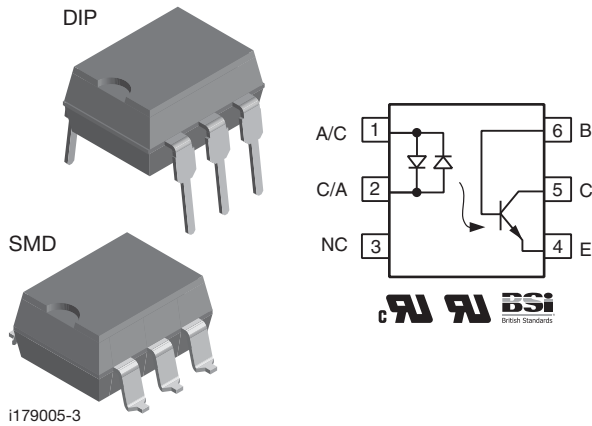


## Optocoupler, Phototransistor Output, AC Input, with Base Connection



### FEATURES

- AC or polarity insensitive inputs
- Continuous forward current, 130 mA
- Built-in reverse polarity input protection
- Improved CTR symmetry
- Industry standard DIP package
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### APPLICATIONS

- Telecommunications
- Ring detection
- Loop current detector

### AGENCY APPROVALS

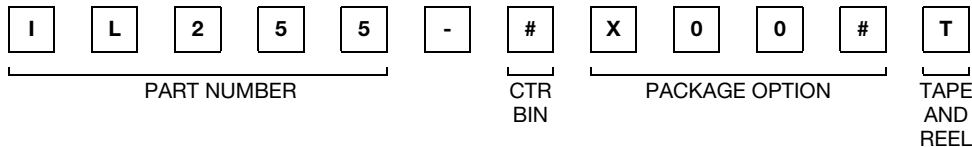
- UL1577, file no. E52744 system code H, double protection
- cUL tested to CSA 22.2 bulletin 5A
- BSI IEC 60950; IEC 60065

### DESCRIPTION

The IL255 is a bidirectional input optically coupled isolator consisting of two high current GaAs infrared LEDs coupled to a silicon NPN phototransistor. The IL255 has a minimum CTR of 20 %.

This optocoupler is ideal for applications requiring AC signal detection and monitoring.

### ORDERING INFORMATION



| AGENCY CERTIFIED/PACKAGE | CTR (%)     |         |
|--------------------------|-------------|---------|
| UL, cUL, BSI             | ≥ 20        | ≥ 50    |
| DIP-6                    | -           | IL255-2 |
| SMD-6, option 7          | IL255-X007T | -       |

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER                           | TEST CONDITION | SYMBOL            | VALUE | UNIT  |
|-------------------------------------|----------------|-------------------|-------|-------|
| <b>INPUT</b>                        |                |                   |       |       |
| Peak pulsed current                 | 1 μs, 300 pps  | I <sub>FP</sub>   | 3     | A     |
| Forward continuous current          |                | I <sub>F</sub>    | 130   | mA    |
| Power dissipation                   |                | P <sub>diss</sub> | 175   | mW    |
| Derate linearly from 25 °C          |                |                   | 2.3   | mW/°C |
| <b>OUTPUT</b>                       |                |                   |       |       |
| Collector emitter breakdown voltage |                | BV <sub>CEO</sub> | 30    | V     |
| Emitter base breakdown voltage      |                | BV <sub>EBO</sub> | 5     | V     |
| Collector base breakdown voltage    |                | BV <sub>CBO</sub> | 70    | V     |
| Power dissipation                   |                | P <sub>diss</sub> | 200   | mW    |
| Derate linearly from 25 °C          |                |                   | 2.6   | mW/°C |

Vishay Semiconductors Optocoupler, Phototransistor Output,  
AC Input, with Base Connection

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |  |           |                |           |
|--|--|-----------|----------------|-----------|
| PARAMETER  | TEST CONDITION   | SYMBOL    | VALUE          | UNIT      |
| <b>COUPLER</b>   |  |           |                |           |
| Isolation test voltage between emitter and detector  |  | $V_{ISO}$ | 5300           | $V_{RMS}$ |
| Creepage distance  |  |           | $\geq 7$       | mm        |
| Clearance distance   |  |           | $\geq 7$       | mm        |
| Isolation resistance   | $V_{IO} = 500\text{ V}, T_{amb} = 25\text{ }^{\circ}\text{C}$  | $R_{IO}$  | $\geq 10^{12}$ | $\Omega$  |
|  | $V_{IO} = 500\text{ V}, T_{amb} = 100\text{ }^{\circ}\text{C}$ | $R_{IO}$  | $\geq 10^{11}$ | $\Omega$  |
| Total dissipation  |  | $P_{tot}$ | 250            | mW        |
| Derate linearly from 25 °C   |  |           | 3.3            | mW/°C     |
| Storage temperature  |  | $T_{stg}$ | - 55 to + 150  | °C        |
| Operating temperature  |  | $T_{amb}$ | - 55 to + 100  | °C        |
| Lead soldering time at $\geq 260\text{ }^{\circ}\text{C}$ <sup>(1)</sup>                               |  |           | 10             | s         |

**Notes**

- 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.
- <sup>(1)</sup> Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

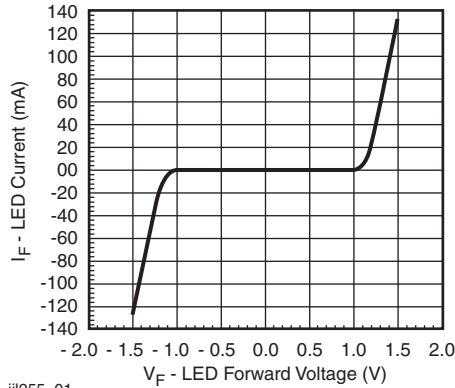
| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |   |         |             |      |      |      |      |
|--|---|---------|-------------|------|------|------|------|
| PARAMETER  | TEST CONDITION                                | PART    | SYMBOL      | MIN. | TYP. | MAX. | UNIT |
| <b>INPUT</b>   |   |         |             |      |      |      |      |
| Forward voltage  | $I_F = \pm 100\text{ mA}$                     |         | $V_F$       |      | 1.4  | 1.7  | V    |
| <b>OUTPUT</b>  |   |         |             |      |      |      |      |
| Collector emitter breakdown voltage  | $I_C = 10\text{ mA}$                          |         | $BV_{CEO}$  | 30   | 50   |      | V    |
| Emitter collector breakdown voltage  | $I_E = 10\text{ }\mu\text{A}$                 |         | $BV_{ECO}$  | 7    | 10   |      | V    |
| Collector base breakdown voltage   | $I_C = 100\text{ }\mu\text{A}$                |         | $BV_{CBO}$  | 70   |      |      | V    |
| Emitter base breakdown voltage   | $I_E = 100\text{ }\mu\text{A}$                |         | $BV_{EBO}$  | 70   |      |      | V    |
| Collector emitter leakage current  | $V_{CE} = 10\text{ V}$                        |         | $I_{CEO}$   |      | 5    | 50   | nA   |
| <b>COUPLER</b>   |   |         |             |      |      |      |      |
| Collector emitter saturation voltage   | $I_F = \pm 10\text{ mA}, I_C = 0.5\text{ mA}$ | IL255   | $V_{CEsat}$ |      |      | 0.4  | V    |
|  | $I_F = \pm 16\text{ mA}, I_C = 2\text{ mA}$   | IL255-2 | $V_{CEsat}$ |      |      | 0.4  | 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.

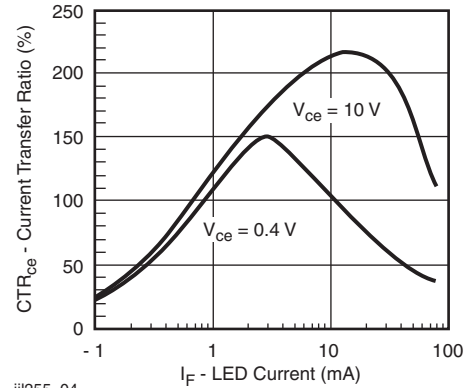
| <b>CURRENT TRANSFER RATIO</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |  |         |        |      |      |      |      |
|--|--|---------|--------|------|------|------|------|
| PARAMETER  | TEST CONDITION                                 | PART    | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Current transfer ratio   | $I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$ | IL255   | CTR    | 20   |      |      | %    |
|  | $I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$ | IL255-2 | CTR    | 50   |      |      | %    |
| Current transfer ratio symmetry  | $I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$ | IL255   |        | 0.33 |      | 3    |      |
|  | $I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$ | IL255-2 |        | 0.5  | 1    | 2    |      |

# Optocoupler, Phototransistor Output, Vishay Semiconductors AC Input, with Base Connection

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


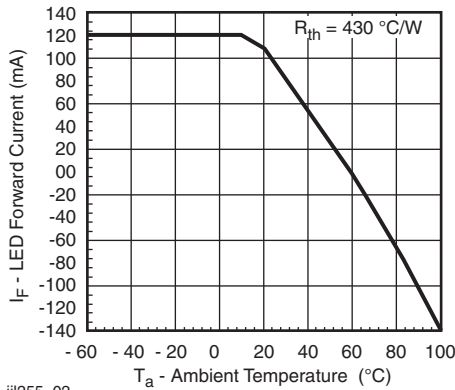
iil255\_01

Fig. 1 - LED Forward Current vs. Forward Voltage



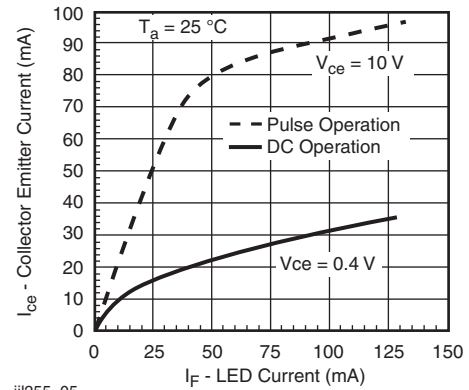
iil255\_04

Fig. 4 - Current Transfer Ratio vs. LED Current and Collector-Emitter Voltage



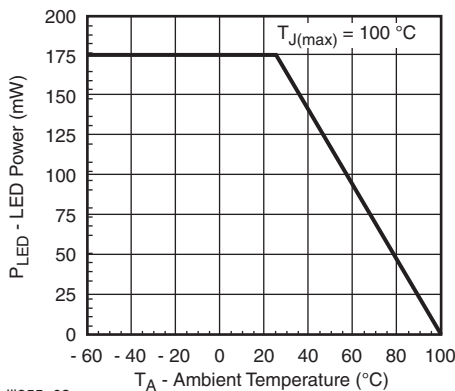
iil255\_02

Fig. 2 - Maximum LED Current vs. Ambient Temperature



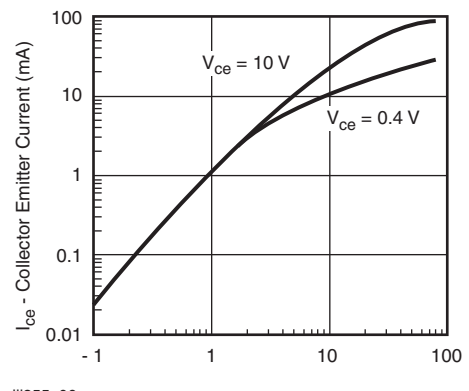
iil255\_05

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



iil255\_03

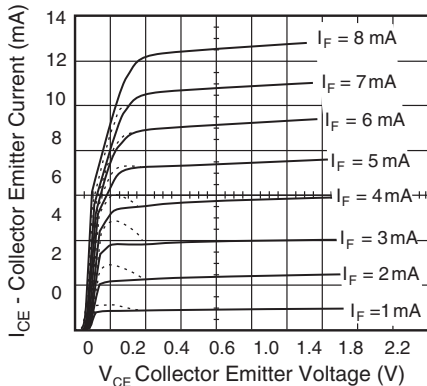
Fig. 3 - Maximum LED Power Dissipation



iil255\_06

Fig. 6 - Non-Saturated and Saturated Collector Emitter Current vs. LED Current

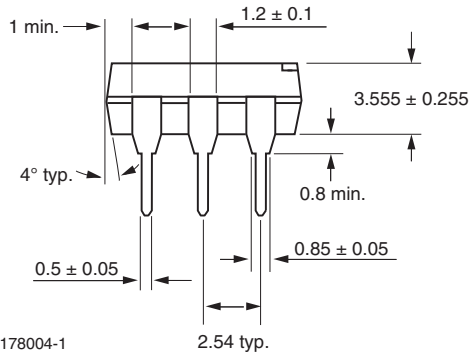
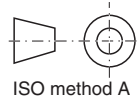
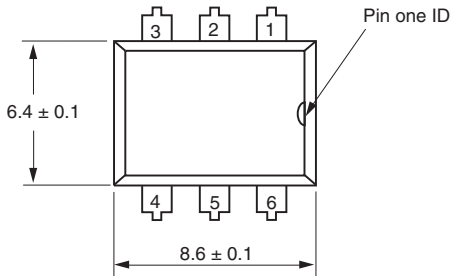
Vishay Semiconductors Optocoupler, Phototransistor Output, AC Input, with Base Connection



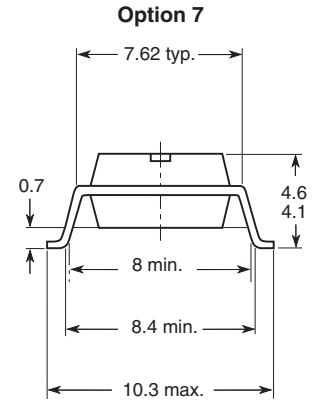
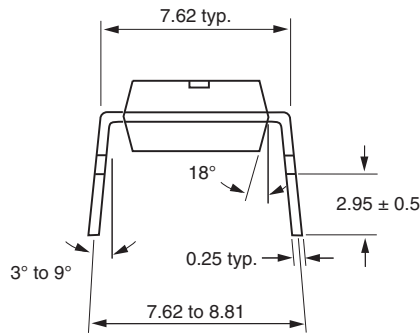
iii255\_07

Fig. 7 - Collector Emitter Current vs. LED Collector Emitter Voltage

**PACKAGE DIMENSIONS** in millimeters



i178004-1



**PACKAGE MARKING**



**Notes**

- Only option 7 reflected in the package marking
- Tape and reel suffix (T) is not part of the package marking



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