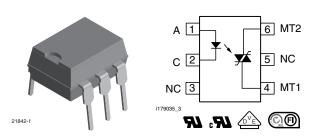


Optocoupler, Phototriac Output, High dV/dt, Low Input Current



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_{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 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_{RMS}
- Material categorization:
 For definitions of compliance please see www.vishav.com/doc?99912





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 60747-5-5 (VDE 0884) available with option 1
- FIMKO: FI25250

ORDERING INFORMATION									
V O 4 2 5 # X - X O O # T PART NUMBER PACKAGE OPTION TAPE AND REEL Option 7 Option 7 Option 7									
AGENCY		V _{DRM} 400		V _{DRM} 600					
CERTIFIED/PACKAGE			RENT, I _{FT} (mA)	T (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	-	-			



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		
Power dissipation			P _{diss}	100	mW		
Derate from 25 °C				1.33	mW/°C		
OUTPUT							
Daals off state valtage		VO4254D/H/M	V_{DRM}	400	V		
Peak off-state voltage		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		
COUPLER							
Isolation test voltage (between emitter and detector, climate per DIN 500414, part 2, Nov. 74)	t = 1 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 (2)	max. ≤ 10 s dip soldering ≥ 0.5 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).

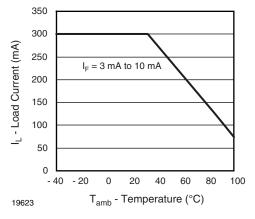


Fig. 1 - Recommended Operating Condition



THERMAL CHARACTERISTICS			
PARAMETER	SYMBOL	VALUE	UNIT
LED power dissipation	P _{diss}	100	mW
Output power dissipation	P _{diss}	500	mW
Maximum LED junction temperature	T _{jmax} .	125	°C
Maximum output die junction temperature	T _{jmax} .	125	°C
Thermal resistance, junction emitter to board	θ_{JEB}	150	°C/W
Thermal resistance, junction emitter to case	θ_{JEC}	139	°C/W
Thermal resistance, junction detector to board	θ_{JDB}	78	°C/W
Thermal resistance, junction detector to case	θ_{JDC}	103	°C/W
Thermal resistance, junction emitter to junction detector	θ_{JED}	496	°C/W
Thermal resistance, case to ambient	$\theta_{\sf CA}$	3563	°C/W

Note

The thermal characteristics table above were measured at 25 °C and the thermal model is represented in the thermal network below. Each
resistance value given in this model can be used to calculate the temperatures at each node for a given operating condition. The thermal
resistance from board to ambient will be dependent on the type of PCB, layout and thickness of copper traces. For a detailed explanation
of the thermal model, please reference Vishay's Thermal Characteristics of Optocouplers application note.

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	1.4	V	
Reverse current	V _R = 6 V		I _R		0.1	10	μA	
Input capacitance	V _F = 0 V, f = 1 MHz		CI		40		pF	
OUTPUT								
Repetitive peak off-state voltage	I _{DRM} = 100 μA	VO4254D/H/M	V_{DRM}	400			V	
		VO4256D/H/M	V_{DRM}	600			V	
Off-state current	$V_D = V_{DRM}$		I _{DRM}			100	μΑ	
On-state voltage	I _T = 300 mA		V_{TM}			3	V	
On-current	PF = 1, V _{T(RMS)} = 1.7 V		I _{TM}			300	mA	
Critical rate of rise of off-state voltage	V _D = 0.67 V _{DRM} , T _J = 25 °C		dV/dt _{cr}	5000			V/µs	
COUPLER								
	V _D = 3 V	VO4254D	I _{FT}			1.6	mA	
LED trigger current, current required to latch output		VO4254H	I _{FT}			2	mA	
		VO4254M	I _{FT}			3	mA	
		VO4256D	I _{FT}			1.6	mA	
		VO4256H	I _{FT}			2	mA	
		VO4256M	I _{FT}			3	mA	
Capacitance (input to output)	f = 1 MHz, V _{IO} = 0 V		C _{IO}		0.8		pF	

Note

Minimum and maximum values were tested requierements. Typical values are characteristics of the device and are the result of engineering
evaluation. Typical values are for information only and are not part of the testing requirements.



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 °C, unless otherwise specified)

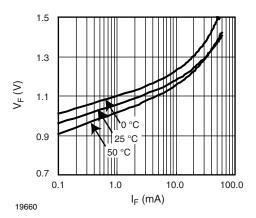


Fig. 2 - Diode Forward Voltage vs. Forward Current

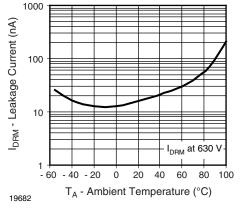


Fig. 4 - Leakage Current vs. Ambient Temperature

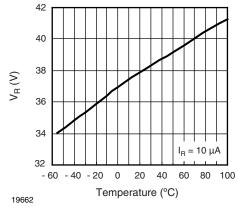


Fig. 3 - Diode Reverse Voltage vs. Temperature

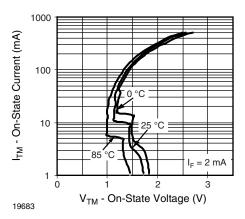


Fig. 5 - On-State Current vs. On-State Voltage



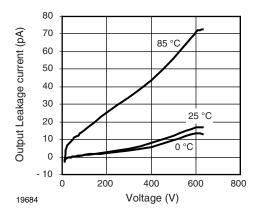


Fig. 6 - Output Off Current (Leakage) vs. Voltage

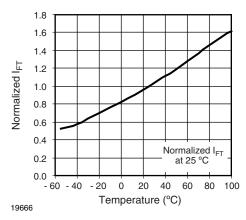


Fig. 7 - Normalized Trigger Input Current vs. Temperature

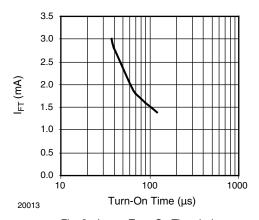


Fig. 8 - I_{FT} vs. Turn-On Time (µs)

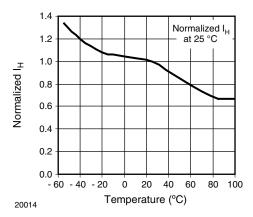


Fig. 9 - Normalized I_H vs. Temperature

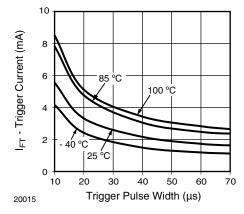
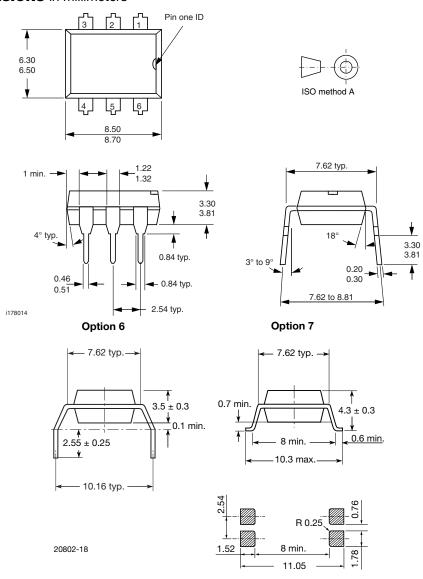


Fig. 10 - I_{FT} vs. LED Pulse Width

ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000



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.

Legal Disclaimer Notice



Vishay

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