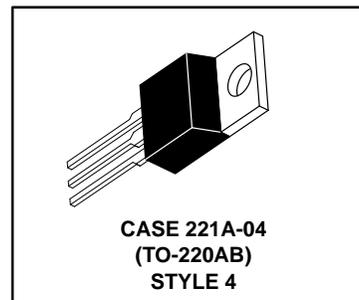
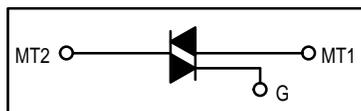


# Triacs

## Silicon Bidirectional Thyristors

... designed for full-wave ac control applications primarily in industrial environments needing noise immunity.

- Guaranteed High Commutation Voltage  
dv/dt — 500 V/μs Min @ T<sub>C</sub> = 25°C
- High Blocking Voltage — V<sub>DRM</sub> to 800 V
- Photo Glass Passivated Junction for Improved Power Cycling Capability and Reliability



### MAXIMUM RATINGS (T<sub>C</sub> = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage <sup>(1)</sup> (T <sub>J</sub> = -40 to +125°C, 1/2 Sine Wave 50 to 60 Hz, Open Gate)	V <sub>DRM</sub>		Volts
MAC321-4		200	
MAC321-6		400	
MAC321-8		600	
MAC321-10		800	
Peak Gate Voltage	V <sub>GM</sub>	10	Volts
On-State Current RMS (T <sub>C</sub> = +75°C Full Cycle Sine Wave 50 to 60 Hz)	I <sub>T(RMS)</sub>	20	Amp
Peak Surge Current (One Full Cycle, 60 Hz, T <sub>C</sub> = +75°C preceded and followed by Rated Current)	I <sub>TSM</sub>	150	Amp
Circuit Fusing Considerations (t = 8.3 ms)	I <sup>2</sup> t	93	A <sup>2</sup> s
Peak Gate Power (T <sub>C</sub> = +75°C, Pulse Width = 2.0 μs)	P <sub>GM</sub>	20	Watts
Average Gate Power (T <sub>C</sub> = +75°C, t = 8.3 ms)	P <sub>G(AV)</sub>	0.5	Watt
Peak Gate Current	I <sub>GM</sub>	2.0	Amp
Operating Junction Temperature Range	T <sub>J</sub>	-40 to +125	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +150	°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	1.8	°C/W

1. V<sub>DRM</sub> 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.

# MAC321 Series

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current (V <sub>D</sub> = Rated V <sub>DRM</sub> , Gate Open)  T <sub>J</sub> = 25°C T <sub>J</sub> = +125°C	I <sub>DRM</sub>	— —	— —	10 2.0	μA mA
Peak On-State Voltage (Either Direction) (I <sub>TM</sub> = 28 A Peak; Pulse Width ≤ 2.0 ms, Duty Cycle ≤ 2.0%)	V <sub>TM</sub>	—	1.4	1.7	Volts
Gate Trigger Current (Continuous dc) (Main Terminal Voltage = 12 Vdc, R <sub>L</sub> = 100 Ohms) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	I <sub>GT</sub>	— — —	— — —	100 100 100	mA
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, R <sub>L</sub> = 100 Ohms) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) (Main Terminal Voltage = Rated V <sub>DRM</sub> , R <sub>L</sub> = 10 kΩ, T <sub>J</sub> = +125°C) MT2(+), G(+); MT2(-), G(-); MT2(+), G(-)	V <sub>GT</sub>	— — — 0.2	— — — —	2.0 2.0 2.0 —	Volts
Holding Current (Either Direction) (Main Terminal Voltage = 12 Vdc, Gate Open, Initiating Current = 200 mA)	I <sub>H</sub>	—	—	100	mA
Turn-On Time (V <sub>D</sub> = Rated V <sub>DRM</sub> , I <sub>TM</sub> = 28 A, I <sub>GT</sub> = 120 mA, Rise Time = 0.1 μs, Pulse Width = 2.0 μs)	t <sub>gt</sub>	—	1.5	—	μs
Critical Rate of Rise of Off-State Voltage (V <sub>D</sub> = Rated V <sub>DRM</sub> , Exponential Voltage Rise, Gate Open)  T <sub>J</sub> = 25°C T <sub>J</sub> = +125°C	dv/dt(s)	500 200	— —	— —	V/μs

### TYPICAL CHARACTERISTICS

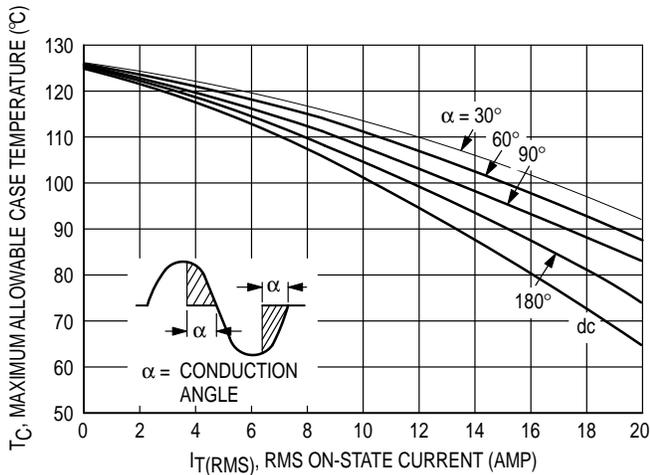


Figure 1. RMS Current Derating

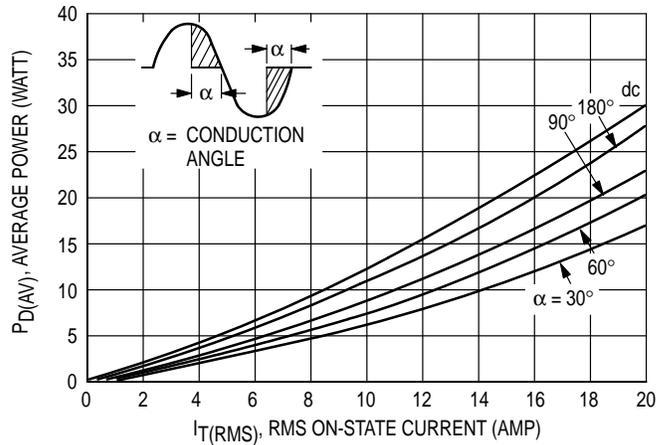


Figure 2. On-State Power Dissipation

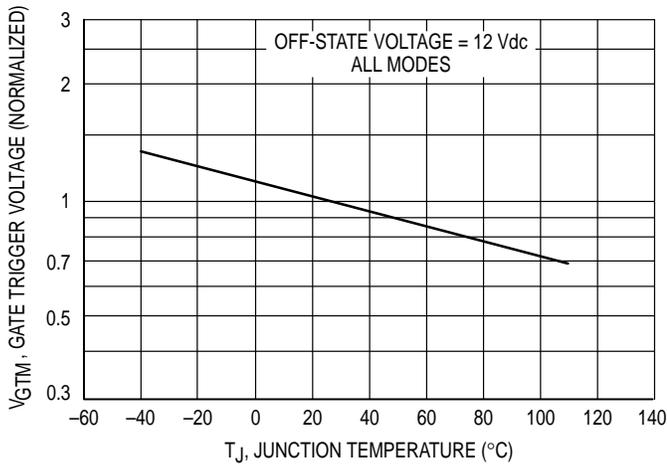


Figure 3. Typical Gate Trigger Voltage

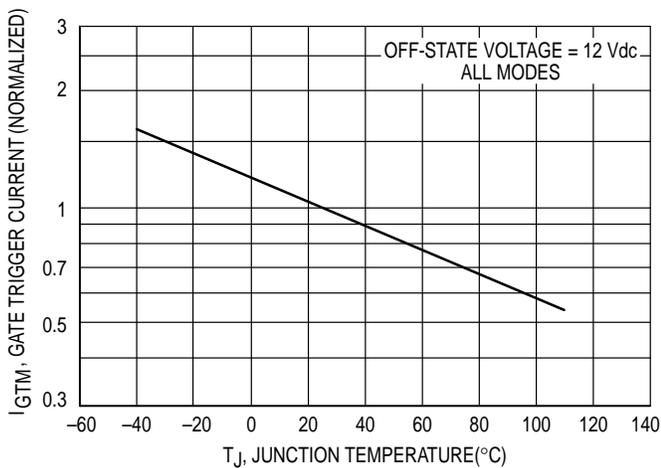


Figure 4. Typical Gate Trigger Current

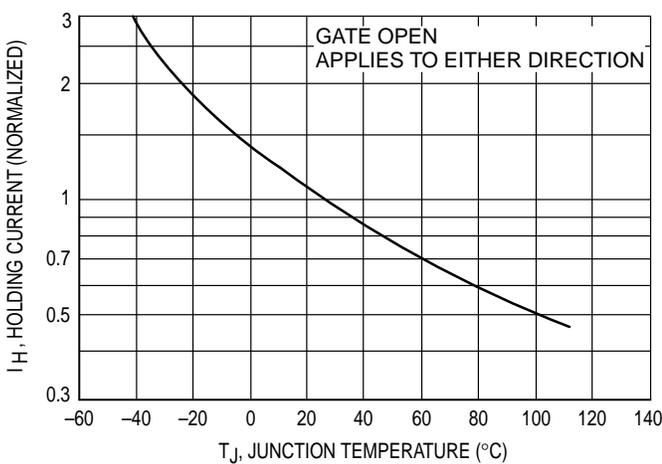


Figure 6. Typical Holding Current

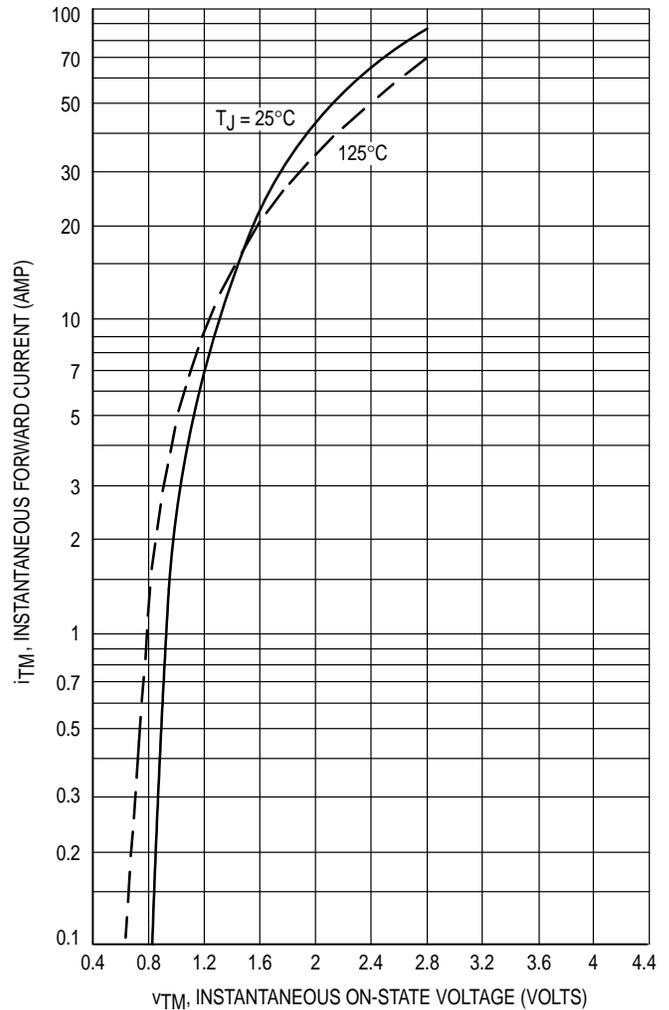


Figure 5. Maximum On-State Characteristics

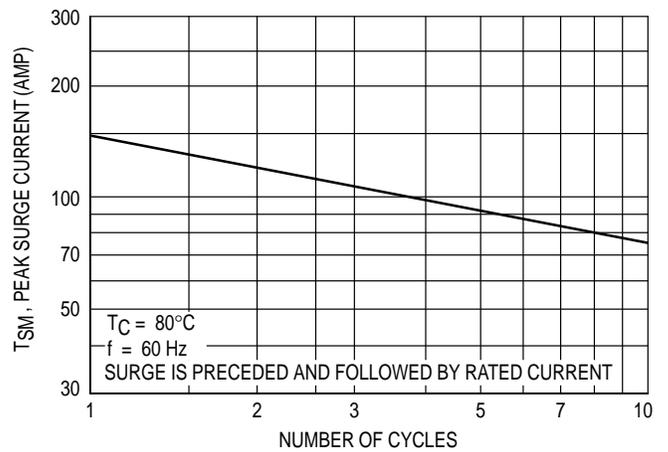


Figure 7. Maximum On-Repetitive Surge Current

# MAC321 Series

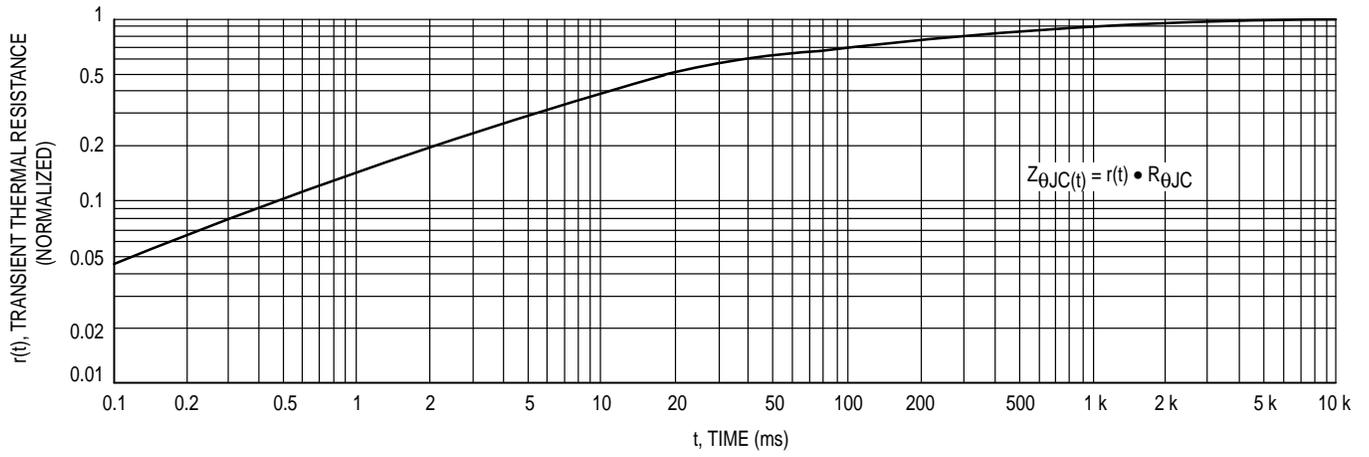
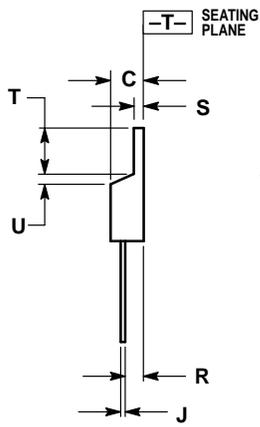
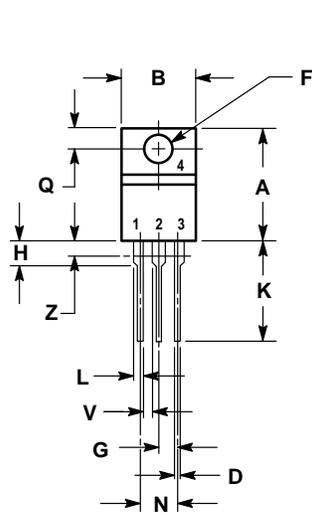


Figure 8. Thermal Response

PACKAGE DIMENSIONS



STYLE 4:  
 PIN 1. MAIN TERMINAL 1  
 PIN 2. MAIN TERMINAL 2  
 PIN 3. GATE  
 PIN 4. MAIN TERMINAL 2

- 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	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.022	0.36	0.55
K	0.500	0.562	12.70	14.27
L	0.045	0.055	1.15	1.39
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

CASE 221A-04  
 (TO-220AB)

## MAC321 Series

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MAC321/D

