

### LSP05GI Module Series



#### Description

Littelfuse's LSP05GI thermally protected Surge Protective Device is a self-protected device specially designed to be used in outdoor and commercial LED lighting fixtures for transient overvoltage protection. It has been developed with Littelfuse's thermally protected varistor technology. Its built-in thermal disconnect function provides additional protection to prevent catastrophic failure and fire hazard even under extreme circumstances of varistor end-of-life or sustaining over voltage conditions.




The LSP05GI features a built-in LED indicator that notifies when replacement of the module is needed.

#### Features

- Build-in LED Indication, saves maintenance time by identifying replacement need
- Thermally Protected
- Suitable for use in luminaire with Class I or Class II insulation\*
- 10kA Maximum Discharge Current ( $I_{max}$ ), 8/20 $\mu$ s
- Meets ANSI C82.77-5-2015: Location C Medium
- Meets ANSI C136.2-2015: Enhanced Level
- Meets IEEE C62.41.2: Location Category C Low
- Meets US Dept. of Energy MSSSLC Model Spec.
- High line-to-earth/ground resistance
- IP66: Dust-tight and water resistant
- Parallel or Series connected options
- UL 1449 and IEC 61643-11/EN 61643-11 recognized\*

\* See '[Part Numbering System](#)' for exact details of voltages available for Class I and Class II installations, and '[Device Ratings and Specifications](#)' table for voltage specific approvals.

#### Agency Approvals

| Agency  | Standard                   | Agency File Number |
|---|----------------------------|--------------------|
|  | UL 1449 <sup>+</sup>       | E320116            |
|  | IEC 61643-11 <sup>++</sup> | NL40819            |
|  | EN 61643-11 <sup>++</sup>  | 3177948.01         |

+ = For 120V, 240V and 277V

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#### Additional Information



**Datasheet**



**Resources**



**Samples**

#### Applications

- Outdoor and Commercial LED Lighting
- Roadway lighting
- Traffic lighting
- Digital signage
- Wall wash lighting
- Parking garage lighting
- Flood lighting
- Tunnel lighting
- Street lighting

### Absolute Maximum Ratings

• For ratings of individual members of a series, see Device Ratings and Specifications chart

|  | LSP05GI Series | Units      |
|--|----------------|------------|
| <b>Continuous:</b>   |                |            |
| <b>Steady State Applied Voltage:</b>                             |                |            |
| Max AC Voltage Range ( $V_{M(AC)(RMS)}$ )                        | 150 to 510     | V          |
| Continuous Current   | 3.5            | A          |
| <b>Transient:</b>  |                |            |
| Maximum Discharge Current, 8/20 $\mu$ s Waveform ( $I_{max}$ )   | 10,000         | A          |
| Nominal Discharge Current, 8/20 $\mu$ s Waveform ( $I_n$ )       | 5,000          | A          |
| Operating Ambient Temperature Range ( $T_A$ )                    | -40 to +85     | °C         |
| Storage Temperature Range ( $T_{STG}$ )                          | -40 to +85     | °C         |
| Isolation Voltage Capability (When the thermal disconnect opens) | 600            | V          |
| Insulation Resistance  | >1,000         | M $\Omega$ |

**CAUTION:** Stresses above those listed in 'Absolute Maximum Ratings' may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### LSP05GI Series Device Ratings and Specifications

| Part Number               | Operating Voltage (VAC) | MCOV/ $U_c$ <sup>1</sup> (VAC) | Maximum Discharge Current <sup>2</sup> $I_{max}$ (A) | Nominal Discharge Current <sup>3</sup> $I_n$ (A) | MLV <sup>4</sup> (V)               | $U_p$ <sup>5</sup> (V)                   | Safety Compliance |        |
|---------------------------|-------------------------|--------------------------------|--|--|------------------------------------|--|-------------------|--------|
|                           |                         |                                |  |  |                                    |  | IEC/EN 61643-11   | UL1449 |
| LSP05GI120*               | 120                     | 150                            | 10,000   | 5,000  | LN:650<br>LG:1280<br>N-G:1230      | –  | –                 | X      |
| LSP05GI240*               | 240                     | 275                            | 10,000   | 5,000  | LN:1080<br>LG:1230<br>N-G:1340     | LN: 1300<br>L-G/PE: 2400<br>N-G/PE: 2200 | X                 | X      |
| LSP05GI277*               | 277                     | 320                            | 10,000   | 5,000  | LN: 1260<br>L-G: 1260<br>N-G:1300  | LN: 1400<br>L-G/PE: 2400<br>N-G/PE: 2200 | X                 | X      |
| LSP05GI347*               | 347                     | 420                            | 10,000   | 5,000  | LN: 1530<br>L-G: 1550<br>N-G: 1410 | –  | –                 | –      |
| LSP05GI480*               | 480                     | 510                            | 10,000   | 5,000  | LN: 1800<br>L-G: 1900<br>N-G: 1410 | –  | –                 | –      |
| LSP05GI120*H <sup>†</sup> | 120                     | 150                            | 10,000   | 5,000  | LN: 650<br>L-G: 3150<br>N-G: 3210  | –  | –                 | X      |
| LSP05GI240*H <sup>†</sup> | 240                     | 275                            | 10,000   | 5,000  | LN: 1080<br>L-G: 3170<br>N-G: 3430 | –  | –                 | X      |
| LSP05GI277*H <sup>†</sup> | 277                     | 320                            | 10,000   | 5,000  | LN: 1260<br>L-G: 3160<br>N-G: 3310 | –  | –                 | X      |
| LSP05GI480*H <sup>†</sup> | 480                     | 510                            | 10,000   | 5,000  | LN: 1800<br>L-G: 3090<br>N-G: 3090 | –  | –                 | –      |

\* = S or P

<sup>†</sup> = Module with 'H' designation features 1500Vac Hi-Pot withstand capability in common mode (L-G and N-G).

#### Glossary:

1. MCOV/ $U_c$ : Maximum Continuous Operating Voltage - maximum r.m.s. voltage that could be continuously applied to the SPD.
2. Maximum Discharge Current  $I_{max}$  (A): The maximum discharge current is a measure of the SPDs maximum capability; single impulse of discharge current uses the 8/20 $\mu$ s current waveform. All Devices pass maximum discharge current with possible, safe opening of thermal disconnect.
3. Nominal Discharge Current  $I_n$  (A): The nominal discharge current is a measure of the SPDs endurance capability; 15 impulses of discharge current uses the 8/20 $\mu$ s current waveform.
4. MLV: UL1449 Measured limiting voltage; the highest value of residual voltage measurements during the application of impulses of 8/20 $\mu$ s nominal discharge current ( $I_n$ ); an average voltage value of 15 impulses.
5.  $U_p$ : IEC 61643-11 Voltage protection level; the highest value of residual voltage measurements during the application of impulses of 8/20 $\mu$ s nominal discharge current ( $I_n$ ); a rounding voltage value of maximum measurement.

| Specification   | Value                 |                       | Condition  |
|---|-----------------------|-----------------------|--|
|   | 240V                  | 277V                  |  |
| Temporary Overvoltage (V)<br>TOV UT @ $t_T = 5$ s     | 337                   | 403                   | LV System Fault for TN Power Grid  |
| Temporary Overvoltage (V)<br>TOV UT @ $t_T = 120$ min | 442                   | 529                   | LV System Fault for TN Power Grid  |
| Power grids   | TN                    | TN                    |  |
| Backup fuse (A)                                       | 16                    | 20                    | Maximum gG Fuse  |
| End of life indication                                | Yes                   | Yes                   | Optical<br>Light ON: SPD is functional<br>Light OFF: SPD has reached end-of-life |
| Max earth leakage current at $U_c$ ( $\mu$ A)         | 50                    | 50                    |  |
| IEC 61643-11 Test Classification                      | Test Class II and III | Test Class II and III |  |
| EN 61643-11 Type Classification                       | Type 2 and 3          | Type 2 and 3          |  |
| UL 1449 Type  | 4CA                   | 4CA                   |  |

### Repetitive Surge Capability



| Pulse Rating<br>(8x20 $\mu$ Sec) |         |
|----------------------------------|---------|
| Strikes                          | Surge   |
| 1                                | 10,000A |
| 2                                | 7,000A  |
| 15                               | 5,000A  |
| 100                              | 1,500A  |
| 1,000                            | 700A    |

### LSP05GI Series Wire Specification

| Part Number Extension | Length           | Diameter         | Double Insulation | Installation Class | Color  |
|-----------------------|------------------|------------------|-------------------|--------------------|--|
| X3333                 | 250mm $\pm$ 20mm | 1mm <sup>2</sup> | Yes               | I                  | L - Brown<br>N - Blue<br>G/PE - Green with Yellow stripe |
| X3316                 | 250mm $\pm$ 20mm | 1mm <sup>2</sup> | Yes               | II                 | L - Brown<br>N - Blue                                    |
| None                  | 250mm $\pm$ 20mm | 16AWG            | Yes               | –                  | L - Black<br>N- White<br>G- Green                        |

### Dimensions

#### Series Version



#### Parallel Version



Note: Dimensions are in millimeters (mm)

### Application/Installation Schematic



Note:  
Green LED light on: SPD is good  
Green LED light off: SPD needs replacement

### Part Numbering System



Other Options:  
**X3333**: with GND wire connection, available for 240Vac and 277Vac rating with CE Marking for Class I earthed luminaire installation  
Wire Color: Line: Brown, Neutral: Blue, Ground/PE: Green with yellow stripe  
**X3316**: without GND wire connection, available for 240Vac and 277Vac rating with CE Marking for Class II unearthened luminaire installation  
Wire Color: Line: Brown, Neutral: Blue