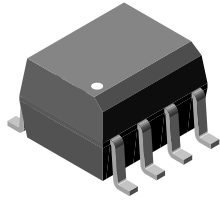
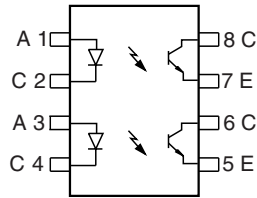


Optocoupler, Phototransistor Output, Dual Channel, SOIC-8 package



1179018



DESCRIPTION

The ILD205T/206T/207T/211T/213T/217T are optically coupled pairs with a Gallium Arsenide infrared LED and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output. The ILD205T/206T/207T/211T/213T/217T come in a standard SOIC-8 small outline package for surface mounting which makes it ideally suited for high density applications with limited space. In addition to eliminating through-holes requirements, this package conforms to standards for surface mounted devices.

A specified minimum and maximum CTR allows a narrow tolerance in the electrical design of the adjacent circuits. The high BV_{CEO} of 70 V gives a higher safety margin compared to the industry standard of 30 V.

FEATURES

- Two channel coupler
- SOIC-8 surface mountable package
- Standard lead spacing of 0.05"
- Available only on tape and reel option (conforms to EIA standard 481-2)
- Isolation test voltage, 4000 V_{RMS}
- Compatible with dual wave, vapor phase and IR reflow soldering
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

AGENCY APPROVALS

- UL1577, file no. E52744 system code Y
- CUL - file no. E52744, equivalent to CSA bulletin 5A
- DIN EN 60747-5-2 (VDE 0884) available with option 1

ORDER INFORMATION

| PART | REMARKS |
|---------|--------------------------|
| ILD205T | CTR 40 to 80 %, SOIC-8 |
| ILD206T | CTR 63 to 125 %, SOIC-8 |
| ILD207T | CTR 100 to 200 %, SOIC-8 |
| ILD211T | CTR > 20 %, SOIC-8 |
| ILD213T | CTR > 100 %, SOIC-8 |
| ILD217T | CTR > 100 %, SOIC-8 |

ILD205T/206T/207T/211T/213T/217T



Vishay Semiconductors Optocoupler, Phototransistor Output,
Dual Channel, SOIC-8 package

| ABSOLUTE MAXIMUM RATINGS ⁽¹⁾ | | | | |
|---|--------------------|------------|---------------|-----------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| INPUT | | | | |
| Peak reverse voltage | | V_R | 6 | V |
| Peak pulsed voltage | 1 μ s, 300 pps | | 1 | A |
| Continuous forward current per channel | | | 30 | mA |
| Power dissipation | | P_{diss} | 50 | mW |
| Derate linearly from 25 °C | | | 0.66 | mW/°C |
| OUTPUT | | | | |
| Collector emitter breakdown voltage | | BV_{CEO} | 70 | V |
| Emitter collector breakdown voltage | | BV_{ECO} | 7 | V |
| Power dissipation per channel | | P_{diss} | 125 | mW |
| Derate linearly from 25 °C | | | 1.67 | mW/°C |
| COUPLER | | | | |
| Isolation test voltage | t = 1 s | V_{ISO} | 4000 | V_{RMS} |
| Total package dissipation ambient (2 LEDs and 2 detectors, 2 channels) | | P_{tot} | 300 | mW |
| Derate linearly from 25 °C | | | 4 | mW/°C |
| Storage temperature | | T_{stg} | - 55 to + 150 | °C |
| Operating temperature | | T_{amb} | - 55 to + 100 | °C |
| Soldering time from 260 °C ⁽²⁾ | | T_{sld} | 10 | s |

Notes

⁽¹⁾ $T_{amb} = 25$ °C, unless otherwise specified.

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 Rating for extended periods of the time can adversely affect reliability.

⁽²⁾ Refer to reflow profile for soldering conditions for surface mounted devices.

| ELECTRICAL CHARACTERISTICS | | | | | | | |
|--------------------------------------|-------------------------------|------|-------------|------|------|------|------------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| INPUT | | | | | | | |
| Forward voltage | $I_F = 10$ mA | | V_F | | 1.2 | 1.55 | V |
| Reverse current | $V_R = 6$ V | | I_R | | 0.1 | 100 | μ A |
| Capacitance | $V_R = 0$ V | | C_O | | 25 | | pF |
| OUTPUT | | | | | | | |
| Collector emitter breakdown voltage | $I_C = 10$ μ A | | BV_{CEO} | 70 | | | V |
| Emitter collector breakdown voltage | $I_E = 10$ μ A | | BV_{ECO} | 7 | | | V |
| Collector emitter leakage current | $V_{CE} = 10$ V, $I_F = 0$ A | | I_{CEO} | | 5 | 50 | nA |
| Collector emitter capacitance | $V_{CE} = 0$ V | | C_{CE} | | 10 | | pF |
| COUPLER | | | | | | | |
| Collector emitter saturation voltage | $I_F = 10$ mA, $I_C = 2.5$ mA | | V_{CEsat} | | | 0.4 | V |
| Capacitance (input to output) | | | C_{IO} | | 0.5 | | pF |
| Resistance (input to output) | | | R_{IO} | | 100 | | G Ω |

Note

$T_{amb} = 25$ °C, unless otherwise specified.

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



ILD205T/206T/207T/211T/213T/217T

Optocoupler, Phototransistor Output, Vishay Semiconductors
Dual Channel, SOIC-8 package

| CURRENT TRANSFER RATIO | | | | | | | |
|---------------------------|--|---------|------------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| DC current transfer ratio | $V_{CE} = 5\text{ V}, I_F = 10\text{ mA}$ | ILD205T | CTR_{DC} | 40 | | 80 | % |
| | | ILD206T | CTR_{DC} | 63 | | 125 | % |
| | | ILD207T | CTR_{DC} | 100 | | 200 | % |
| | | ILD211T | CTR_{DC} | 20 | | | % |
| | | ILD213T | CTR_{DC} | 100 | | | % |
| | $V_{CE} = 5\text{ V}, I_F = 1.0\text{ mA}$ | ILD205T | CTR_{DC} | 13 | 30 | | % |
| | | ILD206T | CTR_{DC} | 22 | 45 | | % |
| | | ILD207T | CTR_{DC} | 34 | 70 | | % |
| ILD217T | CTR_{DC} | 100 | 120 | | % | | |

| SWITCHING CHARACTERISTICS | | | | | | | |
|---------------------------|--|------|-----------|------|------|------|---------------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Turn-on time | $I_C = 2\text{ mA}, R_L = 100\ \Omega,$ $V_{CC} = 5\text{ V}$ | | t_{on} | 5 | | | μs |
| Turn-off time | $I_C = 2\text{ mA}, R_L = 100\ \Omega,$ $V_{CC} = 5\text{ V}$ | | t_{off} | 4 | | | μs |

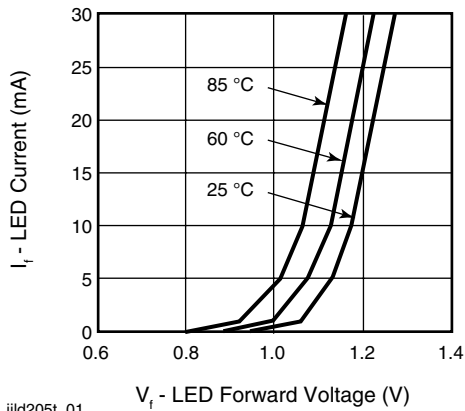
| SAFETY AND INSULATION RATINGS | | | | | | | |
|---|-----------------------|--------|------|-----------|------|------|--|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT | |
| Climatic classification (according to IEC 68 part 1) | | | | 55/100/21 | | | |
| Comparative tracking index | | CTI | 175 | | 399 | | |
| V_{IOTM} | | | 6000 | | | V | |
| V_{IORM} | | | 560 | | | V | |
| P_{SO} | | | | | 350 | mW | |
| I_{SI} | | | | | 150 | mA | |
| T_{SI} | | | | | 165 | °C | |
| Creepage | | | 4 | | | mm | |
| Clearance | | | 4 | | | mm | |
| Insulation thickness, reinforced rated | per IEC60950 2.10.5.1 | | 0.2 | | | mm | |

Note

As per IEC60747-5-2, §7.4.3.8.1, 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.

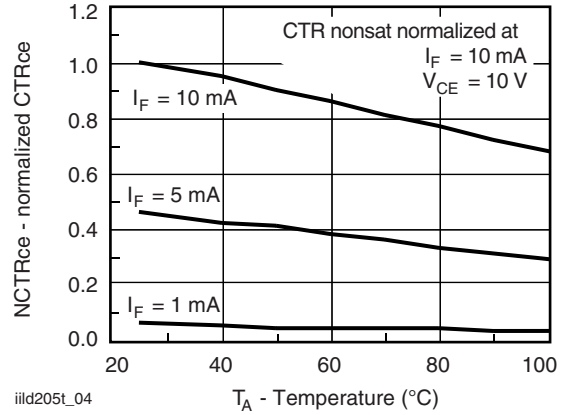
TYPICAL CHARACTERISTICS

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



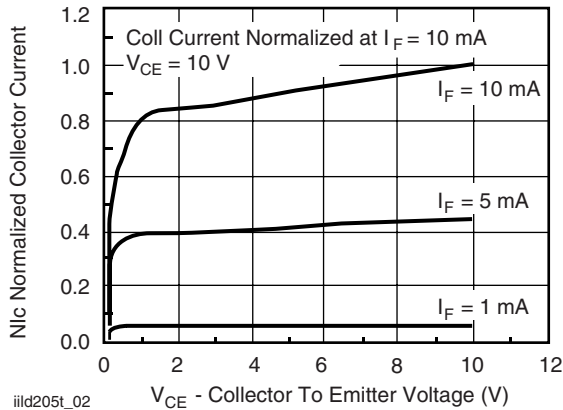
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Fig. 1 - Forward Current vs. Forward Voltage



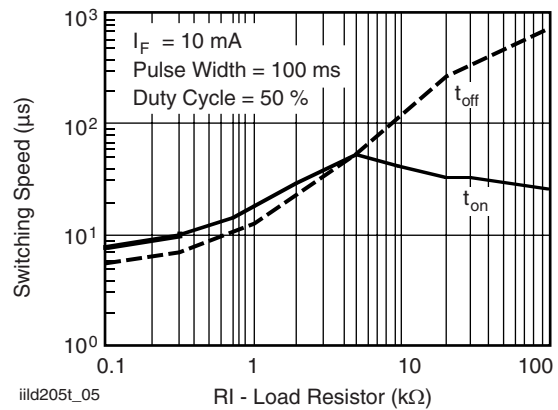
iiild205t_04

Fig. 4 - Current Transfer Ratio (normalized) vs. Ambient Temperature



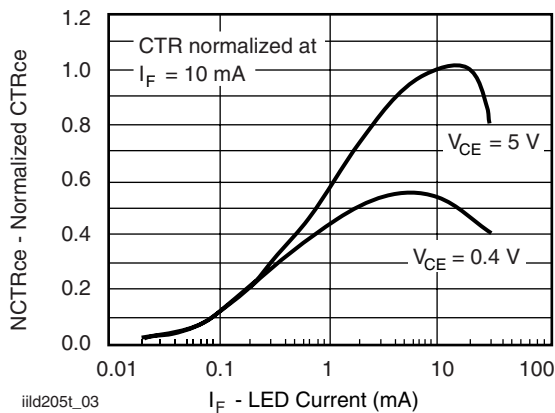
iiild205t_02

Fig. 2 - Collector Emitter Current vs. V_{CE}



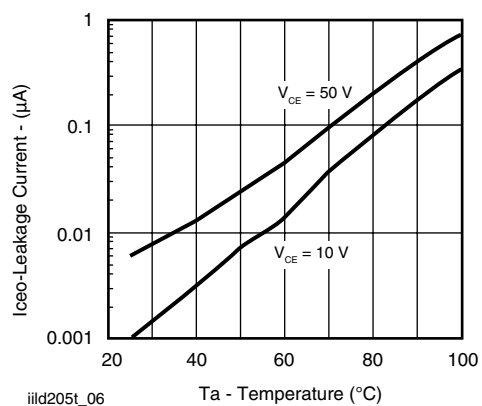
iiild205t_05

Fig. 5 - Switching Speed vs. Load Resistor



iiild205t_03

Fig. 3 - Normalized CTR_{CE} vs. Forward Current



iiild205t_06

Fig. 6 - Collector Current vs. Ambient Temperature

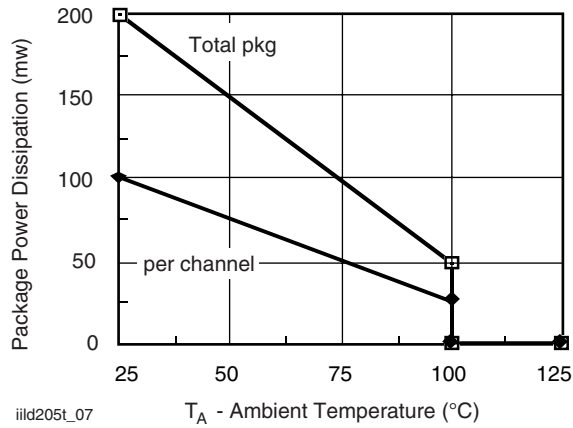
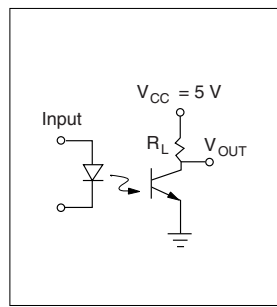


Fig. 7 - Power Dissipation vs. Ambient Temperature



iiid205t_08

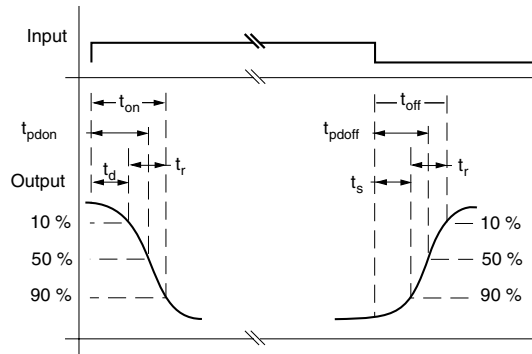


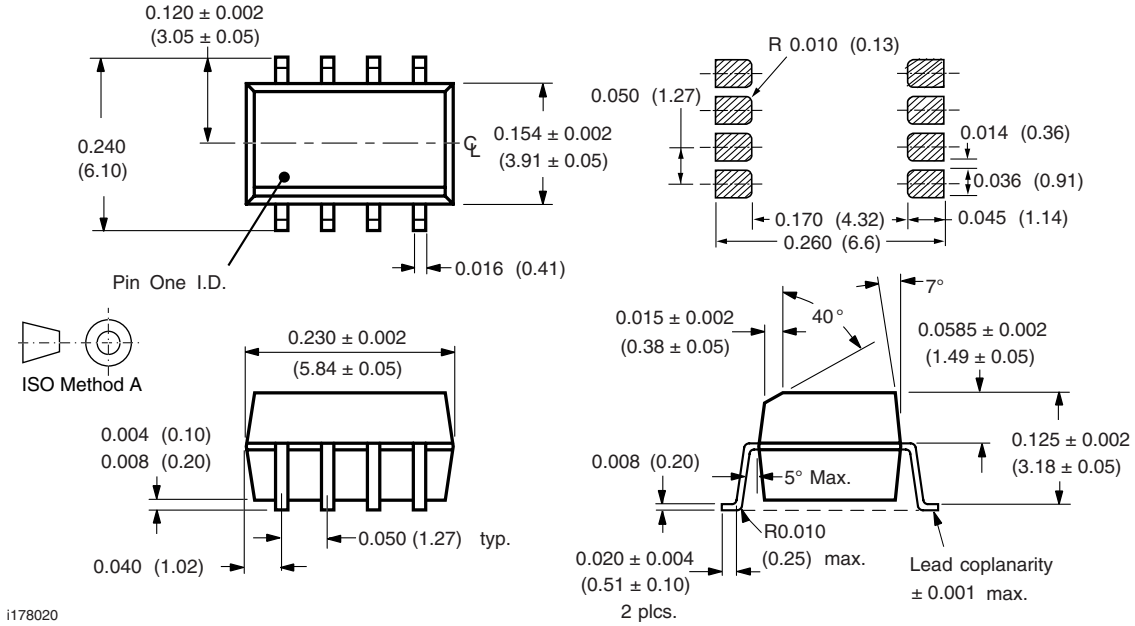
Fig. 8 Switching Test Circuit

ILD205T/206T/207T/211T/213T/217T



Vishay Semiconductors Optocoupler, Phototransistor Output,
Dual Channel, SOIC-8 package

PACKAGE DIMENSIONS in inches (millimeters)





OZONE DEPLETING SUBSTANCES POLICY STATEMENT

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively.
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design
and may do so without further notice.

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