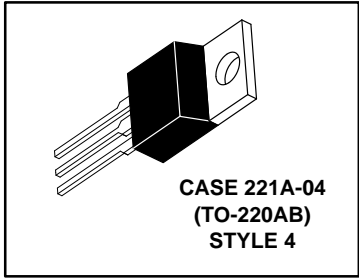
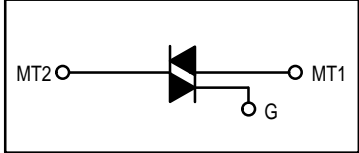


# Triacs

## 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



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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage <sup>(1)</sup> ( $T_J = -40$ to $110^\circ\text{C}$ , 1/2 Sine Wave 50 to 60 Hz, Gate Open)	$V_{DRM}$	200 400 600	Volts
On-State RMS Current ( $T_C = 80^\circ\text{C}$ ) Full Cycle Sine Wave 50 to 60 Hz	$I_T(\text{RMS})$	10	Amps
Peak Non-repetitive Surge Current (One Full Cycle 60 Hz, $T_J = 110^\circ\text{C}$ )	$I_{TSM}$	100	Amps
Circuit Fusing ( $t = 8.3$ ms)	$I^2t$	40	$\text{A}^2\text{s}$
Peak Gate Current ( $t \leq 2$ $\mu\text{s}$ )	$I_{GM}$	$\pm 2$	Amps
Peak Gate Voltage ( $t \leq 2$ $\mu\text{s}$ )	$V_{GM}$	$\pm 10$	Volts
Peak Gate Power ( $t \leq 2$ $\mu\text{s}$ )	$P_{GM}$	20	Watts
Average Gate Power ( $T_C = 80^\circ\text{C}$ , $t \leq 8.3$ ms)	$P_{G(AV)}$	0.5	Watts
Operating Junction Temperature Range	$T_J$	-40 to 110	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to 150	$^\circ\text{C}$
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)

# MAC310 Series MAC310A Series

## THERMAL CHARACTERISTICS

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

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}C$ and either polarity of MT2 to MT1 voltage unless otherwise noted.)

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

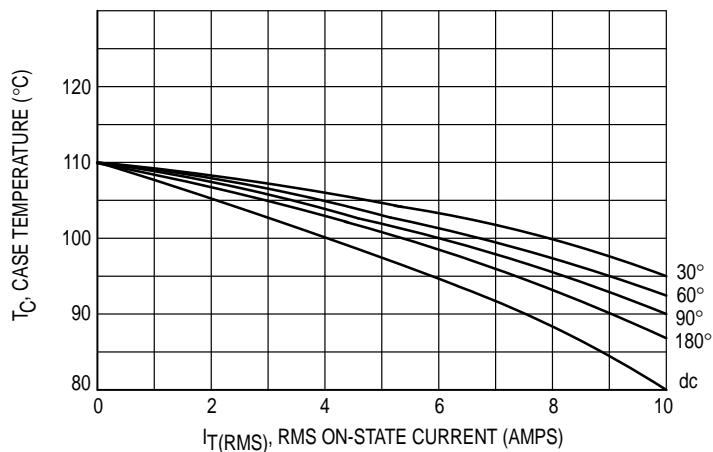


Figure 1. RMS Current Derating

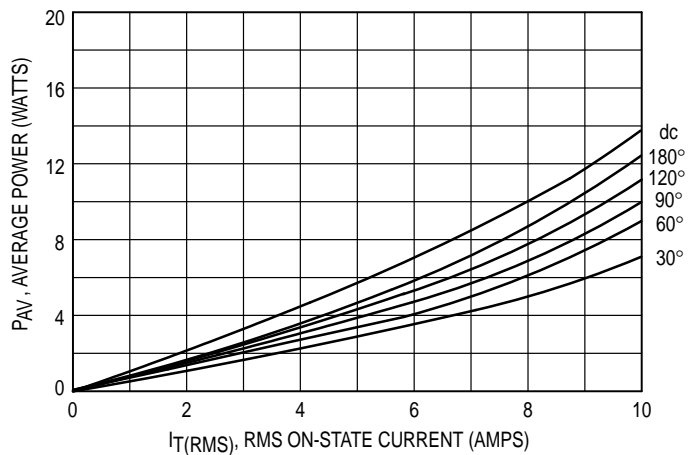
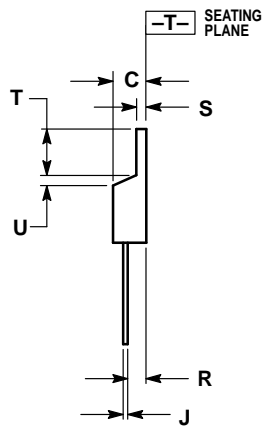
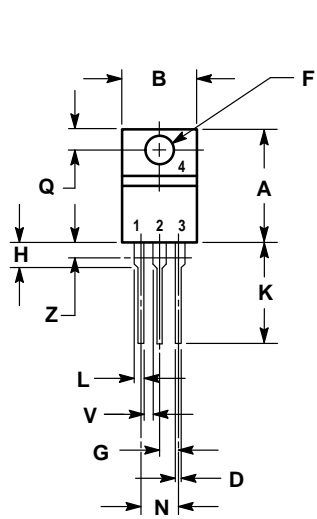


Figure 2. On-State Power Dissipation

PACKAGE DIMENSIONS



STYLE 4:  
 PIN 1: MAIN TERMINAL 1  
 PIN 2: MAIN TERMINAL 2  
 PIN 3: GATE  
 PIN 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	0.014	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)

## MAC310 Series MAC310A Series

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MAC310/D

