

# HOA088X/089X

## Transmissive Sensor

### FEATURES

- Phototransistor output
- Four mounting configurations
- Accurate position sensing
- 0.125 in.(3.18 mm) slot width
- Choice of detector aperture
- 24.0 in.(610 mm) min. 26 AWG UL 1429 wire leads
- Choice of opaque or IR transmissive housings

### DESCRIPTION

The HOA088X/089X series consists of an infrared emitting diode facing an NPN silicon phototransistor encased in a black thermoplastic housing. Phototransistor switching takes place whenever an opaque object passes through the slot between emitter and detector. This series allows the user to choose from available options: (1) mounting tab configuration, (2) detector aperture size, (3) electro-optical characteristics, and (4) housing materials.

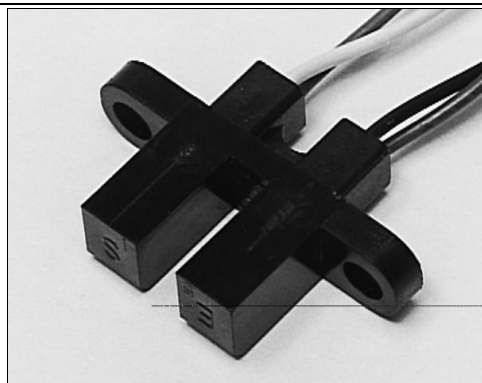
All devices employ a built-in strain relief for maximum wire attachment strength. The HOA088X series utilizes an IR transmissive polysulfone housing which features smooth optical faces without external aperture openings; this feature is desirable when aperture blockage from airborne contaminants is a possibility. The HOA089X series employs an opaque polysulfone housing with aperture openings for use in applications in which maximum rejection of ambient light is important and in situations where maximum position resolution is desired. The HOA088X/089X series employs plastic molded components. For additional component information see SEP8506 and SDP8406.

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

The detector to emitter lead spacing is 0.32 in.(8.13 mm) for all versions. Wire color code and functions are:

|                      |                            |
|----------------------|----------------------------|
| Red - IRED Anode     | White - Detector Collector |
| Black - IRED Cathode | Green - Detector Emitter   |

To specify the complete product characteristics, see PART NUMBER GUIDE.

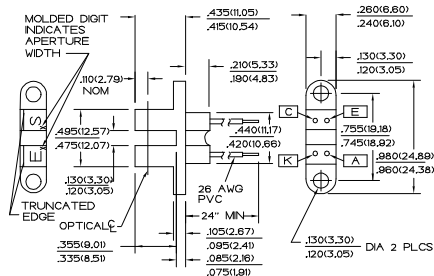


INFRA-66.TIF

### OUTLINE DIMENSIONS in inches (mm)

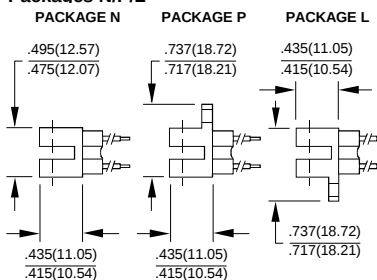
|           |                |              |
|-----------|----------------|--------------|
| Tolerance | 3 plc decimals | ±0.010(0.25) |
|           | 2 plc decimals | ±0.020(0.51) |

### Package T



DIM\_042.cdr

### Packages N/P/L



DIM\_067.d54

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## Transmissive Sensor

### ELECTRICAL CHARACTERISTICS (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  | $V_{(BR)CEO}$ | 30  |     |     | V             | $I_C=100\text{ }\mu\text{A}$                                     |
| Emitter-Collector Breakdown Voltage  | $V_{(BR)ECO}$ | 5.0 |     |     | V             | $I_E=100\text{ }\mu\text{A}$                                     |
| Collector Dark Current               | $I_{CE0}$     |     |     | 100 | nA            | $V_{CE}=10\text{ V}, I_F=0$                                      |
| <b>COUPLED CHARACTERISTICS</b>       |               |     |     |     |               |                                                                  |
| On-State Collector Current           | $I_{C(ON)}$   |     |     |     | mA            |                                                                  |
| Parameter A<br>(HOA0880/0890)        |               | 0.5 |     |     |               | $V_{CE}=10, I_F=20\text{ mA}$                                    |
| Parameter B<br>(HOA0881/0891)        |               | 1.0 |     |     |               | $V_{CE}=5\text{ V}, I_F=10\text{ mA}$                            |
| Parameter C<br>(HOA0882/0892)        |               | 1.8 |     |     |               | $V_{CE}=0.6, I_F=20\text{ mA}$                                   |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ |     |     |     | V             |                                                                  |
| Parameter A<br>(HOA0880/0890)        |               |     | 0.4 |     |               | $I_C=0.4\text{ mA}, I_F=20\text{ mA}$                            |
| Parameter B<br>(HOA0881/0891)        |               |     | 0.4 |     |               | $I_C=0.8\text{ mA}, I_F=10\text{ mA}$                            |
| Parameter C<br>(HOA0882/0892)        |               |     | 0.6 |     |               | $I_C=1.8\text{ mA}, I_F=20\text{ mA}$                            |
| Rise And Fall Time                   | $t_r, t_f$    |     | 15  |     | $\mu\text{s}$ | $V_{CC}=5\text{ V}, I_C=1\text{ mA}$<br>$R_L=1000\text{ }\Omega$ |

### 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         |

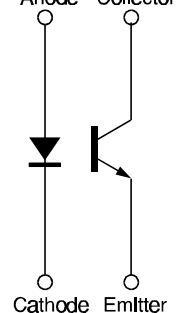
#### IR EMITTER

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

#### DETECTOR

|                           |                       |
|---------------------------|-----------------------|
| Collector-Emitter Voltage | 30 V                  |
| Emitter-Collector Voltage | 5 V                   |
| Power Dissipation         | 100 mW <sup>(1)</sup> |
| Collector DC Current      | 30 mA                 |

### SCHEMATIC



Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

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Fig. 1 IRED Forward Bias Characteristics

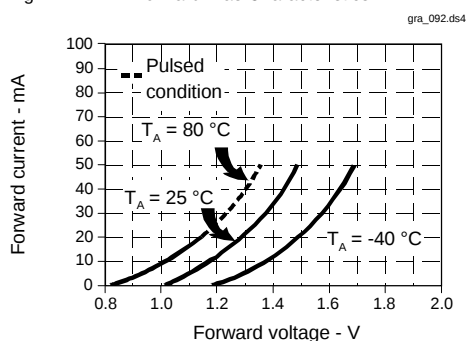


Fig. 2 Non-Saturated Switching Time vs Load Resistance

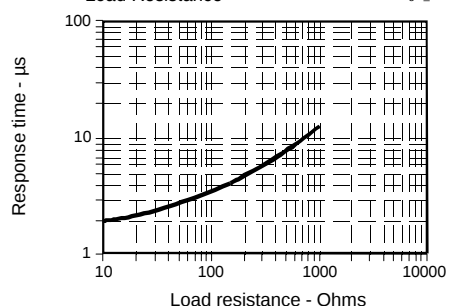


Fig. 3 Dark Current vs Temperature

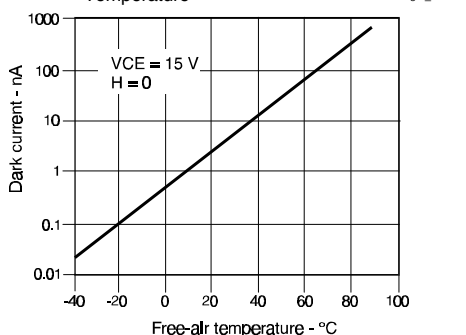
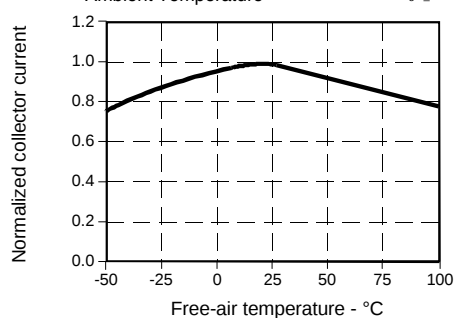


Fig. 4 Collector Current vs Ambient Temperature



All Performance Curves Show Typical Values

### PART NUMBER GUIDE

### HOA08XX-XXX

#### Housing Material

8 = Polysulfone, IR transmissive  
9 = Polysulfone, opaque

#### Electrical Specifications

0 = Parameter A  
1 = Parameter B  
2 = Parameter C

\*0.010 in. (.25 mm) aperture available  
with electrical Parameter A only

#### Aperture Width In Front Of Detector

\*1 = 0.010 in. (0.25 mm)  
5 = 0.050 in. (1.27 mm)  
Aperture length is 0.060 in. (1.52 mm)

#### Aperture Width In Front Of IRED

5 = 0.050 in. (1.27 mm)  
Aperture length is 0.060 in. (1.52 mm)

#### Mounting Configuration

L = Single mounting tab, emitter side  
N = No mounting tabs  
P = Single mounting tab, detector side  
T = Two mounting tabs

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