



# THDT6511D

## Application Specific Discretes TRANSIENT VOLTAGE SUPPRESSOR A.S.D.™ FOR SLIC PROTECTION

### FEATURES

- DUAL ASYMETRICAL TRANSIENT SUPPRESSOR
- PEAK PULSE CURRENT :  $I_{PP} = 40A, 10/100\mu s$
- HOLDING CURRENT : 150 mA min.
- BREAKDOWN VOLTAGE : 65 V min.
- LOW DYNAMIC CHARACTERISTICS
- STAND CCITT K20 AND LSSGR

### DESCRIPTION

This device has been especially designed to protect subscriber line cards against overvoltage.

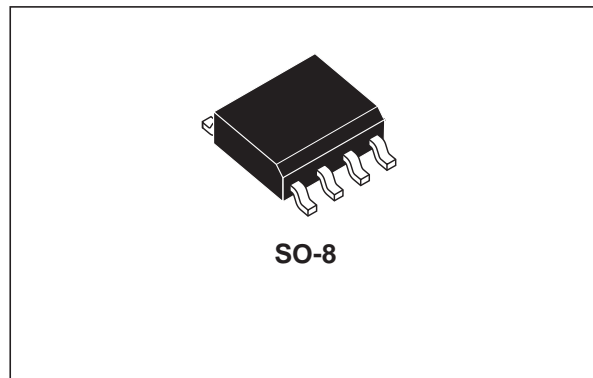
Two diodes clamp positive overloads while negative surges are suppressed by two protection thyristors.

A particular attention has been given to the internal wire bonding. The "4-point" configuration ensures a reliable protection, eliminating overvoltages introduced by the parasitic inductances of the wiring ( $Ldi/dt$ ), especially for very fast transient overvoltages.

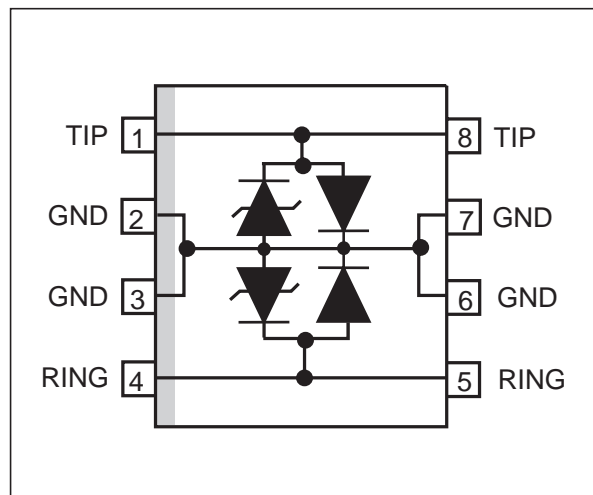
### COMPLIES WITH THE FOLLOWING STANDARDS :

<b>CCITT K20 :</b>	10/700 $\mu s$	1kV
	5/310 $\mu s$	38A
<b>VDE 0433 :</b>	10/700 $\mu s$	2kV
	5/310 $\mu s$	50A
<b>VDE 0878 :</b>	1.2/50 $\mu s$	1.5kV
	1/20 $\mu s$	40A
<b>I3124 :</b>	0.5/700 $\mu s$	1kV
	0.2/310 $\mu s$	38A
<b>FCC part 68 :</b>	2/10 $\mu s$	2.5kV
	2/10 $\mu s$	125A (*)
<b>BELLCORE TR-NWT-001089 :</b>	2/10 $\mu s$	2.5kV
	2/10 $\mu s$	125A (*)
	10/1000 $\mu s$	1kV
	10/1000 $\mu s$	40A (*)

(\*) with series resistors or PTC.



### SCHEMATIC DIAGRAM



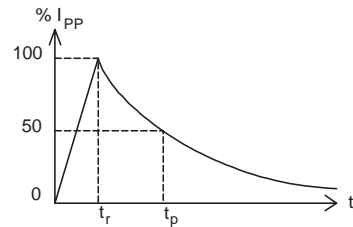
# THDT6511D

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

Symbol	Parameter	Value	Unit	
I <sub>PP</sub>	Peak pulse current (see note 1)	10/1000μs 5/310μs 2/10μs	40 50 125	A
I <sub>TSM</sub>	Non repetitive surge peak on-state current F = 50 Hz	t = 300 ms t = 1 s t = 5 s	10 3.5 1	A
I <sub>TSM</sub>	F = 50 Hz, 60 x 1 s, 2 mn between pulse		1	A
T <sub>stg</sub> T <sub>j</sub>	Storage temperature range Maximum junction temperature		- 55 to + 150 150	°C
T <sub>L</sub>	Maximum lead temperature for soldering during 10s		260	°C

Note 1 : Pulse waveform :

10/1000μs	t <sub>r</sub> =10μs	t <sub>p</sub> =1000μs
5/310μs	t <sub>r</sub> =5μs	t <sub>p</sub> =310μs
2/10μs	t <sub>r</sub> =2μs	t <sub>p</sub> =10μs



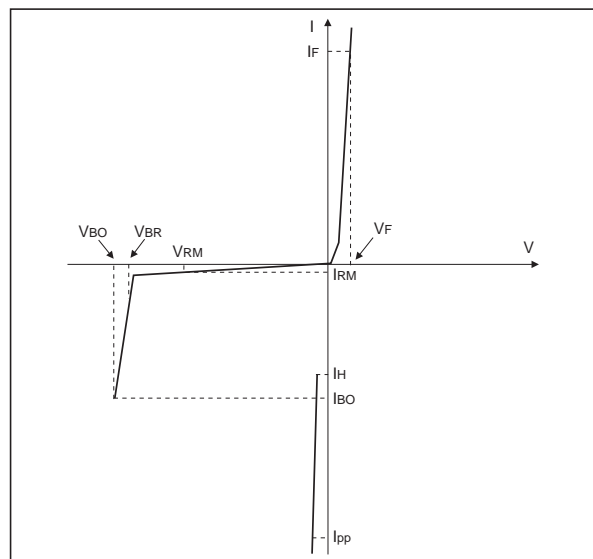
## THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R <sub>th(j-a)</sub>	Junction to ambient	170	°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>BR</sub>	Breakdown voltage
V <sub>BO</sub>	Breakover voltage
I <sub>H</sub>	Holding current
V <sub>F</sub>	Forward voltage drop
V <sub>FP</sub>	Peak forward voltage
I <sub>BO</sub>	Breakover current
I <sub>PP</sub>	Peak pulse current
C	Capacitance
αT	Temperature coefficient



## 1 - PARAMETERS RELATED TO DIODE LINE / GND

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_F$	$I_F = 1 \text{ A}$ $t_p = 100 \mu\text{s}$			2	V
$V_{FP}$	see curve fig. 1	NA	NA	NA	V

NA : Non Available

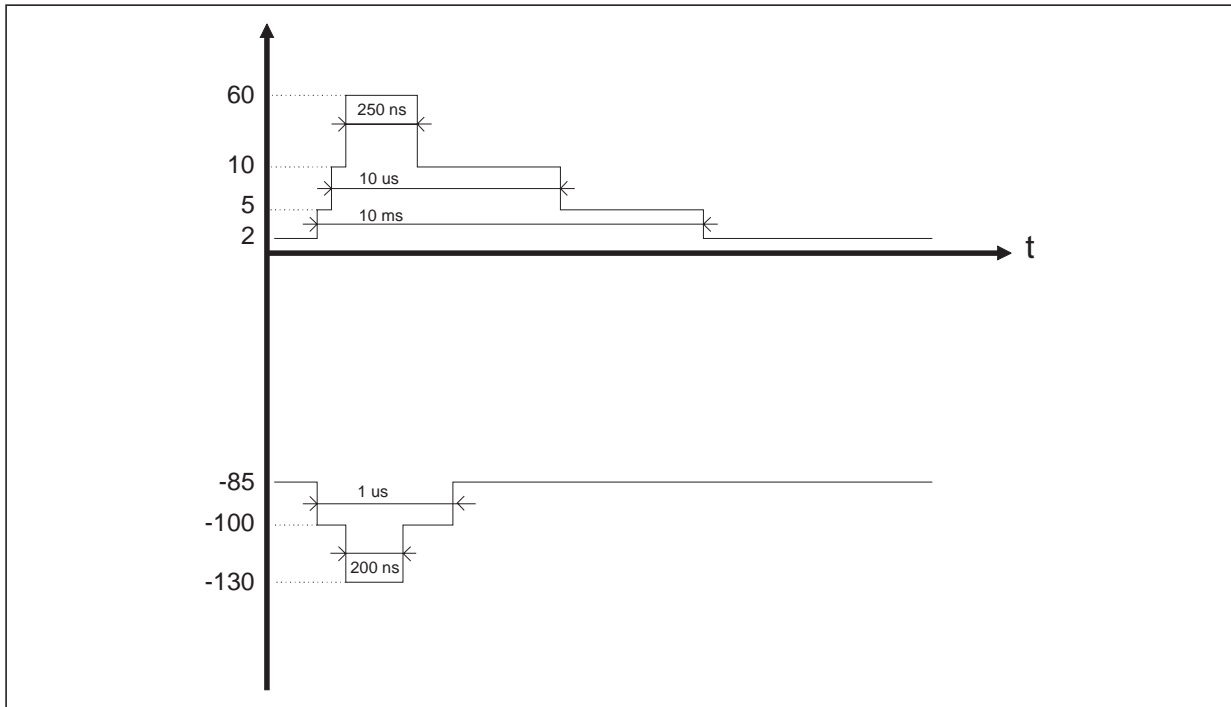
## 2 - PARAMETERS RELATED TO PROTECTION THYRISTOR

Symbol	Tests conditions	Min.	Typ.	Max.	Unit
$V_{BR}$	$I_R = 1 \text{ mA}$	65			V
$V_{BO}$		68		85	V
$I_{RM}$	$V_{RM} = 63 \text{ V}$			100	$\mu\text{A}$
$I_{BO}$	$t_p = 100 \mu\text{s}$	110		450	mA
$I_{BO}$	$F = 50 \text{ Hz}$ $R_G = 600 \Omega$			500	mA
$I_H$		150			mA
$\alpha_T$			15		$10^{-4}/^\circ\text{C}$
C	$V_D = 100 \text{ mV}_{RMS}$ $F = 1 \text{ KHz}$			500	pF
dV/dt	Linear ramp up to 67 % of $V_{BR}$	5			$\text{kV} / \mu\text{s}$

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## DYNAMIC CHARACTERISTICS : $V_{FP}$ and $V_{BO}$

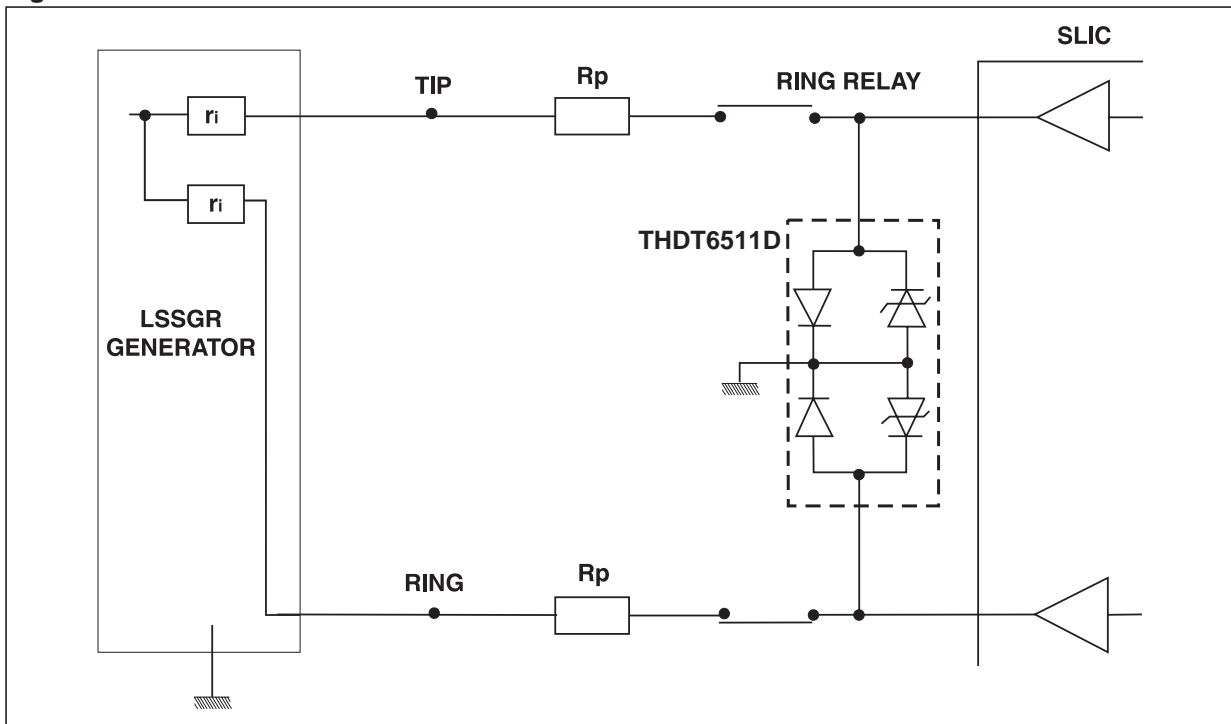
Figure 1 :



Under lightning and power crossing test, the device limits the transient voltage to the values indicated in the figure

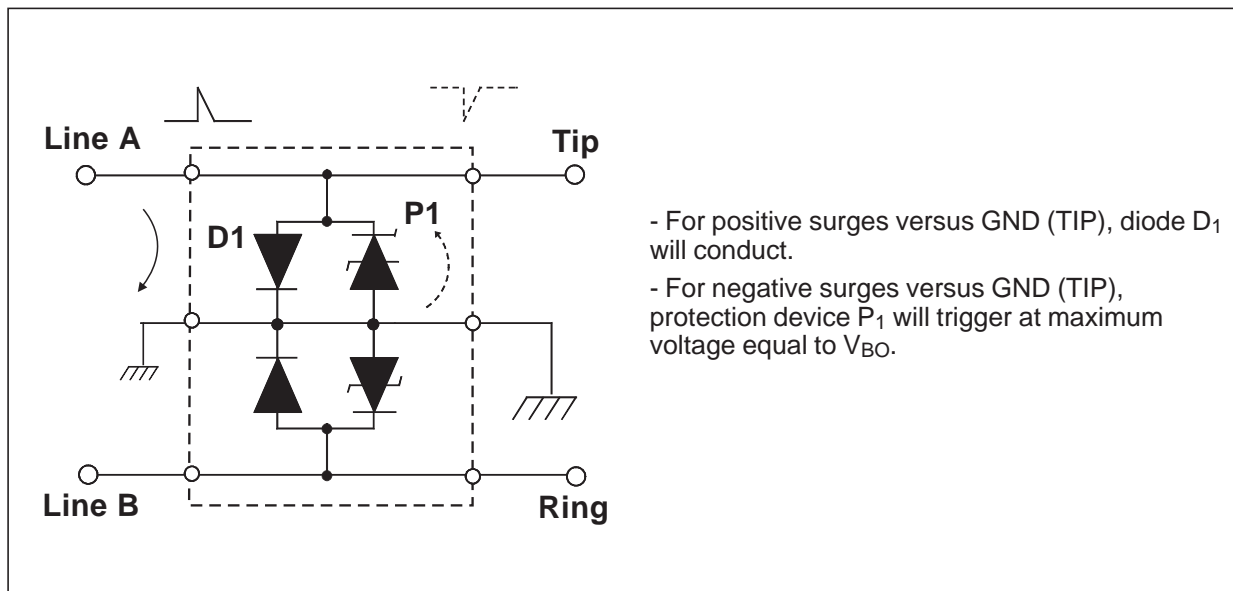
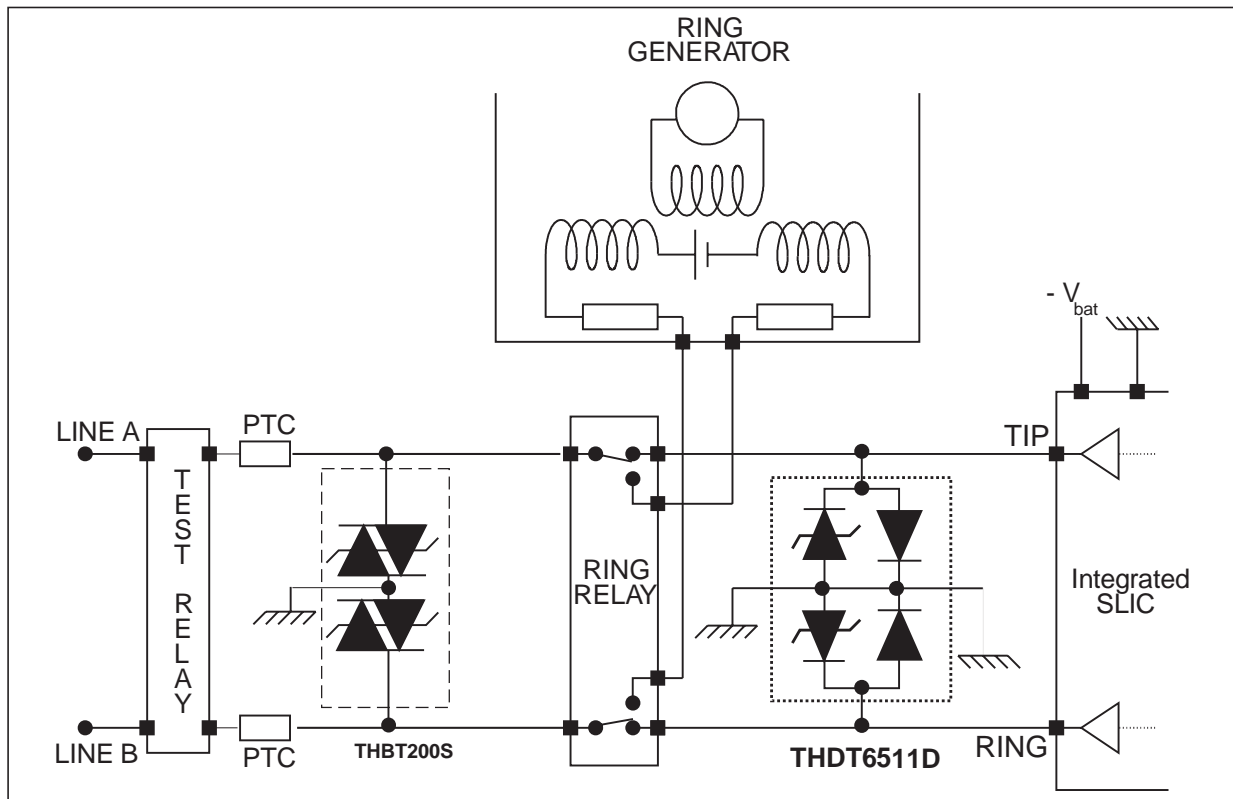
## LSSGR TEST DIAGRAM

Figure 2 :



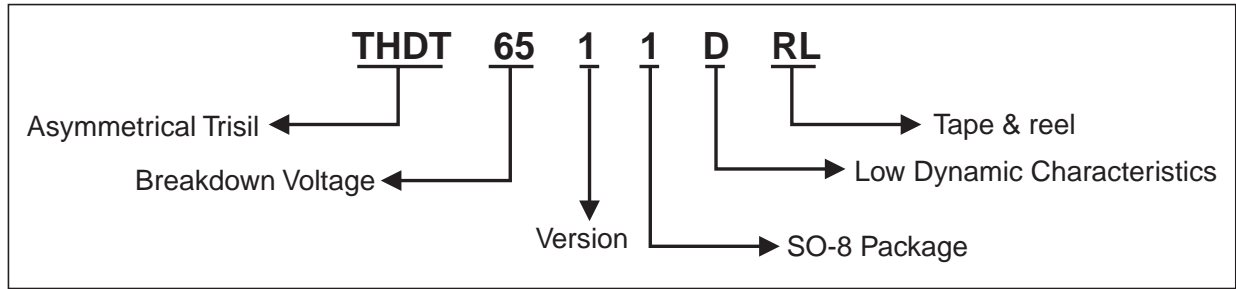
To stand the LSSGR test requirements,  $R_p$  must be  $\geq 15 \Omega$

TYPICAL APPLICATION



# THDT6511D

## ORDER CODE



## 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)					

### MARKING : DT651D

**PACKAGING** : Products supplied in antistatic tube or tape and reel.

**Weight** : 0.08g

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