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## Is Now

# onsemi™

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# MCR265-4 Series

Preferred Device

## Silicon Controlled Rectifiers

### Reverse Blocking Thyristors

Designed for inverse parallel SCR output devices for solid state relays, welders, battery chargers, motor controls or applications requiring high surge operation.

- Photo Glass Passivated Blocking Junctions for High Temperature Stability, Center Gate for Uniform Parameters
- 550 Amperes Surge Capability
- Blocking Voltage to 800 Volts
- Device Marking: Logo, Device Type, e.g., MCR265-4, Date Code

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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage <sup>(1)</sup> ( $T_J = 25$ to $125^\circ\text{C}$ , Sine Wave, 50 to 60 Hz, Gate Open)	$V_{DRM}$ , $V_{RRM}$		Volts
MCR265-4		200	
MCR265-6		400	
MCR265-8		600	
MCR265-10		800	
On-State RMS Current ( $180^\circ$ Conduction Angles; $T_C = 70^\circ\text{C}$ )	$I_{T(RMS)}$	55	Amps
Average On-State Current ( $180^\circ$ Conduction Angles; $T_C = 70^\circ\text{C}$ )	$I_{T(AV)}$	35	Amps
Peak Non-Repetitive Surge Current (1/2 Cycle, Sine Wave, 60 Hz, $T_J = 70^\circ\text{C}$ )	$I_{TSM}$	550	Amps
Forward Peak Gate Power (Pulse Width $\leq 1.0 \mu\text{s}$ , $T_C = 70^\circ\text{C}$ )	$P_{GM}$	20	Watts
Forward Average Gate Power ( $t = 8.3 \text{ ms}$ , $T_C = 70^\circ\text{C}$ )	$P_{G(AV)}$	0.5	Watt
Forward Peak Gate Current (Pulse Width $\leq 1.0 \mu\text{s}$ , $T_C = 70^\circ\text{C}$ )	$I_{GM}$	2.0	Amps
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.

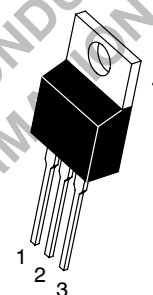
These devices are rated for use in applications subject to high surge conditions. Care must be taken to insure proper heat sinking when the device is to be used at high sustained currents.



**ON Semiconductor**

<http://onsemi.com>

**SCRs**  
**55 AMPERES RMS**  
**200 thru 800 VOLTS**



**TO-220AB**  
**CASE 221A**  
**STYLE 3**

#### PIN ASSIGNMENT

Pin	Assignment
1	Cathode
2	Anode
3	Gate
4	Anode

#### ORDERING INFORMATION

Device	Package	Shipping
MCR265-4	TO220AB	500/Box
MCR265-6	TO220AB	500/Box
MCR265-8	TO220AB	500/Box
MCR265-10	TO220AB	500/Box

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

## MCR265-4 Series

### Thermal Characteristics

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.9	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	$^{\circ}\text{C}/\text{W}$
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 ( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}, \text{ Gate Open}$ )	$I_{DRM}, I_{RRM}$	—	—	10	$\mu\text{A}$
				$T_J = 25^{\circ}\text{C}$	2.0
		—	—		
		—	—		

### ON CHARACTERISTICS

Peak Forward On-State Voltage <sup>(1)</sup> ( $I_{TM} = 110 \text{ A}$ )	$V_{TM}$	—	1.5	1.9	Volts
Gate Trigger Current (Continuous dc) ( $V_{AK} = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$ ( $T_C = -40^{\circ}\text{C}$ ))	$I_{GT}$	—	20	50	$\text{mA}$
		—	40	90	
Gate Trigger Voltage (Continuous dc) ( $V_{AK} = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$ )	$V_{GT}$	—	1.0	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 ( $V_{AK} = 12 \text{ Vdc}, \text{ Initiating Current} = 200 \text{ mA}, \text{ Gate Open}$ )	$I_H$	—	30	75	$\text{mA}$
Turn-On Time ( $I_{TM} = 55 \text{ A}, I_{GT} = 200 \text{ mAdc}$ )	$t_{gt}$	—	1.5	—	$\mu\text{s}$

### DYNAMIC CHARACTERISTICS

Critical Rate-of-Rise of Off-State Voltage (Gate Open, $V_D = \text{Rated } V_{DRM}, \text{ Exponential Waveform}$ )	$dv/dt$	—	50	—	$\text{V}/\mu\text{s}$
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(1) Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

# MCR265-4 Series

## 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

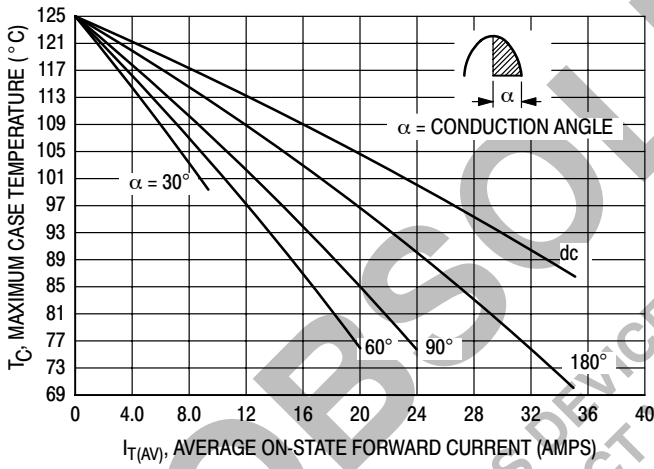
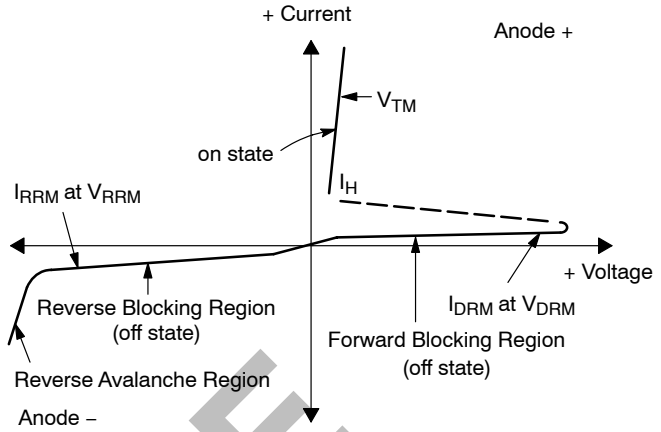


Figure 1. Average Current Derating

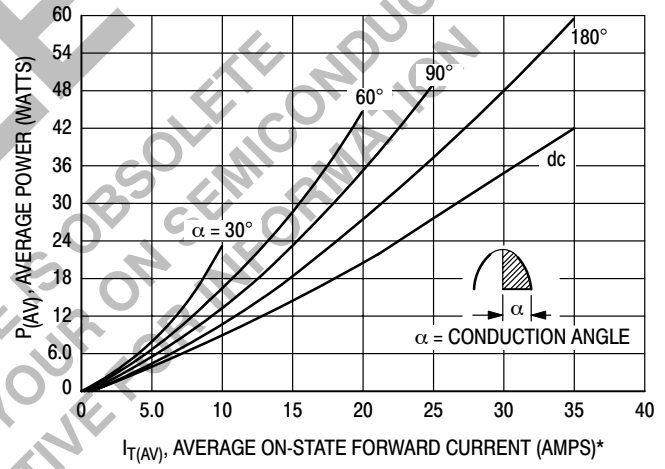


Figure 2. Maximum On-State Power Dissipation

# MCR265-4 Series

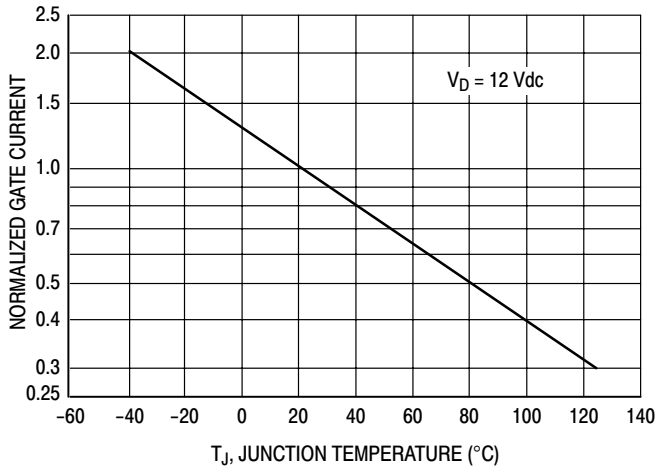


Figure 3. Typical Gate Trigger Current

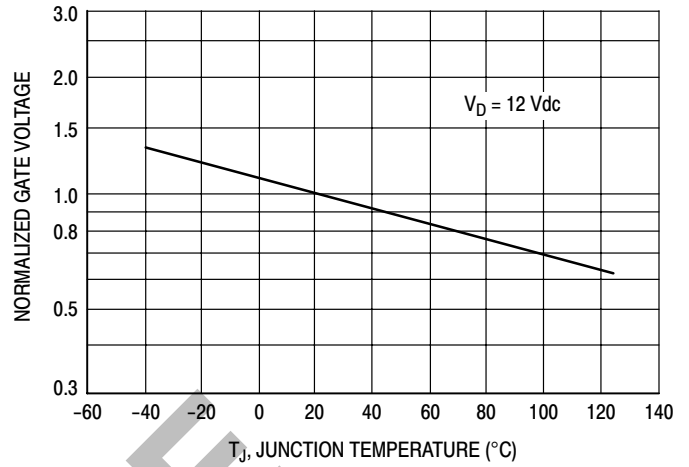


Figure 4. Typical Gate Trigger Voltage

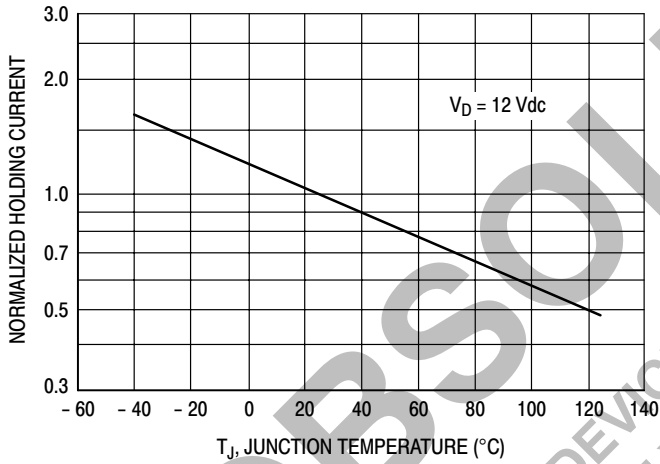


Figure 5. Typical Holding Current

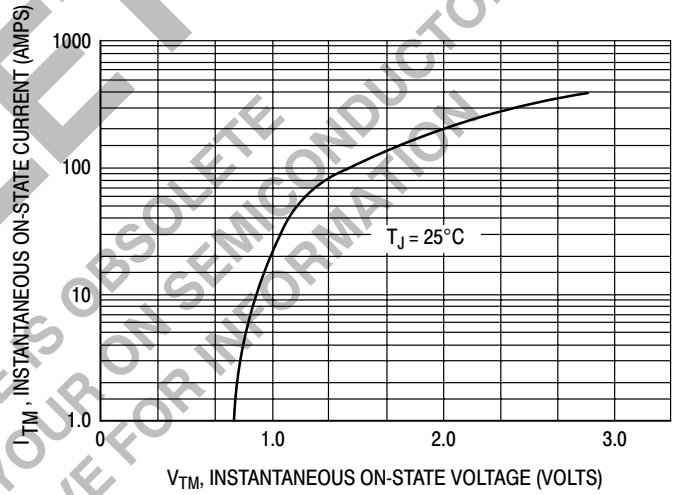


Figure 6. Typical On-State Characteristics

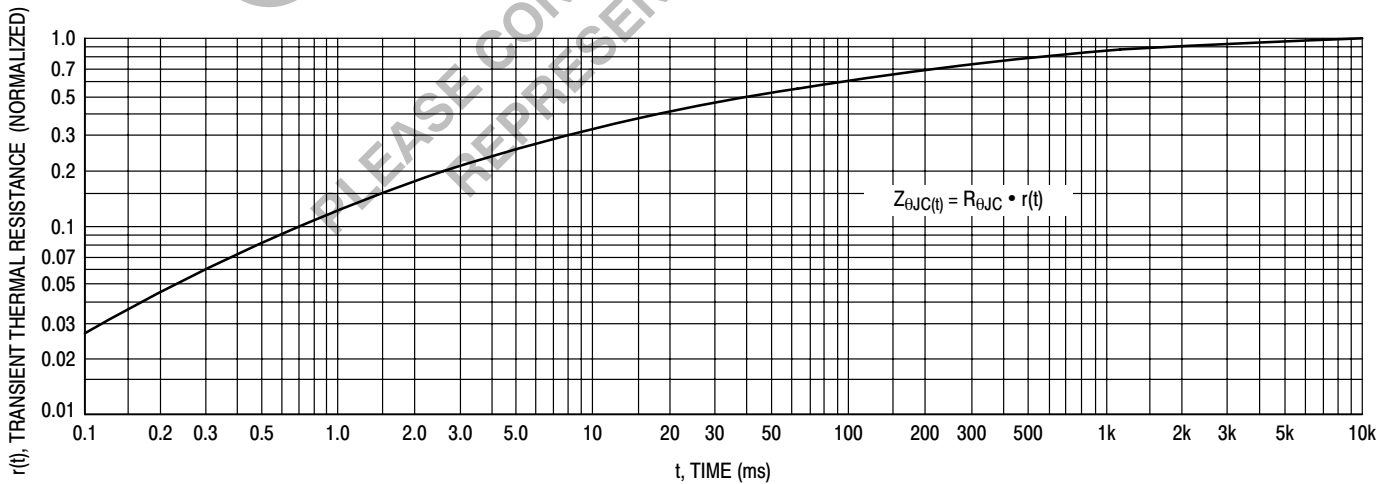
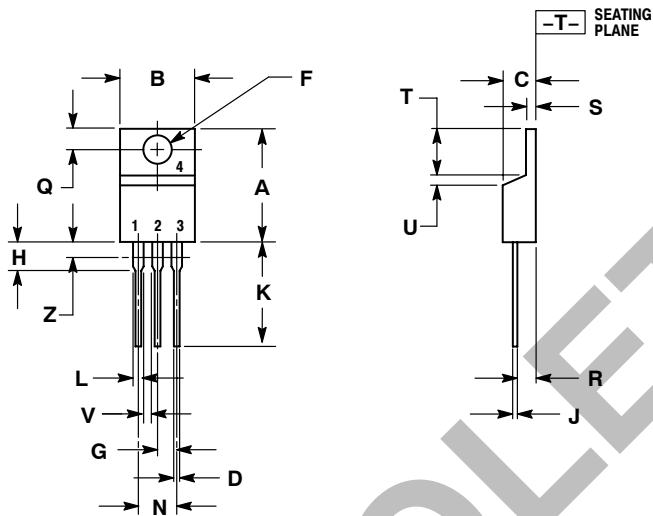


Figure 7. Thermal Response

# MCR265-4 Series

## PACKAGE DIMENSIONS

TO-220AB  
CASE 221A-07  
ISSUE Z



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.022	0.36	0.55
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

STYLE 3:

1. CATHODE
2. ANODE
3. GATE
4. ANODE

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