DATA SHEET

OLH6000/6001: High-Speed Schmitt Trigger Hermetic Optocouplers

Features

- Performance guaranteed over –55 °C to +125 °C ambient temperature range
- Guaranteed minimum Common Mode Rejection (CMR) transient immunity >1000 V/µs @ 300 V_{CM}
- Microprocessor-compatible drive
- On/off threshold hysteresis
- Fast switching: t_r, t_f = 10 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 Inline Package (DIP), which provides 1500 V_{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 ns. The CMR transient immunity is greater than 1000 V/µs at 300 V_{CM}.

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

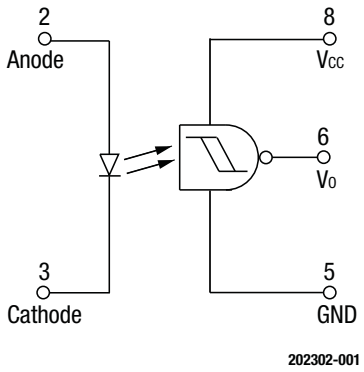

Figure 1. OLH6000/6001 Block Diagram

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 [1]

Parameter	Symbol	Minimum	Maximum	Units
Coupled				
Input to output isolation voltage [2]	V_{DC}	–1500	+1500	V
Storage temperature range	T_{STG}	–65	+150	°C
Operating temperature range	T_A	–55	+125	°C
Mounting temperature range (3 minutes maximum)			+240	°C
Total power dissipation	P_D		+300	mW
Input Diode				
Average input current	I_{DD}		20	mA
Reverse voltage	V_R		5	V
Power dissipation	P_D		40	mW
Output Detector				
Peak output current			40	mA
Supply voltage	V_{CC}		18	V
Output voltage	V_{OUT}		18	V

[1] 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.

[2] Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. T_A =25 °C and duration = 1 s.

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.*

Table 2. OLH6000/6001 Electrical Specifications [1]
(T_A = –55 °C to +125 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Threshold Current, ON	$I_{F(ON)}$	V_{CC} = 18 V, I_{OL} = 10 mA			5	mA
Hysteresis ratio	$I_{F(OFF)}$ / $I_{F(ON)}$	V_{CC} = 18 V, I_{OL} = 10 mA		0.8		
Low level output voltage	V_{OL}	V_{CC} = 18 V, I_{OL} = 10 mA, I_F = 5 mA		0.15	0.5	V
High level output current	I_{OH}	V_{CC} = V_O =18 V, I_F = 0 mA		0	250	µA
Supply current:						
High level	I_{CCH}	V_{CC} = 18 V, I_F = 0 mA		9.0	15.0	mA
Low level	I_{CCL}	V_{CC} = 18 V, I_F = 5 mA		9.5	16.0	mA
Input forward voltage	V_F	I_F = 5 mA		1.55	2.0	V
Input reverse current	I_R	V_R = 3 V			10	µA
Input to output leakage current (Note 2)	I_{I_O}	R_H ≤50%, T_A = 25 °C, V_{I_O} = 1500 V_{DC}			1	µA
Propagation delay time:						
High to low	t_{PHL}	I_F = 5 mA, V_{CC} = 18 V, R_L = 2 kΩ		150	300	ns
Fall time	t_f	I_F = 5 mA, V_{CC} = 18 V, R_L = 2 kΩ		10		ns
High to low	t_{PLH}	I_F = 5 mA, V_{CC} = 18 V, R_L = 2 kΩ		250	500	ns
Rise time	t_r	I_F = 5 mA, V_{CC} = 18 V, R_L = 2 kΩ		10		ns
Common mode transient immunity:						
Logic high	CM_H	V_{CM} = 300 V peak, R_L = 2 kΩ, V_{CC} = 18 V, I_F = 0 mA, T_A = 25 °C	1000	>10,000		V/µs
Logic low	CM_L	I_F = 5 mA, T_A = 25 °C	1000	>10,000		V/µs

[1] Performance is guaranteed only under the conditions listed in the above table.

[2] Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. TA = 25 °C and duration = 1 s.

Typical Performance Characteristics

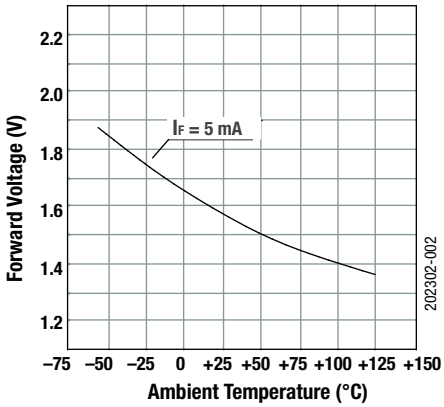

Figure 2. Forward Voltage vs Temperature

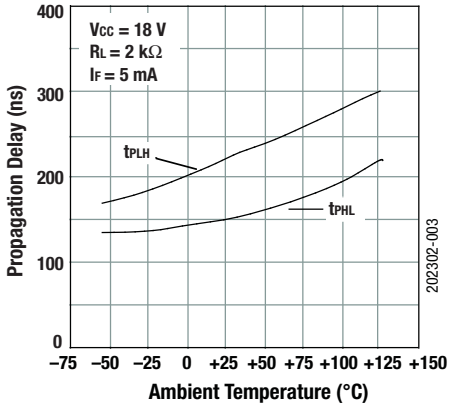

Figure 3. Propagation Delay vs Temperature

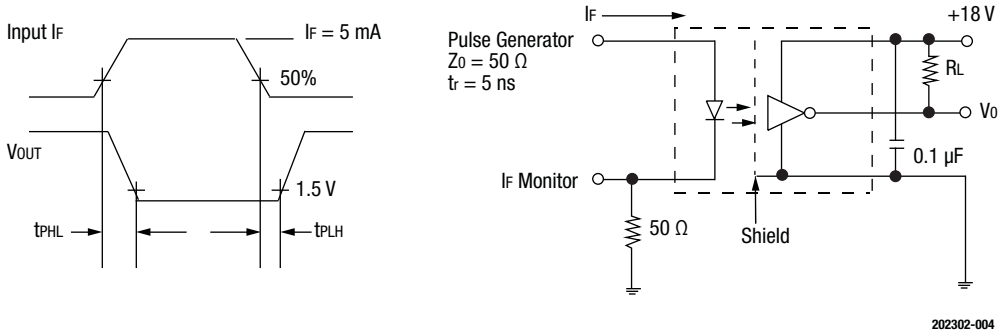

Figure 4. OLH6000/6001 Switching Test Circuit

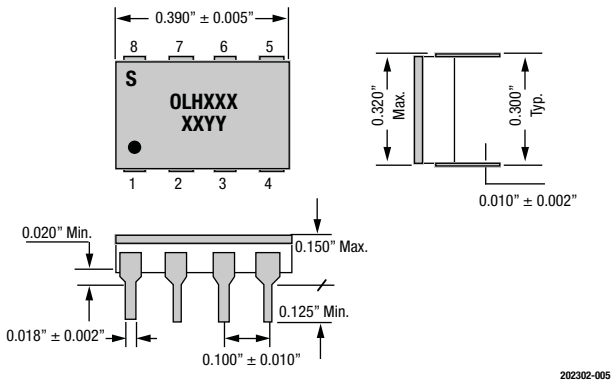

Figure 5. OLH6000/6001 Package Dimensions

Ordering Information

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