MAC15 Series
TRIAC – 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)	MAC15A6G MAC15-8G, MAC15A8G MAC15-10G, MAC15A10G	V_{DRM}, V_{RRM}	400 600 800	V
On-State RMS Current (Full Cycle Sine Wave, 50 to 60 Hz, T_C = 80°C)		$I_{T\ (RMS)}$	15	A
Peak Non-Repetitive Surge Current (One Full Cycle Sine Wave, 60 Hz, T_C = 80°C) Preceded and Followed by Rated Current		I_{TSM}	150	A
Peak Gate Voltage (Pulse Width ≤ 1.0 µsec; T_C = 90°C)		V_{GM}	10	V
Circuit Fusing Consideration (t = 8.3 ms)		I^2t	93	A²sec
Peak Gate Power (T_C = 80°C, Pulse Width = 1.0 µs)		P_{GM}	20	W
Peak Gate Current (Pulse Width ≤ 1.0 µsec; T_C = 90°C)		I_{GM}	2.0	A
Average Gate Power (t = 8.3 ms, T_C = 80°C)		$P_{G\ (AV)}$	0.5	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	$R_{\theta JC}$ $R_{\theta JA}$	2.0 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} = ±21 A Peak)		V_{TM}	-	1.3	1.6	V
Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 100 Ω)	MT2(+), G(+)	I_{GT}	-	-	50	mA
	MT2(+), G(–)		-	-	50	
	MT2(–), G(–)		-	-	50	
	MT2(–), G(+)		-	-	75	
Gate Trigger Voltage (Continuous dc) (V_D = 12 V, R_L = 100 Ω)	MT2(+), G(+)	V_{GT}	-	0.9	2	V
	MT2(+), G(–)		-	0.9	2	
	MT2(–), G(–)		-	1.1	2	
	MT2(–), G(+)		-	1.4	2.5	
Gate Non–Trigger Voltage (T_J = 110°C) (V_D = 12 V, R_L = 100 Ω)	MT2(+), G(+)	V_{GD}	0.2	-	-	V
	MT2(+), G(–)		0.2	-	-	
	MT2(–), G(–)		0.2	-	-	
	MT2(–), G(+)		0.2	-	-	
Holding Current (V_D = 12 V_{dc}, Gate Open, Initiating Current = ±200 mA))		I_H	-	6.0	40	mA
Turn-On Time (VD = Rated VDRM, ITM = 17 A) (IGT = 120 mA, Rise Time = 0.1 µs, Pulse Width = 2 µs)		tgt	-	1.5	-	µs

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

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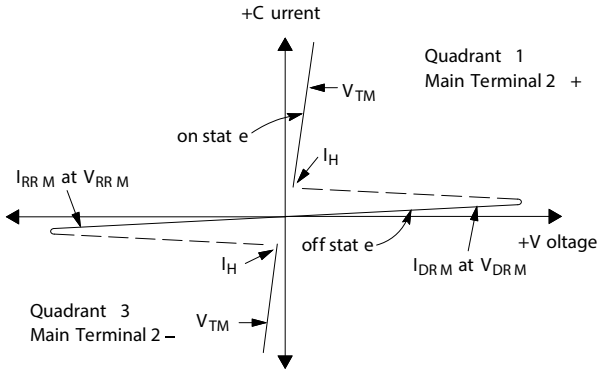
Dynamic Characteristics

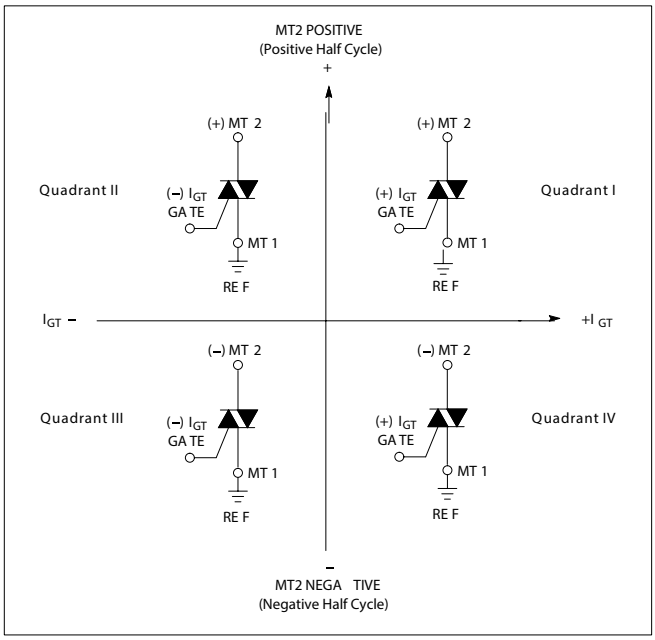
Characteristic	Symbol	Min	Typ	Max	Unit
Critical Rate of Rise of Commutation Voltage (V_D = Rated V_{DRM}, I_{TM} = 21 A, Commutating di/dt = 7.6 A/ms, Gate Unenergized, T_C = 80°C)	dV/dt	–	5.0	–	V/µs

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

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Figure 1. RMS Current Derating

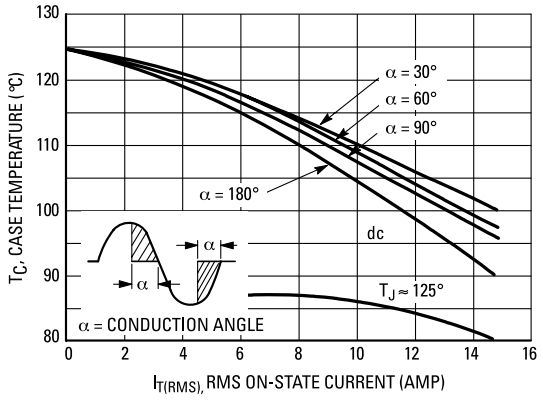

Figure 2. On–State Power Dissipation

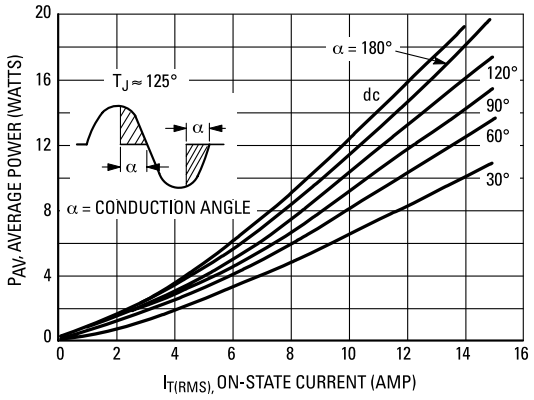

Figure 3. Typical Gate Trigger Voltage

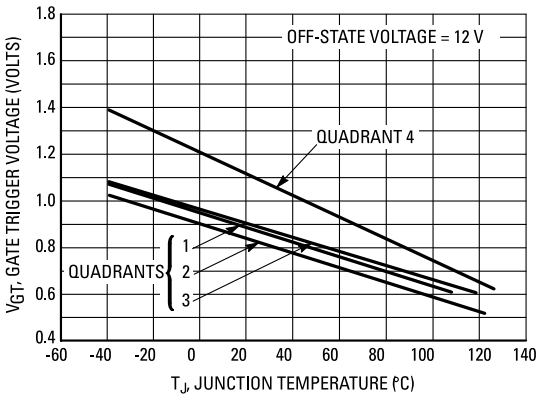

Figure 4. Typical Gate Trigger Current

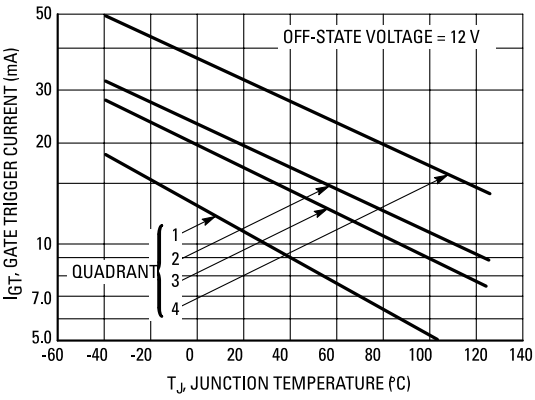

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Figure 5. On–State Characteristics

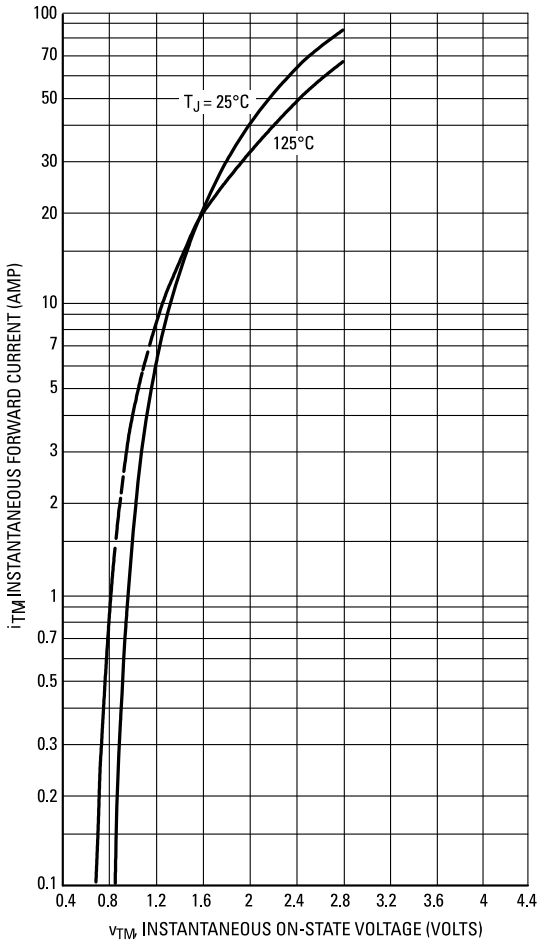


Figure 6. Typical Holding Current

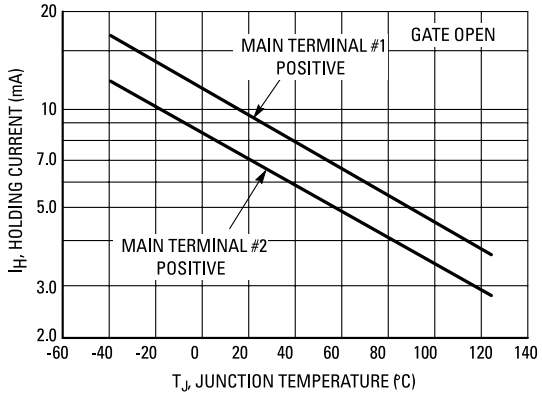


Figure 7. Maximum Non–Repetitive Surge Current

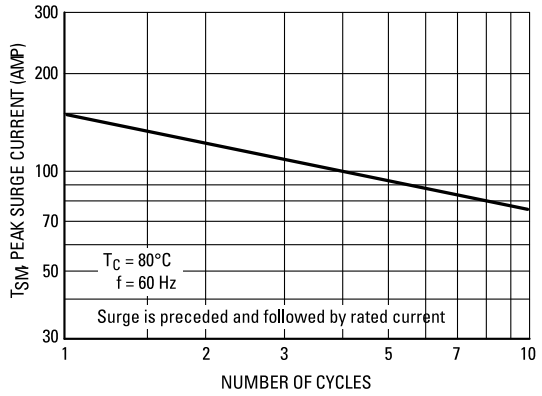
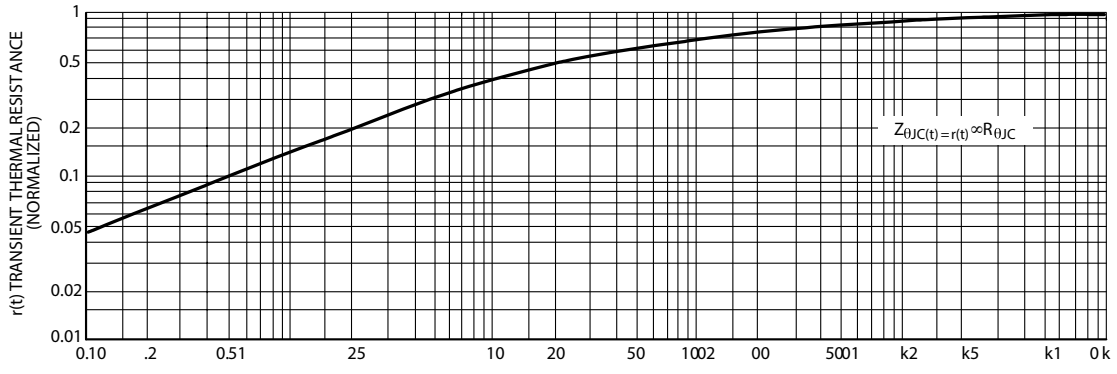


Figure 8. Thermal Response



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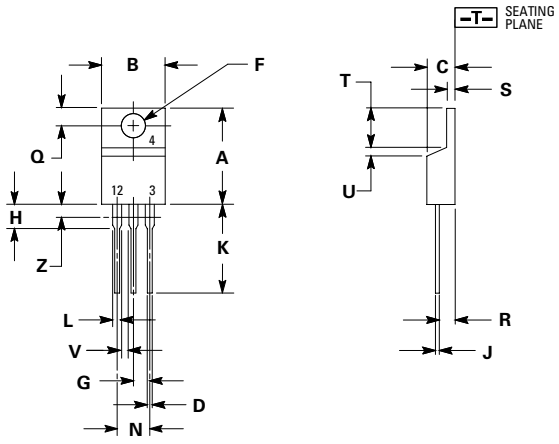
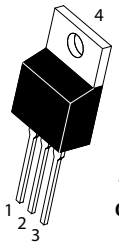
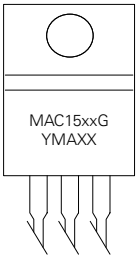
Dimensions



Part Marking System



TO–220AB
CASE 221A
STYLE 12



xx =See Table on Page 2
Y =Year
M =Month
A =Assembly Site
XX =Lot Serial Code
G =Pb-Free Package

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.

Pin Assignment	
1	Main Terminal 1
2	Main Terminal 2
3	Gate
4	Main Terminal 2

Ordering Information

Device	Device Marking	Package	Shipping
MAC15–8G	MAC15–8	TO-220AB (Pb-Free)	1000 Units/Box
MAC15–10G	MAC1510		
MAC15A6G	MAC15A6		
MAC15A8G	MAC15A8		
MAC15A10G	MAC15A10		

Revised: GD. 03/08/21

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Authorized Distributor

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Littelfuse:

MAC15A8G MAC15A6G MAC15-8G MAC15-10G MAC15A10G