

OLF300: Hermetic Surface-Mount High-Speed Optocoupler

Applications

- Aerospace
- Defense
- Industrial
- Commercial

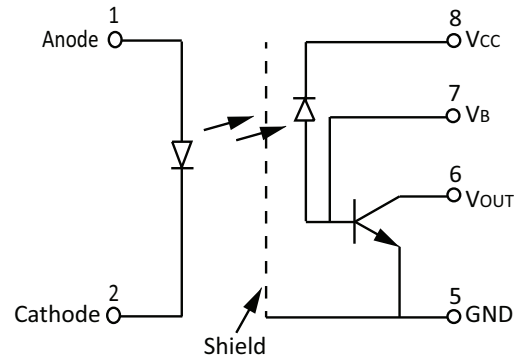
Features

- Electrical parameters assured over -55°C to $+125^{\circ}\text{C}$
- 1000 V_{DC} electrical isolation
- High-speed, 1 Mbps typical
- Open collector output
- 300 kHz bandwidth
- Similar to 6N135, 6N136, and 4N55 type optocouplers
- Radiation tolerant
- High-reliability screening available
 - MIL-STD-883 Class B equivalent
 - MIL-PRF-19500 JAN, JANTX, JANTXV, JANS equivalent
 - MIL-PRF-38534 Class H, K equivalent
 - Per customer requirements
- For RoHS and other product compliance information, see the [Skyworks Certificate of Conformance](#).

Description

The OLF300 high-speed optocoupler family 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 optically coupled in a custom 8-pin hermetic flatpack package, providing 1000 V_{DC} electrical isolation between the input and output.



Pin 3: N/C

Pin 4: Electrically connected to seal ring

Figure 1. Pinout and Functional Diagram

The integrated photodiode transistor improves the switching speed by orders of magnitude compared to standard phototransistors by reducing the base-to-collector capacitance. The internal shield provides high common-mode immunity performance.

Electrical Specifications

Table 1. Absolute Maximum Ratings¹

(T_A = +25 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Max	Units
Input					
Average forward current	I _{DD}			20	mA
Peak forward current	I _{FPK}	Pulse width ≤ 1 ms		40	mA
Reverse voltage	V _R			5	V
Input power dissipation	P _D			36	mW
Output					
Average output current	I _{OUT}			8	mA
Peak output current	I _{OUTPK}			16	mA
Supply voltage	V _{CC}		−0.5	18.0	V
Output voltage	V _{OUT}		−0.5	18.0	V
Output power dissipation	P _D			50	mW
Coupler					
Input to output isolation voltage ²	V _{ISO}		−1000	1000	V
Storage temperature range	T _{STG}		−65	150	°C
Operating temperature range	T _A		−55	125	°C
Soldering temperature	T _{SLD}	20 seconds		240	°C
Electrostatic Discharge					
MIL-STD-883, Method 3015 Human Body Model (HBM)	ESD	Class 1C rating		2000	V

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

ESD Handling: Industry-standard ESD handling precautions must be adhered to at all times to avoid damage to this device.

Table 2. Specifications¹
 (T_A = -55 to +125 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input						
Forward voltage	V _F	I _F = 10 mA		1.7	2.5	V
Reverse breakdown voltage	BV _R	I _R = 10 μA	3			V
Logic State (V _O) Behavior						
Logic low output voltage	V _{OL}	I _F = 10.0 mA, V _{CC} = 4.5 V, I _{OL} = 1.5 mA		0.15	0.4	V
Logic high output current	I _{OH}	I _F = 0 mA, V _O = V _{CC} = 15.0 V		0.05	100.0	μA
Logic low supply current	I _{CCL}	I _F = 10 mA, V _{CC} = 15.0 V, V _O = open		40	200	μA
Logic high supply current	I _{CCH}	I _F = 0 mA, V _{CC} = 15.0 V, V _O = open		0.05	10	μA
Coupler						
Current transfer ratio (I _C /I _F)	CTR	V _{CC} = 4.5 V, I _F = 16 mA, V _O = 0.4 V	20.0	45.0		%
Input-output leakage current ²	I _{I-O}	RH ≤ 50%, V _{I-O} = 1000 V _{DC}			1	μA
Propagation Delay Time Logic						
High to low	t _{PHL}	V _{CC} = 5 V, I _F = 16 mA, R _L = 8.2 kΩ, C _L = 50 pF		0.3	2	μs
Low to high	t _{PLH}			0.8	6	μs
Common Mode Transient Immunity ³						
Logic high level	CM _H	V _{CM} = 10 V _{P-P} , I _F = 0 mA, R _L = 8.2 kΩ		>1		kV
Logic low level	CM _L	V _{CM} = 10 V _{P-P} , I _F = 16 mA, R _L = 8.2 kΩ		>1		kV

1. Performance is assured only under the conditions listed in the above table. Catalog OLF300 is 100% tested at 25 °C only and specifications over temperature are assured by design or initial characterization.
2. Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. T_A = 25 °C, duration = 1 second.
3. Assured by design. Characterized at initial product release, not production tested.

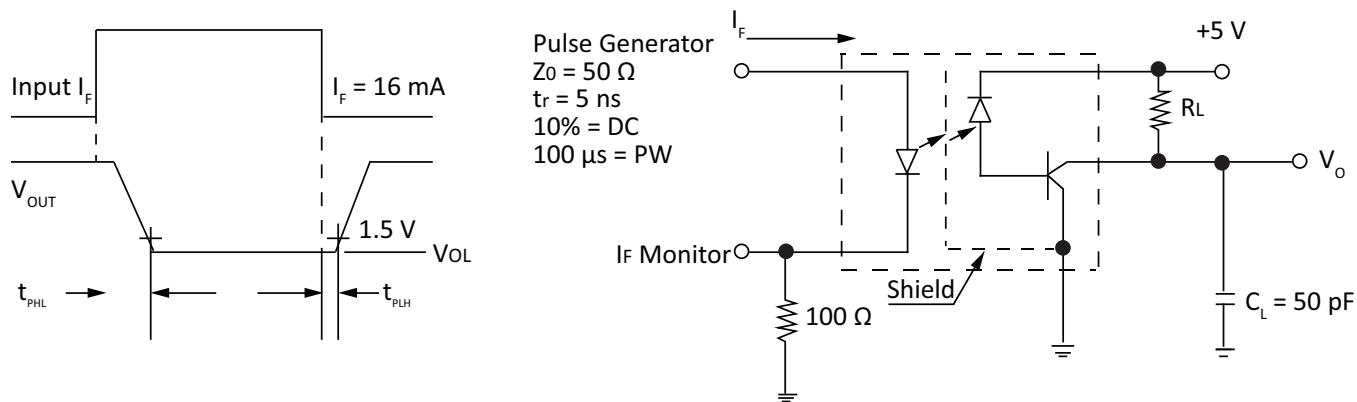
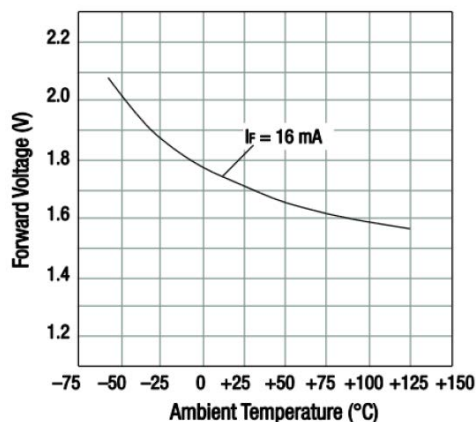
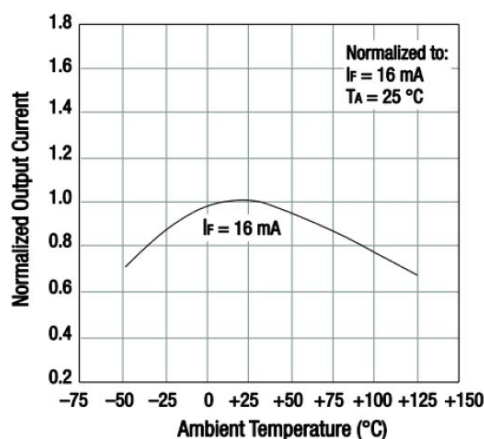
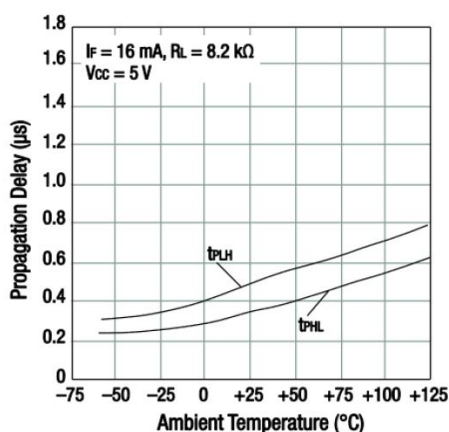


Figure 2. Switching Test Circuit

Typical Performance Characteristics ($T_A = 25^\circ\text{C}$, Unless Otherwise Indicated)

Figure 3. LED V_F vs. TempFigure 4. Normalized I_{OUT} vs. TempFigure 5. t_{PHL} and t_{PLH} vs. Temp

Package and Handling Information

Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment.

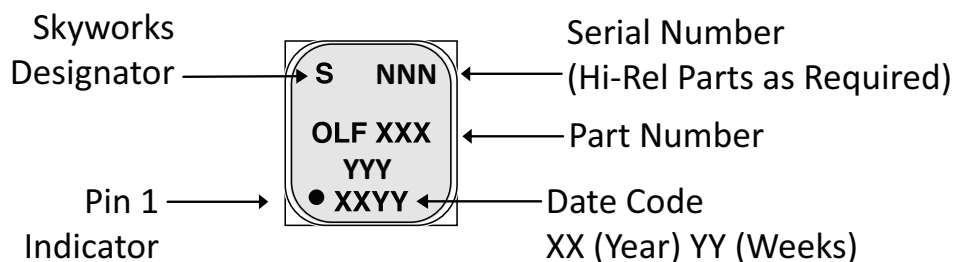


Figure 6. Typical Part Marking, 8-Lead Flatpack (OLF300YYY-N)

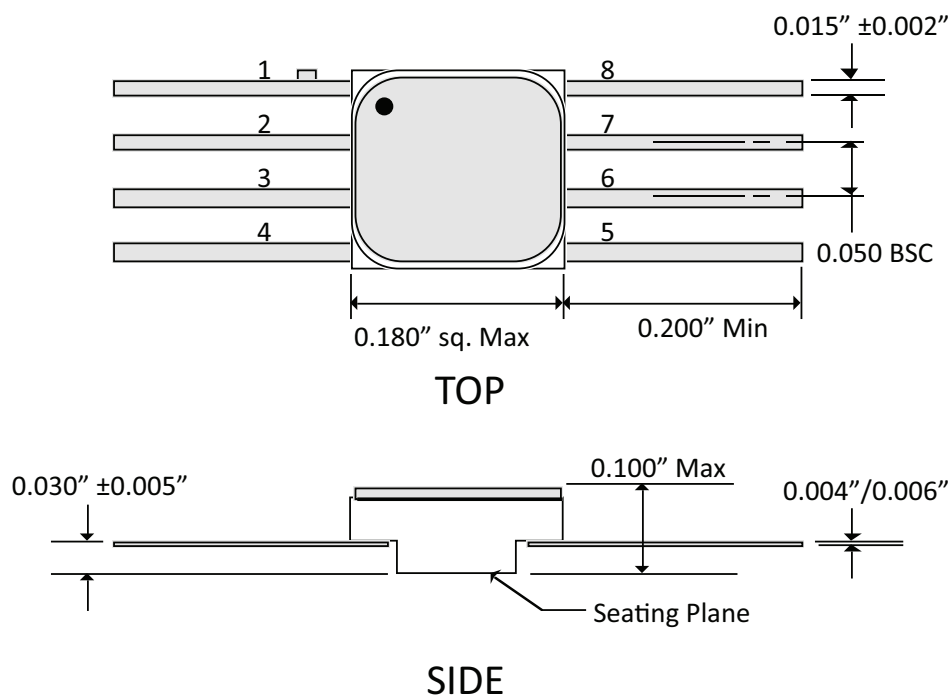
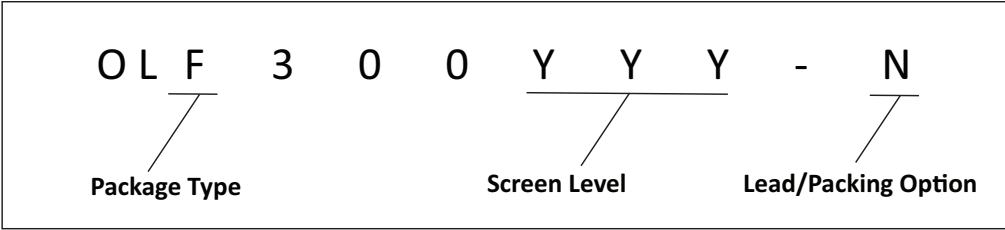


Figure 7. Package Dimensions, 8-Lead Flatpack (OLF300YYY-N)

Table 3. Additional Package Information

	8-Lead Flatpack (OLF300YYY-N)
	Surface mount
Lead finish/plating	Min 60 μ in Au over min 80 μ in Ni
Lead thickness	5 mils
Hermetic	Yes
Max package weight	0.180 grams
CAGE code 0JGG3	

Ordering Information



	Hermetic 8-Lead Flatpack
Screen Level	
Catalog	OLF300
MIL-STD-883 Class B equivalent	OLF300SB
JANTX equivalent	OLF300SX
JANTXV equivalent	OLF300SXV
JANS equivalent	OLF300PS
Lead Finish and Packing Options (-N)	
Non-solder dipped and standard packing	Blank
Solder dipped	-1
Tape and reel	N/A
Solder dip and tape and reel	N/A
Standard packing	Individual ESD carriers

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