

# Plastic Silicon Infrared Phototransistor

## QSD123, QSD124

### Description

The QSD123/124 is a phototransistor encapsulated in an infrared transparent, black T-1 3/4 package.

### Features

- PNP Silicon Phototransistor
- Package Type: T-1 3/4
- Matched Emitter: QED12X / QED22X / QED23X
- Narrow Reception Angle: 24°
- Daylight Filter
- Package Material and Color: Black Epoxy
- High Sensitivity
- This is a Pb-Free Device

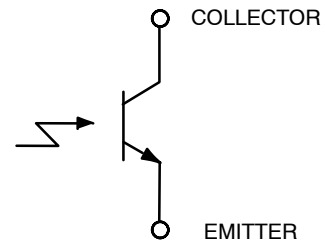
### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
T <sub>OPR</sub>	Operating Temperature	-40 to +100	°C
T <sub>STG</sub>	Storage Temperature	-40 to +100	°C
T <sub>SOL-I</sub>	Soldering Temperature (Iron) (Note 2), (Note 3), (Note 4)	240 for 5 s	°C
T <sub>SOL-F</sub>	Soldering Temperature (Flow) (Note 2), (Note 3)	260 for 10 s	°C
V <sub>CE</sub>	Collector-Emitter Voltage	30	V
V <sub>EC</sub>	Emitter-Collector Voltage	5	V
P <sub>D</sub>	Power Dissipation (Note 1)	100	mW

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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 tip 1/16" (1.6 mm) minimum from housing.

### SCHEMATIC



T-1 3/4, 5MM DETECTOR  
CASE 100CE

### ORDERING INFORMATION

Device	Package	Shipping
QSD123	T-1 3/4, 5MM DETECTOR (Pb-Free)	250 / Bulk Bag
QSD124		

## QSD123, QSD124

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$\lambda_{PS}$	Peak Sensitivity Wavelength		–	880	–	nm
$\Theta$	Reception Angle		–	$\pm 12$	–	$^\circ$
$I_{CEO}$	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 (Note 5) QSD123 QSD124	$E_e = 0.5\text{ mW/cm}^2, V_{CE} = 5\text{ V}$	4 6	– –	16 29	mA
$V_{CE(SAT)}$	Saturation Voltage (Note 5)	$E_e = 0.5\text{ mW/cm}^2, I_C = 0.5\text{ mA}$	–	–	0.4	V
$t_r$	Rise Time	$V_{CC} = 5\text{ V}, R_L = 100\ \Omega, I_C = 0.2\text{ mA}$	–	7	–	$\mu\text{s}$
$t_f$	Fall Time		–	7	–	$\mu\text{s}$

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

TYPICAL PERFORMANCE CHARACTERISTICS

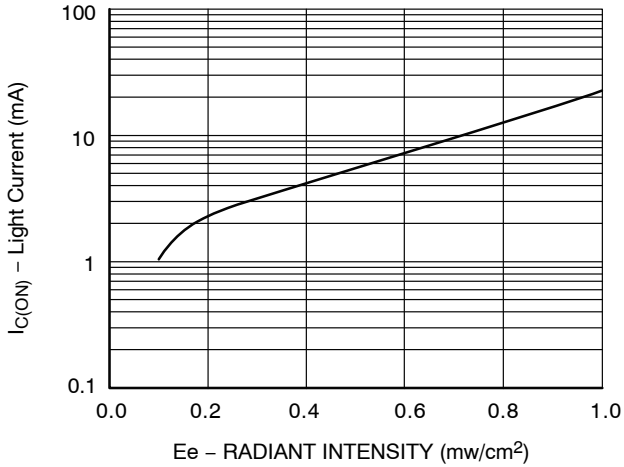


Figure 1. Light Current vs. Radiant Intensity

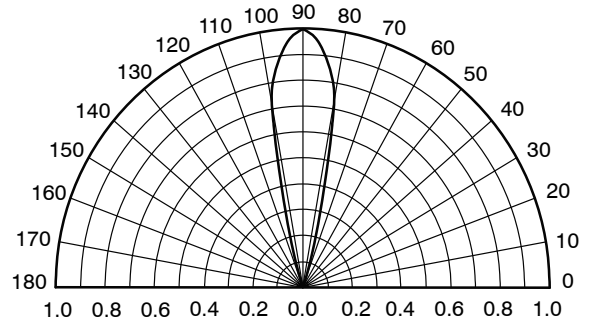


Figure 2. Angular Response Curve

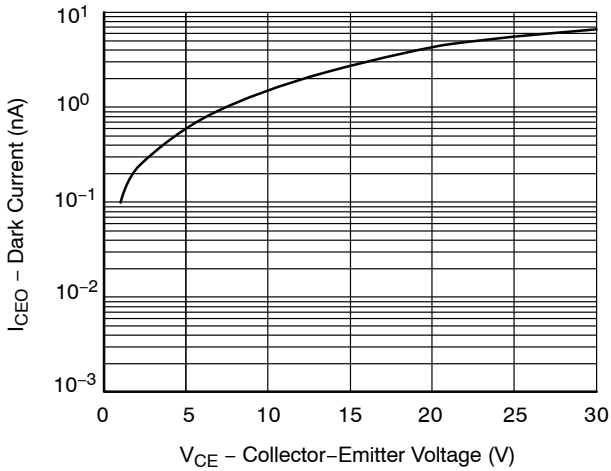


Figure 3. Dark Current vs. Collector - Emitter Voltage

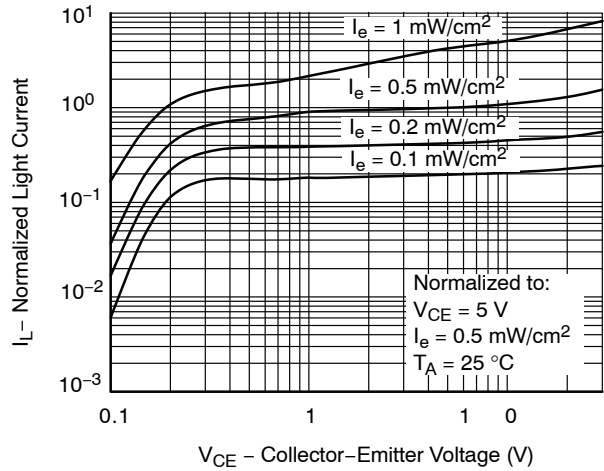


Figure 4. Light Current vs. Collector - Emitter Voltage

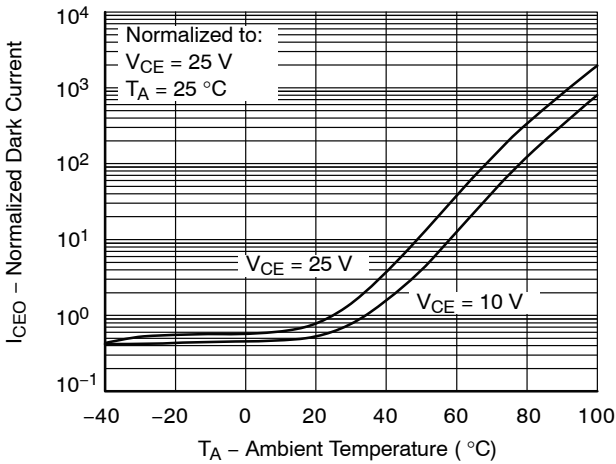
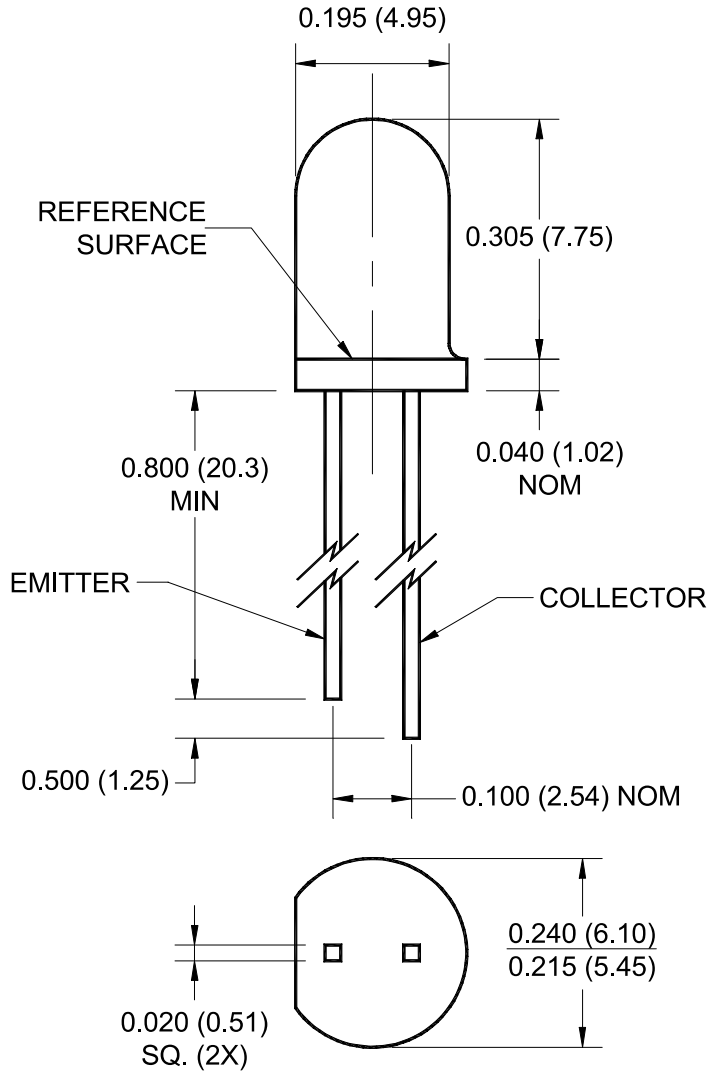


Figure 5. Dark Current vs. Ambient Temperature

**T-1 3/4, 5MM DETECTOR**  
**CASE 100CE**  
**ISSUE 0**

DATE 30 NOV 2016



**Notes:**

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

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