

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⁾ ($T_J = 100^\circ\text{C}$) 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 ($T_C = 75^\circ\text{C}$)	$I_{\text{T(RMS)}}$	10	Amps
Peak non-repetitive surge current (1 cycle, 60Hz, $T_J = -40$ to $+100^\circ\text{C}$)	I_{TSM}	100	Amps
Circuit fusing considerations ($T_J = -40$ to $+100^\circ\text{C}$, $t = 8.3\text{ms}$)	I^2t	40	A^2s
Peak gate power	P_{GM}	10	Watts
Average gate power	$P_{\text{G(AV)}}$	0.5	Watts
Peak gate current	I_{GM}	2	Amps
Operating junction temperature range	T_J	-40 to +100	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +150	$^\circ\text{C}$
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	$R_{\theta\text{JC}}$	2.0	$^\circ\text{C/W}$
Thermal resistance, junction to ambient	$R_{\theta\text{JA}}$	50	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak blocking current (either direction) ($V_D = \text{Rated } V_{\text{DRM}}$, gate open, $T_J = 100^\circ\text{C}$)	I_{DRM}	-	-	2.0	mA
Peak on-state voltage (either direction) ($I_{\text{TM}} = 14\text{A peak}$)	V_{TM}	-	1.3	1.8	Volts
Gate trigger current (continuous dc) ($V_D = 12\text{V}$, $R_L = 100\Omega$) MT2(+),G(+); MT2(-),G(-) , MAC10, MAC11 MT2(+),G(-); MT2(-), G(+), MAC10	I_{GT}	-	-	50 75	mA
Gate trigger voltage (continuous dc) ($V_D = 12\text{V}$, $R_L = 100\Omega$) 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) ($V_D = \text{Rated } V_{\text{DRM}}$, $R_L = 100\Omega$, $T_J = 100^\circ\text{C}$) All modes	V_{GD}	0.2	-	-	Volts

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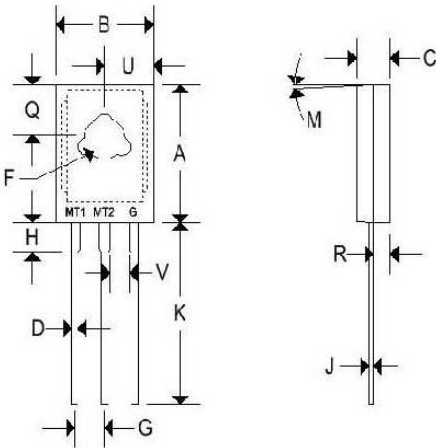
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Characteristic	Symbol	Min	Typ.	Max	Unit
Holding current (either direction) ($V_D = 12V, I_{TM} = 100mA$, gate open)	I_H	-	-	50	mA
Gate controlled turn-on time ($I_{TM} = 14A, I_{GT} = 100mA$)	t_{on}	-	1.5	-	μs
Blocking voltage application rate at commutation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

MECHANICAL CHARACTERISTIC

Case	TO-127
Marking	Alpha-numeric
Pin out	See below



	TO-127			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.635	0.645	16.130	16.380
B	0.495	0.505	12.570	12.830
C	0.125	0.135	3.180	3.430
D	0.043	0.049	1.090	1.240
F	0.138	0.148	3.510	3.760
G	0.166 BSC		4.220 BSC	
H	0.105	0.115	2.670	2.920
J	0.032	0.034	0.813	0.864
K	0.595	0.645	15.110	16.380
M	9° TYP		9° TYP	
Q	0.185	0.195	4.700	4.950
R	0.075	0.085	1.910	2.160
U	0.245	0.255	6.220	6.480
V	0.080	-	2.030	-

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FIGURE 1 - AVERAGE CURRENT DERATING

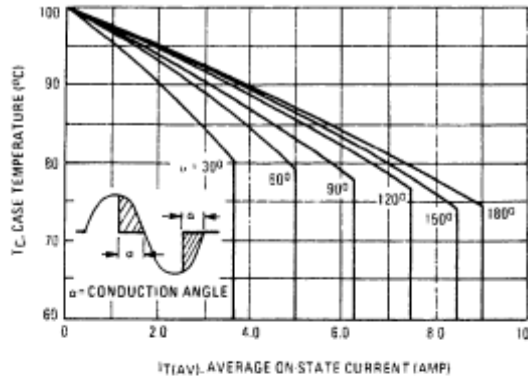


FIGURE 2 - RMS CURRENT DERATING

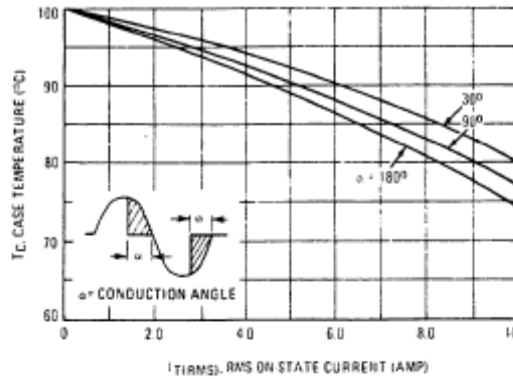


FIGURE 3 - POWER DISSIPATION

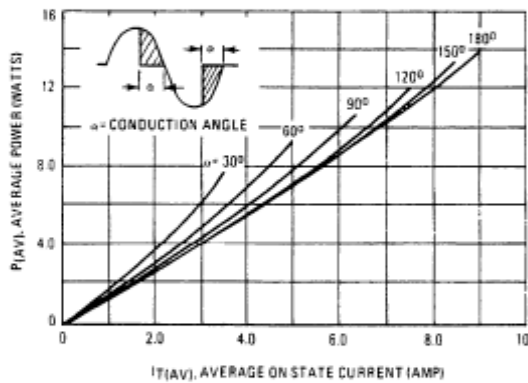


FIGURE 4 - POWER DISSIPATION

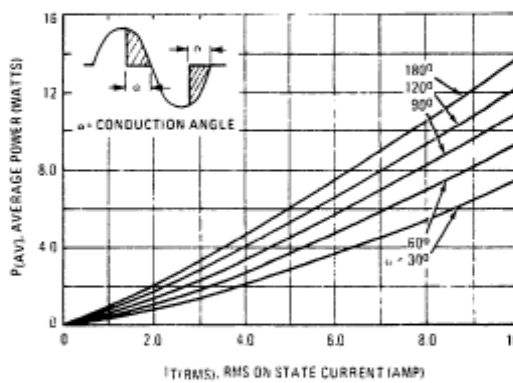


FIGURE 5 - TYPICAL GATE TRIGGER VOLTAGE

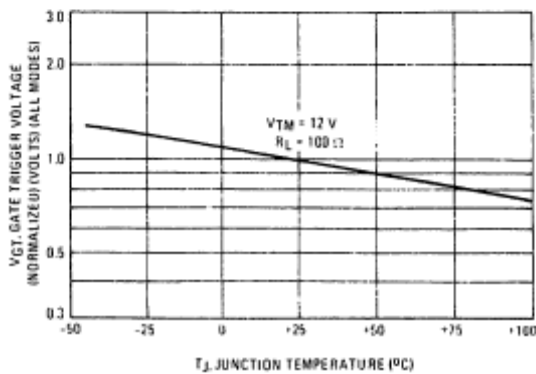
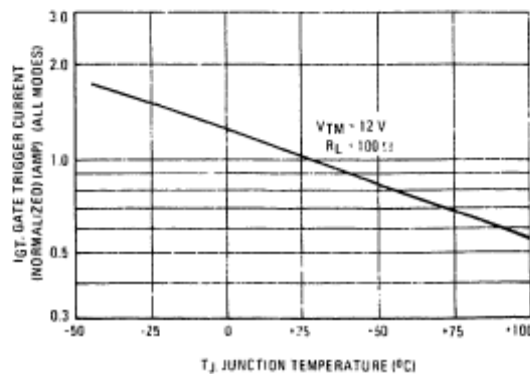


FIGURE 6 - TYPICAL GATE TRIGGER CURRENT



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FIGURE 7 - MAXIMUM ON-STATE CHARACTERISTICS

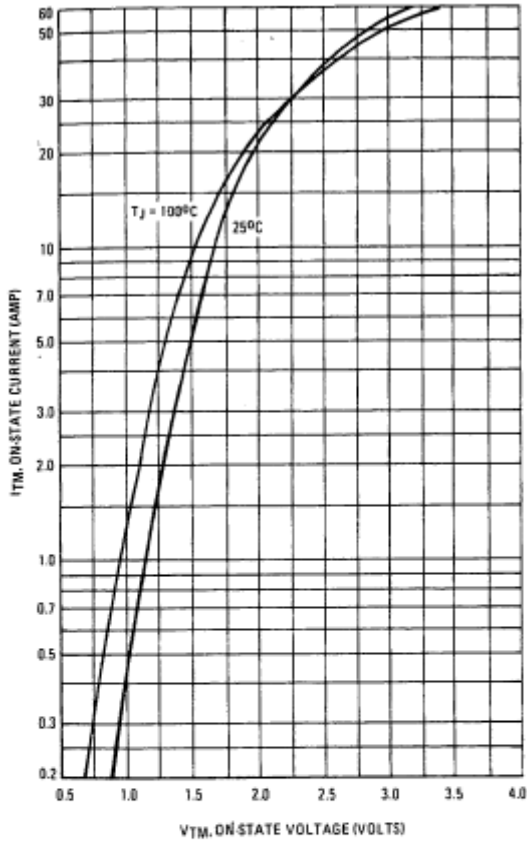


FIGURE 8 - TYPICAL HOLDING CURRENT

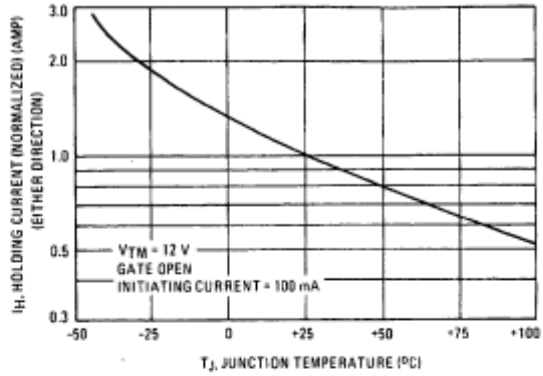


FIGURE 9 - MAXIMUM ALLOWABLE SURGE CURRENT

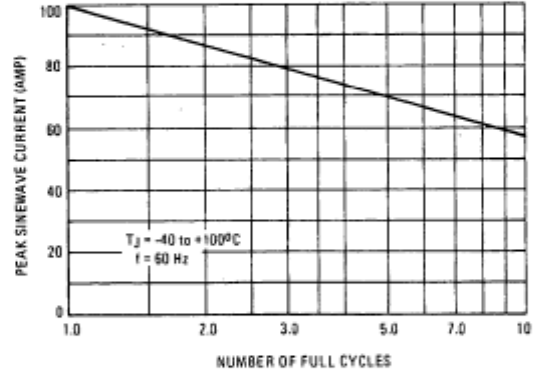


FIGURE 10 - THERMAL RESPONSE

