DIGITRON SEMICONDUCTORS

SC146 SERIES — BIDIRECTIONAL TRIODE THYRISTORS

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).
Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Repetitive peak off-stage voltage, gate open SC146B SC146D SC146E SC146M SC146N	V_{DRM}	 200 400 500 600 700	Volts
RMS on-state current (T_C = 80°C)	$I_{T(RMS)}$	10	Amps
Peak non-repetitive surge current (One Cycle, 60Hz)	I_{TSM}	120	Amps
Circuit fusing considerations (t = 8.3ms)	I^2t	 60	A^2s
Peak gate power (pulse width = 10µs)	P_{GM}	10	Watts
Average gate power (T_C = 80°C, t = 8.3ms)	$P_{G(AV)}$	0.5	Watts
Peak gate current (pulse width = 10µs)	I_{GM}	3.5	Amps
Peak gate voltage	V_{GM}	10	Volts
Operating junction temperature range	T_J	-40 to +100	°C
Storage temperature range	T_{stg}	-40 to +125	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	1.5	°C/W

ELECTRICAL CHARACTERISTICS

(T_C = 25°C unless otherwise noted, either polarity of MT2 to MT1, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak off state current (V_D = V_{DRM}, gate open) T_C = 25°C T_C = 100°C	I_{DRM}	 - -	 - -	 0.1 0.5	mA
Peak on-state voltage (I_{TM} = 14A peak, pulse width ≤ 1 ms, duty cycle ≤ 2%)	V_{TM}	-	-	1.65	Volts
Critical rate of rise of off-state voltage (V_D = Rated V_{DRM}, gate open, exponential waveform, T_C = 100°C)	dv/dt	-	50	-	V/µs
Critical rate of rise of commutating voltage ($I_{T(RMS)}$ = Rated $I_{T(RMS)}$, V_D = Rated V_{DRM}, commutating di/dt = 5.4A/ms, gate open, T_C = 80°C)	dv/dt(c)	4	-	-	V/µs
DC gate trigger current (continuous dc) (V_D = 12V, trigger mode) MT2(+), G(+); MT2(-), G(-); R_L = 100Ω MT2(+), G(-);R_L = 50Ω MT2(+), G(+); MT2(-), G(-); R_L = 50Ω, T_C = -40°C MT2(+), G(-);R_L = 25Ω, T_C = -40°C	I_{GT}	 - - - -	 - - - -	 50 50 80 80	mA
DC gate trigger voltage (continuous dc) (V_D = 12V, trigger mode) MT2(+), G(+); MT2(-), G(-); R_L = 100Ω MT2(+), G(-);R_L = 50Ω MT2(+), G(+); MT2(-), G(-); R_L = 50Ω, T_C = -40°C MT2(+), G(-);R_L = 25Ω, T_C = -40°C (V_D = Rated V_{DRM}, R_L = 1000Ω, T_C = 100°C) all polarities	V_{GT}	 - - - - 0.2	 - - - - -	 2.5 2.5 3.5 3.5 -	Volts

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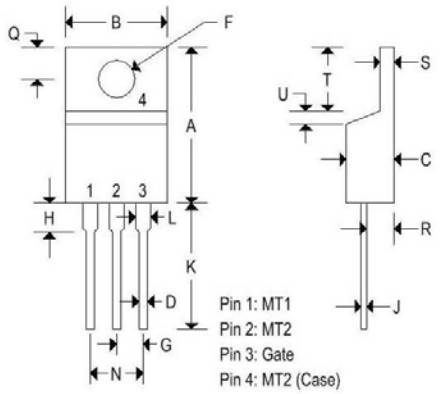
Characteristic	Symbol	Min	Typ	Max	Unit
Holding current					
(V_D = 24V, I_T = 0.5A, pulse width = 1ms, duty cycle ≤ 2%,					
gate trigger source 7V, 20Ω)	I_H				mA
T_C = 25°C		-	-	50	
T_C = -40°C		-	-	100	
Latching current					
(V_D = 24V)					
Trigger source: 15V, 100Ω, trigger mode)					
MT2(+), G(+); MT2(-), G(-)	I_L	-	-	100	mA
MT2(+), G(-)		-	-	200	
MT2(+), G(+); MT2(-), G(-), T_C = -40°C		-	-	200	
MT2(+), G(-), T_C = -40°C		-	-	400	

MECHANICAL CHARACTERISTICS

Case	TO-220AB
Marking	Alpha-numeric
Polarity	See below



	TO-220AB			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.575	0.620	14.600	15.750
B	0.380	0.405	9.650	10.290
C	0.160	0.190	4.060	4.820
D	0.025	0.036	0.640	0.890
F	0.142	0.147	3.610	3.730
G	0.095	0.105	2.410	2.670
H	0.110	0.155	2.790	3.930
J	0.014	0.022	0.360	0.560
K	0.500	0.562	12.700	14.270
L	0.045	0.055	1.140	1.390
N	0.190	0.210	4.830	5.330
Q	0.100	0.120	2.540	3.040
R	0.080	0.110	2.040	2.790
S	0.045	0.055	1.140	1.390
T	0.235	0.255	5.970	6.480
U	-	0.050	-	1.270
V	0.045	-	1.140	-
Z	-	0.080	-	2.030

FIGURE 1 – RMS CURRENT DERATING

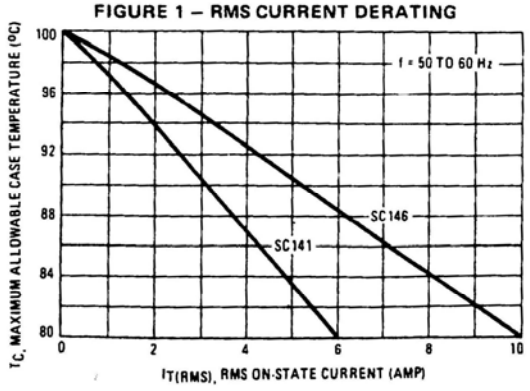
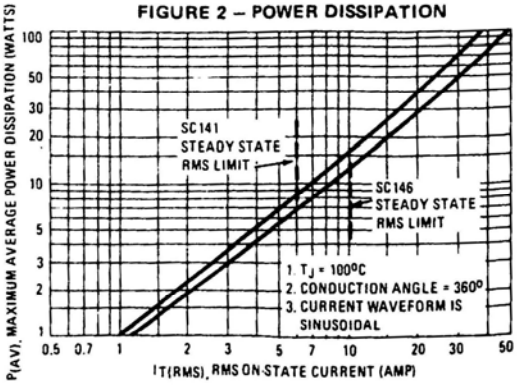


FIGURE 2 – POWER DISSIPATION



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