

# Triacs

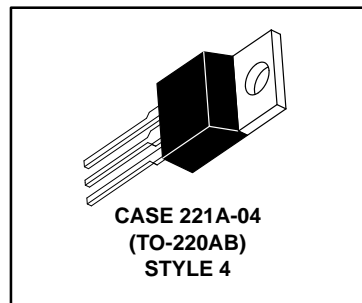
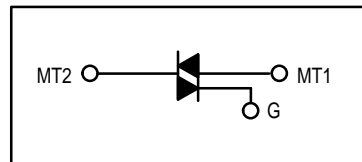
## Silicon Bidirectional Thyristors

... designed primarily for full-wave ac control applications, such as light dimmers, motor controls, heating controls and power supplies.

- Blocking Voltage to 800 Volts
- Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- TO-220 Construction Low Thermal Resistance, High Heat Dissipation and Durability
- Gate Triggering Guaranteed in Three Modes (MAC218 Series) or Four Modes (MAC218A Series)

**MAC218**  
**Series**  
**MAC218A**  
**Series**

**TRIACs**  
**8 AMPERES RMS**  
**200 thru 800 VOLTS**



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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage <sup>(1)</sup> (Gate Open, $T_J = 25$ to $125^\circ\text{C}$ )	$V_{\text{DRM}}$	200 400 600 800	Volts
On-State Current RMS (Conduction Angle = $360^\circ$ , $T_C = +80^\circ\text{C}$ )	$I_{\text{T(RMS)}}$	8	Amps
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, $T_C = 80^\circ\text{C}$ , preceded and followed by rated current)	$I_{\text{TSM}}$	100	Amps
Fusing Current ( $t = 8.3$ ms)	$I^2t$	40	$\text{A}^2\text{s}$
Peak Gate Power ( $T_C = +80^\circ\text{C}$ , Pulse Width = $2 \mu\text{s}$ )	$P_{\text{GM}}$	16	Watts
Average Gate Power ( $T_C = +80^\circ\text{C}$ , $t = 8.3$ ms)	$P_{\text{G(AV)}}$	0.35	Watt
Peak Gate Trigger Current (Pulse Width = $1 \mu\text{s}$ )	$I_{\text{GTM}}$	4	Amps
Operating Junction Temperature Range	$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{\text{stg}}$	-40 to +150	$^\circ\text{C}$

1.  $V_{\text{DRM}}$  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.

# MAC218 Series MAC218A Series

## THERMAL CHARACTERISTICS

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

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}C$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current ( $V_D = \text{Rated } V_{DRM}$ , gate open) $T_J = 25^{\circ}C$ $T_J = 125^{\circ}C$	$I_{DRM}$	— —	— —	10 2	$\mu A$ mA
Peak On-State Voltage (Either Direction) ( $I_{TM} = 11.3$ A Peak; Pulse Width = 1 to 2 ms, Duty Cycle < 2%)	$V_{TM}$	—	1.7	2	Volts
Gate Trigger Current (Continuous dc) ( $V_D = 12$ Vdc, $R_L = 12\Omega$ ) Trigger Mode MT2(+), Gate(+); MT2(+), Gate(-); MT2(-), Gate(-) MT2(-), Gate(+) "A" SUFFIX ONLY	$I_{GT}$	— —	— —	50 75	mA
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, $R_L = 100$ Ohms) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+) "A" SUFFIX ONLY (Main Terminal Voltage = Rated $V_{DRM}$ , $R_L = 10$ k $\Omega$ , $T_J = +125^{\circ}C$ ) MT2(+), G(+); MT2(-), G(-); MT2(+), G(-) MT2(-), G(+) "A" SUFFIX ONLY	$V_{GT}$	— — — — 0.2 0.2	0.9 0.9 1.1 1.4 — —	2 2 2 2.5 — —	Volts
Holding Current (Either Direction) ( $V_D = 24$ Vdc, Gate Open, Initiating Current = 200 mA)	$I_H$	—	—	50	mA
Critical Rate of Rise of Commutating Off-State Voltage ( $V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 11.3$ A, Commutating $di/dt = 4.1$ A/ms, Gate Unenergized, $T_C = 80^{\circ}C$ )	$dv/dt(c)$	—	5	—	V/ $\mu s$
Critical Rate of Rise of Off-State Voltage ( $V_D = \text{Rated } V_{DRM}$ , Exponential Voltage Rise, Gate Open, $T_J = 125^{\circ}C$ )	$dv/dt$	—	100	—	V/ $\mu s$

FIGURE 1 — CURRENT DERATING

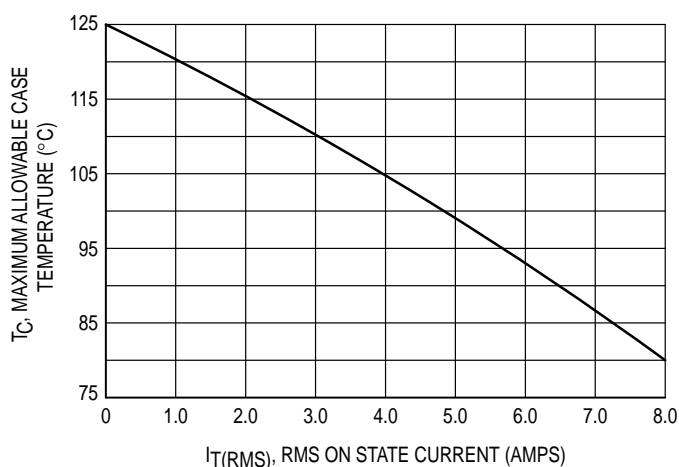


FIGURE 2 — POWER DISSIPATION

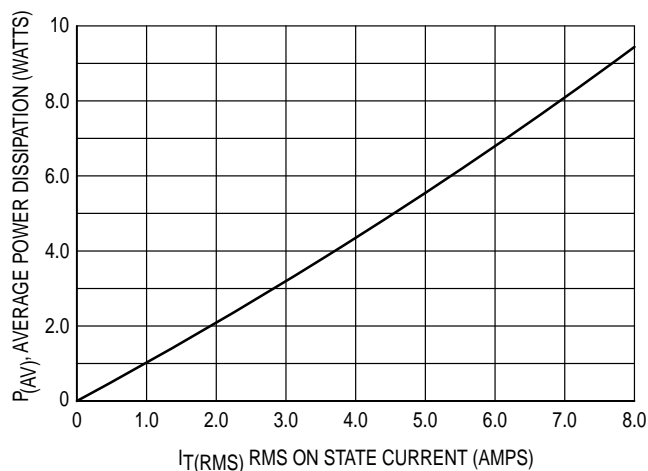


FIGURE 3 — NORMALIZED GATE TRIGGER CURRENT

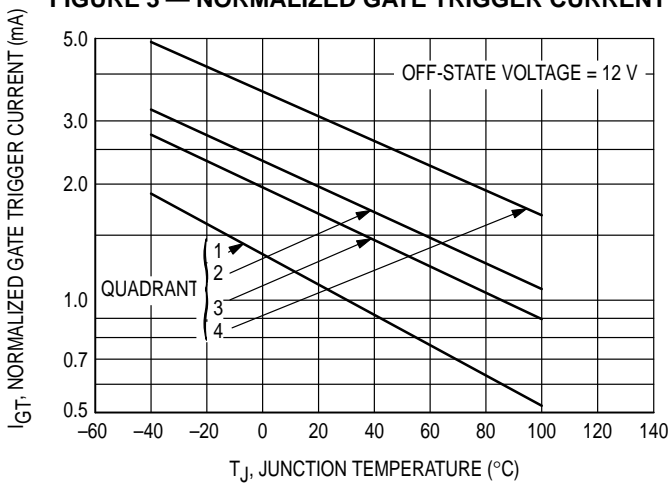


FIGURE 4 — NORMALIZED GATE TRIGGER VOLTAGE

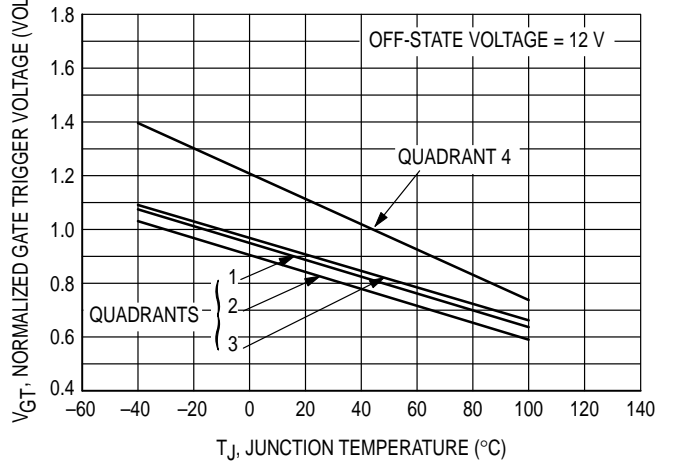
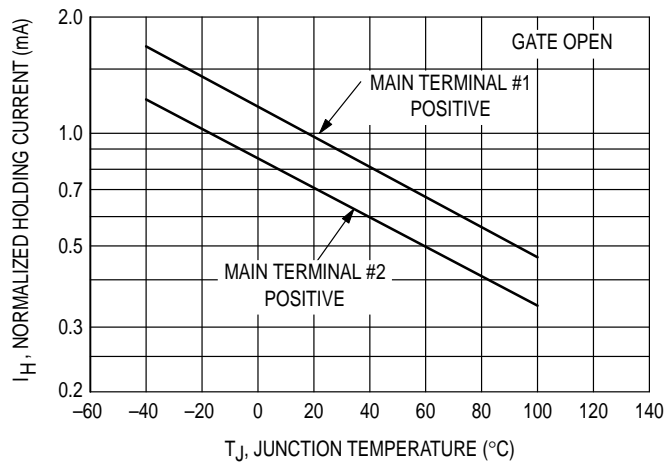
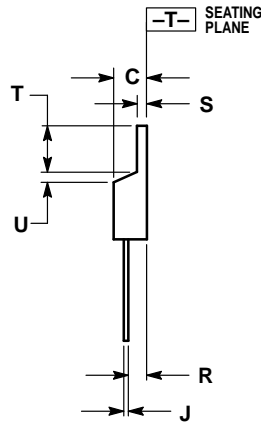
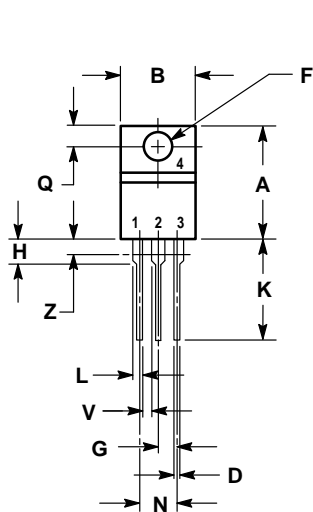


FIGURE 5 — NORMALIZED HOLDING CURRENT



**MAC218 Series MAC218A Series**

**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	0.014	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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