

# Plastic Infrared Light Emitting Diode

## QED123

### Description

The QED123 is 880 nm AlGaAs LEDs encapsulated in a clear peach tinted, plastic T-1 3/4 package.

### Features

- $\lambda = 880 \text{ nm}$
- Chip Material = AlGaAs
- Package Type: T-1 3/4 (5 mm lens diameter)
- Matched Photosensor: QSD123/QSD124
- Narrow Emission Angle,  $16^\circ$
- High Output Power
- Package Material and Color: Clear, Peach Tinted, Plastic

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol      | Parameter                                       | Value        | Unit             |
|-------------|---|--------------|------------------|
| $T_{OPR}$   | Operating Temperature                           | -40 to +100  | $^\circ\text{C}$ |
| $T_{STG}$   | Storage Temperature                             | -40 to +100  | $^\circ\text{C}$ |
| $T_{SOL-I}$ | Soldering Temperature (Iron)<br>(Notes 2, 3, 4) | 240 for 5 s  | $^\circ\text{C}$ |
| $T_{SOL-F}$ | Soldering Temperature (Flow)<br>(Notes 2, 3)    | 260 for 10 s | $^\circ\text{C}$ |
| $I_F$       | Continuous Forward Current                      | 100          | mA               |
| $V_R$       | Reverse Voltage                                 | 5            | V                |
| $P_D$       | Power Dissipation (Note 1)                      | 200          | mW               |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

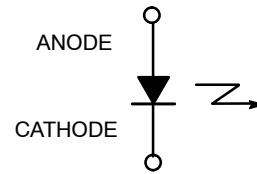
1. Derate power dissipation linearly 2.67 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
2. RMA flux is recommended.
3. Methanol or Isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron tip 1/16" (1.6 mm) minimum from housing.

### ELECTRICAL/OPTICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Symbol          | Parameter                | Test Conditions                                | Min | Typ  | Max | Unit                 |
|-----------------|--------------------------|--|-----|------|-----|----------------------|
| $\lambda_{PE}$  | Peak Emission Wavelength | $I_F = 20 \text{ mA}$                          | –   | 890  | –   | nm                   |
| $TC_\lambda$    | Temperature Coefficient  |  | –   | 0.2  | –   | nm/ $^\circ\text{C}$ |
| $2\theta_{1/2}$ | Emission Angle           | $I_F = 100 \text{ mA}$                         | –   | 16   | –   | $^\circ$             |
| $V_F$           | Forward Voltage          | $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ | –   | –    | 1.7 | V                    |
| $TC_{VF}$       | Temperature Coefficient  |  | –   | –6   | –   | mV/ $^\circ\text{C}$ |
| $I_R$           | Reverse Current          | $V_R = 5 \text{ V}$                            | –   | –    | 10  | $\mu\text{A}$        |
| $I_E$           | Radiant Intensity QED123 | $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$ | 50  | 70   | –   | mW/sr                |
| $TC_{IE}$       | Temperature Coefficient  |  | –   | –0.3 | –   | %/ $^\circ\text{C}$  |
| $t_r$           | Rise Time                | $I_F = 100 \text{ mA}$                         | –   | 900  | –   | ns                   |
| $t_f$           | Fall Time                | $I_F = 100 \text{ mA}$                         | –   | 800  | –   | ns                   |
| $C_j$           | Junction Capacitance     | $V_R = 0 \text{ V}$                            | –   | 11   | –   | pF                   |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

### SCHEMATIC



T-1 3/4, 5MM LED  
CASE 100CC

### ORDERING INFORMATION

| Device     | Package                          | Shipping <sup>†</sup> |
|------------|----------------------------------|-----------------------|
| QED123     | T-1 3/4,<br>5MM LED<br>(Pb-Free) | 250 /<br>Bulk Bag     |
| QED123A4R0 | T-1 3/4,<br>5MM LED<br>(Pb-Free) | 1200 /<br>Tape & Reel |

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](http://BRD8011/D).

TYPICAL PERFORMANCE CURVES

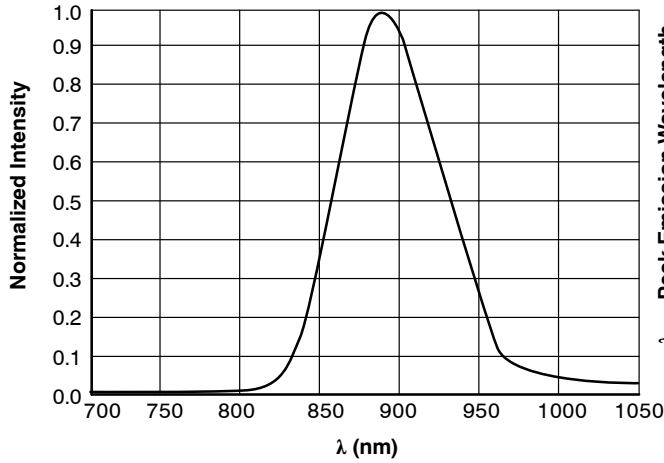


Figure 1. Normalized Intensity vs. Wavelength

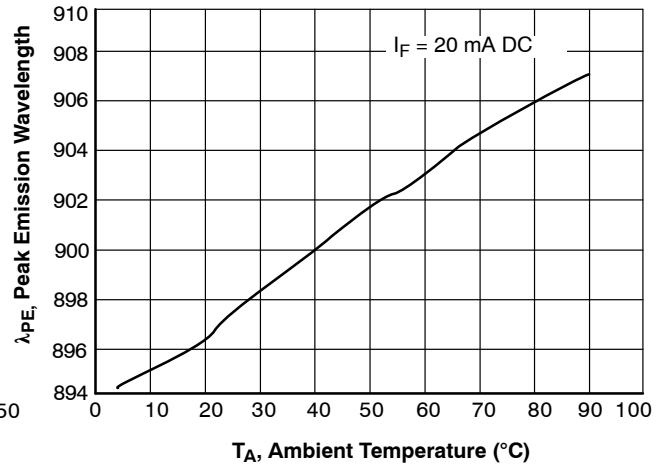


Figure 2. Peak Wavelength vs. Ambient Temperature

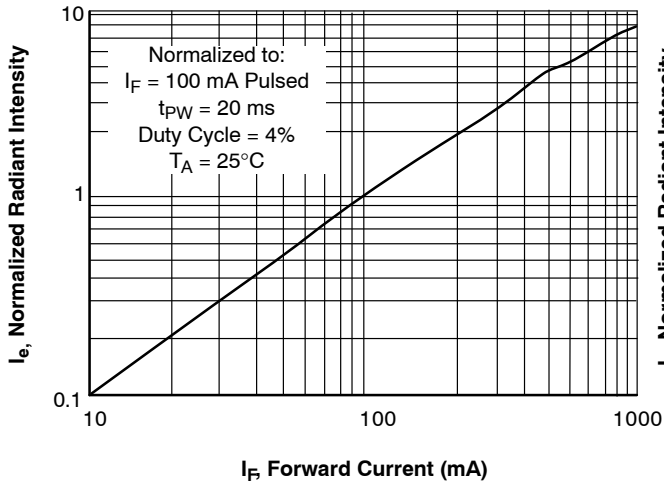


Figure 3. Normalized Radiant Intensity vs. Forward Current

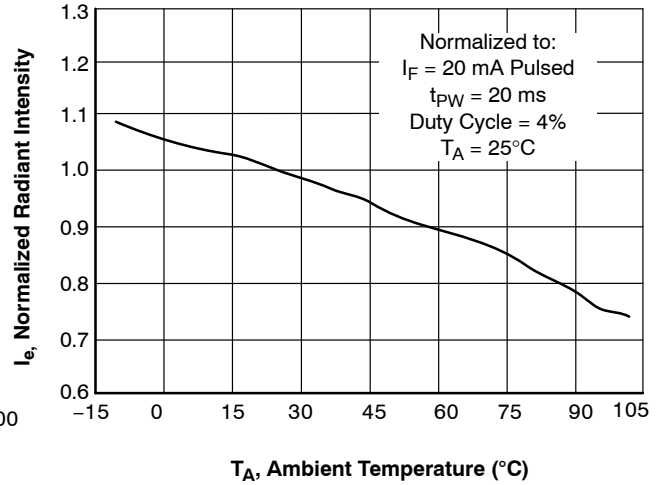


Figure 4. Normalized Radiant Intensity vs. Ambient Temperature

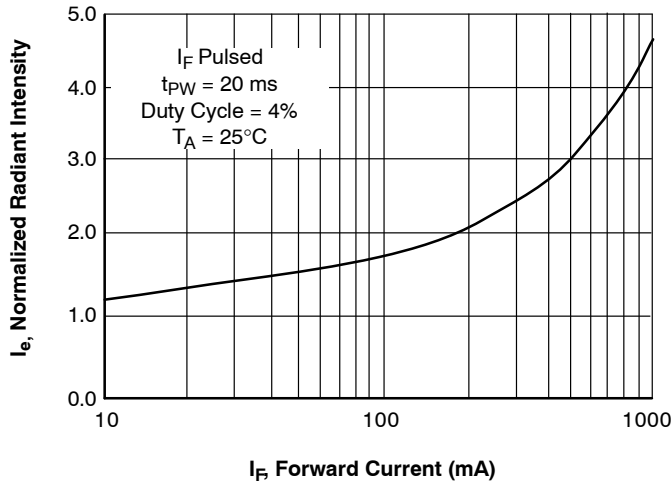


Figure 5. Forward Voltage vs. Forward Current

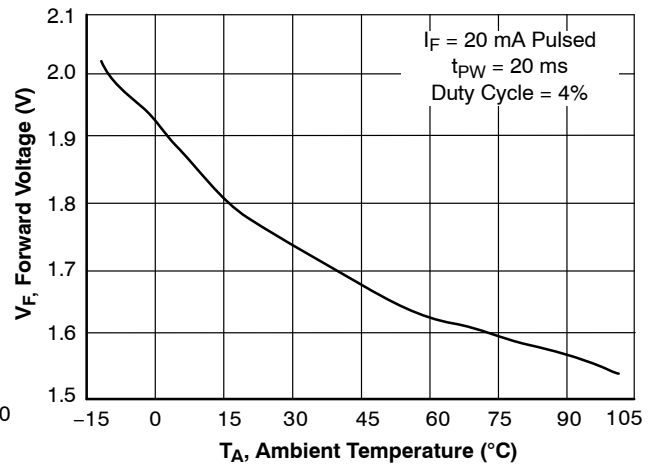
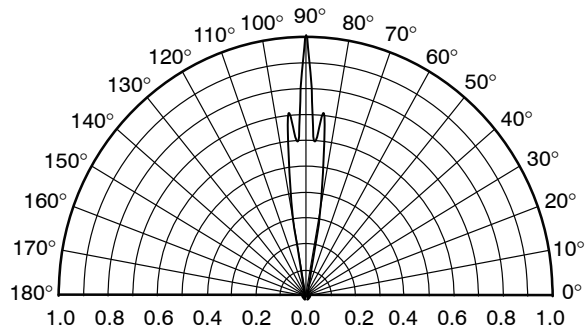
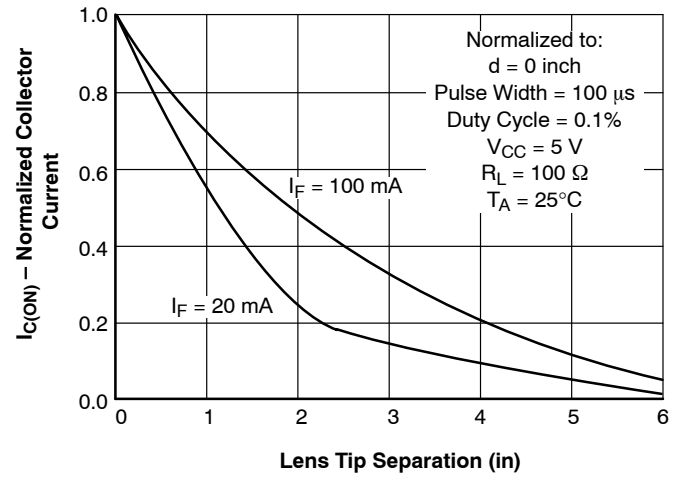


Figure 6. Forward Voltage vs. Ambient Temperature

**TYPICAL PERFORMANCE CURVES (continue)**



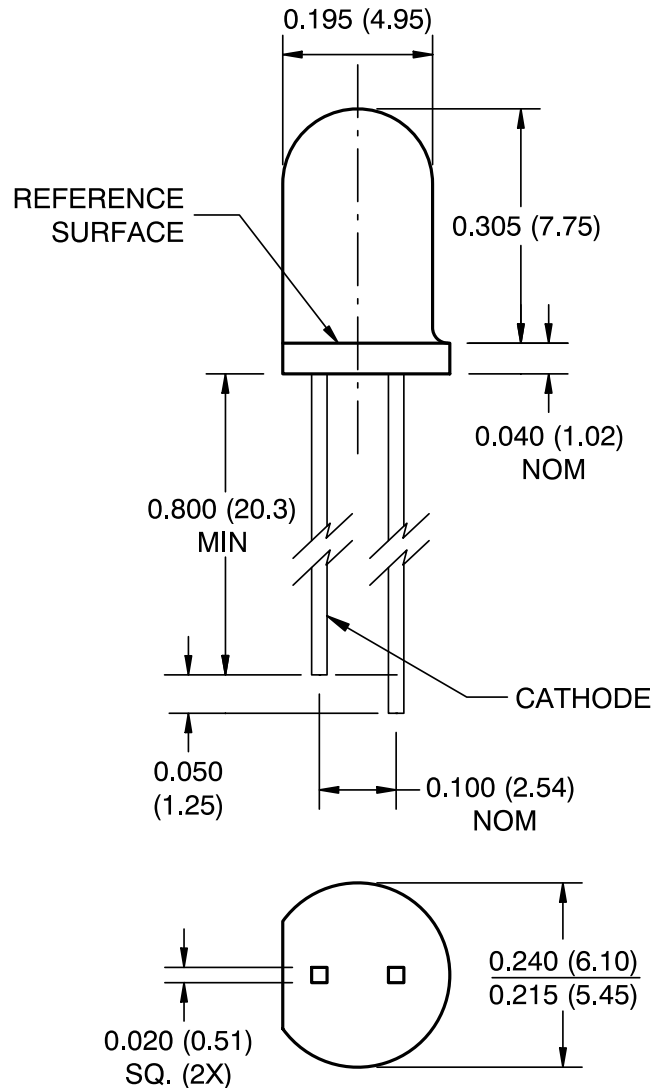
**Figure 7. Radiation Diagram**



**Figure 8. Coupling Characteristics of QED12X and QSD12X**

**T-1 3/4, 5MM LED**  
CASE 100CC  
ISSUE O

DATE 30 NOV 2016



**Notes:**

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of  $\pm 0.010$  (0.25) on all non-nominal dimensions unless otherwise specified.

|                         |                         |   |
|-------------------------|-------------------------|---|
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| <b>DESCRIPTION:</b>     | <b>T-1 3/4, 5MM LED</b> | <b>PAGE 1 OF 1</b>  |

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