

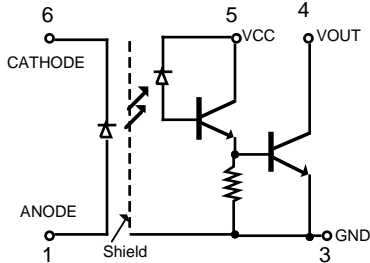


ISO LINK

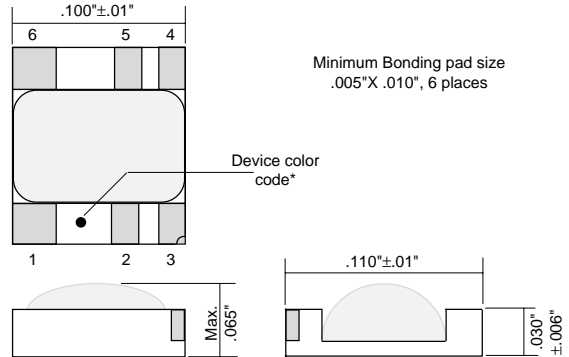
OLI 400

Miniature Low Input-Current Optocoupler

For Hybrid Assembly



SCHEMATIC



* OLI 400 Color code - Yellow

PACKAGE OUTLINE

Features

- ◆ *Electrical parameters guaranteed over -55°C to +125°C ambient temp. range*
- ◆ *1500 Vdc electrical isolation*
- ◆ *Low input current - 0.5 mA*
- ◆ *Low output Vce-sat - 0.1V typical*
- ◆ *High current transfer ratio - 1000% typ.*
- ◆ *Low power consumption*
- ◆ *Similar to industry standard parts 6N138 / 6N139 in plastic and 6N140 in hermetic DIP packages.*
- ◆ *Radiation tolerant*

Description

The OLI 400 has high current transfer ratio at very low input currents making it ideal for applications such as MOS, CMOS, and low power logic interfacing or RS-232C data transmission systems. Each OLI 400 has a light emitting diode and an integrated photodiode-darlington detector IC mounted and coupled in a miniature custom ceramic package providing 1500 Vdc electrical isolation between input and output. The darlington detector has an integrated base - emitter resistor for superior high temperature performance. The split darlington design permits lower output saturation voltage and higher switching speed operation than possible with conventional photodarlington design.

Device mounting is achieved by standard hybrid assembly with non-conductive epoxies. Gold or aluminum wire bonding can be used to make electrical connections for maximum placement flexibility³.

Notes:

1. Measured between pins 1 and 6 shorted together and pins 2, 3, 4, and 5 shorted together. $T_A = 25^\circ\text{C}$ and duration = 1 second.
2. Current transfer ratio is defined as the ratio of output collector current, I_C to the forward LED current, I_F , times 100%.
3. Certain cleaning process may be harmful to this device; consult factory for details

Absolute Maximum Ratings

Coupled	
Input to Output Isolation Voltage ¹	± 1500 Vdc
Storage Temperature Range	-65°C to +150°C
Operation Temperature Range	-55°C to +125°C
Mounting Temperature Range (3 minutes max.)	240°C
Input Diode	
Average Input Current	20 mA
Peak Forward Current (≤ 1mS duration)	40 mA
Reverse Voltage	5.0 V
Power Dissipation	36 mW
Output Detector	
Average Output Current	40 mA
Supply Voltage, V _{cc}	-0.5 V to 20 V
Output Voltage, V _{out}	-0.5 V to 20 V
Power Dissipation	50 mW

ELECTRICAL CHARACTERISTIC (T_A = - 55 °C to +125 °C, Unless Otherwise Specified)

Parameter	Symbol	Min	Typ.	Max	Units	Test Conditions	Fig.	Note
Current Transfer Ratio	CTR	300 300 200			% % %	I _F =0.5 mA, V _O =0.4 V, V _{CC} =4.5 V I _F =1.6 mA, V _O =0.4 V, V _{CC} =4.5 V I _F =5.0 mA, V _O =0.4 V, V _{CC} =4.5 V	2	2
Logic Low Output Voltage	V _{OL}		.1 .2	.4 .4	V V	I _F =0.5 mA, I _{OL} =1.5mA, V _{CC} =4.5V I _F =5mA, I _{OL} =10mA, V _{CC} =4.5V		
Logic High Output Current	I _{OH}		.005	250	μA	I _F =0mA, V _O =V _{CC} =18V		
Logic Low Supply Current	I _{CCL}		0.6	2.0	mA	I _F =1.6mA, V _{CC} =18V		
Logic High Supply Current	I _{CCH}		.01	40	μA	I _F =0mA, V _{CC} =18V		
Input Forward Voltage	V _F		1.65	2.0	V	I _F =1.6mA	1	
Input Reverse Breakdown Voltage	B _{VR}	3			V	I _R =10 μA		
Input to Output Leakage Current	I _{I-O}			1.0	μA	Relative Humidity ≤ 50%, T _A = 25°C, V _{I-O} = 1500 Vdc		1
Propagation Delay Time Logic High to Low	t _{PHL}		26 2	100 10	μS μS	I _F =0.5mA, R _L =4.7 KΩ, I _F =5mA, R _L =680 Ω		
Propagation Delay Time Logic Low to High	t _{PLH}		28 10	60 30	μS μS	I _F =0.5mA, R _L =4.7 KΩ, I _F =5mA, R _L =680 Ω		

TYPICAL PERFORMANCE CURVES

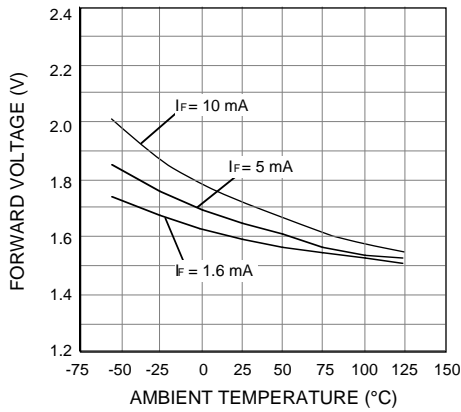


Fig. 1 - LED Forward Characteristics

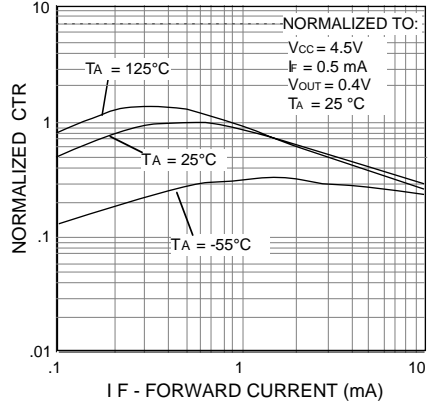


Fig. 2 - Normalized CTR vs. Input Diode Forward Current.

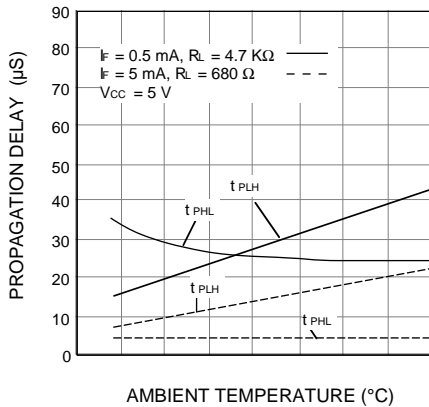


Fig. 3 - Propagation Delay vs. Temperature

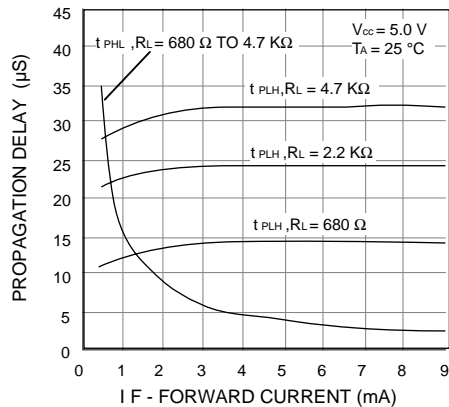


Fig. 4 - Propagation Delay vs. Input Diode Current

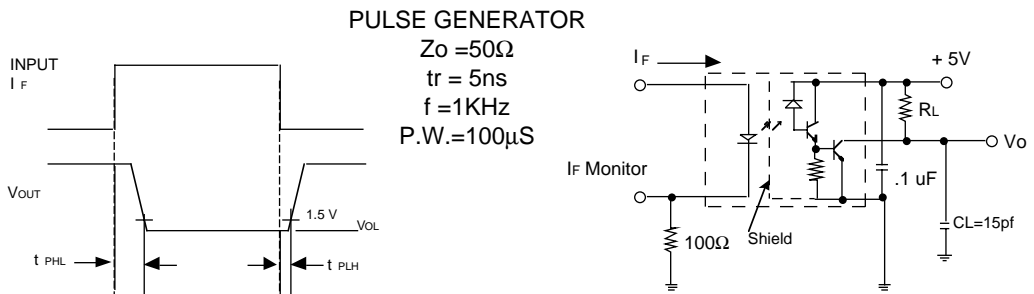


Fig. 5 - Switching Test Circuit