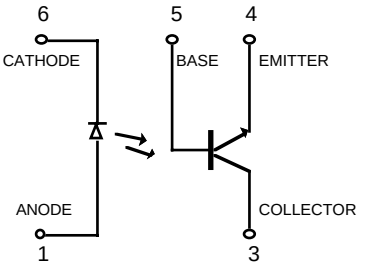
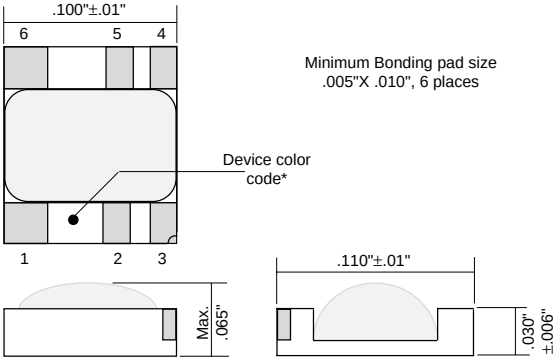
ISO LINK

OLI 249

Radiation Tolerant **Phototransistor Optocoupler** **For Hybrid Assembly**



SCHEMATIC



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PACKAGE OUTLINE

Features

- *Current transfer ratio guaranteed over -55°C to +100°C ambient temp. range*
- *1500 Vdc electrical isolation*
- *Small foot print for hybrid device*
- *More Radiation tolerant than 4N49* [4]
- *High current transfer ratio at low input current - 200% at I_F =2mA over temperature*
- *High reliability and rugged construction*
- *CTR comparable to darlington output but with low saturation V_{CE} = 0.15v typ.*
- *Similar to 4N4X type optocouplers*
- *Custom package available Call Factory* [4]

Description

The OLI 249 is designed especially for hybrid application requiring optical isolation with high current transfer ratio and low saturation Vce. Each OLI 249 consists of a light emitting diode and a NPN silicon phototransistor mounted and coupled in a miniature custom ceramic package. The very low input current makes the OLI 249 well suited for direct CMOS to LSTTL / TTL interfaces. Electrical parameters are similar to the JEDEC registered 4N49 optocoupler but with much better CTR degradation characteristics due to radiation exposure.

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 flexibility .

Special electrical parametric selections are available on request.

NOTES:

1. Measured between pins 1 and 6 shorted together and pins 2,3,4,and 5 shorted together. T_A = 25°C and duration = 1 second.
2. Derate linearly at 3.0 mW / °C above 25 °C
3. Value applies for Pw ≤ 1 µS, PRR ≤ 300 pps.
4. Contact factory for more information

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	40 mA
Peak Forward Current (≤ 1mS duration)	60 mA
Reverse Voltage	3.0 V
Power Dissipation	70 mW
Output Detector	
Collector - Emitter Voltage	40 V
Emitter - Collector Voltage	7 V
Collector - Base Voltage	45 V
Power Dissipation	200 mW[3]

ELECTRICAL CHARACTERISTIC (T_A = 25 °C, Unless Otherwise Specified)

Parameter	Symbol	Min	Max	Units	Test Conditions	Fig.	Note
On-State Collector Current	$I_{C(ON)}$	2.0	12	mA	I_F = 1 mA, V_{CE} = 5.0V	2,3	
		2.8		mA	I_F = 2 mA, V_{CE} = 5.0V, T_A = -55°C		
		2.0		mA	I_F = 2 mA, V_{CE} = 5.0V, T_A = 100°C		
On-State Coll.-Base Current	$I_{CB(ON)}$	30		µA	I_F = 10 mA, V_{CB} = 5.0V		
Saturation Voltage	$V_{CE(SAT)}$		0.3	V	I_F = 2mA, I_C =2.0mA		
Breakdown Voltage							
Collector to Emitter	B_{VCEO}	40		V	I_{CE} = 1 mA		
Collector to Base	B_{VCBO}	45		V	I_{CB} = 100 µA		
Emitter to Base	B_{VEBO}	7		V	I_{EB} = 100 µA		
Off-State Leakage Current							
Collector to Emitter	$I_{CE(OFF)}$		100	nA	V_{CE} = 20V		
			100	µA	V_{CE} = 20V, T_A =100 °C		
Collector to Base	$I_{CB(OFF)}$		10	nA	V_{CB} = 20V		
Input Forward Voltage	V_F	1.8	2.2	V	I_F = 10mA, T_A = -55°C	1	
		1.4	1.8	V	I_F = 10mA	1	
		1.2	1.6	V	I_F = 10mA, T_A = 100°C	1	
Input Reverse Current	I_R		100	µA	V_R = 2.0V		
Input to Output Resistance	r_{I-O}	10^{11}		Ω	V_{I-O} = ±1000Vdc		1
Input to Output Capacitance	c_{I-O}		5	pF	V_{I-O} = 0V, f = 1 MHz		1
Rise Time	t_r		25	µS	V_{CC} = 10V, RL = 100 Ω	4	
Fall Time	t_f		25	µS	I_F = 5mA		

TYPICAL PERFORMANCE CURVES

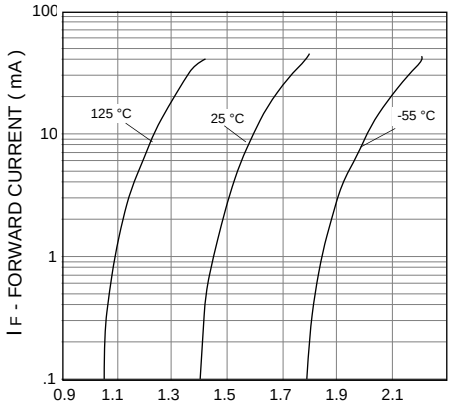

Fig. 1 - Diode Forward Characteristics

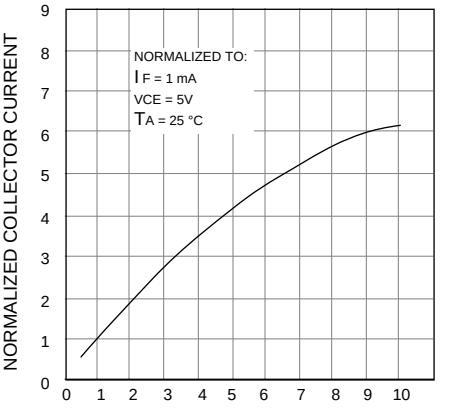

Fig. 2 - Normalized Ic vs. I F

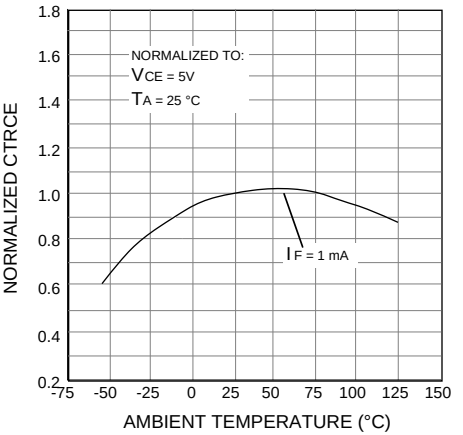

Fig. 3 - Normalized CTR vs. Temperature

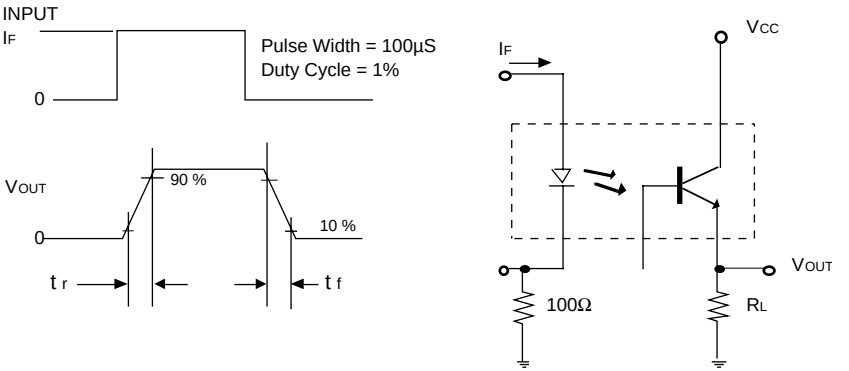

Fig. 4 - Switching Test Circuit