FAIRCHILD SEMICONDUCTOR®

August 2008

QEC121, QEC122, QEC123
Plastic Infrared Light Emitting Diode

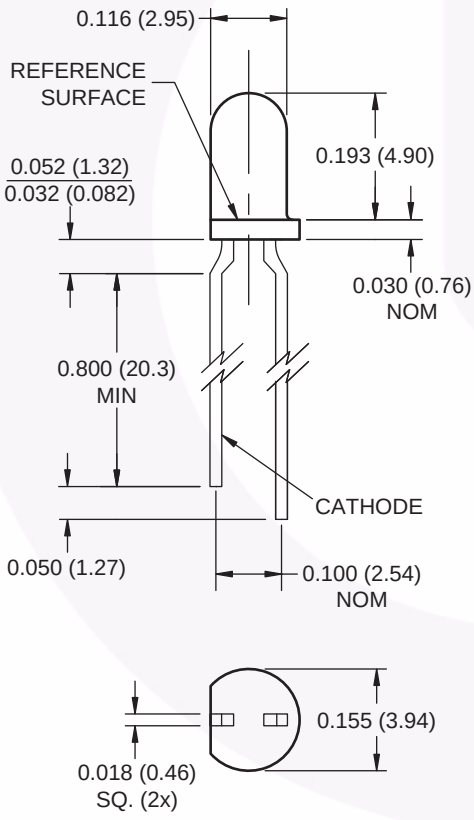
Features

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

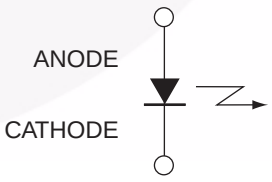
Description

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 ±0.10 (0.25) on all non-nominal dimensions unless otherwise specified.

Absolute Maximum Ratings (T_A = 25°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	°C
T_{STG}	Storage Temperature	-40 to +100	°C
T_{SOL-I}	Soldering Temperature (Iron)[2][3][4]	240 for 5 sec	°C
T_{SOL-F}	Soldering Temperature (Flow)[2][3]	260 for 10 sec	°C
I_F	Continuous Forward Current	50	mA
V_R	Reverse Voltage	5	V
P_D	Power Dissipation[1]	100	mW

Notes:

1. Derate power dissipation linearly 1.33mW/°C above 25°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°C)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
λ_{PE}	Peak Emission Wavelength	I_F = 100mA		890		nm
TC_λ	Temperature Coefficient			0.2		nm / °C
$2\Theta^1/2$	Emission Angle	I_F = 100mA		18		°
V_F	Forward Voltage	I_F = 100mA, tp = 20ms			1.7	V
TC_{VF}	Temperature Coefficient			-6		mV / °C
I_R	Reverse Current	V_R = 5V			10	µA
I_E	Radiant Intensity QEC121	I_F = 100mA, tp = 20ms	14			mW/sr
I_E	Radiant Intensity QEC122	I_F = 100mA, tp = 20ms	27		94	mW/sr
I_E	Radiant Intensity QEC123	I_F = 100mA, tp = 20ms	39	45		mW/sr
TC_{IE}	Temperature Coefficient			-0.3		% / °C
t_r	Rise Time	I_F = 100mA		900		ns
t_f	Fall Time			800		ns
C_j	Junction Capacitance	V_R = 0V		11		pF

Typical Performance Curves

Figure 1. Normalized Intensity vs. Wavelength

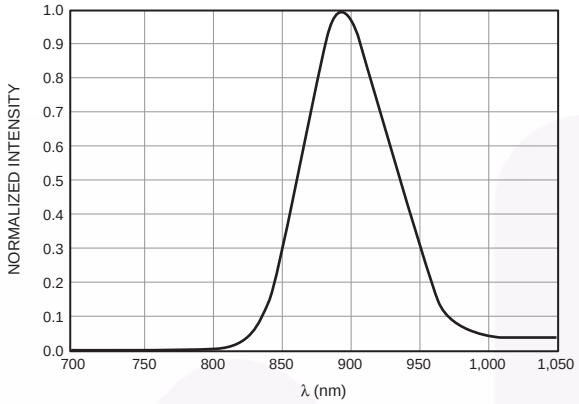


Figure 2. Peak Wavelength vs. Ambient Temperature

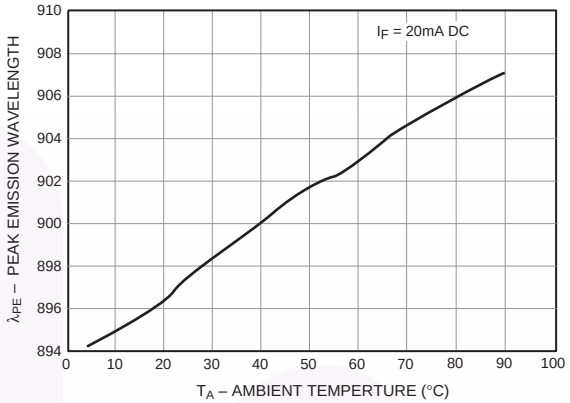


Figure 3. Normalized Radiant Intensity vs. Forward Current

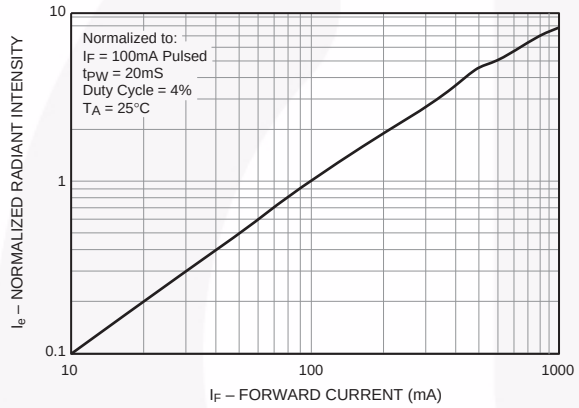


Figure 4. Normalized Radient Intensity vs. Ambient Temperature

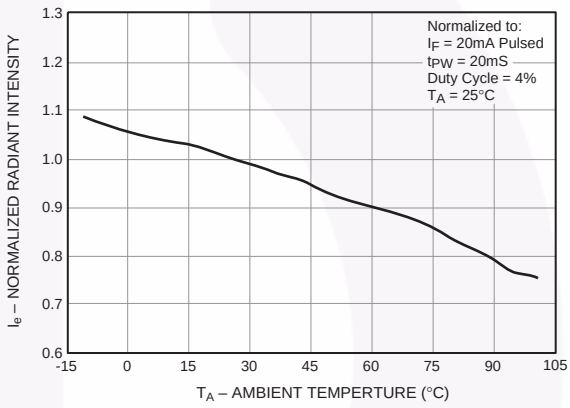


Figure 5. Forward Voltage vs. Forward Current

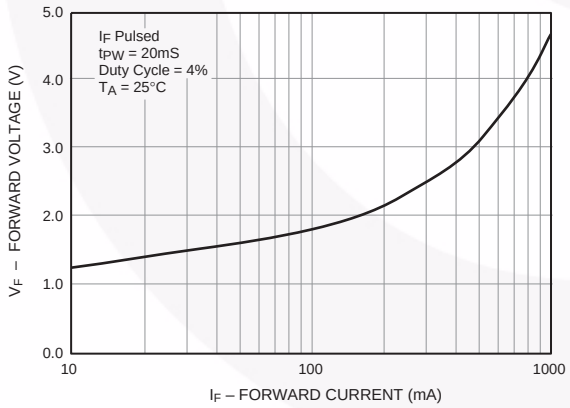
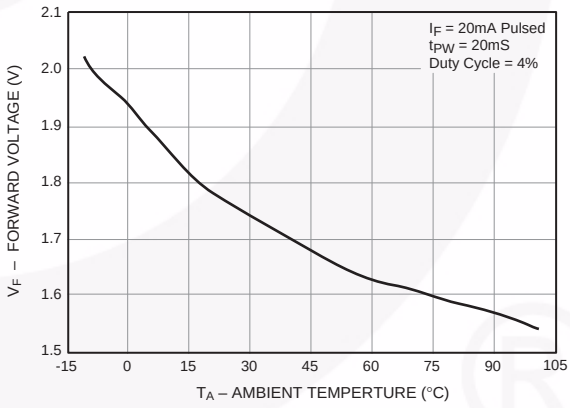


Figure 6. Forward Voltage vs. Ambient Temperature



Typical Performance Curves (Continued)

Figure 7. Radiation Diagram

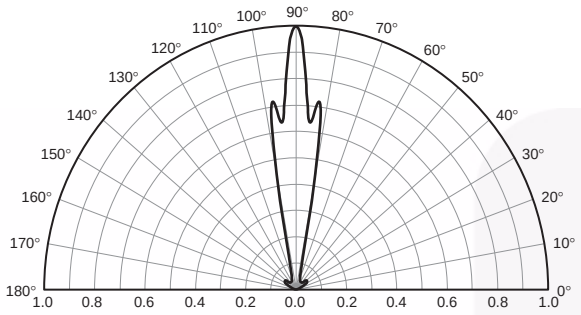
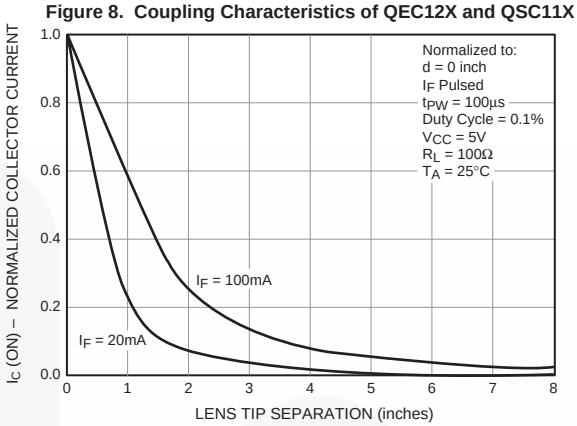


Figure 8. Coupling Characteristics of QEC12X and QSC11X



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