

## Triacs

### Bidirectional Triode Thyristors

... 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 SC251B, SC250B, SC250B3 SC251D, SC250D, SC250D3 SC251M, SC250M, SC250M3 SC251N, SC250N	$V_{DRM}$	200 400 600 800	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 $t = 1$ ms $t = 8.3$ ms	$I^2t$	20 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 $\mu s$ )	$I_{GM}$	2	Amps
Operating Junction Temperature Range	$T_J$	-40 to +115	$^{\circ}C$
Storage Temperature Range	$T_{stg}$	-40 to +125	$^{\circ}C$
Stud Torque	—	30	in. lb.

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case SC250, SC251 SC250( )3	$R_{\theta JC}$	2 2.3	$^{\circ}C/W$

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

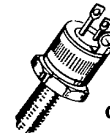
**TRIACs**  
**15 AMPERES RMS**  
**200 thru 600 VOLTS**



**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**

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SC250 • SC250( J3 • SC251

**ELECTRICAL CHARACTERISTICS** (T<sub>C</sub> = +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 <sub>DRM</sub> or V <sub>RRM</sub> , gate open) T <sub>C</sub> = 25°C T <sub>C</sub> = +115°C	I <sub>DRM</sub> , I <sub>RRM</sub>	—	—	10 0.5	μA mA
Peak On-State Voltage (I <sub>TM</sub> = 21 A, Pulse Width = 1 ms, Duty Cycle ≤ 2%)	V <sub>TM</sub>	—	—	1.65	Volts
Critical Rate of Rise of Off-State Voltage (Rated V <sub>DRM</sub> , Gate Open-Circuited, Exponential Waveform) T <sub>C</sub> = +115°C	dv/dt	100	—	—	V/μs
Critical Rate-of-Rise of Commutating Off-State Voltage, Note 1 (I <sub>T(RMS)</sub> = Rated RMS On-State Current, V <sub>D</sub> = V <sub>DRM</sub> ) (Gate Open-Circuited, Commutating di/dt = 8 A/ms) SC250, SC251 T <sub>C</sub> = +84°C SC250( J3 T <sub>C</sub> = +78°C	dv/dt(c)	4 4	— —	— —	V/μs
DC Gate Trigger Current (Continuous dc) (V <sub>D</sub> = 12 Vdc) MT2(+), G(+); MT2(-), G(-); R <sub>L</sub> = 100 Ohms MT2(+), G(-); R <sub>L</sub> = 50 Ohms	I <sub>GT</sub>	— —	— —	50 50	mAdc
DC Gate Trigger Current (Continuous dc) (V <sub>D</sub> = 12 Vdc, T <sub>C</sub> = -40°C) MT2(+), G(+); MT2(-), G(-); R <sub>L</sub> = 50 Ohms MT2(+), G(-); R <sub>L</sub> = 25 Ohms	I <sub>GT</sub>	— —	— —	80 80	mAdc
DC Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> = 12 Vdc) MT2(+), G(+); MT2(-), G(-); R <sub>L</sub> = 100 Ohms MT2(+), G(-); R <sub>L</sub> = 50 Ohms	V <sub>GT</sub>	— —	— —	2.5 2.5	Vdc
DC Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> = 12 Vdc, T <sub>C</sub> = -40°C) MT2(+), G(+); MT2(-), G(-); R <sub>L</sub> = 50 Ohms MT2(+), G(-); R <sub>L</sub> = 25 Ohms	V <sub>GT</sub>	— —	— —	3.5 3.5	Vdc
DC Gate Non-Trigger Voltage (V <sub>D</sub> = Rated V <sub>DRM</sub> , R <sub>L</sub> = 1K Ohms, T <sub>C</sub> = 115°C) All Trigger Modes	V <sub>GD</sub>	0.20	—	—	Vdc
Holding Current (V <sub>D</sub> = 24 Vdc, Peak Initiating Current = 0.5 A, Pulse Width = 0.1 to 10 ms, Gate Trigger) (Source = 7 V, 20 Ohms) T <sub>C</sub> = +25°C T <sub>C</sub> = -40°C	I <sub>H</sub>	— —	— —	50 100	mAdc
Latching Current (V <sub>D</sub> = 24 Vdc, Gate Trigger Source = 15 V, 100 Ohms, Pulse Width = 50 μs, 5 μs Maximum Rise and Fall Times) MT2(+), G(+); MT2(-), G(-); MT2(+), G(-) T <sub>C</sub> = 25°C MT2(+), G(+); MT2(-), G(-); MT2(+), G(-) T <sub>C</sub> = -40°C	I <sub>L</sub>	— —	— —	100 200	mAdc

FIGURE 1 - CURRENT DERATING

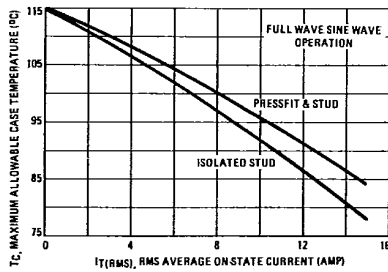
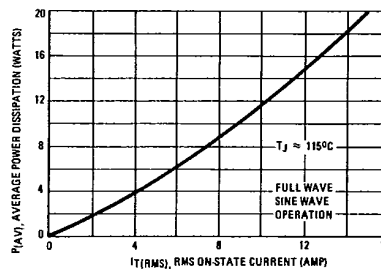


FIGURE 2 - MAXIMUM ON-STATE POWER DISSIPATION



MOTOROLA THYRISTOR DEVICE DATA

