

DIGITRON SEMICONDUCTORS

SC149 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 SC149B SC149D SC149E SC149M	V_{DRM}	200 400 500 600	Volts
RMS on-state current ($T_C = 80^\circ\text{C}$)	$I_{T(RMS)}$	12	Amps
Peak non-repetitive surge current (One Cycle, 60Hz)	I_{TSM}	120	Amps
Circuit fusing considerations ($t = 1.0\text{ms}$)	I^2t	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 ($T_C = 80^\circ\text{C}$, $t = 8.3\text{ms}$)	$P_{G(AV)}$	0.5	Watts
Peak gate current (pulse width = $10\mu\text{s}$)	I_{GM}	3.5	Amps
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

Characteristics	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⁾ ($V_D = V_{DRM}$, gate open) $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	I_{DRM}	- -	- -	0.1 0.5	mA
Peak on-state voltage ⁽¹⁾ ($I_{TM} = 11\text{A}$ peak, pulse width $\leq 1\text{ ms}$, duty cycle $\leq 2\%$) ($I_{TM} = 17\text{A}$ peak, pulse width $\leq 1\text{ ms}$, duty cycle $\leq 2\%$)	V_{TM}	- -	- -	1.55 1.65	Volts
Critical rate of rise of off-state voltage ⁽¹⁾ ($V_D = \text{Rated } V_{DRM}$, gate open, exponential waveform, $T_C = 100^\circ\text{C}$)	dv/dt	-	200	-	$\text{V}/\mu\text{s}$
Critical rate of rise of commutating voltage ⁽¹⁾ ($I_{T(RMS)} = \text{Rated RMS on state current}$, $V_{DRM} = \text{Rated peak off state voltage}$, gate open, commutating $di/dt = 6.5\text{A/ms}$, $T_C = 80^\circ\text{C}$)	$dv/dt(c)$	4	-	-	$\text{V}/\mu\text{s}$
DC gate trigger current (continuous dc) ⁽²⁾ ($V_D = 12\text{V}$, trigger mode) MT2(+), G(+), $R_L = 100\Omega$ MT2(-), G(-), $R_L = 100\Omega$ MT2(+), G(-), $R_L = 50\Omega$ MT2(+), G(+), $R_L = 50\Omega$, $T_C = -40^\circ\text{C}$ MT2(-), G(-), $R_L = 50\Omega$, $T_C = -40^\circ\text{C}$ MT2(+), G(-), $R_L = 25\Omega$, $T_C = -40^\circ\text{C}$	I_{GT}	- - - - - -	- - - - - -	50 50 50 80 80 80	mA

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Characteristic	Symbol	Min	Typ	Max	Unit
DC gate trigger voltage (continuous dc) ⁽²⁾ ($V_D = 12V$, trigger mode) MT2(+), G(+), $R_L = 100\Omega$ MT2(-), G(-), $R_L = 100\Omega$ MT2(+), G(-), $R_L = 50\Omega$ MT2(+), G(+), $R_L = 50\Omega$, $T_C = -40^\circ C$ MT2(-), G(-), $R_L = 50\Omega$, $T_C = -40^\circ C$ MT2(+), G(-), $R_L = 25\Omega$, $T_C = -40^\circ C$ MT2(+), G(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾ MT2(-), G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾ MT2(+), G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾ MT2(-), G(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾	V_{GT}	- - - - - - 0.20 0.20 0.20 0.20	- - - - - - - - - -	2.5 2.5 2.5 3.5 3.5 3.5 - - - -	Volts
Holding current ⁽¹⁾ (main terminal voltage = 24V, peak initiating current = 0.5A, pulse width = 1ms, duty cycle $\leq 2\%$, gate trigger source = 7V, 20 Ω , $T_C = 25^\circ C$) (main terminal voltage = 24V, peak initiating current = 0.5A, pulse width = 1ms, duty cycle $\leq 2\%$, gate trigger source = 7V, 20 Ω , $T_C = -40^\circ C$)	I_H	- -	- -	50 100	mA
Latching current ⁽²⁾ (main terminal voltage = 24V, gate trigger source = 15V, 100 Ω , trigger mode) MT2(+), G(+) MT2(-), G(-) MT2(+), G(-) MT2(+), G(+), $T_C = -40^\circ C$ MT2(-), G(-), $T_C = -40^\circ C$ MT2(+), G(-), $T_C = -40^\circ C$	I_L	- - - - - -	- - - - - -	100 100 200 200 200 400	mA

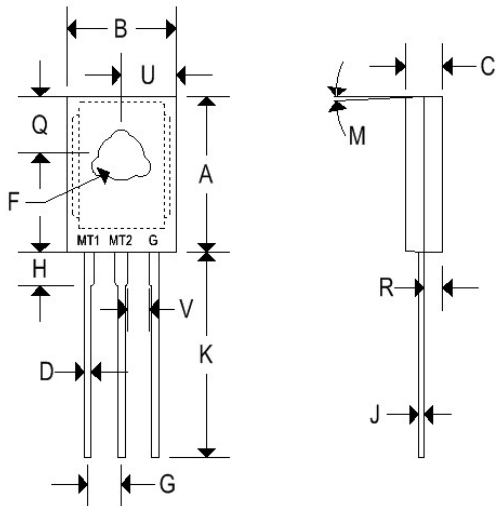
Note 1: Values apply for either polarity of Main Terminal 2 characteristics referenced to Main Terminal 1.

Note 2: Main Terminal 1 is the reference terminal.

Note 3: With V_D equal to rated off-state voltage.

MECHANICAL CHARACTERISTICS

Case	TO-220AB
Marking	Alpha-numeric
Polarity	Cathode is stud



	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	0.035	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