

Triacs

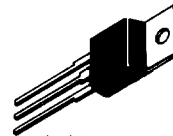
Silicon Bidirectional Thyristors

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

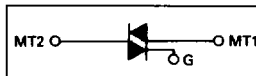
- **Guaranteed High Commutation Voltage**
dv/dt — 500 V/μs Min @ T_C = 25°C
- High Blocking Voltage — V_{DRM} to 800 V
- Photo Glass Passivated Junction for Improved Power Cycling Capability and Reliability

MAC213 Series

TRIACS
12 AMPERES RMS
200 thru 800 VOLTS



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



3

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Repetitive Peak Off-State Voltage, Note 1 (T _J = -40 to +125°C, Gate Open) MAC213-4 MAC213-6 MAC213-8 MAC213-10	V _{DRM}	200 400 600 800	Volts
Peak Gate Voltage	V _{GM}	10	Volts
On-State Current RMS (T _C = +85°C) Full Cycle Sine Wave 50 to 60 Hz	I _{T(RMS)}	12	Amp
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, T _C = +85°C) preceded and followed by Rated Current	I _{TSM}	100	Amp
Circuit Fusing Considerations (T _C = +85°C, t = 8.3 ms)	I ² t	41	A ² s
Peak Gate Power (T _C = +85°C, Pulse Width = 10 μs)	P _{GM}	20	Watts
Average Gate Power (T _C = +85°C, t = 8.3 ms)	P _{G(AV)}	0.35	Watt
Peak Gate Current (T _C = +85°C, Pulse Width = 10 μs)	I _{GM}	2.0	Amp
Operating Junction Temperature	T _J	-40 to +125	°C
Storage Temperature Range	T _{stg}	-40 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	2.1	°C/W

Note 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.

Devices listed in bold, italic are Motorola preferred devices.

MAC213 Series

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current (Either Direction) ($V_D = \text{Rated } V_{DRM}$, 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) ($I_{TM} = 17 \text{ A Peak}$; Pulse Width $\leq 2.0 \text{ ms}$, Duty Cycle $\leq 2.0\%$)	V_{TM}	—	1.3	1.75	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 ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 17 \text{ A}$, $I_{GT} = 120 \text{ mA}$, 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	— —	— —	$\text{V}/\mu\text{s}$

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TYPICAL CHARACTERISTICS

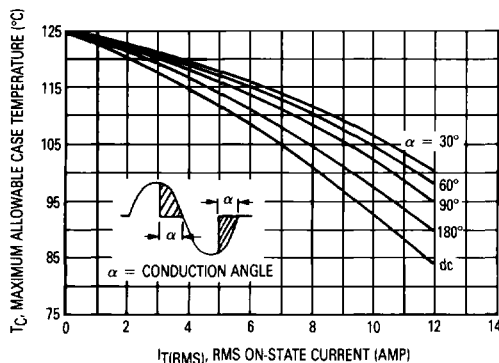


Figure 1. Current Derating

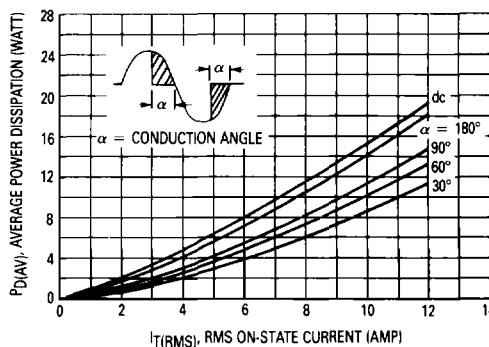


Figure 2. Power Dissipation

MAC213 Series

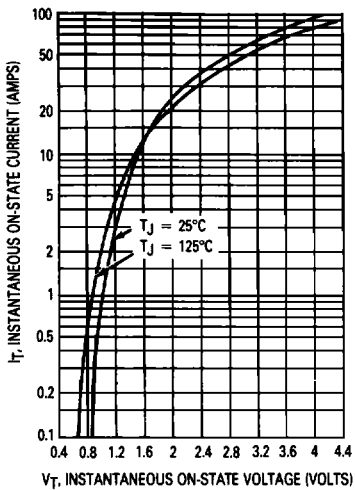


Figure 3. Maximum On-State Characteristics

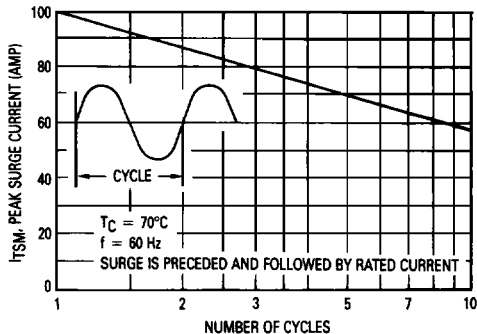


Figure 4. Maximum Non-Repetitive Surge Current

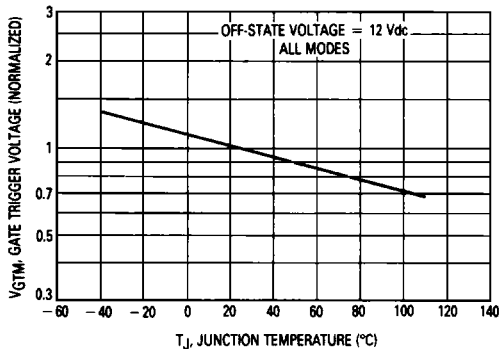


Figure 5. Typical Gate Trigger Voltage

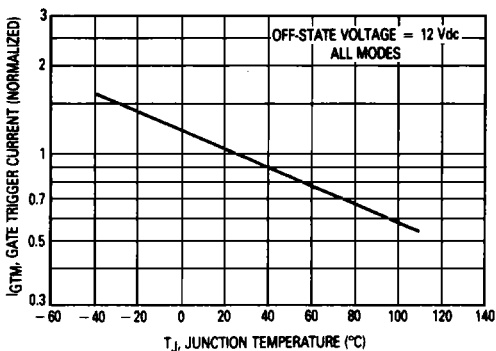


Figure 6. Typical Gate Trigger Current

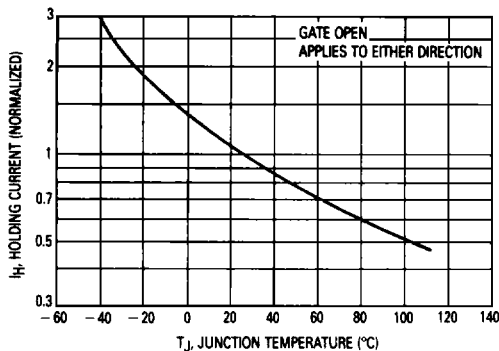


Figure 7. Typical Holding Current

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MAC213 Series

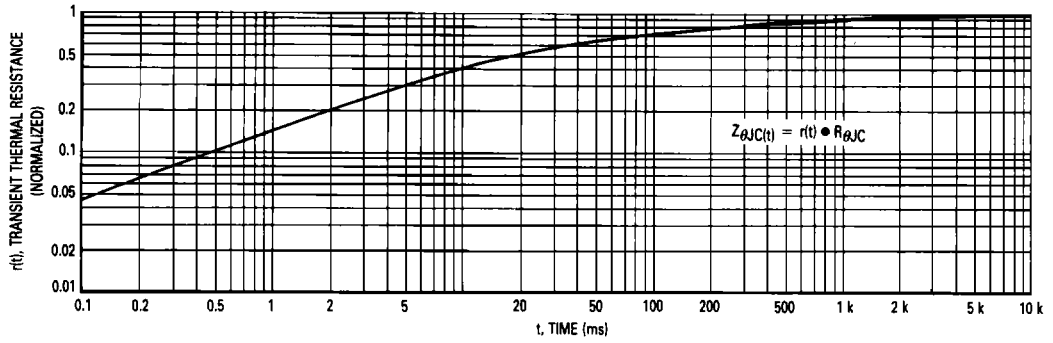


Figure 8. Thermal Response