

DATA SHEET

# OLH5630/OLH5631: Hermetic High CMR/High-Speed Dual-Channel Optocoupler

## Features

- Dual channel in a rugged and reliable hermetic Dual Inline Package (DIP)
- Performance guaranteed over full military temperature range
- High isolation voltage: 3000 V<sub>DC</sub>
- High-speed: 55 ns propagation delay
- Open collector output
- High Common Mode Rejection (CMR)
- Radiation tolerant design

## Description

The OLH5630/5631 are dual-channel, hermetic 8-pin DIP optocouplers for high-speed digital applications. The OLH5631 product is a 100 percent high-reliability screened version of the OLH5630.

Each channel consists of an Aluminum Gallium Arsenide (AlGaAs) LED optically coupled to an integrated photodetector that provides 3000 V<sub>DC</sub> electrical isolation between the input and output. An internal shield provides excellent common mode rejection performance.

The OLH5630/5631 products are functionally compatible to 6N134, 6N137, HCPL2601, and HCPL5600/5601 optocouplers.

Special CMR selection and lower threshold current are available upon request.

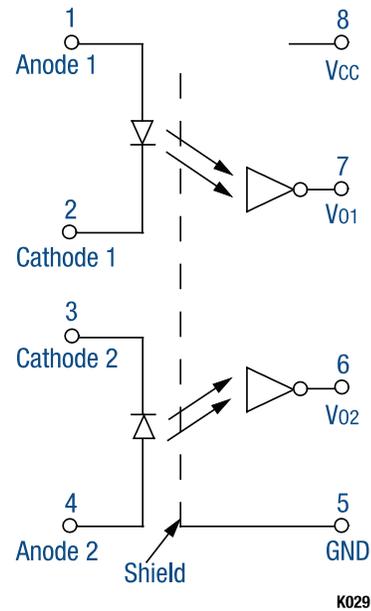


Figure 1. OLH5630/5631 Block Diagram

Figure 1 shows the OLH5630/5631 functional block diagram. Table 1 provides the OLH5630/5631 absolute maximum ratings. Table 2 provides the OLH5630/5631 electrical specifications.

Figures 2 through 5 illustrate the OLH5630/5631 typical performance characteristics. Figure 6 shows the OLH5630/5631 switching test circuit. Figure 7 provides the OLH5630/5631 package dimensions.

**Table 1. OLH5630/5631 Absolute Maximum Ratings**

Parameter	Symbol	Minimum	Maximum	Units
<b><i>Coupled</i></b>				
Input to output isolation voltage (Note 1)	V <sub>DC</sub>	-3000	+3000	V
Storage temperature range	T <sub>STG</sub>	-65	+150	°C
Operating temperature range	T <sub>A</sub>	-55	+125	°C
Lead solder temperature (1.6 mm below seating plane)			+260 for 10 sec	°C
Total package power dissipation	P <sub>D</sub>		+350	mW
<b><i>Input Diode</i></b>				
Average input current	I <sub>DD</sub>		20	mA
Peak forward current (≤1 ms duration)	I <sub>F</sub>		40	mA
Reverse voltage	V <sub>R</sub>		5	V
Input power dissipation	I <sub>P</sub> D		35	mW
<b><i>Output Detector</i></b>				
Average output current			25	mA
Supply voltage	V <sub>CC</sub>		7	V
Output voltage	V <sub>OUT</sub>		7	V
Power dissipation	P <sub>D</sub>		40	mW

**Note 1:** Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together.

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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. OLH5630/5631 Electrical Specifications (Note 1)**  
**(T<sub>A</sub> = -55 °C to +125 °C, Unless Otherwise Noted)**

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Low level output voltage (Note 2)	V <sub>OL</sub>	V <sub>CC</sub> = 5.5 V, I <sub>OL</sub> = 10 mA, I <sub>F</sub> = 10 mA		0.3	0.6	V
High level output current (Note 2)	I <sub>OH</sub>	V <sub>CC</sub> = V <sub>O</sub> = 5.5 V, I <sub>F</sub> = 250 μA		5	250	μA
High level supply current (Note 2)	I <sub>CCH</sub>	V <sub>CC</sub> = 5.5 V, I <sub>F</sub> = 0 mA		18	28	mA
Low level supply current (Note 2)	I <sub>CCL</sub>	V <sub>CC</sub> = 5.5 V, I <sub>F</sub> = 10 mA		27	36	mA
Input forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA		1.6	2.5	V
Input reverse breakdown voltage	B <sub>VR</sub>	I <sub>R</sub> = 10 μA	5			V
Input to output leakage current	I <sub>I_O</sub>	R <sub>H</sub> ≤ 45 %, T <sub>A</sub> = 25 °C, V <sub>I_O</sub> = 3000 V <sub>DC</sub> , t = 1 s			1.0	μA
Input to input leakage current	I <sub>I_I</sub>	R <sub>H</sub> ≤ 45 %, T <sub>A</sub> = 25 °C, V <sub>I_I</sub> = 500 V <sub>DC</sub> , t = 1 s			0.5	μA
Input to output capacitance (Note 3)	C <sub>I_O</sub>	f = 1 MHz		1.0		pF
Input to input capacitance	C <sub>I_I</sub>	f = 1 MHz		0.6		pF
Propagation delay time (Note 2):						
Logic high to low	t <sub>PHL</sub>	I <sub>F</sub> = 13 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 510 Ω		55	140	ns
Logic low to high	t <sub>PLH</sub>	I <sub>F</sub> = 13 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 510 Ω		60	140	ns
Output rise time (10 % – 90 %) (Note 2)	t <sub>R</sub>	I <sub>F</sub> = 13 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 510 Ω		35		ns
Output fall time (90 % – 10 %) (Note 2)	t <sub>F</sub>	I <sub>F</sub> = 13 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 510 Ω		35		ns
Common mode transient immunity (Note 2):						
High output	C <sub>MH</sub>	V <sub>CM</sub> = 350.0 V peak, V <sub>O</sub> (minimum) = 2.0 V, R <sub>L</sub> = 510.0 Ω, I <sub>F</sub> = 0 mA, T <sub>A</sub> = 25 °C	5	>10		KV/μs
Low output	C <sub>ML</sub>	V <sub>CM</sub> = 350.0 V peak, V <sub>O</sub> (maximum) = 0.8 V, R <sub>L</sub> = 510.0 Ω, I <sub>F</sub> = 10.0 mA, T <sub>A</sub> = 25 °C	5	>10		KV/μs

**Note 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.

**Note 2:** A ceramic capacitor (0.01 μF to 0.1 μF) is required between pins 5 and 8.

**Note 3:** Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together.

### Typical Performance Characteristics

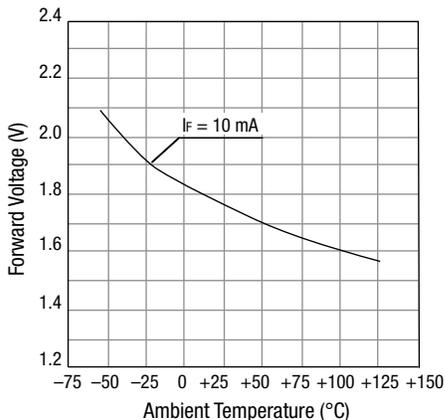


Figure 2. LED Forward Voltage vs Temperature

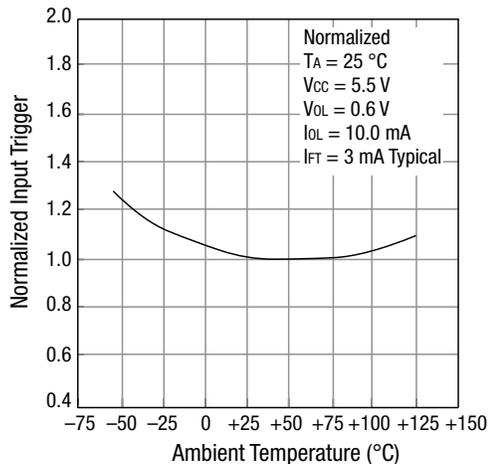


Figure 3. Normalized Input Trigger vs Temperature

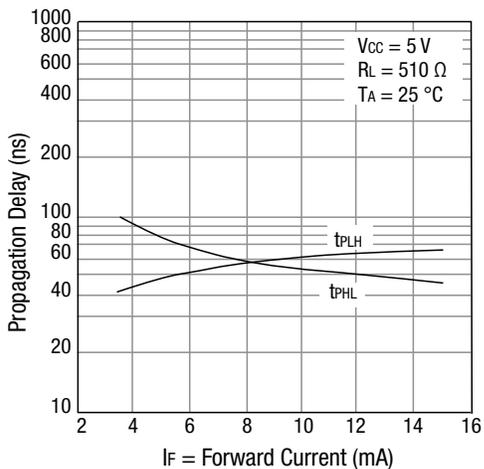


Figure 4. Propagation Delay vs Input Forward Current

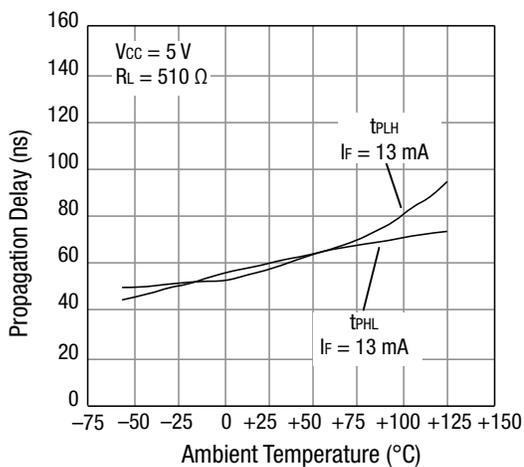


Figure 5. Propagation Delay vs Temperature

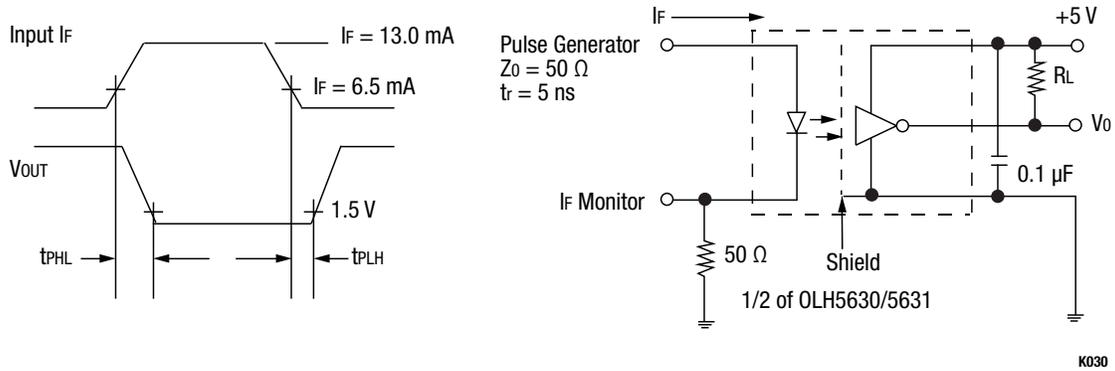


Figure 6. OLH5630/5631 Switching Test Circuit

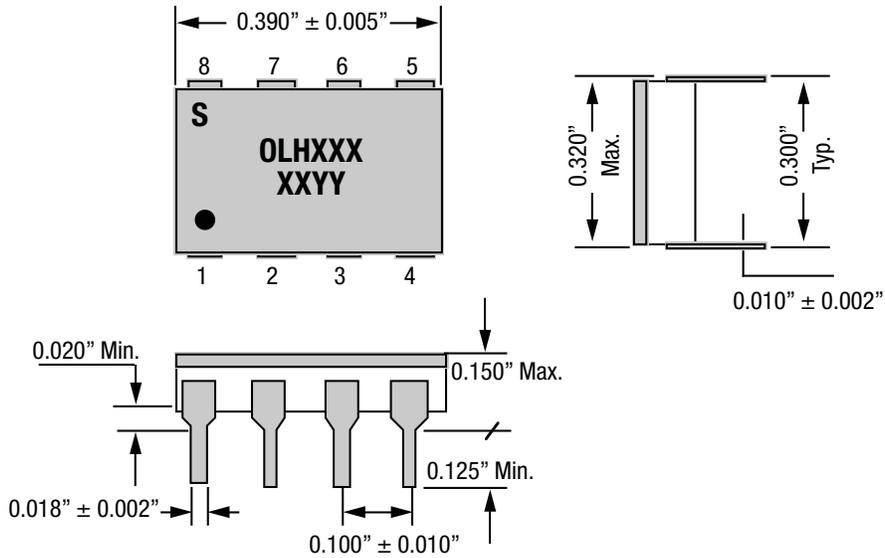


Figure 7. OLH5630/5631 Package Dimensions

## Ordering Information

Model Name	Manufacturing Part Number
OLH5630/5631: Hermetic High CMR/High-Speed Dual-Channel Optocoupler	OLH5630/5631

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