

# Thyristors

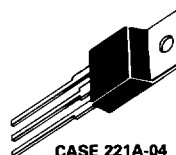
## Silicon-Controlled Rectifiers

... designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supplies; or wherever half-wave silicon gate-controlled, solid-state devices are needed.

- Glass-Passivated Junctions
- Blocking Voltage to 800 Volts
- TO-220 Construction — Low Thermal Resistance, High Heat Dissipation and Durability

### MCR218 Series

SCRs  
8 AMPERES RMS  
50 thru 800 VOLTS



CASE 221A-04  
(TO-220AB)  
STYLE 3

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

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Voltage, Note 1 ( $T_J = 25$ to $125^\circ\text{C}$ , Gate Open)	$V_{DRM}$ $V_{RRM}$	50 100 200 400 600 800	Volts
Forward Current RMS (All Conduction Angles)	$I_T(\text{RMS})$	8	Amps
Peak Forward Surge Current (1/2 Cycle, Sine Wave, 60 Hz)	$I_{TSM}$	80	Amps
Circuit Fusing Considerations ( $t = 8.3$ ms)	$I^2t$	26	$\text{A}^2\text{s}$
Forward Peak Gate Power	$P_{GM}$	5	Watts
Forward Average Gate Power	$P_{G(AV)}$	0.5	Watt
Forward Peak Gate Current	$I_{GM}$	2	Amps
Operating Junction Temperature Range	$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +150	$^\circ\text{C}$

Note 1.  $V_{DRM}$  and  $V_{RRM}$  for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. 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.

## MCR218 Series

### Thermal Characteristics

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2	$^{\circ}C/W$

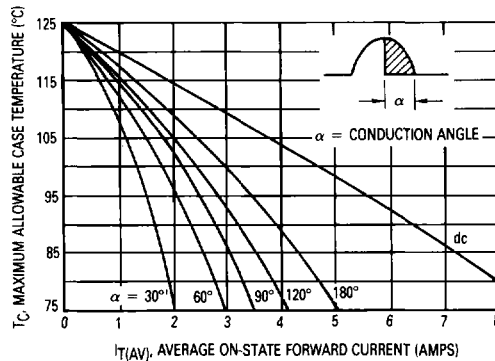
### Electrical Characteristics ( $T_J = 25^{\circ}C$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current ( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$ , Gate Open) $T_J = 25^{\circ}C$ $T_J = 125^{\circ}C$	$I_{DRM}, I_{RRM}$	—	—	10 2	$\mu A$ mA
Peak On-State Voltage, Note 1 ( $I_{TM} = 16 \text{ A Peak}$ )	$V_{TM}$	—	1.5	1.8	Volts
Gate Trigger Current (Continuous dc) ( $V_D = 12 \text{ V}, R_L = 100 \text{ Ohms}$ )	$I_{GT}$	—	10	25	mA
Gate Trigger Voltage (Continuous dc) ( $V_D = 12 \text{ V}, R_L = 100 \text{ Ohms}$ ) (Rated $V_{DRM}$ , $R_L = 1000 \text{ Ohms}, T_J = 125^{\circ}C$ )	$V_{GT}$	— 0.2	— —	1.5 —	Volts
Holding Current (Anode Voltage = 24 Vdc, Peak Initiating On-State Current = 0.5 A, 0.1 to 10 ms Pulse, Gate Trigger Source = 7 V, 20 Ohms)	$I_H$	—	16	30	mA
Critical Rate-of-Rise of Off-State Voltage ( $V_D = \text{Rated } V_{DRM}$ , Exponential Waveform, Gate Open, $T_J = 125^{\circ}C$ )	dv/dt	—	100	—	V/ $\mu s$

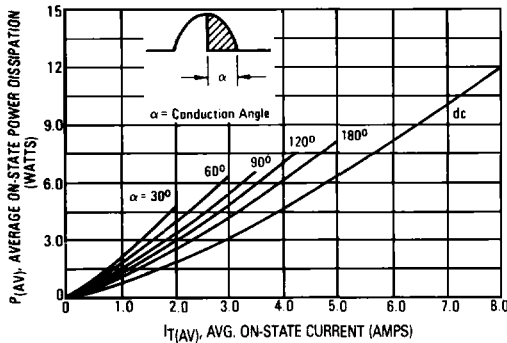
Note 1. Pulse Test: Pulse Width = 1 ms, Duty Cycle  $\leq 2\%$ .

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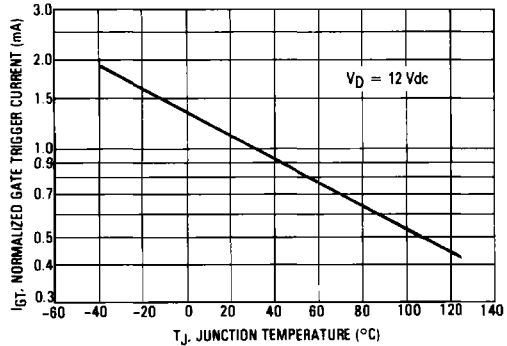
**FIGURE 1 — CURRENT DERATING**



**FIGURE 2 — ON-STATE POWER DISSIPATION**



**FIGURE 3 — NORMALIZED GATE TRIGGER CURRENT**



## MCR218 Series

FIGURE 4 — NORMALIZED GATE TRIGGER VOLTAGE

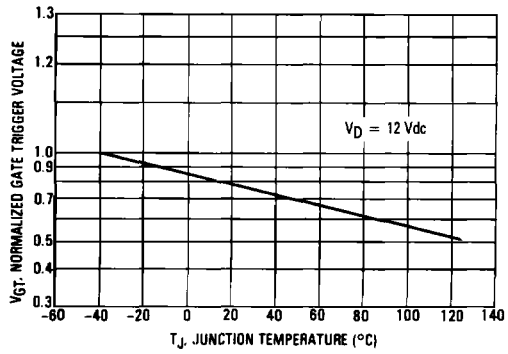


FIGURE 5 — NORMALIZED HOLDING CURRENT

