

Advance Information

TRIACS

Silicon Bidirectional Thyristors

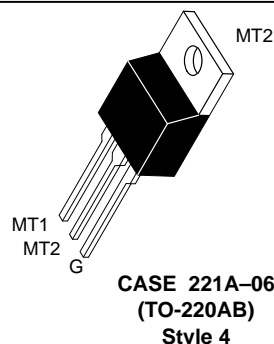
Designed for high performance full-wave ac control applications where high noise immunity and commutating di/dt are required.

- 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, $T_C = 70^\circ\text{C}$)	$I_{\text{T(RMS)}}$	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 ² sec
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, $T_C = 80^\circ\text{C}$)	$P_{\text{G(AV)}}$	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 — Junction to Ambient	$R_{\theta\text{JC}}$ $R_{\theta\text{JA}}$	2.2 62.5	$^\circ\text{C/W}$
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 ($V_D = \text{Rated } V_{\text{DRM}}$, Gate Open)	I_{DRM}	—	—	0.01 2.0	mA
		$T_J = 25^\circ\text{C}$			
		$T_J = 125^\circ\text{C}$			

(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 ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$) MT2(+), G(+) MT2(+), G(–) MT2(–), G(–)	I_{GT}	5.0 5.0 5.0	13 16 18	35 35 35	mA
Hold Current ($V_D = 12\text{ V}$, Gate Open, Initiating Current = $\pm 150\text{ mA}$)	I_H	—	20	40	mA
Latch Current ($V_D = 24\text{ V}$, $I_G = 35\text{ mA}$) MT2(+), G(+); MT2(–), G(–) MT2(+), G(–)	I_L	— —	20 30	50 80	mA
Gate Trigger Voltage ($V_D = 12\text{ V}$, $R_L = 100\ \Omega$) MT2(+), G(+) MT2(+), G(–) MT2(–), G(–)	V_{GT}	0.5 0.5 0.5	0.69 0.77 0.72	1.5 1.5 1.5	Volts
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	—	—	$\text{V}/\mu\text{s}$

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