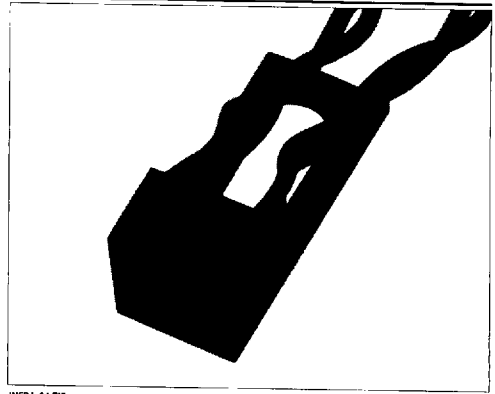


# HOA1180

## Reflective Sensor

### FEATURES

- Choice of phototransistor or photodarlington output
- High sensitivity
- Wide operating temperature range (-55°C to +100°C)
- 12.0 in.(305 mm) min. 28 AWG PVC insulated wire leads



INFRA-24.TIF

### DESCRIPTION

The HOA1180 series consists of an infrared emitting diode and an NPN silicon phototransistor (HOA1180-001, -002) or photodarlington (HOA1180-003), 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. The HOA1180 series employs metal can packaged components. For additional component information see SE1450, SD1440, and SD1410.

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

Wire color code and functions are:

All devices

IRED anode - Red  
IRED cathode - Black

HOA1180-001

Collector - Brown  
Emitter - Black

HOA1180-002

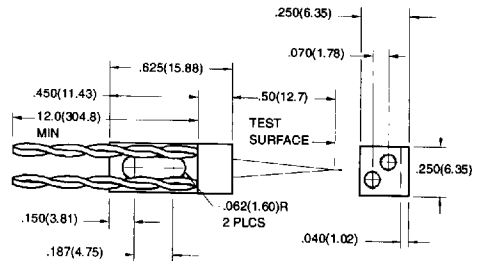
Collector - Orange  
Emitter - Black

HOA1180-003

Collector - Yellow  
Emitter - Black

### OUTLINE DIMENSIONS in inches (mm)

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



DIM\_035.dwg

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# HOA1180

## Reflective Sensor

### ELECTRICAL CHARACTERISTIC (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	$V_{(BR)CEO}$				V	$I_C=100\text{ }\mu\text{A}$
HOA1180-001, -002		30				
HOA1180-003		15				
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5.0			V	$I_E=100\text{ }\mu\text{A}$
Collector Dark Current	$I_{CEO}$				nA	$V_{CE}=10\text{ V}$ $I_F=0$
HOA1180-001, -002				100		
HOA1180-003				250		
<b>COUPLED CHARACTERISTICS</b>						
On-State Collector Current	$I_{C(ON)}$				mA	$V_{CE}=5\text{ V}$ $I_F=30\text{ mA}$ (1)
HOA1180-001		0.04				
HOA1180-002		0.16				
HOA1180-003		2.0				
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$				V	$I_F=30\text{ mA}$ (1) $I_C=5\text{ }\mu\text{A}$ $I_C=20\text{ }\mu\text{A}$ $I_C=250\text{ }\mu\text{A}$
HOA1180-001				0.4		
HOA1180-002				0.4		
HOA1180-003				1.1		
Rise And Fall Time	$t_r, t_f$				$\mu\text{s}$	$V_{CC}=5\text{ V}, I_C=1\text{ mA}$ $R_L=1000\text{ }\Omega$ $R_L=100\text{ }\Omega$
HOA1180-001, -002				15		
HOA1180-003				75		

#### Notes

1. Test surface is a front surface mirror (polished aluminum, 85% reflectance) located 0.50 in. (12.7 mm) from the front surface of the device.

### ABSOLUTE MAXIMUM RATINGS

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

Operating Temperature Range	-55°C to 100°C
Storage Temperature Range	-55°C to 125°C
Soldering Temperature (5 sec)	240°C

#### IR EMITTER

Power Dissipation	75 mW (1)
Reverse Voltage	3 V
Continuous Forward Current	50 mA

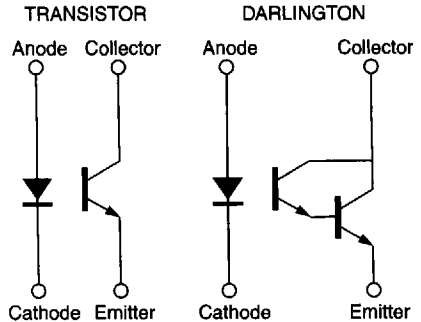
#### DETECTOR

	TRANS.	DARLINGTON
Collector-Emitter Voltage	30 V	15 V
Emitter-Collector Voltage	5 V	5 V
Power Dissipation	75 mW (1)	75 mW (1)
Collector DC Current	30 mA	30 mA

#### Notes

1. Derate linearly at 0.71 mW/°C above 25°C.

### SCHEMATIC



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# HOA1180

## Reflective Sensor

Fig. 1 IRED Forward Bias Characteristics

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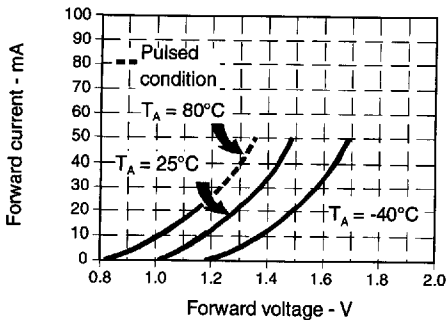


Fig. 2 Non-Saturated Switching Time vs Load Resistance

gra\_079.ds4

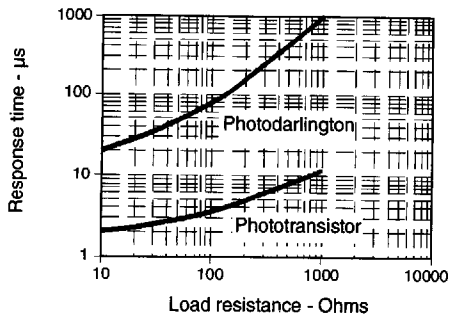


Fig. 3 Dark Current vs Temperature

gra\_303.cdr

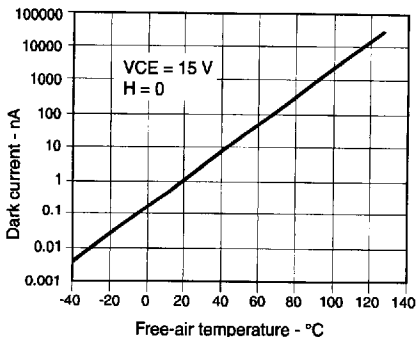


Fig. 4 Collector Current vs Ambient Temperature

gra\_076.ds4

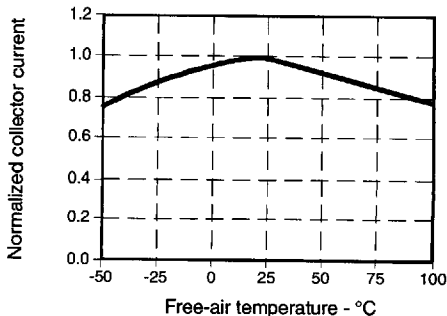


Fig. 5 Collector Current vs Distance to Reflective Surface

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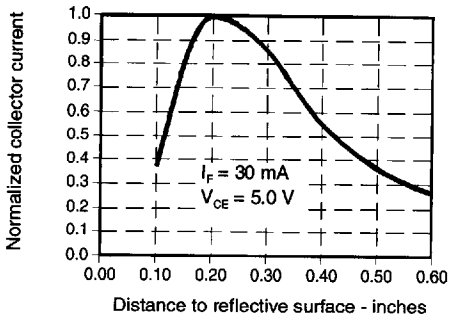
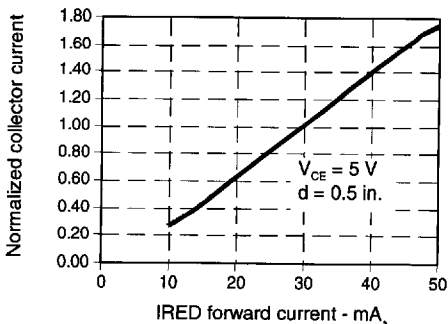


Fig. 6 Collector Current vs IRED Forward Current

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All Performance Curves Show Typical Values

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