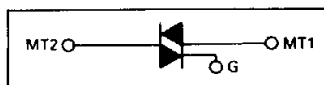


Triacs

Silicon Bidirectional Thyristors

... designed primarily for full-wave ac control applications, such as solid-state relays, motor controls, heating controls and power supplies; or wherever full-wave silicon gate controlled solid-state devices are needed. Triac type thyristors switch from a blocking to a conducting state for either polarity of applied anode voltage with positive or negative gate triggering.

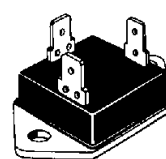
- Blocking Voltage to 600 Volts
- TO-3 Isolated Mounting
- High Isolation Voltage — 2.5 kV rms
- High Commutating dv/dt — 6 V/ μ s Min
- UL Recognized — File # E69369



MAC625 Series

MAC635 Series

**ISOLATED TRIACs
THYRISTORS**
25/35 AMPERES RMS
200–600 VOLTS



CASE 383-01
STYLE 1

3

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage, Note 1 ($T_J = -40$ to $+125^\circ\text{C}$, 1/2 Sine Wave 50 to 60 Hz, Gate Open)	V_{DRM}	200 400 600	Volts
Peak Gate Voltage	V_{GM}	10	Volts
On-State RMS Current ($T_C = +75^\circ\text{C}$, Full Cycle Sine Wave 50 to 60 Hz) Note 2 ($T_C = 58^\circ\text{C}$)	$I_{\text{T(RMS)}}$	25 35	Amps
Peak Nonrepetitive Surge Current (One Full Cycle, 60 Hz, $T_C = +75^\circ\text{C}$ preceded and followed by rated current)	I_{TSM}	250 330	Amps
Peak Gate Power ($T_C = +75^\circ\text{C}$, Pulse Width = 2 μ s)	P_{GM}	10	Watts
Average Gate Power ($T_C = +75^\circ\text{C}$, $t = 8.3$ ms)	$P_{\text{G(AV)}}$	1	Watt
Peak Gate Current	I_{GM}	3	Amps
RMS Isolation Voltage ($T_A = 25^\circ\text{C}$, Relative Humidity $\leq 20\%$)	$V_{\text{(ISO)}}$	2500	Volts
Operating Junction Temperature	T_J	-40 to $+125$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to $+125$	$^\circ\text{C}$
Circuit Fusing ($t = 8.3$ ms)	I^2t	260 350	A^2s

Notes 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

2 The case temperature reference point for all T_C measurements is a point on the center lead of the package as close as possible to the plastic body

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta\text{JC}}$	1.5	$^\circ\text{C/W}$

MOTOROLA THYRISTOR DEVICE DATA

3-155

MAC625 Series • MAC635 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)	I_{DRM}	—	—	10	μA
Peak On-State Voltage (Either Direction) ($I_{TM} = 1.4 I_{T(RMS)}$)	V_{TM}	—	—	1.4	Volts
Peak Gate Trigger Current (Main Terminal Voltage = 16 Vdc, $I_T = 1 \text{ A}$) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+)	I_{GT}	— — — —	— — — —	50 50 50 —	mA
Peak Gate Trigger Voltage (Main Terminal Voltage = 6 Vdc, $I_T = 1 \text{ A}$ Minimum Gate Pulse Width = 2 μs) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-) MT2(-), G(+)	V_{GT}	— — — —	— — — —	3 3 3 —	Volts
Gate Non-Trigger Voltage (Main Terminal Voltage = 1/2 Rated V_{DRM} , $R_L = 10 \text{ k}\Omega$, $T_J = 125^\circ\text{C}$)	V_{GD}	0.2	—	—	Volts
Holding Current (Either Direction)	I_H	—	30	—	mA
Turn-On Time ($V_D = 1/2 \text{ Rated } V_{DRM}$, $I_{TM} = \text{Rated } I_T$, $I_{GT} = 100 \text{ mA}$)	t_{gt}	—	—	10	μs
Critical Rate of Rise of Commutation Voltage ($V_D = 2/3 \text{ Rated } V_{DRM}$, $T_J = 125^\circ\text{C}$) MAC625: $I_{TM} = 35.4 \text{ A}$, $di/dt = 12.7 \text{ A/ms}$ MAC635: $I_{TM} = 49.5 \text{ A}$, $di/dt = 17.8 \text{ A/ms}$	$dv/dt(c)$	6	—	—	$\text{V}/\mu\text{s}$
Critical Rate of Rise of Off-State Voltage ($V_D = 2/3 \text{ Rated } V_{DRM}$, Exponential Voltage Rise, Gate Open, $T_J = 125^\circ\text{C}$)	dv/dt	100	—	—	$\text{V}/\mu\text{s}$

TYPICAL CHARACTERISTICS

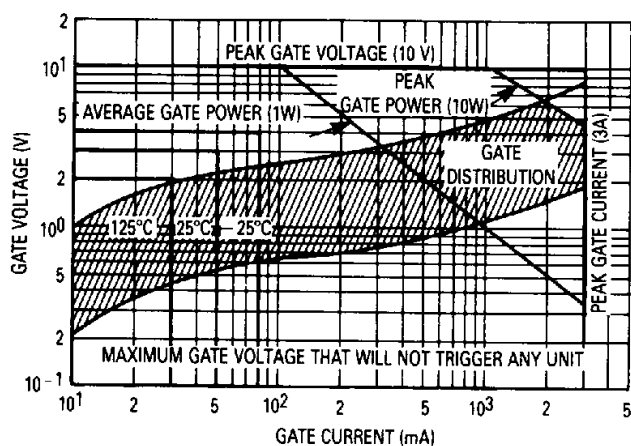


Figure 1. Gate Characteristics

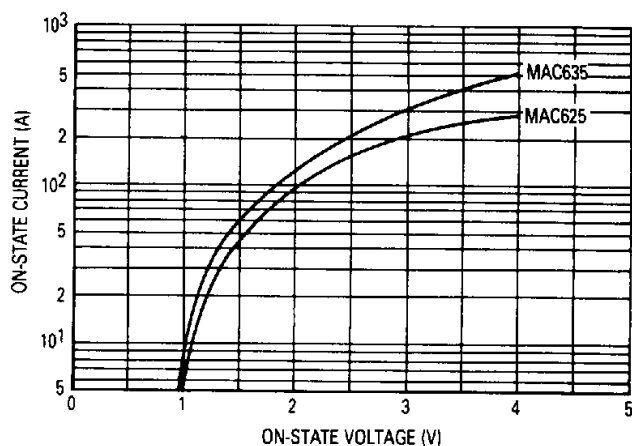


Figure 2. On-State Voltage

MAC625 Series • MAC635 Series

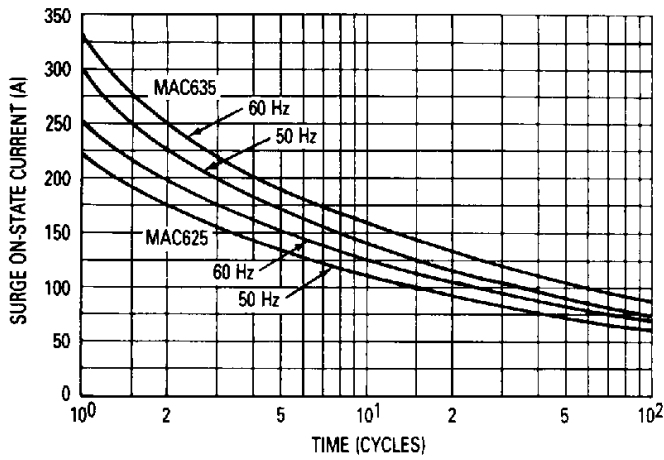


Figure 3. Surge On-State Current Rating (Non-Repetitive)

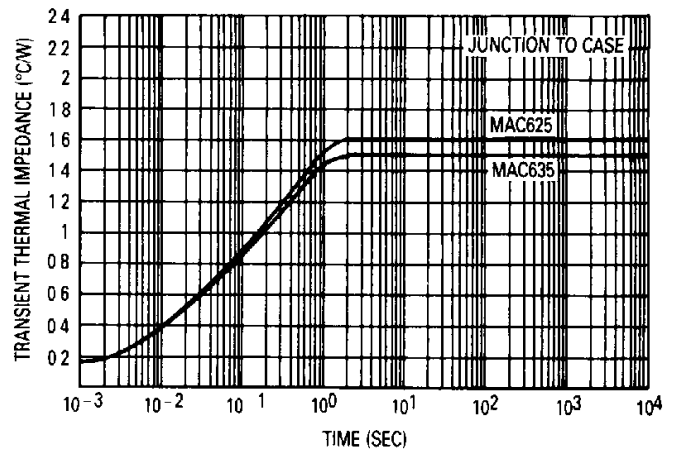


Figure 4. Transient Thermal Impedance

RMS On-State Current versus Maximum Power Dissipation

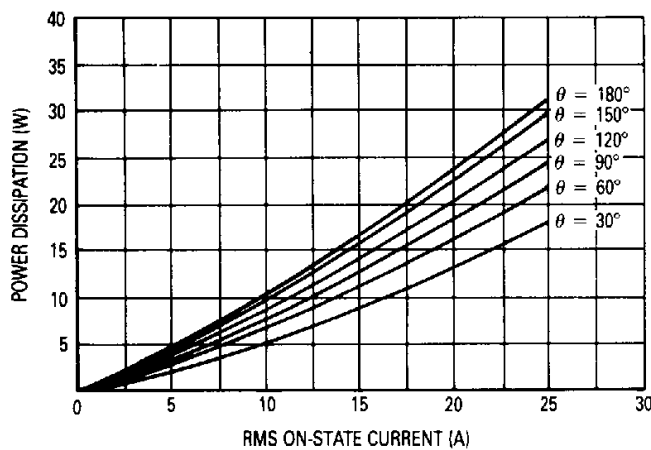


Figure 5. MAC625

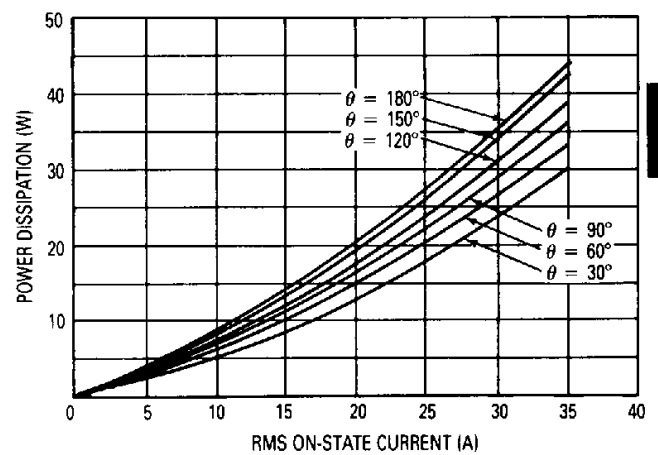


Figure 6. MAC635

RMS On-State Current versus Allowable Case Temperature

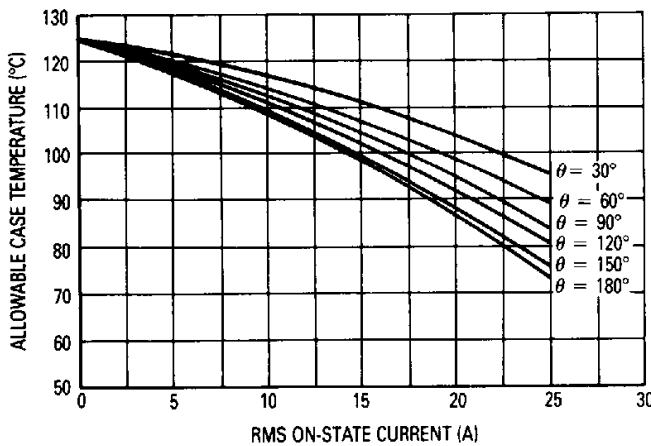


Figure 7. MAC625

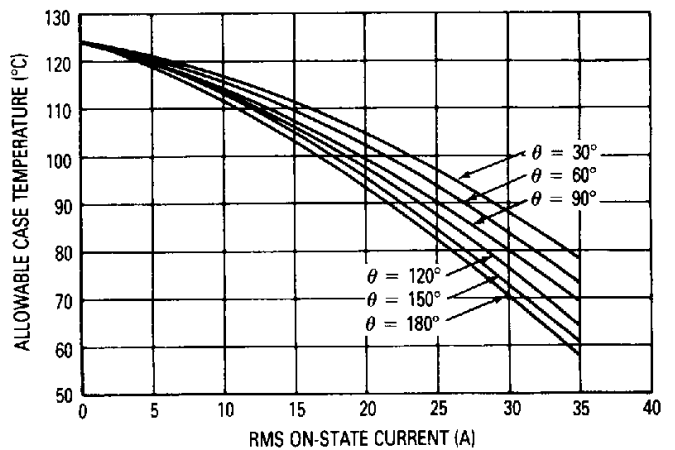


Figure 8. MAC635

MAC625 Series • MAC635 Series

Ambient Temperature versus RMS On-State Current

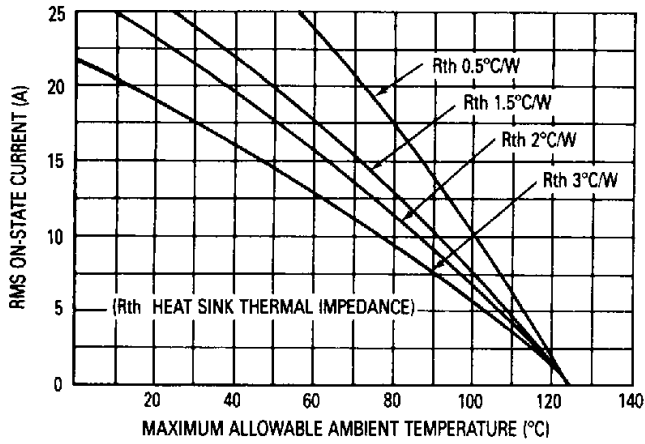


Figure 9. MAC625

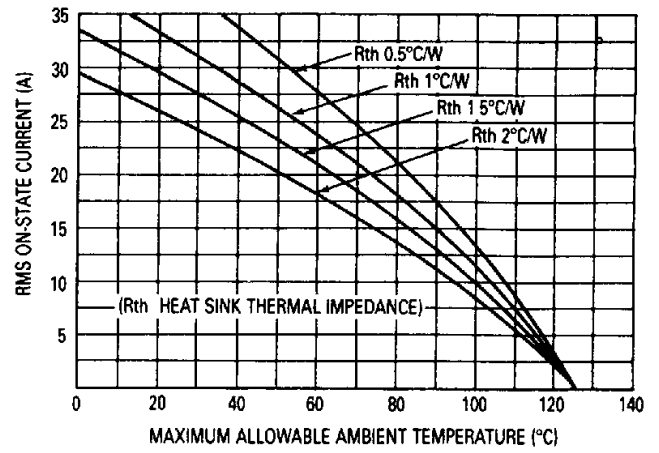


Figure 10. MAC635