

MOTOROLA SC (DIODES/OPTO) 25E D ■ 6367255 0081181 5 ■

T-25-17

MCR5164-67  
(See 2N5168)

## Thyristors

### Silicon Controlled Rectifiers

... 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 —  $I_{TSM} = 200$  Amps
- Low Forward "On" Voltage — 1.2 V (Typ) @  $I_{TM} = 20$  Amps
- Practical Level Triggering and Holding Characteristics — 10 mA (Typ) @  $T_C = 25^\circ\text{C}$
- Rugged Construction in Either Pressfit, Stud or Isolated Stud Package
- Glass Passivated Junctions for Maximum Reliability

**MCR6200**  
**S6210**  
**S6220**  
**Series**
**SCRs**  
**20 AMPERES RMS**  
**100 thru 600 VOLTS**

#### MAXIMUM RATINGS

| Rating                                                                                                                                             | Symbol       | Value       | Unit                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|----------------------|
| Repetitive Peak Off-State Voltage, Note 1                                                                                                          | $V_{DROM}$   |             | Volts                |
| Repetitive Peak Reverse Voltage, Note 1                                                                                                            | $V_{RROM}$   |             |                      |
| MCR6200, S6210, S6220                                                                                                                              | A            | 100         |                      |
| MCR6200, S6210, S6220                                                                                                                              | B            | 200         |                      |
| MCR6200, S6210, S6220                                                                                                                              | D            | 400         |                      |
| MCR6200, S6210, S6220                                                                                                                              | M            | 600         |                      |
| Non-Repetitive Peak Off-State Voltage, Note 1                                                                                                      | $V_{DSOM}$   |             | Volts                |
| Non-Repetitive Peak Reverse Voltage, Note 1                                                                                                        | $V_{DROM}$   |             |                      |
| MCR6200, S6210, S6220                                                                                                                              | A            | 150         |                      |
| MCR6200, S6210, S6220                                                                                                                              | B            | 250         |                      |
| MCR6200, S6210, S6220                                                                                                                              | D            | 500         |                      |
| MCR6200, S6210, S6220                                                                                                                              | M            | 700         |                      |
| RMS On-State Current<br>( $T_C = 75^\circ\text{C}$ )                                                                                               | $I_{T(RMS)}$ | 20          | Amps                 |
| Peak Non-Repetitive Surge Current<br>(One Full Cycle of surge current at 60 Hz, preceded and followed by rated current, $T_C = 75^\circ\text{C}$ ) | $I_{TSM}$    | 200         | Amps                 |
| Circuit Fusing Considerations<br>( $t = 8.3$ ms)                                                                                                   | $I^2t$       | 170         | $\text{A}^2\text{s}$ |
| Peak Gate Power (10 $\mu\text{s}$ Max)                                                                                                             | $P_{GM}$     | 40          | Watts                |
| Average Gate Power                                                                                                                                 | $P_{G(AV)}$  | 0.5         | Watt                 |
| Operating Junction Temperature Range                                                                                                               | $T_J$        | -65 to +100 | $^\circ\text{C}$     |
| Storage Temperature Range                                                                                                                          | $T_{stg}$    | -65 to +150 | $^\circ\text{C}$     |
| Stud Torque                                                                                                                                        | —            | 30          | in. lb.              |

#### THERMAL CHARACTERISTICS

| Characteristic                       | Symbol          | Max | Unit                      |
|--------------------------------------|-----------------|-----|---------------------------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1.2 | $^\circ\text{C}/\text{W}$ |
| MCR6200                              |                 | 1.4 |                           |
| S6210, S6220                         |                 |     |                           |

Note 1. Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.



CASE 174-04  
(TO-203AA)  
STYLE 1  
MCR6200 SERIES



CASE 263-04  
STYLE 1  
S6210 SERIES



CASE 311-02  
STYLE 1  
S6220 SERIES

MOTOROLA THYRISTOR DEVICE DATA

3-300

T-25-17

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

| Characteristic                                                                                                                       | Symbol              | Min | Typ | Max     | Unit                |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----|-----|---------|---------------------|
| Instantaneous Forward Breakover Voltage<br>(Gate Open, $T_C = 100^\circ\text{C}$ )                                                   | $V_{(BO)O}$         |     |     |         | Volts               |
| MCR6200, S6210, S6220 A                                                                                                              |                     | 100 | —   | —       |                     |
| MCR6200, S6210, S6220 B                                                                                                              |                     | 200 | —   | —       |                     |
| MCR6200, S6210, S6220 D                                                                                                              |                     | 400 | —   | —       |                     |
| MCR6200, S6210, S6220 M                                                                                                              |                     | 600 | —   | —       |                     |
| Peak Blocking Current<br>(Rated $V_{DROM}$ @ $T_C = 100^\circ\text{C}$ )                                                             | $I_{DOM}, I_{RROM}$ | —   | —   | 10<br>2 | $\mu\text{A}$<br>mA |
| Peak On-State Voltage<br>( $I_T = 100$ A Peak)                                                                                       | $V_T$               | —   | —   | 2.4     | Volts               |
| Gate Trigger Current (Continuous dc)<br>(Main Terminal Voltage = 12 Vdc, $R_L = 30$ Ohms)                                            | $I_{GT}$            | —   | —   | 15      | mA                  |
| Gate Trigger Voltage (Continuous dc)<br>(Main Terminal Voltage = 12 Vdc, $R_L = 30$ Ohms)                                            | $V_{GT}$            | —   | —   | 2       | Volts               |
| Holding Current (Either Direction)<br>(Main Terminal Voltage = 12 Vdc, Gate Open)                                                    | $I_{HO}$            | —   | —   | 20      | mA                  |
| Gate Controlled Turn-On Time<br>( $V_D = V_{(BO)O}$ , $I_T = 30$ A Peak,<br>$I_{GT} = 200$ mA, Rise Time = $0.1 \mu\text{s}$ )       | $t_{gt}$            | —   | 2   | —       | $\mu\text{s}$       |
| Critical Rate-of-Rise of Off-State Voltage<br>( $V_D = V_{(BO)O}$ , Exponential Voltage Rise, Gate Open, $T_C = 100^\circ\text{C}$ ) | $dv/dt$             |     |     |         | V/ $\mu\text{s}$    |
| MCR6200, S6210, S6220 A,D                                                                                                            |                     | 10  | 100 | —       |                     |
| MCR6200, S6210, S6220 B                                                                                                              |                     | 10  | 150 | —       |                     |
| MCR6200, S6210, S6220 M                                                                                                              |                     | 10  | 75  | —       |                     |