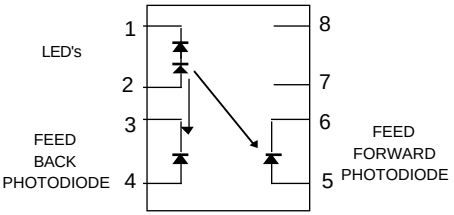
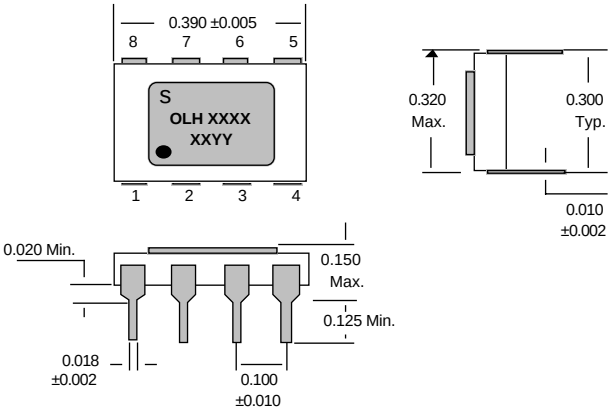
ISO LINK

OLH7000

Hermetic Linear Optocoupler



SCHEMATIC



PACKAGE OUTLINE

Features

- *High reliability and rugged hermetic construction*
- *Couples AC and DC signals*
- *1000 Vdc electrical isolation*
- *Matched photodiodes*
- *Excellent linearity and stability*

Description

The OLH7000 linear optocoupler consists of two LED in series coupled to two PIN photodiode detectors.

The photodiode on the input side acts as a feedback device permitting an external feedback loop to ensure constant LED light output. A similar matching photodiode on the output side is used to drive an output circuit that is electrically isolated from the input. A fixed relationship is thus maintained between input and output. This technique compensates for the LED's nonlinear, time and temperature characteristics.

Each OLH7000 is mounted and coupled in a hermetic 8-pin ceramic DIP providing 1000 Vdc electrical isolation between input and output.

NOTES:

1. Measured between pins 1, 2, 3, and 4 shorted together and pins 5, 6, 7, and 8 shorted together.

Absolute Maximum Ratings

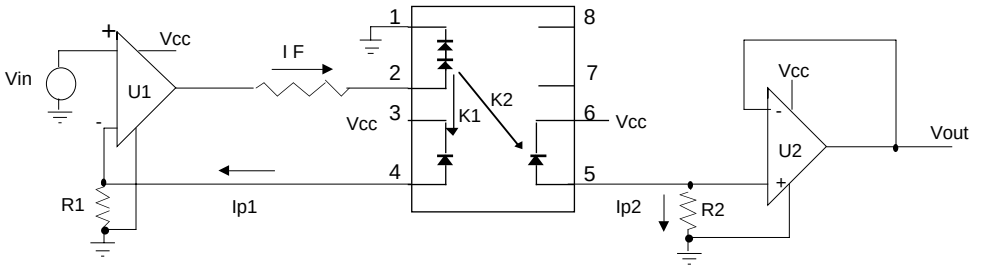
Coupled	
Input to Output Isolation Voltage	± 1000Vdc
Storage Temperature Range	-65°C to +150°C
Operation Temperature Range	-55°C to +125°C
Mounting Temperature Range (3 minutes max.)	240°C
Total Power Dissipation	250mW
Input Diode	
Average Input Current	60mA
Peak Forward Current (≤ 1mS duration)	100mA
Reverse Voltage	3.0V
Power Dissipation	100mW
Output Detector	
Reverse Voltage	30V
Forward voltage	.3V

ELECTRICAL CHARACTERISTIC (T_A = 25° C)

Parameter	Symbol	Min	Typ.	Max	Units	Test Conditions	Fig.	Note
LED Emitter								
Forward Voltage	VF		2.5	3.3	V	I_F = 10 mA		
ReverseVoltage	VR	5.0			V	I_R = 100µA		
Photodiode Detector								
Dark Current	ID		1	25	nA	V_R = 15 V, I_F = 0 mA		
Open Circuit Voltage	VOC		500		mV	I_F = 10 mA		
Junction Capacitance	CJ		12		pF	V_F = 0 v, f = 1Mhz		

ELECTRICAL CHARACTERISTIC (T_A = 25 °C)

Parameter	Symbol	Min	Typ.	Max	Units	Test Conditions	Fig.	Note
Coupled Characteristics								
K1, Servo Current Gain (I_{P1}/ I_F)	K1	.0035	.0050	.0065		I_F = 10 mA, V_{det} = -15 V		
Servo Current	I_{P1}		50		µA	I_F = 10 mA, V_{det} = -15 V		
K2, Forward Current Gain (I_{P2}/ I_F)	K2	.0035	.0050	.0065		I_F = 10 mA, V_{det} = -15 V		
Forward Current	I_{P2}		50		µA	I_F = 10 mA, V_{det} = -15 V		
K3, Transfer Gain (K2 / K1)	K3	0.75	1.00	1.25		I_F = 10 mA, V_{det} = -15 V		
Frequency Response (-3db)	BW		200		KHz	I_F = 10 mA ± 4 mA, R_L = 50Ω		
Phase Response@200KHz			- 45		Deg.	I_F = 10 mA ± 4 mA, R_L = 50Ω		
Rise Time Fall Time	t r t f		2 2		µS µS	I_F = 10 mA ± 4 mA, R_L = 50Ω I_F = 10 mA ± 4 mA, R_L = 50Ω		
Input-Output Capacitance	C_{I-O}		1.5		pF	f = 1 MHz		
Insulation Resistance	R_{I-O}		10		GΩ	V_{I-O} = 500 V_{DC}		
Withstand Test Voltage	WTV	1000			V_{DC}	RH ≤ 50%, I_{I-O} ≤ 1 µA, 1 sec.		



This typical application circuit uses an operational amplifier at the input side to drive the LEDs. The output photodiode is connected to a non-inverting voltage follower amplifier. The overall transfer gain, Vo / Vin, equals (K2 • R2) / (K1 • R1). Since (K2 / K1) = K3, the circuit gain becomes K3 (R2 / R1).