

BIDIRECTIONAL INPUT DARLINGTON OPTOCOUPLEDERS

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 $I_F=1.0\text{ mA}$
- $BV_{CEO} > 80\text{ V}$
- 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_{PK}/5300 VAC_{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 25°C Ambient

(LED Plus Detector) 250 mW

Single 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

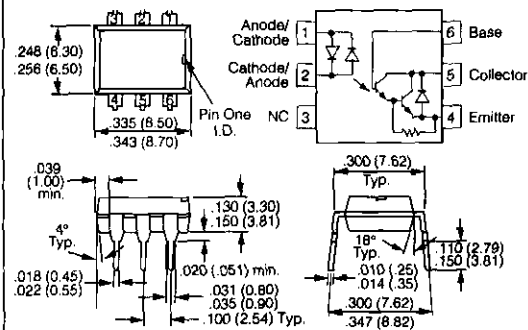
Storage Temperature -55°C to +150°C

Operating Temperature -55°C to +100°C

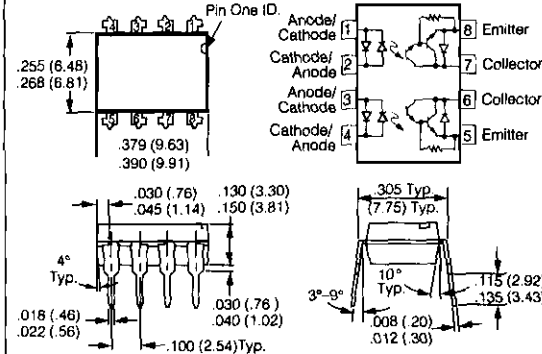
Lead Soldering Time at 260°C 10 sec.

Package Dimensions in Inches (mm)

Single Channel



Dual Channel



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

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F		1.2	1.5	V	$I_F=\pm 10\text{ mA}$
Detector						
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	$V_{CE}=10\text{ V}$
Package						
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			%	$I_F=\pm 2\text{ mA}$, $V_{CE}=5\text{ V}$
IL766-2		500			%	$I_F=\pm 1.0\text{ mA}$, $V_{CE}=5\text{ V}$
Rise Time, Fall Time			100		μs	$V_{CC}=10\text{ V}$, $I_F=\pm 2\text{ mA}$, $R_L=100\ \Omega$

Optocouplers
(Isolators)

Figure 1. Input characteristics

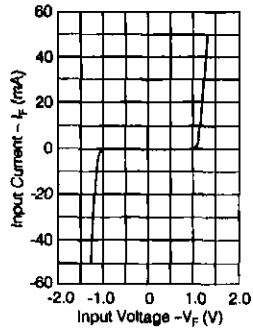


Figure 2. Transistor current versus voltage

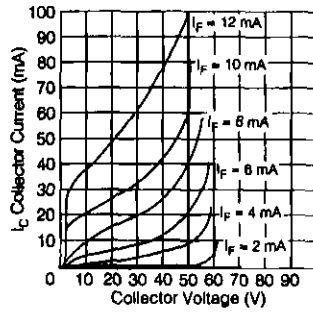


Figure 3. Transistor output current versus voltage

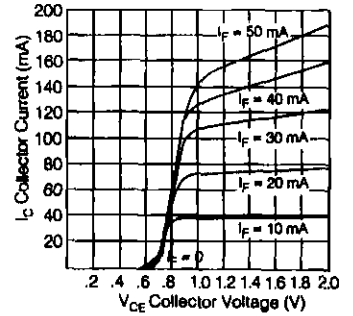


Figure 4. I_{C50} at $V_{CE}=10$ V versus temperature

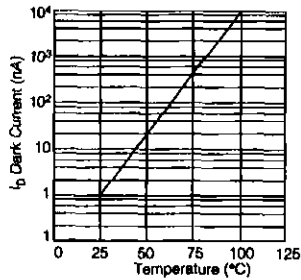


Figure 5. Normalized CTR versus forward current

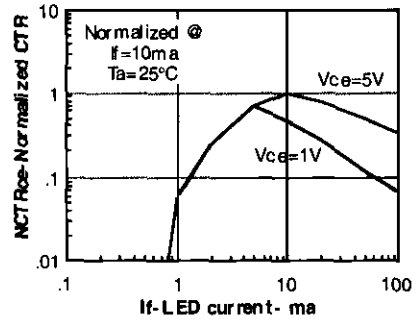


Figure 6. T_r versus forward current

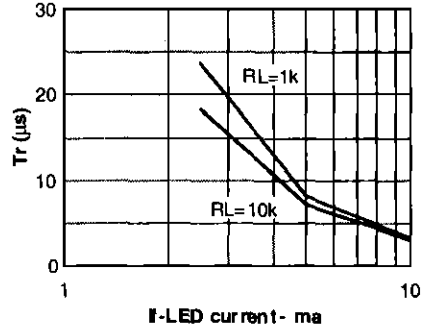


Figure 7. Saturated switching characteristics measurements—schematic and waveform

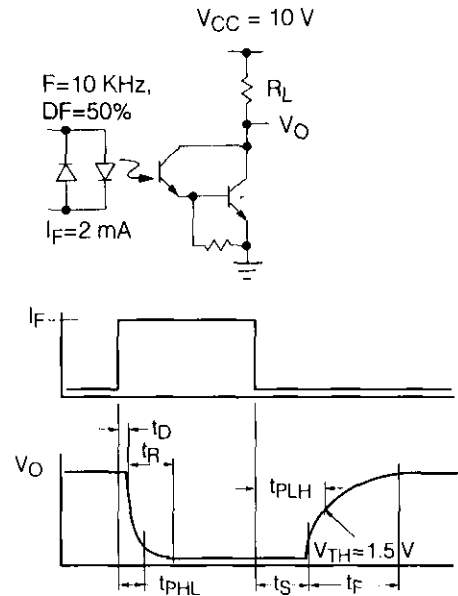


Figure 8. Tfall versus forward current

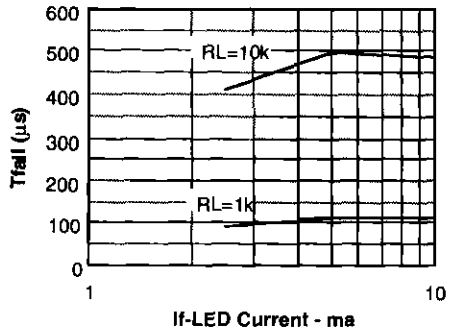


Figure 9. Ton versus forward current

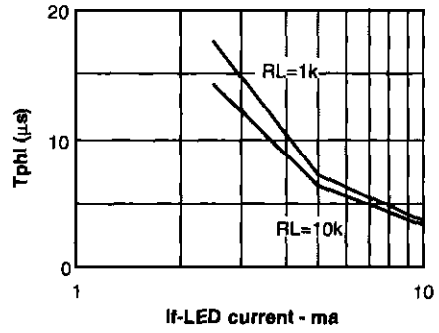


Figure 10. Toff versus forward current

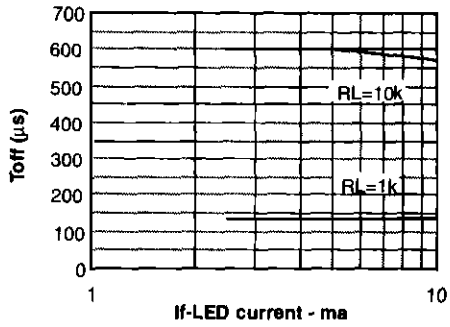


Figure 11. Tphl versus forward current

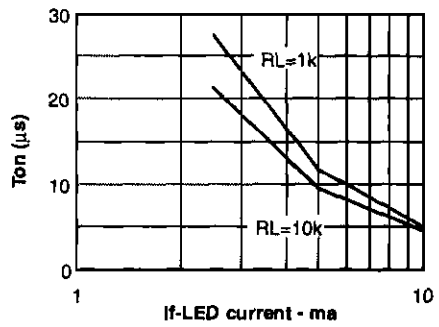


Figure 12. Tplh versus forward current

