
Littelfuse Technologies: Power Thyristors • Protection Arrays • Fuses • PTCs • Varistors • TVS Diodes • GDTs • ESD Suppressors • SIDACtor Devices

**New Product Introduction**

# PLED18 Series

***Open LED Protection for LED Lighting Applications***

**May 18**

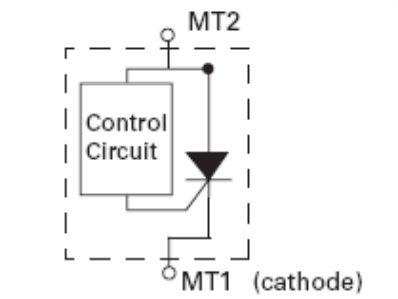
Littelfuse®

Expertise Applied | Answers Delivered

SEMCOR

# Product Series Description:
# PLED18 Series Open LED Protector

CIRCUIT PROTECTION SOLUTIONS




- **Product Description:** The PLED18 Series is an electronic shunt which provides a current bypass in the case of a single LED going into an open circuit condition. LED are susceptible to failure due to surges and other transients conditions. These failures can result in the loss of LED lighting strings in critical applications. As LED lighting becomes more popular, there will be applications where high reliability and quality of the lighting must be maintained.



Littelfuse®
Expertise Applied | Answers Delivered

# Product Features & Benefits

CIRCUIT PROTECTION SOLUTIONS

- Features
  - Available in small footprint QFN* package
  - Internally triggered two terminal device
  - Automatically resets if LED heals itself or is replaced
  - Built-in surge immunity
  - RoHS compliant
  - Halogen-Free

***Quad Flat Pak No Lead***

- Benefits
  - Simple to employ into any design
  - Low On-State Voltage typically 1.5V
  - Low Off-State Current
  - Environmentally friendly package

Littelfuse®

Expertise Applied | Answers Delivered

# Product Brief



- Branding
  - **Littelfuse**
  - ***Series:*** *Open LED Protector*
  - **Part Numbering**
    - See part number definition slide
- Package
  - 3x3 QFN
  - DO-214
- Minimum Order QTY:
  - PLED18S: 2500
  - PLED18Q12: 5000
- Product is RoHS compliant and Halogen-Free
- Packaging
  - Tape and Reel Standard
  - Reel Quantity:
    - PLED18S: 2500
    - PLED18Q12: 5000
  - Bulk Pack: Not Available

# Part Numbering Definition



PLED 18 XXX → Package

S - DO-214

Q12 - QFN 3x3

$V_{DRM}$ Breakdown

18 Volts

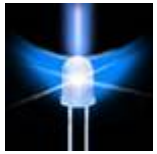
Open LED Protector Series

Product Series is RoHS compliant and Halogen-Free

HF

RoHS

# LED & LED Lighting Market Data



CIRCUIT PROTECTION SOLUTIONS

- The LED lighting sector has an up-and-coming new field, thanks in part to aggressive global government mandates.
- The global market for light-emitting diodes -- known as LEDs -- is projected to grow from $205 million in 2006 to $985 million in 2011, according to Mountain View-based market research group Strategies Unlimited.
- The overall lighting market worldwide is about $100 billion – of which the LED lighting segment is expected to increase from $4 billion in 2005 to $12 billion in 2010.
- Prices for LEDs are already dropping. LEDs became 10 percent to 15 percent less expensive in 2007, and Phillips LED Lighting Division projects that the price of LEDs will continue to decline by at least 10 percent a year.
  - Cheap LED's will accelerate the transition to LED lighting
- Even with cheaper LED prices, LED Lighting manufacturers must be concerned with quality and reliability. This fact will help drive the need for Open LED Protection!

Littelfuse®

Expertise Applied | Answers Delivered

# Product Characteristics

CIRCUIT PROTECTION SOLUTIONS

## Electrical Characteristics

| Part Number | Marking | $V_{BR}$ breakdown | | $V_{DRM}$ breakdown | $I_H$ | $I_S$ | $I_T$@$V_T$ | $V_T$ @ $I_T$ = 1 Amp |
|---|---|---|---|---|---|---|---|---|
| | | Volts | | Volts | mAmps | mAmps | Amps | Volts |
| | | Min | Max | Min | Min | Max | Max | Max |
| PLED18Q12 | PL18 | 18 | 33 | 18 | 5 | 100 | 1.0 | 3 |
| PLED18S | PL18 | 18 | 33 | 18 | 5 | 100 | 1.0 | 3 |

Critical parameters:

- Breakdown Voltage: Voltage at which the device turns on
- Holding Current: Current to keep the device in the on-state
- On-State Voltage: Voltage drop in the fully on-state

Littelfuse®

Expertise Applied | Answers Delivered

# How to Apply the Product



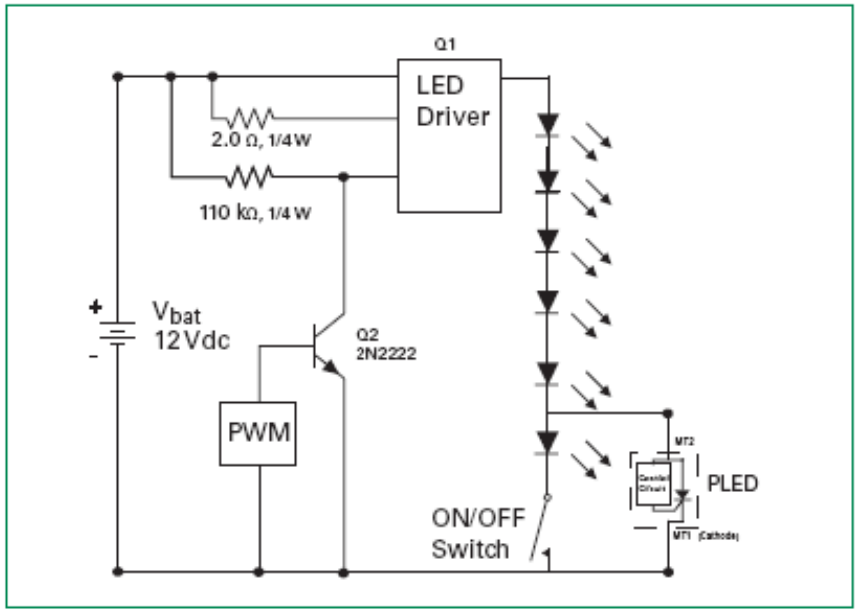
- The PLED is placed in parallel with 4 LEDs in a string

- An LED in the on-state drops 3.5V which makes 4 LED in series approximately 14V drop. which is lower than PLED18's 18V VDRM. And why use PLED18 instead of PLED5 or 6 is to save cost of PLED. If PLED5 r 6, or ON's NUD is used, PLED:LED=1:1. Customer can balance cost and reliability by using PLED9 or 13 or 18. PLED:LED = 1:2 (PLED9), 1:3 (PLED13) and 1:4 (PLED18).

# Application example



**LED Interference Test Circuit**




NOTES:
The PLED is compatible **with one, two, and three watt LEDs with nominal 3V characteristics**
The PLED18 Series can support LED applications up to 1000mA.

# Environmental & Regulatory compliance



- **Environmentally Friendly Packaging**
  - The ***PLED*** product *Series* **is RoHS Compliant and Halogen-Free**
  - ICP reports available from Littelfuse Corporate

RoHS

HF

# Product Series Status

CIRCUIT PROTECTION SOLUTIONS

- Status on SAP
  - All products are currently set up on SAP and are RTO (ready-to-order)
- Lead Times
  - Typical lead time for this product family will range from 8-10 weeks from receipt of order
- Samples: Requests for samples can be placed via SAP
  - Sample stocks are available *NOW* in limited quantities!

Littelfuse®
Expertise Applied | Answers Delivered