

Triacs

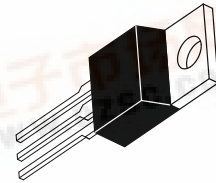
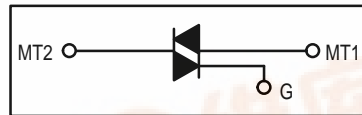
Silicon Bidirectional Thyristors

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

- Guaranteed High Commutation Voltage
 dv/dt — 500 V/ μs Min @ $T_C = 25^\circ C$
- High Blocking Voltage — V_{DRM} to 800 V
- Photo Glass Passivated Junction for Improved Power Cycling Capability and Reliability

MAC321 Series

TRIACS
20 AMPERES RMS
200 thru 800 VOLTS



CASE 221A-04
(TO-220AB)
STYLE 4

MAXIMUM RATINGS ($T_C = 25^\circ C$ unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage ⁽¹⁾ ($T_J = -40$ to $+125^\circ C$, 1/2 Sine Wave 50 to 60 Hz, Open Gate)	V_{DRM}		Volts
MAC321-4		200	
MAC321-6		400	
MAC321-8		600	
MAC321-10		800	
Peak Gate Voltage	V_{GM}	10	Volts
On-State Current RMS ($T_C = +75^\circ C$ Full Cycle Sine Wave 50 to 60 Hz)	$I_T(RMS)$	20	Amp
Peak Surge Current (One Full Cycle, 60 Hz, $T_C = +75^\circ C$ preceded and followed by Rated Current)	I_{TSM}	150	Amp
Circuit Fusing Considerations ($t = 8.3$ ms)	I^2t	93	A^2s
Peak Gate Power ($T_C = +75^\circ C$, Pulse Width = 2.0 μs)	P_{GM}	20	Watts
Average Gate Power ($T_C = +75^\circ C$, $t = 8.3$ ms)	$P_{G(AV)}$	0.5	Watt
Peak Gate Current	I_{GM}	2.0	Amp
Operating Junction Temperature Range	T_J	-40 to +125	$^\circ C$
Storage Temperature Range	T_{stg}	-40 to +150	$^\circ C$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.8	$^\circ C/W$

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.



MAC321 Series

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current ($V_D = \text{Rated } V_{\text{DRM}}$, Gate Open) $T_J = 25^\circ\text{C}$ $T_J = +125^\circ\text{C}$	I_{DRM}	— —	— —	10 2.0	μA mA
Peak On-State Voltage (Either Direction) ($I_{\text{TM}} = 28 \text{ A Peak}$; Pulse Width $\leq 2.0 \text{ ms}$, Duty Cycle $\leq 2.0\%$)	V_{TM}	—	1.4	1.7	Volts
Gate Trigger Current (Continuous dc) (Main Terminal Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	I_{GT}	— — —	— — —	100 100 100	mA
Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) (Main Terminal Voltage = Rated V_{DRM} , $R_L = 10 \text{ k}\Omega$, $T_J = +125^\circ\text{C}$) MT2(+), G(+); MT2(-), G(-); MT2(+), G(-)	V_{GT}	— — — 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_{H}	—	—	100	mA
Turn-On Time ($V_D = \text{Rated } V_{\text{DRM}}$, $I_{\text{TM}} = 28 \text{ A}$, $I_{\text{GT}} = 120 \text{ mA}$, Rise Time = 0.1 μs , Pulse Width = 2.0 μs)	t_{gt}	—	1.5	—	μs
Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{\text{DRM}}$, Exponential Voltage Rise, Gate Open) $T_J = 25^\circ\text{C}$ $T_J = +125^\circ\text{C}$	$dv/dt(\text{s})$	500 200	— —	— —	V/ μs

TYPICAL CHARACTERISTICS

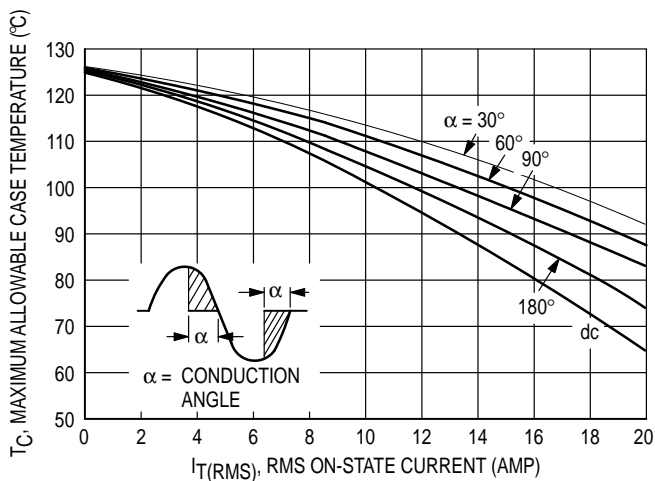


Figure 1. RMS Current Derating

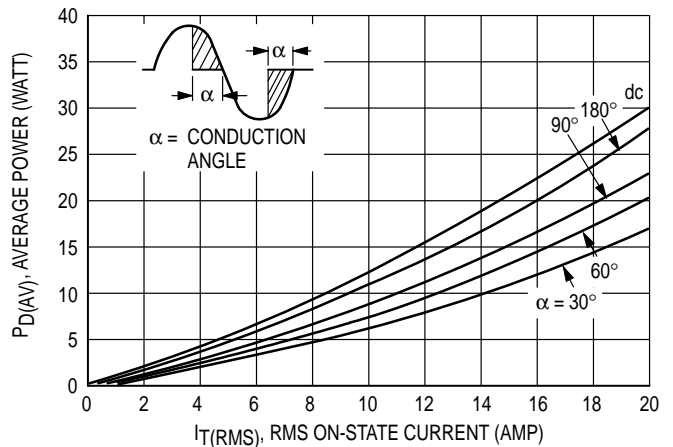


Figure 2. On-State Power Dissipation

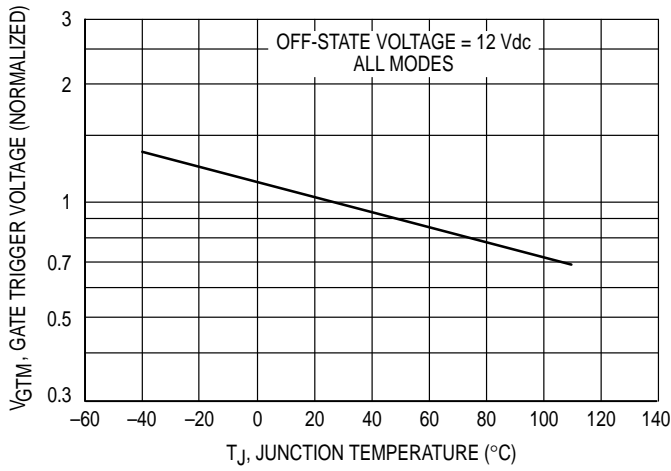


Figure 3. Typical Gate Trigger Voltage

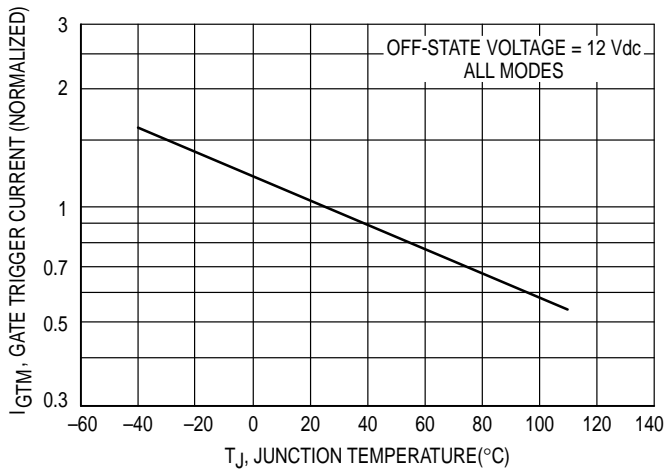


Figure 4. Typical Gate Trigger Current

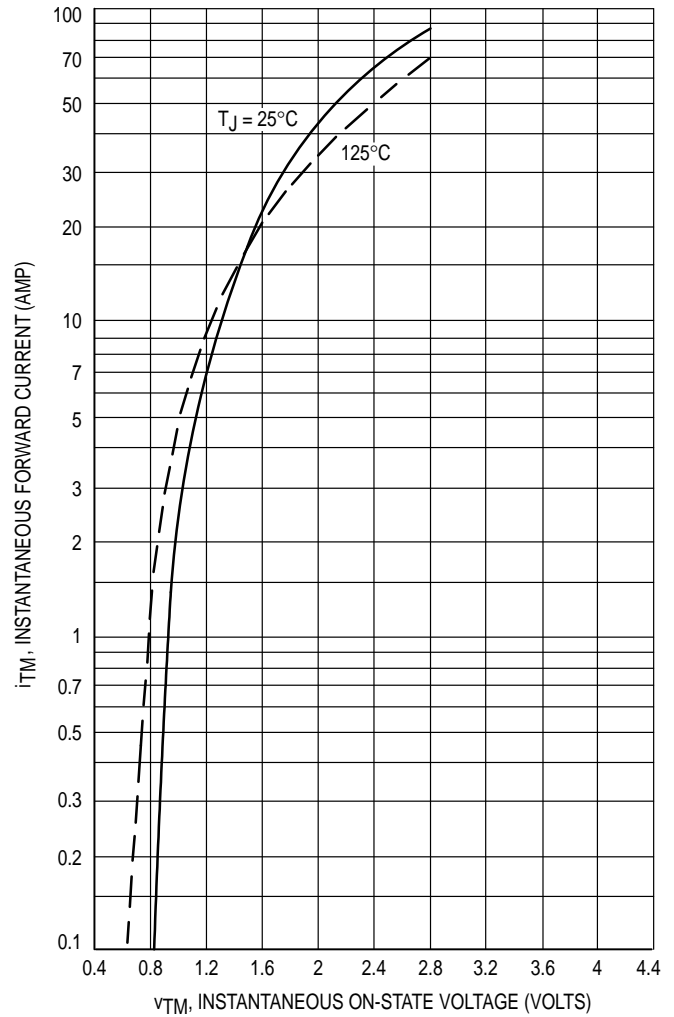


Figure 5. Maximum On-State Characteristics

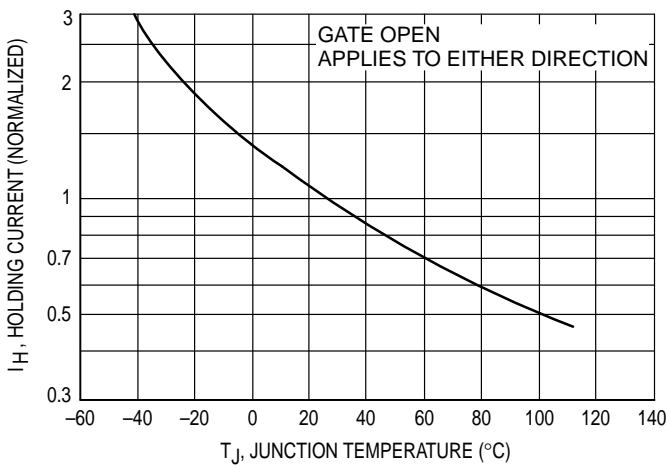


Figure 6. Typical Holding Current

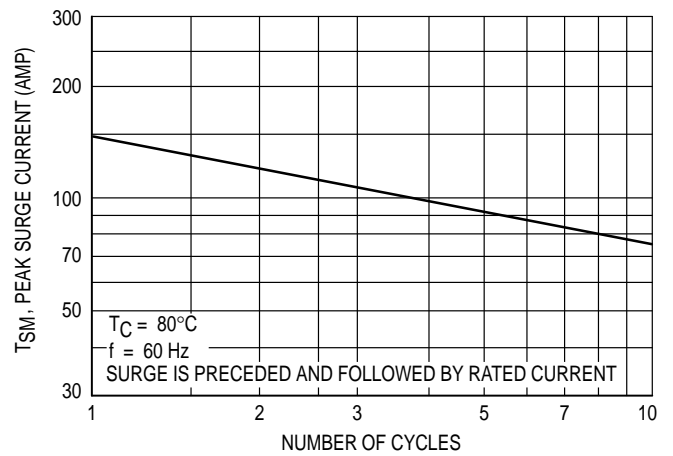


Figure 7. Maximum On-Repetitive Surge Current

MAC321 Series

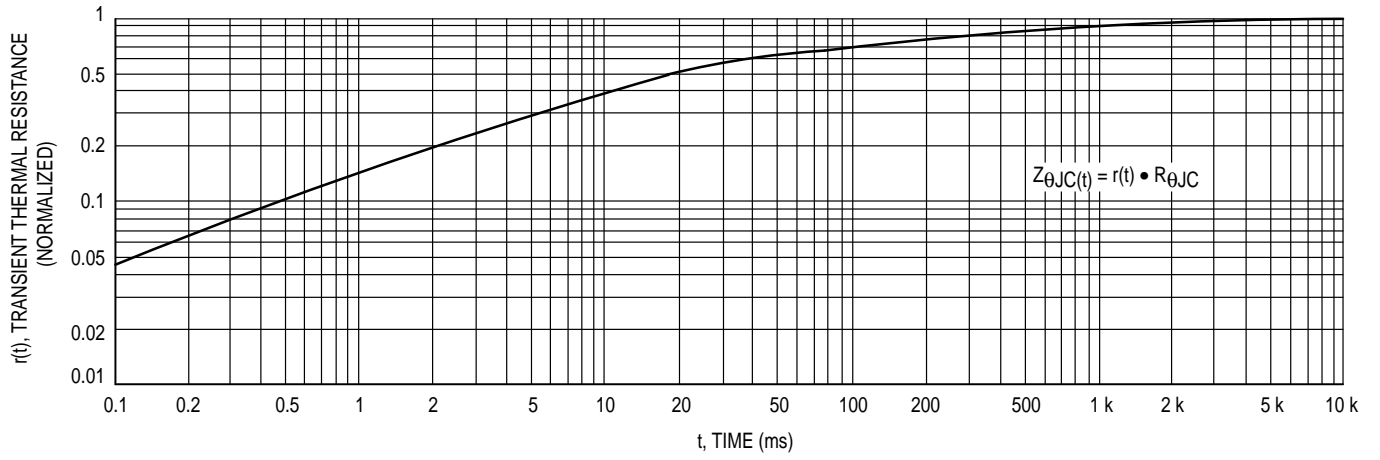
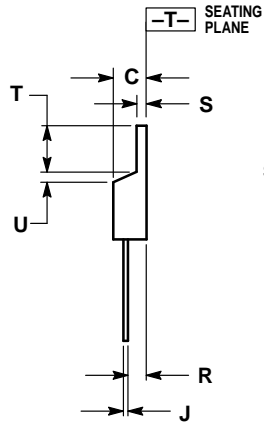
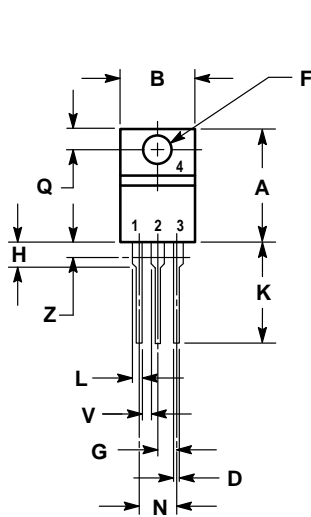


Figure 8. Thermal Response

PACKAGE DIMENSIONS




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