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QSC112, QSC113, QSC114 Plastic Silicon Infrared Phototransistor

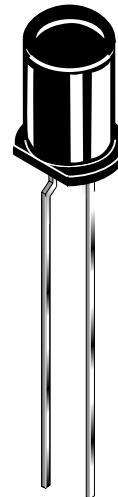
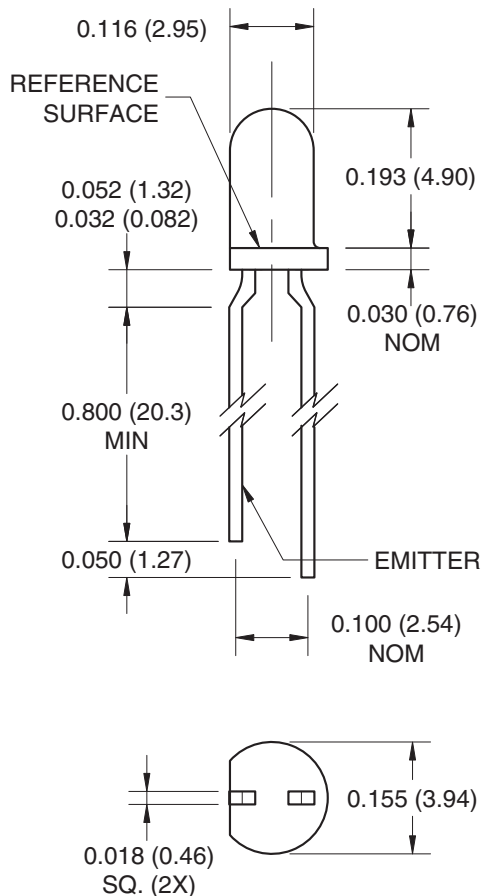
Features

- 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

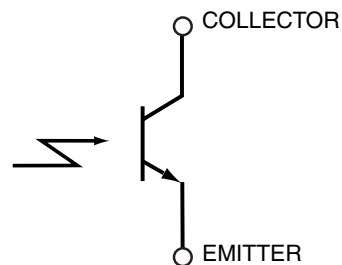
Description

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 ± 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_{OPR}	Operating Temperature	-40 to +100	$^\circ\text{C}$
T_{STG}	Storage Temperature	-40 to +100	$^\circ\text{C}$
$T_{\text{SOL-I}}$	Soldering Temperature (Iron) ^(2,3,4)	240 for 5 sec	$^\circ\text{C}$
$T_{\text{SOL-F}}$	Soldering Temperature (Flow) ^(2,3)	260 for 10 sec	$^\circ\text{C}$
V_{CE}	Collector-Emitter Voltage	30	V
V_{EC}	Emitter-Collector Voltage	5	V
P_{D}	Power Dissipation ⁽¹⁾	100	mW

Notes:

- Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$ above 25°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
λ_{PS}	Peak Sensitivity Wavelength			880		nm
Θ	Reception Angle			± 4		$^\circ$
I_{CEO}	Collector-Emitter Dark Current	$V_{\text{CE}} = 10 \text{ V}, E_e = 0$			100	nA
BV_{CEO}	Collector-Emitter Breakdown	$I_{\text{C}} = 1 \text{ mA}$	30			V
BV_{ECO}	Emitter-Collector Breakdown	$I_{\text{E}} = 100 \mu\text{A}$	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	$E_e = 0.5 \text{ mW/cm}^2, I_{\text{C}} = 0.5 \text{ mA}^{(5)}$			0.4	V
t_{r}	Rise Time	$V_{\text{CC}} = 5 \text{ V}, R_{\text{L}} = 100 \Omega, I_{\text{C}} = 2 \text{ mA}$		5.0		μs
t_{f}	Fall Time			5.0		

Note:

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

Typical Performance Curves

Figure 1. Light Current vs. Radiant Intensity

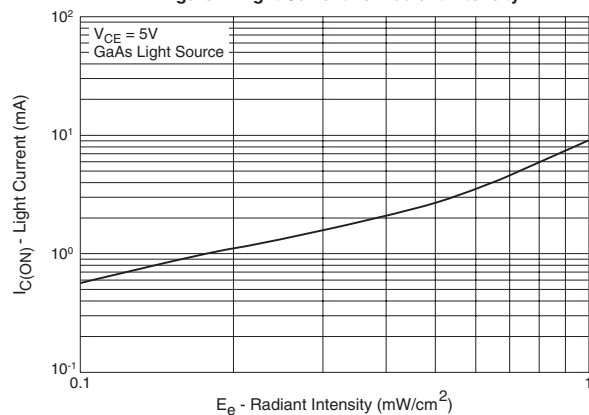


Figure 2. Angular Response Curve

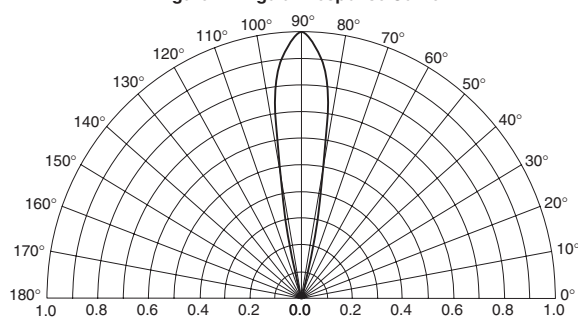


Figure 3. Dark Current vs. Collector - Emitter Voltage

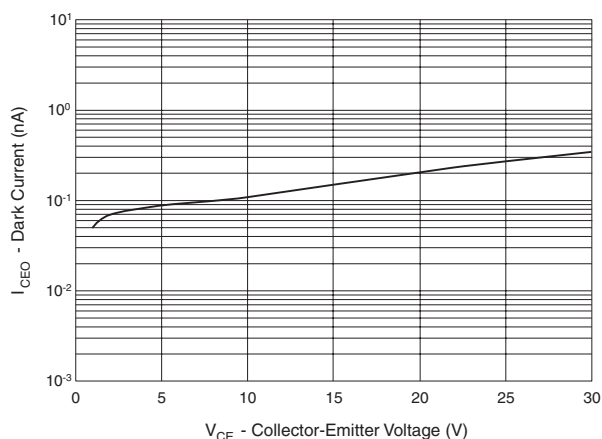


Figure 4. Light Current vs. Collector - Emitter Voltage

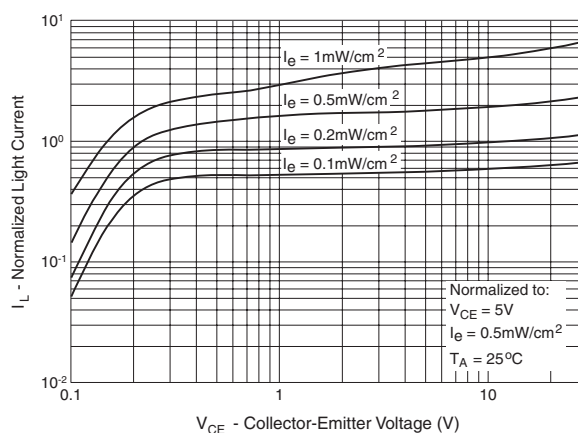
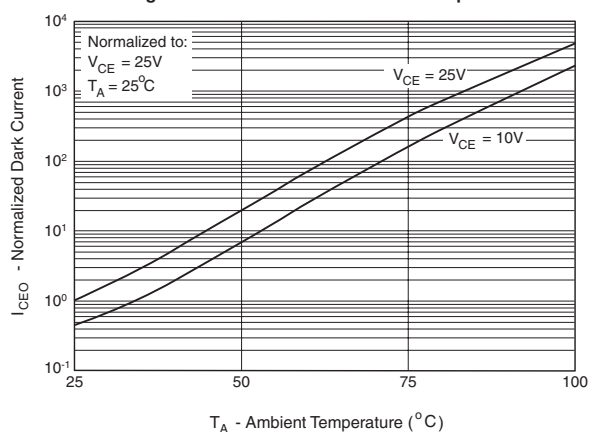


Figure 5. Dark Current vs. Ambient Temperature





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