



## 6-Pin DIP Optoisolators SCR Output

These devices consist of gallium arsenide infrared-emitting diodes optically coupled to photosensitive silicon controlled rectifiers (SCR). They are designed for applications requiring high electrical isolation between low voltage circuitry, like integrated circuits, and the ac line.

- High Blocking Voltage  
 MOC3002, 3003 — 250 V for 120 Vac Lines  
 MOC3007 — 200 V for 120 Vac Lines
- Very High Isolation Voltage  
 $V_{ISO} = 7500 \text{ Vac (pk) Min}$
- Standard 6-Pin DIP
- UL Recognized, File Number E54915 
- VDE approved per standard 0883/6.80 (Certificate number 41853), with additional approval to DIN IEC380/VDE0806, IEC435/VDE0805, IEC65/VDE0860, VDE110b, covering all other standards with equal or less stringent requirements, including IEC204/VDE0113, VDE0160, VDE0832, VDE0833, etc. 
- Special lead form available (add suffix "T" to part number) which satisfies VDE0883/6.80 requirement for 8 mm minimum creepage distance between input and output solder pads.
- Various lead form options available. Consult "Optoisolator Lead Form Options" data sheet for details.

### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
<b>INPUT LED</b>			
Reverse Voltage	$V_R$	7	Volts
Forward Current — Continuous	$I_F$	60	mA
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	120 1.41	mW mW/°C

### OUTPUT DETECTOR

Peak Forward Voltage	MOC3002, 3003 MOC3007	$V_{DM}$	250 200	Volts
Forward RMS Current (Full Cycle, 50 to 60 Hz) $T_A = 25^\circ\text{C}$		$I_T(\text{RMS})$	300	mA
Peak Nonrepetitive Surge Current (PW = 10 ms, dc = 10%)		$I_{TSM}$	3	A
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$		$P_D$	150 1.76	mW mW/°C

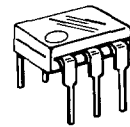
### TOTAL DEVICE

Isolation Surge Voltage (1) (Peak ac Voltage, 60 Hz, 1 second Duration)	$V_{ISO}$	7500	Vac
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	250 2.94	mW mW/°C
Junction Temperature Range	$T_J$	-40 to +100	°C
Ambient Operating Temperature Range	$T_A$	-55 to +100	°C
Storage Temperature Range	$T_{stg}$	-55 to +150	°C
Soldering Temperature (10 s)	—	260	°C

(1) Isolation surge voltage is an internal device dielectric breakdown rating.

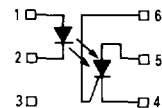
**MOC3002**  
**MOC3003**  
**MOC3007**

**6-PIN DIP**  
**OPTOISOLATORS**  
**SCR OUTPUT**  
**250 AND 200 VOLTS**



**CASE 730A-02**  
**PLASTIC**

### SCHEMATIC



1. LED ANODE
2. LED CATHODE
3. NC
4. SCR CATHODE
5. SCR ANODE
6. SCR GATE

# MOC3002, MOC3003, MOC3007

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>INPUT LED</b>					
Reverse Leakage Current ( $V_R = 3\text{ V}$ )	$I_R$	—	0.05	10	$\mu\text{A}$
Forward Voltage ( $I_F = 10\text{ mA}$ )	$V_F$	—	1.2	1.5	Volts
Capacitance ( $V = 0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_J$	—	18	—	pF

## OUTPUT DETECTOR

Peak Off-State Voltage ( $I_{DM} = 50\ \mu\text{A}$ ) ( $R_{GK} = 10\ \text{k}\Omega$ , $T_A = 100^\circ\text{C}$ , $I_{DM} = 100\ \mu\text{A}$ )	MOC3002, 3003 MOC3007	$V_{DM}$	250 200	— 8	— —	Volts
Peak Reverse Voltage ( $I_{RM} = 50\ \mu\text{A}$ ) ( $R_{GK} = 10\ \text{k}\Omega$ , $T_A = 100^\circ\text{C}$ , $I_{RM} = 100\ \mu\text{A}$ )	MOC3002, 3003 MOC3007	$V_{RM}$	250 200	— —	— —	Volts
On-State Voltage ( $I_{TM} = 0.3\ \text{A}$ )	MOC3002, 3003 MOC3007	$V_{TM}$	— —	1.1 1.2	1.3 1.5	Volts
Off-State Current ( $V_{DM} = 250\ \text{V}$ , $R_{GK} = 10\ \text{k}\Omega$ , $T_A = 100^\circ\text{C}$ ) ( $V_{DM} = 200\ \text{V}$ , $R_{GK} = 10\ \text{k}\Omega$ , $T_A = 100^\circ\text{C}$ )	MOC3002, 3003 MOC3007	$I_{DM}$	— —	— —	50 100	$\mu\text{A}$
Reverse Current ( $V_{RM} = 250\ \text{V}$ , $R_{GK} = 10\ \text{k}\Omega$ , $T_A = 100^\circ\text{C}$ ) ( $V_{RM} = 200\ \text{V}$ , $R_{GK} = 10\ \text{k}\Omega$ , $T_A = 100^\circ\text{C}$ )	MOC3002, 3003 MOC3007	$I_{RM}$	— —	— —	50 100	$\mu\text{A}$
Capacitance ( $V = 0\ \text{V}$ , $f = 1\ \text{MHz}$ ) Anode-Gate Gate-Cathode		$C_J$	— —	20 350	— —	pF

## COUPLED

LED Current Required to Trigger ( $V_{AK} = 50\ \text{V}$ , $R_{GK} = 10\ \text{k}\Omega$ )	MOC3002 MOC3003 MOC3007	$I_{FT}$	— — —	15 10 20	30 20 40	mA
( $V_{AK} = 100\ \text{V}$ , $R_{GK} = 27\ \text{k}\Omega$ )	MOC3002 MOC3003 MOC3007		— — —	8 6 12	14 11 22	
Isolation Resistance ( $V_{IO} = 500\ \text{Vdc}$ )		$R_{ISO}$	100	—	—	G $\Omega$
Capacitance Input to Output ( $V_{IO} = 0$ , $f = 1\ \text{MHz}$ )		$C_{ISO}$	—	0.2	2	pF
Coupled $dv/dt$ , Input to Output ( $R_{GK} = 10\ \text{k}\Omega$ )		$dv/dt$	—	500	—	Volts/ $\mu\text{s}$
Isolation Surge Voltage (Peak ac Voltage, 60 Hz, 1 Second Duration)		$V_{ISO}$	7500	—	—	Vac (pk)

TYPICAL ELECTRICAL CHARACTERISTICS

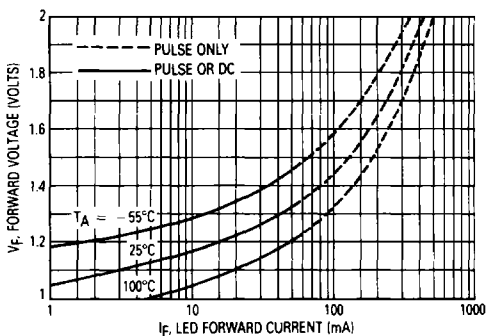


Figure 1. LED Forward Voltage versus Forward Current

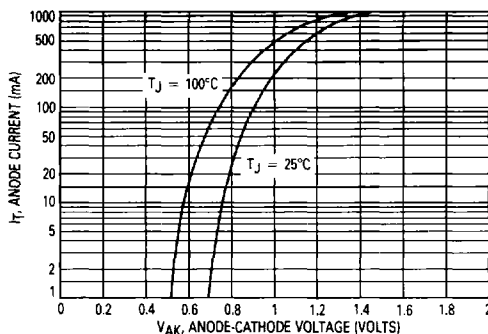


Figure 2. Anode Current versus Anode-Cathode Voltage

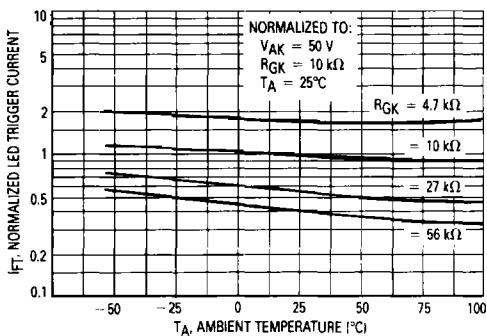


Figure 3. LED Trigger Current versus Temperature

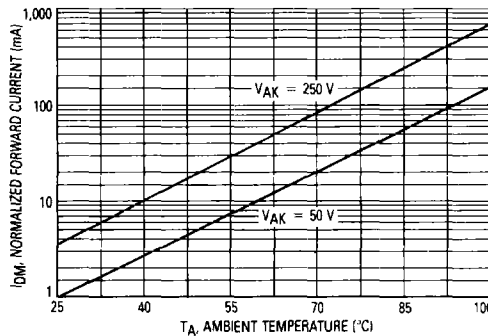


Figure 4. Forward Leakage Current versus Temperature

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OUTLINE DIMENSIONS

