

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⁾ ($T_J = 110^\circ\text{C}$) 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	$I_{\text{T(RMS)}}$	25	Amps
Peak non-repetitive surge current (1 cycle, 60Hz, $T_J = -40$ to $+110^\circ\text{C}$)	I_{TSM}	225	Amps
Circuit fusing considerations ($T_J = -40$ to $+110^\circ\text{C}$, $t = 8.3\text{ms}$)	I^2t	210	A^2s
Peak gate power⁽²⁾	P_{GM}	5.0	Watts
Average gate power	$P_{\text{G(AV)}}$	0.5	Watts
Peak gate current⁽²⁾	I_{GM}	2	Amps
Operating junction temperature range	T_J	-40 to +110	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +150	$^\circ\text{C}$
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: $T_J = 110^\circ\text{C}$, 1 second maximum duration: 5.0% duty cycle, $I_{\text{TM}} = 10\text{A}$.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta\text{JC}}$	1.0	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak blocking current (either direction) ($V_D = \text{Rated } V_{\text{DRM}}, T_J = 110^\circ\text{C}$)	I_{DRM}	-	-	2.0	mA
Peak on-state voltage (either direction) ($I_{\text{TM}} = 35\text{A peak}$)	V_{TM}	-	1.4	1.9	Volts
Gate trigger current (continuous dc) ⁽³⁾ ($V_D = 7\text{V}, R_L = 47\Omega$) MT2(+),G(+); MT2(-),G(-)	I_{GT}	-	20	75	mA
Gate trigger voltage (continuous dc) ⁽³⁾ ($V_D = 7\text{V}, R_L = 47\Omega$) MT2(+),G(+); MT2(-),G(-)	V_{GT}	-	1.0	3.0	Volts
Gate trigger voltage (continuous dc) ⁽³⁾ ($V_D = \text{Rated } V_{\text{DRM}}, R_L = 100\Omega, T_J = 110^\circ\text{C}$) MT2(+),G(+); MT2(-),G(-)	V_{GD}	0.2	-	-	Volts
Holding current (either direction) ($V_D = 7\text{V}, I_{\text{TM}} = 150\text{mA}$, gate open)	I_{H}	-	10	75	mA
Gate controlled turn-on time ($I_{\text{TM}} = 25\text{A}, I_{\text{GT}} = 200\text{mA}$)	t_{on}	-	1.0	-	μs

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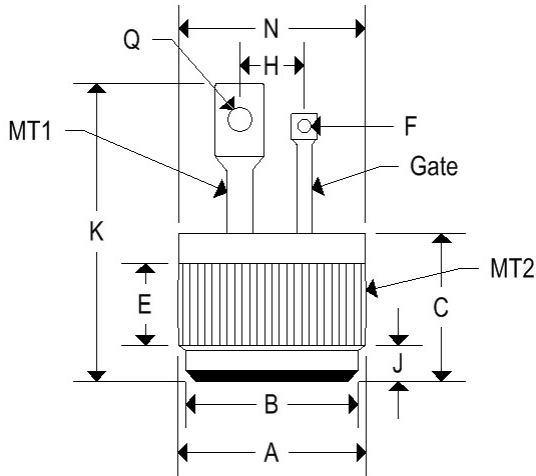
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Characteristic	Symbol	Min	Typ.	Max	Unit
Critical forward voltage application rate (@ $V_{DRM}, T_J = 110^\circ\text{C}$, gate open)	dv/dt	-	100	-	V/ μs

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

MECHANICAL CHARACTERISTIC

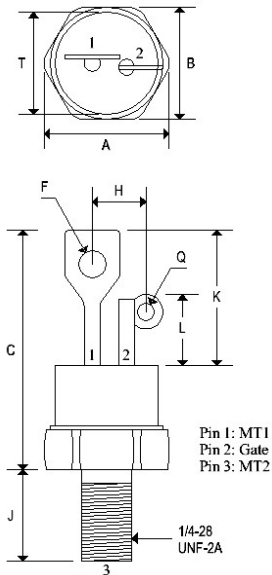
Case	Digi PF2 (MAC37 Series)
Marking	Alpha-numeric
Polarity	Cathode is stud



	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

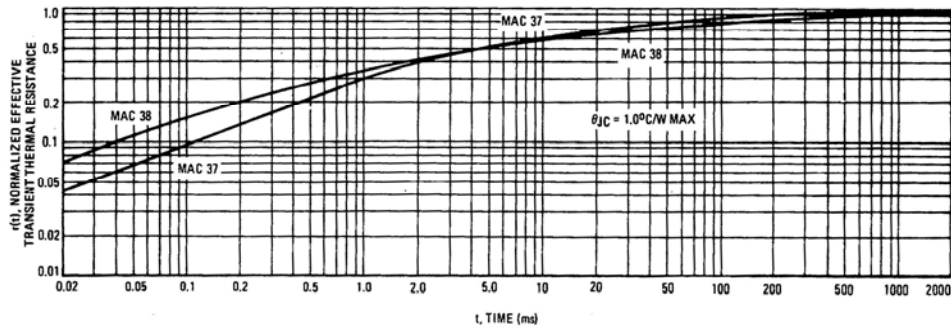


FIGURE 2 – AVERAGE CURRENT DERATING

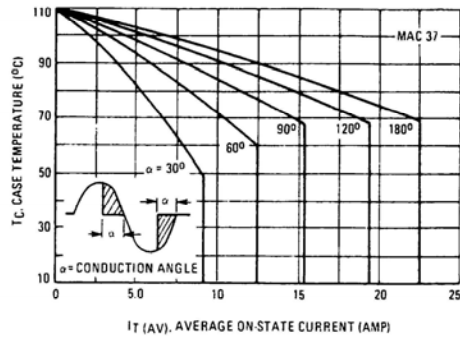


FIGURE 3 – RMS CURRENT DERATING

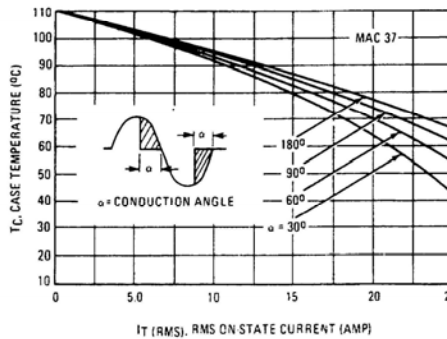


FIGURE 4 – AVERAGE CURRENT DERATING

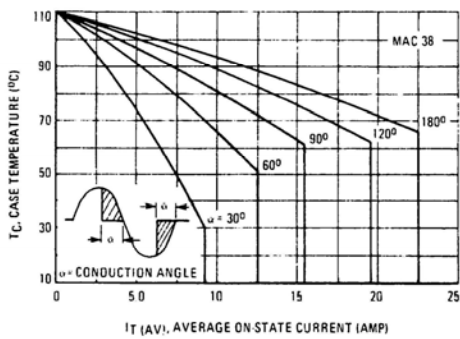


FIGURE 5 – RMS CURRENT DERATING

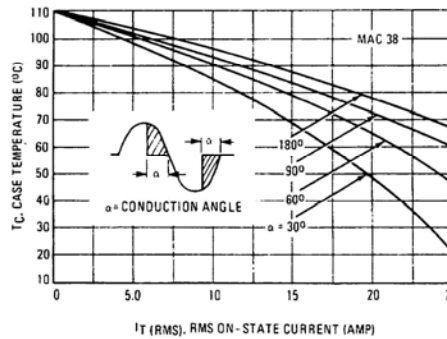


FIGURE 6 – POWER DISSIPATION versus AVERAGE CURRENT

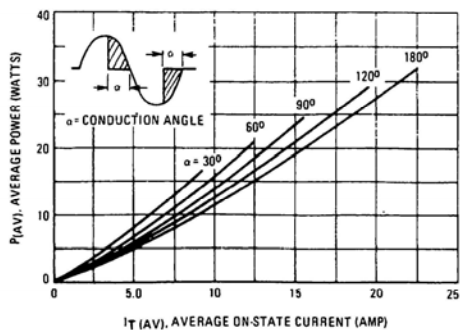
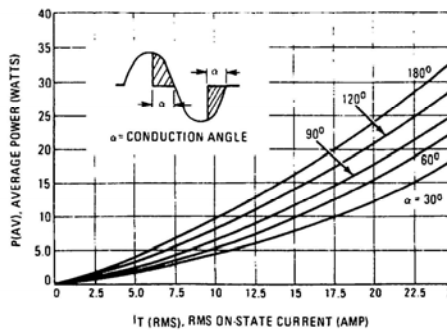


FIGURE 7 – POWER DISSIPATION versus RMS CURRENT



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FIGURE 8 – MAXIMUM ON-STATE CHARACTERISTICS

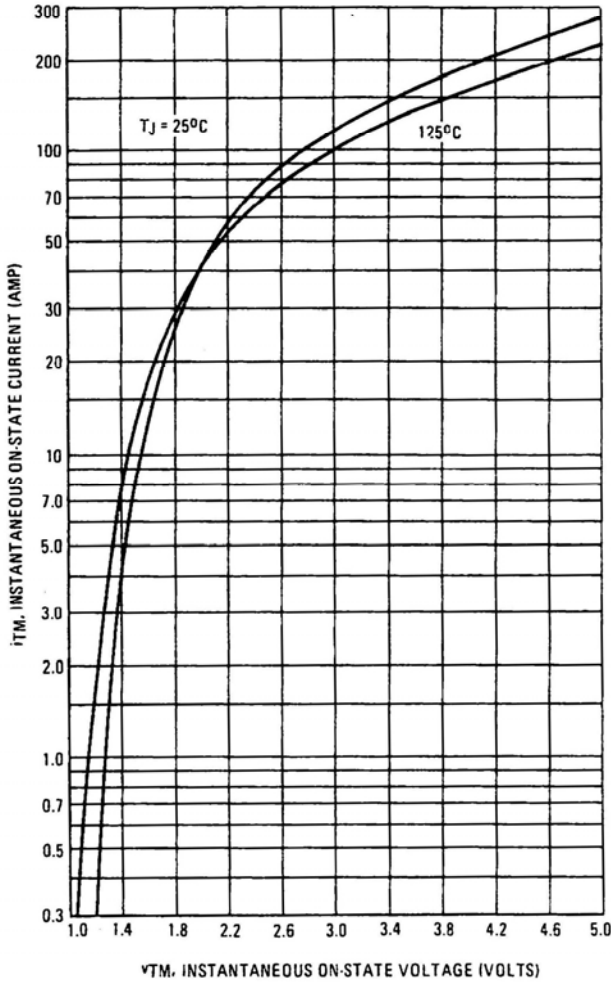


FIGURE 9 – MAXIMUM MULTI-CYCLE SURGE RATING

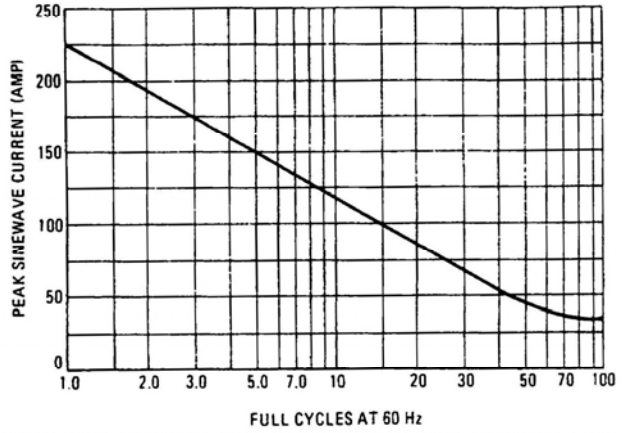


FIGURE 10 – TYPICAL HOLDING CURRENT

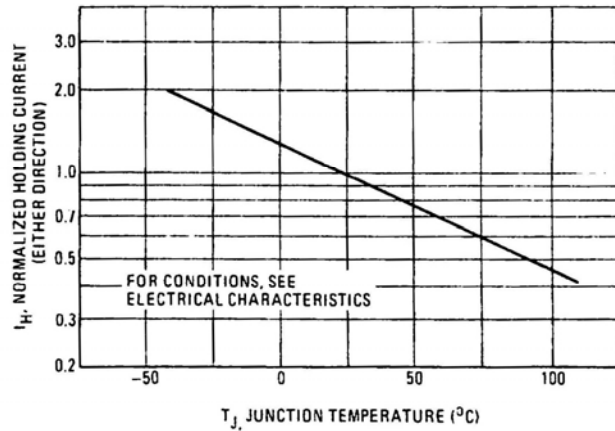


FIGURE 11 – TYPICAL GATE TRIGGER CURRENT

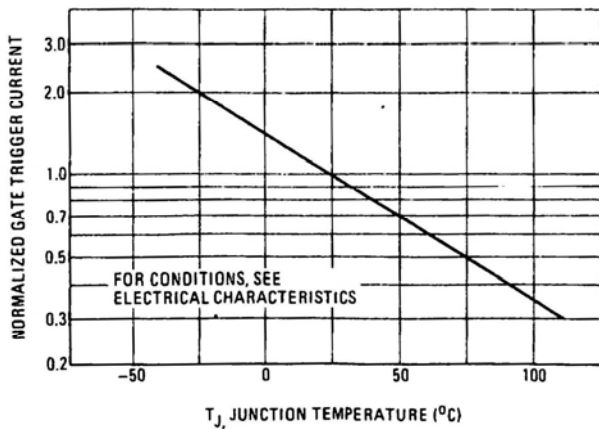


FIGURE 12 – TYPICAL GATE TRIGGER VOLTAGE

