

Transmissive Encoder Sensor

- Dual channel IC
- Direct TTL interface
- Inverting logic output
- Resolution to 0.009 in.(.229 mm)
- Internal temperature compensation
- 0.126 in.(3.2 mm) slot width
- Two mounting configurations

The HOA0901 sensor consists of a dual channel IC detector and an IRED encased in a black thermoplastic housing. The device is typically used with an interrupter strip or disk (code wheel) to encode the rate and direction of mechanical motion. Applications include linear and rotary encoders; it is especially suited for the encoding function in an optical mouse. As the interruptive pattern moves, the detector generates two output signals which can be processed to provide speed and direction information.

Two package styles are available. HOA0901- 011 is primarily intended for direct PCB mounting. HOA0901- 012 has mounting tabs for chassis mounting. The HOA0901 series employs plastic molded components. For additional component information see SEP8506 and HLC2701.

INFRA-78.TIF

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

Top view of a 3-pin PLCC package. Dimensions are in inches (mm).

Dimensions:

- .315(8.0)
- .419(10.64)
- .020(0.51) SQ. LEADS TYP.
- .083(2.1)
- .05(1.27) 3 PLCS
- .075(1.91)
- .050
- .300(7.62)
- .126(3.20)
- .181(4.60)
- .488(12.40)
- .100(2.54)
- .100(2.54)
- .500(12.7) MIN
- .090(2.3)

OPTICAL C

LEADS

1. CATHODE
2. ANODE
3. OUTPUT A
4. GND
5. Vcc
6. OUTPUT B

DIM 059 ds4

Figure 1: Pin connections for the 960 (24-38) LED. The diagram shows a top-down view of the package with pins numbered 1 through 6. Pin 1 is the Cathode, Pin 2 is the Anode, Pin 3 is Output A, Pin 4 is GND, Pin 5 is Vcc, and Pin 6 is Output B. Dimensions are given in inches and millimeters. Key dimensions include: Pin 1 to Pin 2: .315(.80); Pin 2 to Pin 3: .126(.320); Pin 3 to Pin 4: .181(.460); Pin 4 to Pin 5: .126(.320); Pin 5 to Pin 6: .100(.254); Pin 6 to Pin 1: .498(12.40); Pin 1 to Pin 3: .750(19.50); Pin 3 to Pin 5: .300(.762); Pin 5 to Pin 6: .100(.254); Pin 6 to Pin 1: .500(12.7) MIN. The package is labeled 'OPTICAL' and 'LEADS TYP.'

DIM 59h ds4

HOA0901

Transmissive Encoder Sensor

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		5.5	V	
Supply Current	I_{CC}			7.0	mA	$V_{CC}=5.25\text{ V}$
High Level Output Voltage (A and B)	V_{OH}	4.5			V	$V_{CC}=5\text{ V}$, $I_{OH}=0$, $I_F=0$
Low Level Output Voltage (A and B)	V_{OL}			0.4	V	$V_{CC}=5\text{ V}$, $I_{OL}=1.6\text{ mA}$, $I_F=15\text{ mA}$
Internal Pull-up Resistor (A and B)	R_{INT}	5	10	20	$k\Omega$	
Propagation Delay, Low-High, High-Low	t_{PLH} , t_{PHL}		5		μs	$V_{CC}=5\text{ V}$, $R_L=1\text{ k}\Omega$
Output Rise Time, Output Fall Time	t_r , t_f		100		ns	$V_{CC}=5\text{ V}$, $R_L=1\text{ k}\Omega$
COUPLED CHARACTERISTICS						
IRET Trigger Current HOA0901-011, -012	I_{FT}			15	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	5.5 V
Duration of Output Short to V_{CC} or Ground	1.0 sec.

Notes

1. Derate linearly 0.75 mW/°C above 25°C.

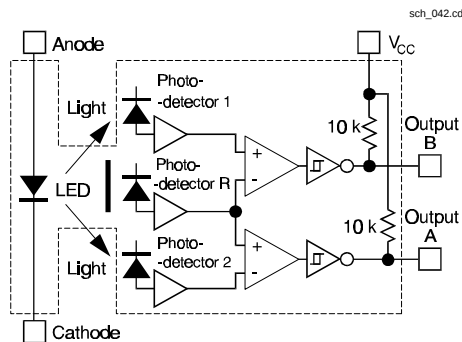
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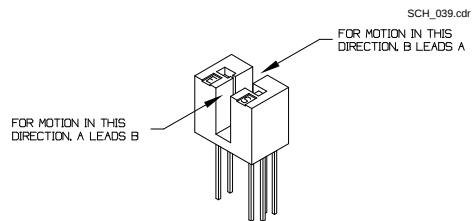
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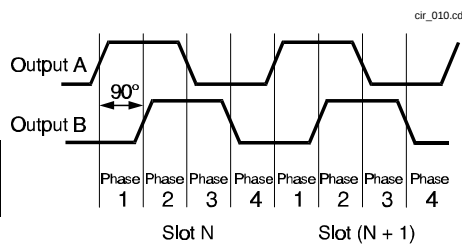
FUNCTIONAL BLOCK DIAGRAM



OUTPUT CONFIGURATION WITH MOTION



OUTPUT TIMING DIAGRAM



SWITCHING WAVEFORM

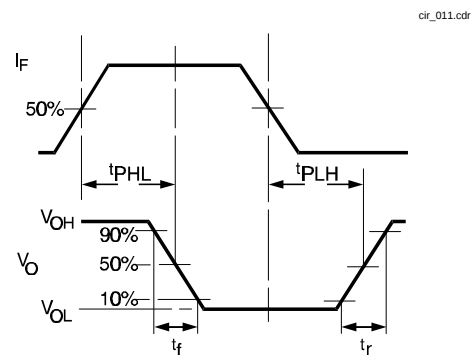


Fig. 1 IRED Forward Bias Characteristics

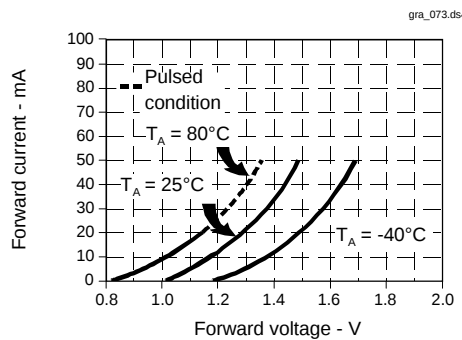
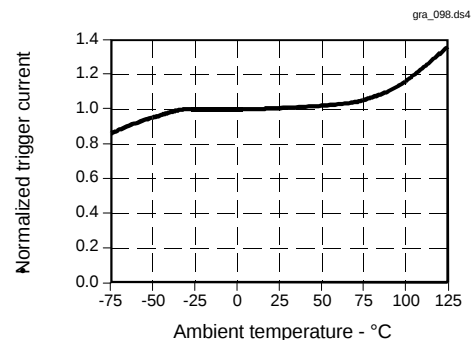


Fig. 2 IRED Trigger Current vs Temperature



All Performance Curves Show Typical Values

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