MAC12 SERIES*

*Motorola preferred devices

Advance Information

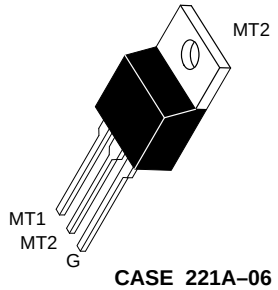
TRIACS

Silicon Bidirectional Thyristors

TRIACS
12 AMPERES RMS
400 thru 800
VOLTS

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



CASE 221A–06
(TO-220AB)
Style 4

MAXIMUM RATINGS (T_J = 25°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)	MAC12D MAC12M MAC12N	V_{DRM}	 400 600 800	Volts
On-State RMS Current (Full Cycle Sine Wave, 60 Hz, T_C = 70°C)		$I_{T(RMS)}$	12	A
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, T_J = 125°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°C)		P_{GM}	16	Watts
Average Gate Power (t = 8.3 ms, T_C = 80°C)		$P_{G(AV)}$	0.35	Watts
Operating Junction Temperature Range		T_J	–40 to +125	°C
Storage Temperature Range		T_{stg}	–40 to +150	°C

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Peak Repetitive Blocking Current (VD = Rated VDRM, Gate Open)	T_J = 25°C T_J =1 25°C	I_{DRM}	— —	— —	0.01 2.0	mA

(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.

REV 1

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
Peak On-State Voltage* (I_{TM} = ±17 A)	V_{TM}	—	—	1.85	Volts
Continuous Gate Trigger Current (V_D = 12 V, R_L = 100 Ω) 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 V, Gate Open, Initiating Current = ±150 mA)	I_H	—	20	40	mA
Latch Current (V_D = 24 V, I_G = 35 mA) MT2(+), G(+); MT2(–), G(–) MT2(+), G(–)	I_L	 — —	 20 30	 50 80	mA
Gate Trigger Voltage (V_D = 12 V, R_L = 100 Ω) 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 V, ITM =4.4A, Commutating dv/dt = 18 V/μs, Gate Open, T_J = 125°C, f = 250 Hz, No Snubber)	(dv/dt)c	6.5	—	—	A/ms
Critical Rate of Rise of Off–State Voltage (V_D = Rated V_{DRM}, Exponential Waveform, Gate Open, T_J = 125°C)	dv/dt	250	—	—	V/μs

*Indicates Pulse Test: Pulse Width ≤ 2.0 ms, Duty Cycle ≤ 2%.