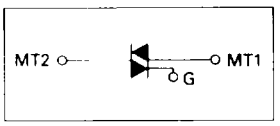
Triacs
Silicon Bidirectional Thyristors

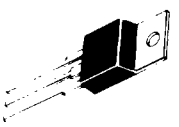
MAC210 Series
MAC210A Series

. . . 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 (MAC210 Series) or Four Modes (MAC210A Series)

TRIACs
10 AMPERES RMS
200 thru 800 VOLTS





CASE 221A-04
(TO-220AB)
STYLE 4

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MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Repetitive Peak Off-State Voltage, Note 1 (T_J 40 to + 125 C)		V_{DRM}		Volts
1 2 Sine Wave 50 to 60 Hz, Gate Open	MAC210-4, MAC210A4		200	
	MAC210-6, MAC210A6		400	
	MAC210-8, MAC210A8		600	
	MAC210-10, MAC210A10		800	
On-State Current RMS (T_C + 70 C) Full Cycle Sine Wave 50 to 60 Hz		$I_{T(RMS)}$	10	Amps
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, T_C + 70 C) Preceded and followed by Rated Current		I_{TSM}	100	Amps
Circuit Fusing Considerations (t 8.3 ms)		I^2t	40	A^2s
Peak Gate Power (T_C + 70 C, Pulse Width 10 μs)		P_{GM}	20	Watts
Average Gate Power (T_C + 70 C, t 8.3 ms)		$P_{G(AV)}$	0.35	Watt
Peak Gate Current (T_C + 70 C, Pulse Width 10 μs)		I_{GM}	2	Amps
Operating Junction Temperature Range		T_J	40 to + 125	C
Storage Temperature Range		T_{stg}	40 to + 125	C

Note 1. Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_C 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current (Rated V_{DRM} or V_{RRM}, gate open) T_J = 25°C T_J = +125°C	I_{DRM}, I_{RRM}	— —	— —	10 2	μA mA
Peak On-State Voltage (Either Direction) (I_{TM} = 14 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle = 2%)	V_{TM}	—	1.2	1.65	Volts
Gate Trigger Current (Continuous dc) (Main Terminal Voltage = 12 Vdc, R_L = 100 Ohms) MT2(+), G(+) MT2(+), G(−) MT2(−), G(−) MT2(−), G(+) "A" SUFFIX ONLY	I_{GT}	 — — — —	 12 12 20 35	 50 50 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 ohms, T_J = +125°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) (Main Terminal Voltage = 12 Vdc, Gate Open, Initiating Current = 500 mA, T_C = 25°C)	I_H	—	6	50	mA
Turn-On Time (Rated V_{DRM}, I_{TM} = 14 A) (I_{GT} = 120 mA, Rise Time = 0.1 μs, Pulse Width = 2 μs)	t_{gt}	—	1.5	—	μs
Critical Rate of Rise of Commutation Voltage (Rated V_{DRM}, I_{TM} = 14 A, Commutating di/dt = 4.3 A/ms, Gate Unenergized, T_C = 70°C)	dv/dt(c)	—	5	—	V/μs
Critical Rate of Rise of Off-State Voltage (V_D = V_{DROM}, Exponential Voltage Rise, Gate Open, T_C = 70°C)	dv/dt	—	100	—	V/μs

FIGURE 1 — CURRENT DERATING

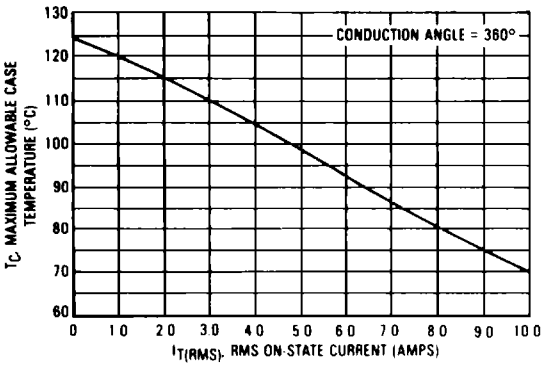

FIGURE 2 — POWER DISSIPATION

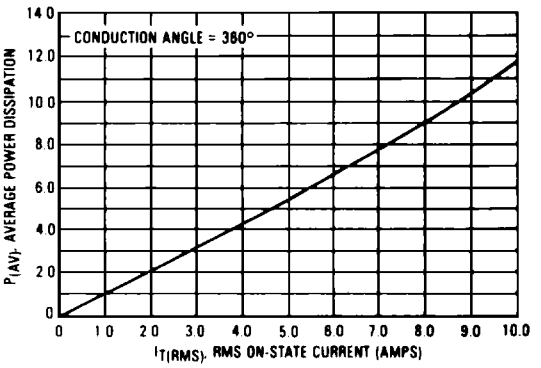

FIGURE 3 — MAXIMUM ON-STATE CHARACTERISTICS

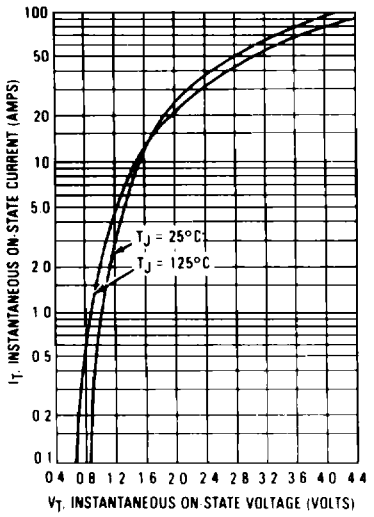

FIGURE 4 — MAXIMUM NON-REPETITIVE SURGE CURRENT

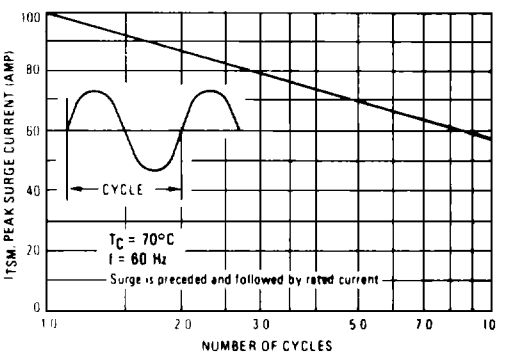

FIGURE 5 — TYPICAL GATE TRIGGER VOLTAGE

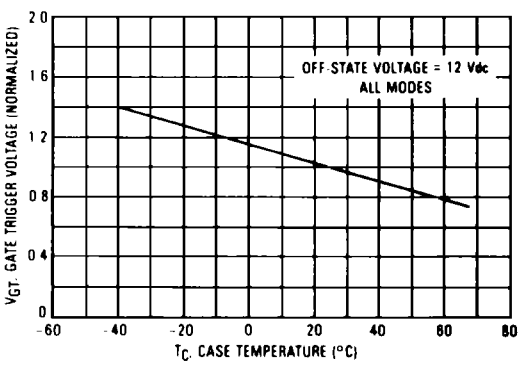

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FIGURE 6 – TYPICAL GATE TRIGGER CURRENT

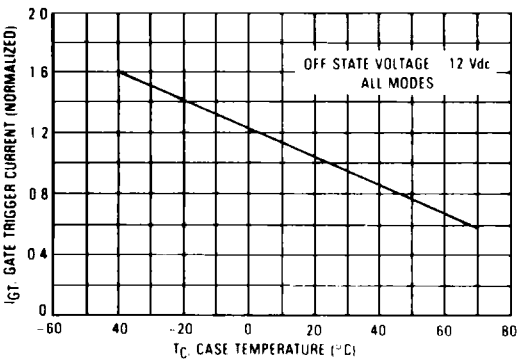


FIGURE 7 – TYPICAL HOLDING CURRENT

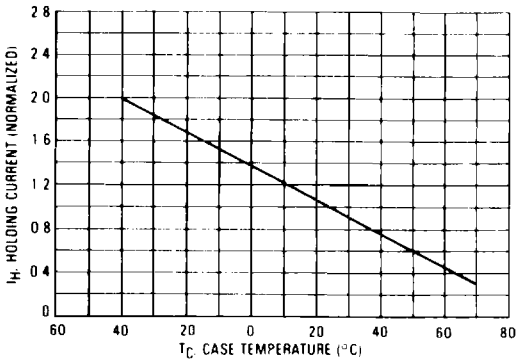
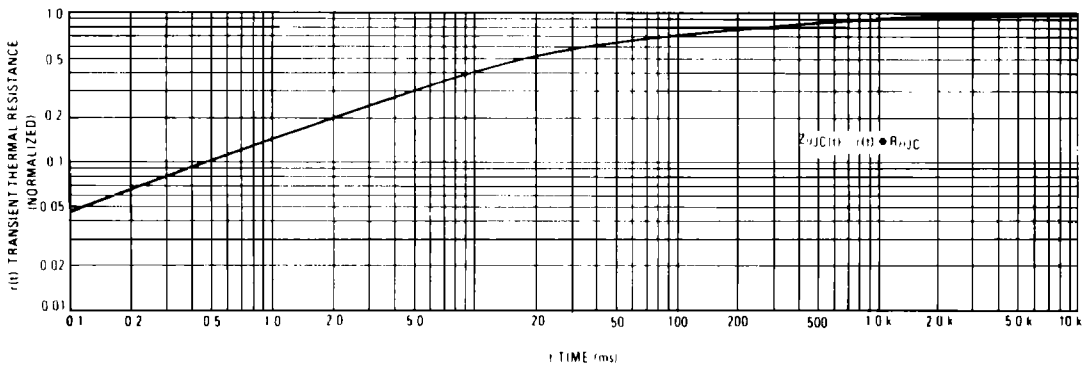


FIGURE 8 THERMAL RESPONSE



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