

Triacs

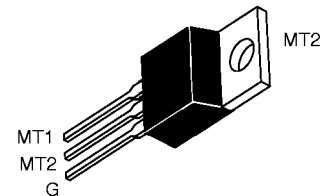
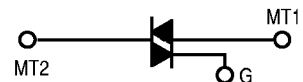
Silicon Bidirectional Thyristors

... 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 Four Modes

MAC212A Series

TRIACs
12 AMPERES RMS
600 thru 800 VOLTS



CASE 221A-07
(TO-220AB)
STYLE 4

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

Rating	Symbol	Value	Unit
Repetitive Peak Off-State Voltage ⁽¹⁾ ($T_J = -40$ to $+125^\circ\text{C}$, 1/2 Sine Wave 50 to 60 Hz, Gate Open)	V_{DRM}	600 800	Volts
On-State Current RMS ($T_C = +85^\circ\text{C}$) Full Cycle Sine Wave 50 to 60 Hz	$I_{\text{T(RMS)}}$	12	Amp
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, $T_C = +85^\circ\text{C}$) preceded and followed by Rated Current	I_{TSM}	100	Amp
Circuit Fusing Considerations ($t = 8.3$ ms)	I^2t	40	A^2s
Peak Gate Power ($T_C = +85^\circ\text{C}$, Pulse Width = 10 μs)	P_{GM}	20	Watts
Average Gate Power ($T_C = +85^\circ\text{C}$, $t = 8.3$ ms)	$P_{\text{G(AV)}}$	0.35	Watt
Peak Gate Current ($T_C = +85^\circ\text{C}$, Pulse Width = 10 μs)	I_{GM}	2	Amp
Operating Junction Temperature Range	T_J	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to +150	$^\circ\text{C}$

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.

MAC212A Series

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
$R_{\theta JC}$ $R_{\theta JA}$	Thermal Resistance — Junction to Case — Junction to Ambient	2.0 62.5	$^{\circ}\text{C}/\text{W}$
T_L	Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	260	$^{\circ}\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current (Either Direction) ($V_D = \text{Rated } V_{DRM}$, Gate Open) $T_J = 25^{\circ}\text{C}$ $T_J = +125^{\circ}\text{C}$	I_{DRM}	— —	— —	10 2	μA mA
Peak On-State Voltage (Either Direction) $I_{TM} = 17 \text{ A Peak}$; Pulse Width = 1 to 2 ms, Duty Cycle $\leq 2\%$	V_{TM}	—	1.3	1.75	Volts
Gate Trigger Current (Continuous dc) (Main Terminal Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+)	I_{GT}	— — — —	12 12 20 35	50 50 50 75	mA
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+) (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(+)	V_{GT}	— — — — 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)	I_H	—	6	50	mA
Turn-On Time ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 17 \text{ A}$, $I_{GT} = 120 \text{ mA}$, Rise Time = 0.1 μs , Pulse Width = 2 μs)	t_{gt}	—	1.5	—	μs
Critical Rate of Rise of Commutation Voltage ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 17 \text{ A}$, Commutating $di/dt = 6.1 \text{ A/ms}$, Gate Unenergized, $T_C = +85^{\circ}\text{C}$)	$dv/dt_{(c)}$	—	5	—	$\text{V}/\mu\text{s}$
Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Voltage Rise, Gate Open, $T_C = +85^{\circ}\text{C}$)	dv/dt	—	100	—	$\text{V}/\mu\text{s}$

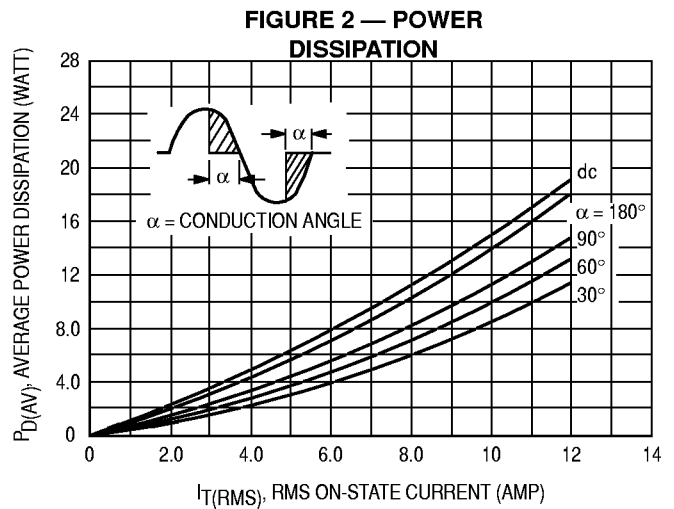
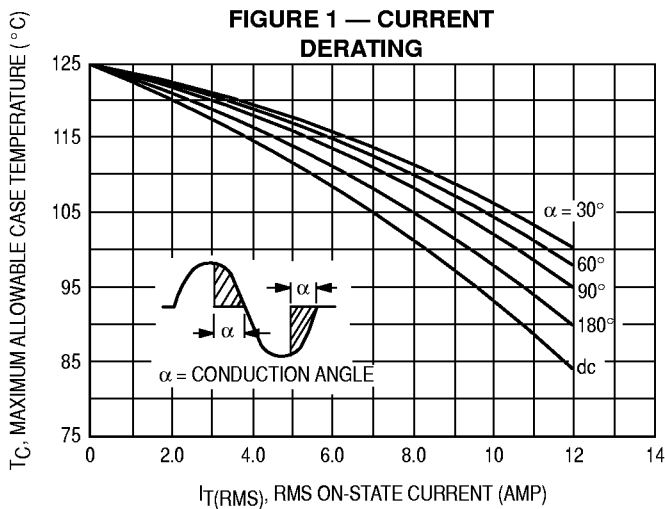


FIGURE 3 — MAXIMUM ON-STATE CHARACTERISTICS

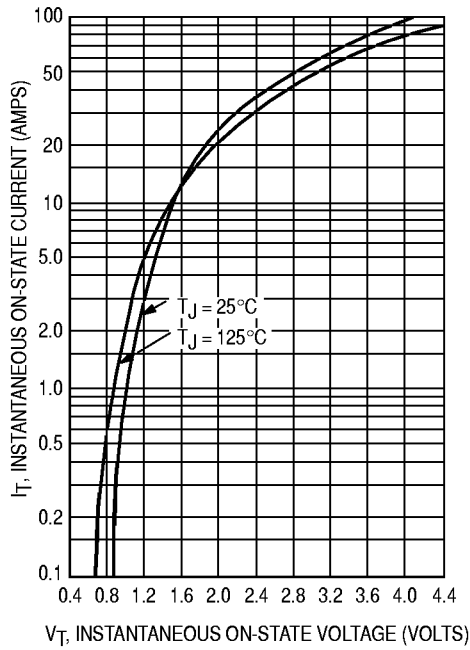


FIGURE 4 — MAXIMUM NON-REPETITIVE SURGE CURRENT

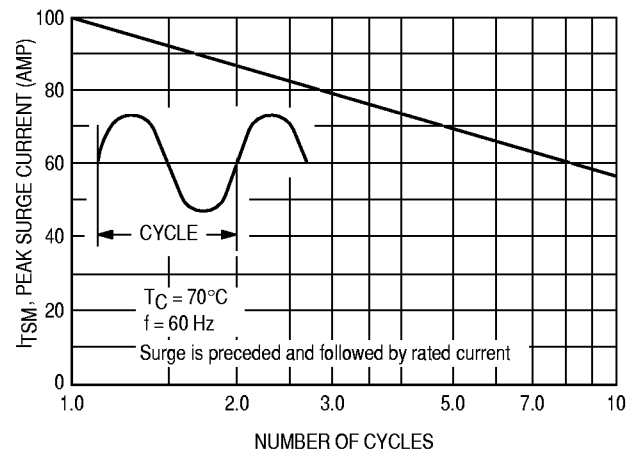


FIGURE 5 — TYPICAL GATE TRIGGER VOLTAGE

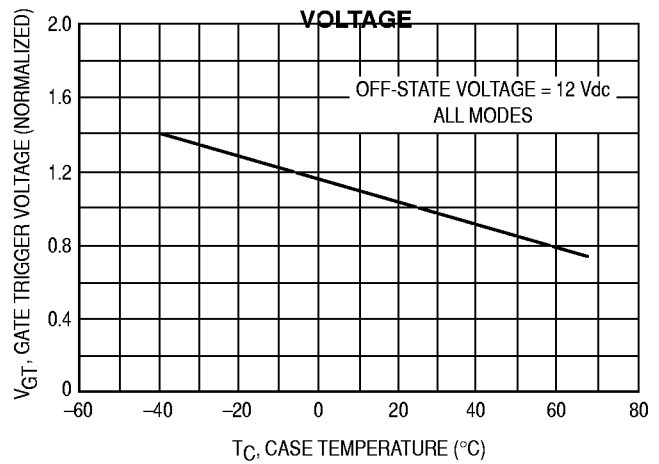


FIGURE 6 — TYPICAL GATE TRIGGER CURRENT

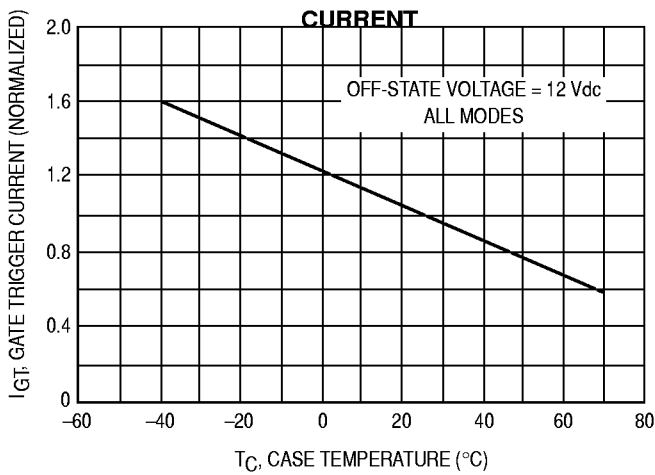


FIGURE 7 — TYPICAL HOLDING CURRENT

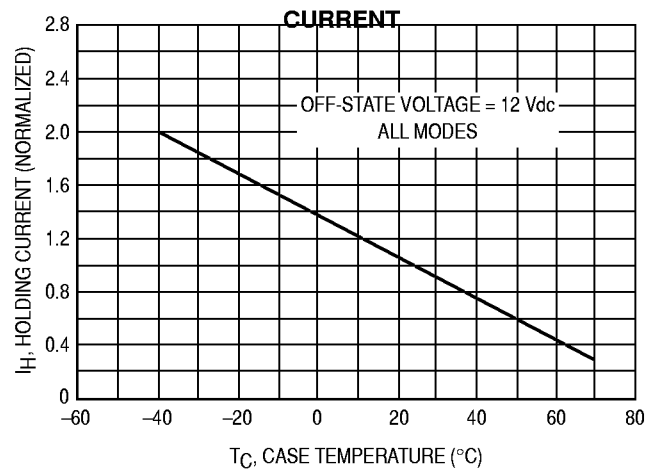
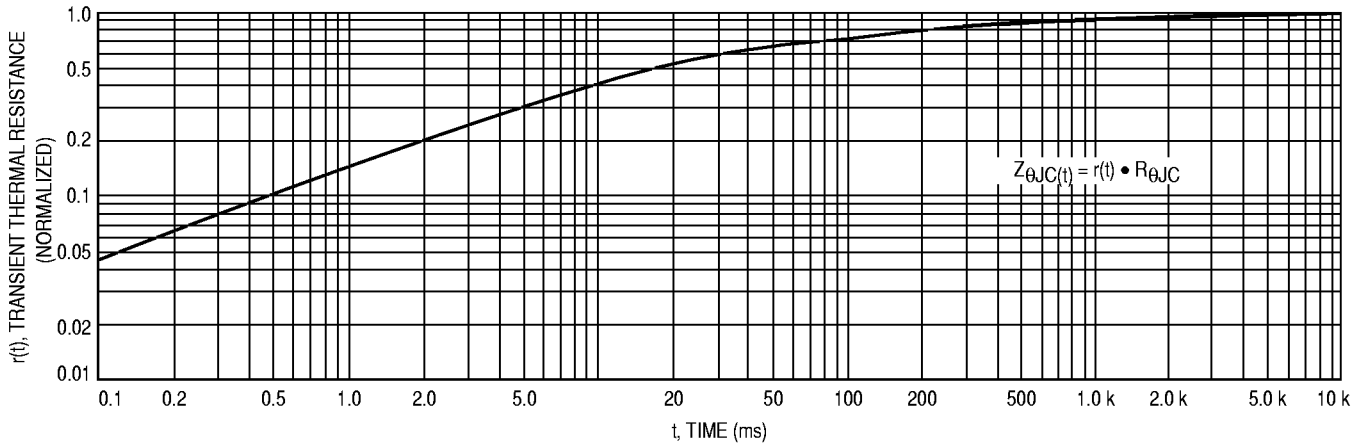
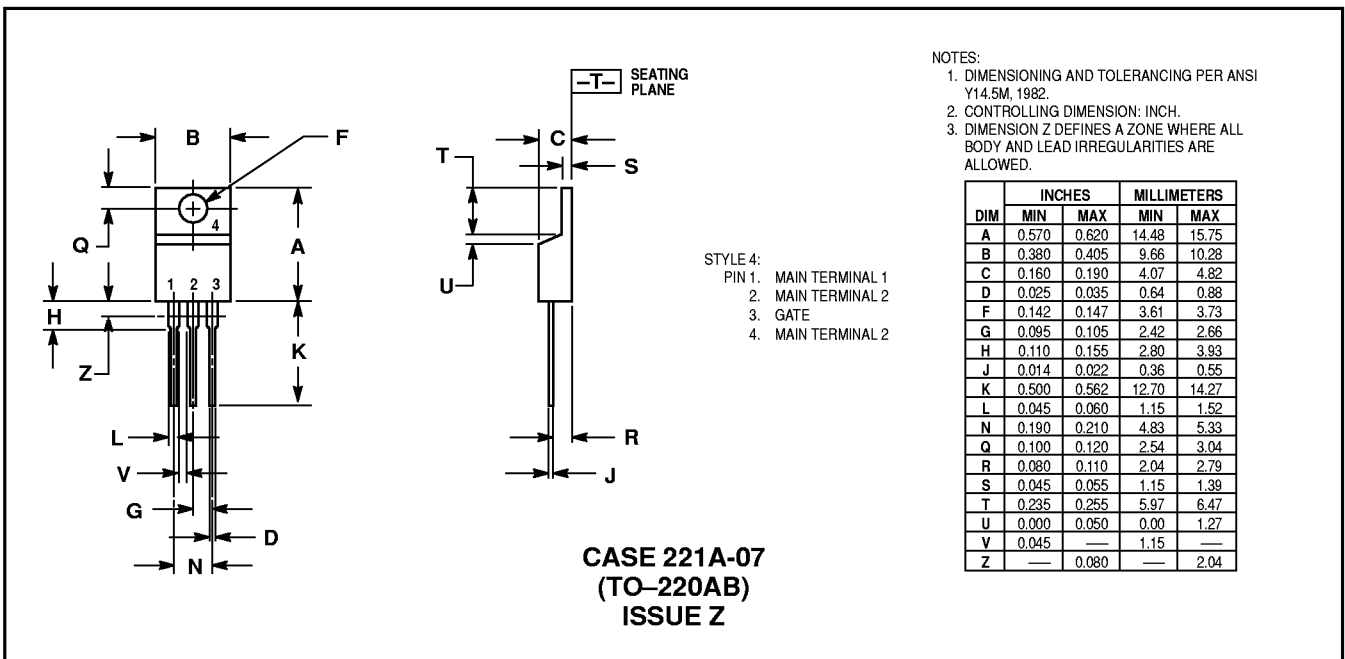


FIGURE 8 – THERMAL RESPONSE



PACKAGE DIMENSIONS



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