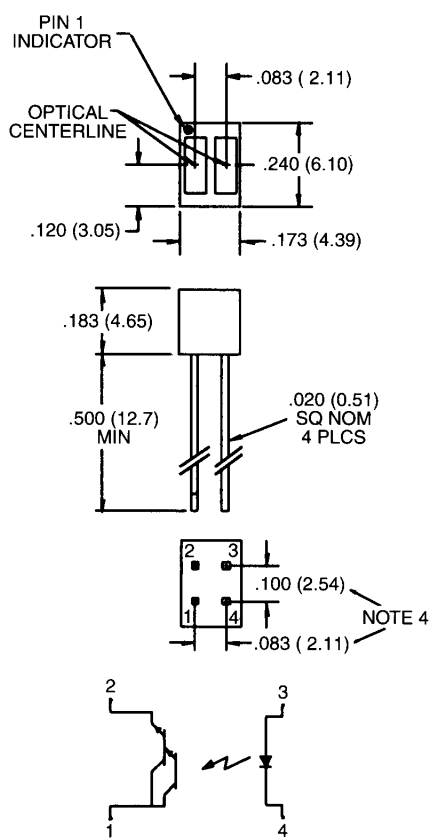


PACKAGE DIMENSIONS



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 $\pm .010$ " [.25] UNLESS OTHERWISE SPECIFIED.
4. THESE DIMENSIONS ARE CONTROLLED AT HOUSING SURFACE.



REFLECTIVE OBJECT SENSOR

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

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

INPUT DIODE

Continuous Forward Current	50 mA
Reverse Voltage	5.0 Volts
Power Dissipation	100 mW ⁽¹⁾

OUTPUT DARLINGTON

Collector-Emitter Voltage	15 Volts
Emitter-Collector Voltage	5.0 Volts
Power Dissipation	100 mW ⁽¹⁾

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
INPUT DIODE						
Forward Voltage	V _F	—		1.70	V	I _F = 20 mA
Reverse Leakage Current	I _R	—		100	μA	V _R = 2.0 V
OUTPUT DARLINGTON						
Collector-Emitter Breakdown	BV _{CEO}	15.0		—	V	I _C = 100 μA, E _e = 0
Emitter-Collector Breakdown	BV _{CE0}	5.0		—	V	I _E = 100 μA, E _e = 0
Collector-Emitter Leakage	I _{CEO}	—		250	nA	V _{CE} = 5.0 V, E _e = 0
COUPLED						
On-State Collector Current	I _{C(ON)}	10.0		—	mA	I _F = 20 mA, V _{CC} = 5.0V, D = .050" ^(5,7)
Crosstalk	I _{CX}	—		10	μA	I _F = 20 mA, V _{CC} = 5.0V, E _e = 0 ⁽⁶⁾
Saturation Voltage	V _{CE(SAT)}	—		1.10	V	I _F = 20 mA, I _C = 2mA, D = .050" ^(5,7)

NOTES

1. Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$ above 25°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.