

# Silicon Controlled Rectifiers

## Reverse Blocking Triode Thyristors

... designed for industrial and consumer applications such as power supplies; battery chargers; temperature, motor, light, and welder controls.

- Economical for a Wide Range of Uses
- High Surge Current —  $I_{TSM} = 550$  Amps
- Rugged Construction in Either Pressfit, Stud, or Isolated Stud
- Glass Passivated Junctions for Maximum Reliability

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

| Rating   | Symbol                       | Value                                 | Unit                 |
|--|------------------------------|---------------------------------------|----------------------|
| Peak Repetitive Forward and Reverse Blocking Voltage,<br>Note 1 ( $T_J = 25$ to $125^\circ\text{C}$ , Gate Open) | $V_{DRM}$<br>or<br>$V_{RRM}$ | 50<br>100<br>200<br>400<br>600<br>800 | Volts                |
| MCR63-( )A   | 2                            | 3                                     |                      |
| MCR64-   | 4                            | 6                                     |                      |
| MCR65-   | 8                            | 10                                    |                      |
| Non-Repetitive Peak Reverse Blocking Voltage<br>( $t \leq 5$ ms), Note 1   | $V_{RSM}$                    | 75<br>150<br>300<br>500<br>700<br>900 | Volts                |
| MCR63-( )A   | 2                            | 3                                     |                      |
| MCR64-   | 4                            | 6                                     |                      |
| MCR65-   | 8                            | 10                                    |                      |
| Forward Current RMS  | $I_T(\text{RMS})$            | 55                                    | Amps                 |
| Peak Surge Current<br>(One Cycle, 60 Hz, $T_J = -40$ to $+125^\circ\text{C}$ )                                   | $I_{TSM}$                    | 550                                   | Amps                 |
| Circuit Fusing Considerations<br>( $t = 8.3$ ms)   | $I^2t$                       | 1255                                  | $\text{A}^2\text{s}$ |
| Peak Gate Power  | $P_{GFM}$                    | 20                                    | Watts                |
| Average Gate Power (Pulse Width $\leq 2 \mu\text{s}$ )   | $P_{GF(AV)}$                 | 0.5                                   | Watt                 |
| Peak Forward Gate Current  | $I_{GFM}$                    | 2                                     | Amps                 |
| Peak Gate Voltage — Forward<br>Reverse   | $V_{GFM}$<br>$V_{GRM}$       | 10<br>10                              | Volts                |
| Operating Junction Temperature Range   | $T_J$                        | $-40$ to $+125$                       | $^\circ\text{C}$     |
| Storage Temperature Range  | $T_{stg}$                    | $-40$ to $+150$                       | $^\circ\text{C}$     |
| Stud Torque  | —                            | 30                                    | in. lb.              |

Note 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.

**MCR63-( )A  
Series  
MCR64 Series  
MCR65 Series**

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



**CASE 263-04  
STYLE 1  
MCR64 Series**



**CASE 174-04  
STYLE 1  
MCR63-( )A Series**



**CASE 311-02  
STYLE 1  
MCR65 Series**

MCR63-( )A Series • MCR64 Series • MCR65 Series

**THERMAL CHARACTERISTICS**

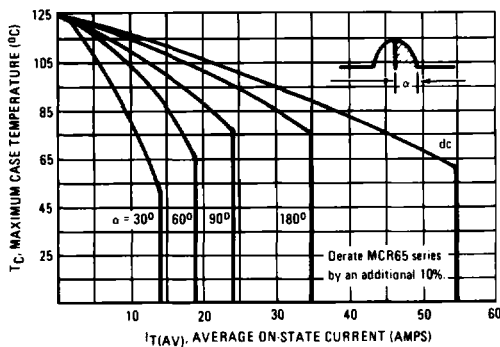
| Characteristic  | Symbol          | Max      | Unit          |
|---|-----------------|----------|---------------|
| Thermal Resistance, Junction to Case<br>Pressfit and Stud<br><u>Isolated Stud</u> | $R_{\theta JC}$ | 1<br>1.1 | $^{\circ}C/W$ |

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

| Characteristic   | Symbol             | Min           | Max           | Unit          |
|--|--------------------|---------------|---------------|---------------|
| Peak Forward or Reverse Blocking Current<br>( $V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}, \text{ Gate Open}$ )<br>$T_J = 25^{\circ}C$<br>$T_J = 125^{\circ}C$   | $I_{DRM}, I_{RRM}$ | —<br>—        | 10<br>2       | $\mu A$<br>mA |
| Forward "On" Voltage<br>( $I_{TM} = 175 \text{ A Peak}$ )  | $V_{TM}$           | —             | 2             | Volts         |
| Gate Trigger Current (Continuous dc)<br>( $V_D = 12 \text{ V}, R_L = 50 \Omega$ )<br>$T_C = 25^{\circ}C$<br>$T_C = -40^{\circ}C$   | $I_{GT}$           | —<br>—        | 40<br>75      | mA            |
| Gate Trigger Voltage (Continuous dc)<br>( $V_D = 12 \text{ V}, R_L = 50 \Omega$ )<br>$T_C = 25^{\circ}C$<br>$T_C = -40^{\circ}C$<br><br>( $V_D = \text{Rated } V_{DRM}, R_L = 1 \text{ k}\Omega, T_J = 125^{\circ}C$ ) | $V_{GT}$           | —<br>—<br>0.2 | 3<br>3.5<br>— | Volts         |
| Holding Current<br>( $V_D = 12 \text{ V}, R_L = 50 \Omega, \text{ Gate Open}$ )  | $I_H$              | —             | 60            | mA            |
| Forward Voltage Application Rate<br>( $T_J = 125^{\circ}C, V_D = \text{Rated } V_{DRM}$ )  | dv/dt              | 50            | —             | V/ $\mu s$    |

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**FIGURE 1 – AVERAGE CURRENT DERATING**



**FIGURE 2 – POWER DISSIPATION**

