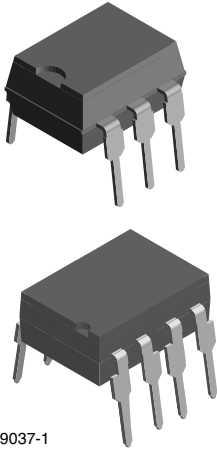
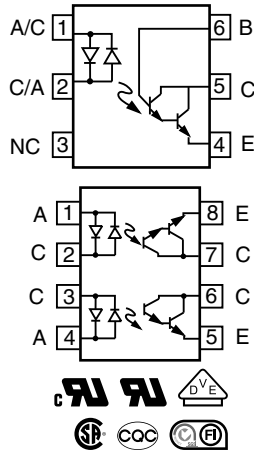


Optocoupler, Photodarlington Output, AC Input, High Gain (Single, Dual Channel)



i179037-1



ILD755 has two isolated channels in a single DIP package.

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



APPLICATIONS

- Designed for applications requiring detection or monitoring of AC signals

AGENCY APPROVALS

- [UL](#) / [cUL](#) 1577
- DIN EN 60747-5-5 (VDE 0884-5) for:
 - [IL755](#)
 - [ILD755](#)
- [CSA](#)
- [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

| ORDERING INFORMATION | | | | | | | | | | | | | | | | | |
|---|-----------------------|--------------|---------------------|---------------|---|---|---|---|---|---|---|---|---|---------|----------------|---------------|--|
| <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">I</td> <td style="padding: 2px 5px;">L</td> <td style="padding: 2px 5px;">x</td> <td style="padding: 2px 5px;">7</td> <td style="padding: 2px 5px;">5</td> <td style="padding: 2px 5px;">5</td> <td style="padding: 2px 5px;">-</td> <td style="padding: 2px 5px;">#</td> <td style="padding: 2px 5px;">X</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">#</td> <td style="padding: 2px 5px;">#</td> <td style="padding: 2px 5px;">T</td> </tr> </table> | I | L | x | 7 | 5 | 5 | - | # | X | 0 | # | # | T | CTR BIN | PACKAGE OPTION | TAPE AND REEL | |
| I | L | x | 7 | 5 | 5 | - | # | X | 0 | # | # | T | | | | | |
| AGENCY CERTIFIED / PACKAGE | CTR (%) | | | | | | | | | | | | | | | | |
| | SINGLE CHANNEL, 6 PIN | | DUAL CHANNEL, 8 PIN | | | | | | | | | | | | | | |
| | ± 2 mA | ± 1 mA | ± 2 mA | ± 1 mA | | | | | | | | | | | | | |
| UL, cUL, CSA, CQC | ≥ 750 | ≥ 1000 | ≥ 750 | ≥ 1000 | | | | | | | | | | | | | |
| DIP-# | IL755-1 | IL755-2 | ILD755-1 | ILD755-2 | | | | | | | | | | | | | |
| SMD-#, option 7 | IL755-1X007 | IL755-2X007T | - | ILD755-2X007T | | | | | | | | | | | | | |
| VDE, UL, cUL, CSA, CQC | ≥ 750 | ≥ 1000 | ≥ 750 | ≥ 1000 | | | | | | | | | | | | | |
| DIP-# | IL755-1X001 | - | - | - | | | | | | | | | | | | | |
| SMD-#, option 7 | - | - | ILD755-1X017 | - | | | | | | | | | | | | | |

Note

- Additional options may be possible, please contact sales office



| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | |
|--|----------------|----------|------------|-------------|-------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | VALUE | UNIT |
| INPUT | | | | | |
| Forward continuous current | | | I_F | 60 | mA |
| Power dissipation | | | P_{diss} | 100 | mW |
| Derate linearly from 25°C | | | | 1.33 | mW/°C |
| OUTPUT | | | | | |
| 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 |
| COUPLER | | | | | |
| 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

| ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|--|--|-------------|------|------|------|------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| INPUT | | | | | | |
| Forward voltage | $I_F = \pm 10\text{ mA}$ | V_F | | 1.2 | 1.5 | V |
| OUTPUT | | | | | | |
| 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 |
| COUPLER | | | | | | |
| 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



| CURRENT TRANSFER RATIO ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 | - | - | % |

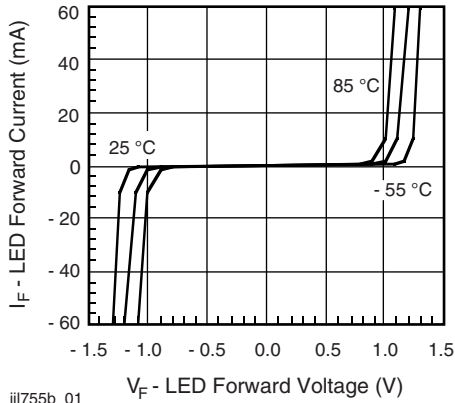
| SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|--|----------|--------|------|------|------|---------------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Rise time | $V_{CC} = 10\text{ V}$, $I_F = \pm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

| SAFETY AND INSULATION RATINGS | | | | |
|--|---|------------|----------------|--------------------|
| 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} | $\geq 10^{12}$ | Ω |
| | $V_{IO} = 500\text{ V}$, $T_{amb} = 100\text{ }^{\circ}\text{C}$ | R_{IO} | $\geq 10^{11}$ | Ω |
| Output safety power | | P_{SO} | 400 | mW |
| Input safety current | | I_{SI} | 275 | mA |
| Safety temperature | | T_S | 175 | $^{\circ}\text{C}$ |
| Creepage distance | | | ≥ 7 | mm |
| Clearance distance | | | ≥ 7 | mm |
| Insulation thickness | | DTI | ≥ 0.4 | mm |

Note

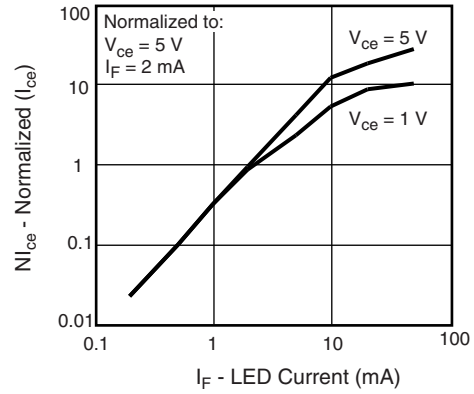
- As per IEC 60747-5-5, § 7.4.3.8.2, this optocoupler is suitable for "safe electrical insulation" only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits

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



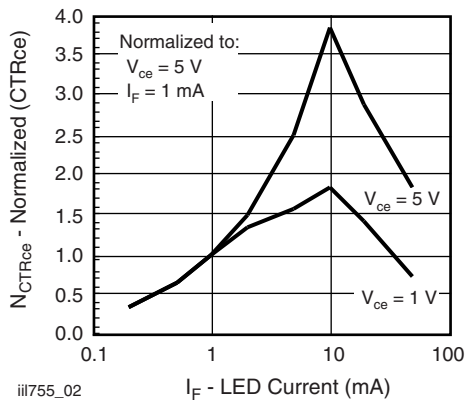
iii755b_01

Fig. 1 - LED Forward Current vs. Forward Voltage



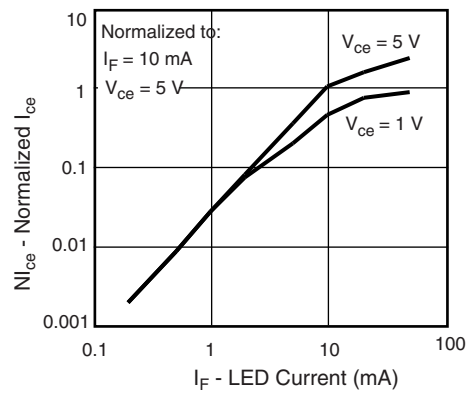
iii755_04

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



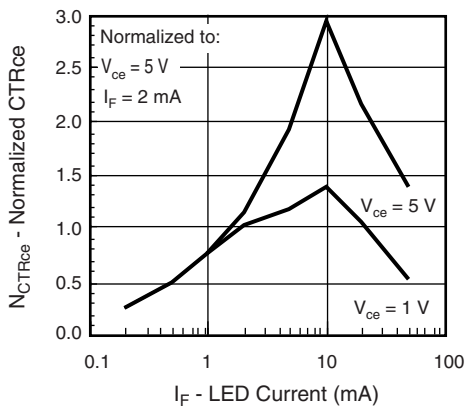
iii755_02

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



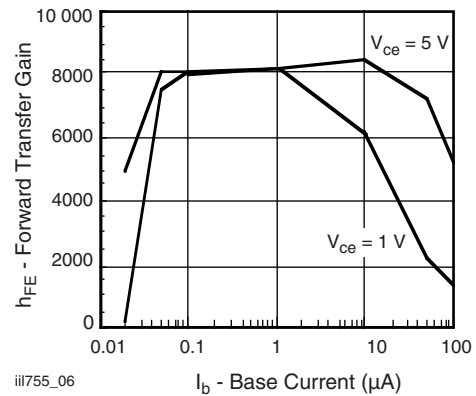
iii755_05

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

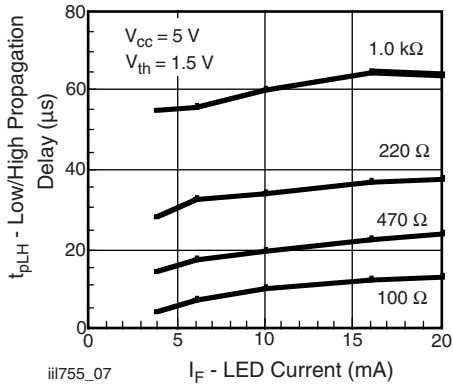


Fig. 7 - Low to High Propagation Delay vs. Collector Load Resistance and LED Current

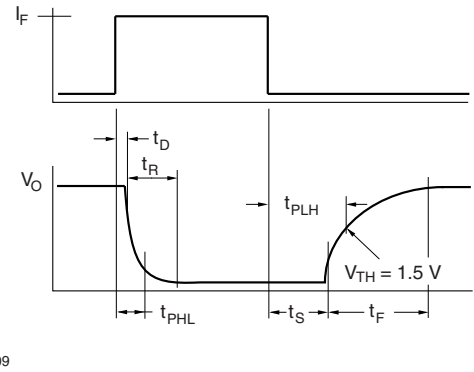


Fig. 9 - Switching Waveform

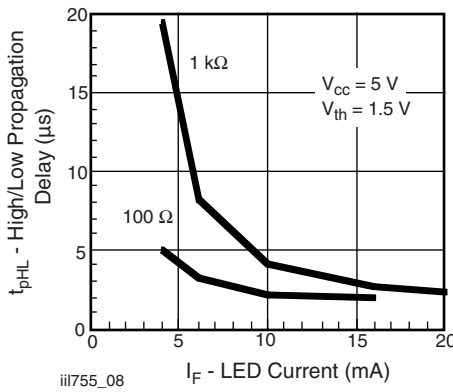


Fig. 8 - High to Low Propagation Delay vs. Collector Load Resistance and LED Current

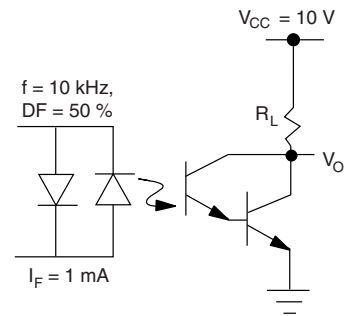
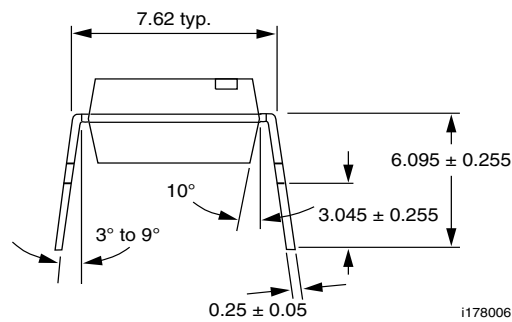
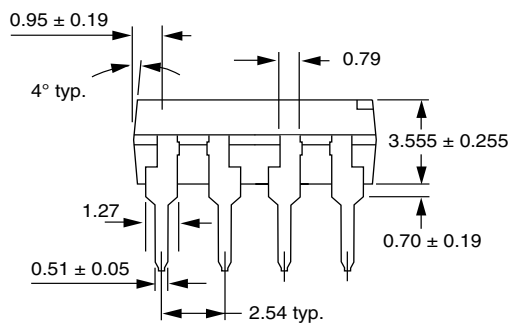
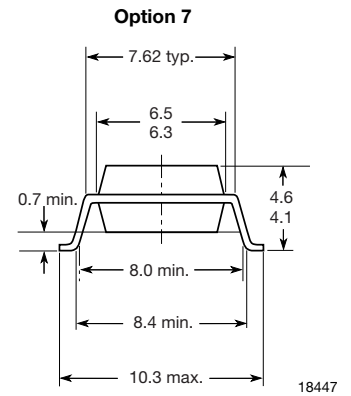
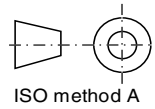
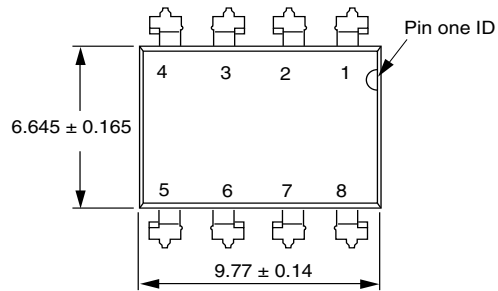
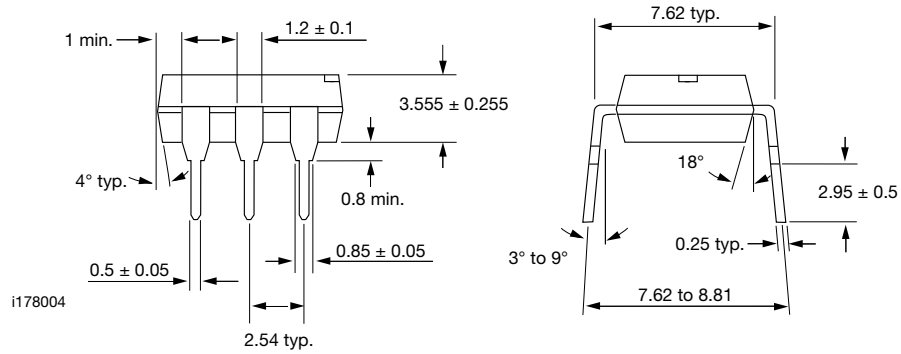
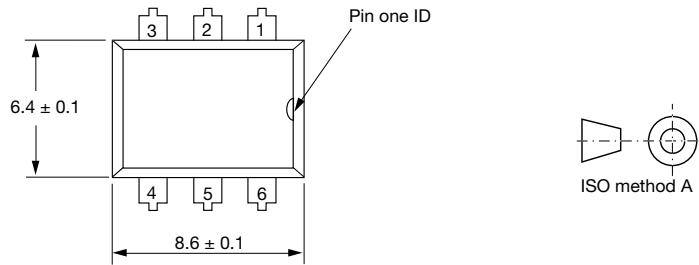
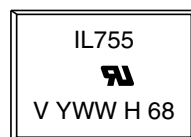


Fig. 10 - Test Circuit, Saturated and Non-Saturated Operation

PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING (example)



Notes

- 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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