

HOA2003

Transmissive Optoschmitt Sensor

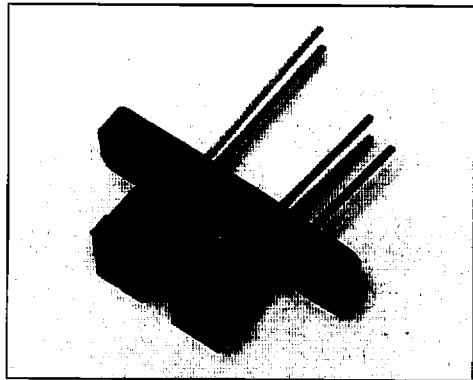
FEATURES

- Direct TTL interface
- Buffer logic
- 0.100 in.(2.54 mm) offset detector leads
- 0.125 in.(3.18 mm) slot width
- Accurate position sensing

DESCRIPTION

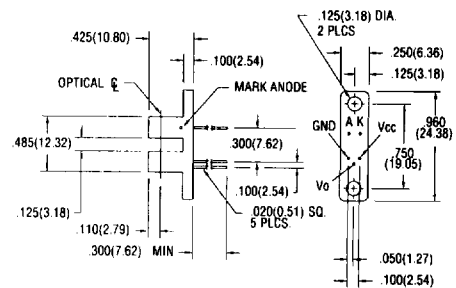
The HOA2003 consists of an infrared emitting diode facing an Optoschmitt detector encased in a black thermoplastic housing. The photodetector consists of a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor with 10 k Ω (nominal) pull-up resistor. The buffer logic provides a high output when the optical path is clear, and a low output when the path is interrupted. The HOA2003 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 detector has a 0.010 in.(.254 mm) x 0.040 in.(1.02 mm) vertical aperture which is ideal for use in applications in which maximum position resolution is desired. The HOA2003 employs plastic molded components. For additional component information see SEP8506 and SDP8600.

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



OUTLINE DIMENSIONS in inches (mm)

Tolerance 3 plc decimals $\pm 0.010(0.25)$
2 plc decimals $\pm 0.020(0.51)$



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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	$I_F=20\text{ mA}$
Reverse Leakage Current	I_R			10	μA	$V_R=3\text{ V}$
DETECTOR						
Operating Supply Voltage	V_{CC}	4.5		12	V	$V_{CC}=5\text{ V}$
Low Level Supply Current	I_{CCL}	4.0		12	mA	$V_{CC}=12\text{ V}$
High Level Supply Current	I_{CCH}	5.0		15	mA	$V_{CC}=5\text{ V}$
		2.0		10		$V_{CC}=12\text{ V}$
Low Level Output Voltage	V_{OL}			0.4	V	$I_{OL}=12.8\text{ mA}, I_F=0\text{ mA}$
High Level Output Voltage	V_{OH}	2.4			V	$I_{OH}=0, I_F=20\text{ mA}$
Propagation Delay, Low-High	t_{PLH}		5		μs	$V_{CC}=5\text{ V}, I_F=20\text{ mA}$
Propagation Delay, High-Low	t_{PHL}		5		μs	$V_{CC}=5\text{ V}, I_F=20\text{ mA}$
Rise Time	t_r		60		ns	$R_L=390\ \Omega, C_L=50\text{ pF}$
Fall Time	t_f		6		ns	$R_L=390\ \Omega, C_L=50\text{ pF}$
COUPLED CHARACTERISTICS						
IRED Trigger Current HOA2003-001	I_{FT}			20	mA	$V_{CC}=5\text{ V}$

Notes

1. It is recommended that a bypass capacitor, 0.1 μF typical, be added between V_{CC} and GND near the device in order to stabilize power supply line.

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⁽¹⁾

Reverse Voltage

3 V

Continuous Forward Current

50 mA

DETECTOR

Supply Voltage

12 V⁽²⁾

Output Sink Current

18 mA

Duration of Output

Short to V_{CC} or Ground

1.0 sec

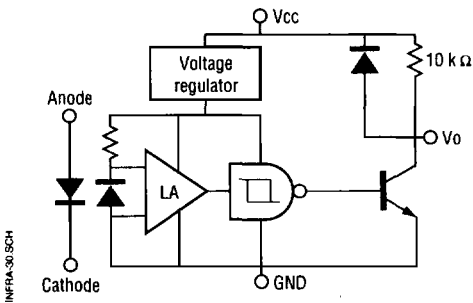
Notes

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

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SCHEMATIC



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SWITCHING WAVEFORM

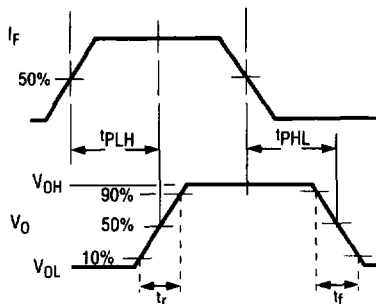


Fig. 2 IRED Trigger Current vs Temperature

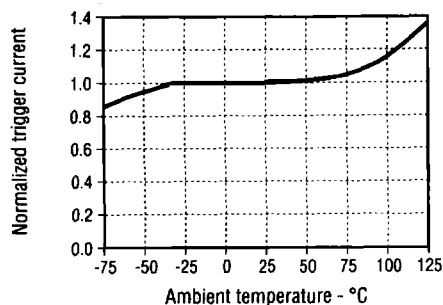
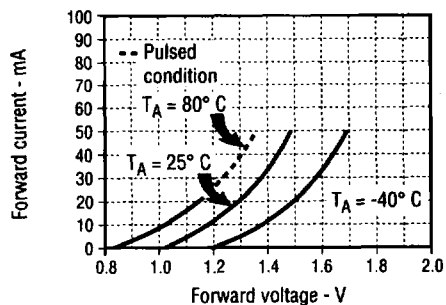


Fig. 1 IRED Forward Bias Characteristics



All Performance Curves Show Typical Values



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