

DIGITRON SEMICONDUCTORS

MAC93(A) 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 $(T_J = -40 \text{ to } 125^\circ\text{C}, \frac{1}{2} \text{ sine wave } 50 \text{ to } 60\text{Hz, gate open})$ MAC93(A)-1 MAC93(A)-2 MAC93(A)-3 MAC93(A)-4	V_{DRM}	30 60 100 200	Volts
RMS on-state current (full cycle sine wave 50 to 60Hz, $T_C = 60^\circ\text{C}$)	$I_{\text{T(RMS)}}$	0.65	Amps
Peak non-repetitive surge current $(1 \text{ cycle, } 60\text{Hz, } T_C = 60^\circ\text{C, preceded and followed by rated current})$	I_{TSM}	6.0	Amps
Circuit fusing considerations ($T_J = -40 \text{ to } +125^\circ\text{C}, t = 8.3\text{ms}$)	I^2t	0.15	A^2s
Average gate power	$P_{\text{G(AV)}}$	0.01	Watts
Peak gate current	I_{GM}	1.0	Amps
Operating junction temperature range	T_J	-40 to +125	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta\text{JC}}$	75	$^\circ\text{C/W}$
Thermal resistance, junction to ambient	$R_{\theta\text{JA}}$	200	$^\circ\text{C/W}$

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

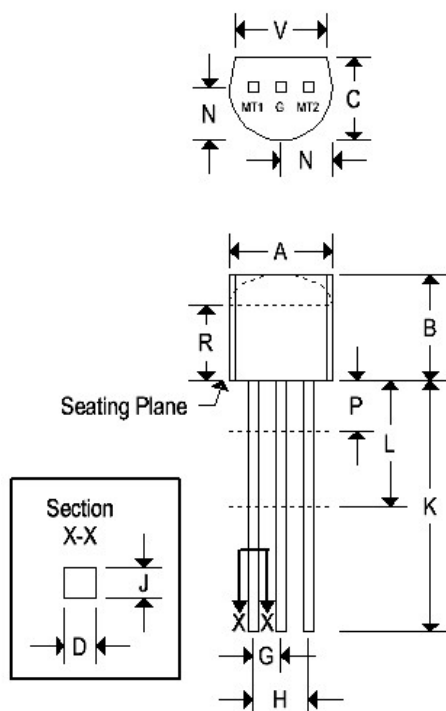
Characteristic	Symbol	Min	Typ.	Max	Unit
Peak blocking current (either direction) $(V_D = \text{Rated } V_{\text{DRM}}, T_J = 125^\circ\text{C, gate open})$	I_{DRM}	-	-	100	μA
Peak on-state voltage (either direction) $(I_{\text{TM}} = 0.92\text{A peak, pulse width} = 1 \text{ to } 2\text{ms, duty cycle} \leq 2\%)$	V_{TM}	-	-	1.85	Volts
Gate trigger current (continuous dc) $(V_D = 7\text{V}, R_L = 100\Omega, \text{minimum gate pulse width} = 2\mu\text{s})$ MT2(+),G(+); MT2(-),G(-), all devices MT2(+),G(-); MT2(-),G(+), MAC93A-1 through MAC93A-4	I_{GT}	- -	- -	5.0 12	mA
Gate trigger voltage (continuous dc) $(V_D = 7\text{V}, R_L = 100\Omega, \text{minimum gate pulse width} = 2\mu\text{s})$ MT2(+),G(+); MT2(-),G(-), all devices MT2(+),G(-); MT2(-),G(+), MAC93A-1 through MAC93A-4 MT2(+),G(+); MT2(-),G(-), $T_C = -40^\circ\text{C}$, all devices MT2(+),G(-); MT2(-),G(+), $T_C = -40^\circ\text{C}$, MAC93A-1 through MAC93A-4 $(V_D = \text{Rated } V_{\text{DRM}}, R_L = 10\text{k}\Omega, T_J = 125^\circ\text{C})$ MT2(+),G(+); MT2(-),G(-), all devices MT2(+),G(-); MT2(-),G(+), MAC93A-1 through MAC93A-4	V_{GT}	- - - - 0.1 0.1	- - - - - -	2.0 2.0 2.5 3.0 - -	Volts
Holding current (either direction) $(V_D = 7\text{V}, I_{\text{TM}} = 20\text{mA, gate open, } T_C = 25^\circ\text{C})$ $(V_D = 7\text{V}, I_{\text{TM}} = 20\text{mA, gate open, } T_C = -40^\circ\text{C})$	I_{H}	- -	- -	10 20	mA

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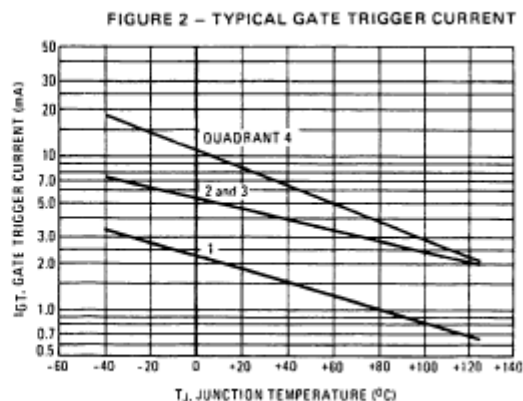
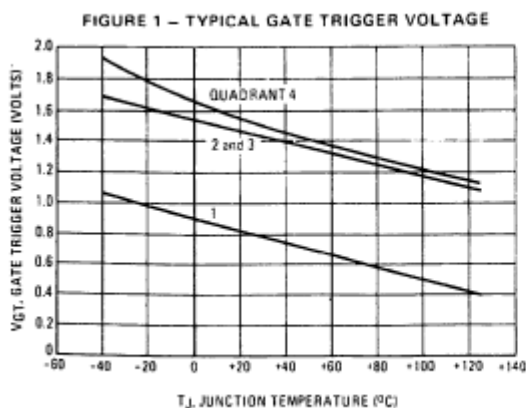
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MECHANICAL CHARACTERISTIC

Case	TO-92
Marking	Alpha-numeric
Pin out	See below



	TO-92			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.175	0.205	4.450	5.200
B	0.170	0.210	4.320	5.330
C	0.125	0.165	3.180	4.190
D	0.016	0.022	0.410	0.550
F	0.016	0.019	0.410	0.480
G	0.045	0.055	1.150	1.390
H	0.095	0.105	2.420	2.660
J	0.015	0.020	0.390	0.500
K	0.500	-	12.700	-
L	0.250	-	6.350	-
N	0.080	0.105	2.040	2.660
P	-	0.100	-	2.540
R	0.115	-	2.930	-
V	0.135	-	3.430	-



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**FIGURE 3 – AVERAGE CURRENT DERATING
(REFERENCE: CASE TEMPERATURE)**

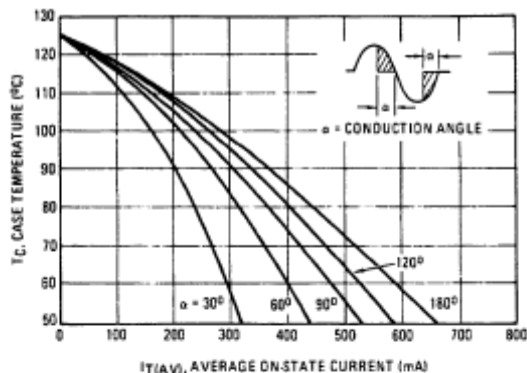


**FIGURE 4 – RMS CURRENT DERATING
(REFERENCE: CASE TEMPERATURE)**

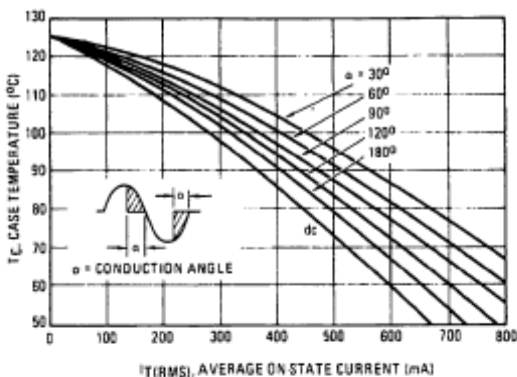


**FIGURE 5 – AVERAGE CURRENT DERATING
(REFERENCE: AMBIENT TEMPERATURE)**

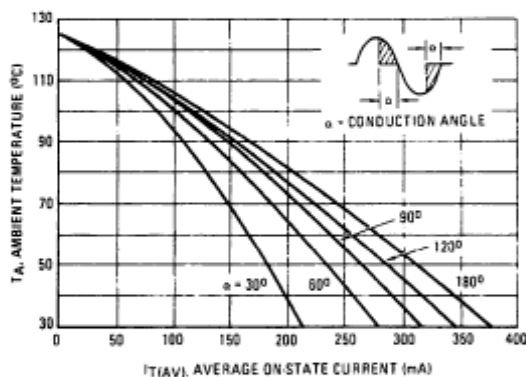


**FIGURE 6 – RMS CURRENT DERATING
(REFERENCE: AMBIENT TEMPERATURE)**

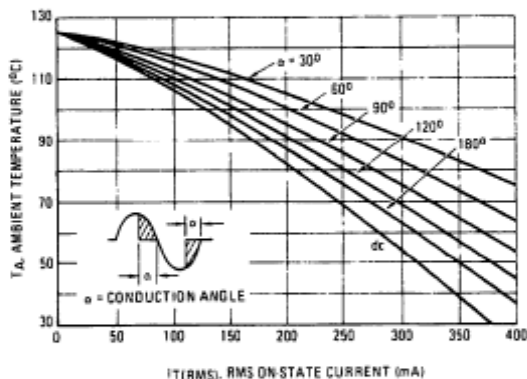


FIGURE 7 – ON-STATE POWER DISSIPATION

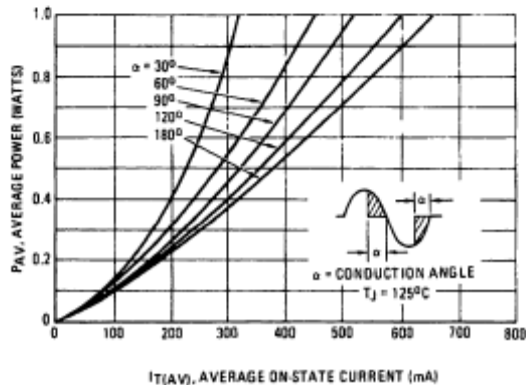
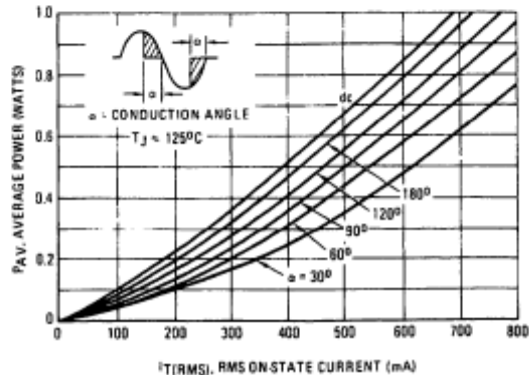


FIGURE 8 – ON-STATE POWER DISSIPATION



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