SL1010A Series

Description

The SL1010A Series Gas Discharge Tube (GDT) offers a compact, three-terminal, surface mount component that's just 5mm in diameter. It is rated for 10 hits (±5 repetitions) of a 5kA 8/20µs surge event with a low off-state capacitance of 1.5pF. Its low arc voltage parameter of 10V reduces thermal accumulation during long-term power fault events.

Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E128662

3 Electrode GDT Graphical Symbol

Additional Information

Datasheet | Resources | Samples

Features

- 5mm diameter size
- Low insertion loss
- Fast response time
- Single component balanced protector (T-grd & R-grd)
- High current rating
- Stable performance over lifetime
- Lead-free and RoHS compliant
- UL Recognized

Applications

- Data lines
- Broadband interfaces such as ADSL2/VDSL2
- xDSL equipment
- Satellite and CATV equipment
- General telecom equipment
- Industrial automation
- Home gateway

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Gas Discharge Tube (GDT) Products
SL1010A Series

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Electrical Characteristics

Part Number	Device Specifications (at 25°C)									
	DC Breakdown in Volts[1,2,3] (@100V/s)			Impulse Breakdown in Volts[2,3] (@100V/µs)	Impulse Breakdown In Volts[2,3] (@1kV/µs)	Insulation Resistance	Capacitance (@1MHz 0V Bias)	Arc Voltage (on state Voltage) @1Amp Min	Nominal Impulse Discharge Current (x10@8/20µs)	Nominal Impulse Discharge Current (x1@10/350µs)
	MIN	TYP	MAX	MAX		MIN	MAX			
SL1010A075	60	75	90	450	600	>1GΩ (at 50VDC)	<1.5 pF	~10 V	5kA	1kA
SL1010A090	72	90	108	550	700					
SL1010A170	136	170	204							
SL1010A230	184	230	276	580	750					
SL1010A350	280	350	420	850	1000					
SL1010A470	376	470	564	800	950					

Notes:
1. At delivery AQL 0.65 level II, DIN ISO 2859
2. In ionized mode, tested according to ITU-T Rec. K.12
3. Comparable to the silicon measurement Switching Voltage (Vs)
4. Total current through center electrode at 10kA, through side electrode respectively at 5kA

Product Characteristics

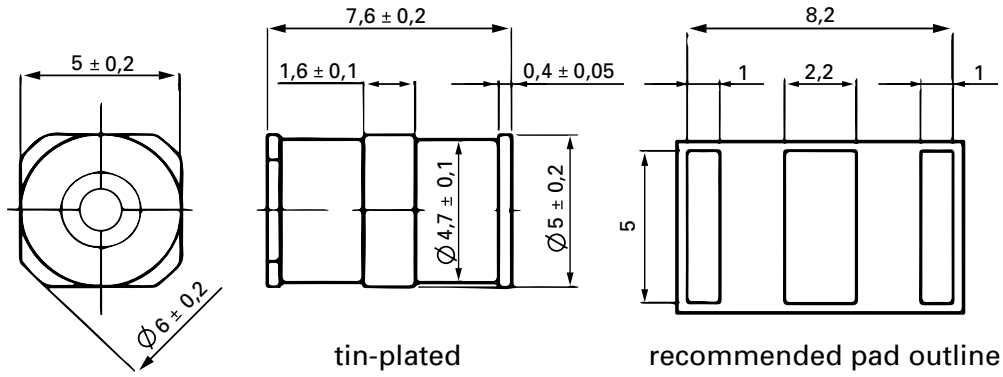
Materials	**Construction:** Ceramic Insulator **Device Finish:** Dull Tin-plated 17.5 +/- 12.5 microns
Product Marking	Littelfuse 'LF' Mark, voltage and date code

Glow to Arc Transition Current	~1 Amp
Glow Voltage	~60 Volts
Storage and Operational Temperature	-40 to +90°C

Device Dimensions

For SL1010A series:

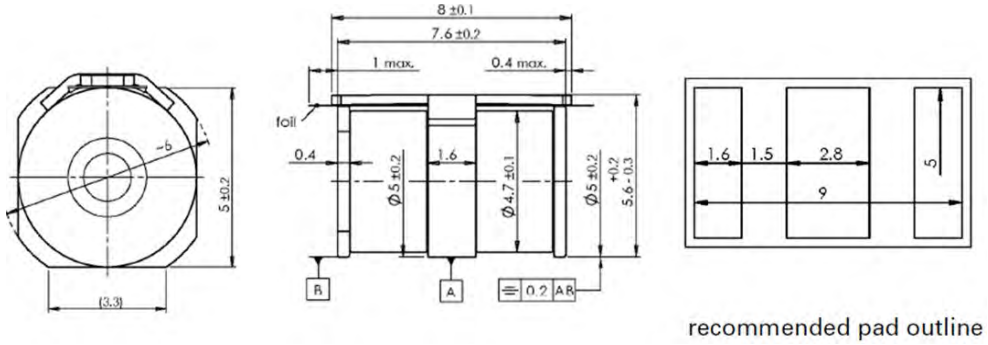
Dimensions are in millimeters [and inches]



tin-plated

recommended pad outline

For SL1010A series failsafe version:



recommended pad outline

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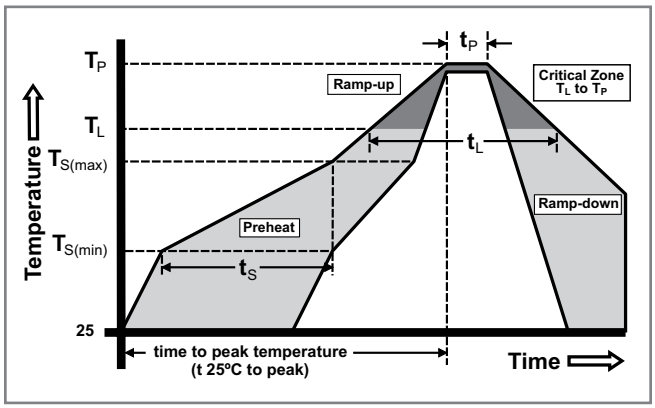
Soldering Parameters - Reflow Soldering (Surface Mount Devices)

Reflow Condition		Pb-free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (Min to Max) (t_s)	60 – 180 seconds
Average Ramp-up Rate (Liquidus Temp (T_L) to peak)		3°C/second max.
$T_{S(max)}$ to T_L - Ramp-up Rate		5°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of Actual Peak Temperature (t_p)		10 – 30 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to Peak Temperature (T_P)		8 minutes max.
Do not exceed		260°C

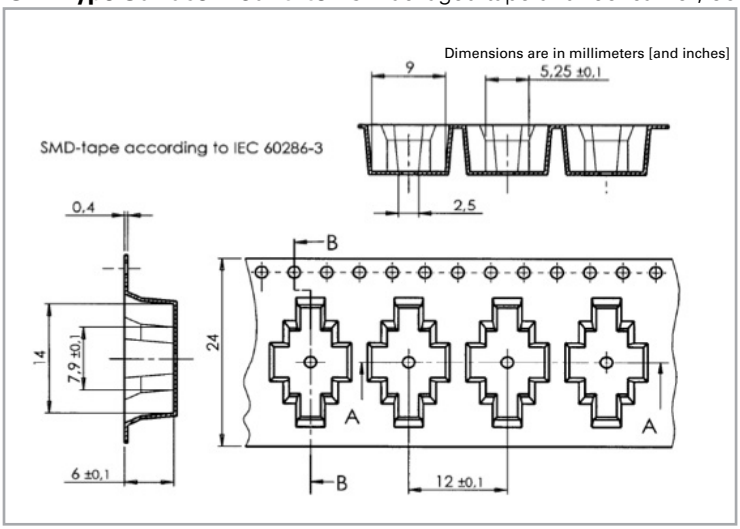


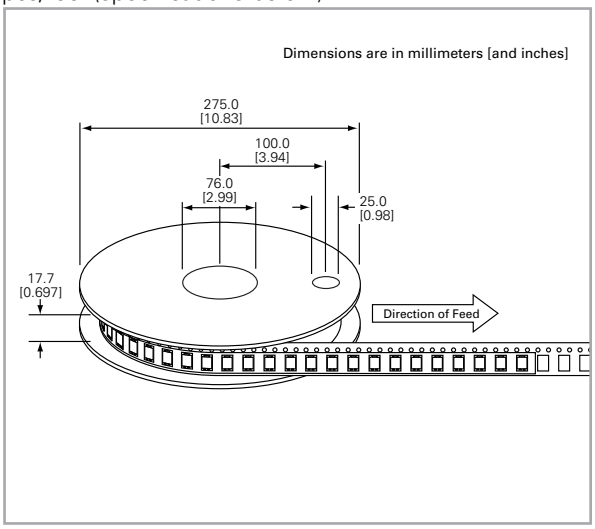
Soldering Parameters - Hand Soldering

Solder Iron Temperature: 350° C +/- 5°C
Heating Time: 5 seconds max.

Packaging

'SM' Type Surface Mount Items: Packaged tape and reel carrier, 900 pcs/reel (specifications below)





Part Numbering System and Ordering Information

SL1010A XXX XX

SL1010A Series

Voltage

Pin Configuration

F = with Failsafe (Packed in carrier and tape, 900pcs/reel)
SM = Surface Mount (Packed in carrier and tape, 900pcs/reel)
SMF = Surface Mount with Failsafe (Packed in carrier and tape, 900pcs,

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SL1122A Series Hybrid

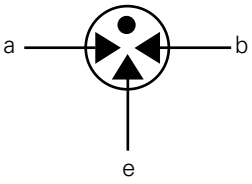
Description

The SL1122A series Hybrid features a high performance Alpha Gas Plasma Tube in conjunction with a MOV. These devices are matched so that high speed pulses are initially clamped by the MOV, then as the current rises, the transient energy is switched through the gas tube. The Hybrid offers high levels of performance on fast rising transients in the domain of 100V/µs to 10 kV/µs, so eliminates the dv/dt switching delay normally exhibited by standard GDTs. These devices are extremely robust and are able to divert a 10,000 Amp pulse without destruction.

Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E128662

2 Electrode GDT Graphical Symbol



a = TIP
b = RING
e = GROUND
(centre electrode)

Features

- RoHs Compliant
- Excellent response to fast rising transients
- Flat response up to 10kV/µs
- 10kA surge capability tested with 8/20µs pulse as defined by IEC 61000-4-5
- Thermal failsafe

Applications

- MDF protection
- ADSL equipment
- XDSL equipment
- Alarm panels
- General telecom equipment

Additional Information

Datasheet | Resources | Samples

Electrical Characteristics

Part Number	Device Specifications (at 25°C)							Life Ratings			
	DC Breakdown in Volts[1, 2] (@100V/s)			DC Voltage[2] (1kV/µs Ignition Time)	Insulation Resistance	Capacitance (@1MHz, 0V bias, 1V oscillation)	Arc Voltage (on state voltage) @1Amp Min	Surge Life[1] (10/1000µs 300x +/-)	Surge Current[1] (8/20µs x 10)	Nominal AC Discharge Current[1] (10x1s@50Hz)	DC Holdover Voltage (<150msecs.)
	MIN	TYP	MAX		MIN	MAX	TYP				TYP
SL1122A090	72	90	108	200 (< 10µs)	> 10^8 Ω (at 50V)	270 pF	~10 to 35 Volts	200 A	10 kA	10 A	50 V
SL1122A230	184	230	276	350 (< 10µs)	> 10^8 Ω (at 100V)	100 pF					135 V
SL1122A260	210	260	310	400 (< 10µs)							

Tested in accordance with ITU-T Rec K.12

Notes:
1. Total current through centre electrode
2. Maximum Peak Break Over Voltage

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Gas Discharge Tube (GDT) Products

SL1122A Series

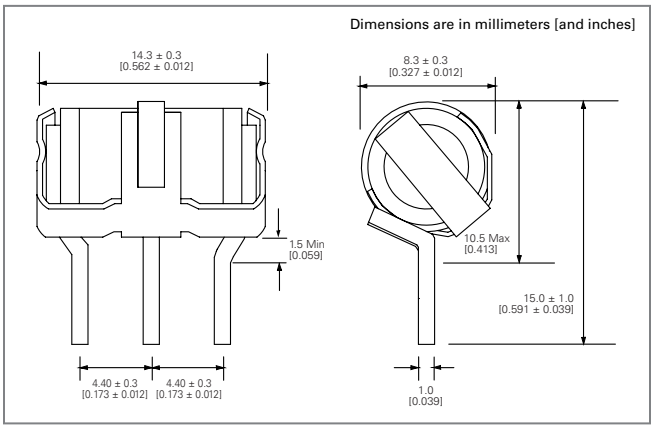
Product Characteristics

Materials	**Electrode Base:** Copper **Electrode Plating:** Bright Tin **Body:** Ceramic
Product Marking	Littelfuse 'LF' Mark, voltage and date code. Red.

Glow to Arc Transition Current	~1 Amp
Glow Voltage	~60 to 200 Volts
Storage and Operational Temperature	-40 to +90°C
Transverse Voltage (Delay Time)	< 0.2 µSec. (Tested to ITU-T Rec.K.12)

Device Dimensions

Radial Lead Devices



Packaging Dimensions

For Radial Lead Items: Packed in tray (100 pcs)

Part Numbering System and Ordering Information

SL1122A XXX X

Voltage

Pin Configuration

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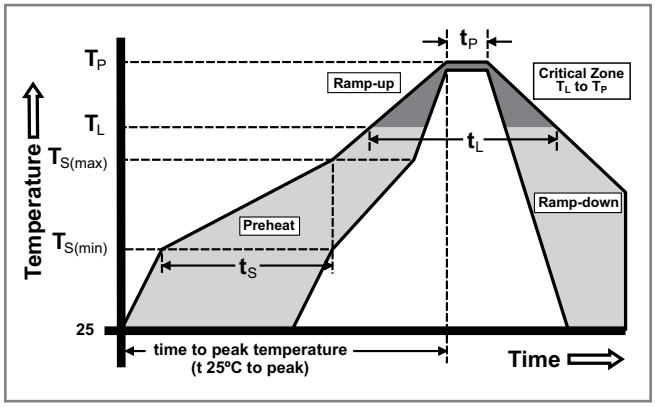
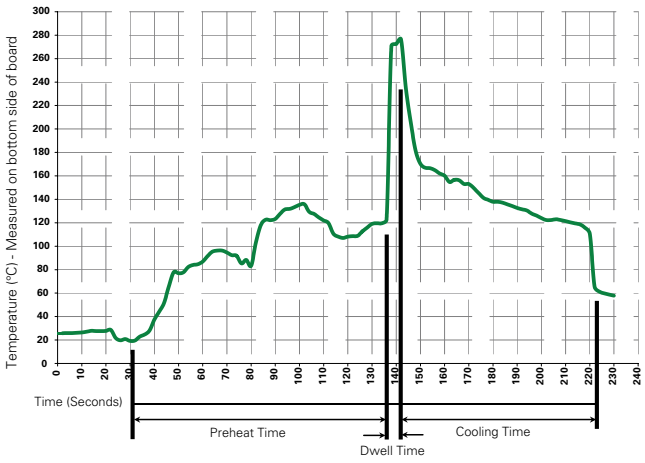
Soldering Parameters - Reflow Soldering

Reflow Condition		Pb-free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (Min to Max) (t_s)	60 – 180 seconds
Average Ramp-up Rate (Liquidus Temp (T_L) to peak)		3°C/second max.
$T_{S(max)}$ to T_L - Ramp-up Rate		5°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of Actual Peak Temperature (t_p)		10 – 30 seconds
Ramp-down Rate		6°C/second max.
Time 25°C to Peak Temperature (T_P)		8 minutes max.
Do not exceed		260°C



* Devices that are soldered require inspection before use.

Soldering Parameters - Wave Soldering (Thru-Hole Devices)



Recommended Process Parameters:

Wave Parameter	Lead-Free Recommendation
Preheat: (Depends on Flux Activation Temperature)	(Typical Industry Recommendation)
Temperature Minimum:	100° C
Temperature Maximum:	150° C
Preheat Time:	60-180 seconds
Solder Pot Temperature:	280° C Maximum
Solder Dwell Time:	2-5 seconds

Soldering Parameters - Hand Soldering

Solder Iron Temperature: 350° C +/- 5°C
Heating Time: 5 seconds max.

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