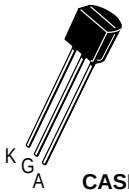
Silicon Controlled Rectifiers
Reverse Blocking Triode Thyristors

MCR102
MCR103

SCRs
0.8 AMPERES RMS
30 and 60 VOLTS

Annular PNPN 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 μA Maximum
- Low Reverse and Forward Blocking Current — 100 μA Maximum, T_C = 85°C
- Low Holding Current — 5 mA Maximum
- Passivated Surface for Reliability and Uniformity



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

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage(2) (T_C = + 85°C, R_{GK} = 1 kΩ) MCR102 / MCR103	V_{DRM} V_{RRM}	30 60	Volts
Forward Current RMS (See Figures 1 & 2) (All Conduction Angles)	$I_{T(RMS)}$	0.8	Amps
Peak Forward Surge Current, T_A = 25°C (1/2 Cycle, Sine Wave, 60 Hz)	I_{TSM}	10	Amps
Circuit Fusing Considerations (t = 8.3 ms)	I^2t	0.415	A^2s
Peak Gate Power — Forward, T_A = 25°C	P_{GM}	0.1	Watt
Average Gate Power — Forward, T_A = 25°C	$P_{GF(AV)}$	0.01	Watt
Peak Gate Current — Forward, T_A = 25°C (300 μs, 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	°C
Storage Temperature Range	T_{stg}	–40 to +150	°C
Lead Solder Temperature (< 1/16″ from case, 10 s max)	—	+ 230	°C

1. Temperature reference point for all case temperature is center of flat portion of package. (T_C = +85°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.

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_C = 25°C, R_{GK} = 1000 Ω unless otherwise specified.)

Characteristic		Symbol	Min	Max	Unit
Peak Forward or Reverse Blocking Current (V_{AK} = Rated V_{DRM} or V_{RRM})	T_C = 25°C T_C = 85°C	I_{DRM}, I_{RRM}	— —	10 100	μA μA
Forward "On" Voltage(1) (I_{TM} = 1 A Peak @ T_A = 25°C)		V_{TM}	—	1.7	Volts
Gate Trigger Current (Continuous dc)(2) (Anode Voltage = 7 Vdc, R_L = 100 Ohms)	T_C = 25°C	I_{GT}	—	200	μA
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 7 Vdc, R_L = 100 Ohms)	T_C = 25°C T_C = –65°C T_C = 85°C	V_{GT} V_{GD}	— — 0.1	0.8 1.2 —	Volts
Holding Current (Anode Voltage = 7 Vdc, initiating current = 20 mA)	T_C = 25°C T_C = –65°C	I_H	— —	5 10	mA

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

FIGURE 1 – CURRENT DERATING (REFERENCE: CASE TEMPERATURE)

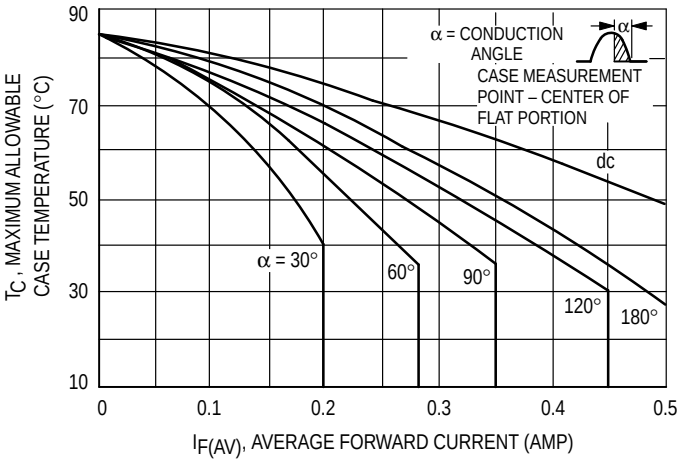
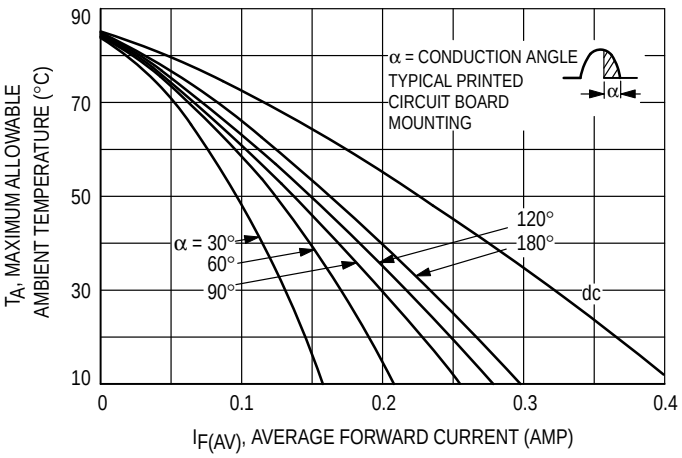
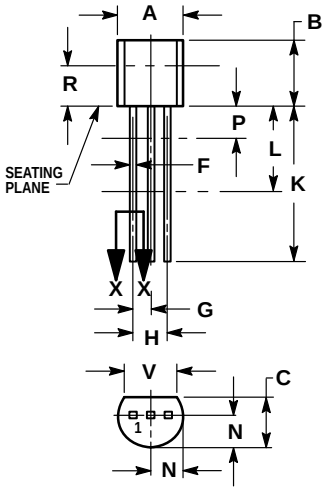
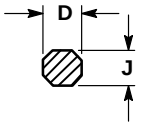


FIGURE 2 – CURRENT DERATING (REFERENCE: AMBIENT TEMPERATURE)



PACKAGE DIMENSIONS





SECTION X–X

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.

	INCHES		MILLIMETERS	
DIM	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)

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.
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