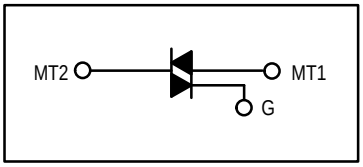
MAC218FP Series MAC218AFP Series

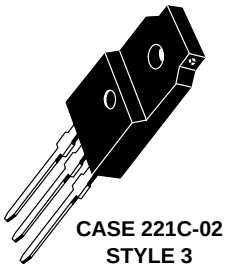
Triacs
Silicon Bidirectional Thyristors

ISOLATED TRIACs THYRISTORS 8 AMPERES RMS 200 thru 800 VOLTS

. . . designed primarily for full-wave ac control applications, such as light dimmers, motor controls, heating controls and power supplies.

- Blocking Voltage to 800 Volts
- Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Isolated TO-220 Type Package for Ease of Mounting
- Gate Triggering in Three Modes (MAC218FP Series) or Four Modes (MAC218AFP Series)





CASE 221C-02
STYLE 3

MAXIMUM RATINGS (T_J = 25°C 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) MAC218-4FP, MAC218A4FP MAC218-6FP, MAC218A6FP MAC218-8FP, MAC218A8FP MAC218-10FP, MAC218A10FP	V_{DRM}	 200 400 600 800	Volts
On-State RMS Current (T_C = +80°C) Full Cycle Sine Wave 50 to 60 Hz(2)	$I_{T(RMS)}$	8	Amps
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, preceded and followed by rated current, T_C = 80°C)	I_{TSM}	100	Amps
Circuit Fusing (t = 8.3 ms)	I^2t	40	A^2s
Peak Gate Power (T_C = +80°C, Pulse Width = 2 µs)	P_{GM}	16	Watts
Average Gate Power (T_C = +80°C, t = 8.3 ms)	$P_{G(AV)}$	0.35	Watt
Peak Gate Current (Pulse Width = 1 µs)	I_{GM}	4	Amps
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

THERMAL CHARACTERISTICS

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

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.

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Off-State Current (Either Direction) (V_D = Rated V_{DRM} @ T_J = 125°C, Gate Open)	I_{DRM}	—	—	2	mA
Peak On-State Voltage (Either Direction) (I_{TM} = 11.3 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle < 2%)	V_{TM}	—	1.7	2	Volts
Gate Trigger Current (Continuous dc) (V_D = 12 Vdc, R_L = 12 Ω) Trigger Mode MT2(+), G(+) ; MT2(+), G(–) MT2(–), G(–) MT2(–), G(+) "A" SUFFIX ONLY	I_{GT}	 — — — —	 — — — —	 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 kΩ, 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) (V_D = 24 Vdc, Gate Open, Initiating Current = 200 mA)	I_H	—	—	50	mA
Critical Rate of Rise of Commutating Off-State Voltage (V_D = Rated V_{DRM}, I_{TM} = 11.3 A, Commutating di/dt = 4.1 A/ms, Gate Unenergized, T_C = 80°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_J = 125°C)	dv/dt	—	100	—	V/µs

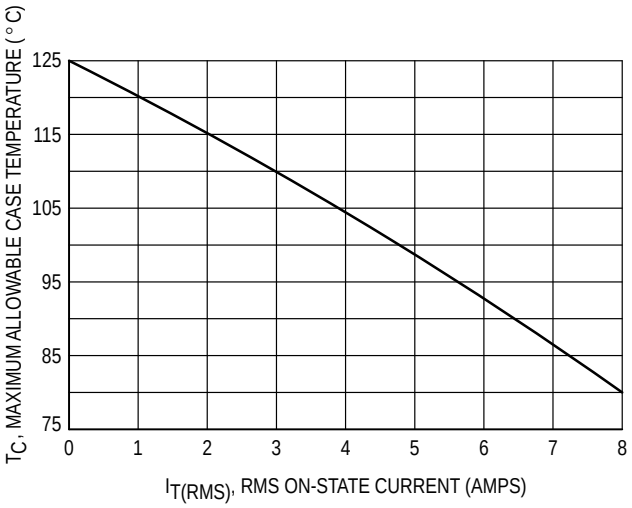


Figure 1. Current Derating

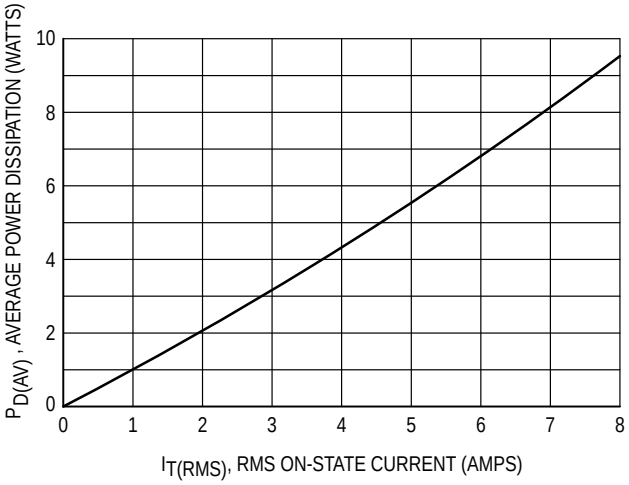


Figure 2. Power Dissipation

TYPICAL CHARACTERISTICS

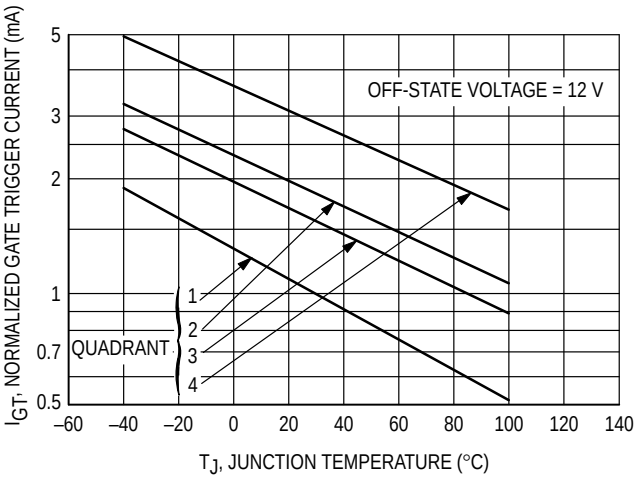


Figure 3. Normalized Gate Trigger Current

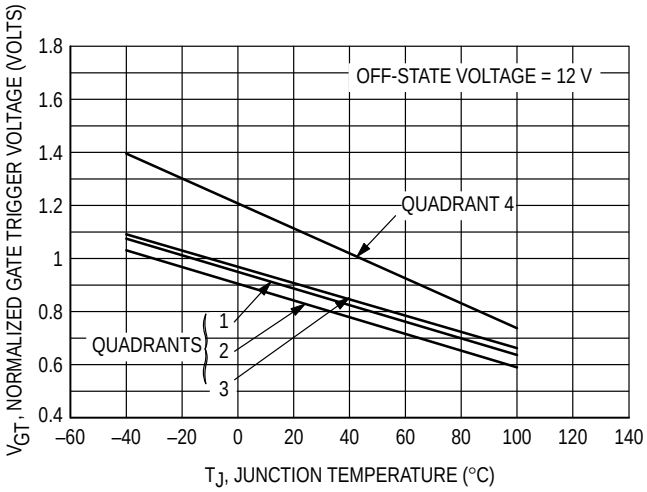


Figure 4. Normalized Gate Trigger Voltage

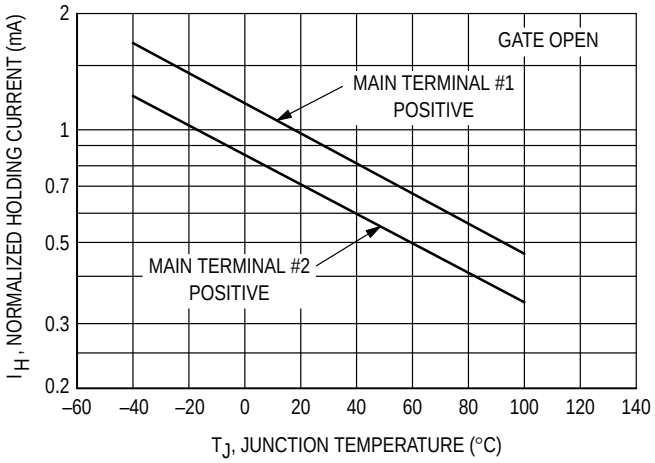
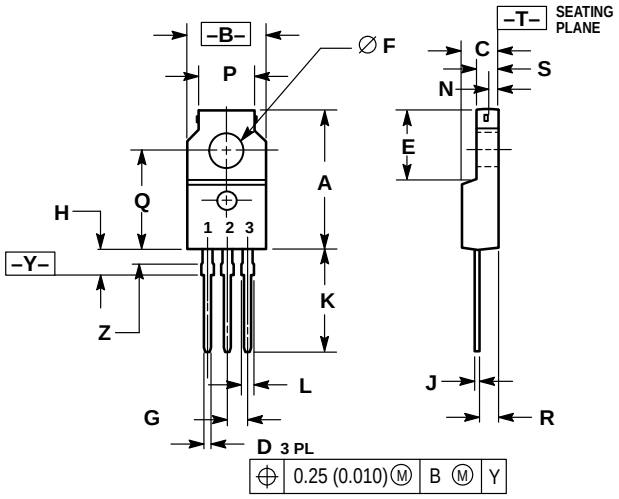


Figure 5. Normalized Holding Current

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

Literature Distribution Centers:
USA: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036.
EUROPE: Motorola Ltd.; European Literature Centre; 88 Tanners Drive, Blakelands, Milton Keynes, MK14 5BP, England.
JAPAN: Nippon Motorola Ltd.; 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan.
ASIA PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Center, No. 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.