



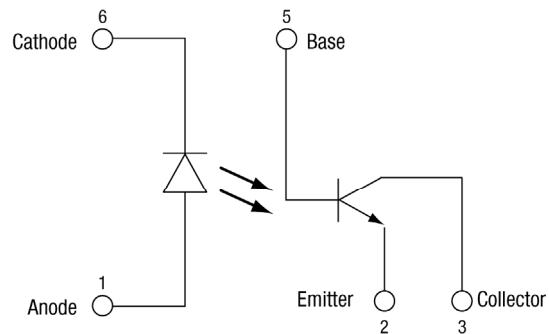
SKYWORKS®

DATA SHEET

OLI100: Miniature Phototransistor Optocoupler for Hybrid Assembly

Features

- Current transfer ratio guaranteed over -55 °C to +125 °C ambient temperature range
- Electrical isolation: 1500 VDC
- High current transfer ratio: 100% minimum over temperature
- High current transfer ratio at low input current: 100% at $I_F = 1$ mA over temperature
- High reliability and rugged construction
- CTR-comparable to Darlington output but with low saturation $V_{CE} = 0.15$ V typical
- Similar to 4N2X, 4N3X type optocouplers
- Custom package available



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Figure 1. OLI100 Block Diagram

Description

The OLI100 is designed especially for hybrid applications that require optical isolation with a high current transfer ratio and low saturation V_{CE} . The device consists of a light emitting diode, and an N-P-N silicon phototransistor mounted and coupled in a miniature custom ceramic package.

The very low input current makes the OLI100 well suited for direct CMOS to Low Power Schottky Transistor to Transistor Logic (LSTTL/TTL) interfaces.

The OLI100 is mounted by 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.
Please consult Isolink for details.

A functional block diagram of the OLI100 is shown in Figure 1. The absolute maximum ratings of the OLI100 are provided in Table 1. Electrical specifications are provided in Table 2.

Typical performance characteristics of the OLI100 are illustrated in Figures 2 through 5. A typical switching test circuit is shown in Figure 6 and package dimensions for the OLI100 are provided in Figure 7.

Table 1. OLI100 Absolute Maximum Ratings¹

Parameter	Symbol	Minimum	Maximum	Units
Coupled				
Input to output isolation voltage ²	VDC		±1500	V
Storage temperature	TSTG	-65	+150	°C
Operating temperature	TA	-55	+125	°C
Mounting temperature (3 minutes maximum)	TMTG		+240	°C
Input Diode				
Average input current	IDD		40	mA
Peak forward current (\leq 1 ms duration)	IF		60	mA
Reverse voltage	VR		3	V
Power dissipation	Pd		70	mW
Output Detector				
Collector to emitter voltage	VCE		35	V
Emitter to collector voltage	VEC		7	V
Collector to base voltage	VCB		70	V
Power dissipation ³	Pd		300	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 and 6 shorted together and pins 2, 3, 4, and 5 shorted together. TA = 25 °C and duration = 1 second.

³ Derate linearly at 3.0 mW/°C above 25 °C.

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. OLI100 Electrical Specifications¹

(TA = -55 °C to +125 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Current transfer ratio ²	CTR	IF = 10 mA, VCE = 5 V	100	200		%
		IF = 1 mA, VCE = 5 V	100	200		%
Saturation voltage	VCE_SAT	IF = 10 mA, IC = 2 mA		0.15	0.30	V
Breakdown voltage: Collector to emitter Collector to base Emitter to collector	BVCEO	IC = 100 μA, TA = 25 °C	30			V
	BVCBO	ICB = 10 μA, TA = 25 °C	70			V
	BVECO	IEC = 100 μA, TA = 25 °C	5			V
Leakage current (collector to emitter)	ICEO	VCE = 20 V, TA = 25 °C VCE = 20 V, TA = 100 °C			100 100	nA μA
Input forward voltage	VF	IF = 10 mA	0.9	1.3	1.7	V
Input reverse current	IR	VR = 3 V			100	μA
Input to output leakage current ³	II_0	Relative humidity ≤50%, TA = 25 °C, VI_0 = 1500 VDC			1	μA
Turn-on time	tON	VCC = 10 V, RL = 100 Ω, IC = 2 mA, TA = 25 °C		5	15	μs
Turn-off time	tOFF	VCC = 10 V, RL = 100 Ω, IC = 2 mA, TA = 25 °C		5	15	μs

¹ Performance is guaranteed only under the conditions listed in this table.² CTR is defined as the ratio of output collector current (IC) to the forward LED current (IF) multiplied by 100%.³ Measured between pins 1 and 6 shorted together and pins 2, 3, 4, and 5 shorted together. TA = 25 °C and duration = 1 second.

Typical Performance Characteristics

($T_{OP} = -55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, Unless Otherwise Noted)

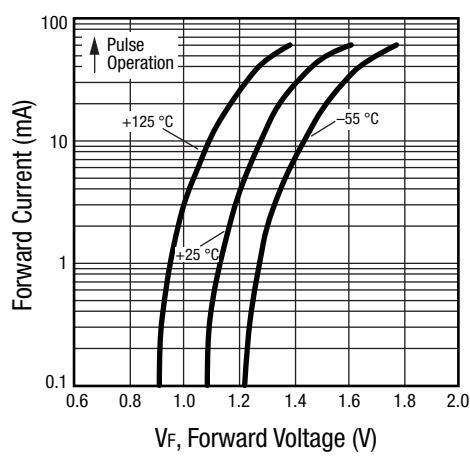


Figure 2. Diode Forward Characteristics

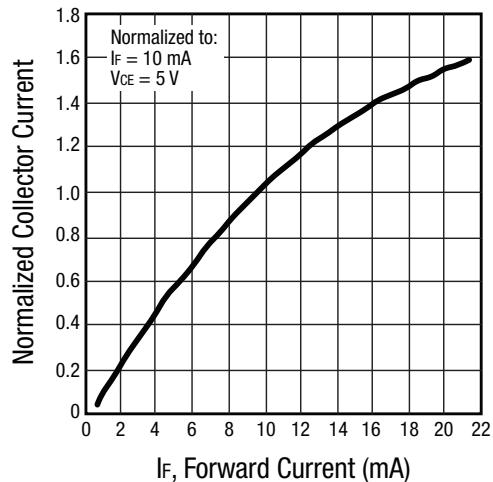


Figure 3. Normalized Collector Current vs. Forward Current

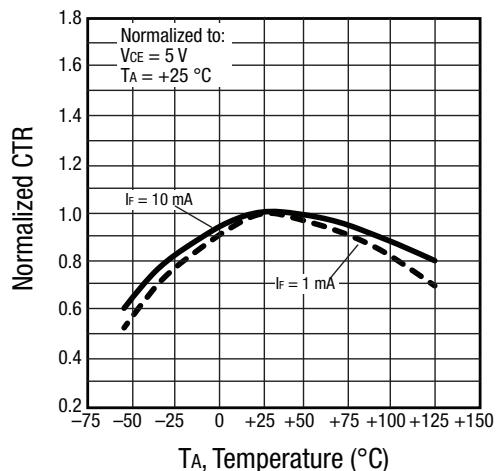


Figure 4. Normalized CTR vs Temperature

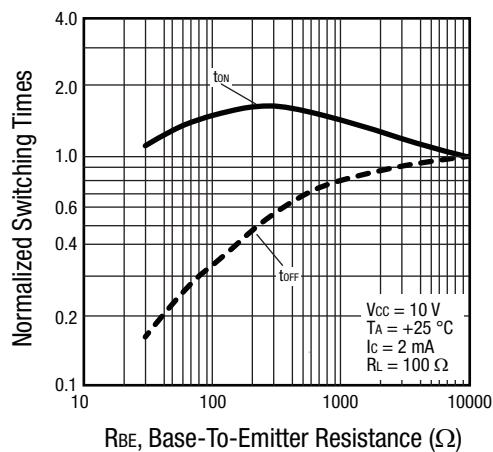
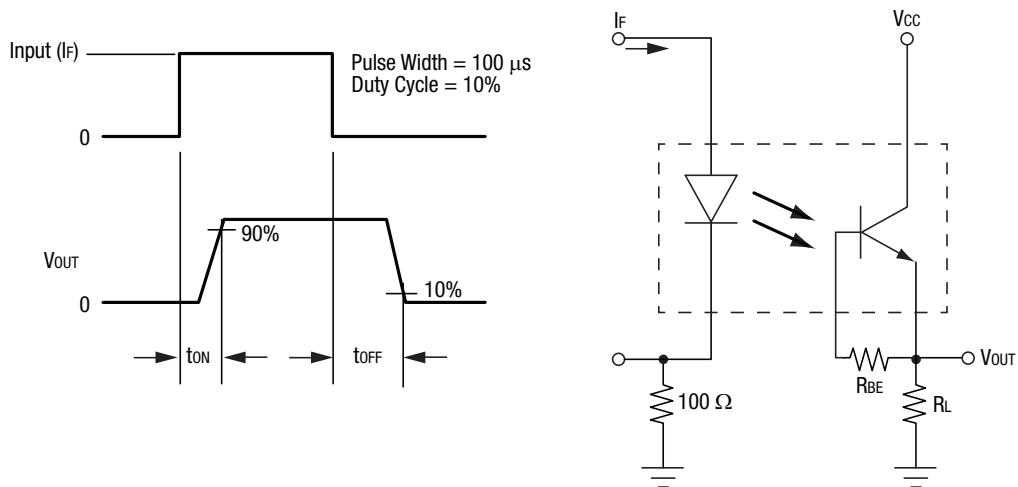


Figure 5. Switching Speed vs Base-to-Emitter Resistance



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Figure 6. OLI100 Switching Test Circuit

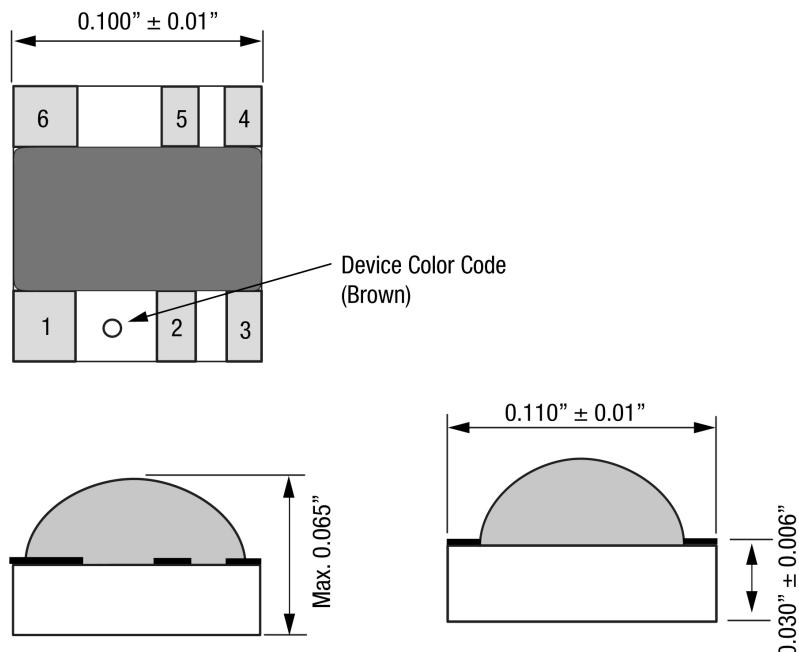


Figure 7. OLI100 Package Dimensions

Ordering Information

Part Number	Product Description
OLI100	Miniature Phototransistor Optocoupler for Hybrid Assembly

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