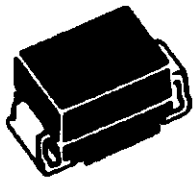
SGS-THOMSON MICROELECTRONICS

SMTHDT58

TRISIL FOR SLIC PROTECTION

FEATURES

- CROWBAR PROTECTION.
- ASYMETRICAL TRANSIENT SUPPRESSOR
- PEAK PULSE CURRENT :
  - I_{PP} = 75 A, 10/1000 µs.
- HOLDING CURRENT = 150 mA min
- BREAKDOWN VOLTAGE = 58 V.
- BREAKOVER VOLTAGE = 80V max.



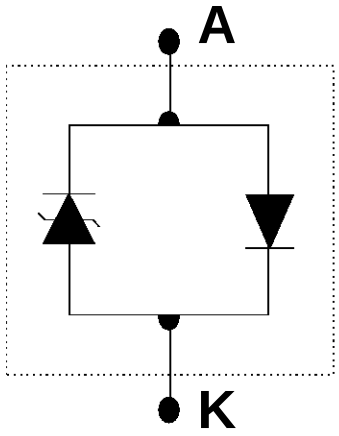
SOD 15
(Plastic)

DESCRIPTION

This device has been especially designed to protect subscriber line card interfaces (SLIC) and terminals against transient overvoltages.

A diode clips positive overloads and a crowbar device protects againts negative surges.

SCHEMATIC DIAGRAM

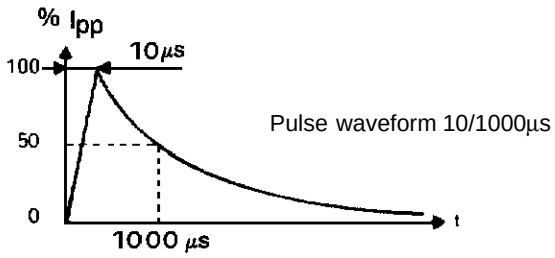


IN ACCORDANCE WITH FOLLOWING STANDARDS :

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
I_{FSM}	Non repetitive surge peak forward 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



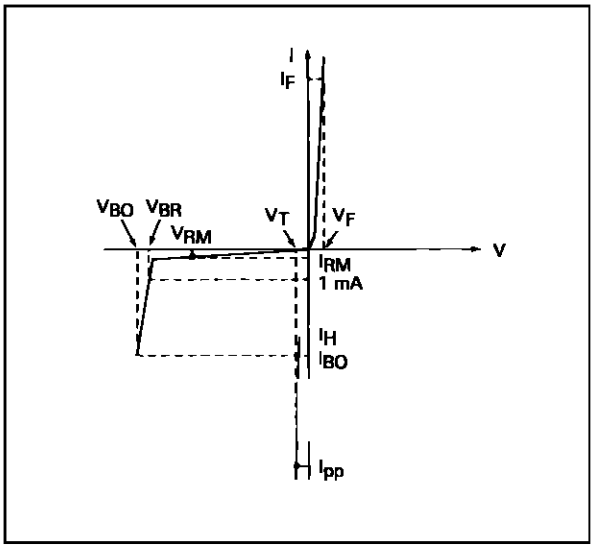
Pulse waveform 10/1000µs

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R_{th} (j-l)	Junction to leads	10	°C/W
R_{th} (j-a)	Junction-to-ambiant	75	°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
V_F	Forward Voltage Drop
I_{BO}	Breakover current
I_{PP}	Peak pulse current



PARAMETER RELATED TO THE DIODE.

Symbol	Test conditions	Value	Unit
V_F	Square pulse, tp = 500 µs, I_F = 5 A.	5	V

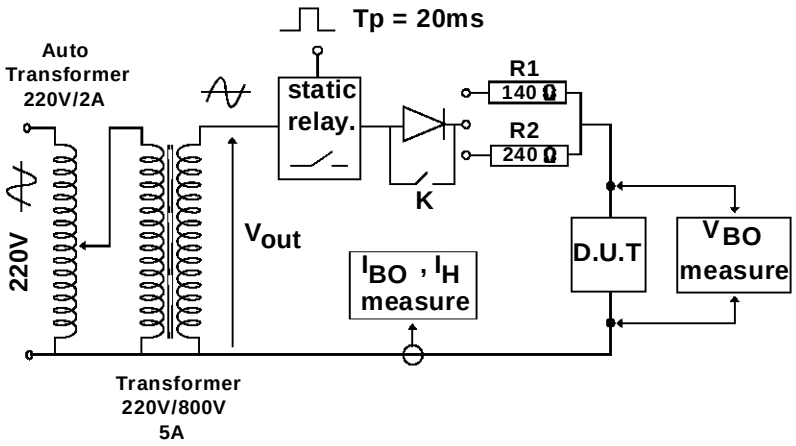
PARAMETERS RELATED TO THE PROTECTION THYRISTOR.

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
SMTHDT58	10	56	58	1	80	150	800	150	5	400

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 Tp = 500 µs - I_T = 5A.
Note 3 : V_R = 1V, F = 1MHz.

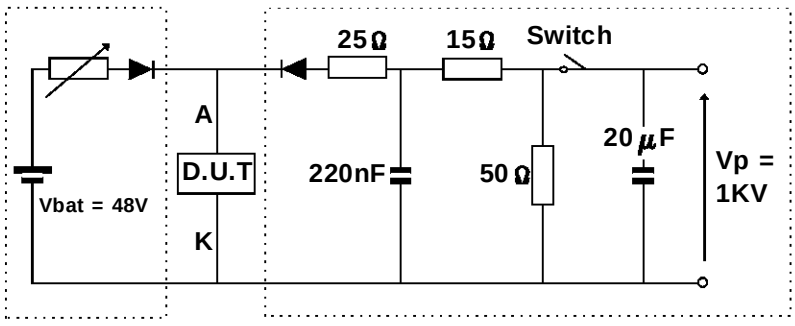
REFERENCE TEST CIRCUIT FOR I_H, I_{BO} and V_{BO} parameters :



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 cant'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.

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

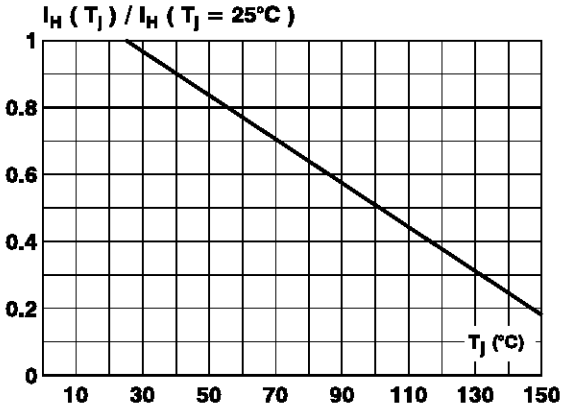


Figure 2 : Non repetitive surge peak on state current versus number of cycles (1 cycle = 20

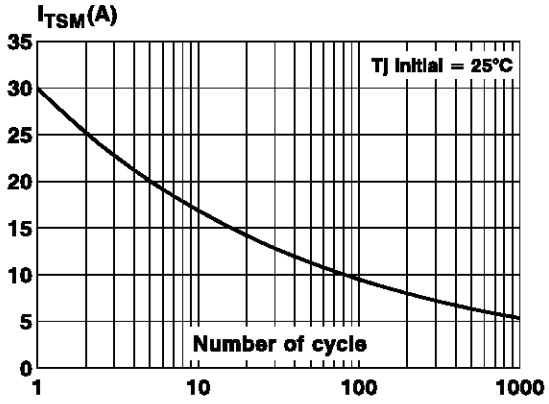


Figure 3 : Peak on state voltage versus peak on state current (typical values).

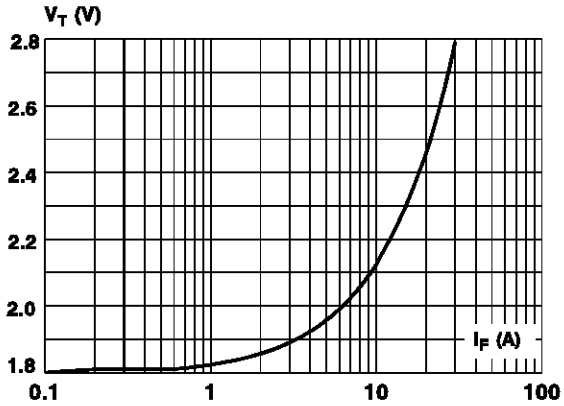


Figure 4 : Peak forward voltage drop versus peak forward current (typical values).

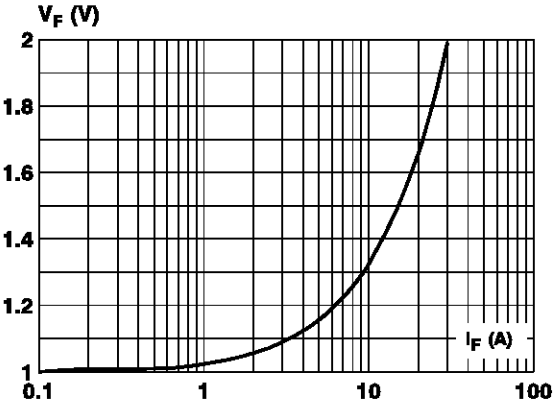
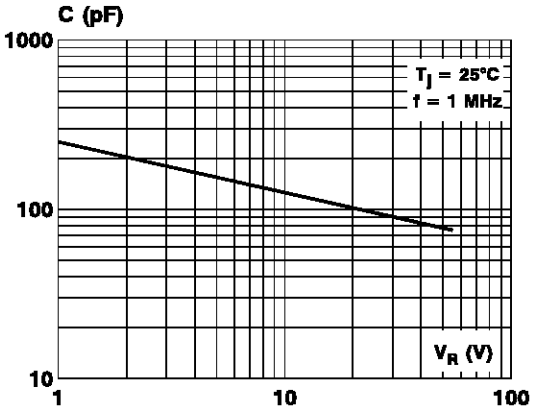
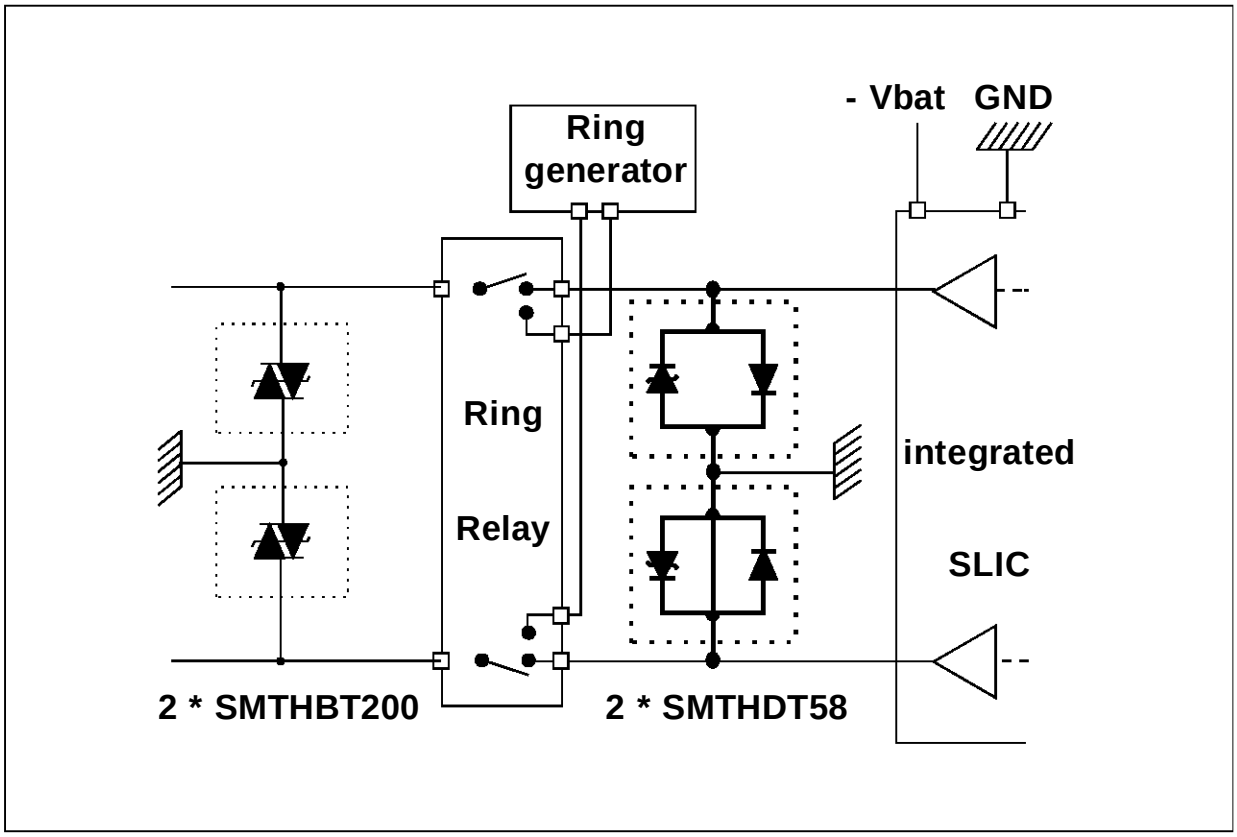


Figure 5 : Capacitance versus reverse applied voltage (typical values).

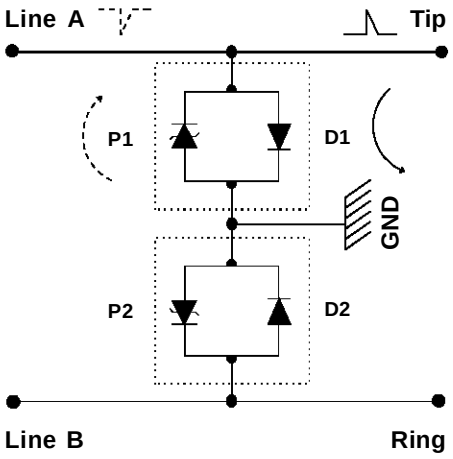


APPLICATION CIRCUIT

Typical slic protection concept



FUNCTIONAL DESCRIPTION



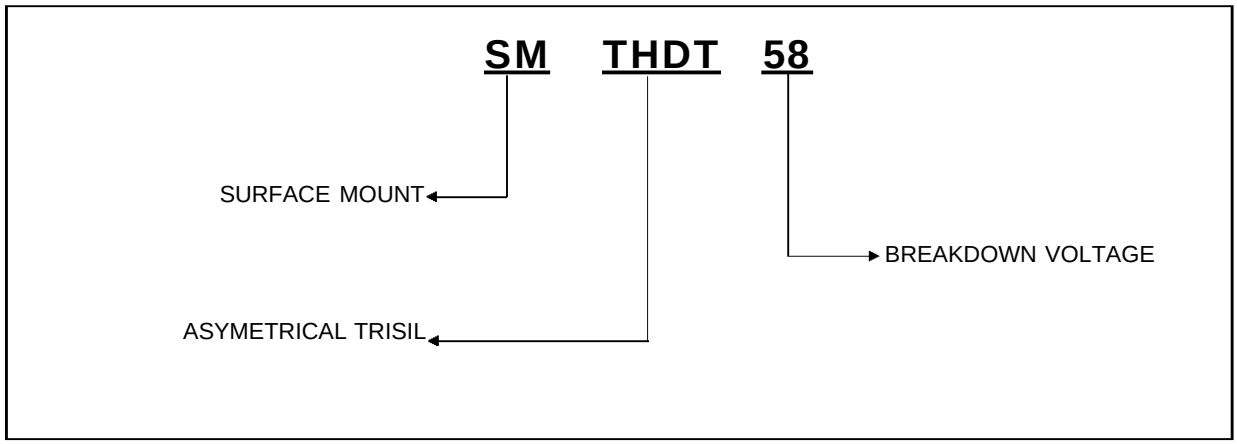
Line A Protection =

- For positive Surges versus GND, the diode D1 will conduct
- For negative Surges versus GND, the Protection device P1 will trigger at a maximum voltage equal to the V_{BO}.

Line B Protection =

- For Surges on line B, the operating mode is the same, D2 or P2 is activated.

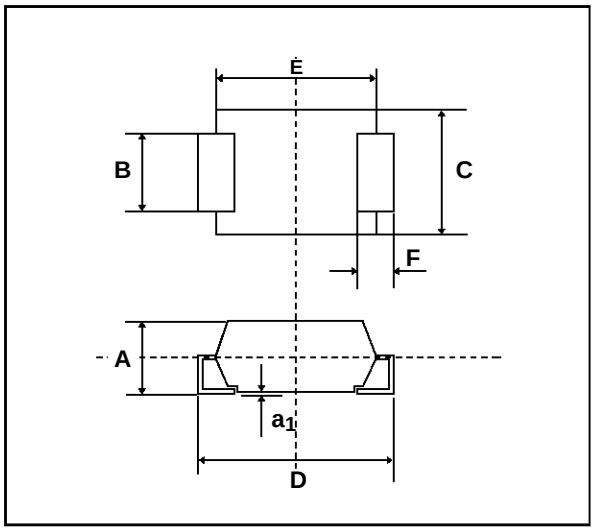
ORDER CODE



MARKING = Logo, WO1
A white band indicates the cathode.

PACKAGE MECHANICAL DATA .

SOD 15 Plastic.



Ref	Millimeters		Inches	
	min	max	min	max
A	2.5	3.1	0.098	0.122
a_1	-	0.2	-	0.008
B	2.9	3.1	0.114	0.122
C	4.8	5.2	0.190	0.200
D	7.6	8.0	0.300	0.315
E	6.3	6.6	0.248	0.259
F	1.3	1.7	0.051	0.067

Packaging : Standard packaging is in film.