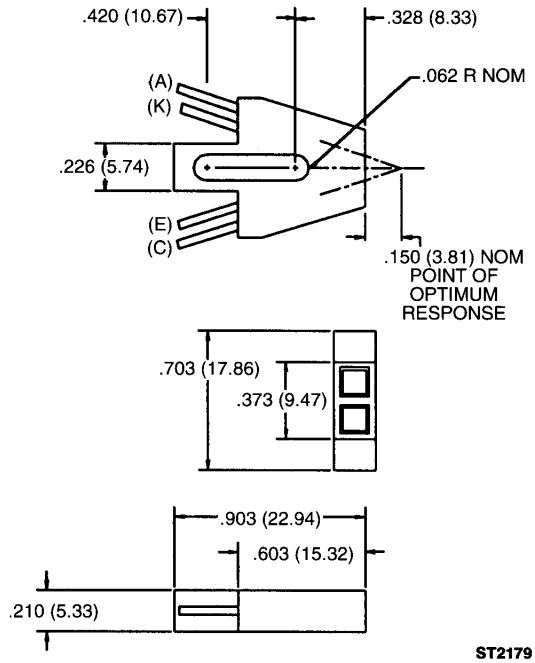
OPTOELECTRONICS

REFLECTIVE OBJECT SENSORS

QRB1113/1114

PACKAGE DIMENSIONS



ST2179

FUNCTION

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

NOTES:
1. DIMENSIONS ARE IN INCHES (mm).
2. TOLERANCE IS ±.010" (.25) UNLESS OTHERWISE SPECIFIED.

DESCRIPTION

The QRB1113/1114 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
- IR transparent plastic covers for dust protection.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless Otherwise Specified)

Storage Temperature ..... −40°C to + 85°C
Operating Temperature ..... −40°C to + 85°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°C Unless Otherwise Specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward Voltage	V_F	—		1.70	V	I_F = 40 mA
Reverse Leakage Current	I_R	—		100	μA	V_R = 2.0 V
OUTPUT TRANSISTOR						
Emitter-Collector Breakdown	BV_{ECO}	5		—	V	I_E = 100μA, Ee = 0
Collector-Emitter Breakdown	BV_{CEO}	30		—	V	I_C = 1.0 mA, Ee = 0
Collector-Emitter Leakage	I_{CEO}	—		100	nA	V_{CE} = 10.0 V, Ee = 0
COUPLED						
On-State Collector Current						
QRB1113	$I_{C(ON)}$	0.20		—	mA	I_F = 40 mA, V_{CE} = 5 V, D = .150" [5,6]
QRB1114	$I_{C(ON)}$	0.60		3.00	mA	I_F = 40 mA, V_{CE} = 5 V, D = .150" [5,6]
Crosstalk	I_{CX}	—		1.00	μA	I_F = 40 mA, V_{CE} = 5V[7]
Saturation Voltage	$V_{CE(SAT)}$	—		.4	V	I_F = 40 mA, I_C = 0.1 mA, D = .150"[5,6]

NOTES

1. *Derate power dissipation linearly 1.67 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. *D is the distance from the assembly face to the reflective surface.*
6. *Measured using Eastman Kodak neutral test card with 90% diffused reflecting surface.*
7. *Cross talk is the photocurrent measured with current to the input diode and no reflecting surface.*