AG180N10BS-Q1

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	3.3mΩ@10V	180A

Feature

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)
- Suffix "-Q1" for AEC-Q101

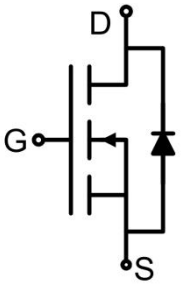
Application

- DC/DC Converter
- Power switching application
- Uninterruptible power supply

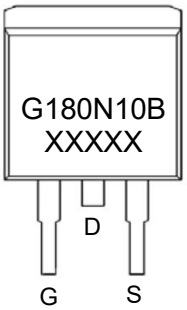
Package

TO-263AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C=25℃)	I_D	180	A
Continuous Drain Current (T_C=100℃)	I_D (100℃)	113	A
Pulsed Drain Current[1)]	I_{DM}	720	A
Power Dissipation[3)]	P_D	2.7	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.5	℃/W
Single pulse avalanche energy[2)]	E_{AS}	1024	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=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	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V,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	3	4	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =50A		2.5	3.3	mΩ
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V,f =1MHz		8900		pF
Output Capacitance	C_{oss}			2750		
Reverse Transfer Capacitance	C_{rss}			65		
Total Gate Charge	Q_g	V_{DS} =50V,V_{GS} =10V,I_D =90A		122		nC
Gate-Source Charge	Q_{gs}			37		
Gate-Drain Charge	Q_{gd}			29		
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V,V_{GS}=10V, I_D =90A,R_{GEN}=2.2Ω		25		nS
Turn-on rise time	t_r			194		
Turn-off delay time	$t_{d(off)}$			52		
Turn-off fall time	t_f			13		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				180	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=50A			1.2	V
Reverse Recovery Time	t_{rr}	I_F =90A, di/dt = 400A/μs		56		nS
Reverse Recovery Charge	Q_{rr}			317		nC

Notes:

1) Repetitive rating; pulse width limited by max. junction temperature.

2) T_J=25℃, V_{DD}=50V, V_G=10V, R_G=25Ω, L=2mH, IAS=32A.

3) P_d is based on max. junction temperature, using junction-case thermal resistance.

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

Typical Characteristics

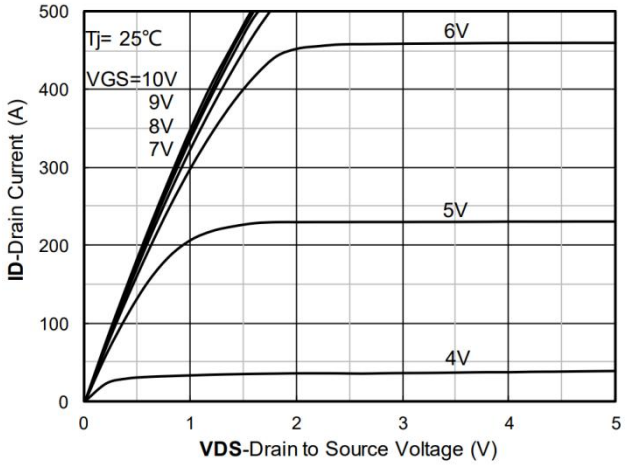


Figure 1. Output Characteristics

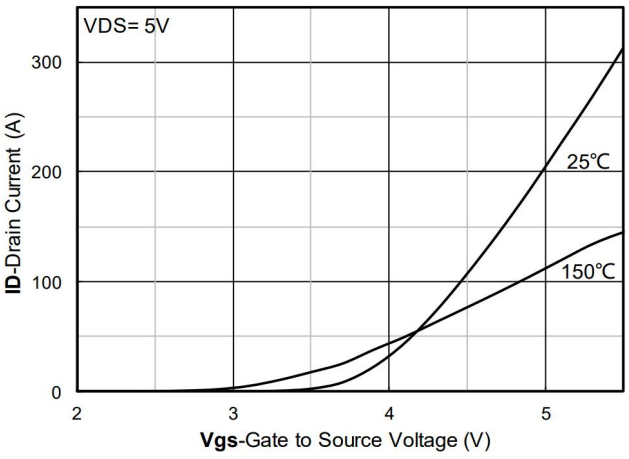


Figure 2. Transfer Characteristics

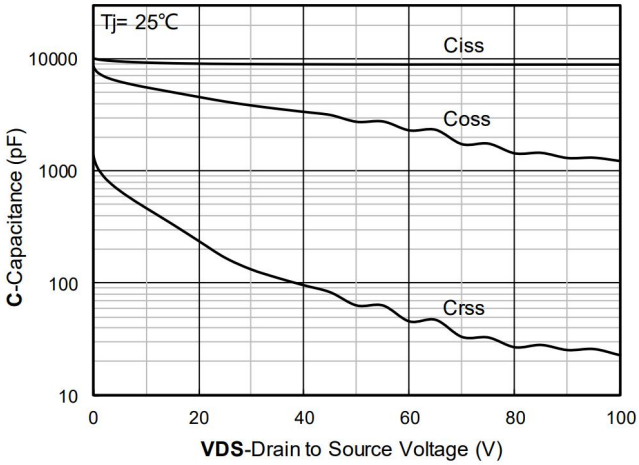


Figure 3. Capacitance Characteristics

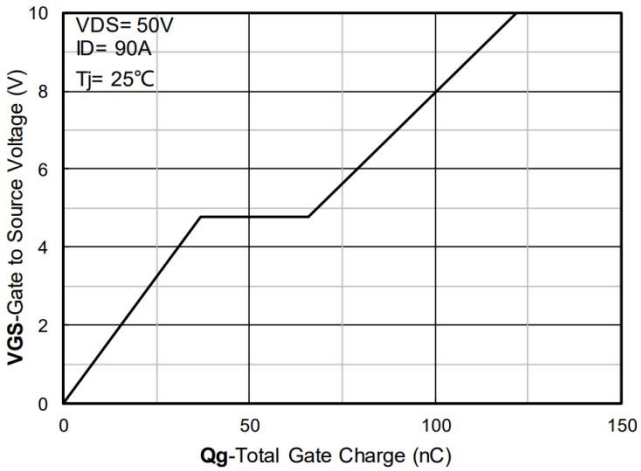


Figure 4. Gate Charge

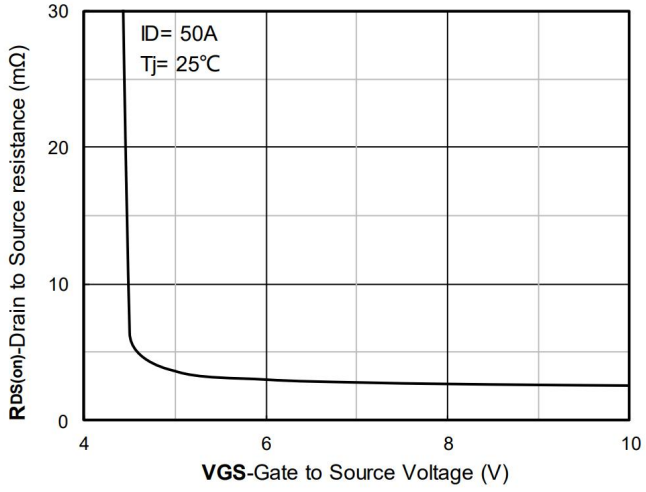


Figure 5. On-Resistance vs Gate to Source Voltage

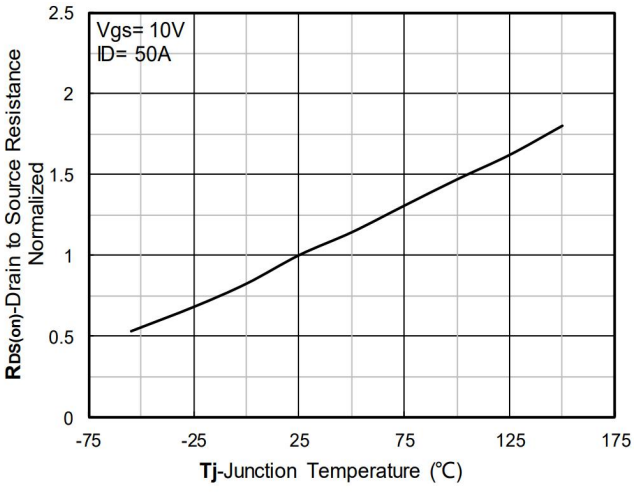


Figure 6. Normalized On-Resistance

Typical Characteristics

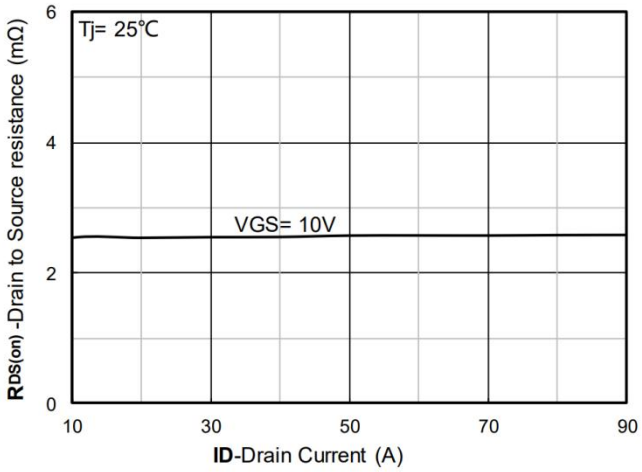


Figure 7. $R_{DS(on)}$ VS Drain Current

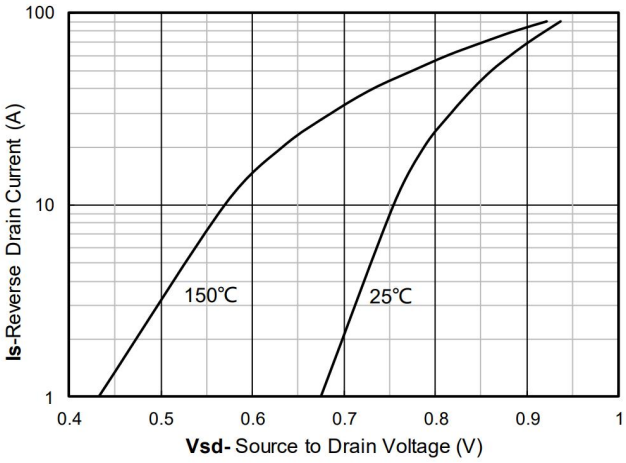


Figure 8. Forward characteristics of reverse diode

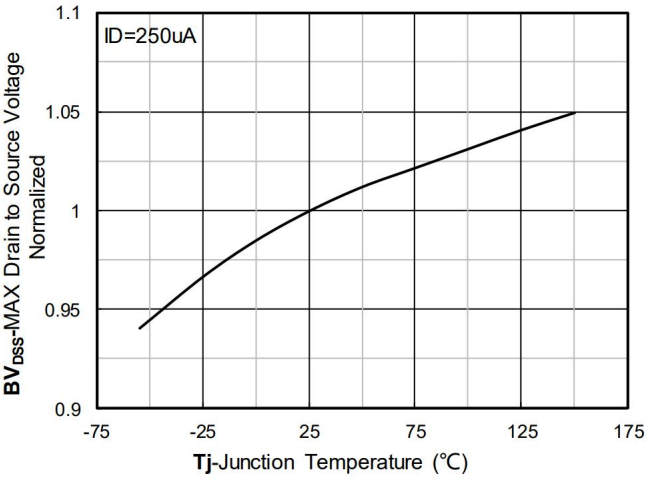


Figure 9. Normalized breakdown voltage

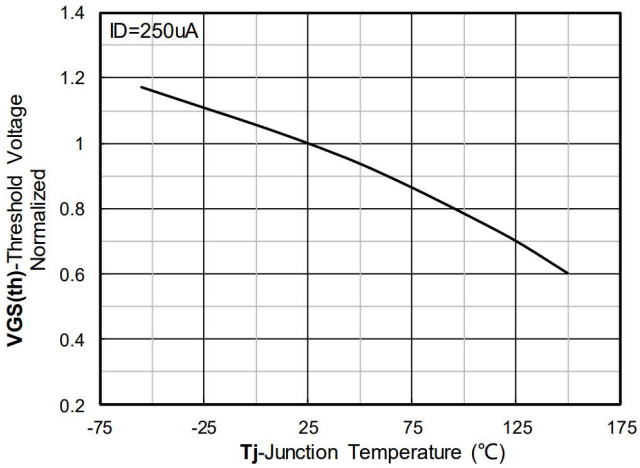


Figure 10. Normalized Threshold voltage

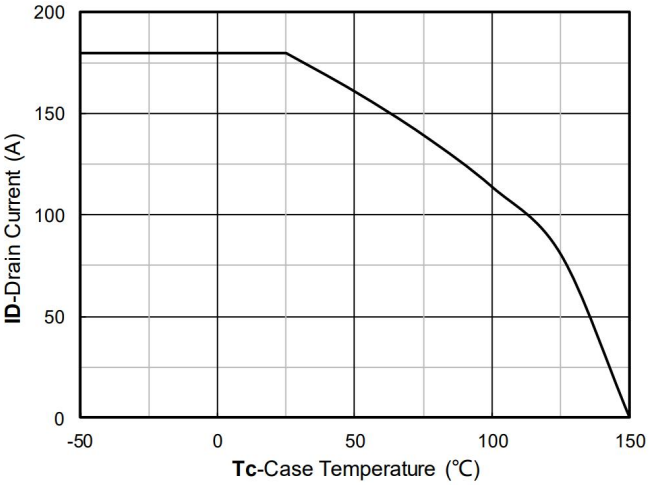


Figure 11. Current dissipation

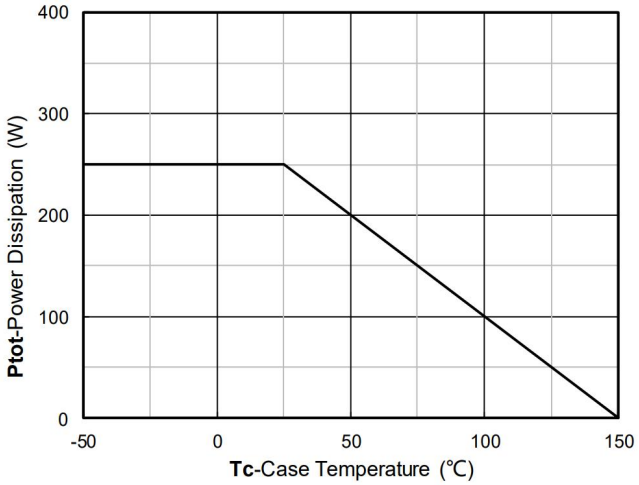


Figure 12. Power dissipation

Typical Characteristics

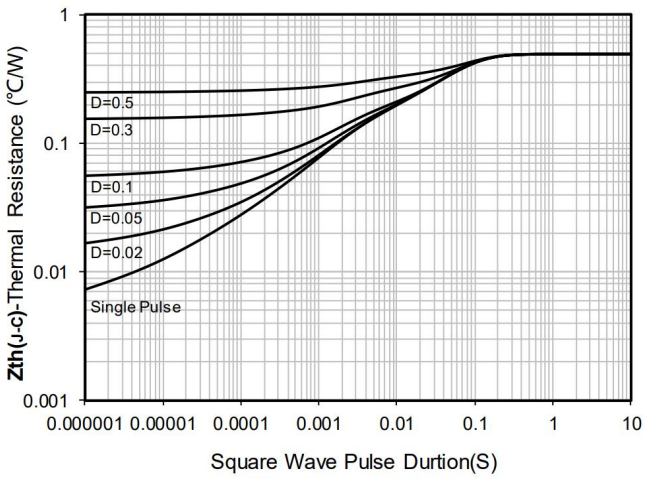


Figure 13. Maximum Transient Thermal Impedance

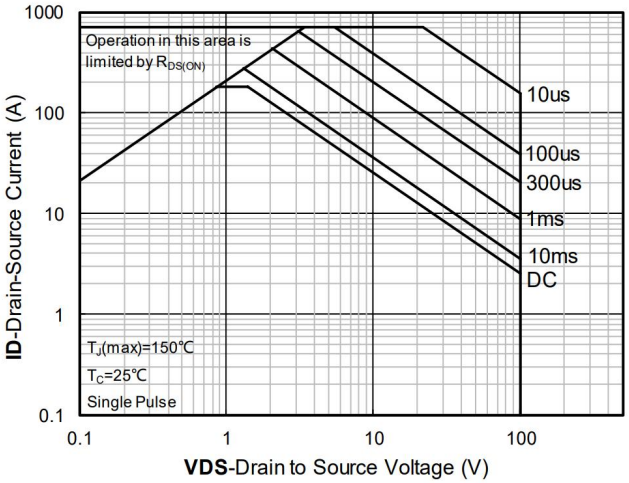
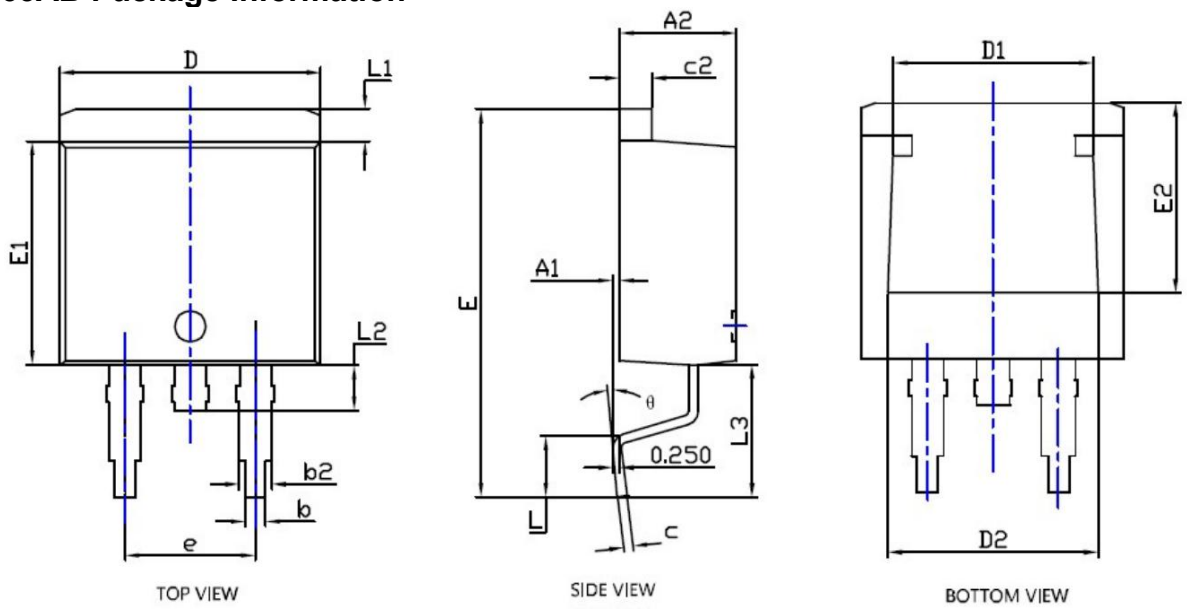


Figure 14. Safe Operation Area

TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A1	0.000	0.250	0.000	0.010
A2	4.430	4.730	0.174	0.186
b	0.720	0.920	0.028	0.036
b2	1.180	1.380	0.046	0.054
c	0.330	0.450	0.013	0.018
c2	1.220	1.340	0.048	0.053
D	10.000	10.300	0.394	0.406
D1	7.500	8.100	0.295	0.319
D2	7.700	8.300	0.303	0.327
E	14.500	15.500	0.571	0.610
E1	8.550	8.850	0.337	0.348
E2	7.000	7.600	0.276	0.299
e	5.080 BSC		0.200 BSC	
L	1.790	2.790	0.070	0.110
L1	1.120	1.420	0.044	0.056
L2	0.770	1.770	0.030	0.070
L3	5.000 REF		0.197 REF	
θ	0°	8°	0°	8°