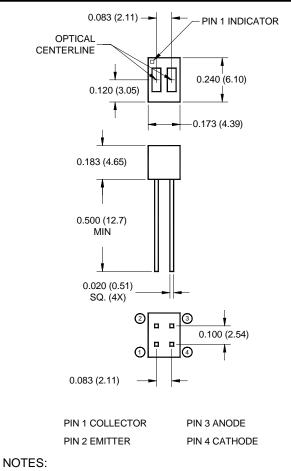


# **QRD1113/1114** REFLECTIVE OBJECT SENSOR

### PACKAGE DIMENSIONS



- 1. Dimensions for all drawings are in inches (millimeters).
- 2. Tolerance of ± .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.

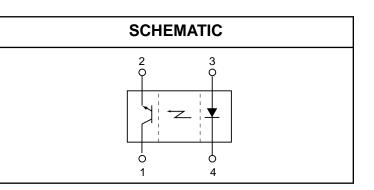
#### FEATURES

- 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<sub>CX</sub>) 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.



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

# **FAIRCHILD**

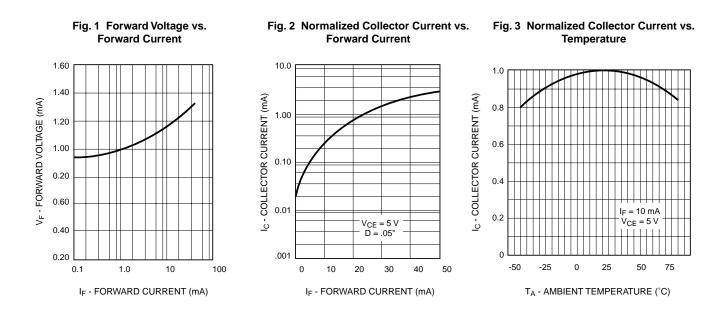
# **QRD1113/1114** REFLECTIVE OBJECT SENSOR

PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
EMITTER	I <sub>F</sub> = 20 mA	V <sub>F</sub>	_	_	1.7	V
Forward Voltage	$I_F = 20 IIIA$					
Reverse Current	$V_R = 5 V$	I <sub>R</sub>	—	_	100	μA
Peak Emission Wavelength	I <sub>F</sub> = 20 mA	$\lambda_{PE}$	—	940	—	nm
SENSOR	I <sub>c</sub> = 1 mA	BV <sub>CEO</sub>	30	_	_	V
Collector-Emitter Breakdown	$I_{\rm C} = 1$ IIIA					
Emitter-Collector Breakdown	I <sub>E</sub> = 0.1 mA	BV <sub>ECO</sub>	5	_	_	V
Dark Current	$V_{CE} = 10 \text{ V}, \text{ I}_{F} = 0 \text{ mA}$	I <sub>D</sub>	_	_	100	nA
COUPLED	$I_{\rm F}$ = 20 mA, $V_{\rm CE}$ = 5 V	I <sub>C(ON)</sub>	0.300	_	_	mA
QRD1113 Collector Current	D = .050" (6,8)					
QRD1114 Collector Current	$I_{\rm F}$ = 20 mA, $V_{\rm CE}$ = 5 V			_	_	mA
	D = .050" (6,8)	I <sub>C(ON)</sub>	1			
Collector Emitter	IF = 40 mA, Ic = 100 µA	VCE (SAT)	_	_	0.4	V
Saturation Voltage	D = .050" (6,8)					
Cross Talk I <sub>F</sub>	= 20 mA, $V_{CE}$ = 5 V, EE = 0 <sup>(7)</sup>	I <sub>CX</sub>	_	.200	10	μA
Rise Time	$V_{CE}$ = 5 V, $R_L$ = 100 $\Omega$	tr	_	10	_	μs
Fall Time	$I_{C(ON)} = 5 \text{ mA}$	t <sub>f</sub>	_	50	_	μs



## **QRD1113/1114** REFLECTIVE OBJECT SENSOR

#### **TYPICAL PERFORMANCE CURVES**





10<sup>2</sup>

10<sup>1</sup>

10

1.0

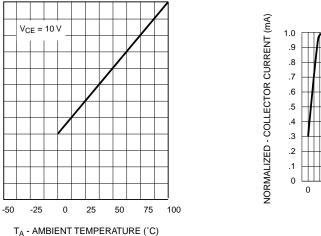
10-1

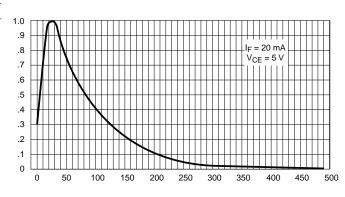
10<sup>-2</sup>

10<sup>-3</sup>

ID - COLLECTOR DARK CURRENT







REFLECTIVE SURFACE DISTANCE (mils)



## **QRD1113/1114** REFLECTIVE OBJECT SENSOR

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