

MCR218-6FP, MCR218-10FP

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
- 80 A Surge Current Capability
- Insulated Package Simplifies Mounting
-  Indicates UL Registered — File #E69369
- Device Marking: Logo, Device Type, e.g., MCR218-6, 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)	V_{DRM} , V_{RRM}	400 800	Volts
On-State RMS Current ($T_C = +70^\circ\text{C}$) ⁽²⁾ (180° Conduction Angles)	$I_{\text{T}}(\text{RMS})$	8.0	Amps
Peak Nonrepetitive Surge Current (1/2 Cycle, Sine Wave 60 Hz, $T_J = 125^\circ\text{C}$)	I_{TSM}	100	Amps
Circuit Fusing ($t = 8.3$ ms)	I_{2t}	26	A^2s
Forward Peak Gate Power ($T_C = +70^\circ\text{C}$, Pulse Width $\leq 1.0\ \mu\text{s}$)	P_{GM}	5.0	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 $\leq 1.0\ \mu\text{s}$)	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	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.

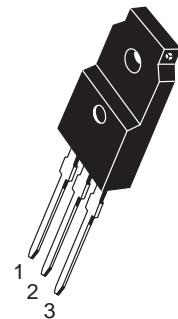
(2) The case temperature reference point for all T_C measurements is a point on the center lead of the package as close as possible to the plastic body.



ON Semiconductor

<http://onsemi.com>

ISOLATED SCR (UL)
8 AMPERES RMS
400 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
MCR218-6FP	ISOLATED TO220FP	500/Box
MCR218-10FP	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	$R_{\theta JC}$	2	°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 ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Peak Repetitive Forward or Reverse Blocking Current (V_D = Rated V_{DRM} , 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⁾ ($I_{TM} = 16$ A Peak)	V_{TM}	—	1	1.8	Volts
Gate Trigger Current (Continuous dc) ($V_{AK} = 12$ Vdc, $R_L = 100$ Ohms)	I_{GT}	—	10	25	mA
Gate Trigger Voltage (Continuous dc) ($V_{AK} = 12$ Vdc, $R_L = 100$ Ohms)	V_{GT}	—	—	1.5	Volts
Gate Non-Trigger Voltage ($V_{AK} = 12$ Vdc, $R_L = 100$ Ohms, $T_J = 125^\circ\text{C}$)	V_{GD}	0.2	—	—	Volts
Holding Current ($V_{AK} = 12$ Vdc, Initiating Current = 200 mA, Gate Open)	I_H	—	16	30	mA
Turn-On Time ($I_{TM} = 8$ A, $I_{GT} = 40$ mAdc)	t_{gt}	—	1.5	—	μs
Turn-Off Time (V_D = Rated V_{DRM} , $I_{TM} = 8$ A, $I_R = 8$ A) $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	t_q	— —	15 35	— —	μs

DYNAMIC CHARACTERISTICS

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

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

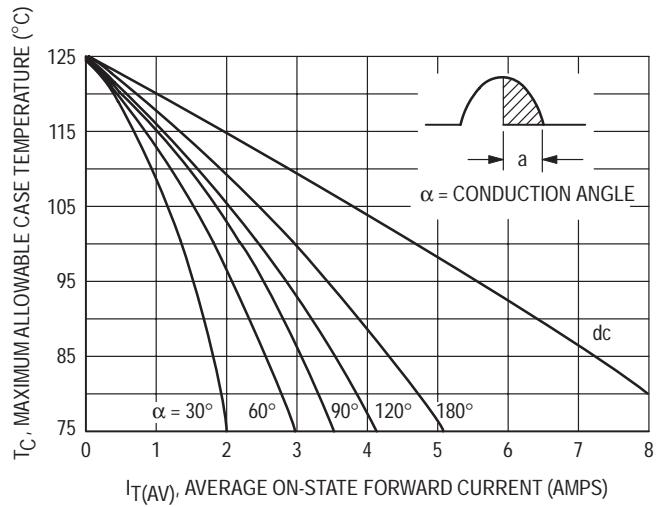
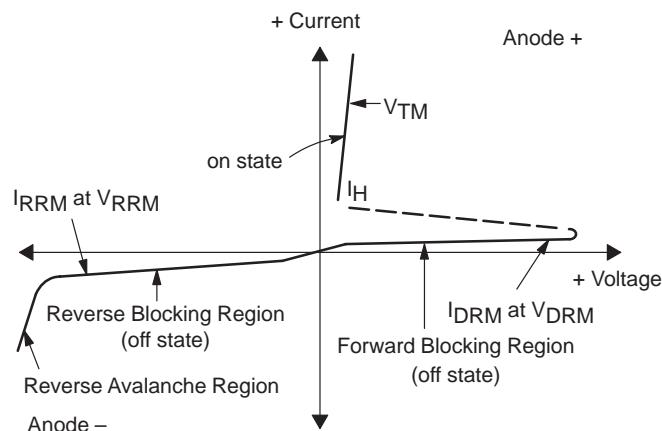


Figure 1. Current Derating

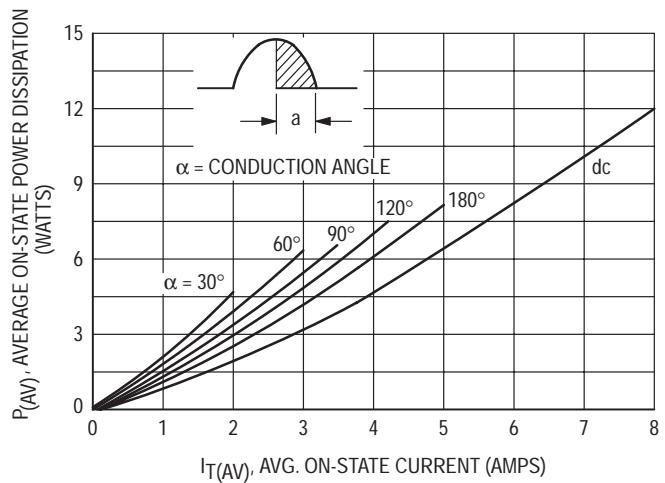


Figure 2. On-State Power Dissipation

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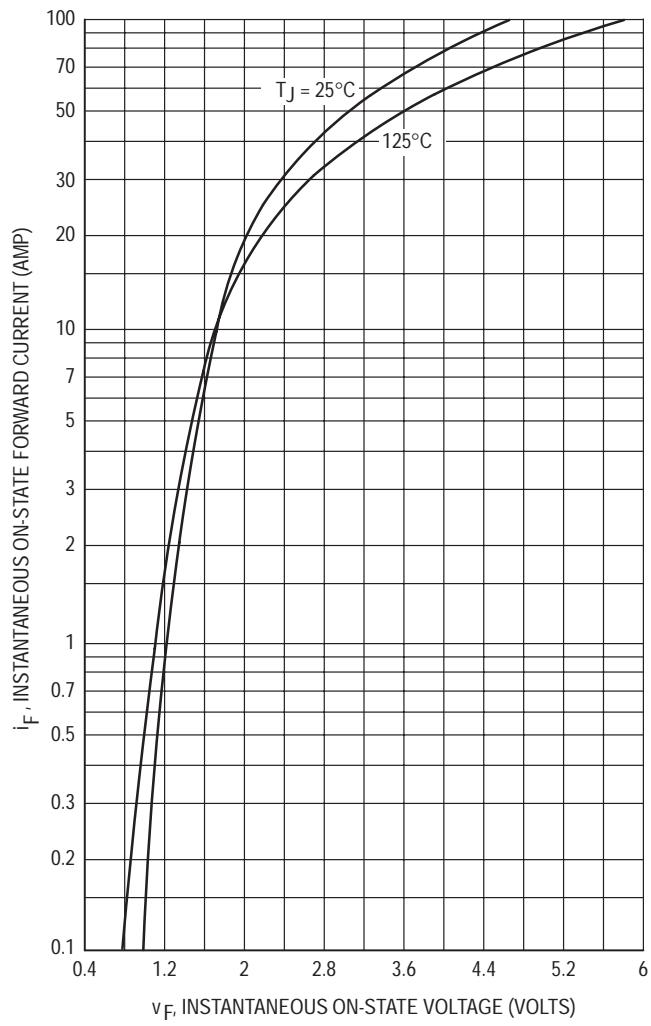


Figure 3. Maximum On-State Characteristics

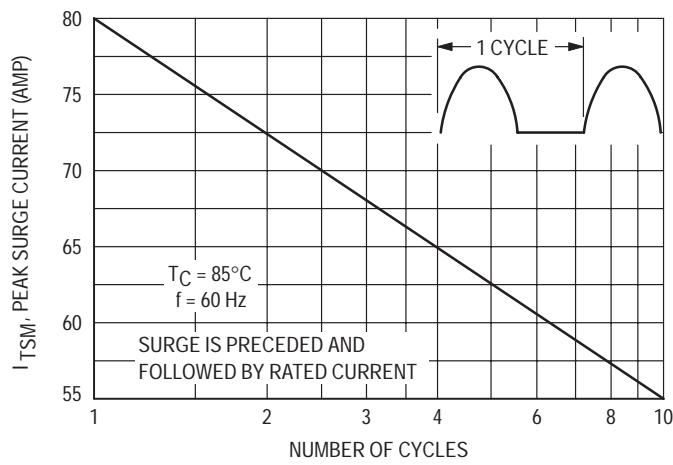


Figure 4. Maximum Non-Repetitive Surge Current

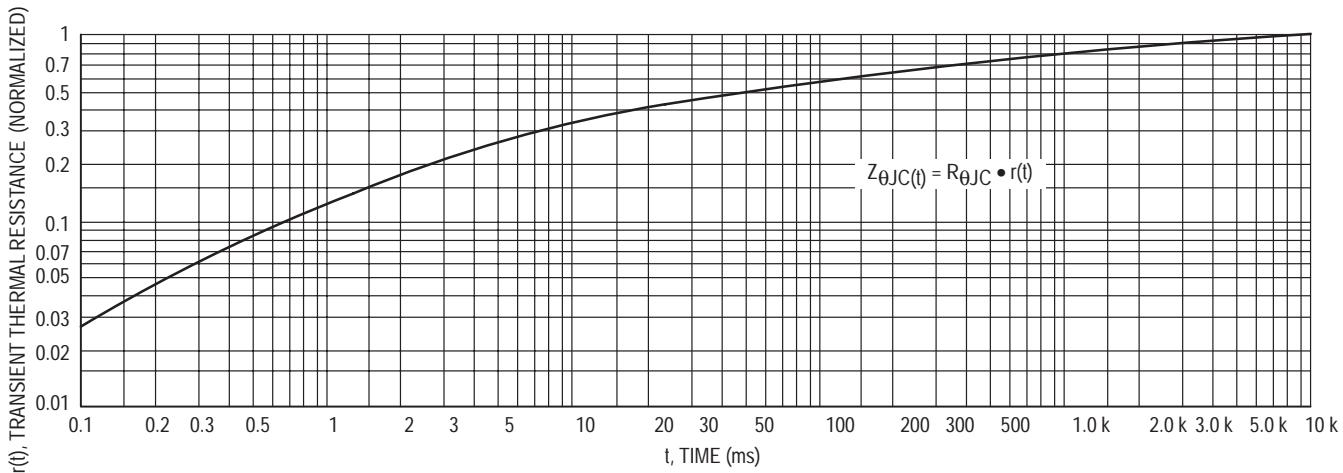


Figure 5. Thermal Response

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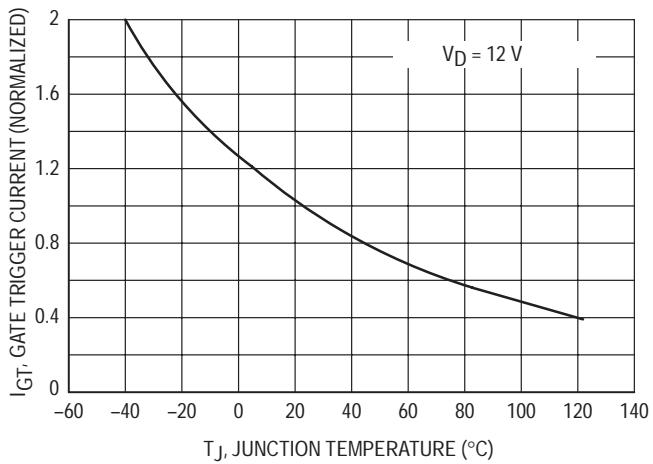


Figure 6. Typical Gate Trigger Current versus Temperature

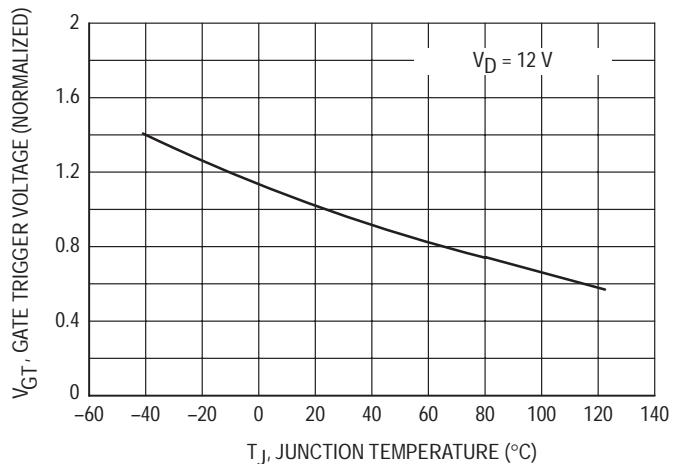


Figure 7. Typical Gate Trigger Voltage versus Temperature

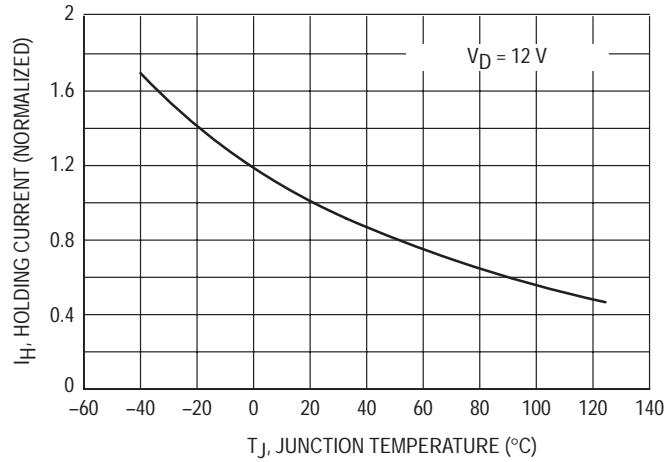
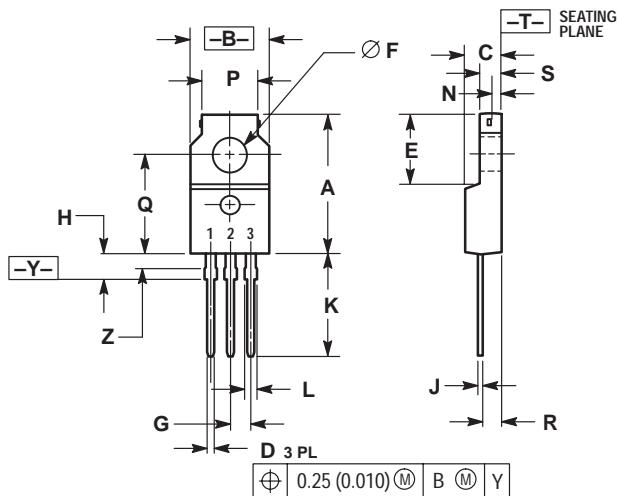


Figure 8. Typical Holding Current versus Temperature

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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
2. ANODE
3. GATE

Notes

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