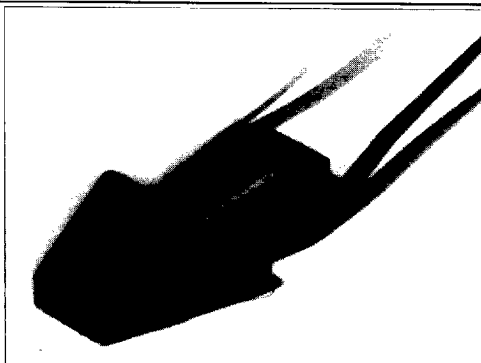


Reflective Sensor

- 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



1NFRA-84 TIF

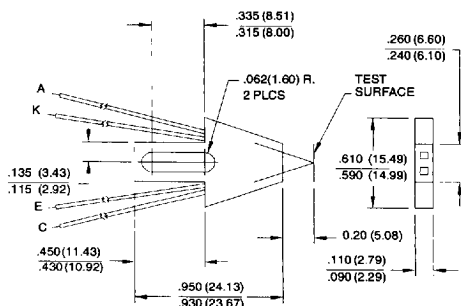
The HOA1406 series consists of an infrared emitting diode facing an NPN silicon phototransistor (HOA1406-001) or photodarlington (HOA1406-003) encased side-by-side on converging optical axes, in a black thermoplastic housing. The detector responds to radiation from the IRED only when a reflective object 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

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



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HOA1406

Reflective Sensor

ELECTRICAL CHARACTERISTIC (25°C unless otherwise noted)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
IR EMITTER						
Forward Voltage	V_F			1.6	V	$I_F=20\text{ mA}$
Reverse Leakage Current	I_R			10	μA	$V_R=3\text{ V}$
DETECTOR						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$				V	$I_C=100\text{ }\mu\text{A}$
HOA1406-001		30				
HOA1406-003		15				
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5.0			V	$I_E=100\text{ }\mu\text{A}$
Collector Dark Current	I_{CEO}			100	nA	$V_{CE}=10\text{ V}, I_F=0$
HOA 1406-001				250		
HOA1406-003						
COUPLED CHARACTERISTICS						
On-State Collector Current	$I_{C(ON)}$				μA	$V_{CE}=5\text{ V}$
HOA1406-001		25				$I_F=40\text{ mA}$
HOA1406-003		2.0			mA	(1)
Crosstalk (2)	I_{CX}			2.0	μA	$V_{CE}=5\text{ V}, I_F=40\text{ mA}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$				V	$I_F=40\text{ mA}$ (1)
HOA1406-001				0.4		$I_C=10\text{ }\mu\text{A}$
HOA1406-003				1.1		$I_C=1\text{ mA}$
Rise And Fall Time	t_r, t_f				μs	$V_{CC}=5\text{ V}, I_C=1\text{ mA}$
HOA1406-001			15			$R_L=1000\text{ }\Omega$
HOA1406-003			75			$R_L=100\text{ }\Omega$

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.

2. Crosstalk (I_{CX}) 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

IR EMITTER

Power Dissipation 80 mW (1)

Reverse Voltage 3 V

Continuous Forward Current 50 mA

DETECTOR

Collector-Emitter Voltage 30 V TRANS. 15 V DARLINGTON

Emitter-Collector Voltage 5 V 5 V

Power Dissipation 75 mW (2) 75 mW (2)

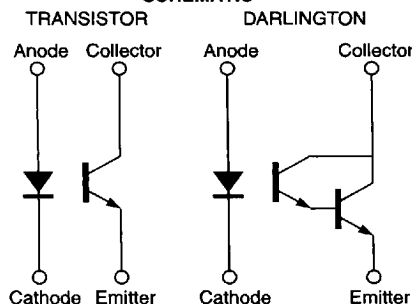
Collector DC Current 30 mA 30 mA

Notes

1. Derate linearly at 1.07 mW/°C above 25°C.

2. Derate linearly at 0.67 mW/°C above 25°C.

SCHEMATIC



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HOA1406

Reflective Sensor

Fig. 1 IRED Forward Bias Characteristics

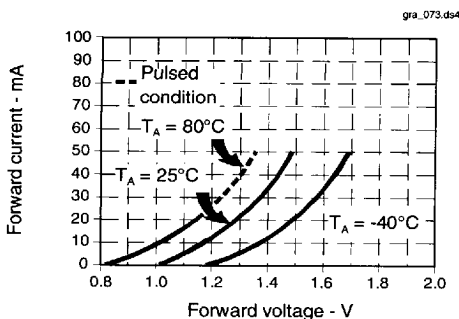


Fig. 2 Non-Saturated Switching Time vs Load Resistance

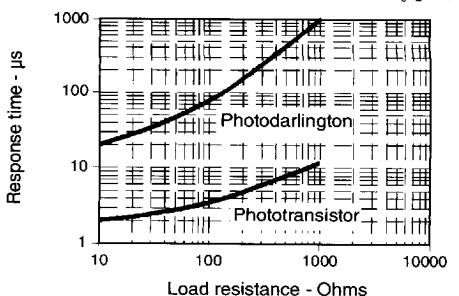


Fig. 3 Dark Current vs Temperature

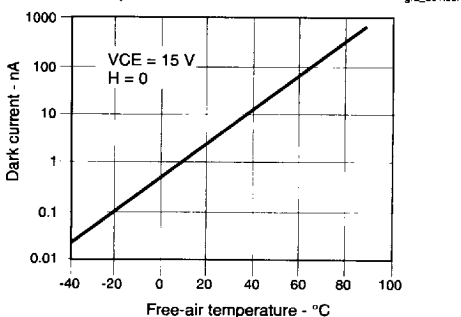


Fig. 4 Collector Current vs Ambient Temperature

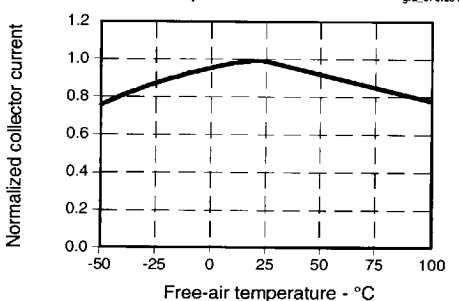


Fig. 5 Collector Current vs Distance to Reflective Surface

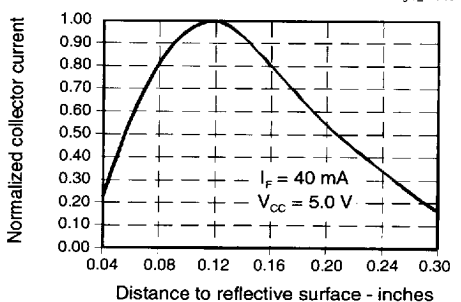
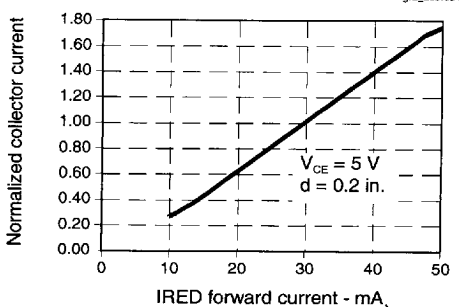


Fig. 6 Collector Current vs IRED Forward Current



All Performance Curves Show Typical Values