MCR101 (SILICON)
thru
MCR104

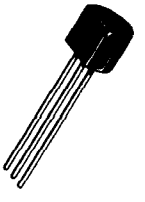
PLASTIC THYRISTORS

. . . 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-92 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 — 5.0 mA Maximum
- Passivated Surface for Reliability and Uniformity

PLASTIC SILICON CONTROLLED RECTIFIERS

0.8 AMPERE RMS
15 thru 100 VOLTS



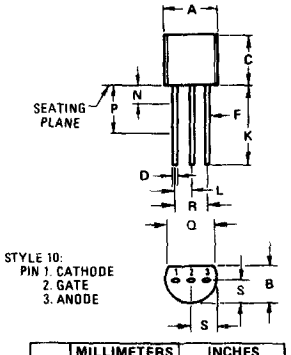
MAXIMUM RATINGS(1)

Rating	Symbol	Value	Unit
Peak Reverse Blocking Voltage MCR101 MCR102 MCR103 MCR104	V_{RRM}	 15 30 60 100	Volts
Forward Current RMS (See Figures 1 & 2) (All Conduction Angles)	$I_{T(RMS)}$	0.8	Amp
Peak Forward Surge Current, T_A = 25°C (1/2 cycle, Sine Wave, 60 Hz)	I_{TSM}	6.0	Amp
Circuit Fusing Considerations, T_A = 25°C (t = 1.0 to 8.3 ms)	I^2t	0.15	A^2s
Peak Gate Power — Forward, T_A = 25°C	P_{GM}	0.1	Watt
Average Gate Power — Forward, T_A = 25°C	$P_{G(AV)}$	0.01	Watt
Peak Gate Current — Forward, T_A = 25°C (300 μs, 120 PPS)	I_{GM}	1.0	Amp
Peak Gate Voltage — Reverse	V_{GM}	4.0	Volts
Operating Junction Temperature Range @ Rated V_{RRM} and V_{DRM}	T_J	-65 to +85	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C
Lead Solder Temperature (<1/16" from case, 10 s max)	—	+230	°C

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

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



	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.450	5.200	0.175	0.205
B	3.180	4.190	0.125	0.165
C	4.320	5.330	0.170	0.210
D	0.407	0.533	0.016	0.021
F	0.407	0.482	0.016	0.019
K	12.700	–	0.500	–
L	1.150	1.390	0.045	0.055
N	–	1.270	–	0.050
P	6.350	–	0.250	–
Q	3.430	–	0.135	–
R	2.410	2.670	0.095	0.105
S	2.030	2.670	0.080	0.105

CASE 29-02
TO-92

ELECTRICAL CHARACTERISTICS (R_{GK} = 1000 Ohms)

Characteristic		Symbol	Min	Max	Unit
Peak Forward Blocking Voltage (Note 1) (T_C = 85°C)		V_{DRM}			Volts
	MCR101		15	–	
	MCR102		30	–	
	MCR103		60	–	
	MCR104		100	–	
Peak Forward Blocking Current (Rated V_{DRM} @ T_C = 85°C)		I_{DRM}	–	100	μA
Peak Reverse Blocking Current (Rated V_{RRM} @ T_C = 85°C)		I_{RRM}	–	100	μA
Forward "On" Voltage (Note 2) (I_{TM} = 1.0 A peak @ T_A = 25°C)		V_{TM}	–	1.7	Volts
Gate Trigger Current (Continuous dc) (Note 3) (Anode Voltage = 7.0 Vdc, R_L = 100 Ohms)	T_C = 25°C	I_{GT}	–	200	μA
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 7.0 Vdc, R_L = 100 Ohms)	T_C = 25°C	V_{GT}	–	0.8	Volts
	T_C = -65°C		–	1.2	
	T_C = 85°C	V_{GD}	0.1	–	
Holding Current (Anode Voltage = 7.0 Vdc, initiating current = 20 mA)	T_C = 25°C	I_H	–	5.0	mA
	T_C = -65°C		–	10	

1. 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.
2. Forward current applied for 1.0 ms maximum duration, duty cycle ≤ 1.0%.
3. R_{GK} current is not included in measurement.

FIGURE 1 – CURRENT DERATING
(REFERENCE: CASE TEMPERATURE)

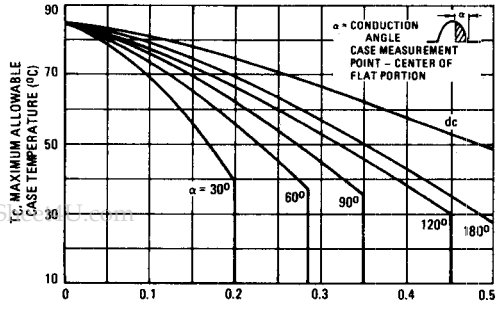


FIGURE 2 – CURRENT DERATING
(REFERENCE: AMBIENT TEMPERATURE)