

DATA SHEET

# OLH6000/6001: High-Speed Schmitt Trigger Hermetic Optocouplers

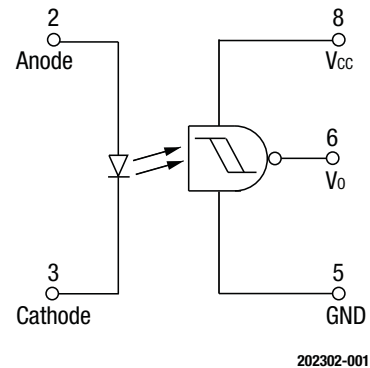
## Features

- Performance guaranteed over  $-55\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$  ambient temperature range
- Guaranteed minimum Common Mode Rejection (CMR) transient immunity  $>1000\text{ V}/\mu\text{s}$  @  $300\text{ V}_{\text{CM}}$
- Microprocessor-compatible drive
- On/off threshold hysteresis
- Fast switching:  $t_r, t_f = 10\text{ ns}$  typical

## Description

The OLH6000/6001 has an LED and integrated high-speed detector that are mounted and coupled in a hermetic 8-pin side brazed Dual In-line Package (DIP), which provides  $1500\text{ V}_{\text{DC}}$  electrical isolation between the input and output. The light from the LED is collected by the photo-diode in the integrated detector. The integrated detector incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping and an open collector output. Typical propagation delay of this product is  $170\text{ ns}$ . The CMR transient immunity is greater than  $1000\text{ V}/\mu\text{s}$  at  $300\text{ V}_{\text{CM}}$ .

The OLH6001 is a 100 percent screened version of the OLH6000.



**Figure 1. OLH6000/6001 Block Diagram**

Figure 1 shows the OLH6000/6001 functional block diagram. Table 1 provides the OLH6000/6001 absolute maximum ratings. Table 2 provides the OLH6000/6001 electrical specifications. Figures 2 and 3 illustrate the OLH6000/6001 typical performance characteristics. Figure 4 shows the OLH6000/6001 switching test circuit. Figure 5 provides the OLH6000/6001 package dimensions.

**Table 1. OLH6000/6001 Absolute Maximum Ratings** <sup>1</sup>

Parameter	Symbol	Minimum	Maximum	Units
<b>Coupled</b>				
Input to output isolation voltage <sup>2</sup>	V <sub>DC</sub>	-1500	+1500	V
Storage temperature range	T <sub>STG</sub>	-65	+150	°C
Operating temperature range	T <sub>A</sub>	-55	+125	°C
Mounting temperature range (3 minutes maximum)			+240	°C
Total power dissipation	P <sub>D</sub>		+300	mW
<b>Input Diode</b>				
Average input current	I <sub>DD</sub>		20	mA
Reverse voltage	V <sub>R</sub>		5	V
Power dissipation	P <sub>D</sub>		40	mW
<b>Output Detector</b>				
Peak output current			40	mA
Supply voltage	V <sub>CC</sub>		18	V
Output voltage	V <sub>OUT</sub>		18	V

<sup>1</sup> Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to the device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

<sup>2</sup> Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. T<sub>A</sub> = 25 °C and duration = 1 s.

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**CAUTION:** Although this device is designed to be as robust as possible, electrostatic discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions should be used at all times.

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**Table 2. OLH6000/6001 Electrical Specifications <sup>1</sup>**  
**(T<sub>A</sub> = -55 °C to +125 °C, Unless Otherwise Noted)**

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Threshold Current, ON	I <sub>F(ON)</sub>	V <sub>CC</sub> = 18 V, I <sub>OL</sub> = 10 mA			5	mA
Hysteresis ratio	I <sub>E(OFF)</sub> I <sub>F(ON)</sub>	V <sub>CC</sub> = 18 V, I <sub>OL</sub> = 10 mA		0.8		
Low level output voltage	V <sub>OL</sub>	V <sub>CC</sub> = 18 V, I <sub>OL</sub> = 10 mA, I <sub>F</sub> = 5 mA		0.15	0.5	V
High level output current	I <sub>OH</sub>	V <sub>CC</sub> = V <sub>O</sub> = 18 V, I <sub>F</sub> = 0 mA		0	250	μA
Supply current:						
High level	I <sub>CCH</sub>	V <sub>CC</sub> = 18 V, I <sub>F</sub> = 0 mA		9.0	15.0	mA
Low level	I <sub>CCL</sub>	V <sub>CC</sub> = 18 V, I <sub>F</sub> = 5 mA		9.5	16.0	mA
Input forward voltage	V <sub>F</sub>	I <sub>F</sub> = 5 mA		1.55	2.0	V
Input reverse current	I <sub>R</sub>	V <sub>R</sub> = 3 V			10	μA
Input to output leakage current (Note 2)	I <sub>L_O</sub>	R <sub>H</sub> ≤ 50%, T <sub>A</sub> = 25 °C, V <sub>L_O</sub> = 1500 V <sub>DC</sub>			1	μA
Propagation delay time:						
High to low	t <sub>PHL</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 18 V, R <sub>L</sub> = 2 kΩ		150	300	ns
Fall time	t <sub>f</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 18 V, R <sub>L</sub> = 2 kΩ		10		ns
High to low	t <sub>PLH</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 18 V, R <sub>L</sub> = 2 kΩ		250	500	ns
Rise time	t <sub>r</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 18 V, R <sub>L</sub> = 2 kΩ		10		ns
Common mode transient immunity:						
Logic high	CM <sub>H</sub>	V <sub>CM</sub> = 300 V peak, R <sub>L</sub> = 2 kΩ, V <sub>CC</sub> = 18 V, I <sub>F</sub> = 0 mA, T <sub>A</sub> = 25 °C	1000	>10,000		V/μs
Logic low	CM <sub>L</sub>	I <sub>F</sub> = 5 mA, T <sub>A</sub> = 25 °C	1000	>10,000		V/μs

<sup>1</sup> Performance is guaranteed only under the conditions listed in the above table.

<sup>2</sup> Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. T<sub>A</sub> = 25 °C and duration = 1 s.

### Typical Performance Characteristics

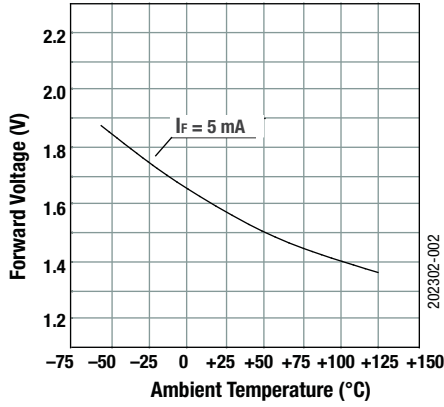


Figure 2. Forward Voltage vs Temperature

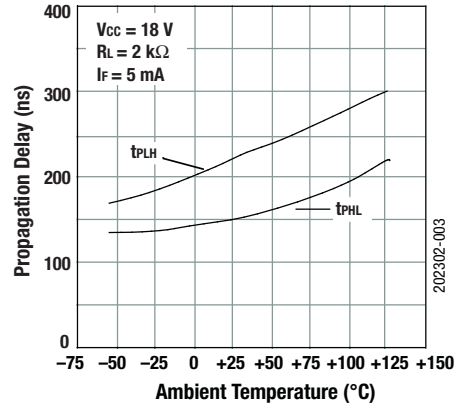


Figure 3. Propagation Delay vs Temperature

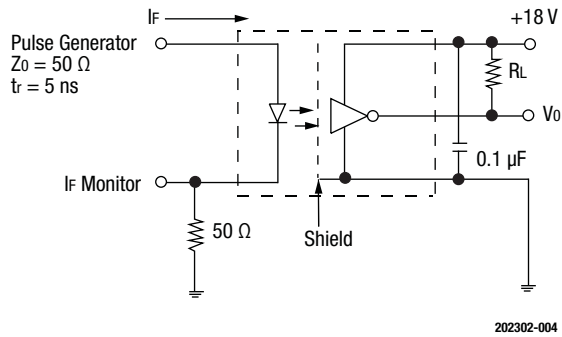
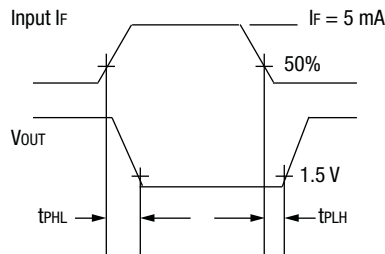


Figure 4. OLH6000/6001 Switching Test Circuit

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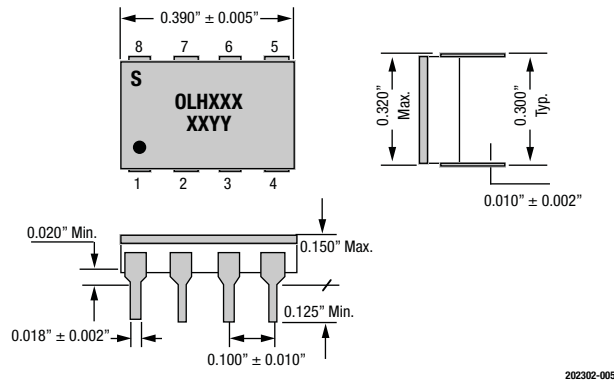


Figure 5. OLH6000/6001 Package Dimensions

## Ordering Information

Model Name	Manufacturing Part Number
OLH6000/6001: High-Speed Schmitt Trigger Hermetic Optocouplers	OLH6000/6001

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