



Triac Driver Output (400 Volts) Type Photocoupler

MOC3020 / MOC3021 / MOC3022 / MOC3023
Series

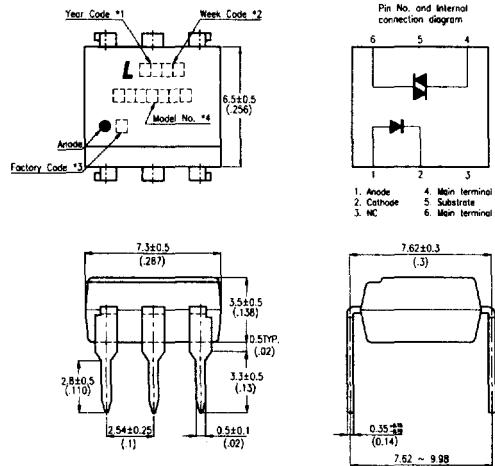
Features

- Isolation voltage between input and output
Viso : 5,000Vrms
- 6pin DIP photocoupler, triac driver output
- High repetitive peak off-state voltage V_{DRM} : Min. 400V
- High critical rate of rise of off-state voltage
(dV/dt : MIN. 100V / μs)
- UL approved (No. E113898)
- VDE approve in progress
- FIMKO approved (No. 209049)
- SEMKO approved (No. 9943380/01-20)
- NEMKO approved (No. P99102464)
- DEMKO approved (No. 99-04182)
- CSA approve in progress
- Options Available :
 - Leads with 0.4" (10.16mm) Spacing (M Type)
 - Lead Bends for Surface Mounting (S Type)
 - Tape and Reel of Type I for SMD (Add "-TA" Suffix)
 - Tape and Reel of Type II for SMD (Add "-TA1" Suffix)
 - VDE 0884 Approvals (Add "-V" Suffix)

Applications

1. Solenoid / Valve Controls
2. Lamp Ballasts
3. Interfacing Microprocessors to 115Vac Peripherals
4. Motor Controls
5. Static ac Power Switch
6. Solid State Relays
7. Incandescent Lamp Dimmers

Package Dimensions



NOTES :

1. Year date code.
2. 2-digit work week.
3. Factory code shall be marked
(Z : Taiwan, Y : Thailand).
4. Model No.: MOC3020 ; MOC3021 ;
MOC3022 ; MOC3023
5. All dimensions are in millimeters (inches).
6. Tolerance is $\pm 0.25\text{mm}$ (.010") unless otherwise noted.
7. Specifications are subject to change without notice.

Ordering Information

Part Number	Package	Safety Standard Approval	Application part number	
MOC3020 MOC3020M MOC3020S MOC3020-TA MOC3020S-TA1	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)	<ul style="list-style-type: none"> • UL approved • FIMKO approved • SEMKO approved • NEMKO approved • DEMKO approved • CSA approve in progress 	MOC3020	
MOC3021 MOC3021M MOC3021S MOC3021S-TA MOC3021S-TA1	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)		MOC3021	
MOC3022 MOC3022M MOC3022S MOC3022S-TA MOC3022S-TA1	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)		MOC3022	
MOC3023 MOC3023M MOC3023S MOC3023S-TA MOC3023S-TA1	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)		MOC3023	
MOC3020-V MOC3020M-V MOC3020S-V MOC3020STA-V MOC3020STA1-V	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)		<ul style="list-style-type: none"> • VDE approve in progress 	MOC3020
MOC3021-V MOC3021M-V MOC3021S-V MOC3021STA-V MOC3021STA1-V	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)			MOC3021
MOC3022-V MOC3022M-V MOC3022S-V MOC3022STA-V MOC3022STA1-V	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)			MOC3022
MOC3023-V MOC3023M-V MOC3023S-V MOC3023STA-V MOC3023STA1-V	6-pin DIP 6-pin (leads with 0.4" spacing) 6-pin (lead bends for surface mount) 6-pin (tape and reel packaging of type I) 6-pin (tape and reel packaging of type II)			MOC3023

Ratings and Characteristics

Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I _F	50	mA
	Reverse Voltage	V _R	6	V
	Power Dissipation	P _D	70	mW
Output	Collector-Emitter Voltage	V _{DRM}	400	V
	Peak Repetitive Surge current (PW=1ms, 120pps)	V _{TSM}	1	A
	Collector Power Dissipation	P _C	300	mW
Total Power Dissipation		P _{tot}	330	mW
*1. Isolation Voltage		V _{iso}	5,000	V _{rms}
Operating Temperature		T _{opr}	-40~+100	°C
Storage Temperature		T _{stg}	-55~+150	°C
*2. Soldering Temperature		T _{sol}	260	°C

*1. AC for 1 minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

- (1) Short between anode and cathode on the primary side and between collector and emitter on the secondary side.
- (2) The isolation voltage tester with zero-cross circuit shall be used.
- (3) The waveform of applied voltage shall be a sine wave.

*2. For 10 seconds

Electrical / Optical Characteristics

(Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit.	Conditions
Input	Forward Voltage	V _F	—	1.15	1.5	V	I _F =10mA
	Reverse Current	I _R	—	—	10	μA	V _R =6V
Output	*1 Peak Blocking Current, Either Direction	I _{DRM}	—	10	100	nA	V _{DRM} =400V
	Peak On-State Voltage, Either Direction	V _{TM}	—	1.7	3	V	I _C =0.1mA I _F =0
	*2 Critical rate of Rise of Off-State Voltage	dv/dt	100	—	—	V/μS	I _E =10 μA I _F =0
Coupled	*3 Led Trigger Current, Current Required to Latch Output, Either Direction	MOC3020	—	15	30	mA	Main Terminal Voltage = 3V
		MOC3021	—	8	15		
		MOC3022	—	—	10		
		MOC3023	—	—	5		
	Holding Current, Either Direction	I _H	100	—	—	μA	
Turn-On time		t _{on}	—	80	200	μS	V _D =6V, I _F =20mA R _L =100 Ω

*1 Test voltage must be applied within dv/dt rating.

*2 This is static dv/dt. Commutating dv/dt is a function of the load-driving thyristor(s) only.

*3 All devices are guaranteed to trigger at an I_F value less than or equal to max. I_{FT}. Therefore, recommended operating I_F lies between max I_{FT} and absolute max I_F (50mA)

Typical Electrical/Optical Characteristic Curves (25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Forward Current vs. Ambient Temperature

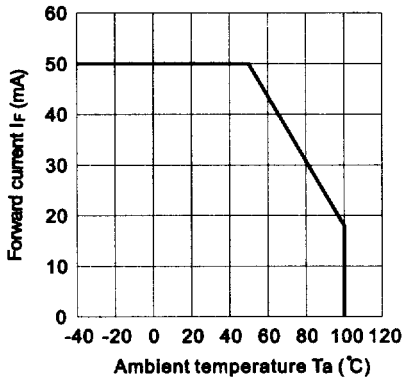


Fig.2 On-state Current vs. Ambient Temperature

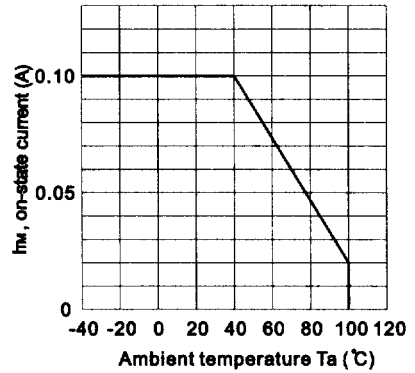


Fig.3 Minimum Trigger Current vs. Ambient Temperature

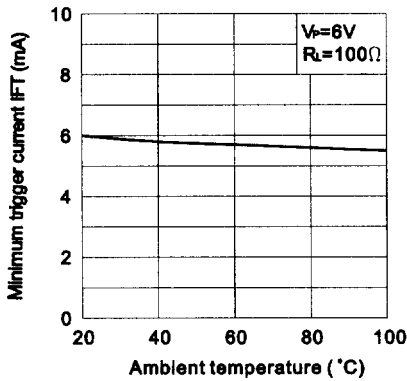


Fig.4 Forward Current vs. Forward Voltage

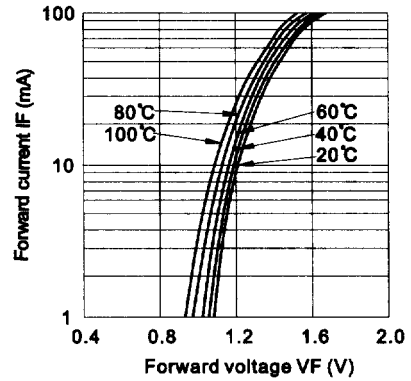


Fig.5 On-state Voltage vs. Ambient Temperature

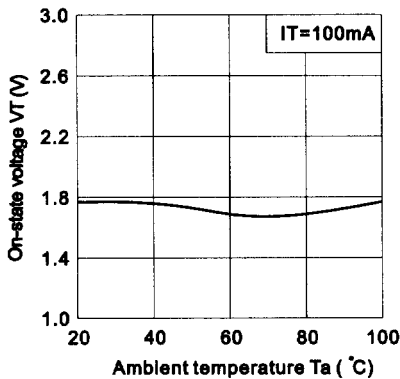
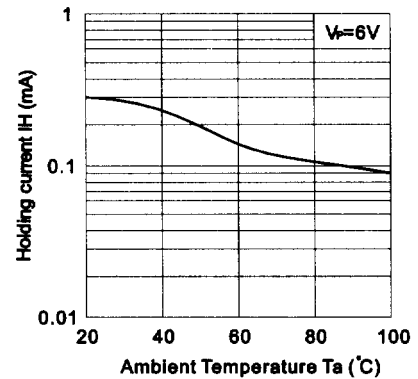


Fig.6 Holding Current vs. Ambient Temperature



PHOTOCOUPLER

Fig.7 Turn-on Time vs. Forward Current

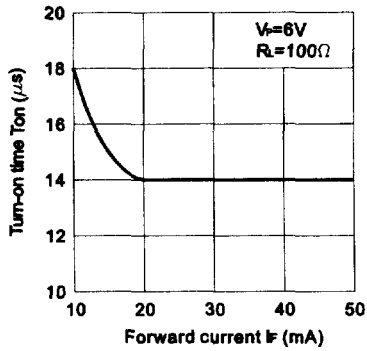


Fig.8 Repetitive Peak Off-state Current vs. Temperature

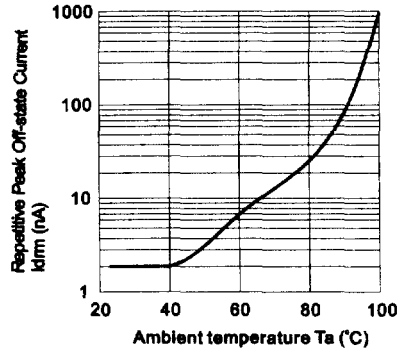
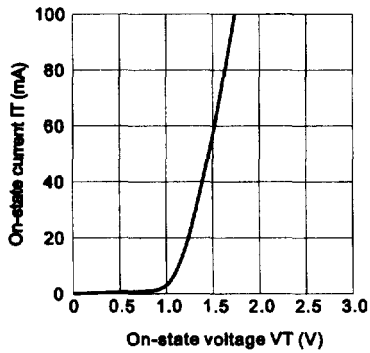


Fig.9 On-state Current vs. On-state Voltage



**Basic Operation Circuit
Medium/High Power Triac Drive Circuit**

