

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



I179066



FEATURES

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



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			
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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 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).

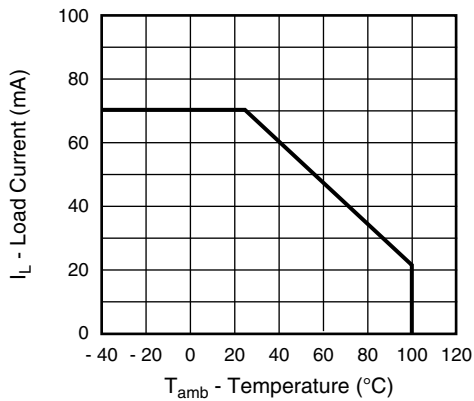


Fig. 1 - Recommended Operating Condition



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			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	$V_D = 3\text{ V}$	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	$I_C = 100\text{ }\mu\text{A}$		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

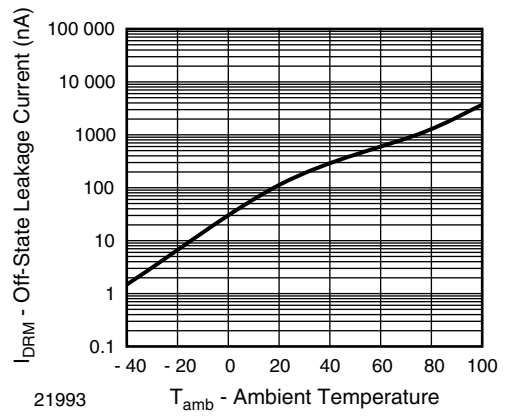


Fig. 5 - Off-State Leakage Current vs. Ambient Temperature

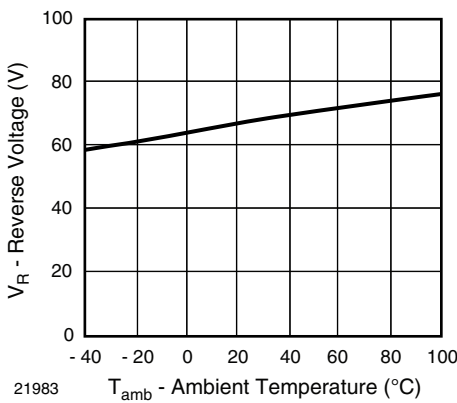


Fig. 3 - Reverse Voltage vs. Ambient Temperature

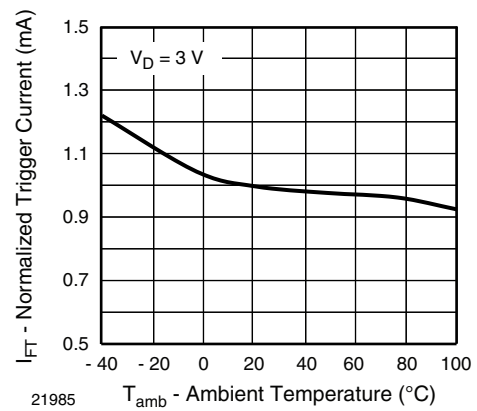


Fig. 6 - Normalized Trigger Current vs. Ambient Temperature



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

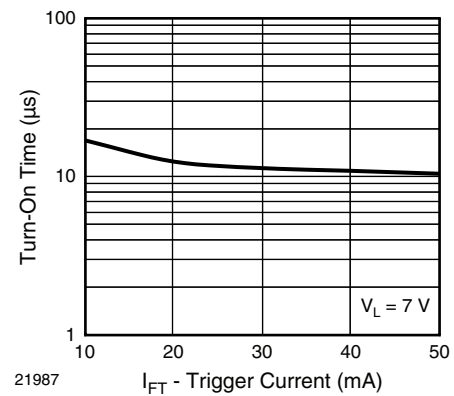


Fig. 7 - Trigger Current vs. Turn-On Time



Fig. 8 - Normalized Holding Current vs. Ambient Temperature

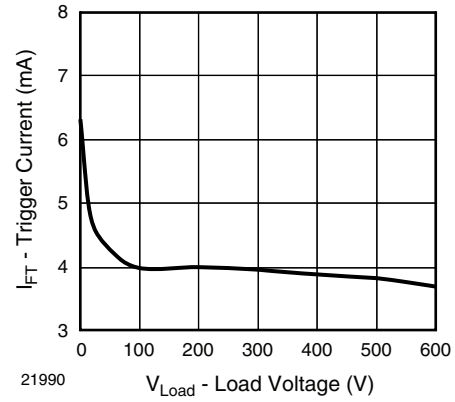


Fig. 11 - Trigger Current vs. Load Voltage



Fig. 9 - Trigger Current vs. Delay Time



Fig. 10 - Trigger Current vs. Trigger Pulse Width



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