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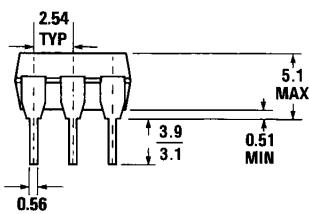
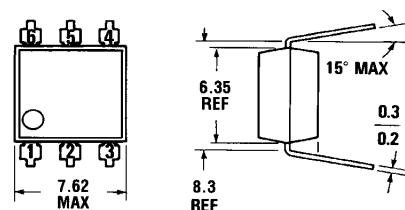
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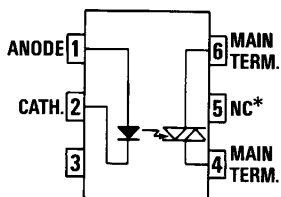
**MOC3009 MOC3010
MOC3011 MOC3012**

PACKAGE DIMENSIONS



DIMENSIONS IN mm
PACKAGE CODE E

ST1603-02



*DO NOT CONNECT
(TRIAC SUBSTRATE)

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

ABSOLUTE MAXIMUM RATINGS

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

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

INDIVIDUAL COMPONENT CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
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	μ A	$V_r=3.0$ V
OUTPUT DETECTOR						
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	—	μ A	Either direction	

TRANSFER CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
AC dv/dt RATING						
Critical rate of rise of off-state voltage	dv/dt	—	12.0	—	V/ μ S	Static dv/dt (see Fig. 4)
Critical rate of rise of commutating voltage	dv/dt	—	0.2	—	V/ μ 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			$V_{AC,RMS}$	$I_{I,O} \leq 1$ μ A, 1 Minute
	V_{ISO}	7500			$V_{AC,PEAK}$	$I_{I,O} \leq 1$ μ A, 1 Minute
Isolation resistance	R_{ISO}	10^{11}			ohms	$V_{I,O}=500$ VDC
Isolation capacitance	C_{ISO}		0.5		pF	$f=1$ MHz

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

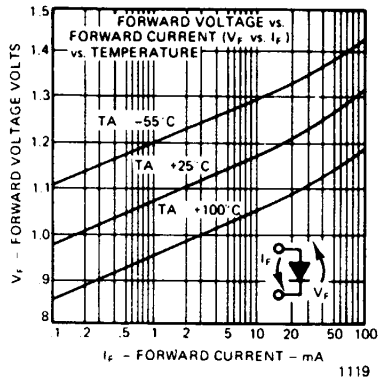


Fig. 1. Forward Voltage Drop vs. Forward Current

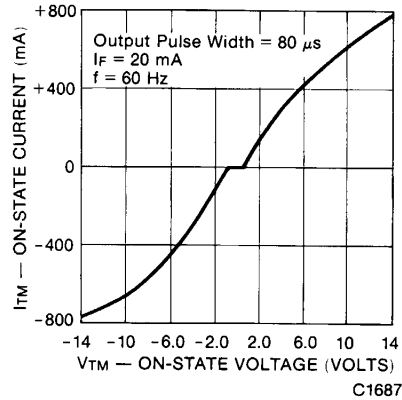


Fig. 2. On-State Characteristics

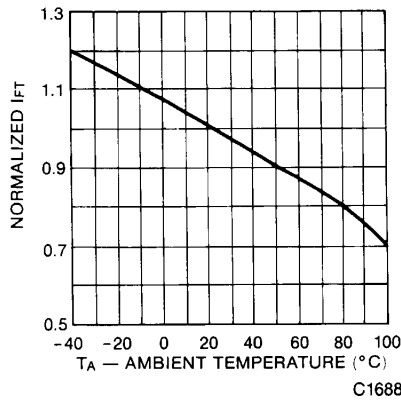


Fig. 3. Trigger Current vs. Temperature

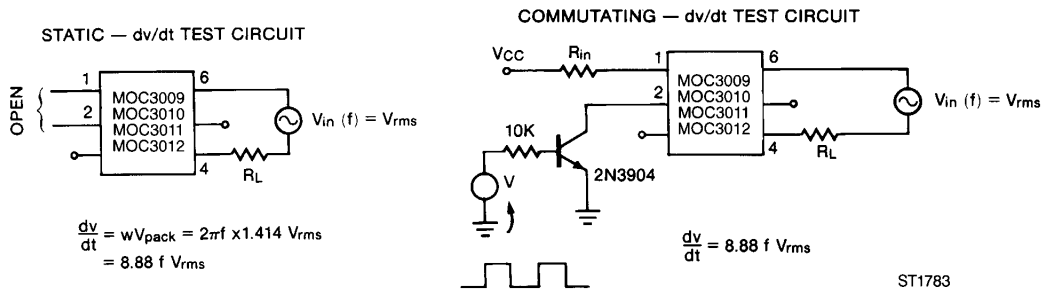


Fig. 4. dv/dt Test Circuits

TYPICAL ELECTRICAL CHARACTERISTIC CURVES
(25°C Free Air Temperature Unless Otherwise Specified) (Cont'd)

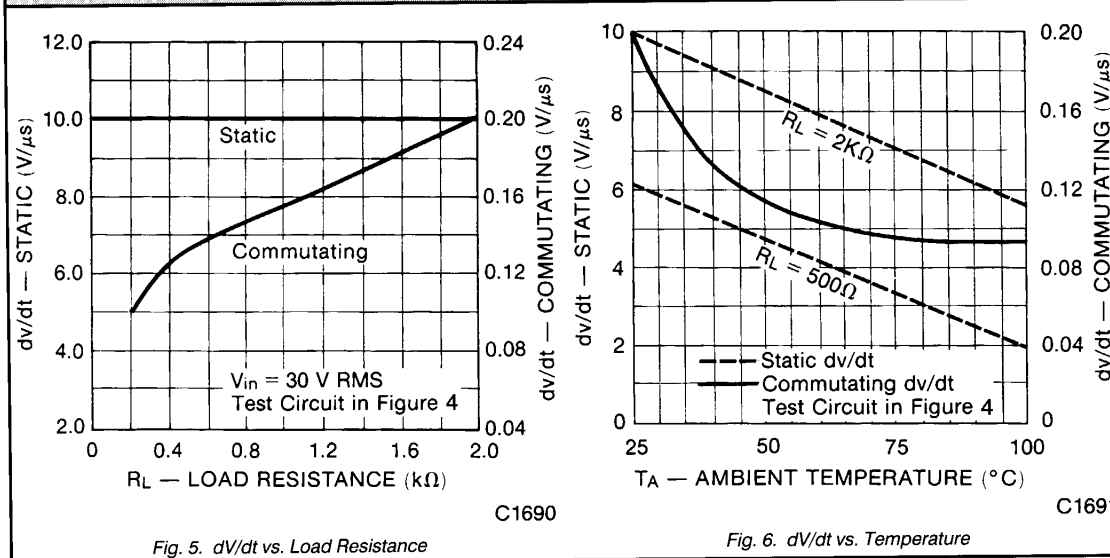


Fig. 5. dv/dt vs. Load Resistance

Fig. 6. dv/dt vs. Temperature

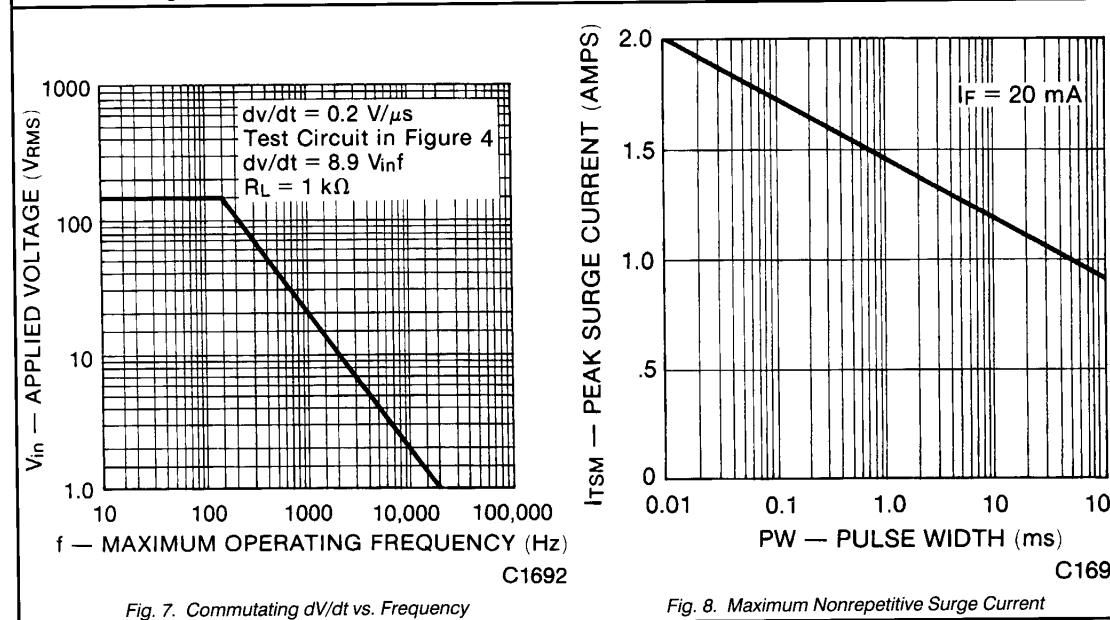
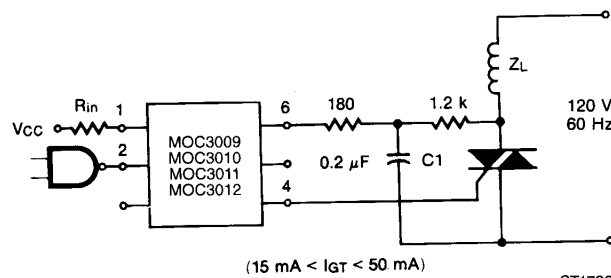
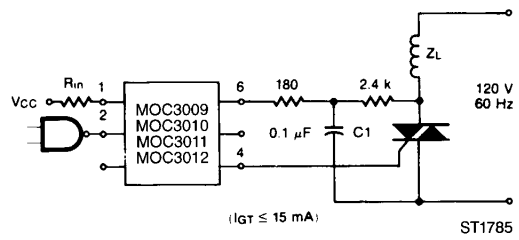
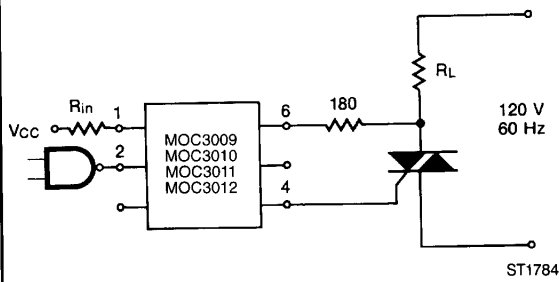


Fig. 7. Commutating dv/dt vs. Frequency

Fig. 8. Maximum Nonrepetitive Surge Current

TYPICAL APPLICATION CIRCUITS



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