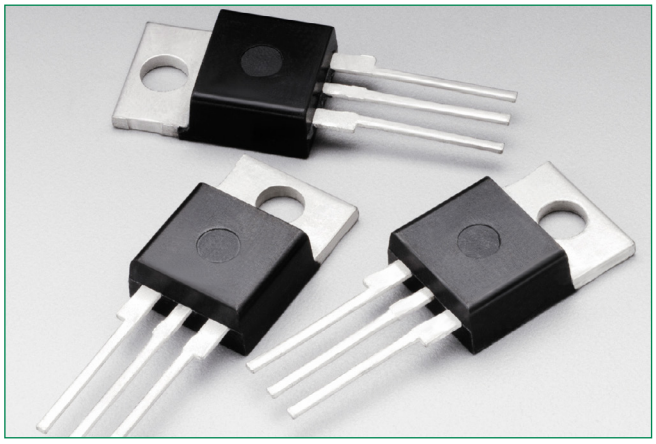
MAC9DG, MAC9MG, MAC9NG

Surface Mount – 400V - 800V



Additional Information

Resources | Accessories | Samples

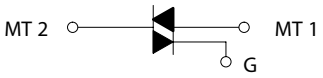
Description

Designed for high performance full-wave ac control applications where high noise immunity and high commutating di/dt are required. The MAC9xG is designed for high performance full-wave ac control applications where high noise immunity and high commutating di/dt are required.

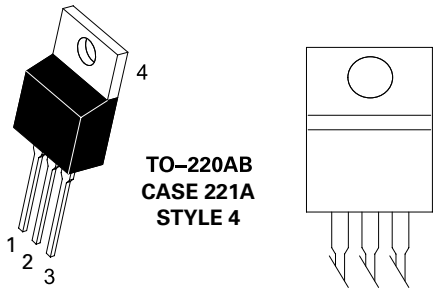
Features

- Blocking Voltage to 800 Volts
- On–State Current Rating of 8.0 Amperes RMS at 100°C
- Uniform Gate Trigger Currents in Three Quadrants
- High Immunity to dv/dt – 500 V/µs minimum at 125°C
- Minimizes Snubber Networks for Protection
- Industry Standard TO–220 Package
- High Commutating di/dt – 6.5 A/ms minimum at 125°C
- These Devices are Pb–Free and are RoHS Compliant

Functional Diagram



Pin Out



TO–220AB
CASE 221A
STYLE 4

Revised: GD. 02/22/21

MAC9DG, MAC9MG, MAC9NG

Surface Mount – 400V - 800V

Maximum Ratings (TJ = 25°C unless otherwise noted)

Rating		Symbol	Value	Unit
Peak Repetitive Off-State Voltage (Note 1) (Gate Open, Sine Wave 50 to 60 Hz, T_J = 40° to 125°C)	MAC9D MAC9M MAC9N	V_{DRM}, V_{RRM}	400 600 800	V
On-State RMS Current (Full Cycle Sine Wave, 60 Hz, T_C = 100°C)		$I_{T\ (RMS)}$	8.0	A
Peak Non-Repetitive Surge Current (One Full Cycle Sine Wave, 60 Hz, T_J= 125°C)		I_{TSM}	80	A
Circuit Fusing Consideration (t = 8.3 ms)		I^2t	26	A²sec
Peak Gate Power (Pulse Width ≤ 1.0 μs, T_C = 80°C)		P_{GM}	16	W
Average Gate Power (t = 8.3 ms, T_C = 80°C)		$P_{G(AV)}$	0.35	W
Operating Junction Temperature Range		T_J	-40 to +125	°C
Storage Temperature Range		T_{stg}	-40 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

Thermal Characteristics

Rating		Symbol	Value	Unit
Thermal Resistance,	Junction–to–Case (AC) Junction–to–Ambient	$R_{\Theta JC}$ $R_{\Theta JA}$	2.2 62.5	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds		T_L	260	°C

Electrical Characteristics - OFF (TJ = 25°C unless otherwise noted ; Electricals apply in both directions)

Characteristic		Symbol	Min	Typ	Max	Unit
Peak Repetitive Blocking Current ($V_D = V_{DRM} = V_{RRM}$; Gate Open)	T_J = 25°C	I_{DRM}, I_{RRM}	-	-	0.01	mA
	T_J = 125°C		-	-	2.0	

Electrical Characteristics - ON (TJ = 25°C unless otherwise noted; Electricals apply in both directions)

Characteristic		Symbol	Min	Typ	Max	Unit
Peak On–State Voltage (Note 2) (I_{TM} = ±11 A)		V_{TM}	–	1.2	1.6	V
Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 100 Ω)	MT2(+), G(+)	I_{GT}	10	16	50	mA
	MT2(+), G(–)		10	18	50	
	MT2(–), G(–)		10	22	5.0	
Holding Current (V_D = 12 V, Gate Open, Initiating Current = ±150 mA))		I_H	–	30	50	mA
Latching Current (V_D = 24 V, I_G = 50 mA)	MT2(+), G(+)	I_L	_	20	50	mA
	MT2(+), G(–)		_	30	80	
	MT2(–), G(–)		_	20	50	
Gate Trigger Voltage (V_D = 12 V, R_L = 100 Ω)	MT2(+), G(+)	V_{GT}	0.5	0.69	1.5	V
	MT2(+), G(–)		0.5	0.77	1.5	
	MT2(–), G(–)		0.5	0.72	1.5	
Gate Non–Trigger Voltage (V_D = 12 V, R_L = 100 Ω, T_J = 125°C)	MT2(+), G(+)	V_{GD}	0.2	_	_	V
	MT2(+), G(–)		0.2	_	_	
	MT2(–), G(–)		0.2	_	_	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Indicates Pulse Test: Pulse Width ≤ 2.0 ms, Duty Cycle ≤ 2%.

Revised: GD. 02/22/21

MAC9DG, MAC9MG, MAC9NG

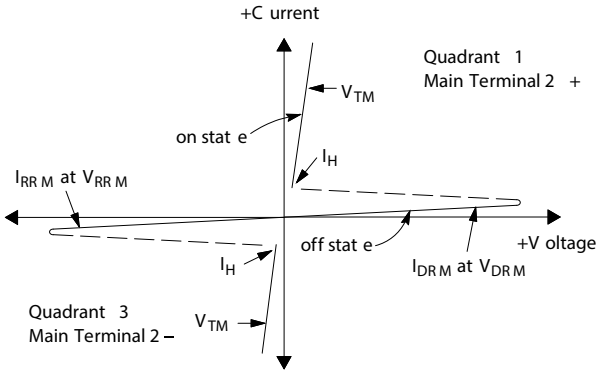
Surface Mount – 400V - 800V

Dynamic Characteristics

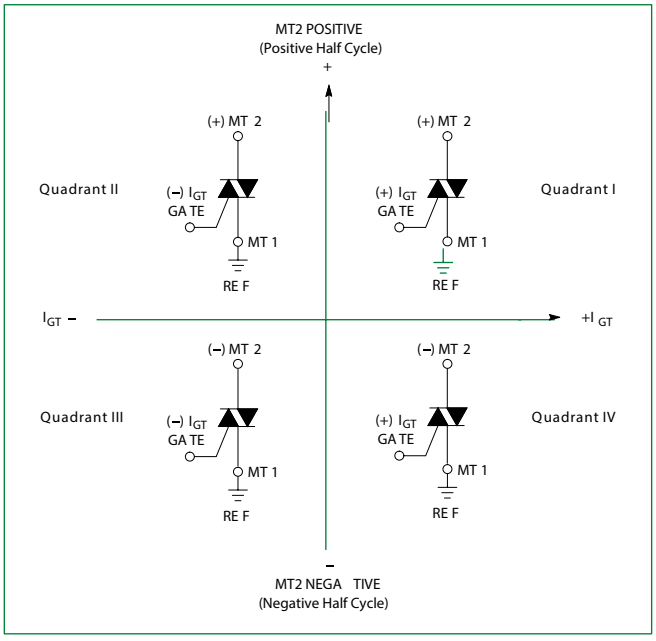
Characteristic	Symbol	Min	Max	Unit
Rate of Change of Commutating Current See Figure 10. (V_D = 400 V, I_{TM} = 4.4 A, Commutating dv/dt = 18 V/µs,Gate Open, T_J = 125°C, f = 250 Hz, No Snubber) C_L = 10 µF L_L = 40 mH	$di/dt_{(C)}$	6.5	–	A/ms
Critical Rate of Rise of Off-State Voltage (V_D = Rated V_{DRM}, Exponential Waveform, Gate open, T_J = 125°C)	dV/dt	500	–	V/µs

Voltage Current Characteristic of SCR

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

Revised: GD. 02/22/21

MAC9DG, MAC9MG, MAC9NG

Surface Mount – 400V - 800V

Figure 1. RMS Current Derating

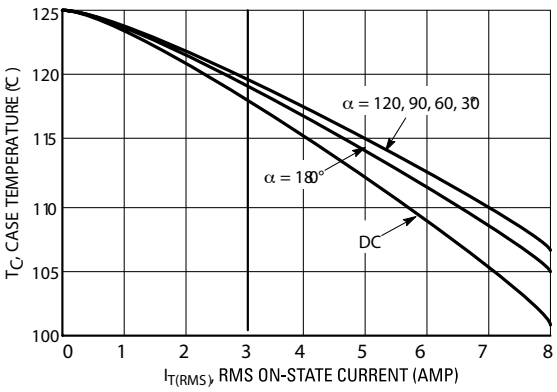


Figure 2. On-State Power Dissipation

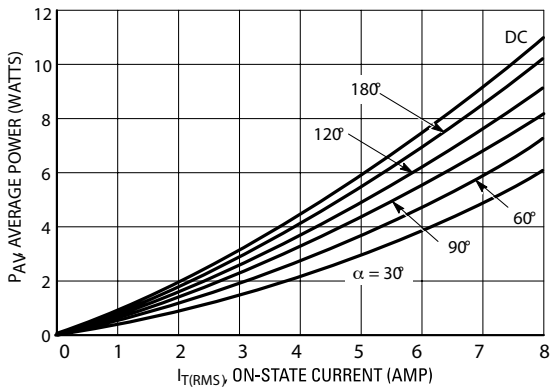


Figure 3. On–State Characteristics

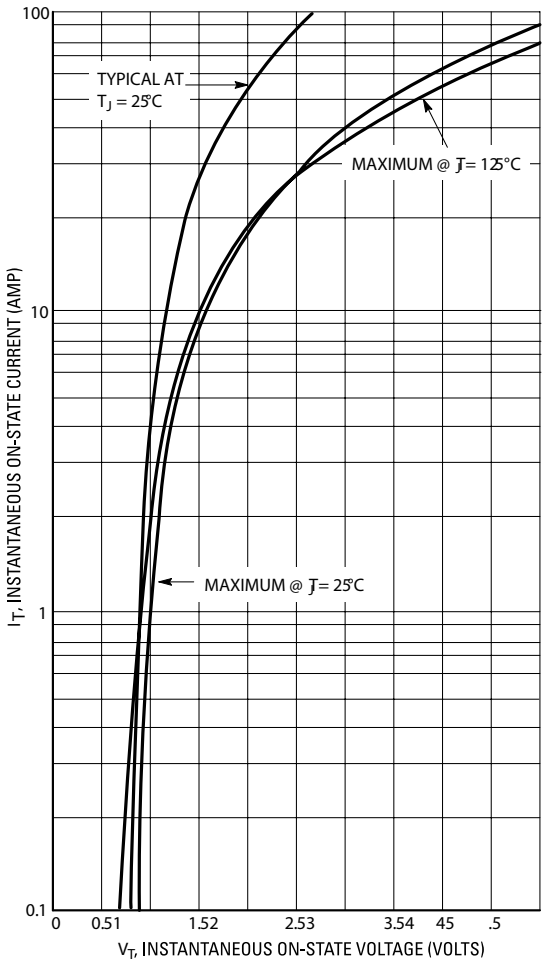


Figure 4. Thermal Response

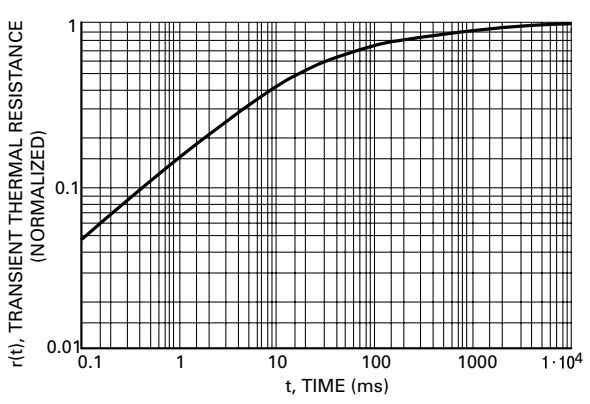
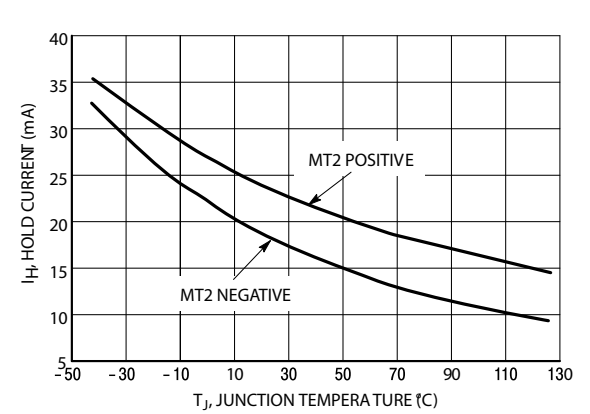


Figure 5. Hold Current Variation



Revised: GD. 02/22/21

MAC9DG, MAC9MG, MAC9NG

Surface Mount – 400V - 800V

Figure 6. Gate Trigger Current Variation

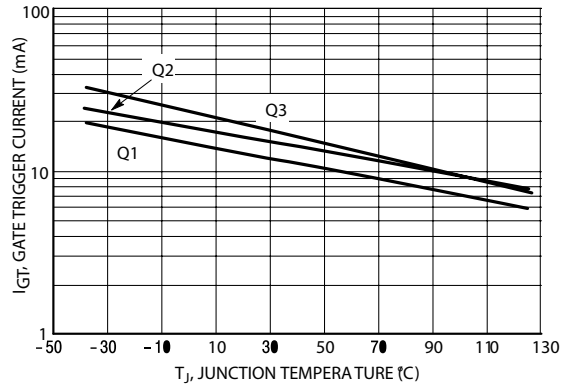


Figure 7. Gate Trigger Voltage Variation

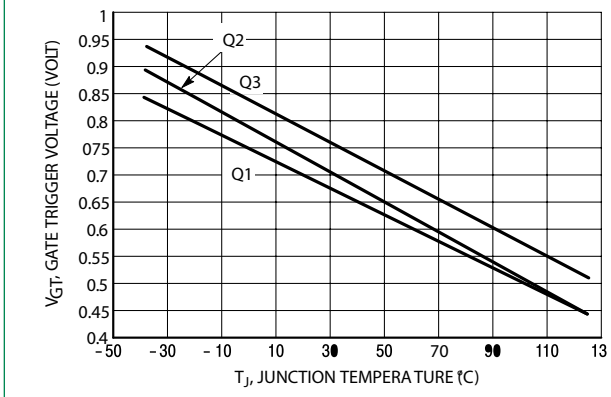


Figure 8. Critical Rate of Rise of Off-State Voltage (Exponential)

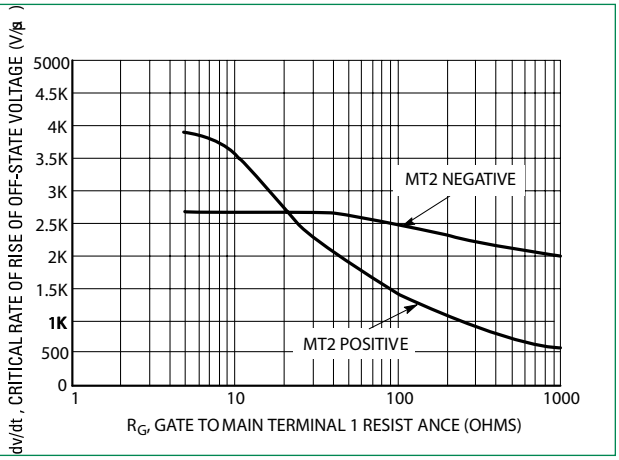


Figure 9. Critical Rate of Rise of Commutating Voltage

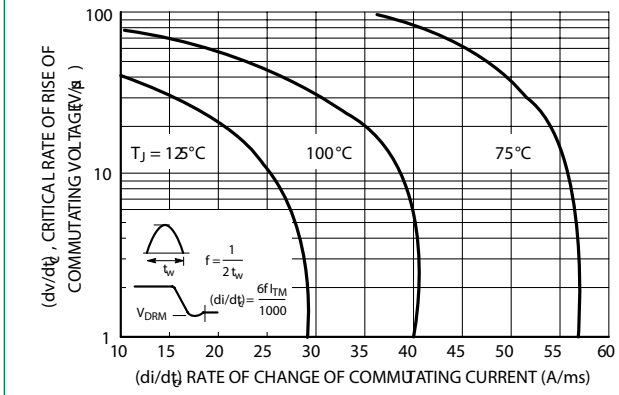
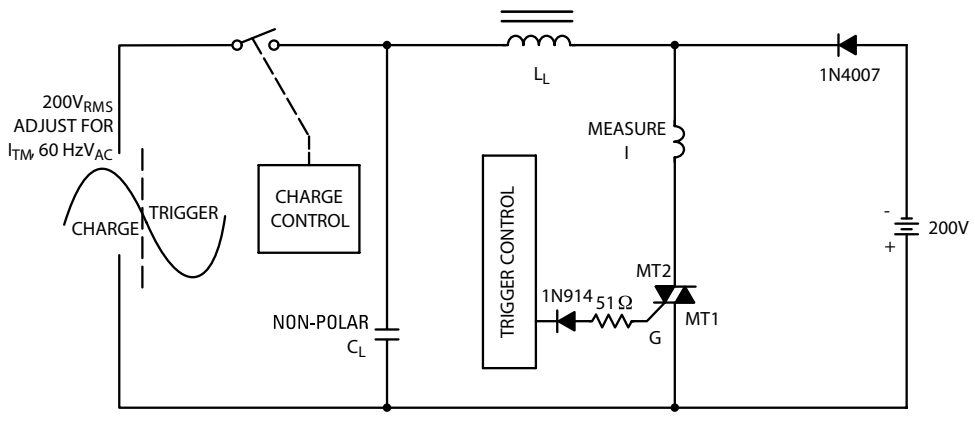


Figure 10. Simplified Test Circuit to Measure the Critical Rate of Rise of Commutating Current (di/dt)

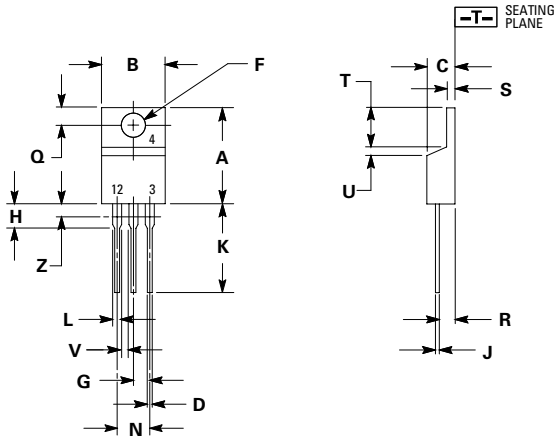


Revised: GD. 02/22/21

MAC9DG, MAC9MG, MAC9NG

Surface Mount – 400V - 800V

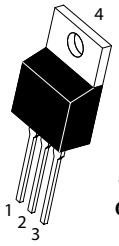
Dimensions



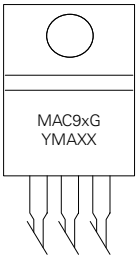
Dim	Inches		Millimeters	
	Min	Max	Min	Max
A	0.590	0.620	14.99	15.75
B	0.380	0.420	9.65	10.67
C	0.178	0.188	4.52	4.78
D	0.025	0.035	0.64	0.89
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.41	2.67
H	0.110	0.130	2.79	3.30
J	0.018	0.024	0.46	0.61
K	0.540	0.575	13.72	14.61
L	0.060	0.075	1.52	1.91
N	0.195	0.205	4.95	5.21
Q	0.105	0.115	2.67	2.92
R	0.085	0.095	2.16	2.41
S	0.045	0.060	1.14	1.52
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

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.

Part Marking System



TO–220AB
CASE 221A
STYLE 12



x =D, M, or N
Y =Year
M =Month
A =Assembly Site
XX =Lot Serial Code
G =Pb-Free Package

Pin Assignment	
1	Main Terminal 1
2	Main Terminal 2
3	Gate
4	No Connection

Ordering Information

Device	Package	Shipping
MAC9DG	TO-220AB (Pb-Free)	1000 Units / Box
MAC9MG		
MAC9NG		

Revised: GD. 02/22/21

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Triacs ***category:***

Click to view products by ON Semiconductor ***manufacturer:***

Other Similar products are found below :

CTA08-1000CW CTB24-800BW CTA08-1000C CTA12-800BWPT CTA16-1000B CTB24-800B BT137-600-0Q 5615 OT415Q 2N6075A NTE5629 NTE5688 CTB08-400CW D31410 BTA425Z-800BTQ KS100N12 TOPT16-800C0,127 OT408,135 BT134-800E BT136D BTB16Q-600BW Z0409MF BTA04-600B BTA06-600BRG BTA06-800BWRG BTA08-600BRG BTA08-800B BT136-600,127 MAC97A6,116 BT137-600E,127 BTB16-600CW3G BTB16-600CW3G Z0109MN,135 T825T-6I T1220T-6I NTE5638 ACST1235-8FP BT136X-600E,127 MAC4DLM-1G BT134-600D,127 BTA08-600BW3G NTE56008 NTE56017 NTE56018 NTE56059 NTE5608 NTE5609 NTE5656 NTE56020 NTE56022