

**DATA SHEET**

# OLI300: Miniature High-Speed Optocoupler for Hybrid Assembly

## Features

- Electrical parameters guaranteed over -55 °C to +125 °C ambient temperature range
- 1500 Vdc 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)

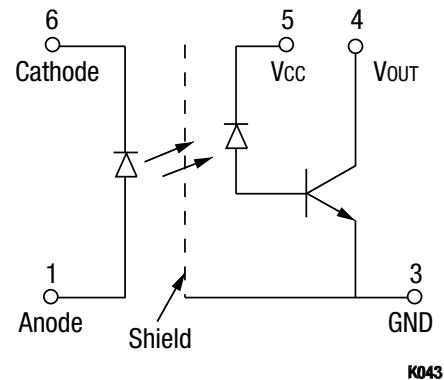
## Description

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 Vdc 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>DC</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 ( $\leq 1$ 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>CH</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>IO</sub>	R <sub>H</sub> ≤ 50%, T <sub>A</sub> = 25 °C, V <sub>I_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

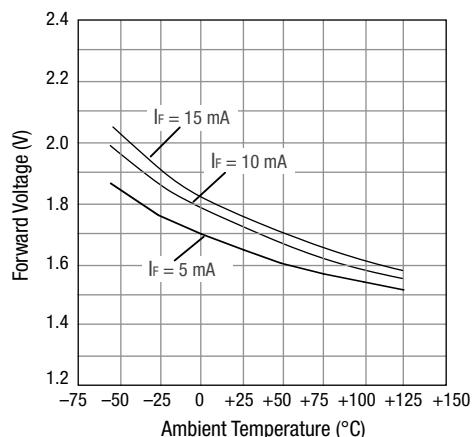


Figure 2. LED Forward Voltage vs Temperature

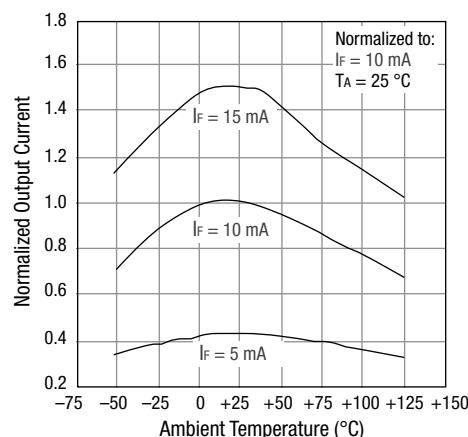


Figure 3. Normalized Output Current vs Temperature

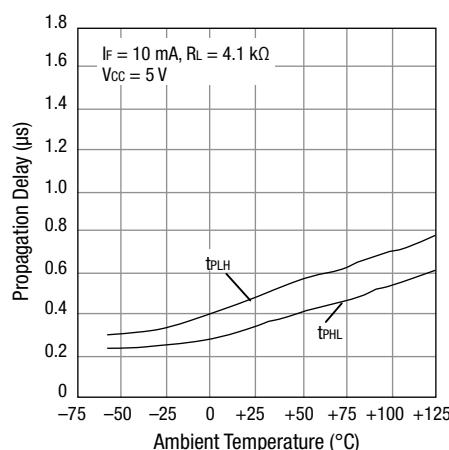


Figure 4. Propagation Delay vs Temperature

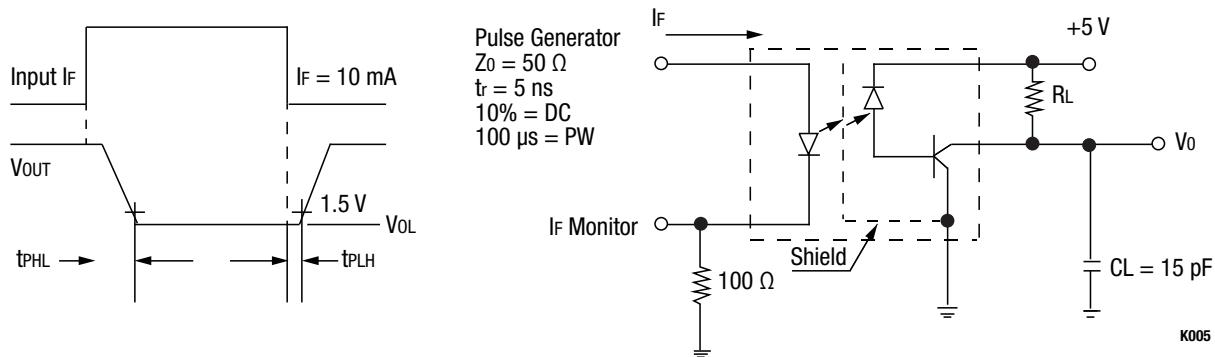


Figure 5. OLI300 Switching Test Circuit

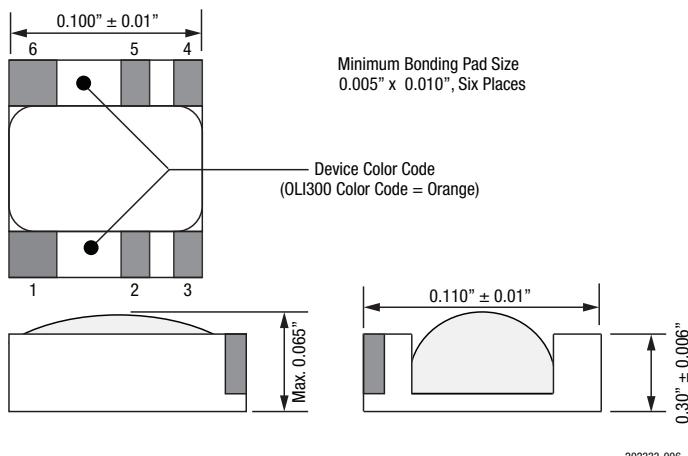


Figure 6. OLI300 Package Dimensions

## Ordering Information

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

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