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.

Features

- 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
- Pb−Free Packages are Available*

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

Rating	Symbol	Value	Unit
Peak Repetitive Off−State Voltage (Note 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	V
On-State RMS Current, (T_C = 93°C) (180° Conduction Angles)	$I_{T(RMS)}$	4.0	A
Average On−State Current, (180° Conduction Angles; T_C = 93°C)	$I_{T(AV)}$	2.55	A
Peak Non-repetitive Surge Current (1/2 Cycle, Sine Wave 60 Hz, T_J = 110°C)	I_{TSM}	25	A
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	W
Forward Average Gate Power, (T_C = 93°C, t = 8.3 ms)	$P_{G(AV)}$	0.1	W
Forward Peak Gate Current, (T_C = 93°C, Pulse Width ≤ 1.0 μs)	I_{GM}	0.2	A
Peak Reverse Gate Voltage, (T_C = 93°C, Pulse Width ≤ 1.0 μs)	V_{RGM}	6.0	V
Operating Junction Temperature Range	T_J	−40 to +110	°C
Storage Temperature Range	T_{stg}	−40 to +150	°C
Mounting Torque (Note 2)	−	6.0	in. lb.

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

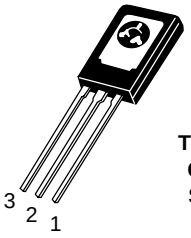
1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that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

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ON Semiconductor®

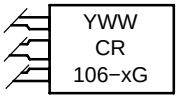
http://onsemi.com

SCRs
4 AMPERES RMS
400 thru 600 VOLTS



TO−225AA
CASE 77
STYLE 2

MARKING DIAGRAM



Y = Year
WW = Work Week
CR106−x = Device Code
x = 6 or 8
G = Pb−Free Package

PIN ASSIGNMENT	
1	Cathode
2	Anode
3	Gate

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

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 (Note 3) (I_{TM} = 4 A Peak)	V_{TM}	−	−	2.0	V
Gate Trigger Current (Continuous dc) (Note 4) (V_{AK} = 7 Vdc, R_L = 100 Ohms) (T_C = −40°C)	I_{GT}	− −	− −	200 500	μA
Gate Trigger Voltage (Continuous dc) (Note 4) (V_{AK} = 7 Vdc, R_L = 100 Ohms)	V_{GT}	−	−	1.0	V
Gate Non-Trigger Voltage (Note 4) (V_{AK} = 12 Vdc, R_L = 100 Ohms, T_J = 110°C)	V_{GD}	0.2	−	−	V
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

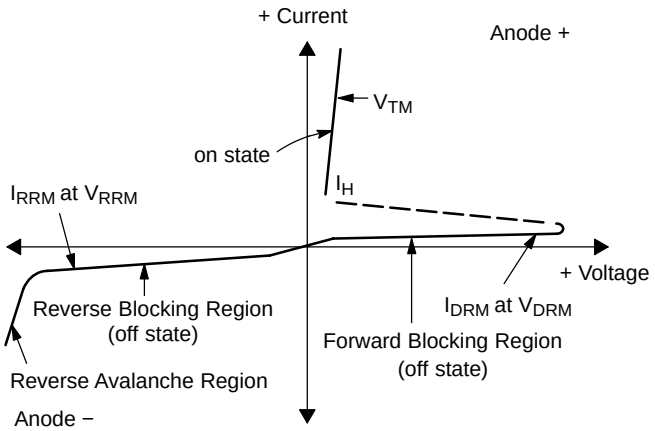
3. Pulse Test: Pulse Width ≤ 1.0 ms, Duty Cycle ≤ 1%.
4. R_{GK} current is not included in measurement.

ORDERING INFORMATION

Device	Package	Shipping
MCR106−6	TO−225AA	500 Units / Box
MCR106−6G	TO−225AA (Pb−Free)	500 Units / Box
MCR106−8	TO−225AA	500 Units / Box
MCR106−8G	TO−225AA (Pb−Free)	500 Units / Box

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

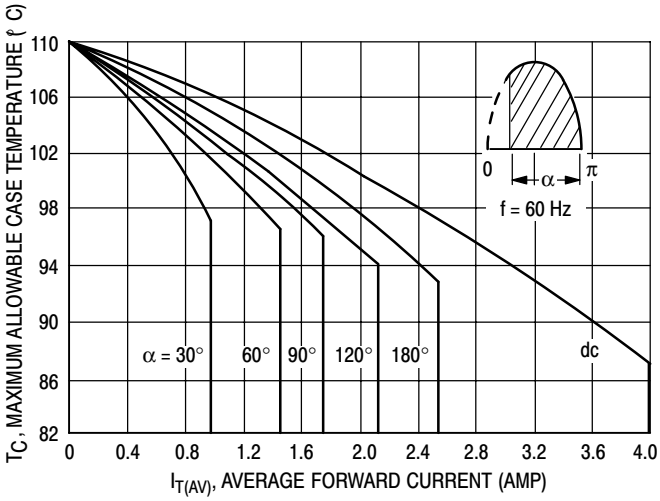


Figure 1. Maximum Case Temperature

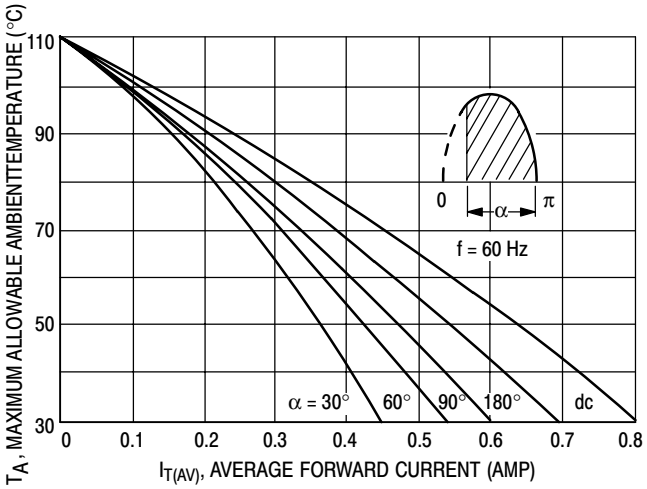
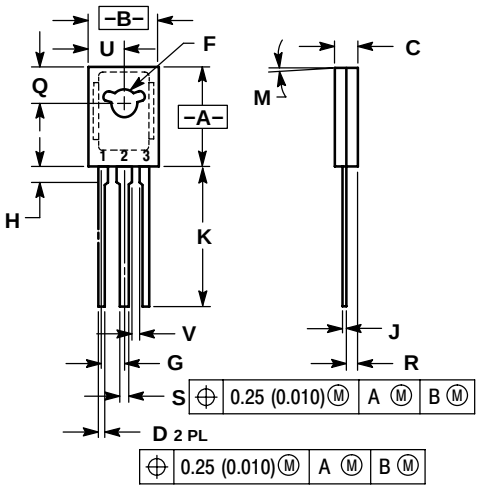


Figure 2. Maximum Ambient Temperature

PACKAGE DIMENSIONS

TO−225
CASE 77−09
ISSUE Z



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077−01 THRU −08 OBSOLETE, NEW STANDARD 077−09.

	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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.

MCR106/D