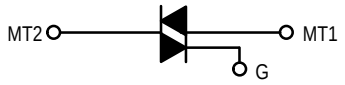
Triacs
Silicon Bidirectional Triode Thyristors

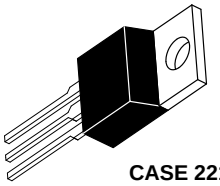
. . . designed primarily for industrial and consumer applications for full wave control of ac loads such as appliance controls, heater controls, motor controls, and other power switching applications.

- Sensitive Gate Triggering in Three Trigger Modes for AC Triggering on Sinking Current Sources (MAC310 Series)
- Four Mode Triggering (10 mA) for Drive Circuits that Source Current (MAC310A Series)
- All Diffused and Glass-Passivated Junctions for Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation
- Center Gate Geometry for Uniform Current Spreading

MAC310 Series
MAC310A Series

TRIACs
10 AMPERES RMS
200 thru 600 VOLTS





CASE 221A-04
(TO-220AB)
STYLE 4

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage(1) (T_J = –40 to 110°C, 1/2 Sine Wave 50 to 60 Hz, Gate Open) MAC310-4, MAC310A4 MAC310-6, MAC310A6 MAC310-8, MAC310A8	V_{DRM}	 200 400 600	Volts
On-State RMS Current (T_C = 80°C) Full Cycle Sine Wave 50 to 60 Hz	$I_{T(RMS)}$	10	Amps
Peak Non-repetitive Surge Current (One Full Cycle 60 Hz, T_J = 110°C)	I_{TSM}	100	Amps
Circuit Fusing (t = 8.3 ms)	I^2t	40	A^2s
Peak Gate Current (t ≤ 2 μs)	I_{GM}	±2	Amps
Peak Gate Voltage (t ≤ 2 μs)	V_{GM}	±10	Volts
Peak Gate Power (t ≤ 2 μs)	P_{GM}	20	Watts
Average Gate Power (T_C = 80°C, t ≤ 8.3 ms)	$P_{G(AV)}$	0.5	Watts
Operating Junction Temperature Range	T_J	–40 to 110	°C
Storage Temperature Range	T_{stg}	–40 to 150	°C
Mounting Torque	—	8	in-lb

1. V_{DRM} 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.

(continued)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C and either polarity of MT2 to MT1 voltage unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current (T_J = 25°C (V_D = Rated V_{DRM}, T_J = 110°C)	I_{DRM}	— —	— —	10 2	mA
Peak On-State Voltage (I_{TM} = 14 A Peak, Pulse Width ≤ 2 ms, Duty Cycle ≤ 2%)	V_{TM}	—	—	2	Volts
Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 100 Ω) MT2(+), G(+); MT2(+), G(–); MT2(–), G(–) MT2(–), G(+) "A" Suffix Only	I_{GT}	 — —	 — —	 5 10	mA
Gate Trigger Voltage (Continuous dc) (V_D = 12 V, R_L = 100 Ω) MT2(+), G(+); MT2(+), G(–); MT2(–), G(–) MT2(–), G(+) "A" Suffix Only (V_D = Rated V_{DRM}, T_C = 110°C, R_L = 10 k) All Trigger Modes	V_{GT}	 — — 0.2	 — — —	 2 2.5 —	Volts
Holding Current (V_D = 12 V, I_{TM} = 200 mA, Gate Open)	I_H	—	—	15	mA
Gate-Controlled Turn-On Time (V_D = Rated V_{DRM}, I_{TM} = 14 A Peak, I_G = 30 mA)	t_{gt}	—	1.5	—	µs
Critical Rate of Rise of Off-State Voltage (V_D = Rated V_{DRM}, Exponential Waveform, T_C = 110°C)	dv/dt	—	25	—	V/µs
Critical Rate of Rise of Commutation Voltage (V_D = Rated V_{DRM}, I_{TM} = 14 A Peak, Commutating di/dt = 5 A/ms, Gate Unenergized, T_C = 80°C)	dv/dt(c)	—	5	—	V/µs

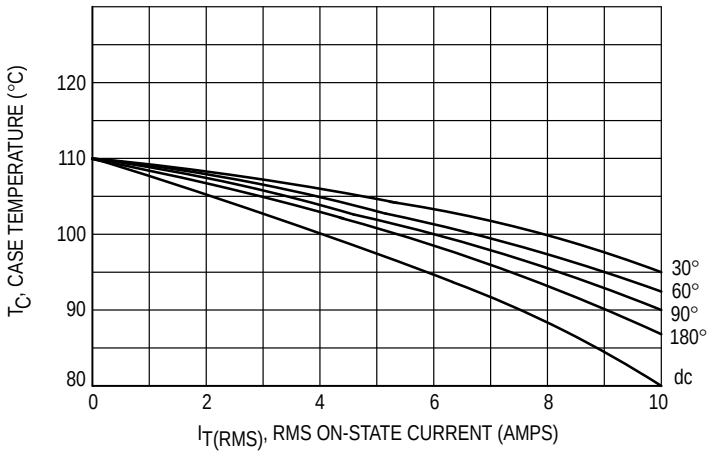


Figure 1. RMS Current Derating

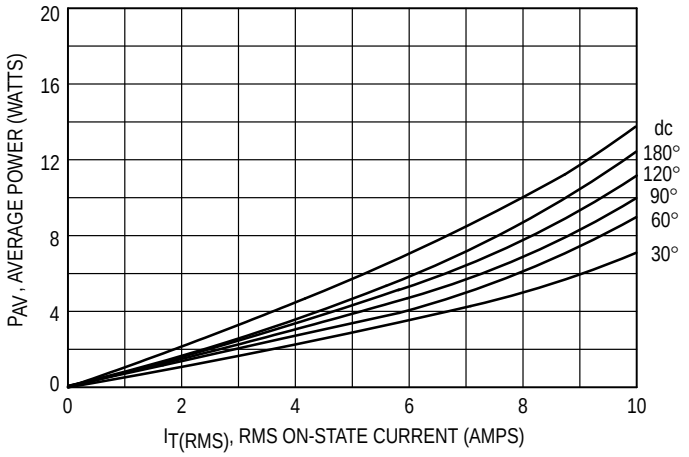
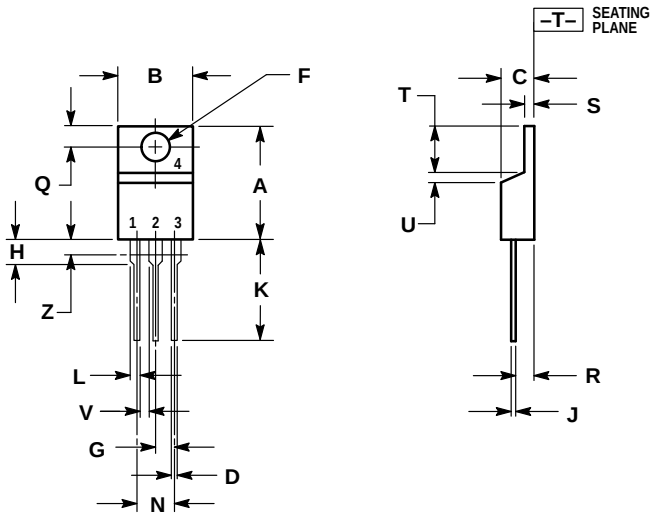


Figure 2. On-State Power Dissipation

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.

	INCHES		MILLIMETERS	
DIM	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	0.014	0.022	0.36	0.55
K	0.500	0.562	12.70	14.27
L	0.045	0.055	1.15	1.39
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-04
(TO–220AB)

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