

6-Pin DIP Random-Phase Optoisolators Triac Driver Output (250 Volts Peak)

The MOC3010 Series consists of gallium arsenide infrared emitting diodes, optically coupled to silicon bilateral switch and are designed for applications requiring isolated triac triggering, low-current isolated ac switching, high electrical isolation (to 7500 Vac peak), high detector standoff voltage, small size, and low cost.

• **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 Vac(rms) Applications:

- Solenoid/Valve Controls
- Lamp Ballasts
- Interfacing Microprocessors to 115 Vac Peripherals
- Motor Controls
- Static ac Power Switch
- Solid State Relays
- Incandescent Lamp Dimmers

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

Rating	Symbol	Value	Unit
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INFRARED EMITTING DIODE

Reverse Voltage	V _R	3	Volts
Forward Current — Continuous	I _F	60	mA
Total Power Dissipation @ T _A = 25°C Negligible Power in Transistor Derate above 25°C	P _D	100 1.33	mW mW/°C

OUTPUT DRIVER

Off-State Output Terminal Voltage	V _{DRM}	250	Volts
Peak Repetitive Surge Current (PW = 1 ms, 120 pps)	I _{TSM}	1	A
Total Power Dissipation @ T _A = 25°C Derate above 25°C	P _D	300 4	mW mW/°C

TOTAL DEVICE

Isolation Surge Voltage ⁽¹⁾ (Peak ac Voltage, 60 Hz, 1 Second Duration)	V _{ISO}	7500	Vac(pk)
Total Power Dissipation @ T _A = 25°C Derate above 25°C	P _D	330 4.4	mW mW/°C
Junction Temperature Range	T _J	-40 to +100	°C
Ambient Operating Temperature Range ⁽²⁾	T _A	-40 to +85	°C
Storage Temperature Range ⁽²⁾	T _{stg}	-40 to +150	°C
Soldering Temperature (10 s)	T _L	260	°C

1. 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.

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 MOC3009/D)

MOC3010

[IFT = 15 mA Max]

MOC3011

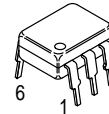
[IFT = 10 mA Max]

MOC3012*

[IFT = 5 mA Max]

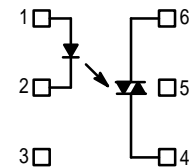
*Motorola Preferred Device

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

MOC3010 MOC3011 MOC3012

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
INPUT LED					
Reverse Leakage Current (V _R = 3 V)	I _R	—	0.05	100	μA
Forward Voltage (I _F = 10 mA)	V _F	—	1.15	1.5	Volts

OUTPUT DETECTOR (I_F = 0 unless otherwise noted)

Peak Blocking Current, Either Direction (Rated V _{DRM} ⁽¹⁾)	I _{DRM}	—	10	100	nA
Peak On-State Voltage, Either Direction (I _{TM} = 100 mA Peak)	V _{TM}	—	1.8	3	Volts
Critical Rate of Rise of Off-State Voltage (Figure 7, Note 2)	dv/dt	—	10	—	V/μs

COUPLED

LED Trigger Current, Current Required to Latch Output (Main Terminal Voltage = 3 V ⁽³⁾)	I _{FT}				mA
		MOC3010	—	8	15
		MOC3011	—	5	10
		MOC3012	—	3	5
Holding Current, Either Direction	I _H	—	100	—	μA

1. Test voltage must be applied within dv/dt rating.
2. This is static dv/dt. See Figure 7 for test circuit. 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} (15 mA for MOC3010, 10 mA for MOC3011, 5 mA for MOC3012) and absolute max I_F (60 mA).

TYPICAL ELECTRICAL CHARACTERISTICS T_A = 25°C

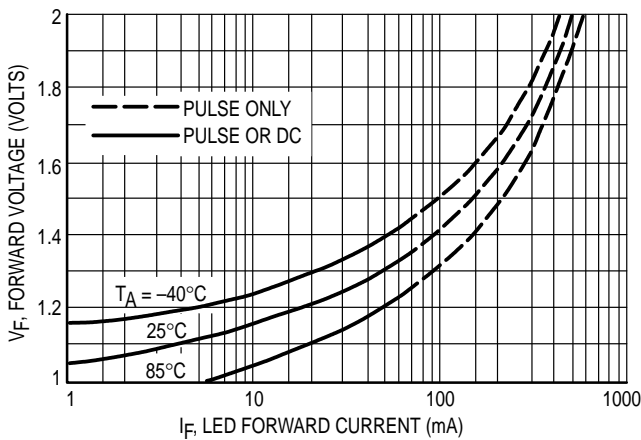


Figure 1. LED Forward Voltage versus Forward Current

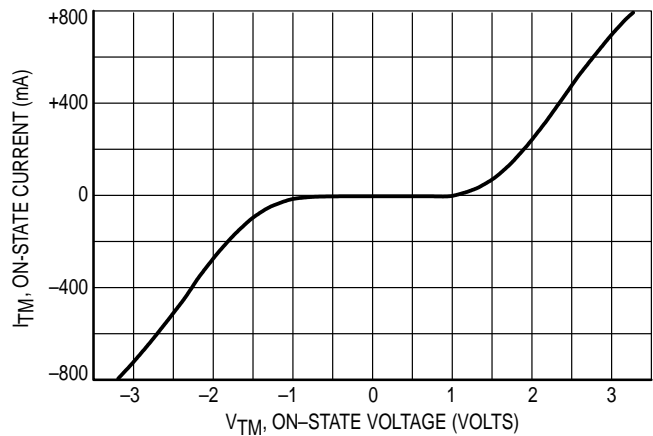


Figure 2. On-State Characteristics