TP30-xxx Series

TRISIL™

FEATURES

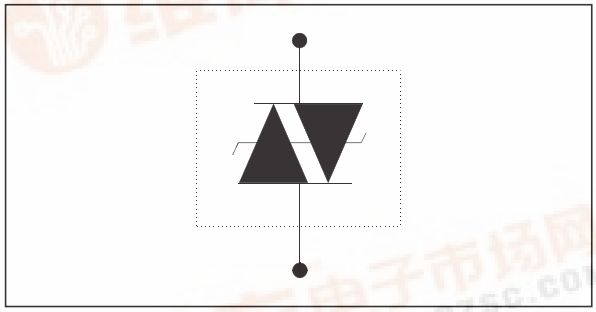
- BIDIRECTIONAL CROWBAR PROTECTION.
- VOLTAGE RANGE: FROM 62 V TO 270 V.
- HOLDING CURRENT :
  I_H = 150 mA min.
- REPETITIVE PEAK PULSE CURRENT :
  I_{PP} = 30 A, 10/1000 µs.
- JEDEC REGISTERED PACKAGE OUTLINE

DO-15

DESCRIPTION

The TP30-xxx series has been designed to protect telecommunication equipment against lightning surges and overvoltages induced by AC power lines.

SCHEMATIC DIAGRAM



COMPLIES WITH THE FOLLOWING STANDARDS:	Peak Surge Voltage (V)	Voltage Waveform (µs)	Current Waveform (µs)	Admissible Ipp (A)	Necessary Resistor (Ω)
(CCITT) ITU-K20	1000	10/700	5/310	25	-
(CCITT) ITU-K17	1500	10/700	5/310	38	-
VDE0433	2000	10/700	5/310	40	10
VDE0878	2000	1.2/50	1/20	50	-
IEC-1000-4-5	level 2 level 3	10/700 1.2/50	5/310 8/20	25 50	- -
FCC Part 68, lightning surge type A	1500 800	10/160 10/560	10/160 10/560	65 50	15.5 8.0
FCC Part 68, lightning surge type B	1000	9/720	5/320	25	-
BELLCORE TR-NWT-001089 First level	2500 1000	2/10 10/1000	2/10 10/1000	125 30	15.0 23.3
BELLCORE TR-NWT-001089 Second level	5000	2/10	2/10	125	15.0
CNET I31-24	1000	0.5/700	0.8/310	25	-

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25°C)

Symbol	Parameter		Value	Unit
P	Power dissipation on infinite heatsink	T_{amb} = 50 °C	3	W
I_{PP}	Peak pulse current	10/1000 µs 8/20 µs	30 60	A
I_{TSM}	Non repetitive surge peak on-state current	tp = 20 ms	15	A
I^2t	I^2t value for fusing	tp = 20 ms	1	A^2s
dV/dt	Critical rate of rise of off-state voltage	V_{RM}	5	kV/µs
T_{stg} T_j	Storage temperature range Maximum junction temperature		- 55 to + 150 150	°C °C
T_L	Maximum lead temperature for soldering during 10s at 5mm for case		230	°C

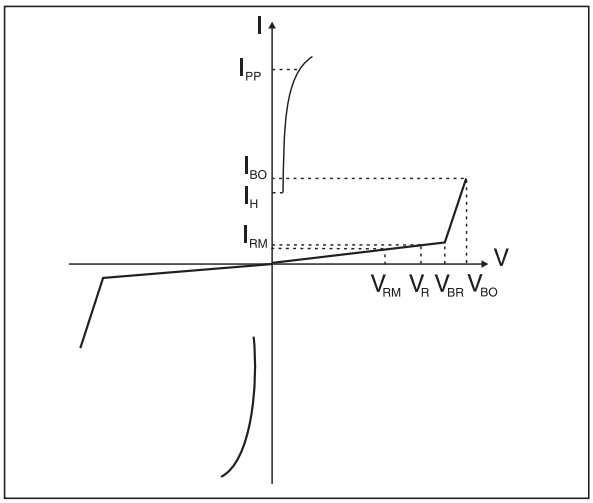
THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R_{th} (j-l)	Junction to leads	60	°C/W
R_{th} (j-a)	Junction to ambient on printed circuit with standard footprint dimension	100	°C/W

ELECTRICAL CHARACTERISTICS

(T_{amb} = 25°C)

Symbol	Parameter
V_{RM}	Stand-off voltage
I_{RM}	Leakage current at stand-off voltage
V_R	Continuous Reverse voltage
V_{BR}	Breakdown voltage
V_{BO}	Breakover voltage
I_H	Holding current
I_{BO}	Breakover current
I_{PP}	Peak pulse current
C	Capacitance



Type	I_{RM} @ V_{RM} max		I_R @ V_R max note 1		V_{BO} @ I_{BO} max note 2		I_H min note 3	C typ note 4	C typ note 5
	µA	V	µA	V	V	mA	mA	pF	
TP30-62	2	56	50	62	82	800	150	50	20
TP30-68	2	61	50	68	90	800	150	50	20
TP30-100	2	90	50	100	133	800	150	40	16
TP30-120	2	108	50	120	160	800	150	40	16
TP30-130	2	117	50	130	173	800	150	35	14
TP30-180	2	162	50	180	240	800	150	35	14
TP30-200	2	180	50	200	267	800	150	30	12
TP30-220	2	198	50	220	293	800	150	30	12
TP30-240	2	216	50	240	320	800	150	30	12
TP30-270	2	243	50	270	360	800	150	30	12

Note 1: I_R measured at V_R guarantee $V_{BRmin} \geq V_R$

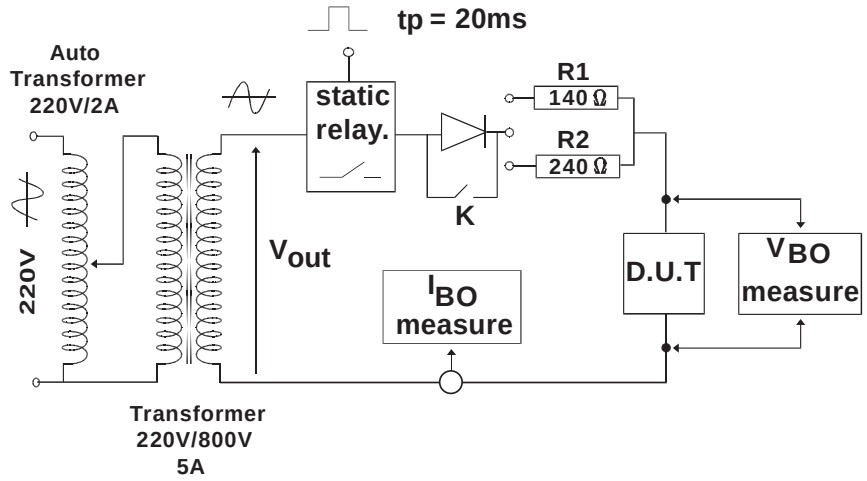
Note 2: Measured at 50 Hz (1 cycle) - See test circuit 1.

Note 3: See test circuit 2.

Note 4: V_R = 1V, F = 1MHz.

Note 5: V_R = 50V, F = 1MHz.

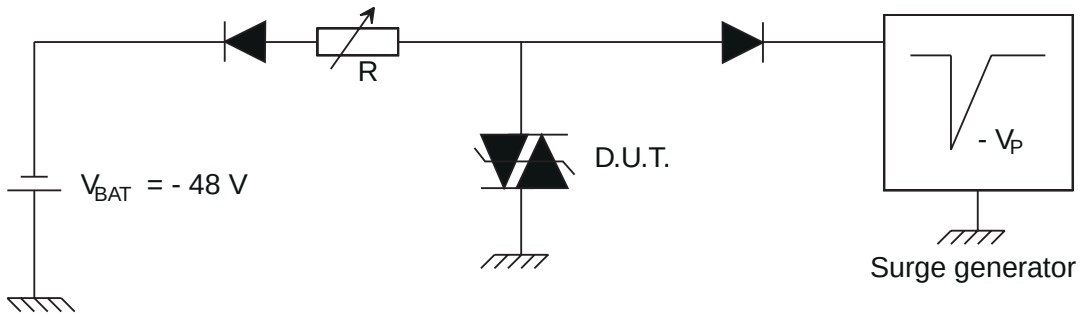
TEST CIRCUIT 1 FOR I_{BO} and V_{BO} parameters :



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_{BO} < 250 Volt
    - V_{OUT} = 250 V_{RMS}, R_1 = 140 Ω.
  - Device with $V_{BO} \geq$ 250 Volt
    - V_{OUT} = 480 V_{RMS}, R_2 = 240 Ω.

TEST CIRCUIT 2 for I_H parameter.



This is a GO-NOGO Test which allows to confirm the holding current (I_H) level in a functional test circuit.

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 = 10A , 10/1000 µs.
  3) The D.U.T will come back off-state within 50 ms max.

Fig. 1: Non repetitive surge peak on-sate current versus overload duration (Tj initial = 25°C).

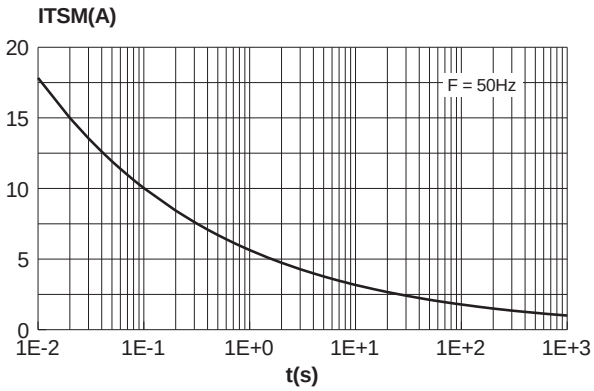


Fig. 2: Relative variation of holding current versus junction temperature.

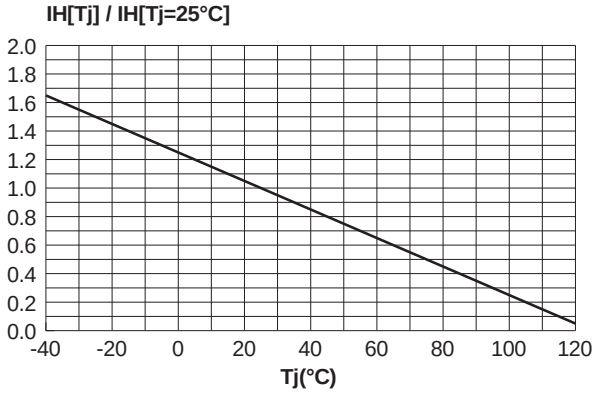


Fig. 3: Relative variation of junction capacitance versus reverse applied voltage (typical values).

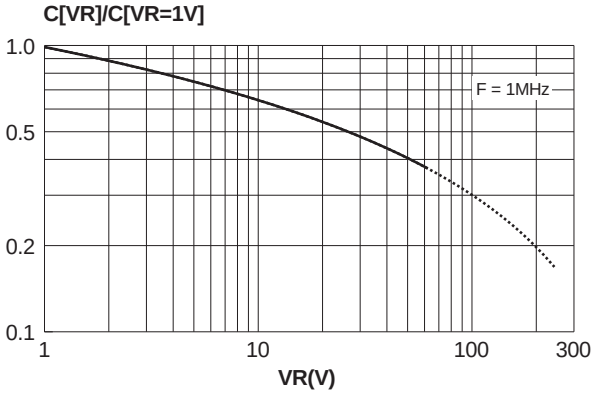


Fig. 4: On-state voltage versus on-state current (typical values).

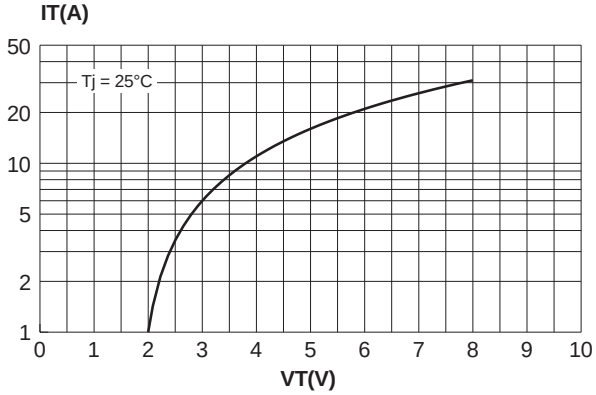


Fig. 5: Variation of thermal impedance junction to ambient versus pulse duration.

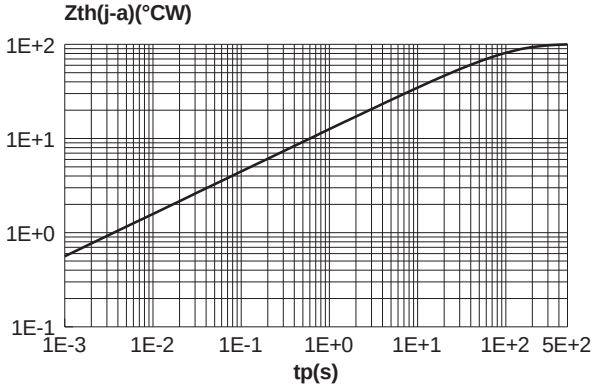
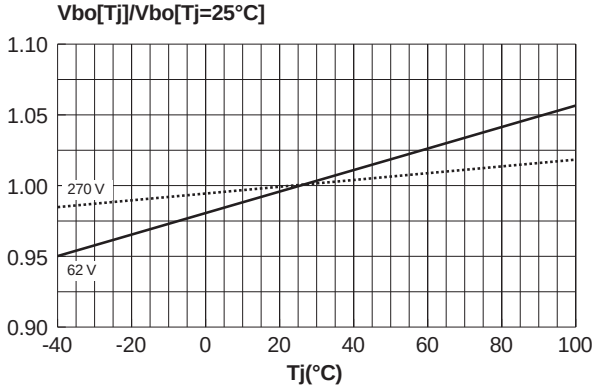
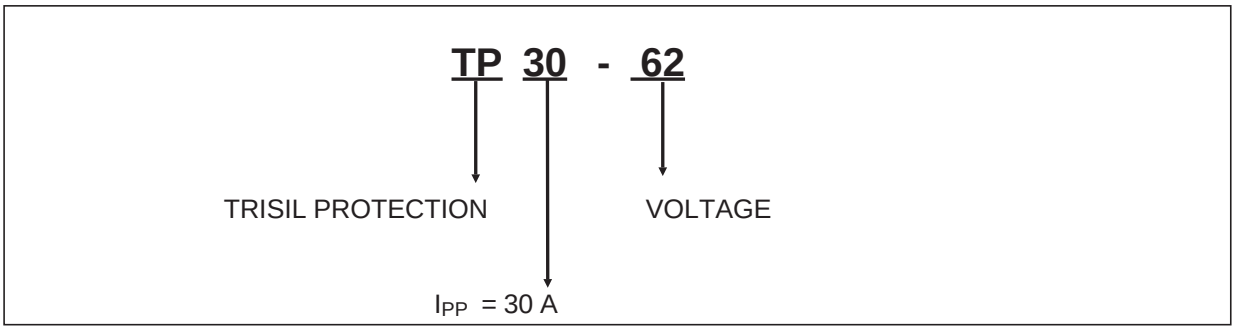


Fig. 6: Relative variation of V_{BO} voltage versus junction temperature.



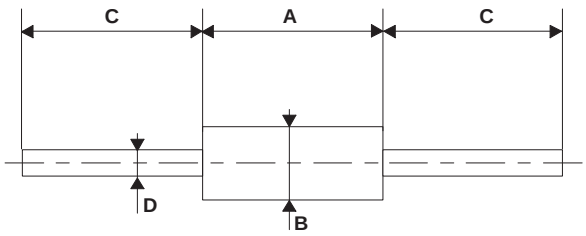
ORDER CODE



MARKING : Logo, Date Code, Part Number.

PACKAGE MECHANICAL DATA

DO-15 (Plastic)



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.05	6.75	0.238	0.266
B	2.95	3.53	0.116	0.139
C	26	31	1.024	1.220
D	0.71	0.88	0.028	0.035

Packaging : Tape and reel.

Weight : 0.4 g.