

Silicon Controlled Rectifiers Reverse Blocking Triode Thyristors

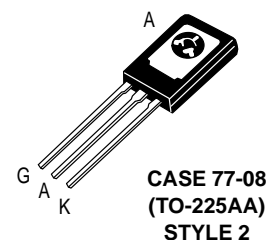
PNPN devices designed for high volume consumer applications such as temperature, light and speed control; process and remote control, and warning systems where reliability of operation is important.

- 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°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage ⁽¹⁾ (T _J = 110°C, R _{GK} = 1 kΩ)	V _{DRM} and V _{RRM}	60 100 200 400 600	Volts
RMS Forward Current (All Conduction Angles)	I _{T(RMS)}	4	Amps
Average Forward Current T _C = 93°C or T _A = 30°C	I _{T(AV)}	2.55	Amps
Peak Non-repetitive Surge Current (1/2 Cycle, 60 Hz, T _J = -40 to +110°C)	I _{TSM}	25	Amps
Circuit Fusing Considerations (t = 8.3 ms)	I ² t	2.6	A ² s
Peak Gate Power	P _{GM}	0.5	Watt
Average Gate Power	P _{G(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	°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°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

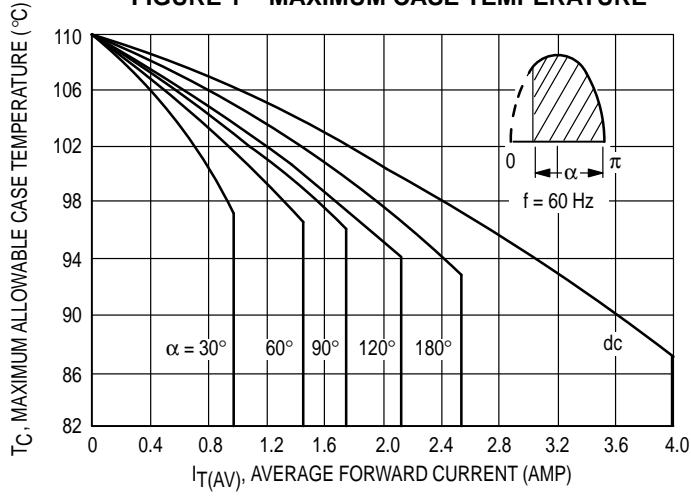
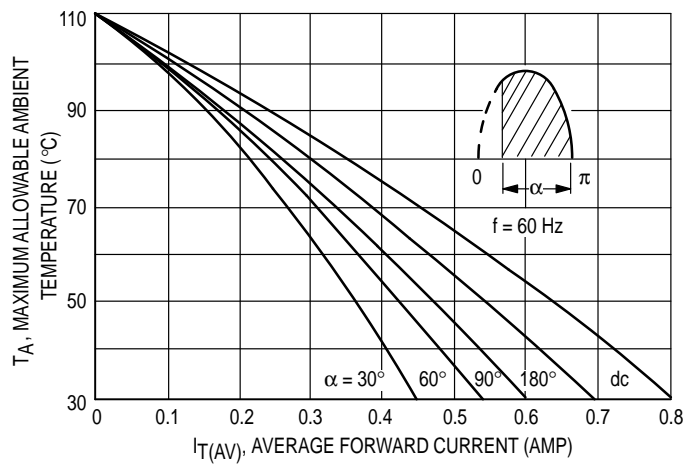
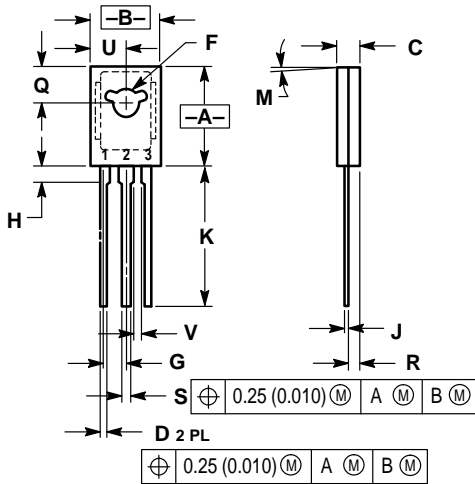


FIGURE 2 – MAXIMUM AMBIENT TEMPERATURE



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)

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