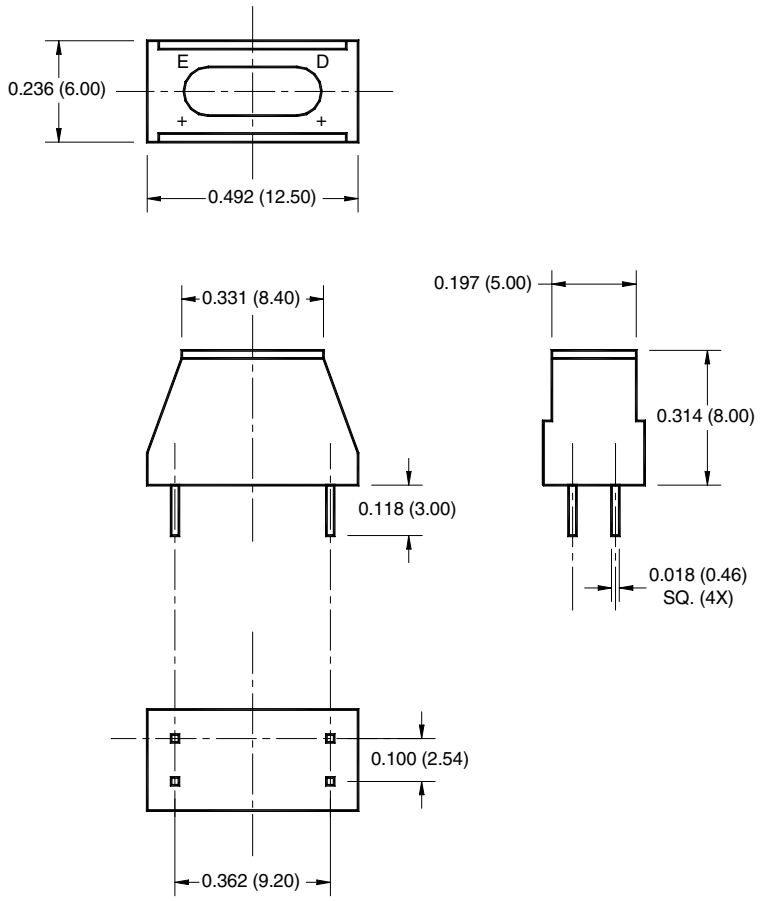
FAIRCHILD
SEMICONDUCTOR®

REFLECTIVE OBJECT SENSOR

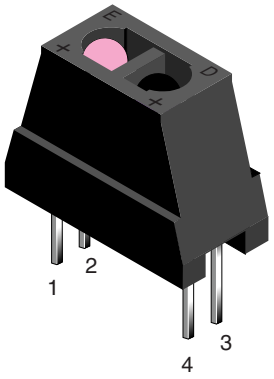
QRE00034

PACKAGE DIMENSIONS

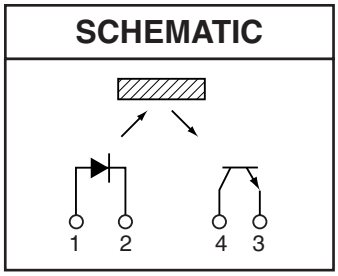


NOTES:

1. Dimensions for all drawings are in inches.
2. Tolerance of ± .010 on all non-nominal dimensions unless otherwise specified.



SCHEMATIC



DESCRIPTION

The QRE00034 reflective object sensor consists of an infrared emitting diode and an NPN phototransistor mounted side by side on a converging optical axis in a black housing. The phototransistor responds to radiation from the emitting diode only when a reflective object passes in its field of view.

FEATURES

- Phototransistor output
- No contact surface sensing
- Daylight filter on the sensor
- Emitter λ = 940 nm

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Rating	Units
Operating Temperature	T_{OPR}	-40 to +85	°C
Storage Temperature	T_{STG}	-40 to +85	°C
Soldering Temperature (Iron)(2,3,4)	T_{SOL-I}	240 for 5 sec	°C
Soldering Temperature (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
Peak Forward Current	I_{FP}	1	A
Power Dissipation(1)	P_D	100	mW
SENSOR Collector-Emitter Voltage	V_{CEO}	30	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 Dark Current	V_{CE} = 10 V, I_F = 0 mA	I_D	—	—	100	nA
Peak Sensitivity Wavelength	V_{CE} = 5 V	λ_{PS}	—	880	—	nm
COUPLED Collector Current	I_F = 20 mA, V_{CE} = 10 V(6,7)	$I_{C(ON)}$	0.16	—	2.00	mA
Collector Emitter Saturation Voltage	I_F = 20 mA, I_C = 0.5 mA	$V_{CE\ (SAT)}$	—	—	0.4	V
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

NOTES

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 at 1/16” (1.6mm) from housing.
5. Pulse conditions: tp = 10 µs; T = 1 ms.
6. Measured as an Eastman Kodak neutral white test card with 90% diffused reflectance as a reflecting surface.
7. 0.160” (4 mm) distance from sensor face to reflector surface.

TYPICAL PERFORMANCE CURVES

Fig. 1 Normalized Collector Current vs. Distance

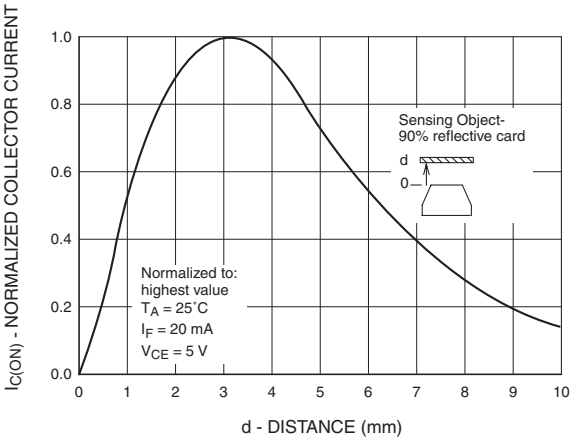


Fig. 2 Forward Current vs. Forward Voltage

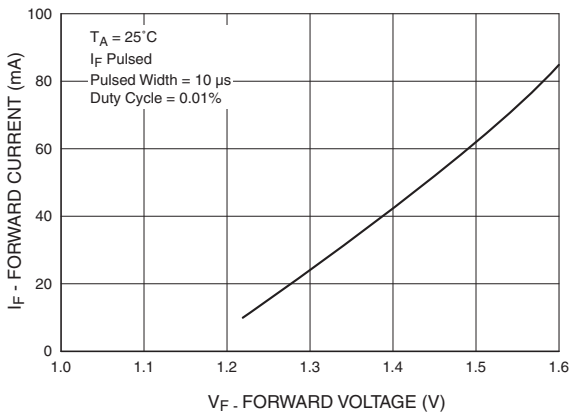


Fig. 3 Normalized Collector Current vs. Angle Deviation

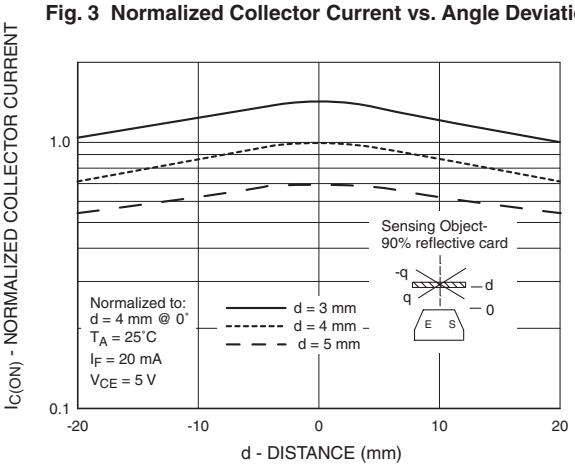


Fig. 4 Collector Current vs. Forward Current

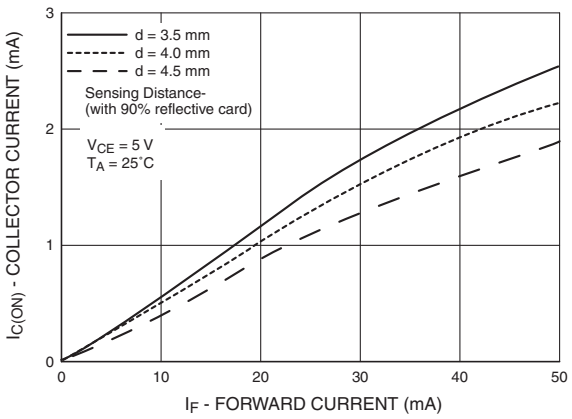


Fig. 5 Normalized Collector Current vs. Ambient Temperature

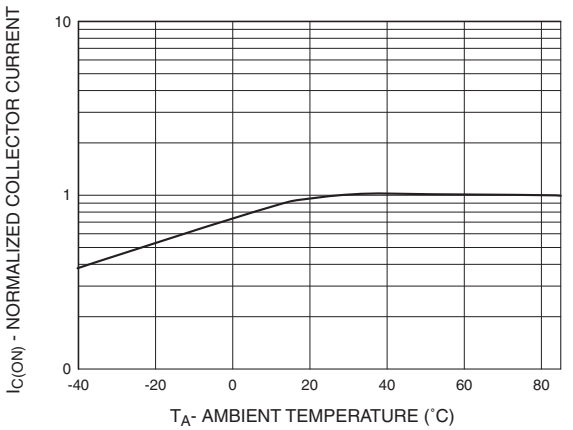


Fig. 6 Rise and Fall Time vs. Collector Current

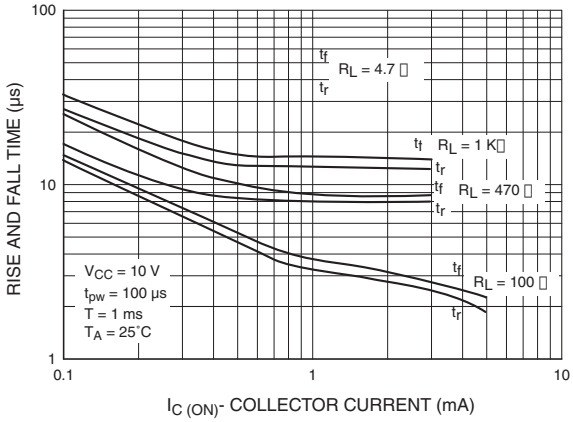


Fig. 7 Collector Current vs. Collector to Emitter Voltage

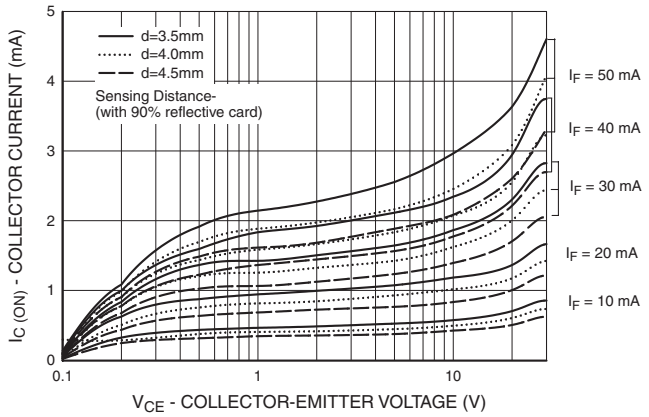


Fig. 8 Collector Emitter Dark Current vs. Forward Current

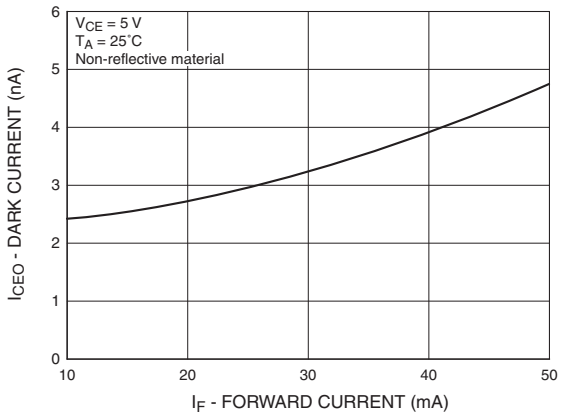


Fig. 9 Forward Voltage vs. Ambient Temperature

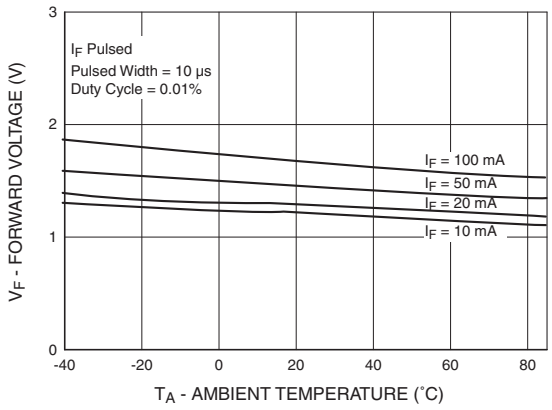


Fig. 10 Normalized Collector Current vs. Distance d_2

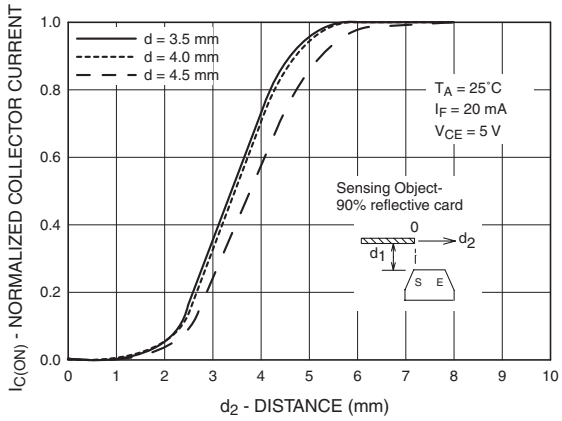


Fig. 11 Normalized Collector Current vs. Distance d_2

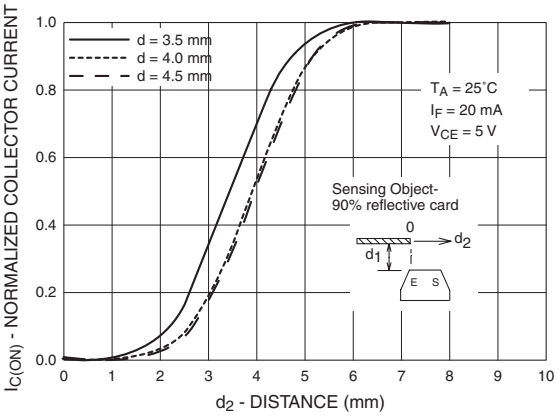
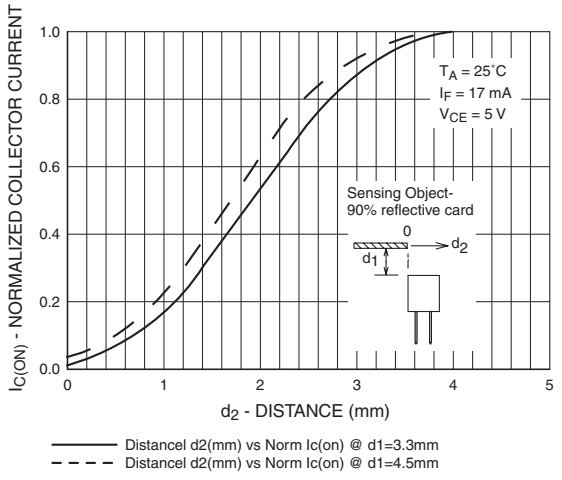
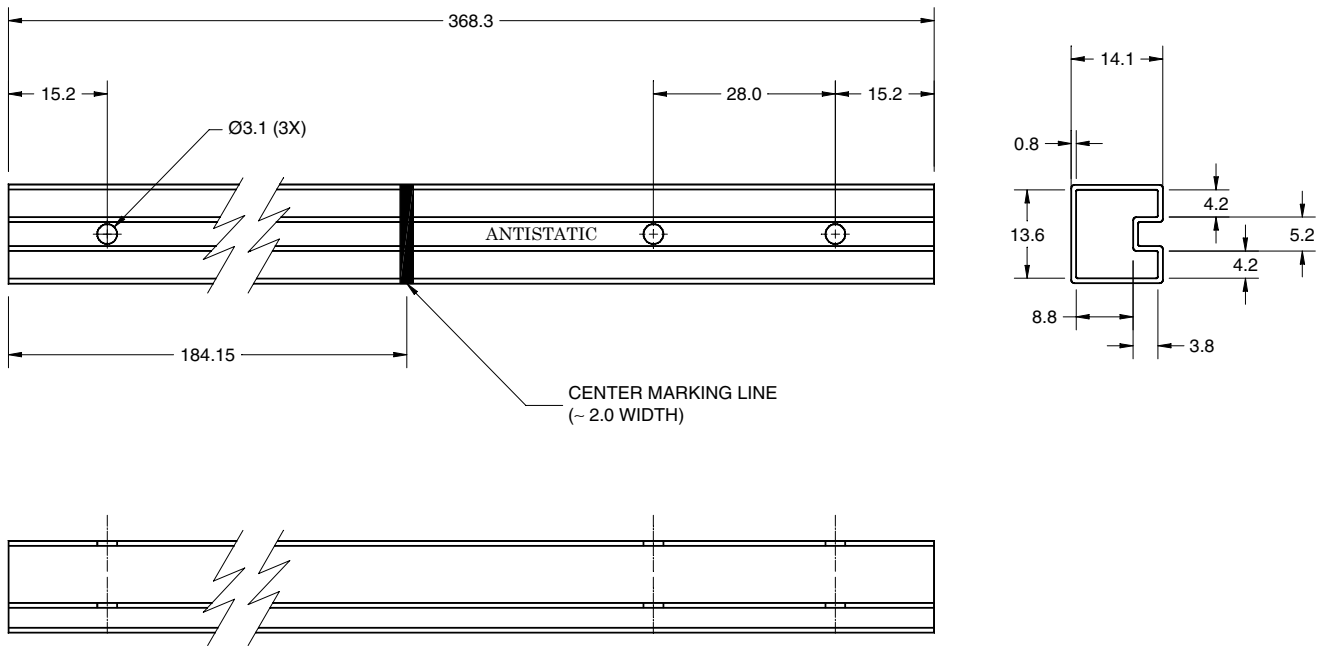


Fig. 12 Normalized Collector Current vs. Distance d_2



ANTISTATIC PLASTIC TUBE PACKING (50 PCS PER TUBE)



NOTES

1. Dimensions: All dimensions are in mm.
2. Color: Clear (Transparent).
3. Antistatic resistivity level: 10^5 - 10^{12} Ohm/sq.
4. Tolerance: ±0.25 inches, unless otherwise specified.

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.