SIEMENS

SINGLE CHANNEL IL766
DUAL CHANNEL ILD766
BIDIRECTIONAL INPUT DARLINGTON OPTOCOUPLERS

FEATURES

- **Internal R_{BE} for Better Stability**
- **High Current Transfer Ratios, V_{CE}=5 V**
  IL/ILD766-1: 500% at I_F=2 mA
  IL/ILD766-2: 500% at I_F=1.0 mA
- **BV_{CEO} >60 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

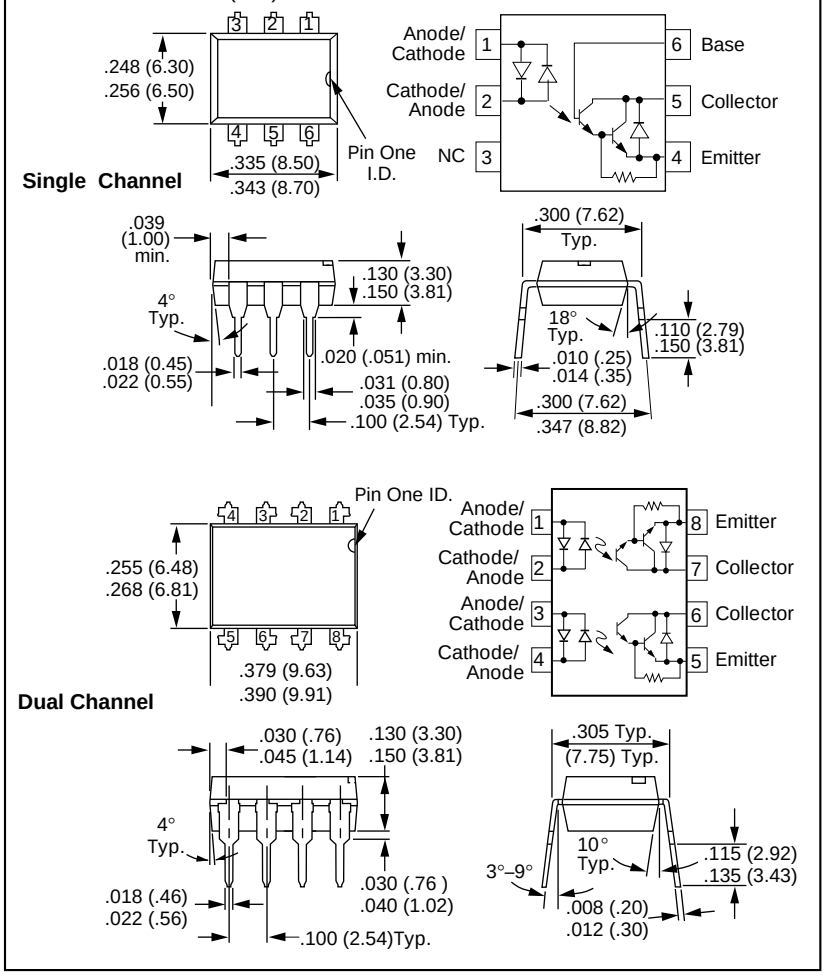
Detector (Each Channel)

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 sec.) ..... 7500 VAC_{PK}/5300 VAC_{RMS}
Isolation Resistance
  T_A=25°C ..... $\geq 10^{12}$ Ω
  T_A=100°C ..... $\geq 10^{11}$ Ω
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.

Dimensions in inches (mm)



Electrical Characteristics (T_A=25°C)

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

Figure 1. Input characteristics

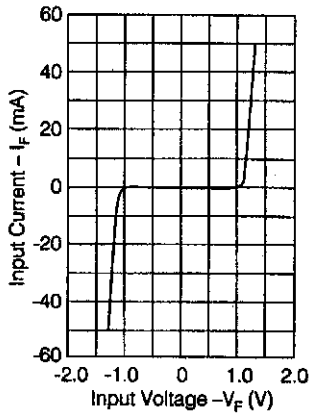


Figure 2. Transistor current versus voltage

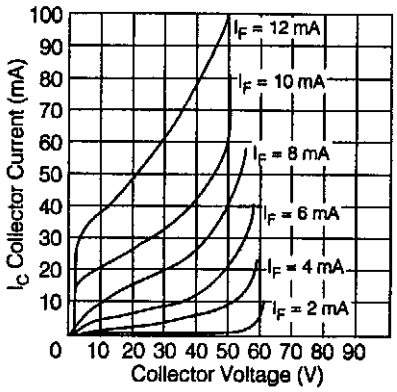


Figure 3. Transistor output current versus voltage

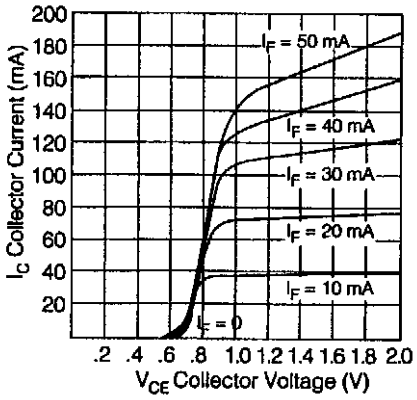


Figure 4. I_{CEO} at V_{CE}=10 V versus temperature

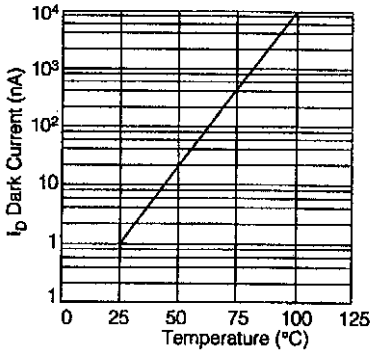


Figure 5. Tr versus forward current

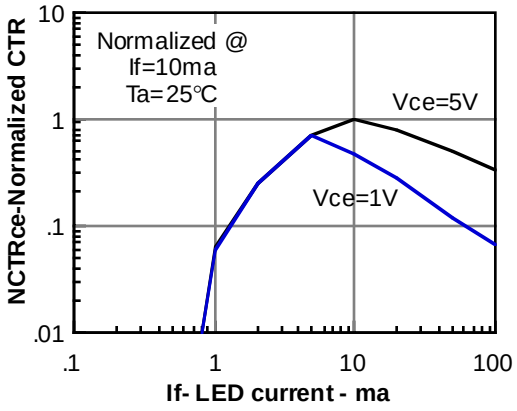


Figure 6. Normalized CTR versus forward current

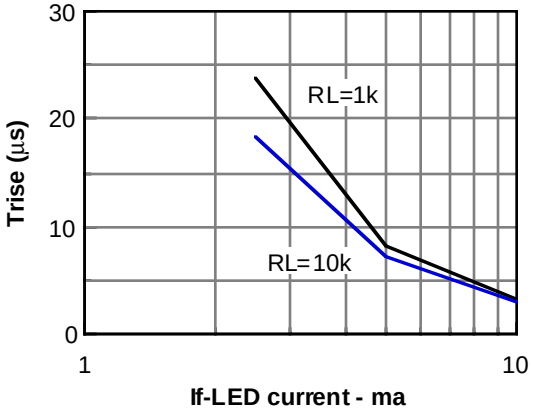


Figure 7. Saturated switching characteristics measurements–schematic and waveform

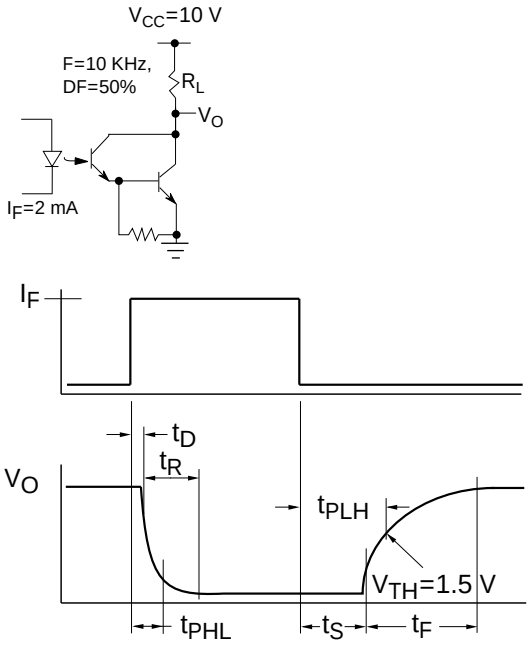


Figure 8. Tfall versus forward current

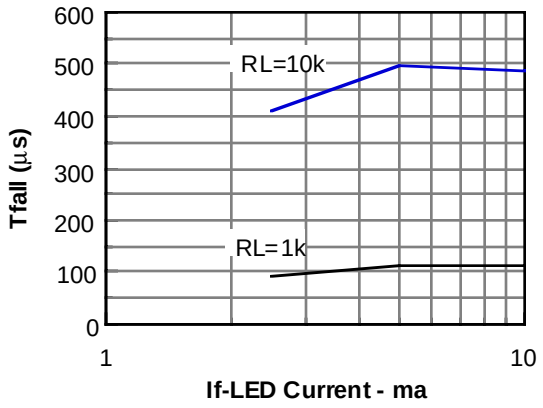


Figure 9. Ton versus forward current

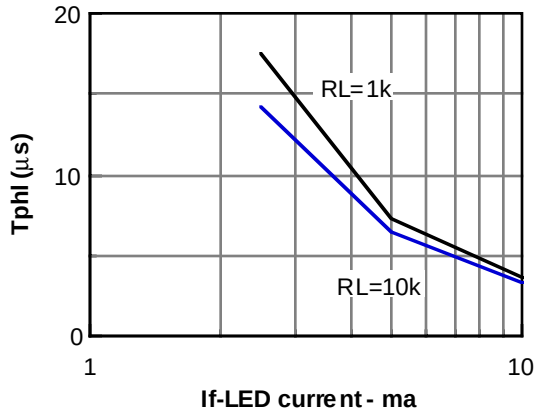


Figure 10. Toff versus forward current

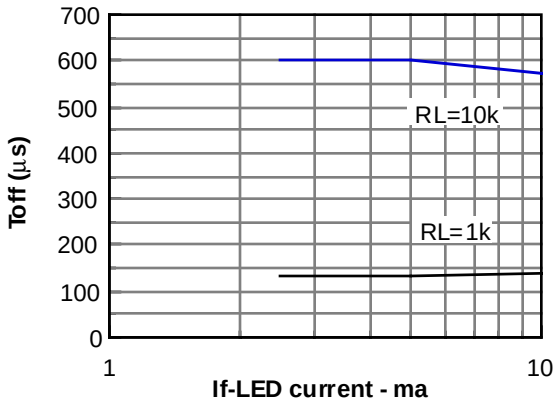


Figure 11. Tphl versus forward current

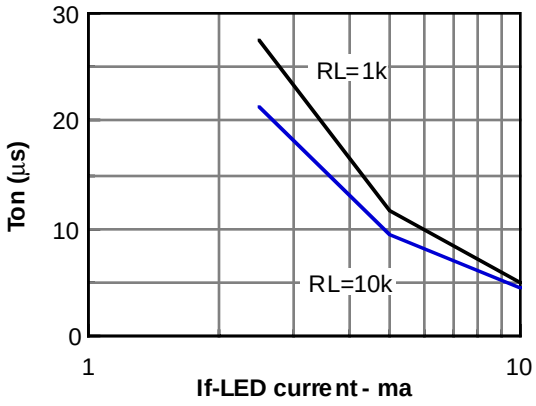


Figure 12. Tplh versus forward current