



TPP25011

Application Specific Discretes
A.S.D.™

OVERVOLTAGE and OVERCURRENT
PROTECTION for TELECOM LINE

FEATURES

- UNIDIRECTIONAL FUNCTION
- PROGRAMMABLE BREAKDOWN VOLTAGE
UP TO 250 V
- PROGRAMMABLE CURRENT LIMITATION
FROM 40 mA TO 500 mA
- SURGE CURRENT CAPABILITY
 $I_{PP} = 30A \quad 10/1000 \mu s$

DESCRIPTION

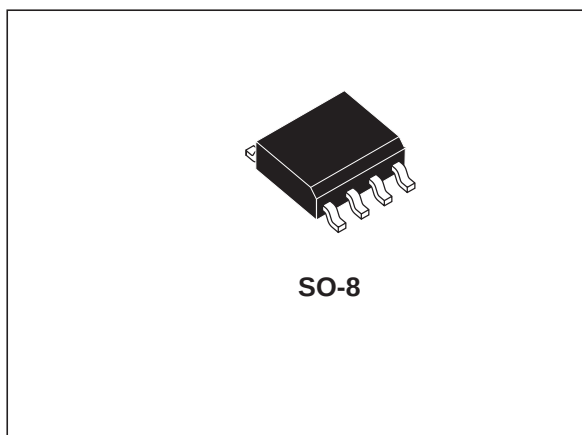
Dedicated to sensitive telecom equipment protection, this device can provide both voltage and current triggered protection with a very tight tolerance. The breakdown voltage can be easily programmed by using an external zener diode.

A multiple protection mode can be also performed when using several zener diodes, providing to each line interface an optimized protection level. The current limiting function is achieved with the use of a resistor between the gate and the cathode. The value of the resistor will determine the level of the desired current.

COMPLIES WITH THE FOLLOWING STANDARDS :

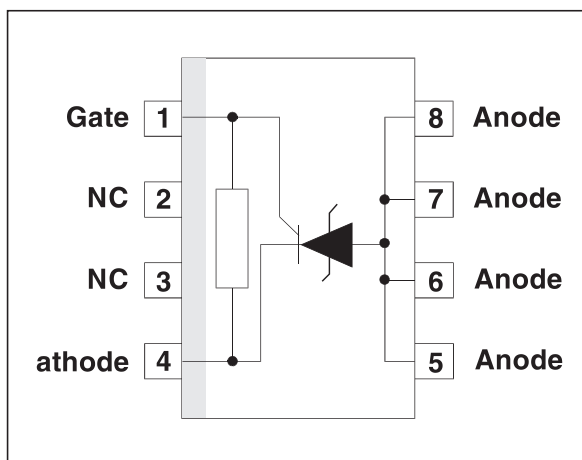
CCITT K17 :	10/700	μs	1.5 kV
	5/310	μs	38 A
VDE 0433 :	10/700	μs	2k V
	5/310	μs	40 A (*)
CNET :	0.5/700	μs	1.5 kV
	0.2/310	μs	38 A
FCC part 68 :	2/10	μs	2.5 kV
	2/10	μs	75 A (*)
BELLCORE			
TR-NWT-000974 :	10/1000	μs	1 kV
	10/1000	μs	30 A (*)

(*) with series resistors or PTC.



SO-8

SCHEMATIC DIAGRAM



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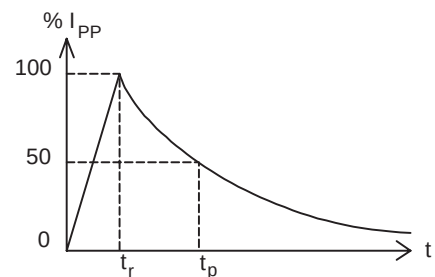
TPP25011

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

Symbol	Parameter		Value	Unit
I_{PP}	Peak pulse current (see note 1)	10/1000 μs 5/310 μs 2/10 μs	30 40 75	A
I_{TSM}	Non repetitive surge peak on-state current ($F = 50\text{Hz}$)	$t_p = 10\text{ms}$ $t = 1\text{s}$	5 3.5	A
T_{stg} T_j	Storage temperature range Maximum junction temperature		- 55 to + 150 150	$^{\circ}\text{C}$

Note 1 : Pulse waveform :

10/1000 μs	$t_r = 10\mu\text{s}$	$t_p = 1000\mu\text{s}$
5/310 μs	$t_r = 5\mu\text{s}$	$t_p = 310\mu\text{s}$
2/10 μs	$t_r = 2\mu\text{s}$	$t_p = 10\mu\text{s}$

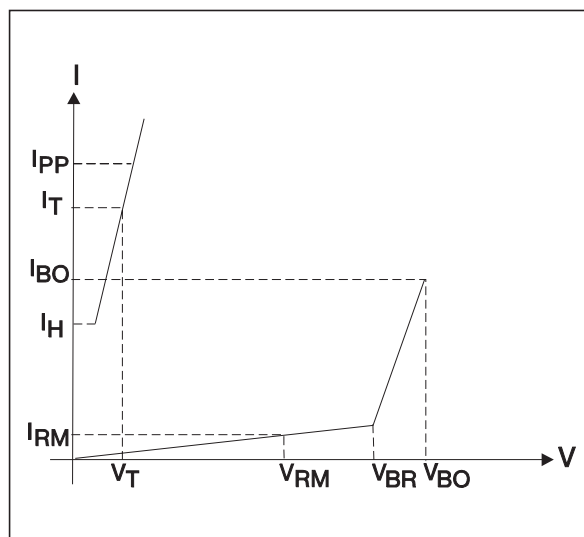


THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient	170	$^{\circ}\text{C/W}$

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

Symbol	Parameter
V_{RM}	Stand-off voltage
I_{RM}	Leakage current at stand-off voltage
V_{BR}	Breakdown voltage
V_{BO}	Breakover voltage
I_H	Holding current
I_{BO}	Breakover current
I_{PP}	Peak pulse current
V_{GN}	Gate voltage
I_G	Gate triggering current
C	Capacitance



1 - OPERATION WITHOUT GATE

Type	$I_{RM} @ V_{RM}$		$V_{BR} @ I_R$		$V_{BO} @ I_{BO}$			I_H	C
	max.		min.		max.	min. note1	max.	min. note 2	max. note 3
	μA	V	V	mA	V	mA	mA	mA	pF
TPP25011	6	60	250	1	340	15	200	180	100

2 - OPERATION WITH GATE

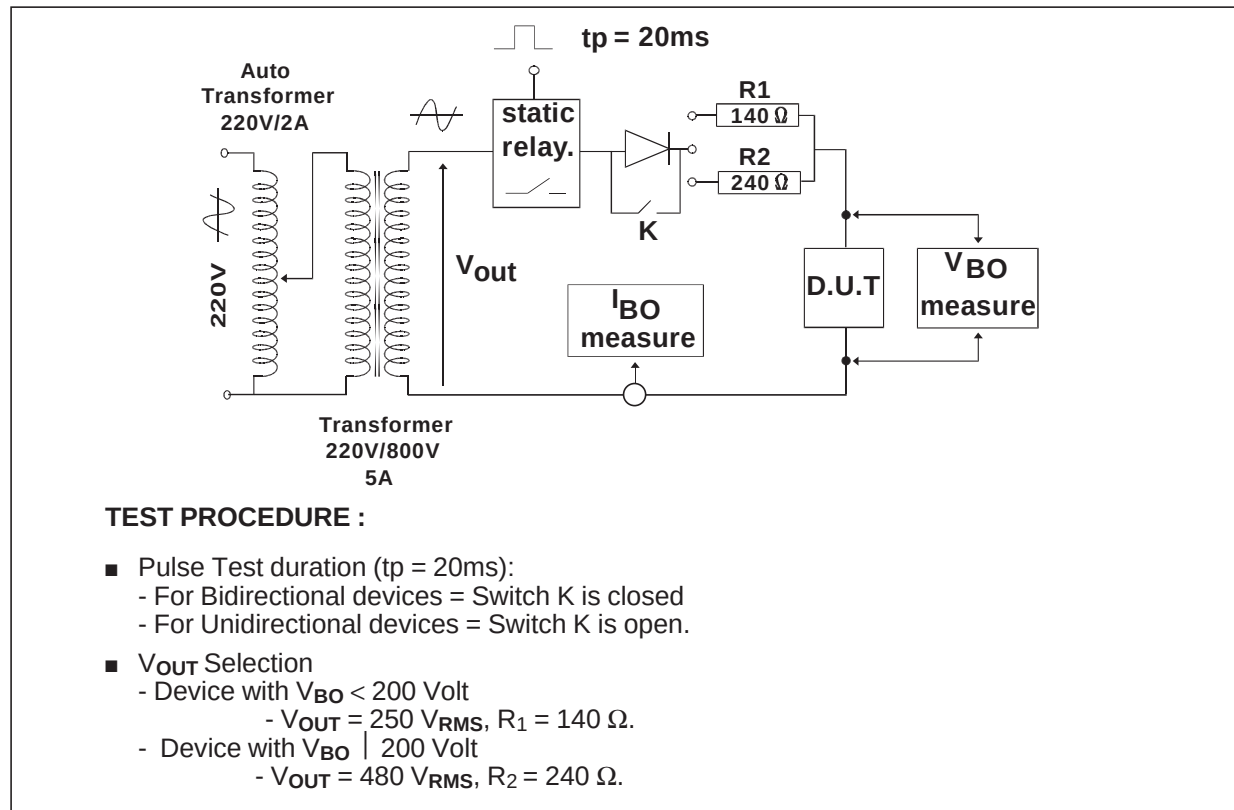
Type	$V_{GN} @ I_{GN} = 30 \text{ mA}$		I_G	
	min.	max.	min.	max.
	note 4		$V_{A-C} = 100 \text{ V}$	
	V	V	mA	mA
TPP25011	1.05	1.35	5	40

Note 1: See the reference test circuit 1.

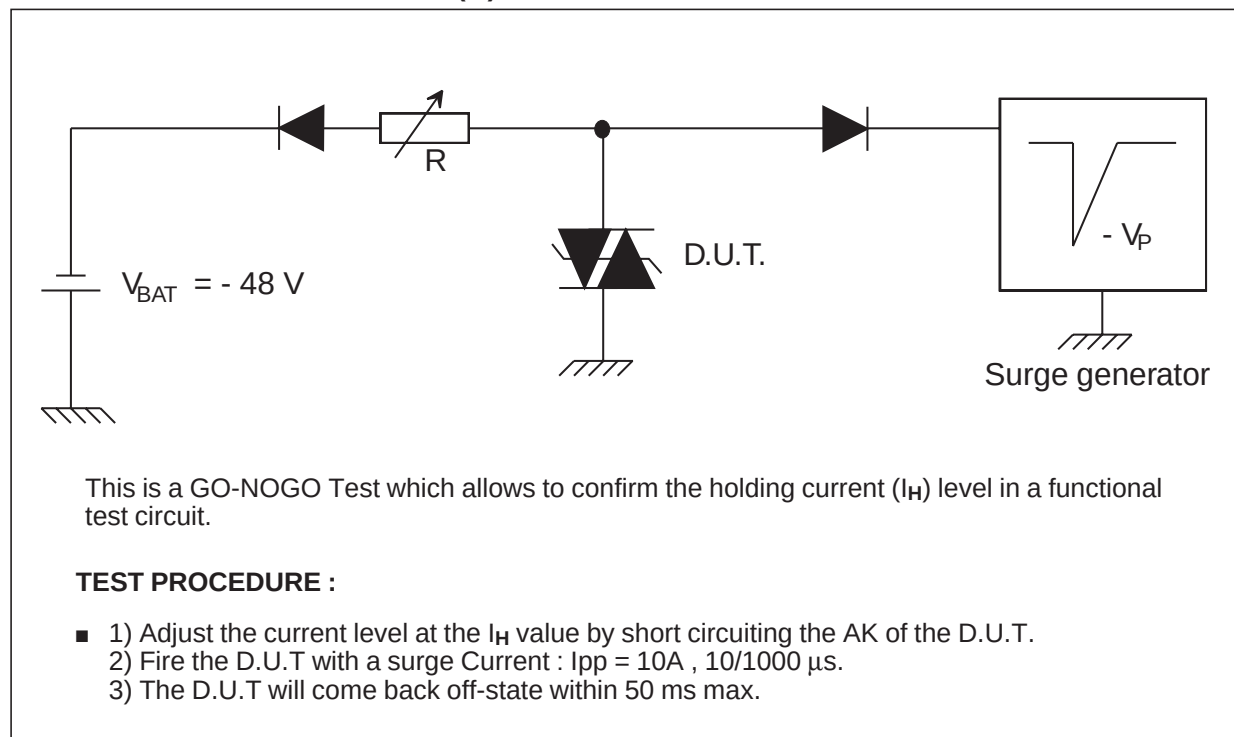
Note 2: See test circuit 2.

Note 3: $V_R = 5\text{V}$, $F = 1\text{MHz}$

REFERENCE TEST CIRCUIT 1 :



FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT 2 = GO - NOGO TEST



APPLICATION CIRCUIT

Overvoltage protection and current limitation

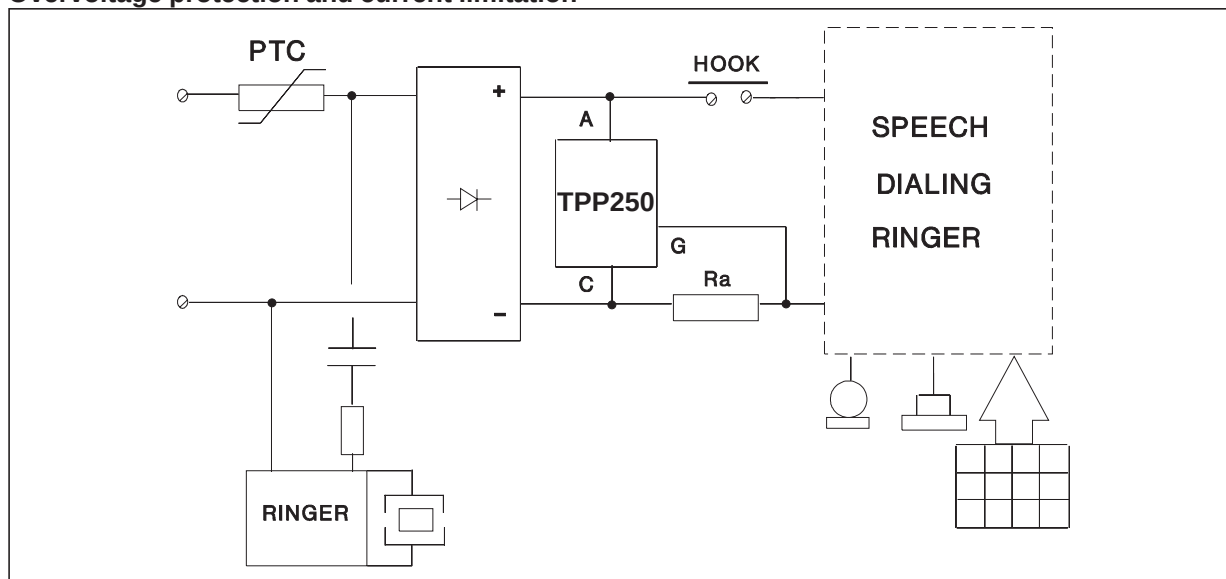
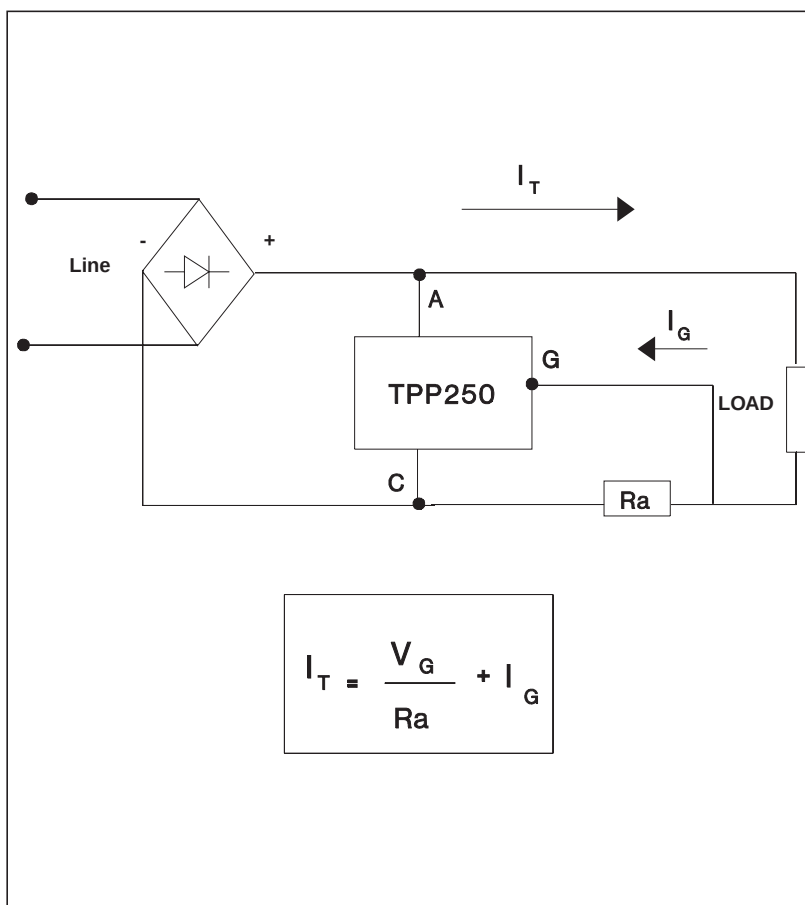


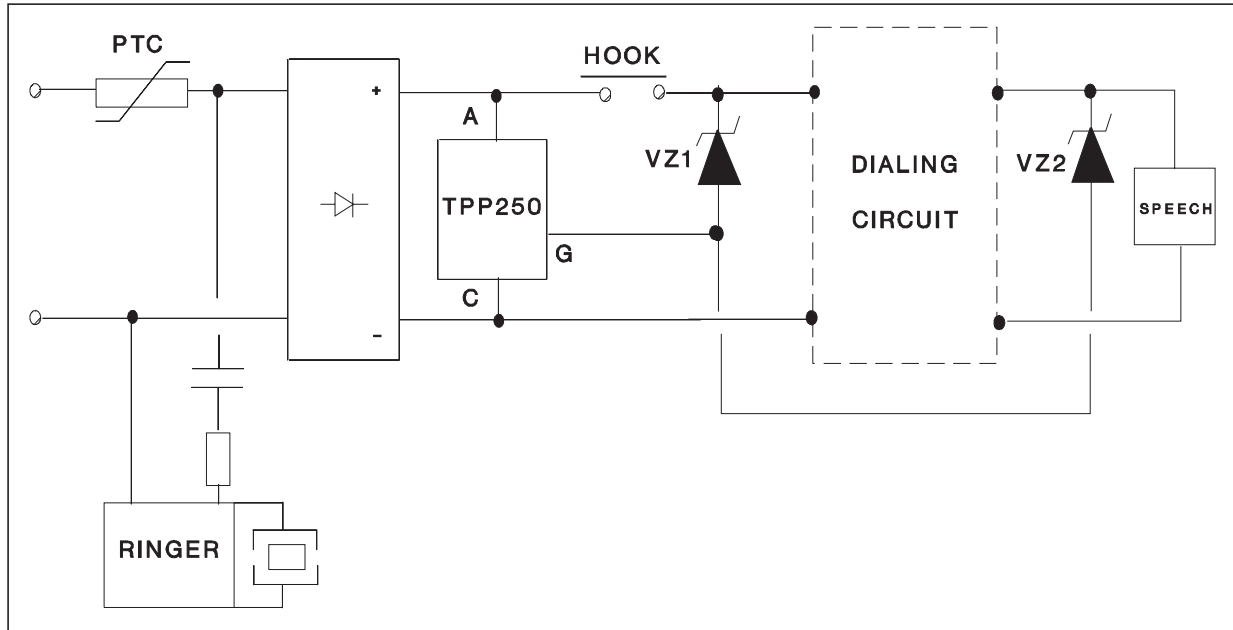
Table below gives the tolerance of the limited current I_T for each standardized resistor value.

CURRENT TOLERANCE		
R Ω (± 5%)	I_T mA min	I_T mA max
3.00	338	514
3.30	308	471
3.60	283	435
3.90	261	404
4.30	238	370
4.70	218	342
5.10	201	319
5.60	184	294
6.20	166	269
6.80	152	249
7.50	138	229
8.20	127	213
9.10	115	196
10.10	104	181
11.00	96	169
12.00	88	158
13.00	82	149
15.00	72	135
16.00	68	129
18.00	61	119
20.00	55	111
22.00	50	105
24.00	47	99
27.00	42	93
30.00	38	87



TPP25011

Telephone set protection

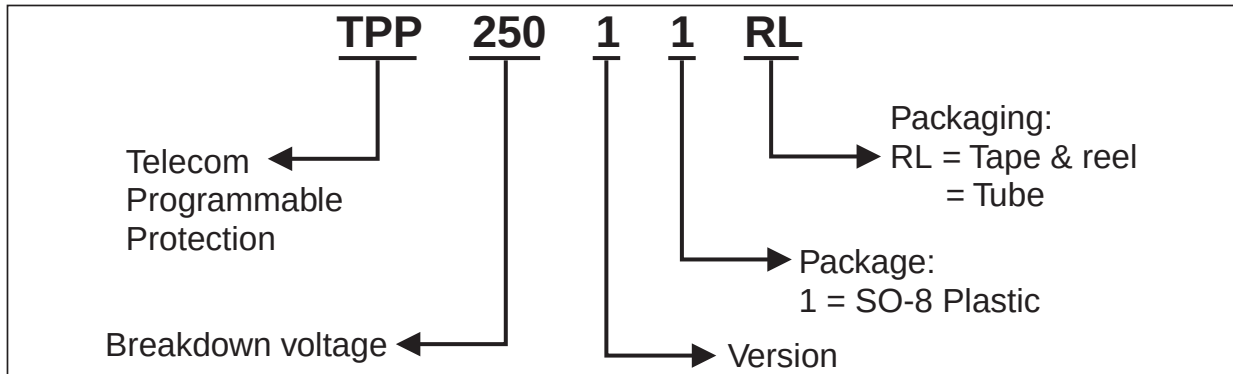


PROTECTION MODES :

OFF HOOK = Ringer circuit protection is insured with intrinsic breakdown voltage at 250 V

ON HOOK = In dialing mode and in conversation mode, the breakdown voltage of TPP250 can be adapted at different levels with zener diodes.

ORDER CODE



MARKING

Package	Type	Marking
SO-8	TPP25011	TPP250

PACKAGE MECHANICAL DATA

SO-8 Plastic

REF.	DIMENSIONS					
	Millimetres			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C		0.50			0.020	
c1	45° (typ)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max)					

Packaging : Products supplied antistatic tubes or tape and reel.

Weight :0.08g

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