



# TP30-xxx Series

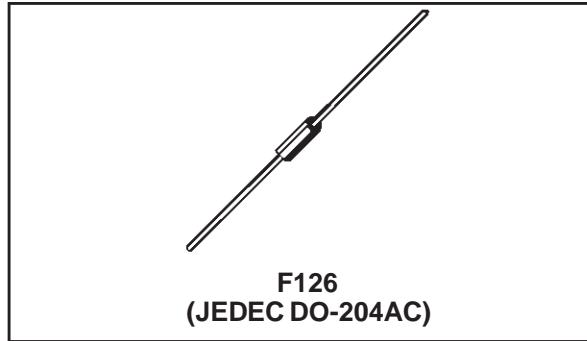
TRISIL™

## 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

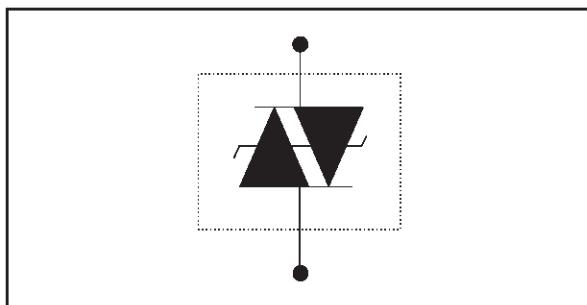
## DESCRIPTION

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



F126  
(JEDEC DO-204AC)

## 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 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	-

## TP30-xxx Series

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ C$ )

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

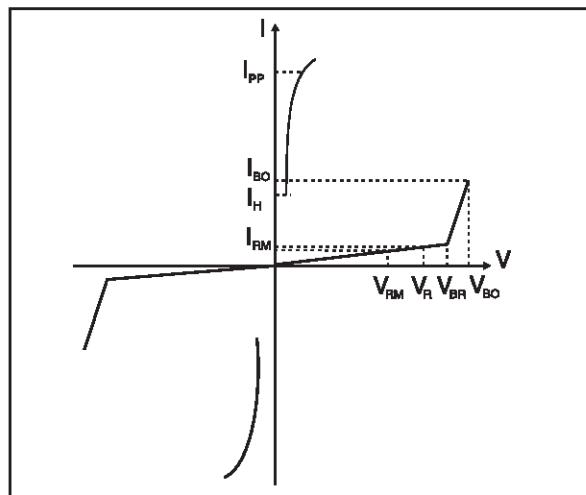
### THERMAL RESISTANCES

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

### ELECTRICAL CHARACTERISTICS

( $T_{amb} = 25^\circ C$ )

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
	$\mu A$	V	$\mu A$	V	V	mA			
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  $V_{BRmin} \geq V_R$

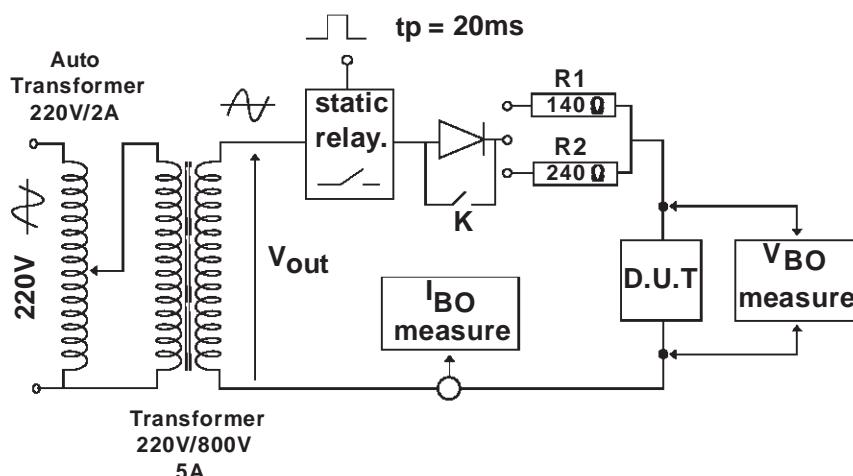
Note 2: Measured at 50 Hz (1 cycle) - See test circuit 1.

Note 3: See test circuit 2.

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

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

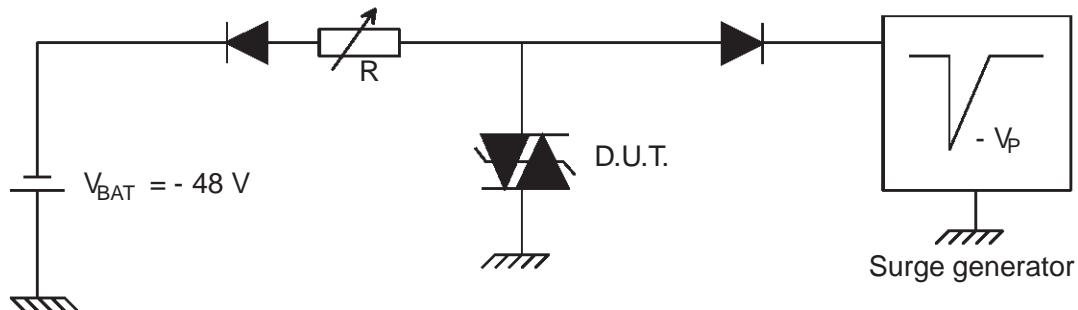
#### TEST CIRCUIT 1 FOR $I_{BO}$ and $V_{BO}$ parameters:



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

**TEST CIRCUIT 2 for  $I_H$  parameter.**

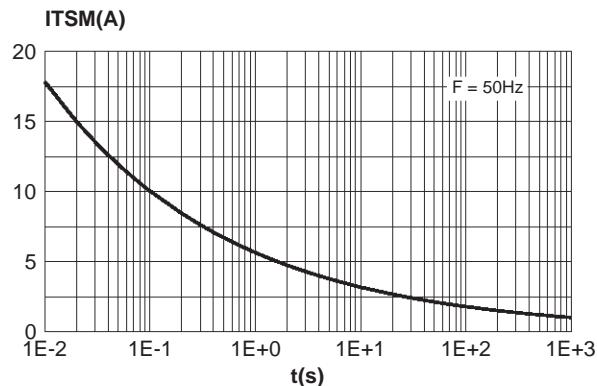


This is a GO-NOGO Test which allows to confirm the holding current ( $I_H$ ) level in a functional test circuit.

**TEST PROCEDURE :**

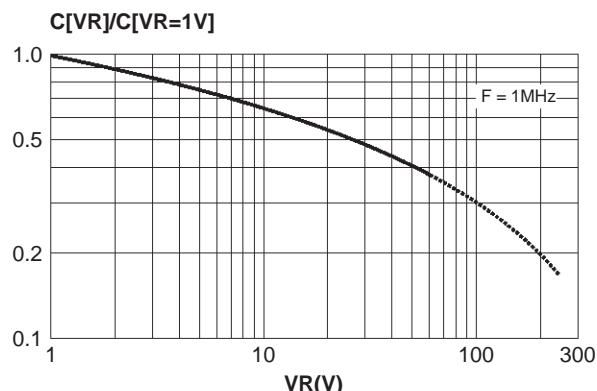
- 1) Adjust the current level at the  $I_H$  value by short circuiting the AK of the D.U.T.
- 2) Fire the D.U.T with a surge Current :  $I_{PP} = 10\text{ A}$ ,  $10/1000\text{ }\mu\text{s}$ .
- 3) The D.U.T will come back off-state within 50 ms max.

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

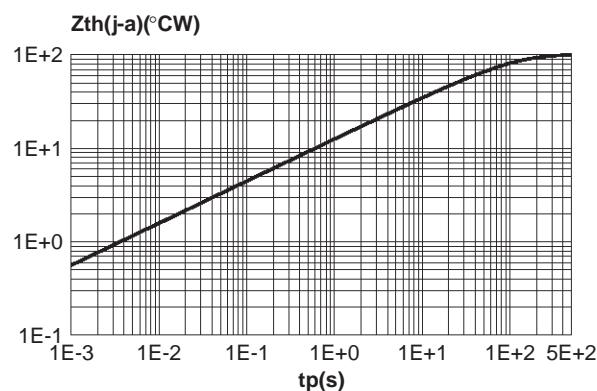


**Fig. 3:** Relative variation of junction capacitance versus reverse applied voltage (typical values).

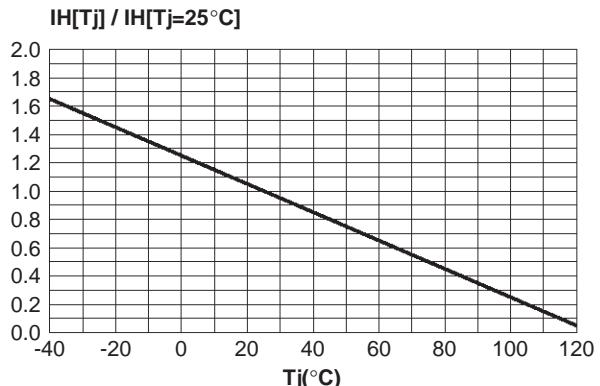
Note: For VRM upper than 56V, the curve is extrapolated (dotted line)



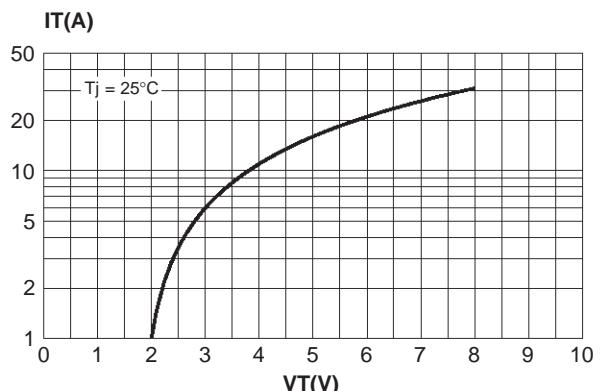
**Fig. 5:** Variation of thermal impedance junction to ambient versus pulse duration.



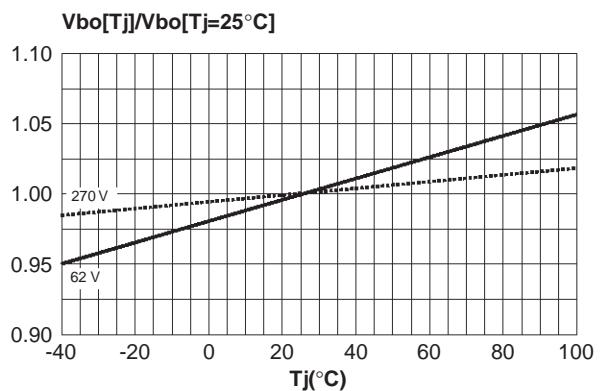
**Fig. 2:** Relative variation of holding current versus junction temperature.



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



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



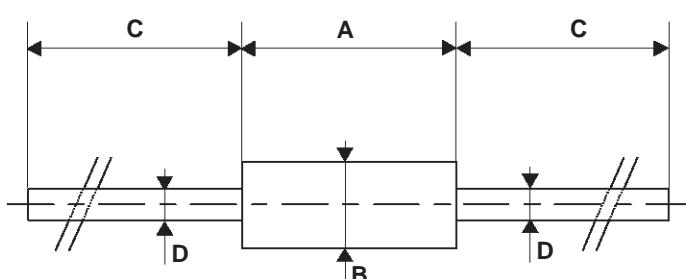
## TP30-xxx Series

### ORDER CODE

TP 30 - 62  
TRISIL PROTECTION      VOLTAGE  
 $I_{PP} = 30 \text{ A}$

**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

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