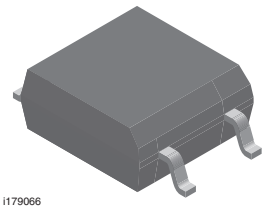
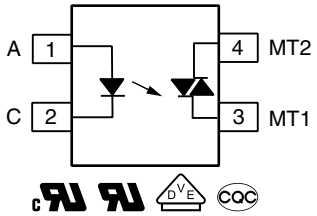
Optocoupler, Phototriac Output, Non-Zero Crossing, 0.5 kV/µs dV/dt, 600 V





FEATURES

- High static dV/dt > 0.5 kV/µs
- Input sensitivity I_{FT} = 5 mA, 7 mA, and 10 mA
- On-state RMS current $I_{T(RMS)}$ = 70 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

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)

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

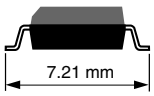
AGENCY APPROVALS

- UL1577, file no. E52744, double protection
- cUL-file no. E52744, equivalent to CSA bulletin 5A
- VDE 0884-5, DIN EN 60747-5-5
- CQC: GB8898, GB4943

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 °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 min		V_{ISO}	3750	V_{RMS}
Power dissipation			P_{tot}	300	mW
Storage temperature range			T_{stg}	- 55 to + 150	°C
Ambient temperature range			T_{amb}	- 40 to + 100	°C
Soldering temperature [1]			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) Wave soldering three cycles are allowed. Also refer to “Assembly Instructions” for surface mounted devices (www.vishay.com/doc?80054).

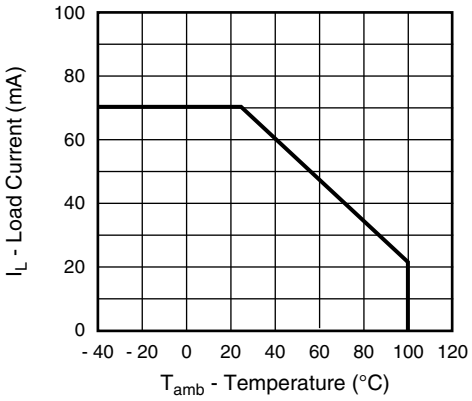


Fig. 1 - Recommended Operating Condition

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT							
Forward voltage	I_F = 10 mA		V_F		1.2	1.5	V
Reverse current	V_R = 6 V		I_R			10	µA
Input capacitance	V_F = 0 V, f = 1 MHz		C_I		25		pF
OUTPUT							
Off-state current	$V_D = V_{DRM}$		I_{DRM}			100	nA
On-state voltage	I_T = 100 mA		V_{TM}			2.8	V
Critical rate of rise off-state voltage	V_D = 0.67 V_{DRM}, T_J = 25 °C		dV/dt_{cr}	500			V/µs
Critical rate of rise of voltage at current commutation			dV/dt_{crq}		0.13		V/µs
COUPLER							
LED trigger current, current required to latch output	V_D = 3 V	VOM160N	I_{FT}			5	mA
		VOM160P	I_{FT}			7	mA
		VOM160R	I_{FT}			10	mA
Capacitance (input - output)	f = 1 MHz, V_{IO} = 0 V		C_{IO}		0.8		pF
Peak off-state voltage	I_C = 100 µA		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 °C, V_{DC} = 500 V	R_{IO}	10^{11}			Ω
Isolation resistance at T_{amb} = 25 °C, V_{DC} = 500 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	°C
Creepage distance		5			mm
Clearance distance		5			mm
Insulation thickness		0.4			mm

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

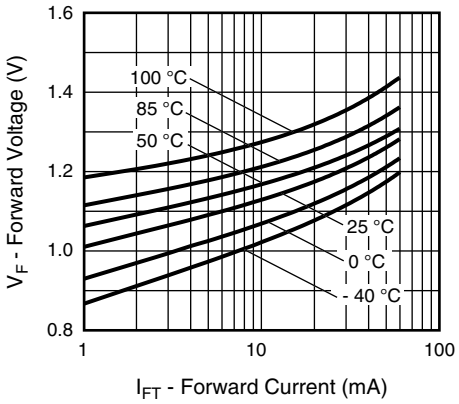


Fig. 2 - Forward Current vs. Forward Voltage

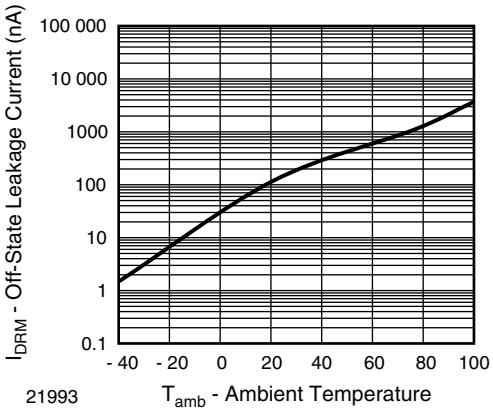


Fig. 5 - Off-State Leakage Current vs. Ambient Temperature

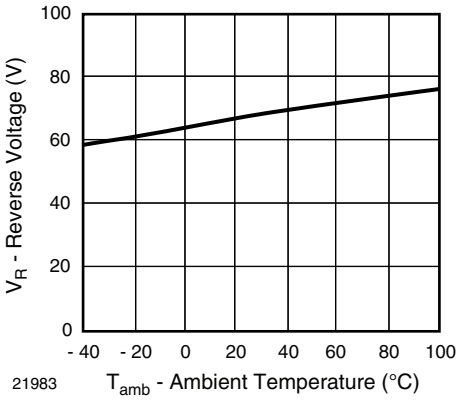


Fig. 3 - Reverse Voltage vs. Ambient Temperature

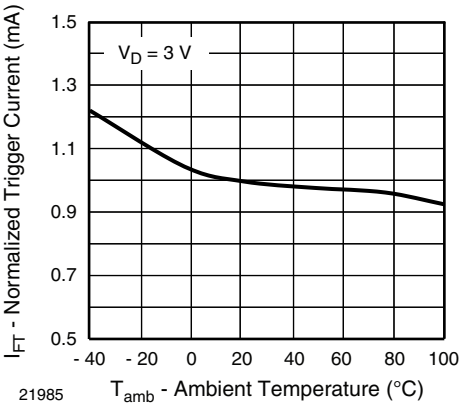


Fig. 6 - Normalized Trigger Current vs. Ambient Temperature

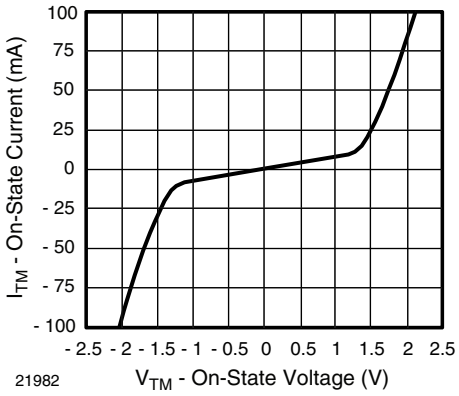


Fig. 4 - On-State Current vs. On-State Voltage

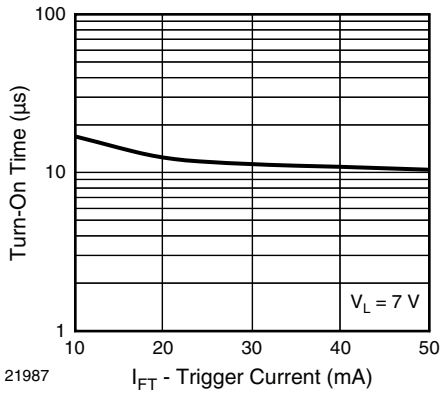


Fig. 7 - Trigger Current vs. Turn-On Time

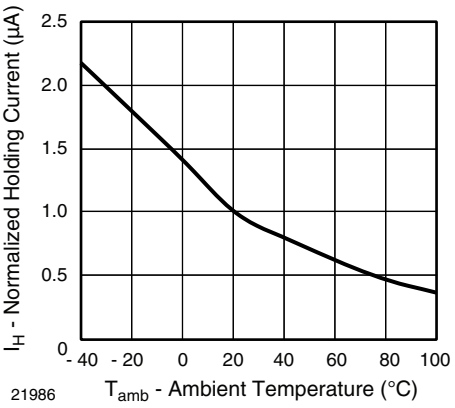


Fig. 8 - Normalized Holding Current vs. Ambient Temperature

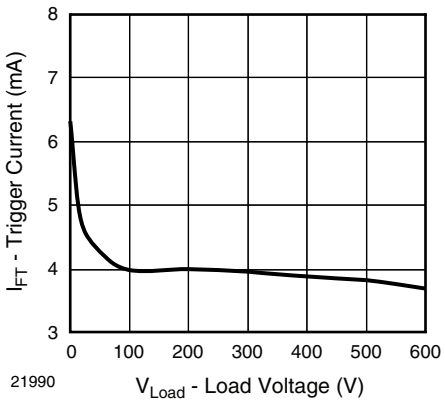


Fig. 11 - Trigger Current vs. Load Voltage

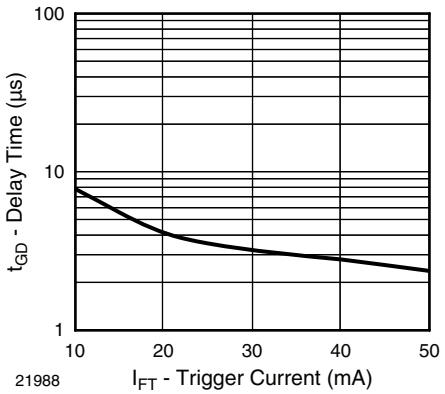


Fig. 9 - Trigger Current vs. Delay Time

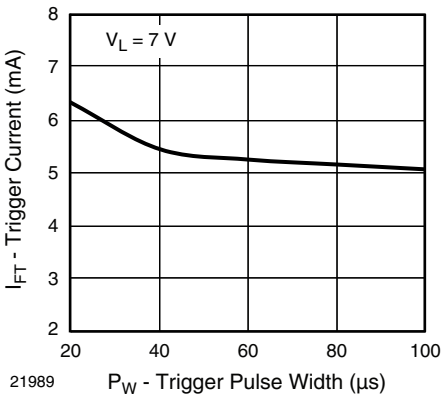
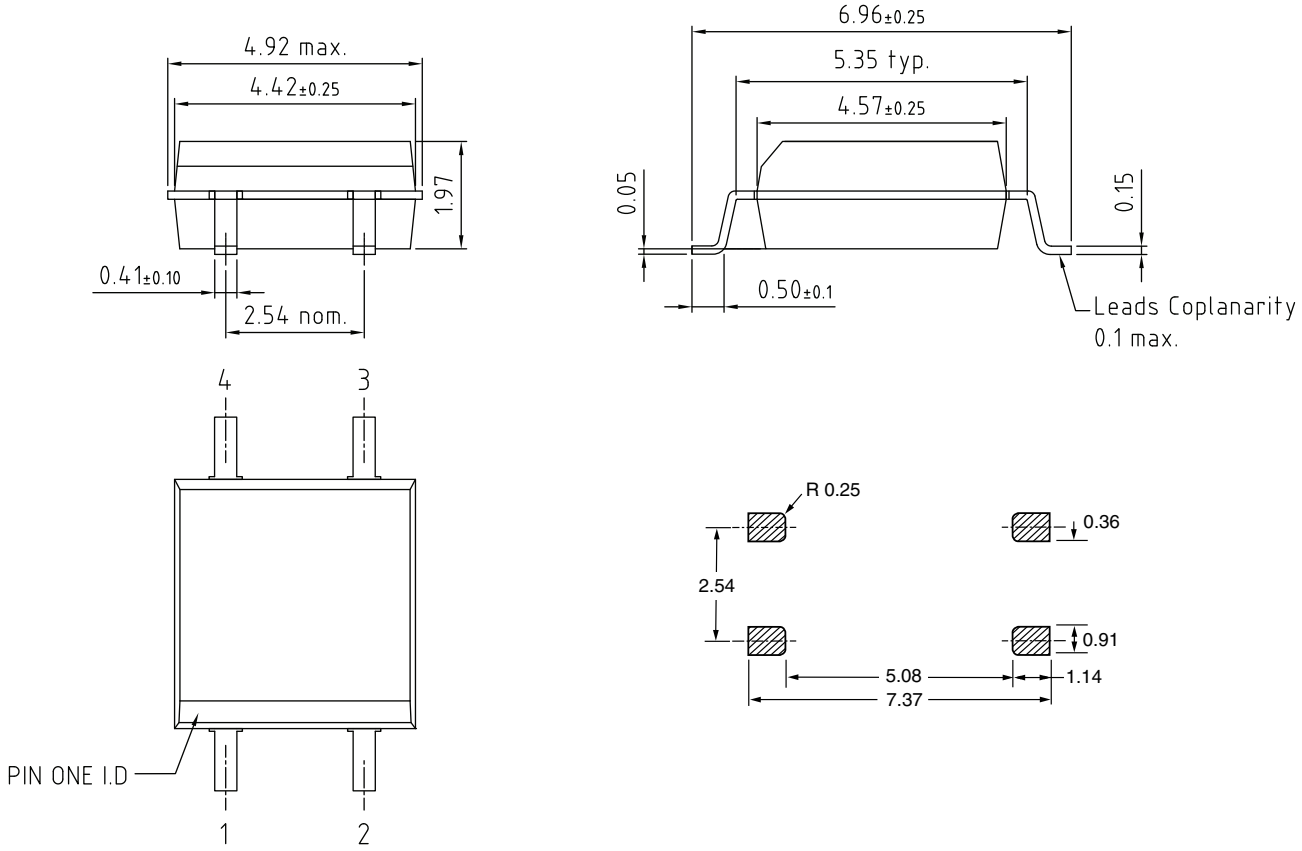
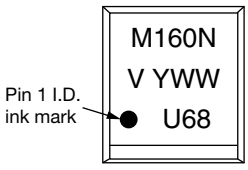


Fig. 10 - Trigger Current vs. Trigger Pulse Width

PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING (example)



TAPE AND REEL PACKAGING

Dimensions in millimeters

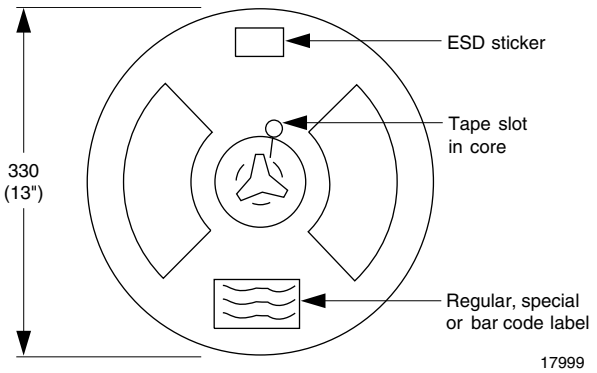


Fig. 12 - Tape and Reel Shipping Medium, 2000 units per reel

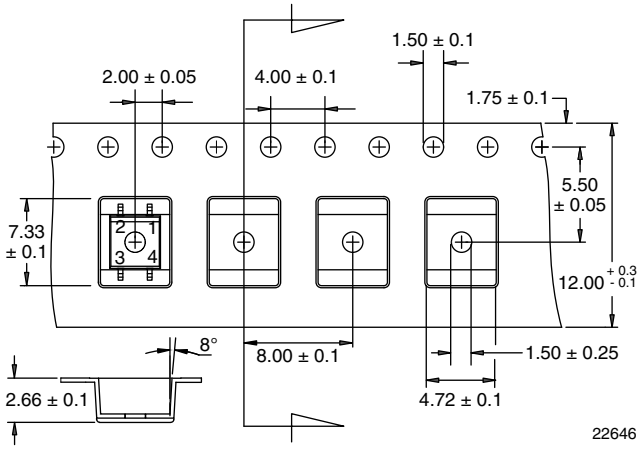


Fig. 13 - Tape Dimensions

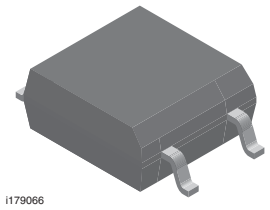
Footprint and Schematic Information for VOM160

The footprint and schematic symbols for the following parts can be accessed using the associated links. They are available in Eagle, Altium, KiCad, OrCAD / Allegro, Pulsonix, and PADS.

Note that the 3D models for these parts can be found on the Vishay product page.

PART NUMBER	FOOTPRINT / SCHEMATIC
VOM160N-X001T	www.snapeda.com/parts/VOM160N-X001T/Vishay/view-part
VOM160NT	www.snapeda.com/parts/VOM160NT/Vishay/view-part
VOM160P-X001T	www.snapeda.com/parts/VOM160P-X001T/Vishay/view-part
VOM160PT	www.snapeda.com/parts/VOM160PT/Vishay/view-part
VOM160R-X001T	www.snapeda.com/parts/VOM160R-X001T/Vishay/view-part
VOM160RT	www.snapeda.com/parts/VOM160RT/Vishay/view-part

For technical issues and product support, please contact optocoupleranswers@vishay.com.



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