

MCR80 series (SILICON)

MCR81 series

MCR82 series



SILICON CONTROLLED RECTIFIERS

... designed for high power industrial and consumer applications in power and speed controls such as welders, furnaces, motors, space heaters and other equipment where control of high current is needed.

- Glass Passivated Junctions with Center Gate Fire for Greater Parameter Uniformity and Stability.
- All Devices are Hermetically Sealed
- Epoxy Encapsulated for Long Voltage Creepage Path
- MCR82 Series Internally Isolated with 5000 Volt Dielectric Strength
- Flexible Leads are Optional – Consult Factory

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Repetitive Peak Reverse Blocking Voltage	$V_{RRM}^{(1)}$	50	Volts
MCR80-		100	
MCR81-		200	
MCR82-		300	
		400	
		500	
		600	
		700	
		800	
Average On-State Current ($T_C = 75^\circ\text{C}$)	$I_T(AV)$	50	Amp
Peak Non-Repetitive Surge Current (One Cycle, 60 Hz) ($T_C = 75^\circ\text{C}$)	I_{TSM}	1000	Amp
Circuit Fusing Considerations ($T_J = -40$ to $+125^\circ\text{C}$) ($t = 1.5$ to 8.3 ms)	I^2t	4150	A^2s
Peak Gate Power	P_{GM}	15	Watts
Average Gate Power	$P_{G(AV)}$	3.0	Watts
Peak Forward Gate Current	I_{GM}	4.0	Amp
Peak Reverse Gate Voltage	V_{GM}	5.0	Volts
Operating Junction Temperature Range	T_J	-40 to $+125$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to $+150$	$^\circ\text{C}$
Stud Torque (3)	—	130	in. lb.

THERMAL CHARACTERISTICS

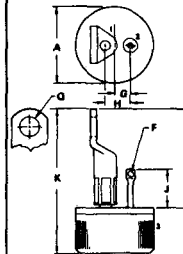
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.6	$^\circ\text{C/W}$

- (1) Ratings apply for zero or negative gate voltage. Devices should not be tested for blocking capability in a manner such that the voltage applied exceeds the rated blocking voltage.
- (2) Devices should not be operated with a positive bias applied to the gate concurrent with a negative potential applied to the anode.
- (3) Reliable operation can be impaired if torque rating is exceeded, terminal tubes bent, or seal broken.

THYRISTORS PNPN

80 AMPERES RMS
50 thru 800 VOLTS

MCR80 SERIES

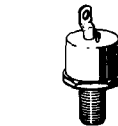
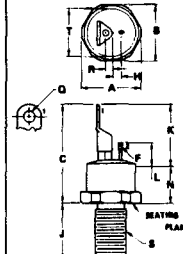


DIM	MIN	MAX	MIN	MAX
A	18.05	18.30	0.710	0.730
B	7.27	7.62	0.286	0.300
C	3.00	3.14	0.118	0.123
D	5.87	6.22	0.231	0.245
E	7.27	7.62	0.286	0.300
F	25.40	27.27	1.000	1.075
G	2.54	2.67	0.100	0.105
H	4.83	5.21	0.190	0.205

STYLE 1:
TERM. 1. CATHODE
2. GATE
3. CASE, ANODE

CASE 287-01

MCR81 SERIES

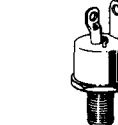
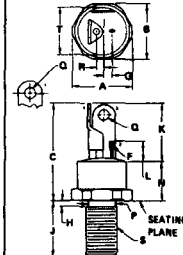


DIM	MIN	MAX	MIN	MAX
A	28.72	30.23	1.129	1.190
B	26.42	27.06	1.040	1.065
C	40.84	43.18	1.608	1.700
D	1.27	1.85	0.050	0.073
E	3.68	3.84	0.145	0.151
F	21.58	22.46	0.850	0.885
G	22.86	23.84	0.900	0.940
H	5.08	5.53	0.200	0.218
I	17.15	20.96	0.675	0.825
J	4.83	5.21	0.190	0.205
K	2.18	2.41	0.085	0.095
L	1.02	1.01	0.040	0.040
M	25.27	25.78	1.000	1.015

STYLE 1:
TERM. 1. CATHODE
2. GATE
3. CASE, ANODE

CASE 288-01

MCR82 SERIES



DIM	MIN	MAX	MIN	MAX
A	28.72	30.23	1.129	1.190
B	26.42	27.06	1.040	1.065
C	45.72	48.26	1.800	1.900
D	1.27	1.85	0.050	0.073
E	3.68	3.84	0.145	0.151
F	21.58	22.46	0.850	0.885
G	22.86	23.84	0.900	0.940
H	5.08	5.53	0.200	0.218
I	17.15	20.96	0.675	0.825
J	4.83	5.21	0.190	0.205
K	2.18	2.41	0.085	0.095
L	1.02	1.01	0.040	0.040
M	25.27	25.78	1.000	1.015

STYLE 1:
PIN 1. CATHODE
2. GATE
3. ANODE
STUD. ISOLATED

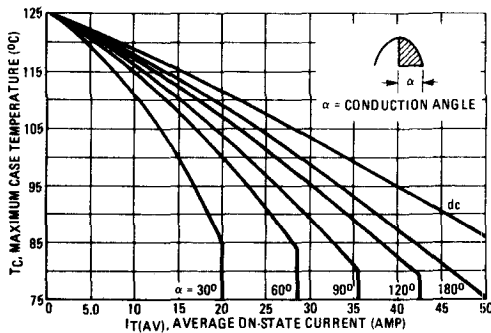
CASE 291-01

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward Blocking Voltage (1) ($T_J = 125^\circ\text{C}$)	V_{DRM}	50	—	—	Volts
MCR80-		100	—	—	
MCR81-		200	—	—	
MCR82-		300	—	—	
		400	—	—	
		500	—	—	
		600	—	—	
		700	—	—	
		800	—	—	
Peak Forward Blocking Current (Rated V_{DRM} , with gate open, $T_J = 125^\circ\text{C}$)	I_{DRM}	—	—	4.0	mA
Peak Reverse Blocking Current (Rated V_{RRM} , with gate open, $T_J = 125^\circ\text{C}$)	I_{RRM}	—	—	4.0	mA
Peak On-State Voltage (2) ($I_{TM} = 160\text{ A Peak}$)	V_{TM}	—	—	1.55	Volts
Gate Trigger Current, Continuous dc ($V_{AK} = 12\text{ V}$, $R_L = 3.0\text{ Ohms}$)	I_{GT}	—	—	70	mA
Gate Trigger Voltage, Continuous dc ($V_{AK} = 12\text{ V}$, $R_L = 3.0\text{ Ohms}$)	V_{GT}	—	—	3.0	Volts
Holding Current ($V_{AK} = 12\text{ V}$, Gate Open)	I_H	—	—	70	mA
Non-Trigger Gate Voltage (Anode Voltage = Rated V_{DM} , $R_L = 100\text{ ohms}$, $T_J = 125^\circ\text{C}$)	V_{GD}	0.25	—	—	Volts
Circuit Commutated Turn-Off Time ($I_T = 50\text{ A}$, $I_R = 20\text{ A}$, $T_J = 125^\circ\text{C}$)	t_q	—	70	—	μs
Critical Rate of Rise of Off-State Voltage (Rated V_{DRM} , Exponential Waveform, $T_J = 125^\circ\text{C}$, Gate Open)	dv/dt	—	100	—	$\text{V}/\mu\text{s}$

(1) Ratings apply for zero or negative gate voltage. Devices should not be tested with a constant current source for forward or reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.

(2) Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

FIGURE 1 – AVERAGE CURRENT DERATING

FIGURE 2 – ON-STATE POWER DISSIPATION
