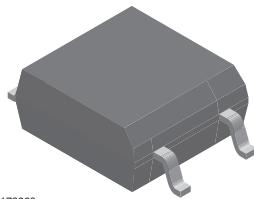
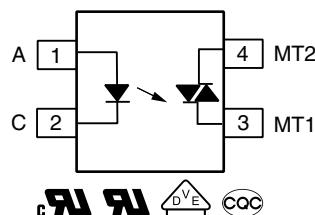


Optocoupler, Phototriac Output, Non-Zero Crossing, 0.5 kV/μs dV/dt, 600 V



i179066



FEATURES

- High static $dV/dt > 0.5 \text{ kV}/\mu\text{s}$
- Input sensitivity $I_{FT} = 5 \text{ mA}, 7 \text{ mA}, \text{ and } 10 \text{ mA}$
- On-state RMS current $I_{T(\text{RMS})} = 70 \text{ mA}$
- 600 V peak off-state blocking voltage
- Isolation test voltage 3750 V_{RMS}
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT
GREEN
(I5-2008)

DESCRIPTION

The VOM160 series phototriac consist a AlGaAs infrared emitting diode (IRED) optically coupled to a photosensitive non-zero crossing TRIAC packaged in a SOP-4 package. It has a IRED trigger current of 5 mA, 7 mA, and 10 mA.

The VOM160 series phototriac isolate low-voltage logic from 120 V_{AC}, 240 V_{AC}, and 380 V_{AC} lines to control resistive, inductive, or capacitive loads including motors, solenoids, high current thyristors or TRIAC and relays.

APPLICATIONS

- Consumer appliances
- Triac drives
- Solid-state relays
- Motor controls
- Office equipment

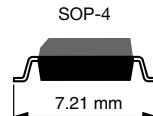
AGENCY APPROVALS

- UL1577, file no. E52744, double protection (pending)
- cUL-file no. E52744, equivalent to CSA bulletin 5A (pending)
- VDE 0884-5, DIN EN 60747-5-5
- CQC (pending)

ORDERING INFORMATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| V | O | M | 1 | 6 | 0 | X | T |
|---|---|---|---|---|---|---|---|

PART NUMBER



| AGENCY CERTIFIED/PACKAGE | TRIGGER CURRENT I_{FT} | | |
|--------------------------|--------------------------|---------------|---------------|
| UL, cUL, CQC | 5 mA | 7 mA | 10 mA |
| SOP-4 | VOM160NT | VOM160PT | VOM160RT |
| VDE, UL, cUL, CQC | 5 mA | 7 mA | 10 mA |
| SOP-4 | VOM160N-X001T | VOM160P-X001T | VOM160R-X001T |

Notes

- For additional information on the available options refer to option information.
- The product is available only on tape and reel.

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | PART | SYMBOL | VALUE | UNIT |
|--------------------------------------|-----------------------------|------|--------------|---------------|--------------------|
| INPUT | | | | | |
| Reverse voltage | | | V_R | 6 | V |
| Forward current | | | I_F | 60 | mA |
| Peak surge current | 100 μs , 200 pps | | I_{FSM} | 0.5 | A |
| Power dissipation | | | P_{diss} | 100 | mW |
| OUTPUT | | | | | |
| Peak off-state voltage | | | V_{DRM} | 600 | V |
| RMS on-state current | | | $I_{T(RMS)}$ | 70 | mA |
| Peak non-repetitive surge current | PW = 100 ms, 120 pps | | I_{TSM} | 1 | A |
| Power dissipation | | | P_{diss} | 200 | mW |
| COUPLER | | | | | |
| Isolation test voltage | $t = 1 \text{ min}$ | | V_{ISO} | 3750 | V_{RMS} |
| Power dissipation | | | P_{tot} | 300 | mW |
| Storage temperature range | | | T_{stg} | - 55 to + 150 | $^{\circ}\text{C}$ |
| Ambient temperature range | | | T_{amb} | - 40 to + 100 | $^{\circ}\text{C}$ |
| Soldering temperature ⁽¹⁾ | | | T_{sld} | 260 | $^{\circ}\text{C}$ |

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) Wave soldering three cycles are allowed. Also refer to "Assembly Instructions" for surface mounted devices (www.vishay.com/doc?80054).

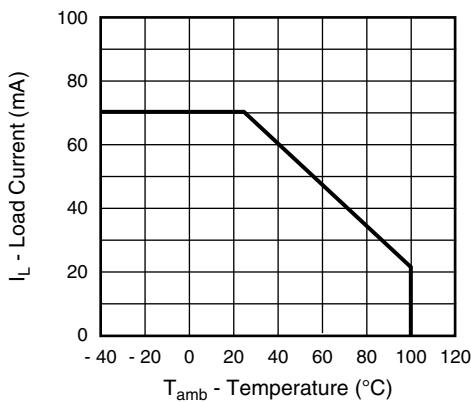


Fig. 1 - Recommended Operating Condition

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

| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|--|--|---------|---------------|------|------|------|------------------------|
| INPUT | | | | | | | |
| Forward voltage | $I_F = 10 \text{ mA}$ | | V_F | | 1.2 | 1.5 | V |
| Reverse current | $V_R = 6 \text{ V}$ | | I_R | | | 10 | μA |
| Input capacitance | $V_F = 0 \text{ V}$, $f = 1 \text{ MHz}$ | | C_I | | 25 | | pF |
| OUTPUT | | | | | | | |
| Off-state current | $V_D = V_{DRM}$ | | I_{DRM} | | | 100 | nA |
| On-state voltage | $I_T = 100 \text{ mA}$ | | V_{TM} | | | 2.8 | V |
| Critical rate of rise off-state voltage | $V_D = 0.67 V_{DRM}$, $T_J = 25 \text{ }^{\circ}\text{C}$ | | dV/dt_{cr} | 500 | | | $\text{V}/\mu\text{s}$ |
| Critical rate of rise of voltage at current commutation | | | dV/dt_{crq} | | 0.13 | | $\text{V}/\mu\text{s}$ |
| COUPLER | | | | | | | |
| LED trigger current, current required to latch output | $V_D = 3 \text{ V}$ | VOM160N | I_{FT} | | | 5 | mA |
| | | VOM160P | I_{FT} | | | 7 | mA |
| | | VOM160R | I_{FT} | | | 10 | mA |
| Capacitance (input - output) | $f = 1 \text{ MHz}$, $V_{IO} = 0 \text{ V}$ | | C_{IO} | | 0.8 | | pF |
| Peak off-state voltage | $I_C = 100 \mu\text{A}$ | | V_{DRM} | 600 | | | V |
| Holding current | | | I_{hold} | | 0.3 | | mA |

Note

- 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.

SAFETY AND INSULATION RATINGS

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|------------|-----------|-----------|------|--------------------|
| Climatic classification (according to IEC 68 part 1) | | | 40/100/21 | | |
| Pollution degree (DIN VDE 0109) | | | 2 | | |
| Comparative tracking index | CTI | 175 | | 399 | |
| Peak transient overvoltage | V_{IOTM} | | | 6000 | V_{peak} |
| Peak insulation voltage | V_{IORM} | | | 707 | V_{peak} |
| Isolation resistance at $T_{amb} = 100 \text{ }^{\circ}\text{C}$, $V_{DC} = 500 \text{ V}$ | R_{IO} | 10^{11} | | | Ω |
| Isolation resistance at $T_{amb} = 25 \text{ }^{\circ}\text{C}$, $V_{DC} = 500 \text{ V}$ | R_{IO} | 10^{12} | | | Ω |
| Safety rating - power rating | P_{SO} | | | 400 | mW |
| Safety rating - input current | I_{SI} | | | 150 | mA |
| Safety rating - temperature | T_{SI} | | | 165 | $^{\circ}\text{C}$ |
| Creepage distance | | 5 | | | mm |
| Clearance distance | | 5 | | | mm |
| Insulation thickness | | 0.4 | | | mm |

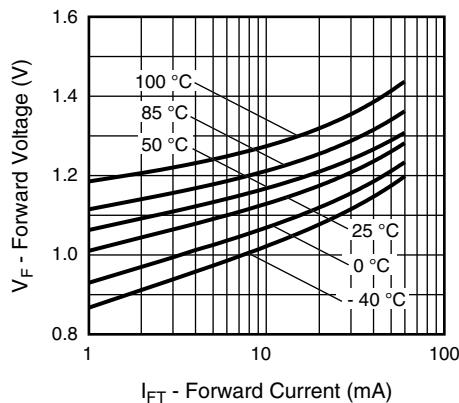
TYPICAL CHARACTERISTICS ($T_{amb} = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 2 - Forward Current vs. Forward Voltage

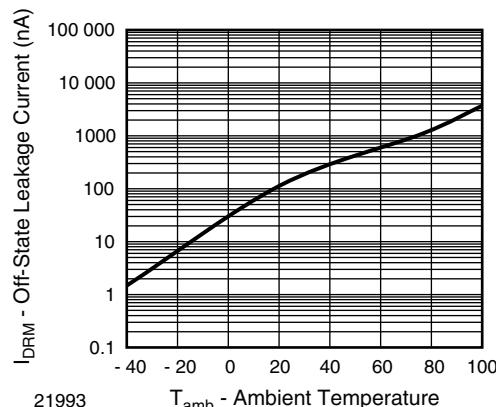


Fig. 5 - Off-State Leakage Current vs. Ambient Temperature

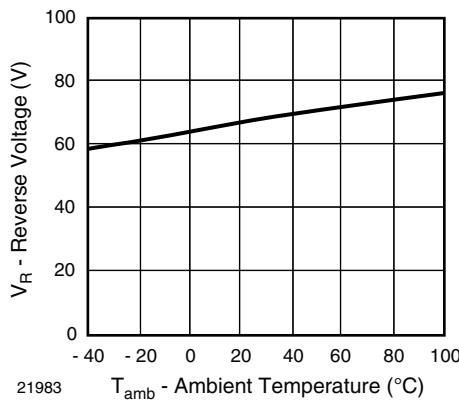


Fig. 3 - Reverse Voltage vs. Ambient Temperature

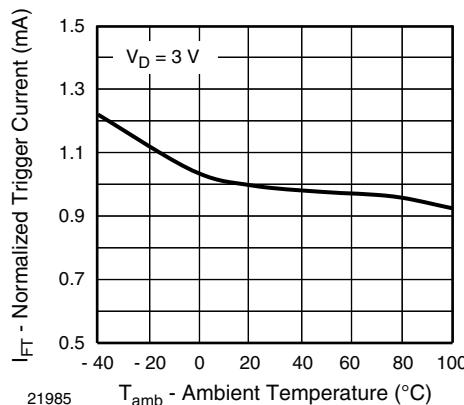


Fig. 6 - Normalized Trigger Current vs. Ambient Temperature

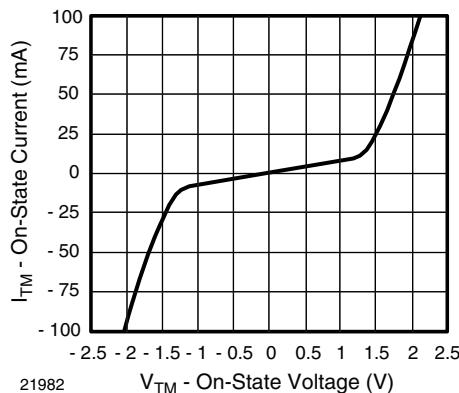


Fig. 4 - On-State Current vs. On-State Voltage

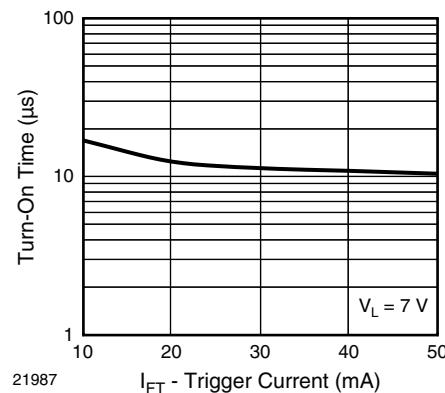


Fig. 7 - Trigger Current vs. Turn-On Time

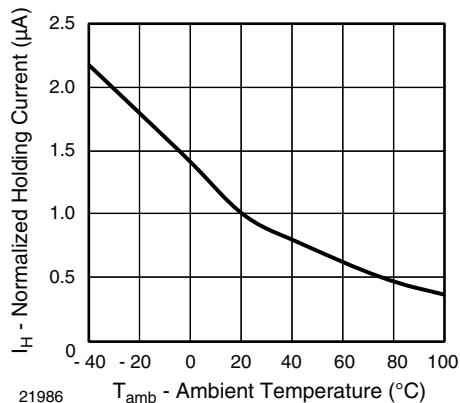


Fig. 8 - Normalized Holding Current vs. Ambient Temperature

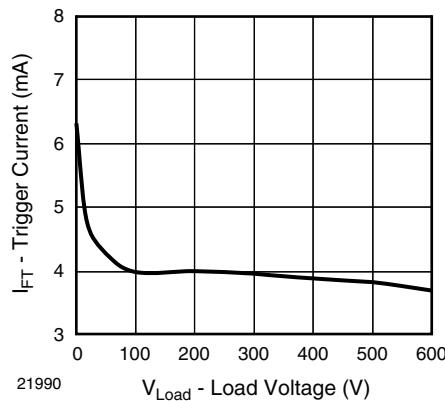


Fig. 11 - Trigger Current vs. Load Voltage

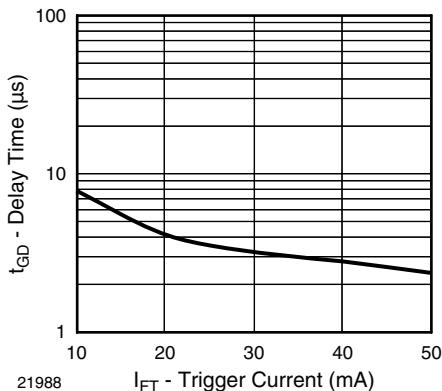


Fig. 9 - Trigger Current vs. Delay Time

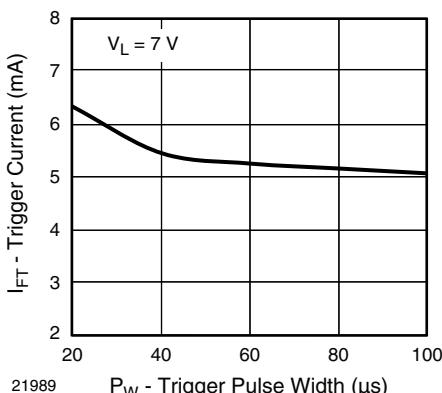
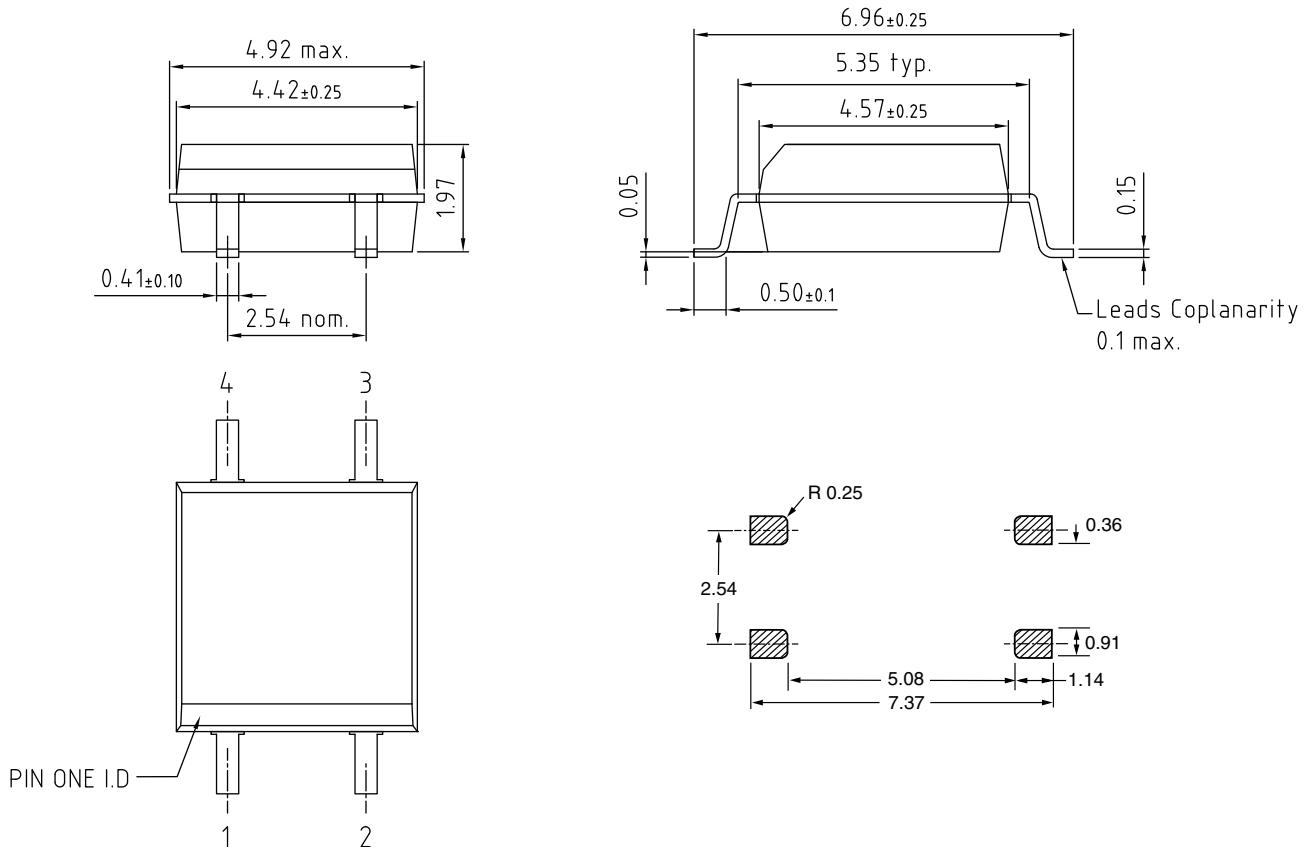
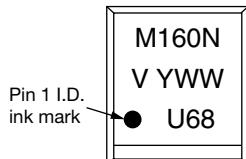


Fig. 10 - Trigger Current vs. Trigger Pulse Width

PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING (example)



TAPE AND REEL PACKAGING

Dimensions in millimeters

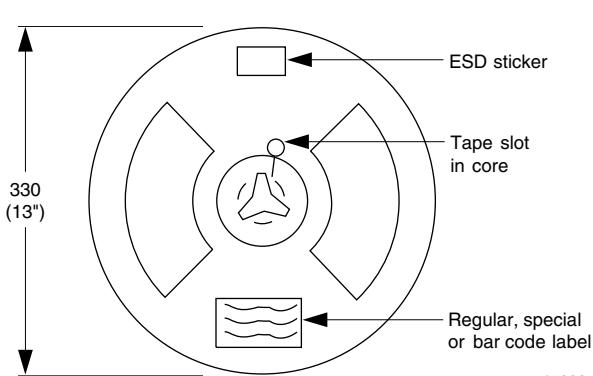


Fig. 12 - Tape and Reel Shipping Medium
(EIA-481, revision A, and IEC 60286), 2000 units per reel

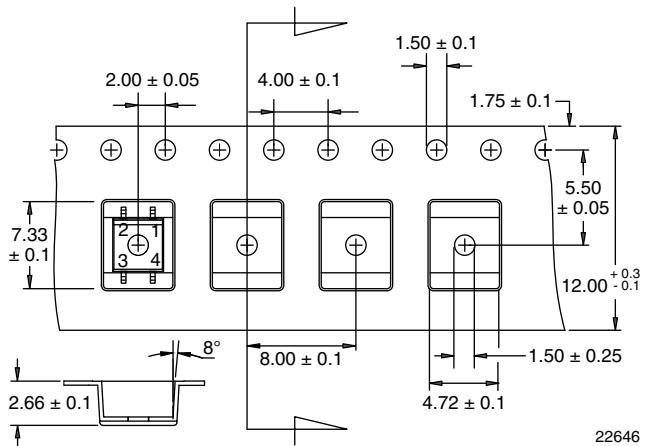


Fig. 13 - Tape Dimensions

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