

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

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

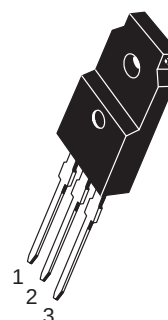
(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that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

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THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	$^{\circ}\text{C/W}$
Thermal Resistance, Case to Sink	$R_{\theta CS}$	2.2 (typ)	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	$^{\circ}\text{C/W}$
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 ($V_D = \text{Rated } V_{DRM}, V_{RRM}$; Gate Open) $T_J = 25^{\circ}\text{C}$ $T_J = 125^{\circ}\text{C}$	$I_{DRM},$ I_{RRM}	— —	— —	10 2	μA mA
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ON CHARACTERISTICS

Peak Forward On-State Voltage ⁽¹⁾ ($I_{TM} = 50 \text{ A}$)	V_{TM}	—	—	1.8	Volts
Gate Trigger Current (Continuous dc) ($V_{AK} = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$)	I_{GT}	—	—	40	mA
Gate Trigger Voltage (Continuous dc) ($V_{AK} = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$)	V_{GT}	—	0.8	1.5	Volts
Gate Non-Trigger Voltage ($V_{AK} = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}, T_J = 125^{\circ}\text{C}$)	V_{GD}	0.2	—	—	Volts
Holding Current ($V_{AK} = 12 \text{ Vdc}$, Initiating Current = 200 mA, Gate Open)	I_H	—	20	40	mA
Turn-On Time ($I_{TM} = 25 \text{ A}, I_{GT} = 40 \text{ mAdc}$)	t_{gt}	—	1.5	—	μs
Turn-Off Time ($V_{DRM} = \text{Rated Voltage}$) ($I_{TM} = 25 \text{ A}, I_R = 25 \text{ A}$) ($I_{TM} = 25 \text{ A}, I_R = 25 \text{ A}, T_J = 125^{\circ}\text{C}$)	t_q	— —	15 35	— —	μs

DYNAMIC CHARACTERISTICS

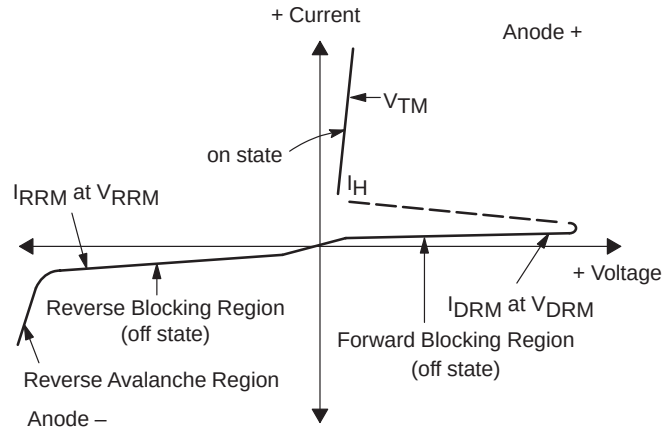
Critical Rate-of-Rise of Off-State Voltage (Gate Open, $V_D = \text{Rated } V_{DRM}$, Exponential Waveform)	dv/dt	—	100	—	$\text{V}/\mu\text{s}$
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(1) Pulse Test: Pulse Width = 1.0 ms, Duty Cycle $\leq 2\%$.

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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



TYPICAL CHARACTERISTICS

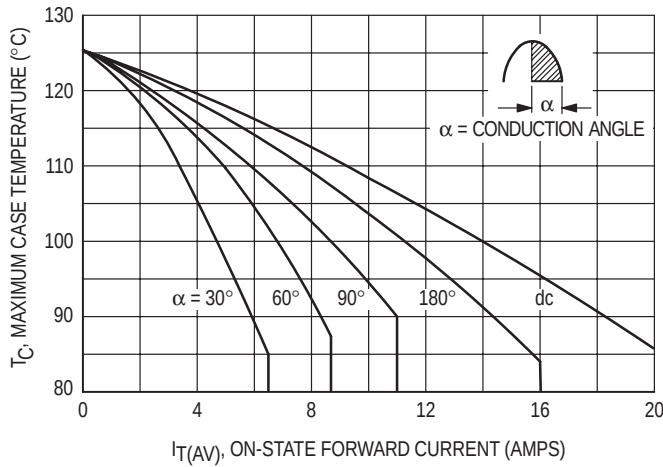


Figure 1. Average Current Derating

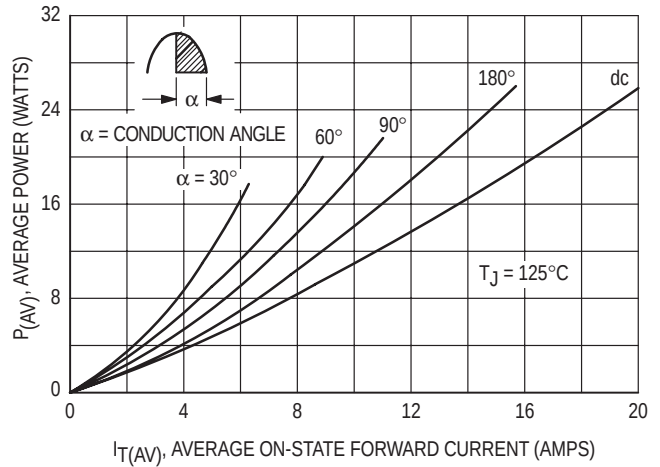


Figure 2. Maximum On-State Power Dissipation

MCR225-8FP, MCR225-10FP

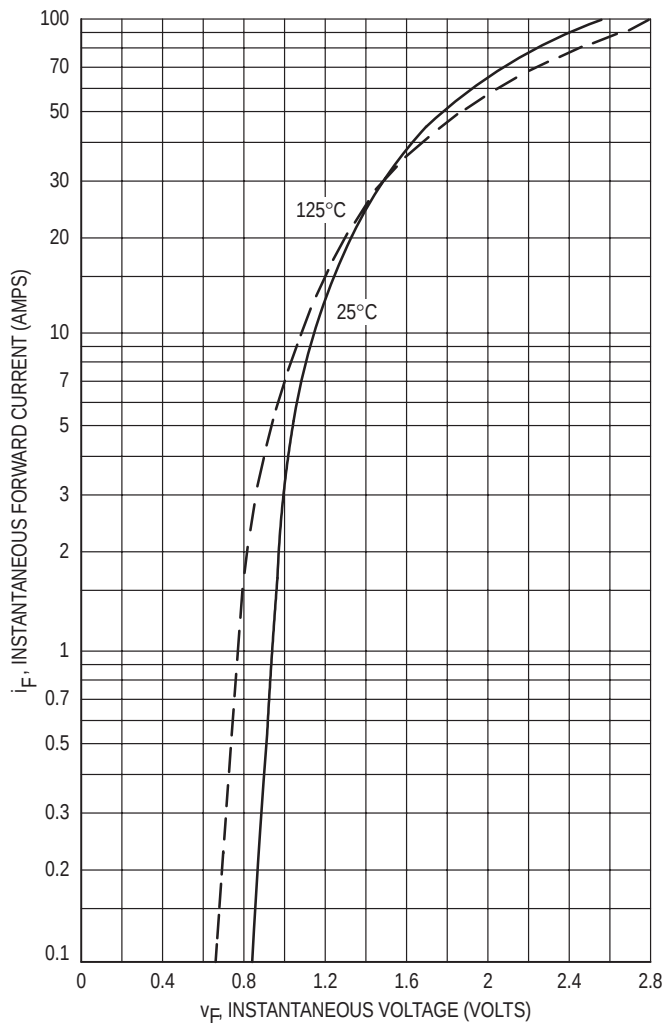


Figure 3. Maximum Forward Voltage

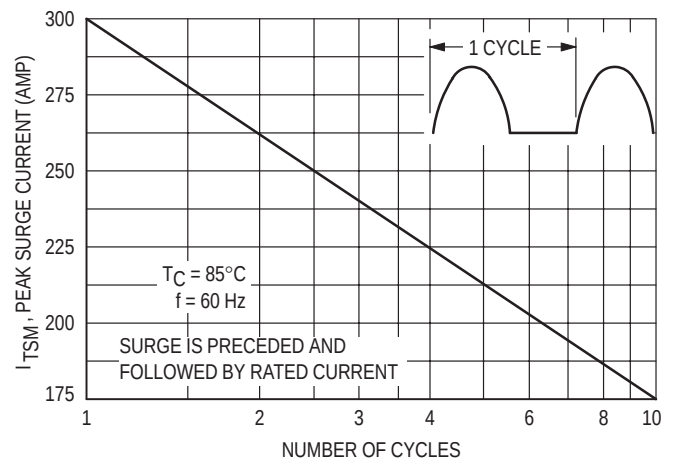


Figure 4. Maximum Non-Repetitive Surge Current

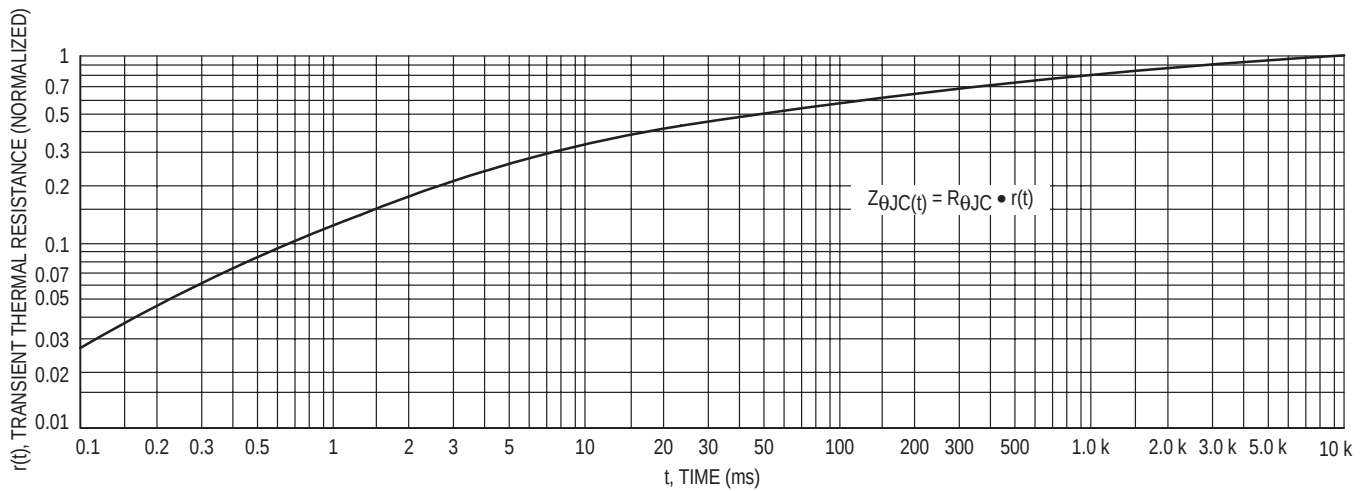


Figure 5. Thermal Response

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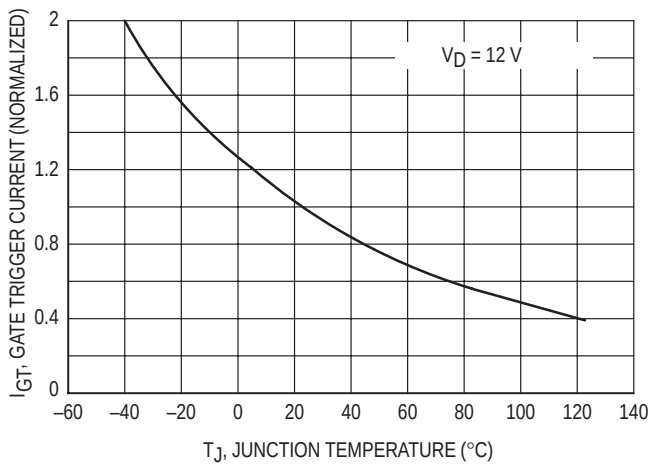


Figure 6. Typical Gate Trigger Current versus Temperature

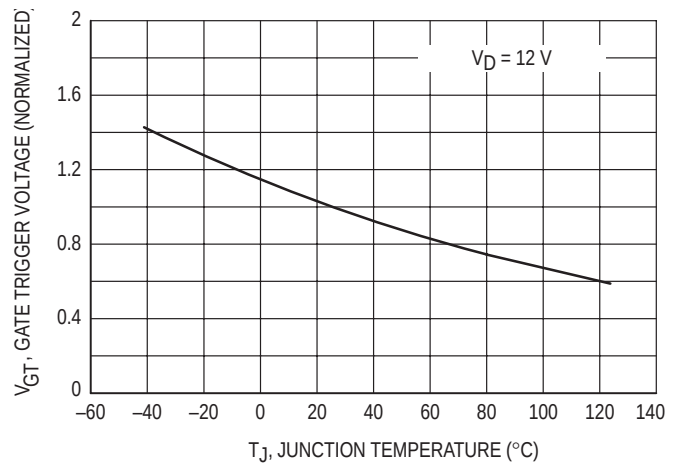


Figure 7. Typical Gate Trigger Voltage versus Temperature

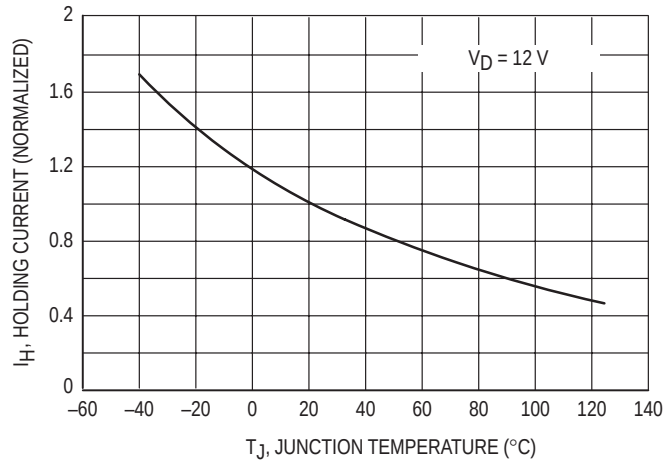
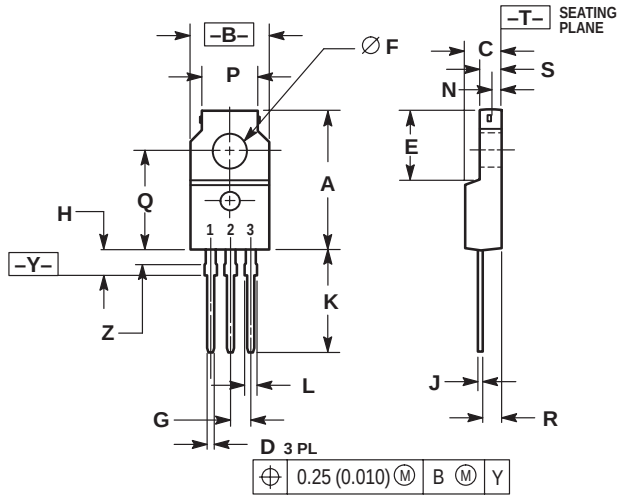


Figure 8. Typical Holding Current versus Temperature

MCR225-8FP, MCR225-10FP

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.

DIM	INCHES		MILLIMETERS	
	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
- ANODE
- GATE

Notes

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