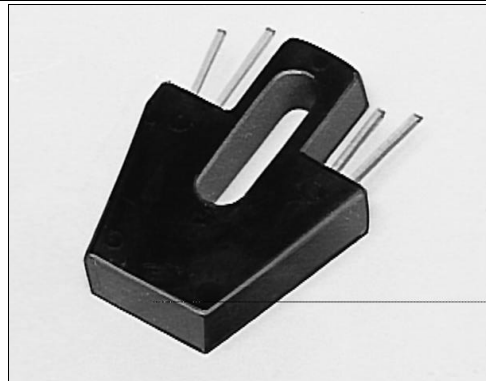


# HOA1405

## Reflective Sensor

### FEATURES

- Phototransistor output
- Focused for maximum response
- Ambient light and dust protective filter



INFRA-68.TIF

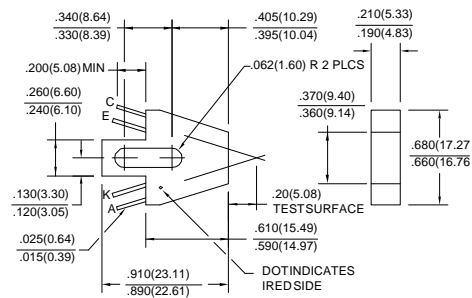
### DESCRIPTION

The HOA1405 series consists of an infrared emitting diode and an NPN silicon phototransistor encased side-by-side on converging optical axes in a black thermoplastic housing. The phototransistor responds to radiation from the IRED only when a reflective object passes within its field of view. The HOA1405 series employs an IR transmissive filter to minimize the effects of visible ambient light and to provide a smooth optical face which prevents the accumulation of airborne contaminants in the optical path. The HOA1405 series contains plastic molded components. For additional component information see SEP8505 and SDP8405.

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

### OUTLINE DIMENSIONS in inches (mm)

Tolerance 3 plc decimals ±0.010(0.25)  
2 plc decimals ±0.020(0.51)



DIM\_032.d54

# HOA1405

## Reflective Sensor

### ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>IR EMITTER</b>						
Forward Voltage	$V_F$		1.6		V	$I_F=20\text{ mA}$
Reverse Leakage Current	$I_R$		10		$\mu\text{A}$	$V_R=3\text{ V}$
<b>DETECTOR</b>						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	30			V	$I_C=100\text{ }\mu\text{A}$
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5.0			V	$I_E=100\text{ }\mu\text{A}$
Collector Dark Current	$I_{CEO}$		100		nA	$V_{CE}=10\text{ V}, I_F=0$
<b>COUPLED CHARACTERISTICS</b>						
On-State Collector Current	$I_{C(ON)}$				mA	$V_{CE}=5\text{ V}$
HOA1405-001		0.2				$I_F=30\text{ mA}$
HOA1405-002		0.8				(1)
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$				V	$I_F=30\text{ mA}$ (1)
HOA1405-001	$V_{(BR)CEO}$			0.4		$I_C=30\text{ }\mu\text{A}$
HOA1405-002				0.4		$I_C=100\text{ }\mu\text{A}$
Rise And Fall Time	$t_r, t_f$		15		$\mu\text{s}$	$V_{CC}=5\text{ V}, I_C=1\text{ mA}$ $R_L=1000\text{ }\Omega$

#### 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.

### ABSOLUTE MAXIMUM RATINGS

(25°C Free-Air Temperature unless otherwise noted)

Operating Temperature Range	-40°C to 85°C
Storage Temperature Range	-40°C to 85°C
Soldering Temperature (5 sec)	240°C

#### IR EMITTER

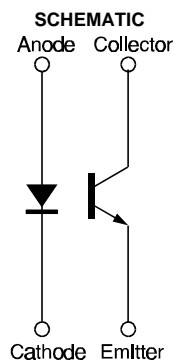
Power Dissipation	70 mW (1)
Reverse Voltage	3 V
Continuous Forward Current	50 mA

#### DETECTOR

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5 V
Power Dissipation	70 mW (1)

#### Notes

1. Derate linearly at 0.18 mW/°C above 25°C.



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

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# HOA1405

## Reflective Sensor

Fig. 1 IRED Forward Bias Characteristics

gra\_073.ds4

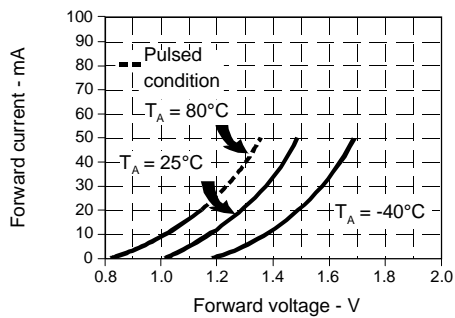


Fig. 2 Non-Saturated Switching Time vs Load Resistance

gra\_074.ds4

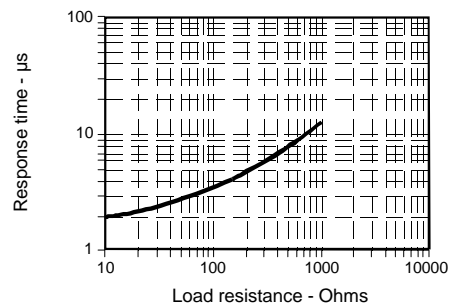


Fig. 3 Dark Current vs Temperature

gra\_301.cdr

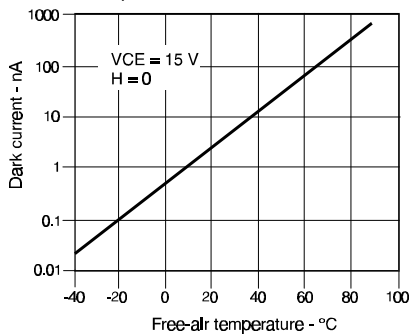


Fig. 4 Collector Current vs Ambient Temperature

gra\_076.ds4

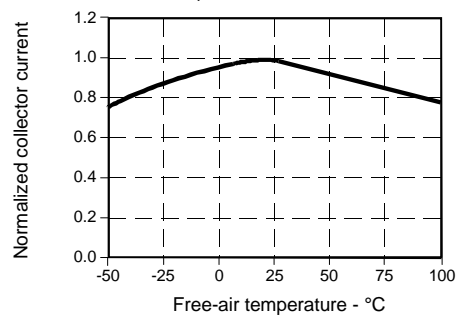


Fig. 5 Collector Current vs Distance to Reflective Surface

gra\_090.ds4

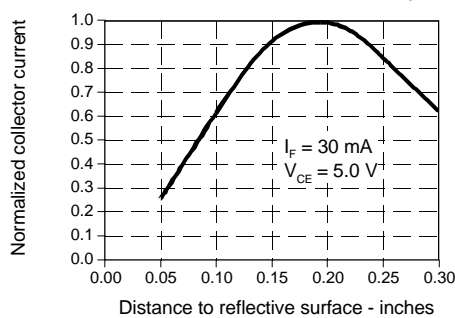
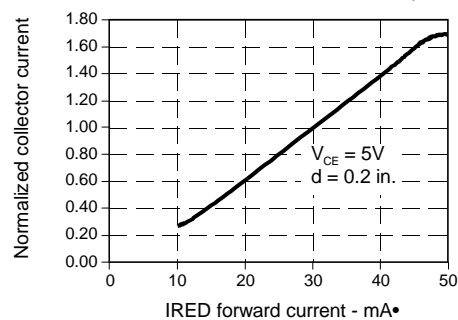


Fig. 6 Collector Current vs IRED Forward Current

gra\_091.ds4



All Performance Curves Show Typical Values

**HOA1405**  
Reflective Sensor

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