

DIGITRON SEMICONDUCTORS

MAC10 SERIES MAC11 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 = 100°C) MAC10-1,MAC11-1 MAC10-2,MAC11-2 MAC10-3,MAC11-3 MAC10-4,MAC11-4 MAC10-5,MAC11-5 MAC10-6,MAC11-6 MAC10-7,MAC11-7 MAC10-8,MAC11-8	V _{DRM}	25 50 100 200 300 400 500 600	Volts
RMS on-state current (T _C = 75°C)	I _{T(RMS)}	10	Amps
Peak non-repetitive surge current (1 cycle, 60Hz, T _J = -40 to + 100°C)	I _{TSM}	100	Amps
Circuit fusing considerations (T _J = -40 to + 100°C, t = 8.3ms)	I ² t	40	A ² s
Peak gate power	P _{GM}	10	Watts
Average gate power	P _{G(AV)}	0.5	Watts
Peak gate current	I _{GM}	2	Amps
Operating junction temperature range	T _J	-40 to +100	°C
Storage temperature range	T _{stg}	-40 to +150	°C
Mounting torque (6-32 screw) ⁽²⁾		8	In. lb.

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.

Note 2: Torque rating applies with use of torque washer. Mounting torque in excess of 8 in. lb. does not appreciably lower case to sink thermal resistance. Anode lead and heatsink contact pad are common.

* Soldering temperatures shall not exceed 200°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	R _{θJC}	2.0	°C/W
Thermal resistance, junction to ambient	R _{θJA}	50	°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 = 100°C)	I _{DRM}	-	-	2.0	mA
Peak on-state voltage (either direction) (I _{TM} = 14A peak)	V _{TM}	-	1.3	1.8	Volts
Gate trigger current (continuous dc) (V _D = 12V, R _L = 100Ω) MT2(+),G(+); MT2(-),G(-) , MAC10, MAC11 MT2(+),G(-); MT2(-), G(+), MAC10	I _{GT}	-	-	50 75	mA
Gate trigger voltage (continuous dc) (V _D = 12V, R _L = 100Ω) MT2(+),G(+); MT2(-),G(-) , MAC10, MAC11 MT2(+),G(-); MT2(-), G(+), MAC10	V _{GT}	-	0.9 1.0	2.0 2.5	Volts
Gate trigger voltage (continuous dc) (V _D = Rated V _{DRM} , R _L = 100Ω, T _J = 100°C) All modes	V _{GD}	0.2	-	-	Volts

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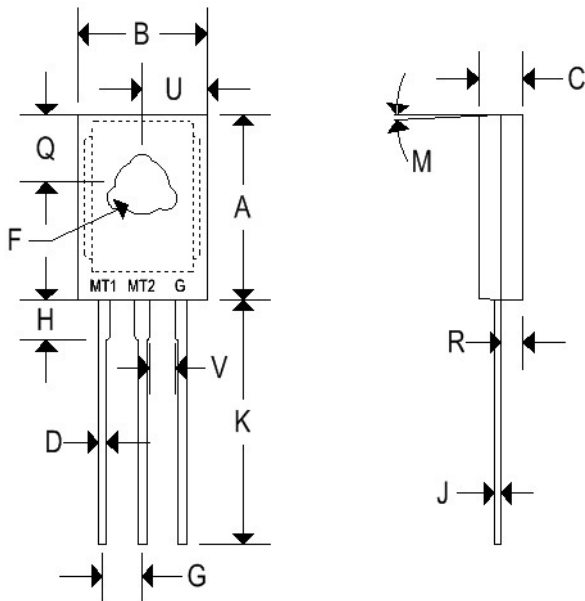
MAC10 SERIES
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SILICON BIDIRECTIONAL THYRISTORS

Characteristic	Symbol	Min	Typ.	Max	Unit
Holding current (either direction) ($V_D = 12V$, $I_{TM} = 100mA$, gate open)	I_H	-	-	50	mA
Gate controlled turn-on time ($I_{TM} = 14A$, $I_{GT} = 100mA$)	t_{on}	-	1.5	-	μs
Blocking voltage application rate at commutation (@ V_{DRM} , $T_J = 75^\circ C$, gate open)	dv/dt	-	5.0	-	$V/\mu s$

MECHANICAL CHARACTERISTIC

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 - AVERAGE CURRENT DERATING

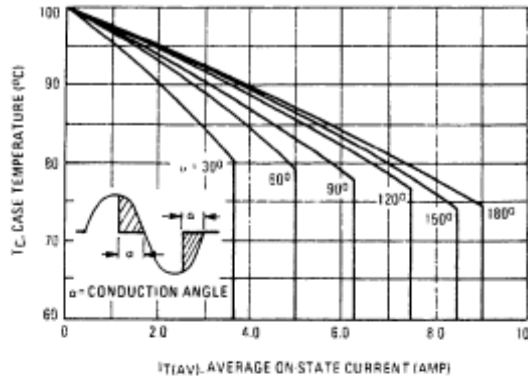


FIGURE 2 - RMS CURRENT DERATING

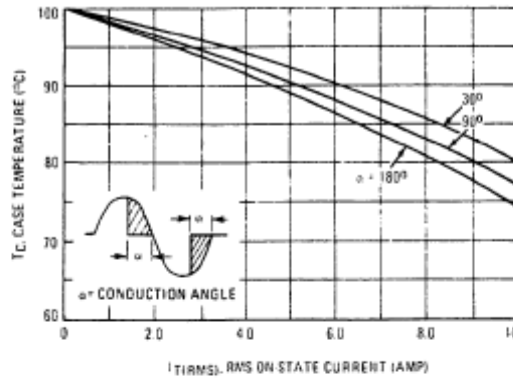


FIGURE 3 - POWER DISSIPATION

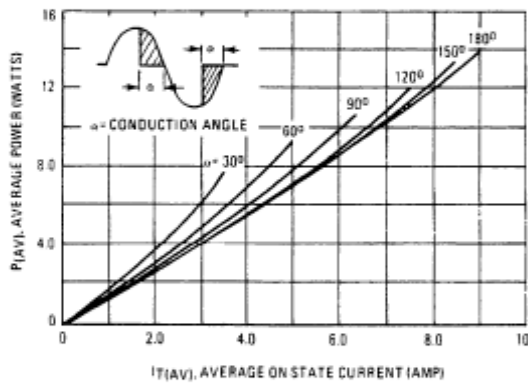


FIGURE 4 - POWER DISSIPATION

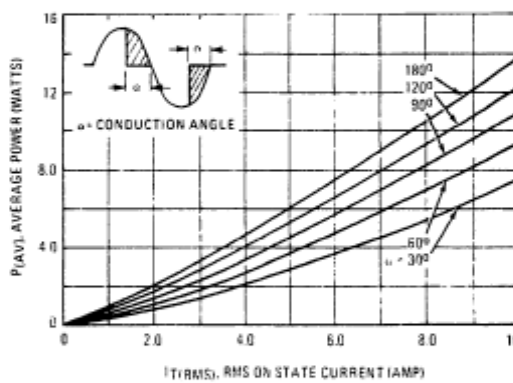


FIGURE 5 - TYPICAL GATE TRIGGER VOLTAGE

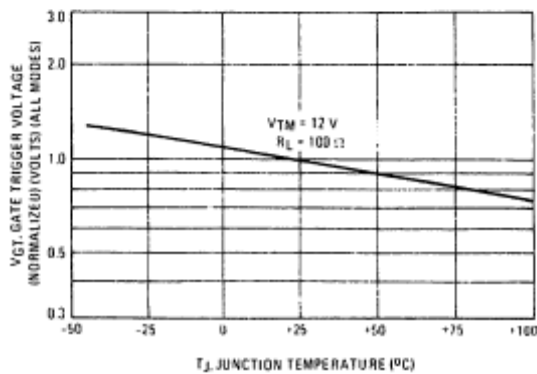
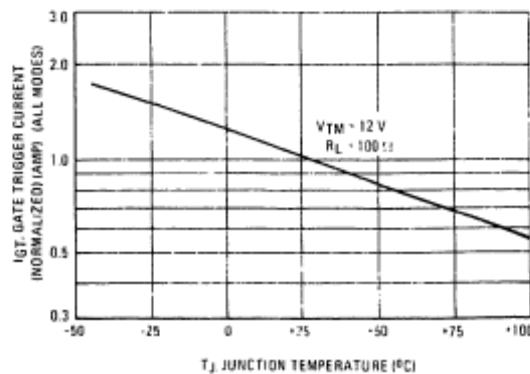


FIGURE 6 - TYPICAL GATE TRIGGER CURRENT



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FIGURE 7 - MAXIMUM ON-STATE CHARACTERISTICS

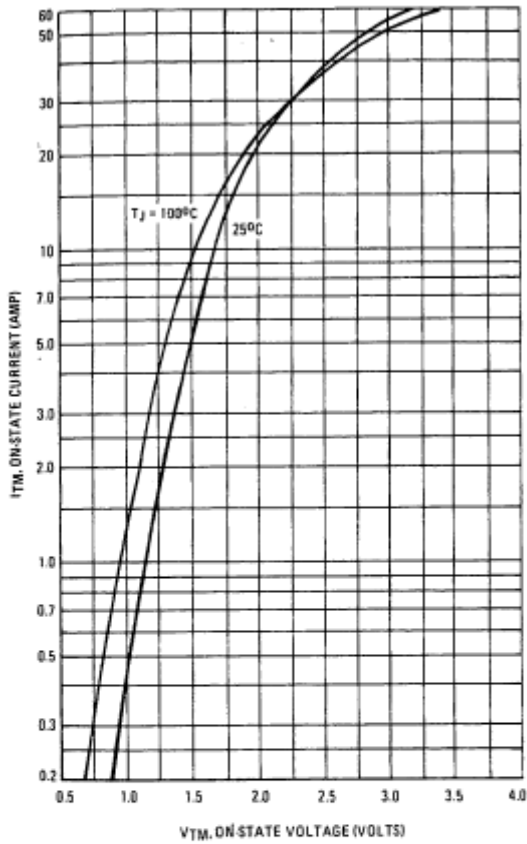


FIGURE 8 - TYPICAL HOLDING CURRENT

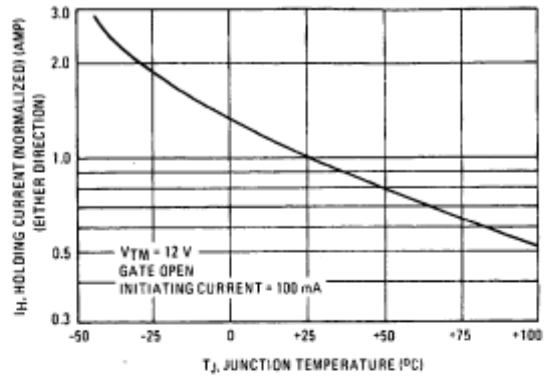


FIGURE 9 - MAXIMUM ALLOWABLE SURGE CURRENT

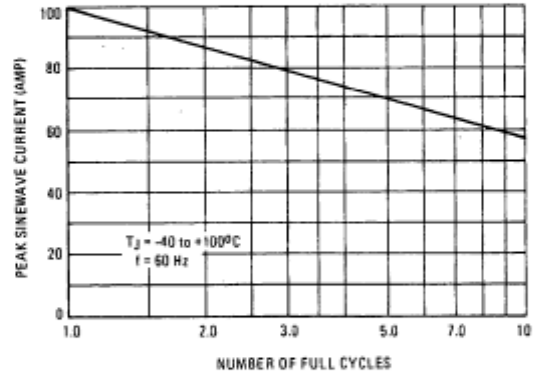


FIGURE 10 - THERMAL RESPONSE

