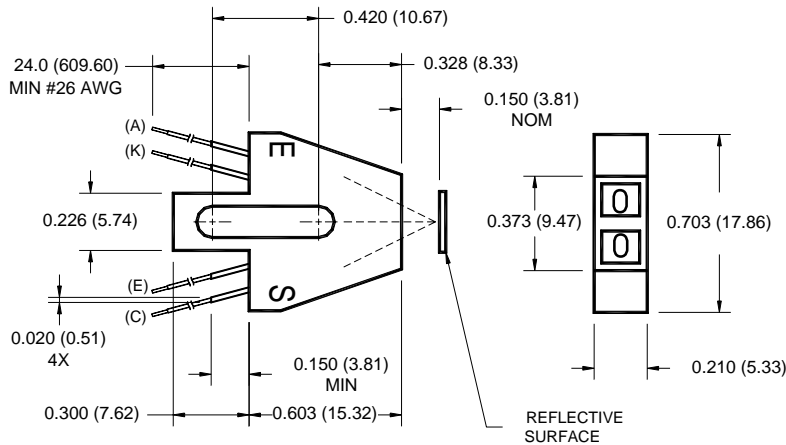
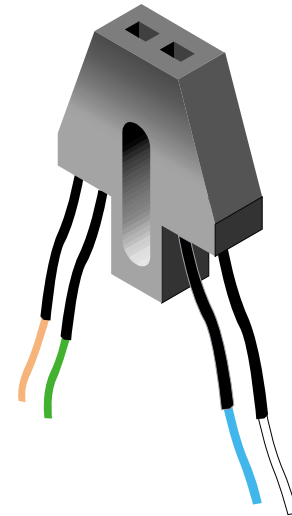


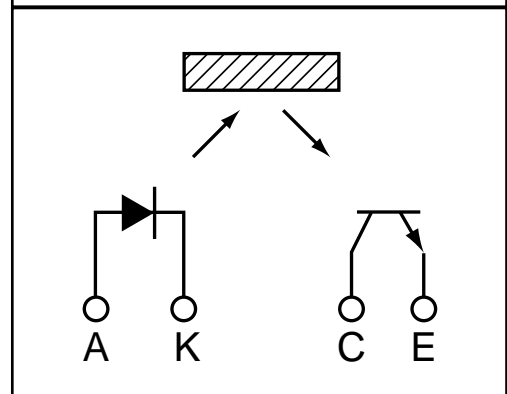
**PACKAGE DIMENSIONS**



FUNCTION	WIRE COLOR
(C) COLLECTOR	WHITE
(E) EMITTER	BLUE
(K) CATHODE	GREEN
(A) ANODE	ORANGE



**SCHEMATIC**



**NOTES:**

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of  $\pm .010$  (.25) on all non-nominal dimensions unless otherwise specified.

**DESCRIPTION**

The QRC1133 consists of an infrared emitting diode and an NPN silicon phototransistor mounted side by side on a converging optical axis in a black plastic housing. The phototransistor responds to radiation from the emitting diode only when a reflective object passes within its field of view. The area of the optimum response approximates a circle .200" in diameter.

**FEATURES**

- Phototransistor output
- High Sensitivity
- Low cost plastic housing
- #26 AWG, 24 inch PVC wire termination

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise specified)			
Parameter	Symbol	Rating	Units
Operating Temperature	$T_{OPR}$	-40 to +85	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-40 to +85	$^\circ\text{C}$
Soldering Temperature (Iron) <sup>(2,3,4)</sup>	$T_{SOL-I}$	240 for 5 sec	$^\circ\text{C}$
Soldering Temperature (Flow) <sup>(2,3)</sup>	$T_{SOL-F}$	260 for 10 sec	$^\circ\text{C}$
<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	$V_{ECO}$	5	V
Collector Current	$I_C$	20	mA
Power Dissipation <sup>(1)</sup>	$P_D$	100	mW

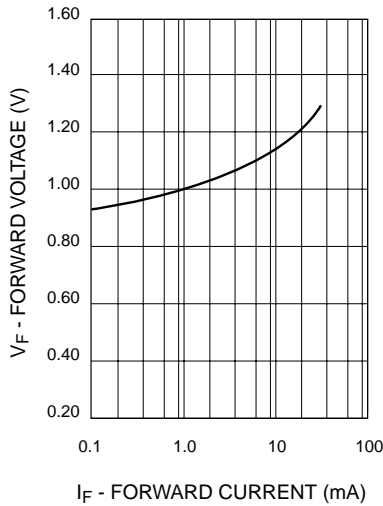
**NOTES**

- Derate power dissipation linearly 1.67 mW/ $^\circ\text{C}$  above 25 $^\circ\text{C}$ .
- RMA flux is recommended.
- Methanol or isopropyl alcohols are recommended as cleaning agents.
- Soldering iron 1/16" (1.6mm) minimum from housing.
- D is the distance from the assembly face to the reflective surface.
- Cross talk is the photo current measured with current to the input diode and no reflecting surface.
- Measured using an Eastman Kodak neutral test card with 90% diffused reflecting surface.

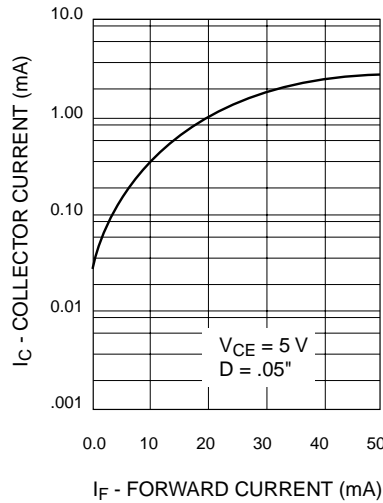
<b>ELECTRICAL / OPTICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ )						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
<b>EMITTER</b>						
Forward Voltage	$I_F = 40\text{ mA}$	$V_F$	—	—	1.7	V
Reverse Current	$V_R = 2.0\text{ V}$	$I_R$	—	—	100	$\mu\text{A}$
Peak Emission Wavelength	$I_F = 20\text{ mA}$	$\lambda_{PE}$	—	940	—	nm
<b>SENSOR</b>						
Collector-Emitter Breakdown Voltage	$I_C = 1\text{ mA}$	$BV_{CEO}$	30	—	—	V
Emitter-Collector Breakdown Voltage	$I_E = 0.1\text{ mA}$	$BV_{ECO}$	5	—	—	V
Collector-Emitter Dark Current	$V_{CE} = 10\text{ V}, I_F = 0\text{ mA}$	$I_{CEO}$	—	—	100	nA
<b>COUPLED</b>						
On-state Collector Current	$I_F = 40\text{ mA}, V_{CE} = 5\text{ V}, D = .150^{(5,6)}$	$I_{C(ON)}$	0.20	—	—	mA
Collector-Emitter Saturation Voltage	$I_F = 40\text{ mA}, I_C = 0.1\text{ mA}$ $D = 1.50^{(5,7)}$	$V_{CE(SAT)}$	—	—	0.4	V
Rise Time	$V_{CE} = 5\text{ V}, R_L = 100\ \Omega$	$t_r$	—	8	—	$\mu\text{s}$
Fall Time	$I_{C(ON)} = 5\text{ mA}$	$t_f$	—	8	—	$\mu\text{s}$
Crosstalk	$I_F = 40\text{ mA}, V_{CE} = 5\text{ V}^{(7)}$	$I_{CX}$	—	—	1.00	$\mu\text{A}$

**TYPICAL PERFORMANCE CURVES**

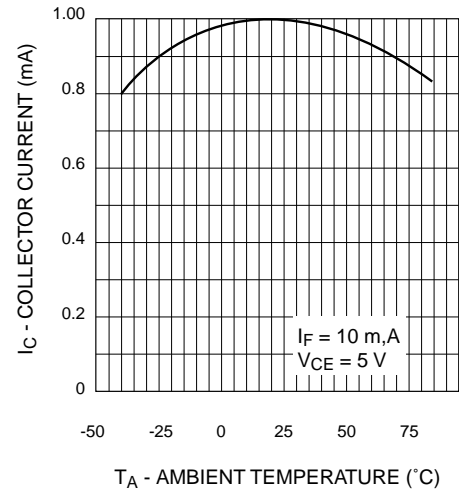
**Fig. 1 Forward Voltage vs. Forward Current**



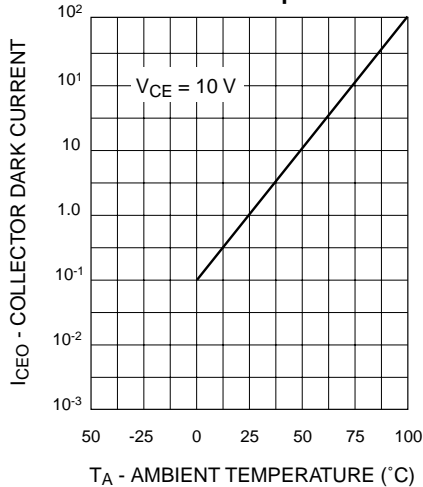
**Fig. 2 Normalized Collector Current vs. Forward Current**



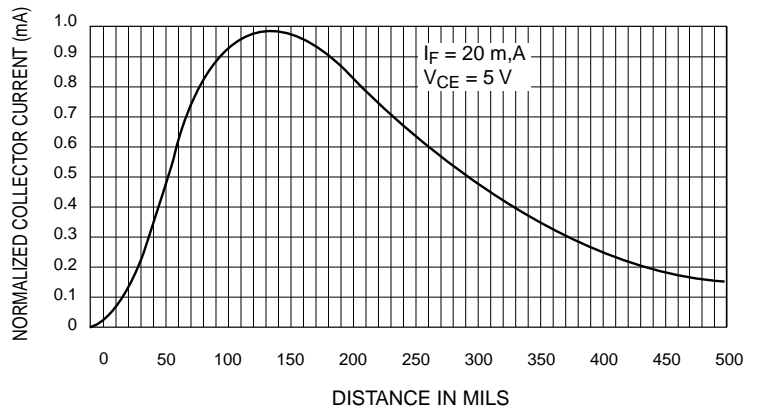
**Fig. 3 Normalized Collector Current vs. Temperature**



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



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



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