DATA SHEET

OLI110: Phototransistor Optocoupler

Features

- High current transfer ratio (CTR)—guaranteed over –55 °C to +100 °C ambient temperature range
- 1500 V_{DC} electrical isolation
- High breakdown voltage, collector to emitter, base open (BV_{CEO}), >60 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.

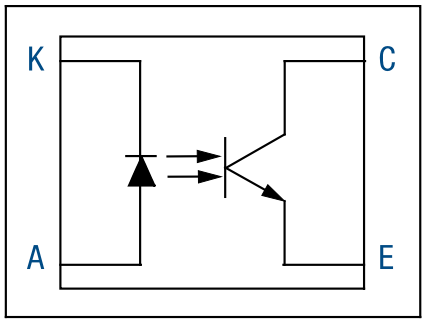

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Figure 1. OLI110 Block Diagram

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
Coupled				
Input to output isolation voltage (Note 2)	V_{DC}	–1500	+1500	V
Storage temperature range	T_{STG}	–65	+150	°C
Operating temperature range	T_A	–55	+125	°C
Input Diode				
Average input current	I_{DD}		40	mA
Peak forward current	I_F		60	mA
Reverse voltage	V_R		3	V
Power dissipation	P_D		70	mW
Output Detector				
Collector to emitter voltage	V_{CE}		60	V
Power dissipation (Note 3)	P_D		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_A = 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_A = –55 °C to +125 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
On-state collector current	I_{C_ON}	I_F = 10 mA, V_{CE} = 5 V	100	200		mA
		I_F = 1 mA, V_{CE} = 5 V	100	200		mA
Saturation voltage	V_{CE_SAT}	I_F = 10.0 mA, I_C = 2.0 mA		0.15	0.3	V
Breakdown voltage:						
Collector to emitter	BV_{CEO}	I_{CE} = 100 µA, T_A = 25 °C	60			V
Emitter to collector	BV_{ECO}	I_{EC} = 100 µA, T_A = 25 °C	5			V
Leakage current collector to emitter	I_{CEO}	V_{CE} = 20 V, T_A = 25 °C			100	nA
		V_{CE} = 20 V, T_A = 100 °C			100	µA
Input:						
Forward voltage	V_F	I_F = 10.0 mA	0.90	1.3	1.7	V
Reverse current	I_R	V_R = 3 V			100	µA
Output leakage current (Note 2)	I_{I_O}	R_L = ≥50%, T_A = 25 °C, $V_{I\text{-}O}$ = ±1500 V_{DC}			1	µA
Time:						
Rise	t_r	V_{CC} = 10 V, R_L = 100 Ω, I_C = 2 mA, T_A = 25 °C		5	15	µs
Fall	t_f			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_A = 25 °C and duration = 1 s.

Typical Performance Characteristics

(T_A = –55 °C to +125 °C, Unless Otherwise Noted)

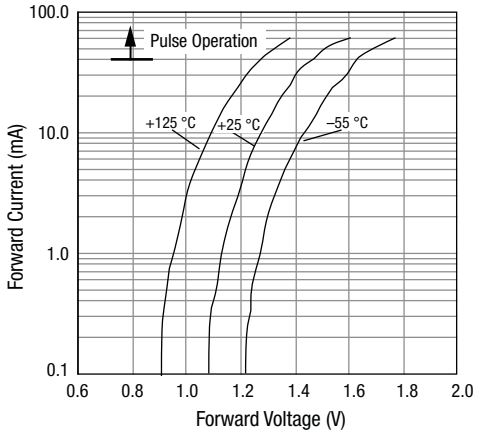

Figure 2. Forward Current vs Forward Voltage

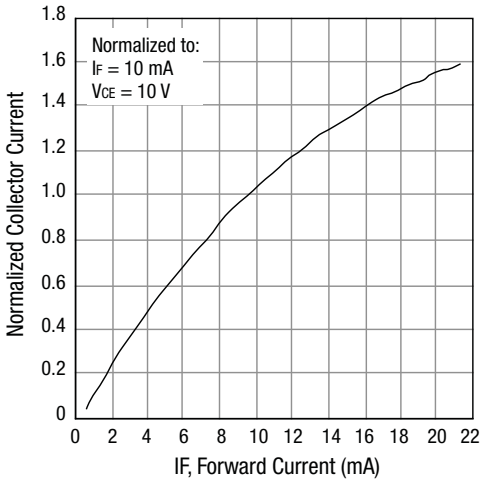

Figure 3. Normalized Collector Current vs Forward Current

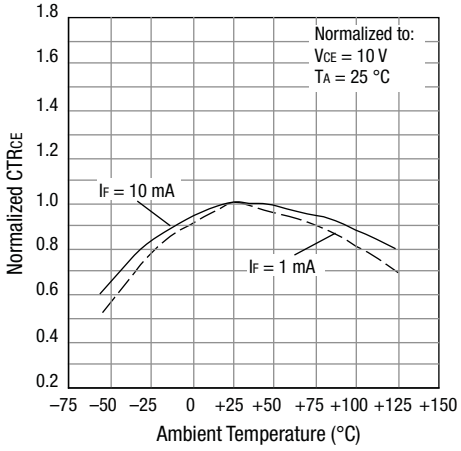

Figure 4. Normalized CTR_{CE} vs Temperature

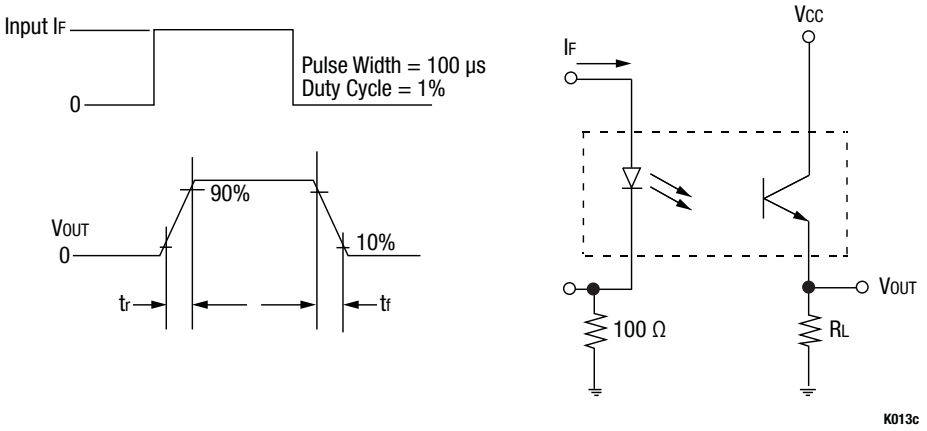

Figure 5. OLI110 Rise and Fall Time Test Circuit

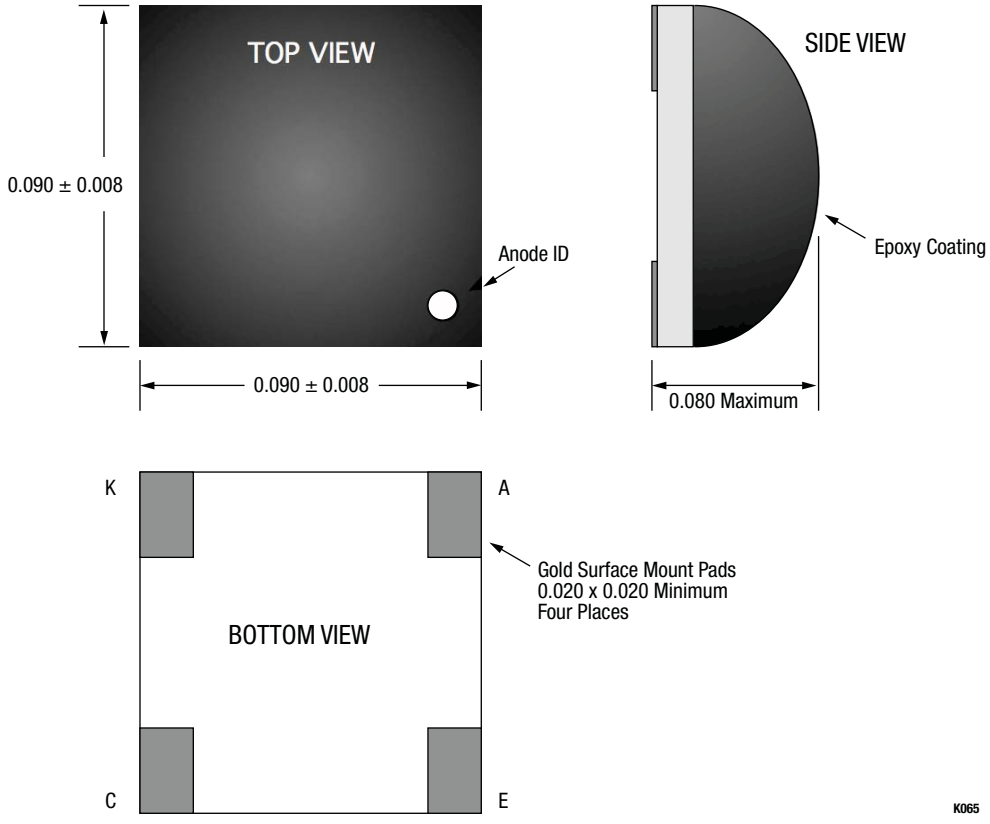

Figure 6. OLI110 Package Dimensions

Ordering Information

Model Name	Manufacturing Part Number
OLI110: Phototransistor Optocoupler	OLI110