MCR225-8FP, MCR225-10FP

Preferred Device

Silicon Controlled Rectifiers

Reverse Blocking Thyristors

Designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supply crowbar circuits.

- Glass Passivated Junctions with Center Gate Fire for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Constructed for Low Thermal Resistance, High Heat Dissipation and Durability
- Blocking Voltage to 800 Volts
- 300 A Surge Current Capability
- Insulated Package Simplifies Mounting
- Ⓤ Indicates UL Registered — File #E69369
- Device Marking: Logo, Device Type, e.g., MCR225−8FP, Date Code

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

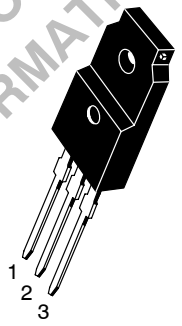
Rating	Symbol	Value	Unit
Peak Repetitive Off−State Voltage(1) (T_J = −40 to +125°C, Sine Wave, 50 to 60 Hz, Gate Open) MCR225−8FP MCR225−10FP	V_{DRM}, V_{RRM}	600 800	Volts
On-State RMS Current (T_C = +70°C) (180° Conduction Angles)	$I_{T(RMS)}$	25	Amps
Peak Non−repetitive Surge Current (1/2 Cycle, Sine Wave 60 Hz, T_C = +70°C)	I_{TSM}	300	Amps
Circuit Fusing (t = 8.3 ms)	I^2t	375	A^2s
Forward Peak Gate Power (T_C = +70°C, Pulse Width ≤ 1.0 μs)	P_{GM}	20	Watts
Forward Average Gate Power (T_C = +70°C, t = 8.3 ms)	$P_{G(AV)}$	0.5	Watt
Forward Peak Gate Current (T_C = +70°C, Pulse Width ≤ 1.0 μs)	I_{GM}	2.0	Amps
RMS Isolation Voltage (T_A = 25°C, Relative Humidity ≤ 20%) Ⓤ	$V_{(ISO)}$	1500	Volts
Operating Junction Temperature Range	T_J	−40 to +125	°C
Storage Temperature Range	T_{stg}	−40 to +150	°C

(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.

ON Semiconductor

http://onsemi.com

ISOLATED SCRs (Ⓤ)
25 AMPERES RMS
600 thru 800 VOLTS



ISOLATED TO−220 Full Pack
CASE 221C
STYLE 2

PIN ASSIGNMENT	
1	Cathode
2	Anode
3	Gate

ORDERING INFORMATION

Device	Package	Shipping
MCR225−8FP	ISOLATED TO220FP	500/Box
MCR225−10FP	ISOLATED TO220FP	500/Box

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	°C/W
Thermal Resistance, Case to Sink	$R_{\theta CS}$	2.2 (typ)	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8″ from Case for 10 Seconds	T_L	260	°C

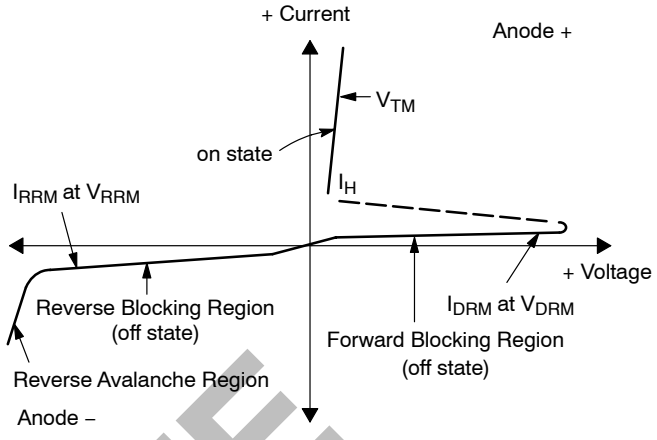
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Peak Repetitive Forward or Reverse Blocking Current (V_D = Rated V_{DRM}, V_{RRM}; Gate Open) T_J = 25°C	I_{DRM}, I_{RRM}	—	—	10	μA
T_J = 125°C		—	—	2	mA
ON CHARACTERISTICS					
Peak Forward On−State Voltage(1) (I_{TM} = 50 A)	V_{TM}	—	—	1.8	Volts
Gate Trigger Current (Continuous dc) (V_{AK} = 12 Vdc, R_L = 100 Ohms)	I_{GT}	—	—	40	mA
Gate Trigger Voltage (Continuous dc) (V_{AK} = 12 Vdc, R_L = 100 Ohms)	V_{GT}	—	0.8	1.5	Volts
Gate Non-Trigger Voltage (V_{AK} = 12 Vdc, R_L = 100 Ohms, T_J = 125°C)	V_{GD}	0.2	—	—	Volts
Holding Current (V_{AK} = 12 Vdc, Initiating Current = 200 mA, Gate Open)	I_H	—	20	40	mA
Turn-On Time (I_{TM} = 25 A, I_{GT} = 40 mAdc)	t_{gt}	—	1.5	—	μs
Turn-Off Time (V_{DRM} = Rated Voltage)	t_q				μs
(I_{TM} = 25 A, I_R = 25 A)		—	15	—	
(I_{TM} = 25 A, I_R = 25 A, T_J = 125°C)		—	35	—	
DYNAMIC CHARACTERISTICS					
Critical Rate-of-Rise of Off-State Voltage (Gate Open, V_D = Rated V_{DRM}, Exponential Waveform)	dv/dt	—	100	—	V/μs

(1) Pulse Test: Pulse Width = 1.0 ms, Duty Cycle ≤ 2%.

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



TYPICAL CHARACTERISTICS

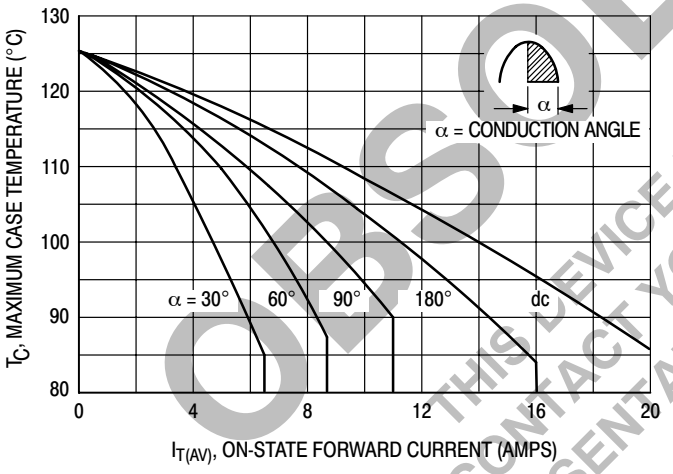


Figure 1. Average Current Derating

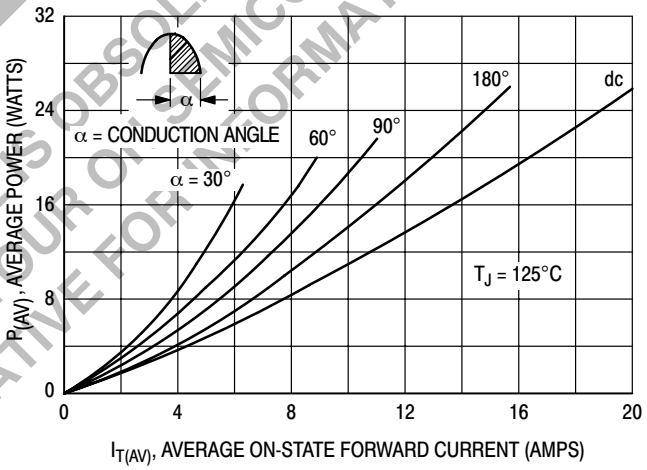


Figure 2. Maximum On−State Power Dissipation

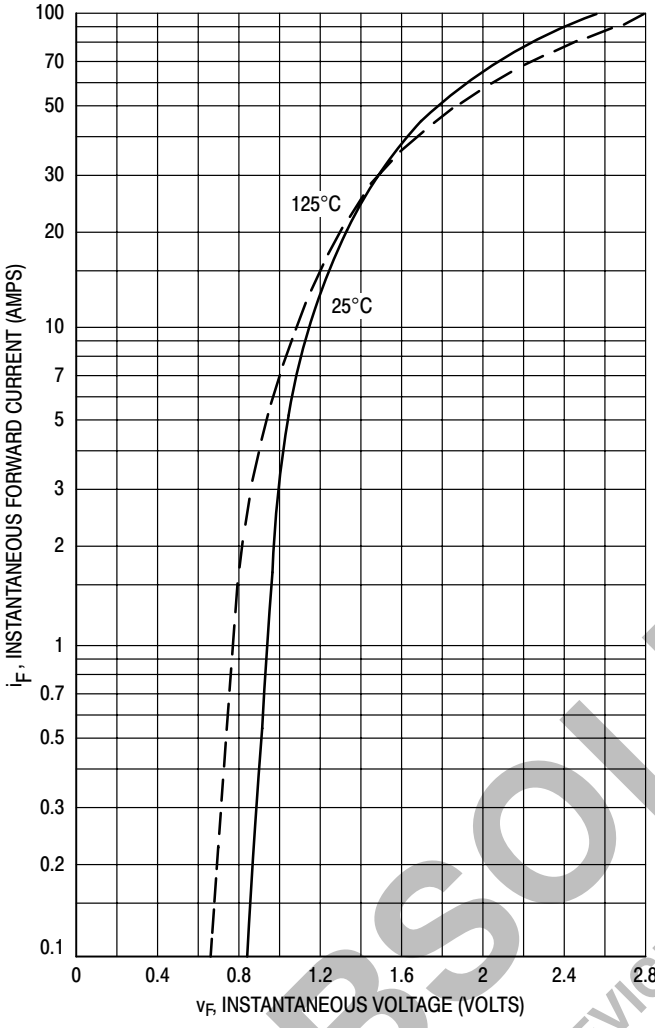


Figure 3. Maximum Forward Voltage

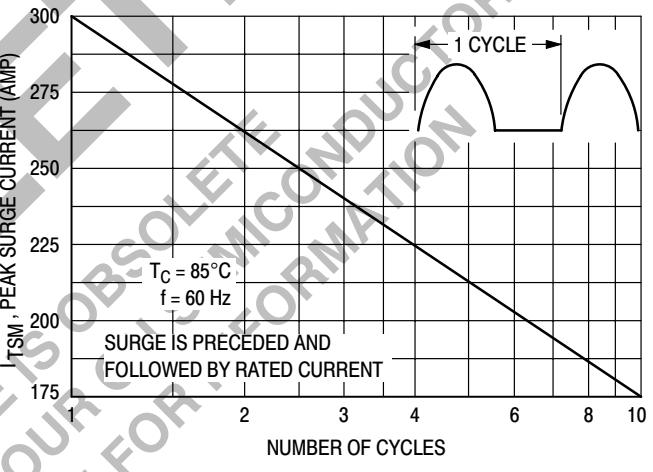


Figure 4. Maximum Non-Repetitive Surge Current

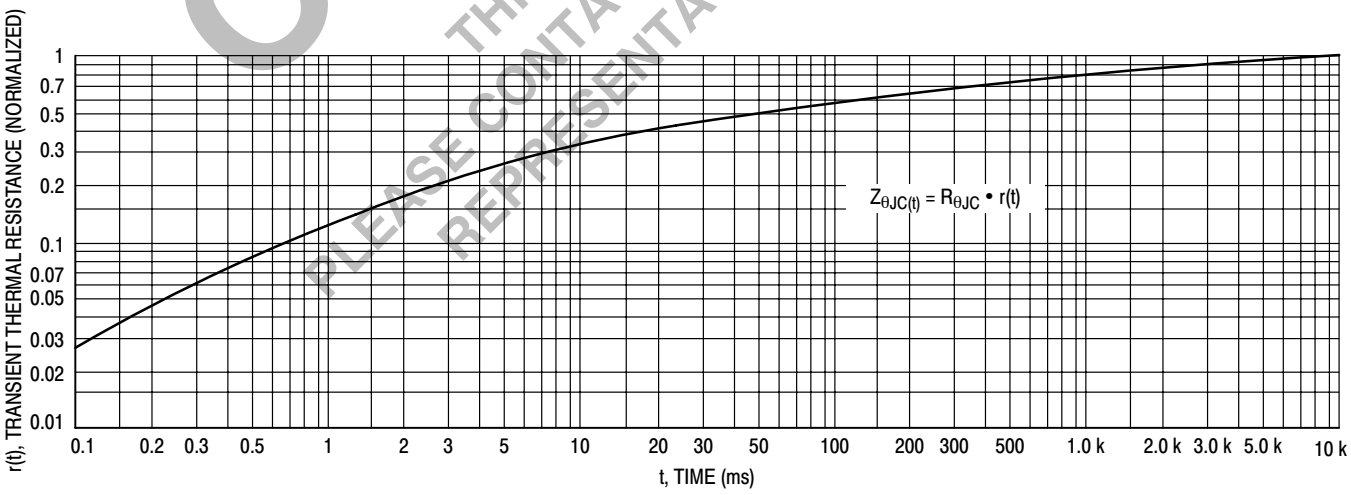


Figure 5. Thermal Response

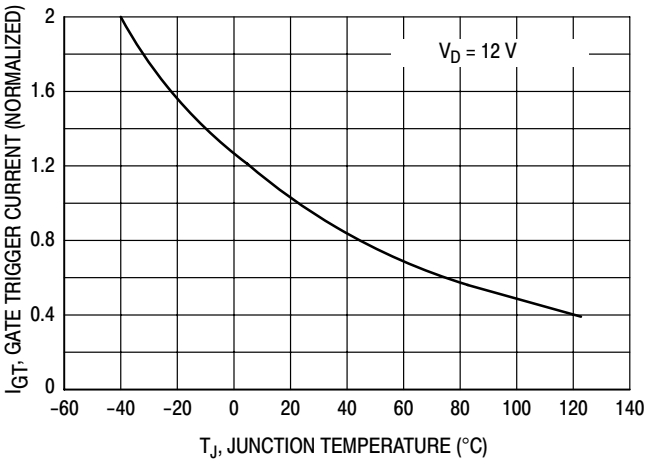


Figure 6. Typical Gate Trigger Current versus Temperature

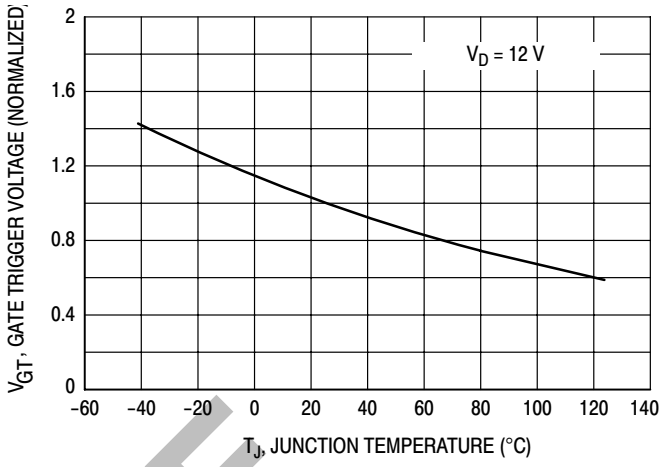


Figure 7. Typical Gate Trigger Voltage versus Temperature

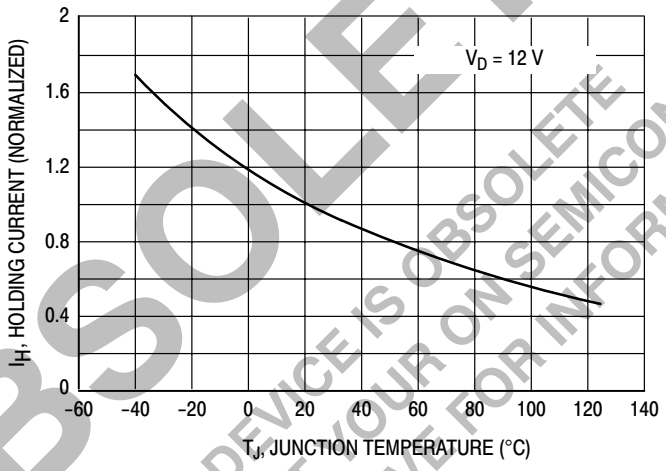
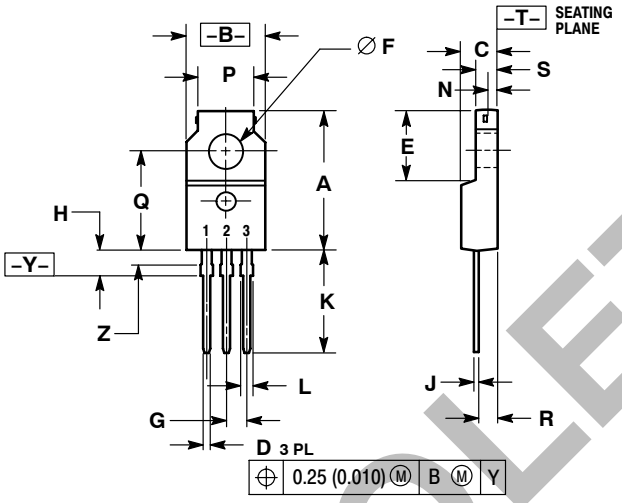


Figure 8. Typical Holding Current versus Temperature

PACKAGE DIMENSIONS

ISOLATED TO−220 Full Pack
CASE 221C−02
ISSUE C



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. LEAD DIMENSIONS UNCONTROLLED WITHIN DIMENSION Z.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.680	0.700	17.28	17.78
B	0.388	0.408	9.86	10.36
C	0.175	0.195	4.45	4.95
D	0.025	0.040	0.64	1.01
E	0.340	0.355	8.64	9.01
F	0.140	0.150	3.56	3.81
G	0.100 BSC		2.54 BSC	
H	0.110	0.155	2.80	3.93
J	0.018	0.028	0.46	0.71
K	0.500	0.550	12.70	13.97
L	0.045	0.070	1.15	1.77
N	0.049	---	1.25	---
P	0.270	0.290	6.86	7.36
Q	0.480	0.500	12.20	12.70
R	0.090	0.120	2.29	3.04
S	0.105	0.115	2.67	2.92
Z	0.070	0.090	1.78	2.28

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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5773−3850

ON Semiconductor Website: **www.onsemi.com**

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

For additional information, please contact your local Sales Representative

MCR225FP/D