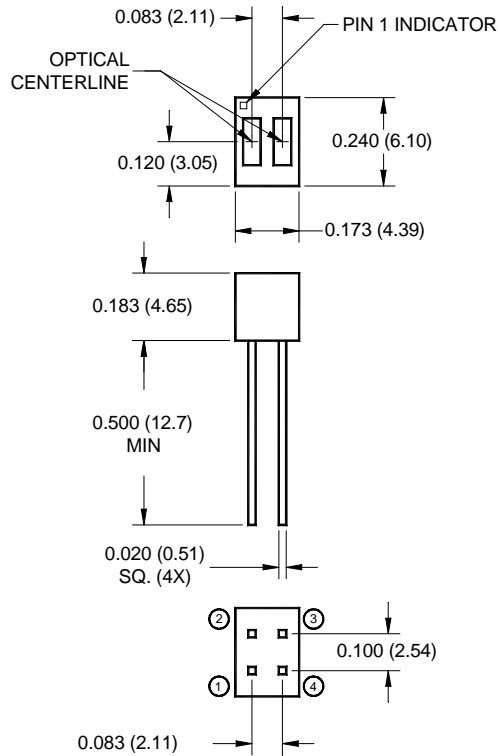


### PACKAGE DIMENSIONS



PIN 1 COLLECTOR

PIN 2 EMITTER

PIN 3 ANODE

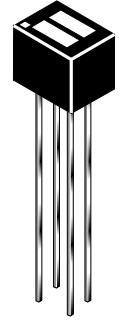
PIN 4 CATHODE

#### 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

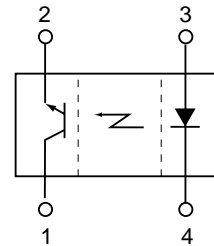
- Phototransistor Output
- No contact surface sensing
- Unfocused for sensing diffused surfaces
- Compact Package
- Daylight filter on sensor



### 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



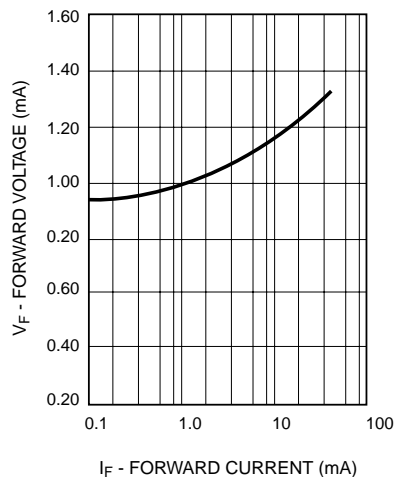
### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

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

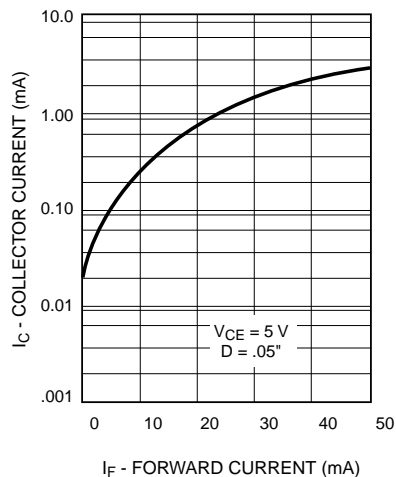
ELECTRICAL / OPTICAL CHARACTERISTICS (T <sub>A</sub> = 25°C)						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>EMITTER</b>						
Forward Voltage	I <sub>F</sub> = 20 mA	V <sub>F</sub>	—	—	1.7	V
Reverse Current	V <sub>R</sub> = 5 V	I <sub>R</sub>	—	—	100	μA
Peak Emission Wavelength	I <sub>F</sub>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

### TYPICAL PERFORMANCE CURVES

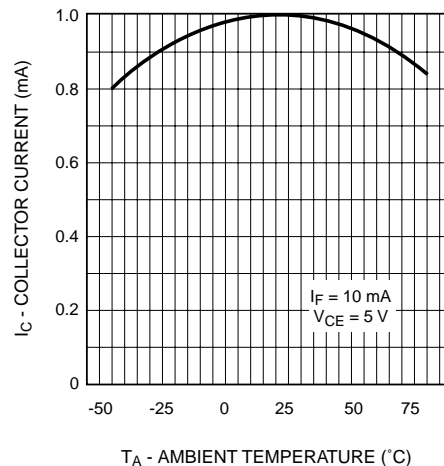
**Fig. 1 Forward Voltage vs. Forward Current**



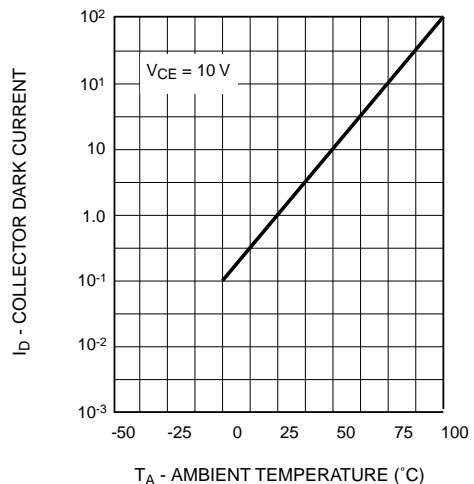
**Fig. 2 Normalized Collector Current vs. Forward Current**



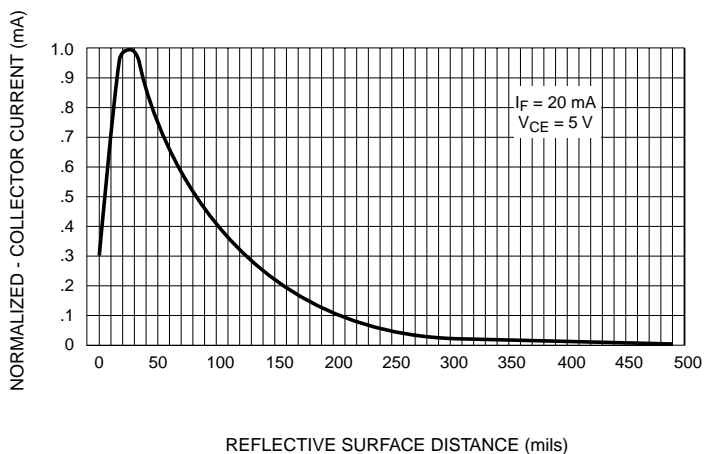
**Fig. 3 Normalized Collector Current vs. Temperature**



**Fig. 4 Normalized Collector Dark Current vs. Temperature**



**Fig. 5 Normalized Collector Current vs. Distance**



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