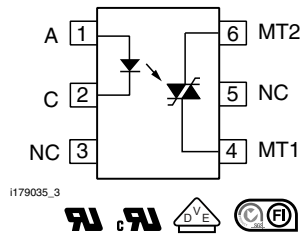


# Optocoupler, Phototriac Output, High dV/dt, Low Input Current



21842-1



## FEATURES

- High static dV/dt 5 kV/μs
- High input sensitivity 1.6 mA, 2 mA, and 3 mA
- 400 V and 600 V blocking voltage
- 300 mA on-state current
- Isolation test voltage 5300 V<sub>RMS</sub>
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

## DESCRIPTION

The VO4254 and VO4256 phototriac consists of a GaAs IRLED optically coupled to a photosensitive non-zero crossing TRIAC packaged in a DIP-6 package.

High input sensitivity is achieved by using an emitter follower phototransistor and a cascaded SCR predriver resulting in an LED trigger current of 1.6 mA for bin D, 2 mA for bin H, and 3 mA for bin M.

The new non zero phototriac family use a proprietary dV/dt clamp resulting in a static dV/dt of greater than 5 kV/μs.

The VO4254 and VO4256 phototriac isolates low-voltage logic from 120 V<sub>AC</sub>, 240 V<sub>AC</sub>, and 380 V<sub>AC</sub> lines to control resistive, inductive, or capacitive loads including motors, solenoids, high current thyristors or TRIAC and relays.

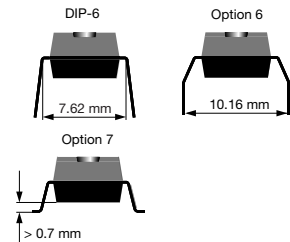
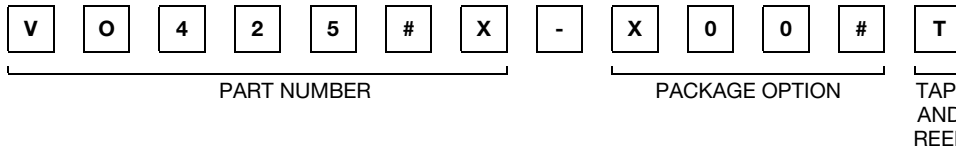
## APPLICATIONS

- Solid-state relays
- Industrial controls
- Office equipment
- Consumer appliances

## AGENCY APPROVALS

- UL1577, file no. E52744 system code H or J, double protection
- cUL - file no. E52744, equivalent to CSA bulletin 5A
- DIN EN 60747-5-5 (VDE 0884) available with option 1
- FIMKO: FI25250

## ORDERING INFORMATION



| AGENCY CERTIFIED/PACKAGE | V <sub>DRM</sub> 400                  |               |               | V <sub>DRM</sub> 600 |               |               |
|--------------------------|---------------------------------------|---------------|---------------|----------------------|---------------|---------------|
|                          | TRIGGER CURRENT, I <sub>FT</sub> (mA) |               |               |                      |               |               |
| UL, cUL, FIMKO           | 1.6                                   | 2             | 3             | 1.6                  | 2             | 3             |
| DIP-6                    | VO4254D                               | VO4254H       | VO4254M       | VO4256D              | VO4256H       | VO4256M       |
| DIP-6, 400 mil, option 6 | VO4254D-X006                          | VO4254H-X006  | VO4254M-X006  | VO4256D-X006         | VO4256H-X006  | VO4256M-X006  |
| SMD-6, option 7          | VO4254D-X007T                         | VO4254H-X007T | VO4254M-X007T | VO4256D-X007T        | VO4256H-X007T | VO4256M-X007T |
| UL, cUL, FIMKO, VDE      | 1.6                                   | 2             | 3             | 1.6                  | 2             | 3             |
| DIP-6                    | -                                     | -             | -             | VO4256D-X001         | -             | -             |



| <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>   |  |             |            |               |           |
| Reverse voltage  |  |             | $V_R$      | 6             | V         |
| Forward current  |  |             | $I_F$      | 60            | mA        |
| Power dissipation  |  |             | $P_{diss}$ | 100           | mW        |
| Derate from 25 °C  |  |             |            | 1.33          | mW/°C     |
| <b>OUTPUT</b>  |  |             |            |               |           |
| Peak off-state voltage   |  | VO4254D/H/M | $V_{DRM}$  | 400           | V         |
|  |  | VO4256D/H/M | $V_{DRM}$  | 600           | V         |
| RMS on-state current   |  |             | $I_{TM}$   | 300           | mA        |
| Power dissipation  |  |             | $P_{diss}$ | 500           | mW        |
| Derate from 25 °C  |  |             |            | 6.6           | mW/°C     |
| <b>COUPLER</b>   |  |             |            |               |           |
| Isolation test voltage (between emitter and detector, climate per DIN 500414, part 2, Nov. 74)         | $t = 1\text{ s}$   |             | $V_{ISO}$  | 5300          | $V_{RMS}$ |
| Storage temperature range  |  |             | $T_{stg}$  | - 55 to + 150 | °C        |
| Ambient temperature range  |  |             | $T_{amb}$  | - 55 to + 100 | °C        |
| Soldering temperature <sup>(2)</sup>   | max. $\leq 10\text{ s}$ dip soldering<br>$\geq 0.5\text{ mm}$ from case bottom |             | $T_{sld}$  | 260           | °C        |

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

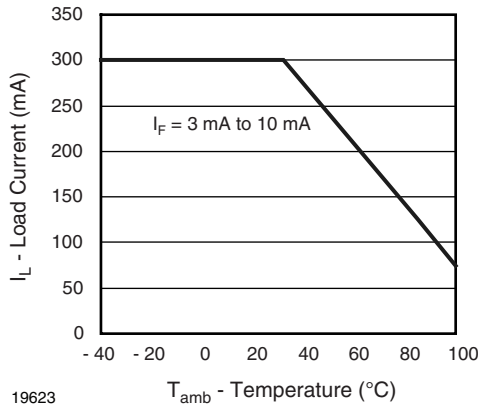
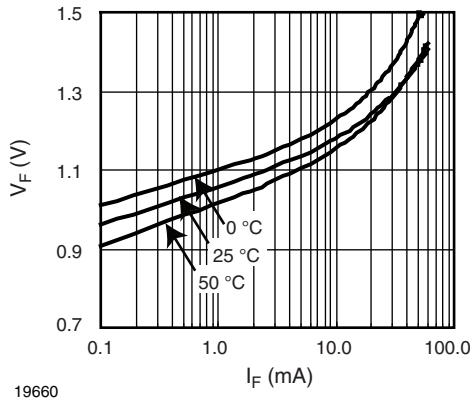


Fig. 1 - Recommended Operating Condition

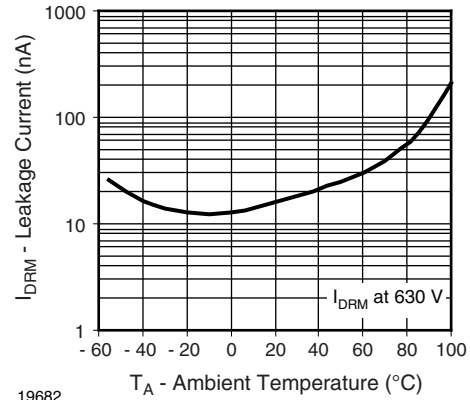


| SAFETY AND INSULATION RATINGS  |                |            |      |           |      |      |
|--|----------------|------------|------|-----------|------|------|
| PARAMETER  | TEST CONDITION | SYMBOL     | MIN. | TYP.      | MAX. | UNIT |
| Climatic classification (according to IEC68 part 1)  |                |            |      | 55/100/21 |      |      |
| Pollution degree (DIN VDE 0109)  |                |            |      | 2         |      |      |
| Comparative tracking index per DIN IEC112/VDE 0303 part 1, group IIIa per DIN VDE 6110 175 399 |                |            | 175  |           | 399  |      |
| $V_{IOTM}$   |                | $V_{IOTM}$ | 8000 |           |      | V    |
| $V_{IORM}$   |                | $V_{IORM}$ | 890  |           |      | V    |
| $P_{SO}$   |                | $P_{SO}$   |      |           | 500  | mW   |
| $I_{SI}$   |                | $I_{SI}$   |      |           | 250  | mA   |
| $T_{SI}$   |                | $T_{SI}$   |      |           | 175  | °C   |
| Creepage distance  |                |            | 7    |           |      | mm   |
| Clearance distance   |                |            | 7    |           |      | mm   |

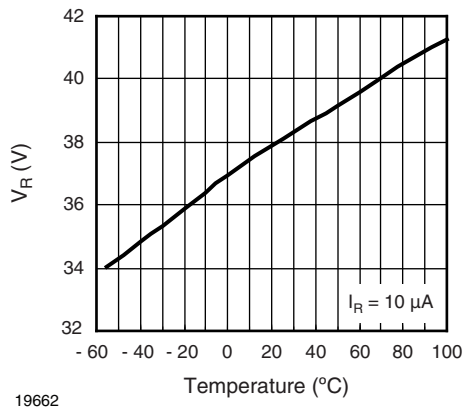
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified)



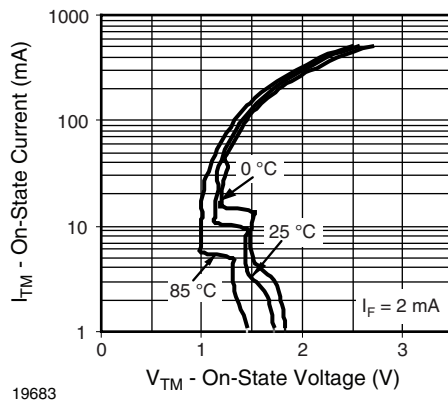
19660  
Fig. 2 - Diode Forward Voltage vs. Forward Current



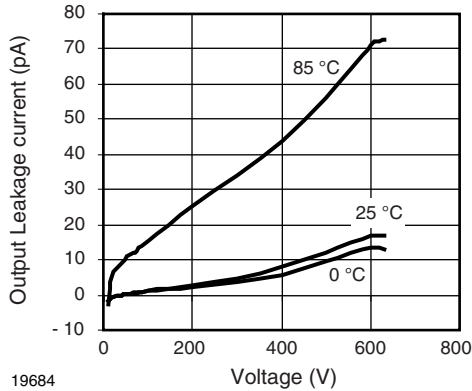
19682  
Fig. 4 - Leakage Current vs. Ambient Temperature



19662  
Fig. 3 - Diode Reverse Voltage vs. Temperature

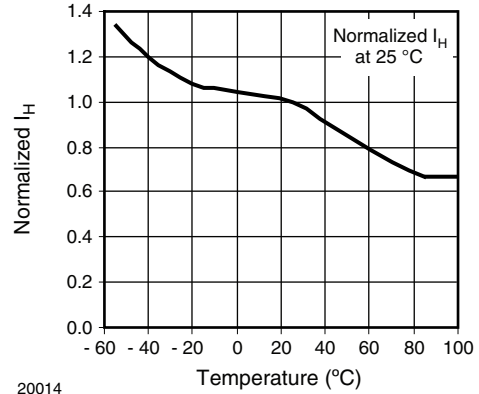


19683  
Fig. 5 - On-State Current vs. On-State Voltage



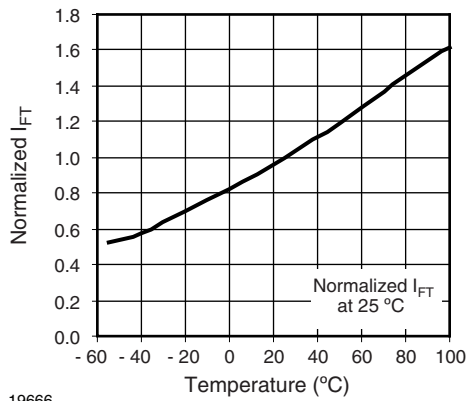
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Fig. 6 - Output Off Current (Leakage) vs. Voltage



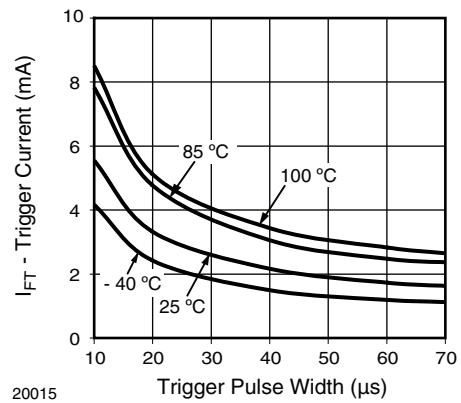
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Fig. 9 - Normalized  $I_H$  vs. Temperature



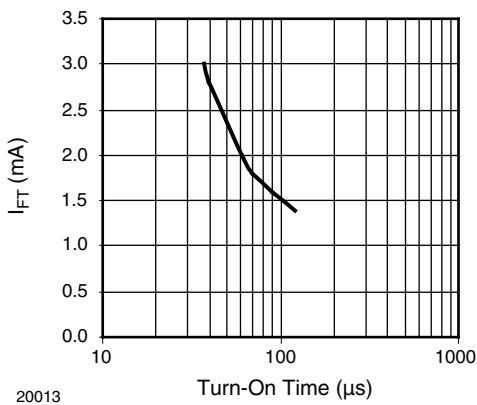
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Fig. 7 - Normalized Trigger Input Current vs. Temperature



20015

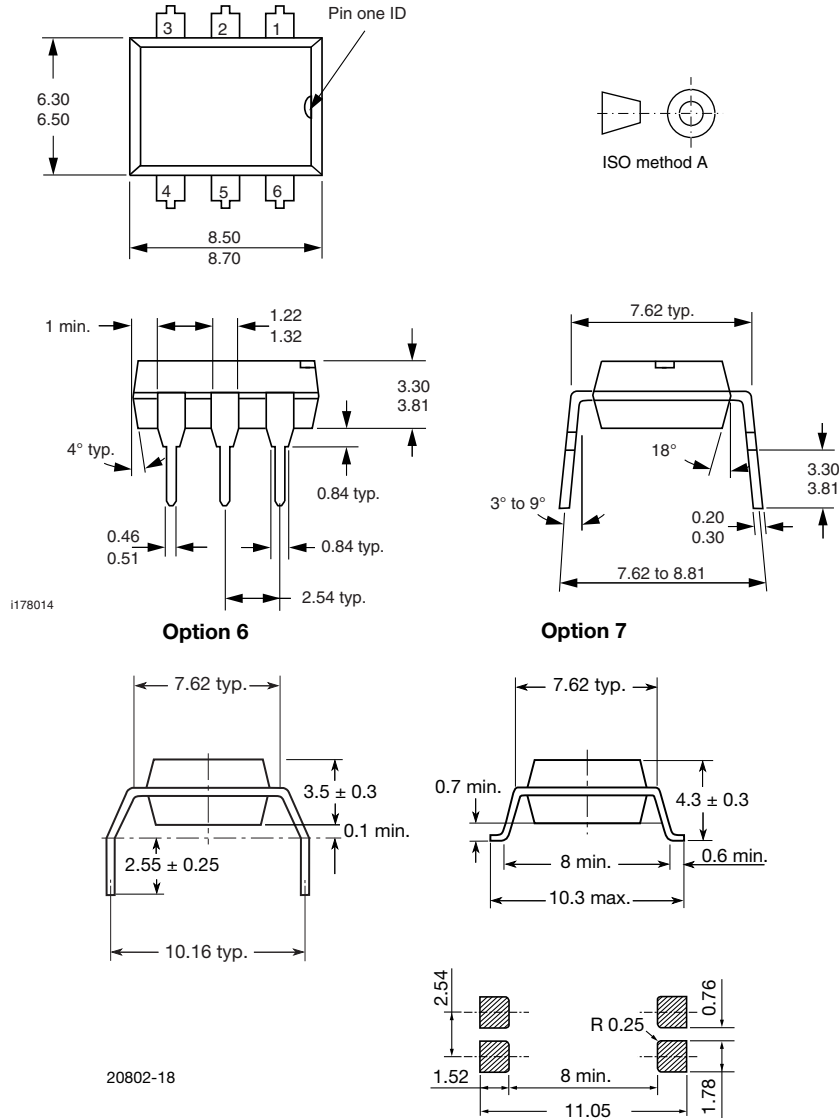
Fig. 10 -  $I_{FT}$  vs. LED Pulse Width



20013

Fig. 8 -  $I_{FT}$  vs. Turn-On Time ( $\mu$ s)

**PACKAGE DIMENSIONS** in millimeters



**PACKAGE MARKING** (example)



**Note**

- 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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