MCR8S SERIES*

***Motorola preferred devices**

Advance Information

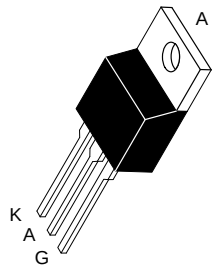
Silicon Controlled Rectifiers

Reverse Blocking Thyristors

SCRs
8 AMPERES RMS
400 thru 800
VOLTS

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, 200μA Maximum for Direct Driving from Integrated Circuits



CASE 221A–06
(TO-220AB)
Style 3

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

Parameter		Symbol	Value	Unit
Peak Repetitive Off-State Voltage (1) Peak Repetitive Reverse Voltage (T_J = –40 to 110°C; R_{GK} = 1.0 KΩ)	MCR8SD MCR8SM MCR8SN	V_{DRM} V_{RRM}	 400 600 800	Volts
On-State RMS Current (All Conduction Angles)		$I_{T(RMS)}$	8	A
Peak Non-repetitive Surge Current (One Half Cycle, 60 Hz, T_J = 125°C)		I_{TSM}	90	A
Circuit Fusing Consideration (t = 8.3 ms)		I^2t	34	A^2sec
Peak Gate Power (Pulse Width ≤ 1.0 μs, T_C = 80°C)		P_{GM}	5.0	Watts
Average Gate Power (t = 8.3 ms, T_C = 80°C)		$P_{G(AV)}$	0.5	Watts
Peak Gate Current (Pulse Width ≤ 1.0 μs, T_C = 80°C)		I_{GM}	2.0	A
Operating Junction Temperature Range		T_J	–40 to +110	°C
Storage Temperature Range		T_{stg}	–40 to +150	°C

THERMAL CHARACTERISTICS

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

MOTOROLA

ELECTRICAL CHARACTERISTICS (T_J = 25°C; R_{GK} = 1.0 KΩ unless otherwise noted)

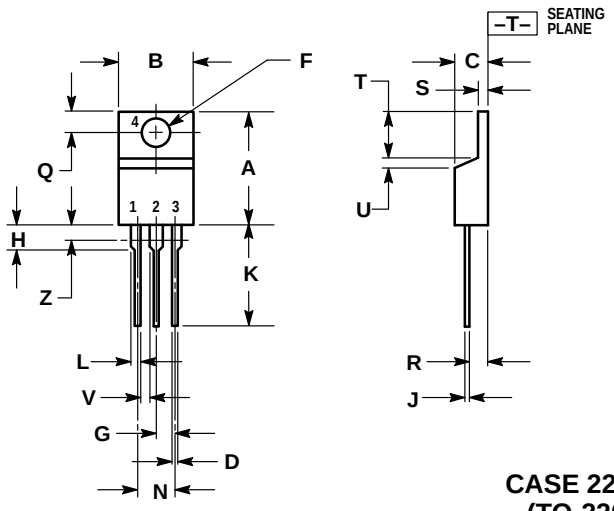
Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Peak Forward Blocking Current Peak Reverse Blocking Current (V_{AK} = Rated V_{DRM} or V_{RRM}, Gate Open) (1)	T_J = 25°C T_J = 110°C	I_{DRM} I_{RRM}	— —	— —	10 500	μA
ON CHARACTERISTICS						
Peak On-State Voltage (I_{TM} = 16 A) (2)		V_{TM}	—	1.4	1.8	Volts
Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 100 Ω) (3)		I_{GT}	5.0	20	200	μA
Gate Trigger Voltage (Continuous dc) (V_D = 12 V, R_L = 100 Ω)		V_{GT}	0.5	0.65	1.0	Volts
Hold Current (Anode Voltage =12 V)		I_H	0.5	1.0	6.0	mA
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of Off–State Voltage (V_D = 67% of Rated V_{DRM}, Exponential Waveform, T_J = 110°C)		(dv/dt)	2.0	10	—	V/μs

(1) 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.

(2) Pulse test: P.W. ≤ 2ms, Duty Cycle ≤ 2%.

(3) Does not include R_{GK} current.

PACKAGE DIMENSIONS



CASE 221A–06
(TO-220AB)

STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

Literature Distribution Centers:
USA: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036.
EUROPE: Motorola Ltd.; European Literature Centre; 88 Tanners Drive, Blakelands, Milton Keynes, MK14 5BP, England.
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