

RoHS  **SL1021A/B, SL1024A/B and PMT8 Series**



### 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 and SL1024A/B Series:

SL1021A/B and SL1024A/B series GDTs are designed to offer high levels of performance on fast rising transients in the range of 100V/μS to 1KV/μS, 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 SL102xA devices able to divert a 10,000 Amp pulse without destruction, and SL102xB 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.

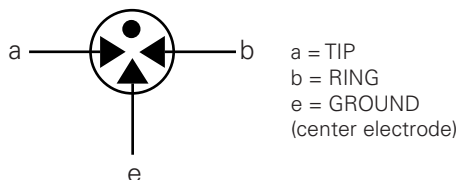
#### PMT8 Series:

PMT8 GDT's are telecom grade devices designed to meet the recommendations in CCITT-K12 and Bellcore GR-1361-CORE. The three electrode configuration is used in applications where simultaneous crowbar action of two signal lines is required.

### 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 8/20μs pulse as defined by IEC 61000-4-5
- Available with thermal failsafe option (add 'F' suffix to part number)

### Applications

#### SL1021 / SL1024:

- Broadband equipment
- ADSL equipment
- XDSL equipment
- Satellite and CATV equipment
- Splitters
- General telecom equipment

#### PMT8:

- Telecom network interfaces
- Telephone line cards
- Repeaters
- Modems
- Line test equipment

### Product Characteristics

|  |  |
|--|--|
| <b>Materials</b>                         | Dull Tin Plate 17.5 ± 12.5 Microns. with ceramic insulator   |
| <b>Product Marking</b>                   | 'LF' mark, voltage & date code:<br>SL102xA - <b>Red</b> /White text<br>SL102xB & <b>PMT8</b> - <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

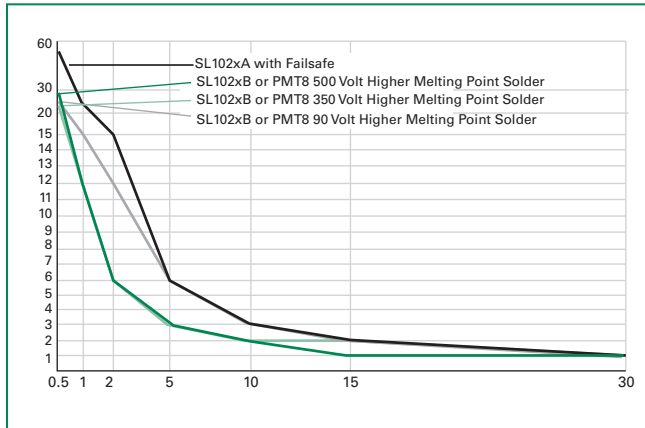
| Device Specifications (at 25°C)                                   |                      |     |     |                        |                      |                               | Life Ratings                  |  |   |  |  |  |                               |  |
|---|----------------------|-----|-----|------------------------|----------------------|-------------------------------|-------------------------------|--|---|--|--|--|-------------------------------|--|
| Part Number*  | DC Voltage 100V/Sec. |     |     | DC Voltage 100 V/μSec. | DC Voltage 1kV/μSec. | Capacitance (@1Mhz)           | Insulation Resistance         | AC Current 50Hz 1Sec.x10 <sup>1</sup>  | Surge Current 8/20μSec x10 <sup>1</sup> | Max Single Surge 8/20μSec <sup>1</sup> | Max Single Surge 10/350μSec <sup>1</sup> | Surge Life 10/1000 μSecx300 <sup>1</sup> |                               |  |
|   | MIN                  | TYP | MAX |                        |                      |                               |                               |  |   |  |  |  | MIN                           |  |
| SL1021A090<br>SL1024A090<br>SL1021B090<br>SL1024B090<br>PMT 8 090 | 72                   | 90  | 108 | 500                    | 650                  | <1.5pF                        | >10 <sup>10</sup> Ω (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                                  |                               |  |
| SL1021A145<br>SL1024A145<br>SL1021B145<br>SL1024B145              | 116                  | 145 | 174 |                        |                      |                               |                               |  |   |  | 600                                      |  | >10 <sup>10</sup> Ω (at 100V) | 2.5kA <sup>2</sup><br>5kA <sup>3</sup> |
| SL1021A150<br>SL1024A150<br>SL1021B150<br>SL1024B150              | 120                  | 150 | 180 |                        |                      |                               |                               |  |   |  |  |  |                               |  |
| SL1021A200  | 150                  | 200 | 250 |                        |                      |                               |                               |  |   |  |  |  |                               |  |
| SL1021A230<br>SL1024A230<br>SL1021B230<br>SL1024B230<br>PMT 8 230 | 184                  | 230 | 276 | 450                    | 650                  | >10 <sup>10</sup> Ω (at 100V) | 10Amps                        | 10kA <sup>2</sup><br>20kA <sup>3</sup> | 15kA <sup>2</sup><br>25kA <sup>3</sup>  | 2.5kA <sup>2</sup><br>5kA <sup>3</sup> | 200Amps                                  |  |                               |  |
| SL1021A250<br>SL1024A250<br>SL1021B250<br>SL1024B250<br>PMT 8 250 | 200                  | 250 | 300 | 500                    |                      |                               |                               |  |   |  |  |  |                               |  |
| SL1021A260<br>SL1024A260<br>SL1021B260<br>SL1024B260              | 210                  | 260 | 310 | 550                    | 700                  | <1.5pF                        | >10 <sup>10</sup> Ω (at 100V) | 10Amps                                 | 10kA <sup>2</sup><br>20kA <sup>3</sup>  | 15kA <sup>2</sup><br>25kA <sup>3</sup> | 2.5kA <sup>2</sup><br>5kA <sup>3</sup>   | 200Amps                                  |                               |  |
| SL1021A300<br>SL1024A300<br>SL1021B300<br>SL1024B300              | 240                  | 300 | 360 | 650                    | 850                  | <1.5pF                        | >10 <sup>10</sup> Ω (at 100V) | 10Amps                                 | 10kA <sup>2</sup><br>20kA <sup>3</sup>  | 15kA <sup>2</sup><br>25kA <sup>3</sup> | 2.5kA <sup>2</sup><br>5kA <sup>3</sup>   | 200Amps                                  |                               |  |
| SL1021A350<br>SL1024A350<br>SL1021B350<br>SL1024B350<br>PMT 8 350 | 280                  | 350 | 420 | 700                    | 900                  | <1.5pF                        | >10 <sup>10</sup> Ω (at 100V) | 10Amps                                 | 10kA <sup>2</sup><br>20kA <sup>3</sup>  | 15kA <sup>2</sup><br>25kA <sup>3</sup> | 2.5kA <sup>2</sup><br>5kA <sup>3</sup>   | 200Amps                                  |                               |  |
| SL1021A400<br>SL1024A400<br>SL1021B400<br>SL1024B400<br>PMT 8 400 | 320                  | 400 | 480 | 850                    | 950                  | <1.5pF                        | >10 <sup>10</sup> Ω (at 100V) | 10Amps                                 | 10kA <sup>2</sup><br>20kA <sup>3</sup>  | 15kA <sup>2</sup><br>25kA <sup>3</sup> | 2.5kA <sup>2</sup><br>5kA <sup>3</sup>   | 200Amps                                  |                               |  |
| SL1021A420<br>SL1024A420<br>SL1021B420<br>SL1024B420              | 345                  | 420 | 500 |                        |                      |                               |                               |  |   |  |  |  |                               |  |
| SL1021A450<br>SL1024A450<br>SL1021B450<br>SL1024B450              | 360                  | 450 | 540 | 900                    | 1000                 | <1.5pF                        | >10 <sup>10</sup> Ω (at 100V) | 10Amps                                 | 10kA <sup>2</sup><br>20kA <sup>3</sup>  | 15kA <sup>2</sup><br>25kA <sup>3</sup> | 2.5kA <sup>2</sup><br>5kA <sup>3</sup>   | 200Amps                                  |                               |  |
| SL1021A500<br>SL1024A500<br>SL1021B500<br>SL1024B500              | 400                  | 500 | 600 | 950                    | 1100                 | <1.5pF                        | >10 <sup>10</sup> Ω (at 100V) | 10Amps                                 | 10kA <sup>2</sup><br>20kA <sup>3</sup>  | 15kA <sup>2</sup><br>25kA <sup>3</sup> | 2.5kA <sup>2</sup><br>5kA <sup>3</sup>   | 200Amps                                  |                               |  |
| SL1021A600<br>SL1024A600  | 480                  | 600 | 720 | 1000                   | 1200                 | <1.5pF                        | >10 <sup>10</sup> Ω (at 100V) | 10Amps                                 | 10kA <sup>2</sup><br>20kA <sup>3</sup>  | 15kA <sup>2</sup><br>25kA <sup>3</sup> | 2.5kA <sup>2</sup><br>5kA <sup>3</sup>   | 200Amps                                  |                               |  |

**NOTES:**

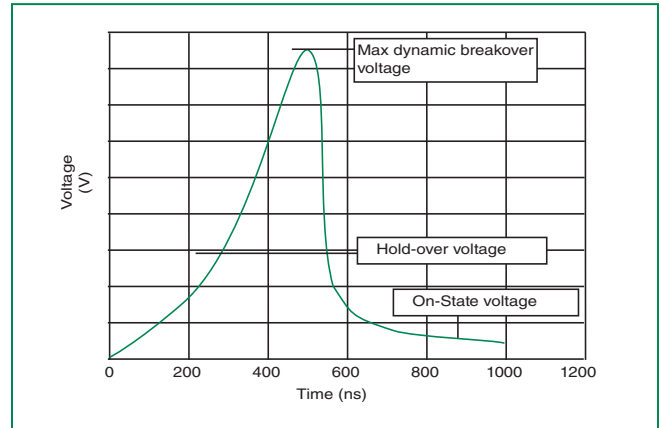
\*Max capacitance is 1.5 pF, measured at 1 MHz.

1. Total current through centre electrode, tested in accordance with ITU-T Rec K.12
2. SL A series
3. SL B series & PMT 8 series

### Time vs. Current for Failsafe

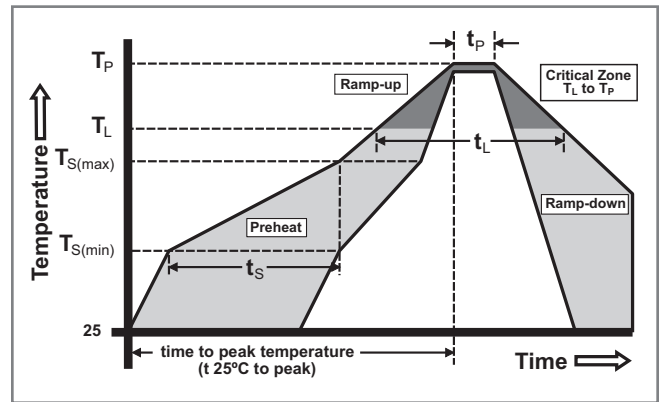


### Voltage vs. Time Characteristic



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

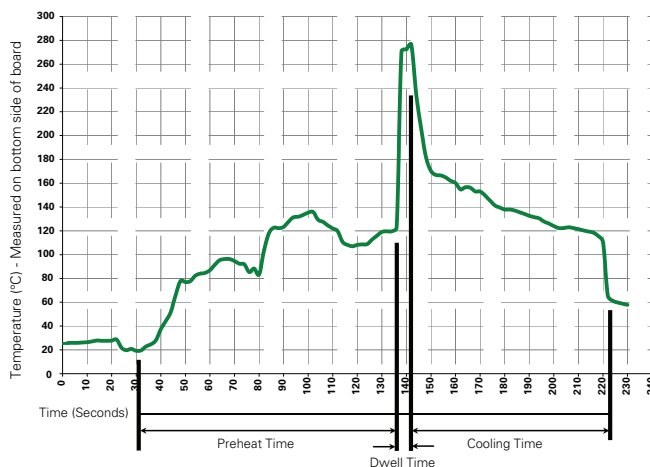
|  |                                    |                         |
|--|------------------------------------|-------------------------|
| Reflow Condition                                       |                                    | Pb – Free assembly      |
| Pre Heat   | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|  | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|  | - Time (Min to Max) ( $t_s$ )      | 60 – 180 secs           |
| 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                   |



### 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:

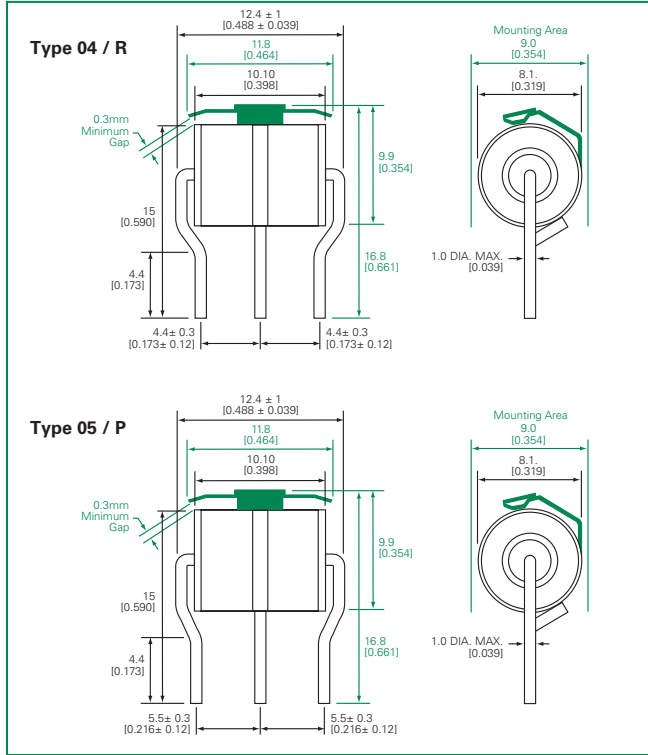
| Wave Parameter  | Lead-Free Recommendation |
|---|--------------------------|
| <b>Preheat:</b><br>(Depends on Flux Activation Temperature) (Typical Industry Recommendation) |                          |
| Temperature Minimum:  | 100° C                   |
| Temperature Maximum:  | 150° C          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

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

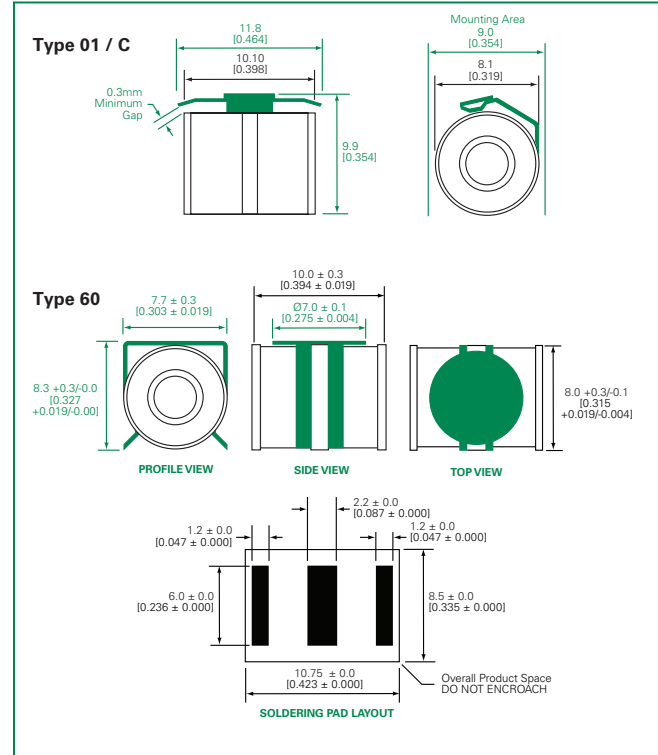
### Device Dimensions

NOTE: Failsafe option dimensions shown in green.

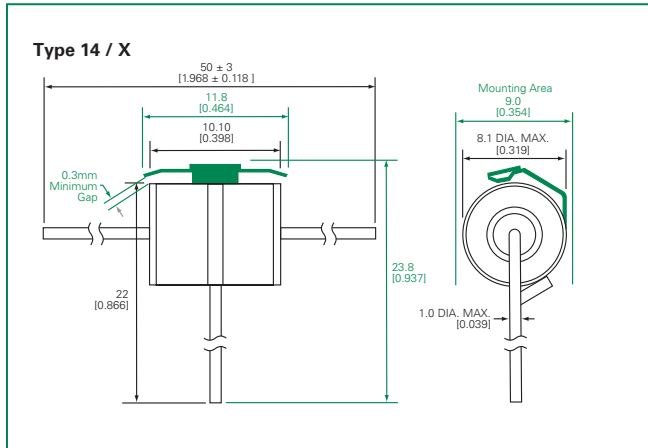
#### Shaped Radial Ledged Devices:



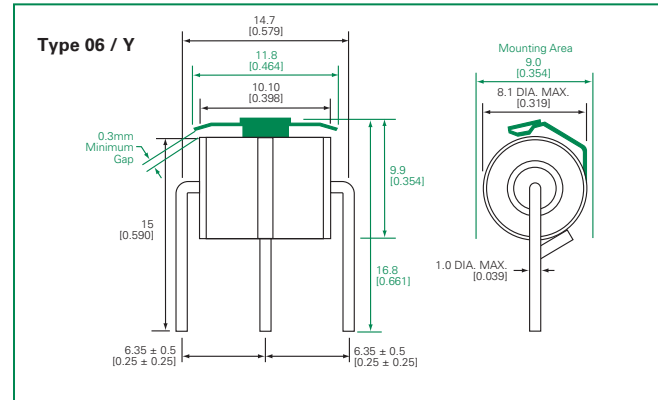
#### Surface Mount Devices:



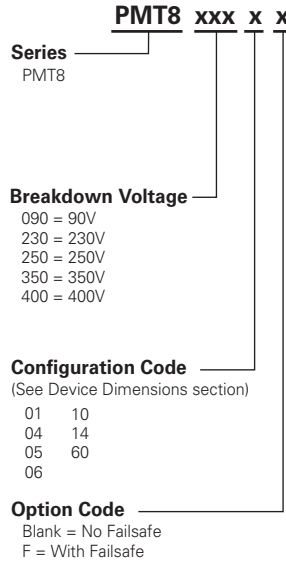
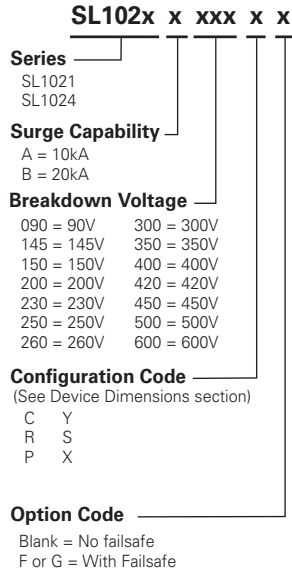
#### Straight "T" Ledged Devices:



#### Straight Radial Ledged Devices:



### Part Numbering System and Ordering Information



### Packaging

| Device Type | Description                        | Quantity |
|-------------|------------------------------------|----------|
| Type 01 / C | 100pcs/tray x 5 trays per carton   | 500      |
| Type 04 / R | 100pcs/tray x 5 trays per carton   | 500      |
| Type 05 / P | 100pcs/tray x 5 trays per carton   | 500      |
| Type 06 / Y | 100pcs/tray x 5 trays per carton   | 500      |
| Type 14 / X | 50pcs/tray x 5 trays per carton    | 250      |
| Type 60     | 500pcs/reel* x 10 reels per carton | 5000     |

\* For tape and reel specifications, please contact factory.