

# QEC112, QEC113 Plastic Infrared Light Emitting Diode

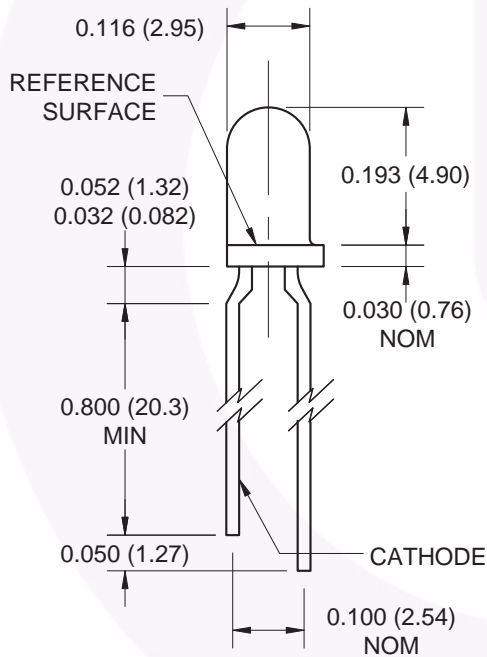
## Features

- $\lambda = 940\text{nm}$
- Chip material = GaAs
- Package type: T-1 (3 mm)
- Can be used with QSCXXX Photosensor
- Narrow Emission Angle,  $8^\circ$  at 80% intensity
- High Output Power
- Package material and color: Clear, peach tinted plastic

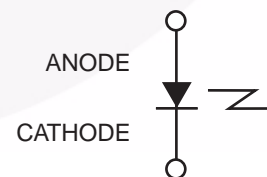
## Description

The QEC11X is an 940nm GaAs LED encapsulated in a clear peach tinted, plastic T-1 package.

## Package Dimensions



## Schematic



## Notes:

1. Dimensions of all drawings are in inches (mm).
2. Tolerance is  $\pm 0.010$  (.25) on all non-nominal dimensions unless otherwise specified.

**Absolute Maximum Ratings** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

| Symbol             | Parameter                                       | Rating         | Units            |
|--------------------|---|----------------|------------------|
| $T_{\text{OPR}}$   | Operating Temperature                           | -40 to +100    | $^\circ\text{C}$ |
| $T_{\text{STG}}$   | Storage Temperature                             | -40 to +100    | $^\circ\text{C}$ |
| $T_{\text{SOL-I}}$ | Soldering Temperature (Iron) <sup>(2,3,4)</sup> | 240 for 5 sec  | $^\circ\text{C}$ |
| $T_{\text{SOL-F}}$ | Soldering Temperature (Flow) <sup>(2,3)</sup>   | 260 for 10 sec | $^\circ\text{C}$ |
| $I_F$              | Continuous Forward Current                      | 50             | mA               |
| $V_R$              | Reverse Voltage                                 | 5              | V                |
| $P_D$              | Power Dissipation <sup>(1)</sup>                | 100            | mW               |

**Notes:**

- Derate power dissipation linearly 1.33mW/ $^\circ\text{C}$  above 25 $^\circ\text{C}$ .
- RMA flux is recommended.
- Methanol or isopropyl alcohols are recommended as cleaning agents.
- Soldering iron 1/16" (1.6mm) minimum from housing.

**Electrical / Optical Characteristics** ( $T_A = 25^\circ\text{C}$ )

| Symbol                | Parameter                | Test Conditions                            | Min. | Typ. | Max. | Units                |
|-----------------------|--------------------------|--|------|------|------|----------------------|
| $\lambda_{\text{PE}}$ | Peak Emission Wavelength | $I_F = 100\text{mA}$                       |      | 940  |      | nm                   |
| $\text{TC}_\lambda$   | Temperature Coefficient  |  |      | 0.3  |      | nm/ $^\circ\text{C}$ |
| $2\theta^{1/2}$       | Emission Angle           | $I_F = 100\text{mA}$                       |      | 18   |      | $^\circ$             |
| $V_F$                 | Forward Voltage          | $I_F = 100\text{mA}$ , $t_p = 20\text{ms}$ |      |      | 1.5  | V                    |
| $\text{TC}_{V_F}$     | Temperature Coefficient  |  |      | -2   |      | mV/ $^\circ\text{C}$ |
| $I_R$                 | Reverse Current          | $V_R = 5\text{V}$                          |      |      | 10   | $\mu\text{A}$        |
| $I_E$                 | Radiant Intensity QEC112 | $I_F = 100\text{mA}$ , $t_p = 20\text{ms}$ | 6    |      | 30   | mW/sr                |
| $I_E$                 | Radiant Intensity QEC113 | $I_F = 100\text{mA}$ , $t_p = 20\text{ms}$ | 14   | 40   |      | mW/sr                |
| $\text{TC}_{I_E}$     | Temperature Coefficient  |  |      | -0.7 |      | %/ $^\circ\text{C}$  |
| $t_r$                 | Rise Time                | $I_F = 100\text{mA}$                       |      | 800  |      | ns                   |
| $t_f$                 | Fall Time                |  |      | 800  |      | ns                   |
| $C_j$                 | Junction Capacitance     | $V_R = 0\text{V}$                          |      | 14   |      | pF                   |

## Typical Performance Curves

Fig. 1 Normalized Intensity vs. Wavelength

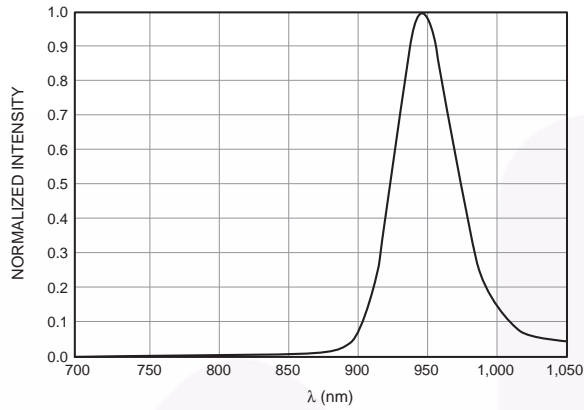


Fig. 2 Peak Wavelength vs. Ambient Temperature

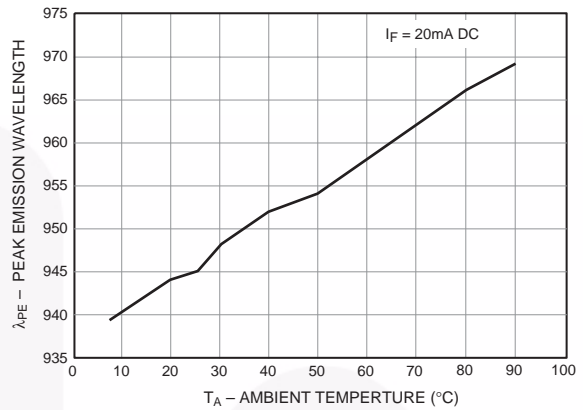


Fig. 3 Normalized Radiant Intensity vs. Forward Current

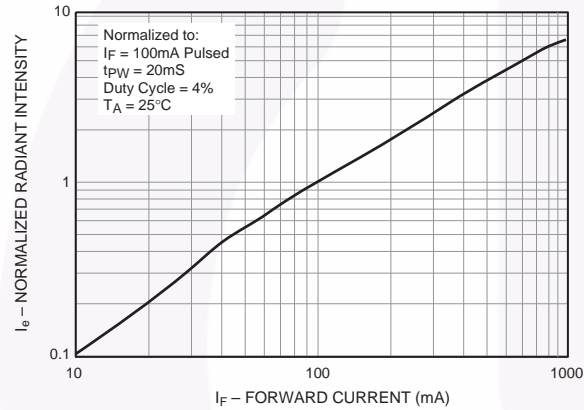


Fig. 4 Normalized Radiant Intensity vs. Ambient Temperature

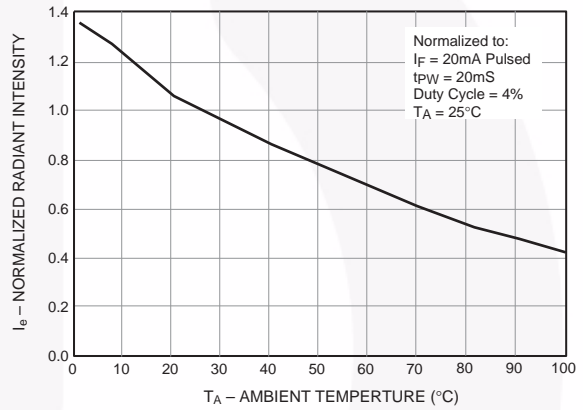


Fig. 5 Forward Voltage vs. Forward Current

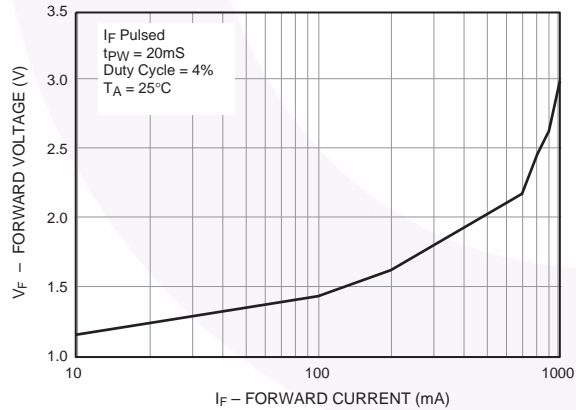
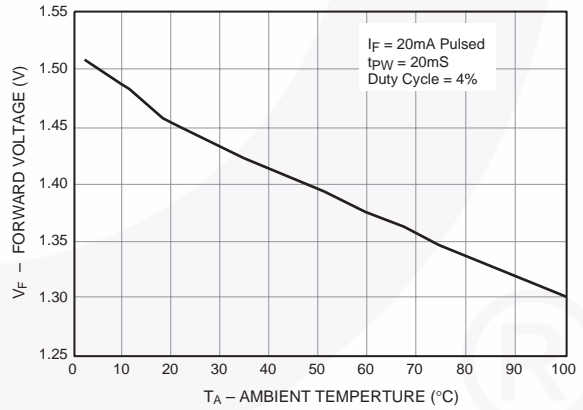
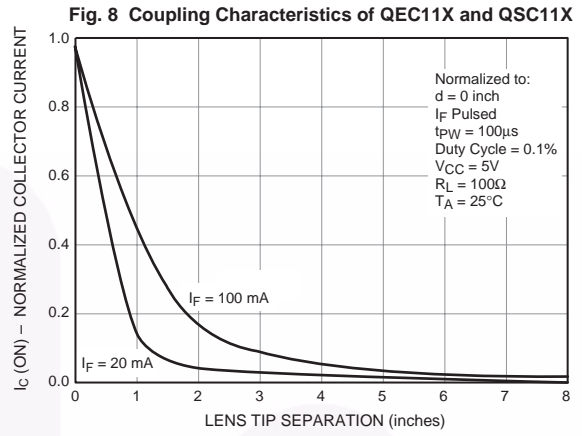
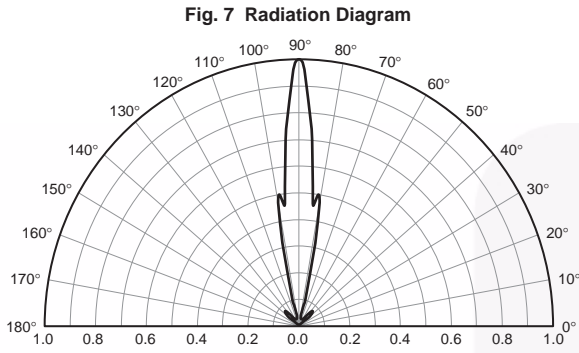


Fig. 6 Forward Voltage vs. Ambient Temperature








Typical Performance Curves (Continued)





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