

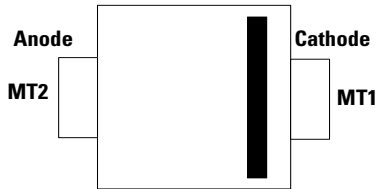
PLEDxN Series



Description

The open LED protector provides a switching electronic shunt path when a single LED in an LED string fails as an open circuit. This ensures the entire LED string will continue to function even if a single LED in the string does not. This provides higher reliable lighting functions in applications such as headlights, aircraft lights, airport runway lighting, roadside warning lights, etc. This component is compatible with one watt rated LEDs with a nominal 350 mA current at 3V. The SOD-123FL package is one of the lowest height profiles (1.1 mm) packages offered in the industry.

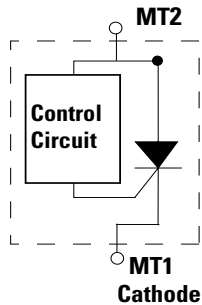
Pinout Diagram



Features & Benefits

- Fast switching
- Automatically resets after power cycle
- Compatible with industrial standard package SOD-123FL
- Compatible with industrial lighting environments
- IEC 61000-4-2 ESD 30kV (Air), 30kV (Contact)
- ESD protection of data lines in accordance with IEC 61000-4-2
- Low profile: maximum height of 1.1mm
- RoHS compliant and halogen-free
- MSL: Level 1 - unlimited

Schematic Symbol



Electrical Characteristics (All parameters are measured at $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Part Number | Marking | V_{BR} | | I_{LEAK} | I_H | I_S | $I_T @ V_T$ | V_T | Critical rate of rise dV/dt | Capacitance @ 1MHz, 2V bias |
|-------------|---------|------------------------------|-----|------------------|-------|-------|--------------------|------------------------|-----------------------------|-----------------------------|
| | | @ $I_{BR} = 1 \text{ mAmps}$ | | @ $V_{MT2} = 5V$ | | | | @ $I_T = 350\text{mA}$ | | |
| | | Min | Max | Max | Max | Max | Max | Max | | |
| PLED6N | P6N | 5.5 | 7.5 | 250 | 12 | 70 | 1.0 ^{1,2} | 1.2 | 250 | 24 |

Notes:
1) Standard FR-4 PCB with Copper Pads (2mm x 2mm/pad)
2) Aluminum PCB Pads (2mm x 3mm/pad)

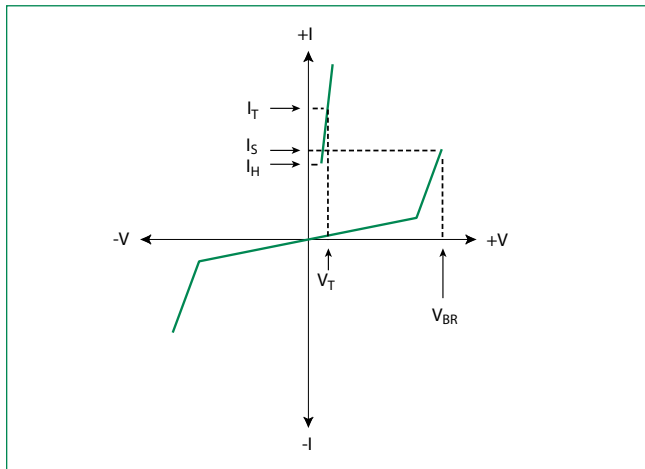
Thermal Considerations

| Symbol | Parameter | Value | Unit |
|-----------------|--|--------------------|---------------------------|
| I_T | Average On-State Current, ($T_A = 25^\circ\text{C}$) | 1.0 ^{1,2} | A |
| V_T | On-state Voltage ($T_A = 125^\circ\text{C}$) | 1.0 | V |
| P_D | Power Dissipation ($T_A = 25^\circ\text{C}$) | 1.45 ¹ | W |
| | | 1.50 ² | |
| T_J | Operating Junction Temperature Range | -65 to +150 | $^\circ\text{C}$ |
| T_S | Storage Temperature Range | | $^\circ\text{C}$ |
| $R_{\theta JL}$ | Thermal Resistance: Junction to Lead | 25 ¹ | $^\circ\text{C}/\text{W}$ |
| | | 20 ² | |
| $R_{\theta JA}$ | Thermal Resistance: Junction to Ambient | 80 ¹ | $^\circ\text{C}/\text{W}$ |
| | | 50 ² | |

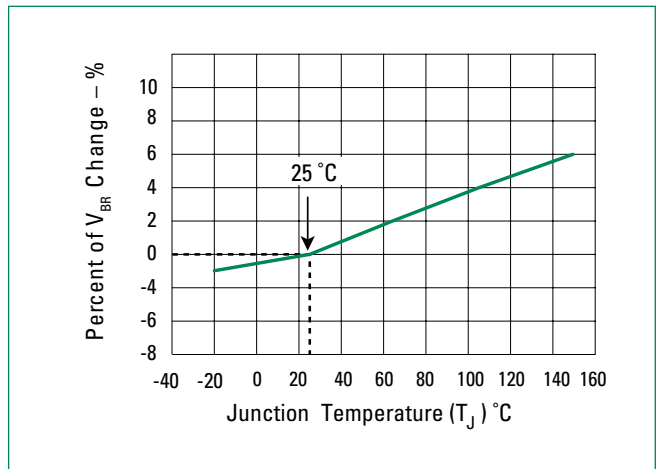
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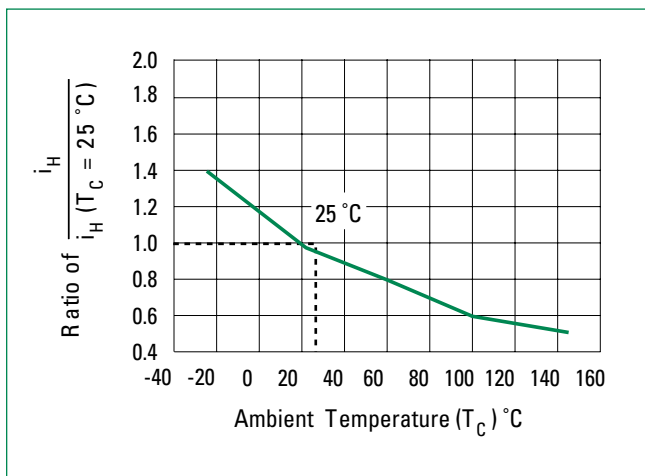
V-I Characteristics



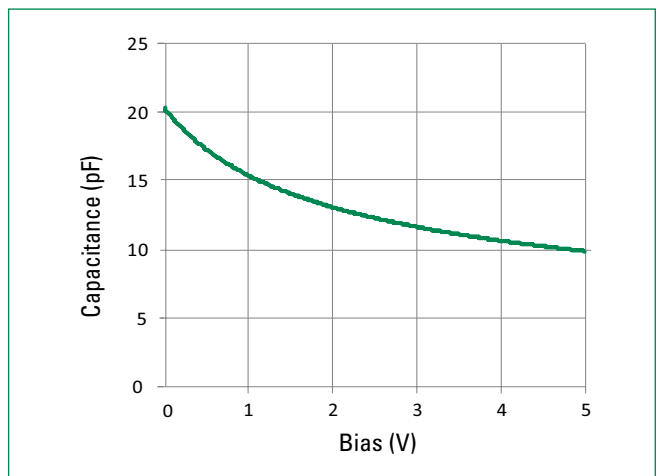
V_{BR} vs. Junction Temperature



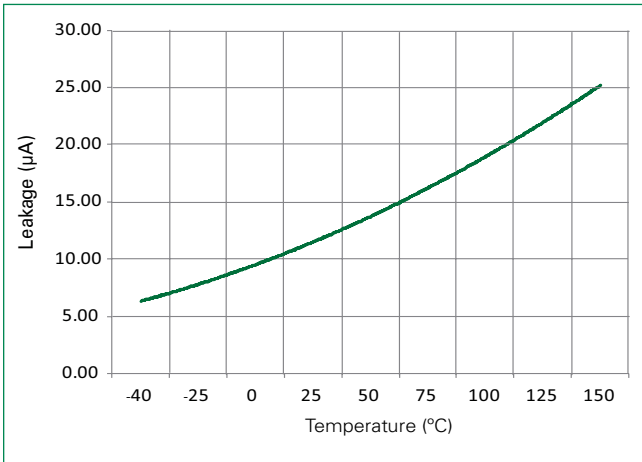
Normalized DC Holding Current vs. Ambient Temperature



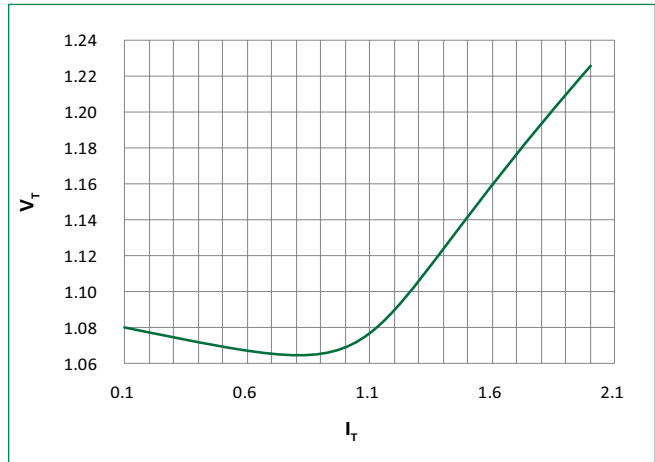
Capacitance vs Voltage



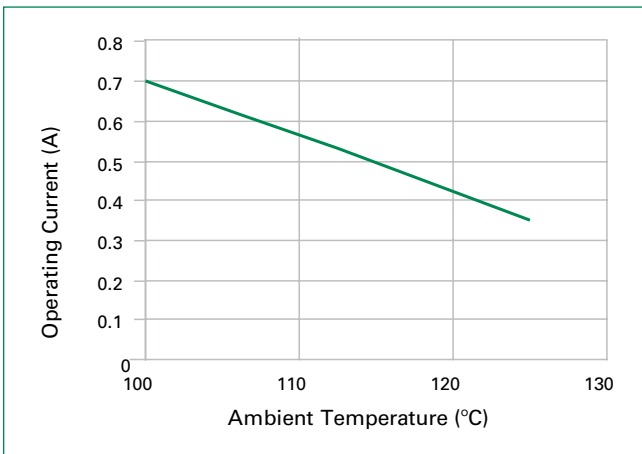
Leakage Current vs Temperature



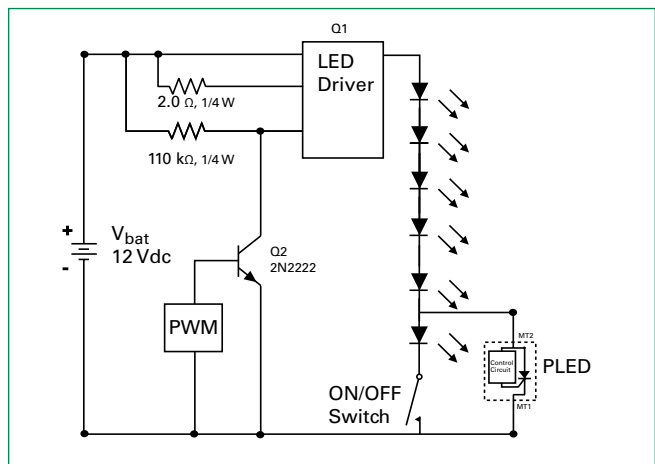
V_T vs I_T



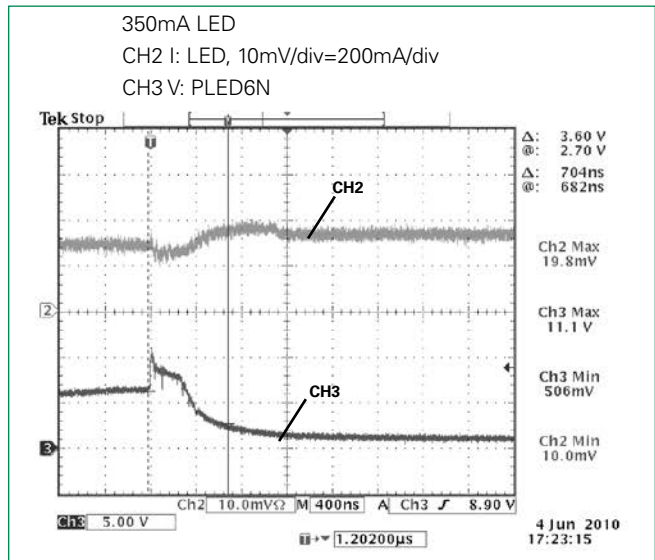
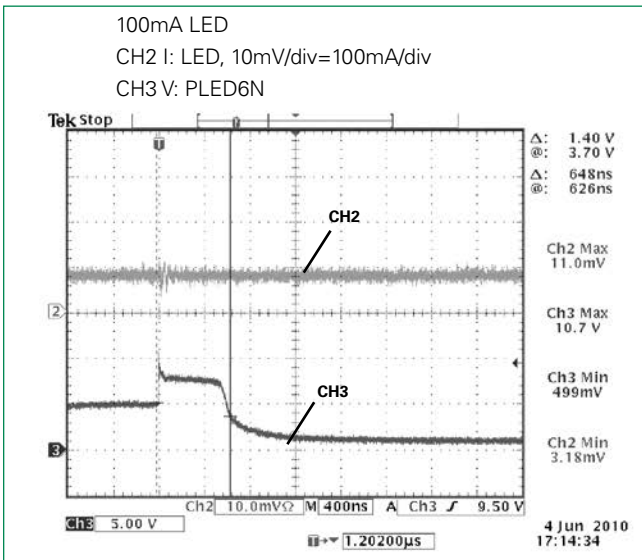
Operating Current vs. Ambient Temperature



LED Interference Test Circuit

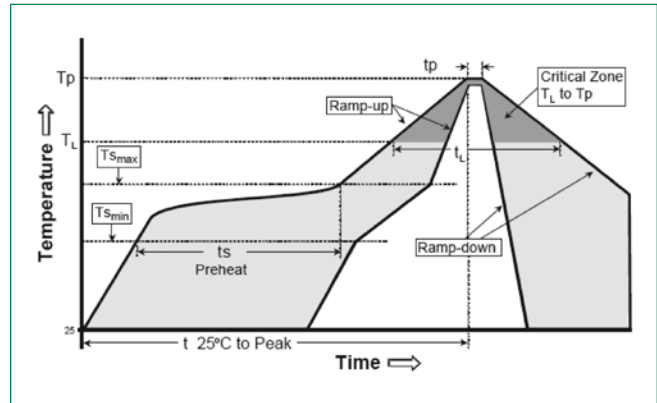


Typical Operation Waveforms



Soldering Parameters

| | | |
|---|------------------------------------|-------------------------|
| 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 | | 3°C/second max |
| Reflow | - Temperature (T_L) (Liquidus) | 217°C |
| | - Temperature (t_L) | 60 – 150 seconds |
| Peak Temperature (T_p) | | 260 ^{+0/-5} °C |
| Time within 5°C of actual peak Temperature (t_p) | | 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 |



Physical Specifications

| | |
|--------------------------|---|
| Terminal Material | Copper Alloy |
| Terminal Finish | 100% Matte Tin Plated |
| Body Material | UL recognized epoxy meeting flammability classification V-0 |

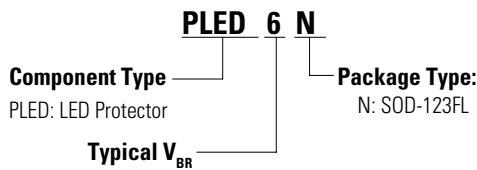
Packaging

| Package Code | Description | Packaging Quantity | Industry Standard |
|--------------|-------------|--------------------|--------------------------|
| N | SOD-123FL | 3000 | EIA-481 Tape and Reel |

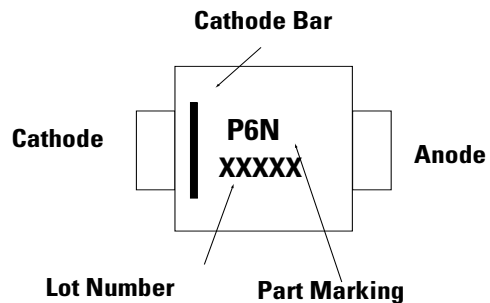
Environmental Specifications

| | |
|--|--|
| High Temperature Voltage Blocking | MIL-STD-750: Method 1040, Condition A, 80% min V_{BR} DC, 150°C, 504 hours |
| Temperature Cycling | MIL-STD-750: Method 1051, -65°C to 150°C, 15-minute dwell, 100 cycles |
| Biased Temperature & Humidity | EIA/JEDEC: JESD22-A101, 80% min V_{BR} , 85°C, 85%RH, 1008 hours |
| Resistance to Solder Heat | MIL-STD-750: Method 2031, 260°C, 10 seconds |
| Moisture Sensitivity Level | JEDEC-J-STD-020, Level 1 |
| Burn-In Test | $I_T = 0.350$ Adc, 1008 hours |

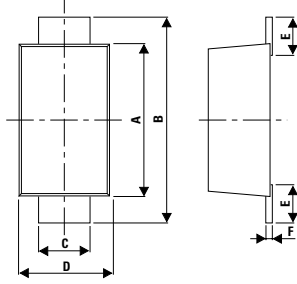
Part Numbering System



Part Marking System

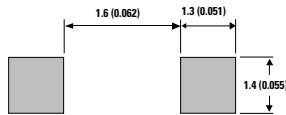


Dimensions - SOD-123FL Package

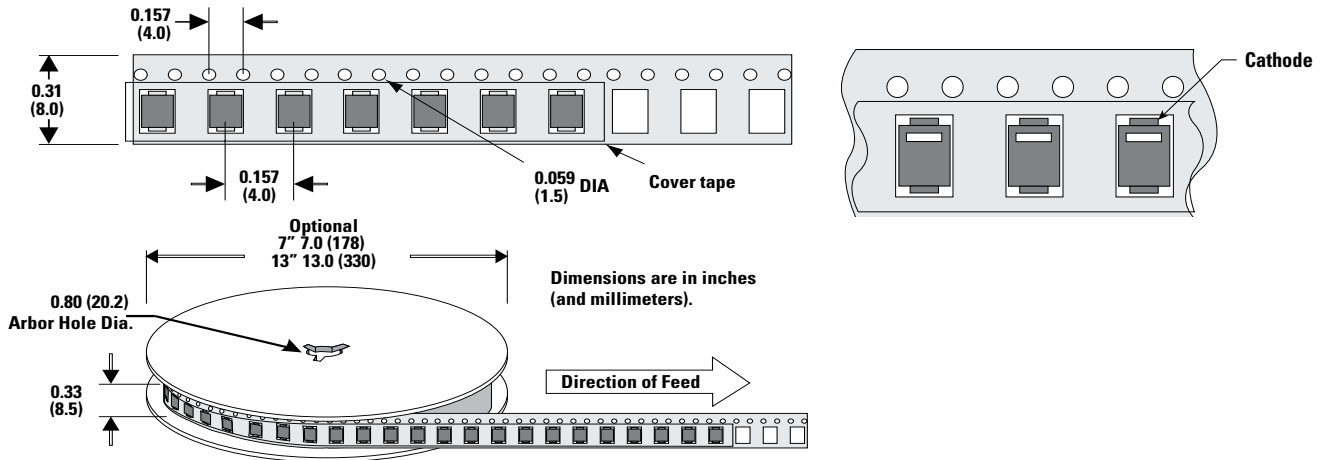


| Dimensions | Millimeters | | Inches | |
|------------|-------------|------|--------|--------|
| | Min | Max | Min | Max |
| A | 2.50 | 2.90 | 0.0984 | 0.1142 |
| B | 3.40 | 3.90 | 0.1339 | 0.1535 |
| C | 0.70 | 1.20 | 0.0275 | 0.0472 |
| D | 1.50 | 2.00 | 0.0591 | 0.0787 |
| E | 0.35 | 0.90 | 0.0138 | 0.0354 |
| F | 0.05 | 0.26 | 0.0020 | 0.0102 |
| G | 0.00 | 0.10 | 0.0000 | 0.0039 |
| H | 0.95 | 1.10 | 0.0374 | 0.0433 |

Mounting Pad Layout



Tape and Reel Specification



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