

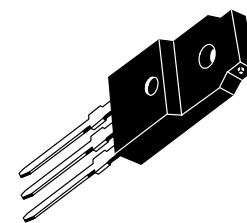
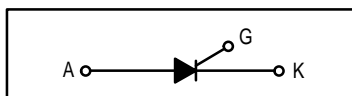
**MCR225FP  
Series**

**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

**ISOLATED SCRs**  
**25 AMPERES RMS**  
**600 thru 800 VOLTS**



**CASE 221C-02  
STYLE 2**

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

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage <sup>(1)</sup> ( $T_J = -40$ to $+125^\circ\text{C}$ , Gate Open)	$V_{DRM}$ $V_{RRM}$	600 800	Volts
On-State RMS Current ( $T_C = +70^\circ\text{C}$ ) Full Cycle Sine Wave 50 to 60 Hz <sup>(2)</sup>	$I_T(\text{RMS})$	25	Amps
Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, $T_C = +70^\circ\text{C}$ ) Preceded and followed by rated current	$I_{TSM}$	300	Amps
Circuit Fusing ( $t = 8.3$ ms)	$I^2t$	375	$\text{A}^2\text{s}$
Peak Gate Power ( $T_C = +70^\circ\text{C}$ , Pulse Width = 10 $\mu\text{s}$ )	$P_{GM}$	20	Watts
Average Gate Power ( $T_C = +70^\circ\text{C}$ , $t = 8.3$ ms)	$P_{G(AV)}$	0.5	Watt
Peak Gate Current ( $T_C = +70^\circ\text{C}$ , Pulse Width = 10 $\mu\text{s}$ )	$I_{GM}$	2	Amps
RMS Isolation Voltage ( $T_A = 25^\circ\text{C}$ , Relative Humidity $\leq 20\%$ )	$V_{(ISO)}$	1500	Volts
Operating Junction Temperature Range	$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +125	$^\circ\text{C}$

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.

2. The case temperature reference point for all  $T_C$  measurements is a point on the center lead of the package as close as possible to the plastic body.

REV 1

# MCR225FP Series

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.5	$^{\circ}C/W$
Thermal Resistance, Case to Sink	$R_{\theta CS}$	2.2 (typ)	$^{\circ}C/W$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	$^{\circ}C/W$

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward Blocking Current ( $V_D = \text{Rated } V_{DRM}$ , Gate Open) $T_J = 25^{\circ}C$ $T_J = 125^{\circ}C$	$I_{DRM}$	— —	— —	10 2	$\mu A$ mA
Peak Reverse Blocking Current ( $V_R = \text{Rated } V_{RRM}$ ) $T_J = 125^{\circ}C$	$I_{RRM}$	—	—	2	mA
Forward "On" Voltage <sup>(1)</sup> ( $I_{TM} = 50 A$ )	$V_{TM}$	—	—	1.8	Volts
Gate Trigger Current (Continuous dc) (Anode Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$ )	$I_{GT}$	—	—	40	mA
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 12 Vdc, $R_L = 100 \text{ Ohms}$ )	$V_{GT}$	—	0.8	1.5	Volts
Gate Non-Trigger Voltage (Anode Voltage = Rated $V_{DRM}$ , $R_L = 100 \text{ Ohms}$ , $T_J = 125^{\circ}C$ )	$V_{GD}$	0.2	—	—	Volts
Holding Current (Anode Voltage = 12 Vdc)	$I_H$	—	20	40	mA
Turn-On Time ( $I_{TM} = 25 A$ , $I_{GT} = 40 \text{ mAdc}$ )	$t_{gt}$	—	1.5	—	$\mu s$
Turn-Off Time ( $V_{DRM} = \text{Rated Voltage}$ ) ( $I_{TM} = 25 A$ , $I_R = 25 A$ ) ( $I_{TM} = 25 A$ , $I_R = 25 A$ , $T_J = 125^{\circ}C$ )	$t_q$	— —	15 35	— —	$\mu s$
Critical Rate-of-Rise of Off-State Voltage (Gate Open, $V_D = \text{Rated } V_{DRM}$ , Exponential Waveform)	dv/dt	—	100	—	V/ $\mu s$

1. Pulse Test: Pulse Width = 1 ms, Duty Cycle  $\leq 2\%$ .

## TYPICAL CHARACTERISTICS

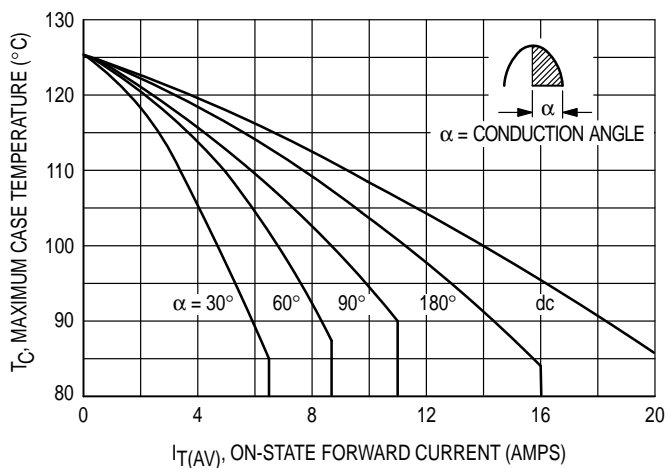


Figure 1. Average Current Derating

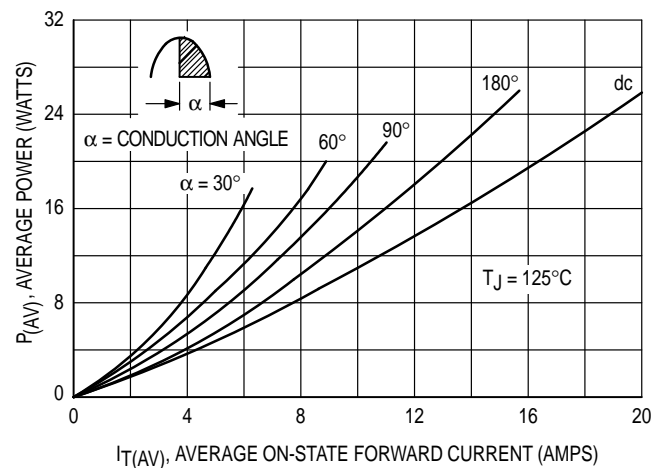


Figure 2. Maximum On-State Power Dissipation

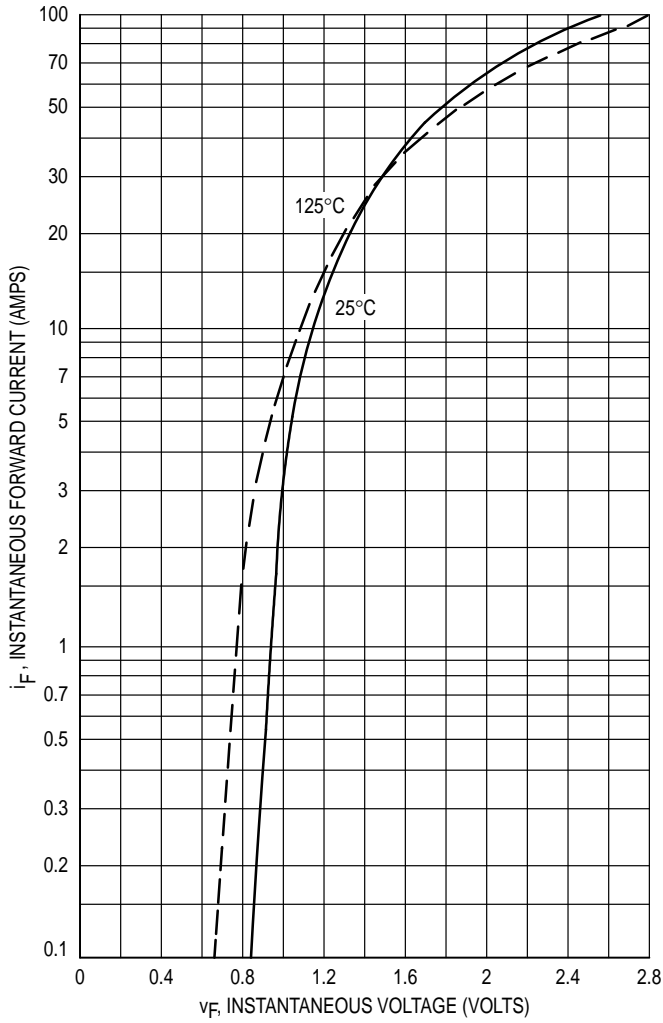


Figure 3. Maximum Forward Voltage

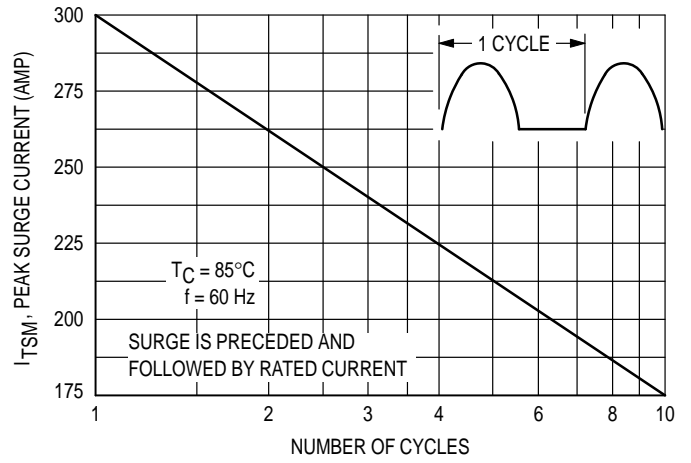


Figure 4. Maximum Non-Repetitive Surge Current

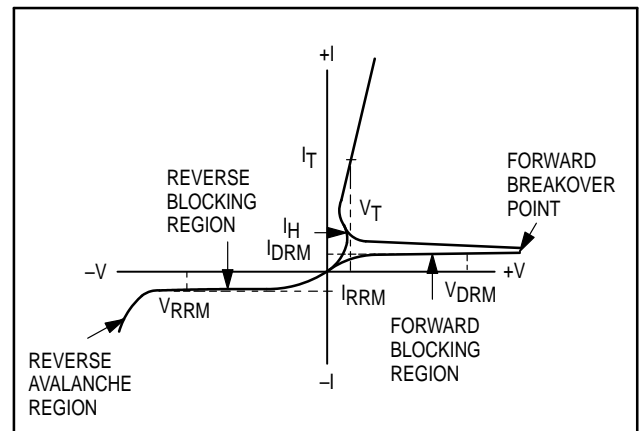


Figure 5. Characteristics and Symbols

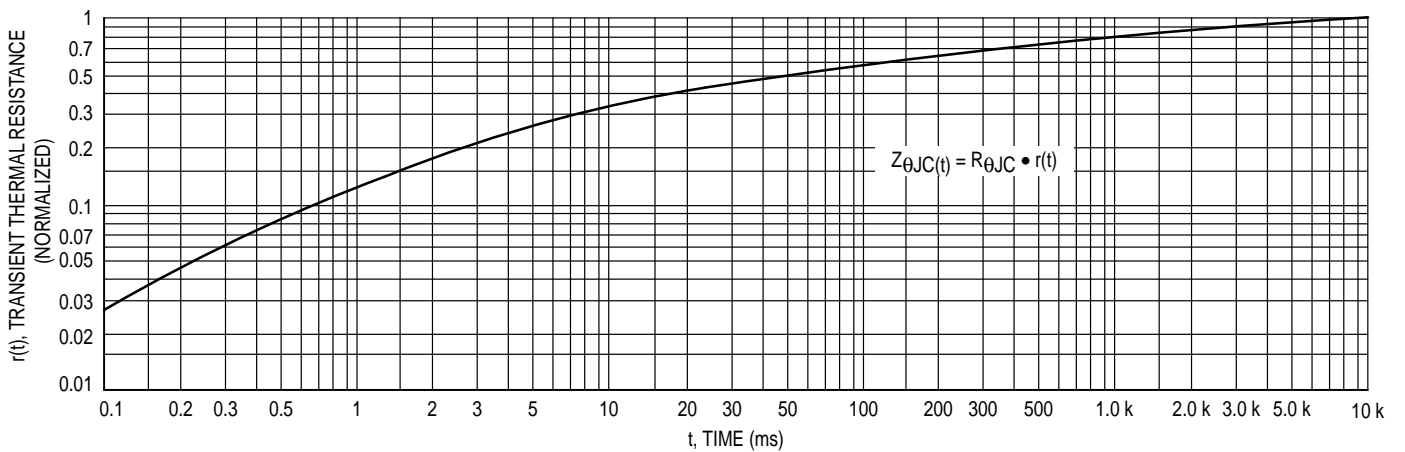


Figure 6. Thermal Response

## MCR225FP Series

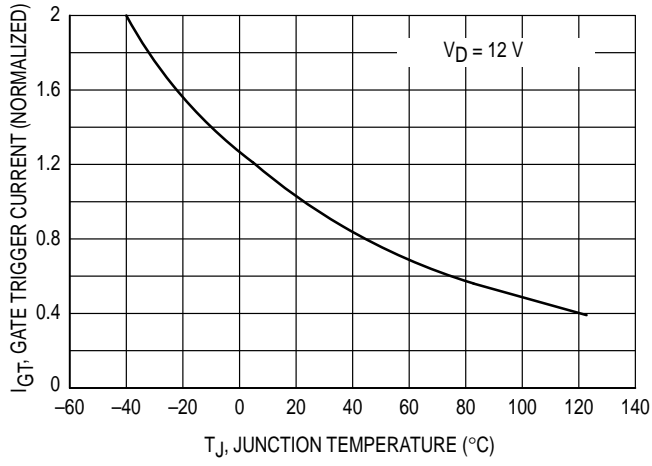


Figure 7. Gate Trigger Current versus Temperature

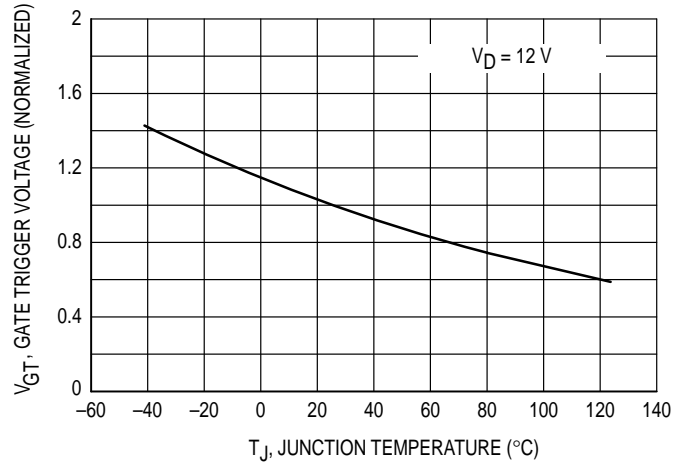


Figure 8. Gate Trigger Voltage versus Temperature

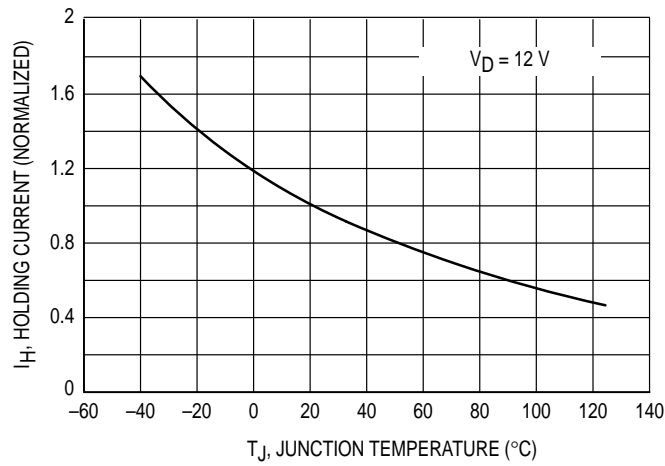
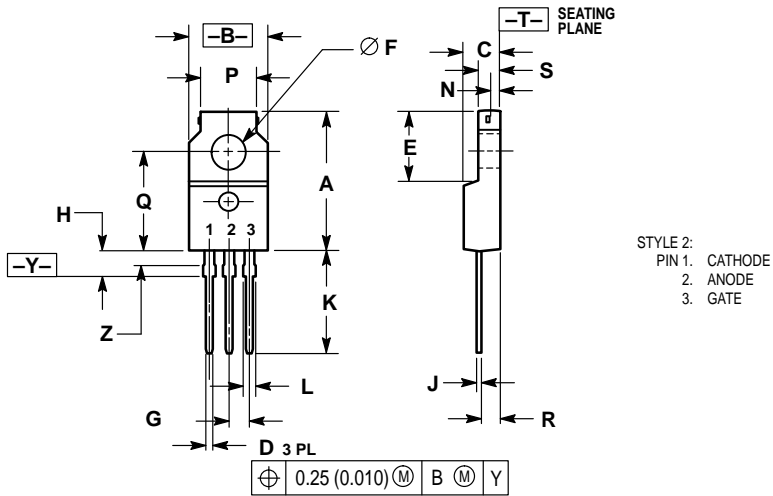


Figure 9. Holding Current versus Temperature

PACKAGE DIMENSIONS




- 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

CASE 221C-02  
 ISSUE B

## MCR225FP Series

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4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan. 81-3-5487-8488

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2, Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.  
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