

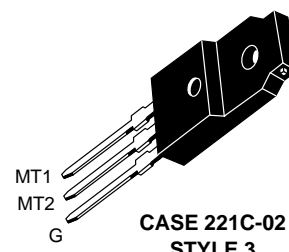
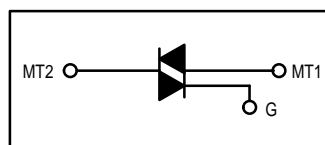
MAC218AFP Series

ISOLATED TRIACs
THYRISTORS
8 AMPERES RMS
400 thru 800 VOLTS

Triacs Silicon Bidirectional Thyristors

... 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 Four Modes



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)	V _{DRM}	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 Nonrepetitive 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 ² t	40	A ² s
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 _{θJC}	2.2	°C/W
Thermal Resistance, Case to Sink	R _{θCS}	2.2 (typ)	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	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.

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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Off-State Current (Either Direction) ($V_D = \text{Rated } V_{DRM}$ @ $T_J = 125^\circ\text{C}$, 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 $\leq 2\%$)	V_{TM}	—	1.7	2	Volts
Gate Trigger Current (Continuous dc) ($V_D = 12$ Vdc, $R_L = 12\ \Omega$) Trigger Mode	I_{GT}				mA
MT2(+), G(+)		—	—	50	
MT2(+), G(—)		—	—	50	
MT2(—), G(—)		—	—	50	
MT2(—), G(+)		—	—	75	
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, $R_L = 100\ \Omega$)	V_{GT}				Volts
MT2(+), G(+)		—	0.9	2	
MT2(+), G(—)		—	0.9	2	
MT2(—), G(—)		—	1.1	2	
MT2(—), G(+)		—	1.4	2.5	
(Main Terminal Voltage = Rated V_{DRM} , $R_L = 10\ \text{k}\Omega$, $T_J = +125^\circ\text{C}$)					
MT2(+), G(+); MT2(—), G(—); MT2(+), G(—)		0.2	—	—	
MT2(—), G(+)		0.2	—	—	
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 ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 11.3$ A, Commutating $di/dt = 4.1$ A/ms, Gate Unenergized, $T_C = 80^\circ\text{C}$)	$dv/dt(c)$	—	5	—	V/ μs
Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Voltage Rise, Gate Open, $T_J = 125^\circ\text{C}$)	dv/dt	—	100	—	V/ μs

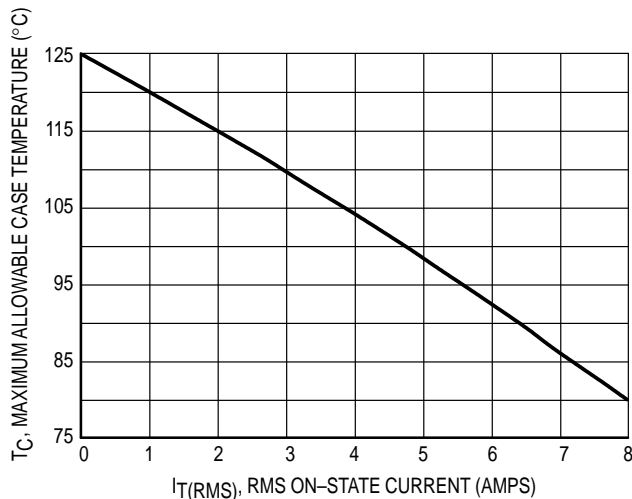


Figure 1. Current Derating

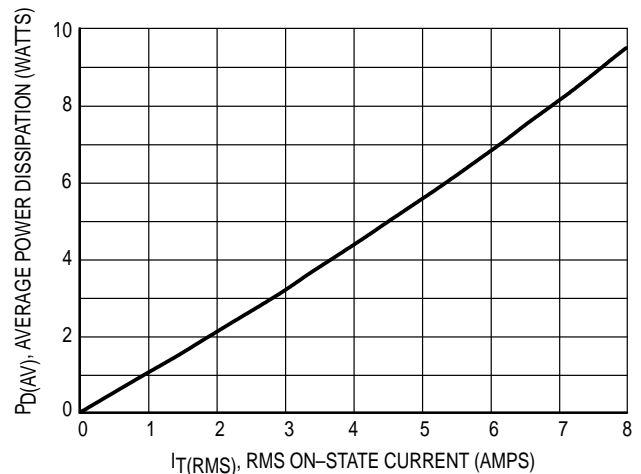


Figure 2. Power Dissipation

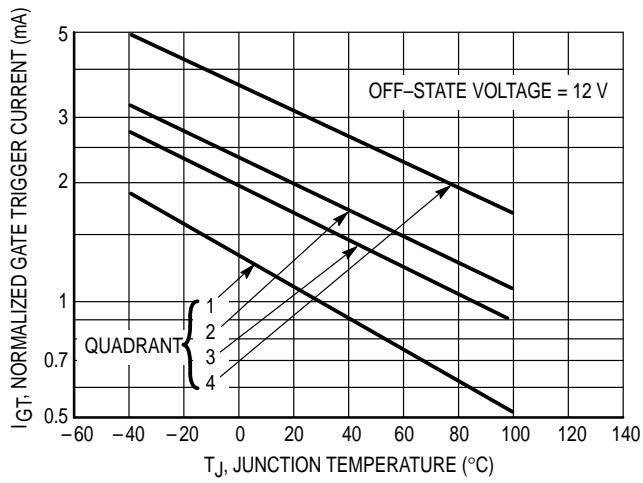


Figure 3. Normalized Gate Trigger Current

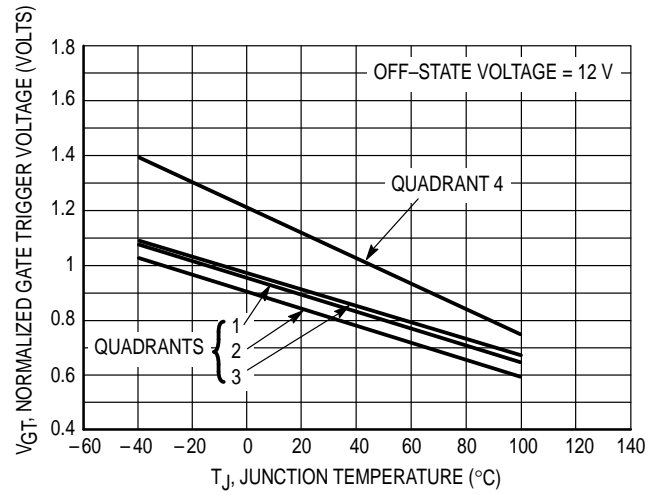


Figure 4. Normalized Gate Trigger Voltage

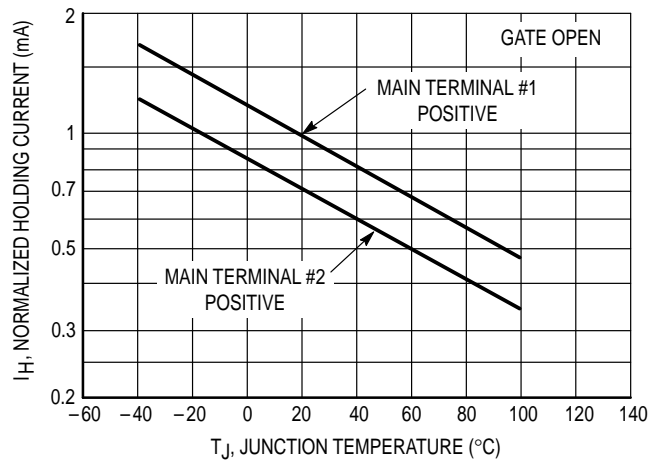
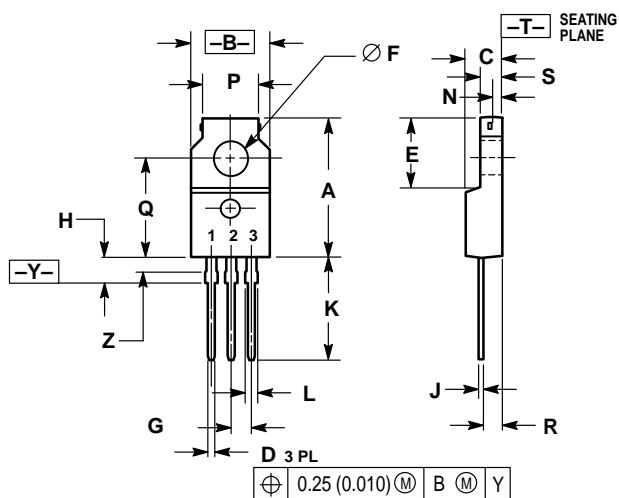


Figure 5. Normalized Holding Current


PACKAGE DIMENSIONS



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

DIM	INCHES		MILLIMETERS	
	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
ISSUE B

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MOTOROLA



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