

# DIGITRON SEMICONDUCTORS

GA300, GA300A, GA301, GA301A

SILICON CONTROLLED RECTIFIER  
NANOSECOND SWITCHING PLANAR

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 RANKINGS

		GA300 GA300A	GA301 GA301A
Repetitive Peak Off State Voltage	$V_{DRM}$	60V	100V
Repetitive Peak On-State Current	$I_{TRM}$	Up to 100A	
Peak Gate Current	$I_{GM}$	250 mA	
Average Gate Current	$I_{G(AV)}$	25 mA	
Reverse Gate Current	$I_{GR}$	3 mA	
Reverse Gate Voltage	$V_{GR}$	5 V	
Storage Temperature Range		-65 to +150°C	
Operating Temperature Range		0 to +125°C	

## ELECTRICAL CHARACTERISTICS (@ 25°C unless otherwise noted)

Test	Symbol	Min	Typical	Max	Units	Conditions
Delay Time	$t_d$	-	20 10	30 -	ns	$I_G = 20 \text{ mA}, I_T = 1 \text{ A}$ $I_G = 30 \text{ mA}, I_T = 1 \text{ A}$
Rise Time <sup>(Note 1)</sup> GA300, GA300A	$t_r$	-	15 25	25 -	ns	$V_D = 60 \text{ V}, I_T = 1 \text{ A}$ $V_D = 60 \text{ V}, I_T = 30 \text{ A}$ <sup>(Note 1)</sup>
Rise Time <sup>(Note 1)</sup> GA301, GA301A	$t_r$	-	10 20	20 -	ns	$V_D = 100 \text{ V}, I_T = 1 \text{ A}$ $V_D = 100 \text{ V}, I_T = 30 \text{ A}$ <sup>(Note 1)</sup>
Circuit Commutated Turn Off Time GA300, GA301	$t_q$	-	0.8	2.0	$\mu\text{s}$	$I_T = 1 \text{ A}, I_R = 1 \text{ A}, R_{GK} = 1 \text{ K}$
GA300A, GA301A			0.3	0.5		
Gate Trigger On Pulse Width	$t_{pg(on)}$	-	0.02	0.05	$\mu\text{s}$	$I_G = 10 \text{ mA}, I_T = 1 \text{ A}$
Off-State Current	$I_{DRM}$	-	0.01 20	0.1 100	$\mu\text{A}$	$V_{DRM} = \text{Rating}, R_{GK} = 1 \text{ K}, T = 25^\circ\text{C}$ $V_{DRM} = \text{Rating}, R_{GK} = 1 \text{ K}, T = 125^\circ\text{C}$
Reverse Current <sup>(Note 2)</sup>	$I_{RRM}$	-	1.0	10	mA	$V_{RRM} = 30 \text{ V}, R_{GK} = 1 \text{ K}$ <sup>(Note 2)</sup>
Gate Trigger Voltage	$V_{GT}$	0.4 0.10	0.6 0.2	0.75 -	V	$V_D = 5 \text{ V}, R_{GS} = 100 \Omega, T = 25^\circ\text{C}$ $V_D = 5 \text{ V}, R_{GS} = 100 \Omega, T = 125^\circ\text{C}$
Gate Trigger Current	$I_{GT}$	-	10	200	$\mu\text{A}$	$V_D = 5 \text{ V}, R_{GS} = 10 \text{ K}$
On-State Voltage	$V_T$	-	1.1	1.5	V	$I_T = 2 \text{ A}$
Off-State Voltage – Critical Rate of Rise	$dV/dt$	15	30	-	V/ $\mu\text{s}$	$V_D = 30 \text{ V}, R_{GK} = 1 \text{ K}$
Reverse Gate Current	$I_{GR}$	-	0.01	0.1	mA	$V_{GR} = 5 \text{ V}$
Holding Current	$I_H$	0.3 0.05	2.0 0.4	5.0 -	mA	$V_D = 5 \text{ V}, R_{GK} = 1 \text{ K}, T = 25^\circ\text{C}$ $V_D = 5 \text{ V}, R_{GK} = 1 \text{ K}, T = 125^\circ\text{C}$

Note 1 –  $I_G = 10 \text{ mA}$ , Pulse Test: Duty Cycle < 1%.

Note 2 – Pulse test intended to guarantee reverse anode voltage capability for pulse commutation. Device should not be operated in the reverse blocking mode on a continuous basis.

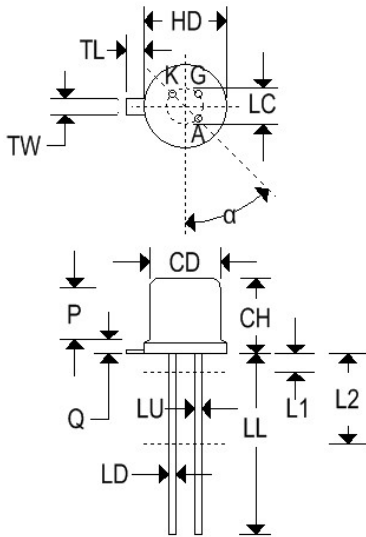
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## MECHANICAL CHARACTERISTICS

GA300(A), GA301(A)	
Case	TO-18
Marking	Alpha-numeric
Pin out	See below



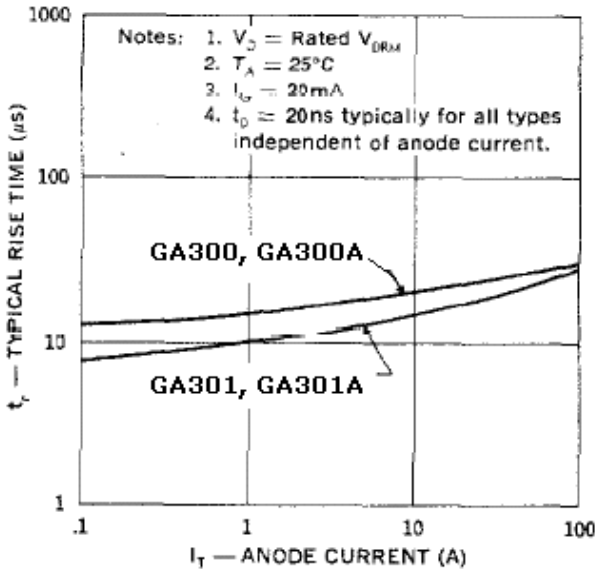
	TO-18			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.209	0.230	5.310	5.840
B	0.178	0.195	4.520	4.950
C	0.170	0.210	4.320	5.330
D	0.016	0.021	0.406	0.533
E	-	0.030	-	0.762
F	0.016	0.019	0.406	0.483
G	0.100 BSC		2.540 BSC	
H	0.036	0.046	0.914	1.170
J	0.028	0.048	0.711	1.220
K	0.500	-	12.700	-
L	0.250	-	6.350	-
M	45° BSC		45° BSC	
N	0.050 BSC		1.270 BSC	
P	-	0.050	-	1.270

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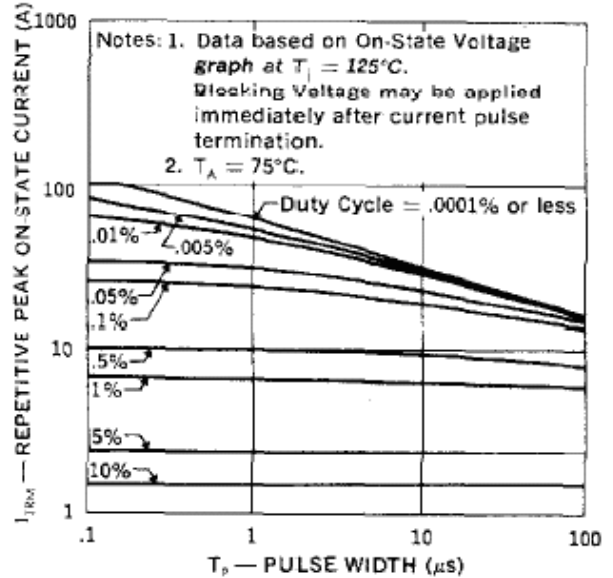
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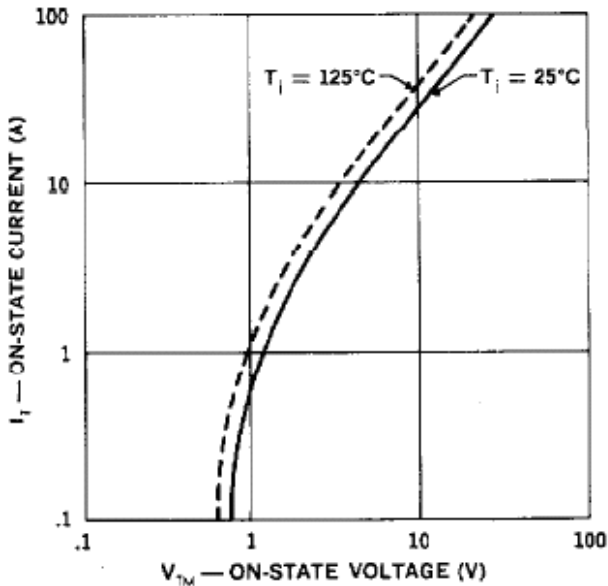
**Switching Speed vs. Current**



**Peak Current vs. Pulse Width  
GA300 Series**



**On-State Voltage vs. Current**



**Surge Rating**

