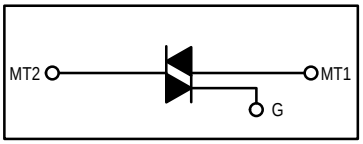
MAC223FP Series
MAC223AFP Series

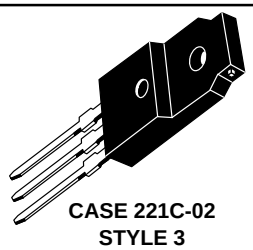
Triacs
Silicon Bidirectional Triode Thyristors

. . . designed primarily for full-wave ac control applications, such as lighting systems, heater controls, motor controls and power supplies; or wherever full-wave silicon-gate-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 (MAC223FP Series) or Four Modes (MAC223AFP Series)

ISOLATED TRIACs
THYRISTORS
25 AMPERES RMS
200 thru 800 VOLTS





CASE 221C-02
STYLE 3

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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage(1) (T_J = –40 to +125°C, 1/2 Sine Wave 50 to 60 Hz, Gate Open) MAC223-4FP, MAC223A4FP MAC223-6FP, MAC223A6FP MAC223-8FP, MAC223A8FP MAC223-10FP, MAC223A10FP	V_{DRM}	 200 400 600 800	Volts
On-State RMS Current (T_C = +80°C) Full Cycle Sine Wave 50 to 60 Hz(2)	$I_{T(RMS)}$	25	Amps
Peak Nonrepetitive Surge Current (One Full Cycle, 60 Hz, T_C = 80°C, preceded and followed by rated current)	I_{TSM}	250	Amps
Circuit Fusing (t = 8.3 ms)	I^2t	260	A^2s
Peak Gate Power (t ≤ 2 µs)	P_{GM}	20	Watts
Average Gate Power (T_C = +80°C, t ≤ 8.3 ms)	$P_{G(AV)}$	0.5	Watt
Peak Gate Current (t ≤ 2 µs)	I_{GM}	2	Amps
Peak Gate Voltage (t ≤ 2 µs)	V_{GM}	±10	Volts
RMS Isolation Voltage (T_A = 25°C, Relative Humidity ≤ 20%)	$V_{(ISO)}$	1500	Volts
Operating Junction Temperature	T_J	–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.
2. The case temperature reference point for all T_C measurements is a point on the center lead of the package as close as possible to the plastic body.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.2	°C/W
Thermal Resistance, Case to Sink	$R_{\theta CS}$	2.2	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C and either polarity of MT2 to MT1 voltage unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
Peak Blocking Current(1) (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 (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 Ω) MT2(+), G(+); MT2(–), G(–); MT2(+), G(–) MT2(–), G(+) "A" SUFFIX ONLY		I_{GT}	 — —	 20 30	 50 75	mA
Gate Trigger Voltage (Continuous dc) (V_D = 12 V, R_L = 100 Ω) MT2(+), G(+); MT2(–), G(–); MT(+), G(–) MT2(–), G(+) "A" SUFFIX ONLY (V_D = Rated V_{DRM}, T_J = 125°C, R_L = 10 k) MT(+), G(+); MT2(–), G(–); MT2(+), G(–) MT2(–), G(+) "A" SUFFIX ONLY		V_{GT}	 — — 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)		I_H	—	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.

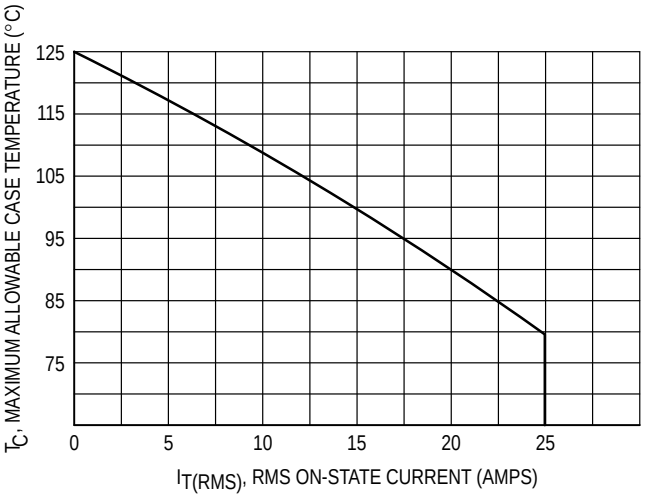


Figure 1. RMS Current Derating

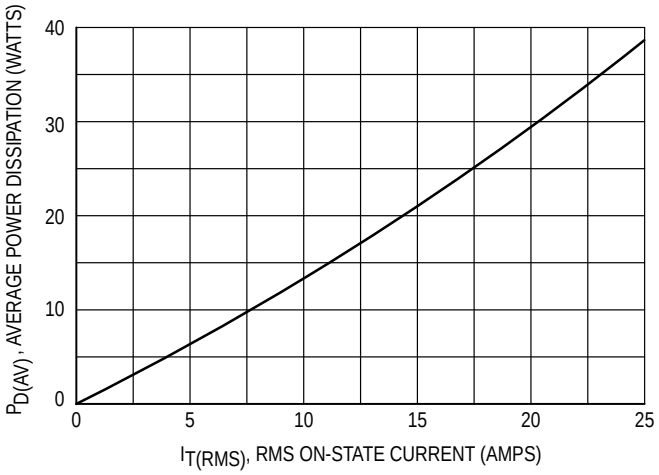


Figure 2. On-State Power Dissipation

TYPICAL CHARACTERISTICS

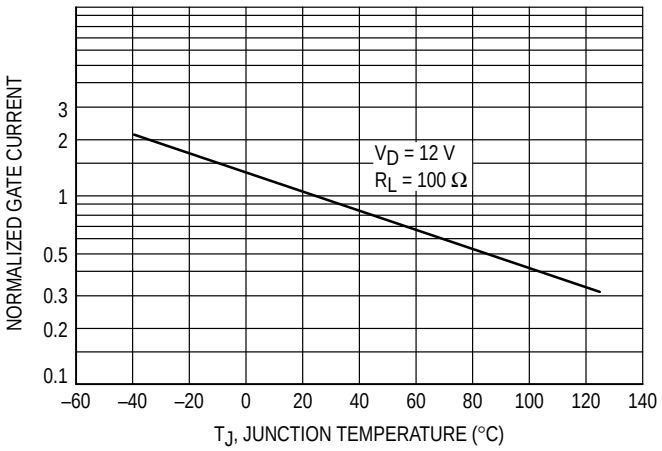


Figure 3. Gate Trigger Current

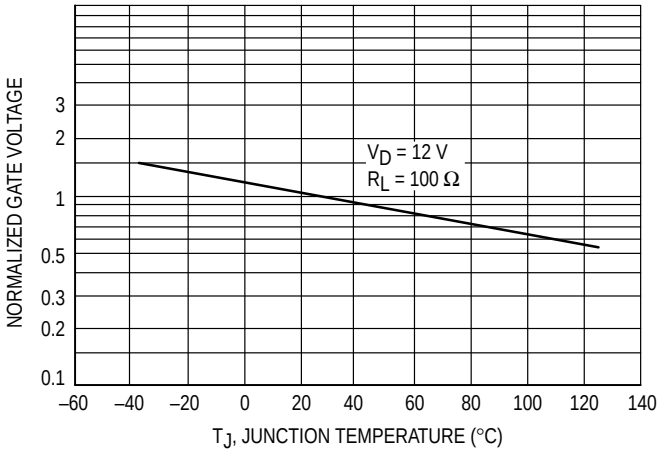


Figure 4. Gate Trigger Voltage

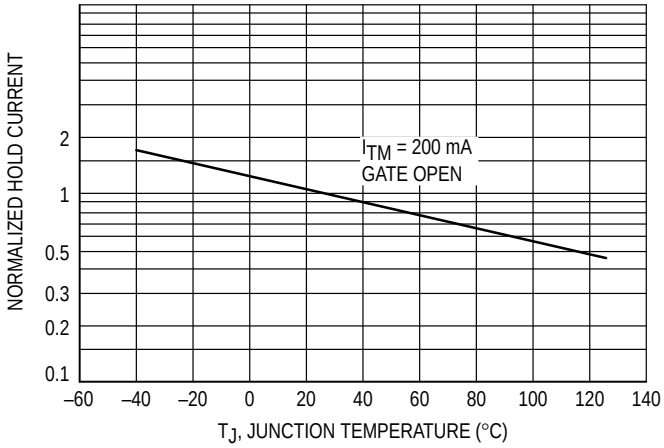


Figure 5. Hold Current

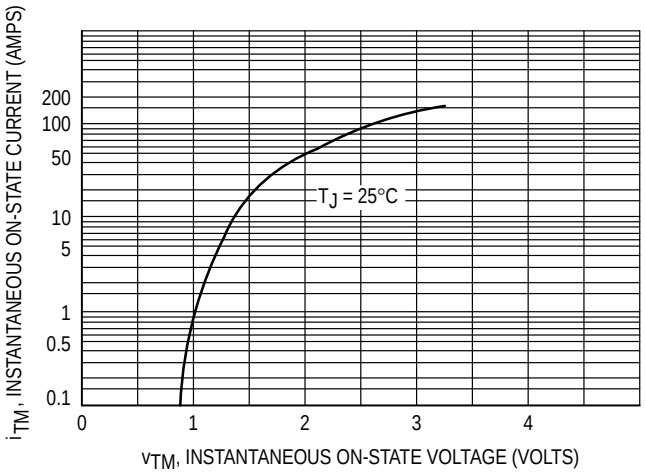
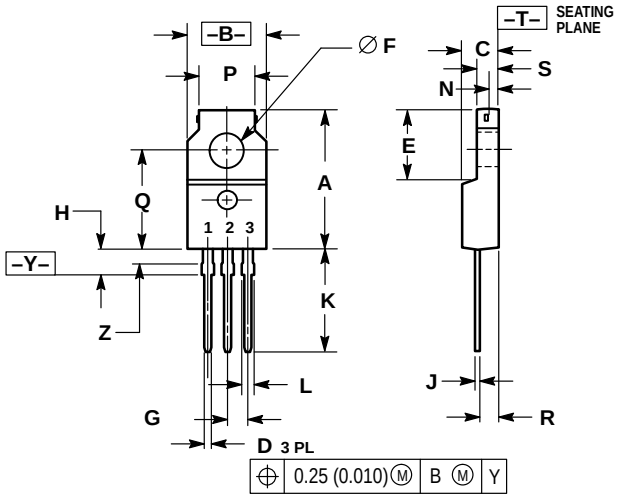


Figure 6. Typical On-State Characteristics

PACKAGE DIMENSIONS



STYLE 3:
PIN 1. MT 1
2. MT 2
3. GATE

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. LEAD DIMENSIONS UNCONTROLLED WITHIN DIMENSION Z.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.680	0.700	17.28	17.78
B	0.388	0.408	9.86	10.36
C	0.175	0.195	4.45	4.95
D	0.025	0.040	0.64	1.01
E	0.340	0.355	8.64	9.01
F	0.140	0.150	3.56	3.81
G	0.100 BSC		2.54 BSC	
H	0.110	0.155	2.80	3.93
J	0.018	0.028	0.46	0.71
K	0.500	0.550	12.70	13.97
L	0.045	0.070	1.15	1.77
N	0.049	—	1.25	—
P	0.270	0.290	6.86	7.36
Q	0.480	0.500	12.20	12.70
R	0.090	0.120	2.29	3.04
S	0.105	0.115	2.67	2.92
Z	0.070	0.090	1.78	2.28

CASE 221C-02

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