# Triacs
## Bidirectional Triode Thyristors

**SC250**
**SC250( )3**
**SC251**

**TRIACs**
**15 AMPERES RMS**
**200 thru 600 VOLTS**

. . . designed primarily for industrial and military applications for the control of ac loads in applications such as light dimmers, power supplies, heating controls, motor controls, welding equipment and power switching systems; or wherever full-wave, silicon gate controlled solid-state devices are needed.

- All Diffused and Glass Passivated Junctions for Greater Stability
- Pressfit, Stud and Isolated Stud Packages
- Gate Triggering Guaranteed In All 3 Quadrants


**MAXIMUM RATINGS**

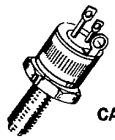
| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Repetitive Peak Off-State Voltage<br>SC251B, SC250B, SC250B3<br>SC251D, SC250D, SC250D3<br>SC251M, SC250M, SC250M3<br>SC251N, SC250N | $V_{DRM}$ | <br>200<br>400<br>600<br>800 | Volts |
| RMS On-State Current | $I_{T(RMS)}$ | 15 | Amps |
| Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz) | $I_{TSM}$ | 100 | Amps |
| Circuit Fusing Considerations<br>t = 1 ms<br>t = 8.3 ms | $I^2t$ | <br>20<br>41.5 | $A^2s$ |
| Peak Gate Power | $P_{GM}$ | 10 | Watts |
| Average Gate Power | $P_{G(AV)}$ | 0.5 | Watt |
| Peak Gate Power (Pulse Width = 10 μs) | $I_{GM}$ | 2 | Amps |
| Operating Junction Temperature Range | $T_J$ | −40 to +115 | °C |
| Storage Temperature Range | $T_{stg}$ | −40 to +125 | °C |
| Stud Torque | — | 30 | in. lb. |

**THERMAL CHARACTERISTICS**

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction to Case<br>SC250, SC251<br>SC250( )3 | $R_{\theta JC}$ | <br>2<br>2.3 | °C/W |

**CASE 174-04**
**(TO-203)**
**STYLE 3**
**SC251**
**PRESS FIT**

**CASE 175-03**
**STYLE 3**
**SC250**
**STUD**



**CASE 235-03**
**STYLE 2**
**SC250( )3**
**ISOLATED STUD**

3

**ELECTRICAL CHARACTERISTICS** ($T_C$ = +25°C unless otherwise noted. Values apply for either polarity of Main Terminal 2 Characteristics referenced to Main Terminal 1.)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Peak Forward or Reverse Blocking Current (Rated $V_{DRM}$ or $V_{RRM}$, gate open) $T_C$ = 25°C | $I_{DRM}$, $I_{RRM}$ | — | — | 10 | μA |
| $T_C$ = +115°C | | — | — | 0.5 | mA |
| Peak On-State Voltage ($I_{TM}$ = 21 A, Pulse Width = 1 ms, Duty Cycle ≤ 2%) | $V_{TM}$ | — | — | 1.65 | Volts |
| Critical Rate of Rise of Off-State Voltage (Rated $V_{DRM}$, Gate Open-Circuited, Exponential Waveform) $T_C$ = +115°C | dv/dt | 100 | — | — | V/μs |
| Critical Rate-of-Rise of Commutating Off-State Voltage, Note 1 ($I_{T(RMS)}$ = Rated RMS On-State Current, $V_D$ = $V_{DRM}$) (Gate Open-Circuited, Commutating di/dt = 8 A/ms) | dv/dt(c) | | | | V/μs |
| SC250, SC251 $T_C$ = +84°C | | 4 | — | — | |
| SC250( )3 $T_C$ = +78°C | | 4 | — | — | |
| DC Gate Trigger Current (Continuous dc) ($V_D$ = 12 Vdc) | $I_{GT}$ | | | | mAdc |
| MT2(+), G(+); MT2(−), G(−); $R_L$ = 100 Ohms | | — | — | 50 | |
| MT2(+), G(−); $R_L$ = 50 Ohms | | — | — | 50 | |
| DC Gate Trigger Current (Continuous dc) ($V_D$ = 12 Vdc, $T_C$ = −40°C) | $I_{GT}$ | | | | mAdc |
| MT2(+), G(+); MT2(−), G(−); $R_L$ = 50 Ohms | | — | — | 80 | |
| MT2(+), G(−); $R_L$ = 25 Ohms | | — | — | 80 | |
| DC Gate Trigger Voltage (Continuous dc) ($V_D$ = 12 Vdc) | $V_{GT}$ | | | | Vdc |
| MT2(+), G(+); MT2(−), G(−); $R_L$ = 100 Ohms | | — | — | 2.5 | |
| MT2(+), G(−); $R_L$ = 50 Ohms | | — | — | 2.5 | |
| DC Gate Trigger Voltage (Continuous dc) ($V_D$ = 12 Vdc, $T_C$ = −40°C) | $V_{GT}$ | | | | Vdc |
| MT2(+), G(+); MT2(−), G(−); $R_L$ = 50 Ohms | | — | — | 3.5 | |
| MT2(+), G(−); $R_L$ = 25 Ohms | | — | — | 3.5 | |
| DC Gate Non-Trigger Voltage ($V_D$ = Rated $V_{DRM}$, $R_L$ = 1K Ohms, $T_C$ = 115°C) All Trigger Modes | $V_{GD}$ | 0.20 | — | — | Vdc |
| Holding Current ($V_D$ = 24 Vdc, Peak Initiating Current = 0.5 A, Pulse Width = 0.1 to 10 ms, Gate Trigger) (Source = 7 V, 20 Ohms) $T_C$ = +25°C | $I_H$ | — | — | 50 | mAdc |
| $T_C$ = −40°C | | — | — | 100 | |
| Latching Current ($V_D$ = 24 Vdc, Gate Trigger Source = 15 V, 100 Ohms, Pulse Width = 50 μs, 5 μs Maximum Rise and Fall Times) | $I_L$ | | | | mAdc |
| MT2(+), G(+); MT2(−), G(−); MT2(+), G(−) $T_C$ = 25°C | | — | — | 100 | |
| MT2(+), G(+); MT2(−), G(−); MT2(+), G(−) $T_C$ = −40°C | | — | — | 200 | |

**FIGURE 1 – CURRENT DERATING**

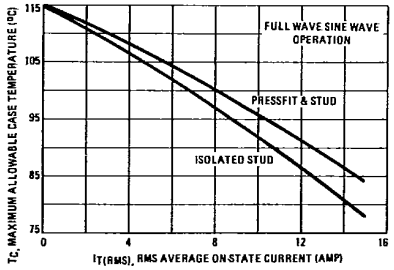



**FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION**