

## Infrared Assemblies

### Dual Channel Transmissive Optoschmitt Sensor *HOA2007 Series*

#### FEATURES

- Direct TTL interface
- Two channel operation
- Buffer logic
- PCB mount package
- Polarized locator pins
- Accurate position sensing
- 0,5 mm (0.020 in.) aperture windows
- 1,78 mm (0.070 in.) slot width
- Available in shipping tubes



The HOA2007 Series consists of two infrared emitting diodes facing two Optoschmitt detectors encased in a black thermoplastic housing. The photodetector consists of a photodiode, amplifier, voltage regulator, schmitt trigger and an NPN phototransistor with a 10 k $\Omega$  (nominal) pull-up resistor. Detector switching takes place whenever an opaque object passes through the slot between the emitter and the detector. The buffer logic provides a high output when the optical path is clear. The dual channels allow both the speed and the direction of the interrupter to be sensed. Emitters and detectors have a 0,5 mm (0.020 in.) vertical aperture. This feature is ideal for use in applications in which high position resolution is desired.

The sensor housing is an opaque thermoplastic with aperture openings for use in applications in which maximum rejection of ambient light is important and maximum position resolution is desired. The HOA2007 series contains plastic molded components. For additional component information see SEP8506 and SDP8601.

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

Valox is a registered trademark of General Electric Company.

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HOA2007 Series

### ABSOLUTE MAXIMUM RATINGS (25°C free-air temperature unless otherwise noted)

Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C
Soldering Temperature (5 sec)	240°C

### IR EMITTER

Power Dissipation	100 mW <sup>(1)</sup>
Reverse Voltage	3 V
Continuous Forward Current	50 mA

### DETECTOR

Supply Voltage	12 V <sup>(2)</sup>
Output Sink Current	18 mA
Duration of Output Short to V <sub>cc</sub> or Ground	1.0 sec

### Notes:

1. Derate linearly at 0.78 mW/°C above 25°C.
2. Derate linearly from 25°C to 5.5 V at 70°C.

### CAUTION

#### STRESS DAMAGE

Functional operation of the device at or above "Absolute Maximum Ratings" for extended periods of time may affect reliability.

**Failure to comply with these instructions may result in product damage.**

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

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
<b>IR EMITTER (each)</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 (each)</b>						
Operating Supply Voltage	V <sub>cc</sub>	4.5		12	V	
Low Level Supply Current	I <sub>ccl</sub>	4.0		12	mA	V <sub>cc</sub> =5 V
		5.0		15		V <sub>cc</sub> =12 V
High Level Supply Current	I <sub>cch</sub>	2.0		10	mA	V <sub>cc</sub> =5 V
		3.0		12		V <sub>cc</sub> =12 V
Low Level Output Voltage	V <sub>OL</sub>			0.4	V	I <sub>OL</sub> =12.8 mA, I <sub>F</sub> =0 mA
High Level Output Voltage	V <sub>OH</sub>	2.4			V	I <sub>OH</sub> =0, I <sub>F</sub> =20 mA
Hysteresis <sup>(1)</sup>	HYST		10		%	
Propagation Delay	t <sub>PLH</sub> , t <sub>PHL</sub>		5		μs	V <sub>cc</sub> =5 V, I <sub>F</sub> =20 mA
Low-High, High-Low						
Rise Time	t <sub>r</sub>		60		ns	R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF
Fall Time	t <sub>f</sub>		15		ns	R <sub>L</sub> =390 Ω, C <sub>L</sub> =50 pF
<b>COUPLED CHARACTERISTICS</b>						
IRET Trigger Current, HOA2007-001	I <sub>FT</sub>			20	mA	V <sub>cc</sub> =5 V

### Notes:

\*Add a bypass capacitor, 0.1 μF typical, between V<sub>cc</sub> and GND near the device in order to stabilize the power supply line.

1. Hysteresis is defined as the difference between the operating and release threshold intensities, expressed as a percentage of the operate threshold intensity.

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HOA2007 Series

## SCHEMATIC

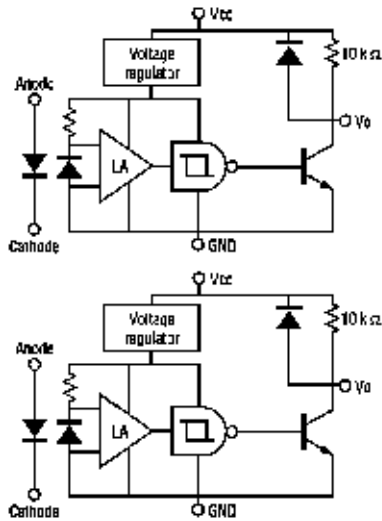


Figure 1  
IRED Forward Bias Characteristics

## SWITCHING WAVEFORM

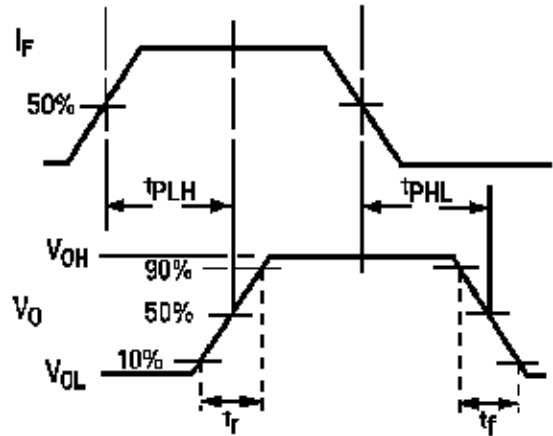
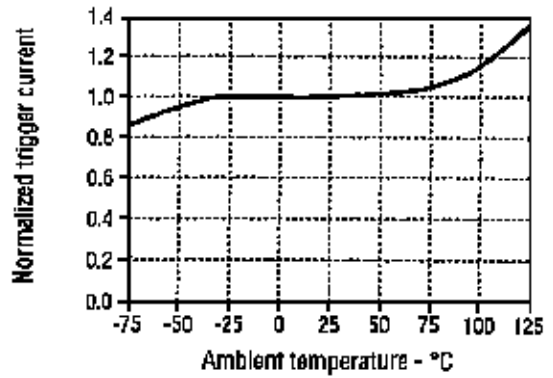
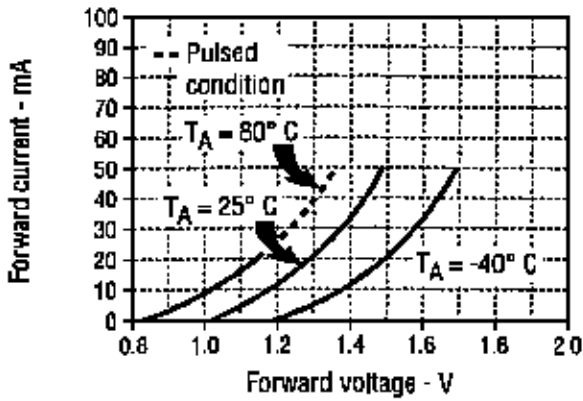


Figure 2  
IRED Trigger Current vs Temperature



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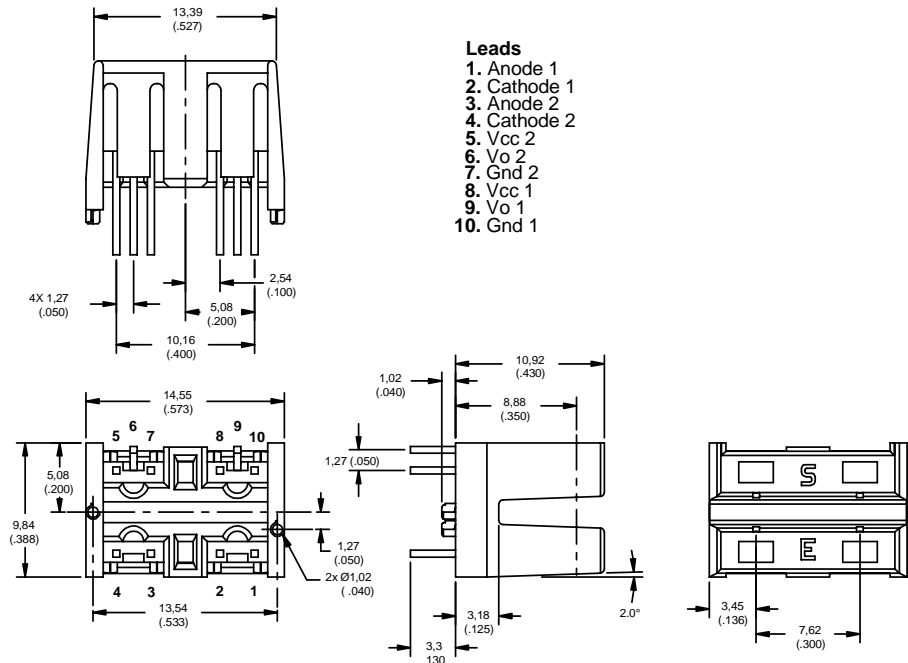
## Dual Channel Transmissive Optoschmitt Sensor

HOA2007 Series

### ORDER GUIDE

Catalog Listing	Description
HOA2007-001	Dual Channel Transmissive Optoschmitt Sensor

### OUTLINE DIMENSIONS mm/(in.) (for reference only)



### WARRANTY/REMEDY

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