

# Triacs

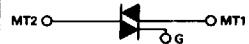
## Bidirectional Triode Thyristors

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

- Triggering Specified in Three Quadrants
- Blocking Voltage to 800 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

**SC141**  
**SC146**

**TRIACS**  
**6 and 10 AMPERES RMS**  
**200 thru 800 VOLTS**



**CASE 221A-04**  
**(TO-220AB)**  
**STYLE 4**

3

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

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage, Note 1 (Gate Open, $T_J = 25$ to $125^\circ\text{C}$ )	V <sub>DRM</sub>	200 400 600 800	Volts
SC141 B			
SC146 D			
M			
RMS On-State Current ( $T_C = 80^\circ\text{C}$ )	I <sub>T(RMS)</sub>	6 10	Amps
SC141			
SC146	I <sub>TSM</sub>	80 120	Amps
Peak Non-Repetitive Surge Current (One Full Cycle, 60 Hz)			
Circuit Fusing Considerations ( $t = 8.3$ ms)	I <sup>2</sup> t	26.5 60	A <sup>2</sup> s
SC146	P <sub>GM</sub>	10	Watts
Peak Gate Power (Pulse Width = 10 μs)			
Average Gate Power ( $T_C = +80^\circ\text{C}$ , $t = 8.3$ ms)	P <sub>G(AV)</sub>	0.5	Watt
Peak Gate Current (Pulse Width = 10 μs)	I <sub>GM</sub>	3.5	Amps
Peak Gate Voltage	V <sub>GM</sub>	10	Volts
Operating Junction Temperature Range	T <sub>J</sub>	-40 to +125	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +125	°C

Note 1. V<sub>DRM</sub> 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

SC141 • SC146

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case SC141 SC146	$R_{\theta JC}$	2.2 1.5	$^{\circ}C/W$

**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^{\circ}C$ , Either Polarity of MT2 to MT1 Voltage unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current ( $V_D = \text{Rated } V_{DRM}$ , Gate Open) $T_C = 25^{\circ}C$ $T_C = 100^{\circ}C$	$I_{DRM}$	— —	— —	10 0.5	$\mu A$ mA
Peak On-State Voltage (Pulse Width $\leq 1$ ms, Duty Cycle $\leq 2\%$ ) SC141 $I_{TM} = 8.5$ A Peak SC146 $I_{TM} = 14$ A Peak	$V_{TM}$	— —	— —	1.83 1.65	Volts
Critical Rate-of-Rise of Off-State Voltage ( $V_D = \text{Rated } V_{DRM}$ , Gate Open-Circuited, Exponential Waveform) $T_C = 100^{\circ}C$	dv/dt	—	50	—	V/ $\mu s$
Critical Rate-of-Rise of Commutating Off-State Voltage (1) ( $I_T(RMS) = \text{Rated } I_T(RMS)$ , $V_D = \text{Rated } V_{DRM}$ , Gate Open-Circuited) SC141 Commutating di/dt = 3.0 A/ms SC146 Commutating di/dt = 5.1 A/ms $T_C = 80^{\circ}C$	dv/dt(c)	4 4	— —	— —	V/ $\mu s$
DC Gate Trigger Current (Continuous dc) ( $V_D = 12$ Vdc) Trigger Mode MT2(+), G(+); MT2(-), G(-); $R_L = 100$ Ohms MT2(+), G(-); $R_L = 50$ Ohms MT2(+), G(+); MT2(-), G(-); $R_L = 50$ Ohms MT2(+), G(-); $R_L = 25$ Ohms $T_C = -40^{\circ}C$ $T_C = -40^{\circ}C$	$I_{GT}$	— — — —	— — — —	50 50 80 80	mAdc
DC Gate Trigger Voltage (Continuous dc) ( $V_D = 12$ Vdc, Trigger Mode) MT2(+), G(+); MT2(-), G(-); $R_L = 100$ Ohms MT2(+), G(-); $R_L = 50$ Ohms MT2(+), G(+); MT2(-), G(-); $R_L = 50$ Ohms MT2(+), G(-); $R_L = 25$ Ohms ( $V_D = \text{Rated } V_{DRM}$ ; $R_L = 1000$ Ohms) $T_C = -40^{\circ}C$ $T_C = -40^{\circ}C$ All Polarities $T_C = 100^{\circ}C$	$V_{GT}$	— — — —	— — — —	2.5 2.5 3.5 3.5	Vdc
Holding Current ( $V_D = 24$ Vdc, $I_T = 0.5$ A, Pulse Width = 1 ms, Duty Cycle $\leq 2\%$ , Gate Trigger Source = 7 V, 20 Ohms) $T_C = 25^{\circ}C$ $T_C = -40^{\circ}C$	$I_H$	— —	— —	50 100	mAdc
Latching Current ( $V_D = 24$ Vdc) (Gate Trigger Source = 15 V, 100 Ohms, Trigger Mode) MT2(+), G(+); MT2(-), G(-) MT2(+), G(-) MT2(+), G(+); MT2(-), G(-) MT2(+), G(-) $T_C = -40^{\circ}C$ $T_C = -40^{\circ}C$	$I_L$	— — — —	— — — —	100 200 200 400	mAdc

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SC141 • SC146

FIGURE 1 - RMS CURRENT DERATING

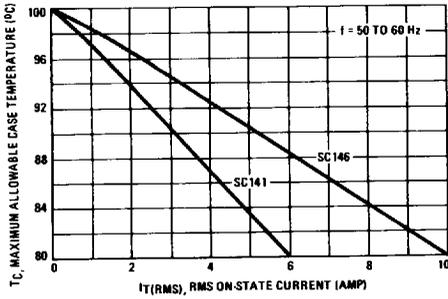


FIGURE 2 - POWER DISSIPATION

