FAIRCHILD SEMICONDUCTOR®

September 2012

QSD122, QSD123, QSD124
Plastic Silicon Infrared Phototransistor

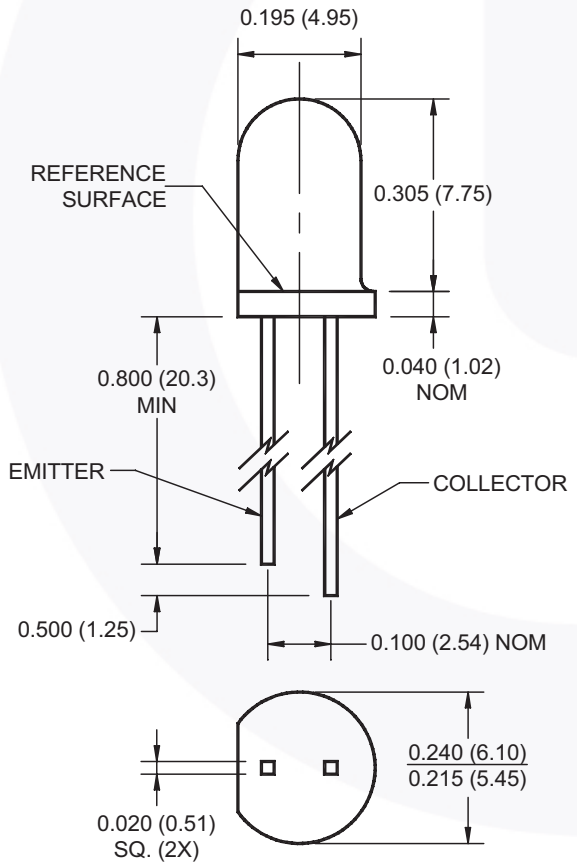
Features

- NPN Silicon Phototransistor
- Package Type: T-1 3/4
- Matched Emitter: QED12X/QED22X/QED23X
- Narrow Reception Angle: 24°C
- Daylight Filter
- Package Material and Color: Black Epoxy
- High Sensitivity

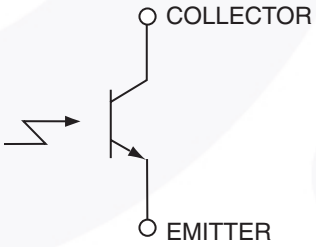
Description

The QSD122/123/124 is a phototransistor encapsulated in an infrared transparent, black T-1 3/4 package.

Package Dimensions



Schematic



Notes:
1. Dimensions for all drawings are in inches (mm).
2. Tolerance of ±0.010 (0.25) on all non-nominal dimensions unless otherwise specified.

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Absolute Maximum Ratings (T_A = 25°C unless otherwise specified)

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.

Symbol	Parameter	Rating	Unit
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 1.33mW/°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.
5. λ = 880nm, AlGaAs.

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			±12		°
I_{CEO}	Collector-Emitter Dark Current	V_{CE} = 10V, Ee = 0			100	nA
BV_{CEO}	Collector-Emitter Breakdown	I_C = 1mA	30			V
BV_{ECO}	Emitter-Collector Breakdown	I_E = 100µA	5			V
$I_{C(ON)}$	On-State Collector Current(5)	Ee = 0.5mW/cm^2, V_{CE} = 5V				
	QSD122		1.00		6.00	mA
	QSD123		4.00		16.00	mA
	QSD124		6.00			mA
$V_{CE(SAT)}$	Saturation Voltage(5)	Ee = 0.5mW/cm^2, I_C = 0.5mA			0.4	V
t_r	Rise Time	V_{CC} = 5V, R_L = 100Ω, I_C = 0.2mA		7		µs
t_f	Fall Time			7		µs

Typical Performance Characteristics

Figure 1. Light Current vs. Radiant Intensity

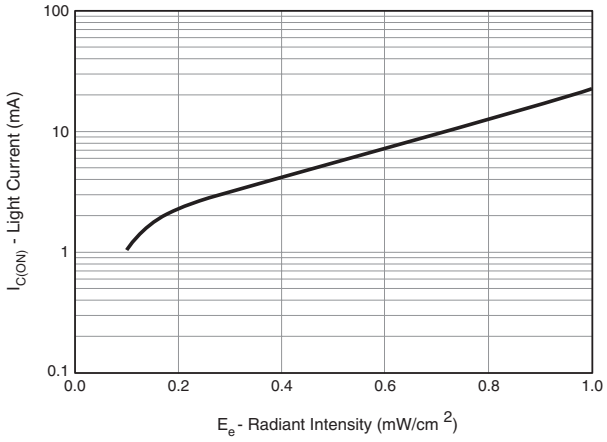


Figure 2. Angular Response Curve

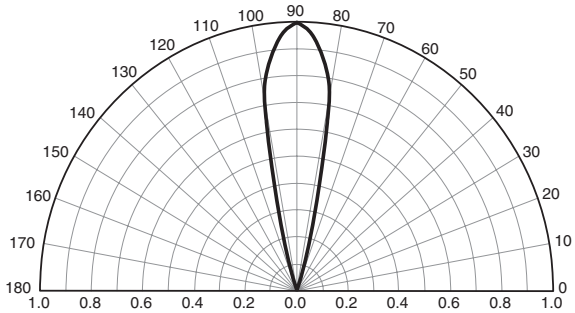


Figure 3. Dark Current vs. Collector - Emitter Voltage

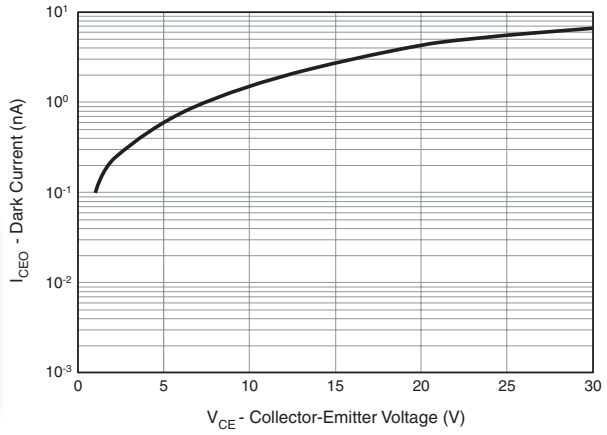


Figure 4. Light Current vs. Collector - Emitter Voltage

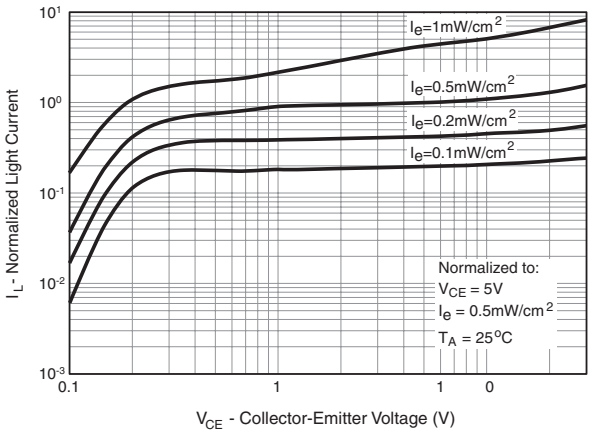
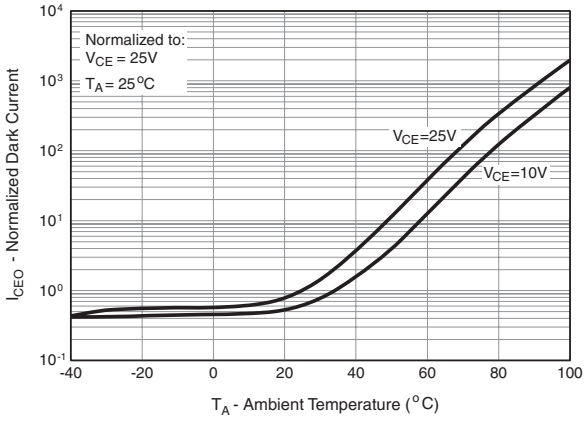


Figure 5. Dark Current vs. Ambient Temperature



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