DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

MAC321 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 = -40 to +125°C, ½ sine wave, 50 to 60Hz, gate open) MAC321-4 MAC321-6 MAC321-8 MAC321-10	V_{DRM}	 200 400 600 800	Volts
Peak gate voltage	V_{GM}	10	Volts
RMS on-state current (Full cycle sine wave, 50 to 60Hz, T_C = 75°C)	$I_{T(RMS)}$	20	Amps
Peak non-repetitive surge current (1 cycle, 60Hz, T_C = 75°C, preceded and followed by rated current)	I_{TSM}	 150	Amps
Circuit fusing considerations (t = 8.3ms)	I^2t	93	A^2s
Peak gate power (T_C = 75°C, t ≤ 2μs)	P_{GM}	20	Watts
Average gate power (T_C = 75°C, t ≤ 8.3ms)	$P_{G(AV)}$	0.5	Watts
Peak gate current	I_{GM}	2	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 voltages 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	$R_{\Theta JC}$	1.8	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C and either polarity of MT2 to MT1 voltage unless otherwise noted)

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak blocking current (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} = 28A peak, pulse width ≤ 2ms, duty cycle ≤ 2%.)	V_{TM}	-	1.4	1.7	Volts
Gate trigger current (continuous dc) (V_D = 12V, R_L = 100Ω) MT2(+),G(+) MT2(+),G(-) MT2(-),G(-)	I_{GT}	 - - -	 - - -	 100 100 100	 mA
Gate trigger voltage (continuous dc) (V_D = 12V, R_L = 100Ω) MT2(+),G(+) MT2(+),G(-) MT2(-),G(-) (V_D = Rated V_{DRM}, R_L = 10kΩ, T_J = 125°C) MT2(+),G(+); MT2(+),G(-); MT2(-),G(-)	V_{GT}	 - - - 0.2	 - - - -	 2.0 2.0 2.0 -	 Volts

DIGITRON™ Semiconductors

High-reliability discrete products and engineering services since 1977

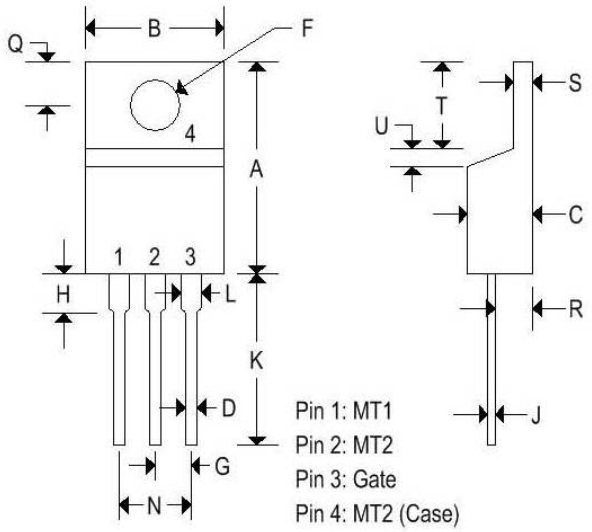
MAC321 SERIES

SILICON BIDIRECTIONAL THYRISTORS

Holding current (either direction) (V_D = 12V, I_{TM} = 200mA, gate open)	I_H	-	-	100	mA
Gate controlled turn-on time (V_D = Rated V_{DRM}, I_{TM} = 28A, I_{GT} = 120mA, rise time = 0.1µs, pulse width = 2µs)	t_{gt}	-	1.5	-	µs
Critical rate of rise of off state voltage (V_D = Rated V_{DRM}, exponential voltage rise, gate open, T_J = 25°C) (V_D = Rated V_{DRM}, exponential voltage rise, gate open, T_J = 125°C)	dv/dt(s)	500 200	- -	- -	V/µs

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

DIGITRON™ Semiconductors

High-reliability discrete products and engineering services since 1977

MAC321 SERIES

SILICON BIDIRECTIONAL THYRISTORS

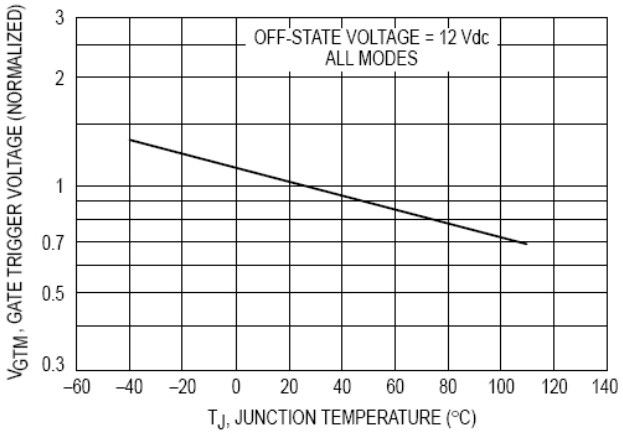


Figure 3. Typical Gate Trigger Voltage

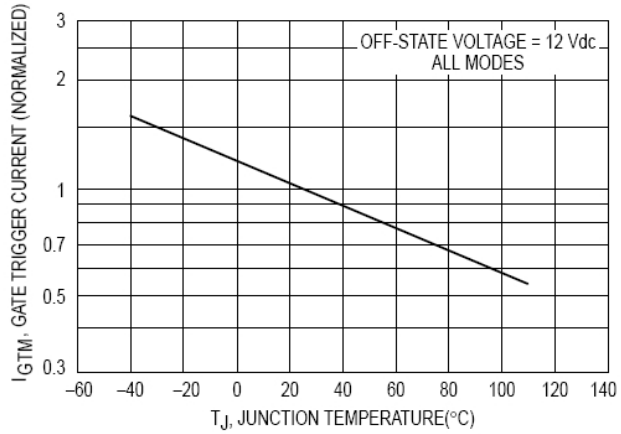


Figure 4. Typical Gate Trigger Current

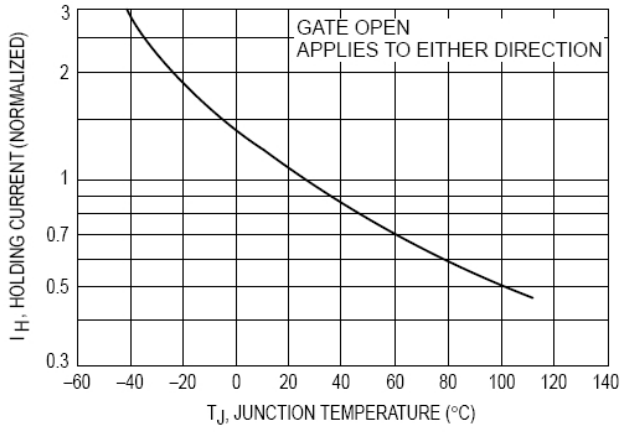


Figure 6. Typical Holding Current

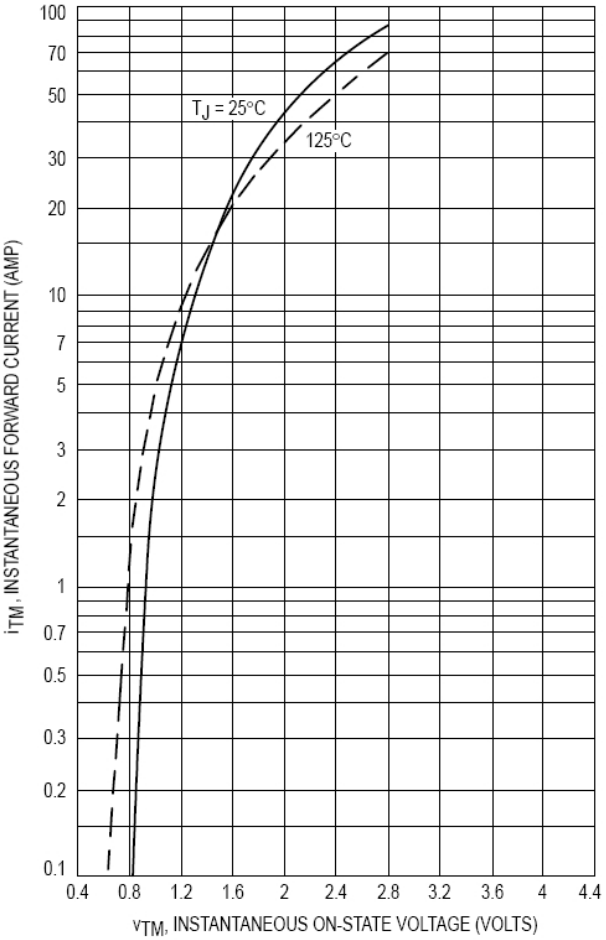


Figure 5. Maximum On-State Characteristics

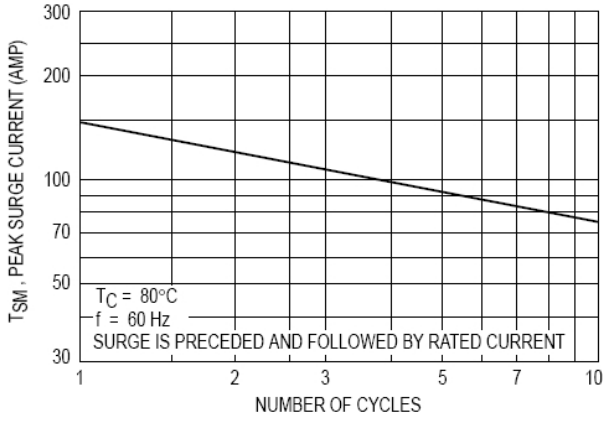


Figure 7. Maximum On-Repetitive Surge Current

MAC321 SERIES

SILICON BIDIRECTIONAL THYRISTORS

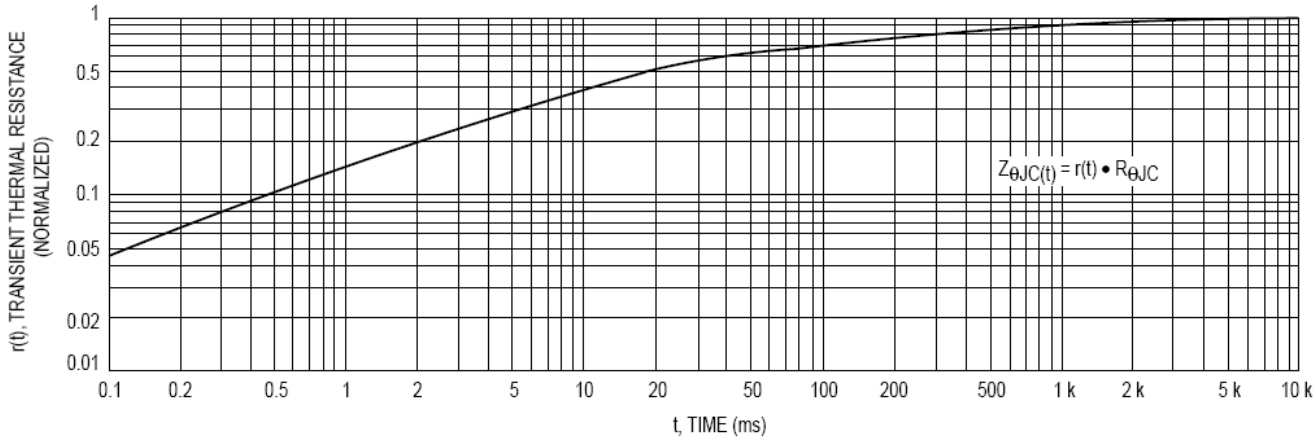


Figure 8. Thermal Response