

DATA SHEET

# OLS600: Hermetic Surface Mount, High-Speed Schmitt Trigger Optocoupler

## Features

- Performance guaranteed over  $-55\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$  ambient temperature range
- Guaranteed minimum CMR transient immunity  $>1000\text{ V}/\mu\text{s}$  @  $300\text{ V}_{\text{CM}}$
- $1500\text{ V}_{\text{DC}}$  electrical isolation
- Microprocessor-compatible drive
- On/off threshold hysteresis
- Fast switching:  $t_r, t_f = 10\text{ ns}$  typical

## Description

The OLS600 has an LED and an integrated high-speed detector that are mounted and coupled in a six-pin Leadless Chip Carrier (LCC) package, which provides  $1500\text{ V}_{\text{DC}}$  electrical isolation between the input and output.

The light from the LED is collected by the photo-diode in the integrated detector. The integrated detector incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping and an open collector output. Typical propagation delay of this product is  $170\text{ ns}$ . The Common Mode Rejection (CMR) transient immunity is greater than  $1000\text{ V}/\mu\text{s}$ .

Device surface mounting is achieved with reflow soldering or conductive epoxies.

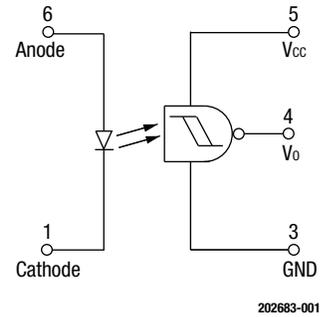


Figure 1. OLS600 Block Diagram

Figure 1 shows the OLS600 functional block diagram. Table 1 provides the OLS600 absolute maximum ratings. Table 2 provides the OLS600 electrical specifications.

Figures 2 and 3 illustrate the OLS600 typical performance characteristics. Figure 4 shows the OLS600 switching test circuit. Figure 5 provides the OLS600 package dimensions.

**Table 1. OLS600 Absolute Maximum Ratings <sup>1</sup>**

Parameter	Symbol	Minimum	Maximum	Units
<b><i>Coupled</i></b>				
Input to output isolation voltage <sup>2</sup>	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
Mounting temperature range (3 minutes maximum)			+240	°C
Total power dissipation	P <sub>D</sub>		+250	mW
<b><i>Input Diode</i></b>				
Average input current	I <sub>DD</sub>		20	mA
Reverse voltage	V <sub>R</sub>		5	V
Power dissipation	P <sub>D</sub>		40	mW
<b><i>Output Detector</i></b>				
Peak output current			40	mA
Supply voltage	V <sub>CC</sub>		18	V
Output voltage	V <sub>OUT</sub>		18	V

<sup>1</sup> 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.

<sup>2</sup> Measured between pins 1, 2 and 6 shorted together, and pins 3, 4, and 5 shorted together. T<sub>A</sub> = 25 °C and duration = 1 s.

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**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.

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**Table 2. OLS600 Electrical Specifications <sup>1</sup>**  
**(T<sub>A</sub> = -55 °C to +125 °C, Unless Otherwise Noted)**

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Threshold Current, ON	I <sub>F(ON)</sub>	V <sub>CC</sub> = 15 V, R <sub>L</sub> = 680 Ω			10	mA
Hysteresis ratio	I <sub>F(OFF)</sub> I <sub>F(ON)</sub>	V <sub>CC</sub> = 15.0 V, R <sub>L</sub> = 680.0 Ω		0.8		
Low level output voltage	V <sub>OL</sub>	V <sub>CC</sub> = 15.0 V, R <sub>L</sub> = 680.0 Ω, I <sub>F</sub> = 10.0 mA		0.3	0.5	V
High level output current	I <sub>OH</sub>	V <sub>CC</sub> = V <sub>O</sub> = 15 V, I <sub>F</sub> = 0 mA			250	μA
Supply current:						
High level	I <sub>CCH</sub>	V <sub>CC</sub> = 15 V, I <sub>F</sub> = 0 mA		9	15	mA
Low level	I <sub>CCL</sub>	V <sub>CC</sub> = 15 V, I <sub>F</sub> = 5 mA		9	16	mA
Input:						
Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10.0 mA		1.6	2.4	V
Reverse current	I <sub>R</sub>	V <sub>R</sub> = 3.0 V			10	μA
Output leakage current <sup>2</sup>	I <sub>L_O</sub>	R <sub>H</sub> ≤ 50%, T <sub>A</sub> = 25 °C, V <sub>L_O</sub> = 1500 V <sub>OC</sub>			1	μA
Propagation delay time:						
High to low	t <sub>PHL</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 15 V, R <sub>L</sub> = 680 Ω, T <sub>A</sub> = 25 °C			300	ns
Low to high	t <sub>PLH</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 15 V, R <sub>L</sub> = 680 Ω, T <sub>A</sub> = 25 °C			300	ns
Times:						
Fall	t <sub>f</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 15 V, R <sub>L</sub> = 680 Ω, T <sub>A</sub> = 25 °C		10		ns
Rise	t <sub>r</sub>	I <sub>F</sub> = 5 mA, V <sub>CC</sub> = 15 V, R <sub>L</sub> = 680 Ω, T <sub>A</sub> = 25 °C		10		ns
Common mode transient immunity:						
Logic high	CMH	I <sub>F</sub> = 0 mA, V <sub>CM</sub> = 300 V peak, R <sub>L</sub> = 680 Ω, V <sub>CC</sub> = 15 V, T <sub>A</sub> = 25 °C	1000	>10,000		V/μs
Logic low	CML	I <sub>F</sub> = 5 mA, V <sub>CM</sub> = 300 V peak, R <sub>L</sub> = 680 Ω, V <sub>CC</sub> = 15 V, T <sub>A</sub> = 25 °C	1000	>10,000		V/μs

<sup>1</sup> Performance is guaranteed only under the conditions listed in the above table.

<sup>2</sup> Measured between pins 1, 2, and 6 shorted together, and pins 3, 4, and 5 shorted together. T<sub>A</sub> = 25°C and duration = 1 s.

### Typical Performance Characteristics

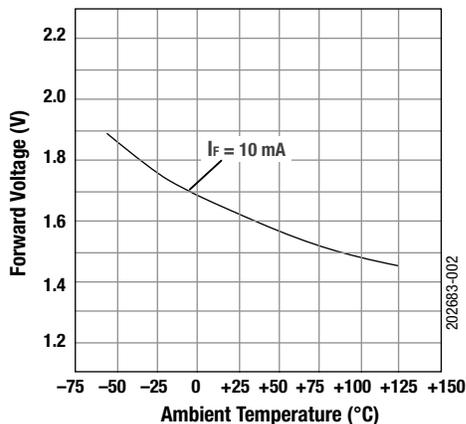


Figure 2. Forward Voltage vs Temperature

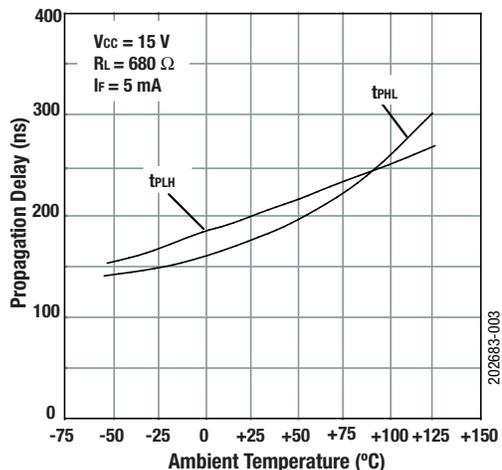


Figure 3. Propagation Delay vs Temperature

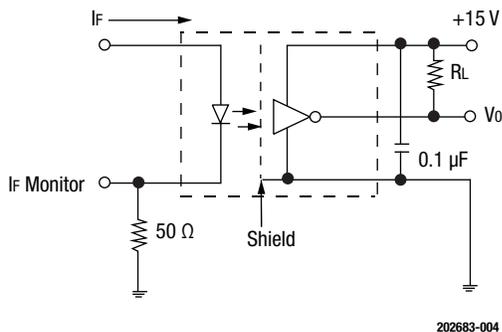
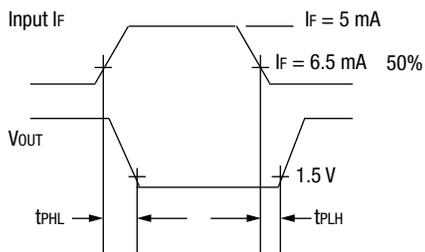


Figure 4. OLS600 Switching Test Circuit

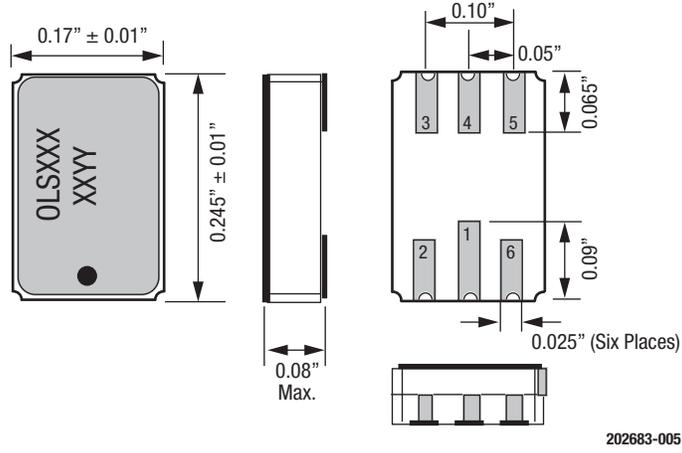


Figure 5. OLS600 Package Dimensions

## Ordering Information

Model Name	Manufacturing Part Number
OLS600: Miniature High-Speed Schmitt Trigger Optocoupler for Hybrid Assembly	OLS600

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