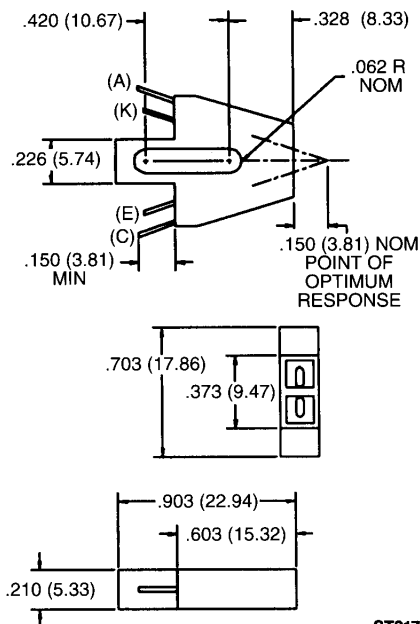


PACKAGE DIMENSIONS



ST2178

- (C) COLLECTOR
- (E) EMITTER
- (K) CATHODE
- (A) ANODE

- NOTES:
1. CATHODE AND EMITTER LEADS ARE .050 NOM SHORTER THAN ANODE AND COLLECTOR LEADS.
 2. DIMENSIONS ARE IN INCHES (mm).
 3. TOLERANCE IS $\pm .010"$ [.25] UNLESS OTHERWISE SPECIFIED.

DESCRIPTION

The QRC1113 consists of an infrared emitting diode and an NPN silicon phototransistor mounted side by side on a converging optical axis in a black plastic housing. The phototransistor responds to radiation from the emitting diode only when a reflective object passes within its field of view. The area of the optimum response approximates a circle .200" in diameter.

FEATURES

- Phototransistor output
- High Sensitivity
- Low cost plastic housing



REFLECTIVE OBJECT SENSORS

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

Storage Temperature	-40°C to $+85^\circ\text{C}$
Operating Temperature	-40°C to $+85^\circ\text{C}$
Soldering:	
Lead Temperature (Iron)	240°C for 5 sec. ^(2,3,4)
Lead Temperature (Flow)	260°C for 10 sec. ^(2,3)
INPUT DIODE	
Continuous Forward Current	50 mA
Reverse Voltage	5.0 Volts
Power Dissipation	100 mW ⁽¹⁾
OUTPUT TRANSISTOR	
Collector-Emitter Voltage	30 Volts
Emitter-Collector Voltage	5.0 Volts
Collector Current	40 mA
Power Dissipation	100 mW ⁽¹⁾

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward Voltage	V_F	—		1.70	V	$I_F = 40\text{ mA}$
Reverse Leakage Current	I_R	—		100	μA	$V_R = 2.0\text{ V}$
OUTPUT TRANSISTOR						
Emitter-Collector Breakdown	BV_{ECO}	5		—	V	$I_E = 100\mu\text{A}$, $E_e = 0$
Collector-Emitter Breakdown	BV_{CEO}	30		—	V	$I_C = 1.0\text{ mA}$, $E_e = 0$
Collector-Emitter Leakage	I_{CEO}	—		100	nA	$V_{CE} = 10.0\text{ V}$, $E_e = 0$
COUPLED						
On-State Collector Current	$I_{C(ON)}$.200		—	mA	$I_F = 40\text{ mA}$, $V_{CE} = 5\text{ V}$, $D = .150^{(5,7)}$
Crosstalk	I_{CX}	—		1.0	μA	$I_F = 40\text{ mA}$, $V_{CE} = 5\text{ V}^{(6)}$
Saturation Voltage	$V_{CE(SAT)}$	—		0.40	V	$I_F = 40\text{ mA}$, $I_C = .1\text{ mA}$, $D = .150^{(5,7)}$

NOTES

1. Derate power dissipation linearly 1.67 mW/ $^\circ\text{C}$ 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. D is the distance from the assembly face to the reflective surface.
6. Cross talk is the photocurrent measured with current to the input diode and no reflecting surface.
7. Measured using Eastman Kodak neutral test card with 90% diffused reflecting surface.