AG300SN150MTL

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	4.2mΩ@10V	300A

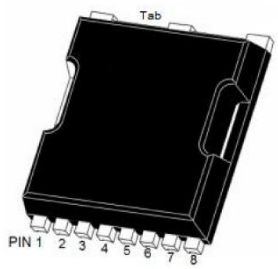
Feature

- Advanced SGT technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Application

- DC/DC Converter
- LED Backlighting
- Power management switches

Package



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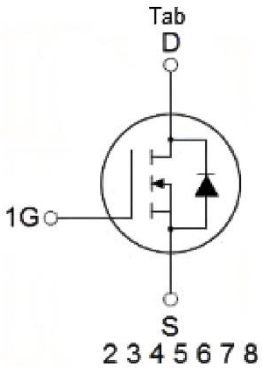
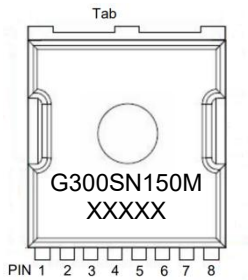
Circuit diagram



Marking



Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1] (V_{GS} =10V)	I_D	300	A
Continuous Drain Current[1] (V_{GS} =10V, T_C=100℃)	I_D(100℃)	188	A
Pulsed Drain Current[2]	I_{DM}	817	A
Single Pulse Avalanche Energy[3]	E_{AS}	2201	mJ
Power Dissipation[4]	P_D	600	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.21	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature Range	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} =0V, I_D =250μA	150			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =150V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.5	3.2	4.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =40A		3.3	4.2	mΩ
Dynamic characteristics[5]						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1MHz		6540		pF
Output Capacitance	C_{oss}			772		
Reverse Transfer Capacitance	C_{rss}			6.7		
Total Gate Charge	Q_g	V_{DS} =75V, V_{GS} =10V, I_D =20A		88		nC
Gate-Source Charge	Q_{gs}			32		
Gate-Drain Charge	Q_{gd}			16		
Turn-on delay time	$t_{d(on)}$	V_{DS} =75V, V_{GS} =10V, R_G =6Ω R_L =3.75Ω		48		nS
Turn-on rise time	t_r			90		
Turn-off delay time	$t_{d(off)}$			94		
Turn-off fall time	t_f			60		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				300	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =1A			1	V
Reverse Recovery Time	T_{rr}	I_F =20A ,di/dt =500A/μs		122		nS
Reverse Recovery Charge	Q_{rr}			279		nC

Notes:

1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2) The data tested by pulsed , pulse width ≤300us , duty cycle ≤2%.

3) The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=88A.

4) The power dissipation is limited by 150°C junction temperature.

5) Guaranteed by design, not subject to production.

Typical Characteristics

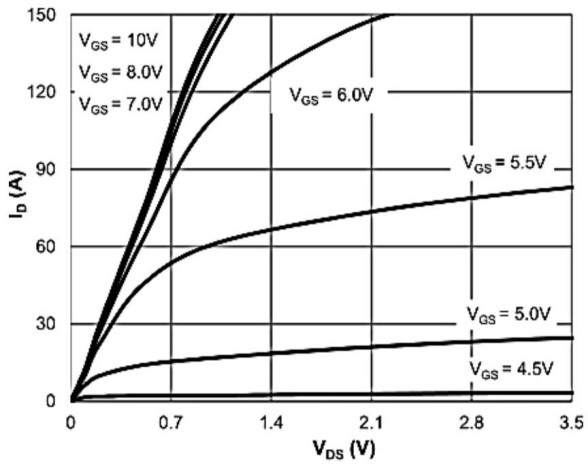


Figure 1: Saturation Characteristics

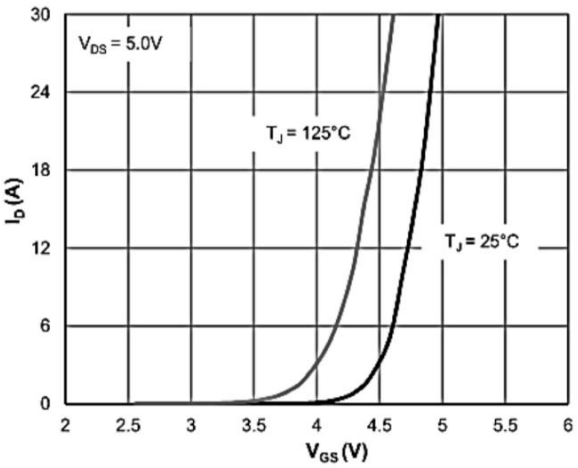


Figure 2: Transfer Characteristics

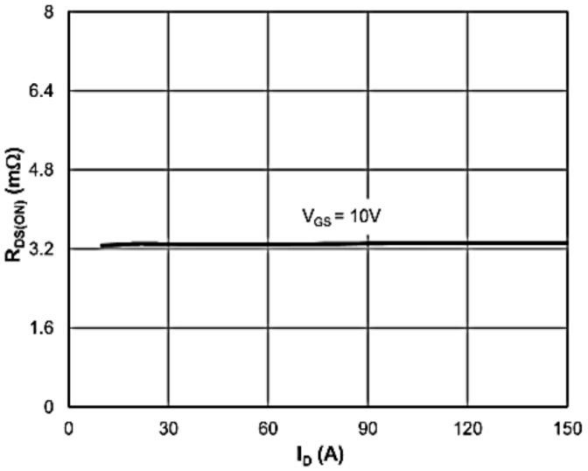


Figure 3: RDS(ON) vs. Drain Current

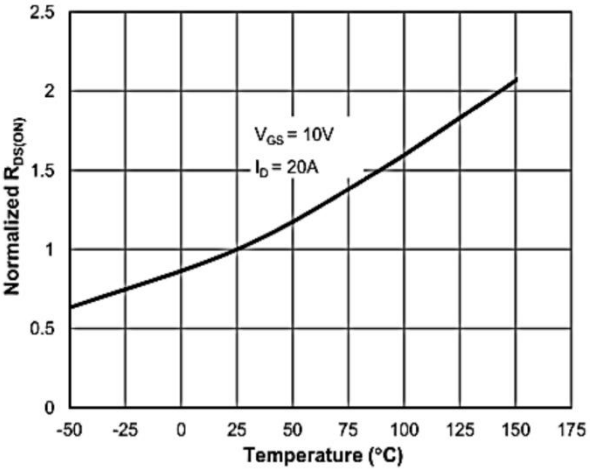


Figure 4: RDS(ON) vs. Junction Temperature

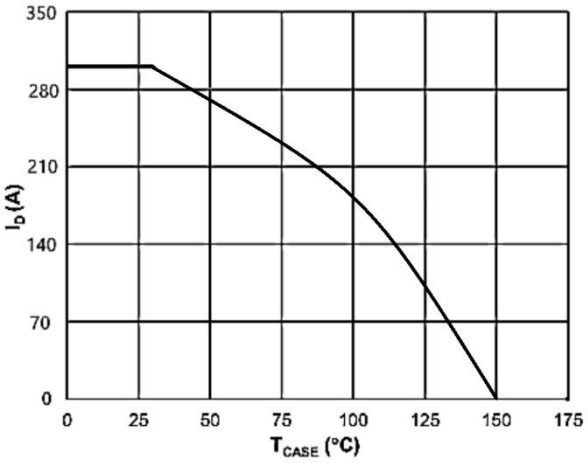


Figure 5: Current De-rating

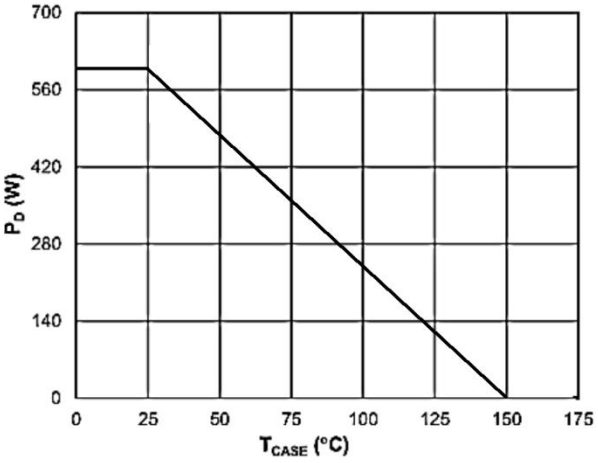


Figure 6: Power De-rating

Typical Characteristics

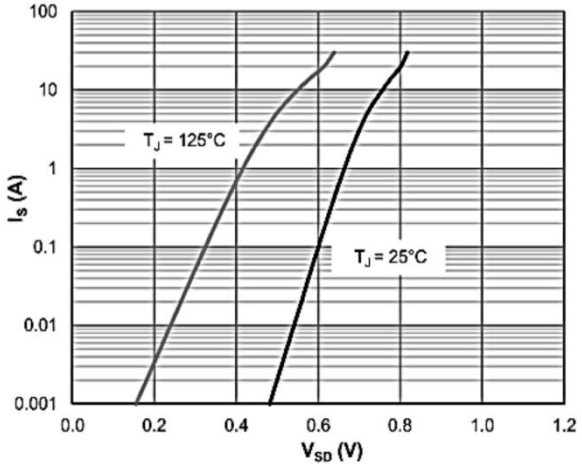


Figure 7: Body-Diode Characteristics

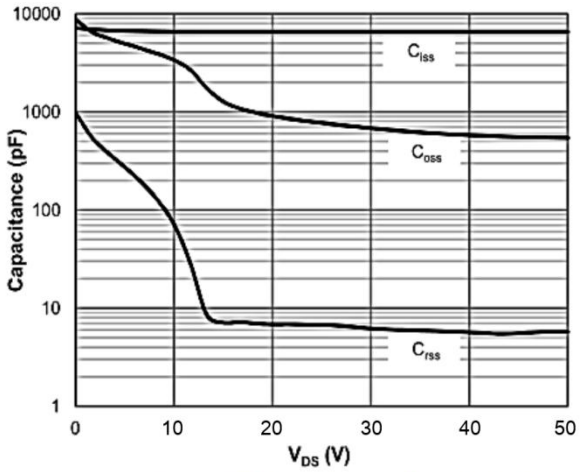


Figure 8: Capacitance Characteristics

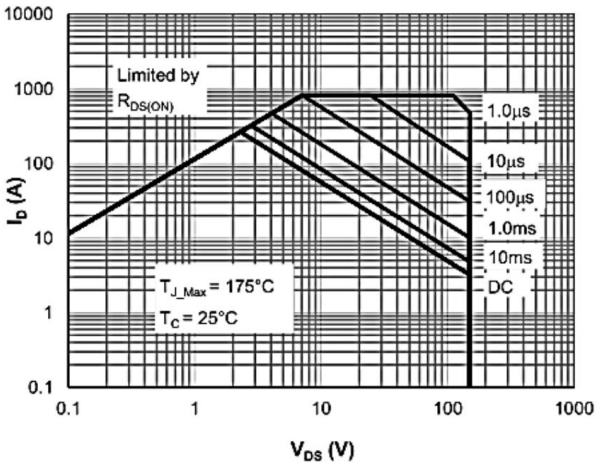


Figure 9: Maximum Safe Operating Area

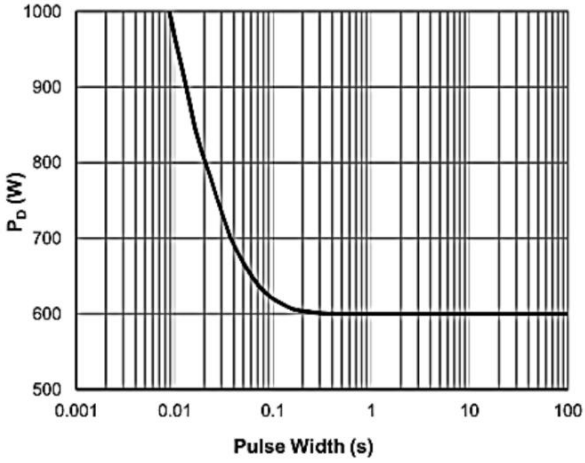


Figure 10: Single Pulse Power Rating, Junction-to-Case

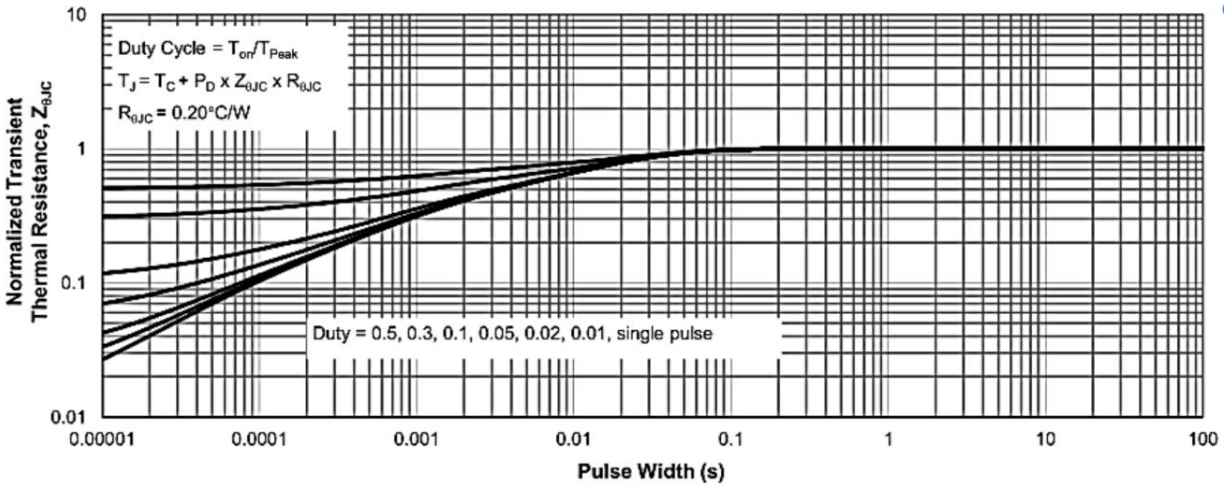
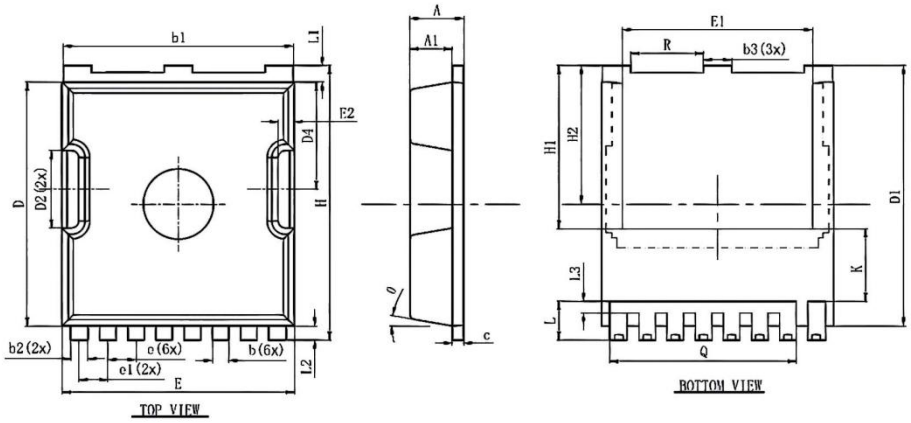


Figure 11: Normalized Maximum Transient Thermal Impedance

TOLL Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.700	1.900	0.067	0.075
b	0.600	0.800	0.024	0.031
b1	9.700	9.900	0.382	0.390
b2	0.650	0.850	0.026	0.033
b3	1.100	1.300	0.043	0.051
C	0.400	0.600	0.016	0.024
D	10.300	10.500	0.406	0.413
D1	11.000	11.200	0.433	0.441
D2	3.200	3.400	0.126	0.134
D4	4.470	4.670	0.176	0.184
E	9.800	10.000	0.386	0.394
E1	8.000	8.200	0.315	0.323
E2	0.500	0.700	0.020	0.028
e	1.200 BSC.		0.047 BSC.	
e1	1.225 BSC.		0.048 BSC.	
H	11.600	11.800	0.457	0.465
H1	6.950 BSC.		0.274 BSC.	
H2	5.900 BSC.		0.232 BSC.	
i	0.100 REF.		0.004 REF.	
j	3.350 REF.		0.132 REF.	
K	3.100 REF.		0.122 REF.	
L	1.550	1.750	0.061	0.069
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	0.400	0.600	0.016	0.024
Q	7.950 REF.		0.313 REF.	
R	3.000	3.200	0.118	0.126
θ	10°		10°	