

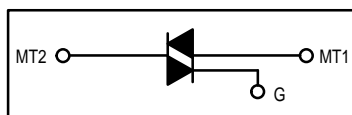
Advance Information

TRIACS

Silicon Bidirectional Thyristors

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

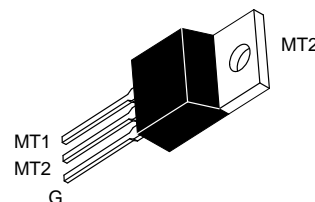
- Blocking Voltage to 800 Volts
- On-State Current Rating of 12 Amperes RMS at 70°C
- Uniform Gate Trigger currents in Three Modes
- High Immunity to dv/dt — 250 V/μs minimum at 125°C
- High Commutating di/dt — 6.5 A/ms minimum at 125°C
- Industry Standard TO-220 AB Package
- High Surge Current Capability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



MAC12 SERIES*

*Motorola preferred devices

TRIACS
12 AMPERES RMS
400 thru 800
VOLTS



CASE 221A-09
(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)	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 ² t	41	A ² sec
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 _{θJC} R _{θJA}	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
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OFF CHARACTERISTICS

Peak Repetitive Blocking Current (V _D = Rated V _{DRM} , Gate Open)	T _J = 25°C T _J = 125°C	I _{DRM}	— —	— —	0.01 2.0	mA
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(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 2



MAC12 SERIES

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

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

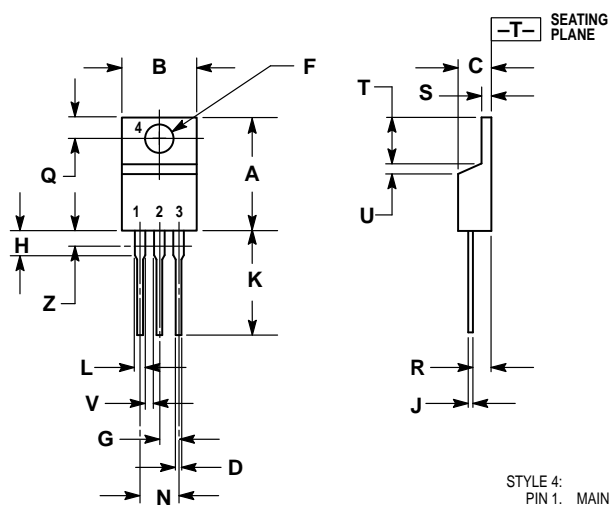
Peak On-State Voltage* (I _{TM} = ± 17 A)	V _{TM}	—	—	1.85	Volts
Continuous Gate Trigger Current (V _D = 12 V, R _L = 100 Ω)	I _{GT}	5.0	13	35	mA
MT2(+), G(+)		5.0	16	35	
MT2(+), G(-)		5.0	18	35	
MT2(-), G(-)					
Hold Current (V _D = 12 V, Gate Open, Initiating Current = ± 150 mA)	I _H	—	20	40	mA
Latch Current (V _D = 24 V, I _G = 35 mA)	I _L	—	20	50	mA
MT2(+), G(+); MT2(-), G(-)		—	30	80	
MT2(+), G(-)					
Gate Trigger Voltage (V _D = 12 V, R _L = 100 Ω)	V _{GT}	0.5	0.69	1.5	Volts
MT2(+), G(+)		0.5	0.77	1.5	
MT2(+), G(-)		0.5	0.72	1.5	
MT2(-), G(-)					

DYNAMIC CHARACTERISTICS

Rate of Change of Commutating Current* (V _D = 400 V, I _{TM} = 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%.

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)
 ISSUE Z

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