

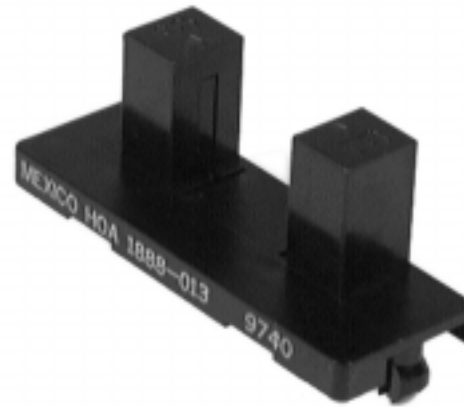
## Infrared Assemblies

### Wide Gap Transmissive Sensor

### *HOA1888 Series*

#### FEATURES

- Choice of phototransistor or photodarlington output
- Visible ambient light and dust protective filter
- 12 mm (0.47 in.) slot width
- Snap-in housing



The HOA1888 Series consists of an infrared emitting diode facing an NPN silicon phototransistor (HOA1888-011) or photodarlington (HOA1888-013) encased in a black thermoplastic housing. Detector switching takes place whenever an opaque object passes through the slot between emitter and detector. Both emitter and detector have 1,52 mm (0.060 in.) x 1,52 mm (0.060 in.) vertical apertures.

The sensor housing contains IR (Infrared) transmissive optical windows. This arrangement provides excellent protection against visible ambient light while eliminating aperture openings which could be clogged by airborne contaminants.

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

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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 <sup>(1)</sup> |
| 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 <sup>(1)</sup> | 100 mW <sup>(1)</sup> |
| Collector DC Current      | 30 mA                 | 30 mA                 |

### Note:

- 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           |
|--------------------------------------|---------------|-----|-----|-----|------|--------------------------|
| <b>IR EMITTER</b>                    |               |     |     |     |      |                          |
| Forward Voltage                      | $V_F$         |     |     | 1.6 | V    | $I_F=20$ mA              |
| Reverse Leakage Current              | $I_R$         |     |     | 10  | μA   | $V_R=3$ V                |
| <b>DETECTOR</b>                      |               |     |     |     |      |                          |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ |     |     |     | V    | $I_C=100$ μA             |
| HOA1888-011                          |               | 30  |     |     |      |                          |
| HOA1888-013                          |               | 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<br>$I_F=0$ |
| HOA1888-011                          |               |     |     | 100 |      |                          |
| HOA1888-013                          |               |     |     | 250 |      |                          |
| <b>COUPLED CHARACTERISTICS</b>       |               |     |     |     |      |                          |
| On-State Collector Current           | $I_{C(ON)}$   |     |     |     | mA   | $V_{CE}=5$ V             |
| HOA1888-011                          |               | 0.5 |     |     |      | $I_F=20$ mA              |
| HOA1888-013                          |               | 2.0 |     |     |      |                          |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ |     |     |     | V    | $I_F=20$ mA              |
| HOA1888-011                          |               |     |     | 0.4 |      | $I_C=60$ μA              |
| HOA1888-013                          |               |     |     | 1.1 |      | $I_C=250$ μA             |
| Rise And Fall Time                   | $t_r, t_f$    |     |     |     | μs   | $V_{CC}=5$ V, $I_C=1$ mA |
| HOA1888-011                          |               |     | 15  |     |      | $R_L=1000$ Ω             |
| HOA1888-013                          |               |     | 75  |     |      | $R_L=100$ Ω              |

# Infrared Assemblies

## Wide Gap Transmissive Sensor

HOA1888 Series

### SCHEMATIC

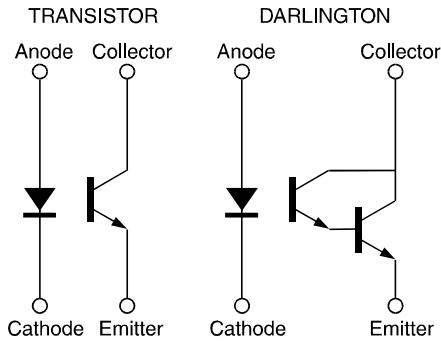


Figure 1: IRED Forward Bias Characteristics

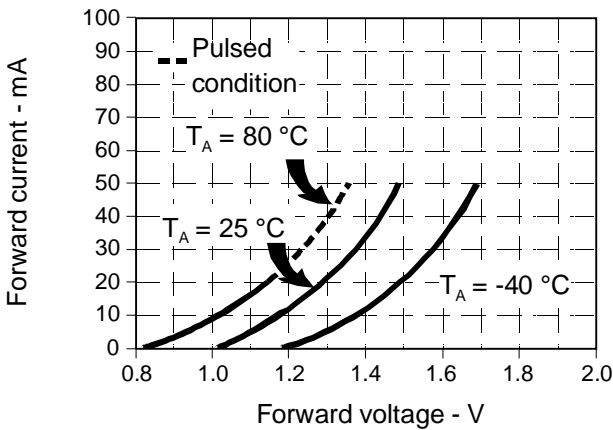


Figure 3: Detector Dark Current vs Temperature

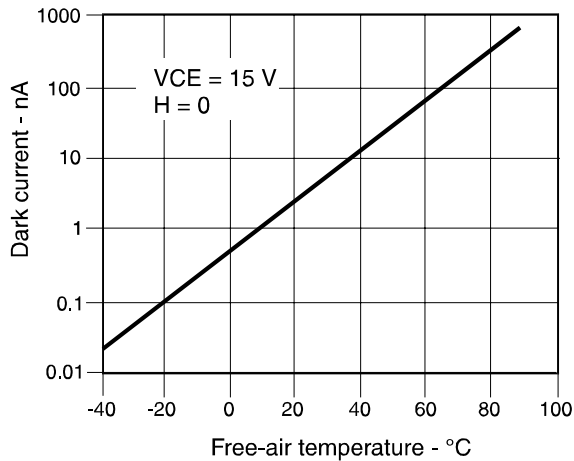


Figure 2: Non-saturated Switching Time vs Load Resistance

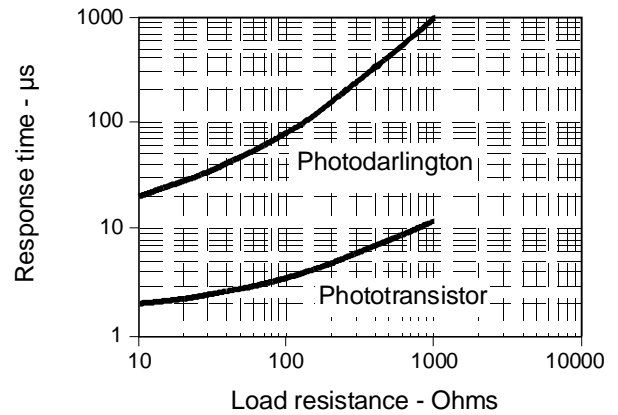
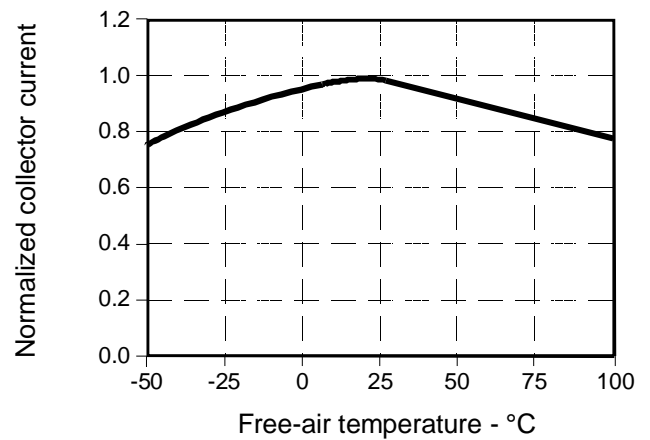


Figure 4: Collector Current vs Ambient Temperature



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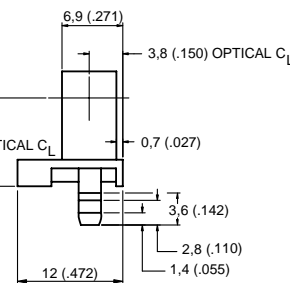
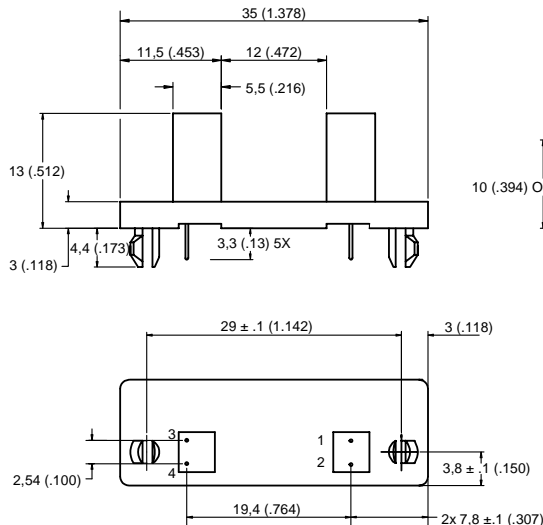
## Wide Gap Transmissive Sensor

HOA1888 Series

### ORDER GUIDE

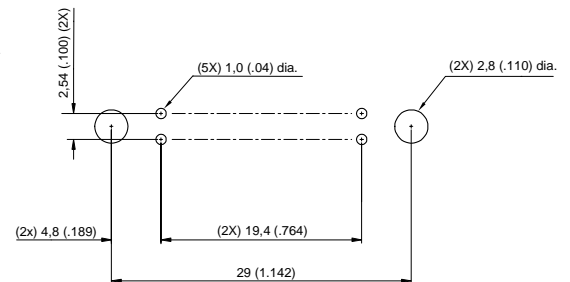
| Catalog Listing | Description                                   |
|-----------------|---|
| HOA1888-011     | Wide Gap Transmissive Sensor, Phototransistor |
| HOA1888-013     | Wide Gap Transmissive Sensor, Photodarlington |

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



LEADS:  
 1. ANODE 3. EMITTER  
 2. CATHODE 4. COLLECTOR

### RECOMMENDED PCB MOUNTING HOLE DIMENSIONS mm (in.)



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