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_{DC}
- 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_{DC} 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.

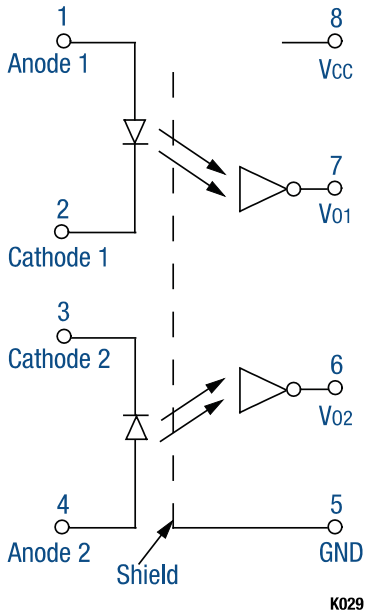

Figure 1. OLH5630/5631 Block Diagram

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
Coupled				
Input to output isolation voltage (Note 1)	V_{DC}	–3000	+3000	V
Storage temperature range	T_{STG}	–65	+150	°C
Operating temperature range	T_A	–55	+125	°C
Lead solder temperature (1.6 mm below seating plane)			+260 for 10 sec	°C
Total package power dissipation	P_D		+350	mW
Input Diode				
Average input current	I_{DD}		20	mA
Peak forward current (≤1 ms duration)	I_F		40	mA
Reverse voltage	V_R		5	V
Input power dissipation	IP_D		35	mW
Output Detector				
Average output current			25	mA
Supply voltage	V_{CC}		7	V
Output voltage	V_{OUT}		7	V
Power dissipation	P_D		40	mW

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

***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. OLH5630/5631 Electrical Specifications (Note 1)
(T_A = –55 °C to +125 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Low level output voltage (Note 2)	V_{OL}	V_{CC} = 5.5 V, I_{OL} = 10 mA, I_F = 10 mA		0.3	0.6	V
High level output current (Note 2)	I_{OH}	V_{CC} = V_O = 5.5 V, I_F = 250 µA		5	250	µA
High level supply current (Note 2)	I_{CCH}	V_{CC} = 5.5 V, I_F = 0 mA		18	28	mA
Low level supply current (Note 2)	I_{CCL}	V_{CC} = 5.5 V, I_F = 10 mA		27	36	mA
Input forward voltage	V_F	I_F = 10 mA		1.6	2.5	V
Input reverse breakdown voltage	B_{VR}	I_R = 10 µA	5			V
Input to output leakage current	I_{I_O}	R_H ≤45 %, T_A = 25 °C, V_{I_O} = 3000 V_{DC}, t = 1 s			1.0	µA
Input to input leakage current	I_{I_I}	R_H ≤45 %, T_A = 25 °C, V_{I_I} = 500 V_{DC}, t = 1 s			0.5	µA
Input to output capacitance (Note 3)	C_{I_O}	f = 1 MHz		1.0		pF
Input to input capacitance	C_{I_I}	f = 1 MHz		0.6		pF
Propagation delay time (Note 2):						
Logic high to low	t_{PHL}	I_F = 13 mA, V_{CC} = 5 V, R_L = 510 Ω		55	140	ns
Logic low to high	t_{PLH}	I_F = 13 mA, V_{CC} = 5 V, R_L = 510 Ω		60	140	ns
Output rise time (10 % – 90 %) (Note 2)	t_R	I_F = 13 mA, V_{CC} = 5 V, R_L = 510 Ω		35		ns
Output fall time (90 % – 10 %) (Note 2)	t_F	I_F = 13 mA, V_{CC} = 5 V, R_L = 510 Ω		35		ns
Common mode transient immunity (Note 2):						
High output	CM_H	V_{CM} = 350.0 V peak, V_O (minimum) = 2.0 V, R_L = 510.0 Ω, I_F = 0 mA, T_A = 25 °C	5	>10		KV/µs
Low output	CM_L	V_{CM} = 350.0 V peak, V_O (maximum) = 0.8 V, R_L = 510.0 Ω, I_F = 10.0 mA, T_A = 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

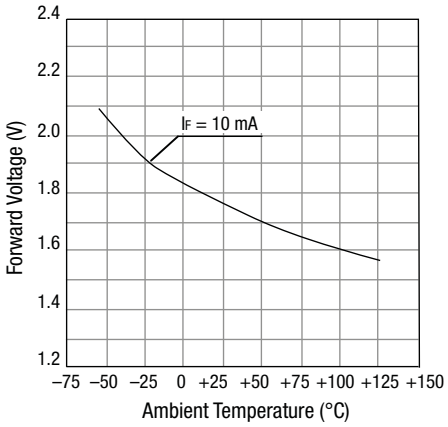

Figure 2. LED Forward Voltage vs Temperature

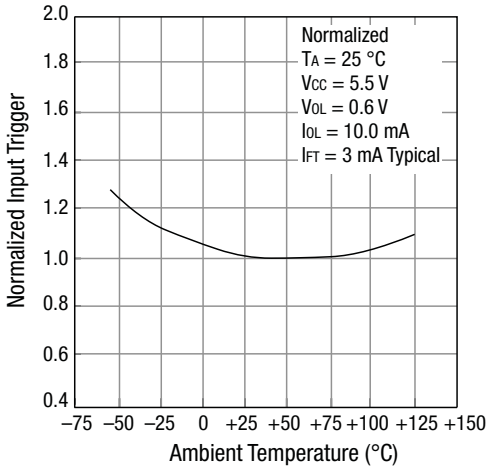

Figure 3. Normalized Input Trigger vs Temperature

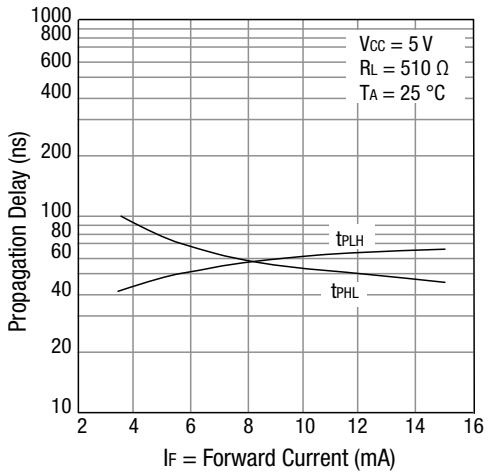

Figure 4. Propagation Delay vs Input Forward Current

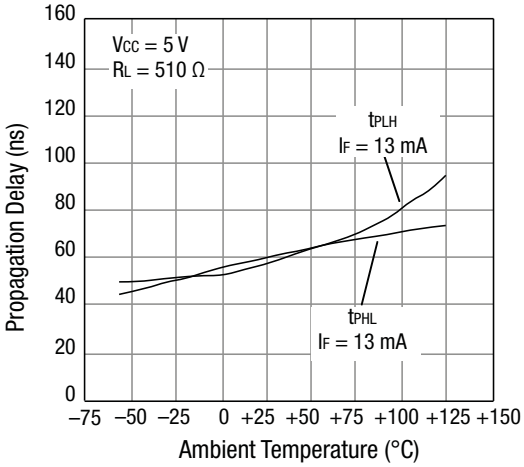

Figure 5. Propagation Delay vs Temperature

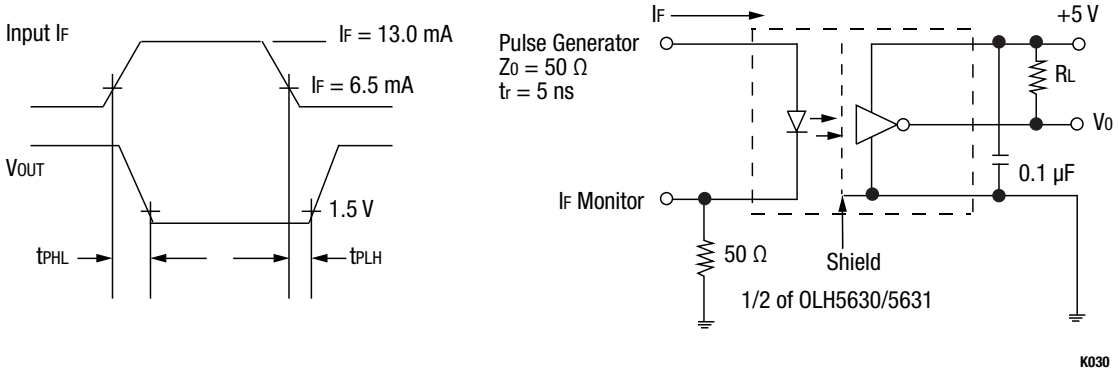

Figure 6. OLH5630/5631 Switching Test Circuit

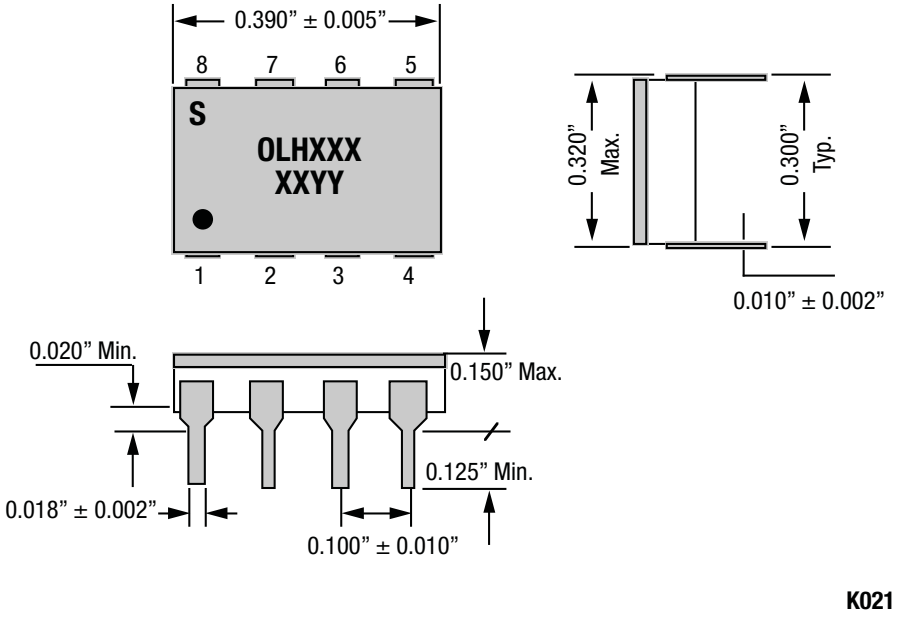

Figure 7. OLH5630/5631 Package Dimensions

Ordering Information

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