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# QSC112, QSC113, QSC114 Plastic Silicon Infrared Phototransistor

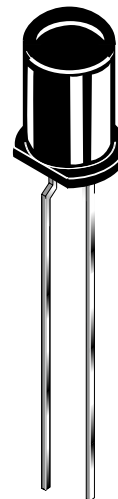
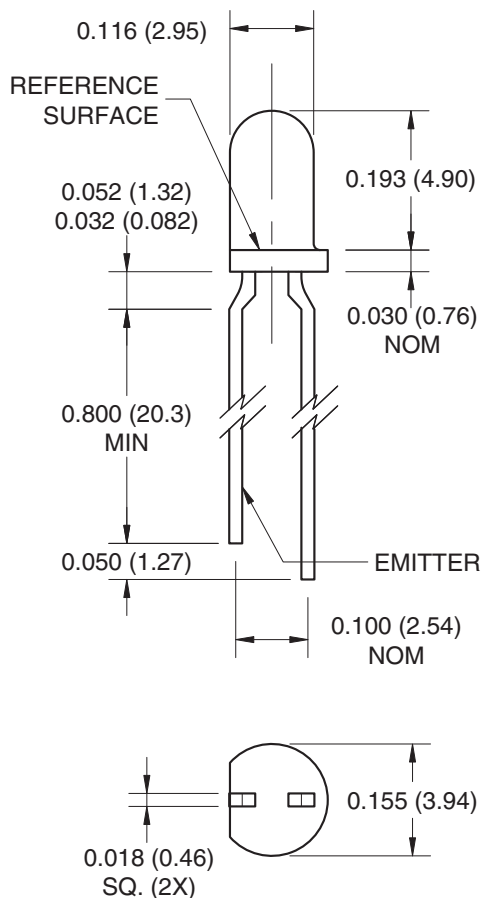
## Features

- Tight production distribution
- Steel lead frames for improved reliability in solder mounting
- Good optical-to-mechanical alignment
- Plastic package is infrared transparent black to attenuate visible light
- Can be used with QECXXX LED
- Black plastic body allows easy recognition from LED

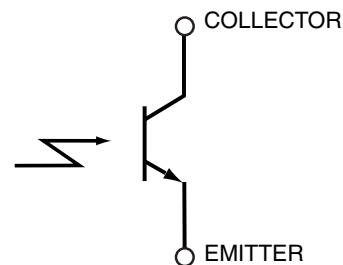
## Description

The QSC112/113/114 is a silicon phototransistor encapsulated in an infrared transparent, black T-1 package.

## Package Dimensions



## Schematic



## Notes:

1. Dimensions of all drawings are in inches (mm).
2. Tolerance is  $\pm 0.10$  (.25) on all non-nominal dimensions unless otherwise specified.

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

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	$^\circ\text{C}$
$V_{\text{CE}}$	Collector-Emitter Voltage	30	V
$V_{\text{EC}}$	Emitter-Collector Voltage	5	V
$P_D$	Power Dissipation <sup>(1)</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** ( $T_A = 25^\circ\text{C}$ )

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$\lambda_{\text{PS}}$	Peak Sensitivity Wavelength			880		nm
$\Theta$	Reception Angle			$\pm 4$		$^\circ$
$I_{\text{CEO}}$	Collector-Emitter Dark Current	$V_{\text{CE}} = 10 \text{ V}, E_e = 0$			100	nA
$BV_{\text{CEO}}$	Collector-Emitter Breakdown	$I_C = 1 \text{ mA}$	30			V
$BV_{\text{ECO}}$	Emitter-Collector Breakdown	$I_E = 100 \mu\text{A}$	5			V
$I_{\text{C(ON)}}$	On-State Collector Current QSC112	$E_e = 0.5 \text{ mW/cm}^2, V_{\text{CE}} = 5 \text{ V}^{(5)}$	1		4	mA
	On-State Collector Current QSC113		2.40		9.60	
	On-State Collector Current QSC114		4.00			
$V_{\text{CE(sat)}}$	Saturation Voltage	$E_e = 0.5 \text{ mW/cm}^2, I_C = 0.5 \text{ mA}^{(5)}$			0.4	V
$t_r$	Rise Time	$V_{\text{CC}} = 5 \text{ V}, R_L = 100 \Omega, I_C = 2 \text{ mA}$		5.0		$\mu\text{s}$
$t_f$	Fall Time			5.0		

**Note:**

- $\lambda = 880 \text{ nm}$ , AlGaAs.

## Typical Performance Curves

Figure 1. Light Current vs. Radiant Intensity

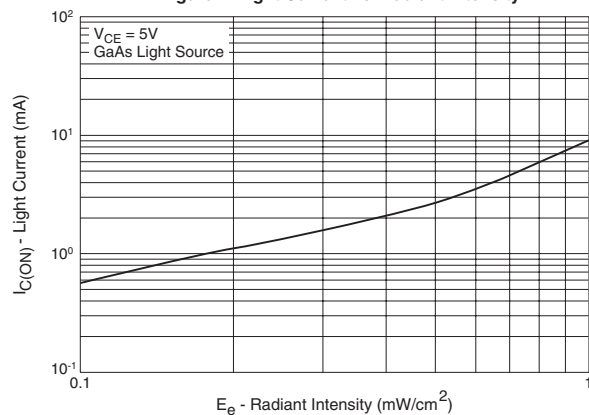


Figure 2. Angular Response Curve

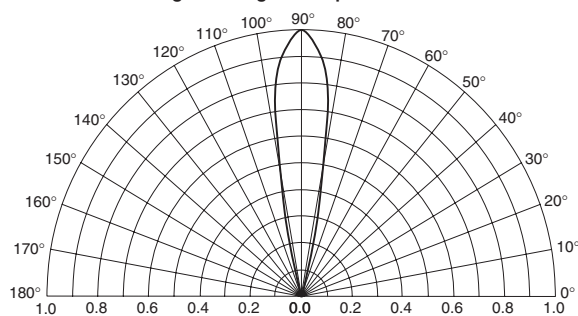


Figure 3. Dark Current vs. Collector - Emitter Voltage

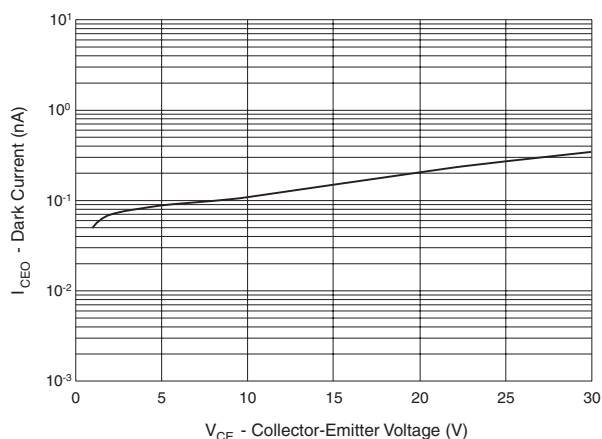


Figure 4. Light Current vs. Collector - Emitter Voltage

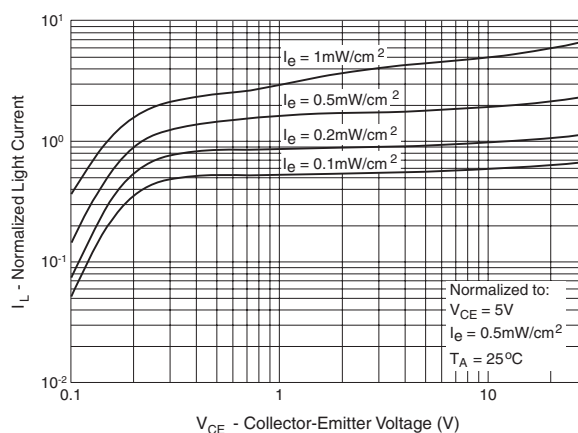
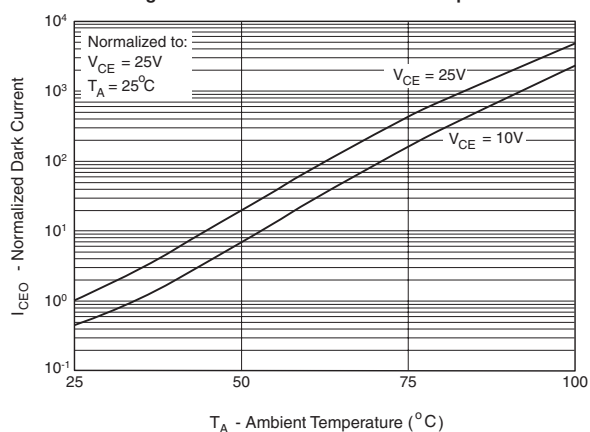



Figure 5. Dark Current vs. Ambient Temperature





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