

## SINGLE CHANNEL IL755 DUAL CHANNEL ILD755 BIDIRECTIONAL INPUT DARLINGTON OPTOCOUPLER

### FEATURES

- High Current Transfer Ratios,  $V_{CE}=5\text{ V}$   
IL/ILD755-1: 750% at  $I_F=2\text{ mA}$
- IL/ILD755-2: 1000% at  $I_F=1\text{ mA}$   
 $BV_{CEO} > 60\text{ V}$
- AC or Polarity Insensitive Inputs
- Built-In Reverse Polarity Input Protection
- Industry Standard DIP Package
- Underwriters Lab File #E52744
- VDE #0884 Available with Option 1

### DESCRIPTION

The IL/ILD755 are bidirectional input optically coupled isolators. They consist of two Gallium Arsenide infrared emitting diodes coupled to a silicon NPN photodarlington per channel.

The IL755 are single channel Darlington optocouplers. The ILD755 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 ..... 100 mW  
Derate Linearly from 25°C ..... 1.33 mW/°C

#### Detector (Each Channel)

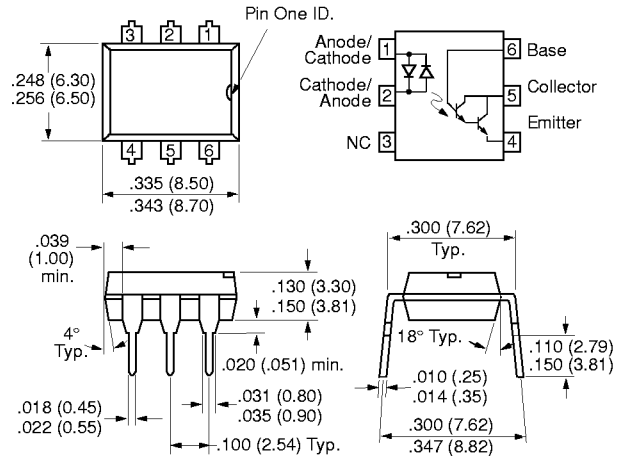
Collector-Emitter Breakdown Voltage ..... 60 V  
Collector-Base Breakdown Voltage ..... 60 V  
Power Dissipation at 25°C  
IL755 ..... 200 mW  
ILD755 ..... 150 mW  
Derate Linearly from 25°C  
ILD755 ..... 2.6 mW/°C  
ILD755-2 ..... 2.6 mW/°C

### Package

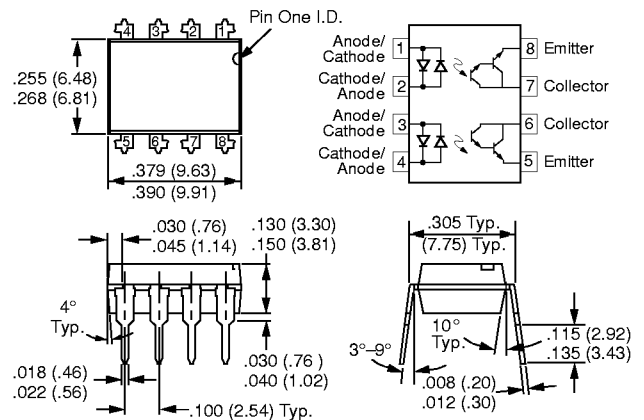
Isolation Test Voltage (PK)  
( $t=1\text{ sec.}$ ) ..... 7500 VAC<sub>PK</sub>/5300 VAC<sub>RMS</sub>  
Total Power Dissipation at 25°C Ambient  
(LED Plus Detector)  
IL755 ..... 250 mW  
ILD755 ..... 400 mW  
Derate Linearly from 25°C  
IL755 ..... 3.3 mW/°C  
ILD755 ..... 5.3 mW/°C  
Creepage ..... 7 mm min.  
Clearance ..... 7 mm min.  
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 ( $T_A=25^\circ\text{C}$ )

	Symbol	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>						
	$BV_{CEO}$	60	75		V	$I_C=1\text{ mA}$
	$BV_{CBO}$	60	90		V	$I_C=10\text{ }\mu\text{A}$
	$I_{CEO}$		10	100	nA	$V_{CE}=10\text{ V}$
<b>Package</b>						
	$V_{CEsat}$			1.0		$I_F=\pm 10\text{ mA}$ , $I_C=10\text{ mA}$
DC Current Transfer Ratio	CTR				%	$I_F=\pm 2\text{ mA}$ , $V_{CE}=5\text{ V}$
IL755/ILD755-1		750			%	$I_F=\pm 1\text{ mA}$ , $V_{CE}=5\text{ V}$
IL755/ILD755-2		1000			%	
Rise Time/Fall Time					$\mu\text{s}$	$V_{CC}=10\text{ V}$ , $R_L=100\text{ }\Omega$ , $I_F=2\text{ mA}$
IL/ILD755-1			50		$\mu\text{s}$	
Rise Time/Fall Time					$\mu\text{s}$	$V_{CC}=10\text{ V}$ , $R_L=100\text{ }\Omega$ , $I_F=1\text{ mA}$
IL/ILD755-2			70		$\mu\text{s}$	

Figure 1. LED forward current versus forward voltage

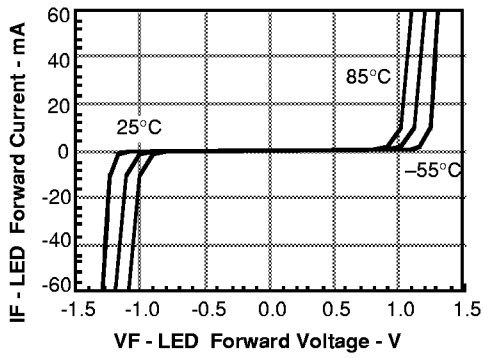


Figure 2. Normalized non-saturated and saturated  $CTR_{ce}$  versus LED current

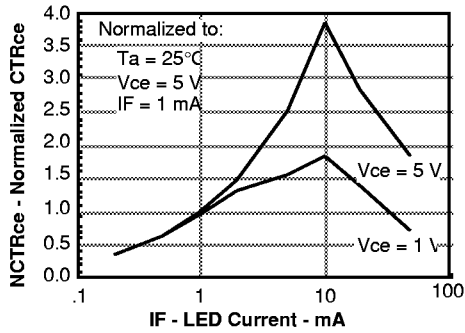


Figure 3. Normalized non-saturated and saturated  $CTR_{ce}$  versus LED current

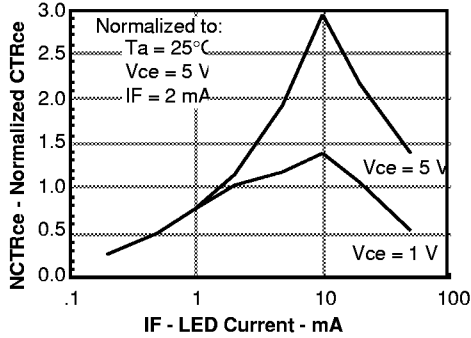


Figure 4. Normalized non-saturated and saturated  $I_{ce}$  versus LED current

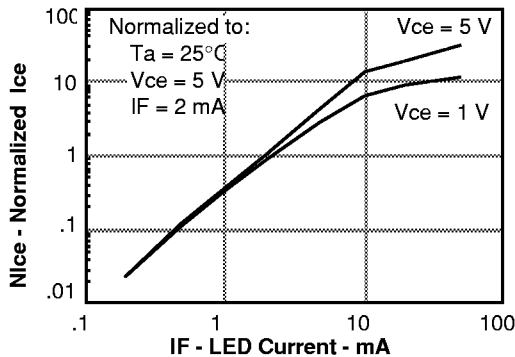


Figure 5. Normalized non-saturated and saturated collector-emitter current versus LED current

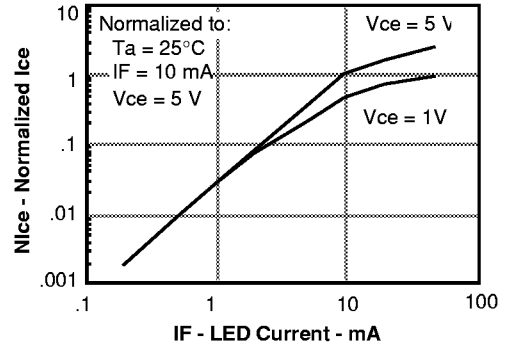


Figure 6. Non-saturated and saturated HFE versus base current

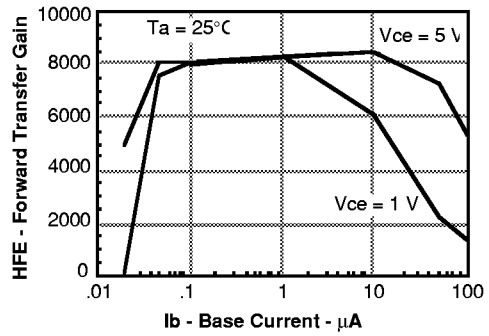


Figure 7. Low to high propagation delay versus collector load resistance and LED current

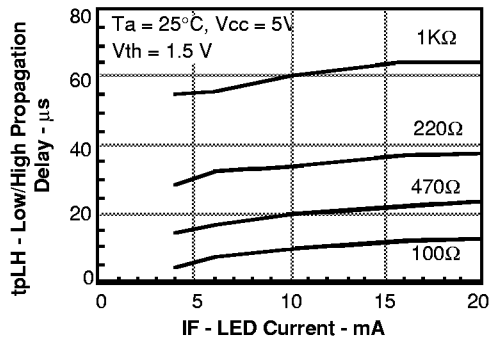


Figure 8. High to low propagation delay versus collector load resistance and LED current

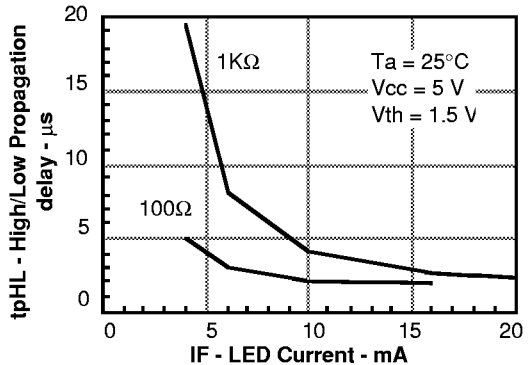


Figure 9. Switching waveform

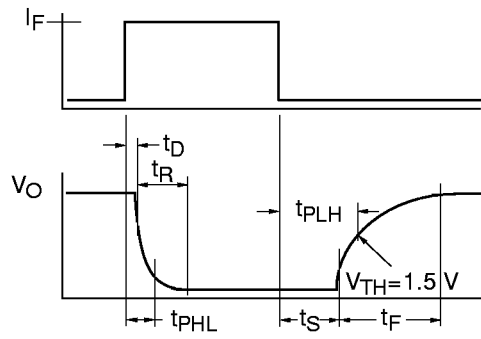


Figure 10. Normalized non-saturated and saturated  $CTR_{ce}$  versus LED currenth

