

DATA SHEET

# OLI300: Miniature High-Speed Optocoupler for Hybrid Assembly

## Features

- Electrical parameters guaranteed over -55 °C to +125 °C ambient temperature range
- 1500 V<sub>DC</sub> electrical isolation
- Small footprint for a hybrid device
- High-speed, 1 Mbps typical
- Open collector output
- High reliability and rugged construction
- Similar to 6N135/136, 4N55 type optocouplers
- Radiation tolerant
- Custom packages are available (contact Isolink)

## Description

The OLI300 is suitable for interfacing Transistor-to-Transistor Logic (TTL) to Low Power Schottky Transistor-Transistor Logic (LSTTL), TTL, or Complementary Metal Oxide Semiconductor (CMOS), as well as wide bandwidth analog applications.

Each OLI300 has an LED and an integrated photodiode transistor detector mounted and coupled in a miniature custom ceramic package that provides 1500 V<sub>DC</sub> of electrical isolation between the input and output. The integrated photodiode transistor improves the switching speed by orders of magnitude as compared to standard phototransistors by reducing the base-to-collector capacitance.

Device mounting is achieved by a standard hybrid assembly with non-conductive epoxies. Gold or aluminum wire bonding can be used to make electrical connections for maximum placement flexibility.

**Note:** *Certain cleaning processes may be harmful to this device. Contact Isolink for details.*

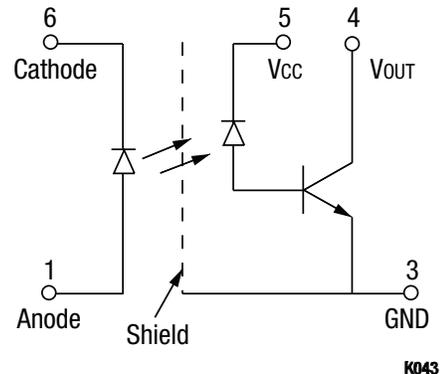


Figure 1. OLI300 Block Diagram

Figure 1 shows the OLI300 functional block diagram. Table 1 provides the OLI300 absolute maximum ratings. Table 2 provides the OLI300 electrical specifications.

Figures 2 through 4 illustrate the OLI300 typical performance characteristics. Figure 5 shows the OLI300 switching test circuit. Figure 6 provides the OLI300 package dimensions.

**Table 1. OLI300 Absolute Maximum Ratings<sup>1</sup>**

Parameter	Symbol	Minimum	Maximum	Units
<b>Coupled</b>				
Input to output isolation voltage <sup>2</sup>	V <sub>OC</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
<b>Input Diode</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
Power dissipation	P <sub>D</sub>		36	mW
<b>Output Detector</b>				
Average output current			8	mA
Peak output current			16	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	P <sub>D</sub>		50	mW
Derate linearly from 100 °C			1.4	mW/°C

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

**ESD HANDLING:** *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 when handling or transporting. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD handling precautions should be used at all times.*

**Table 2. OLI300 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 (CTR) <sup>2</sup>	CTR	I <sub>F</sub> = 10.0 mA, V <sub>O</sub> = 0.4 V, V <sub>CC</sub> = 4.5 V	15.0	25.0		%
Logic low output voltage	V <sub>OL</sub>	I <sub>F</sub> = 10.0 mA, I <sub>OL</sub> = 1.5 mA, V <sub>CC</sub> = 4.5 V		0.15	0.4	V
Logic high output current	I <sub>OH</sub>	I <sub>F</sub> = 0 mA, V <sub>O</sub> = V <sub>CC</sub> = 15.0 V		0.05	100.0	μA
Logic low supply current	I <sub>CCL</sub>	I <sub>F</sub> = 10 mA, V <sub>CC</sub> = 15 V, V <sub>O</sub> = open		40	200	μA
Logic high supply current	I <sub>CCH</sub>	I <sub>F</sub> = 0 mA, V <sub>CC</sub> = 15.0 V, V <sub>O</sub> = open		0.05	10.0	μA
Input forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10.0 mA		1.8	2.5	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> = 1500 V <sub>DC</sub>			1	μA
Propagation delay time:						
Logic high to low	t <sub>PHL</sub>	I <sub>F</sub> = 10.0 mA, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 4.1 kΩ		0.3	1.0	μs
Logic low to high	t <sub>PLH</sub>	I <sub>F</sub> = 10.0 mA, V <sub>CC</sub> = 5.0 V, R <sub>L</sub> = 4.1 kΩ		0.5	2.0	μs

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

<sup>2</sup> Current transfer ratio 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 and 6 shorted together, and pins 2, 3, 4, and 5 shorted together. T<sub>A</sub> = 25°C and duration = 1 s.

### Typical Performance Characteristics

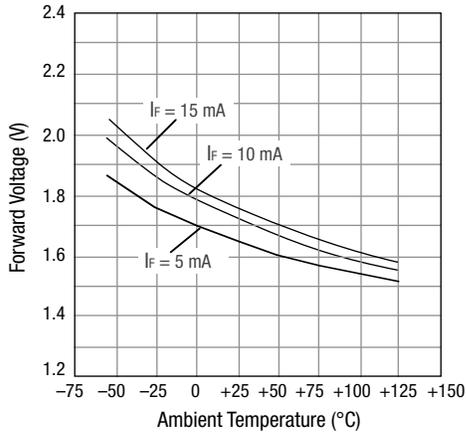


Figure 2. LED Forward Voltage vs Temperature

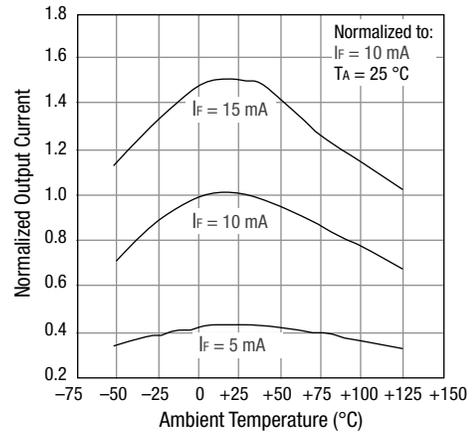


Figure 3. Normalized Output Current vs Temperature

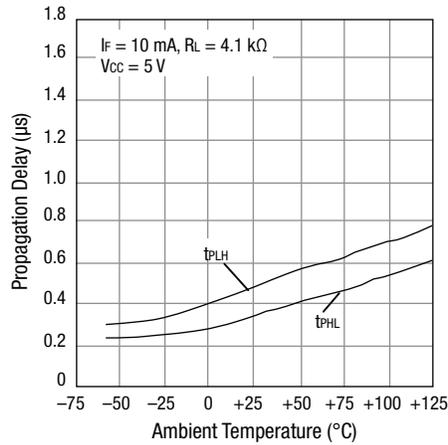


Figure 4. Propagation Delay vs Temperature

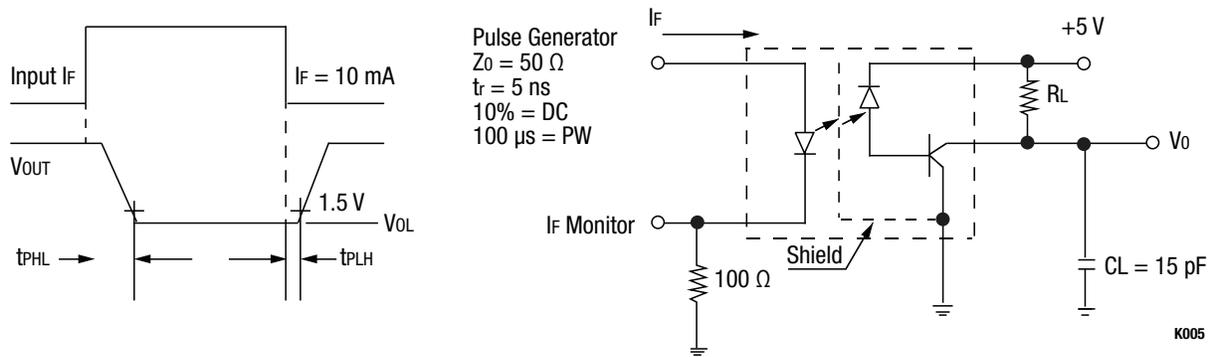


Figure 5. OLI300 Switching Test Circuit

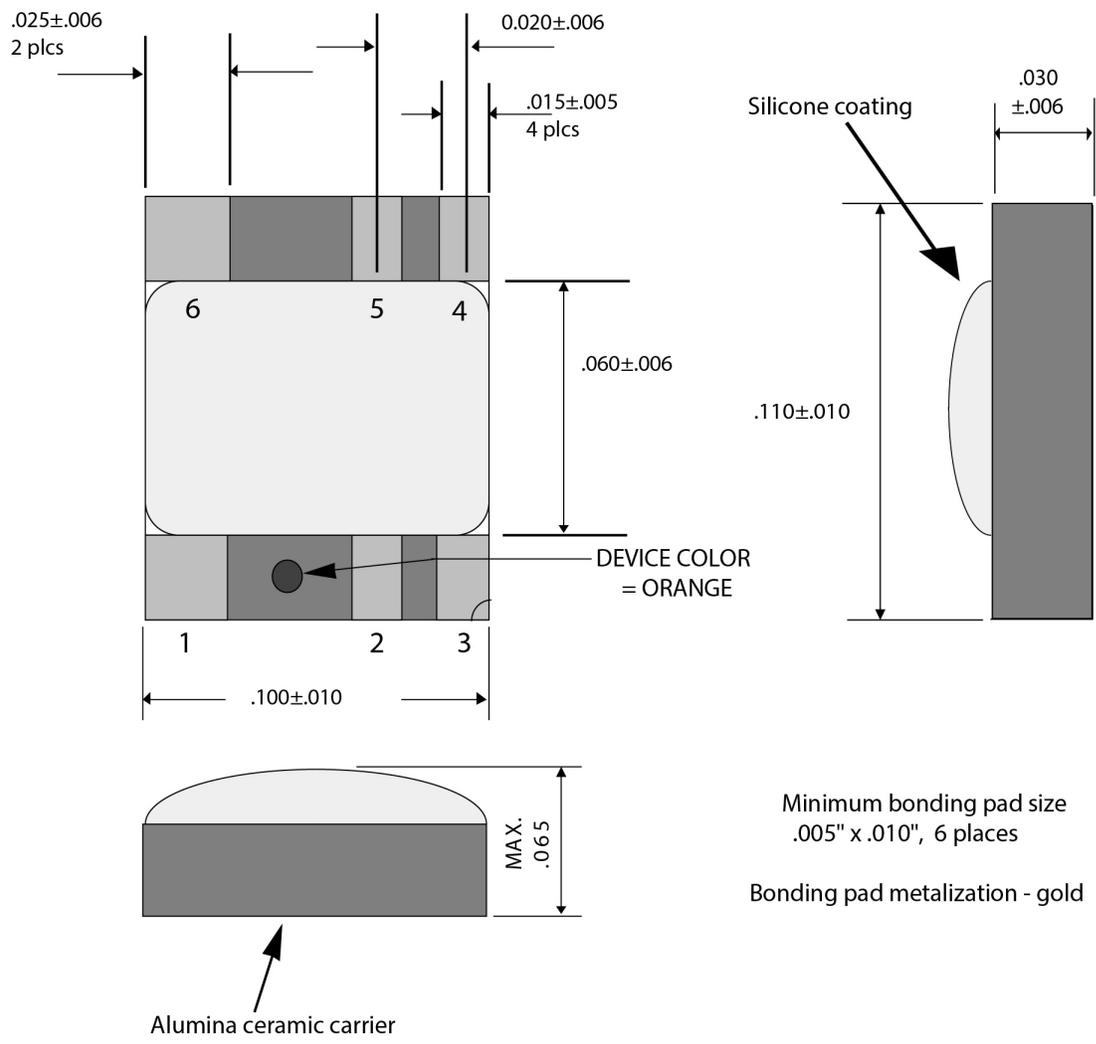


Figure 6. OLI300 Package Dimensions

202333-006

**Ordering Information**

Model Name	Manufacturing Part Number
OLI300: Miniature High-Speed Optocoupler for Hybrid Assembly	OLI300

Copyright © 2021 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.

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.