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/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 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.

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:
- 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 Datasheet

Specifications are subject to change without notice.
Revised: GD. 01/26/22
# SL1021A/B Series

Gas Discharge Tubes

## Product Characteristics

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

## Electrical Characteristics

<table>
<thead>
<tr>
<th>Part Number</th>
<th>DC Voltage 100V/Sec. MIN</th>
<th>DC Voltage 100 V/μSec.</th>
<th>DC Voltage 1kV/μSec.</th>
<th>Capacitance @1MHz MIN</th>
<th>Insulation Resistance AC Current 50Hz 1Sec. x10¹</th>
<th>Surge Current 8/20μSec x10¹</th>
<th>Max Single Surge 8/20μSec x10¹</th>
<th>Max Single Surge 10/350μSec x10¹</th>
<th>Surge Life 10/1000 μSec x300 x10¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL1021B075</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>500</td>
<td>&gt;10¹Ω (at 50V)</td>
<td>10Amps</td>
<td>10kA²</td>
<td>25kA³</td>
<td>200Amps</td>
</tr>
<tr>
<td>SL1021A090</td>
<td>72</td>
<td>90</td>
<td>108</td>
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<td>SL1021B090</td>
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<td>145</td>
<td>174</td>
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<td>SL1021A145</td>
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<td>180</td>
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<td>SL1021B145</td>
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<td>SL1021A200</td>
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<td>SL1021B200</td>
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<td>SL1021A230</td>
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<td>SL1021B230</td>
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<td>360</td>
<td>650</td>
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<td>SL1021A300</td>
<td>280</td>
<td>350</td>
<td>420</td>
<td>700</td>
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<td>SL1021B300</td>
<td>320</td>
<td>400</td>
<td>480</td>
<td>850</td>
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<td>SL1021A400</td>
<td>345</td>
<td>420</td>
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<td>900</td>
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<td>SL1021B400</td>
<td>360</td>
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<td>540</td>
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<td>SL1021A500</td>
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<td>SL1021B500</td>
<td>480</td>
<td>600</td>
<td>720</td>
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</tbody>
</table>

**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)

<table>
<thead>
<tr>
<th>Reflow Condition</th>
<th>Pb – Free assembly</th>
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<tbody>
<tr>
<td>Pre Heat</td>
<td>Temperature Min (T_{min}) 150°C</td>
</tr>
<tr>
<td></td>
<td>Temperature Max (T_{max}) 200°C</td>
</tr>
<tr>
<td></td>
<td>Time (Min to Max) (t_s) 60 – 180 secs</td>
</tr>
<tr>
<td>Average ramp up rate (Liquidus Temp (T_L) to peak)</td>
<td>3°C/second max</td>
</tr>
<tr>
<td>T_{max} to T_L - Ramp-up Rate</td>
<td>5°C/second max</td>
</tr>
<tr>
<td>Reflow</td>
<td>Temperature (T_P) (Liquidus) 217°C</td>
</tr>
<tr>
<td></td>
<td>Temperature (t_P) 60 – 150 seconds</td>
</tr>
<tr>
<td>Peak Temperature (T_P)</td>
<td>260+0/-5 °C</td>
</tr>
<tr>
<td>Time within 5°C of actual peak Temperature (t_P)</td>
<td>10 – 30 seconds</td>
</tr>
<tr>
<td>Ramp-down Rate</td>
<td>6°C/second max</td>
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<tr>
<td>Time 25°C to peak Temperature (T_{25})</td>
<td>8 minutes Max.</td>
</tr>
<tr>
<td>Do not exceed</td>
<td>260°C</td>
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</tbody>
</table>

Soldering Parameters - Wave Soldering (Thru-Hole Devices)

Recommended Process Parameters:

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

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:

**Type 04 / R**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

**Type 05 / P**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

#### Core Devices:

**Type 01 / C**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

#### Straight Radial Leaded Devices:

**Type 06 / Y**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

**Type 14 / X**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

### Straight “T” Leaded Devices:

**Type 04 / R**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

**Type 05 / P**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

**Type 01 / C**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

**Type 06 / Y**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

**Type 14 / X**

- Mounting Area: 3.0 [0.354]
- 0.3mm Minimum Gap
- 0.866 [1.0 DIA.]
- 0.173 ± 0.12
- 0.3mm Minimum Gap
- 0.590 [0.216 ± 0.12]
- 5.5 ± 0.3
- 16.8
- 2.2 ± 0.0

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SL1021A/B Series
Gas Discharge Tubes

Part Numbering System and Ordering Information

<table>
<thead>
<tr>
<th>SL102x</th>
<th>x</th>
<th>xxx</th>
<th>x</th>
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<tbody>
<tr>
<td>Series</td>
<td>SL1021</td>
<td>SL1024</td>
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<tr>
<td>Surge Capability</td>
<td>A = 10kA</td>
<td>B = 20kA</td>
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<tr>
<td>Breakdown Voltage</td>
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<tr>
<td>090 = 90V</td>
<td>145 = 145V</td>
<td>150 = 150V</td>
<td>200 = 200V</td>
<td>230 = 230V</td>
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<td>300 = 300V</td>
<td>420 = 420V</td>
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<td>Configuration Code</td>
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<tr>
<td>C = Type C</td>
<td>Y = Type Y</td>
<td>R = Type R</td>
<td>X = Type X</td>
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<tr>
<td>P</td>
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<tr>
<td>Option Code</td>
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<tr>
<td>Blank = No failsafe</td>
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<tr>
<td>F or G = With Failsafe</td>
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<tr>
<td>F = With Failsafe</td>
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</tbody>
</table>

Packaging

For ‘SL1021A/B’ device type C, R, P, Y packing

- Box (Cardboard)
- Tray (PET)
- Tray, Bottom (PET)
- PE Form

For ‘SL1021A/B’ device type X packing

- Box (Cardboard)
- Tray (PET)
- Tray, Bottom (PET)
- PE Form

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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