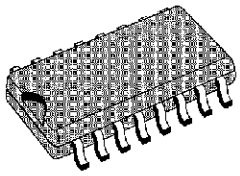
SGS-THOMSON MICROELECTRONICS

TSIxxxB5

TELEPHONE SET INTERFACE

FEATURES

- SINGLE DEVICE PROVIDING :
  DIODE BRIDGE
  BIDIRECTIONAL PROTECTION
- CROWBAR PROTECTION
- PEAK PULSE CURRENT :
  I_{PP} = 30A, 10/1000 µs
- VOLTAGE RANGE FROM 120V to 270V
- Maximum current : Io = 0.5

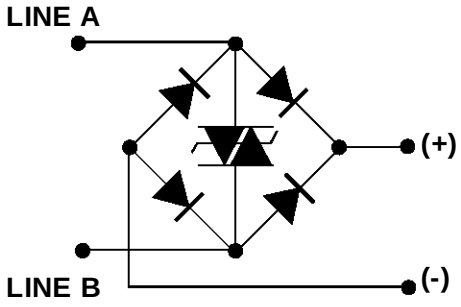


SO16
(Plastic)

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

FUNCTIONAL DIAGRAM



ABSOLUTE RATINGS (limiting values) (-40°C ≤ Tamb ≤ +85°C)

Symbol	Parameter		Value	Unit
I_{PP}	Peak pulse current	10/1000 µs 5/310 µs 2/10 µs	30 40 75	A
Io	Maximum current		0.5	A
I_{TSM}	Non repetitive surge peak on-state current	tp = 10 ms tp = 1 s	5 3.5	A
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

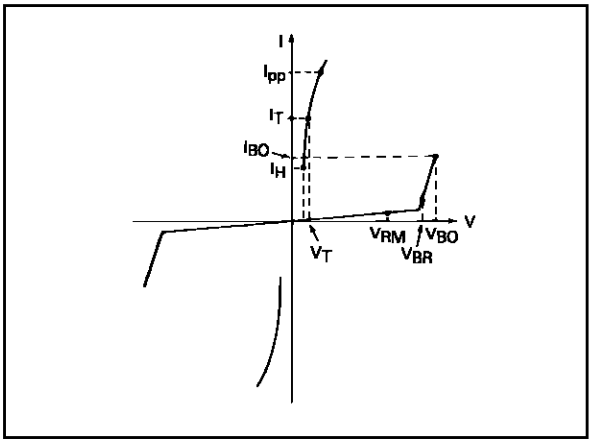
THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R_{th} (j-a)	Junction-ambient thermal resistance - mounting on FR4	80	°C/W

ELECTRICAL CHARACTERISTICS

Tamb = 25°C

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



PARAMETERS RELATED TO THE PROTECTION DEVICE

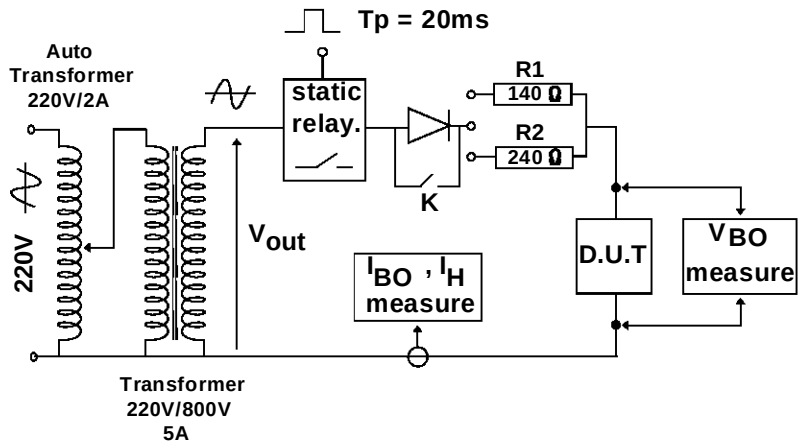
Types	I_R @ V_{RM} max		VBO @ I_{BO} max note1	IH min note1	I_{BO} min note1	I_{BO} max	V_T max note2
	µA	V	V	mA	mA	mA	V
TSI120B5	1 5	50 120	180	150	50	400	8
TSI150B5	1 5	50 150	230	150	50	400	8
TSI180B5	1 5	50 180	250	150	50	400	8
TSI200B5	1 5	50 200	290	150	50	400	8
TSI270B5	1 5	50 270	380	150	50	400	8

PARAMETERS RELATED TO THE DIODE BRIDGE

Symbol	Test conditions	Value	Unit
V_F	I_F = 20mA note 3 i_F = 100mA note 3	0.9 1.0	V
C	note 4	200	pF

All parameters are tested at 25°C, except where indicated
Note 1 : See test conditions for V_{BO}, I_{BO}, I_H parameters
Note 2 : Square pulse tp = 500 µs - I_T = 5A.
Note 3 : V_F is given for one diode
Note 4 : V_R = 0V, F = 1MHz.

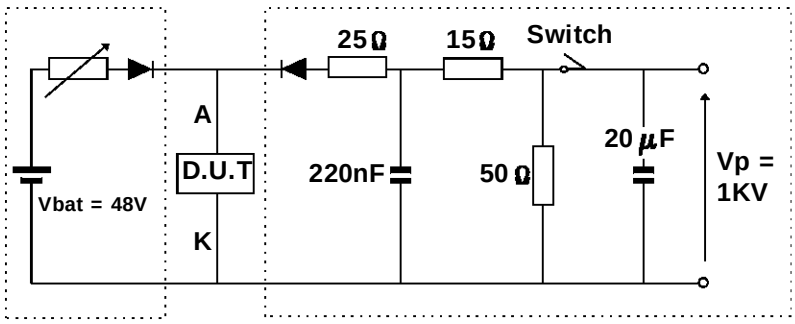
REFERENCE TEST CIRCUIT FOR I_H, I_{BO} and V_{BO} parameters :



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.

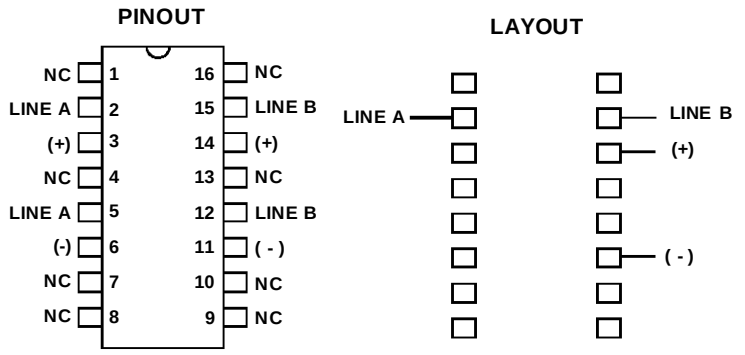
- **TEST PROCEDURE :**

1) Adjust the current level at the I_H value by short circuiting the AK of the D.U.T.

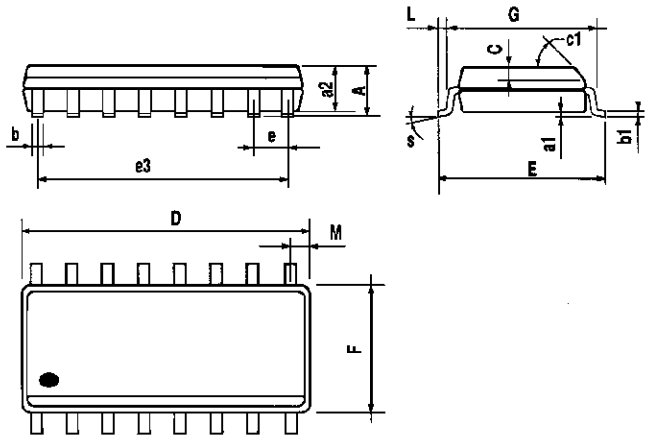
2) Fire the D.U.T with a surge Current : Ipp = 25A , 10/700 µs.

3) The D.U.T will come back to the OFF-State withing a duration of 50 ms max.

PINOUT CONFIGURATION AND LAYOUT RECOMMENDATIONS :



PACKAGE MECHANICAL DATA



DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.2	0.004		0.008
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45° max					
D	9.8		10	0.386		0.394
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.150		0.157
G	4.6		5.3	0.181		0.209
L	0.5		1.27	0.020		0.050
M			0.62			0.024
S	8° max					

MARKING : LOGO, DATE CODE, DEVICE CODE.

DEVICE	TSI120B5	TSI150B5	TSI180B5	TSI200B5	TSI270B5
MARKING	TSI120	TSI150	TSI180	TSI200	TSI270