

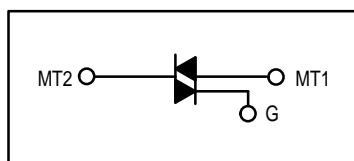
# MAC218FP Series MAC218AFP Series

## Triacs

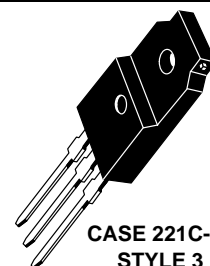
### Silicon Bidirectional Thyristors

... 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
- Isolated TO-220 Type Package for Ease of Mounting
- Gate Triggering in Three Modes (MAC218FP Series) or Four Modes (MAC218AFP Series)



**ISOLATED TRIACs  
THYRISTORS  
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> ( $T_J = -40$ to $+125^\circ\text{C}$ ) (1/2 Sine Wave 50 to 60 Hz, Gate Open)    MAC218-4FP, MAC218A4FP MAC218-6FP, MAC218A6FP MAC218-8FP, MAC218A8FP MAC218-10FP, MAC218A10FP	$V_{\text{DRM}}$	200 400 600 800	Volts
On-State RMS Current ( $T_C = +80^\circ\text{C}$ ) Full Cycle Sine Wave 50 to 60 Hz <sup>(2)</sup>	$I_{\text{T(RMS)}}$	8	Amps
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, preceded and followed by rated current, $T_C = 80^\circ\text{C}$ )	$I_{\text{TSM}}$	100	Amps
Circuit Fusing ( $t = 8.3$ 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 Current (Pulse Width = 1 $\mu\text{s}$ )	$I_{\text{GM}}$	4	Amps
RMS Isolation Voltage ( $T_A = 25^\circ\text{C}$ , Relative Humidity $\leq 20\%$ )	$V_{\text{(ISO)}}$	1500	Volts
Operating Junction Temperature	$T_J$	$-40$ to $+125$	$^\circ\text{C}$
Storage Temperature Range	$T_{\text{stg}}$	$-40$ to $+150$	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

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

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.
2. The case temperature reference point for all  $T_C$  measurements is a point on the center lead of the package as close as possible to the plastic body.



## MAC218FP Series MAC218AFP Series

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Off-State Current (Either Direction) ( $V_D = \text{Rated } V_{DRM}$ @ $T_J = 125^\circ\text{C}$ , Gate Open)	$I_{DRM}$	—	—	2	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(+), G(+); MT2(+), G(-) MT2(-), G(-) MT2(-), G(+) "A" SUFFIX ONLY	$I_{GT}$	— — — —	— — — —	50 50 50 75	mA
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, $R_L = 100 \Omega$ ) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+) "A" SUFFIX ONLY (Main Terminal Voltage = Rated $V_{DRM}$ , $R_L = 10 \text{ k}\Omega$ , $T_J = +125^\circ\text{C}$ ) 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, $T_C = 80^\circ\text{C}$ )	$dv/dt(c)$	—	5	—	V/ $\mu\text{s}$
Critical Rate of Rise of Off-State Voltage ( $V_D = \text{Rated } V_{DRM}$ , Exponential Voltage Rise, Gate Open, $T_J = 125^\circ\text{C}$ )	$dv/dt$	—	100	—	V/ $\mu\text{s}$

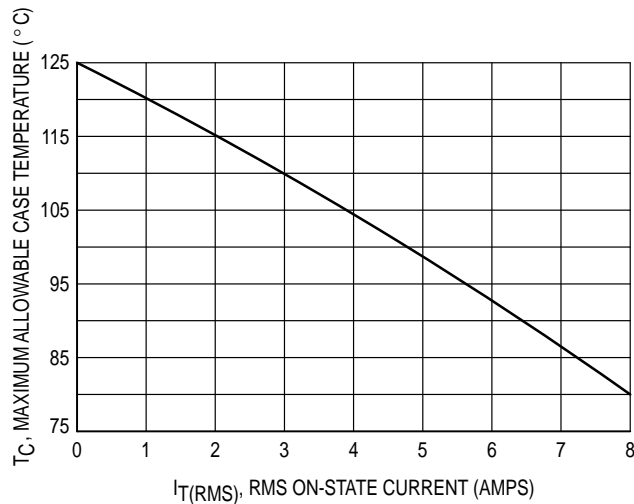


Figure 1. Current Derating

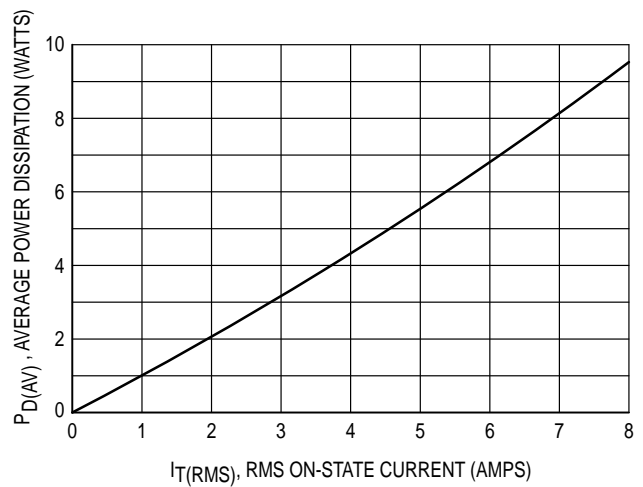


Figure 2. Power Dissipation

TYPICAL CHARACTERISTICS

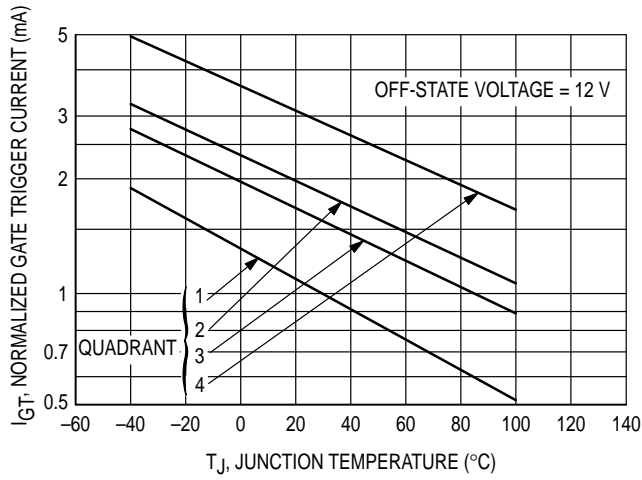


Figure 3. Normalized Gate Trigger Current

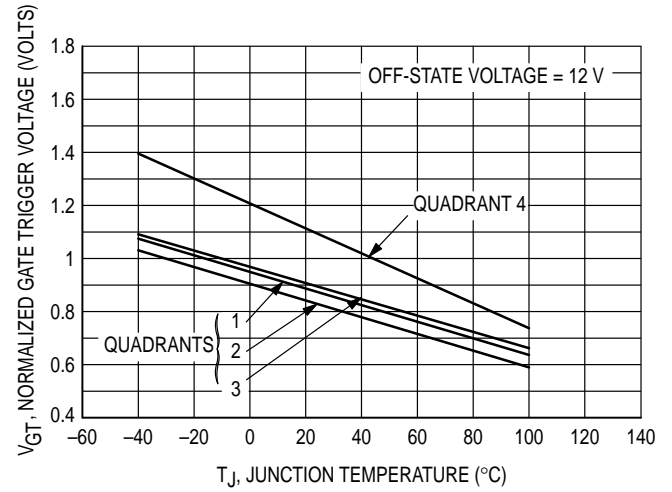


Figure 4. Normalized Gate Trigger Voltage

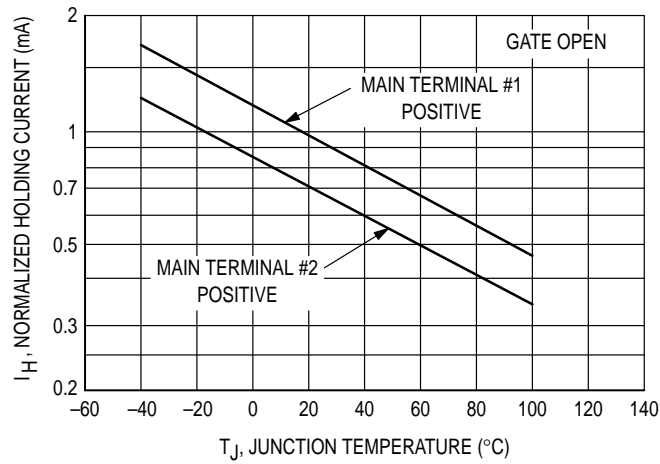
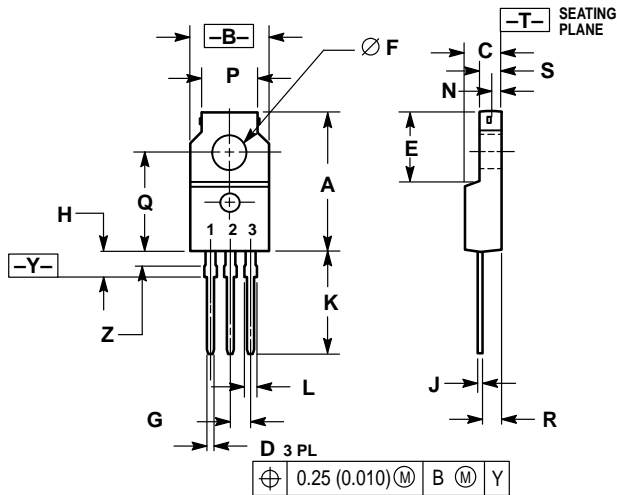


Figure 5. Normalized Holding Current

MAC218FP Series MAC218AFP Series


PACKAGE DIMENSIONS



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.  
3. LEAD DIMENSIONS UNCONTROLLED WITHIN DIMENSION Z.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.680	0.700	17.28	17.78
B	0.388	0.408	9.86	10.36
C	0.175	0.195	4.45	4.95
D	0.025	0.040	0.64	1.01
E	0.340	0.355	8.64	9.01
F	0.140	0.150	3.56	3.81
G	0.100	BSC	2.54	BSC
H	0.110	0.155	2.80	3.93
J	0.018	0.028	0.46	0.71
K	0.500	0.550	12.70	13.97
L	0.045	0.070	1.15	1.77
N	0.049	—	1.25	—
P	0.270	0.290	6.86	7.36
Q	0.480	0.500	12.20	12.70
R	0.090	0.120	2.29	3.04
S	0.105	0.115	2.67	2.92
Z	0.070	0.090	1.78	2.28

CASE 221C-02

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MAC218FP/D

