AJ220SN050ETA

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
500	220mΩ@10V	13.5A

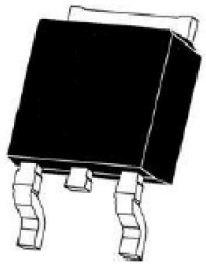
Feature

- New technology for high voltage device
- Low on-resistance and low conduction losses
- Ultra Low gate charge cause lower driving requirements

Application

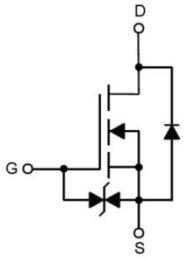
- Power factor correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible power supply (UPS)

Package



TO-252AB

Circuit diagram



Marking

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	500	V
Gate-Source Voltage (V_{GS}=0V) AC (f > 1Hz)	V_{GS}	±30	V
Gate-Source Voltage (V_{GS}=0V) DC	V_{GS}	±20	V
Continuous Drain Current	I_D	13.5	A
Continuous Drain Current (T_C=100℃)	I_D(100℃)	9.45	A
Pulsed Drain Current [1]	I_{DM}	40.5	A
Power Dissipation	P_D	109	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.37	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

Electrical characteristics (T_A=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	500			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =500V, V_{GS} =0V, T_C =25℃			10	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±200	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3		5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =6.5A		180	220	mΩ
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz		846		pF
Output Capacitance	C_{oss}			46		
Reverse Transfer Capacitance	C_{rss}			1.8		
Total Gate Charge	Q_g	V_{DS} =380V, V_{GS} =10V I_D =6.5A		19		nC
Gate-Source Charge	Q_{gs}			7.3		
Gate-Drain Charge	Q_{gd}			5.7		
Turn-on delay time	$t_{d(on)}$	V_{DS} =380V, V_{GS} =10V I_D =6.5A, R_G =4Ω		8		nS
Turn-on rise time	t_r			10		
Turn-off delay time	$t_{d(off)}$			41		
Turn-off fall time	t_f			10		
Source-Drain Diode characteristics						
Diode Forward Current	I_S	T_C =25℃			13.5	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_{SD} =13.5A,T_J =25℃			1.2	V
Reverse recovery time	t_{rr}	I_F =6.5A, di/dt =100 A/μs T_J =25℃		150		nS
Reverse recovery charge	Q_{rr}			0.34		μC
Peak Reverse Recovery Current	I_{rrm}			4.5		A

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.
2) Guaranteed by design, not subject to production.

Typical Characteristics

Figure1. Output characteristics

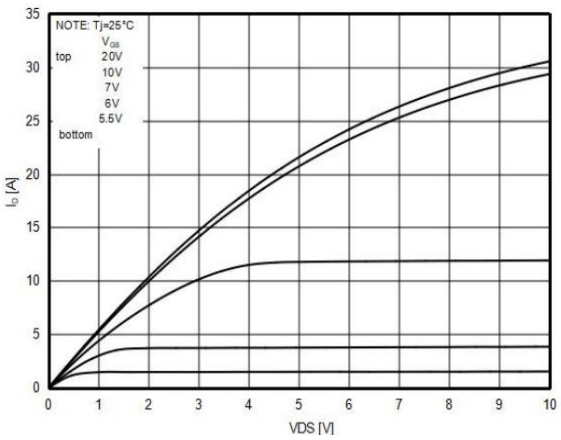


Figure2. Transfer characteristics

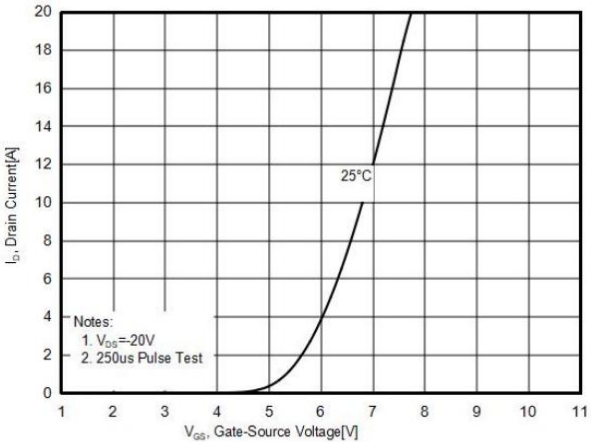


Figure3. $R_{DS(ON)}$ vs Junction Temperature

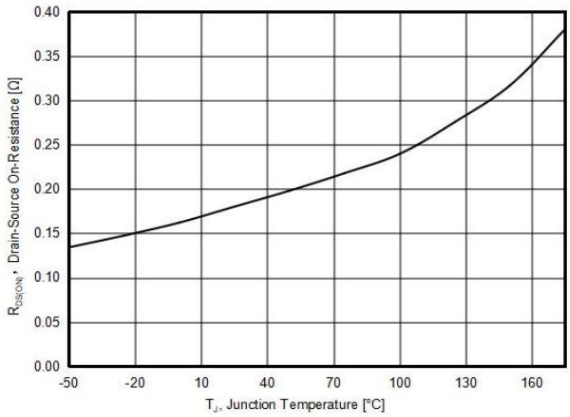


Figure4. BV_{DSS} vs Junction Temperature

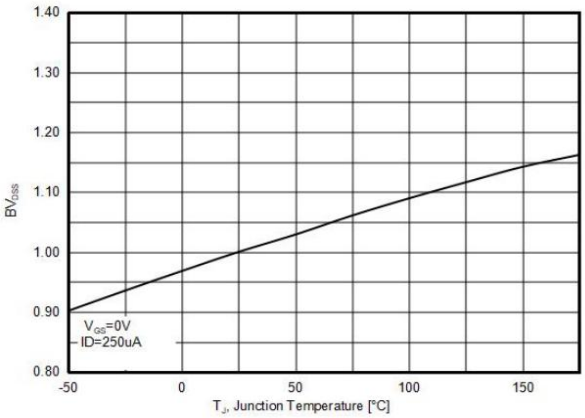


Figure5. Maximum I_D vs Junction Temperature

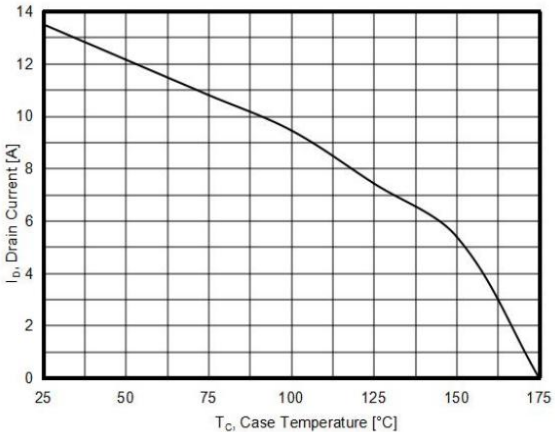
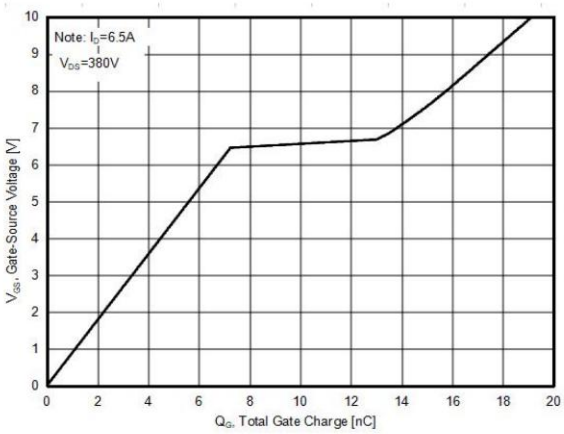


Figure6. Gate charge waveforms



Typical Characteristics

Figure7. Static drain-source on resistance

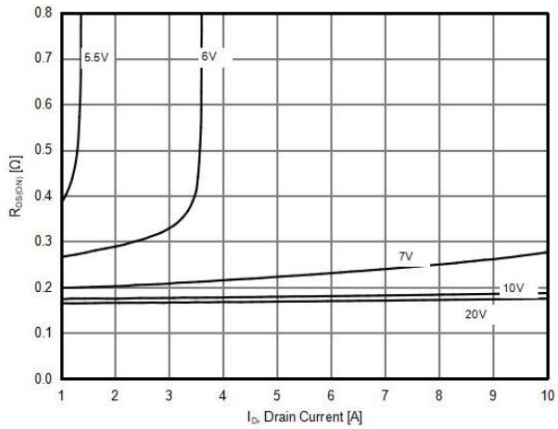


Figure8. Source-Drain Diode Forward Voltage

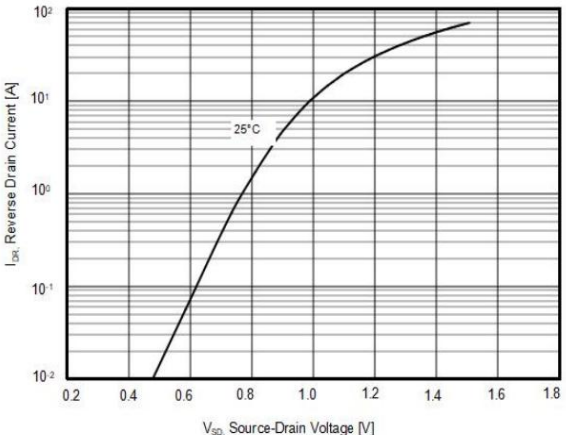


Figure9. Capacitance

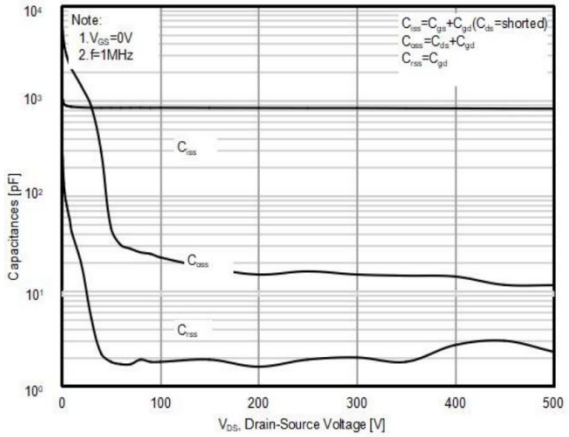
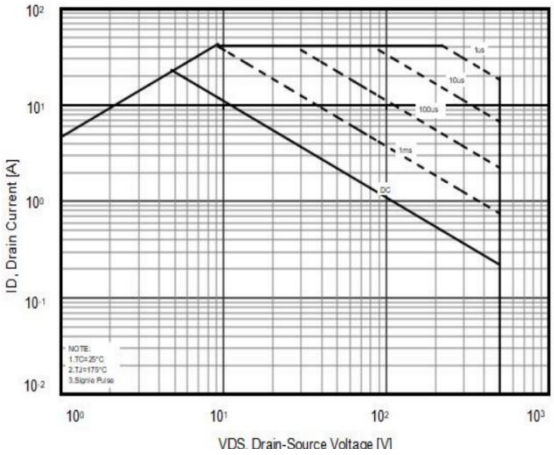
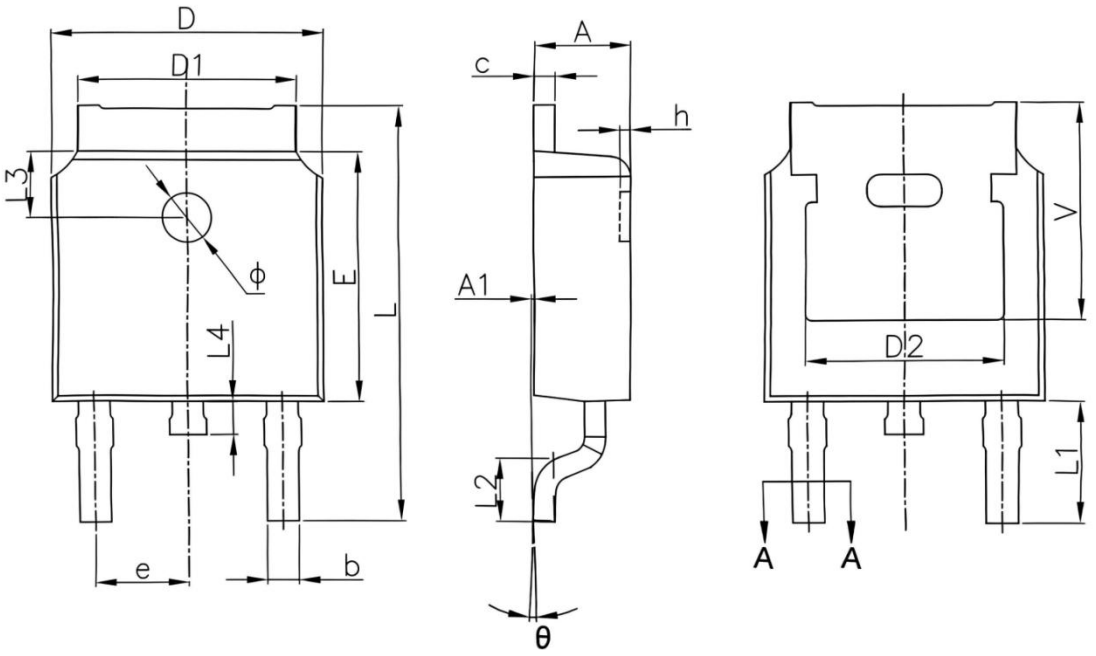


Figure10. Safe operating area



TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.130	0.000	0.005
b	0.660	0.860	0.026	0.034
b1	0.730	0.790	0.029	0.031
c	0.460	0.580	0.018	0.023
c1	0.500	0.520	0.020	0.020
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.190	2.390	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.067	0.055
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
ϕ	1.100	1.300	0.043	0.051
h	0.000	0.300	0.000	0.012
θ	0°	8°	0°	8°