

DIGITRON SEMICONDUCTORS

MAC219 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 ⁽¹⁾ (T _J = -40 to +125°C) MAC219-4 MAC219-6 MAC219-8 MAC219-10	V _{DRM}	200 400 600 800	Volts
Peak gate voltage	V _{GM}	±10	Volts
RMS on-state current (conduction angle = 360°, T _C = 80°C)	I _{T(RMS)}	8.0	Amps
Peak non-repetitive surge current (1 cycle, 60 Hz)	I _{TSM}	100	Amps
Circuit fusing considerations (t = 8.3ms)	I ² t	35	A ² s
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 = 1.0µs)	I _{GM}	4.0	Amps
Operating junction temperature range	T _J	-40 to +125	°C
Storage temperature range	T _{stg}	-40 to +150	°C

Note 1: Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	R _{θJC}	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} @ T _J = 25°C) (V _D = Rated V _{DRM} @ 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) (main terminal voltage = 12V, R _L = 12Ω) Trigger mode MT2(+),G(+); MT2(+),G(-); MT2(-),G(-)	I _{GT}	-	-	100	mA
Gate trigger voltage (continuous dc) (main terminal voltage = 12V, R _L = 100Ω) MT2(+),G(+) MT2(+),G(-) MT2(-),G(-) (main terminal voltage = Rated V _{DRM} , R _L = 10kΩ, T _J = 125°C) MT2(+), G(+); MT2(-), G(-); MT2(+), G(-)	V _{GT}	- - - 0.2	0.9 0.9 1.1 -	2 2 2 -	Volts

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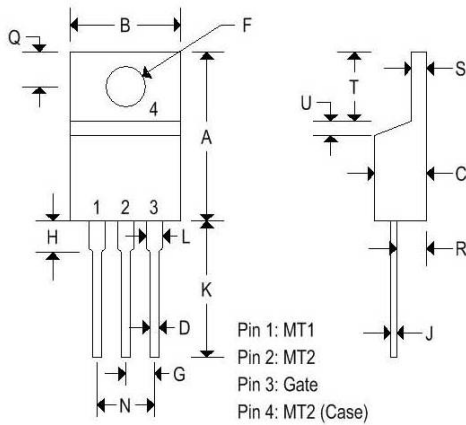
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SILICON BIDIRECTIONAL THYRISTORS

Characteristic	Symbol	Min	Typ.	Max	Unit
Holding current (either direction) (main terminal voltage= 12V, gate open, initiating current = 200mA)	I_H	-	-	100	mA
Rate of rise of commutation voltage (Rated V_{DRM} , $I_{T(RMS)} = 6.0A$, commutating $di/dt = 4.3A/ms$, gate unenergized, $T_C = 80^\circ C$)	$dv/dt(c)$	-	5.0	-	V/ μs
Critical rate of rise of off-state voltage ($V_D = \text{Rated } V_{DRM}$, exponential voltage rise, gate open, $T_C = 25^\circ C$) ($V_D = \text{Rated } V_{DRM}$, exponential voltage rise, gate open, $T_C = 125^\circ C$)	dv/dt	500 200	- -	- -	V/ μs

MECHANICAL CHARACTERISTIC

Case	TO-220AB
Marking	Body painted, 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

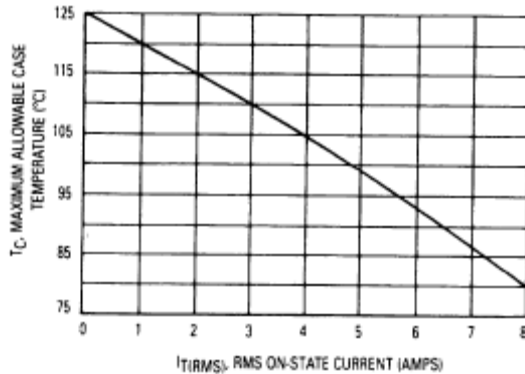


Figure 1. Current Derating

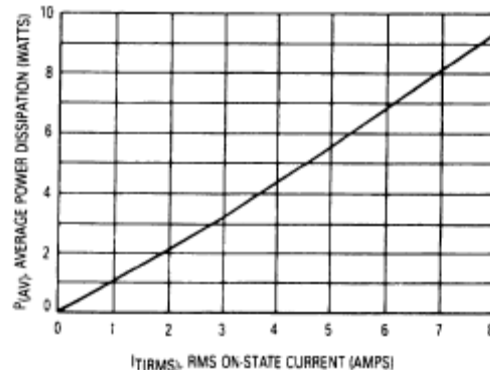


Figure 2. Power Dissipation