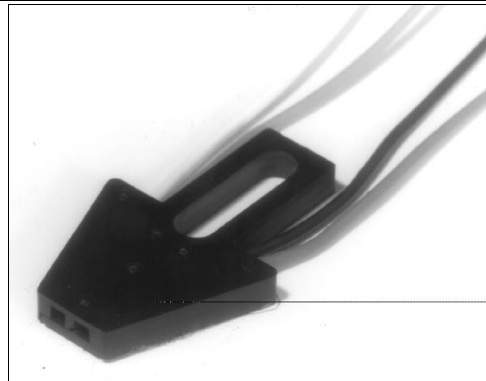


# HOA1406

## Reflective Sensor

### FEATURES

- Choice of phototransistor or photodarlington output
- Low profile package
- Hermetic style emitter and detector
- Focused for maximum response
- 24.0 in.(610 mm) min. 26 AWG Teflon insulated lead wires



INFRA-84.TIF

### DESCRIPTION

The HOA1406 series consists of an infrared emitting diode facing an NPN silicon phototransistor (HOA1406- 001) or photodarlington (HOA1406- 003) encased side- by- side on converging optical axes, in a black thermoplastic housing. The detector responds to radiation from the IRED only when a reflective object passes within its field of view. This low profile sensor is ideally suited for applications where space is limited, or stacking of sensors is required. The HOA1406 series employs hermetically sealed metal can packaged components. For additional component information see SE2460, SD2440, SD2410.

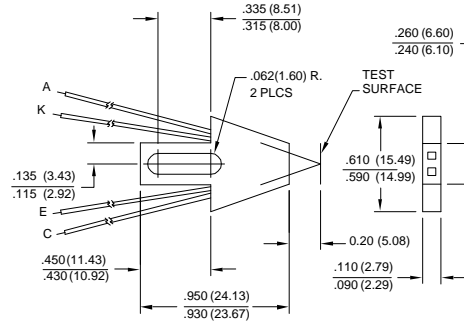
Housing material is polycarbonate. Housings are soluble in chlorinated hydrocarbons and ketones. Recommended cleaning agents are methanol and isopropanol.

Wire color code and functions are:

- IRED anode - red
- IRED cathode - black
- Collector - white
- Emitter - green

### OUTLINE DIMENSIONS in inches (mm)

Tolerance 3 plc decimals  $\pm 0.010(0.25)$   
2 plc decimals  $\pm 0.020(0.51)$



DIM\_072.ds4

# HOA1406

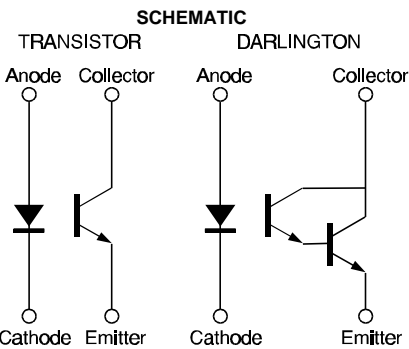
Reflective Sensor

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)						
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>IR EMITTER</b>						
Forward Voltage	V <sub>F</sub>			1.6	V	I <sub>F</sub> =20 mA
Reverse Leakage Current	I <sub>R</sub>			10	µA	V <sub>R</sub> =3 V
<b>DETECTOR</b>						
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>				V	I <sub>C</sub> =100 µA
HOA1406-001		30				
HOA1406-003		15				
Emitter-Collector Breakdown Voltage	V <sub>(BR)ECO</sub>	5.0			V	I <sub>E</sub> =100 µA
Collector Dark Current	I <sub>CEO</sub>			100	nA	V <sub>CE</sub> =10 V, I <sub>F</sub> =0
HOA 1406-001				250		
HOA1406-003						
<b>COUPLED CHARACTERISTICS</b>						
On-State Collector Current	I <sub>C(ON)</sub>				µA	V <sub>CE</sub> =5 V
HOA1406-001		25			mA	I <sub>F</sub> =40 mA
HOA1406-003		2.0			(1)	
Crosstalk (2)	I <sub>CX</sub>		2.0		µA	V <sub>CE</sub> =5 V, I <sub>F</sub> =40 mA
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>			0.4	V	I <sub>F</sub> =40 mA (1)
HOA1406-001				1.1		I <sub>C</sub> =10 µA
HOA1406-003						I <sub>C</sub> =1 mA
Rise And Fall Time	t <sub>r</sub> , t <sub>f</sub>				µs	V <sub>CC</sub> =5 V, I <sub>C</sub> =1 mA
HOA1406-001		15				R <sub>L</sub> =1000 Ω
HOA1406-003		75				R <sub>L</sub> =100 Ω

Notes  
1. Test surface is a Eastman Kodak neutral white card with 90% diffuse reflectance located 0,20 in. (5,0 mm) from the front surface of the device.  
2. Crosstalk (I<sub>CX</sub>) is the collector current measured with current to emitter and no reflecting surface.

**ABSOLUTE MAXIMUM RATINGS**  
(25°C Free-Air Temperature unless otherwise noted)  
Operating Temperature Range -40°C to 100°C  
Storage Temperature Range -40°C to 100°C

<b>IR EMITTER</b>		
Power Dissipation	80 mW (1)	
Reverse Voltage	3 V	
Continuous Forward Current	50 mA	
<b>DETECTOR</b>		
Collector-Emitter Voltage	TRANS. 30 V	DARLINGTON 15 V
Emitter-Collector Voltage	5 V	5 V
Power Dissipation	75 mW (2)	75 mW (2)
Collector DC Current	30 mA	30 mA



Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

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# HOA1406

## Reflective Sensor

Fig. 1 IRED Forward Bias Characteristics

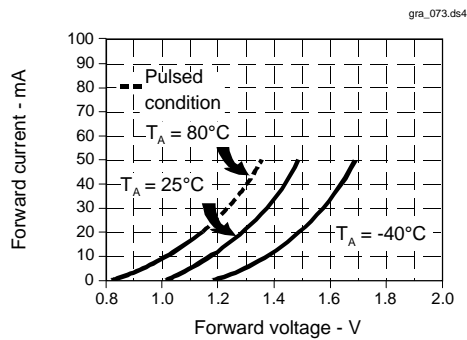


Fig. 2 Non-Saturated Switching Time vs Load Resistance

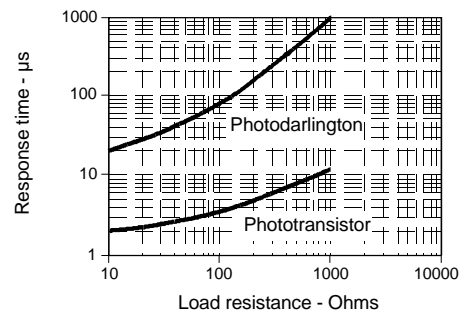


Fig. 3 Dark Current vs Temperature

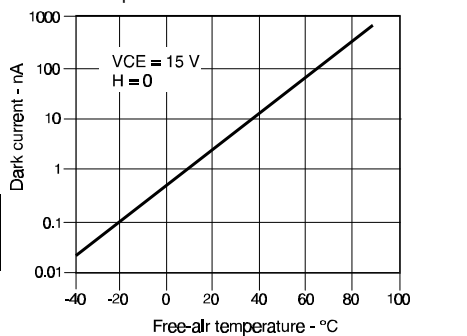


Fig. 4 Collector Current vs Ambient Temperature

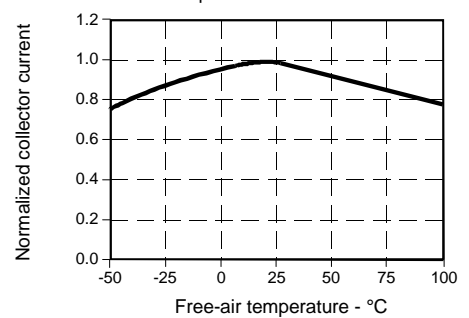


Fig. 5 Collector Current vs Distance to Reflective Surface

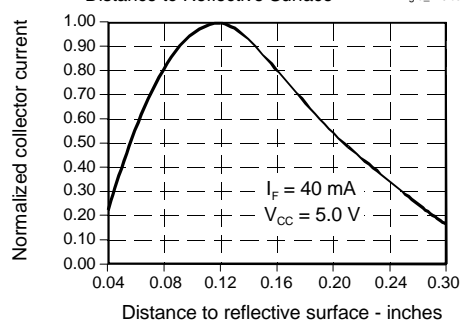
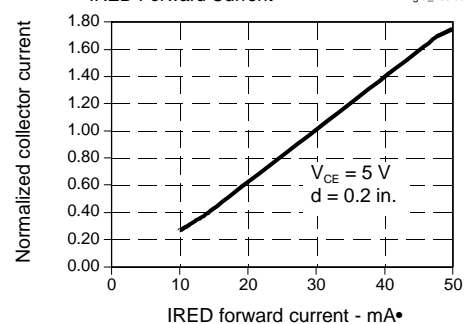


Fig. 6 Collector Current vs IRED Forward Current



All Performance Curves Show Typical Values

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