

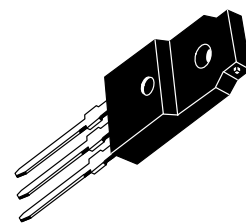
MCR225FP Series

Silicon Controlled Rectifiers Reverse Blocking Thyristors

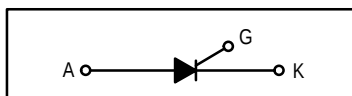
... designed primarily for half-wave ac control applications, such as motor controls, heating controls and power supply crowbar circuits.

- 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
50 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 ⁽¹⁾ ($T_J = -40$ to $+125^\circ\text{C}$, Gate Open)	V_{DRM} V_{RRM}	50 200 400 600 800	Volts
On-State RMS Current ($T_C = +70^\circ\text{C}$) Full Cycle Sine Wave 50 to 60 Hz ⁽²⁾	$I_T(\text{RMS})$	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	A^2s
Peak Gate Power ($T_C = +70^\circ\text{C}$, Pulse Width = 10 μs)	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 μs)	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.

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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	$^{\circ}\text{C/W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward Blocking Current ($V_D = \text{Rated } V_{DRM}$, Gate Open) $T_J = 25^{\circ}\text{C}$ $T_J = 125^{\circ}\text{C}$	I_{DRM}	— —	— —	10 2	μA mA
Peak Reverse Blocking Current ($V_R = \text{Rated } V_{RRM}$) $T_J = 125^{\circ}\text{C}$	I_{RRM}	—	—	2	mA
Forward "On" Voltage ⁽¹⁾ ($I_{TM} = 50 \text{ A}$)	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} , $R_L = 100 \text{ Ohms}$, $T_J = 125^{\circ}\text{C}$)	V_{GD}	0.2	—	—	Volts
Holding Current (Anode Voltage = 12 Vdc)	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
Critical Rate-of-Rise of Off-State Voltage (Gate Open, $V_D = \text{Rated } V_{DRM}$, Exponential Waveform)	dv/dt	—	100	—	$\text{V}/\mu\text{s}$

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

TYPICAL CHARACTERISTICS

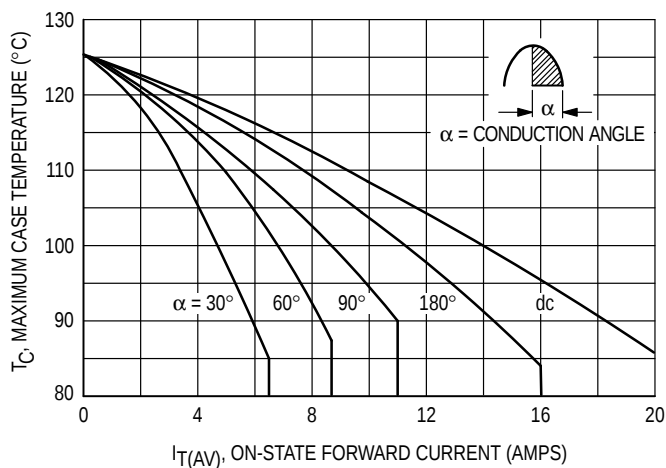


Figure 1. Average Current Derating

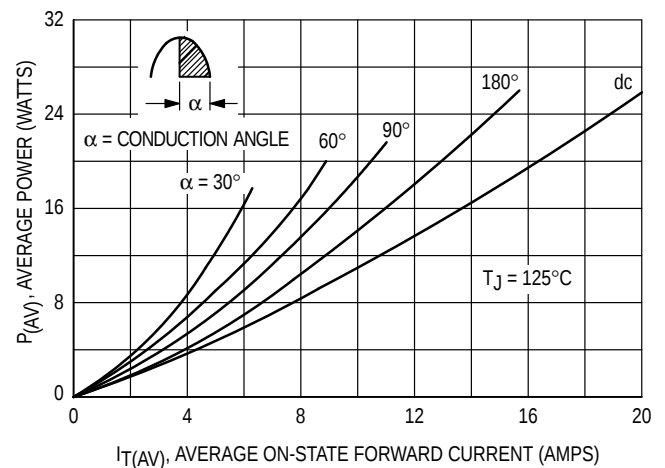


Figure 2. Maximum On-State Power Dissipation

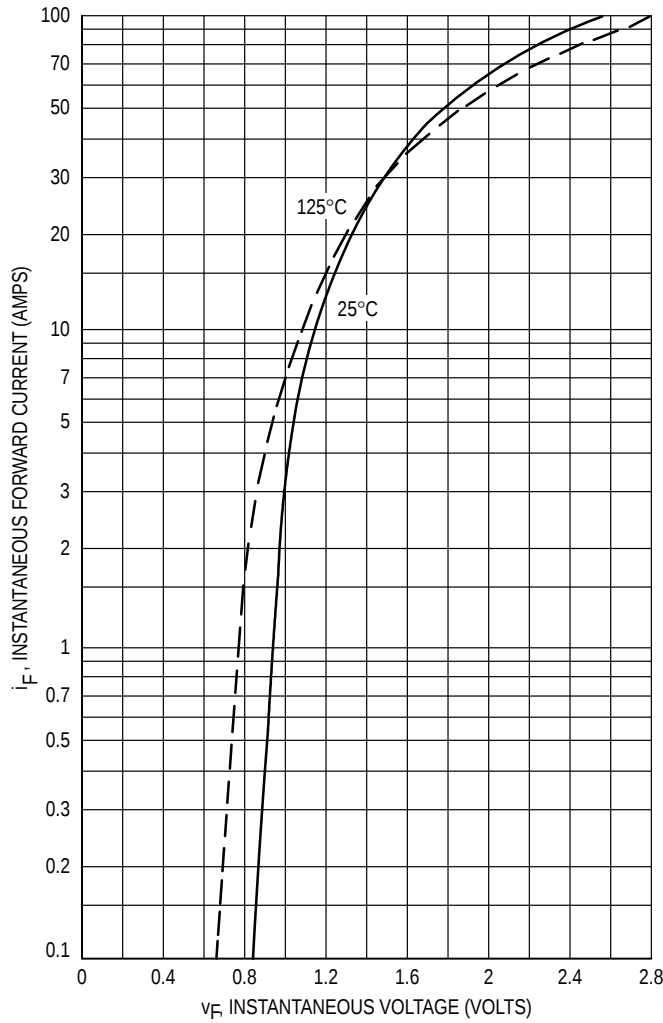


Figure 3. Maximum Forward Voltage

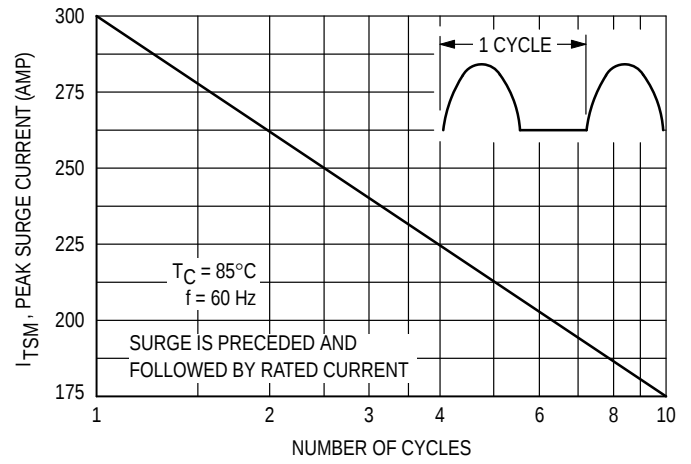


Figure 4. Maximum Non-Repetitive Surge Current

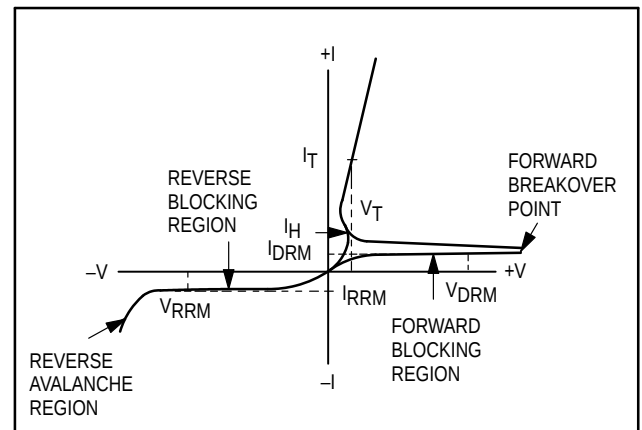


Figure 5. Characteristics and Symbols

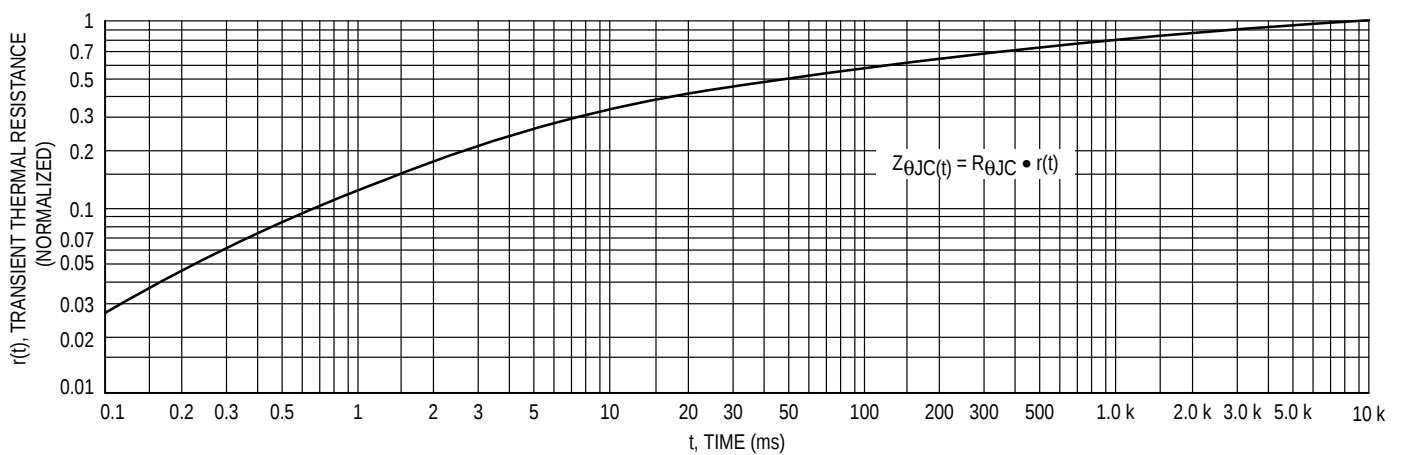


Figure 6. Thermal Response

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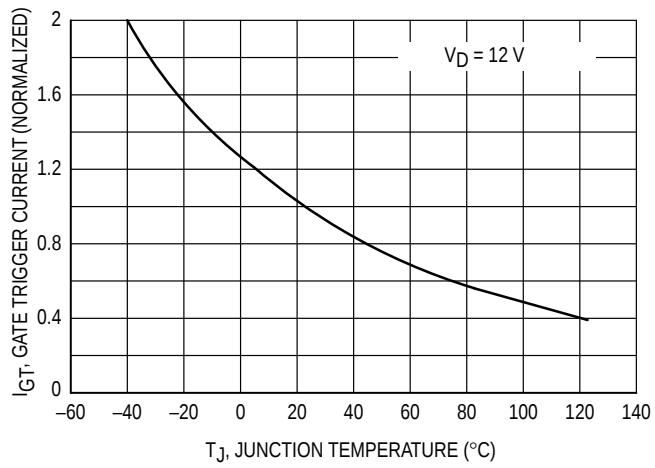


Figure 7. Gate Trigger Current versus Temperature

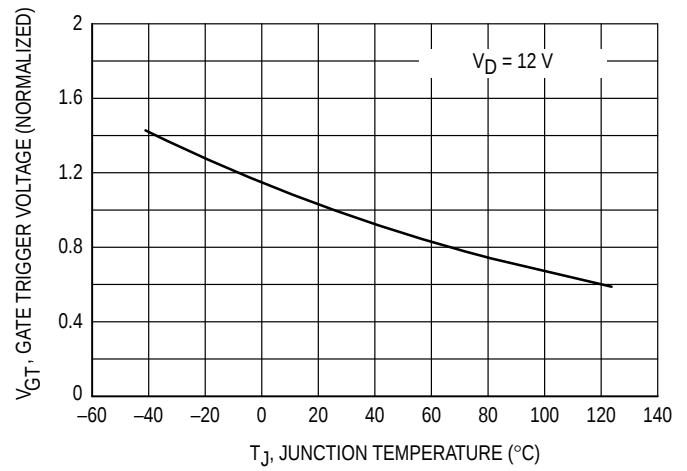


Figure 8. Gate Trigger Voltage versus Temperature

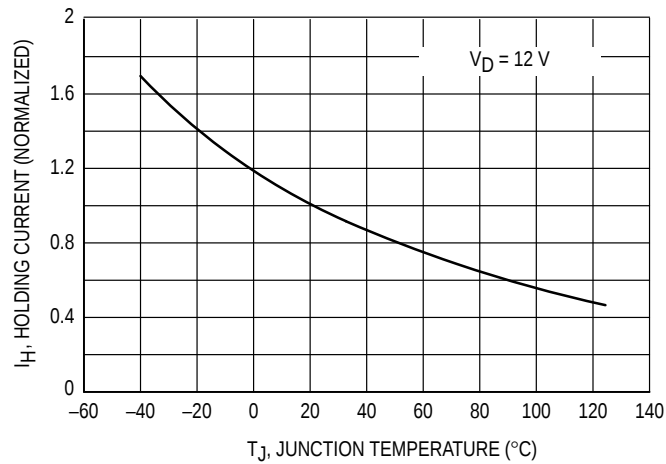
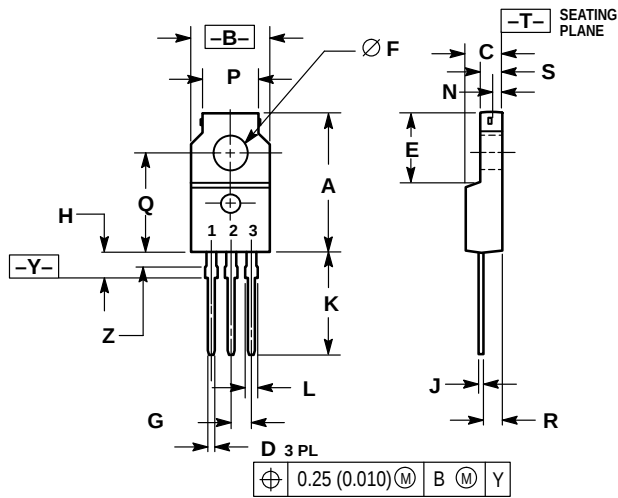


Figure 9. Holding Current versus Temperature

PACKAGE DIMENSIONS



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

- 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

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