

TRISIL

FEATURES

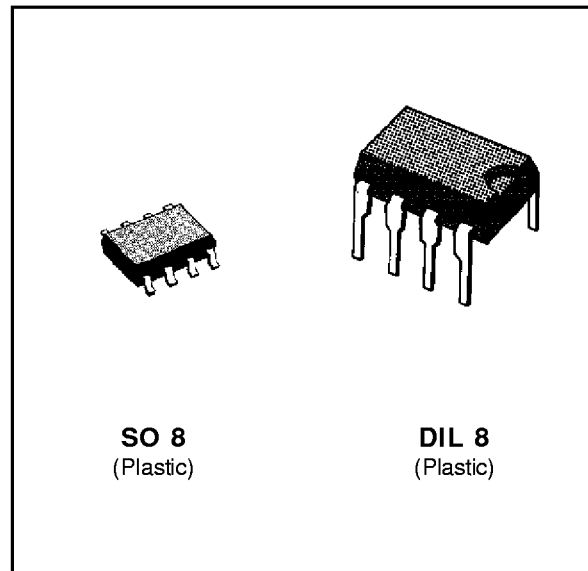
- BIDIRECTIONAL TRIPLE PROTECTION
- CROWBAR PROTECTION
- PEAK PULSE CURRENT :
 $I_{PP} = 30 \text{ A}, 10/1000 \mu\text{s}$
- HOLDING CURRENT = 150 mA min
- AVAILABLE IN DIP 8 AND SO 8 PACKAGES

DESCRIPTION

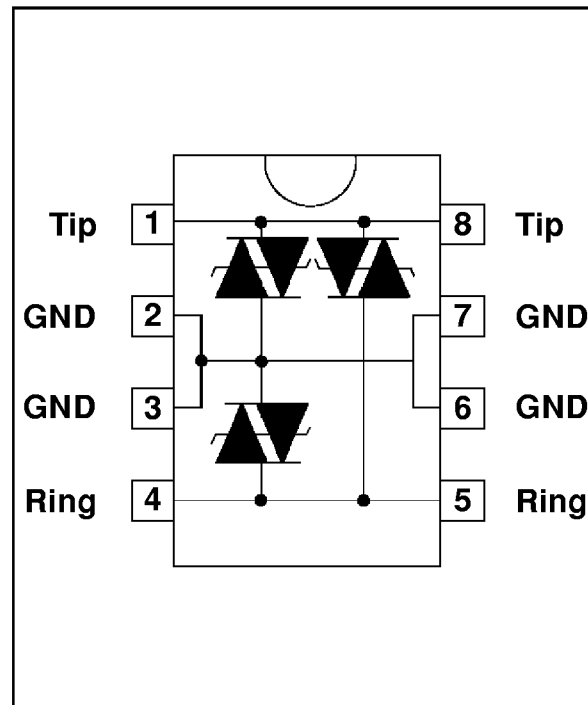
Dedicated to telecommunication equipment protection, these devices provide a triple bidirectional protection function.

They ensure the same protection capability with the same breakdown voltage both in common mode and in differential mode.

Particular attention has been given to the internal wire bonding . A 4-point configuration ensures reliable protection, eliminating the overvoltage introduced by the parasitic inductances of the wiring (Ldi/dt) especially for very fast transients.



SCHEMATIC DIAGRAM



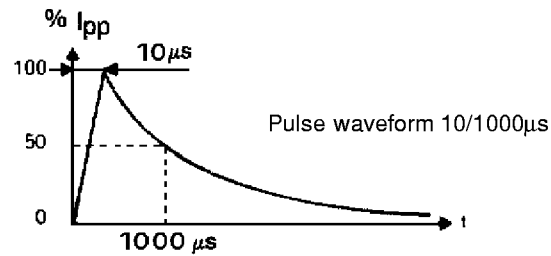
IN ACCORDANCE WITH FOLLOWING STANDARDS :

| | | | |
|-----------------|---|-----------------------|--------|
| 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 |

THBT150 / THBT200 / THBT270

ABSOLUTE RATINGS (limiting values) ($-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +85^{\circ}\text{C}$)

| Symbol | Parameter | | Value | Unit |
|------------------------------------|--|--|------------------------|--|
| I_{PP} | Peak pulse current | 10/1000 μs 5/320 μs 2/10 μs | 30 40 75 | A |
| I_{TSM} | Non repetitive surge peak on-state current | $t_{\text{p}} = 10 \text{ ms}$ $t_{\text{p}} = 1 \text{ s}$ | 5 3.5 | 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 | $^{\circ}\text{C}$ $^{\circ}\text{C}$ |

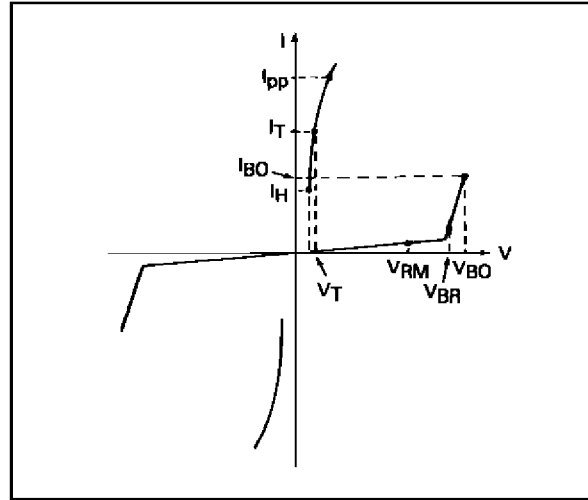


THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|----------------------|---------------------|---------------|------------|--|
| $R_{\text{th}}(j-a)$ | Junction-to-ambient | DIL 8 SO 8 | 125 171 | $^{\circ}\text{C}/\text{W}$ $^{\circ}\text{C}/\text{W}$ |

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 |



STATIC PARAMETERS

| Types | I_R @ V_{RM} | | V_{BR} @ I_R | | V_{BO} @ I_{BO} | | | I_H | V_T | C |
|---------|------------------|-----|------------------|----|---------------------|-----|-----|-------|-------|-----|
| | max | | min | | max | min | max | min | max | max |
| | μA | V | V | mA | V | mA | mA | mA | V | pF |
| THBT150 | 5 | 135 | 150 | 1 | 210 | 50 | 400 | 150 | 8 | 200 |
| THBT200 | 5 | 180 | 200 | 1 | 290 | 50 | 400 | 150 | 8 | 200 |
| THBT270 | 5 | 240 | 270 | 1 | 380 | 50 | 400 | 150 | 8 | 200 |

DYNAMIC PARAMETERS

| Types | V_{BO} dyn Typical Value |
|---------|-------------------------------|
| | note 4 (V) |
| THBT150 | 290 |
| THBT200 | 380 |
| THBT270 | 420 |

All parameters tested at 25°C, except where indicated

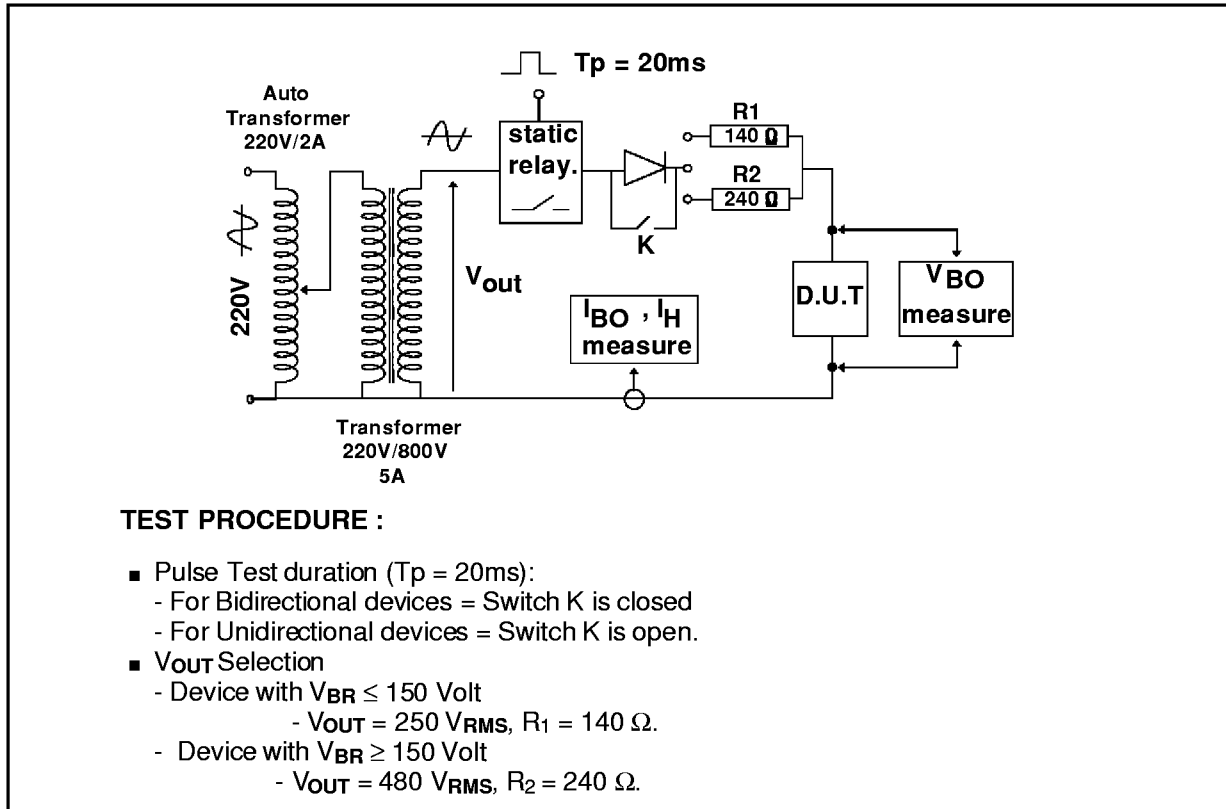
Note 1 : See the reference test circuit for I_H , I_{BO} and V_{BO} parameters.

Note 2 : Square pulse $T_p = 500 \mu s$ - $I_T = 5A$.

Note 3 : $V_R = 1V$, $F = 1MHz$.

Note 4 : The dynamic breakover voltage is measured with following surge test : CCITT - 1.5 KV 10/700 μs

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



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

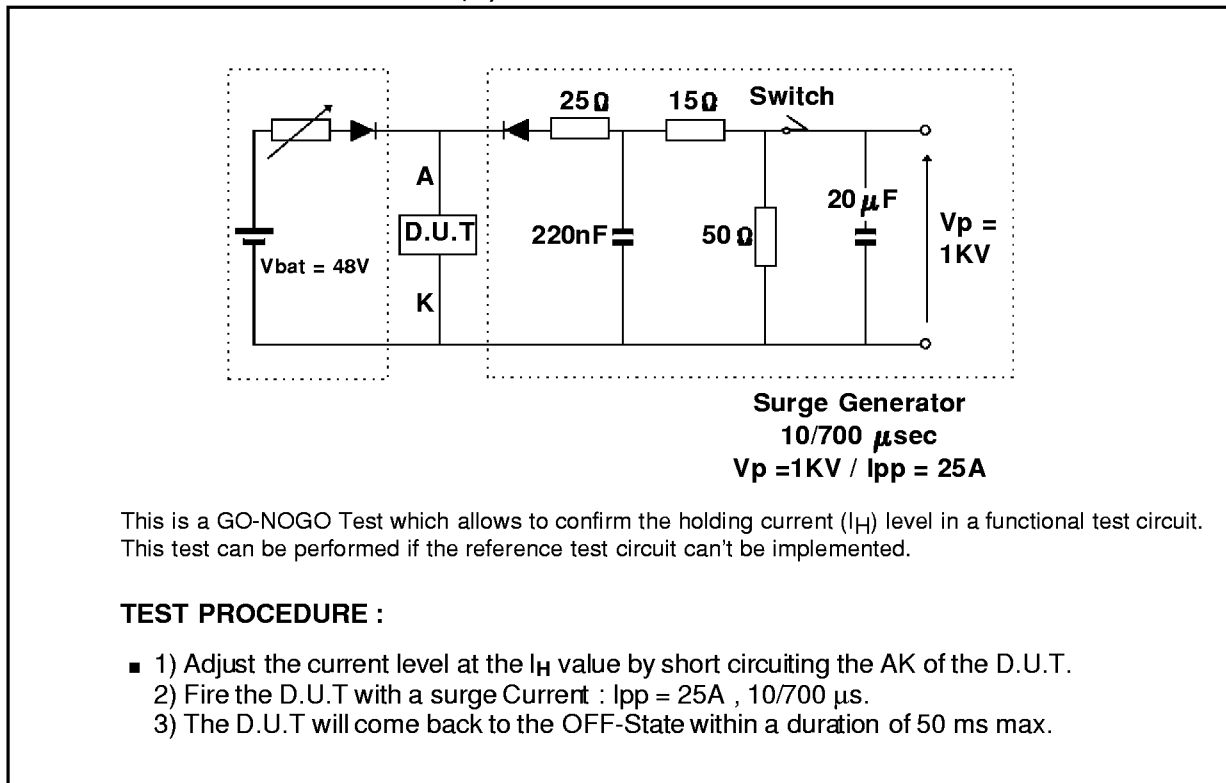
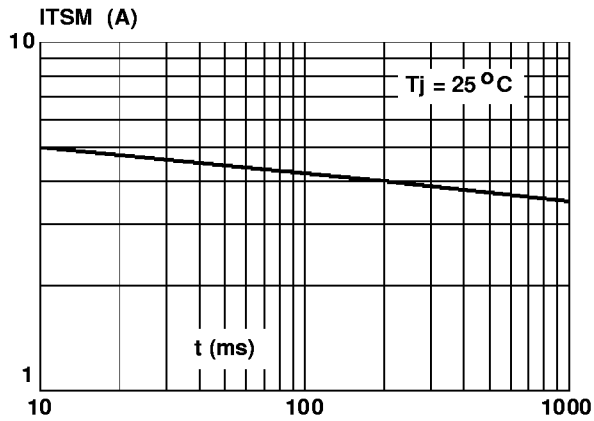


Figure 1 : Non repetitive surge peak on-state current. (with sinusoidal pulse : F =50Hz)



APPLICATION NOTE

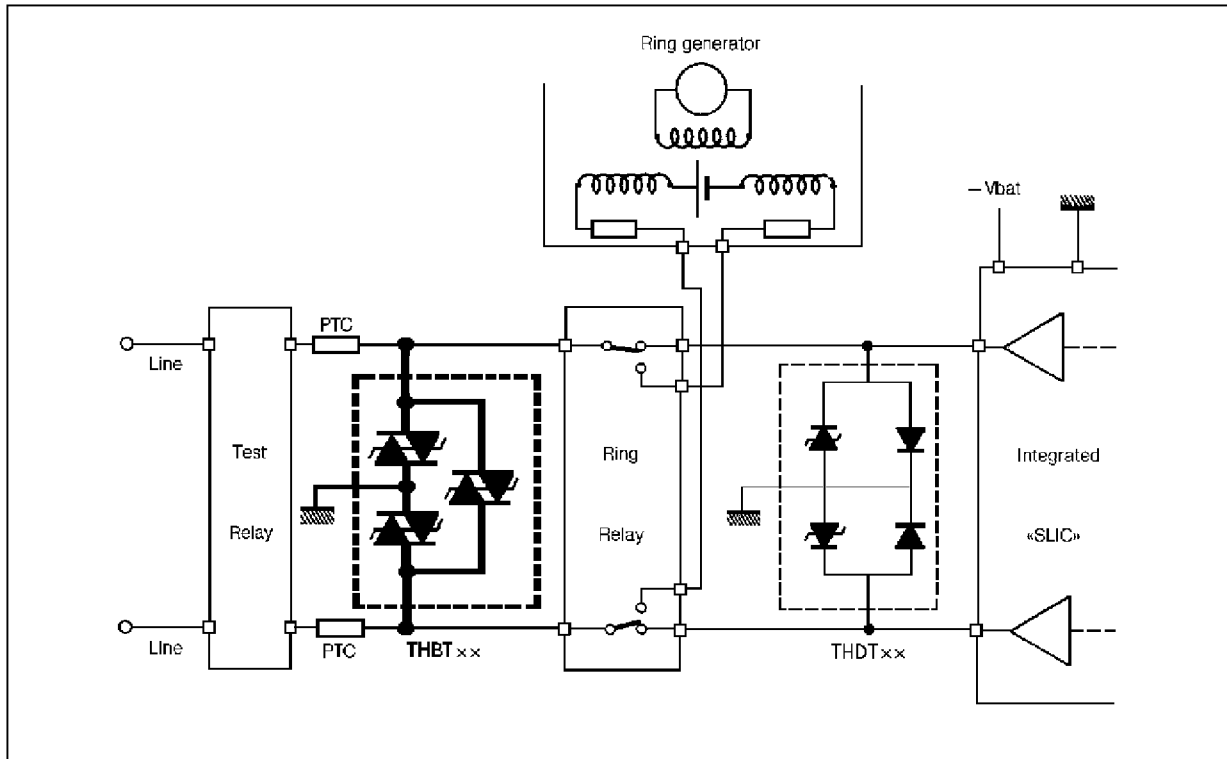
4- points structure lay-out.

- 1) Connect pins 2, 3, 6 and 7 to ground in order to guarantee a good surge current capability for long duration disturbances.

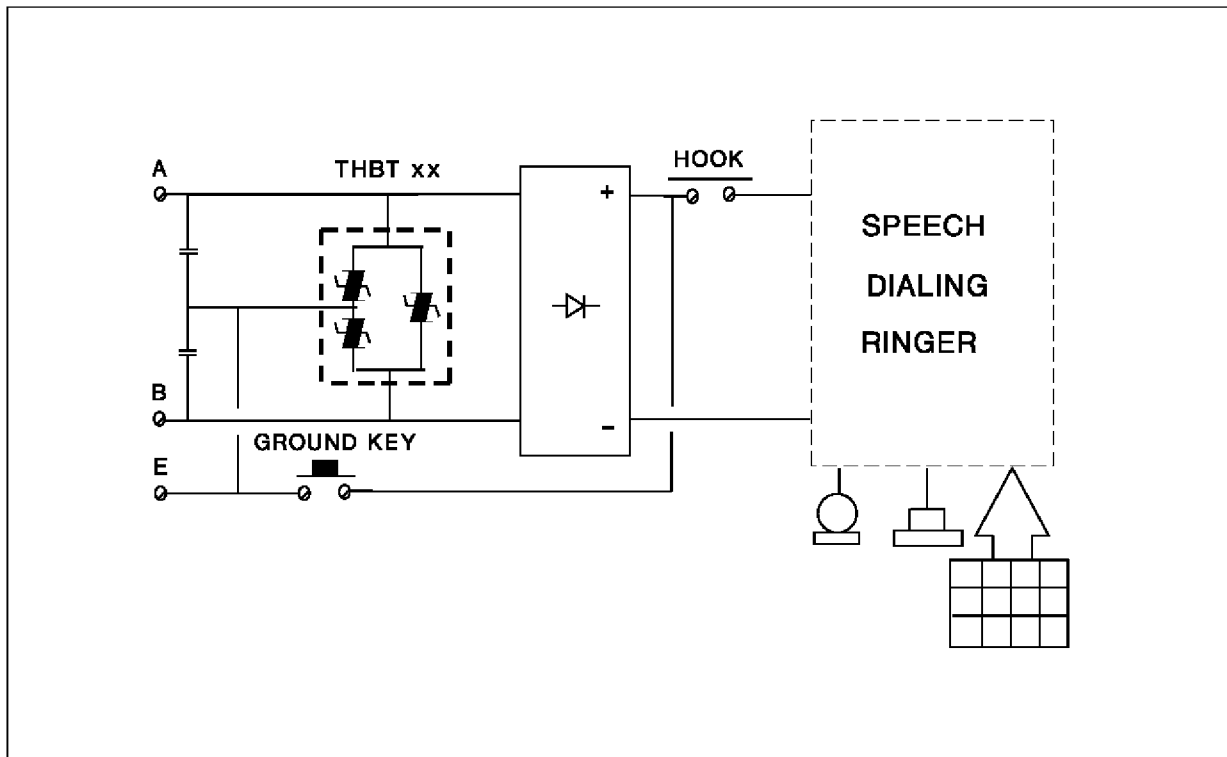
- 2) In order to take advantage of the "4-points structure" of the THBTxxx, the tip and Ring lines have to cross through the device. In this case, the device will eliminate the overvoltages generated by the parasitic inductances of the wiring (Ldi/dt), especially for very fast Transients.

APPLICATION CIRCUIT

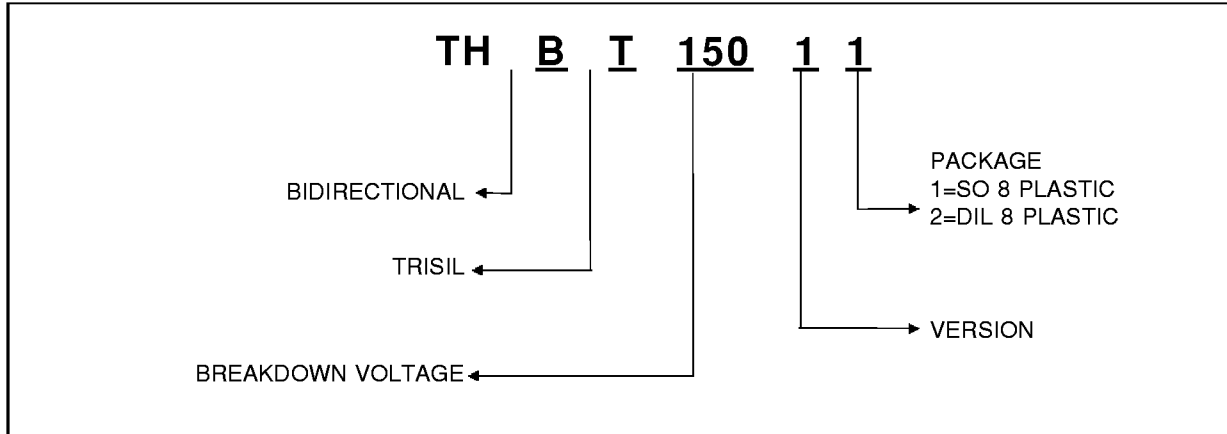
Line card protection



Ground key telephone set protection



ORDER CODE



MARKING

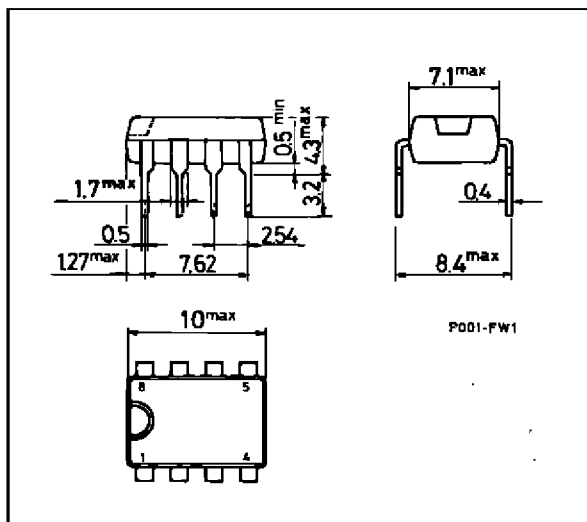
| Package | Type | Marking |
|---------|-----------|---------|
| SO8 | THBT15011 | BT1511 |
| | THBT20011 | BT2011 |
| | THBT27011 | BT2711 |

| Package | Type | Marking |
|---------|-----------|---------|
| DIL8 | THBT15012 | BT1512 |
| | THBT20012 | BT2012 |
| | THBT27012 | BT2712 |

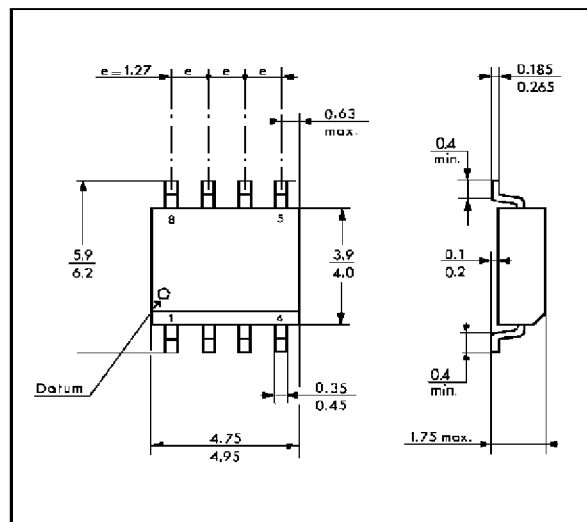
Packaging : Products supplied in antistatic tubes.

PACKAGE MECHANICAL DATA (in millimeters)

DIL 8 Plastic

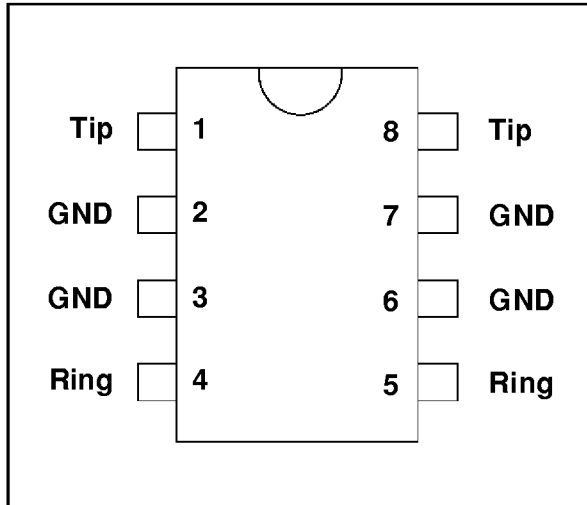


SO 8 Plastic

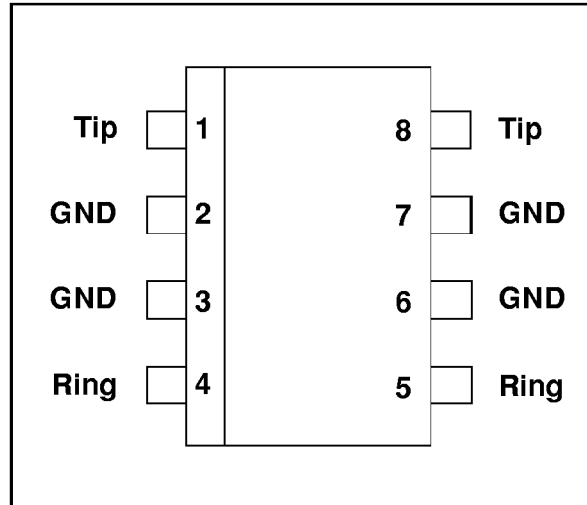


CONNECTION DIAGRAM

DIL 8 Plastic



SO 8 Plastic



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I²C Components by SGS-THOMSON Microelectronics, conveys a licence under the Philips I²C Patent. Rights to use these components in an I²C system, is granted provided that the system conforms to the I²C Standard Specification as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands -
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A