

MAC8D, MAC8M, MAC8N

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.2	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$ unless otherwise noted; Electricals apply in both directions)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Peak Repetitive Blocking Current ($V_D = \text{Rated } V_{DRM}, V_{RRM}$; Gate Open) $T_J = 25^{\circ}\text{C}$ $T_J = 125^{\circ}\text{C}$	I_{DRM}	-	-	0.01	mA
	I_{RRM}	-	-	2.0	

ON CHARACTERISTICS

Peak On-State Voltage (Note 2), ($I_{TM} = \pm 11 \text{ A Peak}$)	V_{TM}	-	1.2	1.6	V
Gate Trigger Current (Continuous DC) ($V_D = 12 \text{ V}, R_L = 100 \Omega$) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	I_{GT}	5.0	13	35	mA
		5.0	16	35	
		5.0	18	35	
Holding Current, ($V_D = 12 \text{ V}$, Gate Open, Initiating Current = $\pm 150 \text{ mA}$)	I_H	-	20	40	mA
Latching Current ($V_D = 24 \text{ V}, I_G = 35 \text{ mA}$), MT2(+), G(+); MT2(-), G(-) MT2(+), G(-)	I_L	-	20	50	mA
		-	30	80	
Gate Trigger Voltage ($V_D = 12 \text{ V}, R_L = 100 \Omega$) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	V_{GT}	0.5	0.69	1.5	V
		0.5	0.77	1.5	
		0.5	0.72	1.5	
Gate Non-Trigger Voltage ($V_D = 12 \text{ V}, R_L = 100 \Omega, T_J = 125^{\circ}\text{C}$) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-)	V_{GD}	0.2	-	-	V

DYNAMIC CHARACTERISTICS

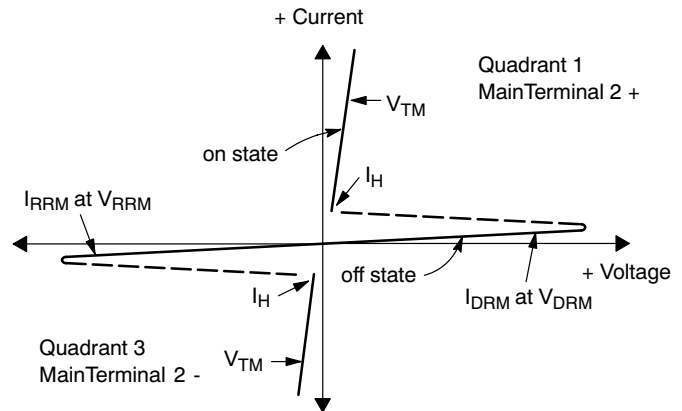
Rate of Change of Commutating Current See Figure 10. ($V_D = 400 \text{ V}, I_{TM} = 4.4 \text{ A}$, Commutating $dv/dt = 18 \text{ V}/\mu\text{s}$, Gate Open, $T_J = 125^{\circ}\text{C}$, $f = 250 \text{ Hz}$, No Snubber) $C_L = 10 \mu\text{F}$ $L_L = 40 \text{ mH}$	$(di/dt)_C$	6.5	-	-	A/ms
Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Waveform, Gate Open, $T_J = 125^{\circ}\text{C}$)	dv/dt	250	-	-	V/ μs

2. Indicates Pulse Test: Pulse Width $\leq 2.0 \text{ ms}$, Duty Cycle $\leq 2\%$.

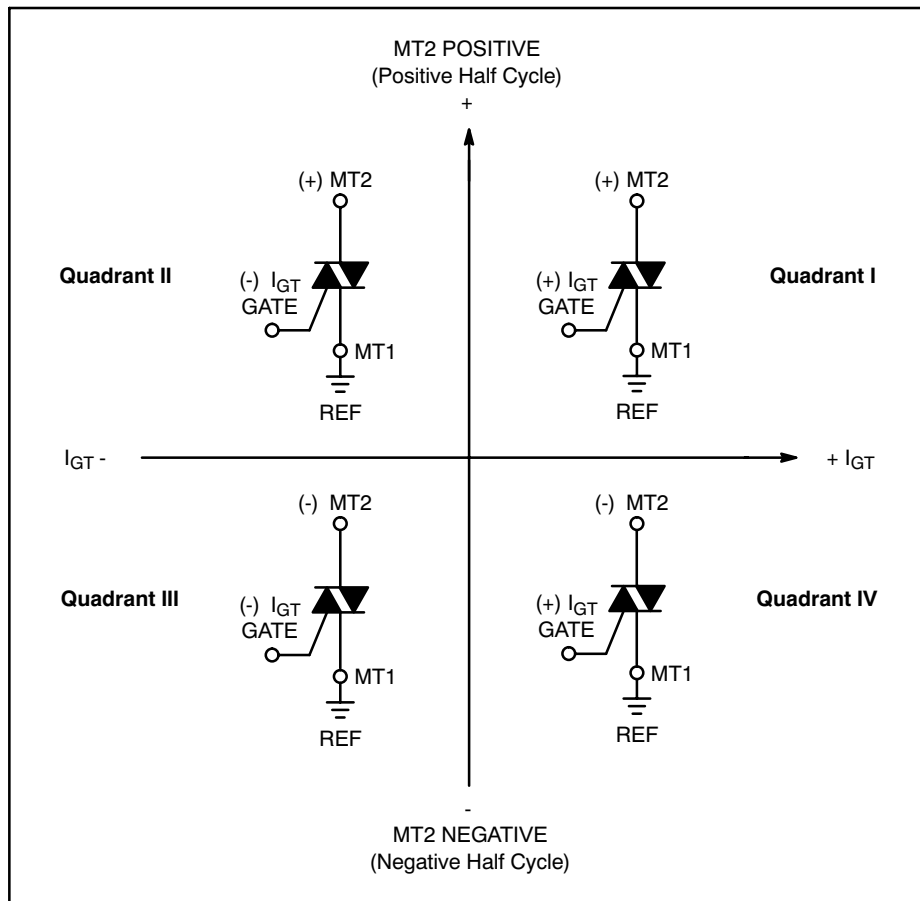
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Voltage Current Characteristic of Triacs (Bidirectional Device)

Symbol	Parameter
V_{DRM}	Peak Repetitive Forward Off State Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Reverse Off State Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Maximum On State Voltage
I_H	Holding Current



Quadrant Definitions for a Triac



All polarities are referenced to MT1.
With in-phase signals (using standard AC lines) quadrants I and III are used.

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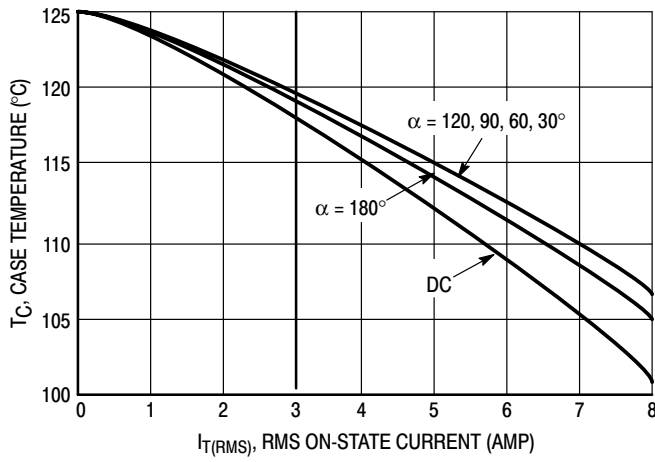


Figure 1. RMS Current Derating

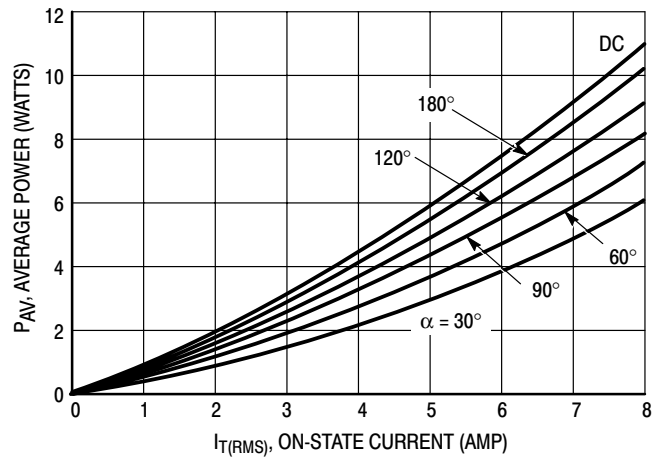


Figure 2. On-State Power Dissipation

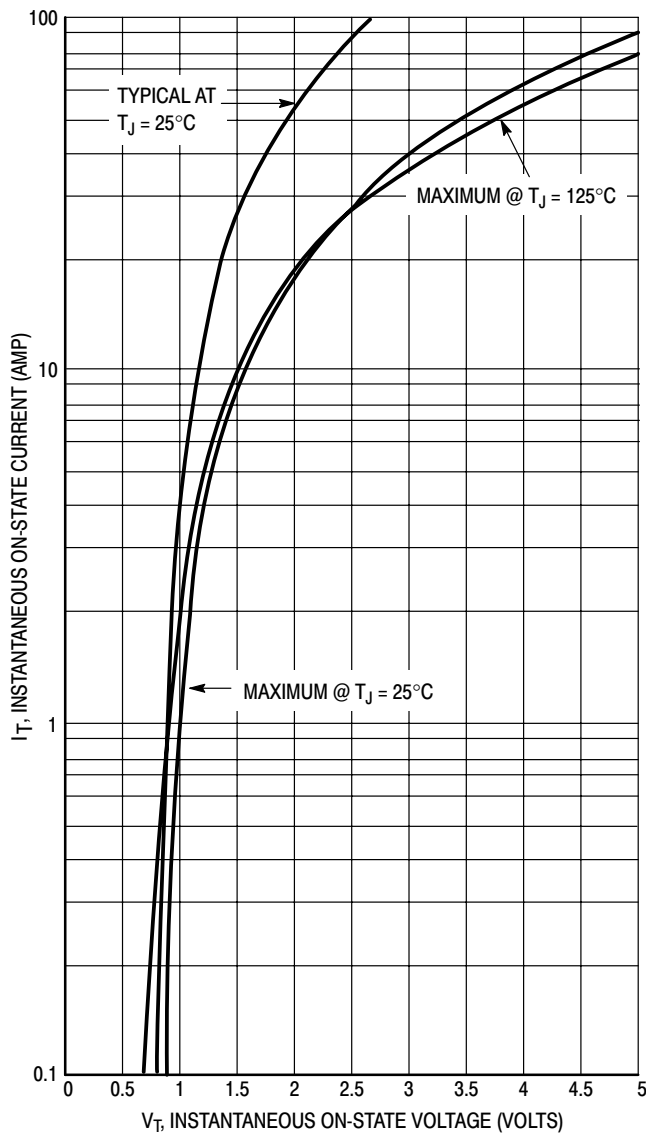


Figure 3. On-State Characteristics

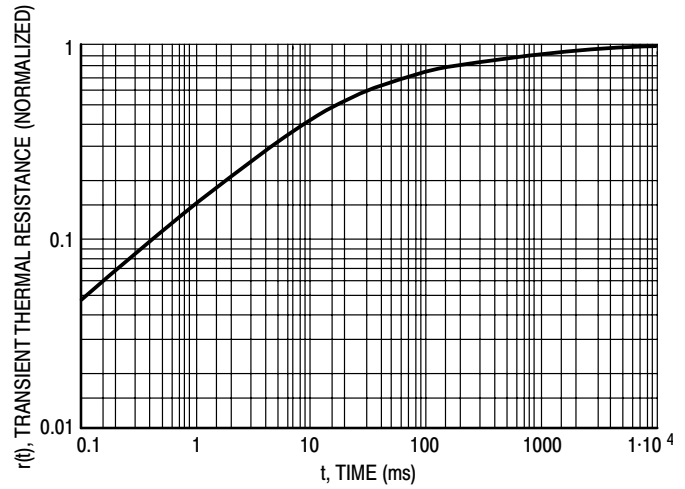


Figure 4. Thermal Response

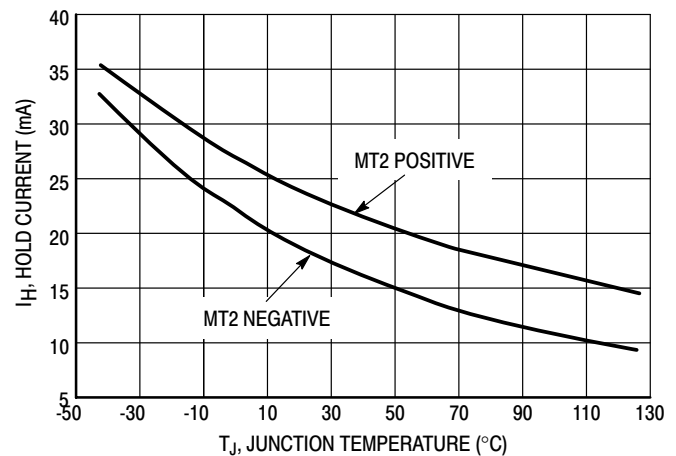


Figure 5. Hold Current Variation

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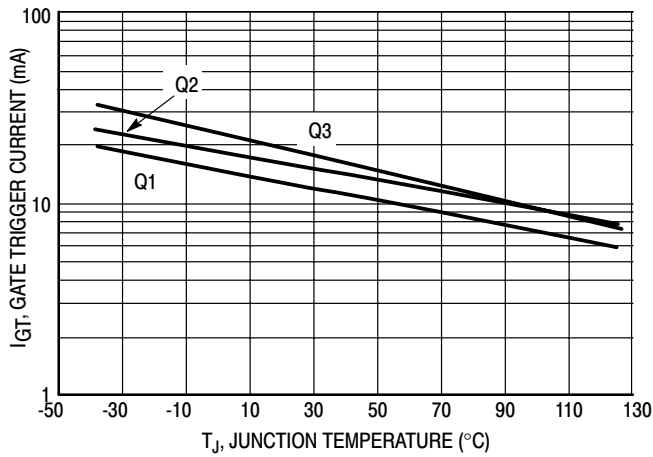


Figure 6. Gate Trigger Current Variation

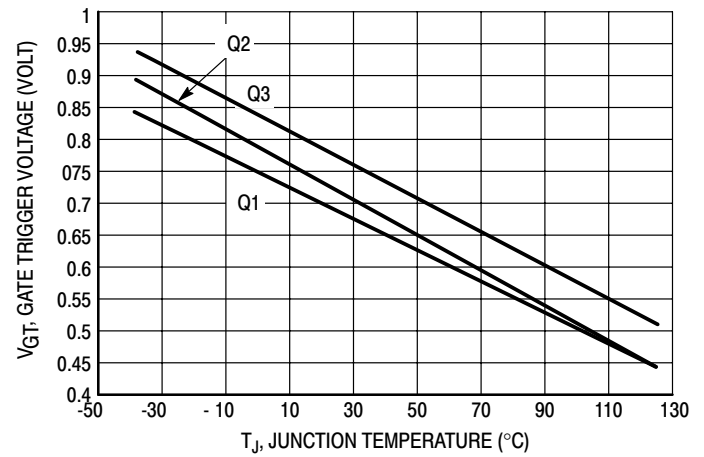


Figure 7. Gate Trigger Voltage Variation

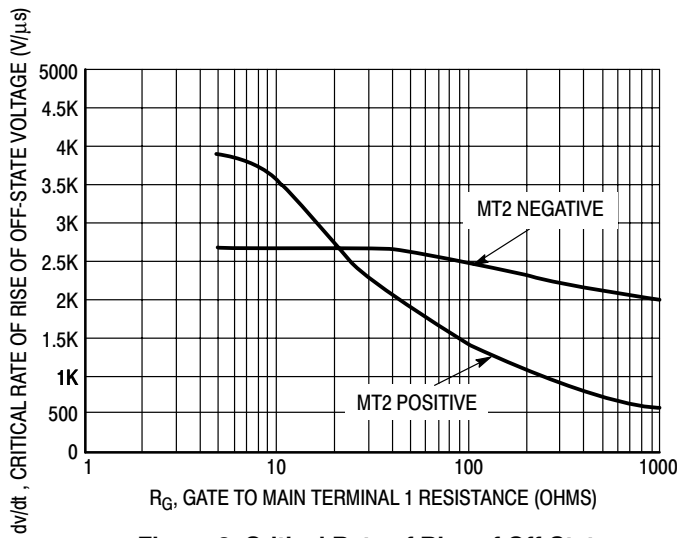


Figure 8. Critical Rate of Rise of Off-State Voltage (Exponential)

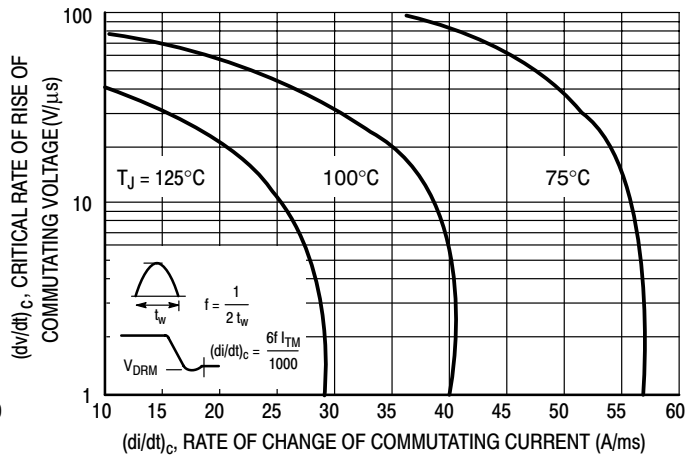
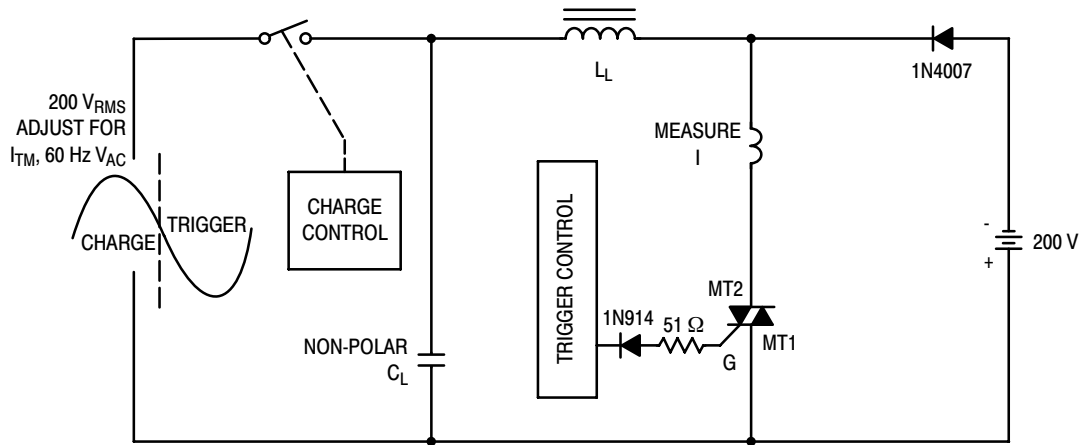


Figure 9. Critical Rate of Rise of Commutating Voltage



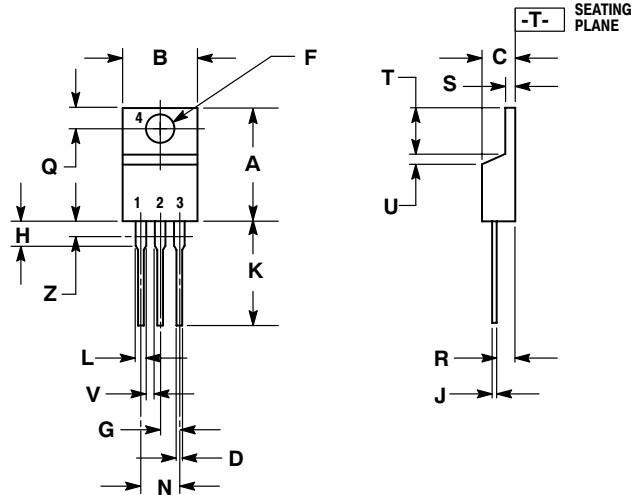
Note: Component values are for verification of rated $(di/dt)_c$. See AN1048 for additional information.

Figure 10. Simplified Test Circuit to Measure the Critical Rate of Rise of Commutating Current (di/dt)

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PACKAGE DIMENSIONS

TO-220
CASE 221A-09
ISSUE AE



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	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
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

STYLE 4:

- PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

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