

Triacs

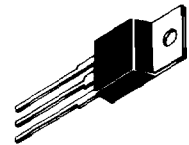
Silicon Bidirectional Thyristors

MAC321 Series

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

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

TRIACS
20 AMPERES RMS
200 thru 800 VOLTS



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



MAXIMUM RATINGS

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

THERMAL CHARACTERISTICS

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

Note 1. Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.

MAC321 Series

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current (Either Direction) Rated V_{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) $I_{TM} = 28 \text{ A Peak}$; 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 Rated V_{DRM} , $I_{TM} = 28 \text{ A}$, $I_{GT} = 120 \text{ mA}$, Rise Time = 0.1 μs , Pulse Width = 2.0 μs	t_{gt}	—	1.5	—	μs
Critical Rate of Rise of Off-State Voltage $V_D = \text{Rated } V_{DRM}$, Exponential Voltage Rise, Gate Open $T_J = 25^\circ\text{C}$ $T_J = +125^\circ\text{C}$	$dv/dt(s)$	500 200	— —	— —	$\text{V}/\mu\text{s}$

3

TYPICAL CHARACTERISTICS

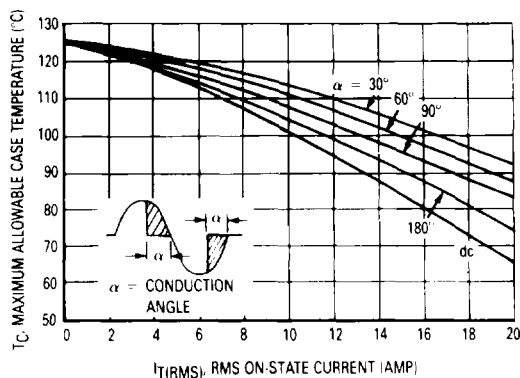


Figure 1. RMS Current Derating

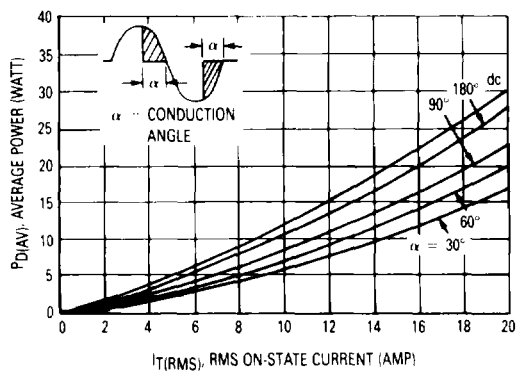


Figure 2. On-State Power Dissipation

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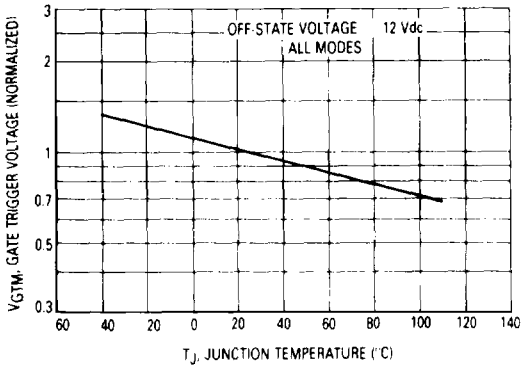


Figure 3. Typical Gate Trigger Voltage

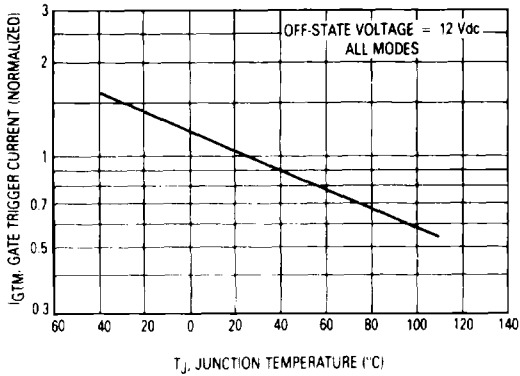


Figure 4. Typical Gate Trigger Current

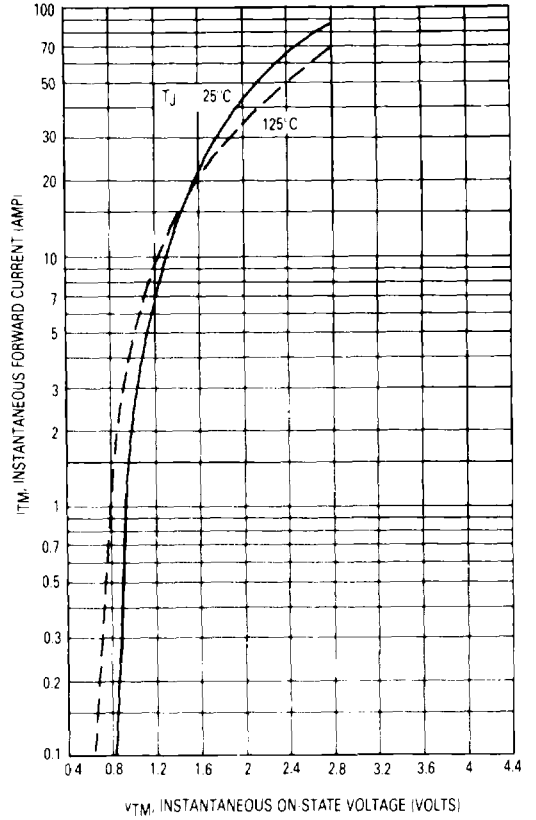


Figure 5. Maximum On-State Characteristics

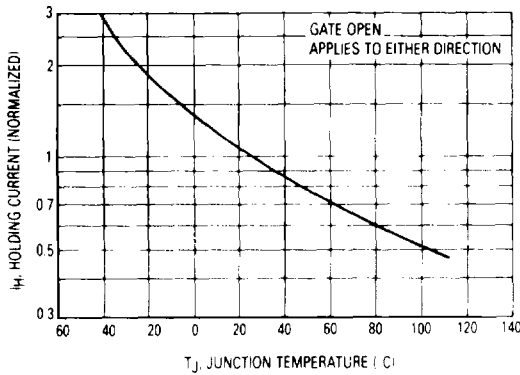


Figure 6. Typical Holding Current

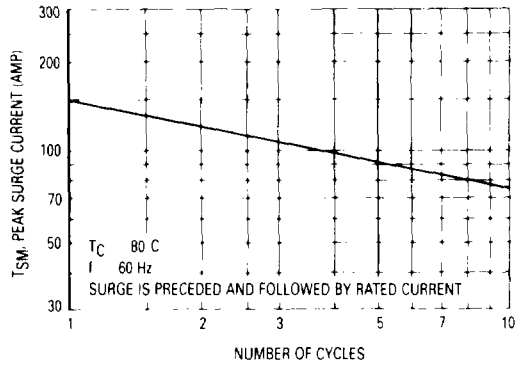


Figure 7. Maximum On-Repetitive Surge Current

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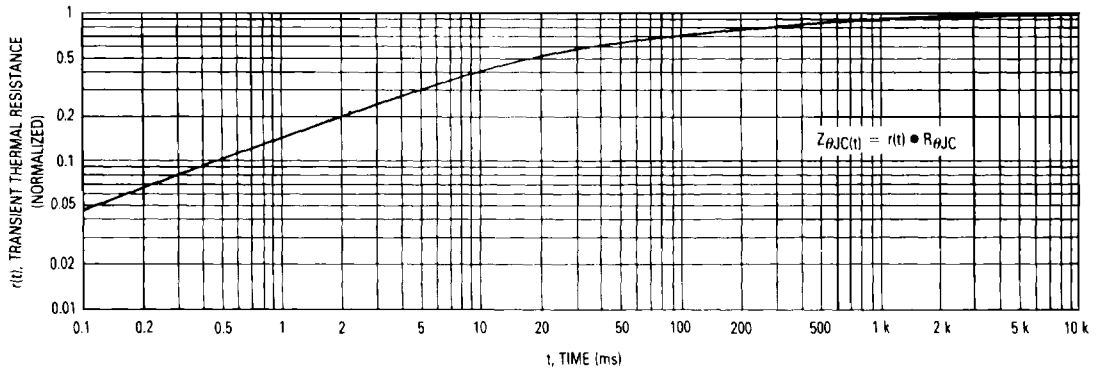


Figure 8. Thermal Response