

## Thyristors

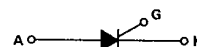
### Silicon Controlled Rectifiers

... 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

**S6200  
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                                                                                                            | $V_{RROM}$        |             |                      |
| S6200, S6210, S6220                                                                                                                                | A                 | 100         |                      |
| S6200, S6210, S6220                                                                                                                                | B                 | 200         |                      |
| S6200, S6210, S6220                                                                                                                                | D                 | 400         |                      |
| S6200, S6210, S6220                                                                                                                                | M                 | 600         |                      |
| Non-Repetitive Peak Off-State Voltage, Note 1                                                                                                      | $V_{DSOM}$        |             | Volts                |
| Non-Repetitive Peak Reverse Voltage, Note 1                                                                                                        | $V_{DROM}$        |             |                      |
| S6200, S6210, S6220                                                                                                                                | A                 | 150         |                      |
| S6200, S6210, S6220                                                                                                                                | B                 | 250         |                      |
| S6200, S6210, S6220                                                                                                                                | D                 | 500         |                      |
| S6200, S6210, S6220                                                                                                                                | M                 | 700         |                      |
| RMS On-State Current<br>( $T_C = 75^\circ\text{C}$ )                                                                                               | $I_T(\text{RMS})$ | 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>( $T_J = -65$ to $+100^\circ\text{C}$ , $t = 1$ to 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 S6200 | $R_{\theta JC}$ | 1.2 | $^\circ\text{C/W}$ |
| S6210, S6220                               |                 | 1.4 |                    |

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-203)  
STYLE 1  
S6200 SERIES**



**CASE 263-04  
STYLE 1  
S6210 SERIES**



**CASE 311-02  
STYLE 1  
S6220 SERIES**

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**S6200 • S6210 • S6220 Series****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                  |
| S6200, S6210, S6220<br>A                                                                                                                              |                         | 100 | —   | —       |                        |
| S6200, S6210, S6220<br>B                                                                                                                              |                         | 200 | —   | —       |                        |
| S6200, S6210, S6220<br>D                                                                                                                              |                         | 400 | —   | —       |                        |
| S6200, S6210, S6220<br>M                                                                                                                              |                         | 600 | —   | —       |                        |
| Peak Blocking Current<br>(Rated $V_{DROM}$ @ $T_C = 100^\circ\text{C}$ )                                                                              | $I_{DOM}$<br>$I_{RROM}$ | —   | —   | 10<br>2 | $\mu\text{A}$<br>mA    |
| Peak On-State Voltage<br>( $I_T = 100\text{ A Peak}$ )                                                                                                | $V_T$                   | —   | —   | 2.4     | Volts                  |
| Gate Trigger Current (Continuous dc)<br>(Main Terminal Voltage = 12 Vdc, $R_L = 30\text{ Ohms}$ )                                                     | $I_{GT}$                | —   | —   | 15      | mA                     |
| Gate Trigger Voltage (Continuous dc)<br>(Main Terminal Voltage = 12 Vdc, $R_L = 30\text{ Ohms}$ )                                                     | $V_{GT}$                | —   | —   | 2       | Volts                  |
| Holding Current (Either Direction)<br>(Main Terminal Voltage = 12 Vdc, Gate Open)                                                                     | $I_{HO}$                | —   | —   | 20      | mA                     |
| Gate Controlled Turn-On Time<br>( $V_D = V_{(BO)O}$ , $I_T = 30\text{ A Peak}$ ,<br>$I_{GT} = 200\text{ mA}$ , Rise Time = $0.1\text{ }\mu\text{s}$ ) | $t_{gt}$                | —   | 2   | —       | $\mu\text{s}$          |
| Critical Rate-of-Rise of Off-State Voltage<br>( $V_D = V_{(BO)O}$ , Exponential Voltage Rise, Gate Open, $T_C = 100^\circ\text{C}$ )                  | $dv/dt$                 |     |     |         | $\text{V}/\mu\text{s}$ |
| S6200, S6210, S6220<br>A,D                                                                                                                            |                         | 10  | 100 | —       |                        |
| S6200, S6210, S6220<br>B                                                                                                                              |                         | 10  | 150 | —       |                        |
| S6200, S6210, S6220<br>M                                                                                                                              |                         | 10  | 75  | —       |                        |