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April 2007

QSC112, QSC113, QSC114
Plastic Silicon Infrared Phototransistor

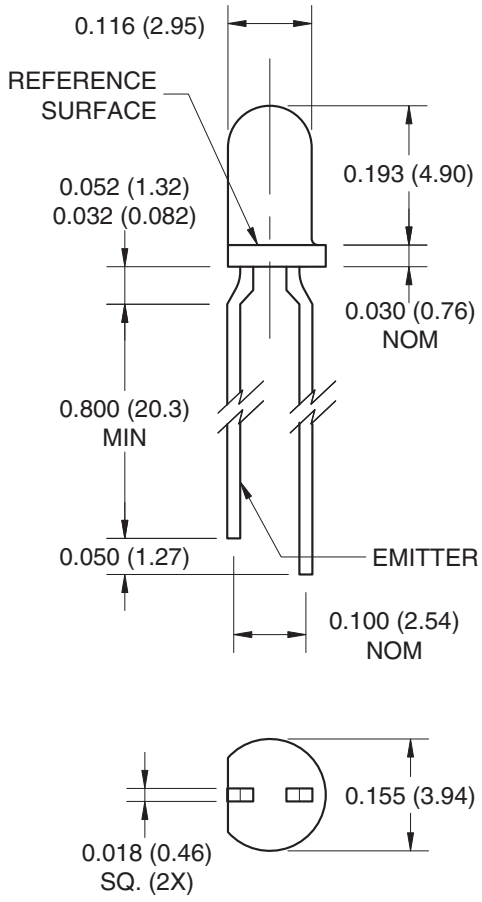
Features

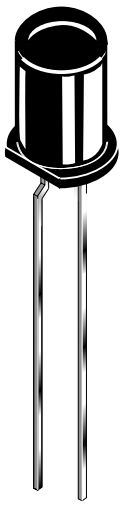
- Tight production distribution
- Steel lead frames for improved reliability in solder mounting
- Good optical-to-mechanical alignment
- Plastic package is infrared transparent black to attenuate visible light
- Can be used with QECXXX LED
- Black plastic body allows easy recognition from LED

Description

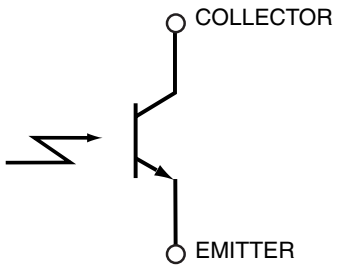
The QSC112/113/114 is a silicon phototransistor encapsulated in an infrared transparent, black T-1 package.

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°C unless otherwise specified)

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
V_{CE}	Collector-Emitter Voltage	30	V
V_{EC}	Emitter-Collector Voltage	5	V
P_D	Power Dissipation[1]	100	mW

Notes:

1. Derate power dissipation linearly 1.33 mW/°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_{PS}	Peak Sensitivity Wavelength			880		nm
Θ	Reception Angle			±4		°
I_{CEO}	Collector-Emitter Dark Current	V_{CE} = 10 V, Ee = 0			100	nA
BV_{CEO}	Collector-Emitter Breakdown	I_C = 1 mA	30			V
BV_{ECO}	Emitter-Collector Breakdown	I_E = 100 µA	5			V
$I_{C(ON)}$	On-State Collector Current QSC112	Ee = 0.5 mW/cm^2, V_{CE} = 5 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	Ee = 0.5 mW/cm^2, I_C = 0.5 mA[5]			0.4	V
t_r	Rise Time	V_{CC} = 5 V, R_L = 100 Ω, I_C = 2 mA		5.0		µs
t_f	Fall Time			5.0		

Note:

5. λ = 880 nm, AlGaAs.

Typical Performance Curves

Figure 1. Light Current vs. Radiant Intensity

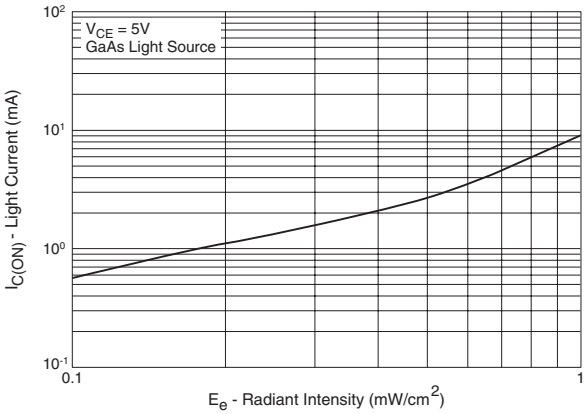


Figure 2. Angular Response Curve

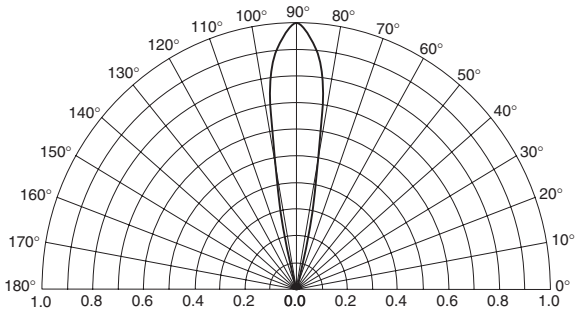


Figure 3. Dark Current vs. Collector - Emitter Voltage

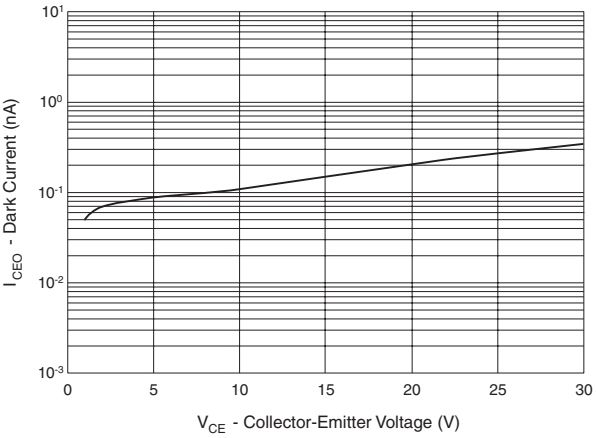


Figure 4. Light Current vs. Collector - Emitter Voltage

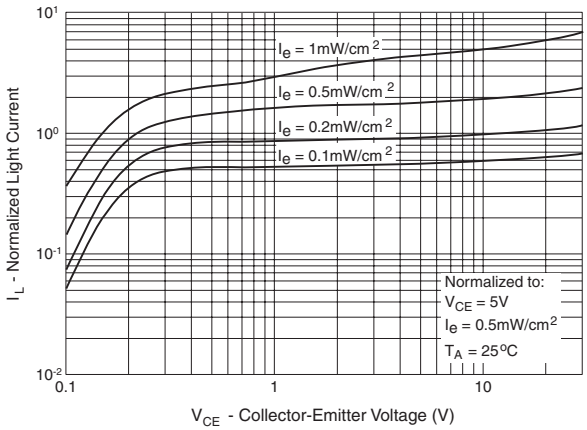
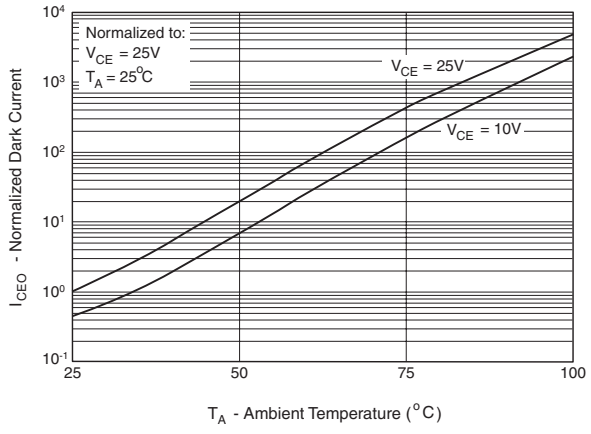


Figure 5. Dark Current vs. Ambient Temperature



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