

DATA SHEET

OLS700: Hermetic Surface-Mount Isolinear Optocoupler

Features

- Electrical parameters guaranteed over -55°C to $+125^{\circ}\text{C}$ ambient temperature range
- 1000 V_{DC} electrical isolation
- High reliability and rugged construction
- Matched photodiodes
- Excellent linearity
- Offers 100% high reliability screenings

Description

The OLS700 optocoupler consists of one LED that is optically coupled to two matched photodiode detectors. Photodiode detectors are used for excellent linearity.

A fixed relationship is maintained between input and output:

- The photodiode on the input side acts as a feedback device that permits 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.

Each OLS700 is mounted and coupled in a custom hermetic surface-mount Leadless Chip Carrier (LCC) ceramic package, that provides 1000 V_{DC} electrical isolation between the input and output.

Device mounting is achieved with reflow soldering or conductive epoxies.

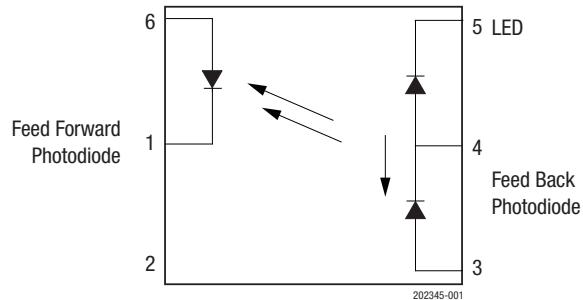


Figure 1. OLS700 Block Diagram

Figure 1 shows the OLS700 functional block diagram. Table 1 provides the OLS700 absolute maximum ratings. Table 2 provides the OLS700 electrical specifications. Figure 2 provides the OLS700 package dimensions.

Table 1. OLS700 Absolute Maximum Ratings¹

Parameter	Symbol	Minimum	Maximum	Units
Coupled				
Input to output isolation voltage	V _{DC}	-1000	+1000	V
Storage temperature range	T _{TG}	-65	+150	°C
Operating temperature range	T _A	-55	+125	°C
Mounting temperature range (3 minutes maximum)			+240	°C
Total power dissipation	P _D		+250	mW
Input Diode				
Average input current	I _{DD}		60	mA
Peak forward current (≤ 1 ms duration)	I _F		100	mA
Reverse voltage	V _R		3	V
Power dissipation	P _D		100	mW
Output Detector				
Reverse voltage	V _R		30	V
Forward voltage	V _F		0.3	V

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.

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. OLS700 Electrical Specifications¹
($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
LED emitter:						
Forward voltage	V_F	$I_F = 10.0 \text{ mA}$		1.3	1.6	V
Reverse current	I_R	$V_R = 3 \text{ V}$		10	10	μA
Photodiode detector:						
Dark current	I_D	$V_R = 15 \text{ V}, I_F = 0 \text{ mA}$		1	25	nA
Open circuit voltage	V_{OC}	$I_F = 10 \text{ mA}$		500	500	mV
Coupled characteristics:						
K1, servo current gain (IP1/IF)	K1	$I_F = 10.0 \text{ mA}, V_{DET} = -15.0 \text{ V}$	0.0020	0.0030	0.0060	
Servo current	IP1	$I_F = 10 \text{ mA}, V_{DET} = -15 \text{ V}$		30	30	μA
K2, forward current gain (IP2/IF)	K2	$I_F = 10.0 \text{ mA}, V_{DET} = -15.0 \text{ V}$	0.0020	0.0030	0.0060	
Forward current	IP2	$I_F = 10 \text{ mA}, V_{DET} = -15 \text{ V}$		30	30	μA
K3, transfer gain (K2/K1)	K3	$I_F = 10.0 \text{ mA}, V_{DET} = -15.0 \text{ V}$	0.75	1.0	1.25	
Frequency response (-3 dB)	Bw	$I_F = 10 \text{ mA} \pm 4 \text{ mA}, R_L = 50 \Omega$		200	200	kHz
Phase response @ 200 kHz	tr	$I_F = 10 \text{ mA} \pm 4 \text{ mA}, R_L = 50 \Omega$		-45	-45	$^\circ\text{C}$
Rise time	tf	$I_F = 10 \text{ mA} \pm 4 \text{ mA}, R_L = 50 \Omega$		2	2	μs
Fall time	C _{IO}	$I_F = 10 \text{ mA} \pm 4 \text{ mA}, R_L = 50 \Omega$		2	2	μs
Input-output capacitance	R _{IO}	$f = 1 \text{ MHz}$		1.5	1.5	pF
Insulation resistance	W _{TV}	$V_{IO} = 500 \text{ V}_{DC}$	1000	10	10	$\text{G}\Omega$
Withstand test voltage		$R_H \leq 50\%, I_{IO} \leq 1 \mu\text{A}, 1 \text{ s}$				V _{DC}

¹ Performance is guaranteed only under the conditions listed in the above table.

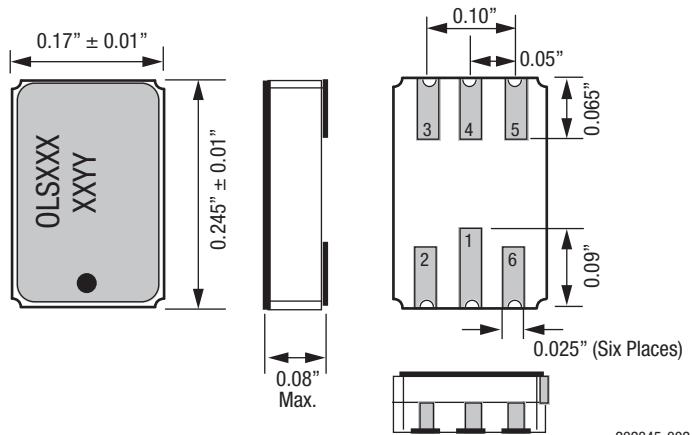


Figure 2. OLS700 Package Dimensions

Ordering Information

Model Name	Manufacturing Part Number
OLS700: Hermetic Surface-Mount Isolinar Optocoupler	OLS700

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