

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 ( $\pm 5$  repetitions) of a 5kA 8/20 $\mu$ s 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

### Electrical Characteristics

Part Number	Device Specifications (at 25°C)								Nominal Impulse Discharge Current (x10@8/20µs)	Nominal Impulse Discharge Current (x1@10/350µs)
	DC Breakdown in Volts <sup>1,2,3</sup> (@100V/s)			Impulse Breakdown in Volts <sup>2,3</sup> (@100V/µs)	Impulse Breakdown In Volts <sup>2,3</sup> (@1kV/µs)	Insulation Resistance	Capacitance (@1MHz 0V Bias)	Arc Voltage (on state Voltage) @1Amp Min		
	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	580	750					
SL1010A230	184	230	276	850	1000					
SL1010A350	280	350	420	800	950					
SL1010A470	376	470	564							

Notes:

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

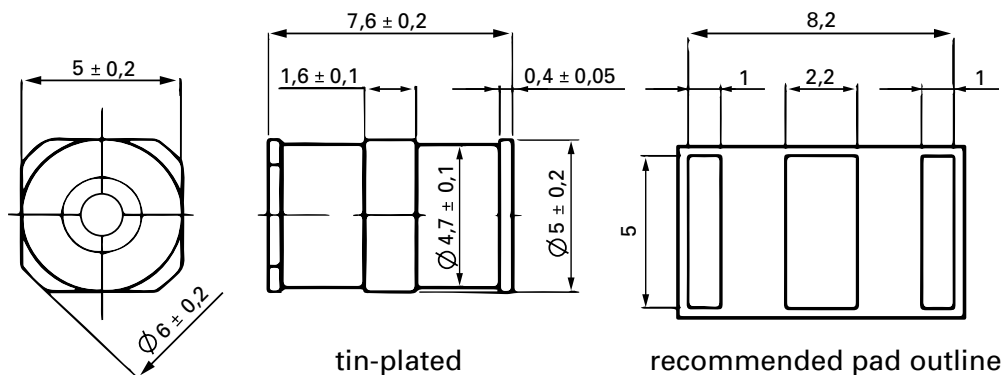
### Product Characteristics

<b>Materials</b>	<b>Construction:</b> Ceramic Insulator	<b>Glow to Arc Transition Current</b>	~1 Amp
	<b>Device Finish:</b> Dull Tin-plated 17.5 +/- 12.5 microns		<b>Glow Voltage</b>
<b>Product Marking</b>	Littelfuse 'LF' Mark, voltage and date code	<b>Storage and Operational Temperature</b>	-40 to +90°C

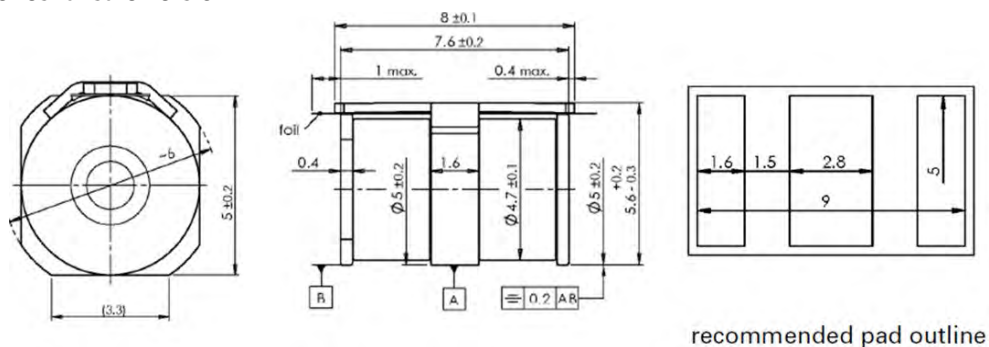
### Device Dimensions

#### For SL1010A series:

Dimensions are in millimeters [and inches]

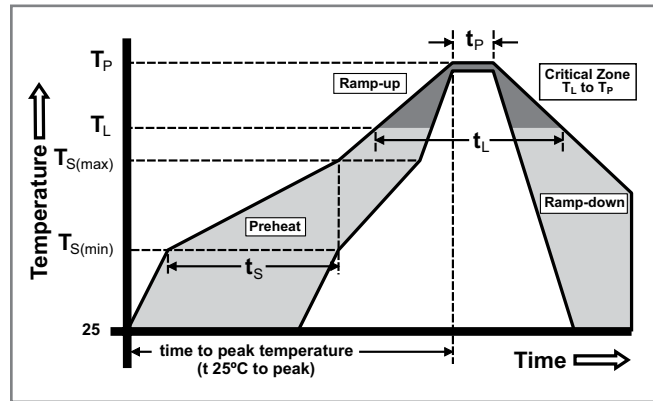


#### For SL1010A series failsafe version:



**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 (LiquidusTemp ( $T_L$ ) 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 <sup>+0/-5</sup> °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

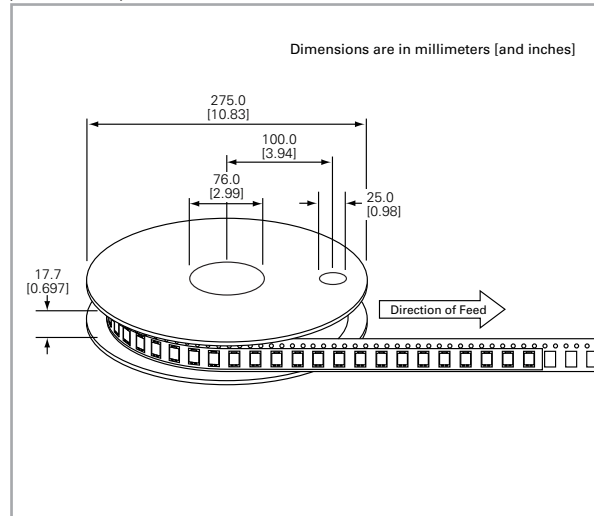
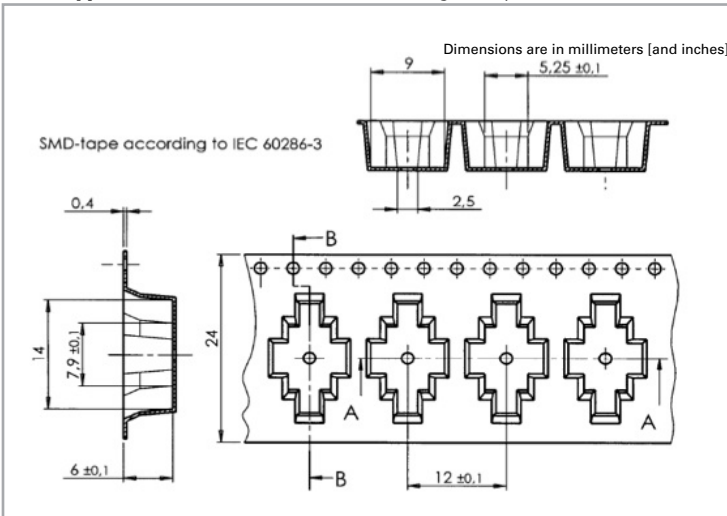


**Soldering Parameters - Hand Soldering**

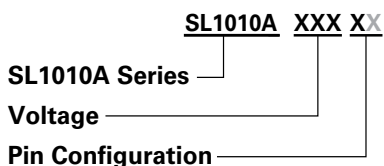
Solder Iron Temperature: 350° C +/- 5°C  
Heating Time: 5 seconds max.

**Packaging**

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



**Part Numbering System and Ordering Information**



- 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)

## SL1122A Series Hybrid



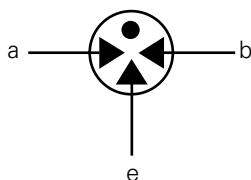
### Description

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 <sup>1,2</sup> (@100V/s)			DC Voltage <sup>2</sup> (1kV/μs Ignition Time)	Insulation Resistance	Capacitance (@1MHz, 0V bias, 1V oscillation)	Arc Voltage (on state voltage) @1Amp Min	Surge Life <sup>1</sup> (10/1000μs 300x +/-)	Surge Current <sup>1</sup> (8/20μs x 10)	Nominal AC Discharge Current <sup>1</sup> (10x1s@50Hz)	DC Holdover Voltage (<150msecs.)
	MIN	TYP	MAX		MIN	MAX	TYP			TYP	
SL1122A090	72	90	108	200 (< 10μs)	> 10 <sup>8</sup> Ω (at 50V)	270 pF	~10 to 35 Volts	200 A	10 kA	10 A	50 V
SL1122A230	184	230	276	350 (< 10μs)	> 10 <sup>8</sup> 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

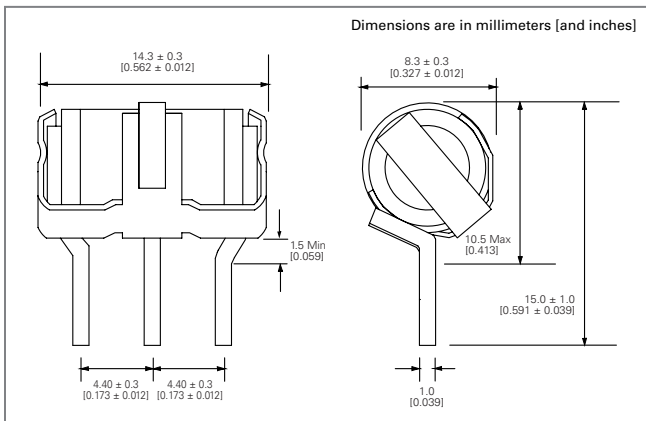
**Product Characteristics**

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

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

**Device Dimensions**

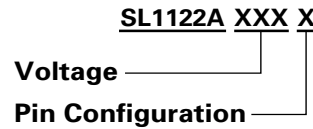
**Radial Lead Devices**



**Packaging Dimensions**

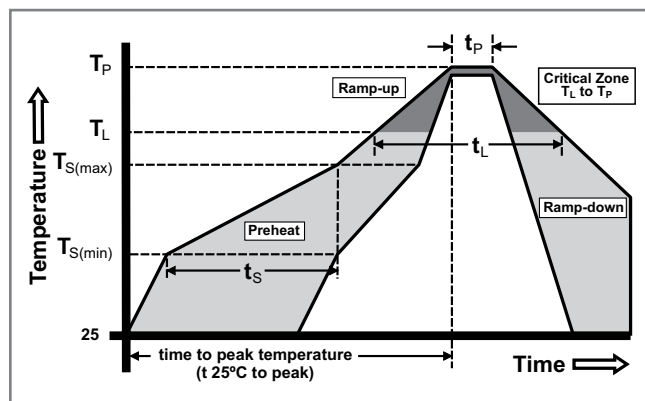
**For Radial Lead Items: Packed in tray (100 pcs)**

**Part Numbering System and Ordering Information**



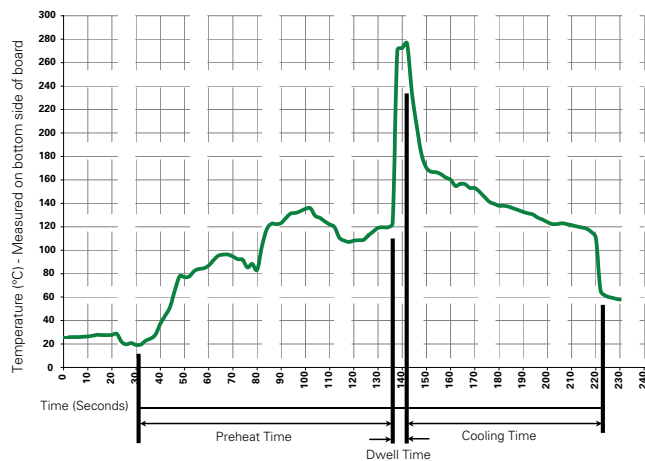
### Soldering Parameters - Reflow Soldering

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 <sup>+0/-5</sup> °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
<b>Preheat:</b> (Depends on Flux Activation Temperature) (Typical Industry Recommendation)	
Temperature Minimum:	100° C
Temperature Maximum:	150° C
Preheat Time:	60-180 seconds
<b>Solder Pot Temperature:</b> 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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