Triacs

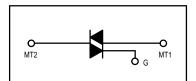
Silicon Bidirectional Triode Thyristors

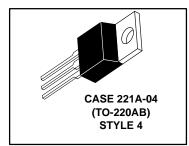
... designed primarily for full-wave ac control applications such as lighting sysjtems, heater controls, motor controls and power supplies; or wherever full-wave silicongate-controlled devices are needed.

- · Off-State Voltages to 800 Volts
- · All Diffused and Glass-Passivated Junctions for Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Thermal Resistance and High Heat Dissipation
- Gate Triggering Guaranteed in Three Modes (MAC223 Series) or Four Modes (MAC223A Series)

MAC223 Series MAC223A Series

TRIACs 25 AMPERES RMS 200 thru 800 VOLTS





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

Rating		Symbol	Value	Unit
Peak Repetitive Off-State Voltage (T _J = -40 to 125°C)(1) (1/2 Sine Wave 50 to 60 Hz, Gate Open)		VDRM		Volts
(172 Silie vvave 30 to 60 Fiz, Gate Open)	MAC223-4, MAC223A4 MAC223-6, MAC223A6 MAC223-8, MAC223A8 MAC223-10, MAC223A10		200 400 600 800	
On-State RMS Current (T _C = 80°C) (Full Cycle Sine Wave 50 to 60 Hz)		IT(RMS)	25	Amps
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, T _C = 80°C, preceded an	d followed by rated current)	ITSM	250	Amps
Circuit Fusing (t = 8.3 ms)		l ² t	260	A ² s
Peak Gate Current (t ≤ 2 μs)		I _{GM}	2	Amps
Peak Gate Voltage (t ≤ 2 μs)		V _{GM}	±10	Volts
Peak Gate Power (t \leq 2 μ s)		P _{GM}	20	Watts
Average Gate Power ($T_C = 80^{\circ}C$, $t \le 8.3 \text{ ms}$)		P _{G(AV)}	0.5	Watts
Operating Junction Temperature Range		TJ	-40 to 125	°C
Storage Temperature Range		T _{stg}	-40 to 150	°C
Mounting Torque		_	8	in. lb.

^{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.



MAC223 Series MAC223A Series

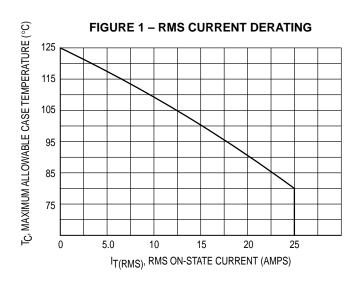
THERMAL CHARACTERISTICS

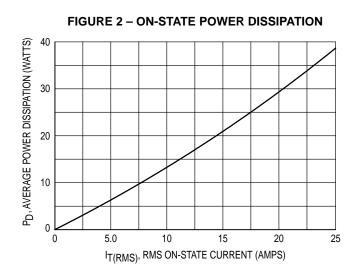
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{ heta JC}$	1.2	°C/W
Thermal Resistance, Junction to Ambient	$R_{ heta JA}$	60	°C/W

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

Characteristic	Symbol	Min	Тур	Max	Unit
Peak Blocking Current ⁽¹⁾ $(V_D = Rated V_{DRM}) T_J = 25^{\circ}C$ $T_J = 125^{\circ}C$	IDRM	_	_	10 2	μA mA
Peak On-State Voltage (I _{TM} = 35 A Peak, Pulse Width ≤ 2 ms, Duty Cycle ≤ 2%)	V _{TM}		1.4	1.85	Volts
Gate Trigger Current (Continuous dc) $ (V_D=12~V,~R_L=100~\Omega) \\ MT2(+),~G(+);~MT2(-),~G(-);~MT(+),~G(-) \\ MT2(-),~G(+)~"A"~SUFFIX~ONLY $	lGT		20 30	50 75	mA
Gate Trigger Voltage (Continuous dc) $ (V_D = 12 \text{ V}, \text{ R}_L = 100 \ \Omega) \\ \text{MT2(+)}, \text{ G(+)}; \text{MT2(-)}, \text{ G(-)}; \text{MT(+)}, \text{ G(-)} \\ \text{MT2(-)}, \text{ G(+) "A" SUFFIX ONLY} \\ (V_D = \text{Rated } V_{DRM}, \text{T}_J = 125^{\circ}\text{C}, \text{ R}_L = 10 \text{ k}) \\ \text{MT(+)}, \text{ G(+)}; \text{MT2(-)}, \text{ G(-)}; \text{MT2(+)}, \text{ G(-)} \\ \text{MT2(-)}, \text{ G(+) "A" SUFFIX ONLY} $	Vgт	— — 0.2 0.2	1.1 1.3 0.4 0.4	2 2.5 —	Volts
Holding Current (V _D = 12 V, I _{TM} = 200 mA, Gate Open)	lн	_	10	50	mA
Gate Controlled Turn-On Time (V _D = Rated V _{DRM} , I _{TM} = 35 A Peak, I _G = 200 mA)	^t gt	_	1.5	_	μs
Critical Rate of Rise of Off-State Voltage (V _D = Rated V _{DRM} , Exponential Waveform, T _C = 125°C)	dv/dt	_	40	_	V/µs
Critical Rate of Rise of Commutation Voltage (V_D = Rated V_{DRM} , I_{TM} = 35 A Peak, Commutating di/dt = 12.6 A/ms, Gate Unenergized, T_C = 80°C)	dv/dt(c)	_	5	_	V/µs

^{1.} Ratings apply for open gate conditions. Devices shall not be tested with a constant current source for blocking voltage such that the voltage applied exceeds the rated blocking voltage.





MAC223 Series MAC223A Series

FIGURE 3 - GATE TRIGGER CURRENT

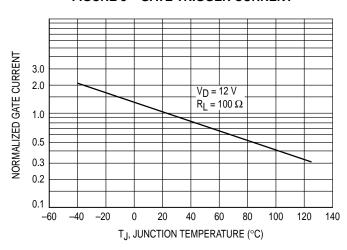


FIGURE 4 - GATE TRIGGER VOLTAGE

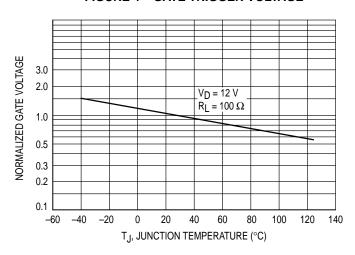


FIGURE 5 - HOLD CURRENT

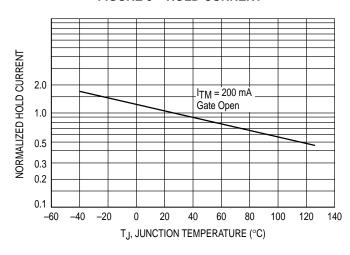
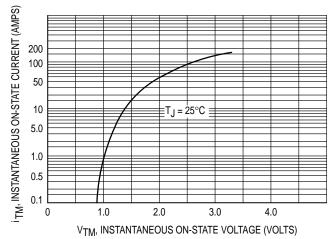
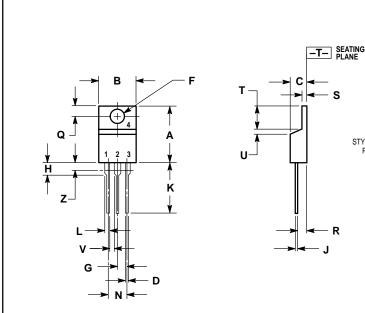


FIGURE 6 - TYPICAL ON-STATE CHARACTERISTICS



PACKAGE DIMENSIONS



NOTES:

- 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	
Α	0.570	0.620	14.48	15.75	
В	0.380	0.405	9.66	10.28	
С	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	
Н	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	
Т	0.235	0.255	5.97	6.47	
U	0.000	0.050	0.00	1.27	
٧	0.045		1.15		
Z		0.080		2.04	

CASE 221A-04 (TO-220AB)

STYLE 4:

3. GATE MAIN TERMINAL 2

MAIN TERMINAL 1 MAIN TERMINAL 2

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