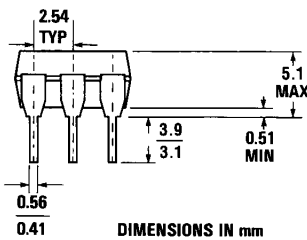
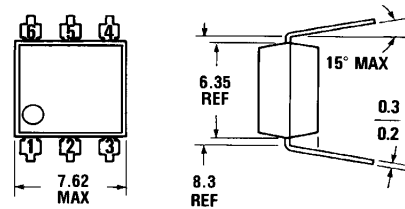


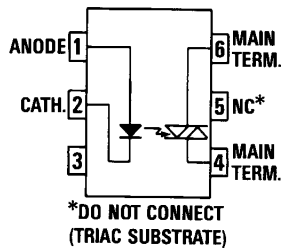
**MOC3009 MOC3010  
MOC3011 MOC3012**

**PACKAGE DIMENSIONS**



DIMENSIONS IN mm  
PACKAGE CODE E

ST1603-02



Equivalent Circuit

C2081

**DESCRIPTION**

The MOC3009, MOC3010, MOC3011 and MOC3012 are optically isolated triac driver devices. These devices contain a GaAs infrared emitting diode and a light activated silicon bilateral switch, which functions like a triac. This series is designed for interfacing between electronic controls and power triacs to control resistive and inductive loads for 120 VAC operations.

**FEATURES**

- Low input current required (typically 5mA—MOC3011)
- High isolation voltage—minimum 7500 VAC peak
- Underwriters Laboratory (UL) recognized—File E90700

**APPLICATIONS**

- Triac driver
- Industrial controls
- Traffic lights
- Vending machines
- Motor control
- Solid state relay

<b>ABSOLUTE MAXIMUM RATINGS</b>	
<b>TOTAL PACKAGE</b>	
Storage temperature	−55°C to 150°C
Operating temperature	−40°C to 100°C
Lead temperature (soldering 10 sec)	260°C
Withstand test voltage	7500 VAC Peak (50-60 Hz)
<b>INPUT DIODE</b>	
Forward DC current	50 mA
Reverse voltage	3 V
Peak forward current (1 μs pulse, 300 pps)	3.0 A
Power dissipation (25°C ambient)	100 mW
Derate linearly (above 25°C)	1.33 mW/°C
<b>OUTPUT DRIVER</b>	
Off-state output terminal voltage	250 volts
On-state RMS current T <sub>A</sub> =25°C	100 mA
(Full cycle, 50 to 60 Hz) T <sub>A</sub> =70°C	50 mA
Peak nonrepetitive surge current (PW=10 ms, DC=10%)	1.2 A
Total power dissipation @ T <sub>A</sub> =25°C	300 mW
Derate above 25°C	4.0 mW/°C



## NON-ZERO-CROSSING TRIACS

### ELECTRO-OPTICAL CHARACTERISTICS (25°C Temperature Unless Otherwise Specified)

#### INDIVIDUAL COMPONENT CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
<b>INPUT DIODE</b>						
Forward voltage	$V_f$		1.2	1.50	V	$I_f=10$ mA
Junction capacitance	$C_j$		50		pF	$V_f=0$ V, $f=1$ MHz
Reverse leakage current	$I_r$			100	$\mu$ A	$V_r=3.0$ V
<b>OUTPUT DETECTOR</b>						
Peak blocking current, either direction	$I_{DRM}$	—		100	nA	$V_{DRM}=250$ V, Note 1
Peak on-state voltage, either direction	$V_{TM}$	—	2.0	3.0	Volts	$I_{TM}=100$ mA Peak
Note 1. Test voltage must be applied within dv/dt rating.						

#### TRANSFER CHARACTERISTICS

DC CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS	
LED trigger current (current required to latch output)	MOC3009	$I_{FT}$	—	15.0	30	mA	Main terminal voltage=3.0 V, $R_L = 150\Omega$
	MOC3010	$I_{FT}$	—	10.0	15	mA	
	MOC3011	$I_{FT}$	—	5	10	mA	
	MOC3012	$I_{FT}$	—	—	5	mA	
Holding current	$I_H$	—	100	—	$\mu$ A	Either direction	

#### TRANSFER CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
<b>AC dv/dt RATING</b>						
Critical rate of rise of off-state voltage	dv/dt	—	12.0	—	V/ $\mu$ S	Static dv/dt (see Fig. 4)
Critical rate of rise of commutating voltage	dv/dt	—	0.2	—	V/ $\mu$ S	Commutating dv/dt $I_{LOAD}=15$ mA (see Fig. 4)

#### ISOLATION CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Isolation voltage	$V_{ISO}$	5300			$V_{AC}$ RMS	$I_{IO} \leq 1$ $\mu$ A, 1 Minute
	$V_{ISO}$	7500			$V_{AC}$ PEAK	$I_{IO} \leq 1$ $\mu$ A, 1 Minute
Isolation resistance	$R_{ISO}$	$10^{11}$			ohms	$V_{IO}=500$ VDC
Isolation capacitance	$C_{ISO}$		0.5		pF	$f=1$ MHz

**TYPICAL ELECTRICAL CHARACTERISTIC CURVES**  
(25°C Free Air Temperature Unless Otherwise Specified)

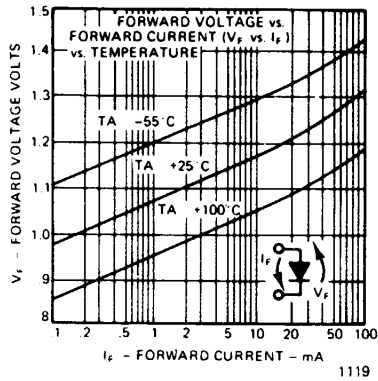


Fig. 1. Forward Voltage Drop vs. Forward Current

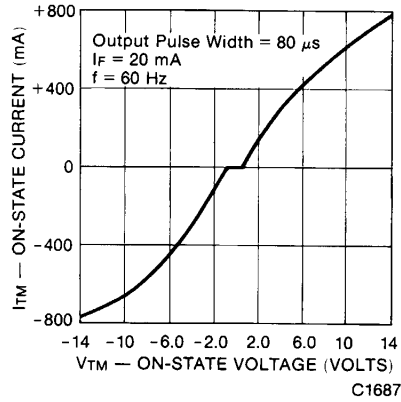


Fig. 2. On-State Characteristics

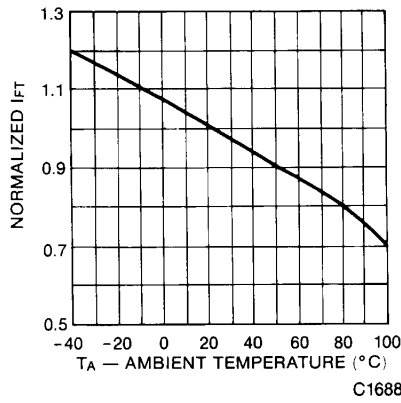


Fig. 3. Trigger Current vs. Temperature

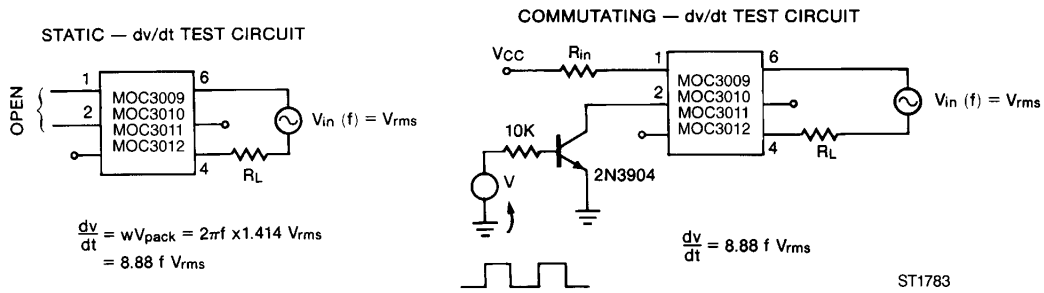
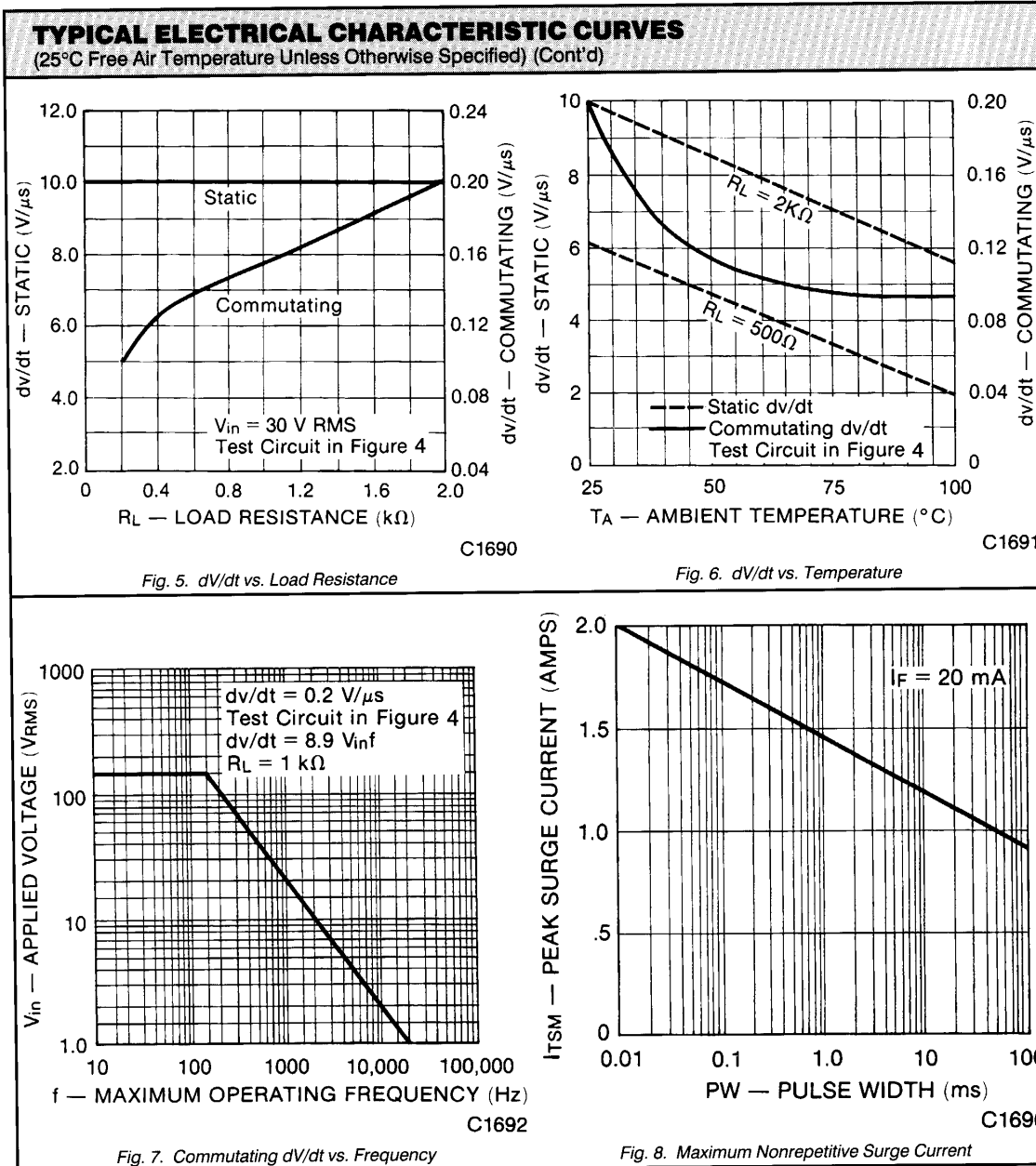


Fig. 4. dv/dt Test Circuits

ST1783



**TYPICAL APPLICATION CIRCUITS**

