SGS-THOMSON MICROELECTRONICS

TPB SERIES

TRISIL

FEATURES

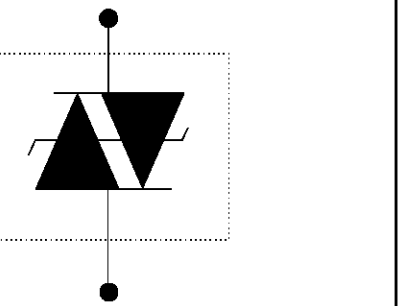
- BIDIRECTIONAL CROWBAR PROTECTION.
- BREAKDOWN VOLTAGE RANGE:
  From 62 V To 270 V.
- HOLDING CURRENT = I_H
  Suffix 12 = 120mA min.
  Suffix 18 = 180mA min.
- PEAK PULSE CURRENT :
  I_{PP} = 90 A, 10/1000 µs.

CB 429
(Plastic)

DESCRIPTION

The TPBxx series has been designed to protect telecommunication equipments against lightning and transient induced by AC power lines.

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

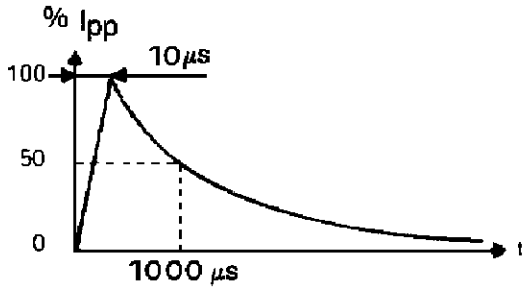
ABSOLUTE RATINGS (limiting values) (-40°C ≤ T_{amb} ≤ + 85°C)

Symbol	Parameter		Value	Unit
P	Power dissipation on infinite heatsink	T_{amb} = 50 °C	5	W
I_{PP}	Peak pulse current See note1	10/1000 µs 8/20 µs	90 150	A
I_{TSM}	Non repetitive surge peak on-state current	tp = 20 ms	50	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.		230	°C

THERMAL RESISTANCES

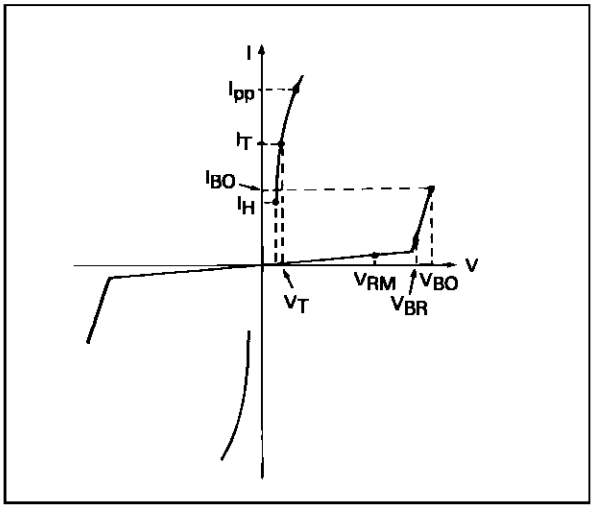
Symbol	Parameter	Value	Unit
R_{th} (j-l)	Junction to leads. On infinite heatsink.	20	°C/W
R_{th} (j-a)	Junction to ambient. On printed circuit. L_{lead} = 10 mm	75	°C/W

Note 1: 10/1000 µs wave form.



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



ELECTRICAL CHARACTERISTICS

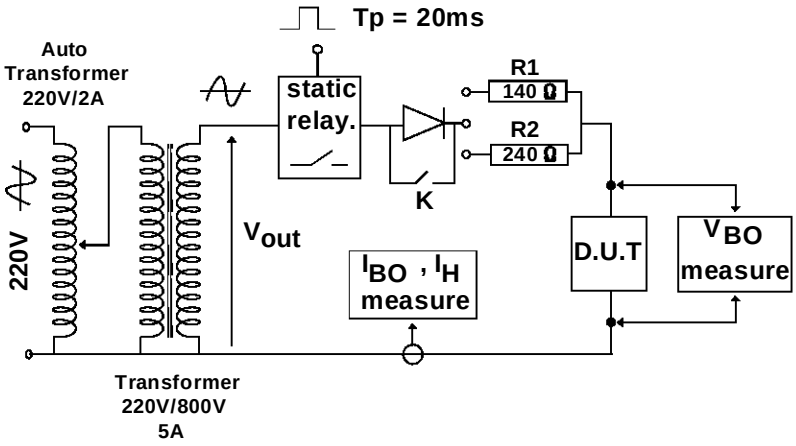
Type	I_{RM} @ V_{RM} max		V_{BR} @ I_R min		V_{BO} @ I_{BO} max note2	max	V_T max note3	C max note4	I_H min note2
	µA	V	V	mA	V	mA	V	pF	mA
P TPB62A - 12 or 18	2	56	62	1	82	300	3.5	300	
TPB62B - 12 or 18	2	56	62	1	75	300	3.5	300	
P TPB68A - 12 or 18	2	61	68	1	90	300	3.5	300	
TPB68B - 12 or 18	2	61	68	1	82	300	3.5	300	
(1) TPB75A - 12 or 18	2	67	75	1	100	300	3.5	300	
(1) TPB75B - 12 or 18	2	67	75	1	91	300	3.5	300	
(1) TPB82A - 12 or 18	2	74	82	1	109	300	3.5	300	
(1) TPB82B - 12 or 18	2	74	82	1	99	300	3.5	300	Suffix 12
(1) TPB91A - 12 or 18	2	82	91	1	121	300	3.5	300	for 120 mA.
(1) TPB91B - 12 or 18	2	82	91	1	110	300	3.5	300	
P TPB100A - 12 or 18	2	90	100	1	133	300	3.5	200	
TPB100B - 12 or 18	2	90	100	1	121	300	3.5	200	
P TPB110A - 12 or 18	2	99	110	1	147	300	3.5	200	
TPB110B - 12 or 18	2	99	110	1	133	300	3.5	200	
P TPB120A - 12 or 18	2	108	120	1	160	300	3.5	200	Suffix 18
TPB120B - 12 or 18	2	108	120	1	145	300	3.5	200	for 180 mA.
P TPB130A - 12 or 18	2	117	130	1	173	300	3.5	200	
TPB130B - 12 or 18	2	117	130	1	157	300	3.5	200	
(1) TPB150A - 12 or 18	2	135	150	1	200	300	7	150	
(1) TPB150B - 12 or 18	2	135	150	1	181	300	7	150	
(1) TPB160A - 12 or 18	2	144	160	1	213	300	7	150	
(1) TPB160B - 12 or 18	2	144	160	1	193	300	7	150	
P TPB180A - 12 or 18	2	162	180	1	240	300	7	150	
TPB180B - 12 or 18	2	162	180	1	217	300	7	150	
P TPB200A - 12 or 18	2	180	200	1	267	300	7	150	
TPB200B - 12 or 18	2	180	200	1	241	300	7	150	
P TPB220A - 12 or 18	2	198	220	1	293	300	7	150	
TPB220B - 12 or 18	2	198	220	1	265	300	7	150	
P TPB240A - 12 or 18	2	216	240	1	320	300	7	150	
TPB240B - 12 or 18	2	216	240	1	289	300	7	150	
P TPB270A - 12 or 18	2	243	270	1	360	300	7	150	
TPB270B - 12 or 18	2	243	270	1	325	300	7	150	

All parameters tested at 25°C, except where indicated.

P : Preferred device.
(1): These voltages are on request.

Note 2 : See the reference test circuit for I_H, I_{BO} and V_{BO} parameters.
Note 3 : Square pulse Tp = 1 ms - I_T = 5A.
Note 4 : V_R = 1V, F = 1MHz.

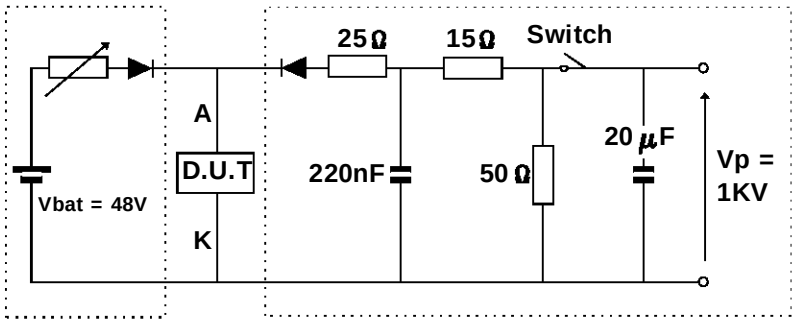
REFERENCE TEST CIRCUIT FOR I_H, I_{BO} and V_{BO} parameters :



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 withing a duration of 50 ms max.

Figure 1 : Non repetitive surge peak on state current versus number of cycles. (with sinusoïdal

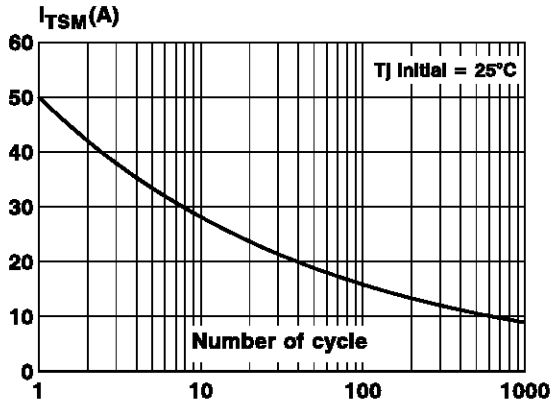
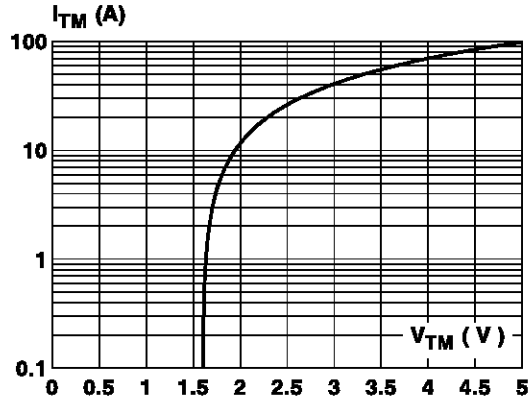
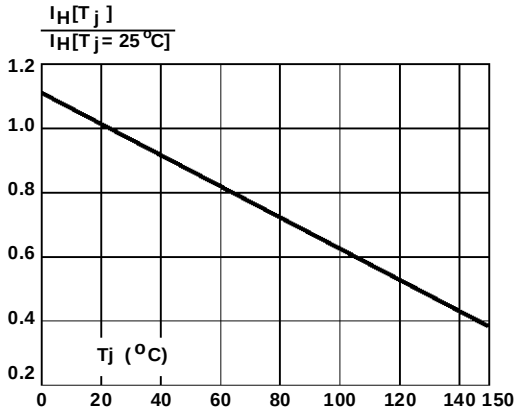


Figure 2 : On - state characteristics (typical values).

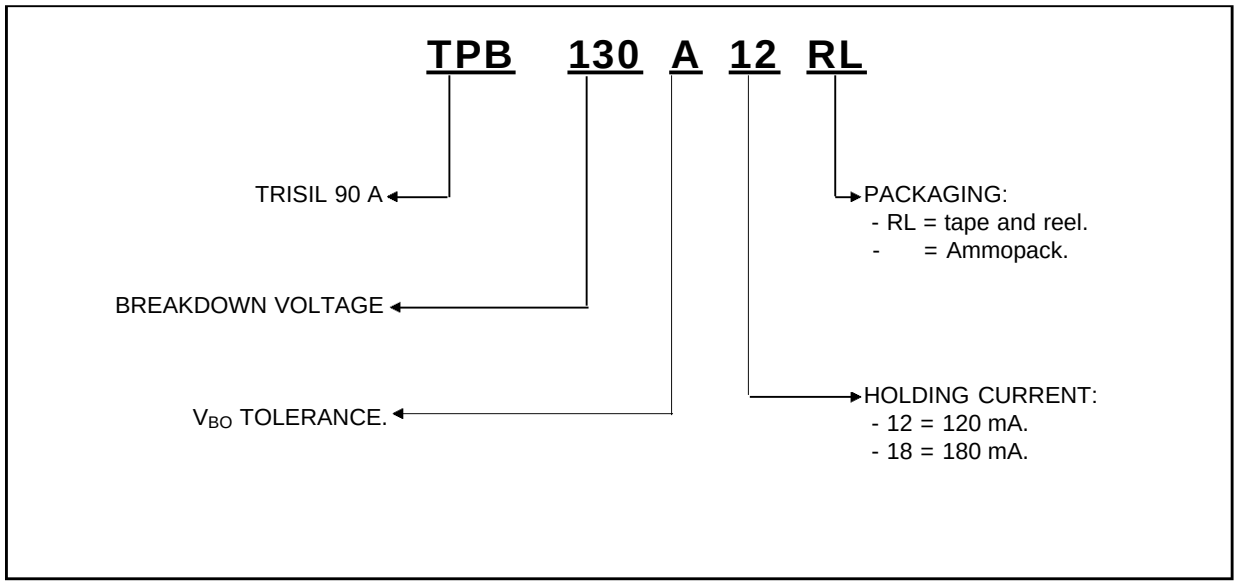


Note : For devices with $V_{BR} > 150$ V
The V_T value is twice that shown.

Figure 3 : Relative variation of holding current versus junction temperature.



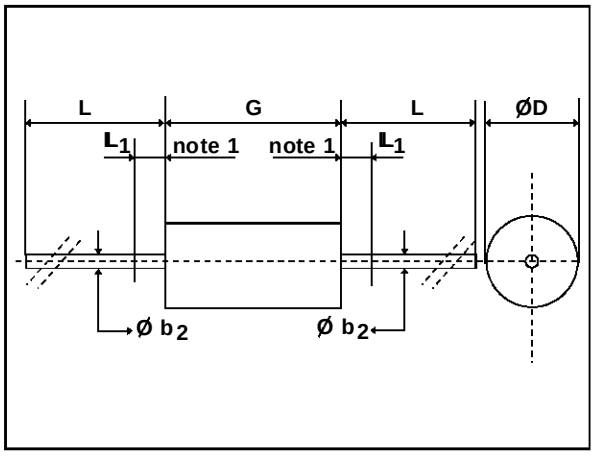
ORDER CODE



MARKING : Logo, Date Code, Part Number.

PACKAGE MECHANICAL DATA.

CB 429 Plastic.



Ref	Millimeters		Inches	
	min	max	min	max
∅ b_2	-	1.06	-	0.042
∅ D	-	5.1	-	0.20
G	-	9.8	-	0.386
L	26	-	1.024	-
L_1	-	1.27	-	0.050
note 1:The diameter ∅ b_2 is not controlled over zone L_1.				

Packaging : Standard packaging is in tape and reel.