DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

MAC218(A) SERIES

SILICON BIDIRECTIONAL THYRISTORS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak repetitive off-state voltage[1] (T_J = 25 to +125°C, gate open) MAC218-4, MAC218A-4 MAC218-5, MAC218A-5 MAC218-6, MAC218A-6 MAC218-7, MAC218A-7 MAC218-8, MAC218A-8 MAC218-9, MAC218A-9 MAC218-10, MAC218A-10	V_{DRM}	 200 300 400 500 600 700 800	Volts
RMS on-state current (conduction angles = 360°, T_C = 80°C)	$I_{T(RMS)}$	8	Amps
Peak non-repetitive surge current (1 cycle, 60 Hz, T_C = 80°C, preceded and followed by rated current)	I_{TSM}	100	Amps
Circuit fusing considerations (t = 8.3ms)	I^2t	40	A^2s
Peak gate power (T_C = 80°C, pulse width = 2µs)	P_{GM}	16	Watts
Average gate power (T_C = 80°C, t = 8.3ms)	$P_{G(AV)}$	0.35	Watts
Peak gate trigger current (pulse width = 1µs)	I_{GTM}	4	Amps
Operating junction temperature range	T_J	-40 to +125	°C
Storage temperature range	T_{stg}	-40 to +150	°C

Note 1: V_{DRM} for all types can be applied on a continuous basis. Blocking voltage shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	2.2	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak blocking current (either direction) (V_D = Rated V_{DRM}, gate open @ T_J = 25°C) (V_D = Rated V_{DRM}, gate open @ T_J = 125°C)	I_{DRM}	 - -	 - -	 10 2	 µA mA
Peak on-state voltage (either direction) (I_{TM} = 11.3A peak, pulse width = 1 to 2 ms, duty cycle ≤ 2%)	V_{TM}	-	1.7	2.0	Volts
Gate trigger current (continuous dc) (V_D = 12V, R_L = 12Ω) Trigger Mode MT2(+),G(+); MT2(+),G(-); MT2(-),G(-) MT2(-),G(+) "A" suffix only	I_{GT}	 - -	 - -	 50 75	 mA
Gate trigger voltage (continuous dc)	V_{GT}				Volts

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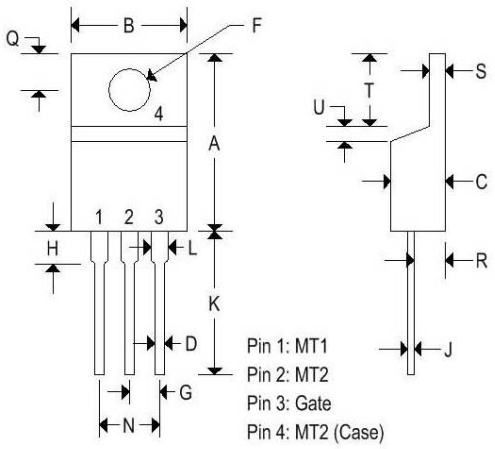
(main terminal voltage = 12V, R_L = 100Ω)					
MT2(+),G(+)		-	0.9	2	
MT2(+),G(-)		-	0.9	2	
MT2(-),G(-)		-	1.1	2	
MT2(-),G(+) "A" suffix only		-	1.4	2.5	
(main terminal voltage= Rated V_{DRM}, R_L = 10kΩ, T_J = 125°C)					
MT2(+), G(+); MT2(-), G(-); MT2(+), G(-)		0.2	-	-	
MT2(-), G(+) "A" suffix only		0.2	-	-	
Holding current (either direction)	I_H				mA
(V_D = 24V, gate open, initiating current = 200mA)		-	-	50	
Critical rate of rise of commutating off-state voltage	dv/dt(c)	-	5	-	V/µs
(V_D = Rated V_{DRM}, I_{TM} = 11.3A, commutating di/dt = 4.1A/ms, gate unenergized, T_C = 80°C)					
Critical rate of rise of off-state voltage	dv/dt				V/µs
(V_D = Rated V_{DRM}, exponential voltage rise, gate open, T_J = 125°C)		-	100	-	

MECHANICAL CHARACTERISTICS

Case	TO-220AB
Marking	Alpha-numeric
Pin out	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	0.035	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

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FIGURE 1 — CURRENT DERATING

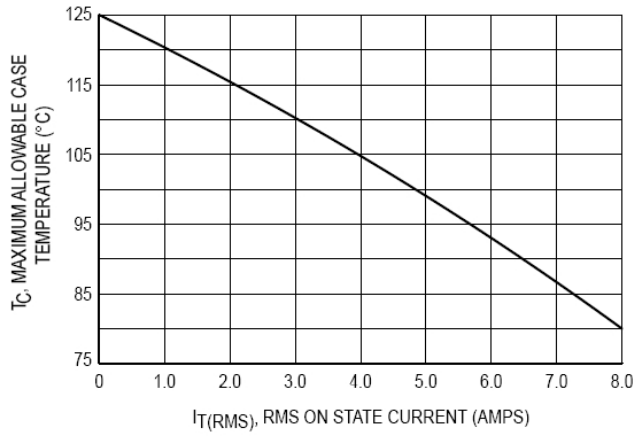

FIGURE 2 — POWER DISSIPATION

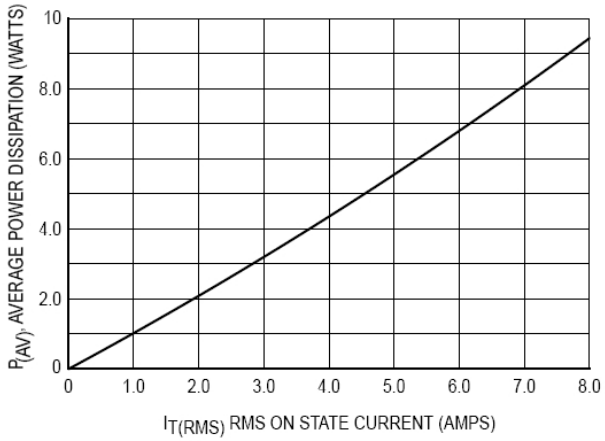

FIGURE 3 — NORMALIZED GATE TRIGGER CURRENT

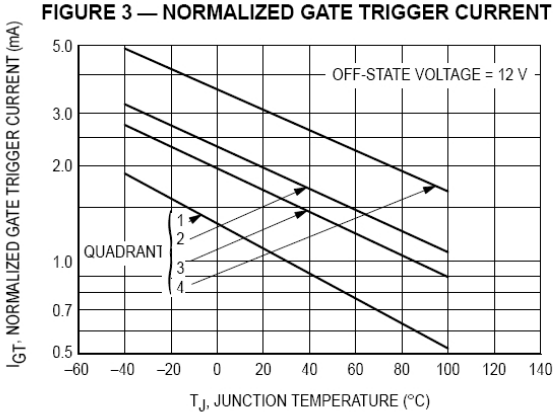

FIGURE 4 — NORMALIZED GATE TRIGGER VOLTAGE

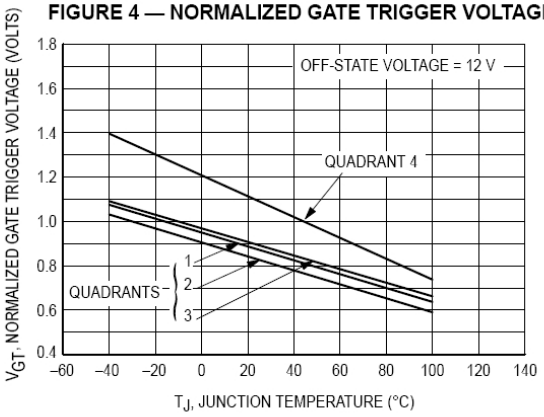

FIGURE 5 — NORMALIZED HOLDING CURRENT