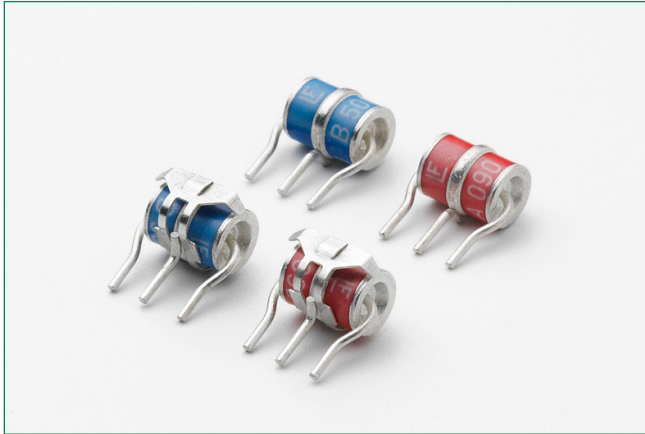


# SL1021A/B Series

## Gas Discharge Tubes



### Description

GDT circuit protection devices dissipate electrical surge energy safely within a contained plasma gas. Commonly used to help protect sensitive telecom and networking equipment and lines, GDTs protect from damage that may result from lightning strikes and equipment switching operations.

The Littelfuse GDT series described in this document are available in a variety of leaded and surface mount forms and offered with and without optional fail-safe clip. Please refer to the electrical specifications, dimension and packaging options section of this document for additional information.

#### SL1021A/B Series:

SL1021A/B series GDTs are designed to offer high levels of performance on fast rising transients in the range of 100V/ $\mu$ S to 1KV/ $\mu$ S, which are those most likely created by induced lightning disturbances.

These devices feature ultra low capacitance (typically 1.5pF or less) and are extremely robust with SL1021A devices able to divert a 10,000 Amp pulse without destruction, and SL1021B suffix devices able to divert a 20,000 Amp pulse without destruction.

These series offer optimized internal geometry which provide low insertion loss at high frequencies, ideal for the protection of broadband and other high speed transmission equipment.

### Additional Information



Resources  
SL1021A



Accessories  
SL1021A



Samples  
SL1021A



Resources  
SL1021B



Accessories  
SL1021B

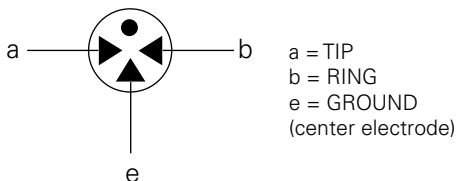


Samples  
SL1021B

### Agency Approvals

| Agency | Agency File Number |
|--------|--------------------|
|        | E128662            |

### 3 Electrode GDT Graphical Symbol



### Features

- RoHS compliant
- Low insertion loss
- Excellent response to fast rising transients
- Ultra low capacitance
- 10KA (A suffix devices) / 20KA (B suffix devices) surge capability tested with 8/20 $\mu$ s pulse as defined by IEC 61000-4-5
- Available with thermal failsafe option (add 'F' suffix to part number)

### Applications

#### SL1021:

- Broadband equipment
- ADSL equipment
- XDSL equipment
- Satellite and CATV equipment
- Splitters
- General telecom equipment
- Telecom network interfaces
- Telephone line cards
- Repeaters
- Modems
- Line test equipment

# SL1021A/B Series

## Gas Discharge Tubes

### Product Characteristics

|                                          |                                                                                                          |
|------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Materials</b>                         | Dull Tin Plate 17.5 ± 12.5 Microns.<br>with ceramic insulator                                            |
| <b>Product Marking</b>                   | 'LF' mark, voltage & date code:<br>SL1021A - <b>Red</b> /White text<br>SL1021B - <b>Blue</b> /White text |
| <b>Glow to arc transition current</b>    | ~ 1Amp                                                                                                   |
| <b>Glow Voltage</b>                      | ~60-200 Volts                                                                                            |
| <b>Storage and Operation Temperature</b> | -40 to +90°C                                                                                             |
| <b>Transverse Voltage (Delay Time)</b>   | < 0.2µSec (Tested to ITU-T Rec. K.12)                                                                    |
| <b>Arc Voltage</b>                       | ~10 to 35 Volts                                                                                          |
| <b>Holdover Voltage</b>                  | <150mS (Tested to ITU-T Rec. K.12)                                                                       |

### Electrical Characteristics

| Device Specifications (at 25°C) |                         |     |     |                           |                            |                             | Life Ratings                    |                                              |                                                  |                                              |                                                |                                                |
|---------------------------------|-------------------------|-----|-----|---------------------------|----------------------------|-----------------------------|---------------------------------|----------------------------------------------|--------------------------------------------------|----------------------------------------------|------------------------------------------------|------------------------------------------------|
| Part Number                     | DC Voltage<br>100V/Sec. |     |     | DC Voltage<br>100 V/μSec. | DC<br>Voltage<br>1kV/μSec. | Capaci-<br>tance<br>(@1Mhz) | Insulation<br>Resistance        | AC Current<br>50Hz 1Sec.<br>x10 <sup>1</sup> | Surge<br>Current<br>8/20μSec<br>x10 <sup>1</sup> | Max Single<br>Surge<br>8/20μSec <sup>1</sup> | Max Single<br>Surge<br>10/350μSec <sup>1</sup> | Surge Life<br>10/1000<br>μSecx300 <sup>1</sup> |
|                                 | MIN                     | TYP | MAX |                           |                            |                             | MIN                             |                                              |                                                  |                                              |                                                |                                                |
| SL1021B075                      | 60                      | 75  | 90  | 500                       | 650                        | <1.5pF                      | >10 <sup>10</sup> Ω<br>(at 50V) | 10Amps                                       | 10kA <sup>2</sup><br>20kA <sup>3</sup>           | 15kA <sup>2</sup><br>25kA <sup>3</sup>       | 4kA <sup>2</sup><br>5kA <sup>3</sup>           | 200Amps                                        |
| SL1021A090                      | 72                      | 90  | 108 |                           | 600                        |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021B090                      | 116                     | 145 | 174 |                           |                            |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021A145                      | 120                     | 150 | 180 |                           |                            |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021B145                      | 150                     | 200 | 250 |                           |                            |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021A150                      | 184                     | 230 | 276 | 450                       | 650                        |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021B150                      | 200                     | 250 | 300 | 500                       |                            |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021A200                      | 210                     | 260 | 310 | 550                       |                            |                             | 700                             |                                              |                                                  |                                              |                                                |                                                |
| SL1021A230                      | 240                     | 300 | 360 | 650                       |                            |                             | 850                             |                                              |                                                  |                                              |                                                |                                                |
| SL1021B230                      | 280                     | 350 | 420 | 700                       | 900                        |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021A250                      | 320                     | 400 | 480 | 850                       | 950                        |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021B250                      | 345                     | 420 | 500 |                           |                            |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021A260                      | 360                     | 450 | 540 | 900                       | 1000                       |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021B260                      | 400                     | 500 | 600 | 950                       | 1100                       |                             |                                 |                                              |                                                  |                                              |                                                |                                                |
| SL1021A300                      | 480                     | 600 | 720 | 1000                      | 1200                       |                             |                                 |                                              |                                                  |                                              |                                                |                                                |

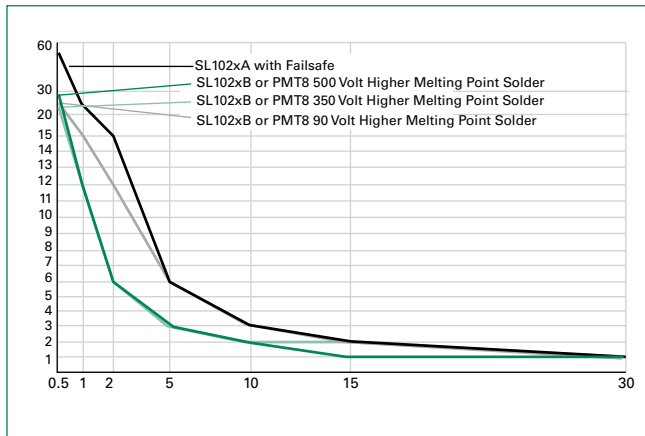
#### Notes:

1. Total current through centre electrode, tested in accordance with ITU-T Rec K.12
2. SL1021A series
3. SL1021B series

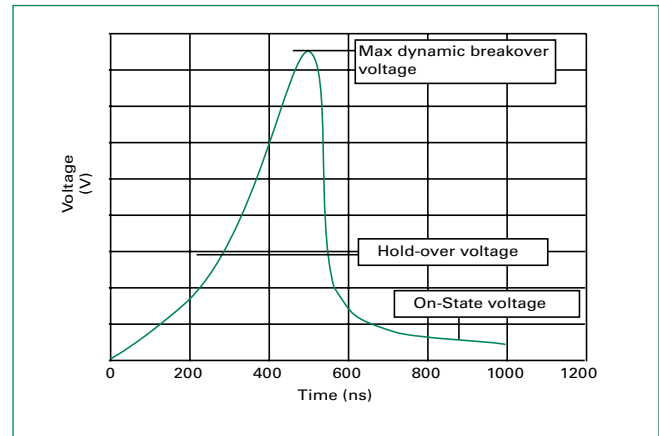
# SL1021A/B Series

## Gas Discharge Tubes

Time vs. Current for Failsafe

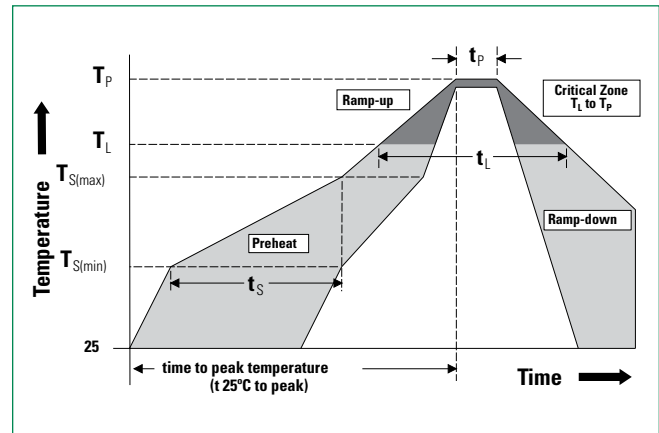


Voltage vs. Time Characteristic



## Soldering Parameters - Reflow Soldering (Surface Mount Devices)

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

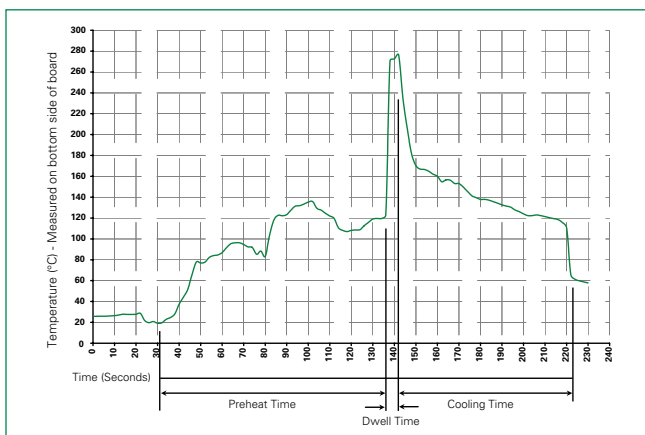


## Soldering Parameters - Hand Soldering

Solder Iron Temperature: 350° C +/- 5°C

Heating Time: 5 seconds max.

## Soldering Parameters - Wave Soldering (Thru-Hole Devices)



## Recommended Process Parameters:

| Wave Parameter                                       | Lead-Free Recommendation          |
|------------------------------------------------------|-----------------------------------|
| Preheat:<br>(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                       |

**Note:** Surge Arrestors with a Failsafe mechanism should be individually examined after soldering

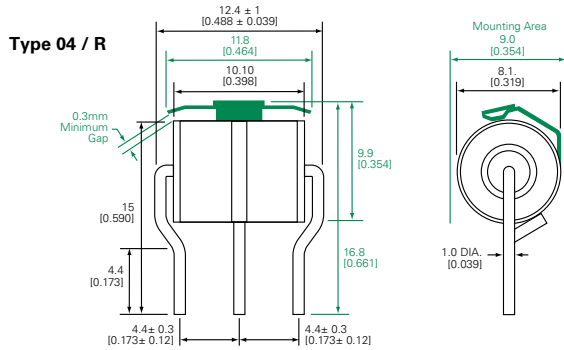
# SL1021A/B Series

## Gas Discharge Tubes

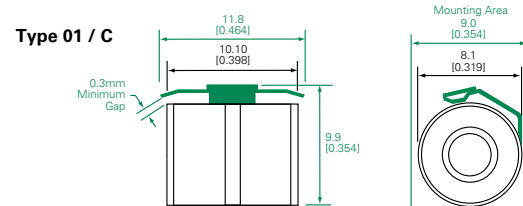
### Device Dimensions

**Note:** Failsafe option dimensions shown in green.

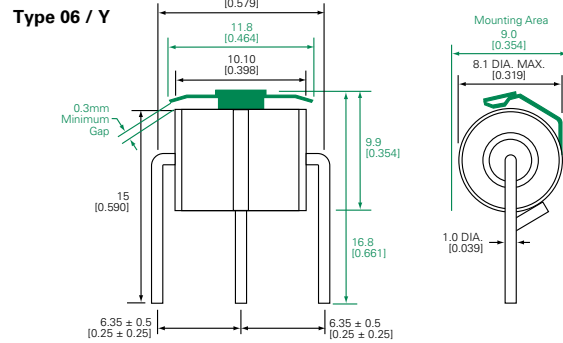
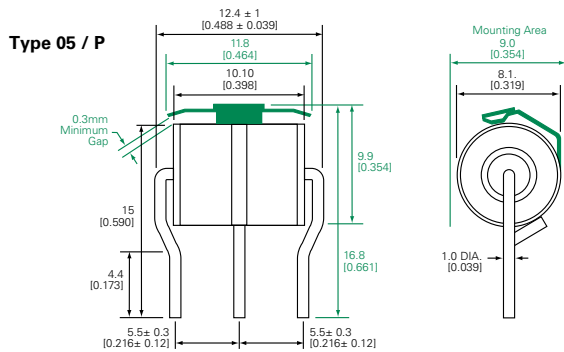
#### Shaped Radial Leaded Devices:



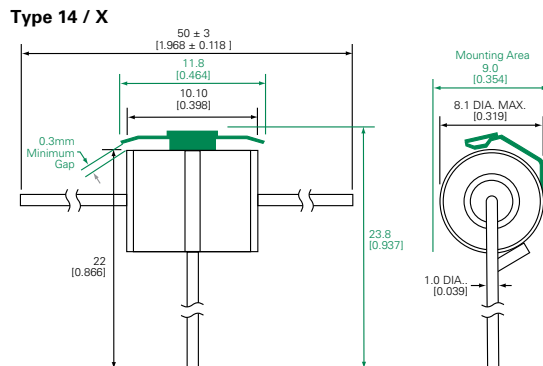
#### Core Devices:



#### Straight Radial Leaded Devices:



#### Straight "T" Leaded Devices:



# SL1021A/B Series

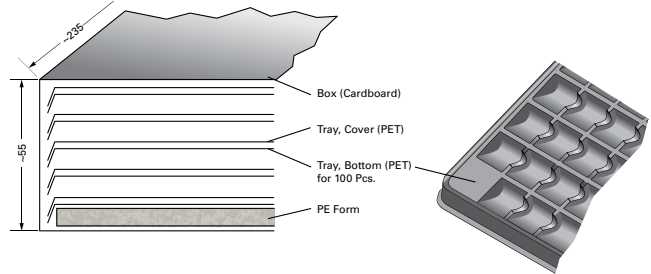
## Gas Discharge Tubes

### Part Numbering System and Ordering Information

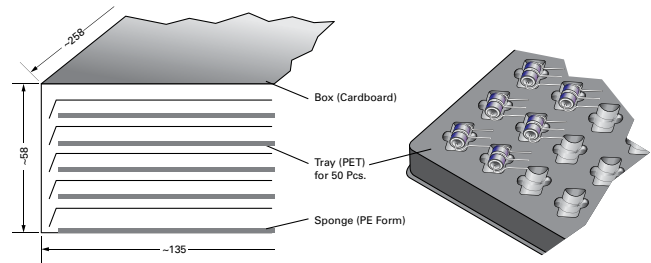
| SL102x x xxx x x                                                                                                                                                                                                            | PMT8 xxx x x                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>Series</b><br>SL1021<br>SL1024                                                                                                                                                                                           | <b>Series</b><br>PMT8                                                                                  |
| <b>Surge Capability</b><br>A = 10kA<br>B = 20kA                                                                                                                                                                             |                                                                                                        |
| <b>Breakdown Voltage</b><br>090 = 90V    300 = 300V<br>145 = 145V    350 = 350V<br>150 = 150V    400 = 400V<br>200 = 200V    420 = 420V<br>230 = 230V    450 = 450V<br>250 = 250V    500 = 500V<br>260 = 260V    600 = 600V | <b>Breakdown Voltage</b><br>090 = 90V<br>230 = 230V<br>250 = 250V<br>350 = 350V<br>400 = 400V          |
| <b>Configuration Code</b><br>(See Device Dimensions section)<br>C    Y<br>R    X<br>P                                                                                                                                       | <b>Configuration Code</b><br>(See Device Dimensions section)<br>01    10<br>04    14<br>05    60<br>06 |
| <b>Option Code</b><br>Blank = No failsafe<br>F or G = With Failsafe                                                                                                                                                         | <b>Option Code</b><br>Blank = No Failsafe<br>F = With Failsafe                                         |

### Packaging

#### For 'SL1021A/B' device type C, R, P, Y packing



#### For 'SL1021A/B' device type X packing



| Device Type | Description                      | Quantity |
|-------------|----------------------------------|----------|
| Type C      | 100pcs/tray x 5 trays per carton | 500      |
| Type R      | 100pcs/tray x 5 trays per carton | 500      |
| Type P      | 100pcs/tray x 5 trays per carton | 500      |
| Type Y      | 100pcs/tray x 5 trays per carton | 500      |
| Type X      | 50pcs/tray x 5 trays per carton  | 250      |

\* Please contact the factory for further packaging information.

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