

DATA SHEET

OLF100: Phototransistor Hermetic Surface Mount Optocoupler

Features

- Hermetic SMT package
- Compliant surface mounting leads
- High current transfer ratio
- Small package size
- High reliability and rugged construction
- Offers 100% high reliability screenings

Description

The OLF100 consists of a LED that is optically coupled to an N-P-N silicon phototransistor mounted in an 8-pin hermetic surface mount flat-pack package. The leads can be formed to provide compliant solder connections to the mounting substrate. Special electrical parametric selections are available on request.

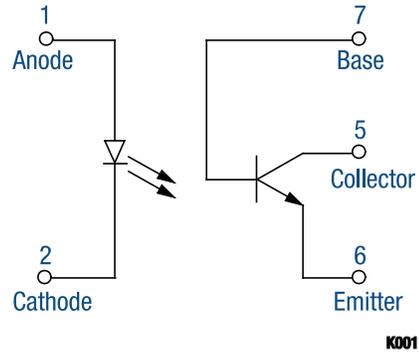


Figure 1. OLF100 Block Diagram

Figure 1 shows the OLF100 functional block diagram. Table 1 provides the OLF100 absolute maximum ratings. Table 2 provides the OLF100 electrical specifications.

Figures 2 through 5 illustrate the OLF100 typical performance characteristics. A typical switching test circuit is shown in Figure 6, and Figure 7 provides the OLF100 package dimensions.

Table 1. OLF100 Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Minimum	Maximum	Units
Coupled				
Input to output isolation voltage (Note 2)	V _{DC}		±1000	V
Storage temperature	T _{STG}	-65	+150	°C
Operating temperature	T _A	-55	+125	°C
Mounting temperature (10 seconds maximum)	T _{MTG}		+240	°C
Input Diode				
Average input current (Note 3)	I _{DD}		40	mA
Peak forward current (Note 4)	I _F		1	A
Reverse voltage	V _R		2	V
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 3)	P _D		300	mW

Note 1: Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to 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.

Note 3: Derate linearly to 125 °C free-air temperature at 0.67 mA/°C above 65 °C.

Note 4: For pulse width ≤ 1 μs, pulse repetition rate ≤ 300 pps.

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. OLF100 Electrical Specifications (Note 1)
($T_A = -55\text{ °C}$ to $+125\text{ °C}$, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Current transfer ratio (Note 2)	CTR	$I_F = 10\text{ mA}$, $V_{CE} = 5\text{ V}$	100	200		%
		$I_F = 1\text{ mA}$, $V_{CE} = 5\text{ V}$	100	200		%
Saturation voltage	V_{CE_SAT}	$I_F = 10\text{ mA}$, $I_C = 1\text{ mA}$		0.15	0.30	V
Breakdown voltage:						
Collector to emitter	BV_{CEO}	$I_{CE} = 100\text{ }\mu\text{A}$, $T_A = 25\text{ °C}$	30			V
Collector to base	BV_{CBO}	$I_{CB} = 10\text{ }\mu\text{A}$, $T_A = 25\text{ °C}$	70			V
Emitter to collector	BV_{ECO}	$I_{EC} = 100\text{ }\mu\text{A}$, $T_A = 25\text{ °C}$	5			V
Leakage current (collector to emitter)	I_{CEO}	$V_{CE} = 20\text{ V}$, $T_A = 25\text{ °C}$			100	nA
		$V_{CE} = 20\text{ V}$, $T_A = 100\text{ °C}$			100	μA
Input forward voltage	V_F	$I_F = 10\text{ mA}$	0.9	1.3	1.7	V
Input reverse current	I_R	$V_R = 3\text{ V}$			100	μA
Input to output leakage current (Note 3)	I_{I_O}	Relative humidity $\leq 50\%$, $T_A = 25\text{ °C}$, $V_{I_O} = 1000\text{ V}_{DC}$			1	μA
Turn-on time	T_{ON}	$V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$, $I_C = 2\text{ mA}$, $T_A = 25\text{ °C}$		5	15	μs
Turn-off time	T_{OFF}	$V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$, $I_C = 2\text{ mA}$, $T_A = 25\text{ °C}$		5	15	μs

Note 1: Performance is guaranteed only under the conditions listed in this table.

Note 2: CTR is defined as the ratio of output collector current (I_C) to the forward LED current (I_F) multiplied by 100%.

Note 3: Measured between pins 1 and 6 shorted together and pins 2, 3, 4, and 5 shorted together. $T_A = 25\text{ °C}$ and duration = 1 second.

Typical Performance Characteristics

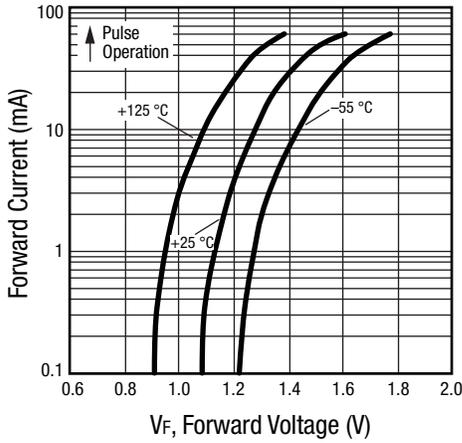


Figure 2. Diode Forward Characteristics

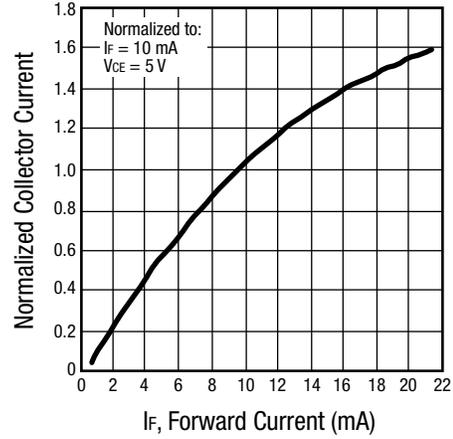


Figure 3. Normalized Collector Current vs. Forward Current

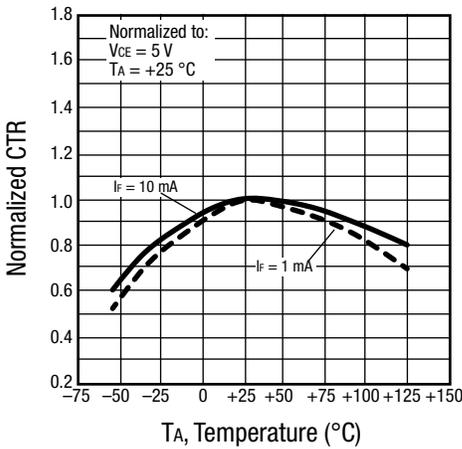


Figure 4. Normalized CTR vs Temperature

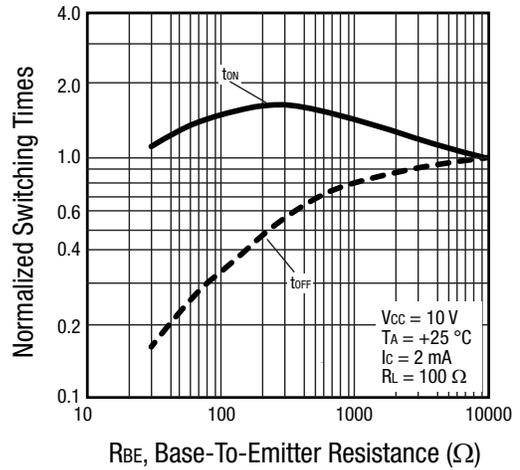


Figure 5. Switching Speed vs Base-to-Emitter Resistance

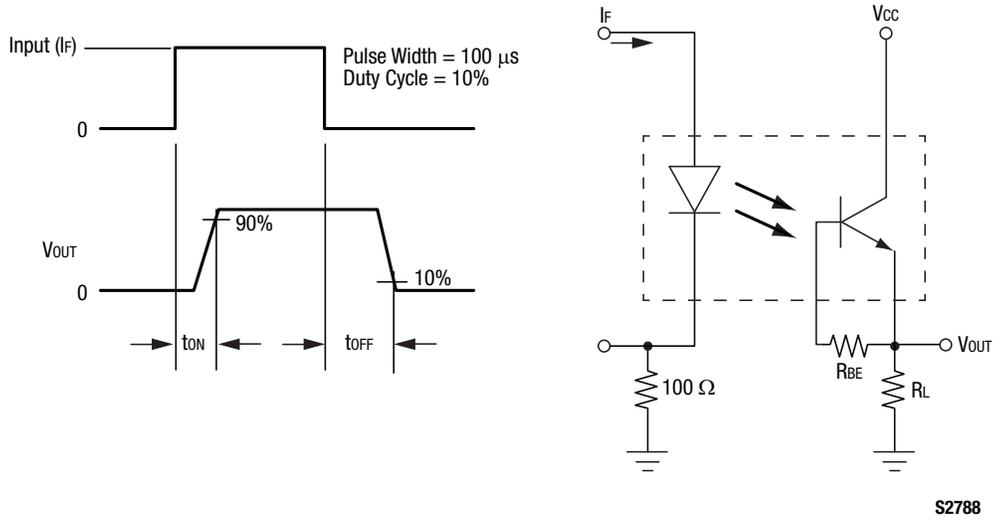


Figure 6. OLF100 Switching Test Circuit

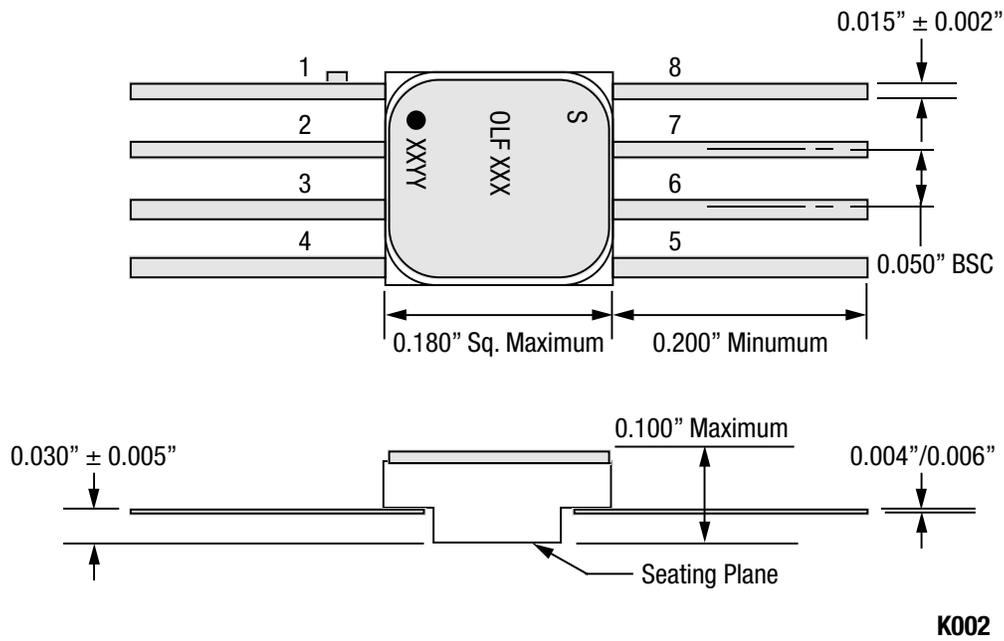


Figure 7. OLF100 Package Dimensions

Ordering Information

Model Name	Manufacturing Part Number
OLF100: Phototransistor Hermetic Surface Mount Optocoupler	OLF100

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