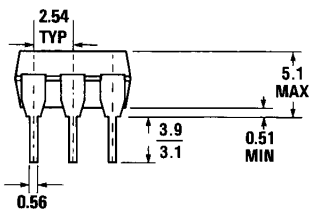
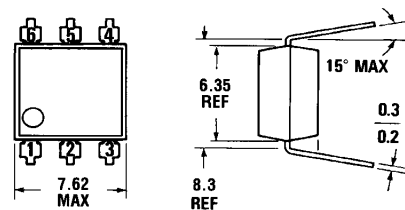


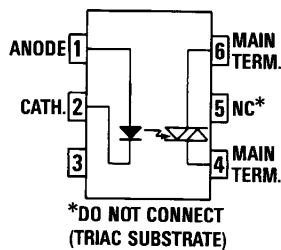
**MOC3009 MOC3010
MOC3011 MOC3012**

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

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			$V_{AC,RMS}$	$I_{IO} \leq 1$ μ A, 1 Minute
	V_{ISO}	7500			$V_{AC,PEAK}$	$I_{IO} \leq 1$ μ 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)

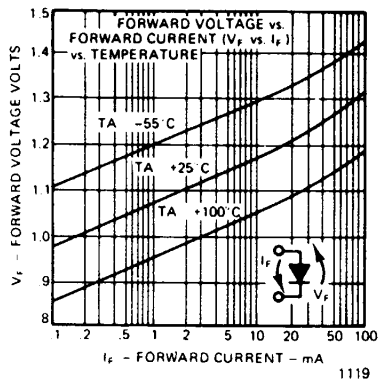


Fig. 1. Forward Voltage Drop vs. Forward Current

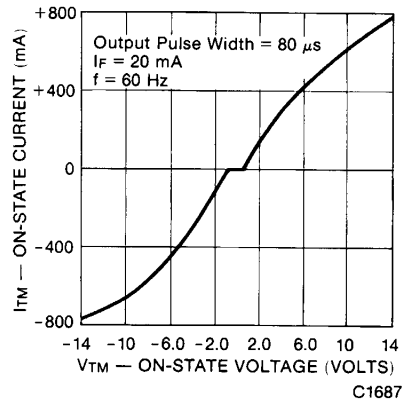


Fig. 2. On-State Characteristics

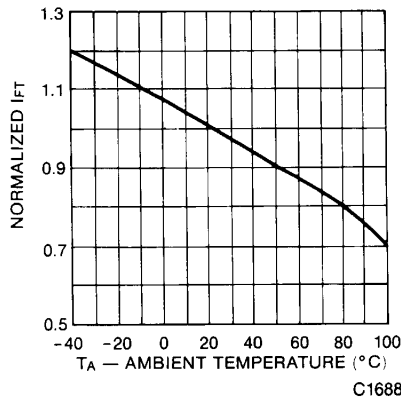


Fig. 3. Trigger Current vs. Temperature

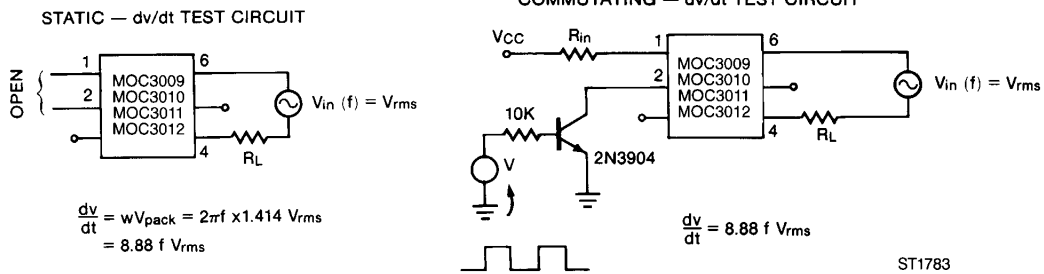
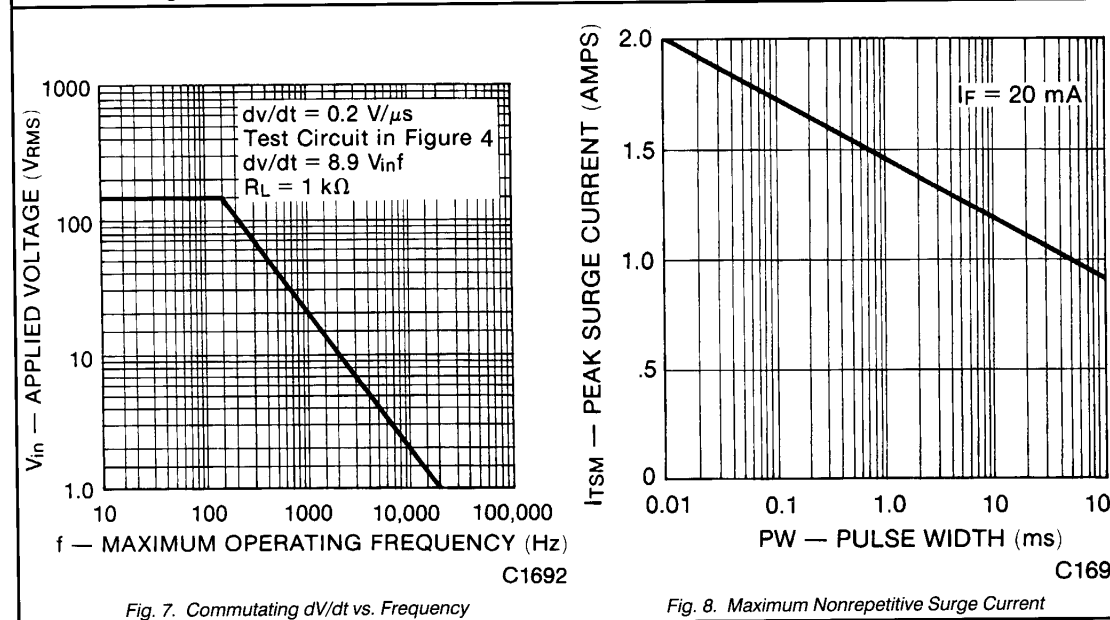
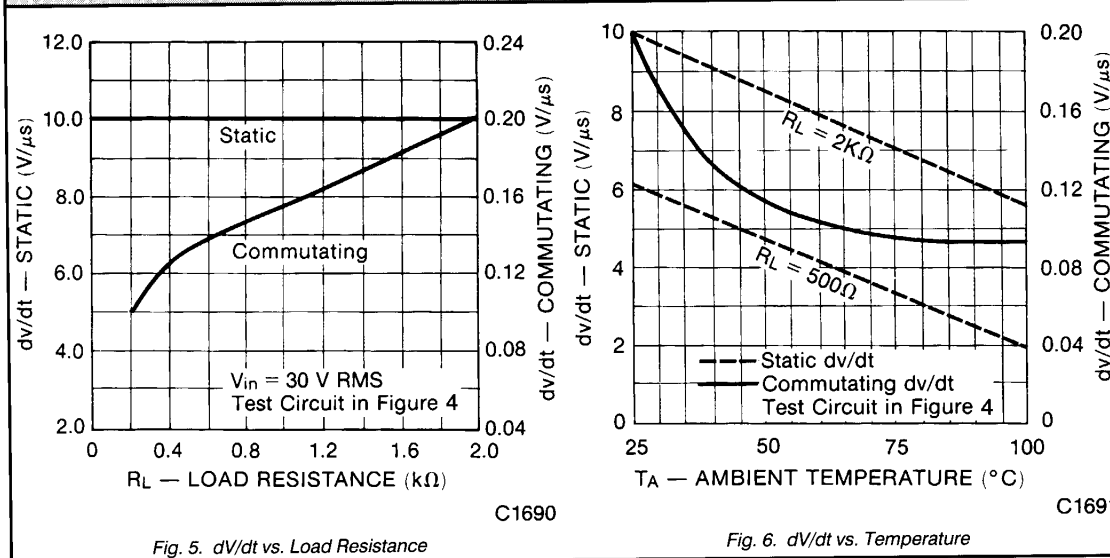


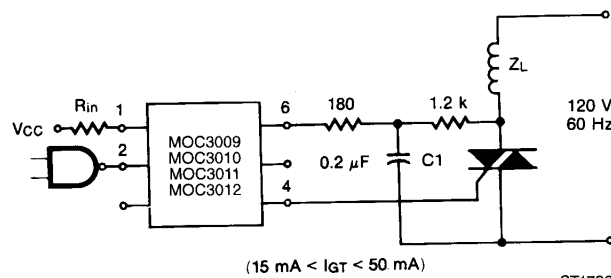
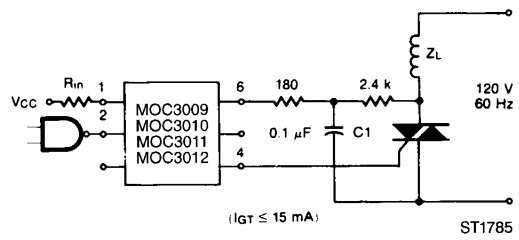
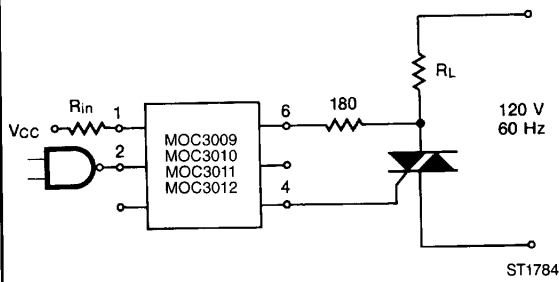
Fig. 4. dv/dt Test Circuits

ST1783

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



TYPICAL APPLICATION CIRCUITS



DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.