

# SINGLE CHANNEL IL766 DUAL CHANNEL ILD766

## Bidirectional Input Darlington Optocoupler

### FEATURES

- Internal  $R_{BE}$  for Better Stability
- High Current Transfer Ratios,  $V_{CE}=5.0\text{ V}$   
IL/ILD766-1: 500% at  $I_F=2.0\text{ mA}$   
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)

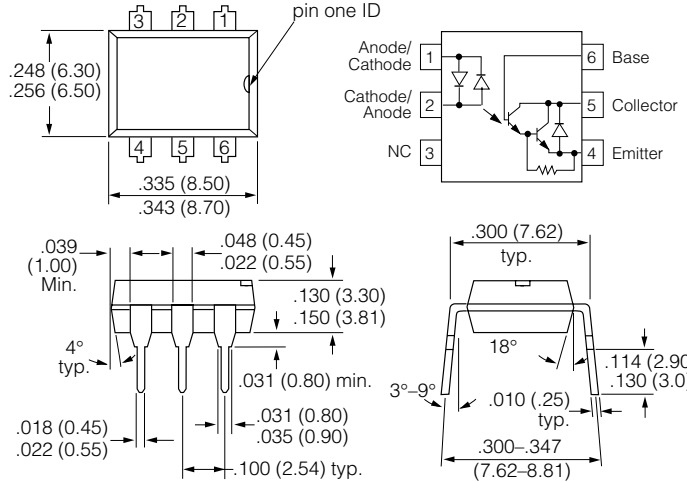
Collector-Emitter Breakdown Voltage .....	60 V
Collector-Base Breakdown Voltage .....	70 V
Power Dissipation at 25°C .....	100 mW
Derate Linearly from 25°C .....	1.33 mW/°C

### Package

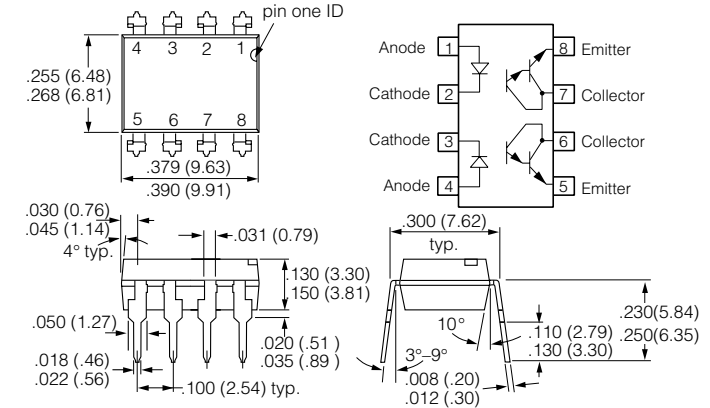
Isolation Test Voltage ( $t=1.0\text{ sec.}$ ) .....	5300 $V_{RMS}$
Isolation Resistance	
$T_A=25^\circ\text{C}$ .....	$\geq 10^{12}\ \Omega$
$T_A=100^\circ\text{C}$ .....	$\geq 10^{11}\ \Omega$
Total Power Dissipation at $T_A=25^\circ\text{C}$ (LED Plus Detector)	
Single Channel.....	250 mW
Dual Channel.....	400 mW
Derate Linearly from 25°C	
Single Channel.....	3.3 mW/°C
Dual Channel.....	5.3 mW/°C
Creepage .....	$\geq 7.0\text{ mm}$
Clearance .....	$\geq 7.0\text{ mm}$
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.

Dimensions in inches (mm)

#### Single Channel



#### Dual Channel



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

Parameter	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	$I_C=1.0\text{ mA}$
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 IL766/ILD766-1	CTR	500	—	—	%	$V_{CE}=5.0\text{ V}$ $I_F=\pm 2.0\text{ mA}$
IL766-2		500	—	—	%	$I_F=\pm 1.0\text{ mA}$
Rise Time, Fall Time	—	—	100	—	$\mu\text{s}$	$V_{CC}=10\text{ V}$ $I_F=\pm 2.0\text{ mA}$ $R_L=100\ \Omega$

Figure 1. Input characteristics

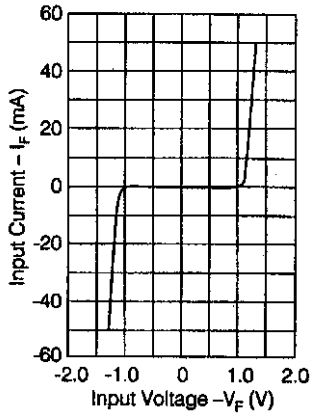


Figure 2. Transistor current versus voltage

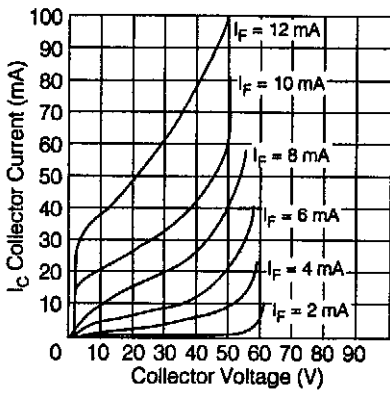


Figure 3. Transistor output current versus voltage

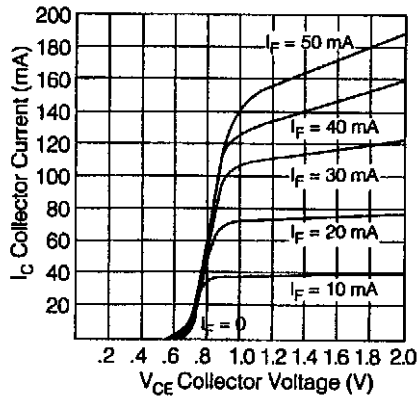


Figure 4.  $I_{CEO}$  at  $V_{CE}=10$  V versus temperature

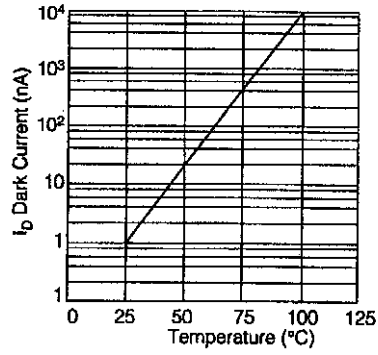


Figure 5. Normalized CTR versus forward current

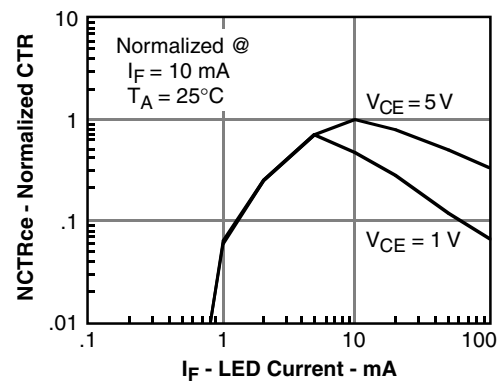
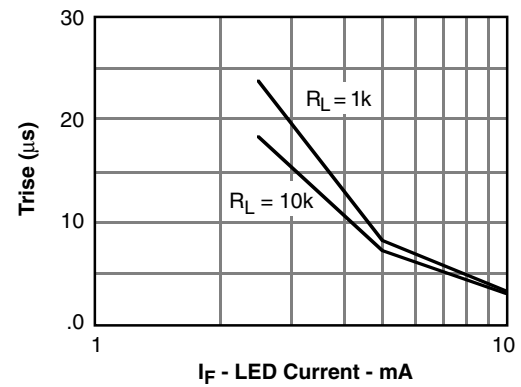
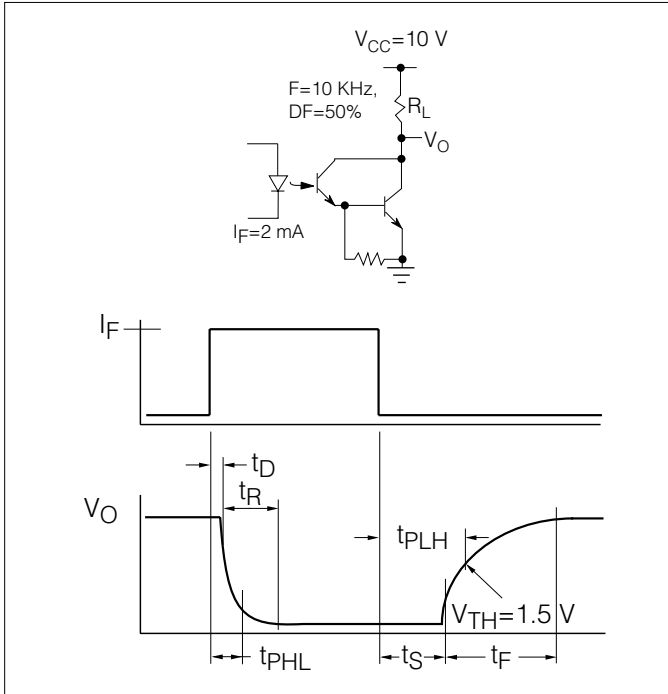


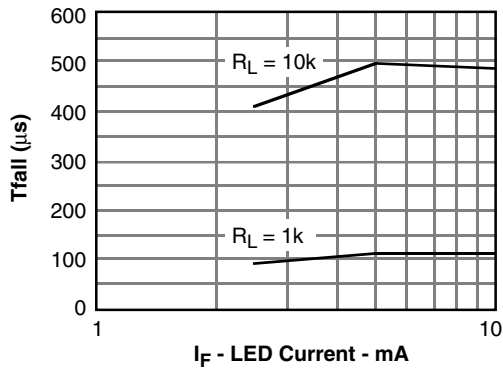
Figure 6.  $t_r$  versus forward current



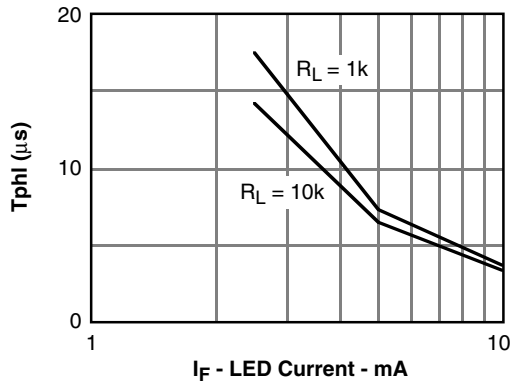
**Figure 7. Saturated switching characteristics measurements—schematic and waveform**



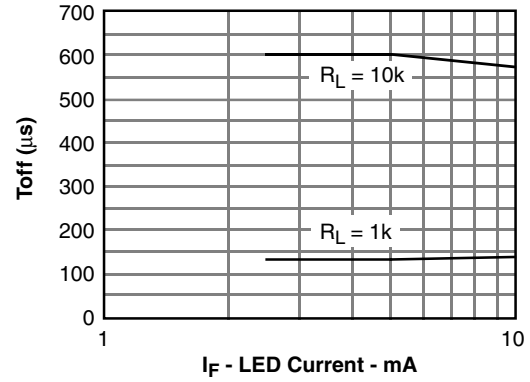
**Figure 8.  $t_{fall}$  versus forward current**



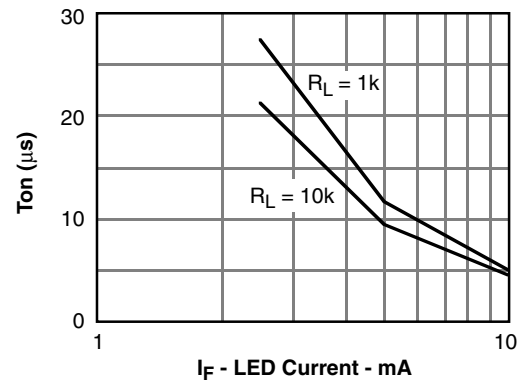
**Figure 9.  $t_{on}$  versus forward current**



**Figure 10.  $t_{off}$  versus forward current**



**Figure 11.  $t_{phl}$  versus forward current**



**Figure 12.  $t_{plh}$  versus forward current**

