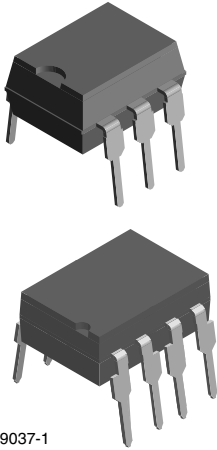
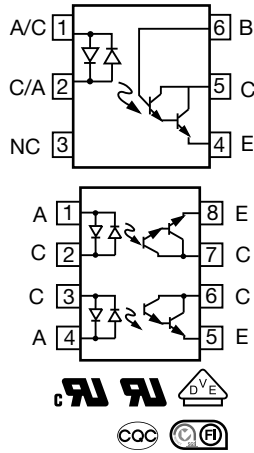




# Optocoupler, Photodarlington Output, AC Input, High Gain (Single, Dual Channel)



i179037-1



## FEATURES

- AC or polarity insensitive inputs
- Built-in reverse polarity input protection
- Industry standard DIP package
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

## APPLICATIONS

- Designed for applications requiring detection or monitoring of AC signals

## AGENCY APPROVALS

- [UL 1577](#)
- [cUL](#)
- DIN EN 60747-5-5 (VDE 0884-5), available with option 1 for:
  - [IL755](#)
  - [ILD755](#)
- [CQC GB8898](#)
- [CQC GB4943.1](#)
- [BSI](#)

## LINKS TO ADDITIONAL RESOURCES



## DESCRIPTION

The IL755, 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 is single channel Darlington optocoupler. The ILD755 has two isolated channels in a single DIP package.

ORDERING INFORMATION				
I	L	x	7	5
PART NUMBER				
-	#	X	0	#
CTR BIN		PACKAGE OPTION		T
Tape and Reel				
		DIP-#	Option 7	
		7.62 mm	> 0.7 mm	
AGENCY CERTIFIED / PACKAGE	CTR (%)			
	SINGLE CHANNEL, 6 PIN		DUAL CHANNEL, 8 PIN	
	± 2 mA	± 1 mA	± 2 mA	± 1 mA
<b>UL, cUL, BSI, CQC</b>	≥ 750	≥ 1000	≥ 750	≥ 1000
DIP-#	IL755-1	IL755-2	ILD755-1	ILD755-2
SMD-#, option 7	IL755-1X007	IL755-2X007T	-	ILD755-2X007T
<b>UL, cUL, BSI, CQC, VDE (option 1)</b>	≥ 750	≥ 1000	≥ 750	≥ 1000
DIP-#	IL755-1X001	-	-	-
SMD-#, option 7	-	-	ILD755-1X017	-

### Note

- Additional options may be possible, please contact sales office



<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)					
PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
<b>INPUT</b>					
Forward continuous current			$I_F$	60	mA
Power dissipation			$P_{diss}$	100	mW
Derate linearly from 25°C				1.33	mW/°C
<b>OUTPUT</b>					
Collector emitter breakdown voltage			$BV_{CEO}$	60	V
Collector base breakdown voltage			$BV_{CBO}$	60	V
Power dissipation		IL755-1	$P_{diss}$	200	mW
		IL755-2		200	mW
		ILD755-1		150	mW
		ILD755-2		150	mW
Derate linearly from 25°C		IL755-1		2.6	mW/°C
		IL755-2		2.6	mW/°C
		ILD755-1		2.0	mW/°C
		ILD755-2		2.0	mW/°C
<b>COUPLER</b>					
Total power dissipation		IL755-1	$P_{tot}$	250	mW
		IL755-2		250	mW
		ILD755-1		400	mW
		ILD755-2		400	mW
Derate linearly from 25 °C		IL755-1		3.0	mW/°C
		IL755-2		3.0	mW/°C
		ILD755-1		3.0	mW/°C
		ILD755-2		3.0	mW/°C
Storage temperature			$T_{stg}$	-55 to +150	°C
Operating temperature			$T_{amb}$	-55 to +100	°C
Lead soldering time at 260 °C				10	s

**Note**

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>						
Forward voltage	$I_F = \pm 10\text{ mA}$	$V_F$		1.2	1.5	V
<b>OUTPUT</b>						
Collector emitter breakdown voltage	$I_C = 1.0\text{ mA}$	$BV_{CEO}$	60	75		V
Collector base breakdown voltage	$I_C = 10\text{ }\mu\text{A}$	$BV_{CBO}$	60	90		V
Collector emitter leakage current	$V_{CE} = 10\text{ V}, I_F = 0\text{ A}$	$I_{CEO}$		10	100	nA
<b>COUPLER</b>						
Collector emitter saturation voltage	$I_C = 10\text{ mA}, I_F = \pm 10\text{ mA}$	$V_{CEsat}$			1	V

**Note**

- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.



<b>CURRENT TRANSFER RATIO</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	$I_F = \pm 2\text{ mA}$ , $V_{CE} = 5.0\text{ V}$	IL755-1	CTR	750	-	-	%
	$I_F = \pm 2\text{ mA}$ , $V_{CE} = 5.0\text{ V}$	ILD755-1	CTR	750	-	-	%
	$I_F = \pm 1\text{ mA}$ , $V_{CE} = 5.0\text{ V}$	IL755-2	CTR	1000	-	-	%
	$I_F = \pm 1\text{ mA}$ , $V_{CE} = 5.0\text{ V}$	ILD755-2	CTR	1000	-	-	%

<b>SWITCHING CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Rise time	$V_{CC} = 10\text{ V}$ , $I_F = \pm 2\text{ mA}$ , $R_L = 100\text{ }\Omega$	IL755-1	$t_r$	-	50	-	$\mu\text{s}$
		ILD755-1	$t_r$	-	50	-	$\mu\text{s}$
Fall time	$V_{CC} = 10\text{ V}$ , $I_F = \pm 2\text{ mA}$ , $R_L = 100\text{ }\Omega$	IL755-1	$t_f$	-	50	-	$\mu\text{s}$
		ILD755-1	$t_f$	-	50	-	$\mu\text{s}$
Rise time	$V_{CC} = 10\text{ V}$ , $I_F = \pm 1\text{ mA}$ , $R_L = 100\text{ }\Omega$	IL755-2	$t_r$	-	70	-	$\mu\text{s}$
		ILD755-2	$t_r$	-	70	-	$\mu\text{s}$
Fall time	$V_{CC} = 10\text{ V}$ , $I_F = \pm 1\text{ mA}$ , $R_L = 100\text{ }\Omega$	IL755-2	$t_f$	-	70	-	$\mu\text{s}$
		ILD755-2	$t_f$	-	70	-	$\mu\text{s}$

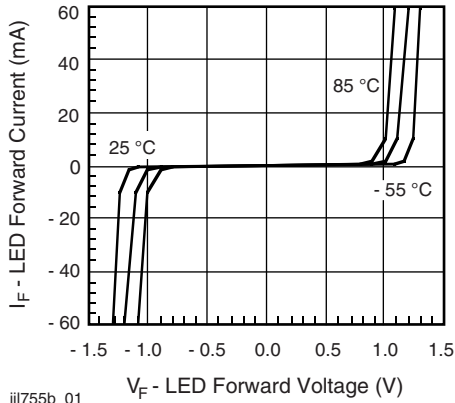
<b>SAFETY AND INSULATION RATINGS</b>				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Climatic classification	According to IEC 68 part 1		55 / 100 / 21	
Comparative tracking index		CTI	175	
Maximum rated withstanding isolation voltage	$t = 1\text{ min}$	$V_{ISO}$	4420	$V_{RMS}$
Maximum transient isolation voltage		$V_{IOTM}$	10 000	$V_{peak}$
Maximum repetitive peak isolation voltage		$V_{IORM}$	890	$V_{peak}$
Isolation resistance	$V_{IO} = 500\text{ V}$ , $T_{amb} = 25\text{ }^{\circ}\text{C}$	$R_{IO}$	$\geq 10^{12}$	$\Omega$
	$V_{IO} = 500\text{ V}$ , $T_{amb} = 100\text{ }^{\circ}\text{C}$	$R_{IO}$	$\geq 10^{11}$	$\Omega$
Output safety power		$P_{SO}$	400	mW
Input safety current		$I_{SI}$	275	mA
Safety temperature		$T_S$	175	$^{\circ}\text{C}$
Creepage distance			$\geq 7$	mm
Clearance distance			$\geq 7$	mm
Insulation thickness		DTI	$\geq 0.4$	mm

**Note**

- As per IEC 60747-5-5, § 7.4.3.8.2, this optocoupler is suitable for "safe electrical insulation" only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

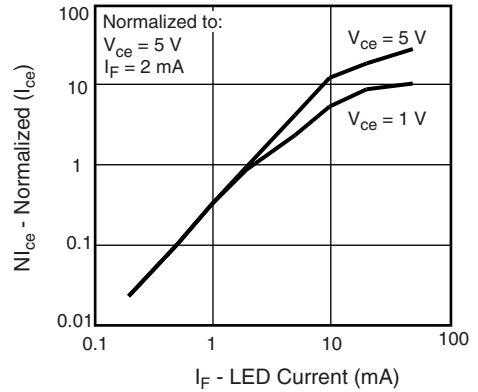


**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)



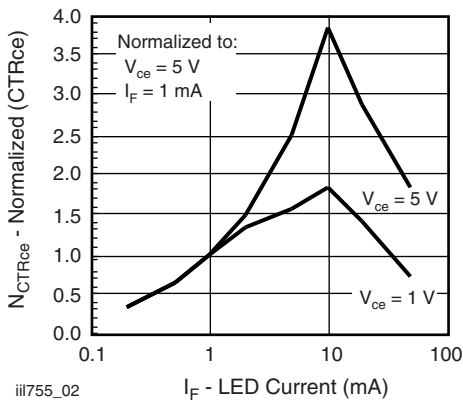
iii755b\_01

Fig. 1 - LED Forward Current vs. Forward Voltage



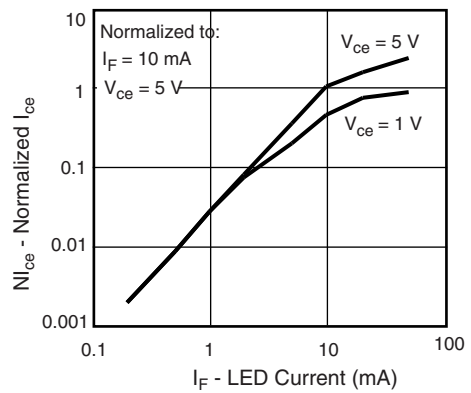
iii755\_04

Fig. 4 - Normalized Non-Saturated and Saturated  $I_{CE}$  vs. LED Current



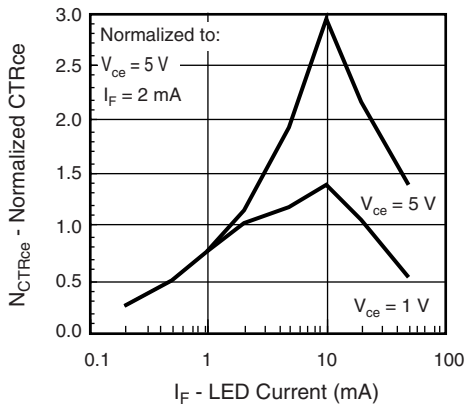
iii755\_02

Fig. 2 - Normalized Non-Saturated and Saturated  $CTR_{CE}$  vs. LED Current



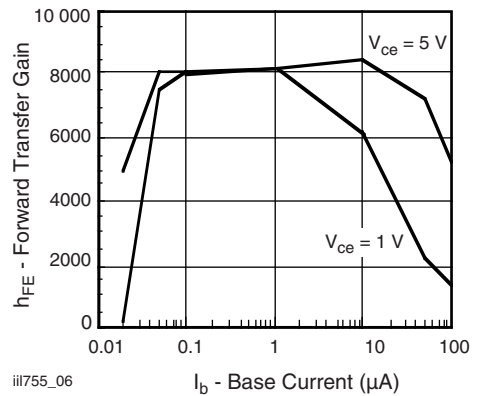
iii755\_05

Fig. 5 - Normalized Non-Saturated and Saturated Collector-Emitter Current vs. LED Current



iii755\_03

Fig. 3 - Normalized Non-Saturated and Saturated  $CTR_{CE}$  vs. LED Current



iii755\_06

Fig. 6 - Non-Saturated and Saturated  $h_{FE}$  vs. Base Current

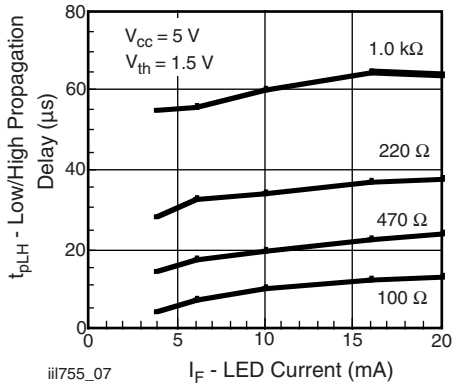


Fig. 7 - Low to High Propagation Delay vs. Collector Load Resistance and LED Current

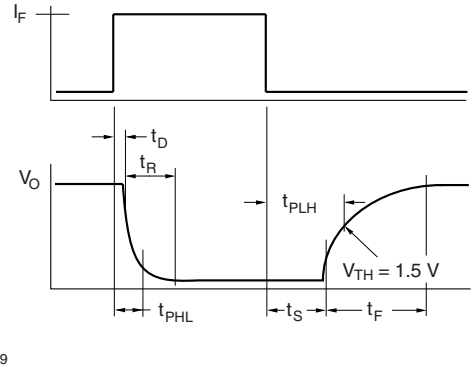


Fig. 9 - Switching Waveform

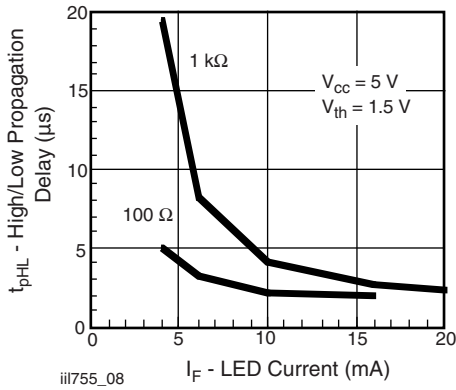


Fig. 8 - High to Low Propagation Delay vs. Collector Load Resistance and LED Current

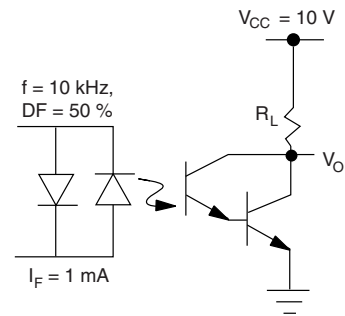
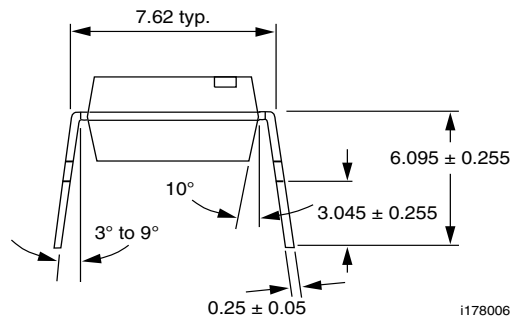
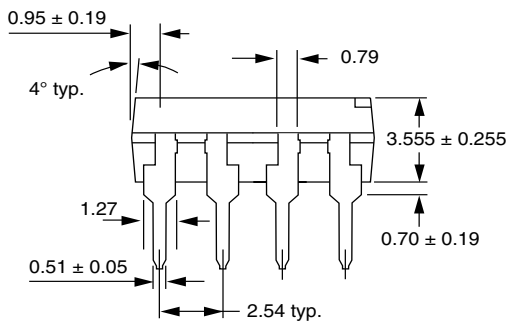
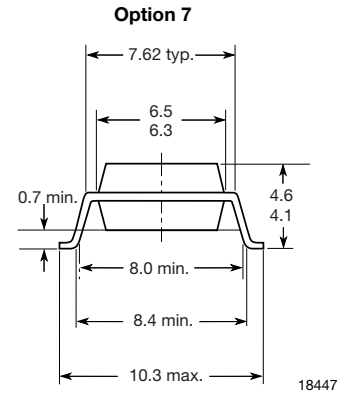
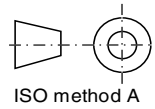
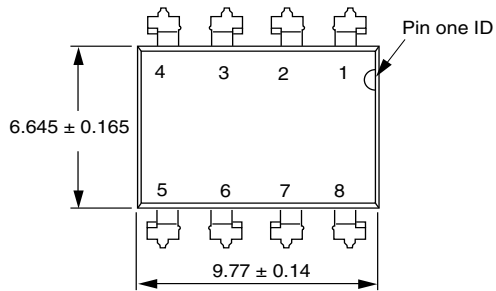
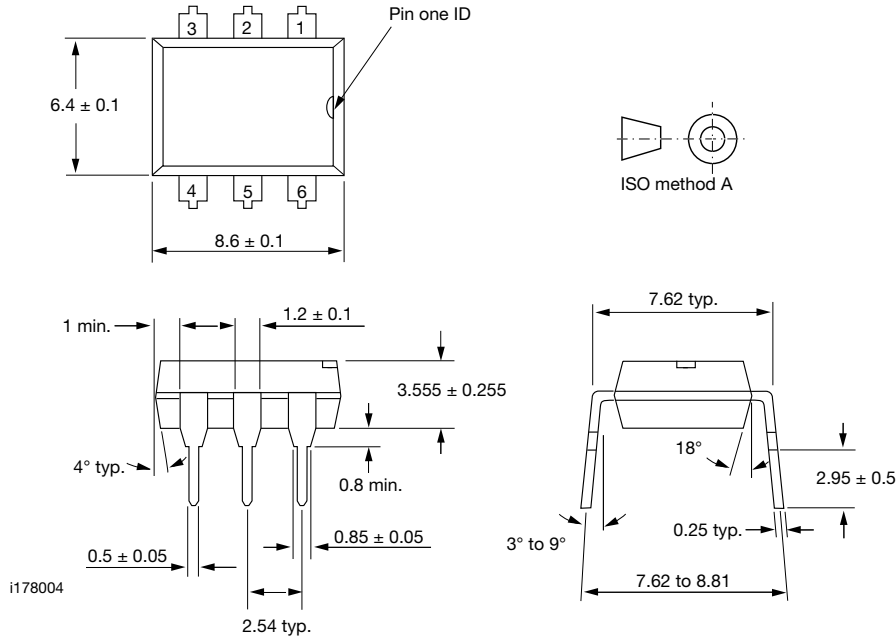


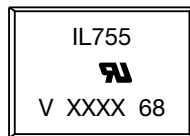
Fig. 10 - Test Circuit, Saturated and Non-Saturated Operation



**PACKAGE DIMENSIONS** in millimeters



**PACKAGE MARKING** (example)



**Notes**

- XXXX = LMC (lot marking code)
- The VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking



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