



MOTOROLA

SC141 SC146



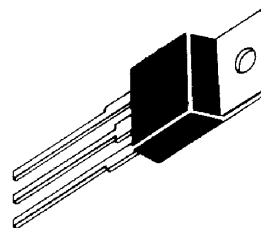
BIDIRECTIONAL TRIODE THYRISTORS

... 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 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

TRIACS

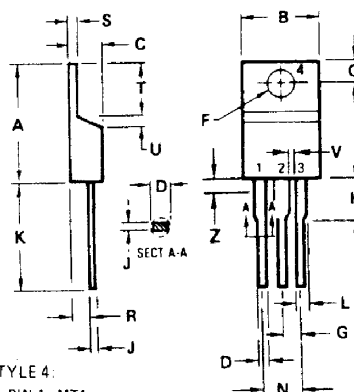
6 AND 10 AMPERES RMS
200-600 VOLTS



2.3

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage, Gate Open, SC141 } B SC146 } D E M	V_{DRM} 31819 31827	200 400 500 600	Volts
RMS On-State Current $T_C = 80^\circ C$ SC141 SC146	$I_T(RMS)$	6 10	Amp
Peak Non-Repetitive Surge Current One Full Cycle, 60 Hz SC141 SC146	I_{TSM}	80 120	Amp
Circuit Fusing Considerations $t = 8.3$ ms SC141 SC146	I^2t	26.5 60	A ² s
Peak Gate Power (Pulse Width = 10 μ s)	P_{GM}	10	Watts
Average Gate Power ($T_C = +80^\circ C$, $t = 8.3$ ms)	$P_{G(AV)}$	0.5	Watt
Peak Gate Current (Pulse Width = 10 μ s)	I_{GM}	3.5	Amp
Peak Gate Voltage	V_{GM}	10	Volts
Operating Junction Temperature Range	T_J	-40 to +100	$^\circ C$
Storage Temperature Range	T_{stg}	-40 to +125	$^\circ C$
THERMAL CHARACTERISTICS			
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case SC141 SC146	$R_{\theta JC}$	2.2 1.5	$^\circ C/W$



STYLE 4:
PIN 1. MT1
2. MT2
3. GATE
4. MT2

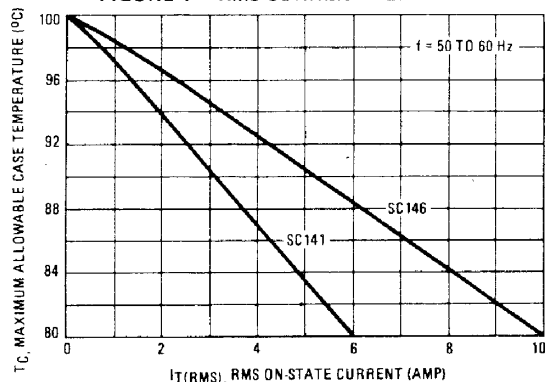
DIM	MIN	MAX	MIN	MAX
A	14.60	15.75	0.575	0.620
B	9.65	10.29	0.380	0.405
C	4.06	4.82	0.160	0.190
D	0.64	0.89	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.41	2.67	0.095	0.105
H	2.79	3.93	0.110	0.155
J	0.36	0.56	0.014	0.022
K	12.70	14.27	0.500	0.562
L	1.14	1.39	0.045	0.055
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.14	1.39	0.045	0.055
T	5.97	6.48	0.235	0.255
U	0.00	1.27	0.000	0.050
V	1.14	-	0.045	-
Z	-	2.03	-	0.080

CASE 221A - 02
TO-220 AB

All JEDEC dimensions and notes apply

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Off-State Current $V_D = \text{Rated } V_{\text{DRM}}$ Gate Open-Circuited $T_C = +25^{\circ}\text{C}$ $T_C = +100^{\circ}\text{C}$	I_{DRM}	— —	— —	0.1 0.5	mA
Peak On-State Voltage Pulse Width ≤ 1 ms, Duty Cycle $\leq 2\%$. SC141 $I_{\text{TM}} = 8.5$ A Peak SC146 $I_{\text{TM}} = 14$ A Peak	V_{TM}	— —	— —	1.83 1.65	Volts
Critical Rate of Rise of Off-State Voltage $V_D = \text{Rated } V_{\text{DRM}}$, Gate Open-Circuited, Exponential Waveform $T_C = +100^{\circ}\text{C}$	dv/dt	—	50	—	Volts/ μs
Critical Rate-of-Rise of Commutating Off-State Voltage (1) $I_{\text{T(RMS)}} = \text{Rated } I_{\text{T(RMS)}}$, $V_D = \text{Rated } V_{\text{DRM}}$, $T_C = +80^{\circ}\text{C}$ Gate Open-Circuited SC141 Commutating $di/dt = 3.2$ A/ms SC146 Commutating $di/dt = 5.4$ A/ms	$dv/dt(c)$	— 4 4	— — —	— — —	Volts/ μs
DC Gate Trigger Current $V_D = 12$ Vdc, Trigger Mode MT2 (+), Gate (+); MT2 (-), Gate (-); $R_L = 100$ Ohms MT2 (+), Gate (-); $R_L = 50$ Ohms MT2 (+), Gate (+); MT2 (-), Gate (-); $R_L = 50$ Ohms $T_C = -40^{\circ}\text{C}$ MT2 (+), Gate (-); $R_L = 25$ Ohms; $T_C = -40^{\circ}\text{C}$	I_{GT}	— — — — —	— — — — —	50 50 80 80	mA _{dc}
DC Gate Trigger Voltage $V_D = 12$ Vdc, Trigger Mode MT2 (+), Gate (+); MT2 (-), Gate (-); $R_L = 100$ Ohms MT2 (+), Gate (-); $R_L = 50$ Ohms MT2 (+), Gate (+); MT2 (-), Gate (-); $R_L = 50$ Ohms $T_C = -40^{\circ}\text{C}$ MT2 (+), Gate (-); $R_L = 25$ Ohms; $T_C = -40^{\circ}\text{C}$ $V_D = \text{Rated } V_{\text{DRM}}$; $R_L = 1000$ Ohms; All Polarities $T_C = +100^{\circ}\text{C}$	V_{GT}	— — — — 0.2	— — — — —	2.5 2.5 3.5 3.5 —	V _{dc}
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 $T_C = +25^{\circ}\text{C}$ $T_C = -40^{\circ}\text{C}$	I_{H}	— —	— —	50 100	mA _{dc}
Latching Current $V_D = 24$ Vdc Gate Trigger Source = 15 V, 100 Ohms, Trigger Mode MT2 (+), Gate (+); MT2 (-), Gate (-) MT2 (+), Gate (-) MT2 (+), Gate (+); MT2 (-), Gate (-); $T_C = -40^{\circ}\text{C}$ MT2 (+), Gate (-); $T_C = -40^{\circ}\text{C}$	I_{L}	— — — — —	— — — — —	100 200 200 400	mA _{dc}

FIGURE 1 – RMS CURRENT DERATING**FIGURE 2 – POWER DISSIPATION**