



# 6-Pin DIP Zero-Cross Optoisolators Triac Driver Output (400 Volts Peak)

The MOC3041, MOC3042 and MOC3043 devices consist of gallium arsenide infrared emitting diodes 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 triac in the interface of logic systems to equipment powered from 115 Vac lines, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances, etc.

- Simplifies Logic Control of 115 Vac Power
- Zero Voltage Crossing
- dv/dt of 2000 V/μs Typical, 1000 V/μs Guaranteed
- **To order devices that are tested and marked per VDE 0884 requirements, the suffix "V" must be included at end of part number. VDE 0884 is a test option.**

### Recommended for 115/240 Vac(rms) Applications:

- Solenoid/Valve Controls
- Lighting Controls
- Static Power Switches
- AC Motor Drives
- Temperature Controls
- E.M. Contactors
- AC Motor Starters
- Solid State Relays

### MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
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#### INFRARED EMITTING DIODE

Reverse Voltage	V <sub>R</sub>	6	Volts
Forward Current — Continuous	I <sub>F</sub>	60	mA
Total Power Dissipation @ T <sub>A</sub> = 25°C Negligible Power in Output Driver Derate above 25°C	P <sub>D</sub>	120	mW
		1.41	mW/°C

#### OUTPUT DRIVER

Off-State Output Terminal Voltage	V <sub>DRM</sub>	400	Volts
Peak Repetitive Surge Current (PW = 100 μs, 120 pps)	I <sub>TSM</sub>	1	A
Total Power Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	150	mW
		1.76	mW/°C

#### TOTAL DEVICE

Isolation Surge Voltage <sup>(1)</sup> (Peak ac Voltage, 60 Hz, 1 Second Duration)	V <sub>ISO</sub>	7500	Vac(pk)
Total Power Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	250	mW
		2.94	mW/°C
Junction Temperature Range	T <sub>J</sub>	-40 to +100	°C
Ambient Operating Temperature Range <sup>(2)</sup>	T <sub>A</sub>	-40 to +85	°C
Storage Temperature Range <sup>(2)</sup>	T <sub>stg</sub>	-40 to +150	°C
Soldering Temperature (10 s)	T <sub>L</sub>	260	°C

1. Isolation surge voltage, V<sub>ISO</sub>, is an internal device dielectric breakdown rating.

For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.

2. Refer to Quality and Reliability Section in Opto Data Book for information on test conditions.

Preferred devices are Motorola recommended choices for future use and best overall value.

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**(Replaces MOC3040/D)**

**MOC3041**

[IFT = 15 mA Max]

**MOC3042**

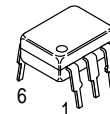
[IFT = 10 mA Max]

**MOC3043\***

[IFT = 5 mA Max]

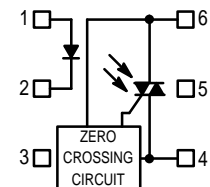
\*Motorola Preferred Device

### STYLE 6 PLASTIC



STANDARD THRU HOLE  
CASE 730A-04

### COUPLER SCHEMATIC



1. ANODE
2. CATHODE
3. NC
4. MAIN TERMINAL
5. SUBSTRATE  
DO NOT CONNECT
6. MAIN TERMINAL

# MOC3041 MOC3042 MOC3043

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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### INPUT LED

Reverse Leakage Current (V <sub>R</sub> = 6 V)	I <sub>R</sub>	—	0.05	100	μA
Forward Voltage (I <sub>F</sub> = 30 mA)	V <sub>F</sub>	—	1.3	1.5	Volts

### OUTPUT DETECTOR (I<sub>F</sub> = 0 unless otherwise noted)

Leakage with LED Off, Either Direction (Rated V <sub>DRM</sub> <sup>(1)</sup> )	I <sub>DRM1</sub>	—	2	100	nA
Peak On-State Voltage, Either Direction (I <sub>TM</sub> = 100 mA Peak)	V <sub>TM</sub>	—	1.8	3	Volts
Critical Rate of Rise of Off-State Voltage <sup>(3)</sup>	dv/dt	1000	2000	—	V/μs

### COUPLED

LED Trigger Current, Current Required to Latch Output (Main Terminal Voltage = 3 V <sup>(2)</sup> )	I <sub>FT</sub>				mA
		MOC3041	—	—	15
		MOC3042	—	—	10
		MOC3043	—	—	5
Holding Current, Either Direction	I <sub>H</sub>	—	250	—	μA
Isolation Voltage (f = 60 Hz, t = 1 sec)	V <sub>ISO</sub>	7500	—	—	Vac(pk)

### ZERO CROSSING

Inhibit Voltage (I <sub>F</sub> = Rated I <sub>FT</sub> , MT1–MT2 Voltage above which device will not trigger.)	V <sub>IH</sub>	—	5	20	Volts
Leakage in Inhibited State (I <sub>F</sub> = Rated I <sub>FT</sub> , Rated V <sub>DRM</sub> , Off State)	I <sub>DRM2</sub>	—	—	500	μA

1. Test voltage must be applied within dv/dt rating.
2. All devices are guaranteed to trigger at an I<sub>F</sub> value less than or equal to max I<sub>FT</sub>. Therefore, recommended operating I<sub>F</sub> lies between I<sub>FT</sub> (15 mA for MOC3041, 10 mA for MOC3042, 5 mA for MOC3043) and absolute max I<sub>F</sub> (60 mA).
3. This is static dv/dt. See Figure 7 for test circuit. Commutating dv/dt is a function of the load-driving thyristor(s) only.

## TYPICAL ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C

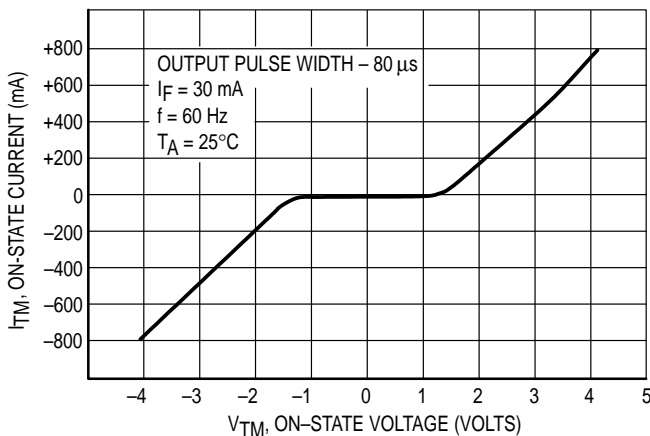


Figure 1. On-State Characteristics

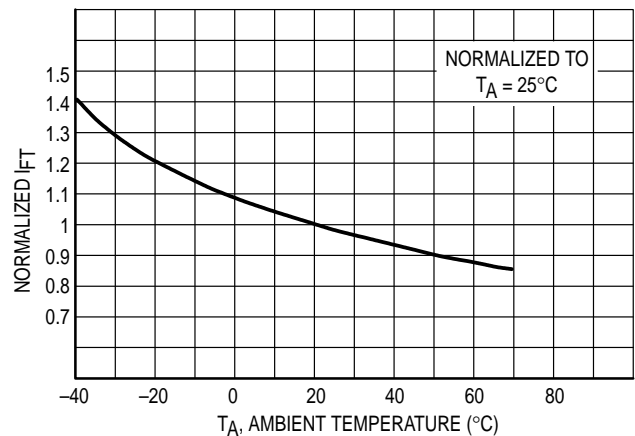


Figure 2. Trigger Current versus Temperature