

DIGITRON SEMICONDUCTORS

SC250, SC251, SC250()3 SERIES

BIDIRECTIONAL TRIODE THYRISTOR

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
Peak repetitive off-state voltage SC250B, SC251B, S250B3 SC250D, SC251D, S250D3 SC250E, SC251E, S250E3 SC250M, SC251M, S250M3	V_{DRM}	200 400 500 600	Volts
Forward on-state current RMS	$I_{T(RMS)}$	15	Amps
Peak forward surge current (one cycle, sine wave, 60Hz)	I_{TSM}	100	Amps
Circuit fusing considerations (t = 1ms) (t = 8.3ms)	I^2t	20 41.5	A ² s
Peak gate power	P_{GM}	10	Watts
Average gate power	$P_{G(AV)}$	0.5	Watts
Peak gate power (pulse width = 10μs)	I_{GM}	2	Amps
Operating junction temperature range	T_J	-40 to +115	°C
Storage temperature range	T_{stg}	-40 to +125	°C
Stud torque		30	In. lb.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case SC250, SC251 SC250()3	$R_{\theta JC}$	2.0 2.3	°C/W

ELECTRICAL CHARACTERISTICS

($T_C = 25^\circ\text{C}$ unless otherwise noted. Values apply for either polarity of MT2. Characteristics referenced to MT1.)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Peak forward blocking current ($V_D = \text{rated } V_{DRM}$, gate open) $T_C = 25^\circ\text{C}$ $T_C = 115^\circ\text{C}$	I_{DRM}	- -	- -	0.1 0.5	mA
Peak on-state voltage ($I_{TM} = 21\text{A}$ peak, pulse width = 1ms, duty cycle $\leq 2\%$)	V_T	-	-	1.65	Volts
Critical rate of rise of off-state voltage (Rated V_{DRM} , gate open, exponential waveform, $T_C = 115^\circ\text{C}$)	dv/dt	100	-	-	V/μs
Critical rate of rise of commutating off-state voltage ⁽¹⁾ ($I_{T(RMS)}$ = Rated RMS on state current, $V_D = V_{DRM}$, gate open, commutating di/dt = 8A/ms) SC250, SC251: $T_C = 84^\circ\text{C}$ SC250()3: $T_C = 78^\circ\text{C}$	dv/dt(c)	4 4	- -	- -	V/μs
Gate trigger current ($V_D = 12\text{V}$) MT2(+), G(+); MT2(-), G(-); $R_L = 100\Omega$) MT2(+), G(-); $R_L = 50\Omega$)	I_{GT}	- -	- -	50 50	mA
Gate trigger current ($V_D = 12\text{V}$, $T_C = -40^\circ\text{C}$) MT2(+), G(+); MT2(-), G(-); $R_L = 50\Omega$) MT2(+), G(-); $R_L = 25\Omega$)	I_{GT}	- -	- -	80 80	mA

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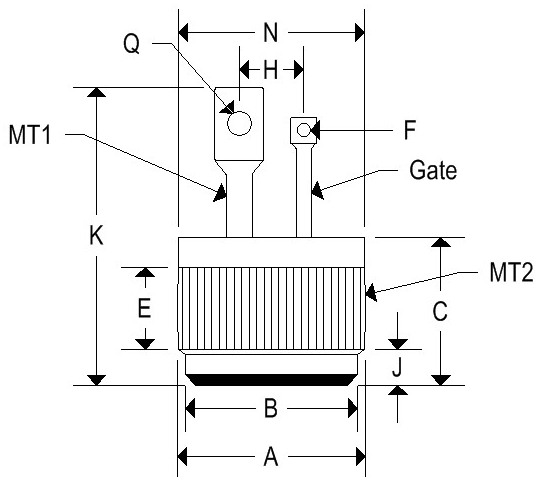
SC250, SC251, SC250()3 SERIES

BIDIRECTIONAL TRIODE THYRISTOR

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Gate trigger voltage ($V_D = 12V$) MT2(+), G(+); MT2(-), G(-); $R_L = 100\Omega$) MT2(+), G(-); $R_L = 50\Omega$)	V_{GT}	-	-	2.5	Volts
Gate trigger voltage ($V_D = 12V, T_C = -40^\circ C$) MT2(+), G(+); MT2(-), G(-); $R_L = 50\Omega$) MT2(+), G(-); $R_L = 25\Omega$)	V_{GT}	-	-	3.5	Volts
DC gate non-trigger voltage (all trigger modes) ($V_D = \text{Rated } V_{DRM}, R_L = 1k\Omega, T_C = 115^\circ C$)	V_{GD}	0.20	-	-	Volts
Holding current ($V_D = 24V$, peak initiating current = 0.5A, pulse width = 0.1 to 10ms, gate trigger source = 7V, 20 Ω) $T_C = 25^\circ C$ $T_C = -40^\circ C$	I_H	-	-	50 100	mA
Latching current ($V_D = 24V$, gate trigger source = 15V, pulse width = 50 μs , maximum rise and fall times) MT2(+), G(+); MT2(-), G(-) MT2(+), G(-), $T_C = 25^\circ C$ MT2(+), G(+); MT2(-), G(-) MT2(+), G(-), $T_C = -40^\circ C$	I_L	-	-	100 200	mA

MECHANICAL CHARACTERISTICS

Case	Digi PF2 (SC251 Series)
Marking	Body painted, alpha-numeric
Polarity	Cathode is stud



	DIGI PF2			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.501	0.505	12.730	12.830
B	0.465	0.475	11.810	12.060
C	0.330	0.380	8.390	9.650
E	0.100	-	2.540	-
F	0.035	0.085	0.890	2.160
J	0.080	0.097	2.040	2.460
K	-	0.800	-	20.320
N	-	0.510	-	12.950
Q	0.065	0.160	1.650	4.060

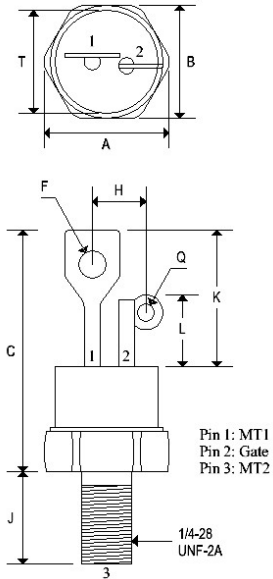
DIGITRON SEMICONDUCTORS

SC250, SC251, SC250()3 SERIES

BIDIRECTIONAL TRIODE THYRISTOR

MECHANICAL CHARACTERISTICS

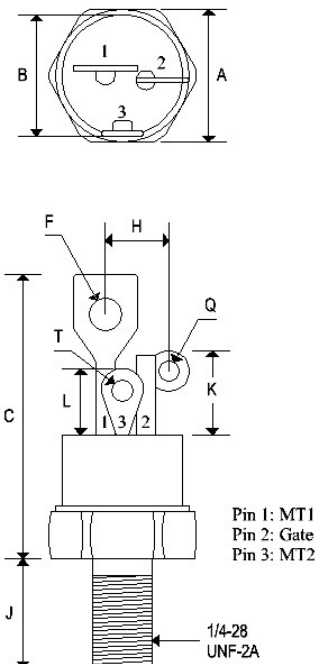
Case	TO-48 (SC250 Series)
Marking	Body painted, alpha-numeric
Polarity	Cathode is stud



	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.604	0.614	15.340	15.600
B	0.551	0.559	14.000	14.200
C	1.050	1.190	2.670	30.230
F	0.135	0.160	3.430	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.620	0.670	15.750	17.020
L	0.300	0.350	7.620	8.890
Q	0.055	0.085	1.400	2.160
T	0.501	0.505	12.730	12.830

MECHANICAL CHARACTERISTICS

Case	TO-48 ISO (SC250()3 Series)
Marking	Body painted, alpha-numeric
Polarity	Cathode is stud



	TO-48 ISO			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.551	0.559	14.000	14.200
B	0.501	0.505	12.730	12.830
C	-	1.280	-	32.510
F	-	0.160	-	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.300	0.350	7.620	8.890
L	0.255	0.275	6.480	6.990
Q	0.055	0.085	1.400	2.160
T	0.135	0.150	3.430	3.810

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FIGURE 1 - CURRENT DERATING

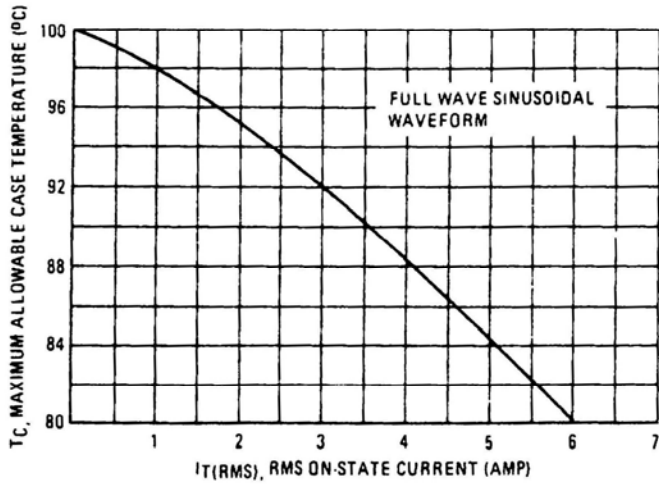


FIGURE 2 - POWER DISSIPATION

