

Infrared Assemblies

Dual Channel Transmissive Sensor

HOA1889 Series

FEATURES

- Choice of phototransistor or photodarlington output
- 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 HOA1889 Series consists of two infrared emitting diodes facing two NPN silicon phototransistors (HOA1889-011) or two photodarlington transistors (HOA1889-013) encased in a black thermoplastic housing. Detector switching takes place whenever an opaque object passes through the slot between the the emitter and the detector. 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 HOA1889 Series contains plastic molded components. For additional component information see SEP8506, SDP8406, and SDP8106.

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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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 | 100 mW ⁽¹⁾ |
| Reverse Voltage | 3 V |
| Continuous Forward Current | 50 mA |

| DETECTOR | TRANSISTOR | DARLINGTON |
|---------------------------|-----------------------|-----------------------|
| Collector-Emitter Voltage | 30 V | 15 V |
| Emitter Collector Voltage | 5 V | 5 V |
| Power Dissipation | 100 mW ⁽¹⁾ | 100 mW ⁽¹⁾ |
| Collector DC Current | 30 mA | 30 mA |

Note:

1. Derate linearly at 0.78 mW/°C above 25°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 |
|--------------------------------------|---------------|-----|-----|-----|------|--------------------------|
| IR EMITTER (each) | | | | | | |
| Forward Voltage | V_F | | | 1.6 | V | $I_F=20$ mA |
| Reverse Leakage Current | I_R | | | 10 | μA | $V_R=3$ V |
| DETECTOR (each) | | | | | | |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | | | | V | $I_C=100$ μA |
| HOA1889-011 | | 30 | | | | |
| HOA1889-013 | | 15 | | | | |
| Emitter-Collector Breakdown Voltage | $V_{(BR)ECO}$ | 5.0 | | | V | $I_E=100$ μA |
| Collector Dark Current | I_{CEO} | | | | nA | $V_{CE}=10$ V |
| HOA1889-011 | | | | 100 | | $I_F=0$ |
| HOA1889-013 | | | | 250 | | |
| COUPLED CHARACTERISTICS | | | | | | |
| On-State Collector Current | $I_{C(ON)}$ | | | | mA | $V_{CE}=5$ V |
| HOA1889-011 | | 0.5 | | | | $I_F=20$ mA |
| HOA1889-013 | | 2.0 | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | | | | V | $I_F=20$ mA |
| HOA1889-011 | | | | 0.4 | | $I_C=40$ μA |
| HOA1889-013 | | | | 1.1 | | $I_C=250$ μA |
| Rise And Fall Time | t_r, t_f | | | | μs | $V_{CC}=5$ V, $I_C=1$ mA |
| HOA1889-011, | | | 15 | | | $R_L=1000$ Ω |
| HOA1889-013 | | | 75 | | | $R_L=100$ Ω |

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SCHEMATIC

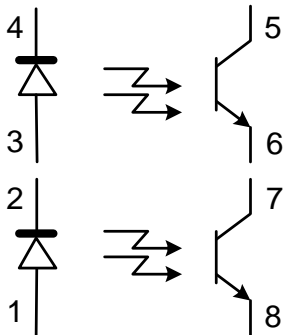


Figure 1: IRED Forward Bias Characteristics

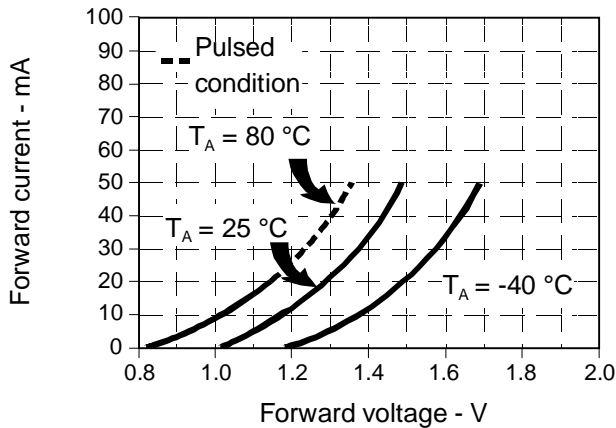


Figure 3: Detector Dark Current vs Temperature

Figure 2: Non-saturated Switching Time vs Load Resistance

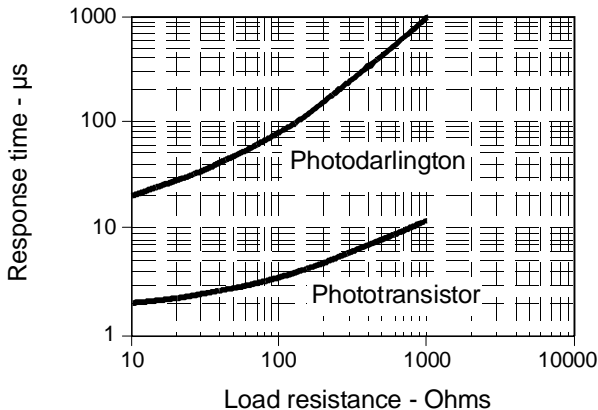
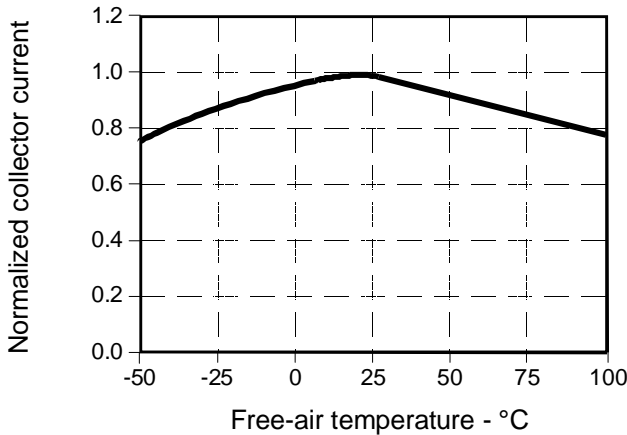


Figure 4: Collector Current vs Ambient Temperature



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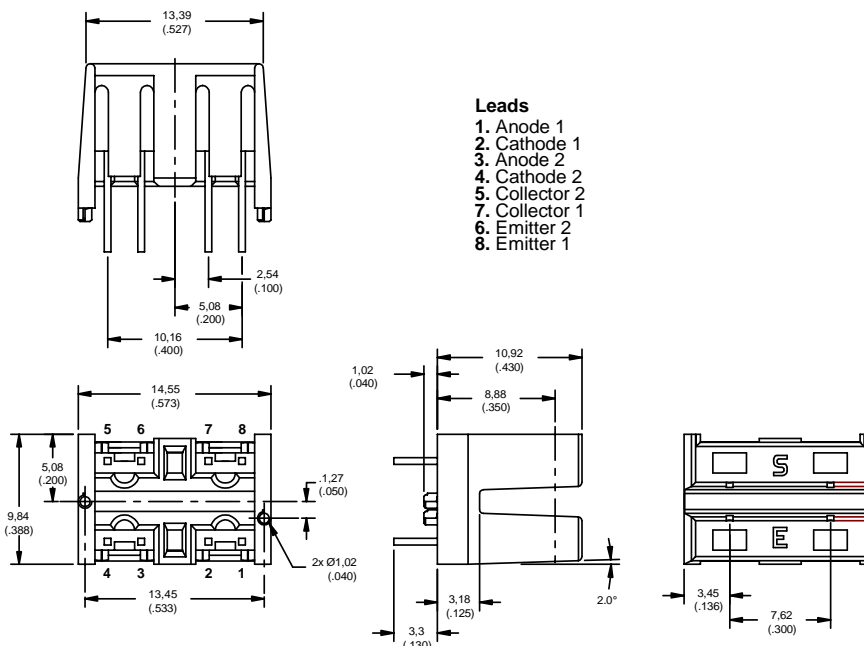
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ORDER GUIDE

| Catalog Listing | Description |
|-----------------|---|
| HOA1889-011 | Dual Channel Transmissive Sensor, Phototransistor |
| HOA1889-013 | Dual Channel Transmissive Sensor, Photodarlington |

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



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