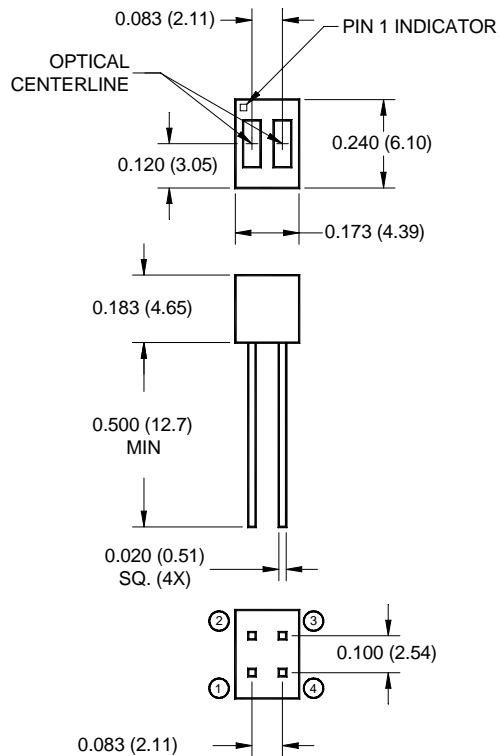


PACKAGE DIMENSIONS



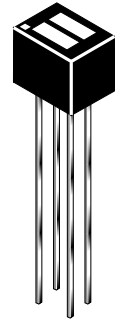
PIN 1 COLLECTOR PIN 3 ANODE
PIN 2 EMITTER PIN 4 CATHODE

NOTES:

1. Dimensions for all drawings are in inches (millimeters).
2. Tolerance of $\pm .010$ (.25) on all non-nominal dimensions unless otherwise specified.
3. Pins 2 and 4 typically .050" shorter than pins 1 and 3.
4. Dimensions controlled at housing surface.

FEATURES

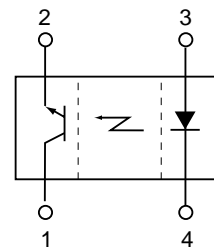
- Phototransistor Output
- No contact surface sensing
- Unfocused for sensing diffused surfaces
- Compact Package
- Daylight filter on sensor



NOTES (Applies to Max Ratings and Characteristics Tables.)

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) from housing.
5. As long as leads are not under any spring tension.
6. D is the distance from the sensor face to the reflective surface.
7. Cross talk (I_{CX}) is the collector current measured with the indicator current on the input diode and with no reflective surface.
8. Measured using an Eastman Kodak neutral white test card with 90% diffused reflecting as a reflective surface.

SCHEMATIC



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Units
Operating Temperature	T_{OPR}	-40 to +85	°C
Storage Temperature	T_{STG}	-40 to +85	°C
Lead Temperature (Solder Iron) ^(2,3)	T_{SOL-I}	240 for 5 sec	°C
Lead Temperature (Solder Flow) ^(2,3)	T_{SOL-F}	260 for 10 sec	°C
EMITTER			
Continuous Forward Current	I_F	50	mA
Reverse Voltage	V_R	5	V
Power Dissipation ⁽¹⁾	P_D	100	mW
SENSOR			
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector Voltage	V_{ECO}		V
Power Dissipation ⁽¹⁾	P_D	100	mW

ELECTRICAL / OPTICAL CHARACTERISTICS (T _A = 25°C)						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
EMITTER						
Forward Voltage	I _F = 20 mA	V _F	—	—	1.7	V
Reverse Current	V _R = 5 V	I _R	—	—	100	μA
Peak Emission Wavelength	I _F = 20 mA	λ _{PE}	—	940	—	nm
SENSOR						
Collector-Emitter Breakdown	I _C = 1 mA	BV _{CEO}	30	—	—	V
Emitter-Collector Breakdown	I _E = 0.1 mA	BV _{ECO}	5	—	—	V
Dark Current	V _{CE} = 10 V, I _F = 0 mA	I _D	—	—	100	nA
COUPLED						
QRD1113 Collector Current	I _F = 20 mA, V _{CE} = 5 V D = .050" (6,8)	I _{C(ON)}	0.300	—	—	mA
QRD1114 Collector Current	I _F = 20 mA, V _{CE} = 5 V D = .050" (6,8)	I _{C(ON)}	1	—	—	mA
Collector Emitter Saturation Voltage	I _F = 40 mA, I _C = 100 μA D = .050" (6,8)	V _{CE (SAT)}	—	—	0.4	V
Cross Talk	I _F = 20 mA, V _{CE} = 5 V, E _E = 0 (7)	I _{CX}	—	.200	10	μA
Rise Time	V _{CE} = 5 V, R _L = 100 Ω	t _r	—	10	—	μs
Fall Time	I _{C(ON)} = 5 mA	t _f	—	50	—	μs

TYPICAL PERFORMANCE CURVES

Fig. 1 Forward Voltage vs. Forward Current

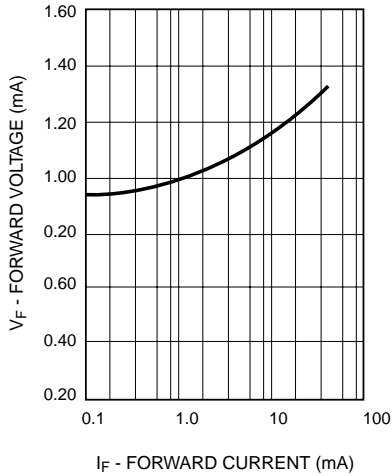


Fig. 2 Normalized Collector Current vs. Forward Current

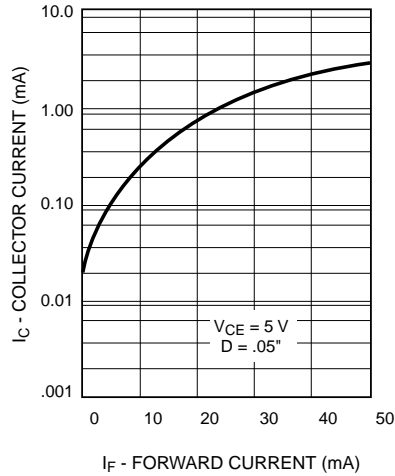


Fig. 3 Normalized Collector Current vs. Temperature

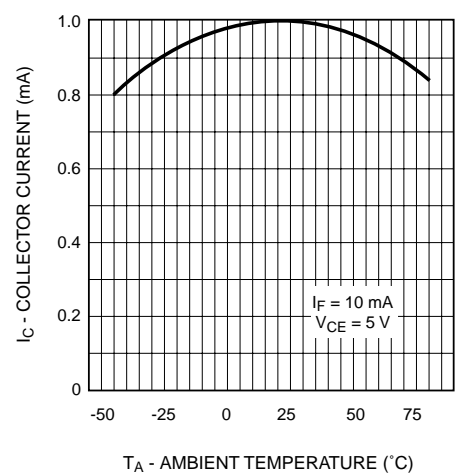


Fig. 4 Normalized Collector Dark Current vs. Temperature

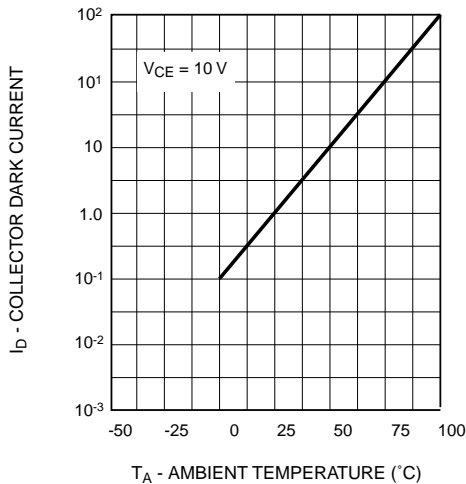
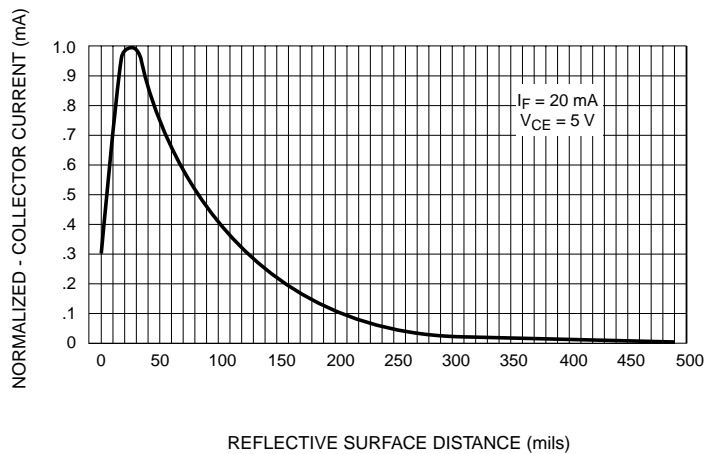


Fig. 5 Normalized Collector Current vs. Distance



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