DIGITRON SEMICONDUCTORS

MAC37 SERIES
MAC38 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 = 110°C) MAC37-1,MAC38-1 MAC37-2,MAC38-2 MAC37-3,MAC38-3 MAC37-4,MAC38-4 MAC37-5,MAC38-5 MAC37-6,MAC38-6 MAC37-7,MAC38-7	V_{DRM}	 25 50 100 200 300 400 500	Volts
RMS on-state current	$I_{T(RMS)}$	25	Amps
Peak non-repetitive surge current (1 cycle, 60Hz, T_J = -40 to + 110°C)	I_{TSM}	225	Amps
Circuit fusing considerations (T_J = -40 to + 110°C, t = 8.3ms)	I^2t	210	A^2s
Peak gate power (2)	P_{GM}	5.0	Watts
Average gate power	$P_{G(AV)}$	0.5	Watts
Peak gate current (2)	I_{GM}	2	Amps
Operating junction temperature range	T_J	-40 to +110	°C
Storage temperature range	T_{stg}	-40 to +150	°C
Mounting torque		30	In. lb.

Note 1: For either direction of blocking voltage. V_{DRM} for all types can be applied on a continuous dc basis without incurring damage. 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: T_J = 110°C, 1 second maximum duration: 5.0% duty cycle, I_{TM} = 10A.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	1.0	°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 = 110°C)	I_{DRM}	-	-	2.0	mA
Peak on-state voltage (either direction) (I_{TM} = 35A peak)	V_{TM}	-	1.4	1.9	Volts
Gate trigger current (continuous dc) (3) (V_D = 7V, R_L = 47Ω) MT2(+),G(+); MT2(-),G(-)	I_{GT}	-	20	75	mA
Gate trigger voltage (continuous dc) (3) (V_D = 7V, R_L = 47Ω) MT2(+),G(+); MT2(-),G(-)	V_{GT}	-	1.0	3.0	Volts
Gate trigger voltage (continuous dc) (3) (V_D = Rated V_{DRM}, R_L = 100Ω, T_J = 110°C) MT2(+),G(+); MT2(-),G(-)	V_{GD}	0.2	-	-	Volts
Holding current (either direction) (V_D = 7V, I_{TM} = 150mA, gate open)	I_H	-	10	75	mA
Gate controlled turn-on time (I_{TM} = 25A, I_{GT} = 200mA)	t_{on}	-	1.0	-	µs

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D I G I T R O N S E M I C O N D U C T O R S

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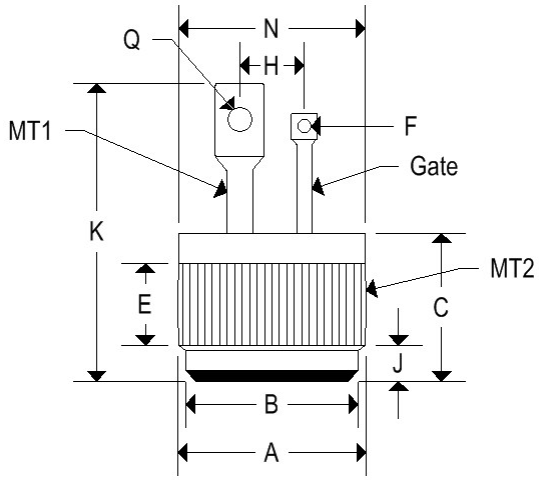
Characteristic	Symbol	Min	Typ.	Max	Unit
Critical forward voltage application rate (@ $V_{DRM,}$ T_J = 110°C, gate open)	dv/dt	-	100	-	V/µs

Note 3: All voltage polarity reference to Main Terminal 1.

MECHANICAL CHARACTERISTIC

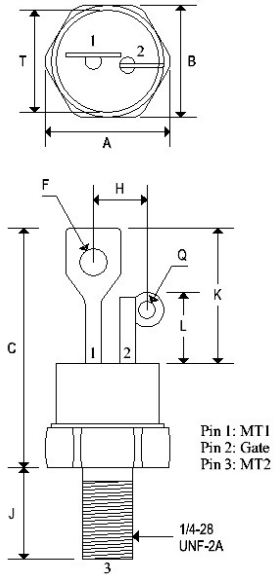
Case	Digi PF2 (MAC37 Series)
Marking	Alpha-numeric
Polarity	Cathode is stud



	DIGI PF2			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.501	0.505	12.730	12.830
B	0.465	0.475	11.810	12.060
C	0.330	0.380	8.390	9.650
E	0.100	-	2.540	-
F	0.035	0.085	0.890	2.160
J	0.080	0.097	2.040	2.460
K	-	0.800	-	20.320
N	-	0.510	-	12.950
Q	0.065	0.160	1.650	4.060

MECHANICAL CHARACTERISTIC

Case	TO-48 (MAC38 Series)
Marking	Alpha-numeric
Polarity	Cathode is stud



	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.604	0.614	15.340	15.600
B	0.551	0.559	14.000	14.200
C	1.050	1.190	2.670	30.230
F	0.135	0.160	3.430	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.620	0.670	15.750	17.020
L	0.300	0.350	7.620	8.890
Q	0.055	0.085	1.400	2.160
T	0.501	0.505	12.730	12.830

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FIGURE 1 – MAXIMUM THERMAL RESPONSE

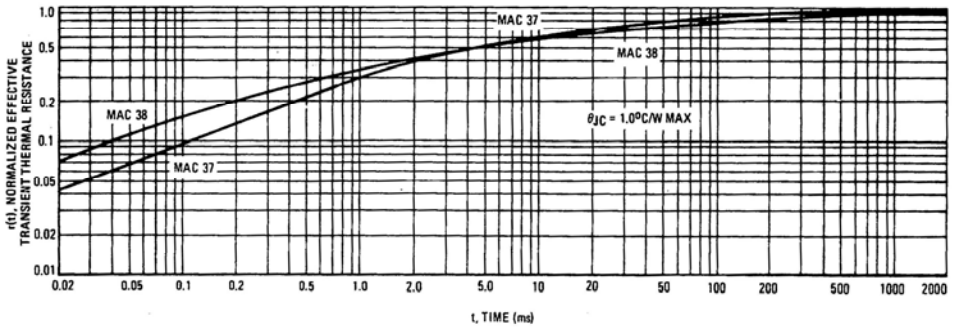

FIGURE 2 – AVERAGE CURRENT DERATING

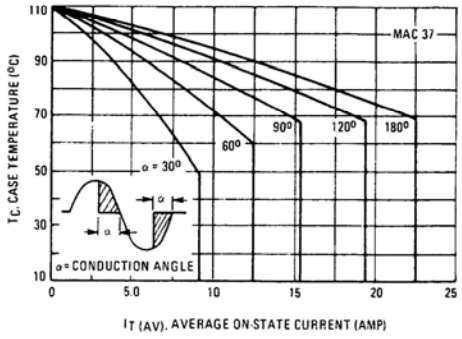

FIGURE 3 – RMS CURRENT DERATING

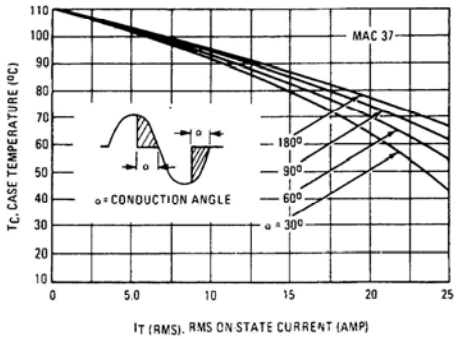

FIGURE 4 – AVERAGE CURRENT DERATING

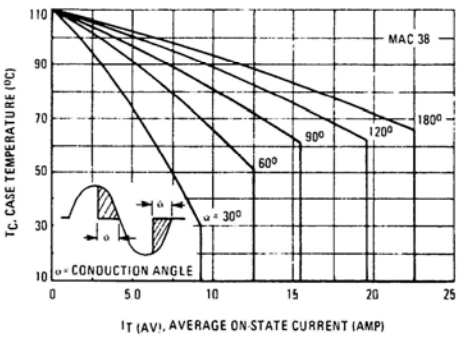

FIGURE 5 – RMS CURRENT DERATING

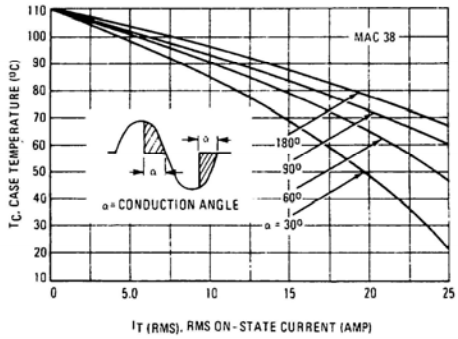

FIGURE 6 – POWER DISSIPATION versus AVERAGE CURRENT

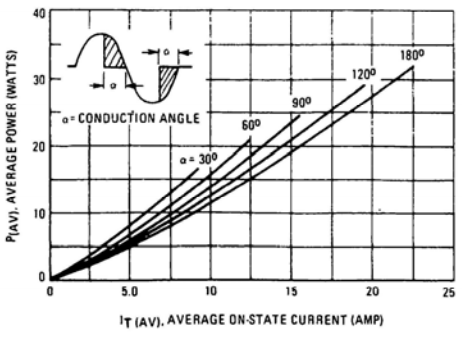

FIGURE 7 – POWER DISSIPATION versus RMS CURRENT

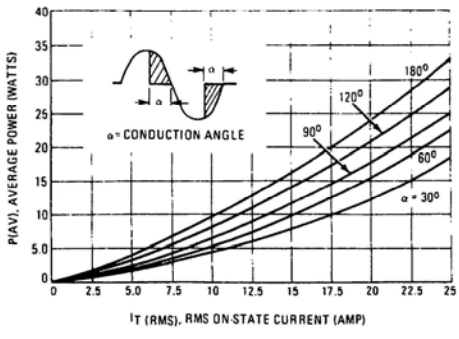

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FIGURE 8 – MAXIMUM ON-STATE CHARACTERISTICS

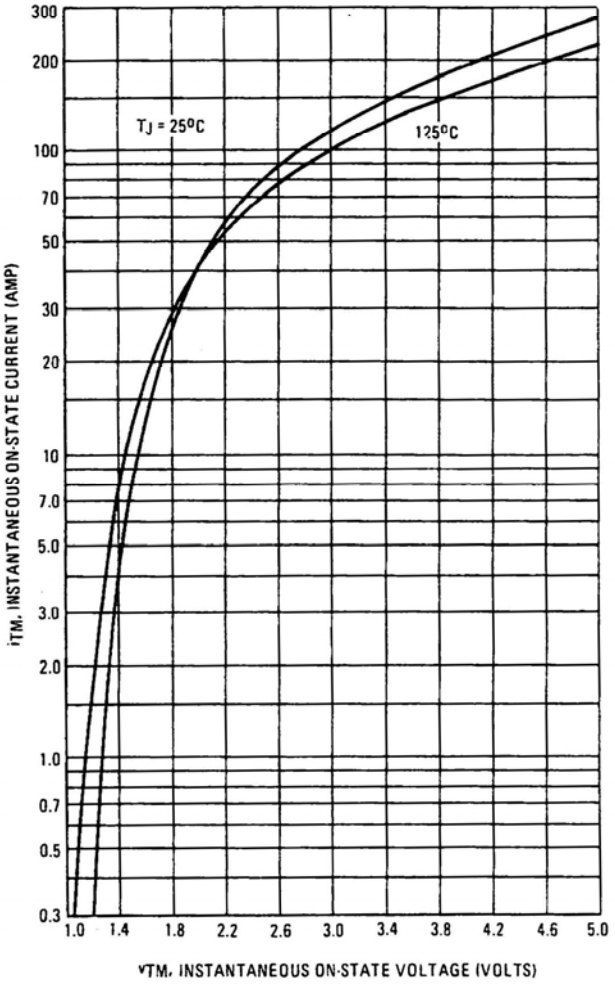


FIGURE 9 – MAXIMUM MULTI-CYCLE SURGE RATING

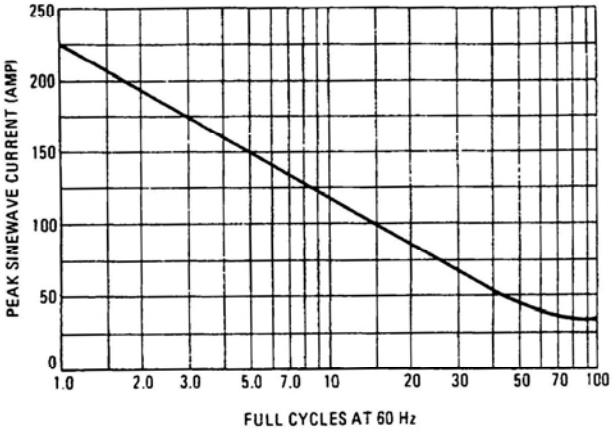


FIGURE 10 – TYPICAL HOLDING CURRENT

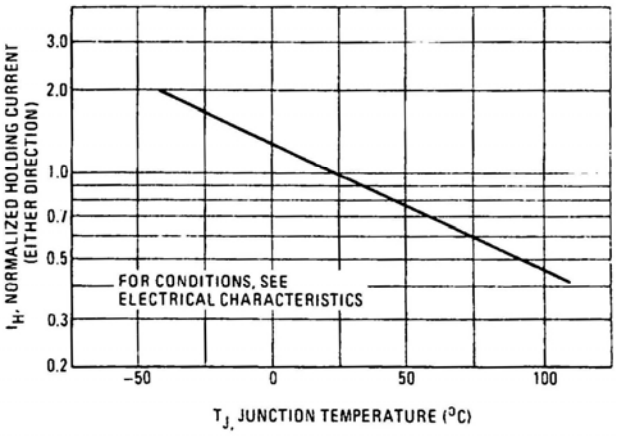


FIGURE 11 – TYPICAL GATE TRIGGER CURRENT

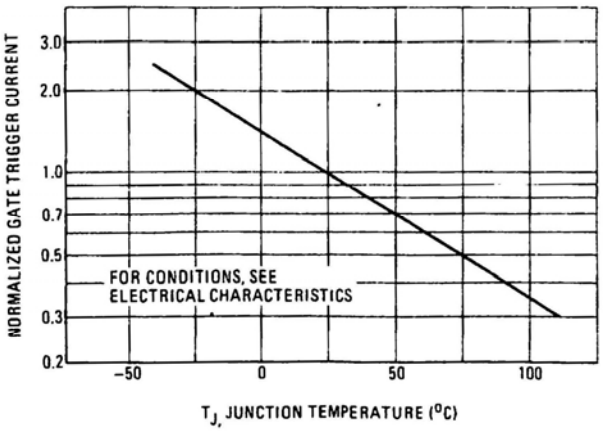
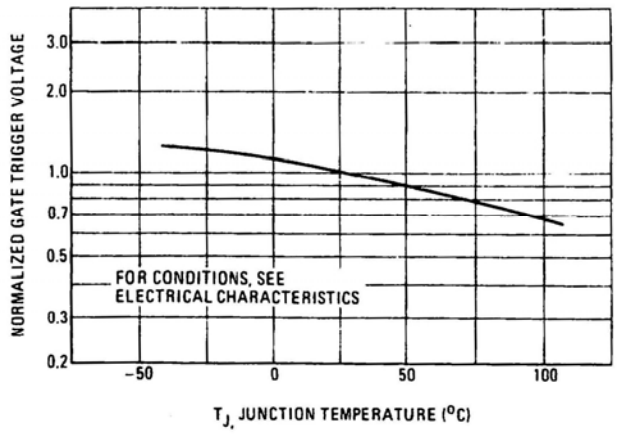


FIGURE 12 – TYPICAL GATE TRIGGER VOLTAGE



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