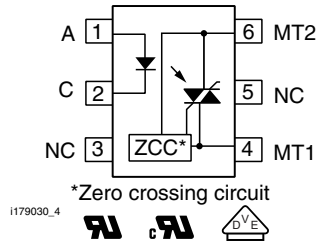


Optocoupler, Phototriac Output, Zero Crossing, High dV/dt, Low Input Current



21842-1



*Zero crossing circuit

DESCRIPTION

The VO4154 and VO4156 consists of a GaAs IRLED optically coupled to a photosensitive 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 phototriac zero crossing family uses a proprietary dV/dt clamp resulting in a static dV/dt of greater than 5 kV/μs.

The VO4154 and VO4156 isolates 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.

FEATURES

- High static dV/dt 5 kV/μs
- High input sensitivity I_{FT} = 1.6 mA, 2 mA, and 3 mA
- 300 mA on-state current
- Zero voltage crossing detector
- 400 V and 600 V blocking voltage
- Isolation test voltage 5300 V_{RMS}
- Compliant to RoHS Directive 2011/65/EU



RoHS COMPLIANT

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 60747-5-2 (VDE 0884) available with option 1

ORDERING INFORMATION						
<div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> VO415#X-X00#T </div>						
PART NUMBER			PACKAGE OPTION		TAPE AND REEL	
AGENCY CERTIFIED/PACKAGE	V _{DRM} 400			V _{DRM} 600		
	TRIGGER CURRENT, I _{FT} (mA)					
UL, cUL	1.6	2	3	1.6	2	3
DIP-6	VO4154D	VO4154H	VO4154M	VO4156D	VO4156H	VO4156M
DIP-6, 400 mil, option 6	VO4154D-X006	VO4154H-X006	VO4154M-X006	VO4156D-X006	VO4156H-X006	VO4156M-X006
SMD-6, option 7	VO4154D-X007T	VO4154H-X007T	VO4154M-X007T	VO4156D-X007T	VO4156H-X007T	VO4156M-X007T



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
Surge current			I _{FSM}	2.5	A
Power dissipation			P _{diss}	100	mW
Derate from 25 °C				1.33	mW/°C
OUTPUT					
Peak off-state voltage		VO4154D/H/M	V _{DRM}	400	V
		VO4156D/H/M	V _{DRM}	600	V
RMS on-state current			I _{TM}	300	mA
Total power dissipation			P _{diss}	500	mW
Derate from 25 °C				6.6	mW/°C
COUPLER					
Isolation test voltage (between emitter and detector, climate per DIN 500414, part 2, Nov. 74)	t = 1 min		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	max. ≤ 10 s dip soldering ≥ 0.5 mm from case bottom		T _{sld}	260	°C

Note

- 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.



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

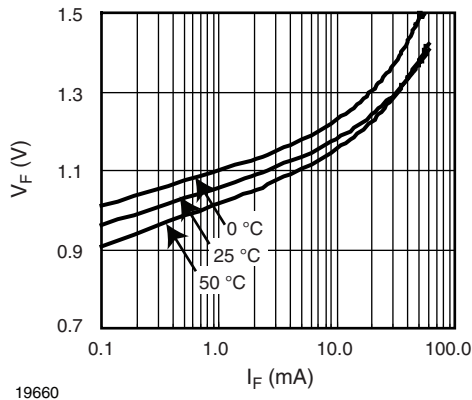
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$, unless otherwise specified)


Fig. 2 - Diode Forward Voltage vs. Forward Current

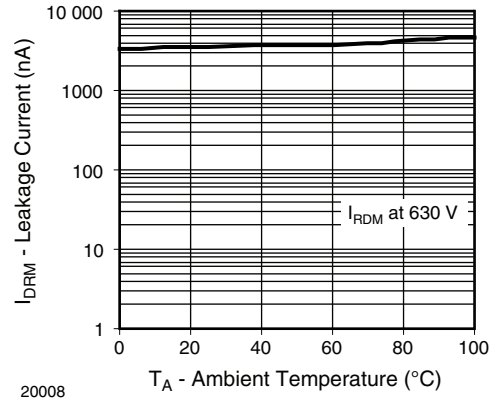


Fig. 4 - Leakage Current vs. Ambient Temperature

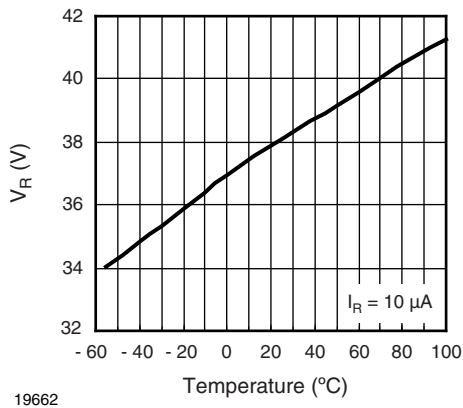


Fig. 3 - Diode Reverse Voltage vs. Temperature

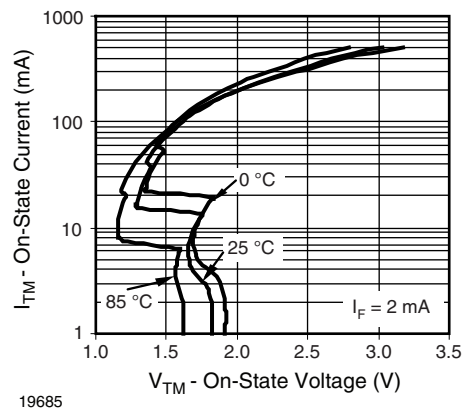
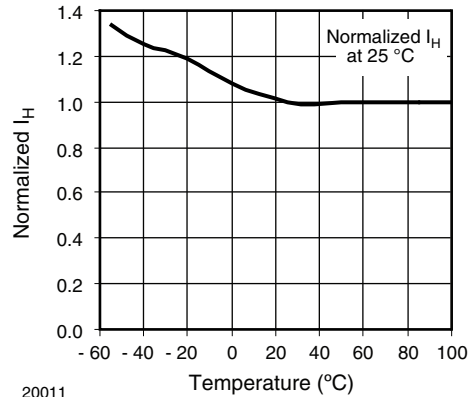


Fig. 5 - On-State Current vs. On-State Voltage



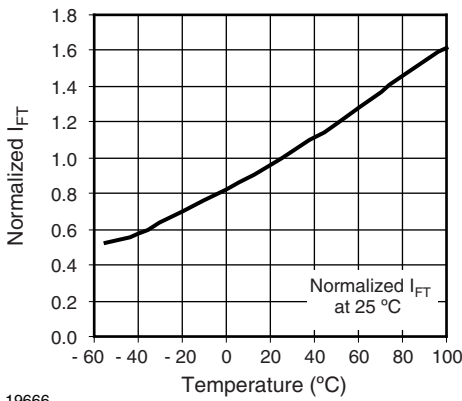
20009

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



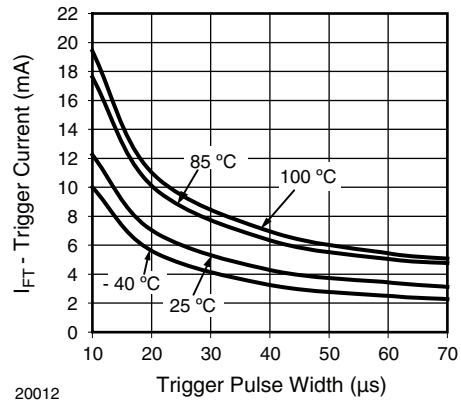
20011

Fig. 9 - Normalized Holding Current vs. Temperature



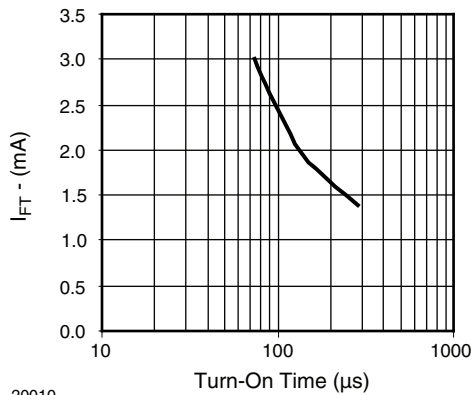
19666

Fig. 7 - Normalized Trigger Input Current vs. Temperature



20012

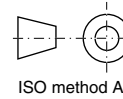
Fig. 10 - I_{FT} vs. LED Pulse Width



20010

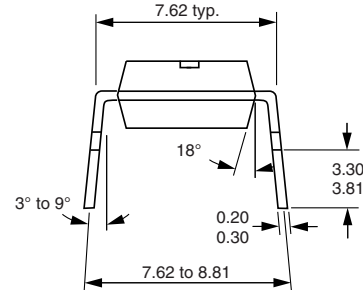
Fig. 8 - I_{FT} (mA) vs. Turn-On Time (μ s)

PACKAGE DIMENSIONS in millimeters



i178014

Option 6

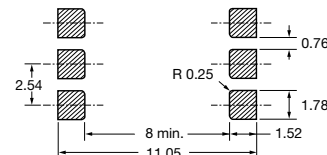
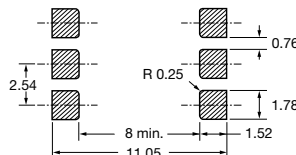
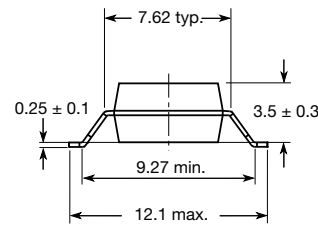


Option 7

Option 8



20802-41



PACKAGE MARKING (example)



Notes

- Only options 1, 7, and 8 are reflected in the package marking.
- The 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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