DATA SHEET

OLH2047/OLH2048/OLH2049: Photo-Transistor Hermetic Optocouplers

Features

- Current Transfer Ratio (CTR) guaranteed over –55 °C to +100 °C ambient temperature range
- 2500 V electrical isolation
- Standard 8-pin DIP configuration
- High CTR at low input current
- Two isolated channels per package
- Offers 100% high-reliability screenings

Description

The OLH2047, OLH2048, and OLH2049 are dual-channel, hermetic 8-pin DIP optocouplers designed especially for high-reliability applications that require optical isolation with high CTR and low saturation V_{CE}.

Each optocoupler channel consists of an LED and N-P-N silicon photo-transistor mounted and coupled in an 8-pin hermetically sealed DIP package. The pinout configuration is similar to MCT6 and ILD1/2/5 plastic optocouplers.

High-reliability screening and special CTR selections are available (contact Isolink for more information).

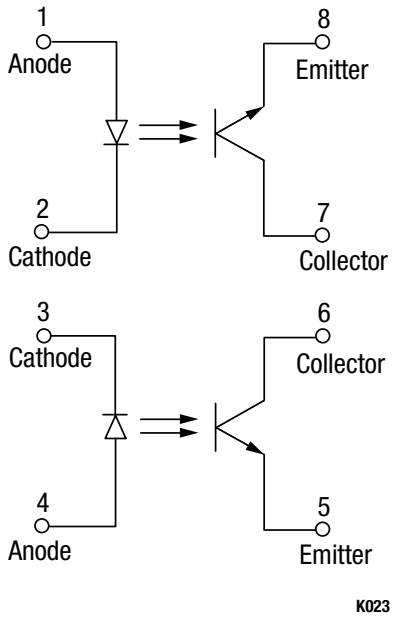

Figure 1. OLH2047/ OLH2048/ OLH2049 Block Diagram

A functional block diagram is shown in Figure 1. Table 1 provides the OLH2047/OLH2048/OLH2049 absolute maximum ratings and Table 2 provides the electrical specifications.

Figures 2 through 4 illustrate typical performance characteristics of the OLH2047/OLH2048/OLH2049 optocouplers. Figure 5 shows the switching test circuit. Figure 6 provides the package dimensions.

Table 1. OLH2047/48/49 Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Coupled				
Input to output isolation voltage	V_{DC}	–2500	+2500	V
Storage temperature range	T_{STG}	–65	+150	°C
Operation temperature range	T_A	–55	+125	°C
Lead temperature 1.6 mm from the case for 10 seconds			+240	°C
Input Diode				
Average input current	I_{DD}		40	mA
Peak forward current	I_F		1	A
Reverse voltage	V_R		2	V
Power dissipation	P_D		70	mW
Output Detector				
Collector to emitter voltage	V_{CE}		40	V
Emitter to base voltage	V_{EB}		7	V
Collector to base voltage	V_{CB}		45	V
Continuous collector current			50	mA
Power dissipation (Note 1)	P_D		300	mW

Note 1: Derate linearly at 3.0 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. OLH2047/OLH2048/OLH2049 Electrical Specifications (Note 1)
(T_A = 25 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	OLH2047			OLH2048			OLH2049			Units
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
On-state collector current	$I_{C(ON)}$	I_F = 1 mA, V_{CE} = 5 V										
		I_F = 2 mA, V_{CE} = 5 V, T_A = –55 °C	0.5			1.0		5.0	2.0		10	mA
		I_F = 2 mA, V_{CE} = 5 V, T_A = +100 °C	0.7			1.4			2.8			mA
			0.5			1.0			2.0			mA
On-state collector base current	$I_{CCB(ON)}$	I_F = 10 mA, V_{CB} = 5 V	30			30		30				µA
Saturation voltage	V_{CE_SAT}	I_F = 2 mA, I_{CC} = 0.5 mA			0.3							V
		I_F = 2 mA, I_{CC} = 1.0 mA						0.3				V
		I_F = 2 mA, I_{CC} = 2.0 mA									0.3	V
Breakdown voltage:												
Collector to emitter	BV_{CEO}	I_{CE} = 1 mA	40			40			40			V
Emitter to collector	BV_{ECO}	I_{EC} = 100 µA	6			6			6			V
Off-state:												
Collector to emitter	$I_{CE(OFF)}$	V_{CE} = 20 V			100			100			100	nA
		V_{CE} = 20 V, T_A = 100 °C			100			100			100	µA
Input forward voltage	V_F	I_F = 10 mA, T_A = –55 °C	1.0		1.7	1.0		1.7	1.0		1.7	V
		I_F = 10 mA	0.8		1.5	0.8		1.5	0.8		1.5	V
		I_F = 10 mA, T_A = +100 °C	0.7		1.3	0.7		1.3	0.7		1.3	V
Input reverse current	I_R	V_R = 2 V			100			100			100	µA
Input to output resistance (Note 2)	R_{I_O}	V_{I_O} = ± 1000 V_{DC}	10^{11}			10^{11}			10^{11}			Ω
Input to output capacitance (Note 2)	C_{I_O}	V_{I_O} = 0 V, f = 1 MHz			5			5			5	pF
Rise time	t_R	V_{CC} = 10 V, R_L = 100 Ω		10	20		10	20		15	25	µs
Fall time	t_F	I_F = 5 mA		10	20		10	20		15	25	µs

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 here may result in permanent damage to the device.

Note 2: Measured between pins 1, 2, 3, and 4 shorted together, and pins 5, 6, 7, and 8 shorted together. T_A = 25 °C and duration = 1 second.

Typical Performance Characteristics

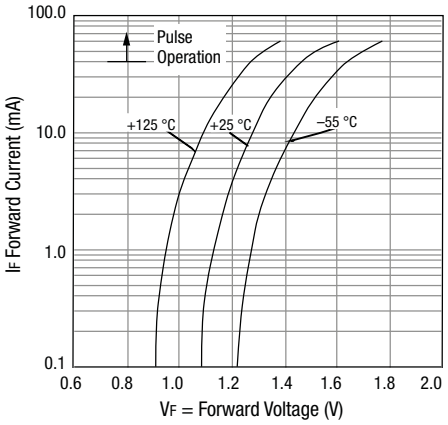

Figure 2. Forward Current vs Diode Forward Voltage

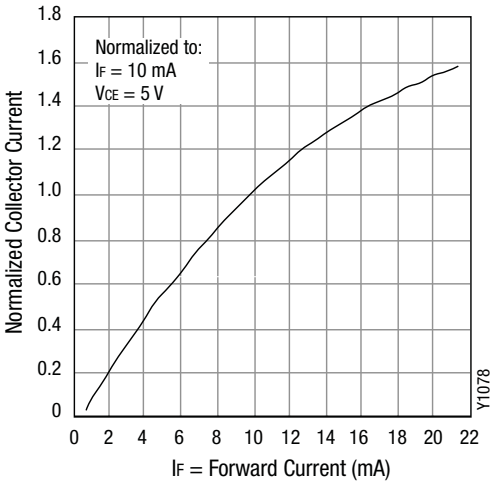

Figure 3. Normalized Collector Current vs Forward Current

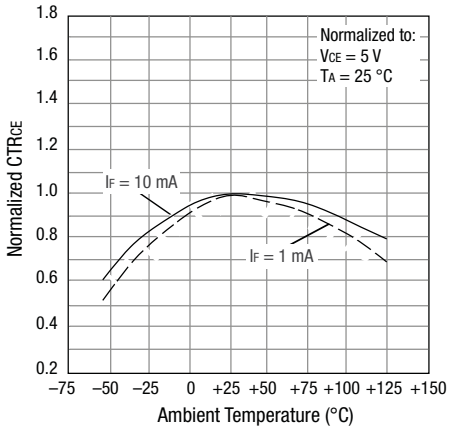

Figure 4. Normalized CTRCE vs Temperature

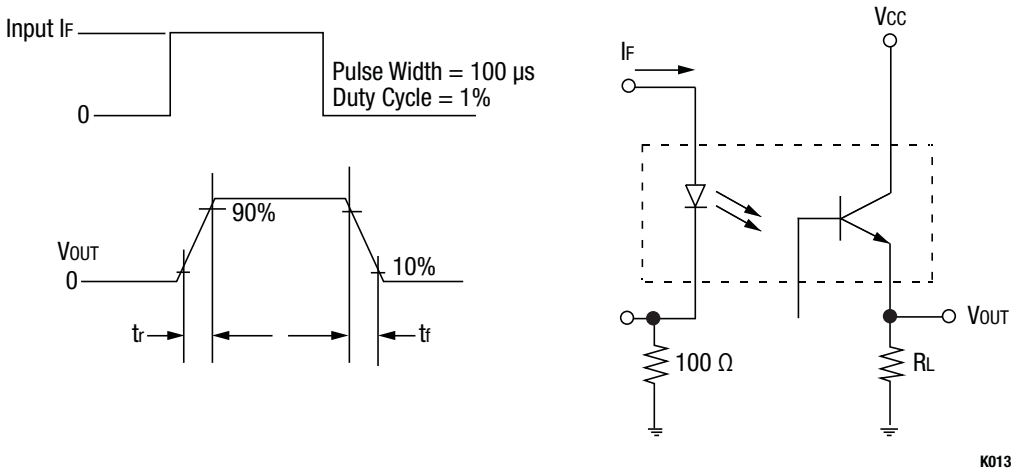

Figure 5. OLH2047/OLH2048/OLH2049 Switching Test Circuit

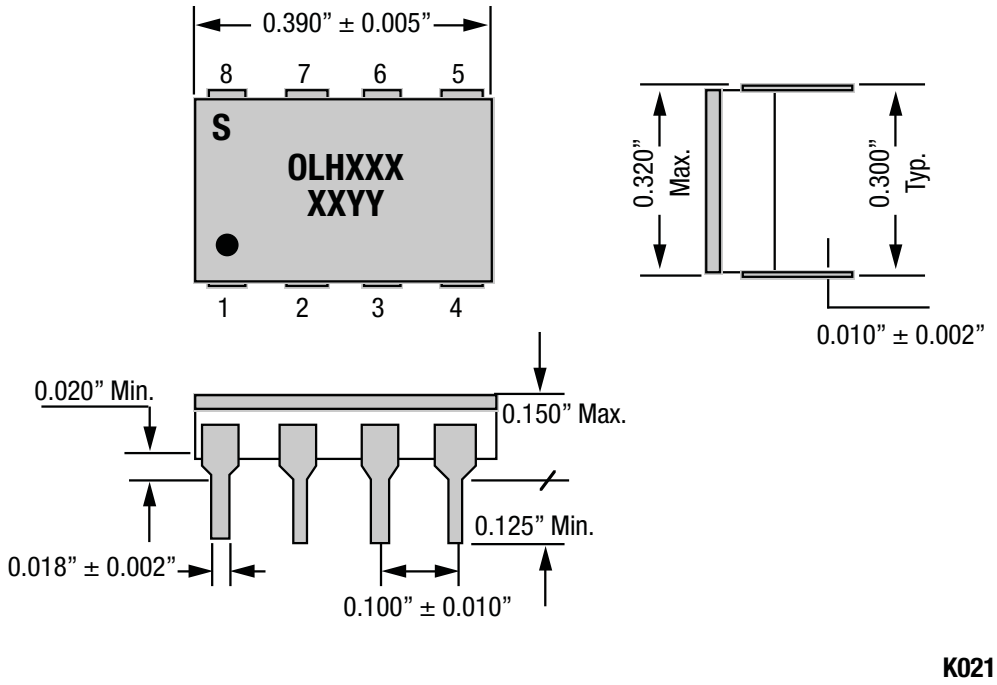

Figure 6. OLH2047/OLH2048/OLH2049 Package Dimensions

Ordering Information

Model Name	Manufacturing Part Number
OLH2047/OLH2048/OLH2049: Photo-Transistor Hermetic Optocouplers	OLH2047/OLH2048/OLH2049