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°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°C) (180° Conduction Angles)	$I_{T(RMS)}$	4.0	Amps
Average On–State Current (180° Conduction Angles; T_C = 93°C)	$I_{T(AV)}$	2.55	Amps
Peak Non-repetitive Surge Current (1/2 Cycle, Sine Wave 60 Hz, T_J = 110°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°C, Pulse Width ≤ 1.0 µs)	P_{GM}	0.5	Watt
Forward Average Gate Power (T_C = 93°C, t = 8.3 ms)	$P_{G(AV)}$	0.1	Watt
Forward Peak Gate Current (T_C = 93°C, Pulse Width ≤ 1.0 µs)	I_{GM}	0.2	Amp
Peak Reverse Gate Voltage (T_C = 93°C, Pulse Width ≤ 1.0 µs)	V_{RGM}	6.0	Volts
Operating Junction Temperature Range	T_J	–40 to +110	°C
Storage Temperature Range	T_{stg}	–40 to +150	°C
Mounting Torque(2)	—	6.0	in. lb.

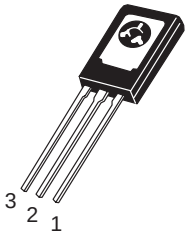
(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that 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°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.

May, 2000 – Rev. 3

Publication Order Number:
MCR106/D

THERMAL CHARACTERISTICS

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

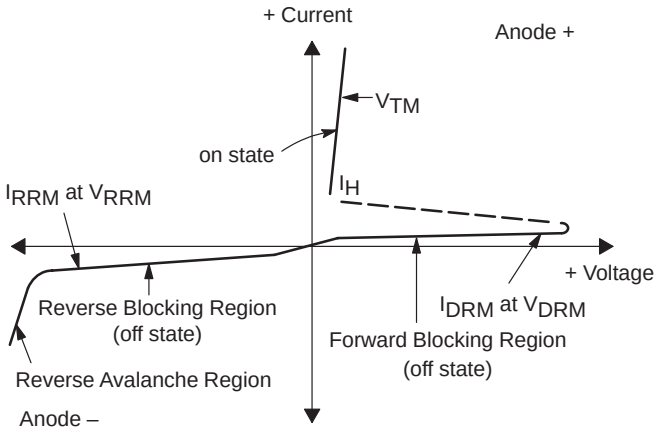
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Peak Repetitive Forward or Reverse Blocking Current (V_{AK} = Rated V_{DRM} or V_{RRM}; R_{GK} = 1000 Ohms) T_J = 25°C T_J = 110°C	I_{DRM}, I_{RRM}	— —	— —	10 200	μA μA
ON CHARACTERISTICS					
Peak Forward On–State Voltage(1) (I_{TM} = 4 A Peak)	V_{TM}	—	—	2.0	Volts
Gate Trigger Current (Continuous dc)(2) (V_{AK} = 7 Vdc, R_L = 100 Ohms) (T_C = –40°C)	I_{GT}	— —	— —	200 500	μA
Gate Trigger Voltage (Continuous dc)(2) (V_{AK} = 7 Vdc, R_L = 100 Ohms)	V_{GT}	—	—	1.0	Volts
Gate Non-Trigger Voltage(2) (V_{AK} = 12 Vdc, R_L = 100 Ohms, T_J = 110°C)	V_{GD}	0.2	—	—	Volts
Holding Current (V_{AK} = 7 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°C)	dv/dt	—	10	—	V/μs

(1) Pulse Test: Pulse Width ≤ 1.0 ms, Duty Cycle ≤ 1%.
(2) R_{GK} current is not included in measurement.

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

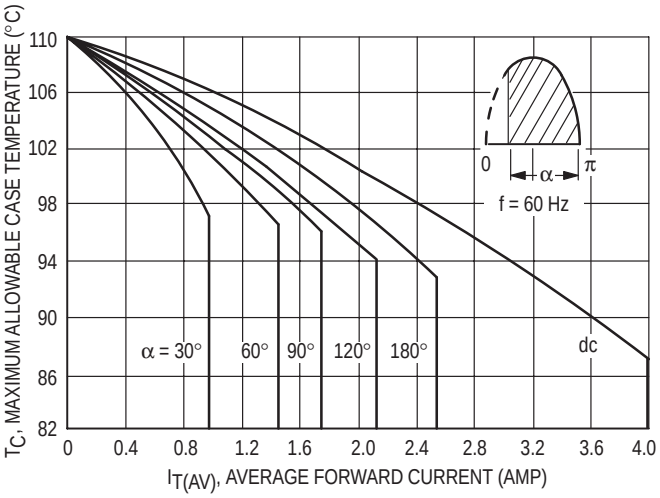


Figure 1. Maximum Case Temperature

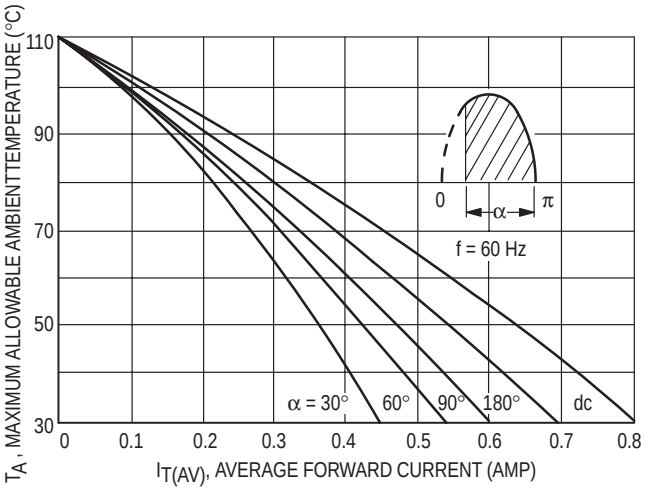
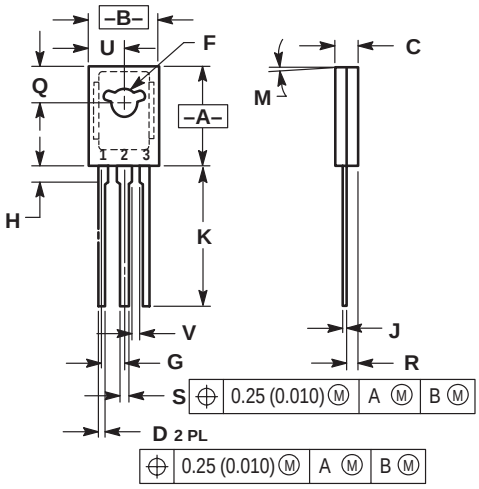


Figure 2. Maximum Ambient Temperature

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.

	INCHES		MILLIMETERS	
DIM	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:
PIN 1. CATHODE
2. ANODE
3. GATE

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