

Triacs

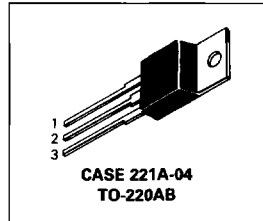
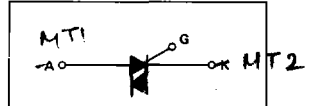
Silicon Bidirectional Thyristors

... designed primarily for full-wave ac control applications, such as light dimmers, motor controls, heating controls and power supplies.

- Blocking Voltage to 600 Volts
- All Diffused and Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability

SC143 Series
SC149 Series

TRIACs
8 and 12 AMPERES RMS
200 thru 600 VOLTS



3

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

Rating	Symbol	Value	Unit		
Repetitive Peak Off-State Voltage, Note 1 (Gate Open, $T_J = 25$ to 100°C)	V_{DRM}		Volts		
				B	200
				SC143 D	400
				SC149 M	600
RMS On-State Current $T_C = 80^\circ\text{C}$	SC143 SC149	8 12	Amps		
Peak Non-Repetitive Surge Current One Full Cycle, 60 Hz	SC143 SC149	120 120	Amps		
Circuit Fusing Considerations $t = 1$ ms	SC143 SC149	I^2t 20 25	A^2s		
Critical Rate-of-Rise of On-State Current	di/dt	10	$\text{A}/\mu\text{s}$		
Peak Gate Power (Pulse Width = $10 \mu\text{s}$)	P_{GM}	10	Watts		
Average Gate Power ($T_C = +80^\circ\text{C}$, $t = 8.3$ ms)	$P_{G(AV)}$	0.5	Watt		
Peak Gate Current (Pulse Width = $10 \mu\text{s}$)	I_{GM}	3.5	Amps		
Peak Gate Voltage	V_{GM}	10	Volts		
Operating Junction Temperature Range	T_J	-40 to +100	$^\circ\text{C}$		
Storage Temperature Range	T_{stg}	-40 to +125	$^\circ\text{C}$		

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Off-State Current (1) ($V_D = \text{Rated } V_{DRM}$, Gate Open) $T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$	I_{DRM}	—	—	0.1	mA
		—	—	0.5	
Peak On-State Voltage Pulse Width = 1 ms, Duty Cycle < 2%. $I_{TM} = 11$ A Peak $I_{TM} = 17$ A Peak	V_{TM}	—	—	1.55	Volts
		—	—	1.65	
		—	—	—	

(cont.)

Note 1. V_{DRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

SC143 Series • SC149 Series

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

Characteristic	Symbol	Min	Typ	Max	Unit
Critical Rate-of-Rise of Off-State Voltage (1) ($V_D = \text{Rated } V_{DRM}$, Gate Open, Exponential Waveform) SC143 Series SC149 Series $T_C = 100^\circ\text{C}$	dv/dt	—	150 200	—	Volts/ μs
Critical Rate-of-Rise of Commutating Off-State Voltage (1) $I_T(\text{RMS}) = \text{Rated RMS On-State Current}$ $V_D = \text{Rated } V_{DRM}$, Gate Open SC143 Commutating di/dt = 4.1 A/ms SC149 Commutating di/dt = 6.1 A/ms $T_C = 80^\circ\text{C}$	dv/dt(C)	4 4	— —	— —	Volts/ μs
DC Gate Trigger Current (2) ($V_D = 12 \text{ Vdc}$) Trigger Mode MT2(+), Gate(+), $R_L = 100 \text{ Ohms}$ MT2(-), Gate(-), $R_L = 100 \text{ Ohms}$ MT2(+), Gate(-), $R_L = 50 \text{ Ohms}$ MT2(+), Gate(+), $R_L = 50 \text{ Ohms}$, $T_C = -40^\circ\text{C}$ MT2(-), Gate(-), $R_L = 50 \text{ Ohms}$, $T_C = -40^\circ\text{C}$ MT2(+), Gate(-), $R_L = 25 \text{ Ohms}$, $T_C = -40^\circ\text{C}$	I_{GT}	— — — — — —	— — — — — —	50 50 50 80 80 80	mAdc
DC Gate Trigger Voltage (2) ($V_D = 12 \text{ Vdc}$) Trigger Mode MT2(+), Gate(+), $R_L = 100 \text{ Ohms}$ MT2(-), Gate(-), $R_L = 100 \text{ Ohms}$ MT2(+), Gate(-), $R_L = 50 \text{ Ohms}$ MT2(+), Gate(+), $R_L = 50 \text{ Ohms}$, $T_C = -40^\circ\text{C}$ MT2(-), Gate(-), $R_L = 50 \text{ Ohms}$, $T_C = -40^\circ\text{C}$ MT2(+), Gate(-), $R_L = 25 \text{ Ohms}$, $T_C = -40^\circ\text{C}$ MT2(+), Gate(+), $R_L = 1000 \text{ Ohms}$, $T_C = 100^\circ\text{C}$ (2,3) MT2(-), Gate(-), $R_L = 1000 \text{ Ohms}$, $T_C = 100^\circ\text{C}$ (2,3) MT2(+), Gate(-), $R_L = 1000 \text{ Ohms}$, $T_C = 100^\circ\text{C}$ (2,3) MT2(-), Gate(+), $R_L = 1000 \text{ Ohms}$, $T_C = 100^\circ\text{C}$ (2,3)	V_{GT}	— — — — — — 0.2 0.2 0.2 0.2	— — — — — — — — — —	2.5 2.5 2.5 3.5 3.5 3.5 — — — —	Vdc
Holding Current (1) (Main Terminal Voltage = 24 Vdc, Peak Initiating Current = 0.5 A, Pulse Width = 1 ms, Duty Cycle $\leq 2\%$, Gate Trigger Source = 7 V, 20 Ohms) $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$	I_H	— —	— —	50 100	mAdc
Latching Current (2) (Main Terminal Source Voltage = 24 Vdc, Gate Trigger Source = 15 V, 100 Ohms) Trigger Mode MT2(+), Gate(-) MT2(-), Gate(-) MT2(+), Gate(-) MT2(+), Gate(+), $T_C = -40^\circ\text{C}$ MT2(-), Gate(-), $T_C = -40^\circ\text{C}$ MT2(+), Gate(-), $T_C = -40^\circ\text{C}$	I_L	— — — — — — —	— — — — — — —	100 100 200 200 200 200 400	mAdc

NOTES:

1. Values apply for either polarity of Main Terminal 2 characteristics referenced to Main Terminal 1.
2. Main Terminal 1 is the reference terminal.
3. With V_D equal to rated off-state voltage.