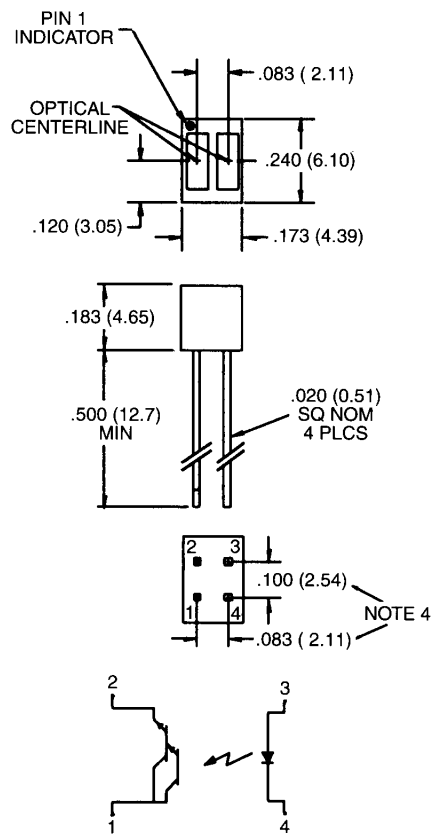


**PACKAGE DIMENSIONS**



ST2173

**DESCRIPTION**

The QRD1313 reflective sensors consists of an infrared emitting diode and an NPN silicon photodarlington mounted side by side in a black plastic housing. The on-axis radiation of the emitter and the on-axis response of the detector are both perpendicular to the face of the QRD1313. The photodarlington responds to radiation emitted from the diode only when a reflective object or surface is in the field of view of the detector.

**FEATURES**

- Photodarlington output.
- Unfocused for sensing diffused surfaces.
- Low cost plastic housing.
- Designed for paper path and other non-contact surface sensing.

**NOTES:**

1. PINS 2 AND 4 TYPICALLY .050" SHORTER THAN PINS 1 AND 3
2. DIMENSIONS ARE IN INCHES (mm).
3. TOLERANCE IS +.010" [.25] UNLESS OTHERWISE SPECIFIED.
4. THESE DIMENSIONS ARE CONTROLLED AT HOUSING SURFACE.

**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  Unless Otherwise Specified)

Storage Temperature .....	$-40^\circ\text{C}$ to $+100^\circ\text{C}$
Operating Temperature .....	$-40^\circ\text{C}$ to $+100^\circ\text{C}$
Soldering:	
Lead Temperature (Iron) .....	$240^\circ\text{C}$ for 5 sec. <sup>(2,3,4)</sup>
Lead Temperature (Flow) .....	$260^\circ\text{C}$ for 10 sec. <sup>(2,4)</sup>

**INPUT DIODE**

Continuous Forward Current .....	50 mA
Reverse Voltage .....	5.0 Volts
Power Dissipation .....	100 mW <sup>(1)</sup>

**OUTPUT DARLINGTON**

Collector-Emitter Voltage .....	15 Volts
Emitter-Collector Voltage .....	5.0 Volts
Power Dissipation .....	100 mW <sup>(1)</sup>

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  Unless Otherwise Specified)  
(All measurements made under pulse conditions.)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
<b>INPUT DIODE</b>						
Forward Voltage	$V_F$	—	1.70		V	$I_F = 20\text{ mA}$
Reverse Leakage Current	$I_R$	—	100		$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>OUTPUT DARLINGTON</b>						
Collector-Emitter Breakdown	$BV_{CEO}$	15.0	—		V	$I_C = 100\text{ }\mu\text{A}$ , $E_e = 0$
Emitter-Collector Breakdown	$BV_{CE0}$	5.0	—		V	$I_E = 100\text{ }\mu\text{A}$ , $E_e = 0$
Collector-Emitter Leakage	$I_{CEO}$	—	250		nA	$V_{CE} = 5.0\text{ V}$ , $E_e = 0$
<b>COUPLED</b>						
On-State Collector Current	$I_{C(ON)}$	10.0	—		mA	$I_F = 20\text{ mA}$ , $V_{CC} = 5.0\text{ V}$ , $D = .050''$ <sup>(5,7)</sup>
Crosstalk	$I_{CX}$	—	10		$\mu\text{A}$	$I_F = 20\text{ mA}$ , $V_{CC} = 5.0\text{ V}$ , $E_e = 0$ <sup>(6)</sup>
Saturation Voltage	$V_{CE(SAT)}$	—	1.10		V	$I_F = 20\text{ mA}$ , $I_C = 2\text{ mA}$ , $D = .050''$ <sup>(5,7)</sup>

**NOTES**

1. Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
2. RMA flux is recommended.
3. Soldering iron  $\frac{1}{16}''$  (1.6mm) minimum from housing.
4. As long as leads are not under any stress or spring tension.
5. D is the distance from the sensor face to the reflective surface.
6. Crosstalk ( $I_{CX}$ ) is the collector current measured with the indicated current on the input diode and with no reflective surface.
7. Measured using Eastman Kodak neutral white test card with 90% diffused reflecting as a reflecting surface.

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