

DATA SHEET

# OLI110: Phototransistor Optocoupler

## Features

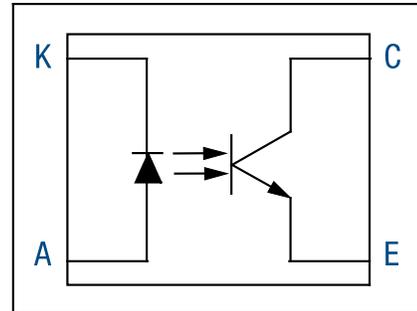
- High current transfer ratio (CTR)—guaranteed over  $-55\text{ }^{\circ}\text{C}$  to  $+100\text{ }^{\circ}\text{C}$  ambient temperature range
- 1500 V<sub>dc</sub> electrical isolation
- High breakdown voltage, collector to emitter, base open ( $BV_{CE0}$ ),  $>60\text{ V}$
- Small surface mount size

## Description

The OLI110 consists of an LED and N-P-N silicon phototransistor that is electrically isolated, but optically coupled on a ceramic Leadless Chip Carrier (LCC) surface mount package. The epoxy coating on the OLI110 allows the device to withstand normal solvent cleaning operations.

Surface mounting can be accomplished with either conductive epoxies or by reflow soldering.

Special electrical parametric selections are available upon request.



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**Figure 1. OLI110 Block Diagram**

A functional block diagram of the OLI110 is shown in Figure 1. The absolute maximum ratings of the OLI110 are provided in Table 1. Electrical specifications are provided in Table 2.

Typical performance characteristics of the OLI110 are illustrated in Figures 2 through 4. A rise and fall time test circuit is shown in Figure 5, and package dimensions for the OLI110 are provided in Figure 6.

**Table 1. OLI110 Absolute Maximum Ratings (Note 1)**

Parameter	Symbol	Minimum	Maximum	Units
<b>Coupled</b>				
Input to output isolation voltage (Note 2)	V <sub>DC</sub>	-1500	+1500	V
Storage temperature range	T <sub>STG</sub>	-65	+150	°C
Operating temperature range	T <sub>A</sub>	-55	+125	°C
<b>Input Diode</b>				
Average input current	I <sub>DD</sub>		40	mA
Peak forward current	I <sub>F</sub>		60	mA
Reverse voltage	V <sub>R</sub>		3	V
Power dissipation	P <sub>D</sub>		70	mW
<b>Output Detector</b>				
Collector to emitter voltage	V <sub>CE</sub>		60	V
Power dissipation (Note 3)	P <sub>D</sub>		200	mW

**Note 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 in the above table may result in permanent damage to the device.

**Note 2:** Measured between LED pins shorted together, and output pins shorted together. T<sub>A</sub> = 25 °C and duration = 1 s.

**Note 3:** Derate linearly at 2 mW/°C above 25 °C.

**CAUTION:** 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. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions should be used at all times.

**Table 2. OLI110 Electrical Specifications (Note 1)**  
(T<sub>A</sub> = -55 °C to +125 °C, Unless Otherwise Noted)

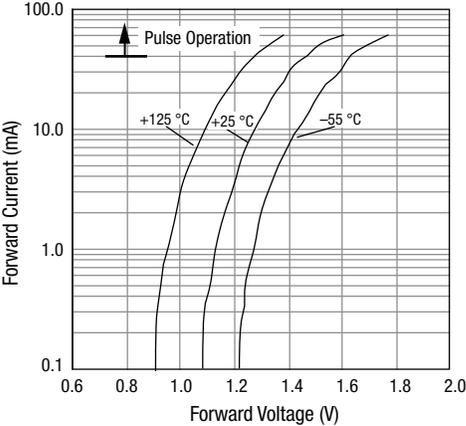
Parameter	Symbol	Test Condition	Min	Typical	Max	Units
On-state collector current	I <sub>C_ON</sub>	I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 5 V	100	200		mA
		I <sub>F</sub> = 1 mA, V <sub>CE</sub> = 5 V	100	200		mA
Saturation voltage	V <sub>CE_SAT</sub>	I <sub>F</sub> = 10.0 mA, I <sub>C</sub> = 2.0 mA		0.15	0.3	V
Breakdown voltage:						
Collector to emitter	BV <sub>CEO</sub>	I <sub>CE</sub> = 100 µA, T <sub>A</sub> = 25 °C	60			V
Emitter to collector	BV <sub>ECO</sub>	I <sub>EC</sub> = 100 µA, T <sub>A</sub> = 25 °C	5			V
Leakage current collector to emitter	I <sub>CEO</sub>	V <sub>CE</sub> = 20 V, T <sub>A</sub> = 25 °C			100	nA
		V <sub>CE</sub> = 20 V, T <sub>A</sub> = 100 °C			100	µA
Input:						
Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10.0 mA	0.90	1.3	1.7	V
Reverse current	I <sub>R</sub>	V <sub>R</sub> = 3 V			100	µA
Output leakage current (Note 2)	I <sub>L_O</sub>	R <sub>L</sub> = ≥50%, T <sub>A</sub> = 25 °C, V <sub>I-O</sub> = ±1500 V <sub>DC</sub>			1	µA
Time:						
Rise	t <sub>r</sub>	V <sub>CC</sub> = 10 V, R <sub>L</sub> = 100 Ω, I <sub>C</sub> = 2 mA, T <sub>A</sub> = 25 °C		5	15	µs
Fall	t <sub>f</sub>			5	15	µs

**Note 1:** Performance is guaranteed only under the conditions listed in this table.

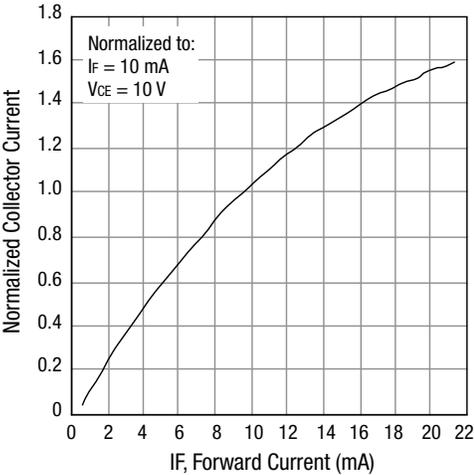
**Note 2:** Measured between LED pins shorted together, and output pins shorted together. T<sub>A</sub> = 25 °C and duration = 1 s.

**Typical Performance Characteristics**

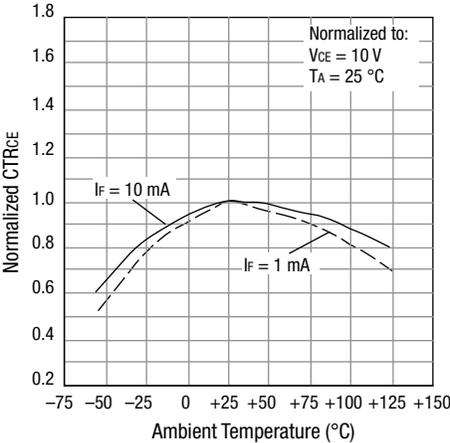
( $T_A = -55\text{ }^\circ\text{C}$  to  $+125\text{ }^\circ\text{C}$ , Unless Otherwise Noted)



**Figure 2. Forward Current vs Forward Voltage**



**Figure 3. Normalized Collector Current vs Forward Current**



**Figure 4. Normalized  $CTR_{CE}$  vs Temperature**

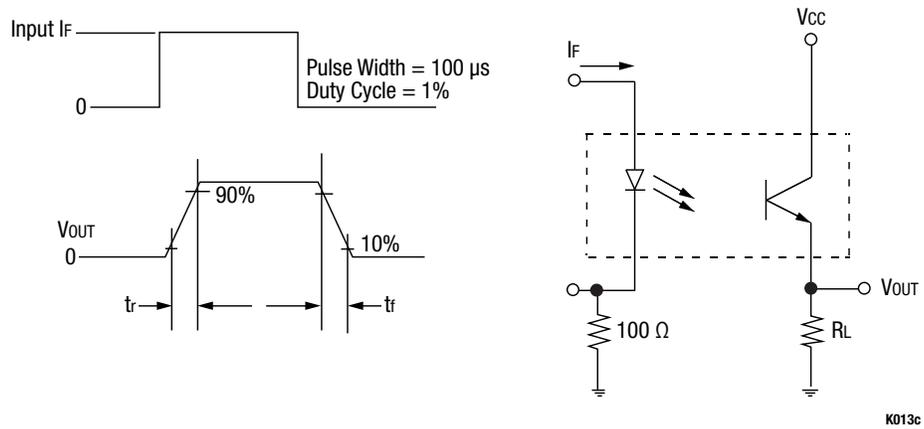


Figure 5. OLI110 Rise and Fall Time Test Circuit

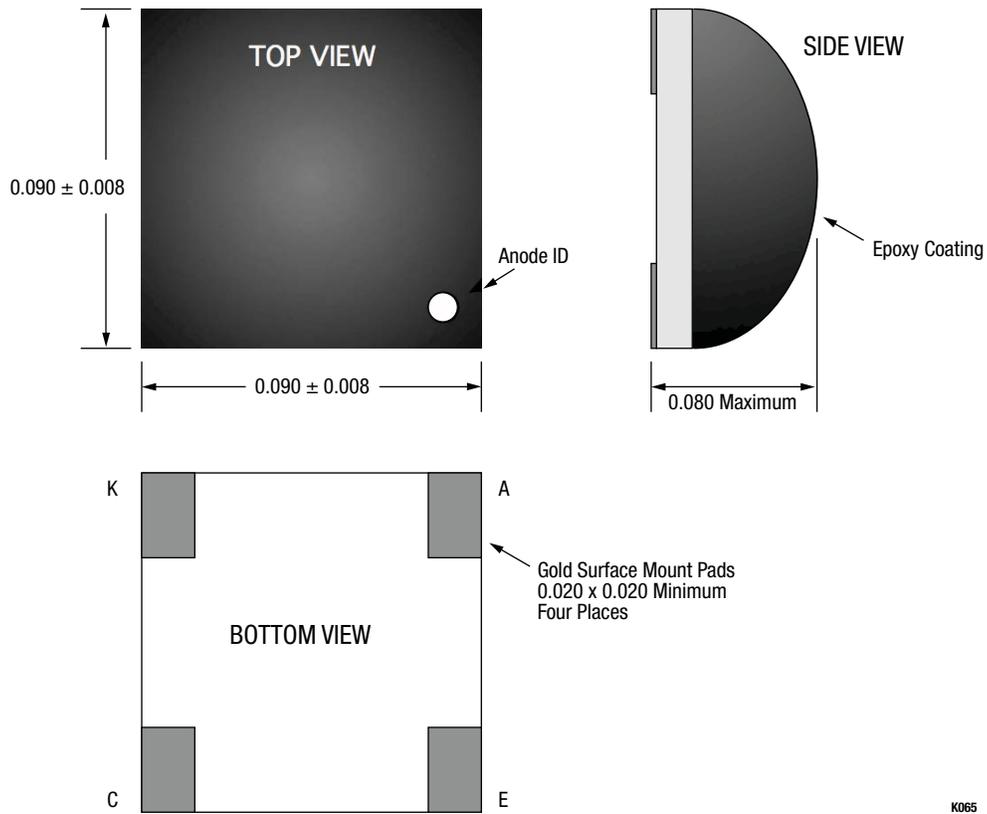


Figure 6. OLI110 Package Dimensions

**Ordering Information**

Model Name	Manufacturing Part Number
OLI110: Phototransistor Optocoupler	OLI110

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