DIGITRON SEMICONDUCTORS

MAC250 SERIES, MAC250()3 SERIES SILICON BIDIRECTIONAL 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
Peak repetitive off-state voltage SC251B, MAC250B, MAC250B3 SC251D, MAC250D, MAC250D3 SC251M, MAC250M, MAC250M3 SC251N, MAC250N	V_{DRM}	 200 400 600 800	Volts
RMS on-state current	$I_{T(RMS)}$	15	Amps
Peak non-repetitive surge current (1 cycle, 60Hz)	I_{TSM}	 100	Amps
Circuit fusing considerations (t = 1ms) (t = 8.3ms)	I^2t	 20 41.5	A^2s
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
Mounting torque		30	In. lb.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case MAC250, SC251 MAC250()3	$R_{\Theta JC}$	 2.0 2.3	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25° unless otherwise noted)

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak blocking current (V_D = Rated V_{DRM}, T_C = 25°C) (V_D = Rated V_{DRM}, T_C = 115°C)	I_{DRM}	 - -	 - -	 10 0.5	 μA mA
Peak on-state voltage (I_{TM} = 21A peak, pulse width = 1ms, duty cycle ≤ 2%)	V_{TM}	-	-	1.65	Volts
Critical rate of rise of off-state voltage (Rated V_{DRM}, exponential waveform, gate open, T_C = 115°C)	dv/dt	100	-	-	V/μs
Critical rate of rise of commutating off-state voltage ($I_{T(RMS)}$ = rated RMS on-state current, V_D = V_{DRM}, commutating di/dt = 8A/ms, gate open) T_C = 84°C, MAC250, SC251 T_C = 78°CMAC250()3	dv/dt(c)	 4 4	 - -	 - -	V/μs
DC gate trigger current (continuous dc) (V_D = 12V) MT2(+),G(+); MT2(-),G(-); R_L = 100Ω MT2(+),G(-), R_L = 50Ω	I_{GT}	 - -	 - -	 50 50	mA
DC gate trigger current (continuous dc) (V_D = 12V, T_C = -40°C) MT2(+),G(+); MT2(-),G(-); R_L = 50Ω MT2(+),G(-), R_L = 25Ω	I_{GT}	 - -	 - -	 80 80	mA

144 Market Street
Kenilworth NJ 07033 USA

phone +1.908.245-7200
fax +1.908.245-0555

sales@digitroncorp.com
www.digitroncorp.com

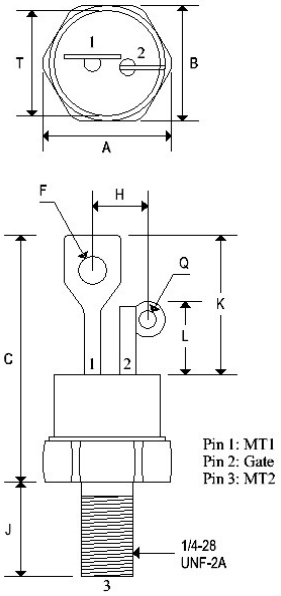
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Characteristic	Symbol	Min	Typ.	Max	Unit
Gate trigger voltage (continuous dc) (V_D = 12V) MT2(+),G(+); MT2(-),G(-); R_L = 100Ω MT2(+),G(-), R_L = 50Ω	V_{GT}	 - -	 - -	 2.5 2.5	Volts
Gate trigger voltage (continuous dc) (V_D = 12V, T_C = -40°C) MT2(+),G(+); MT2(-),G(-); R_L = 50Ω MT2(+),G(-), R_L = 25Ω	V_{GT}	 - -	 - -	 3.5 3.5	Volts
DC gate non-trigger voltage (V_D = Rated V_{DRM}, R_L = 1kΩ, T_C = 115°C) All trigger modes	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, 20Ω) T_C = 25°C T_C = -40°C	I_H	 - -	 - -	 50 100	mA
Latching current (V_D = 24V, gate trigger source = 15V, 100Ω, pulse width = 50µs, 5µs maximum rise and fall times) MT2(+),G(+); MT2(-),G(-); MT2(+),G(-), T_C = 25°C MT2(+),G(+); MT2(-),G(-); MT2(+),G(-), T_C = -40°C	I_L	 - -	 - -	 100 200	mA

MECHANICAL CHARACTERISTIC

Case	TO-48 (MAC250 Series)
Marking	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

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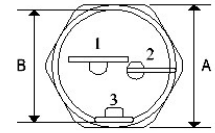
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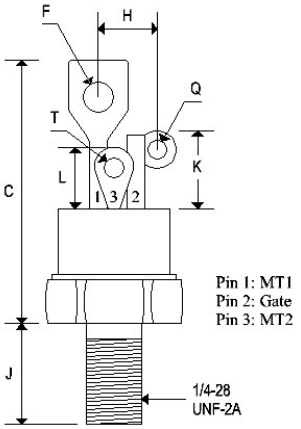
D I G I T R O N S E M I C O N D U C T O R S

MAC250 SERIES, MAC250()3 SERIES SILICON BIDIRECTIONAL THYRISTORS

MECHANICAL CHARACTERISTIC

Case	TO-48 ISO (MAC250()3 Series)
Marking	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

FIGURE 1 – CURRENT DERATING

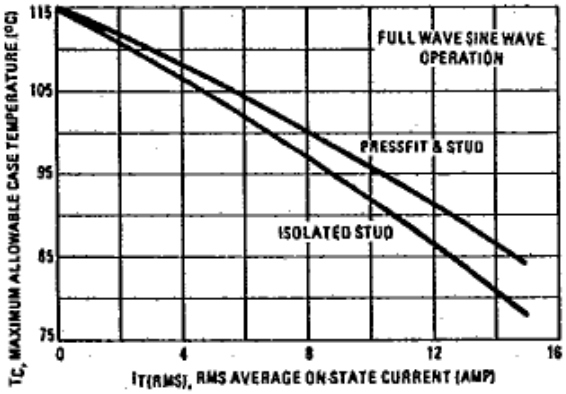
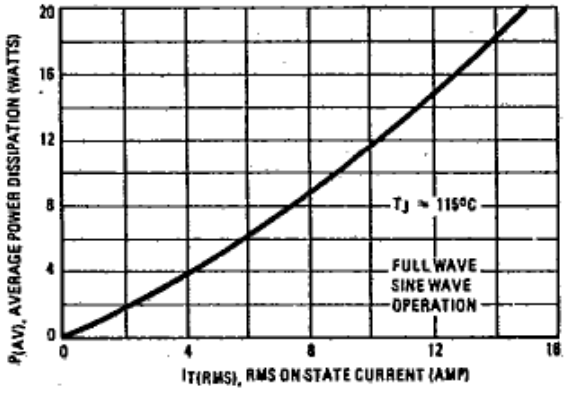


FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION



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