

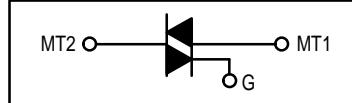
**MAC210FP  
Series  
MAC210AFP  
Series**

**Triacs**

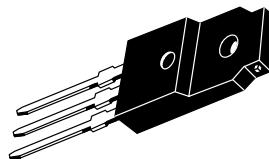
**Silicon Bidirectional Thyristors**

... designed primarily for full-wave ac control applications, such as light dimmers, motor controls, heating controls and power supplies; or wherever full-wave silicon gate controlled solid-state devices are needed. Triac type thyristors switch from a blocking to a conducting state for either polarity of applied anode voltage with positive or negative gate triggering.

- Blocking Voltage to 800 Volts
- All Diffused and Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Gate Triggering Guaranteed in Three Modes (MAC210FP Series) or Four Modes (MAC210AFP Series)



**ISOLATED TRIACs  
THYRISTORS  
10 AMPERES RMS  
200 thru 800 VOLTS**



**CASE 221C-02  
STYLE 3**

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

Rating	Symbol	Value	Unit
Repetitive Peak Off-State Voltage <sup>(1)</sup> ( $T_J = -40$ to $+125^\circ\text{C}$ ) 1/2 Sine Wave 50 to 60 Hz, Gate Open	$V_{\text{DRM}}$		Volts
MAC210-4FP, MAC210A4FP		200	
MAC210-6FP, MAC210A6FP		400	
MAC210-8FP, MAC210A8FP		600	
MAC210-10FP, MAC210A10FP		800	
On-State RMS Current ( $T_C = +70^\circ\text{C}$ ) Full Cycle Sine Wave 50 to 60 Hz <sup>(2)</sup>	$I_{\text{T(RMS)}}$	10	Amps
Peak Nonrepetitive Surge Current (One Full Cycle, 60 Hz, $T_C = +70^\circ\text{C}$ ) preceded and followed by rated current	$I_{\text{TSM}}$	100	Amps
Circuit Fusing ( $t = 8.3$ ms)	$I_{2t}$	40	$\text{A}^2\text{s}$
Peak Gate Power ( $T_C = +70^\circ\text{C}$ , Pulse Width = 10 $\mu\text{s}$ )	$P_{\text{GM}}$	20	Watts
Average Gate Power ( $T_C = +70^\circ\text{C}$ , $t = 8.3$ ms)	$P_{\text{G(AV)}}$	0.35	Watt
Peak Gate Current ( $T_C = +70^\circ\text{C}$ , Pulse Width = 10 $\mu\text{s}$ )	$I_{\text{GM}}$	2	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 +125	$^\circ\text{C}$

**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.

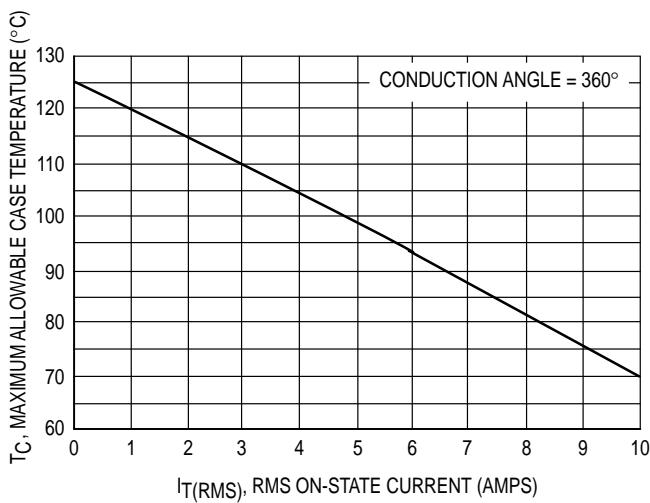
2. The case temperature reference point for all  $T_C$  measurements is a point on the center lead of the package as close as possible to the plastic body.

## MAC210FP Series MAC210AFP Series

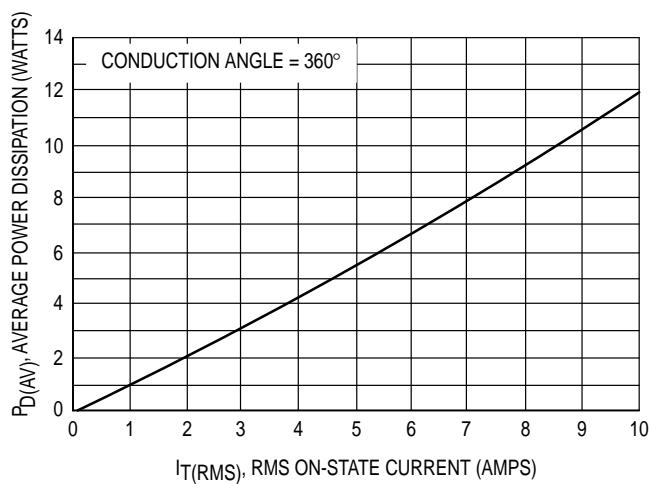
### ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current (Either Direction) (V <sub>D</sub> = Rated V <sub>DRM</sub> , Gate Open) T <sub>J</sub> = 25°C T <sub>J</sub> = +125°C	I <sub>DRM</sub>	— —	— —	10 2	µA mA
Peak On-State Voltage (Either Direction) (I <sub>TM</sub> = 14 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle ≤ 2%)	V <sub>TM</sub>	—	1.2	1.65	Volts
Gate Trigger Current (Continuous dc) (Main Terminal Voltage = 12 Vdc, R <sub>L</sub> = 100 Ohms Minimum Gate Pulse Width = 2 µs)  MT2(+), G(+) MT2(+), G(−) MT2(−), G(−) MT2(−), G(+) "A" SUFFIX ONLY	I <sub>GT</sub>	— — — —	12 12 20 35	50 50 50 75	mA
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, R <sub>L</sub> = 100 Ohms Minimum Gate Pulse Width = 2 µs)  MT2(+), G(+) MT2(+), G(−) MT2(−), G(−) MT2(−), G(+) "A" SUFFIX ONLY  (Main Terminal Voltage = Rated V <sub>DRM</sub> , R <sub>L</sub> = 10 kΩ, T <sub>J</sub> = +125°C MT2(+), G(+); MT2(+), G(−); MT2(−), G(−) MT2(−), G(+) "A" SUFFIX ONLY	V <sub>GT</sub>	— — — — 0.2 0.2	0.9 0.9 1.1 1.4	2 2 2 2.5 — —	Volts
Holding Current (Either Direction) (Main Terminal Voltage = 12 Vdc, Gate Open, Initiating Current = 500 mA, T <sub>C</sub> = +25°C)	I <sub>H</sub>	—	6	50	mA
Turn-On Time (Rated V <sub>DRM</sub> , I <sub>TM</sub> = 14 A, I <sub>GT</sub> = 120 mA, Rise Time = 0.1 µs, Pulse Width = 2 µs)	t <sub>gt</sub>	—	1.5	—	µs
Critical Rate of Rise of Commutation Voltage (V <sub>D</sub> = Rated V <sub>DRM</sub> , I <sub>TM</sub> = 14 A, Commutating di/dt = 5.0 A/ms, Gate Unenergized, T <sub>C</sub> = +70°C)	dv/dt(c)	—	5	—	V/µs
Critical Rate of Rise of Off-State Voltage (V <sub>D</sub> = Rated V <sub>DRM</sub> , Exponential Voltage Rise, Gate Open, T <sub>C</sub> = +70°C)	dv/dt	—	100	—	V/µs

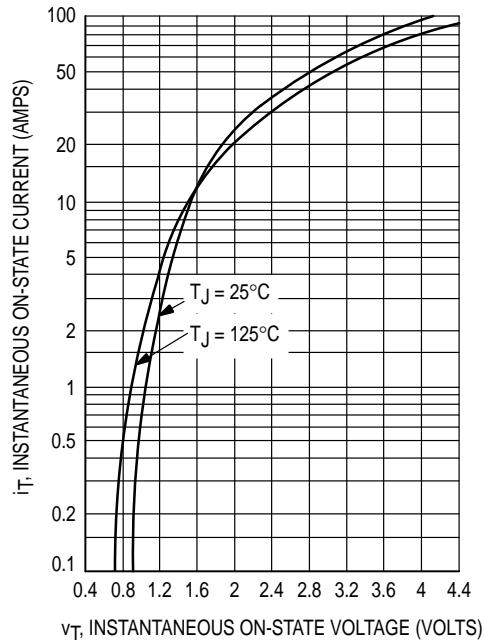
**TYPICAL CHARACTERISTICS**



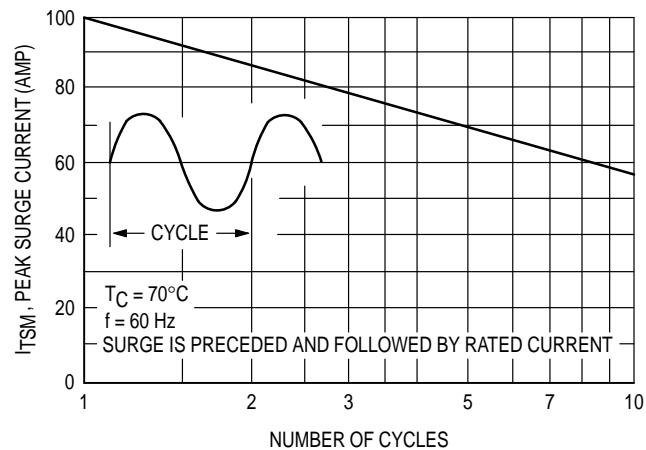
**Figure 1. Current Derating**



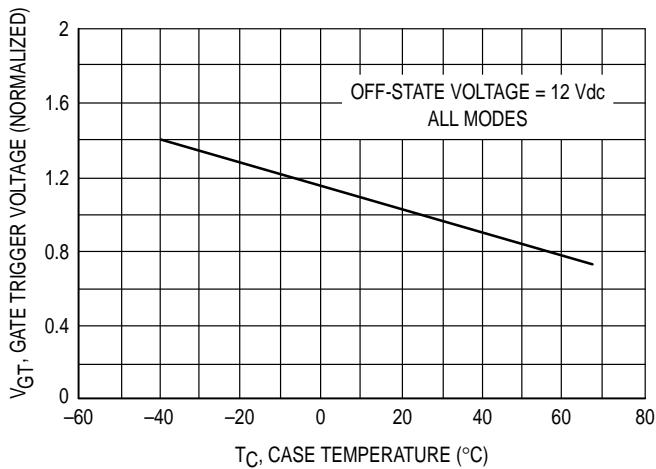
**Figure 2. Power Dissipation**



**Figure 3. Maximum On-State Characteristics**



**Figure 4. Maximum Nonrepetitive Surge Current**



**Figure 5. Typical Gate Trigger Voltage**

## MAC210FP Series MAC210AFP Series

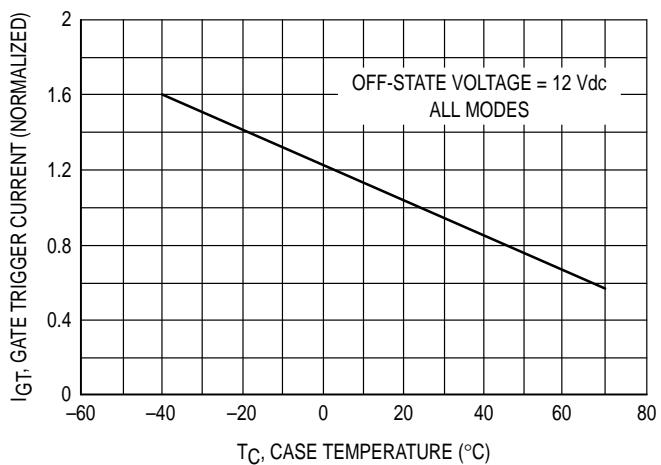


Figure 6. Typical Gate Trigger Current

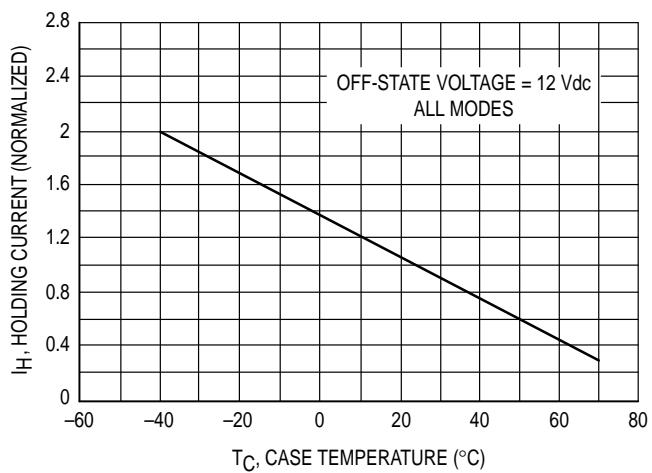


Figure 7. Typical Holding Current

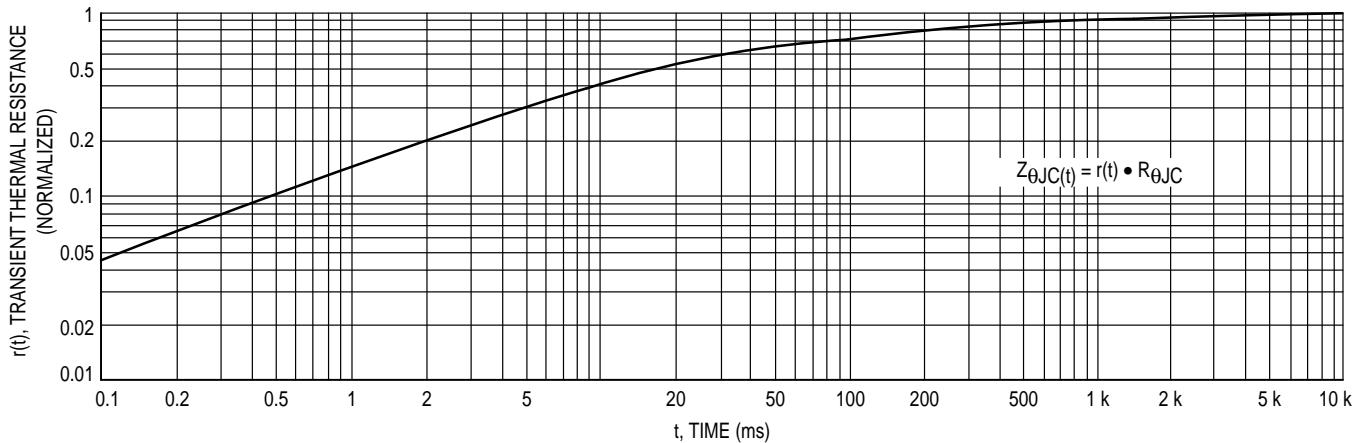
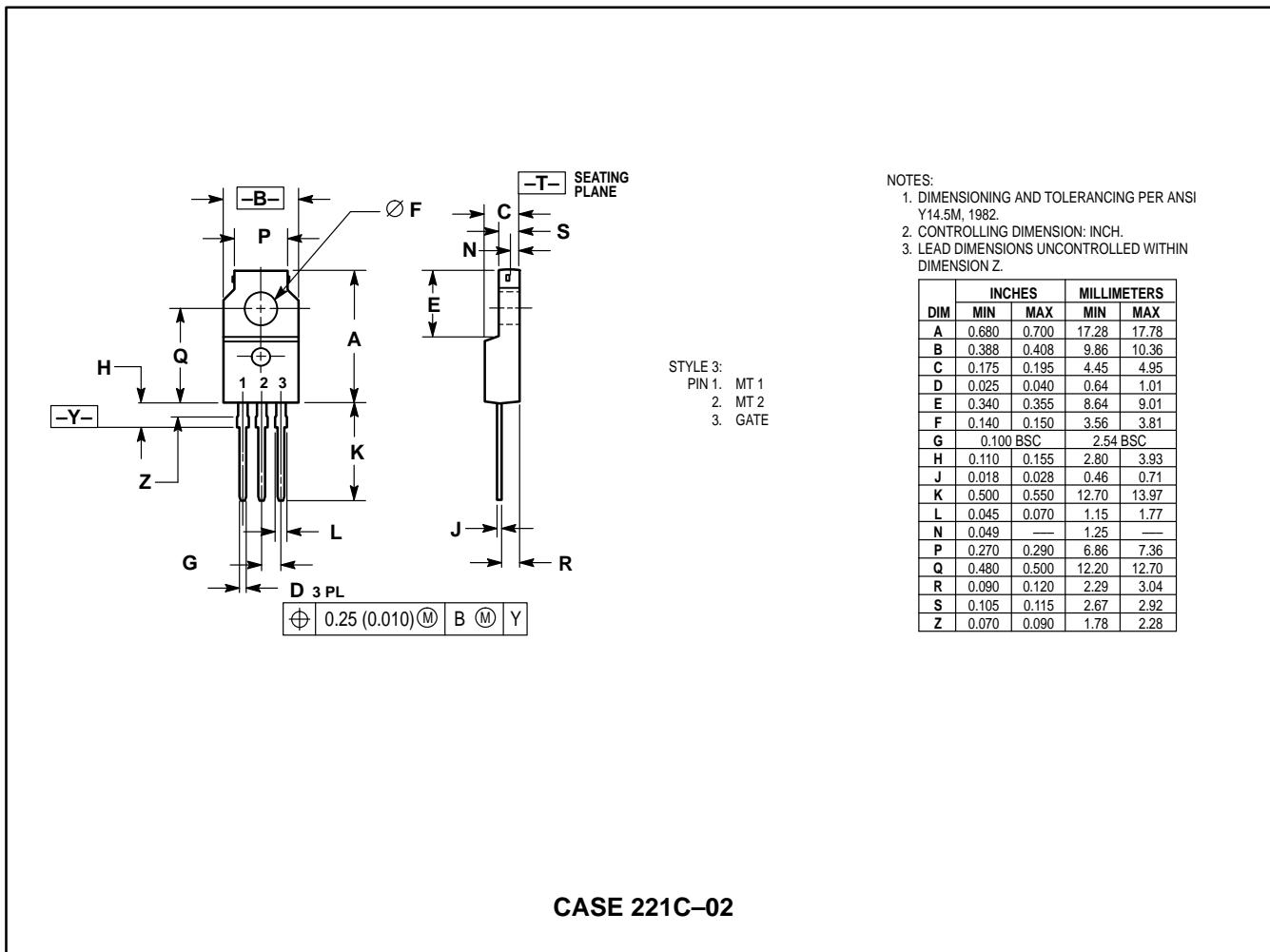


Figure 8. Thermal Response

## PACKAGE DIMENSIONS



## MAC210FP Series MAC210APP Series

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