LSP05G Module Series
LED Lighting Surge Protection Module

**Description**
Littelfuse's LSP05G thermally protected surge protection device specially designed to be used in outdoor, commercial, and industrial LED lighting fixtures. It utilizes Littelfuse's thermally protected varistor technology which acts as a self-protector, helping prevent end-of-life issues related to varistors as well as issues related to sustaining over-voltage conditions. It also provides high line-to-earth/ground resistance, facilitating faster production line testing.

LSP05G series connected option allows clear indication of thermal fault protection by disconnecting power to luminaire, thereby signaling SPD module replacement. The LSP05G Surge Protective Device facilitates customer’s product compliance to IEEE C62.41.2 Location Category C Low ANSI C136.2 and US Dept. of Energy MSSLC Model Spec.

**Features & Benefits**
- Maximum Discharge Current (I_{max}) 10kA, 8/20µs
- Thermally Protected Varistor technology
- Parallel and Series Connected SPD Options
- IP66 Waterproof and Dust-proof
- UL1449 Recognized (120Vac, 240Vac and 277Vac only)
- Series connected – Varistor thermal protection indication by removal of power to luminaire
- Compact form factor with mounting tabs
- 240Vac and 277Vac are CE compliant and available for Class I and Class II installation based on IEC luminaire protection classes
- High line-to-earth/ground resistance
- RohS compliant

**Applications**
- Outdoor and Commercial LED Lighting
- Roadway lighting
- Traffic lighting
- Digital signage
- Wall wash lighting
- Parking garage lighting
- Flood lighting
- Tunnel lighting
- Street lighting
- Industrial high-bay and low-bay lighting

**Absolute Maximum Ratings**
- Max AC Voltage Range (V_{MAX(AC)}) 150 to 510 V
- Continuous Current 10 A
- Nominal Discharge Current, 8/20μs Waveform (I_{nom}) 10,000 A
- Operating Ambient Temperature Range (T_{a}) -45 to +85 °C
- Storage Temperature Range (T_{st}) -45 to +90 °C
- Isolation Voltage (When the thermal disconnect opens) 600 V
- Insulation Resistance >1,000 MΩ

**Agency Approvals**
<table>
<thead>
<tr>
<th>Agency</th>
<th>Standard</th>
<th>Agency File Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL</td>
<td>UL1449</td>
<td>E320116</td>
</tr>
<tr>
<td>IEC</td>
<td>IEC 61643-11+</td>
<td>NL-37684 and NL-40516</td>
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<tr>
<td>KEMA</td>
<td>IEC 61643-11+</td>
<td>31-122332 and 31-122333</td>
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</tbody>
</table>

* + For 240V and 277V Series connection version, respectively

**Additional Information**

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**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.

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Revised: GD 08/18/23
## LSP05G Series Device Ratings & Specifications

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Operating Voltage (VAC)</th>
<th>MCOV/Uc (VAC)</th>
<th>Maximum Discharge Current In mA (A)</th>
<th>Nominal Discharge Current (A)</th>
<th>Typical MLV (V)</th>
<th>Typical Ul (V)</th>
<th>Safety Compliance</th>
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<tbody>
<tr>
<td>LSP05G120*</td>
<td>120</td>
<td>150</td>
<td>10,000</td>
<td>5,000</td>
<td>L-N: 600</td>
<td>L-N: 700</td>
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<td></td>
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<td></td>
<td>L-G: 1410</td>
<td></td>
<td>L-G: 1600</td>
<td>N-G: 1600</td>
<td>X</td>
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<tr>
<td>LSP05G240*</td>
<td>240</td>
<td>275</td>
<td>10,000</td>
<td>5,000</td>
<td>L-N: 970</td>
<td>L-N: 1100</td>
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<td></td>
<td>L-G: 1410</td>
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<td>L-G: 1600</td>
<td>N-G: 1600</td>
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<tr>
<td>LSP05G277*</td>
<td>277</td>
<td>320</td>
<td>10,000</td>
<td>5,000</td>
<td>L-N: 1270</td>
<td>L-N: 1200</td>
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<td>L-G: 1400</td>
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<td>L-G: 1600</td>
<td>N-G: 1600</td>
<td>X</td>
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<tr>
<td>LSP05G347*</td>
<td>347</td>
<td>420</td>
<td>10,000</td>
<td>5,000</td>
<td>L-N: 1530</td>
<td>L-N: 1600</td>
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<td>L-G: 1550</td>
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<td>L-G: 1700</td>
<td>N-G: 1600</td>
<td>X</td>
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<tr>
<td>LSP05G480*</td>
<td>480</td>
<td>510</td>
<td>10,000</td>
<td>5,000</td>
<td>L-N: 1800</td>
<td>L-N: 2100</td>
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<tr>
<td>LSP05G480*S</td>
<td>480</td>
<td>510</td>
<td>10,000</td>
<td>5,000</td>
<td>L-N: 1800</td>
<td>L-N: 2100</td>
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<td>L-G: 3090</td>
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<td>L-G: 3700</td>
<td>N-G: 3700</td>
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</tbody>
</table>

* = S or P  
† with 1500Vac Hi-Pot withstand capability in common mode (L-G and N-G)

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### Glossary:

1. MCOV/Uc: Maximum Continuous Operating Voltage - maximum r.m.s. voltage that could be continuously applied to the SPD.  
2. Maximum Discharge Current In mA (A): The maximum discharge current is a measure of the SPD's maximum capability; single impulse of discharge current uses the 8/20µs current waveform.  
3. Nominal Discharge Current In (A): The nominal discharge current is a measure of the SPD's endurance capability; 15 impulses of discharge current uses the 8/20µs current waveform.  
4. MLV: UL1449 Measured limiting voltage; the highest value of residual voltage measurements during the application of impulses of 8/20µs nominal discharge current (In); an average voltage value of 15 impulses.  
5. Ul: IEC 61643-11 Voltage protection level; the highest value of residual voltage measurements during the application of impulses of 8/20µs nominal discharge current (In); a rounding voltage value of maximum measurement.  
7. LSP05G240S & LSP05G277S are certified by DEKRA with below IEC 61643-11 specifications:

### LSP05G240S Specification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary overvoltage TOV</td>
<td>U1</td>
<td>V</td>
<td>LV system fault 255 V x 1.32 at t = 5 s, TN power grid</td>
</tr>
<tr>
<td>Temporary overvoltage TOV</td>
<td>U1</td>
<td>V</td>
<td>LV system fault 255 V x 1.732 at t = 120 min, TN power grid</td>
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<tr>
<td>Power grids</td>
<td></td>
<td></td>
<td>TN</td>
</tr>
<tr>
<td>Backup fuse</td>
<td>16</td>
<td>A</td>
<td>max., gG fuse</td>
</tr>
<tr>
<td>End of life indication</td>
<td>yes</td>
<td></td>
<td>Optical, light ON: SPD is functional Light OFF: SPD has reached end-of-life</td>
</tr>
<tr>
<td>Max earth leakage current</td>
<td>50</td>
<td>μA</td>
<td>Max. rms, to GND</td>
</tr>
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</table>

### LSP05G277S Specification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary overvoltage TOV</td>
<td>U1</td>
<td>V</td>
<td>LV system fault 305 V x 1.32 at t = 5 s, TN power grid</td>
</tr>
<tr>
<td>Temporary overvoltage TOV</td>
<td>U1</td>
<td>V</td>
<td>LV system fault 305 V x 1.732 at t = 120 min, TN power grid</td>
</tr>
<tr>
<td>Power grids</td>
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<td></td>
<td>TN</td>
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<tr>
<td>Backup fuse</td>
<td>20</td>
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<td>max., gG fuse</td>
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<tr>
<td>End of life indication</td>
<td>yes</td>
<td></td>
<td>Optical, light ON: SPD is functional Light OFF: SPD has reached end-of-life</td>
</tr>
</tbody>
</table>
LSP05G Module Series
LED Lighting Surge Protection Module

Repetitive Surge Capability

Dimensions

Notes:
P/N with suffix X3333/X3316: Brown: Line; Blue: Neutral; Green-Yellow stripe: Ground.
2. Wire Gauge: AWG16, wire length: 100mm±20mm, wire stripping length:10±2mm.
3. Caution: Line/neutral wires must be correctly connected to AC power grid. Wiring error on line/neutral polarity may cause module failure.
LSP05G Module Series
LED Lighting Surge Protection Module

Application/Installation Schematic

Notes:
1. Series module used in parallel connection for indication circuit connection.
2. LED indicator and associated circuitry are not included in the module.
3. Black wire is AC line voltage (hot); white wire is AC neutral voltage.
4. Black wire voltage is cut off when SPD needs replacement.
5. R is current limiting resistor; its resistance/wattage is determined by AC line voltage and desired current driving LED. Example: AC line voltage 240V, LED: 1.6mA, resistor: 150Kohm/0.5W.
6. The power line must be disconnected/not connected during the light/SPD installation and maintenance process.

Part Numbering System
LSP 05G 120 P N H X Xxxx

Littelfuse Surge Protection Module
5kA (Nominal Discharge Current)
Operating Voltage
P: Parallel connection
S: Series connection
Blank: Waterproof IP66
N: Non-waterproof
Blank: No Hi-Pot withstand capability in common mode
H: With 1500Vac Hi-Pot withstand capability in common mode (L-G and N-G)

Other Options:
X333: 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: Green with yellow stripe
X3316: without GND wire connection, available for 240Vac and 277Vac rating with CE Marking for Class II ungrounded luminaire installation
Wire Color: Line: Brown, Neutral: Blue
X3379: Input wire length: 110mm +/-10mm, output wire length: 210mm +/-10mm
Product is CE Marked for Class I earthed Luminaire installation and Class II ungrounded Luminaire installation (if earth connection is not utilized).

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