



Triac Driver Output (400 Volts) Type Photocoupler

MOC3020 / MOC3021 / MOC3022 / MOC3023
Series

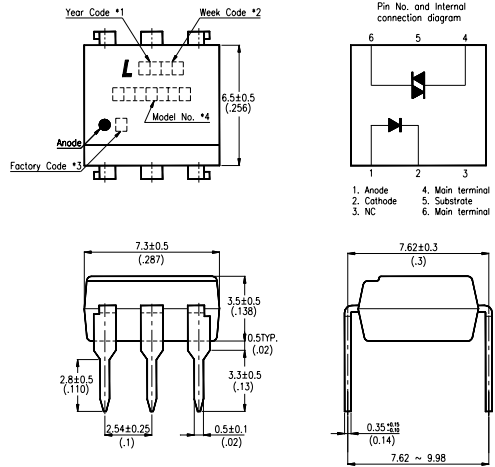
Features

- 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 / μ s)
- 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 ± 0.25 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

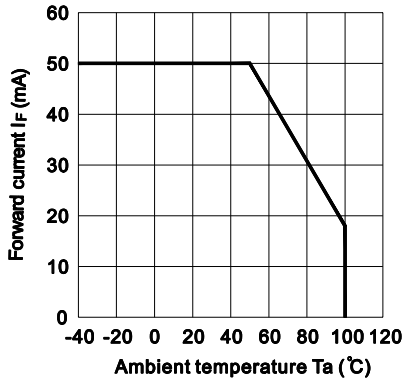


Fig.2 On-state Current vs. Ambient Temperature

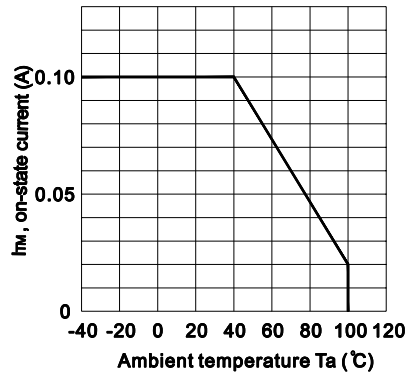


Fig.3 Minimum Trigger Current vs. Ambient Temperature

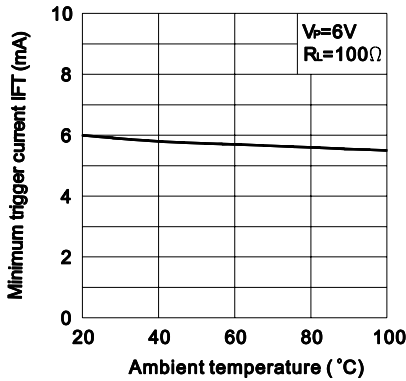


Fig.4 Forward Current vs. Forward Voltage

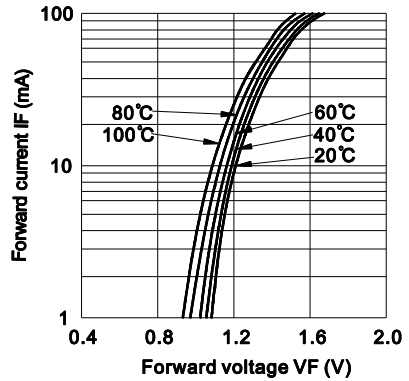


Fig.5 On-state Voltage vs. Ambient Temperature

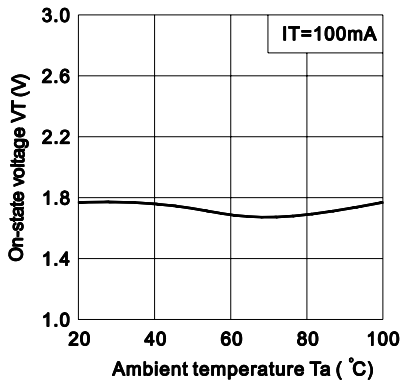
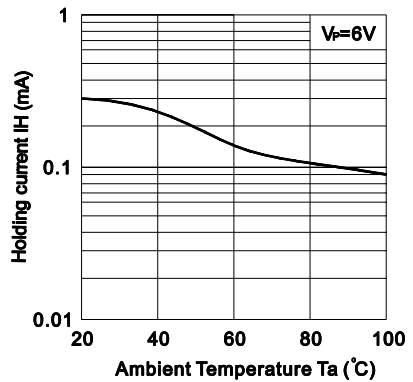


Fig.6 Holding Current vs. Ambient Temperature



PHOTOCOUPLER

Fig.7 Turn-on Time vs. Forward Current

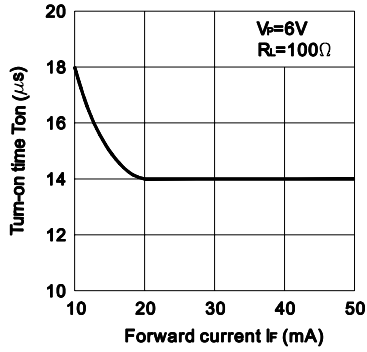


Fig.8 Repetitive Peak Off-state Current vs. Temperature

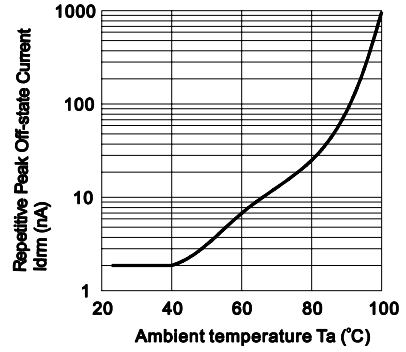
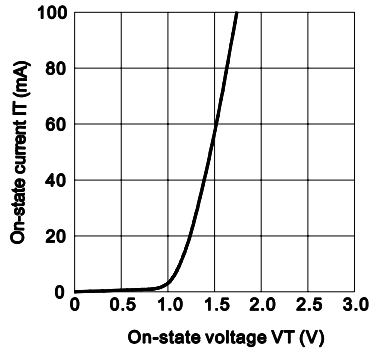


Fig.9 On-state Current vs. On-state Voltage



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

