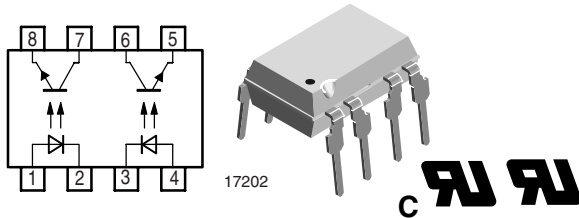


Optocoupler, Phototransistor Output, Dual Channel



FEATURES

- Current transfer ratio (CTR) of typical 100 %
- Isolation test voltage $V_{ISO} = 5300 V_{RMS}$
- Low temperature coefficient of CTR
- Low coupling capacitance of typical 0.3 pF
- Wide ambient temperature range
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS
COMPLIANT

DESCRIPTION

The MCT6H and MCT62H consist of a phototransistor optically coupled to a gallium arsenide infrared emitting diode in a 6-lead plastic dual inline package.

The elements are mounted on one leadframe, providing a fixed distance between input and output for highest safety requirements.

APPLICATIONS

- Galvanically separated circuits
- Non-interacting switches

AGENCY APPROVALS

- UL1577, file no. E76222 system code U, double protection

ORDER INFORMATION

| PART | REMARKS |
|--------|--------------------|
| MCT6H | CTR > 50 %, DIP-8 |
| MCT62H | CTR > 100 %, DIP-8 |

Note

MCT6H and MCT62H are marked as MCT6 and MCT62 respectively.

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

| PARAMETER | TEST CONDITION | PART | SYMBOL | VALUE | UNIT |
|--------------------------------------|-------------------------------|------|------------|---------------|-----------|
| INPUT | | | | | |
| Reverse voltage | | | V_R | 6 | V |
| Forward current | | | I_F | 60 | mA |
| Forward surge current | $t_p \leq 10 \mu s$ | | I_{FSM} | 1.5 | A |
| Power dissipation | | | P_{diss} | 100 | mW |
| Junction temperature | | | T_j | 125 | °C |
| OUTPUT | | | | | |
| Collector emitter voltage | | | V_{CEO} | 70 | V |
| Emitter collector voltage | | | V_{ECO} | 7 | V |
| Collector current | | | I_C | 50 | mA |
| Collector peak current | $t_p/T = 0.5, t_p \leq 10 ms$ | | I_{CM} | 100 | mA |
| Power dissipation | | | P_{diss} | 150 | mW |
| Junction temperature | | | T_j | 125 | °C |
| COUPLER | | | | | |
| AC isolation test voltage (RMS) | $t = 1.0 min$ | | V_{ISO} | 5000 | V_{RMS} |
| Total power dissipation | | | P_{tot} | 250 | mW |
| Ambient temperature range | | | T_{amb} | - 55 to + 100 | °C |
| Storage temperature range | | | T_{stg} | - 55 to + 125 | °C |
| Soldering temperature ⁽²⁾ | 2 mm from case, $t \leq 10 s$ | | T_{sld} | 260 | °C |

Notes

⁽¹⁾ $T_{amb} = 25 \text{ }^\circ\text{C}$, 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 ratings for extended periods of the time can adversely affect reliability.

⁽²⁾ Refer to wave profile for soldering conditions for through hole devices.



| ELECTRICAL CHARACTERISTICS (1) | | | | | | |
|--------------------------------------|--|-------------|------|-----------|------|-----------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| INPUT | | | | | | |
| Forward voltage | $I_F = 50 \text{ mA}$ | V_F | | 1.25 | 1.6 | V |
| OUTPUT | | | | | | |
| Collector emitter voltage | $I_C = 1 \text{ mA}$ | V_{CEO} | 70 | | | V |
| Emitter collector voltage | $I_E = 100 \mu\text{A}$ | V_{ECO} | 7 | | | V |
| Collector dark current | $V_{CE} = 20 \text{ V}, I_F = 0, E = 0$ | I_{CEO} | | | 100 | nA |
| COUPLER | | | | | | |
| DC isolation test voltage | $t = 2 \text{ s}$ | V_{ISO} | 5000 | | | V_{RMS} |
| Isolation resistance | $V_{IO} = 1000 \text{ V},$ 40 % relative humidity | R_{IO} | | 10^{12} | | Ω |
| Collector emitter saturation voltage | $I_F = 10 \text{ mA}, I_C = 1 \text{ mA}$ | V_{CEsat} | | | 0.3 | V |
| Cut off frequency | $I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V},$ $R_L = 100 \Omega$ | f_C | | 100 | | kHz |
| Coupling capacitance | $f = 1 \text{ MHz}$ | C_k | | 0.3 | | pF |

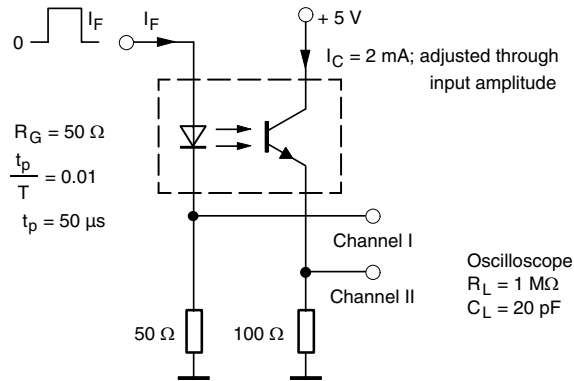
Note

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

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 | | | | | | | |
|------------------------|---|--------|--------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| I_C/I_F | $V_{CE} = 5 \text{ V}, I_F = 5 \text{ mA}$ | MCT6H | CTR | 50 | 100 | | % |
| | $V_{CE} = 5 \text{ V}, I_F = 10 \text{ mA}$ | MCT6H | CTR | 60 | 120 | | % |
| | $V_{CE} = 5 \text{ V}, I_F = 5 \text{ mA}$ | MCT62H | CTR | 100 | 200 | | % |

| SWITCHING CHARACTERISTICS | | | | | | |
|---------------------------|---|-----------|------|------|------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Delay time | $V_S = 5 \text{ V}, I_C = 2 \text{ mA}, R_L = 100 \Omega$ (see figure 1) | t_d | | 3 | | μs |
| Rise time | $V_S = 5 \text{ V}, I_C = 2 \text{ mA}, R_L = 100 \Omega$ (see figure 1) | t_r | | 3 | | μs |
| Fall time | $V_S = 5 \text{ V}, I_C = 2 \text{ mA}, R_L = 100 \Omega$ (see figure 1) | t_f | | 4.7 | | μs |
| Storage time | $V_S = 5 \text{ V}, I_C = 2 \text{ mA}, R_L = 100 \Omega$ (see figure 1) | t_s | | 0.3 | | μs |
| Turn-on time | $V_S = 5 \text{ V}, I_C = 2 \text{ mA}, R_L = 100 \Omega$ (see figure 1) | t_{on} | | 6 | | μs |
| Turn-off time | $V_S = 5 \text{ V}, I_C = 2 \text{ mA}, R_L = 100 \Omega$ (see figure 1) | t_{off} | | 5 | | μs |



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Fig. 1 - Test Circuit, non Saturated Operation

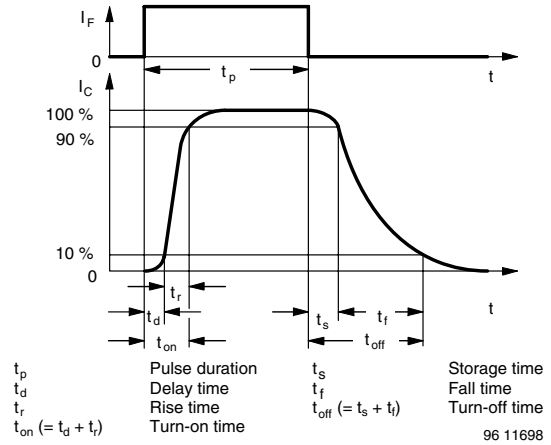


Fig. 2 - Switching Times

TYPICAL CHARACTERISTICS

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

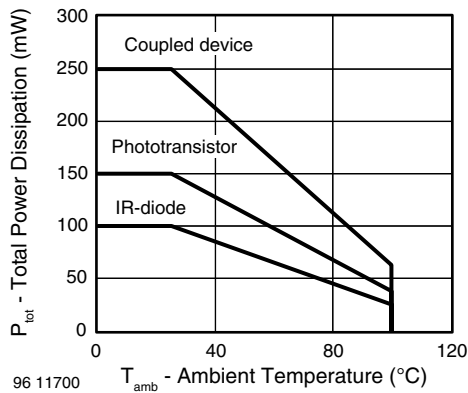


Fig. 3 - Total Power Dissipation vs. Ambient Temperature

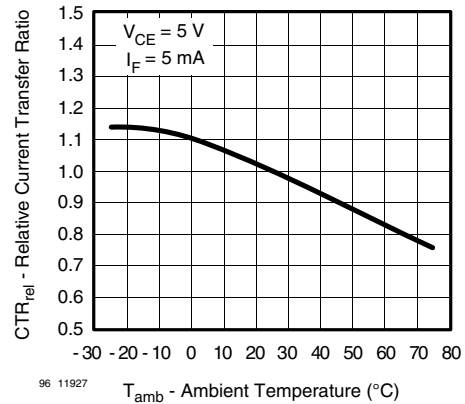


Fig. 5 - Relative Current Transfer Ratio vs. Ambient Temperature

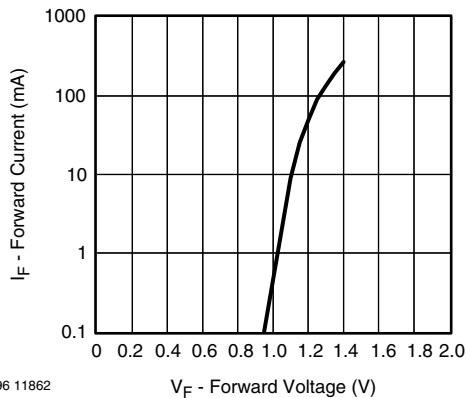


Fig. 4 - Forward Current vs. Forward Voltage

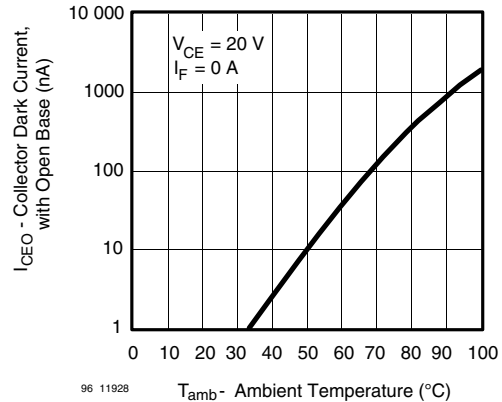


Fig. 6 - Collector Dark Current vs. Ambient Temperature

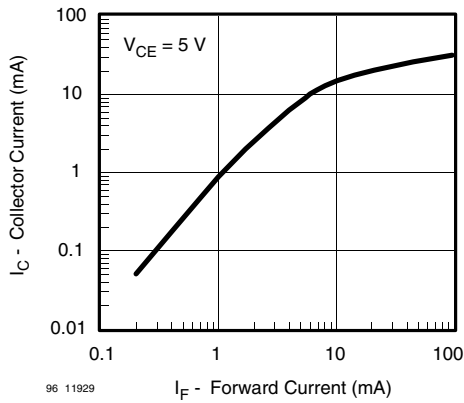


Fig. 7 - Collector Current vs. Forward Current

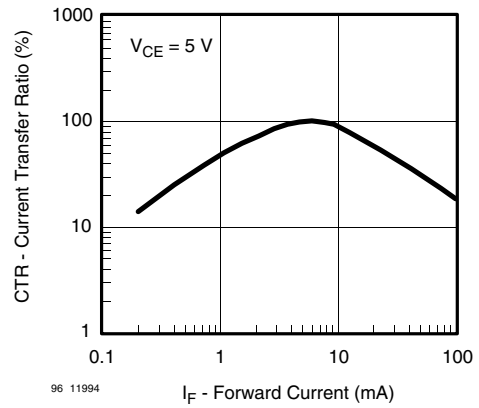


Fig. 10 - Current Transfer Ratio vs. Forward Current

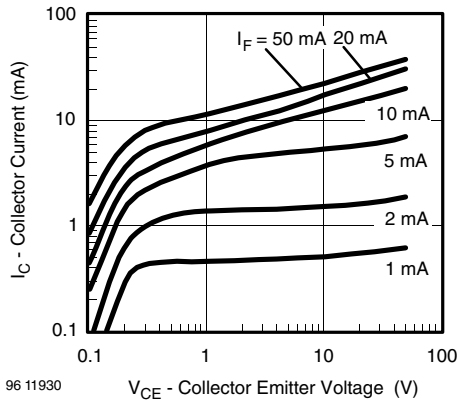


Fig. 8 - Collector Current vs. Collector Emitter Voltage

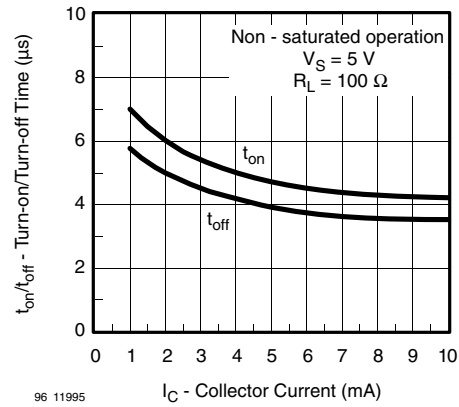


Fig. 11 - Turn-on/Turn-off Time vs. Collector Current

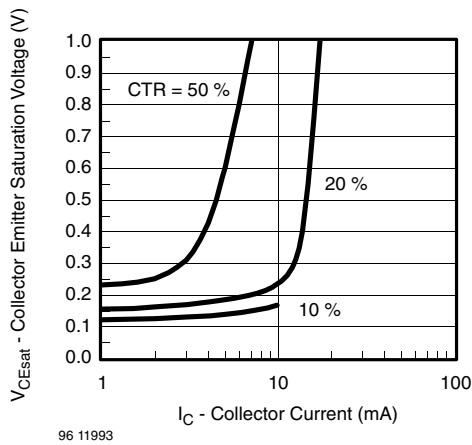


Fig. 9 - Collector Emitter Saturation Voltage vs. Collector Current

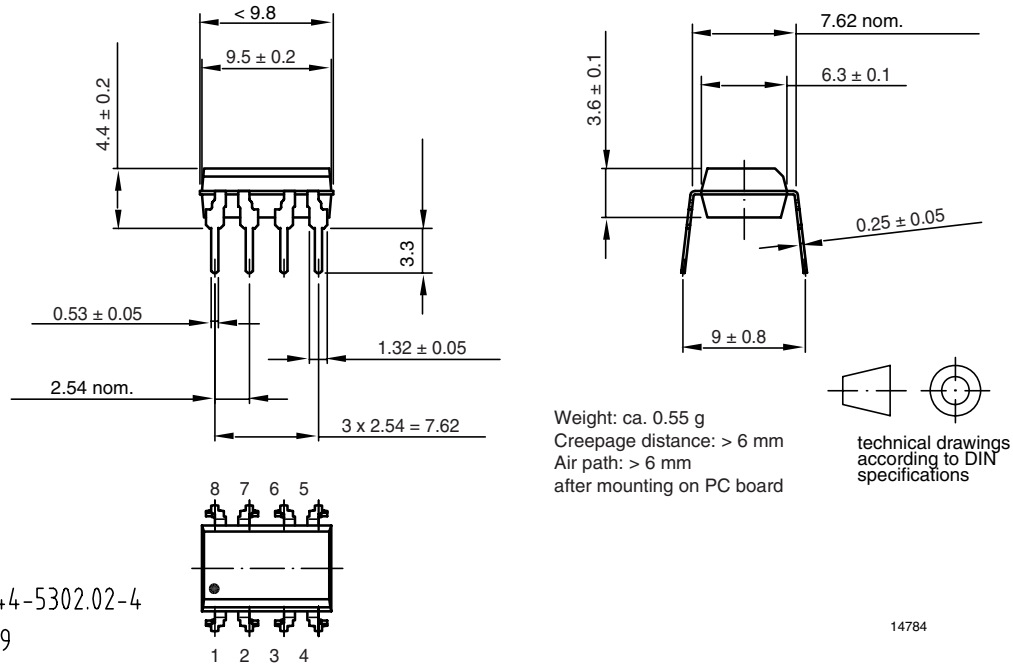
MCT6H, MCT62H



Vishay Semiconductors

Optocoupler, Phototransistor
Output, Dual Channel

PACKAGE DIMENSIONS in inches (millimeters)



Drawing-No.: 6.544-5302.02-4
Issue: 4; 02.06.99

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**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
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