

Silicon Controlled Rectifiers

Reverse Blocking Triode Thyristors

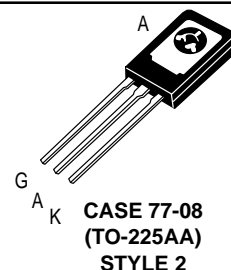
PNPN devices designed for high volume consumer applications such as temperature, light and speed control; process and remote control, and warning systems where reliability of operation is important.

- 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
60 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 ⁽¹⁾ ($T_J = 110^\circ\text{C}$, $R_{GK} = 1\text{ k}\Omega$)	V_{DRM} and V_{RRM}	60 100 200 400 600	Volts
RMS Forward Current (All Conduction Angles)	$I_T(\text{RMS})$	4	Amps
Average Forward Current $T_C = 93^\circ\text{C}$ $T_A = 30^\circ\text{C}$ or	$I_T(\text{AV})$	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	A^2s
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.

MCR106 Series

MAXIMUM RATINGS — continued

Rating	Symbol	Value	Unit
Storage Temperature Range	T_{stg}	-40 to +150	°C
Mounting Torque ⁽¹⁾	—	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	μA μA
Forward "On" Voltage ($I_{TM} = 4$ A Peak)	V_{TM}	—	—	2	Volts
Gate Trigger Current (Continuous dc) ⁽²⁾ ($V_{AK} = 7$ Vdc, $R_L = 100$ Ohms) ($V_{AK} = 7$ Vdc, $R_L = 100$ Ohms, $T_C = -40^\circ\text{C}$)	I_{GT}	— —	— —	200 500	μA
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/ μs

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

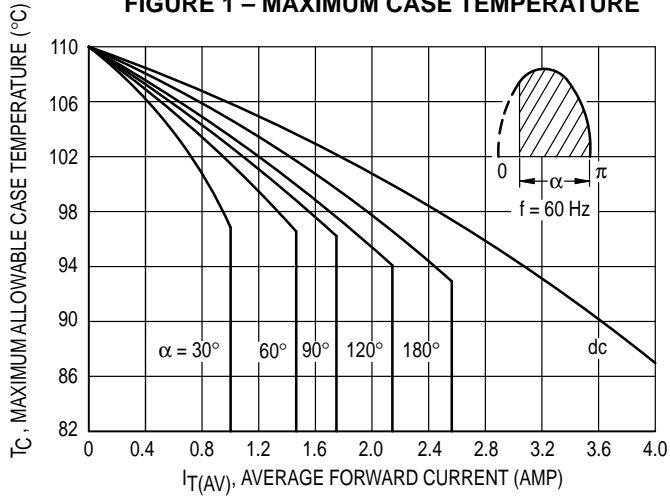
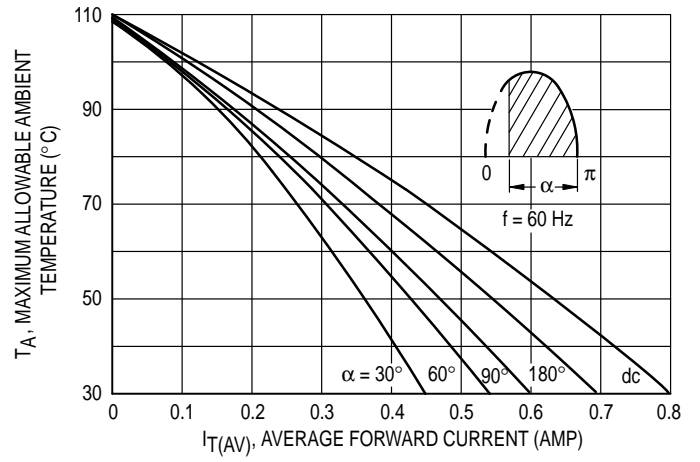
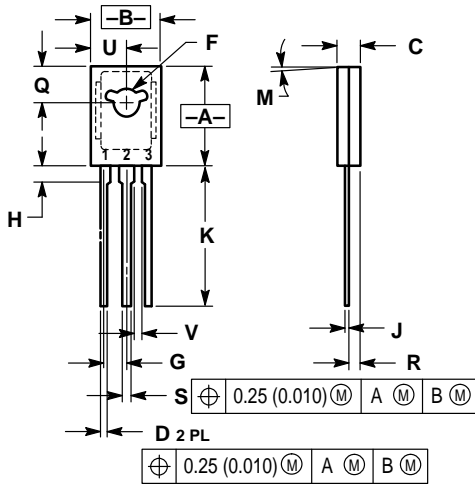


FIGURE 2 – MAXIMUM AMBIENT TEMPERATURE



PACKAGE DIMENSIONS



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)

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

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.
JAPAN: Nippon Motorola Ltd.; 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan.
ASIA PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Center, No. 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.

