

**9DATA SHEET**

# OLH5730/5731: Hermetic Low Input Current, Dual-Channel Optocouplers

## Features

- Rugged and reliable hermetic Dual Inline Package (DIP)
- Performance guaranteed over full military temperature range
- High isolation voltage, 3000 V<sub>DC</sub>
- Low input current, 0.5 mA
- Low power consumption
- High Common Mode Rejection (CMR)
- Radiation tolerant design
- High-density, dual-channel package

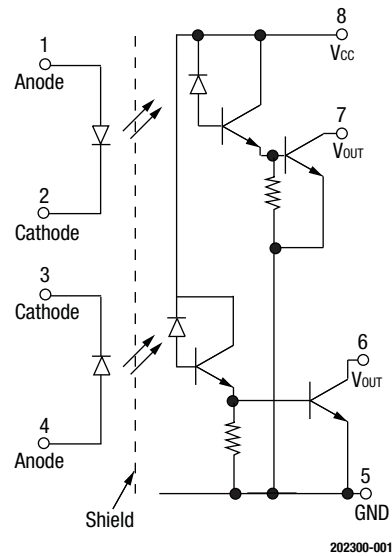
## Description

The OLH5730/5731 are dual-channel, hermetic 8-pin DIP optocouplers for low input current applications. The OLH5731 product is a 100 percent high-reliability screened version of the OLH5730.

Each channel consists of an Aluminum Gallium Arsenide (AlGaAs) LED optically coupled to an integrated photo-diode, split-Darlington detector. The AlGaAs LED provides superior low current performance. The split-Darlington open collector output results in high gain and low saturation voltage.

The OLH5730/5731 products are functionally compatible to the HCPL2730/2731 and 6N140A optocouplers. The performance of the OLH5730/5731 products under a radiation environment is significantly improved over standard photo-transistors.

Special low input current or Current Transfer Ratio (CTR) selection are available upon request.



**Figure 1. OLH5730/5731 Block Diagram**

Figure 1 shows the OLH5730/5731 functional block diagram. Table 1 provides the OLH5730/5731 absolute maximum ratings. Table 2 provides the OLH5730/5731 electrical specifications.

Figures 2 through 5 illustrate the OLH5730/5731 typical performance characteristics. Figure 6 shows the OLH5730/5731 switching test circuit. Figure 7 provides the OLH5730/5731 package dimensions.

**Table 1. OLH5730/5731 Absolute Maximum Ratings**

Parameter	Symbol	Minimum	Maximum	Units
<b>Coupled</b>				
Input to output isolation voltage <sup>1</sup>	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 the seating plane)			+260 for 10 sec	°C
<b>Input Diode</b>				
Average input current <sup>2</sup>	I <sub>DD</sub>		10	mA
Peak forward current (≤1 ms duration)	I <sub>F</sub>		20	mA
Reverse voltage	V <sub>R</sub>		5	V
<b>Output Detector</b>				
Average output current			+40	mA
Supply voltage	V <sub>CC</sub>	-0.5	+18.0	V
Output voltage	V <sub>OUT</sub>	-0.5	+18.0	V
Power dissipation <sup>3</sup>	P <sub>D</sub>		+50	mW

<sup>1</sup> Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together.

<sup>2</sup> Derate I<sub>F</sub> at 0.33 mA/°C above 110 °C.

<sup>3</sup> Output power is the collector output power plus the total supply power. Derate at 1.66 mW/°C above 110 °C.

---

**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. OLH5730/5731 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
Current transfer ratio <sup>2</sup>	CTR	I <sub>F</sub> = 0.5 mA, V <sub>O</sub> = 0.4 V, V <sub>CC</sub> = 4.5 V	300			%
		I <sub>F</sub> = 1.6 mA, V <sub>O</sub> = 0.4 V, V <sub>CC</sub> = 4.5 V	300			%
		I <sub>F</sub> = 5.0 mA, V <sub>O</sub> = 0.4 V, V <sub>CC</sub> = 4.5 V	200			%
Logic low output voltage	V <sub>OL</sub>	I <sub>F</sub> = 0.5 mA, I <sub>OL</sub> = 1.5 mA, V <sub>CC</sub> = 4.5 V		0.1	0.4	V
		I <sub>F</sub> = 1.6 mA, I <sub>OL</sub> = 4.8 mA, V <sub>CC</sub> = 4.5 V		0.1	0.4	V
		I <sub>F</sub> = 5.0 mA, I <sub>OL</sub> = 10 mA, V <sub>CC</sub> = 4.5 V		0.2	0.4	V
Logic high output current	I <sub>OH</sub> / I <sub>OX</sub>	I <sub>F</sub> = 2 μA, I <sub>F</sub> = 10 mA (other channel), V <sub>O</sub> = V <sub>CC</sub> = 18 V		0.005	250.0	μA
Logic low supply current	I <sub>CCL</sub>	I <sub>F</sub> = 1.6 mA, V <sub>CC</sub> = 18 V		1.0	2.0	mA
Logic high supply current	I <sub>CCH</sub>	I <sub>F</sub> = 0 mA, V <sub>CC</sub> = 18 V		0.01	40.0	μA
Input forward voltage	V <sub>F</sub>	I <sub>F</sub> = 1.6 mA	1.0	1.65	2.0	V
Input reverse breakdown voltage	B <sub>VR</sub>	I <sub>R</sub> = 10 μA	3			V
Input to output leakage current <sup>3</sup>	I <sub>L_O</sub>	R <sub>H</sub> ≤ 50%, T <sub>A</sub> = 25 °C, V <sub>L_O</sub> = 3000 V <sub>DC</sub> , t = 1 s			1	μA
Propagation Delay Time:						
Logic high to low	t <sub>PHL</sub>	I <sub>F</sub> = 0.5 mA, R <sub>L</sub> = 4.7 kΩ, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C		26	100	μs
		I <sub>F</sub> = 1.6 mA, R <sub>L</sub> = 2.2 kΩ, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C		5	30	μs
		I <sub>F</sub> = 5.0 mA, R <sub>L</sub> = 680.0 Ω, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C		2	10	μs
Logic low to high	t <sub>PLH</sub>	I <sub>F</sub> = 0.5 mA, R <sub>L</sub> = 4.7 kΩ, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C		28	60	μs
		I <sub>F</sub> = 1.6 mA, R <sub>L</sub> = 2.2 kΩ, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C		15	50	μs
		I <sub>F</sub> = 5.0 mA, R <sub>L</sub> = 680.0 Ω, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C		10	30	μs
Common mode transient immunity:						
Logic high level	CM <sub>H</sub>	I <sub>F</sub> = 0 mA, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C, R <sub>L</sub> = 1.5 kΩ, V <sub>CM</sub> = 300.0 V <sub>P-P</sub>	5	≥10		KV/μs
Logic low level	CM <sub>L</sub>	I <sub>F</sub> = 1.6 mA, V <sub>CC</sub> = 5.0 V, T <sub>A</sub> = 25 °C, R <sub>L</sub> = 1.5 kΩ, V <sub>CM</sub> = 300.0 V <sub>P-P</sub>	5	≥10		KV/μs

<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> CTR is defined as the ratio of the output collector current I<sub>C</sub> to the forward LED current I<sub>F</sub>, multiplied by 100%.

<sup>3</sup> Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together.

### Typical Performance Characteristics

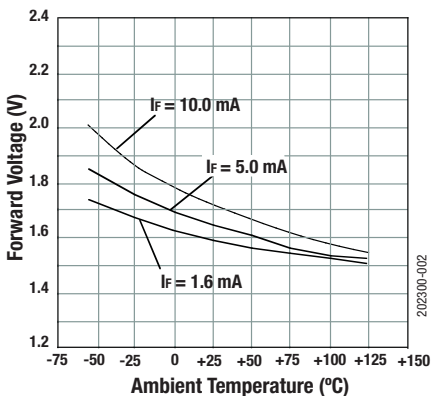


Figure 2. Forward Voltage vs Temperature

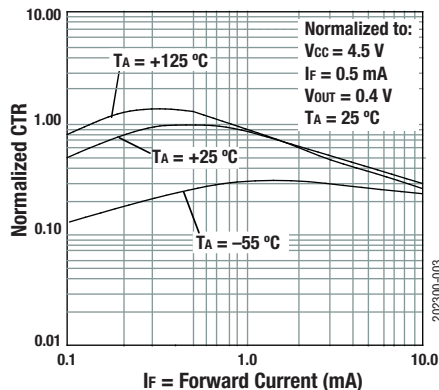


Figure 3. Normalized CTR vs Input Diode Forward Current

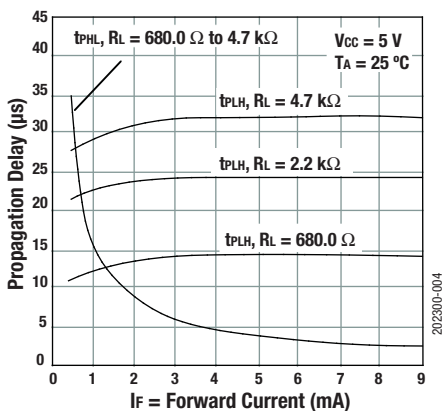


Figure 4. Propagation Delay vs Input Diode Forward Current

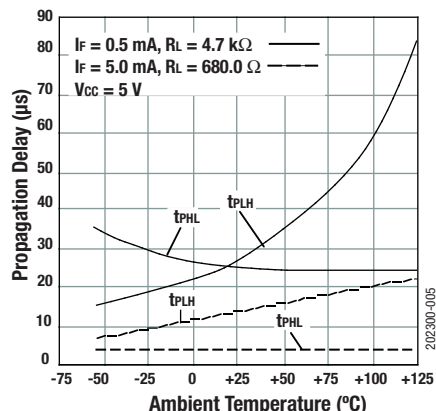


Figure 5. Propagation Delay vs Temperature

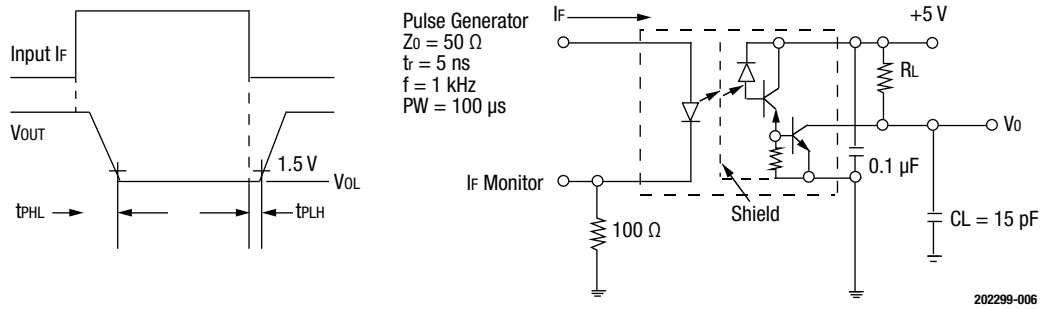


Figure 6. OLH5730/5731 Switching Test Circuit

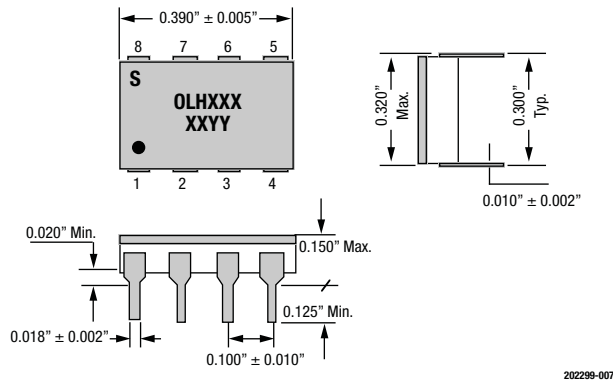


Figure 7. OLH5730/5731 Package Dimensions

## Ordering Information

Model Name	Manufacturing Part Number
OLH5730/5731: Hermetic Low Input Current, Dual-Channel Optocouplers	OLH5730/5731

Copyright © 2012, 2017 Isolink, Inc. All Rights Reserved.

Information in this document is provided in connection with Isolink, Inc. ("Isolink"), a wholly-owned subsidiary of Skyworks Solutions, Inc. These materials, including the information contained herein, are provided by Isolink as a service to its customers and may be used for informational purposes only by the customer. Isolink assumes no responsibility for errors or omissions in these materials or the information contained herein. Isolink may change its documentation, products, services, specifications or product descriptions at any time, without notice. Isolink makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Isolink assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Isolink products, information or materials, except as may be provided in Isolink Terms and Conditions of Sale.

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. ISOLINK DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. ISOLINK SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Isolink products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Isolink products could lead to personal injury, death, physical or environmental damage. Isolink customers using or selling Isolink products for use in such applications do so at their own risk and agree to fully indemnify Isolink for any damages resulting from such improper use or sale.

Customers are responsible for their products and applications using Isolink products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications. Customers should include design and operating safeguards to minimize these and other risks. Isolink assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Isolink products outside of stated published specifications or parameters.

Isolink is a trademark of Isolink Inc. in the United States and other countries. Skyworks and the Skyworks symbol are trademarks or registered trademarks of Skyworks Solutions, Inc., in the United States and other countries. Third-party brands and names are for identification purposes only, and are the property of their respective owners.