INTEGRATED SECONDARY PROTECTORS — LH1150-TYPE

T-62-11

Description

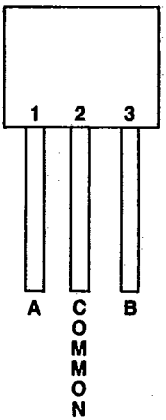
The LH1150-Type Integrated Secondary Protectors (ISPs) are a family of two-wire, bidirectional, overvoltage protection devices. Each circuit contains diode steering, threshold sensing, a thyristor predriver, and shunting devices. Internal zener trimming provides a precise breakover voltage. This internal circuitry combination allows for minimal overshoot. The device also exhibits a breakover current that helps in preventing inadvertent turn-ons.

The ISP devices are specifically designed to protect telephony switching equipment from telephone loop fault-induced lightning and power-cross surges. The device is ideally suited for applications where transient overshoot is a concern. The LH1150-Type ISPs are manufactured in three holding current values and are available in a 3-pin ruggedized plastic package.

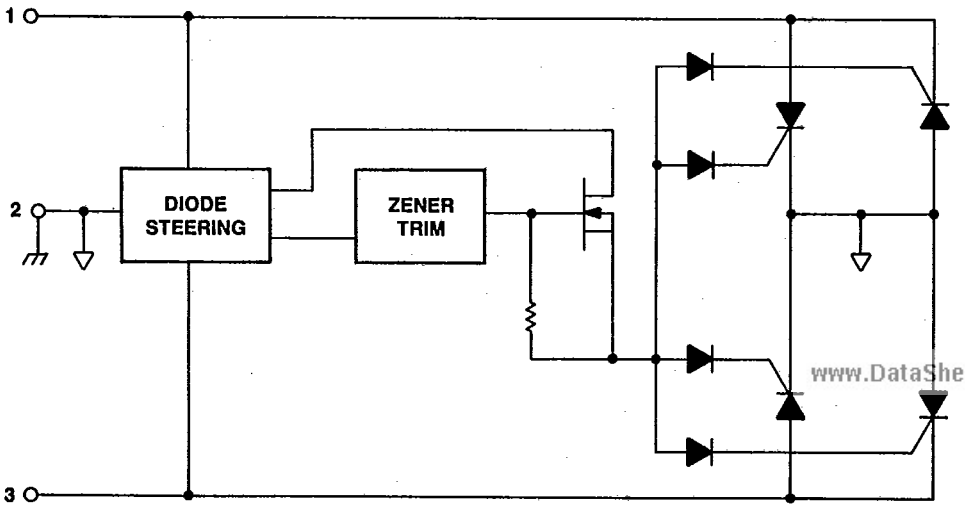
Features

- Bidirectional overvoltage protection
- Crowbars surge waves and power-cross faults
- dv/dt and noise immunity
- Low overshoot
- Low leakage current
- No heat sink required
- Symmetrical pinout

Pin Diagram



Functional Diagram



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Maximum Ratings

At 25 ° C

Stresses in excess of those 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 section of this data sheet is not implied. Exposure to maximum rating conditions for extended periods of time may adversely affect device reliability and present hazardous conditions as detailed in Electrical Saftey Precautions.

Rating	Value	Unit
Ambient Operating Temperature Range	−40 to +85	°C
Storage Temperature Range	−40 to +125	°C
Pin Soldering Temperature	300	°C
Power Dissipation	7	W
Non-Repetitive Peak Pulse Current (10 × 1000 μs, 9.1 amp per side)	18.2	A
dc or RMS Operating Current (t = ≤ 5 s, 1 amp per side)	2	A

Pin Description

Pin	Symbol	Name/Function
1	A	This pin should be connected to a line being protected. To protect against telephone loop induced surges, a minimum of 100 Ω must be connected between this pin and the telephone loop (Figure 6).
2	Common	Fault currents are shunted to this pin.
3	B	This pin should be connected to a line being protected. To protect against telephone loop induced surges, a minimum of 100 Ω must be connected between this pin and the telephone loop (Figure 6).

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Electrical Characteristics

T_A = 25 °C.

Characteristic/Conditions	Min	Typ	Max	Unit
Offstate Current (I_D):				
V_D = ±160 V	—	.001	1.0	μA
V_D = ±210 V	—	.001	5000	μA
V_D = ±224 V (LH1150CAM)	—	—	10.0	mA
Threshold Voltage (V_Z) @ 500 μA	210	220	230	V
Breakover Voltage (V_{BO}) @ I_{BO}	—	230	—	V
Breakover Current (I_{BO}) 20 Hz Sine Wave	—	50	—	mA
On Voltage (V_T) @ 1 amp	—	3.5	—	V
Holding Current (I_H) Rs = 300 Ω (T-R, R-T):				
LH1150AAM	110	150	—	mA
LH1150BAM	155	220	—	mA
LH1150CAM	165	220	—	mA
Peak Voltage (power-cross) (T-G, R-G): Vs = 600 Vrms, 50/60 Hz (Figure 1) Rs = 700 Ω t = 1.0 s	—	—	255*	V
Peak Voltage (transient) (T-G, R-G): Vs = ± Vpeak (Figure 2) 10/1000 μs Rs = 110 Ω	—	—	255*	V

Note: Rs is the resistance in series with the ISP device during characteristics specified.

* Peak voltage will increase by a factor of approximately 0.2V/°C as ambient temperature rises.

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Test Circuits

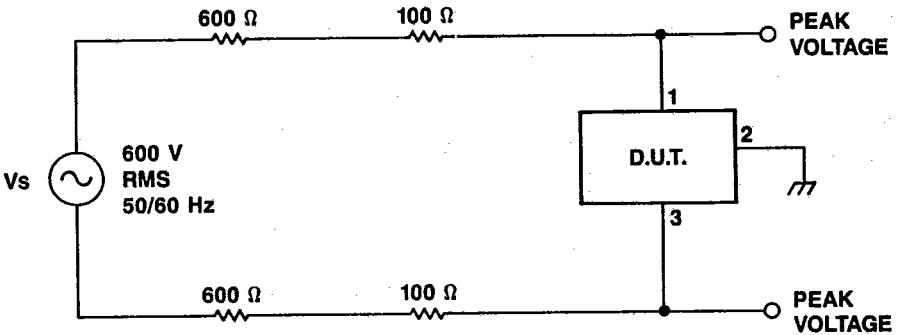

Figure 1. Power Cross Test Circuit

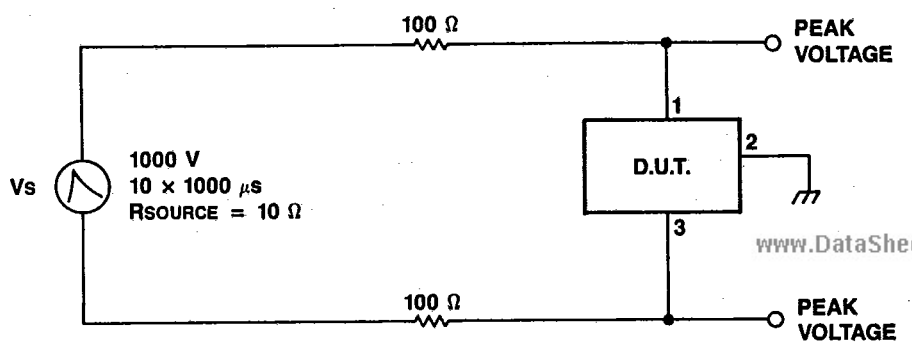

Figure 2. Transient Test Circuit

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Functional Description

During normal circuit operation, the LH1150 ISP remains off (< 210 V). When a fault voltage exceeds the device's threshold voltage (V_Z), current begins to flow. When the breakover current (I_{BO}) is realized, the device will crowbar the fault to ground. After the fault current drops below the device's holding current (I_H), the device will return to the normally off state.

Holding current is a prime consideration when designing a circuit. To ensure the device returns to a normally off state, when a fault condition is depleted, select the LH1150 ISP device which exhibits a holding current greater than the circuit's highest operating current.

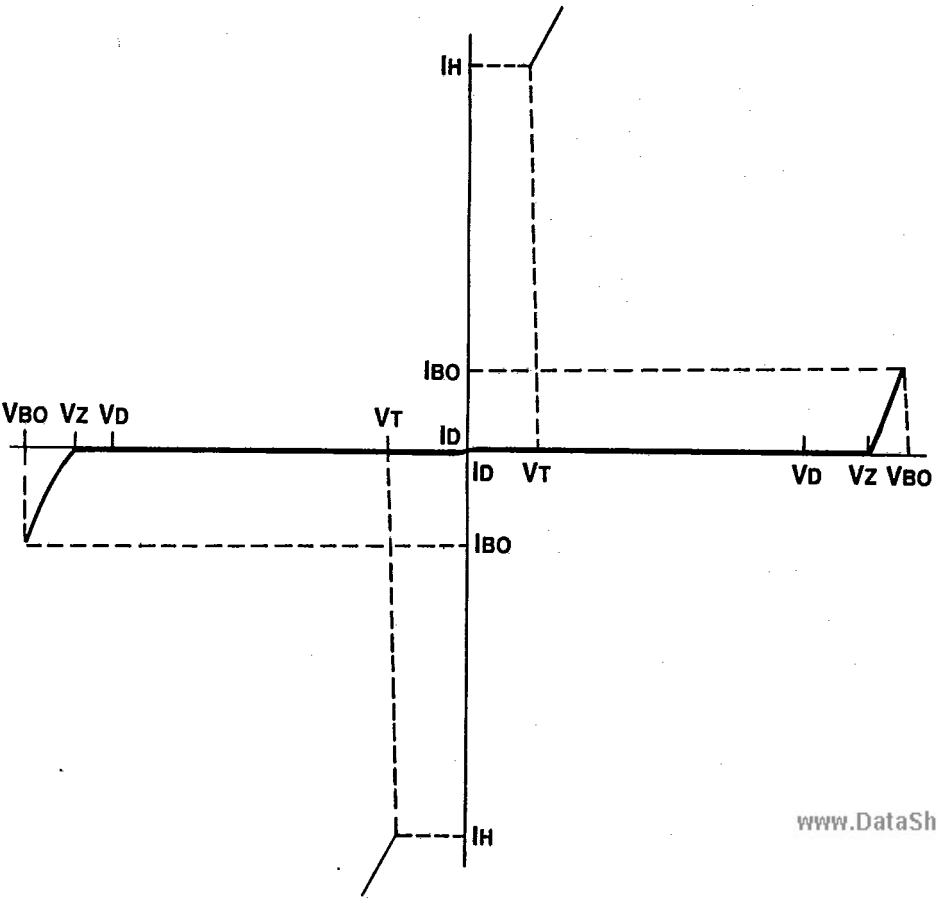

Figure 3. Typical Electrical Characteristics

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Characteristic Curves

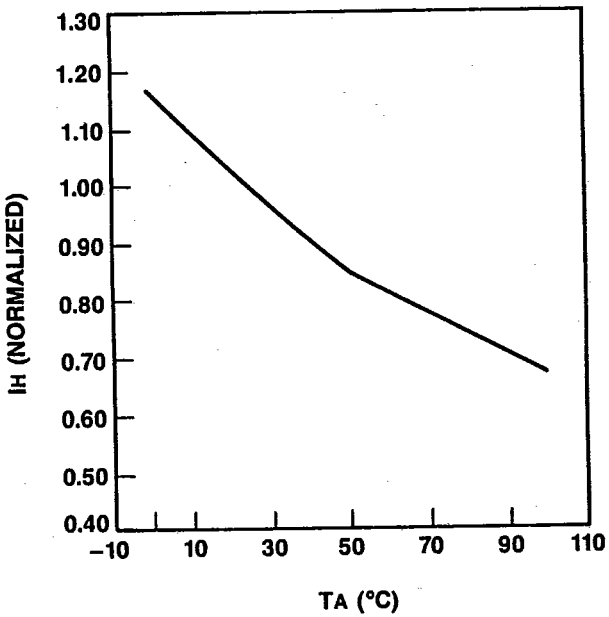

Figure 4. Holding Current vs Temperature

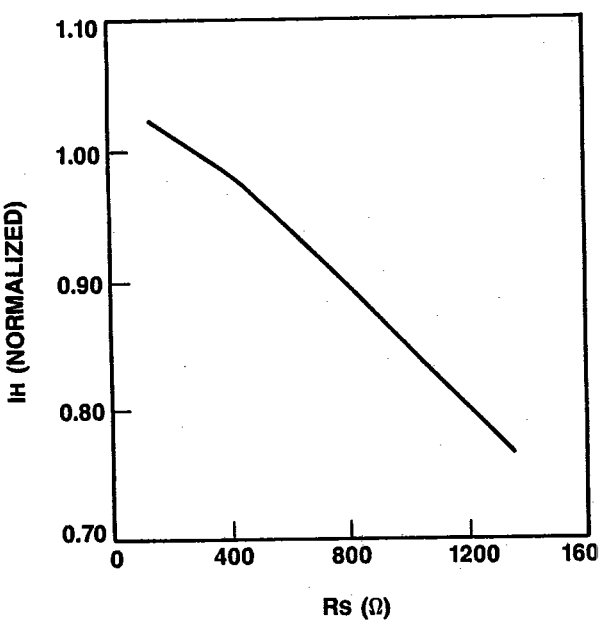

Figure 5. Holding Current vs Series Resistance

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Applications

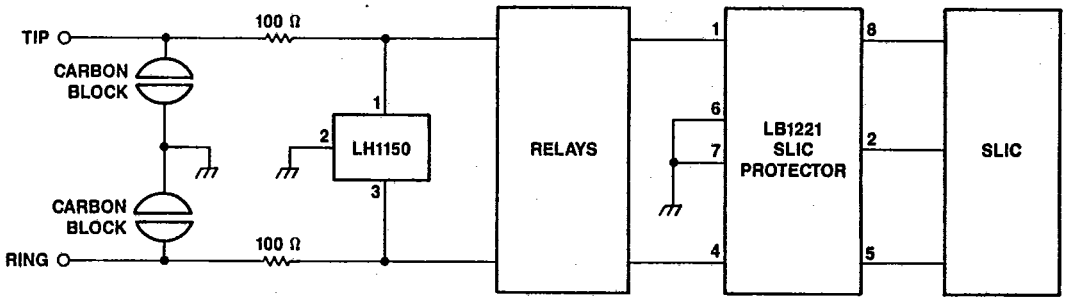
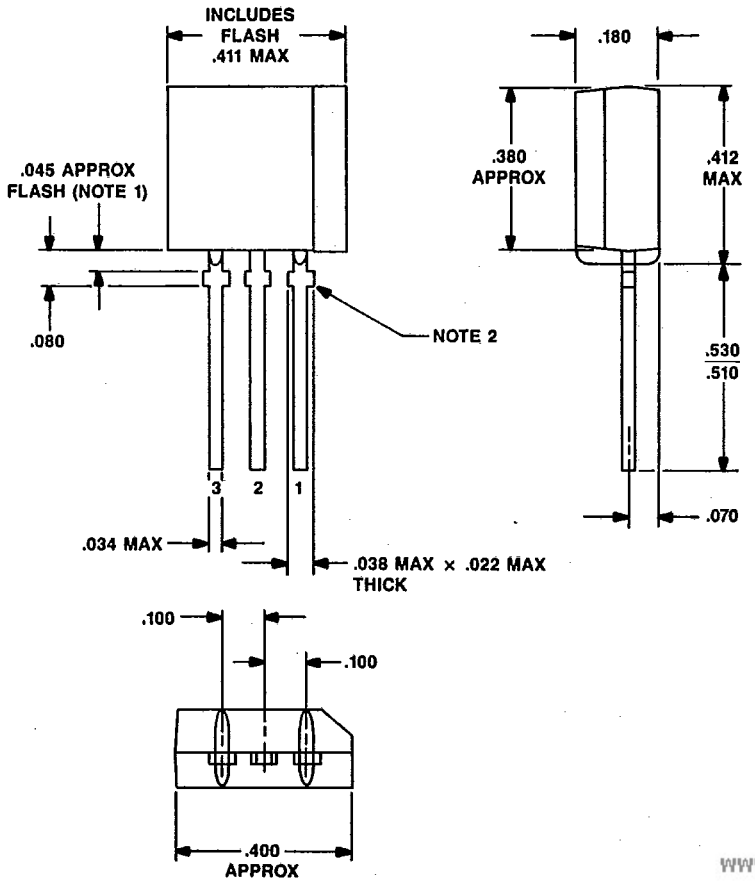


Figure 6. Central Office Protection

Outline Drawing

Dimensions are in Inches



Notes:

1. Flash permissable in this area along with lead length not to exceed the .038″ max. wide × .022″ max thickness of the leads.
2. Burrs in trim are not to exceed overall lead thickness of .023″.

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Ordering Information

Device	Comcode
LH1150AAM	104435607
LH1150BAM	104435615
LH1150CAM	104435623