AG120N08S

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
80V	6mΩ@10V	120A

Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

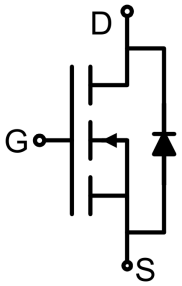
Application

- Automotive applications
- Hard switched and high frequency circuits
- Uninterruptible power supply

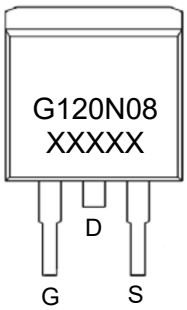
Package

TO-263AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	120	A
Pulsed Drain Current	I_{DM}	450	A
Power Dissipation	P_D	220	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.68	℃/W
Single pulse avalanche energy	E_{AS}	1400	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25 °C, 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	80			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =80V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2		4	V
Drain-source on-resistance[1)]	$R_{DS(on)}$	V_{GS} =10V, I_D =40A		4.9	6	mΩ
Forward transconductance[1)]	g_{FS}	V_{DS} =25V, I_D =57A	90			S
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =25V,V_{GS} =0V,f =1MHz		6500		pF
Output Capacitance	C_{oss}			520		
Reverse Transfer Capacitance	C_{rss}			460		
Total Gate Charge	Q_g	V_{DS} =30V,V_{GS} =10V,ID =30A		163		nC
Gate-Source Charge	Q_{gs}			31		
Gate-Drain Charge	Q_{gd}			64		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,V_{GS}=10V, I_D =2A, R_L=15Ω,R_{GEN}=2.5Ω		26		nS
Turn-on rise time	t_r			24		
Turn-off delay time	$t_{d(off)}$			91		
Turn-off fall time	t_f			39		
Source-Drain Diode characteristics						
Diode Forward Current[1)]	I_S				120	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=40A			1.2	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =40A di/dt = 100A/μs [1)]		42		nS
Reverse Recovery Charge	Q_{rr}			66		nC

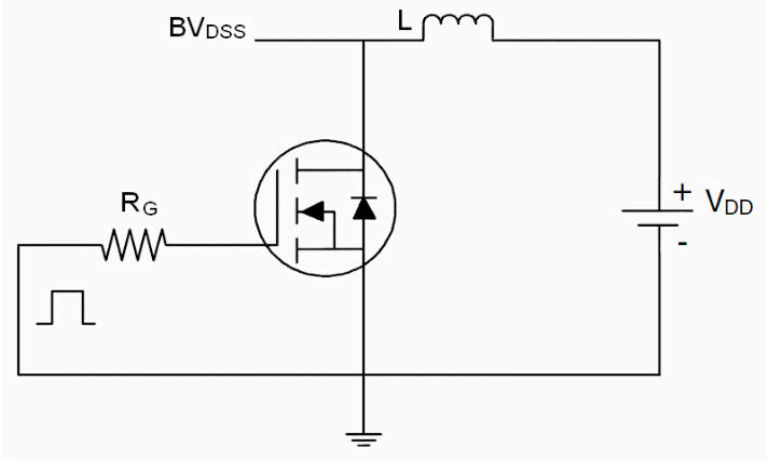
Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

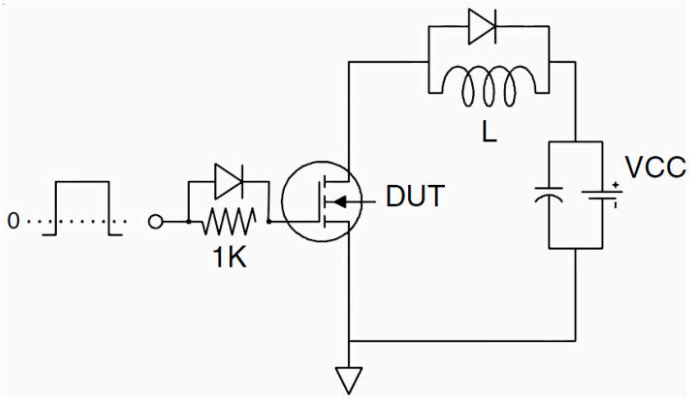
2) Guaranteed by design, not subject to production testing.

Test Circuit

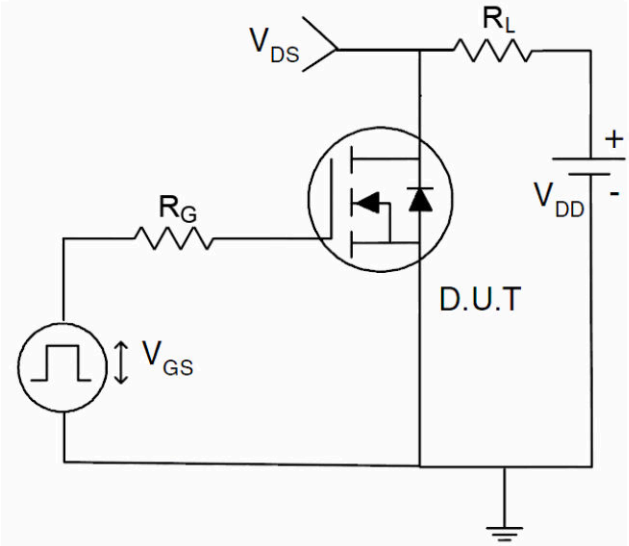
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



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Typical Characteristics

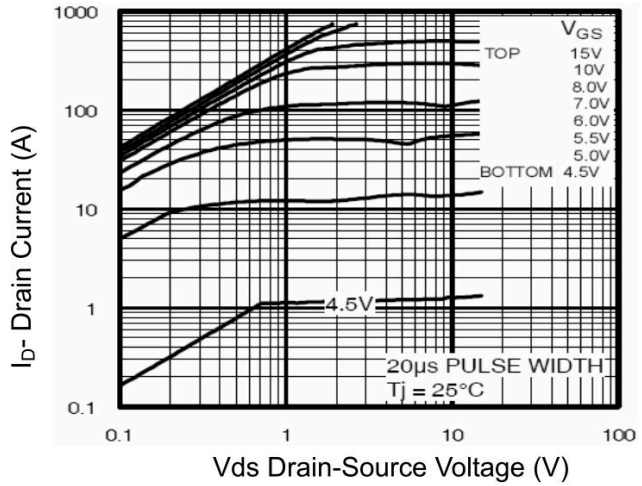


Figure 1 Output Characteristics

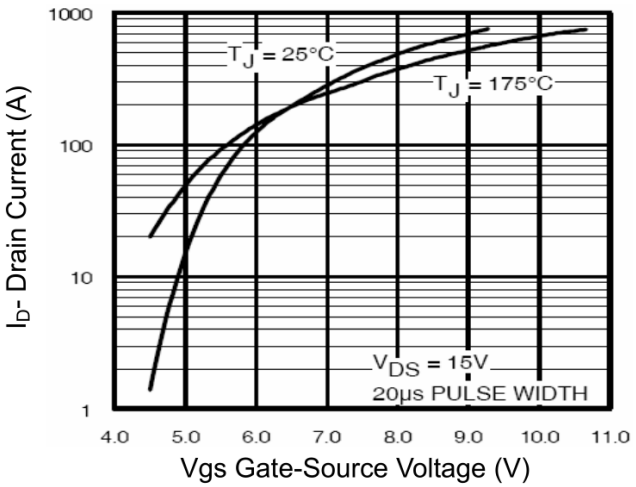


Figure 2 Transfer Characteristics

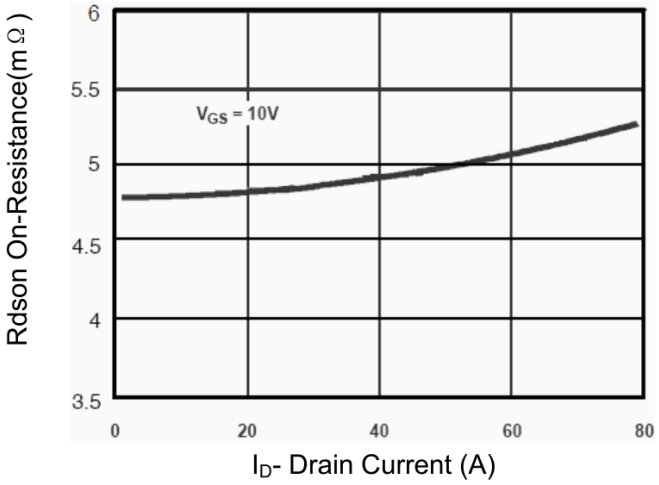


Figure 3 Rdson- Drain Current

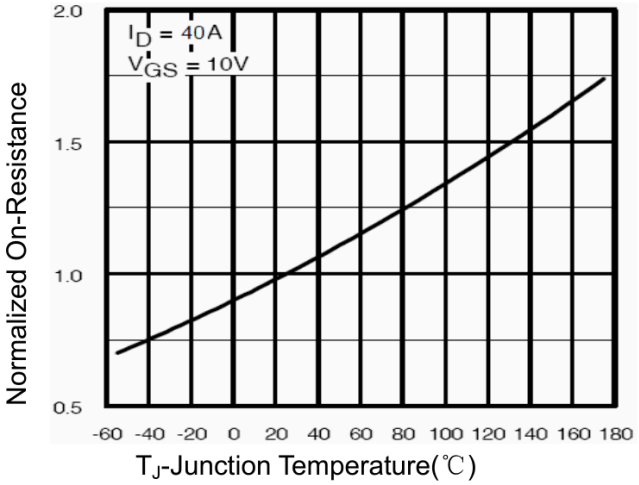


Figure 4 Rdson-JunctionTemperature

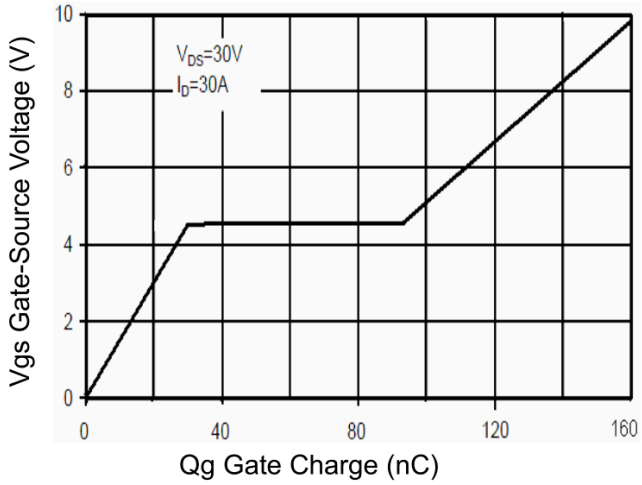


Figure 5 Gate Charge

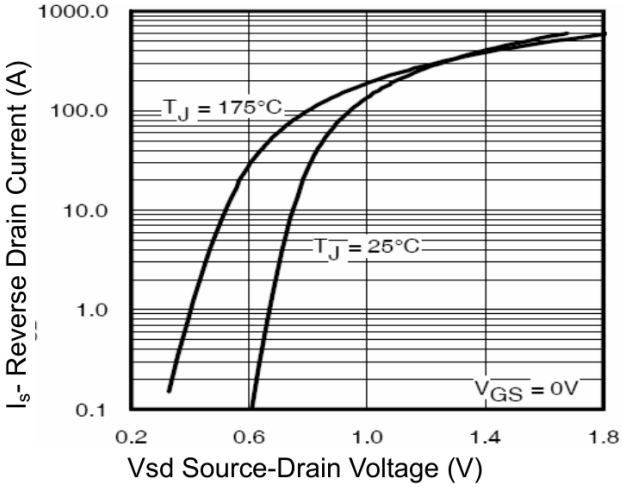


Figure 6 Source- Drain Diode Forward

Typical Characteristics

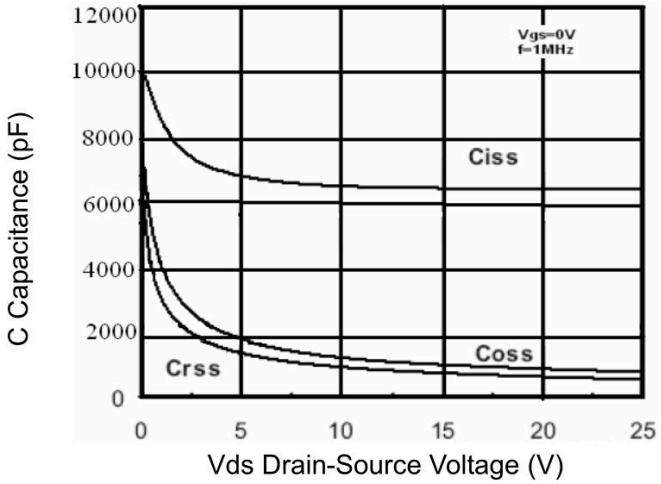


Figure 7 Capacitance vs Vds

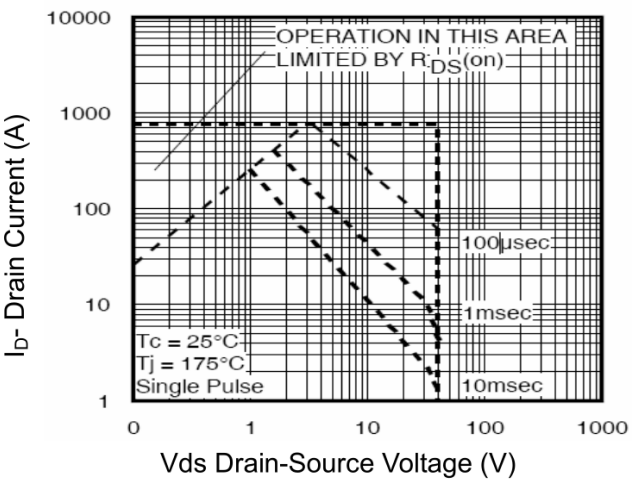


Figure 8 Safe Operation Area

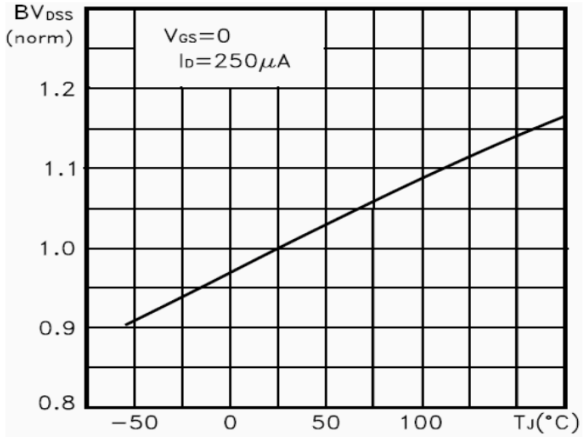


Figure 9 BV_{DSS} vs Junction Temperature

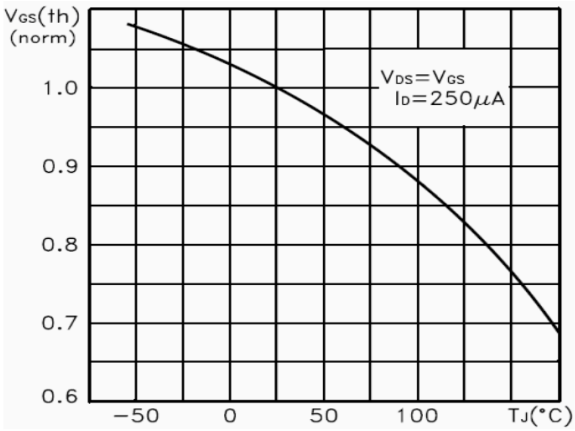


Figure 10 $V_{GS(th)}$ vs Junction Temperature

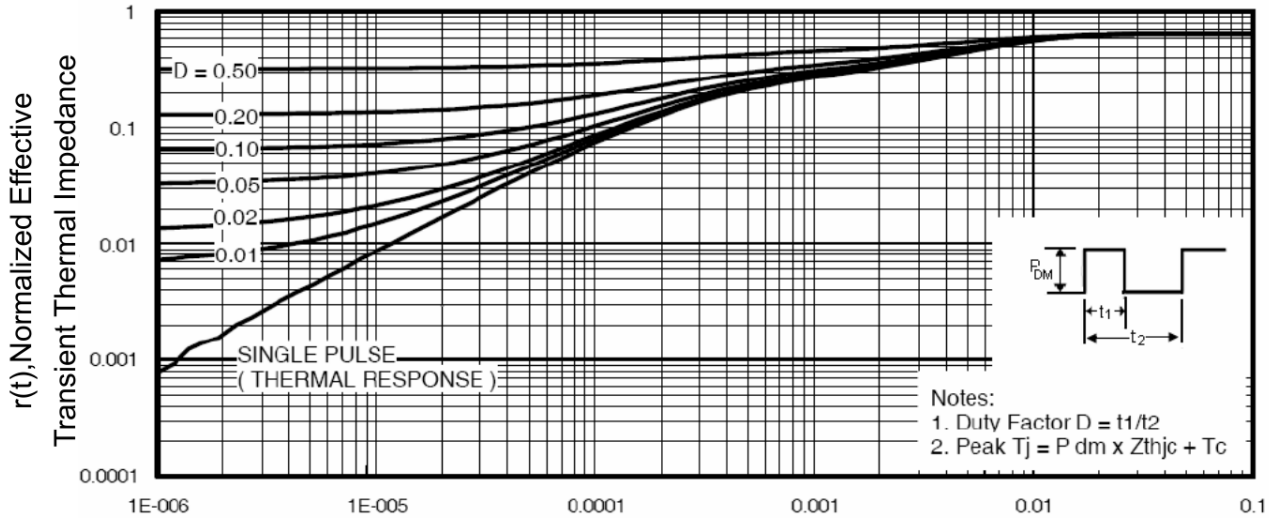
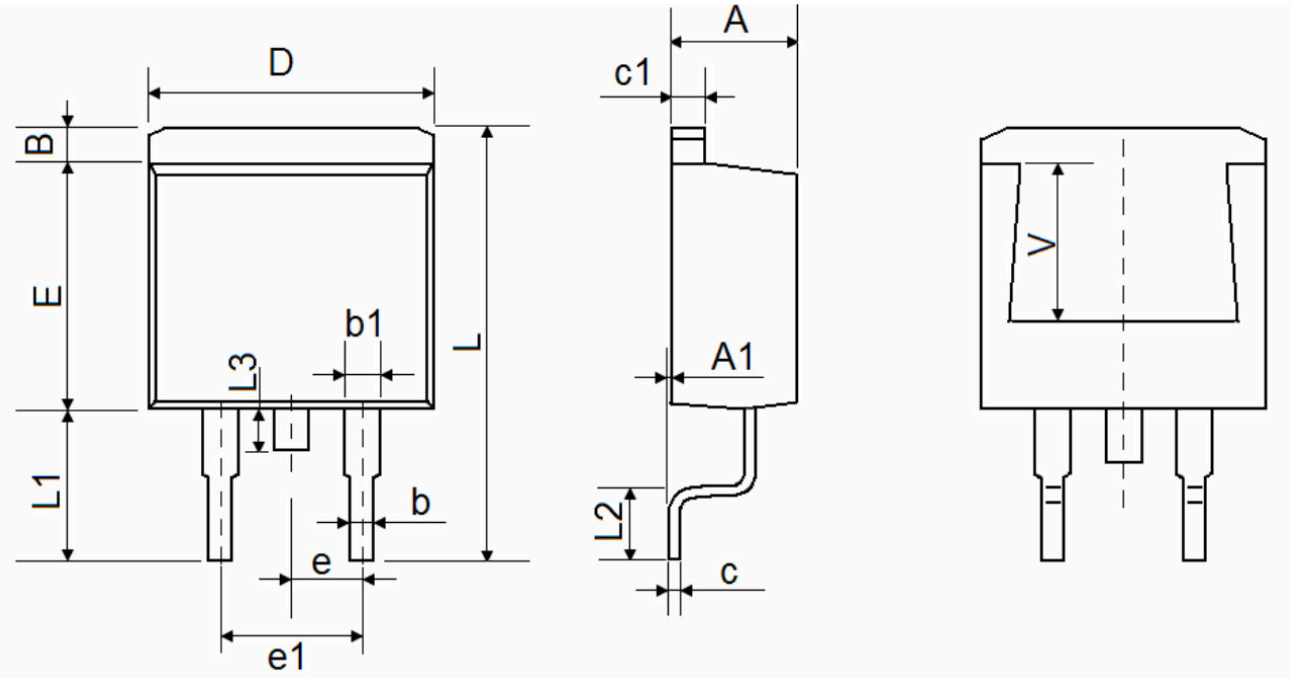


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
V	5.600 REF.		0.220 REF.	