

# QEC121, QEC122, QEC123 Plastic Infrared Light Emitting Diode

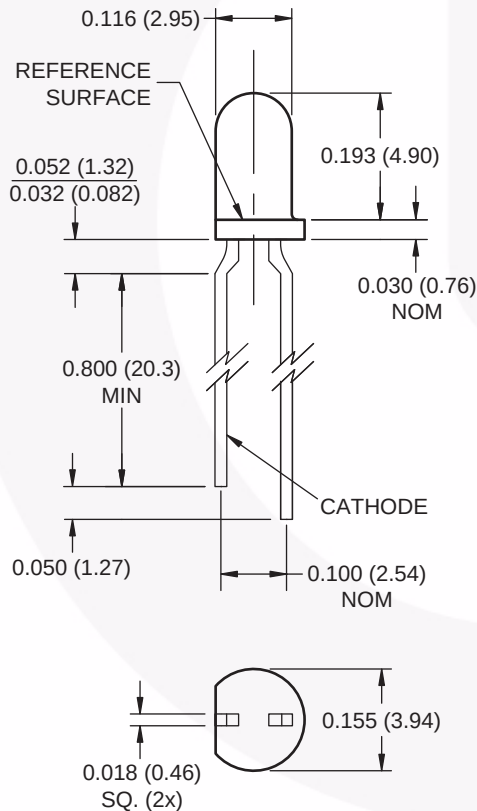
## Features

- $\lambda = 880\text{nm}$
- Chip material = AlGaAs
- Package type: T-1 (3mm)
- Matched photosensor: QSC112/QSC113/QSC114
- Narrow emission angle,  $8^\circ$  at 80% intensity
- High output power
- Package material and color: clear, purple tinted, plastic

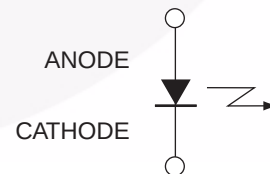
## Description

The QEC121, QEC122 and QEC123 are 880nm AlGaAs LED encapsulated in a clear purple tinted, plastic T-1 package.

## Package Dimensions



## Schematic



## Notes:

1. Dimensions of all drawings are in inches (mm).
2. Tolerance is  $\pm 0.10$  (0.25) 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            |
|-------------|---------------------------------------------------|----------------|------------------|
| $T_{OPR}$   | Operating Temperature                             | -40 to +100    | $^\circ\text{C}$ |
| $T_{STG}$   | Storage Temperature                               | -40 to +100    | $^\circ\text{C}$ |
| $T_{SOL-I}$ | Soldering Temperature (Iron) <sup>(2)(3)(4)</sup> | 240 for 5 sec  | $^\circ\text{C}$ |
| $T_{SOL-F}$ | 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:**

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

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

| Symbol          | Parameter                | Test Conditions                            | Min. | Typ. | Max. | Units                |
|-----------------|--------------------------|--------------------------------------------|------|------|------|----------------------|
| $\lambda_{PE}$  | Peak Emission Wavelength | $I_F = 100\text{mA}$                       |      | 890  |      | nm                   |
| $TC_\lambda$    | Temperature Coefficient  |                                            |      | 0.2  |      | nm/ $^\circ\text{C}$ |
| $2\theta^{1/2}$ | Emission Angle           | $I_F = 100\text{mA}$                       |      | 18   |      | $^\circ$             |
| $V_F$           | 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 QEC121 | $I_F = 100\text{mA}$ , $t_p = 20\text{ms}$ | 14   |      |      | mW/sr                |
| $I_E$           | Radiant Intensity QEC122 | $I_F = 100\text{mA}$ , $t_p = 20\text{ms}$ | 27   |      | 94   | mW/sr                |
| $I_E$           | Radiant Intensity QEC123 | $I_F = 100\text{mA}$ , $t_p = 20\text{ms}$ | 39   | 45   |      | 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                |                                            |      | 800  |      | ns                   |
| $C_j$           | Junction Capacitance     | $V_R = 0\text{V}$                          |      | 11   |      | pF                   |

## Typical Performance Curves

Figure 1. Normalized Intensity vs. Wavelength

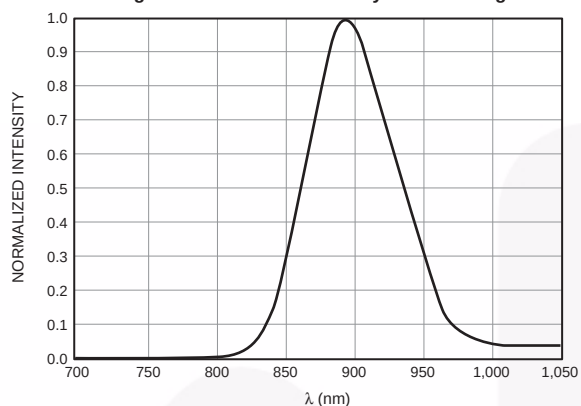


Figure 2. Peak Wavelength vs. Ambient Temperature

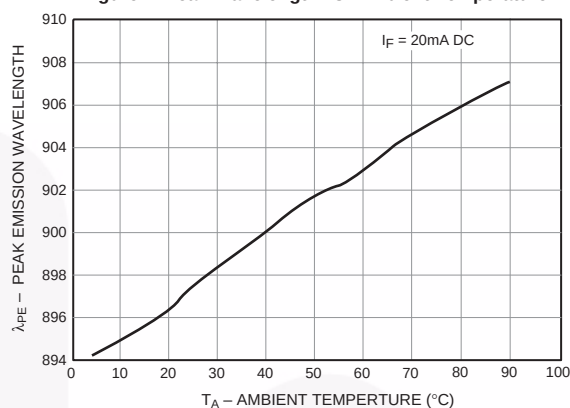


Figure 3. Normalized Radiant Intensity vs. Forward Current

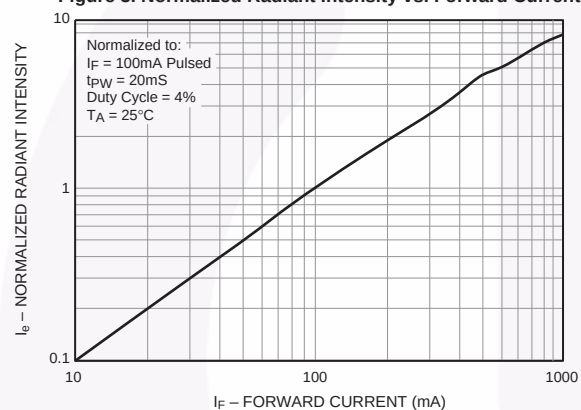


Figure 4. Normalized Radiant Intensity vs. Ambient Temperature

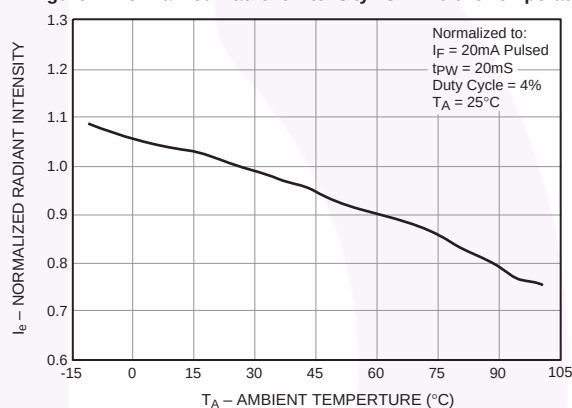


Figure 5. Forward Voltage vs. Forward Current

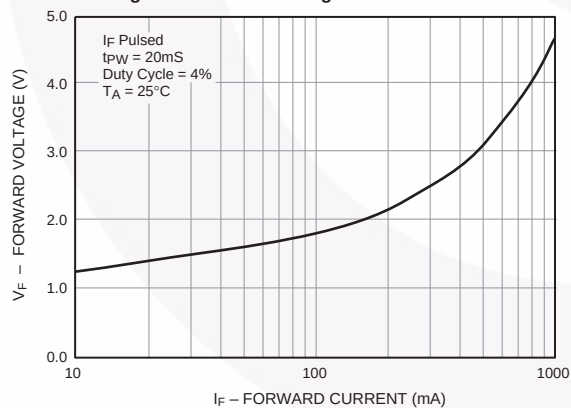
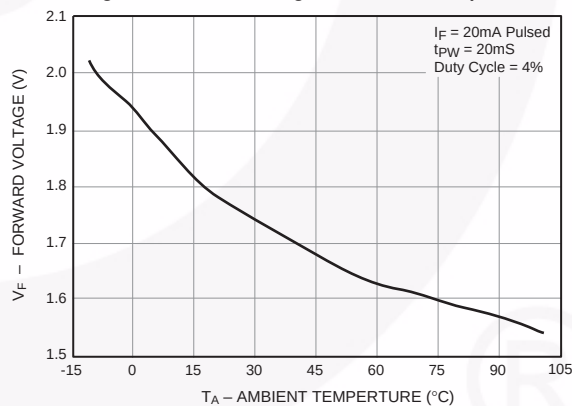


Figure 6. Forward Voltage vs. Ambient Temperature



## Typical Performance Curves (Continued)

Figure 7. Radiation Diagram

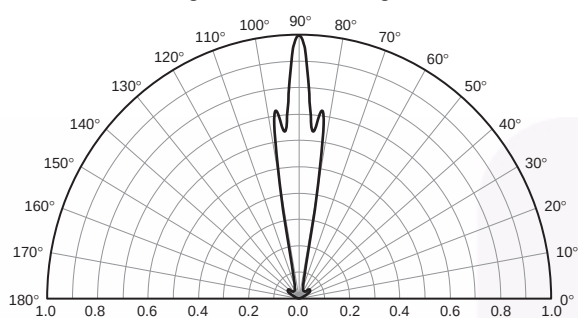
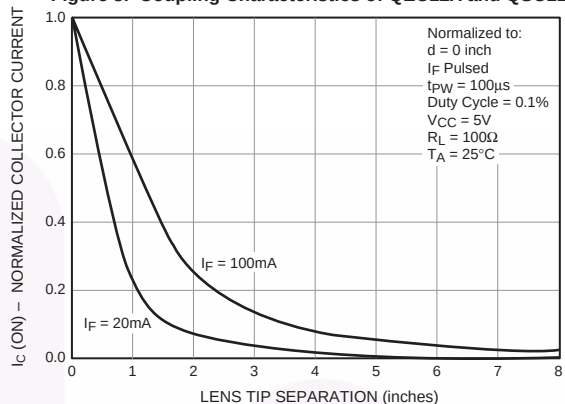


Figure 8. Coupling Characteristics of QEC12X and QSC11X





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