current
V_T	On-state voltage
I_{BO}	Breakover current
I_{PP}	Peak pulse current



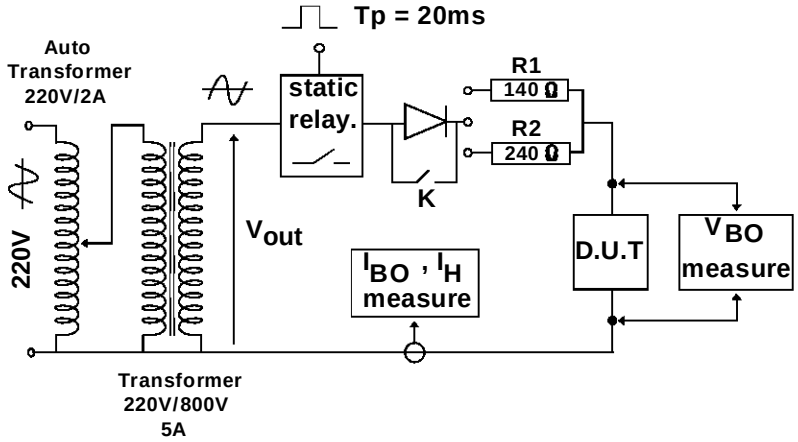
PARAMETERS RELATED TO ONE TRISIL.

Type	I_{RM} @ V_{RM} max		VBR @ I_R min		V_{BO} @ I_{BO} max			I_H min note1	V_T max note2	C max note3
	µA	V	V	mA	V	mA	mA	mA	V	pF
THBT200S	10	180	200	1	290	150	800	150	8	200

All parameters tested at 25°C, except where indicated

Note 1 : See test reference test circuit for I_H, I_{BO} and V_{BO} parameters.
Note 2 : Square pulse Tp = 500 µs - I_T = 5A.
Note 3 : V_R = 1V, F = 1MHz.

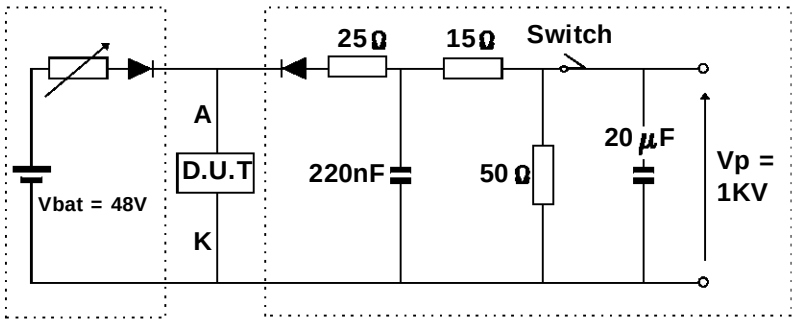
REFERENCE TEST CIRCUIT FOR I_H, I_{BO} and V_{BO} parameters :



TEST PROCEDURE :

- Pulse Test duration (Tp = 20ms):
  - For Bidirectional devices = Switch K is closed
  - For Unidirectional devices = Switch K is open.
- V_{OUT} Selection
  - Device with $V_{BR} \leq 150$ Volt
    - $V_{OUT} = 250\ V_{RMS}$, $R_1 = 140\ \Omega$.
  - Device with $V_{BR} \geq 150$ Volt
    - $V_{OUT} = 480\ V_{RMS}$, $R_2 = 240\ \Omega$.

FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT = GO - NOGO TEST.



Surge Generator
10/700 µsec
Vp =1KV / Ipp = 25A

This is a GO-NOGO Test which allows to confirm the holding current (I_H) level in a functional test circuit. This test can be performed if the reference test circuit can't be implemented.

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 : Ipp = 25A , 10/700 µs.
  3) The D.U.T will come back to the OFF-State within a duration of 50 ms max.

Figure 1 : Relative variation of holding current versus junction temperature.

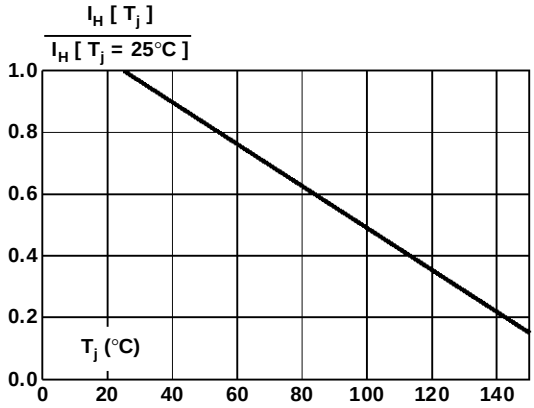


Figure 2 : Non repetitive surge peak on state current versus number of cycles (1 cycle = 20

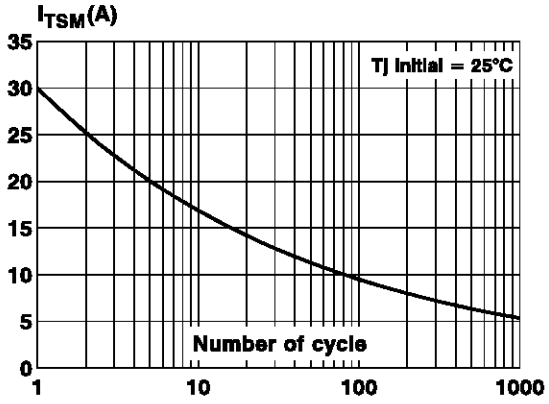


Figure 3 : Peak on state voltage versus peak on state current (typical values).

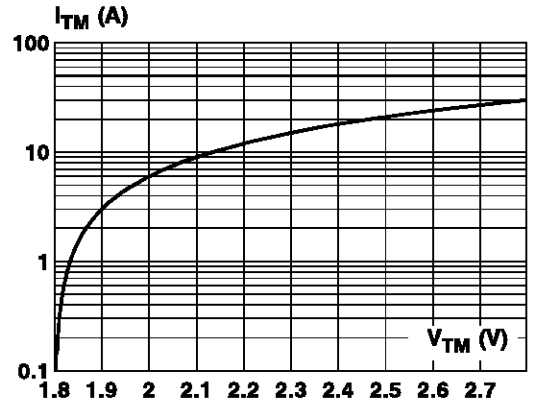
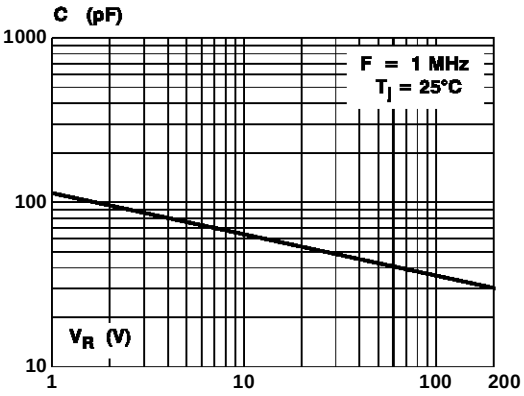
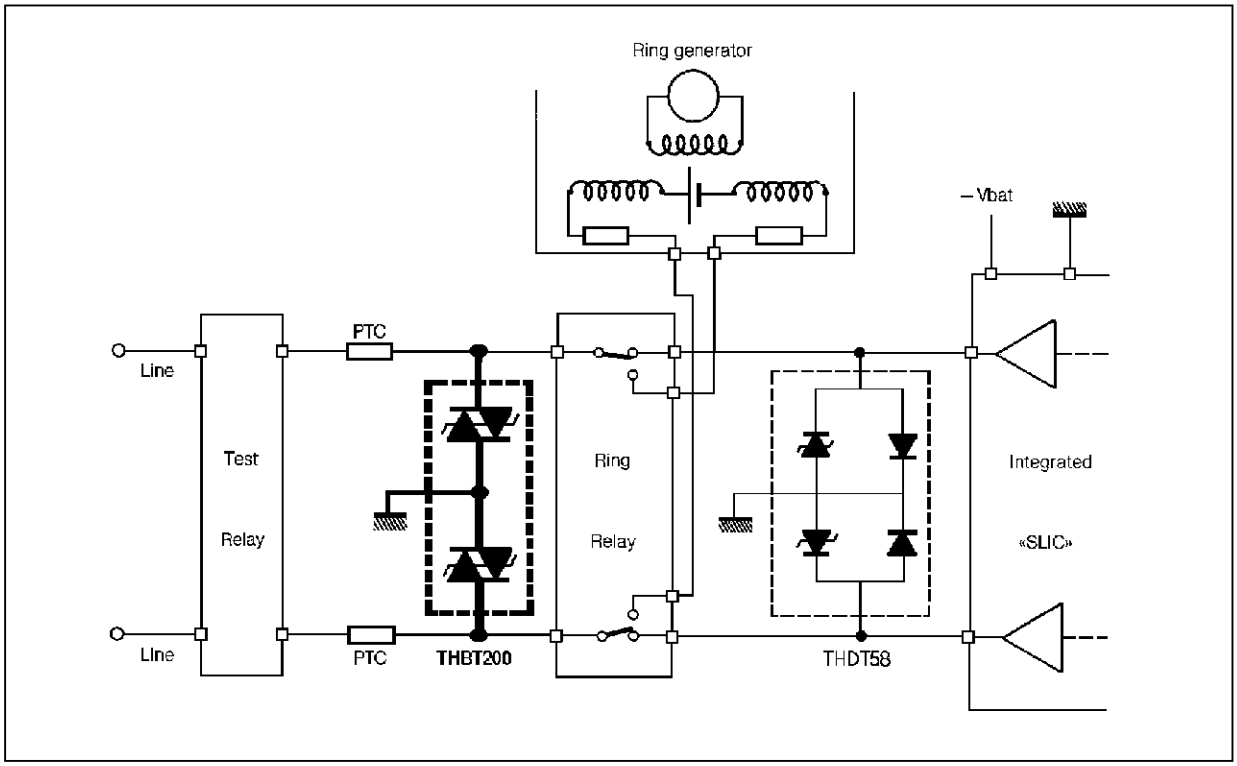


Figure 4 : Capacitance versus reverse applied voltage (typical values).

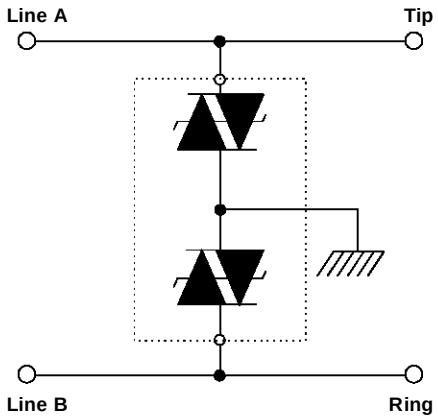


APPLICATION CIRCUIT

Typical line card protection concept



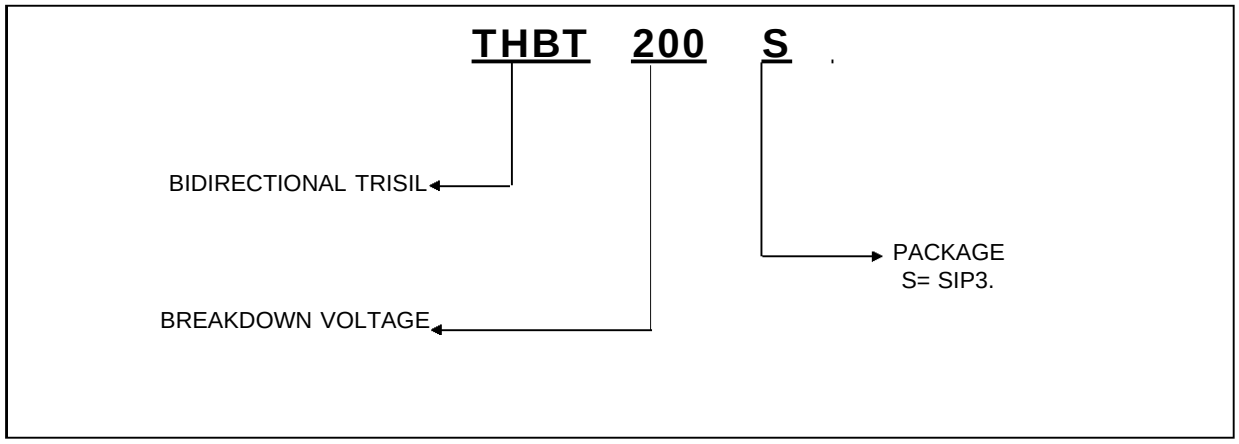
FUNCTIONAL DESCRIPTION



LINE A AND LINE B PROTECTION.

Each line (TIP and RING) is protected by a bidirectional Trisil, which triggers at a maximum voltage equal to the V_{BO}.

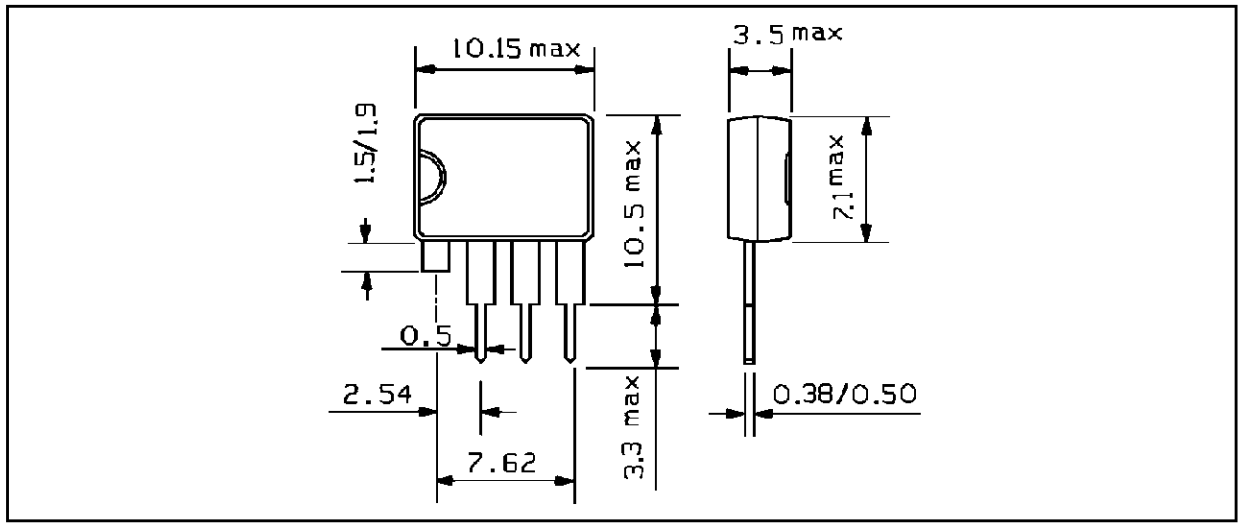
ORDER CODE



MARKING

Package	Type	Marking
SIP3	THBT200S	THBT200S

PACKAGE MECHANICAL DATA (in millimeters)
SIP 3 Plastic.



Packaging : Products supplied in antistatic tubes.