

LCP150S

PROGRAMMABLE TRANSIENT VOLTAGE SUPPRESSOR FOR SLIC PROTECTION

FEATURES

- DUAL PROGRAMMABLE TRANSIENT SUPPRESSOR.
- HIGH SURGE CURRENT CAPABILITY
 - $-I_{PP} = 50 \text{ A}, 10/1000 \text{ us}.$
 - $-I_{PP} = 60 \text{ A}, 5/320 \,\mu\text{s}.$
 - $-I_{PP} = 150 \text{ A}, 2/10 \text{ }\mu\text{s}.$
- WIDE NEGATIVE FIRING VOLTAGE RANGE: $V_{MGI} = -80 \text{ V max}$
- HOLDING CURRENT = 150 mA min.
- LOW GATE TRIGGERING CURRENT: $I_{GT} = 15 \text{ mA max}.$



DESCRIPTION

This device has been especially designed to protect subscriber line card interfaces (SLIC) against transient overvoltages.

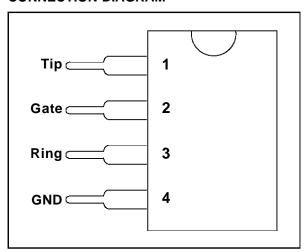
Positive overloads are clipped with two diodes. When negative surges are suppressed by two protection thyristors, the breakdown voltage of which is referenced to the -Vbat.

This component presents a very low gate triggering current (I_{GT}) in order to reduce the current comsumption on PC board during the firing phase.

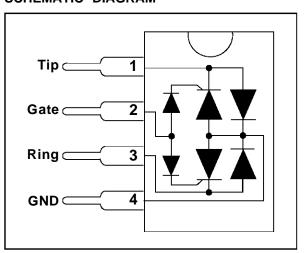
IN ACCORDANCE WITH FOLLOWING **STANDARDS:**

CCITT K17 - K20	{	10/700 μs 5/310 μs	1.5 kV 38 A
VDE 0433	{	10/700 μs 5/200 μs	2 kV 50 A
CNET	{	0.5/700 μs 0.2/310 μs	1.5 kV 38 A

CONNECTION DIAGRAM



SCHEMATIC DIAGRAM

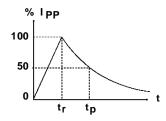


ABSOLUTE RATINGS (limiting values) (-40°C \leq T_{amb} \leq +85°C)

Symbol	Parameter		Value	Unit
lpp	Peak pulse current 10/1000 μs 5/320 μs 2/10 μs		50 60 150	А
ITSM	Non repetitive surge peak on-state current F = 50 Hz	tp = 10 ms tp = 1 s	25 8	А
IGSM	Maximum gate current (hall sine wave 10 ms)	2	А	
VMLG VMGL	Maximum Voltage LINE/GND Maximum Voltage GATE/LINE		- 100 - 80	V
T _{stg} T _j	Storage and operating junction temperature range		- 55 to + 150 150	°C °C

Note 1: Pulse waveform

10/1000 μs	$tr = 10 \mu s$	tp = 1000 μs
5/320 μs	$tr = 5 \mu s$	tp = 320 μs
2/10 us	$tr = 2 \mu s$.	$tp = 10 \mu s$

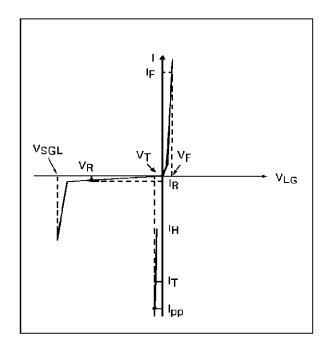


THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
R _{th} (j-a)	Junction-to-ambient	80	°C/W

ELECTRICAL CHARACTERISTICS

Symbol	Parameter
IGT	Gate Trigger Current
lΗ	Holding Current
IR	Reverse Leakage Current LINE/GND
I _{RG}	Reverse Leakage Current GATE/LINE
٧R	Reverse Voltage LINE/GND
٧F	Forward Voltage LINE/GND
VGT	Gate Trigger Voltage
VFP	Peak Forward Voltage LINE/GND
VSGL	Dynamic Switching Voltage GND/LINE
V _{gate}	GATE/GND Voltage
VLG	LINE/GND Voltage
dv/dt	Critical Rate of rise of off State Voltage
VT	On State Voltage
Coff	Off State Capacitance LINE/GND



PARAMETERS RELATED TO THE DIODE LINE/GND

Symbol	Test Conditions	Max.	Unit	l
٧F	Square pulse, Tp = 500 μs, IF = 5 A	3	V	
VFP	lpp = 40 A, 10/1000 μs.	15	V	

PARAMETERS RELATED TO PROTECTION THYRISTOR

Symbol	Tests Conditions		Min.	Max.	Unit
IGT	VGND/LINE = -48 V		0.2	15	mA
lн	VGATE= -48 V	Note 2.	150		mA
VGT	at IGT			2.5	V
I _{RG}	Tc = 25°C Tc = 70°C	V _{RG} = -75 V V _{RG} = -75 V		5 50	μA μA
VsgL	VGATE= -48 V	Note 2.		- 63	V
VT	Square pulse, Tp = $500 \mu s$, IT = $0.5 A$ Square pulse, Tp = $500 \mu s$, IT = $3 A$			3 4	V V

PARAMETERS RELATIVE TO DIODE AND PROTECTION THYRISTOR

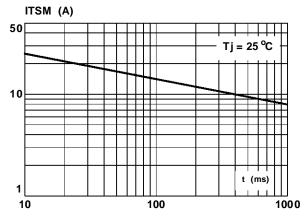
Symbol		Tests Conditions			Max.	Unit
IR	Tc = 25°C Tc = 70°C	-1 < V _{GL} < -Vbat -1 < V _{GL} < -Vbat	$V_{R} = -85 V$ $V_{R} = -85 V$		5 50	μA μA
C _{off}	V _R = - 3 V V _R = - 48 V		F < 1MHz F < 1MHz		150 80	pF pF

All Parameters Tested at 25 °C except when indicated.

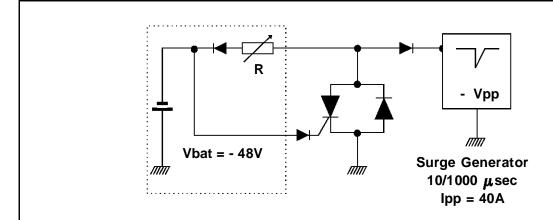
Note 2 : See test circuit for I_H and V_{SGL} .



Figure 1: Non repetitive surge peak on-state current. (with sinusoidal pulse : f =50Hz)



TEST CIRCUIT FOR IH AND VSGL PARAMETERS.



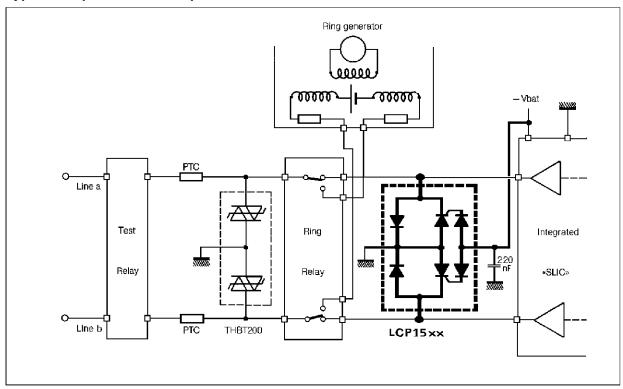
This is a GO-NOGO Test which allows to confirm the holding current (I_H) level, and to measure the dynamic switching voltage (V_{SGL}).

TEST PROCEDURE:

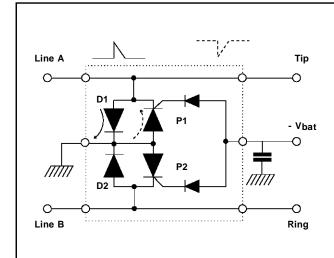
- 1) Adjust the current level at the $l_{\mbox{\scriptsize H}}$ value by short circuiting the AK of the D.U.T.
- 2) Fire the D.U.T with a surge Current : lpp = 40A , $10/1000 \, \mu s$.
- 3) The D.U.T will come back to the OFF-State within a duration of 50 ms max.
- \blacksquare The V_{SGL} is measured just before firing.

APPLICATION CIRCUIT

Typical slic protection concept



FUNCTIONAL DESCRIPTION



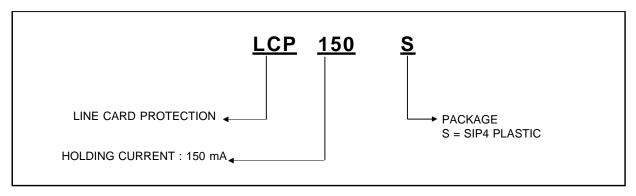
LINE A PROTECTION:

- For positive surges versus GND, the diode D1 will conduct.
- For negative surges versus GND, the protection device P1 will trigger at a voltage fixed by the -VBAT reference.

LINE B PROTECTION:

- For surges on Line B, the operating mode is the same , D2 or P2 is activated.
- A capacitor (C = 220nF) can be added close to the gate of the LCP15xx, in order to speed up the triggering.

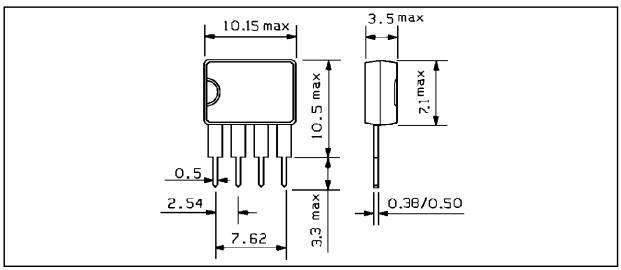
ORDER CODE



MARKING = Logo, date code, LCP150S.

PACKAGE MECHANICAL DATA (in millimeters)

SIP 4 Plastic



Packaging: Products supplied in antistatic tubes.

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