

## Advance Information

# Silicon Controlled Rectifiers

## Reverse Blocking Thyristors

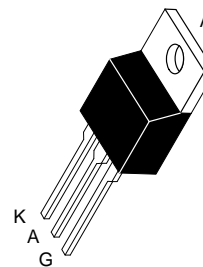
Designed primarily for half-wave ac control applications, such as motor controls, heating controls, and power supplies; or wherever half-wave, silicon gate-controlled devices are needed.

- Blocking Voltage to 800 Volts
- On-State Current Rating of 8 Amperes RMS
- High Surge Current Capability — 90 Amperes
- Industry Standard TO-220AB Package for Ease of Design
- Glass Passivated Junctions for Reliability and Uniformity
- Low Trigger Currents, 200 $\mu$ A Maximum for Direct Driving from Integrated Circuits

**MCR8S**  
**SERIES\***

\*Motorola preferred devices

SCRs  
8 AMPERES RMS  
400 thru 800  
VOLTS



CASE 221A-06  
(TO-220AB)  
Style 3

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

Parameter	Symbol	Value	Unit
Peak Repetitive Off-State Voltage (1) Peak Repetitive Reverse Voltage ( $T_J = -40$ to $110^\circ\text{C}$ ; $R_{GK} = 1.0\text{ K}\Omega$ )	$V_{DRM}$ $V_{RRM}$	400 600 800	Volts
On-State RMS Current (All Conduction Angles)	$I_T(\text{RMS})$	8	A
Peak Non-repetitive Surge Current (One Half Cycle, 60 Hz, $T_J = 125^\circ\text{C}$ )	$I_{TSM}$	90	A
Circuit Fusing Consideration ( $t = 8.3\text{ ms}$ )	$I^2t$	34	$\text{A}^2\text{sec}$
Peak Gate Power (Pulse Width $\leq 1.0\ \mu\text{s}$ , $T_C = 80^\circ\text{C}$ )	$P_{GM}$	5.0	Watts
Average Gate Power ( $t = 8.3\text{ ms}$ , $T_C = 80^\circ\text{C}$ )	$P_{G(AV)}$	0.5	Watts
Peak Gate Current (Pulse Width $\leq 1.0\ \mu\text{s}$ , $T_C = 80^\circ\text{C}$ )	$I_{GM}$	2.0	A
Operating Junction Temperature Range	$T_J$	$-40$ to $+110$	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	$-40$ to $+150$	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Thermal Resistance — Junction to Case — Junction to Ambient	$R_{\theta JC}$ $R_{\theta JA}$	2.2 62.5	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	$T_L$	260	$^\circ\text{C}$

(1)  $V_{DRM}$  and  $V_{RRM}$  for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; 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.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

# MCR8S SERIES

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C; R<sub>GK</sub> = 1.0 KΩ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Peak Forward Blocking Current	T <sub>J</sub> = 25°C I <sub>DRM</sub>	—	—	10	μA
Peak Reverse Blocking Current (V <sub>AK</sub> = Rated V <sub>DRM</sub> or V <sub>RRM</sub> , Gate Open) (1)	T <sub>J</sub> = 110°C I <sub>RRM</sub>	—	—	500	μA

## ON CHARACTERISTICS

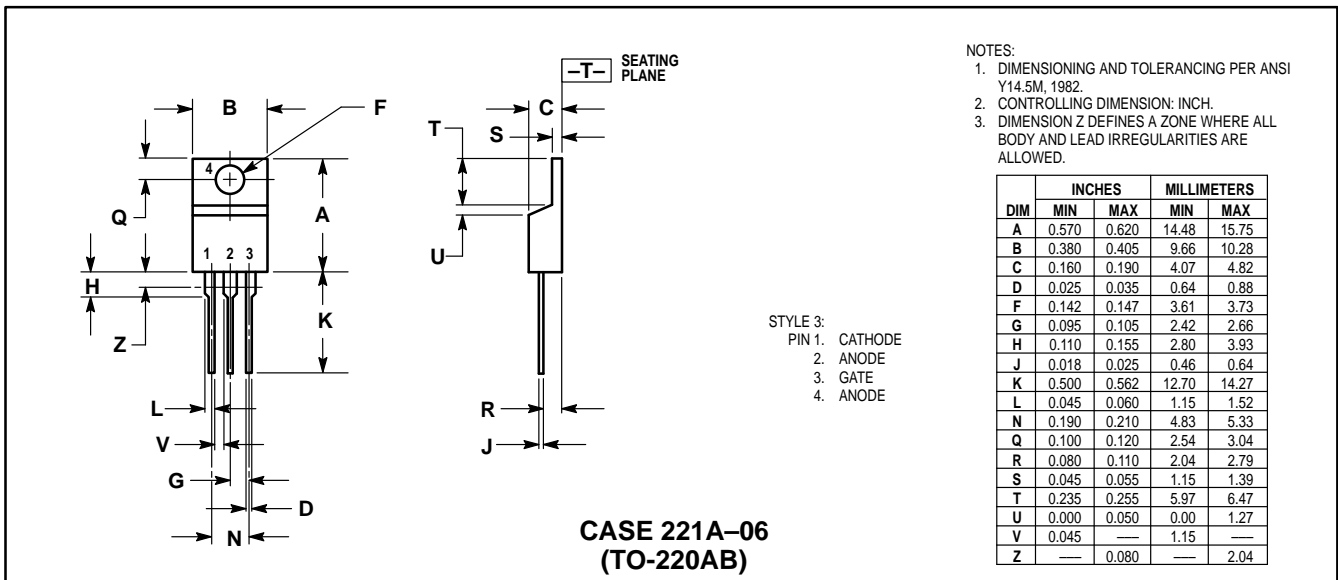
Peak On-State Voltage (I <sub>TM</sub> = 16 A) (2)	V <sub>TM</sub>	—	1.4	1.8	Volts
Gate Trigger Current (Continuous dc) (V <sub>D</sub> = 12 V, R <sub>L</sub> = 100 Ω) (3)	I <sub>GT</sub>	5.0	20	200	μA
Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> = 12 V, R <sub>L</sub> = 100 Ω)	V <sub>GT</sub>	0.5	0.65	1.0	Volts
Hold Current (Anode Voltage = 12 V)	I <sub>H</sub>	0.5	1.0	6.0	mA

## DYNAMIC CHARACTERISTICS

Critical Rate of Rise of Off-State Voltage (V <sub>D</sub> = 67% of Rated V <sub>DRM</sub> , Exponential Waveform, T <sub>J</sub> = 110°C)	(dv/dt)	2.0	10	—	V/μs
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- Devices shall not have a positive gate voltage concurrently with a negative voltage on the anode. Devices should not be tested with a constant current source for forward and reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.
- Pulse test: P.W. ≤ 2ms, Duty Cycle ≤ 2%.
- Does not include R<sub>GK</sub> current.

## PACKAGE DIMENSIONS



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MCR8S/D

