AJ520SN050MTC

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
500V	520mΩ@10V	7.2A

Feature

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

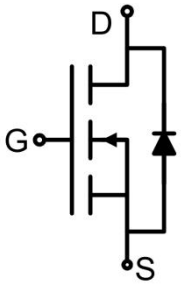
Application

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

Package

TO-220AB

Circuit diagram



Marking

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	500	V
Gate-Source Voltage (V_{DS}=0V) AC (f>1Hz)	V_{GS}	±30	V
Gate-Source Voltage (V_{DS}=0V) DC	V_{GS}	±20	V
Continuous Drain Current	I_D	7.2	A
Continuous Drain Current (T_C=100℃)	I_D (100℃)	5.04	A
Pulsed Drain Current[1)]	I_{DM}	21.6	A
Power Dissipation	P_D	73	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.05	℃/W
Operating Junction Temperature	T_J	-55 ~ +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			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=3.5A		460	520	mΩ
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS}=50V, V_{GS}=0V, f=1MHz		354		pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			4.7		
Total Gate Charge	Q_g	V_{DS}=380V, V_{GS}=10V, I_D=3.5A		10		nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			2.6		
Turn-on delay time	$t_{d(on)}$	V_{DS}=380V, V_{GS}=10V, I_D=4A 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			9		
Source-Drain Diode characteristics						
Diode Continuous Current	I_S	T_C=25°C			7.2	A
Diode Forward voltage	V_{SD}	V_{GS}=0V, I_S=7.2A, T_J=25°C			1.2	V
Reverse recover time	T_{rr}	I_F=4A, di/dt=100A/us T_J=25°C		105		nS
Reverse recovery charge	Q_{rr}			0.42		μC
Peak reverse recovery current	I_{rrm}			7.5		A

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.

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

Typical Characteristics

Figure1. Safe operating area

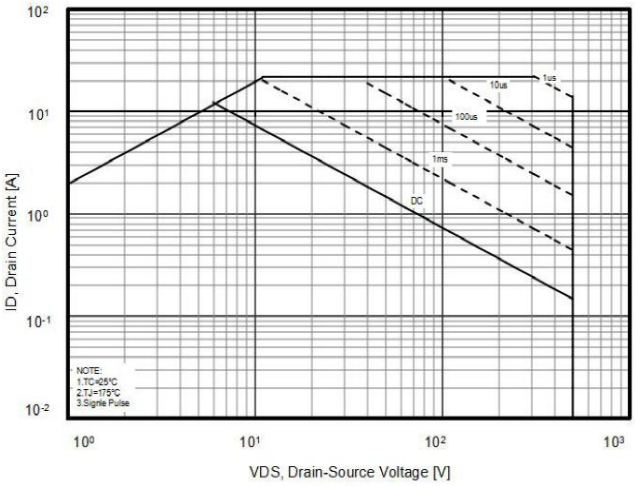


Figure2. Source-Drain Diode Forward Voltage

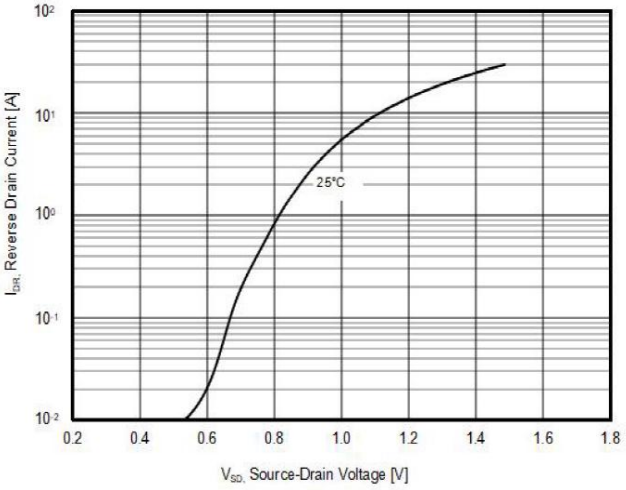


Figure3. Output characteristics

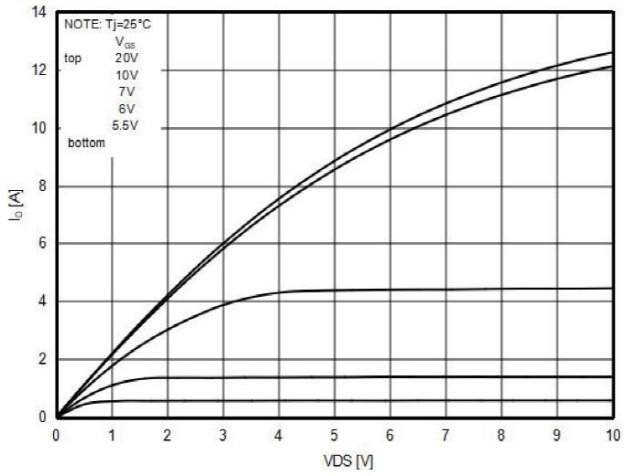


Figure4. Transfer characteristics

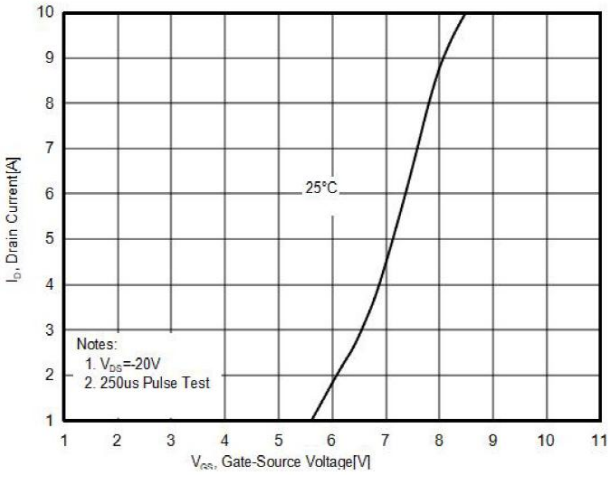


Figure5. Static drain-source on resistance

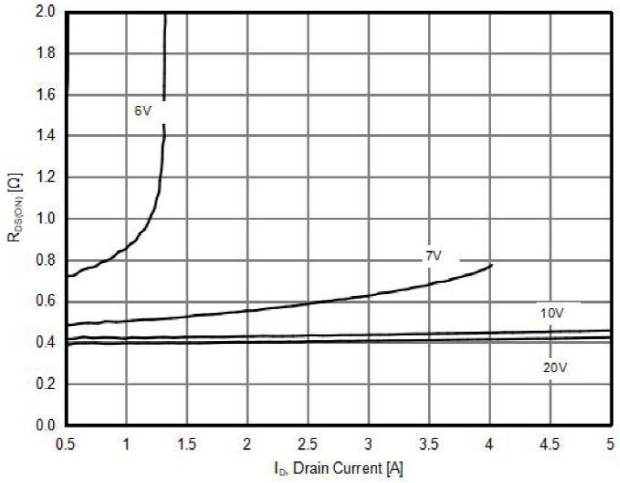
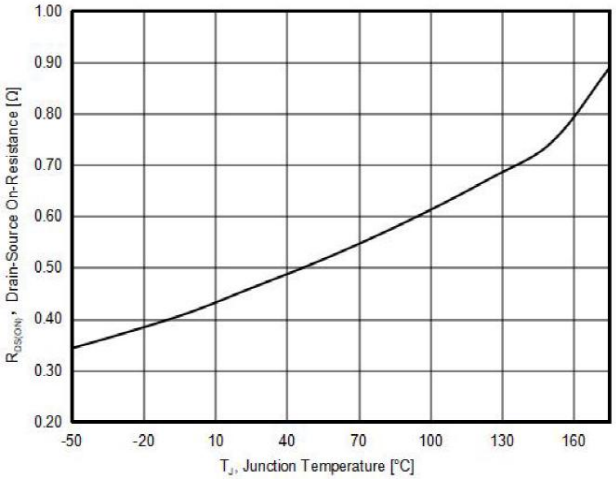


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

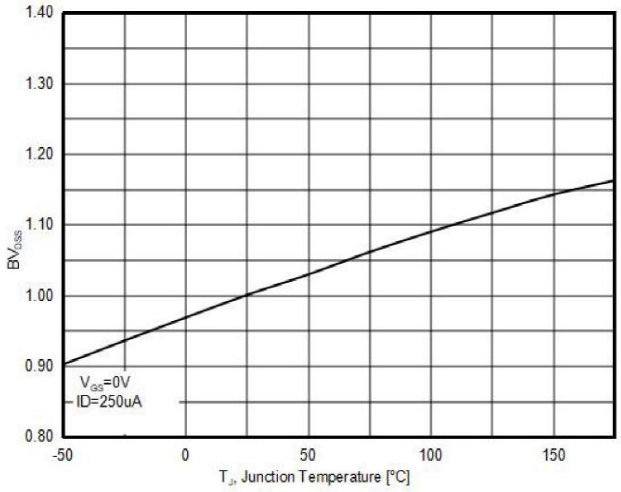


Figure8. Maximum I_D vs Junction Temperature

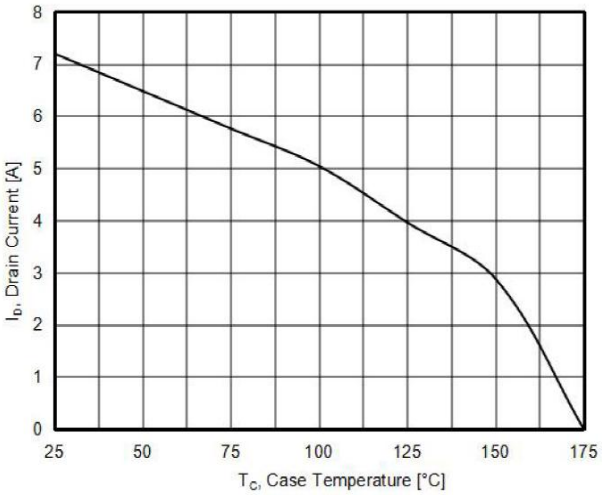


Figure9. Gate charge waveforms

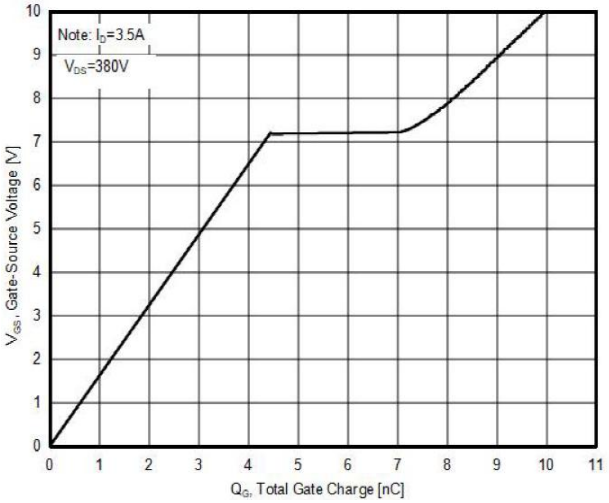
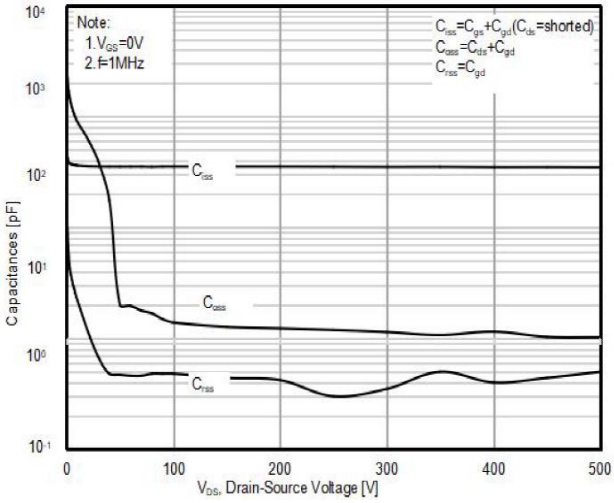
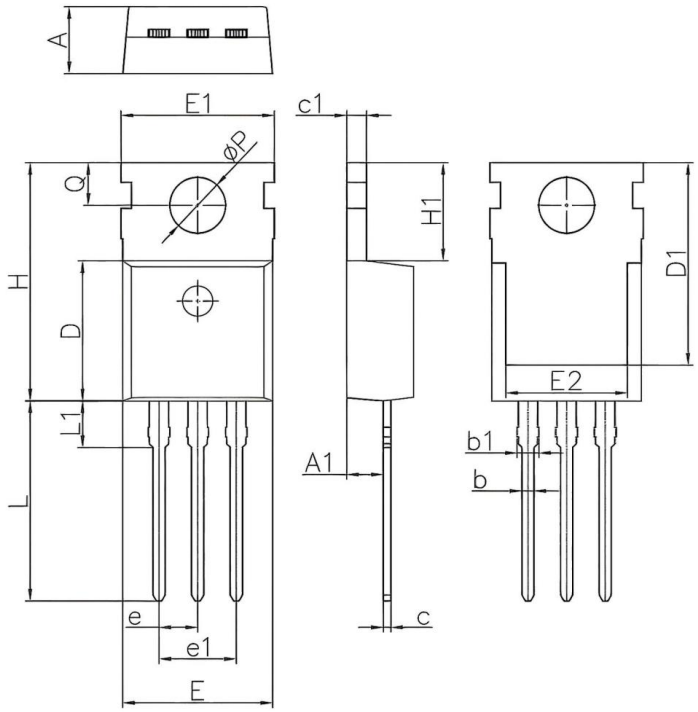


Figure10. Capacitance



TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.200	4.600	0.165	0.181
A1	2.250	2.550	0.089	0.100
b	0.700	0.900	0.028	0.035
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	8.950	9.750	0.352	0.384
D1	13.100	13.500	0.516	0.531
E	9.740	10.040	0.383	0.395
E1	9.910	10.250	0.390	0.404
E2	7.900	8.100	0.311	0.319
e	2.540 BSC.		0.100 BSC.	
e1	5.080 BSC.		0.200 BSC.	
H	15.450	15.850	0.608	0.624
H1	6.300	6.600	0.248	0.260
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
Q	2.650	2.950	0.104	0.116
ΦP	3.400	3.800	0.134	0.150