

Triacs

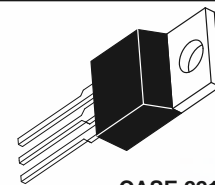
Silicon Bidirectional Triode Thyristors

... designed primarily for industrial and consumer applications for full wave control of ac loads such as appliance controls, heater controls, motor controls, and other power switching applications.

- Sensitive Gate Triggering in 3 Modes for AC Triggering on Sinking Current Sources (MAC228 Series)
- Four Mode Triggering for Drive Circuits that Source Current (MAC228A Series)
- All Diffused and Glass-Passivated Junctions for Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal resistance and High Heat Dissipation
- Center Gate Geometry for Uniform Current Spreading

**MAC228
 Series
 MAC228A
 Series**

**TRIACs
 8 AMPERES RMS
 200 thru 800 VOLTS**



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

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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage ⁽¹⁾ ($T_J = -40$ to 110°C 1/2 Sine Wave 50 to 60 Hz, Gate Open)	V_{DRM}	200 400 600 800	Volts
On-State RMS Current ($T_C = 80^\circ\text{C}$) Full Cycle Sine Wave 50 to 60 Hz	$I_T(\text{RMS})$	8	Amps
Peak Non-repetitive Surge Current (One Full Cycle 60 Hz, $T_J = 110^\circ\text{C}$)	I_{TSM}	80	Amps
Circuit Fusing ($t = 8.3$ ms)	I^2t	26	A^2s
Peak Gate Current ($t \leq 2 \mu\text{s}$)	I_{GM}	± 2	Amps
Peak Gate Voltage ($t \leq 2 \mu\text{s}$)	V_{GM}	± 10	Volts
Peak Gate Power ($t \leq 2 \mu\text{s}$)	P_{GM}	20	Watts

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. (continued)

MAC228 Series MAC228A Series

MAXIMUM RATINGS — continued

Rating	Symbol	Value	Unit
Average Gate Power ($T_C = 80^\circ\text{C}$, $t \leq 8.3$ ms)	$P_{G(AV)}$	0.5	Watts
Operating Junction Temperature Range	T_J	-40 to 110	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to 150	$^\circ\text{C}$
Mounting Torque		8	in. lb.

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ and either polarity of MT2 to MT1 voltage unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current ($V_D = \text{Rated } V_{DRM}$) $T_J = 25^\circ\text{C}$ $T_J = 110^\circ\text{C}$	I_{DRM}	—	—	10 2	μA mA
Peak On-State Voltage ($I_{TM} = 11$ A Peak, Pulse Width ≤ 2 ms, Duty Cycle $\leq 2\%$)	V_{TM}	—	—	1.8	Volts
Gate Trigger Current (Continuous dc) ($V_D = 12$ V, $R_L = 100 \Omega$) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-) MT2(-), G(+) "A" Suffix Only	I_{GT}	—	—	5 10	mA
Gate Trigger Voltage (Continuous dc) ($V_D = 12$ V, $R_L = 100 \Omega$) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-) MT2(-), G(+) "A" Suffix Only ($V_D = \text{Rated } V_{DRM}$, $T_C = 110^\circ\text{C}$, $R_L = 10$ k) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-) MT2(-), G(+) "A" Suffix Only	V_{GT}	— — 0.2 0.2	— — — —	2 2.5	Volts
Holding Current ($V_D = 12$ Vdc, $I_{TM} = 200$ mA, Gate Open)	I_H	—	—	15	mA
Gate-Controlled Turn-On Time ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 16$ A Peak, $I_G = 30$ mA)	t_{gt}	—	1.5	—	μs
Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Waveform, $T_C = 110^\circ\text{C}$)	dv/dt	—	25	—	$\text{V}/\mu\text{s}$
Critical Rate of Rise of Commutation 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	—	$\text{V}/\mu\text{s}$

FIGURE 1 – RMS CURRENT DERATING

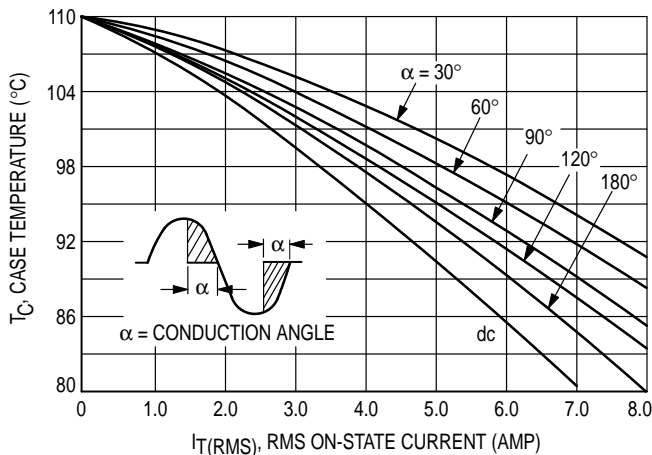
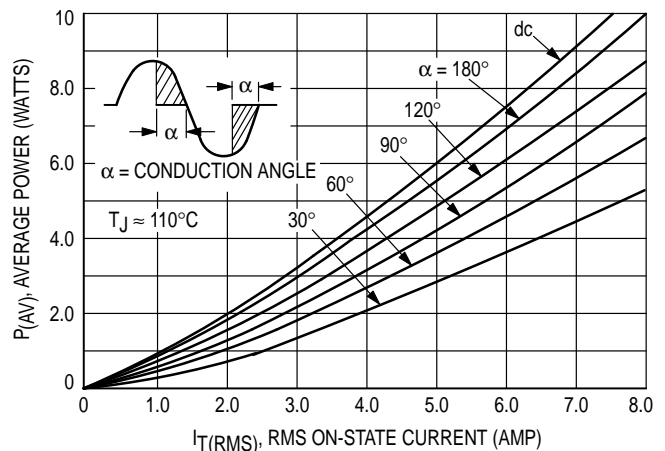
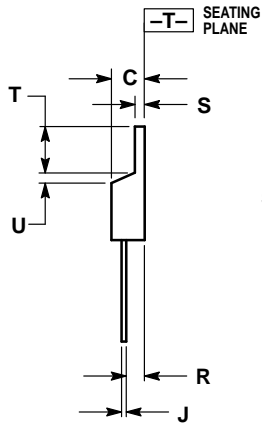
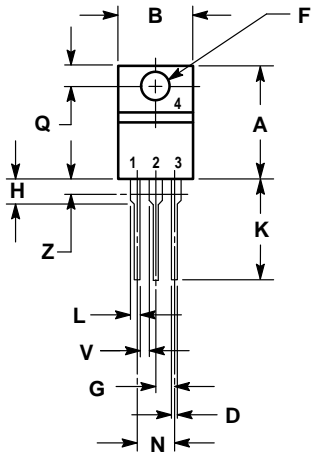


FIGURE 2 – ON-STATE POWER DISSIPATION



MAC228 Series MAC228A Series

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.

DIM	INCHES		MILLIMETERS	
	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	0.055	1.15	1.39
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-04
 (TO-220AB)

MAC228 Series MAC228A Series

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