

*Advance Information*

**TRIACS**

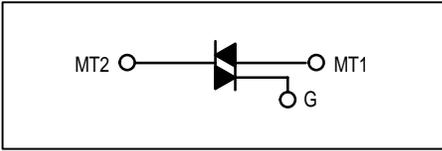
**Silicon Bidirectional Thyristors**

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

- Blocking Voltage to 800 Volts
- On-State Current Rating of 4.0 Amperes RMS at 100°C
- Uniform Gate Trigger Currents in Three Modes
- High Immunity to dv/dt — 500 V/μs minimum at 125°C
- Minimizes Snubber Networks for Protection
- High Surge Current Capability – 40 Amperes
- Industry Standard TO-220AB Package
- High Commutating di/dt — 6.0 A/ms minimum at 125°C

**MAC4M**  
**MAC4N**  
Motorola preferred devices

**TRIACS**  
**4 AMPERES RMS**  
**600 thru 800**  
**VOLTS**



**CASE 221A-09**  
**(TO-220AB)**  
**Style 4**

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

Parameter	Symbol	Value	Unit
Peak Repetitive Off-State Voltage (1) Peak Repetitive Reverse Voltage ( $T_J = -40$ to $125^\circ\text{C}$ , Sine Wave, 50 to 60 Hz, Gate Open)	$V_{DRM}$ $V_{RRM}$	600 800	Volts
On-State RMS Current (Full Cycle Sine Wave, 60 Hz, $T_C = 100^\circ\text{C}$ )	$I_T(\text{RMS})$	4.0	A
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, $T_J = 125^\circ\text{C}$ )	$I_{TSM}$	40	A
Circuit Fusing Consideration ( $t = 8.33$ ms)	$i^2t$	6.6	$\text{A}^2\text{sec}$
Peak Gate Power (Pulse Width $\leq 1.0$ μs, $T_C = 100^\circ\text{C}$ )	$P_{GM}$	0.5	Watts
Average Gate Power ( $t = 8.3$ ms, $T_C = 100^\circ\text{C}$ )	$P_{G(AV)}$	0.1	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	$R_{\theta JC}$ $R_{\theta JA}$	2.2 62.5	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 5 Seconds	$T_L$	260	$^\circ\text{C}$

(1)  $V_{DRM}$  and  $V_{RRM}$  for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

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

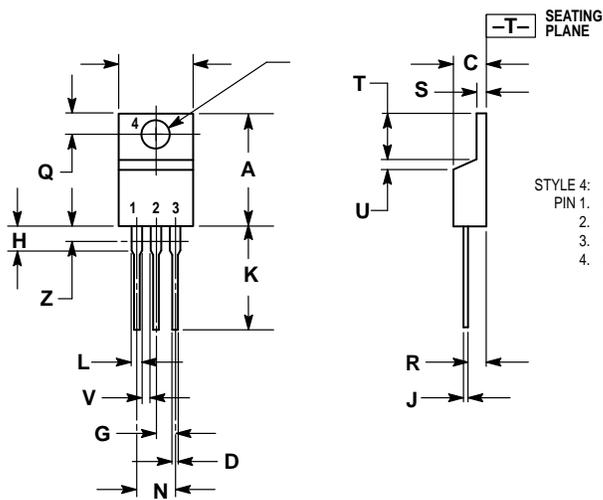
## MAC4M MAC4N

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise noted)

Symbol	Characteristic	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b>						
I <sub>DRM</sub>	Peak Repetitive Blocking Current (V <sub>D</sub> = Rated V <sub>DRM</sub> , Gate Open)	T <sub>J</sub> = 25°C	—	—	0.01	mA
		T <sub>J</sub> = 125°C	—	—	2.0	
<b>ON CHARACTERISTICS</b>						
V <sub>TM</sub>	Peak On-State Voltage <sup>1</sup> (I <sub>TM</sub> = ±6.0 A)	—	—	1.6	V	
I <sub>GT</sub>	Gate Trigger Current (Continuous dc) (V <sub>D</sub> = 12 V, R <sub>L</sub> = 100 Ω) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	8.0	—	35	mA	
		8.0	—	35		
		8.0	—	35		
I <sub>H</sub>	Holding Current (V <sub>D</sub> = 12 V, Gate Open, Initiating Current = ±200 mA)	6.0	—	35	mA	
I <sub>L</sub>	Latching Current (V <sub>D</sub> = 12 V, I <sub>G</sub> = 10 mA) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	—	—	60	mA	
		—	—	80		
		—	—	60		
V <sub>GT</sub>	Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> = 12 V, R <sub>L</sub> = 100 Ω) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	0.5	—	1.3	V	
		0.5	—	1.3		
		0.5	—	1.3		
<b>DYNAMIC CHARACTERISTICS</b>						
(di/dt) <sub>C</sub>	Rate of Change of Commutating Current <sup>1</sup> (V <sub>D</sub> = 400 V, I <sub>TM</sub> = 4.0 A, Commutating dv/dt = 18 V/μs, Gate Open, T <sub>J</sub> = 125°C, f = 500 Hz, C <sub>L</sub> = 5.0 μF, L <sub>L</sub> = 20 mH, No Snubber)	6.0	—	—	A/ms	
dv/dt	Critical Rate of Rise of Off-State Voltage (V <sub>D</sub> = 0.67 x Rated V <sub>DRM</sub> , Exponential Waveform, Gate Open, T <sub>J</sub> = 125°C)	500	—	—	V/μs	
di/dt	Repetitive Critical Rate of Rise of On-State Voltage	—	—	10	A/μs	

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

PACKAGE DIMENSIONS



STYLE 4:  
 PIN 1. MAIN TERMINAL 1  
 2. MAIN TERMINAL 2  
 3. GATE  
 4. MAIN TERMINAL 2

- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.  
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

CASE 221A-09  
 TO-220AB

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