

MCR106-6, MCR106-8

Preferred Device

Sensitive Gate Silicon Controlled Rectifiers Reverse Blocking 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
- Device Marking: Device Type, e.g., MCR106-6, Date Code

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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage ⁽¹⁾ ($T_J = -40$ to 110°C , Sine Wave 50 to 60 Hz, Gate Open) MCR106-6 MCR106-8	V_{DRM} , V_{RRM}	400 600	Volts
On-State RMS Current ($T_C = 93^\circ\text{C}$) (180° Conduction Angles)	$I_T(\text{RMS})$	4.0	Amps
Average On-State Current (180° Conduction Angles; $T_C = 93^\circ\text{C}$)	$I_T(\text{AV})$	2.55	Amps
Peak Non-repetitive Surge Current (1/2 Cycle, Sine Wave 60 Hz, $T_J = 110^\circ\text{C}$)	I_{TSM}	25	Amps
Circuit Fusing Considerations ($t = 8.3$ ms)	I^2t	2.6	A^2s
Forward Peak Gate Power ($T_C = 93^\circ\text{C}$, Pulse Width ≤ 1.0 μs)	P_{GM}	0.5	Watt
Forward Average Gate Power ($T_C = 93^\circ\text{C}$, $t = 8.3$ ms)	$P_{G(\text{AV})}$	0.1	Watt
Forward Peak Gate Current ($T_C = 93^\circ\text{C}$, Pulse Width ≤ 1.0 μs)	I_{GM}	0.2	Amp
Peak Reverse Gate Voltage ($T_C = 93^\circ\text{C}$, Pulse Width ≤ 1.0 μs)	V_{RGM}	6.0	Volts
Operating Junction Temperature Range	T_J	-40 to $+110$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to $+150$	$^\circ\text{C}$
Mounting Torque ⁽²⁾	—	6.0	in. lb.

(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.

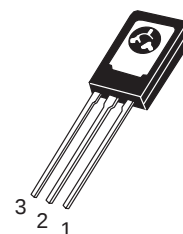
(2) Torque rating applies with use of compression washer (B52200-F006 or equivalent). Mounting torque in excess of 6 in. lb. does not appreciably lower case-to-sink thermal resistance. Anode lead and heatsink contact pad are common. (See AN209B). For soldering purposes (either terminal connection or device mounting), soldering temperatures shall not exceed $+200^\circ\text{C}$. For optimum results, an activated flux (oxide removing) is recommended.



ON Semiconductor

<http://onsemi.com>

SCRs
4 AMPERES RMS
400 thru 600 VOLTS



TO-225AA
(formerly TO-126)
CASE 077
STYLE 2

PIN ASSIGNMENT

1	Cathode
2	Anode
3	Gate

ORDERING INFORMATION

Device	Package	Shipping
MCR106-6	TO225AA	500/Box
MCR106-8	TO225AA	500/Box

Preferred devices are recommended choices for future use and best overall value.

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THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.0	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	$^{\circ}\text{C/W}$
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Peak Repetitive Forward or Reverse Blocking Current ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}; R_{GK} = 1000 \text{ Ohms}$)	I_{DRM}, I_{RRM}	—	—	10	μA
$T_J = 25^{\circ}\text{C}$		—	—	200	μA
$T_J = 110^{\circ}\text{C}$		—	—		

ON CHARACTERISTICS

Peak Forward On-State Voltage ⁽¹⁾ ($I_{TM} = 4 \text{ A Peak}$)	V_{TM}	—	—	2.0	Volts
Gate Trigger Current (Continuous dc) ⁽²⁾ ($V_{AK} = 7 \text{ Vdc}, R_L = 100 \text{ Ohms}$) ($T_C = -40^{\circ}\text{C}$)	I_{GT}	—	—	200	μA
		—	—	500	
Gate Trigger Voltage (Continuous dc) ⁽²⁾ ($V_{AK} = 7 \text{ Vdc}, R_L = 100 \text{ Ohms}$)	V_{GT}	—	—	1.0	Volts
Gate Non-Trigger Voltage ⁽²⁾ ($V_{AK} = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}, T_J = 110^{\circ}\text{C}$)	V_{GD}	0.2	—	—	Volts
Holding Current ($V_{AK} = 7 \text{ Vdc}$, Initiating Current = 200 mA, Gate Open)	I_H	—	—	5.0	mA

DYNAMIC CHARACTERISTICS

Critical Rate-of-Rise of Off-State Voltage ($T_J = 110^{\circ}\text{C}$)	dv/dt	—	10	—	$\text{V}/\mu\text{s}$
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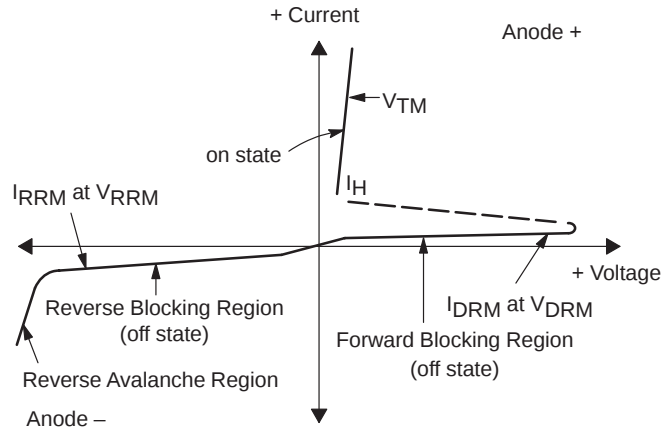
(1) Pulse Test: Pulse Width $\leq 1.0 \text{ ms}$, Duty Cycle $\leq 1\%$.

(2) R_{GK} current is not included in measurement.

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Voltage Current Characteristic of SCR

Symbol	Parameter
V_{DRM}	Peak Repetitive Off State Forward Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Off State Reverse Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Peak On State Voltage
I_H	Holding Current



CURRENT DERATING

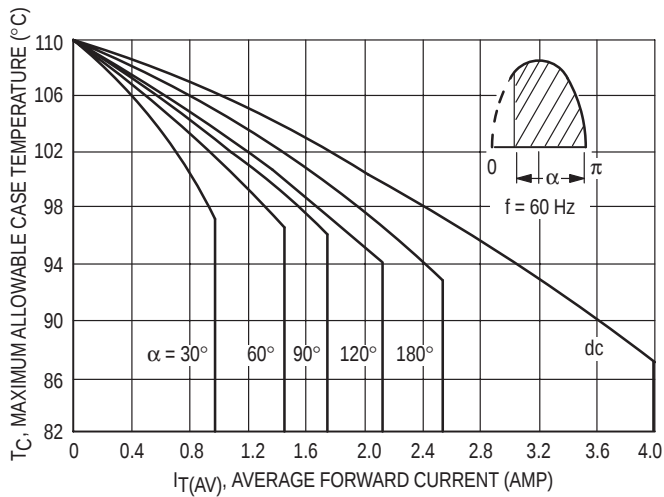


Figure 1. Maximum Case Temperature

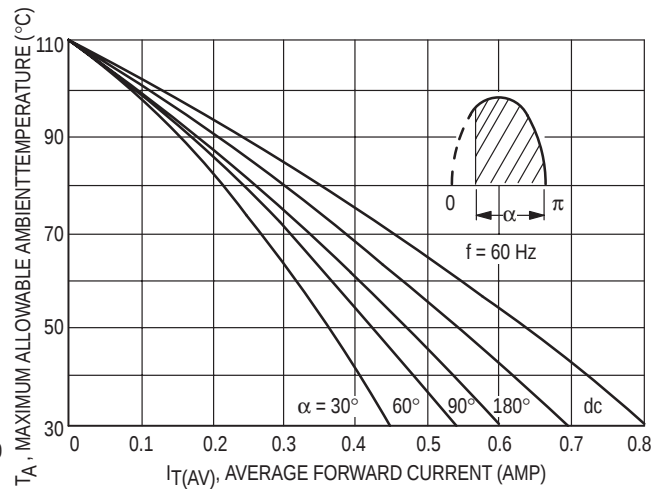
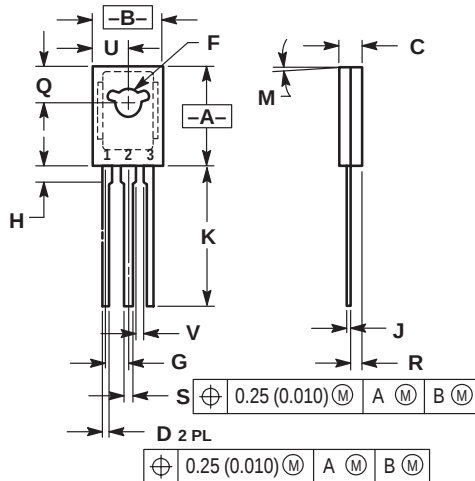


Figure 2. Maximum Ambient Temperature

MCR106-6, MCR106-8

PACKAGE DIMENSIONS

TO-225AA (formerly TO-126) CASE 077-09 ISSUE W



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	0.065	1.15	1.65
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	—	1.02	—

STYLE 2:

1. CATHODE
2. ANODE
3. GATE

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