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QSC112, QSC113, QSC114 Plastic Silicon Infrared Phototransistor

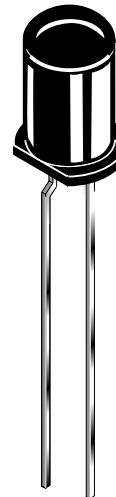
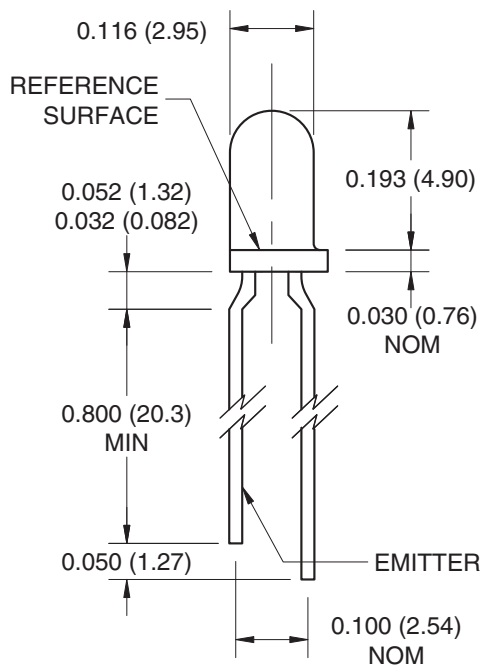
Features

- 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

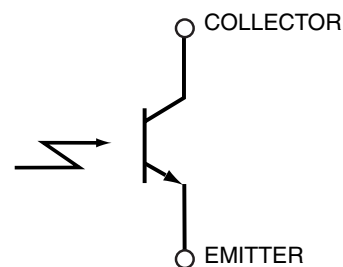
Description

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_{SOL-I}	Soldering Temperature (Iron) ^(2,3,4)	240 for 5 sec	$^\circ\text{C}$
T_{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 $^\circ\text{C}$.
- 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
λ_{PS}	Peak Sensitivity Wavelength			880		nm
Θ	Reception Angle			± 4		$^\circ$
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 10\text{ V}, E_e = 0$			100	nA
BV_{CEO}	Collector-Emitter Breakdown	$I_C = 1\text{ mA}$	30			V
BV_{ECO}	Emitter-Collector Breakdown	$I_E = 100\ \mu\text{A}$	5			V
$I_{C(ON)}$	On-State Collector Current QSC112	$E_e = 0.5\text{ mW/cm}^2, V_{CE} = 5\text{ V}^{(5)}$	1		4	mA
	On-State Collector Current QSC113		2.40		9.60	
	On-State Collector Current QSC114		4.00			
$V_{CE(sat)}$	Saturation Voltage	$E_e = 0.5\text{ mW/cm}^2, I_C = 0.5\text{ mA}^{(5)}$			0.4	V
t_r	Rise Time	$V_{CC} = 5\text{ V}, R_L = 100\ \Omega, I_C = 2\text{ mA}$		5.0		μs
t_f	Fall Time			5.0		

Note:

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

Typical Performance Curves

Figure 1. Light Current vs. Radiant Intensity

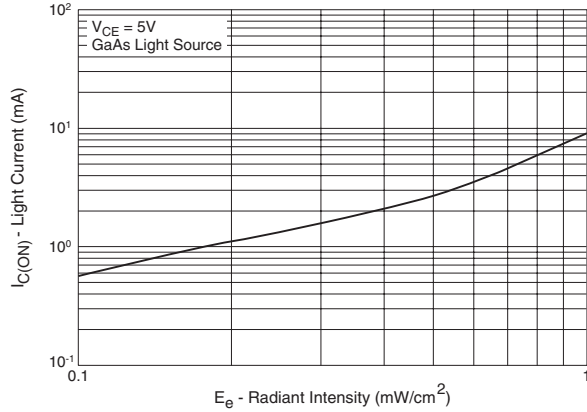


Figure 2. Angular Response Curve

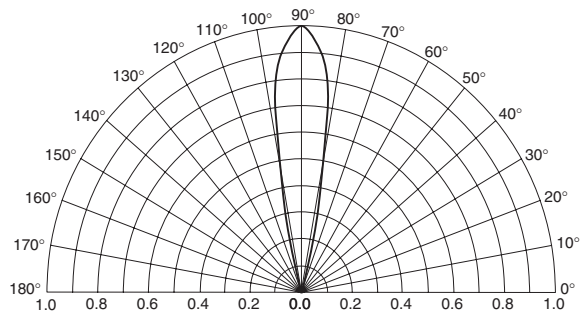


Figure 3. Dark Current vs. Collector - Emitter Voltage

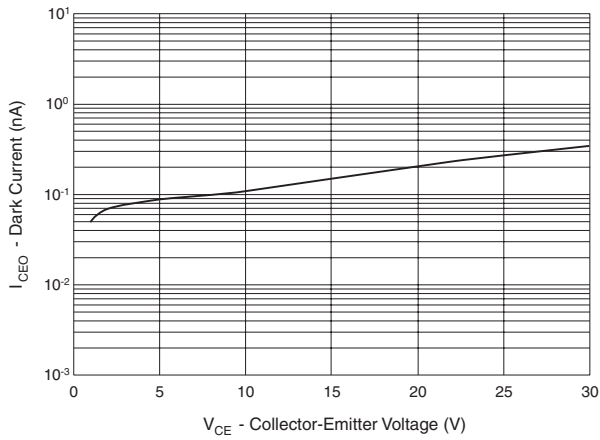


Figure 4. Light Current vs. Collector - Emitter Voltage

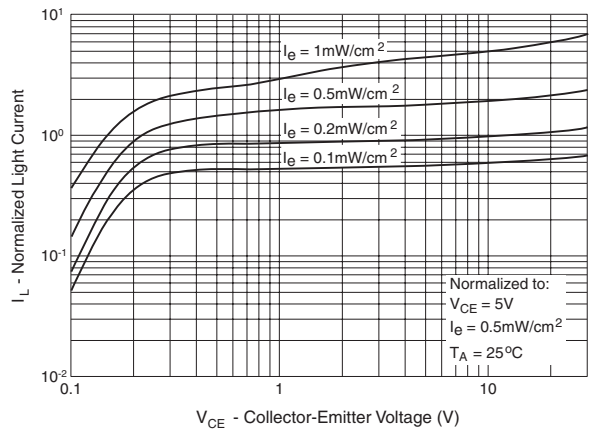
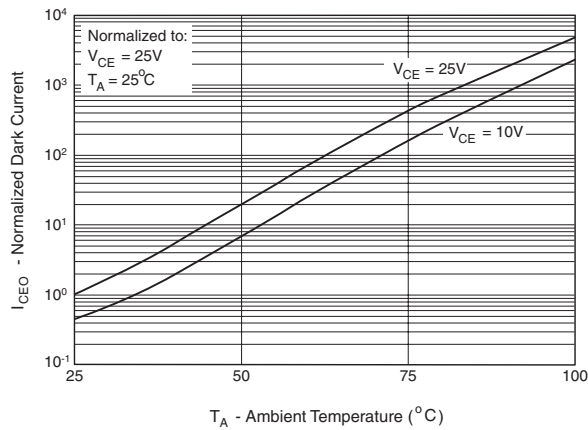



Figure 5. Dark Current vs. Ambient Temperature



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