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May 2015

QEE113 — Plastic Infrared Light Emitting Diode

# QEE113 Plastic Infrared Light Emitting Diode

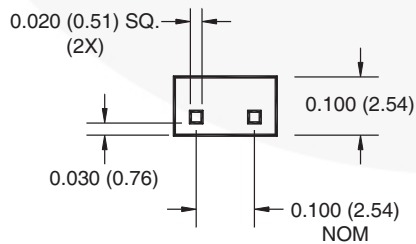
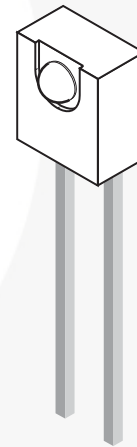
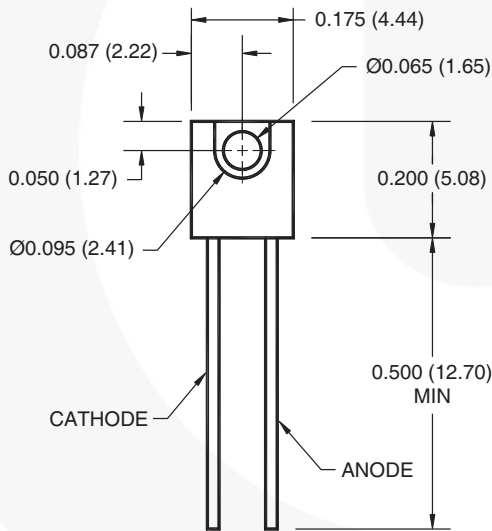
## Features

- $\lambda = 940 \text{ nm}$
- Package Type = Sidelooker
- Chip Material = GaAs
- Matched Photosensor: QSE113
- Medium Wide Emission Angle,  $50^\circ$
- Package Material: Clear Epoxy
- High Output Power
- Gray dot marking on the top side

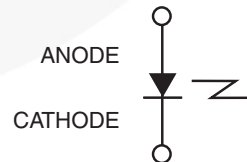
## Description

The QEE113 is a 940 nm GaAs LED encapsulated in a medium wide angle, plastic sidelooker package.

## Package Dimensions<sup>(1, 2)</sup>



## Schematic



## 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.

## Absolute Maximum Ratings

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. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$T_{\text{OPR}}$	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>(4, 5, 6)</sup>	240 for 5 sec	$^\circ\text{C}$
$T_{\text{SOL-F}}$	Soldering Temperature (Flow) <sup>(4, 5)</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>(3)</sup>	100	mW

### Notes:

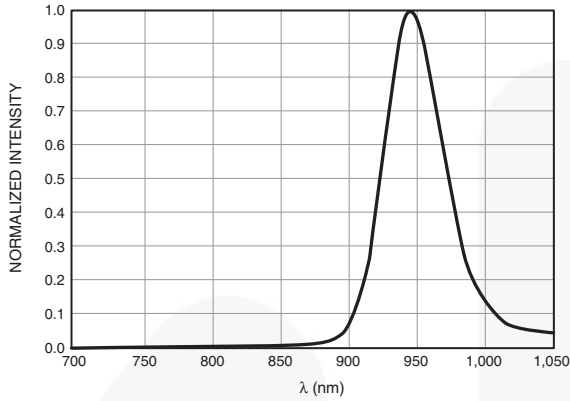
- Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
- RMA flux is recommended.
- Methanol or isopropyl alcohols are recommended as cleaning agents.
- Soldering iron 1/16" (1.6mm) minimum from housing.

## Electrical / Optical Characteristics

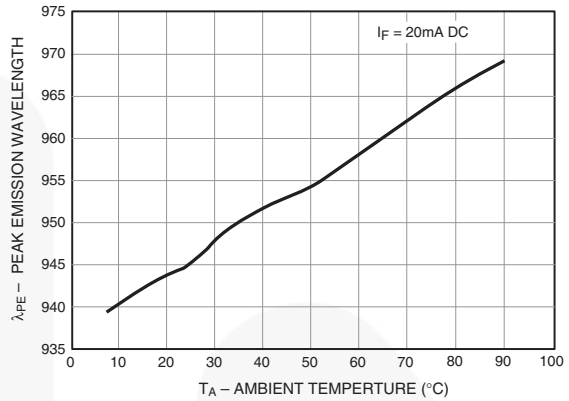
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$\lambda_{\text{PE}}$	Peak Emission Wavelength	$I_F = 20 \text{ mA}$		945		nm
$\text{TC}_\lambda$	Temperature Coefficient			0.3		nm/ $^\circ\text{C}$
$2\theta^{1/2}$	Emission Angle	$I_F = 100 \text{ mA}$		50		$^\circ$
$V_F$	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	$I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$	3	7.5	12	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

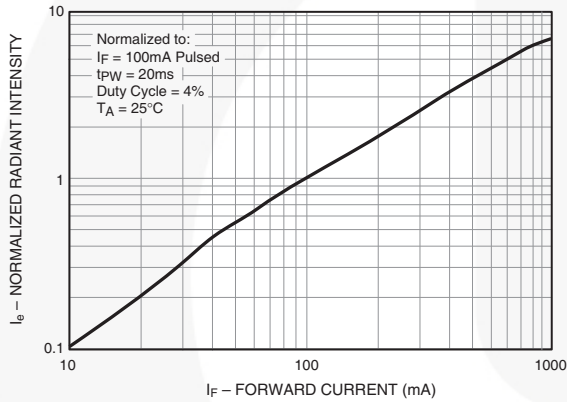
## Typical Performance Characteristics



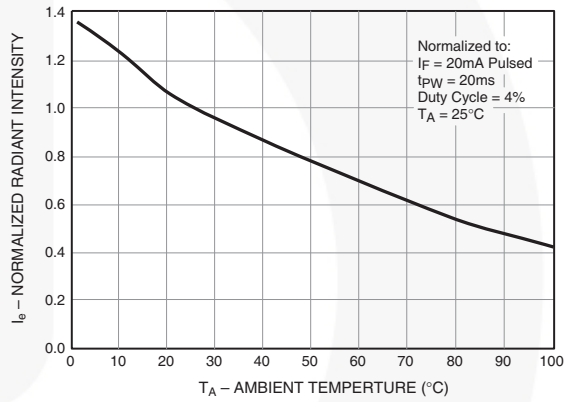
**Figure 1. Normalized Intensity vs. Wavelength**



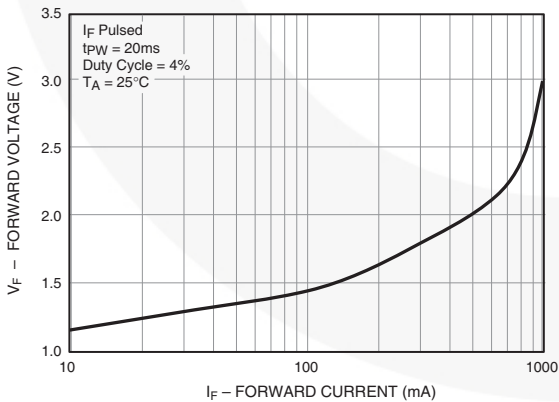
**Figure 2. Peak Wavelength vs. Ambient Temperature**



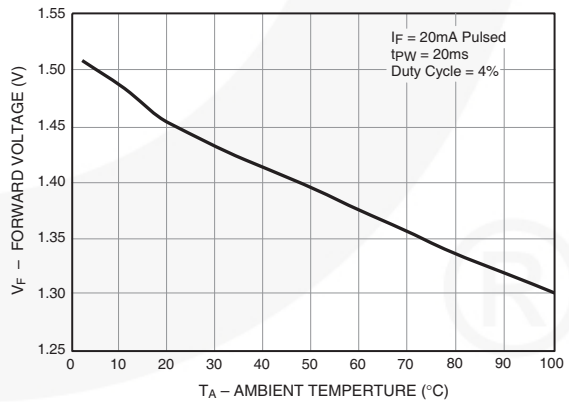
**Figure 3. Normalized Radiant Intensity vs. Forward Current**



**Figure 4. Normalized Radiant Intensity vs. Ambient Temperature**



**Figure 5. Forward Voltage vs. Forward Current**



**Figure 6. Forward Voltage vs. Ambient Temperature**

Typical Performance Characteristics (Continued)

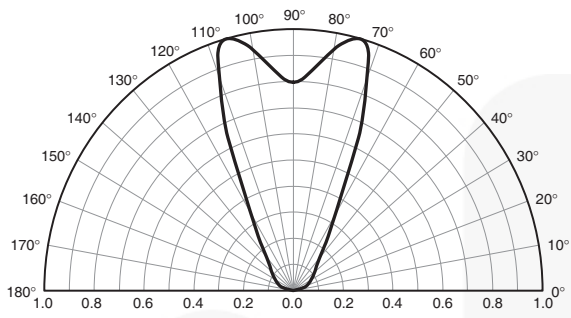


Figure 7. Radiation Diagram

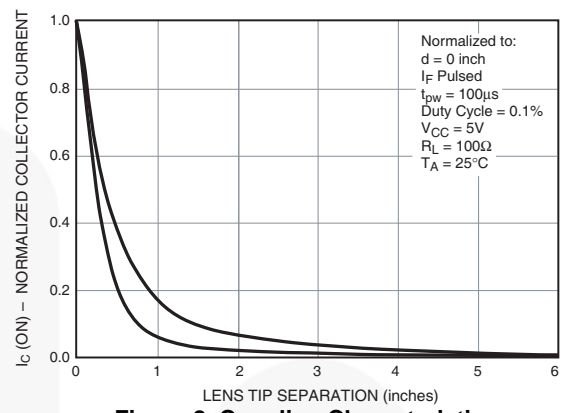


Figure 8. Coupling Characteristics of QEE113 and QSE113



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