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# Surge Protection Module

LED Lighting Surge Protection Module > LSP05

## LSP05 Module Series

## Description

The Littelfuse LSP05 thermally protected Surge Protective Device is a self-protected device which is specially designed to be used in outdoor and commercial LED lighting fixtures for transient overvoltage protection. It is constructed with Littelfuse thermally protected varistor technology. Its built-in thermal disconnect function provides additional protection to prevent catastrophic failure and fire hazard even under the extreme circumstances of varistor end-of-life or sustaining over voltage conditions. The LSP05 facilitates customer's product compliance to IEEE C62.41.2 Location Category C Low and US Dept of Energy MSSLC Model Spec.

## Agency Approvals

| Agency | Standard | Agency File Number |
|---|---|---|
| c UL us | UL1449 | E320116 |

## Applications

- Outdoor and Commercial LED Lighting
- Roadway lighting
- Traffic lighting
- Digital signage
- Wash wall lighting
- Parking garage/lot lighting
- Flood lighting
- Tunnel lighting
- Street lighting

## Features

- Maximum Discharge Current, 10kA, 8/20us
- Meets ANSI C82.77-5-2015: Location Category CM, 10kV/5kA, 1.2/50µS-8/20µS Combination Wave.
- Meets IEEE C62.41.2: Location Category CLow, 6kV/3kA, 1.2/50µS-8/20µS Combination Wave.
- Meets US Dept. of Energy MSSLC Model Spec.
- Parallel connected SPD device
- Thermally protected Varistor technology
- IP66 Water-proof and Dust-proof
- Indication wire lead options for Parallel connected modules
- UL 1449 Type 4 Component Assembly Recognition (Type 4CA)
- IEC61643-11 Class II/ EN61643-11 Type 2 Compliant[1]
- Compact form factor (48x48x30mm) with mounting tabs
- 240Vac and 277Vac voltage ratings are available for Class I and Class II installation based on IEC luminaire protection classes
- CE - Meets the requirements of Low Voltage and RoHS European Directives.

Notes:
1. Self-declared compliance.

## Additional Information

Datasheet | Resources | Samples

## Absolute Maximum Ratings

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

| | LSP05 Series | Units |
|---|---|---|
| **Continous** | | |
| Steady State Applied Voltage: | | |
| Max AC Voltage Range ($V_{M(AC)RMS}$) | 150 to 510 | V |
| **Transient** | | |
| Maximum Discharge Current 8/20µs Waveform (Imax) | 10,000 | A |
| Nominal Discharge Current 8/20µs Waveform ($I_n$) | 5,000 | A |
| Operating Ambient Temperature Range ($T_A$) | -45 to +85 | °C |
| Storage Temperature Range ($T_{STG}$) | -45 to +125 | °C |
| Isolation Voltage Capability (When the thermal disconnect opens) | 600 | V |
| Insulation Resistance | >1,000 | MΩ |

**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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## LSP05 Series Device Ratings & Specifications

| Part Number[7] | Operating Voltage (VAC) | MCOV/Uc (VAC)[5] | Maximum Discharge Current (Imax)(A)[2] | Nominal Discharge Current (In)(A)[1] | MLV (V)[3] | Up (V)[4] | Safety Compliance | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | IEC/EN 61643-11[6] | UL1449 |
| LSP05120* | 120 | 150 | 10,000 | 5,000 | L-N:680<br>L-G:680<br>N-G:630 | 800 | | X |
| LSP05240* | 240 | 275 | 10,000 | 5,000 | L-N:1070<br>L-G:1050<br>N-G:1020 | 1200 | X | X |
| LSP05277* | 277 | 320 | 10,000 | 5,000 | L-N:1260<br>L-G:1280<br>N-G:1220 | 1400 | X | X |
| LSP05347* | 347 | 420 | 10,000 | 5,000 | L-N:1590<br>L-G:1590<br>N-G:1570 | 1700 | | X |
| LSP05480* | 480 | 510 | 10,000 | 5,000 | L-N:1780<br>L-G:1800<br>N-G:1740 | 1900 | | X |
| LSP05240LL* | L-L:240 | L-L:275 | 10,000 | 5,000 | L-L:1070 | L-L:1200 | | X |
| | L-N/G:120 | L-N/G:150 | | | L-N/G:680 | L-N/G:800 | | X |
| LSP05480LL* | L-L:480 | L-L:510 | 10,000 | 5,000 | L-L:1780 | L-L:1900 | | X |
| | L-N/G:277 | L-N/G:320 | | | L-N/G:1280 | L-N/G:1400 | | X |

**Notes:**
1. Nominal Discharge Current (In)(A): The nominal discharge current is a measure of the SPDs endurance capability; 15 impulses of discharge current uses the 8/20us current waveform.
2. Maximum Discharge Current (Imax)(A): The maximum discharge current is a measure of the SPDs maximum capability; single impulse of discharge current uses the 8/20us current waveform.
3. MLV – UL1449 Measured limiting voltage; the highest value of residual voltage measurements during the application of impulses of 8/20us nominal discharge current (In); an average voltage value of 15 impulses
4. Up – IEC 61643-11 Voltage protection level; the highest value of residual voltage measurements during the application of impulses of 8/20us nominal discharge current (In); a rounding voltage value of maximum measurement.
5. MCOV/UC: Maximum Continuous Operating Voltage - maximum r.m.s. voltage that could be continuously applied to the SPD.
6. Part Numbers LSP05xxxPM Only.
7. * = - P or PM
8. Repetitive Surge Withstanding: 15 strikes at 5,000A (8/20us) with steady MLV/Up.

## Figure 1. Repetitive Surge Capability for LSP05

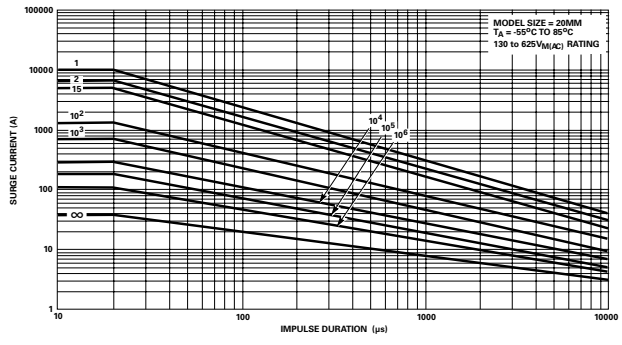


FIGURE 10.

| Pulse Rating (8x20µSec) | |
|---|---|
| Strikes | Surge |
| 1 | 10,000A |
| 2 | 7,000A |
| 15 | 5,000A |
| 100 | 1,500A |
| 1,000 | 700A |

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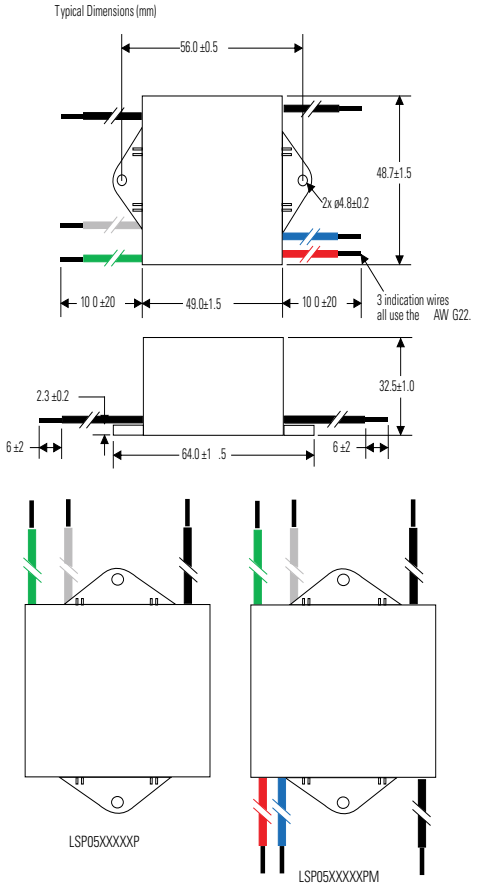
# Surge Protection Module

## LED Lighting Surge Protection Module > LSP05

## Dimensions




**Notes:**

1. Black: Line; White: Neutral; Green: Ground (P/N with suffix X3333/X3316: Brown: Line; Blue: Neutral; Green-Yellow stripe: Ground)
2. Black: R1; Red: R2; Blue: R3
3. Wire Gauge: AWG16 wire Line in, AWG22 Wire for indication; Wire Length: 100mm or customized

## Part Numbering System

**LSP 05 480LL P Xxxxx**

**Device F amily**
Lit telfuse Surge P rotection Module

**Nominal Disc har ge Cur rent (In )**

**Oper ating Vo ltag e**

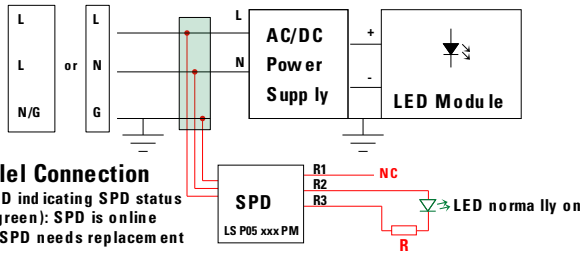
**Connection mode**
LL: for L,L,N/G
Blank: L -N, L -G, N-G

**P or PM**
(P: parallel connection; PM: parallel connection and with monitor indication wire)

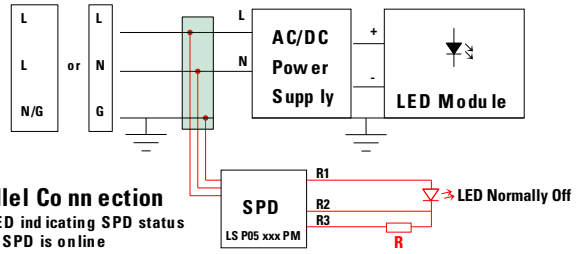
**Other non-standar d option:**
X3333: with GND wire connection, av ailable for 240V ac and 277V ac rating with CE Marking for Class I earthed inst allatio n
W ire Color: Line: Bro wn, Neutral: Blue, Ground/P: Green with ye llo w strip e

331 6: without GND wire connection option
Wire Color: Line: Br ow n, Neutral: Blue

## Application/Installation Schematic

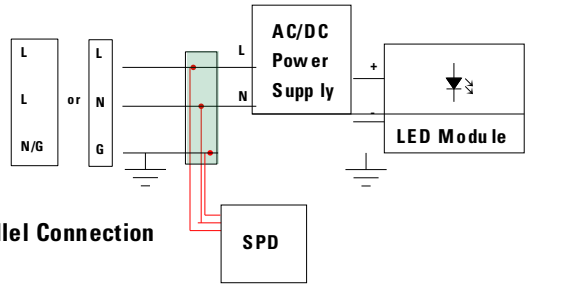



**Parallel Connection**
**With LED ind icating SPD status**
**- ON (green): SPD is online**
**- OFF : SPD needs replacem ent**

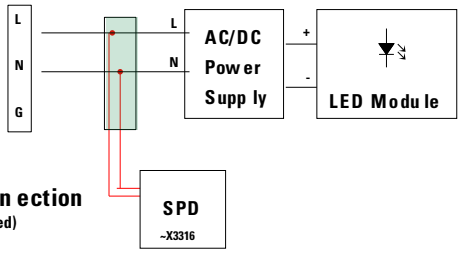



**Parallel Co nn ection**
**With LED ind icating SPD status**
**- OFF : SPD is online**
**- ON (red): SPD needs replacem ent**

Notes:
1. LED indicator and associated circuitry are not included in the module.
2. R1 must be capped off by wire nut when not connected (NC).
3. R1 and R2 are AC line voltage (hot); R3 is AC neutral voltage.
4. R2 voltage is cut off when SPD needs replacement.
5. R is current limiting resistor; it 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.




**Parallel Connection**




**Parallel Co nn ection**
**(for Class II Unearthed)**

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