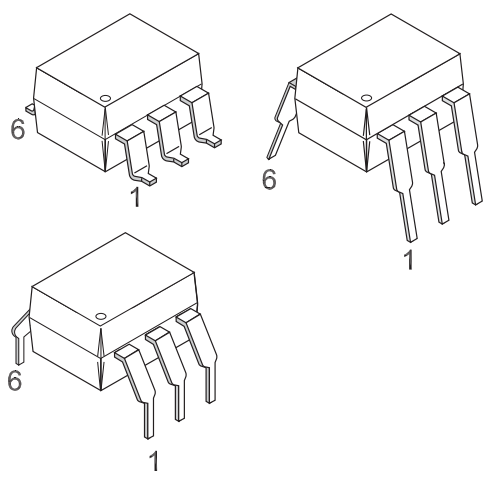
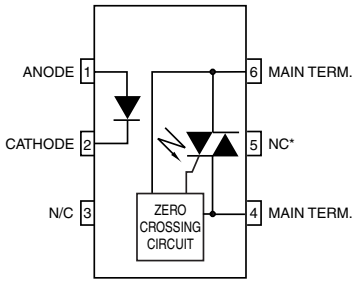
6-PIN DIP ZERO-CROSS OPTOISOLATORS TRIAC DRIVER OUTPUT (800 VOLT PEAK)

MOC3081M **MOC3082M** **MOC3083M**

PACKAGE



SCHEMATIC



DESCRIPTION

The MOC3081M, MOC3082M and MOC3083M devices consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon detector performing the function of a zero voltage crossing bilateral triac driver.

They are designed for use with a discrete power triac in the interface of logic systems to equipment powered from 240 VAC lines, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances, etc.

FEATURES

- Underwriters Laboratories (UL) recognized - file #E90700, Volume 2
- VDE recognized - file #102497 - add option V (e.g., MOC3083VM)
- Simplifies logic control of 240 VAC power
- Zero voltage crossing
- dv/dt of 1500 V/µs typical, 600 V/µs guaranteed
- Compatible with Fairchild's FKPF12N80 discrete power triac

APPLICATIONS

- Solenoid/valve controls
- Lighting controls
- Static power switches
- AC motor drives
- Temperature controls
- E.M. contactors
- AC motor starters
- Solid state relays

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameters	Symbol	Value	Units
TOTAL DEVICE			
Storage Temperature	T_{STG}	-40 to +150	°C
Operating Temperature	T_{OPR}	-40 to +85	°C
Lead Solder Temperature	T_{SOL}	260 for 10 sec	°C
Junction Temperature Range	T_J	-40 to +100	°C
Isolation Surge Voltage(4) (peak AC voltage, 60Hz, 1 sec duration)	V_{ISO}	7500	Vac(pk)
Total Device Power Dissipation @ 25°C	P_D	250	mW
Derate above 25°C		2.94	mW/°C
EMITTER			
Continuous Forward Current	I_F	60	mA
Reverse Voltage	V_R	6	V
Total Power Dissipation 25°C Ambient	P_D	120	mW
Derate above 25°C		1.41	mW/°C
DETECTOR			
Off-State Output Terminal Voltage	V_{DRM}	800	V
Peak Repetitive Surge Current (PW = 100 µs, 120 pps)	I_{TSM}	1	A
Total Power Dissipation @ 25°C Ambient	P_D	150	mW
Derate above 25°C		1.76	mW/°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise specified)

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameters	Test Conditions	Symbol	Min	Typ*	Max	Units
EMITTER						
Input Forward Voltage	I_F = 30 mA	V_F		1.3	1.5	V
Reverse Leakage Current	V_R = 6 V	I_R		0.005	100	µA
DETECTOR						
Peak Blocking Current, Either Direction	V_{DRM} = 800V, I_F = 0 (note 1)	I_{DRM1}		10	500	nA
Critical Rate of Rise of Off-State Voltage	I_F = 0 (figure 9, note 3)	dv/dt	600	1500		V/µs

TRANSFER CHARACTERISTICS (T_A = 25°C Unless otherwise specified.)

DC Characteristics	Test Conditions	Symbol	Device	Min	Typ*	Max	Units
LED Trigger Current	Main Terminal Voltage = 3V (note 2)	I_{FT}	MOC3081M			15	mA
			MOC3082M			10	
			MOC3083M			5	
Peak On-State Voltage, Either Direction	I_{TM} = 100 mA peak, I_F = rated I_{FT}	V_{TM}	All		1.8	3	V
Holding Current, Either Direction		I_H	All		500		µA

ZERO CROSSING CHARACTERISTICS (T_A = 25°C Unless otherwise specified.)

DC Characteristics	Test Conditions	Symbol	Device	Min	Typ*	Max	Units
Inhibit Voltage (MT1-MT2 voltage above which device will not trigger)	I_F = Rated I_{FT}	V_{INH}	All		12	20	V
Leakage in Inhibited State	I_F = Rated I_{FT}, V_{DRM} = 800V, off state	I_{DRM2}	All		200	500	µA

ISOLATION CHARACTERISTICS

Characteristics	Test Conditions	Symbol	Min	Typ*	Max	Units
Input-Output Isolation Voltage	f = 60 Hz, t = 1 sec (note 4)	V_{ISO}	7500			Vac(pk)

*Typical values at T_A = 25°C

Note
1. Test voltage must be applied within dv/dt rating.
2. 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} (15 mA for MOC3081M, 10 mA for MOC3082M, 5 mA for MOC3083M) and absolute max I_F (60 mA).
3. This is static dv/dt. See Figure 9 for test circuit. Commutating dv/dt is a function of the load-driving thyristor(s) only.
4. Isolation surge voltage, V_{ISO}, is an internal device dielectric breakdown rating. For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.

Figure 1. LED Forward Voltage vs. Forward Current

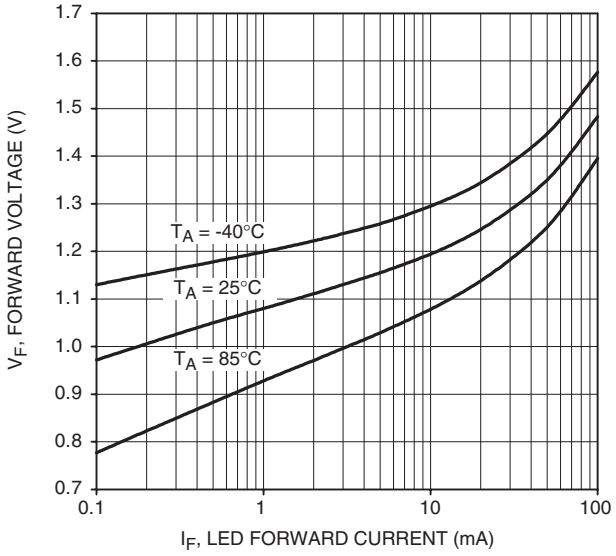


Figure 2. Trigger Current Vs. Temperature

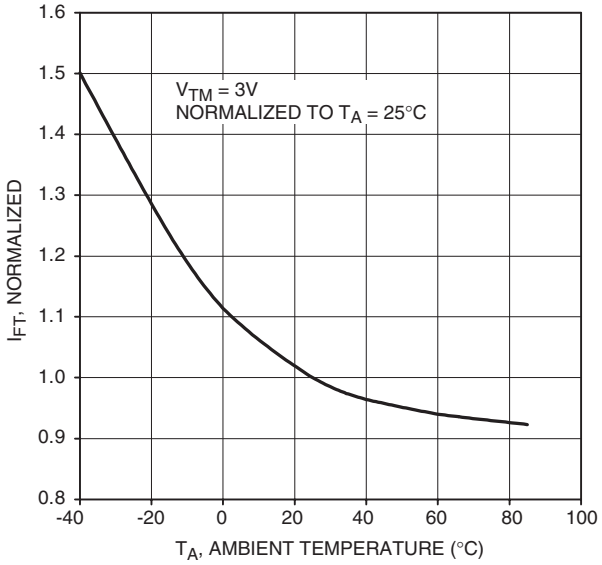


Figure 3. LED Current Required to Trigger vs. LED Pulse Width

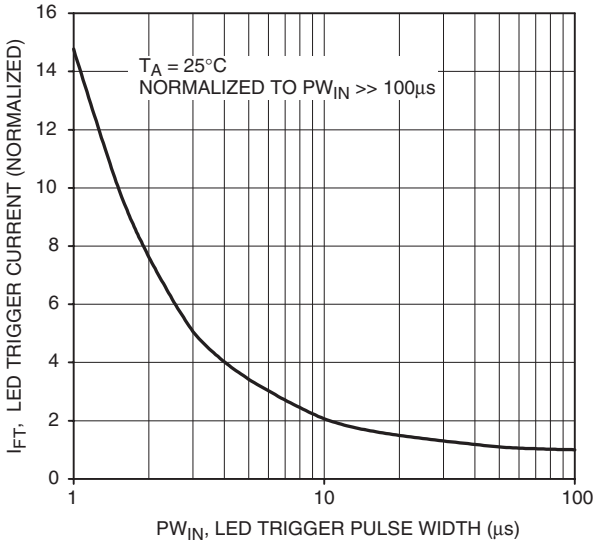


Figure 4. Leakage Current, I_{DRM} vs. Temperature