

# Silicon Controlled Rectifiers

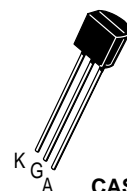
## Reverse Blocking Triode Thyristors

Annular PNP devices designed for low cost, high volume consumer applications such as relay and lamp drivers, small motor controls, gate drivers for larger thyristors, and sensing and detection circuits. Supplied in an inexpensive plastic TO-226AA package which is readily adaptable for use in automatic insertion equipment.

- Sensitive Gate Trigger Current — 200  $\mu$ A Maximum
- Low Reverse and Forward Blocking Current — 100  $\mu$ A Maximum,  $T_C = 85^\circ\text{C}$
- Low Holding Current — 5 mA Maximum
- Passivated Surface for Reliability and Uniformity

**MCR102**  
**MCR103**

**SCRs**  
**0.8 AMPERES RMS**  
**30 and 60 VOLTS**



**CASE 29-04**  
**(TO-226AA)**  
**STYLE 10**

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

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage <sup>(2)</sup> ( $T_C = +85^\circ\text{C}$ , $R_{GK} = 1\text{ k}\Omega$ ) MCR102 MCR103	$V_{DRM}$ $V_{RRM}$	30 60	Volts
Forward Current RMS (See Figures 1 & 2) (All Conduction Angles)	$I_T(\text{RMS})$	0.8	Amps
Peak Forward Surge Current, $T_A = 25^\circ\text{C}$ (1/2 Cycle, Sine Wave, 60 Hz)	$I_{TSM}$	10	Amps
Circuit Fusing Considerations ( $t = 8.3\text{ ms}$ )	$I^2t$	0.415	$\text{A}^2\text{s}$
Peak Gate Power — Forward, $T_A = 25^\circ\text{C}$	$P_{GM}$	0.1	Watt
Average Gate Power — Forward, $T_A = 25^\circ\text{C}$	$P_{GF(AV)}$	0.01	Watt
Peak Gate Current — Forward, $T_A = 25^\circ\text{C}$ (300 $\mu\text{s}$ , 120 PPS)	$I_{GFM}$	1	Amp
Peak Gate Voltage — Reverse	$V_{GRM}$	4	Volts
Operating Junction Temperature Range @ Rated $V_{RRM}$ and $V_{DRM}$	$T_J$	-40 to +85	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +150	$^\circ\text{C}$
Lead Solder Temperature ( $< 1/16''$ from case, 10 s max)	—	+ 230	$^\circ\text{C}$

1. Temperature reference point for all case temperature is center of flat portion of package. ( $T_C = +85^\circ\text{C}$  unless otherwise noted.)
2.  $V_{DRM}$  and  $V_{RRM}$  for all types can be applied on a continuous dc basis without incurring damage. Ratings apply for zero or negative gate voltage but positive gate voltage shall not be applied concurrently with a negative potential on the anode. When checking forward or reverse blocking capability, thyristor devices should not be tested with a constant current source in a manner that the voltage applied exceeds the rated blocking voltage.

# MCR102 MCR103

## THERMAL CHARACTERISTICS

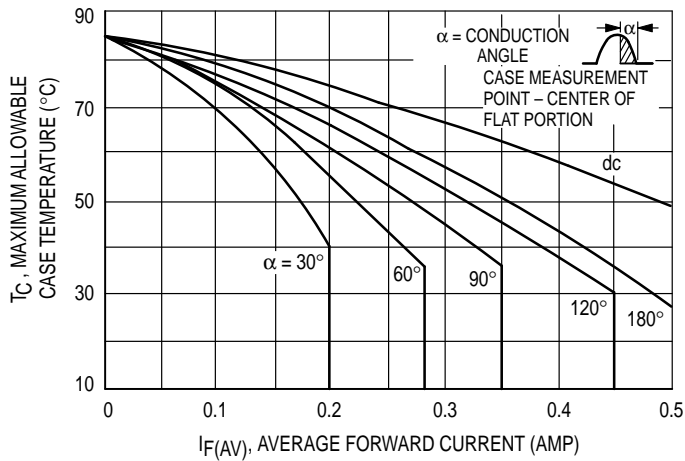
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	75	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	$^{\circ}\text{C}/\text{W}$

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

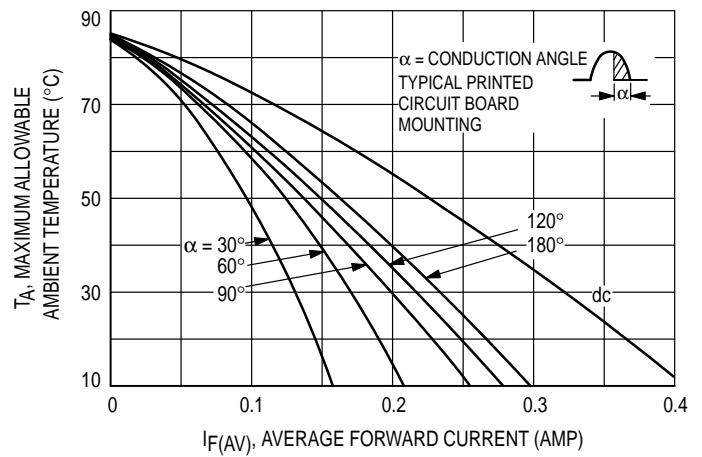
Characteristic	Symbol	Min	Max	Unit
Peak Forward or Reverse Blocking Current ( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$ )	$I_{DRM}, I_{RRM}$	—	10	$\mu\text{A}$
		—	100	$\mu\text{A}$
Forward "On" Voltage(1) ( $I_{TM} = 1 \text{ A Peak @ } T_A = 25^{\circ}\text{C}$ )	$V_{TM}$	—	1.7	Volts
Gate Trigger Current (Continuous dc)(2) (Anode Voltage = 7 Vdc, $R_L = 100 \text{ Ohms}$ )	$I_{GT}$	—	200	$\mu\text{A}$
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 7 Vdc, $R_L = 100 \text{ Ohms}$ )	$V_{GT}$ $V_{GD}$	— — 0.1	0.8 1.2 —	Volts
Holding Current (Anode Voltage = 7 Vdc, initiating current = 20 mA)	$I_H$	— —	5 10	mA

1. Forward current applied for 1 ms maximum duration, duty cycle  $\leq 1\%$ .
2.  $R_{GK}$  current is not included in measurement.

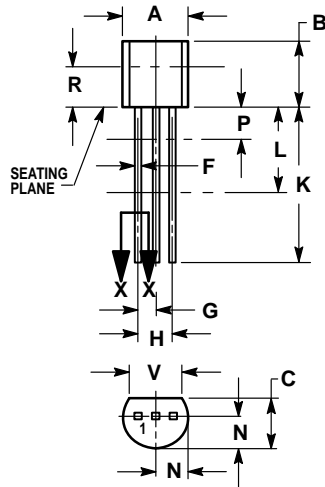
**FIGURE 1 – CURRENT DERATING  
(REFERENCE: CASE TEMPERATURE)**



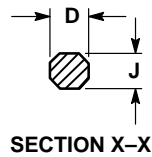
**FIGURE 2 – CURRENT DERATING  
(REFERENCE: AMBIENT TEMPERATURE)**



## PACKAGE DIMENSIONS



STYLE 10:  
PIN 1. CATHODE  
2. GATE  
3. ANODE




## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

CASE 29-04  
(TO-226AA)

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