

MCR8M, MCR8N

Preferred Device

Silicon Controlled Rectifiers

Reverse Blocking Thyristors

Designed primarily for half-wave ac control applications, such as motor controls, heating controls, and power supplies; or wherever half-wave, silicon gate-controlled devices are needed.

- Blocking Voltage of 600 thru 800 Volts
- On-State Current Rating of 8 Amperes RMS at 80°C
- High Surge Current Capability — 80 Amperes
- Rugged, Economical TO220AB Package
- Glass Passivated Junctions for Reliability and Uniformity
- Minimum and Maximum Values of IGT, VGT and IH Specified for Ease of Design
- High Immunity to dv/dt — 100 V/μsec Minimum at 125°C
- Device Marking: Logo, Device Type, e.g., MCR8N, 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)	V _{DRM} , V _{RRM}	600 800	Volts
On-State RMS Current (180° Conduction Angles; T _C = 80°C)	I _{T(RMS)}	8.0	Amps
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz, T _C = 125°C)	I _{TSM}	80	Amps
Circuit Fusing Consideration (t = 8.33 ms)	I ² t	26.5	A ² sec
Forward Peak Gate Power (Pulse Width ≤ 1.0 μs, T _C = 80°C)	P _{GM}	5.0	Watts
Forward Average Gate Power (t = 8.3 ms, T _C = 80°C)	P _{G(AV)}	0.5	Watt
Forward Peak Gate Current (Pulse Width ≤ 1.0 μs, T _C = 80°C)	I _{GM}	2.0	Amps
Operating Junction Temperature Range	T _J	-40 to 125	°C
Storage Temperature Range	T _{stg}	-40 to 150	°C

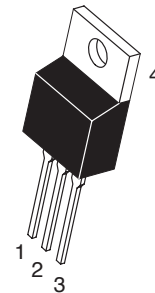
(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage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



ON Semiconductor

<http://onsemi.com>

SCRs
8 AMPERES RMS
600 thru 800 VOLTS



TO-220AB
CASE 221A
STYLE 3

PIN ASSIGNMENT	
1	Cathode
2	Anode
3	Gate
4	Anode

ORDERING INFORMATION

Device	Package	Shipping
MCR8M	TO220AB	50 Units/Rail
MCR8N	TO220AB	50 Units/Rail

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

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THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance — Junction to Case — Junction to Ambient	$R_{\theta JC}$ $R_{\theta JA}$	2.2 62.5	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Peak Repetitive Forward or Reverse Blocking Current ($V_D = \text{Rated } V_{DRM}$ and V_{RRM} ; Gate Open)	I_{DRM} , I_{RRM}	— —	— —	0.01 2.0	mA
					$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$

ON CHARACTERISTICS

Peak Forward On-State Voltage* ($I_{TM} = 16\text{ A}$)	V_{TM}	—	—	1.8	Volts
Gate Trigger Current (Continuous dc) ($V_D = 12\text{ V}$; $R_L = 100\ \Omega$)	I_{GT}	2.0	7.0	15	mA
Holding Current ($V_D = 12\text{ V}$, Gate Open, Initiating Current = 200 mA)	I_H	4.0	17	30	mA
Latch Current ($V_D = 12\text{ V}$, $I_G = 15\text{ mA}$)	I_L	6.0	20	40	mA
Gate Trigger Voltage (Continuous dc) ($V_D = 12\text{ V}$; $100\ \Omega$)	V_{GT}	0.5	0.65	1.0	Volts
Gate Non-Trigger Voltage ($V_D = 12\text{ V}$; $R_L = 100\ \Omega$)	V_{GD}	0.2	—	—	Volts
					$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$

DYNAMIC CHARACTERISTICS

Critical Rate of Rise of Off-State Voltage ($V_D = \text{Rated } V_{DRM}$, Exponential Waveform, Gate Open, $T_J = 125^\circ\text{C}$)	dv/dt	100	250	—	V/ μs
Critical Rate of Rise of On-State Current IPK = 50 A, Pw = 40 μsec , diG/dt = 1 A/ μsec , Igt = 50 mA	di/dt	—	—	50	A/ μs

*Indicates Pulse Test: Pulse Width $\leq 2.0\text{ ms}$, 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

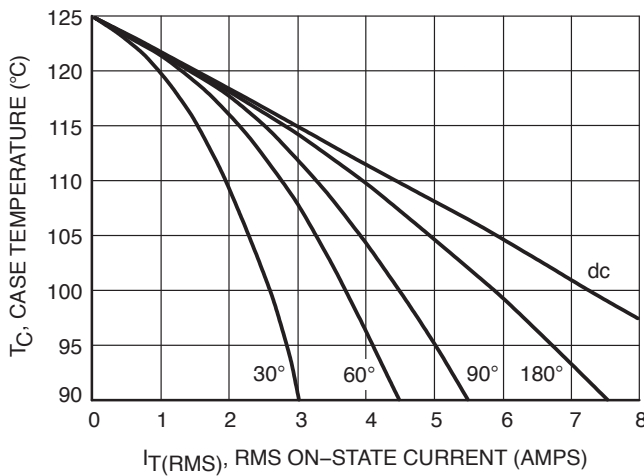
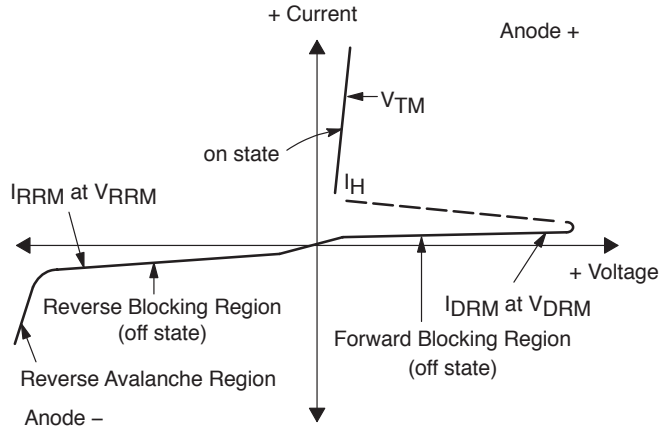


Figure 1. Typical RMS Current Derating

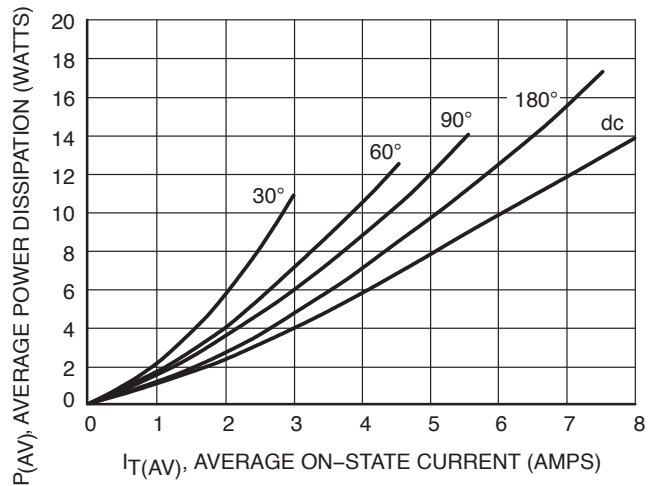


Figure 2. On-State Power Dissipation

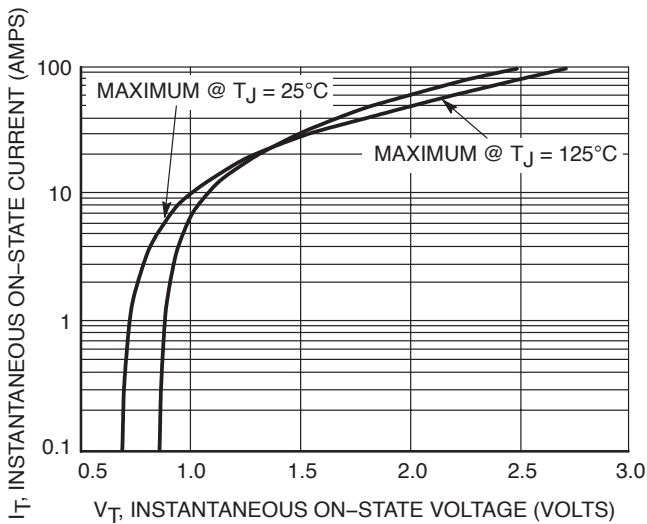


Figure 3. Typical On-State Characteristics

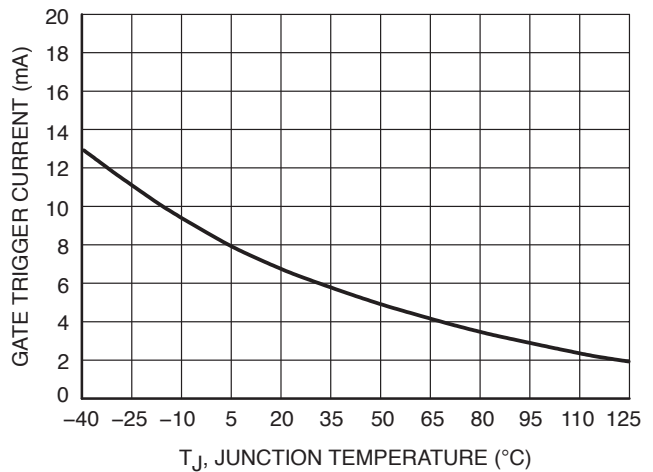


Figure 4. Typical Gate Trigger Current versus Junction Temperature

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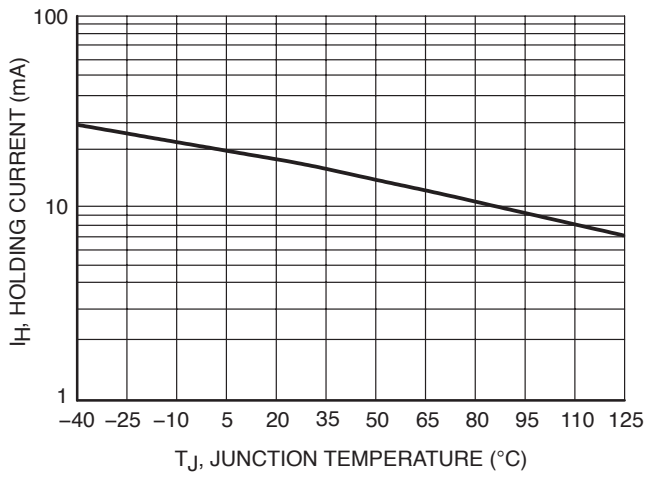


Figure 5. Typical Holding Current versus Junction Temperature

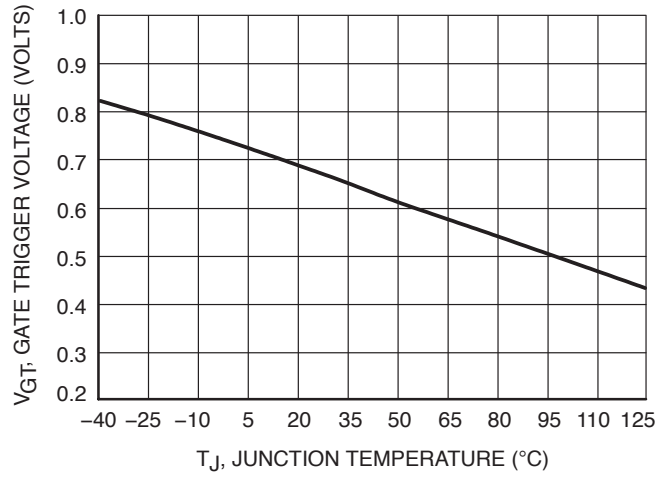


Figure 6. Typical Gate Trigger Voltage versus Junction Temperature

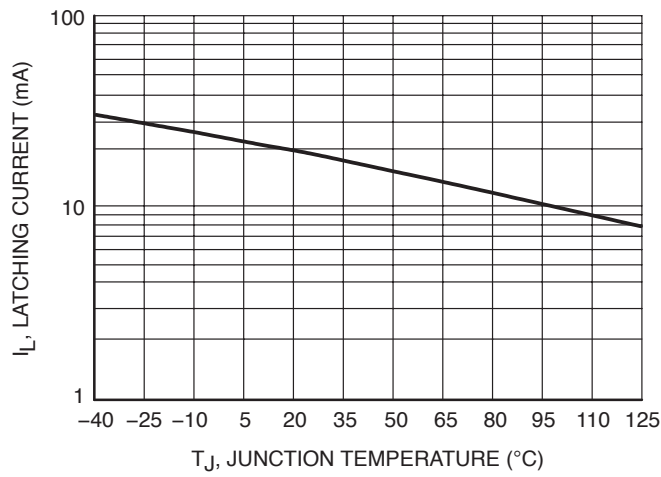


Figure 7. Typical Latching Current versus Junction Temperature