

## SINGLE CHANNEL IL766 DUAL CHANNEL ILD766 BIDIRECTIONAL INPUT DARLINGTON OPTOCOUPLERS

### FEATURES

- Internal  $R_{BE}$  for Better Stability
- High Current Transfer Ratios,  $V_{CE}=5\text{ V}$   
IL/ILD766-1: 500% at  $I_F=2\text{ mA}$   
IL/ILD766-2: 500% at  $I_F=1.0\text{ mA}$
- $BV_{CEO} > 60\text{ V}$
- AC or Polarity Insensitive Inputs
- Built-In Reverse Polarity Input Protection
- Industry Standard DIP Package
- Underwriters Lab File #E52744

### DESCRIPTION

The IL/ILD766 are bidirectional input optically coupled isolators. They consist of two Gallium Arsenide infrared emitting diodes coupled to a silicon NPN photodarlington per channel.

The IL766 are single channel optocouplers. The ILD766 has two isolated channels in a single DIP package. They are designed for applications requiring detection or monitoring of AC signals.

### Maximum Ratings

#### Emitter (Each Channel)

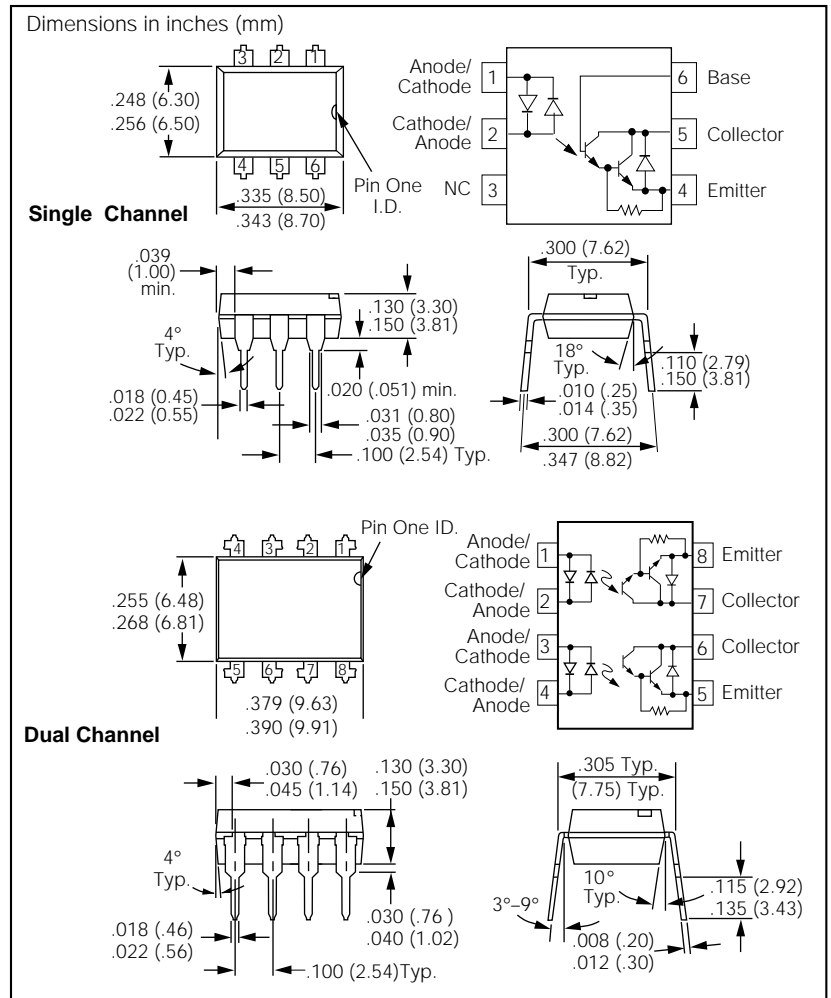
Continuous Forward Current	60 mA
Power Dissipation at 25°C	
Single Channel	200 mW
Dual Channel	90 mW
Derate Linearly from 25°C	
Single Channel	2.6 mW/°C
Dual Channel	1.2 mW/°C

#### Detector (Each Channel)

Collector-Emitter Breakdown Voltage	60 V
Collector-Base Breakdown Voltage	70 V
Power Dissipation at 25°C	100 mW
Derate Linearly from 25°C	1.33 mW/°C

### Package

Isolation Test Voltage ( $t = 1\text{ sec.}$ )	7500 VAC <sub>PK</sub> /5300 VAC <sub>RMS</sub>
Isolation Resistance	
$T_A=25^\circ\text{C}$	$\geq 10^{12}\ \Omega$
$T_A=100^\circ\text{C}$	$\geq 10^{11}\ \Omega$
Total Power Dissipation at 25°C Ambient (LED Plus Detector)	
Single Channel	250 mW
Dual Channel	400 mW
Derate Linearly from 25°C	
Single Channel	3.3 mW/°C
Dual Channel	5.3 mW/°C
Creepage	7 mm min.
Clearance	7 mm min.
Comparative Tracking Index per DIN IEC 112/VDE303, part 1	175
Storage Temperature	-55°C to +150°C
Operating Temperature	-55°C to +100°C
Lead Soldering Time at 260°C	10 sec.



### Electrical Characteristics ( $T_A=25^\circ\text{C}$ )

	Sym	Min	Typ	Max.	Unit	Condition
<b>Emitter</b>						
Forward Voltage	$V_F$		1.2	1.5	V	$I_F=\pm 10\text{ mA}$
<b>Detector</b>						
Breakdown Voltage, Collector-Emitter	$BV_{CEO}$	60	75		V	$I_C=1\text{ mA}$
Collector-Base	$BV_{CBO}$	60	90		V	$I_C=10\ \mu\text{A}$
Leakage Current, Collector-Emitter	$I_{CEO}$		10	100	nA	$V_{CE}=10\text{ V}$
<b>Package</b>						
Saturation Voltage, Collector-Emitter	$V_{CEsat}$			1.0	V	$I_F=\pm 10\text{ mA}$ , $I_C=10\text{ mA}$
DC Current Transfer Ratio	CTR				%	$I_F=\pm 2\text{ mA}$ , $V_{CE}=5\text{ V}$
IL766/ILD766-1		500			%	$I_F=\pm 1.0\text{ mA}$ , $V_{CE}=5\text{ V}$
IL766-2		500			%	
Rise Time, Fall Time			100		$\mu\text{s}$	$V_{CC}=10\text{ V}$ , $I_F=\pm 2\text{ mA}$ , $R_L=100\ \Omega$

Figure 1. Input characteristics

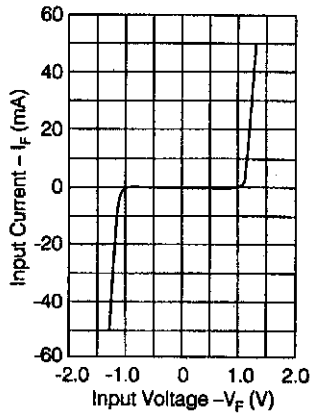


Figure 4.  $I_{CEO}$  at  $V_{CE}=10\text{ V}$  versus temperature

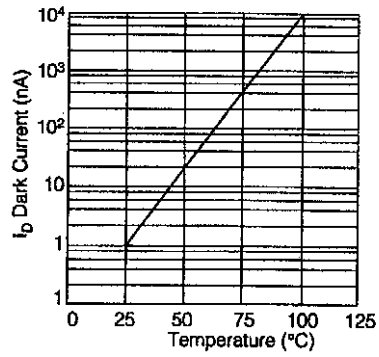


Figure 2. Transistor current versus voltage

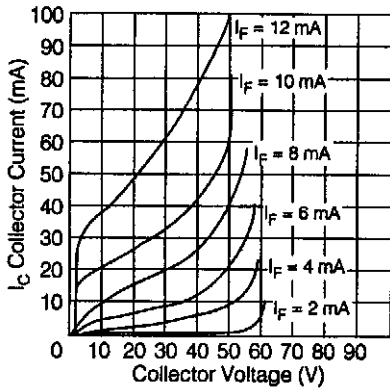


Figure 5.  $T_r$  versus forward current

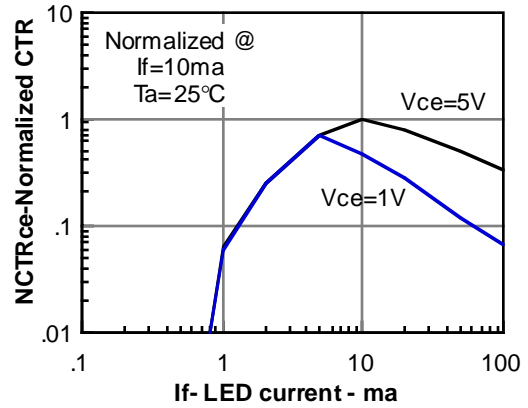


Figure 3. Transistor output current versus voltage

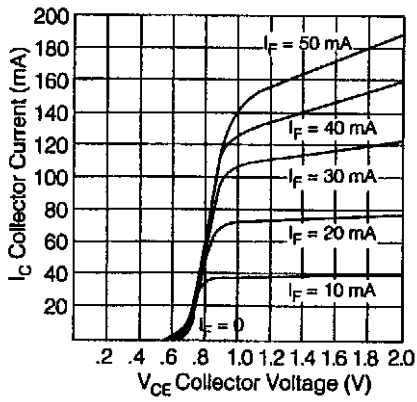
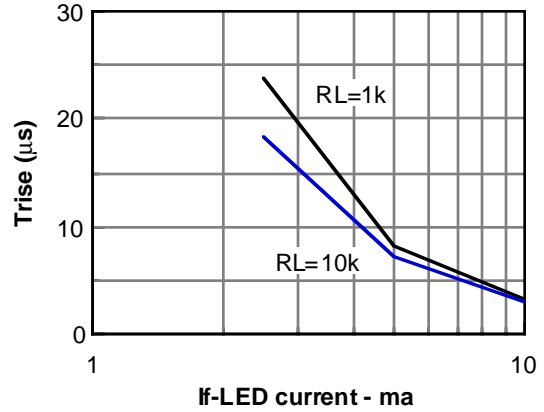
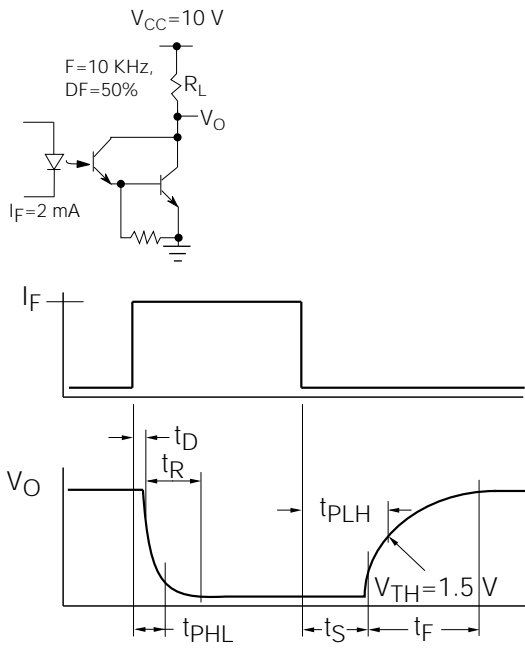


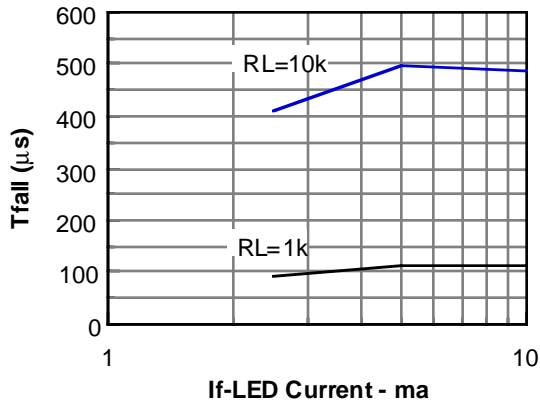
Figure 6. Normalized CTR versus forward current



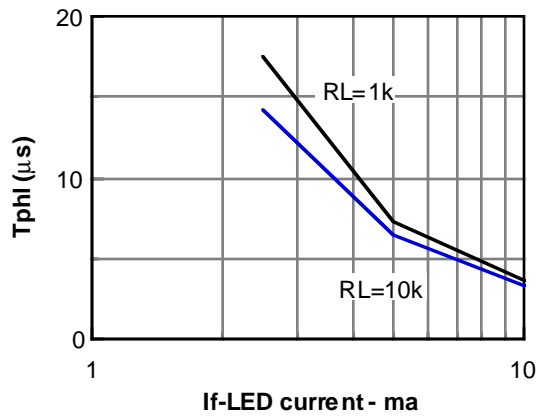
**Figure 7. Saturated switching characteristics measurements—schematic and waveform**



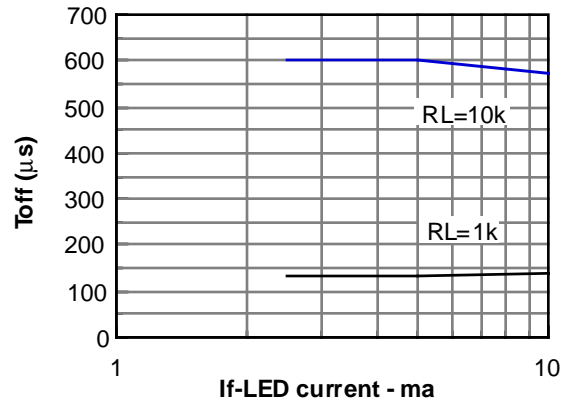
**Figure 8. Tfall versus forward current**



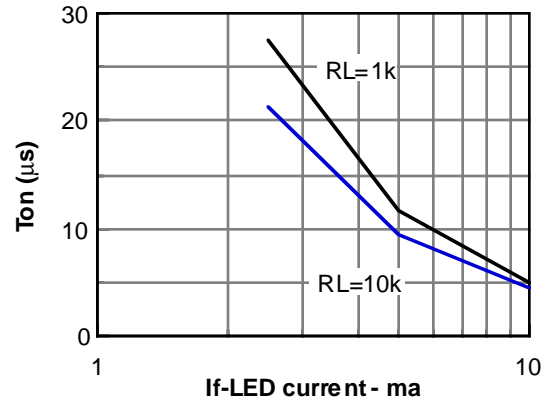
**Figure 9. Ton versus forward current**



**Figure 10. Toff versus forward current**



**Figure 11. Tphl versus forward current**



**Figure 12. Tplh versus forward current**

