

## Silicon Controlled Rectifiers

### Reverse Blocking Triode Thyristors

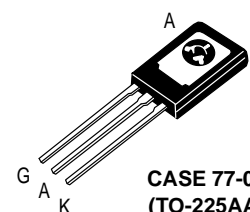
PNPN devices designed for high volume consumer applications such as temperature, light and speed control; process and remote control, and warning systems where reliability of operation is important.

- Glass-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

## MCR106 Series\*

\*Motorola preferred devices  
except MCR106-3

**SCRs**  
**4 AMPERES RMS**  
**400 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> ( $T_J = 110^\circ\text{C}$ , $R_{GK} = 1\text{ k}\Omega$ ) MCR106-6 MCR106-8	$V_{DRM}$ and $V_{RRM}$	400 600	Volts
RMS Forward Current (All Conduction Angles)	$I_T(\text{RMS})$	4	Amps
Average Forward Current $T_C = 93^\circ\text{C}$ or $T_A = 30^\circ\text{C}$	$I_T(\text{AV})$	2.55	Amps
Peak Non-repetitive Surge Current (1/2 Cycle, 60 Hz, $T_J = -40$ to $+110^\circ\text{C}$ )	$I_{TSM}$	25	Amps
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 $+110$	$^\circ\text{C}$

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.

(cont.)

**Preferred** devices are Motorola recommended choices for future use and best overall value.

REV 1

## MCR106 Series

### MAXIMUM RATINGS — continued

Rating	Symbol	Value	Unit
Storage Temperature Range	$T_{stg}$	-40 to +150	°C
Mounting Torque <sup>(1)</sup>	—	6	in. lb.

### THERMAL CHARACTERISTICS

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current ( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$ ) $T_J = 25^\circ\text{C}$ $T_J = 110^\circ\text{C}$	$I_{DRM}, I_{RRM}$	— —	— —	10 200	$\mu\text{A}$ $\mu\text{A}$
Forward "On" Voltage ( $I_{TM} = 4$ A Peak)	$V_{TM}$	—	—	2	Volts
Gate Trigger Current (Continuous dc) <sup>(2)</sup> ( $V_{AK} = 7$ Vdc, $R_L = 100$ Ohms) ( $V_{AK} = 7$ Vdc, $R_L = 100$ Ohms, $T_C = -40^\circ\text{C}$ )	$I_{GT}$	— —	— —	200 500	$\mu\text{A}$
Gate Trigger Voltage (Continuous dc) ( $V_{AK} = 7$ Vdc, $R_L = 100$ Ohms, $T_C = 25^\circ\text{C}$ )	$V_{GT}$	—	—	1	Volts
Gate Non-Trigger Voltage ( $V_{AK} = \text{Rated } V_{DRM}$ , $R_L = 100$ Ohms, $T_J = 110^\circ\text{C}$ )	$V_{GD}$	0.2	—	—	Volts
Holding Current ( $V_{AK} = 7$ Vdc, $T_C = 25^\circ\text{C}$ )	$I_H$	—	—	5	mA
Forward Voltage Application Rate ( $T_J = 110^\circ\text{C}$ )	$dv/dt$	—	10	—	V/ $\mu\text{s}$

1. Torque rating applies with use of compression washer (B52200-F006 or equivalent). Mounting torque in excess of 6 in. lb. does not appreciably lower case-to-sink thermal resistance. Anode lead and heatsink contact pad are common. (See AN209B).

For soldering purposes (either terminal connection or device mounting), soldering temperatures shall not exceed  $+200^\circ\text{C}$ . For optimum results, an activated flux (oxide removing) is recommended.

2.  $R_{GK}$  current is not included in measurement.

CURRENT DERATING

FIGURE 1 – MAXIMUM CASE TEMPERATURE

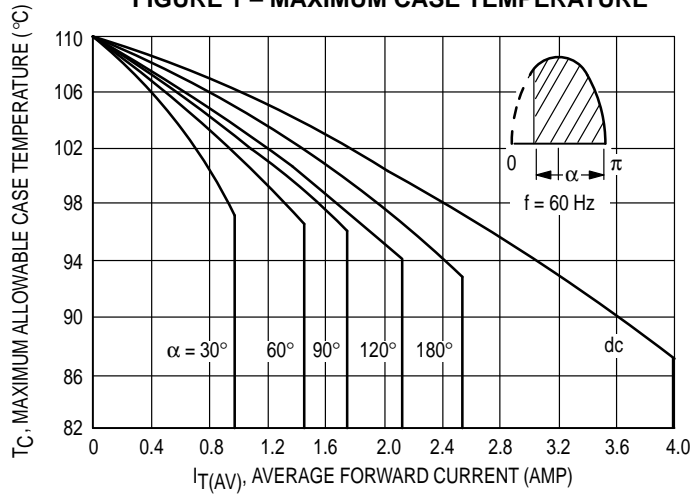
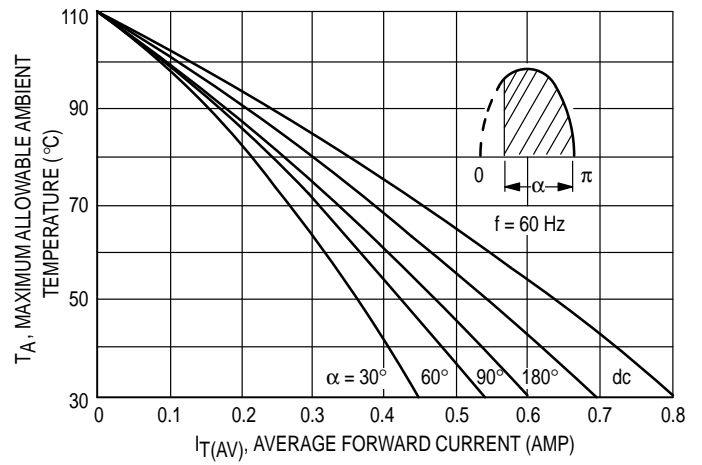
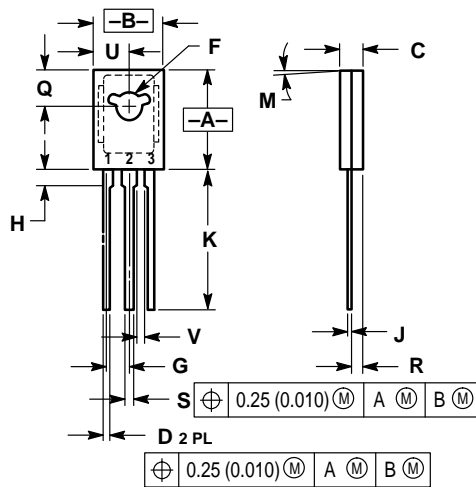


FIGURE 2 – MAXIMUM AMBIENT TEMPERATURE



## PACKAGE DIMENSIONS




- 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	0.065	1.15	1.65
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

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

**CASE 77-09**  
**(TO-225AA)**  
**ISSUE W**

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**JAPAN:** Motorola Japan Ltd.; SPD, Strategic Planning Office, 141,  
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan. 81-3-5487-8488

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**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 1-602-244-6609  
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**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; Silicon Harbour Centre,  
2, Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.  
852-26629298

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