



# THDT6511D

## Application Specific Discretes TRANSIENT VOLTAGE SUPPRESSOR A.S.D.<sup>TM</sup>

### 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.

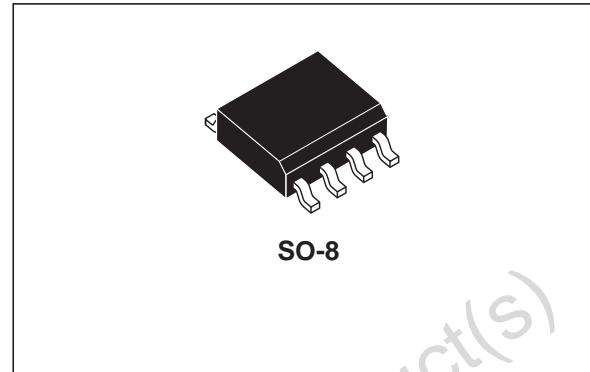
Two diodes clamp positive overloads while negative surges are suppressed by two protection thyristors.

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.

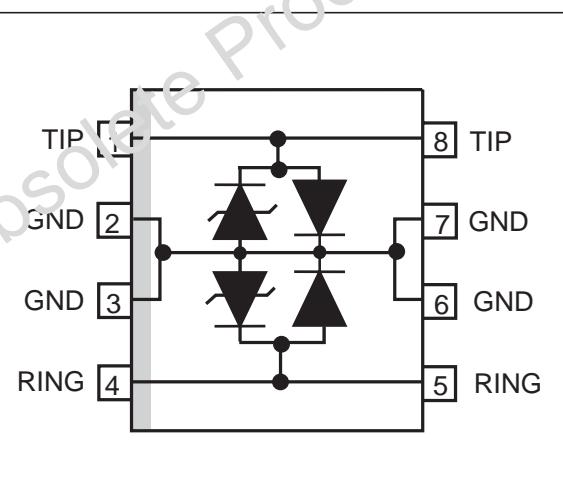
### COMPLIES WITH THE FOLLOWING STANDARDS :

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



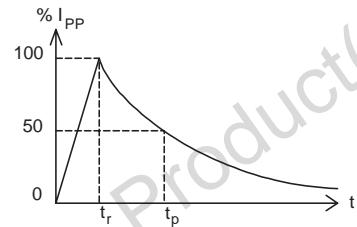
## THDT6511D

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

Symbol	Parameter		Value	Unit
$I_{PP}$	Peak pulse current (see note 1)	10/1000μs 5/310μs 2/10μs	40 50 125	A
$I_{TSM}$	Non repetitive surge peak on-state current $F = 50 \text{ Hz}$	$t = 300 \text{ ms}$ $t = 1 \text{ s}$ $t = 5 \text{ s}$	10 3.5 1	A
$I_{TSM}$	$F = 50 \text{ Hz}, 60 \times 1 \text{ s}, 2 \text{ mn between pulse}$		1	A
$T_{stg}$ $T_j$	Storage temperature range Maximum junction temperature	- 55 to + 150 150		°C
$T_L$	Maximum lead temperature for soldering during 10s		260	°C

Note 1 : Pulse waveform :

$$\begin{array}{lll} 10/1000\mu\text{s} & t_r=10\mu\text{s} & t_p=1000\mu\text{s} \\ 5/310\mu\text{s} & t_r=5\mu\text{s} & t_p=310\mu\text{s} \\ 2/10\mu\text{s} & t_r=2\mu\text{s} & t_p=10\mu\text{s} \end{array}$$



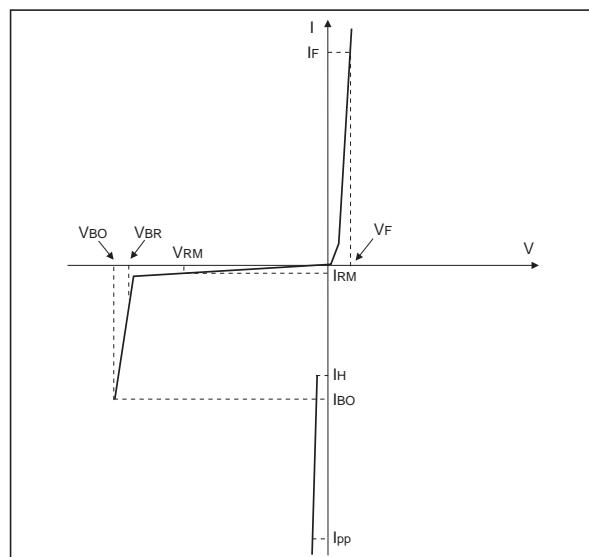
### THERMAL RESISTANCES

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

### ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter
$V_{RM}$	Stand-off voltage
$I_{RM}$	Leakage current at stand-off voltage
$V_{BR}$	Breakdown voltage
$V_{BO}$	Breakover voltage
$I_H$	Holding current
$V_F$	Forward voltage drop
$V_{FP}$	Peak forward voltage
$I_{BO}$	Breakover current
$I_{PP}$	Peak pulse current
$C$	Capacitance
$\alpha T$	Temperature coefficient



**1 - PARAMETERS RELATED TO DIODE LINE / GND**

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

NA : Non Available

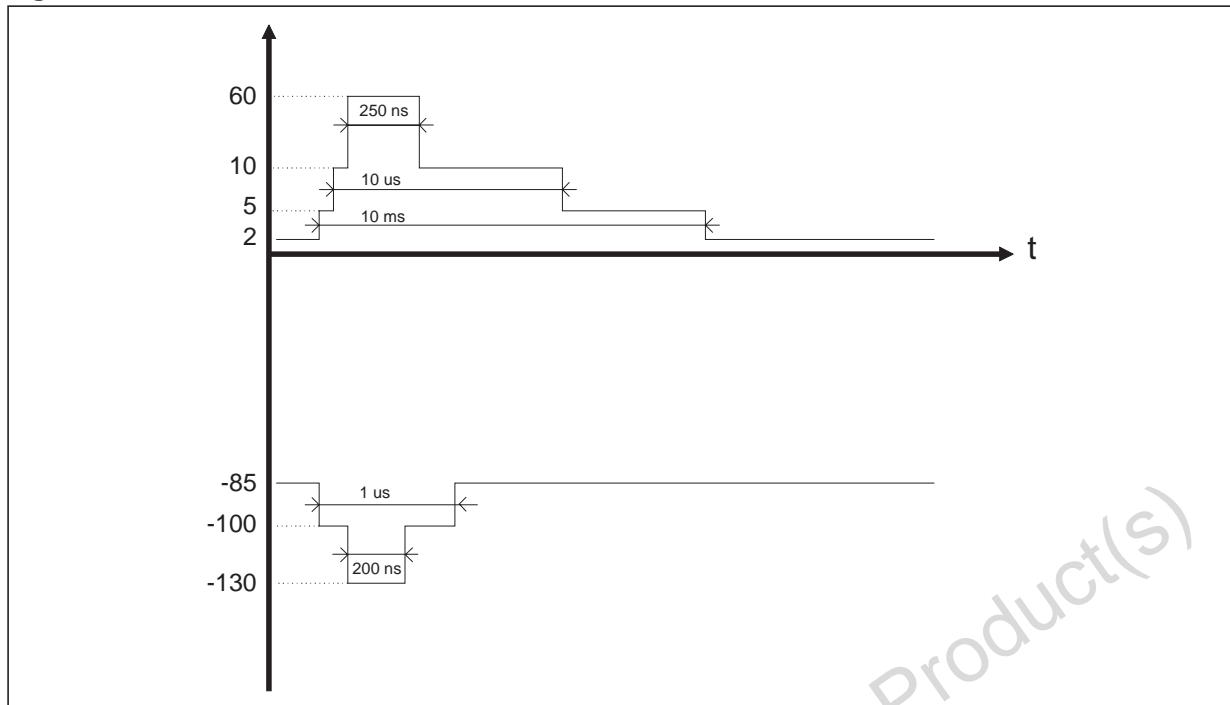
**2 - PARAMETERS RELATED TO PROTECTION THYRISTOR**

<b>Symbol</b>	<b>Tests conditions</b>	<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>	<b>Unit</b>
$V_{BR}$	$I_R = 1 \text{ mA}$	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	$V_D = 100 \text{ mV}_{\text{RMS}}$ F = 1KHz			500	pF
dV/dt	Linear ramp up to 67 % of $V_{BR}$	5			kV / $\mu\text{s}$

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

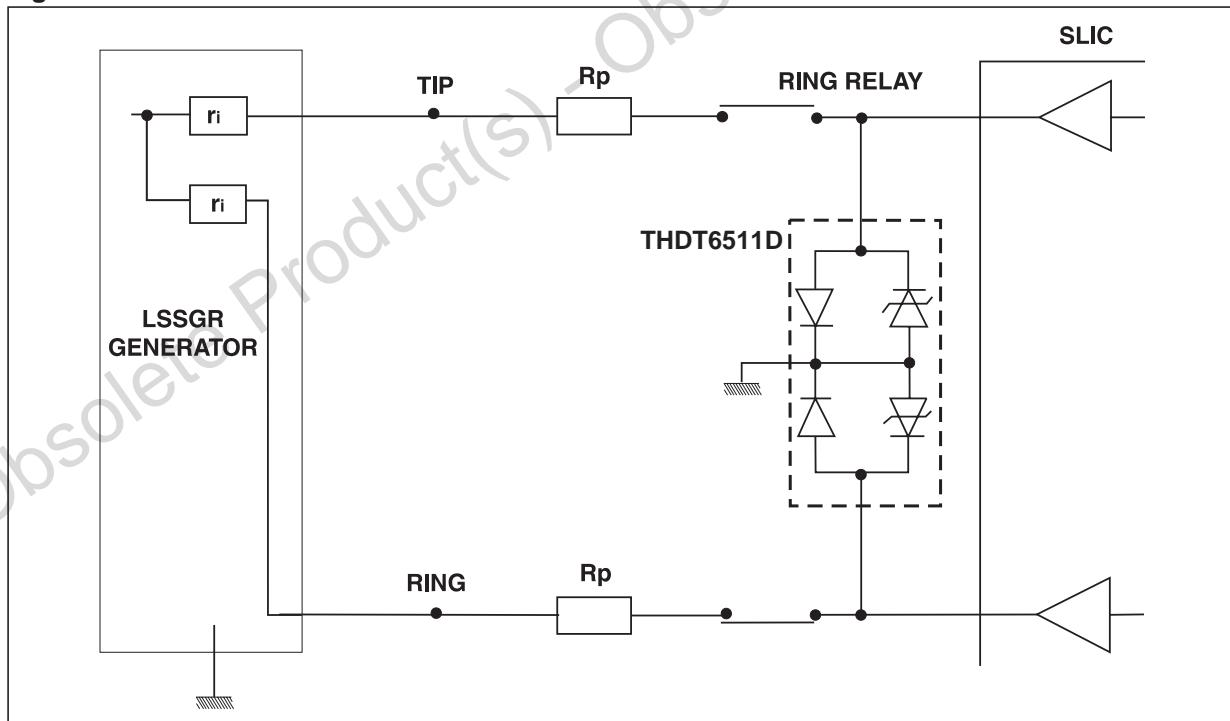
Figure 1 :



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

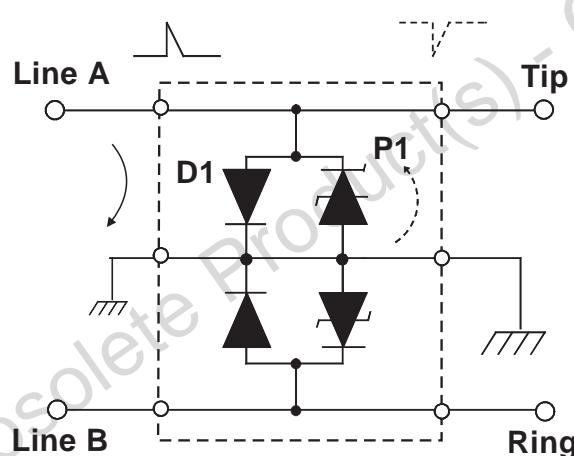
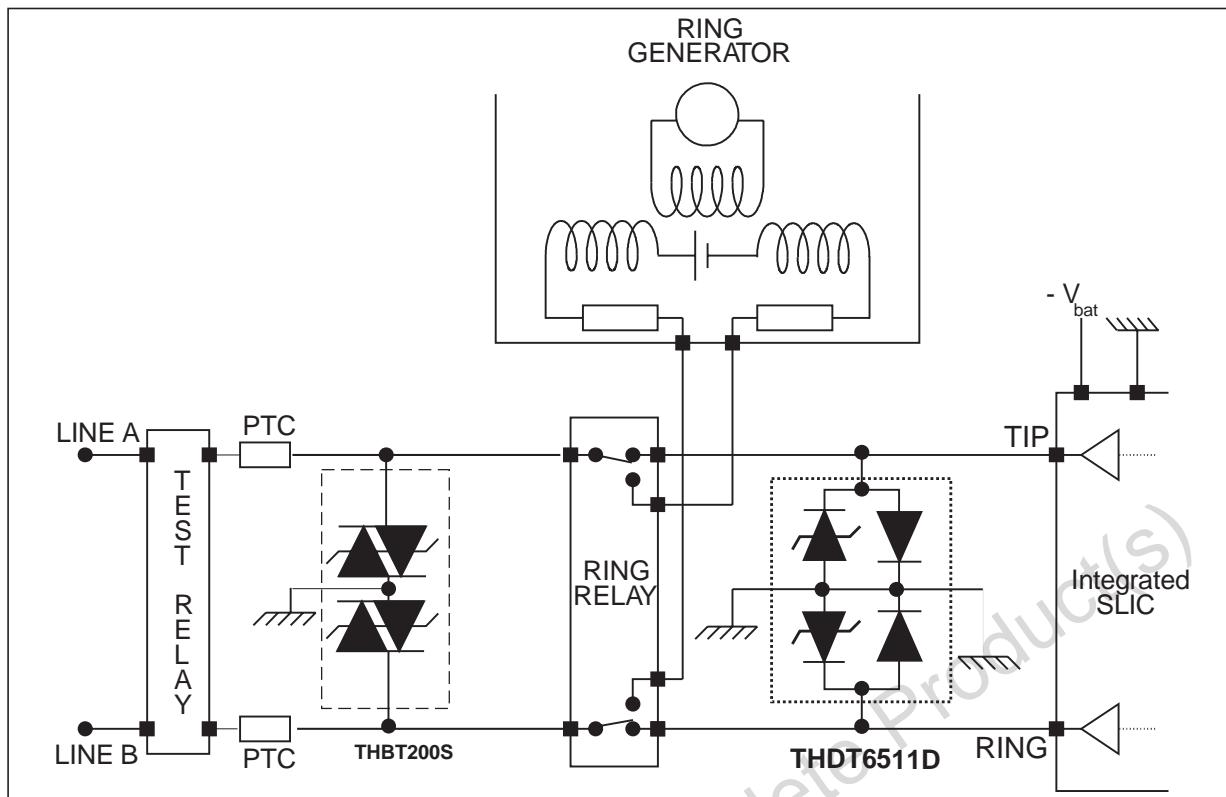
### LSSGR TEST DIAGRAM

Figure 2 :



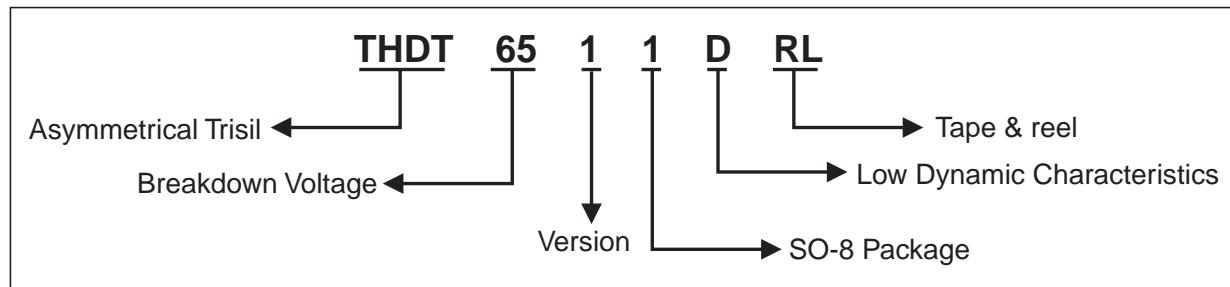
To stand the LSSGR test requirements,  $R_p$  must be  $| 15 \Omega$

## TYPICAL APPLICATION



## THDT6511D

### ORDER CODE



### PACKAGE MECHANICAL DATA.

SO-8 Plastic

The diagram shows three views of the SO-8 package:

- Front View**: Shows the top surface with pins numbered 1 through 8. Dimensions include **D**, **M**, **F**, **e**, **a2**, **A**, **b**, **c**, **a3**, **L**, **c1**, **a1**, and **b1**.
- Side View**: Shows the profile of the package with dimensions **L**, **c**, **c1**, **a1**, and **b1**.
- Bottom View**: Shows the underside of the package with pin numbers 1 through 8 and lead spacing **e**.

**DIMENSIONS**

REF.	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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