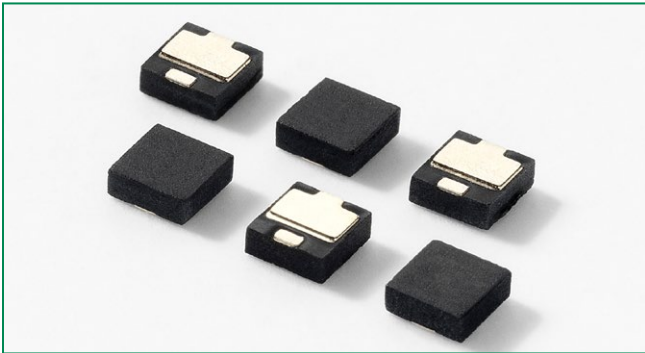


## PLED5 QFN Series

RoHS

**OBSOLETE** DATE: 31/12/2018 PCN/ECN#\_LFPCN41214  
REPLACED BY: PLED6N

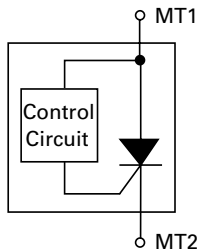


### Description

This PLED5 Open LED Protector component provides three methods for increasing the reliability of LED lighting:

- 1) If one of the LEDs in an array fails open, this device provides a substitute electronic path so that the string continues to function
- 2) It protects against ESD events up to  $\pm 8$  kV for contact discharges and  $\pm 15$  kV for air discharges per the IEC 61000-4-2 electrostatic immunity standard.
- 3) It provides protection in the case of accidental reverse battery or power connection.

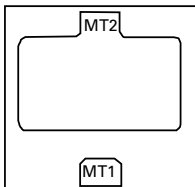
### Schematic Symbol



High reliability of lighting functions such as traffic lighting, aircraft lighting, advertising lighting, and runway lighting demand the use of a component such as the PLED5.

Littelfuse offers over current component for implementation in power circuits that can also enhance the reliability of circuit operation. Our full line of circuit protection products can be viewed at [www.littelfuse.com](http://www.littelfuse.com).

### Pinout



### Features & Benefits

- Reverse Battery/Power Protection
- Low Turn-On (Trigger Voltage)
- ESD, IEC 61000-4-2,  $\pm 8$ kV contact,  $\pm 15$  kV air
- Ideal for MR16, PAR type lamps
- Open LED bypass up to 500 mA
- Fast Switching
- Resets After Power Cycle

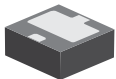
### Electrical Characteristics

| Part                | Marking | Symbol    | Parameter                          | Conditions                   | MIN  | TYP     | MAX  | Unit |         |
|---------------------|---------|-----------|------------------------------------|------------------------------|------|---------|------|------|---------|
| PLED5Q12            | Px5     | $V_{AK}$  | Input Voltage                      |                              |      |         | 40   | V    |         |
|                     |         | $V_{TO}$  | Turn-On Voltage                    |                              | 4.65 | 4.9     | 5.15 | V    |         |
|                     |         | $I_S$     | Switching Current                  |                              |      |         | 20   | mA   |         |
|                     |         | $V_{OS}$  | On-State Voltage                   | $I_{AK} = 350$ mA            |      | 1       | 1.3  | V    |         |
|                     |         | $I_{OS}$  | On-State Current                   | (with adequate heat sinking) |      |         | 500  | mA   |         |
|                     |         | $V_{OSR}$ | Reverse On-State Voltage           | $I = 350$ mA                 |      | 1       | 1.4  | V    |         |
|                     |         | $I_{OSR}$ | Reverse On-State Current           |                              |      |         | 500  | mA   |         |
|                     |         | $I_{DRM}$ | Leakage Current                    | $V_{AK} = 3.5$ V             |      |         | 100  | 150  | $\mu$ A |
|                     |         | $V_{ESD}$ | ESD Withstand Voltage <sup>1</sup> | IEC 61000-4-2 (Contact)      |      | $\pm 8$ |      |      | kV      |
| IEC 61000-4-2 (Air) |         | $\pm 15$  |                                    |                              |      | kV      |      |      |         |

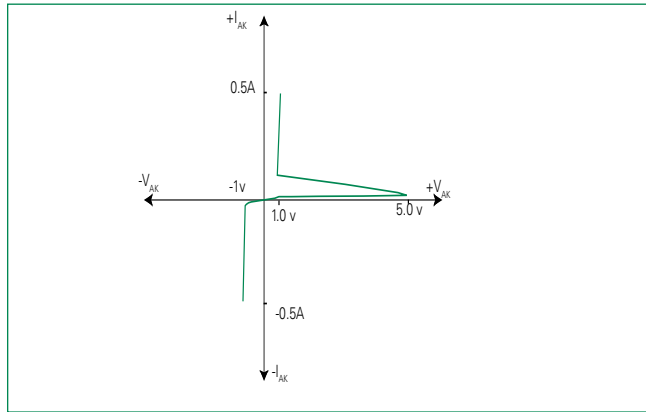
Notes:

<sup>1</sup>Parameter is guaranteed by design and/or component characterization.

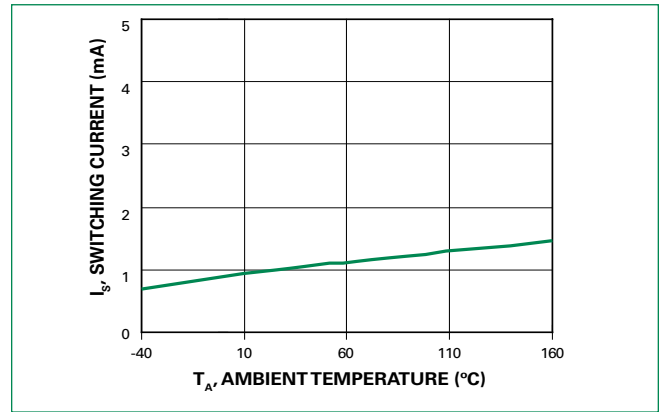
## Thermal Considerations

| Package  | Symbol     | Parameter                    | Value      | Unit |
|--|------------|------------------------------|------------|------|
|  <p>QFN</p> | $T_{OP}$   | Operating Temperature        | -40 to 85  | °C   |
|  | $T_J$      | Maximum Junction Temperature | 150        | °C   |
|  | $T_{STOR}$ | Storage Temperature          | -65 to 150 | °C   |

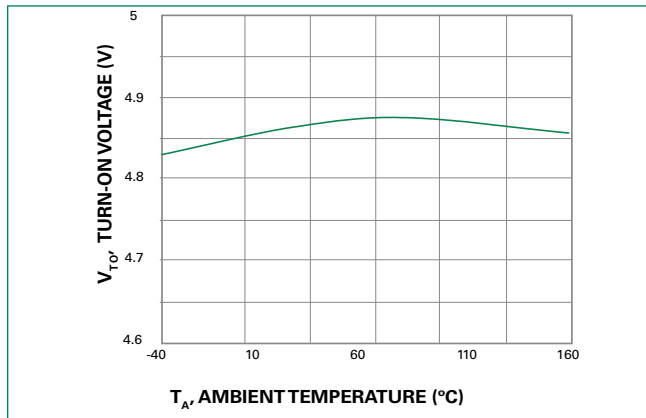
## V-I Characteristics



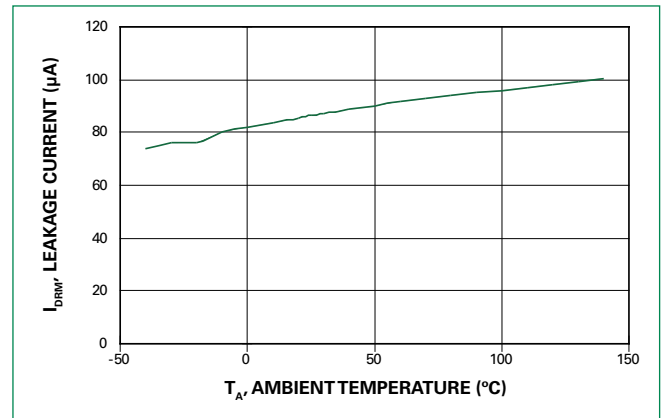
## Switching Current vs Temperature



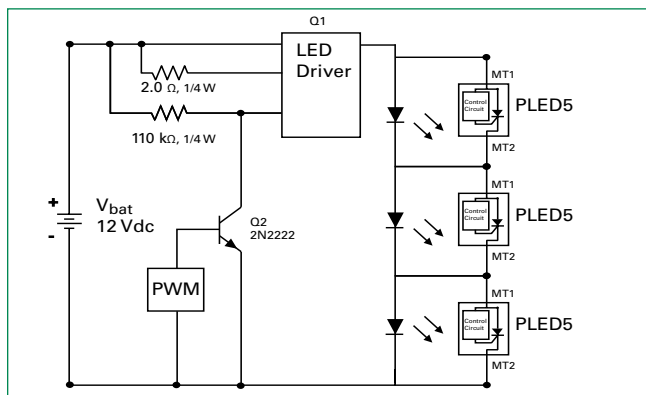
## Turn On Voltage vs Temperature



## Leakage Current vs Temperature



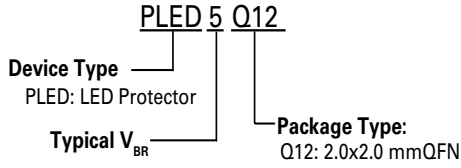
## LED Application and Interference Test Circuit



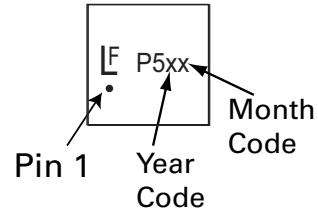
## Ordering Information

| Catalog Number | Package Type | Quantity Per Reel |
|----------------|--------------|-------------------|
| PLED5Q12       | QFN          | 3000 Pieces       |

## Part Numbering System

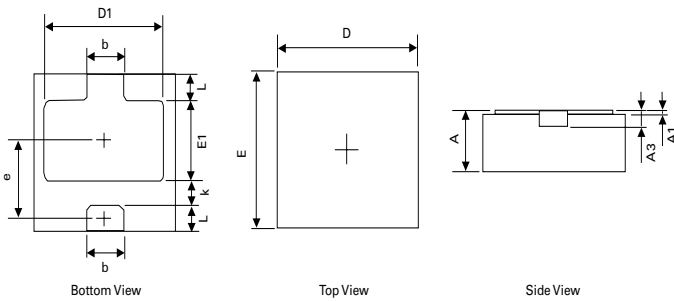


## Part Marking System

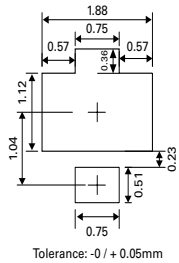


## Package Dimensions - QFN

### Device Dimensions:

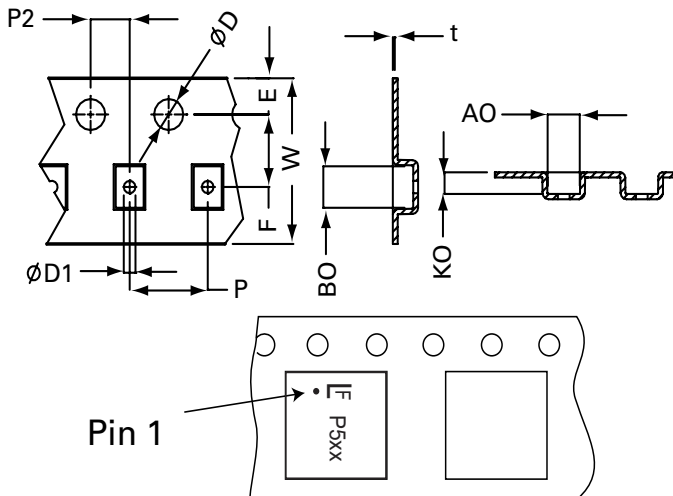


### Recommended Soldering Pad Dimensions:



| Dimension Symbol | Millimetres |             |
|------------------|-------------|-------------|
|                  | Min         | Max         |
| A                | 0.700/0.800 | 0.800/0.900 |
| A1               | 0.000       | 0.050       |
| A3               | 0.203REF    |             |
| D                | 1.924       | 2.076       |
| E                | 1.924       | 2.076       |
| D1               | 1.580       | 1.780       |
| E1               | 0.820       | 1.020       |
| k                | 0.200MIN.   |             |
| b                | 0.550       | 0.650       |
| e                | 1.045TYP.   |             |
| L                | 0.254       | 0.406       |

## Tape and Reel Specification - QFN



|    | Millimetres |      | Inches    |       |
|----|-------------|------|-----------|-------|
|    | Min         | Max  | Min       | Max   |
| E  | 1.65        | 1.85 | 0.065     | 0.073 |
| F  | 3.45        | 3.55 | 0.136     | 0.140 |
| D1 | 1.00        | -    | 0.040     | -     |
| D  | 1.50 min    |      | 0.059 min |       |
| P  | 3.90        | 4.10 | 0.154     | 0.161 |
| W  | 7.70        | 8.30 | 0.303     | 0.327 |
| P2 | 1.95        | 2.05 | 0.077     | 0.081 |
| A0 | 2.20        | 2.30 | 0.086     | 0.090 |
| B0 | 2.20        | 2.30 | 0.086     | 0.090 |
| K0 | 0.64        | 0.74 | 0.025     | 0.029 |
| t  | 0.20 typ    |      | 0.007 typ |       |