

Application Specific Discretes
 A.S.D.TM

PROGRAMMABLE TRANSIENT VOLTAGE SUPPRESSOR FOR SLIC PROTECTION

FEATURES

- DUAL PROGRAMMABLE TRANSIENT SUPPRESSOR
- HIGH SURGE CURRENT CAPABILITY.
 - $I_{PP} = 50A, 10/1000 \mu s.$
 - $I_{PP} = 60 A, 5/310 \mu s.$
 - $I_{PP} = 150 A, 2/10 \mu s.$
- HOLDING CURRENT = 150 mA min.
- LOW GATE TRIGGERING CURRENT :
 $I_{GT} = 15 mA$ max.

DESCRIPTION

This device has been especially designed to protect a subscriber line card interface (SLIC) against transient overvoltage.

Positive overloads are clipped with two diodes, while negative surges are suppressed by two protection thyristors, their breakdown voltage being is referenced to the -Vbat.

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

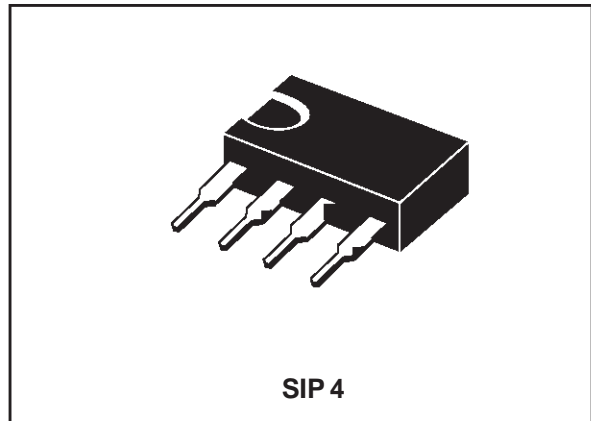
COMPLIES WITH THE FOLLOWING STANDARDS:

| | | |
|-------------------------------------|-----------------|---------|
| CCITT - K20 | 10/700 μs | 1kV |
| | 5/310 μs | 25A |
| VDE 0433 | 10/700 μs | 2kV |
| | 5/200 μs | 50A |
| VDE 0878 | 1.2/50 μs | 1.5kV |
| | 1/20 μs | 40A |
| FCC part 68 | 2/10 μs | 2.5kV |
| | 2/10 μs | 150A(*) |
| BELLCORE TR-NWT-001089 : | 2/10 μs | 2.5kV |
| | 2/10 μs | 150A(*) |
| | 10/1000 μs | 1kV |
| | 10/1000 μs | 50A(*) |
| CNET | 0.5/700 μs | 1kV |
| | 0.2/310 μs | 25A |

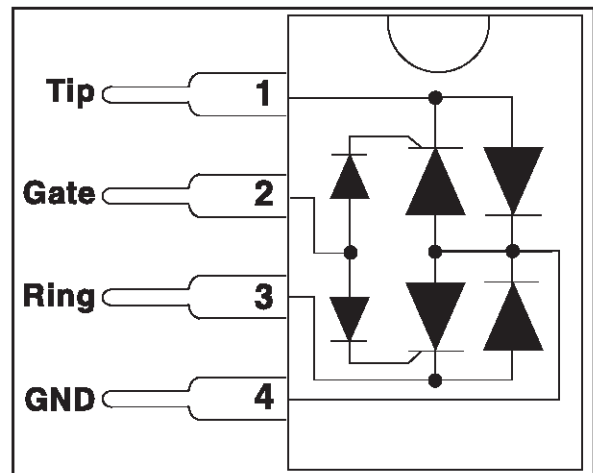
(*) with series resistors or PTC.

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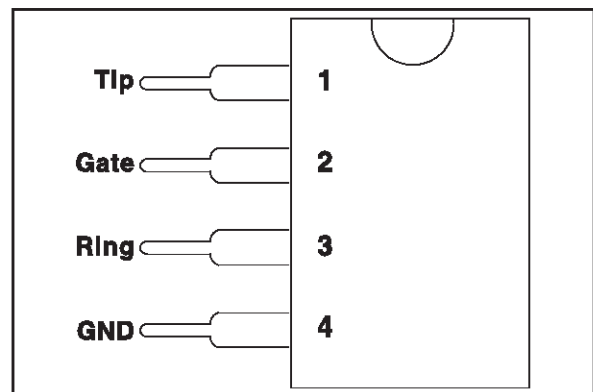
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SCHEMATIC DIAGRAM



CONNECTION DIAGRAM



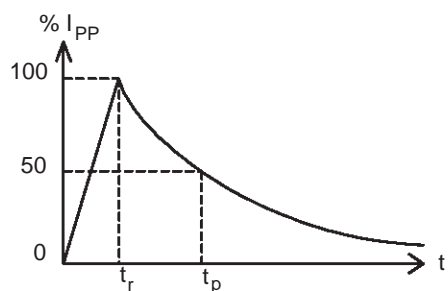
LCP150S

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 5/320 μs 2/10 μs | 50 60 150 | A |
| I_{TSM} | Non repetitive surge peak on-state current F = 50 Hz | $t_p = 10\text{ ms}$ $t = 1\text{ s}$ | 25 8 | A |
| I_{GSM} | Maximum gate current (half sine wave $t_p = 10\text{ ms}$) | | 2 | A |
| V_{MLG} V_{MGL} | Maximum Voltage LINE/GND Maximum Voltage GATE/LINE | | - 100 - 80 | V |
| T_{stg} T_j | Storage temperature range Maximum operating junction temperature | | - 55 to + 150 150 | $^{\circ}\text{C}$ $^{\circ}\text{C}$ |
| T_L | Maximum lead temperature for soldering during 10s | | 260 | $^{\circ}\text{C}$ |

Note 1: Pulse waveform

10/1000 μs $t_r = 10\text{ }\mu\text{s}$ $t_p = 1000\text{ }\mu\text{s}$
 5/320 μs $t_r = 5\text{ }\mu\text{s}$ $t_p = 320\text{ }\mu\text{s}$
 2/10 μs $t_r = 2\text{ }\mu\text{s}$, $t_p = 10\text{ }\mu\text{s}$

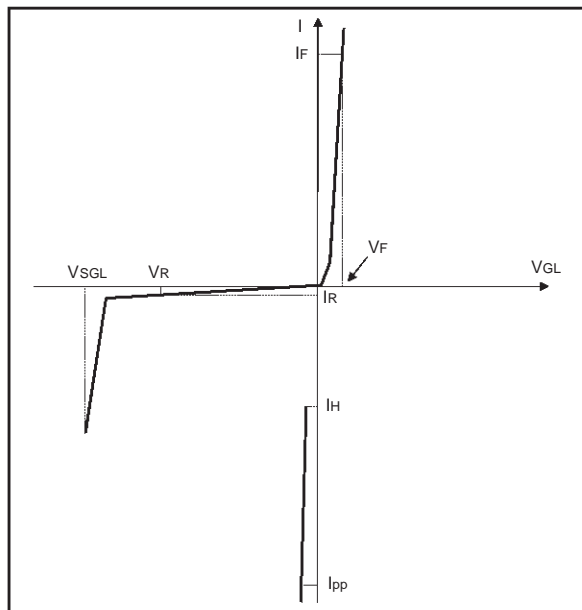


THERMAL RESISTANCE

| Symbol | Parameter | Value | Unit |
|---------------|---------------------|-------|----------------------|
| $R_{th(j-a)}$ | Junction-to-ambient | 80 | $^{\circ}\text{C/W}$ |

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

| Symbol | Parameter |
|------------|------------------------------------|
| I_{GT} | Gate Trigger Current |
| I_H | Holding Current |
| I_R | Reverse Leakage Current LINE/GND |
| I_{RG} | Reverse Leakage Current GATE/LINE |
| V_R | Reverse Voltage LINE/GND |
| V_F | Forward Voltage LINE/GND |
| V_{GT} | Gate Trigger Voltage |
| V_{FP} | Peak Forward Voltage LINE/GND |
| V_{SGL} | Dynamic Switching Voltage GND/LINE |
| V_{gate} | GATE/GND Voltage |
| V_{LG} | LINE/GND Voltage |
| C | Off State Capacitance LINE/GND |

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

| Symbol | Test Conditions | Max. | Unit |
|----------|---|------|------|
| V_F | Square pulse, $T_p = 500 \mu\text{s}$, $I_F = 5 \text{ A}$ | 3 | V |
| V_{FP} | $I_{PP} = 40 \text{ A}$, $10/1000 \mu\text{s}$. | 15 | V |

2 - PARAMETERS RELATED TO PROTECTION THYRISTOR

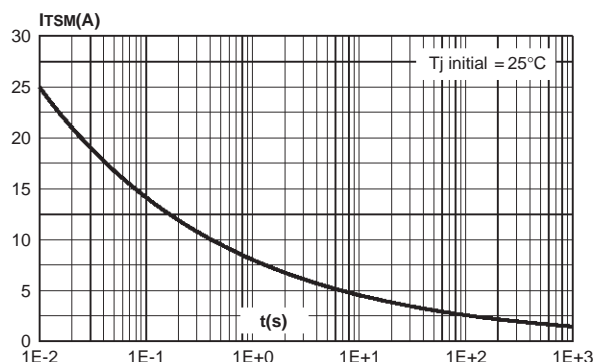
| Symbol | Tests Conditions | Min. | Max. | Unit |
|-----------|--|------|---------|--------------------------------|
| I_{GT} | $V_{GND/LINE} = -48 \text{ V}$ | 0.2 | 15 | mA |
| I_H | $V_{GATE} = -48 \text{ V}$ Note 2 | 150 | | mA |
| V_{GT} | at I_{GT} | | 2.5 | V |
| I_{RG} | $T_c = 25^{\circ}\text{C}$ $V_{RG} = -75 \text{ V}$ $T_c = 70^{\circ}\text{C}$ $V_{RG} = -75 \text{ V}$ | | 5 50 | μA μA |
| V_{SGL} | $V_{GATE} = -48 \text{ V}$ Note 2 | | - 63 | V |

3 - PARAMETERS RELATIVE TO DIODE AND PROTECTION THYRISTOR

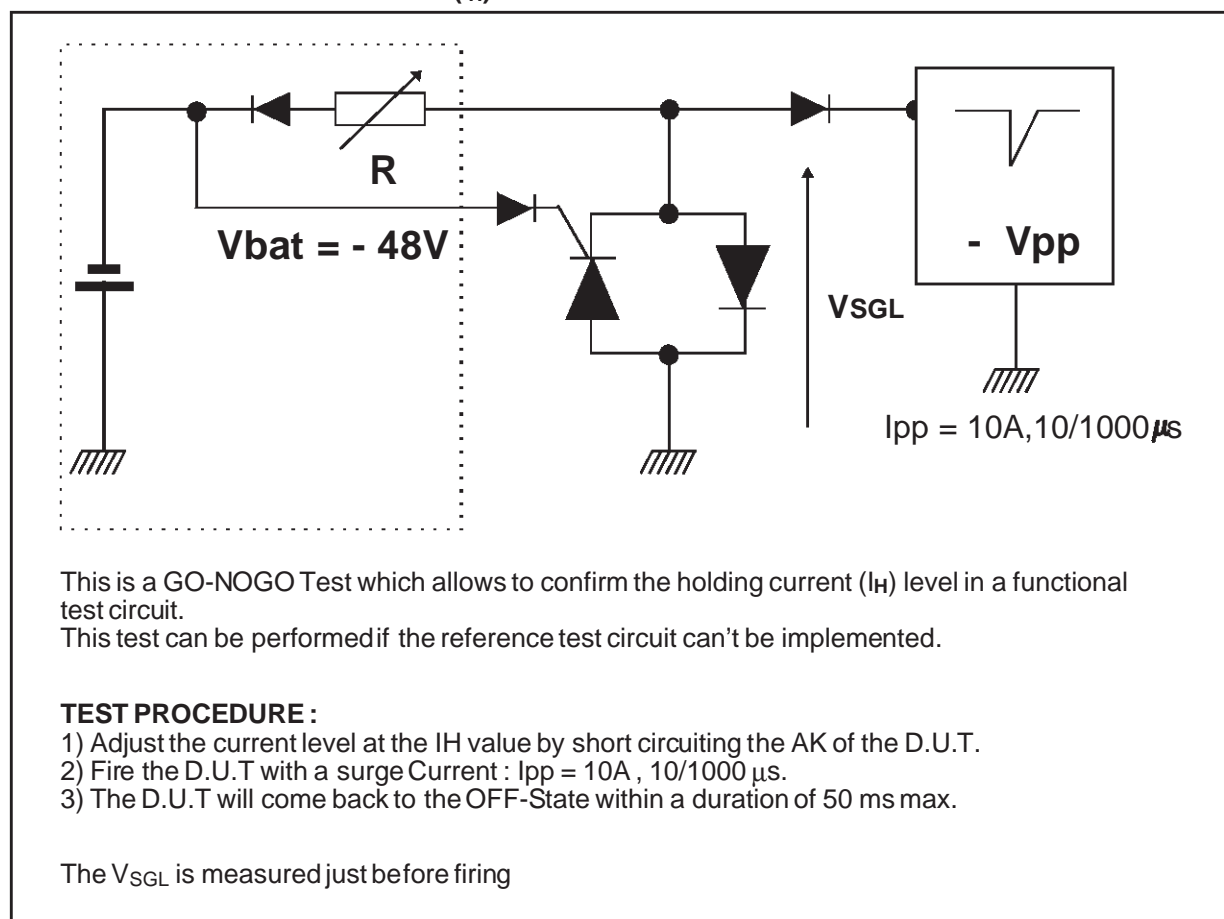
| Symbol | Tests Conditions | Min. | Max. | Unit |
|--------|--|------|-----------|--------------------------------|
| I_R | $T_c = 25^{\circ}\text{C}$ $-1 < V_{GL} < -V_{bat}$ $V_R = -85 \text{ V}$ $T_c = 70^{\circ}\text{C}$ $-1 < V_{GL} < -V_{bat}$ $V_R = -85 \text{ V}$ | | 5 50 | μA μA |
| C | $V_R = -3 \text{ V}$ $F < 1 \text{ MHz}$ $V_R = -48 \text{ V}$ $F < 1 \text{ MHz}$ | | 150 80 | pF pF |

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

Fig. 1 : Surge peak current versus overload duration (typical values).

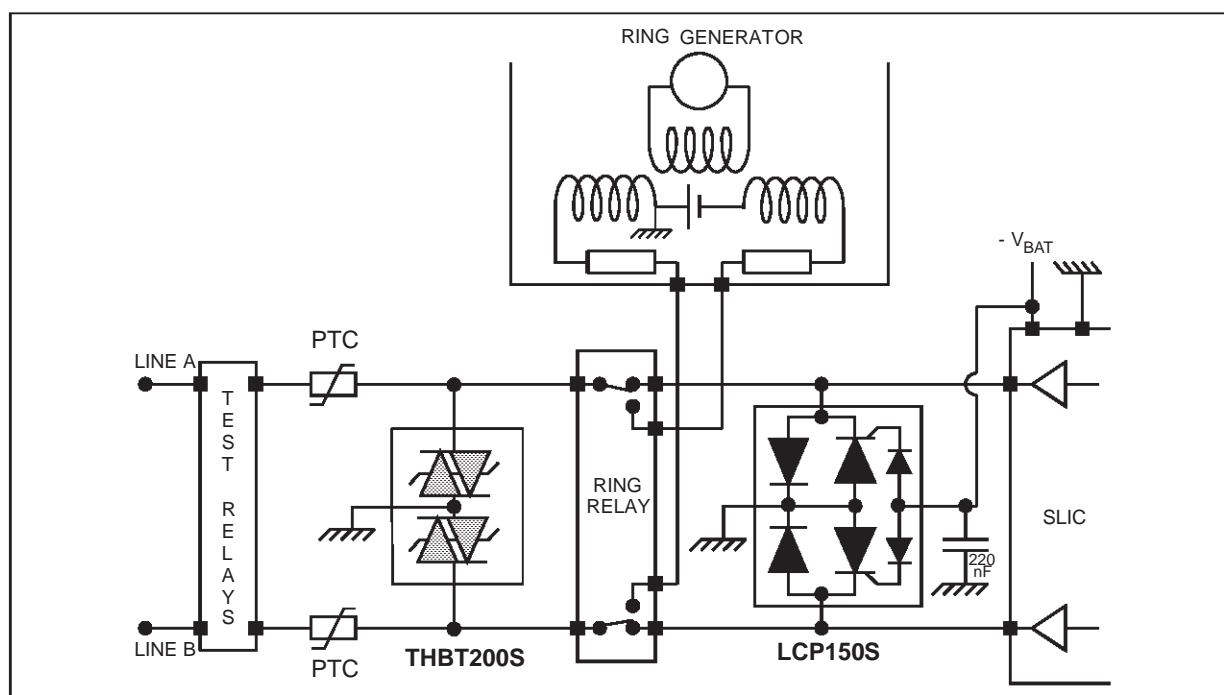


FUNCTIONAL HOLDING CURRENT (I_H) TEST CIRCUIT = GO - NOGO TEST.

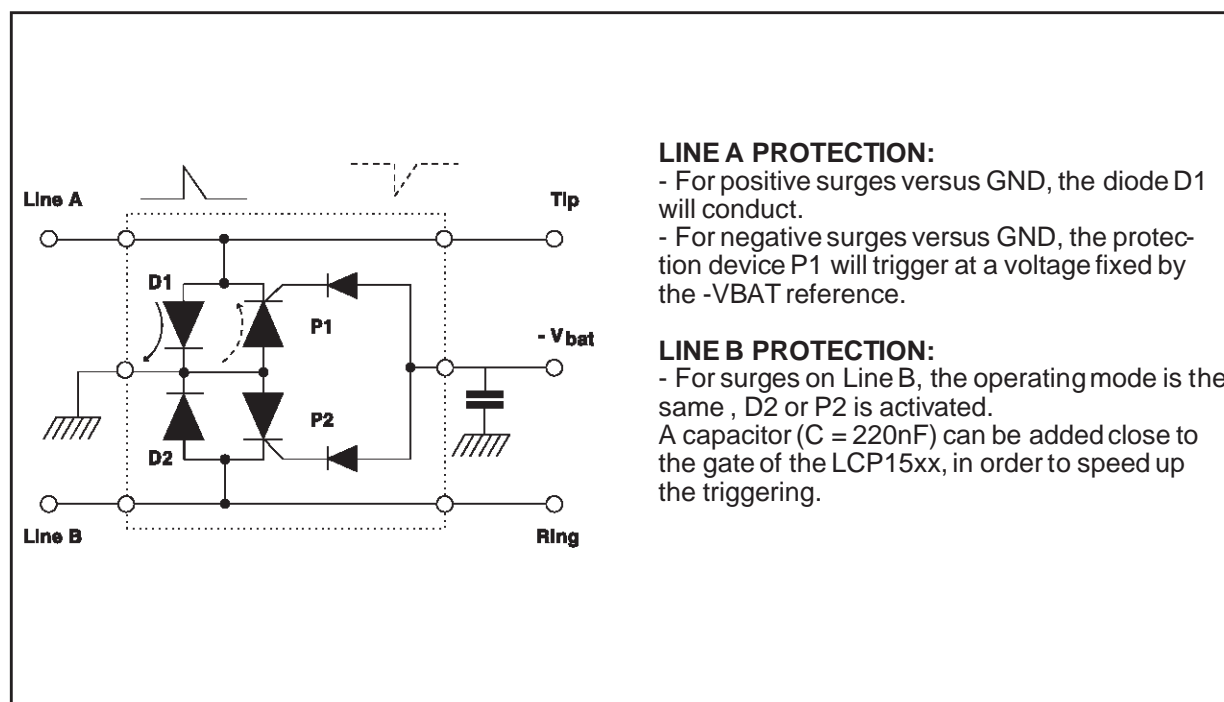


APPLICATION CIRCUIT

Typical SLIC Protection Concept.



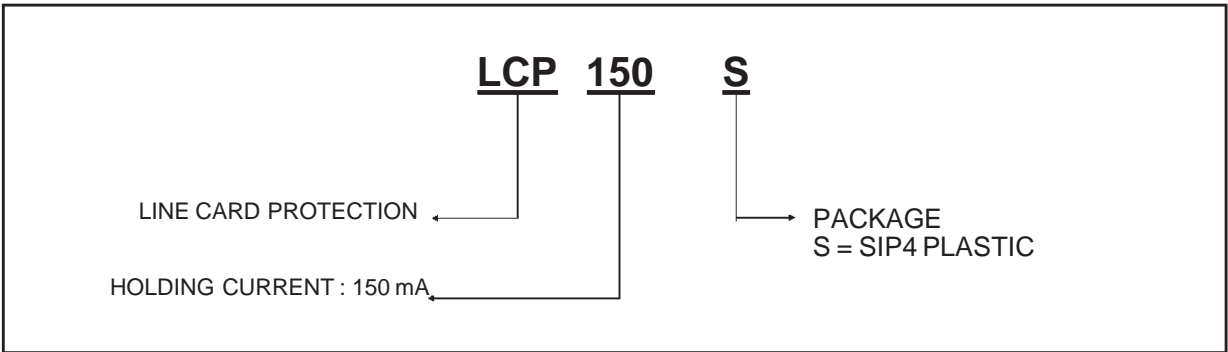
FUNCTIONAL DESCRIPTION



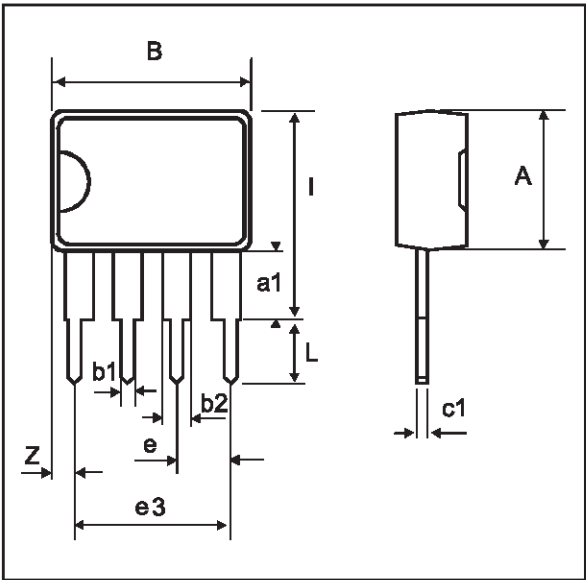
LCP150S

MARKING : Logo, Date Code, LCP150S.

ORDER CODE



PACKAGE MECHANICAL DATA
SIP 4



| REF. | DIMENSIONS | | | | | |
|------|-------------|------|-------|--------|-------|-------|
| | Millimetres | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 7.10 | | | 0.280 |
| a1 | 2.80 | | | 0.110 | | |
| B | | | 10.15 | | | 0.400 |
| b1 | | 0.50 | | | 0.020 | |
| b2 | 1.35 | | 1.75 | 0.053 | | 0.069 |
| c1 | 0.38 | | 0.50 | 0.015 | | 0.020 |
| e | | 2.54 | | | 0.100 | |
| e3 | | 7.62 | | | 0.200 | |
| I | | | 10.50 | | | 0.413 |
| L | | 3.30 | | | 0.130 | |
| Z | | | 1.50 | | | 0.059 |

PACKAGING : Products supplied in antistatic tubes.

WEIGHT : 0.55g

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