

DATA SHEET

OLF300: Hermetic Surface-Mount High-Speed Optocoupler

Features

- Hermetic SMT package
- Electrical parameters guaranteed over $-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ ambient temperature range
- 1000 VDC electrical isolation
- High-speed, 1 Mbps typical
- Open collector output
- 300 kHz bandwidth
- Similar to 6N135/136, 4N55
- Radiation tolerant
- Offers 100% high-reliability screenings

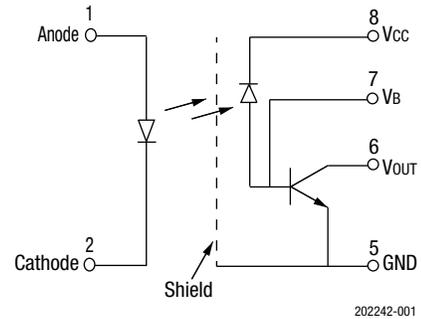


Figure 1. OLF300 Block Diagram

Description

The OLF300 is suitable for interfacing TTL to LSTTL, TTL, or CMOS, as well as wide bandwidth analog applications. Each OLF300 has an LED and an integrated photo-diode transistor detector mounted and coupled in a custom 8-pin hermetic flat-pack package, providing 1000 V_{oe} of electrical isolation between the input and output. The integrated photo-diode transistor improves the switching speed by orders of magnitude as compared to standard photo transistors by reducing the base-to-collector capacitance. The internal shield provides excellent common-mode immunity performance.

Figure 1 shows the OLF300 functional block diagram. Table 1 provides the OLF300 absolute maximum ratings. Table 2 provides the OLF300 electrical specifications.

Figures 2 through 4 illustrate the OLF300 typical performance characteristics. Figure 5 shows the OLF300 switching test circuit. Figure 6 provides the OLF300 package dimensions.

Table 1. OLF300 Absolute Maximum Ratings¹

Parameter	Symbol	Minimum	Maximum	Units
<i>Coupled</i>				
Input to output isolation voltage ²	V _{DC}		±1000	V
Storage temperature range	T _{STG}	-65	+150	°C
Operating temperature range	T _A	-55	+125	°C
Lead temperature (1.6 mm from case from 10 seconds)			+240	°C
<i>Input Diode</i>				
Average input current	I _{DD}		20	mA
Peak forward current (≤1 ms duration)	I _F		40	mA
Reverse voltage	V _R		5	V
Power dissipation	P _D		36	mW
<i>Output Detector</i>				
Average output current			8	mA
Peak output current			16	mA
Supply voltage	V _{CC}	-0.5	+18.0	V
Output voltage	V _{OUT}	-0.5	+18.0	V
Power dissipation	P _D		50	mW

¹ Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to 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.

² Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. T_A = 25 °C and duration = 1 second.

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. OLF300 Electrical Specifications¹
(T_A = 55 °C to + 125 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Current transfer ratio ²	CTR	I _F = 16 mA, V _O = 0.4 V, V _{CC} = 4.5 V	20.0	45.0		%
Logic:						
High output current	I _{OH}	I _F = 0 mA, V _O = V _{CC} = 15.0 V		0.05	100.00	μA
Low supply current	I _{CCL}	I _F = 10 mA, V _{CC} = 15 V, V _O = open		40	200	μA
High supply current	I _{CCH}	I _F = 0 mA, V _{CC} = 15.0 V, V _O = open		0.05	10.0	μA
Input:						
Forward voltage	V _F	I _F = 10.0 mA		1.7	2.5	V
Reverse breakdown voltage	B _{VR}	I _R = 10 μA	3			V
Input to output leakage current ³	I _{L_O}	R _H ≤ 45%, T _A = 25 °C, V _{L_O} = 1000.0 V _{DC}			1.0	μA
Propagation delay time:						
Logic high to low	t _{PHL}	I _F = 16 mA, V _{CC} = 5 V		0.3	2.0	μs
Logic low to high	t _{PLH}	R _L = 8.2 kΩ, C _L = 50 pF		0.8	6.0	μs
Common mode transient immunity: ²						
Logic high level	CM _H	I _F = 0, R _L = 8.2 Ω, V _{CM} = 10 V _{p-p}		> 1		kV
Logic low level	CM _L	I _F = 16, R _L = 8.2 Ω, V _{CM} = 10 V _{p-p}		> 1		kV

¹ Performance is guaranteed only under the conditions listed in the above table.

² CTR is defined as the ratio of the output collector current I_c to the forward LED current I_F, multiplied by 100%.

³ Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. T_A = 25 °C and duration = 1 second.

Typical Performance Characteristics

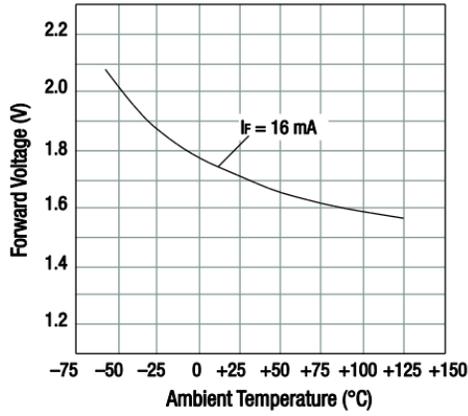


Figure 2. LED Forward Voltage vs Temperature

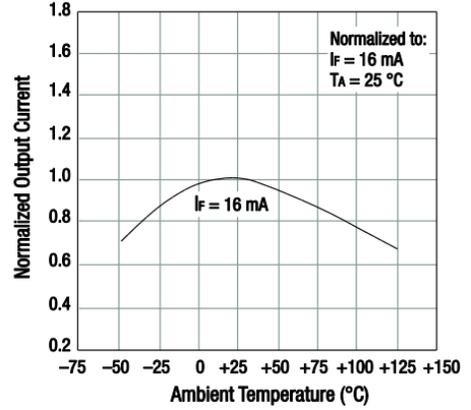


Figure 3. Normalized Output Current vs Temperature

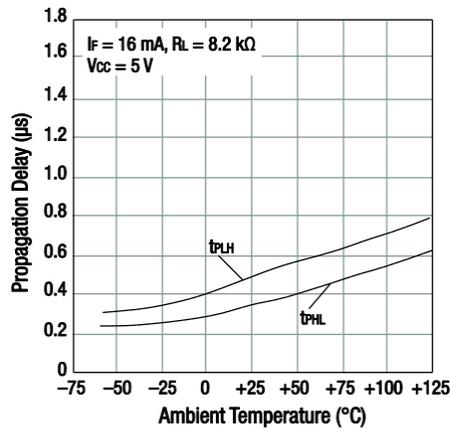


Figure 4. Propagation Delay vs Temperature

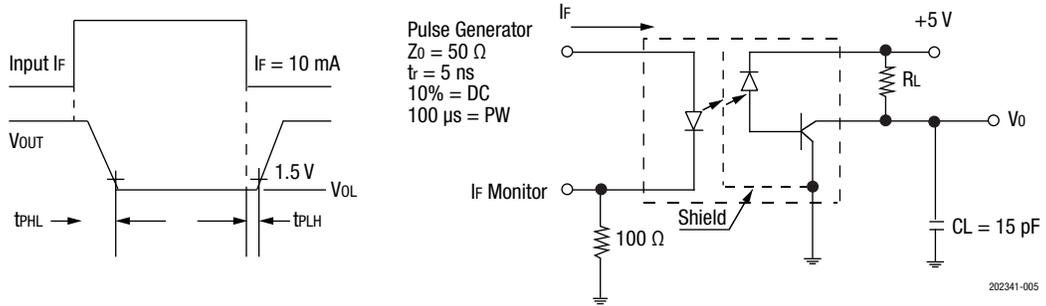


Figure 5. OLF300 Switching Test Circuit

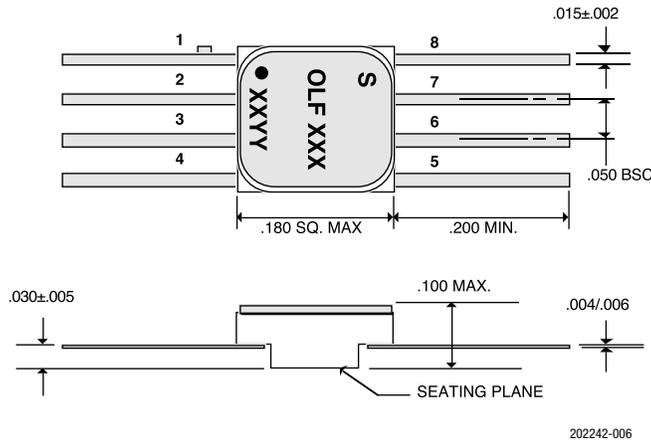


Figure 6. OLF300 Package Dimensions

Ordering Information

Model Name	Manufacturing Part Number
OLF300: Hermetic Surface-Mount High-Speed Optocoupler	OLF300

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