

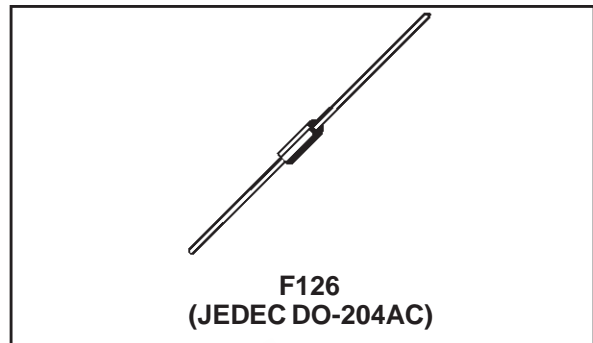


# TP30-xxx Series

TRISIL™

## FEATURES

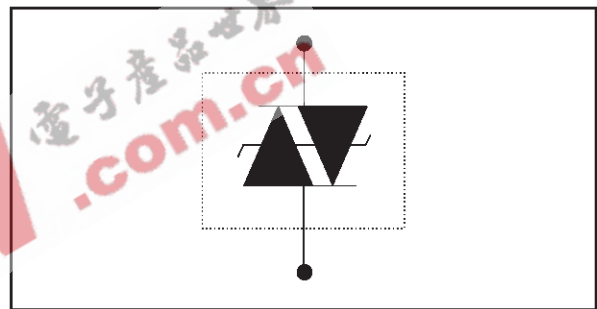
- BIDIRECTIONAL CROWBAR PROTECTION.
- VOLTAGE RANGE: FROM 62 V TO 270 V.
- HOLDING CURRENT :  
 $I_H = 150 \text{ mA min.}$
- REPETITIVE PEAK PULSE CURRENT :  
 $I_{PP} = 30 \text{ A, } 10/1000 \mu\text{s.}$
- JEDEC REGISTERED PACKAGE OUTLINE



## 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 ( $\mu\text{s}$ )	Current Waveform ( $\mu\text{s}$ )	Admissible $I_{pp}$ (A)	Necessary Resistor ( $\Omega$ )
(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	10/700	5/310	25	-
	level 3	1.2/50	8/20	50	-
FCC Part 68, lightning surge type A	1500	10/160	10/160	65	15.5
	800	10/560	10/560	50	8.0
FCC Part 68, lightning surge type B	1000	9/720	5/320	25	-
BELLCORE TR-NWT-001089 First level	2500	2/10	2/10	125	15.0
	1000	10/1000	10/1000	30	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	-

## TP30-xxx Series

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25°C)

Symbol	Parameter	Value	Unit
P	Power dissipation on infinite heatsink	T <sub>amb</sub> = 50 °C	3 W
I <sub>PP</sub>	Peak pulse current	10/1000 μs 8/20 μs	30 A
I <sub>TSM</sub>	Non repetitive surge peak on-state current	t <sub>p</sub> = 20 ms	15 A
I <sup>2</sup> t	I <sup>2</sup> t value for fusing	t <sub>p</sub> = 20 ms	1 A <sup>2</sup> s
dV/dt	Critical rate of rise of off-state voltage	V <sub>RM</sub>	5 kV/μs
T <sub>stg</sub>	Storage temperature range	- 55 to + 150	°C
T <sub>j</sub>	Maximum junction temperature	150	°C
T <sub>L</sub>	Maximum lead temperature for soldering during 10s at 5mm for case	230	°C

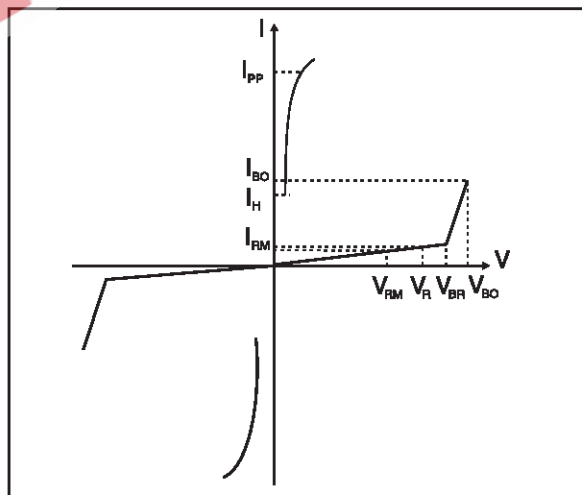
### THERMAL RESISTANCES

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

### ELECTRICAL CHARACTERISTICS

(T<sub>amb</sub> = 25°C)

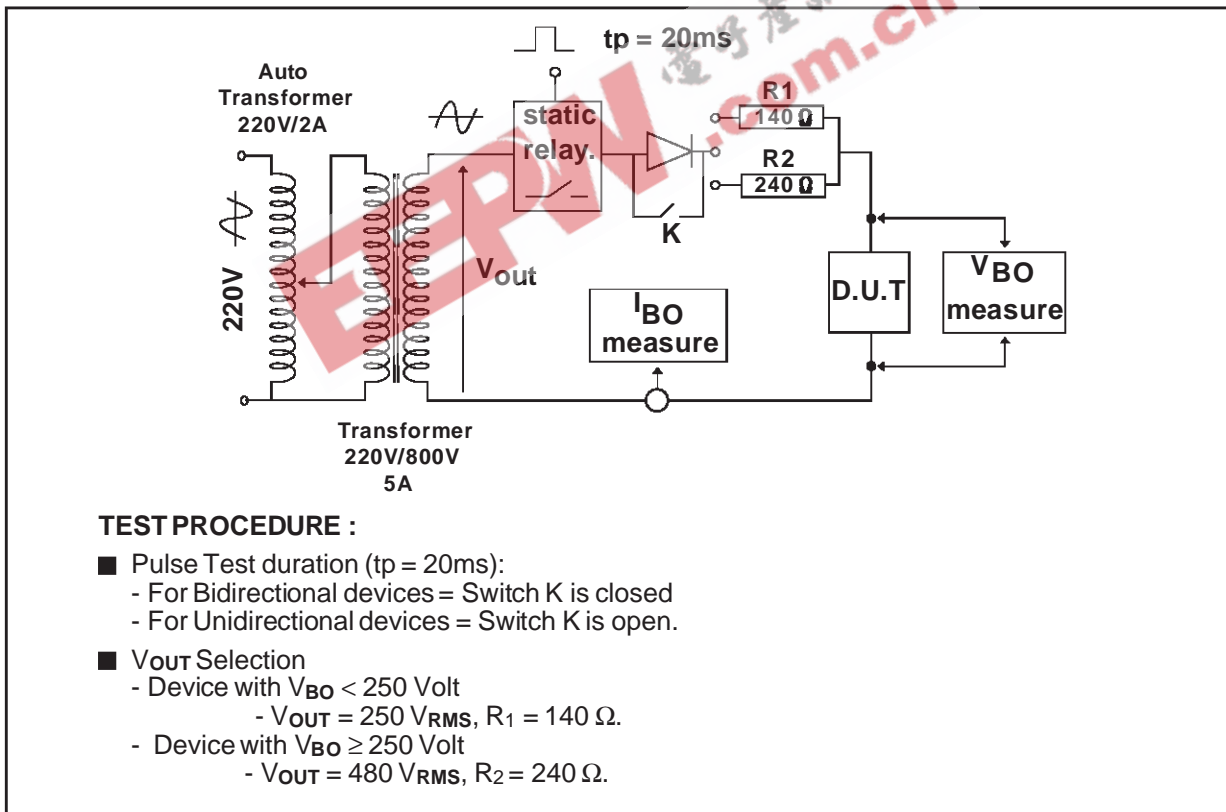
Symbol	Parameter
V <sub>RM</sub>	Stand-off voltage
I <sub>RM</sub>	Leakage current at stand-off voltage
V <sub>R</sub>	Continuous Reverse voltage
V <sub>BR</sub>	Breakdown voltage
V <sub>BO</sub>	Breakover voltage
I <sub>H</sub>	Holding current
I <sub>BO</sub>	Breakover current
I <sub>PP</sub>	Peak pulse current
C	Capacitance



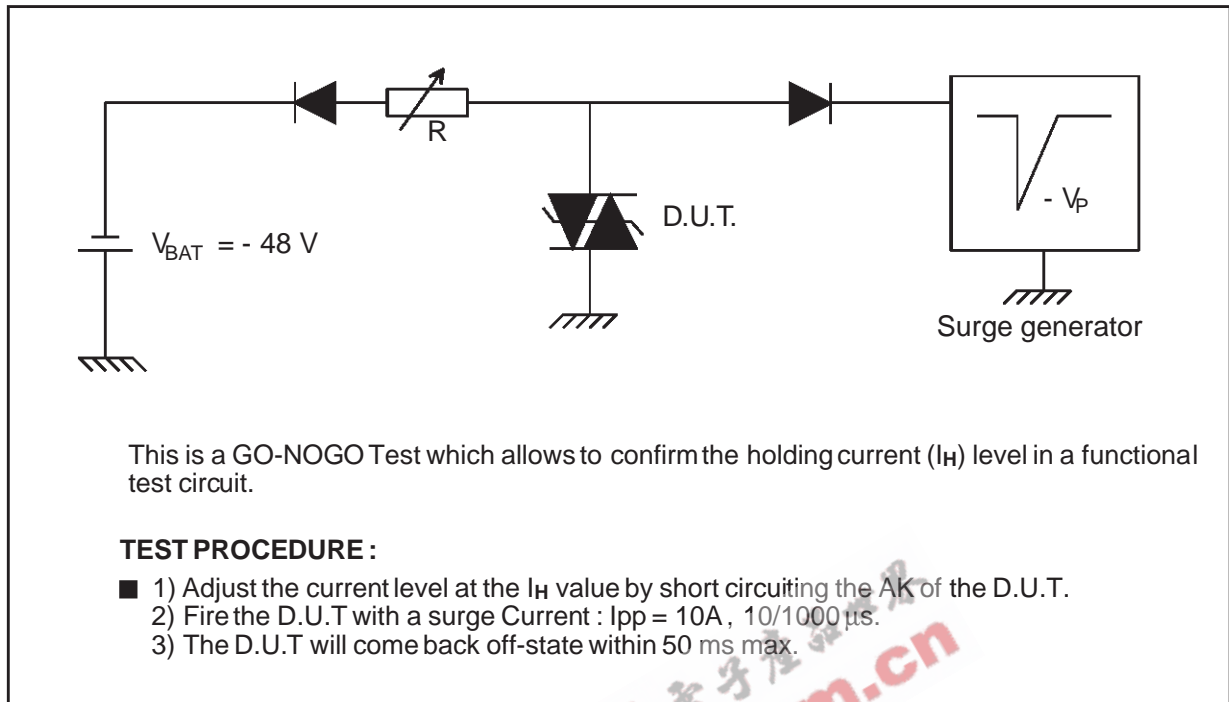
Type	$I_{RM}$ @ $V_{RM}$		$I_R$ @ $V_R$		$V_{BO}$ @ $I_{BO}$		$I_H$ min note 3	C	
	max $\mu A$	V	max note 1 $\mu A$	V	max note 2 V	mA		typ note 4	typ note 5
TP30-62	2	56	50	62	82	800	150	50	20
TP30-68	2	61	50	68	90	800	150	50	20
TP30-100	2	90	50	100	133	800	150	40	16
TP30-120	2	108	50	120	160	800	150	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:**  $V_R = 50V, F = 1MHz.$

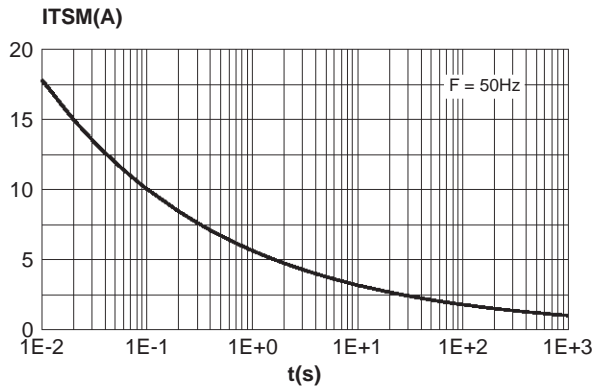
**TEST CIRCUIT 1 FOR  $I_{BO}$  and  $V_{BO}$  parameters:**



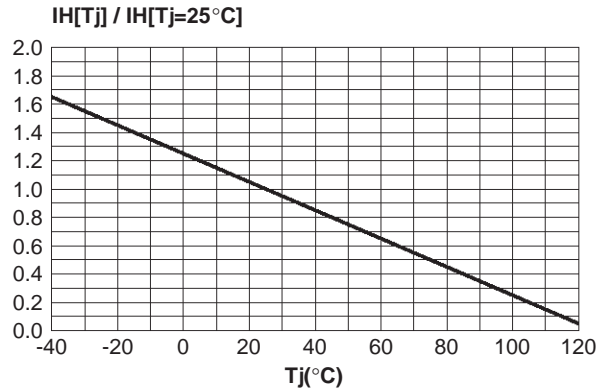
TEST CIRCUIT 2 for  $I_H$  parameter.



**Fig. 1:** Non repetitive surge peak on-state current versus overload duration ( $T_j$  initial = 25°C).

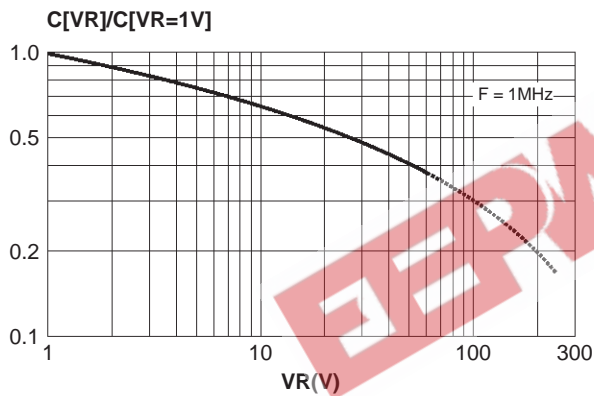


**Fig. 2:** Relative variation of holding current versus junction temperature.

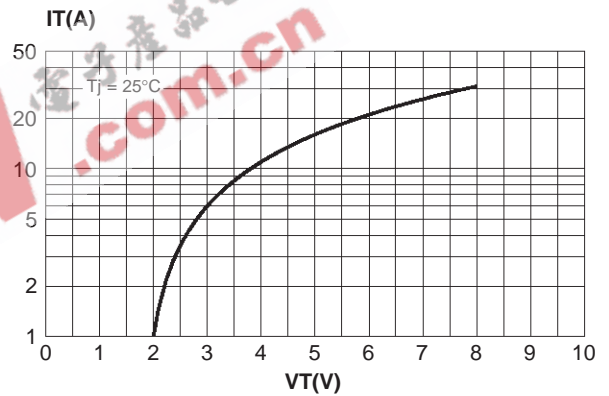


**Fig. 3:** Relative variation of junction capacitance versus reverse applied voltage (typical values).

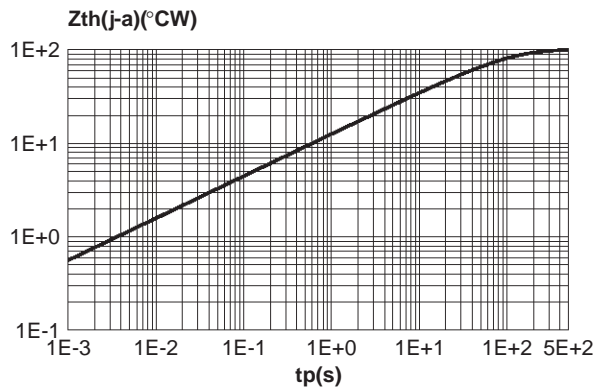
**Note:** For VRM upper than 56V, the curve is extrapolated (dotted line)



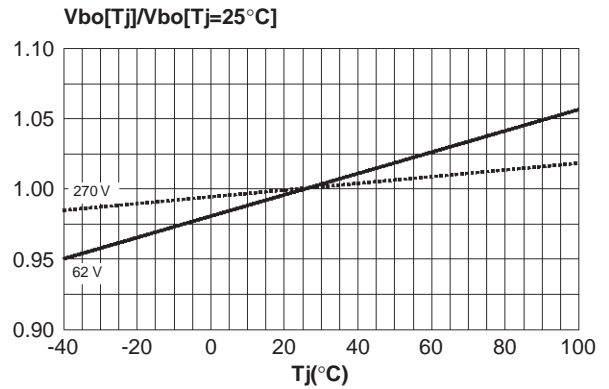
**Fig. 4:** On-state voltage versus on-state current (typical values).



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

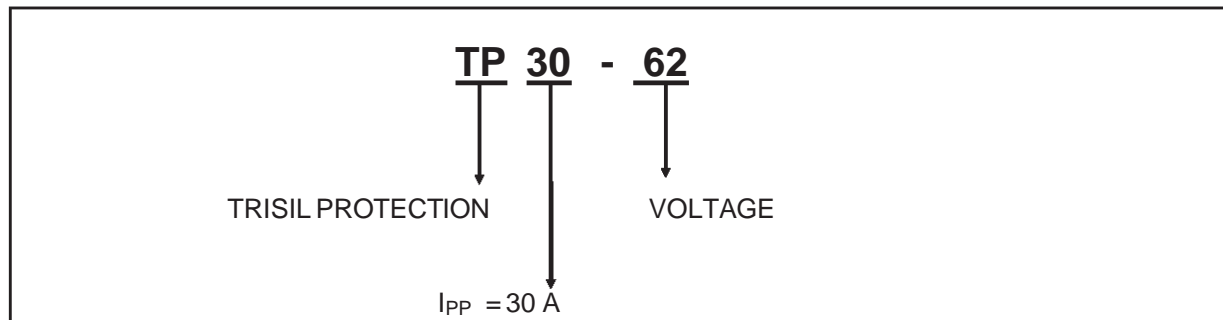


**Fig. 6:** Relative variation of  $V_{BO}$  voltage versus junction temperature.



## TP30-xxx Series

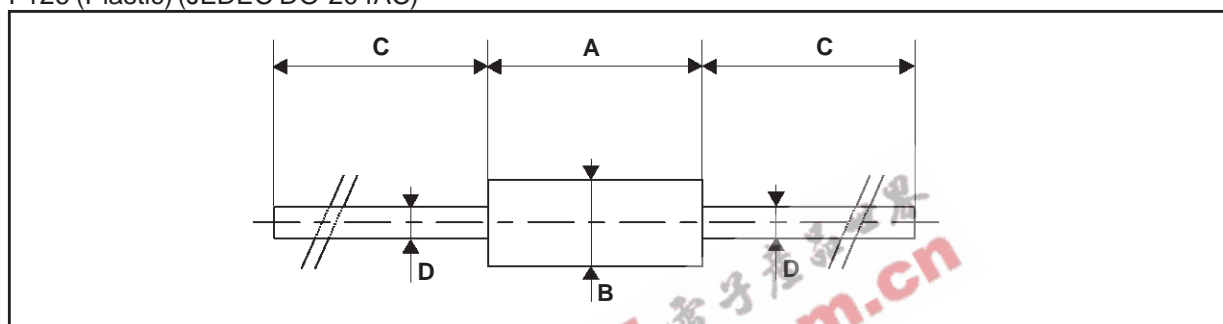
### ORDER CODE



**MARKING** : Logo, Date Code, Part Number.

### PACKAGE MECHANICAL DATA

F126 (Plastic) (JEDEC DO-204AC)



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.05	6.20	6.35	0.238	0.244	0.250
B	2.95	3.00	3.05	0.116	0.118	0.120
C	26		31	1.024		1.220
D	0.76	0.81	0.86	0.030	0.032	0.034

**Packaging** : Tape and reel.

**Weight** : 0.40g

Information furnished is believed to be accurate and reliable. However, STMicroelectronics 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 STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1998 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>