

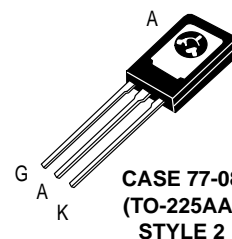
# Silicon Controlled Rectifiers

... PNP devices designed for high volume consumer applications such as temperature, light, and speed control; process and remote control, and warning systems where reliability of operation is important.

- Passivated Surface for Reliability and Uniformity
- Power Rated at Economical Prices
- Practical Level Triggering and Holding Characteristics
- Flat, Rugged, Thermopad Construction for Low Thermal Resistance, High Heat Dissipation and Durability.

## MCR506 Series

SCRs  
6 AMPERES RMS  
50 thru 600 VOLTS



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

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage <sup>(1)</sup> ( $T_J = 25$ to $110^\circ\text{C}$ , $R_{GK} = 1\text{ k}\Omega$ )	$V_{DRM}$ $V_{RRM}$		Volts
MCR506-2		50	
MCR506-3		100	
MCR506-4		200	
MCR506-6		400	
MCR506-8		600	
RMS Forward Current (All Conduction Angles)	$I_T(\text{RMS})$	6	Amp
Average Forward Current ( $T_C = 93^\circ\text{C}$ )	$I_T(\text{AV})$	3.82	Amp
Peak Non-repetitive Surge Current (1/2 Cycle, 60 Hz, $T_J = -40$ to $110^\circ\text{C}$ )	$I_{TSM}$	40	Amp
Circuit Fusing Considerations ( $t = 8.3\text{ ms}$ )	$I^2t$	2.6	$\text{A}^2\text{s}$
Peak Gate Power	$P_{GM}$	0.5	Watt
Average Gate Power	$P_{G(\text{AV})}$	0.1	Watt
Peak Forward Gate Current	$I_{GM}$	0.2	Amp
Peak Reverse Gate Voltage	$V_{RGM}$	6	Volts
Operating Junction Temperature Range	$T_J$	-40 to 110	$^\circ\text{C}$
Storage Temperature Range	$T_{\text{stg}}$	-40 to 150	$^\circ\text{C}$
Mounting Torque <sup>(2)</sup>	—	6	in. lb.

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.
2. Torque rating applies with use of torque washer (Shakeproof WD19523 or equivalent). Mounting torque in excess of 6 in. lb. does not appreciably lower case-to-sink thermal resistance. Anode lead and heat sink contact pad are common. (See AN290 B)  
For soldering purposes (either terminal connection or device mounting), soldering temperatures shall not exceed  $+225^\circ\text{C}$ . For optimum results, an activated flux (oxide removing) is recommended.

# MCR506 Series

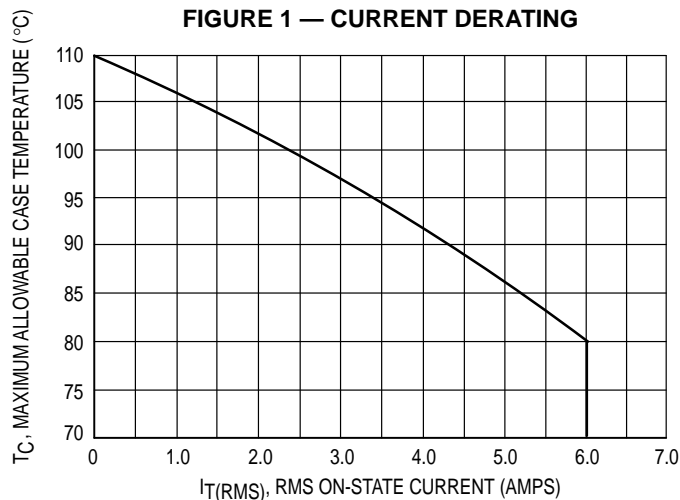
## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3	$^{\circ}C/W$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	$^{\circ}C/W$

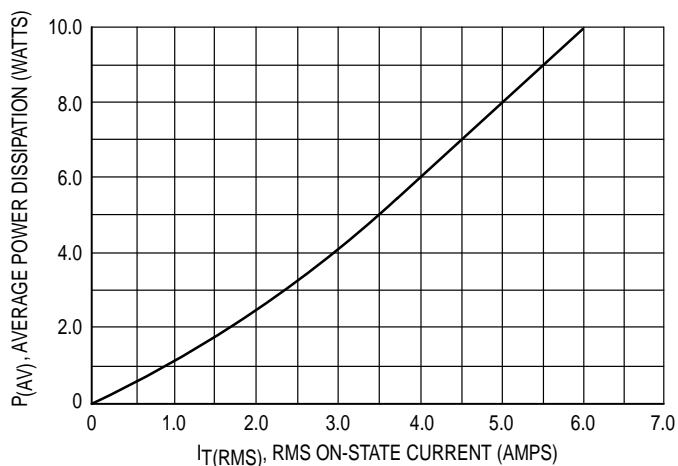
## ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}C$ , $R_{GK} = 1000$ Ohms unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward Blocking Current ( $V_D = \text{Rated } V_{DRM}$ , $T_J = 110^{\circ}C$ )	$I_{DRM}$	—	—	200	$\mu A$
Peak Reverse Blocking Current ( $V_R = \text{Rated } V_{RRM}$ , $T_J = 110^{\circ}C$ )	$I_{RRM}$	—	—	200	$\mu A$
Forward "On" Voltage ( $I_{TM} = 12$ A Peak)	$V_{TM}$	—	—	1.9	Volts
Gate Trigger Current (Continuous dc) ( $V_{AK} = 7$ Vdc, $R_L = 100$ Ohms) ( $V_{AK} = 7$ Vdc, $R_L = 100$ Ohms, $T_C = -40^{\circ}C$ )	$I_{GT}$	— —	— —	200 500	$\mu A$
Gate Trigger Voltage (Continuous dc) ( $V_{AK} = 7$ Vdc, $R_L = 100$ Ohms, $T_C = 25^{\circ}C$ )	$V_{GT}$	—	—	1	Volts
Gate Non-Trigger Voltage ( $V_{AK} = \text{Rated } V_{DRM}$ , $R_L = 100$ Ohms, $T_J = 110^{\circ}C$ )	$V_{GD}$	0.2	—	—	Volts
Holding Current ( $V_{AK} = 7$ Vdc, $T_C = 25^{\circ}C$ )	$I_H$	—	—	5	mA
Forward Voltage Application Rate ( $V_D = \text{Rated } V_{DRM}$ , Exponential Waveform, $T_J = 110^{\circ}C$ )	dv/dt	—	10	—	V/ $\mu s$

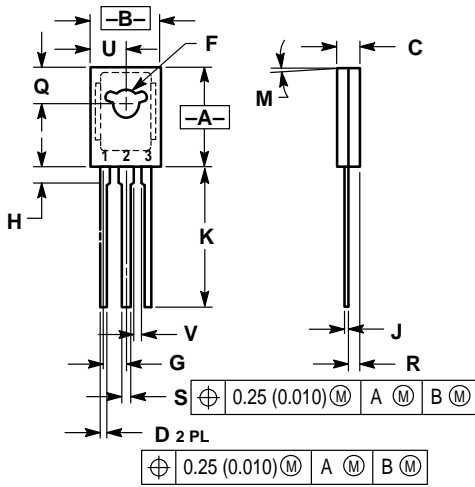
**FIGURE 1 — CURRENT DERATING**



**FIGURE 2 — POWER DISSIPATION**



PACKAGE DIMENSIONS



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

- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.055	1.15	1.39
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

CASE 77-08  
 (TO-225AA)

## MCR506 Series

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MCR506/D

