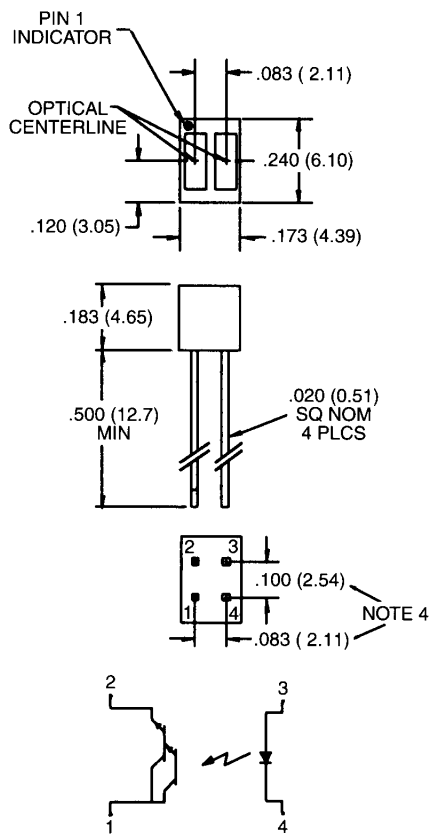


PACKAGE DIMENSIONS



ST2173

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.

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.



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	$I_f = 20\text{ mA}$
Reverse Leakage Current	I_R	—		100	μA	$V_R = 2.0\text{ V}$
OUTPUT DARLINGTON						
Collector-Emitter Breakdown	BV_{CEO}	15.0		—	V	$I_C = 100\ \mu\text{A}$, $E_e = 0$
Emitter-Collector Breakdown	BV_{CE0}	5.0		—	V	$I_E = 100\ \mu\text{A}$, $E_e = 0$
Collector-Emitter Leakage	I_{CEO}	—		250	nA	$V_{CE} = 5.0\text{ V}$, $E_e = 0$
COUPLED						
On-State Collector Current	$I_{C(ON)}$	10.0		—	mA	$I_f = 20\text{ mA}$, $V_{CC} = 5.0\text{V}$, $D = .050$ ^(5,7)
Crosstalk	I_{CX}	—		10	μA	$I_f = 20\text{ mA}$, $V_{CC} = 5.0\text{V}$, $E_e = 0$ ⁽⁶⁾
Saturation Voltage	$V_{CE(SAT)}$	—		1.10	V	$I_f = 20\text{ mA}$, $I_C = 2\text{mA}$, $D = .050$ ^(5,7)

NOTES
1. Derate power dissipation linearly 1.33 mW/°C above 25°C.
2. RMA flux is recommended.
3. Soldering iron 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.