

Description

The LB1221AA/AB Subscriber Line Interface Circuit (SLIC) Protector is designed to protect line-feed circuitry from fault-induced lightning and power cross-surge pulses. If a fault pulse forces TIP or RING to a more negative state than V_s , current is pulled through the trip circuit. When a specified trip current level is reached, transistors PNP1 or PNP2 will conduct and "crowbar" the pulse to ground. If these same pulses force TIP or RING to a more positive state than ground, then diodes D1 or D2 will sink the pulse to ground.

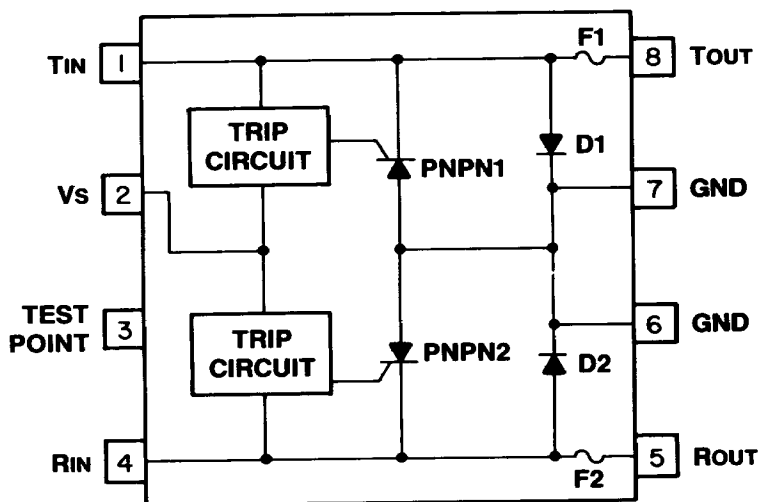
The LB1221AA/AB also provides protection against intangibles through the utilization of fuses F1 and/or F2. If the first (active) level of protection fails from stress, fuses F1 and/or F2 provide a second level of protection between the fault and the subscriber line interface circuitry.

The SLIC protector is available in wafer form (LB1221AA) or in an 8-pin plastic DIP (LB1221AB). When the SLIC protector is supplied in wafer form, it is the responsibility of the customer to provide the processing necessary to obtain usable devices.

Features

- Shunts ± 10 amp, $10 \times 1000 \mu s$ lightning pulses to ground
- Fuse protection against extended surges
- - 83 V battery capability
- Typically less than $20 \mu W$ power consumption in quiescent state

Functional and Pin Diagram



Maximum Ratings

At 25 °C

Stresses exceeding the values listed under Maximum Ratings may cause permanent damage to the device. This is an absolute stress rating only. Functional operation of the device at these or any other conditions in excess of those indicated in the operational sections of this data sheet is not implied. Exposure to maximum-rating conditions for extended periods of time may adversely affect device reliability.

Rating	Value	Unit
Ambient Operating Temperature Range	- 40 to + 85	°C
Storage Temperature Range	- 40 to + 125	°C
Pin Soldering Temperature (t = 15 s max.)	300	°C
Supply Voltage	- 83	V
Power Dissipation	600	mW
dc or rms Operating Current (≤ 2 s, 1 amp each side)	2	A

Pin Description

Pin	Symbol	Name/Function
1	T _{IN}	Tip signal from customer.
2	V _S	Supply voltage (- 34 V to - 76 V).
3	Test Point	Test point internally connected. Do not use as a tie point for external circuitry.
4	R _{IN}	Ring signal from customer.
5	R _{OUT}	Ring signal to SLIC.
6	GND	Device ground.
7	GND	Device ground.
8	T _{OUT}	Tip signal to SLIC.

Electrical Characteristics

T_A = 25 °C

Characteristics	Condition	Min	Typ	Max	Unit
10 × 1000 μs Lightning Pulse	—	±10	+16 -25	—	A
Trip Current	—	-150	—	-300	mA
Hold Current	—	-125	—	-250	mA
TIP or RING Voltage	V _S = -48 V I = -150 mA	-50	-54	-56	V
Diode ON-Voltage	I = 10 amps	—	4.0	—	V
V _S Current	V _S = -83 V R _{IN} = T _{IN} = GND	—	0.2	1.0	μA
dc Fuse Current	—	1	2	4	A

Characteristic Curves

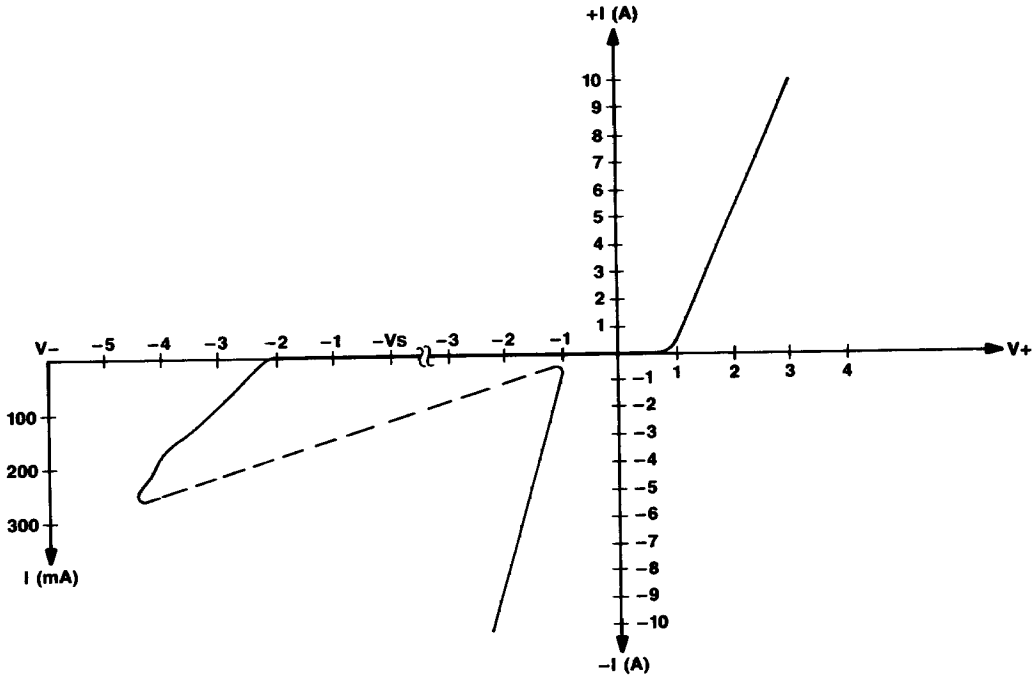


Figure 1. Trip Characteristics of the LB1221AA/AB SLIC Protector

Characteristic Curves

(Continued)

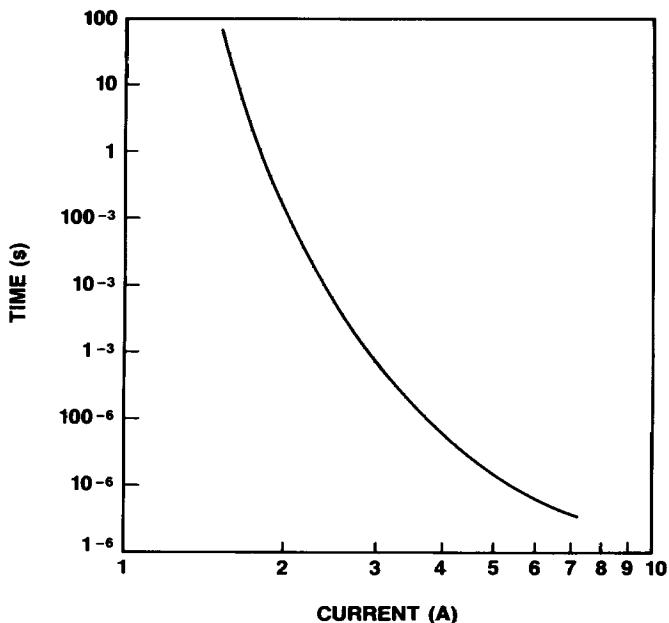
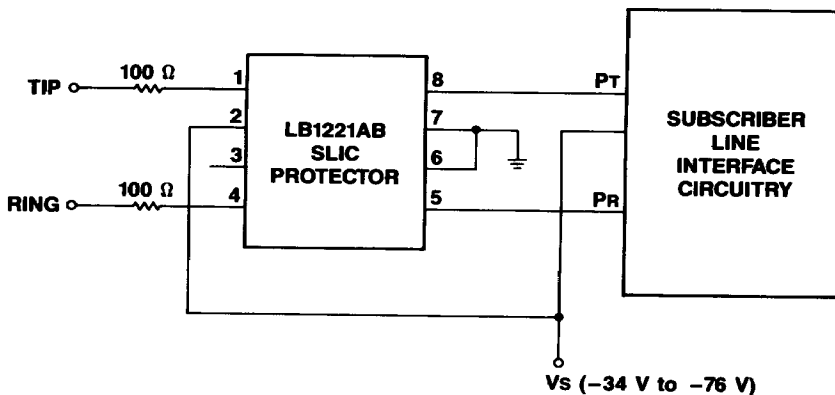


Figure 2. Fuse Characteristics, Time vs. Current

Applications



Notes: Pin 3 is internally connected and cannot be used as a tie point.

Pins 6 and 7 must be grounded to ensure total pulse current capacity.

The 100 Ω resistors at TIP and RING provide current limiting for the SLIC protector. These resistor values are valid if other protection techniques precede the current-limiting resistors (see Electrical Safety Precautions).

Figure 3. Typical Application of the LB1221AB SLIC Protector

Electrical Safety Precautions

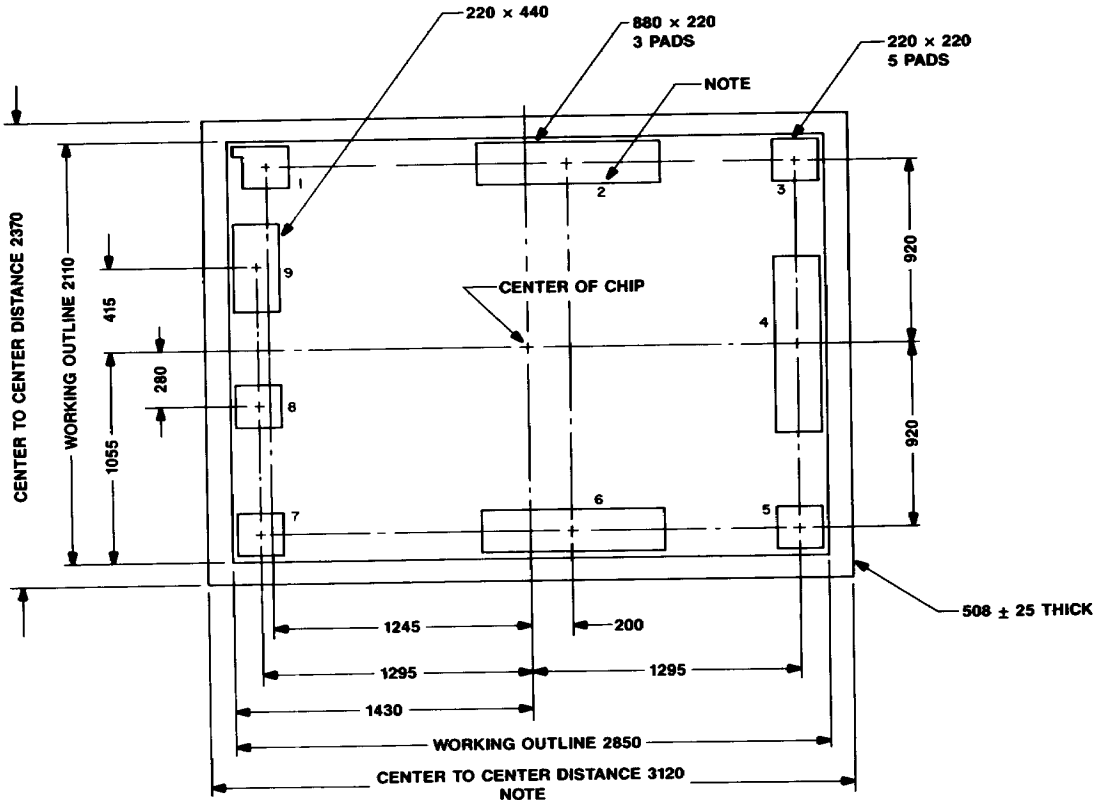
When the LB1221AA/AB SLIC Protector is used in a telephone loop application (Figure 3), lightning surges and power-cross faults can produce currents exceeding the maximum current rating of the device. Power-cross currents in excess of 1 amps rms, or a time span greater than 2 seconds at 1 amp rms, exceed the device's capability and is herein described as an excessive fault. Lightning surges in excess of 10 A and $10 \times 1000 \mu s$ are also considered excessive faults.

CAUTION: The device must be protected against excessive faults. When an excessive fault condition occurs, the LB1221AA/AB device can be subjected to package rupture with expulsion of material. Because of this possibility it is necessary to maintain safe failure conditions. For power cross faults this can be accomplished by utilizing protective current impedance (PTC) or proper fusing techniques (fuses, heat coils etc). In the event of a lightning surge condition, the use of clamp devices such as carbon blocks is recommended. When the LB1221AA/AB SLIC Protector is used in other applications, the aforementioned safety precautions should always be considered.

Outline Drawing

Wafer (LB1221AA)

Dimensions are in microns.

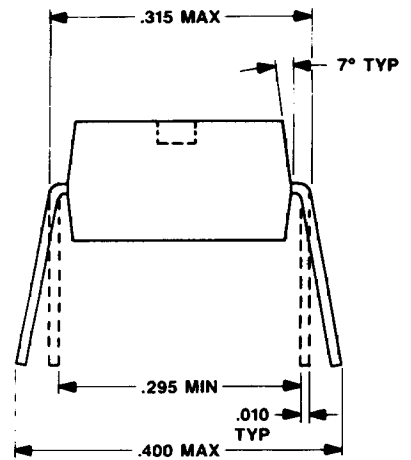
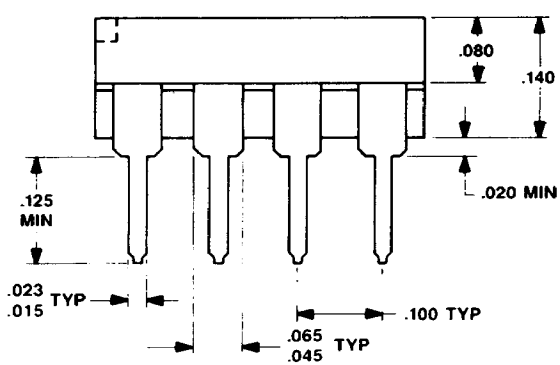
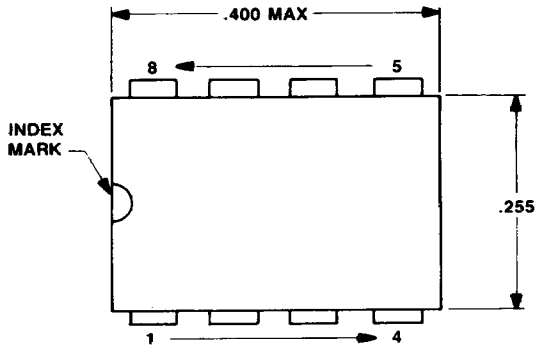


Note: The actual size equals the center-to-center dimensions less the saw kerf width, typically $50 \mu m$ to $70 \mu m$.
 Chip pad numbers are for reference only and do not appear on the chip. The complete metallization pattern is not shown.

Outline Drawing

8-Pin Plastic DIP (LB1221AB)

Dimensions are in inches.



Note: Pin numbers are shown for reference only.

Ordering Information

Device	Comcode
LB1221AA	105540538
LB1221AB	105540546