

Advance Information

TRIACS

Silicon Bidirectional Thyristors

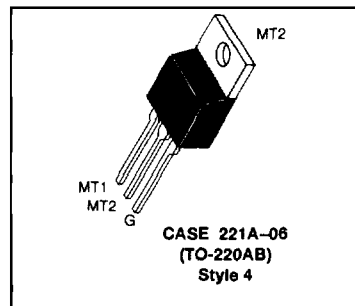
Designed for high performance full-wave ac control applications where high noise immunity and commutating di/dt are required.

- Blocking Voltage to 800 Volts
- On-State Current Rating of 12 Amperes RMS at 70°C
- Uniform Gate Trigger currents in Three Modes
- High Immunity to dv/dt — 250 V/μs minimum at 125°C
- High Commutating di/dt — 6.5 A/ms minimum at 125°C
- Industry Standard TO-220 AB Package
- High Surge Current Capability — 120 Amperes

MAC12 SERIES*

*Motorola preferred devices

TRIACS
12 AMPERES RMS
400 thru 800
VOLTS



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

Parameter	Symbol	Value	Unit
Peak Repetitive Off-State Voltage (1) ($T_J = -40$ to 125°C , Sine Wave, 50 to 60 Hz, Gate Open)	V_{DRM}	400 600 800	Volts
On-State RMS Current (Full Cycle Sine Wave, 60 Hz, $T_C = 70^\circ\text{C}$)	$I_T(\text{RMS})$	12	A
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, $T_J = 125^\circ\text{C}$)	I_{TSM}	100	A
Circuit Fusing Consideration ($t = 8.3$ ms)	I^2t	41	A^2sec
Peak Gate Power (Pulse Width ≤ 1.0 μs, $T_C = 80^\circ\text{C}$)	P_{GM}	16	Watts
Average Gate Power ($t = 8.3$ ms, $T_C = 80^\circ\text{C}$)	$P_{G(AV)}$	0.35	Watts
Operating Junction Temperature Range	T_J	-40 to $+125$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to $+150$	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Case	$R_{\theta JC}$	2.2	$^\circ\text{C/W}$
— Junction to Ambient	$R_{\theta JA}$	62.5	
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Peak Repetitive Blocking Current ($V_D = \text{Rated } V_{DRM}$, Gate Open)	I_{DRM}	—	—	0.01	mA
		—	—	2.0	

(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

Preferred devices are Motorola recommended choices for future use and best overall value.

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MAC12 SERIES

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
Peak On-State Voltage* ($I_{TM} = \pm 17\text{ A}$)	V_{TM}	—	—	1.85	Volts
Continuous Gate Trigger Current ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$)	I_{GT}				mA
MT2(+), G(+)		5.0	13	35	
MT2(+), G(-)		5.0	16	35	
MT2(-), G(-)		5.0	18	35	
Hold Current ($V_D = 12\text{ V}$, Gate Open, Initiating Current = $\pm 150\text{ mA}$)	I_H	—	20	40	mA
Latch Current ($V_D = 24\text{ V}$, $I_G = 35\text{ mA}$)	I_L				mA
MT2(+), G(+); MT2(-), G(-)		—	20	50	
MT2(+), G(-)		—	30	80	
Gate Trigger Voltage ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$)	V_{GT}				Volts
MT2(+), G(+)		0.5	0.69	1.5	
MT2(+), G(-)		0.5	0.77	1.5	
MT2(-), G(-)		0.5	0.72	1.5	
DYNAMIC CHARACTERISTICS					
Rate of Change of Commutating Current* ($V_D = 400\text{ V}$, $I_{TM} = 4.4\text{ A}$, Commutating $dv/dt = 18\text{ V}/\mu\text{s}$, Gate Open, $T_J = 125^\circ\text{C}$, $f = 250\text{ Hz}$, No Snubber)	$(dv/dt)_c$	6.5	—	—	A/ms
Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Waveform, Gate Open, $T_J = 125^\circ\text{C}$)	dv/dt	250	—	—	V/ μs

*Indicates Pulse Test: Pulse Width $\leq 2.0\text{ ms}$, Duty Cycle $\leq 2\%$.