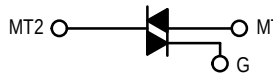
MAC210A8

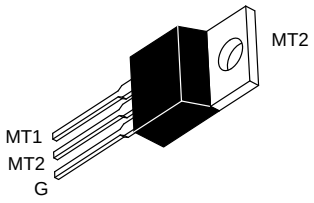
Triacs
Silicon Bidirectional Thyristors

TRIACs
10 AMPERES RMS
600 VOLTS

. . . 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 600 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





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

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Repetitive Peak Off-State Voltage(1) (T_J = –40 to +125°C, 1/2 Sine Wave 50 to 60 Hz, Gate Open) MAC210A8	V_{DRM}	600	Volts
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

(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.

THERMAL CHARACTERISTICS

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current (V_D = Rated V_{DRM}, Gate Open) T_J = 25°C T_J = +125°C	I_{DRM}	 — —	 — —	 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(+)	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(+) (Main Terminal Voltage = Rated V_{DRM}, R_L = 10 k ohms, T_J = +125°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, 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 (V_D = Rated V_{DRM}, I_{TM} = 14 A, Commutating di/dt = 5.0 A/ms, Gate Unenergized, T_C = 70°C)	dv/dt(c)	—	5	—	V/μs
Critical Rate of Rise of Off-State Voltage (V_D = Rated V_{DRM}, Exponential Voltage Rise, Gate Open, T_C = +70°C)	dv/dt	—	100	—	V/μs

FIGURE 1 — CURRENT DERATING

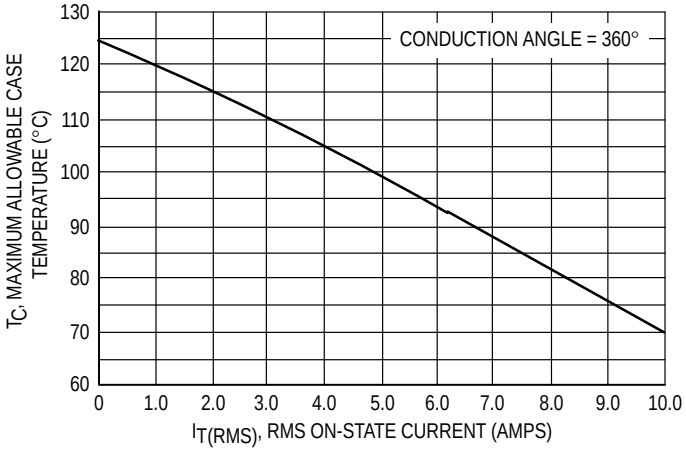


FIGURE 2 — POWER DISSIPATION

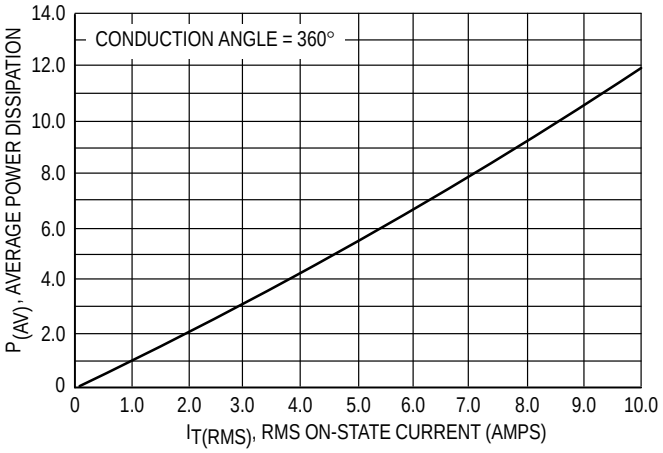


FIGURE 3 — MAXIMUM ON-STATE CHARACTERISTICS

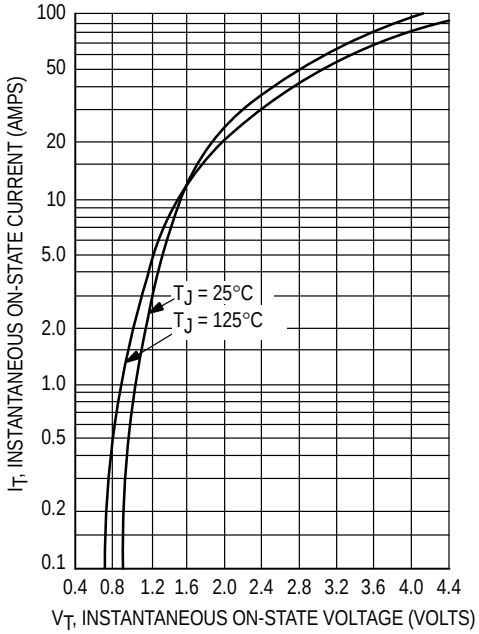


FIGURE 4 — MAXIMUM NON-REPETITIVE SURGE CURRENT

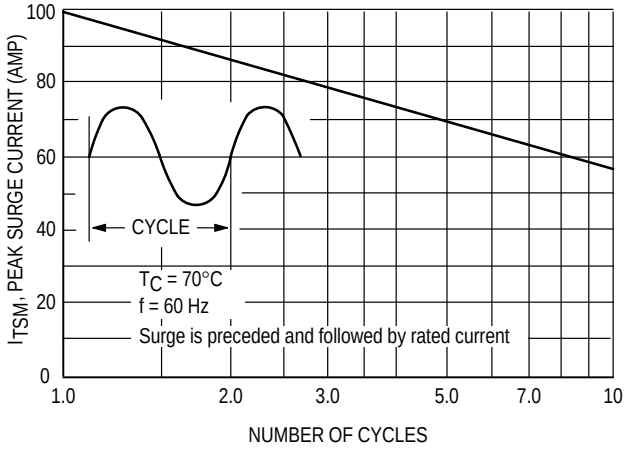


FIGURE 5 — TYPICAL GATE TRIGGER VOLTAGE

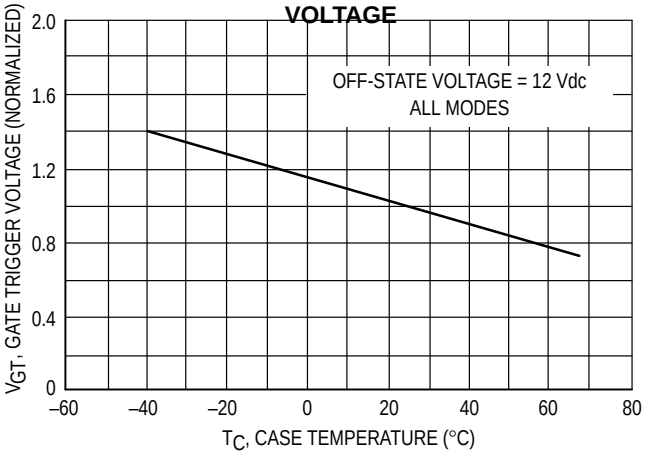


FIGURE 6 — TYPICAL GATE TRIGGER CURRENT

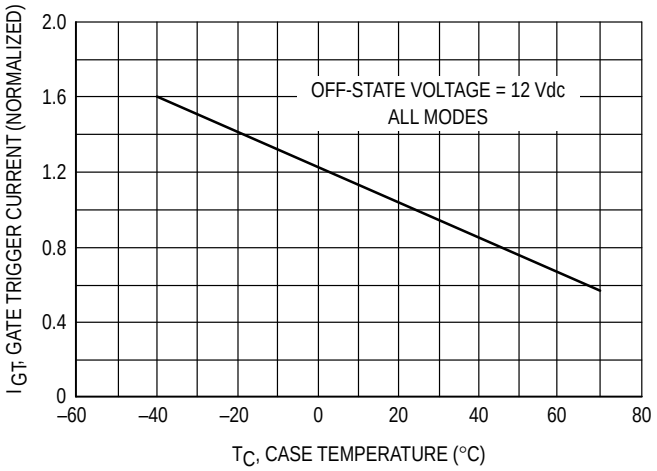


FIGURE 7 — TYPICAL HOLDING CURRENT

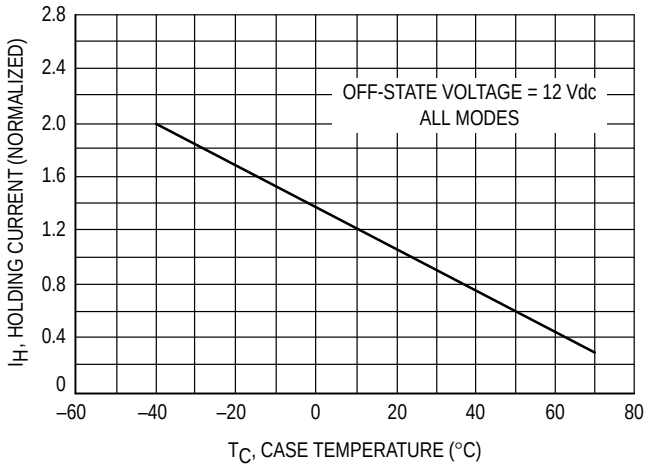
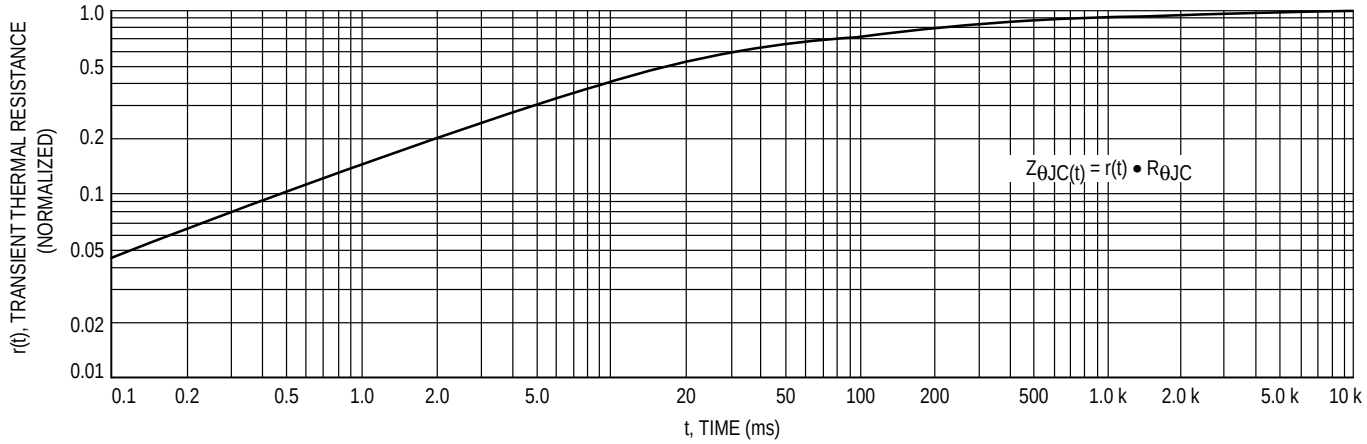
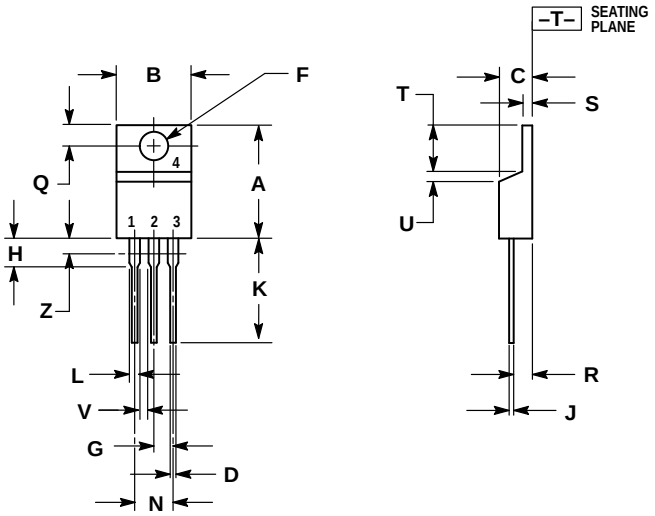


FIGURE 8 – THERMAL RESPONSE



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.

	INCHES		MILLIMETERS	
DIM	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	0.060	1.15	1.52
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-07
(TO–220AB)
ISSUE Z

NOTES

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