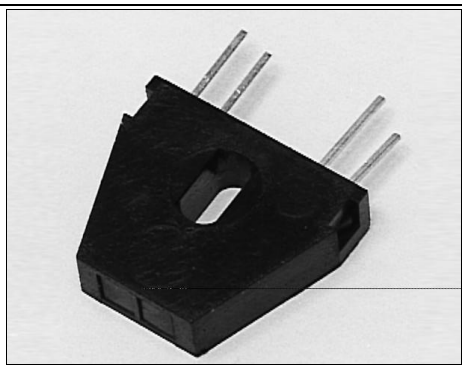
# HOA0708/0709

## Reflective Sensor

### FEATURES

- Choice of phototransistor or photodarlington output
- Focused for maximum response
- Ambient light and dust protective filter
- Adjustable mounting slot



INFRA-56.TIF

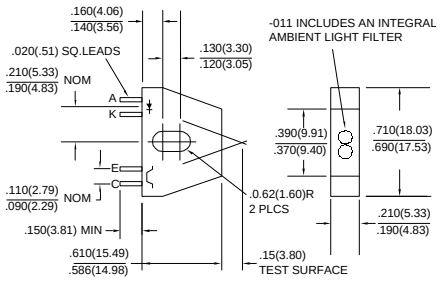
### DESCRIPTION

The HOA0708/0709 series consists of an infrared emitting diode and an NPN silicon phototransistor (HOA0708- 001, - 011) or photodarlington (HOA0709- 001, - 011) 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 HOA0708- 011 and HOA0709- 011 employ an IR transmissive filter to minimize the effects of visible ambient light and provide a smooth optical face which prevents the accumulation of airborne contaminants in the optical path. The HOA0708/0709 series employs plastic molded components. For additional component information see SEP8505, SDP8405, and SDP8105.

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

### OUTLINE DIMENSIONS in inches (mm)

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

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

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| **IR EMITTER** | | | | | | |
| Forward Voltage | $V_F$ | | | 1.6 | V | $I_F$=20 mA |
| Reverse Leakage Current | $I_R$ | | | 10 | µA | $V_R$=3 V |
| **DETECTOR** | | | | | | |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | | | | V | $I_C$=100 µA |
| HOA0708-001, -011 | | 30 | | | | |
| HOA0709-001, -011 | | 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 |
| HOA0708-001, -011 | | | | 100 | | $I_F$=0 |
| HOA0709-001, -011 | | | | 250 | | |
| **COUPLED CHARACTERISTICS** | | | | | | |
| On-State Collector Current | $I_{C(ON)}$ | | | | | $V_{CE}$=5 V |
| HOA0708-001, -011 | | 0.2 | | | | $I_F$=40 mA |
| HOA0709-001, -011 | | 1.0 | | | | (1) |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | | | | V | $I_F$=40 mA (1) |
| HOA0708-001, -011 | | | | 0.4 | | $I_C$=30 µA |
| HOA0709-001, -011 | | | | 1.1 | | $I_C$=125 µA |
| Rise And Fall Time | $t_r$, $t_f$ | | | | µs | $V_{CC}$=5 V, $I_C$=1 mA |
| HOA0708-001, -011 | | | 15 | | | $R_L$=1000 Ω |
| HOA0709-001, -011 | | | 75 | | | $R_L$=100 Ω |

Notes
1. Test surface is Eastman Kodak neutral white test card with 90% diffuse reflectance located 0.15 in. (3.80 mm) from the front surface of the device.

**ABSOLUTE MAXIMUM RATINGS**

| | | |
|---|---|---|
| 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 | 70 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 | 70 mW (1) | 70 mW (1) |
| Collector DC Current | 30 mA | 30 mA |

**SCHEMATIC**

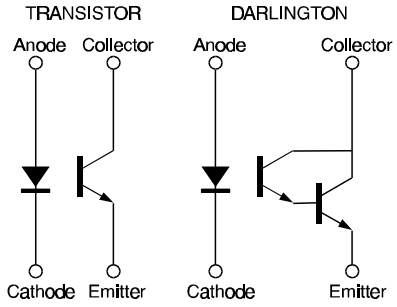




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Fig. 1 IRED Forward Bias Characteristics

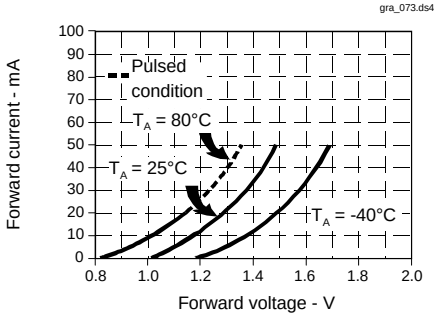



Fig. 2 Non-Saturated Switching Time vs Load Resistance

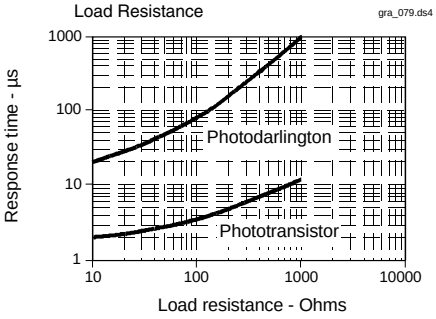



Fig. 3 Dark Current vs Temperature

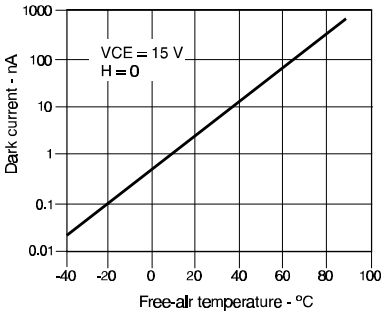



Fig. 4 Collector Current vs Ambient Temperature

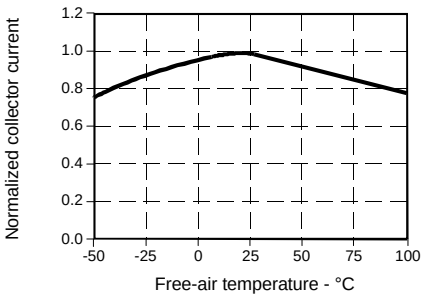



Fig. 5 Collector Current vs Distance to Reflective Surface

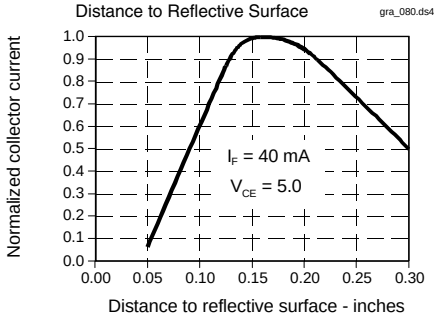
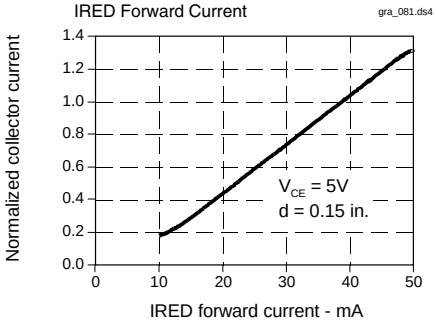



Fig. 6 Collector Current vs IRED Forward Current




All Performance Curves Show Typical Values



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