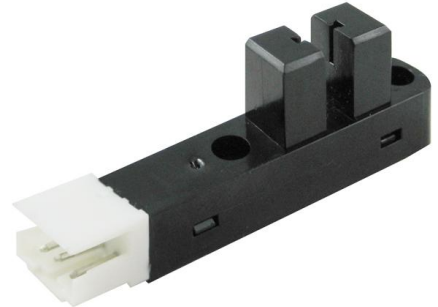


HOA7720/7730 Series

Connectorized Transmissive Optoschmitt Sensor



DESCRIPTION

The HOA7720/7730 Series 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 and Schmitt trigger with either of two output configurations:

- Totem pole (HOA7720-M11)
- Open collector (HOA7730-M11)

The totem pole output is well-suited for applications which require fast transition times. The open collector allows the output of the sensor to interface with circuit elements driven by supply voltages other than Vcc supply.

The inverting logic provides a high output when the optical path is interrupted, and a low output when the path is clear.

FEATURES AND BENEFITS

- Direct TTL interface
- No interface circuits required
- Inverting logic
- Two output options
- High resolution
- 3.00 mm [0.118] slot width
- Integral 3-pin connector

The infrared emitting diode is biased internally, eliminating the need for any external circuitry. Interconnection is simplified through the use of the integral Tyco three-pin connector.

Both the emitter and detector have a 0.508 mm x 1,78 mm [0.020 in x 0,070 in] vertical aperture. The narrow aperture is ideal for use in applications in which the maximum rejection of ambient light is important, and the maximum position resolution is desired.

The HOA7220/7330 series employ plastic molded components. Housing material is opaque polycarbonate. Housings are soluble in chlorinated hydrocarbons and ketones. Recommended cleaning agents are methanol and isopropanol.

POTENTIAL APPLICATIONS

Industrial:

- Flag presence/absence detection
- Edge detection
- Rotary/linear encoders

Medical:

- Edge sensing for labels and paper
- Needle presence/absence detection
- End of motion/travel sensing
- Rotary/linear encoders

HOA7720/7730 Series

Table 1. HOA7720-M11 and HOA7730-M11 Absolute Maximum Ratings (At 25 °C [77 °F] free air temperature unless otherwise noted.)

Characteristic	Parameter
Operating temperature range	-40 °C to 70 °C [-40 °F to 158 °F]
Storage temperature range	-40 °C to 85 °C [-40 °F to 185 °F]
Power dissipation	220 mW
Supply voltage	5.5 V
Supply current	40 mA
Low level output current	12.8 mA
Duration of output: short to Vcc or ground	1.0 s
Applied output voltage ¹	35 V

Notes:

1. Applies to HOA7730 only.

Table 2. HOA7720-M11 Electrical Characteristics (At 25 °C [77 °F] unless otherwise noted.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Operating supply voltage ¹	V _{CC}	4.5	–	5.5	V	T _A = 25 °C
Supply current	I _{CC}	–	–	40	mA	V _{CC} = 5.5 V
Low level output voltage ²	V _{OL}	–	–	0.4	V	V _{CC} = 4.5 V, I _{OL} = 12.8 mA
High level output current ²	V _{OH}	2.4	–	–	V	V _{CC} = 4.5 V, I _{OH} = -800 µA
Short circuit output current	I _{OS}	-20	–	-100	mA	V _{CC} = 5.25 V, Output = GND
Hysteresis ³	HYST	–	50	–	%	–
Propagation delay, low-high, high-low	t _{PLH} , t _{PHL}	–	5	–	µs	V _{CC} = 5 V
Output rise time, output fall time	t _r , t _f	–	70	–	ns	RL = 8 TTL loads

Notes:

1. Add a bypass capacitor, 0.1 µF typ., between Vcc and GND near the device in order to stabilize power supply line.
2. Output is HI when the optical path is interrupted.
3. Hysteresis is defined as the difference between the operating and release threshold intensities and is expressed as a percentage of the operate threshold intensity.

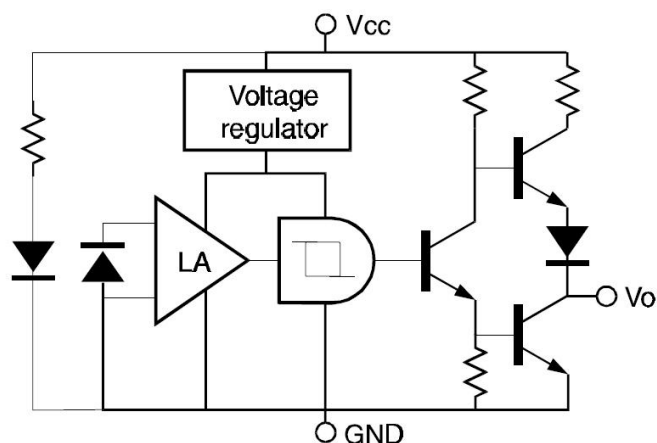
Table 3. HOA7730-M11 Electrical Characteristics (At 25 °C [77 °F] unless otherwise noted.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Operating supply voltage ¹	V _{CC}	4.5	–	5.5	V	T _A = 25 °C
Supply current	I _{CC}	–	–	40	mA	V _{CC} = 5.5 V
Low level output voltage ²	V _{OL}	–	–	0.4	V	V _{CC} = 4.5 V, I _{OL} = 12.8 mA
High level output current ²	I _{OH}	–	–	100	µA	V _{CC} = 4.5 V, V _{OH} = 28 V
Hysteresis ³	HYST	–	50	–	%	–
Propagation delay, low-high, high-low	t _{PLH} , t _{PHL}	–	5	–	µs	V _{CC} = 5 V
Output rise time, output fall time	t _r , t _f	–	70	–	ns	RL = 390 Ω

Notes:

1. Add a bypass capacitor, 0.1 µF typ., between Vcc and GND near the device in order to stabilize power supply line.
2. Output is HI when the optical path is interrupted.
3. Hysteresis is defined as the difference between the operating and release threshold intensities. Expressed as a percentage of the operate threshold intensity.

Figure 1. Inverter, Totem Pole



Symbol definition and test circuit per figures

Rise time T_R

Fall time T_F

The graph shows two curves plotted against Temperature (°C) on the x-axis (ranging from -40 to 100) and Time (ns) on the y-axis (ranging from 0 to 240). The Rise time T_R curve starts at approximately 25 ns at -40°C and increases to about 220 ns at 100°C. The Fall time T_F curve remains relatively flat, starting at approximately 10 ns at -40°C and ending at about 12 ns at 100°C.

Graph of Propagation Delay (us) vs Ambient Temperature (°C) for the 74VHC00. The graph shows two curves: T_{PLH} (Propagation Delay Low-to-High) and T_{PHL} (Propagation Delay High-to-Low). T_{PLH} starts at approximately 4.1 us at -40°C and decreases to about 2.4 us at 100°C. T_{PHL} starts at 0.0 us at -40°C and increases to about 2.4 us at 100°C. The curves intersect at approximately 20°C and 2.6 us.

The diagram shows three waveforms over time. The top waveform is the input I_F , which transitions from a low level to a high level and then back to low. The middle waveform is the output V_O , which transitions from a high level to a low level and then back to high. The bottom waveform shows the output voltage levels V_{OH} and V_{OL} . The propagation delay times t_{PHL} and t_{PLH} are indicated by horizontal arrows. The output voltage levels are marked at 90%, 50%, and 10%.

[illegible]

Catalog Listing	Description
HOA7720-M11	Transmissive Optoschmitt sensor, totem pole output
HOA7730-M11	Transmissive Optoschmitt sensor, open collector output

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