AJ190SN065BTF

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	190mΩ@10V	20A

Feature

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

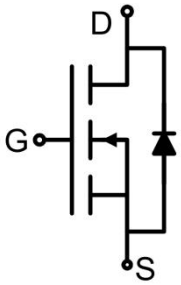
Application

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Package

ITO-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_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current[1,3] (V_{GS} =10V)	I_D	20	A
Continuous Drain Current[1,3] (V_{GS} =10V, T_C=100℃)	I_D (100℃)	12.6	A
Pulsed Drain Current (t_p ≤10μs)	I_{DM}	42	A
Single Pulse Avalanche Energy[2]	E_{AS}	263.34	mJ
Power Dissipation[1,3]	P_D	54	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.3	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=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	650			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±30V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2	2.8	3.6	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =10A		153	190	mΩ
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =325V, V_{GS} =0V, f =1MHz		1250		pF
Output Capacitance	C_{oss}			30		
Reverse Transfer Capacitance	C_{rss}			2.5		
Total Gate Charge	Q_g	V_{DS} =325V, V_{GS} =10V, I_D =10A		25		nC
Gate-Source Charge	Q_{gs}			5.1		
Gate-Drain Charge	Q_{gd}			8.6		
Turn-on delay time	$t_{d(on)}$	V_{DS} =325V, V_{GS} =10V, I_D =10A R_G =3Ω		22		nS
Turn-on rise time	t_r			19.4		
Turn-off delay time	$t_{d(off)}$			33		
Turn-off fall time	t_f			12.3		
Source-Drain Diode characteristics						
Diode Continuous Current	I_S	T_C=25℃			20	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =10.5A			1.2	V
Reverse recover time	T_{rr}	V_{GS} =0V, V_R =325V, I_F =10A di/dt =-100A/us		221		nS
Reverse recovery charge	Q_{rr}			2780		nC
Peak reverse recovery current	I_{rrm}			26.7		A

Notes:

1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

2) E_{AS} condition: T_J =25℃, V_G =10V, R_G =25Ω, L =30mH, I_{AS} =4.19A.

3) Thermal resistance from junction to soldering point (on the exposed drain pad).

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

Typical Characteristics

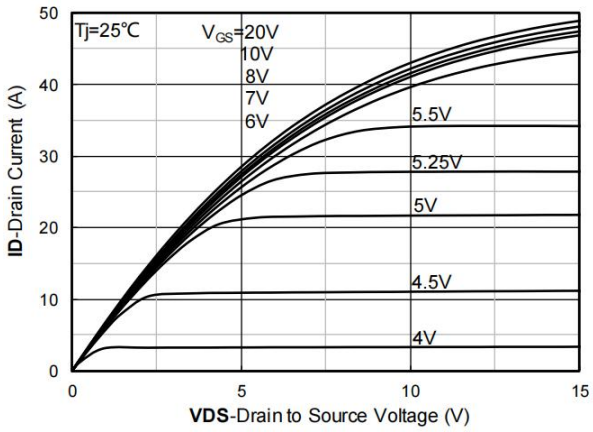


Figure 1. Output Characteristics; typical values

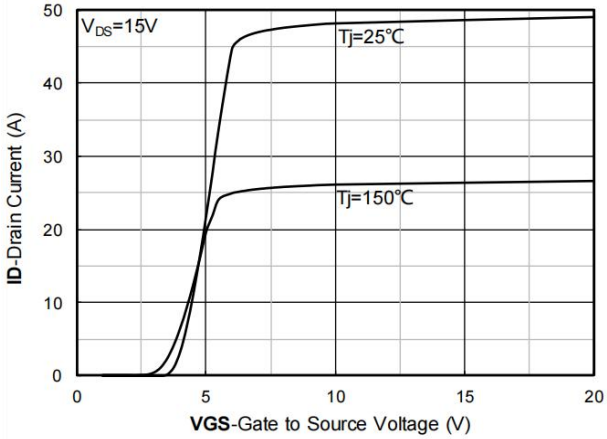


Figure 2. Transfer Characteristics; typical values

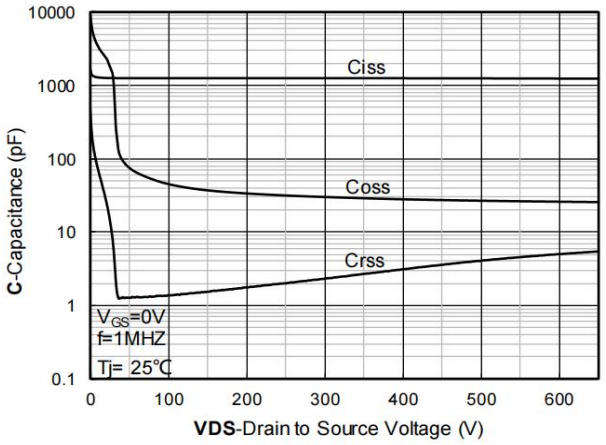


Figure 3. Capacitance Characteristics; typical values

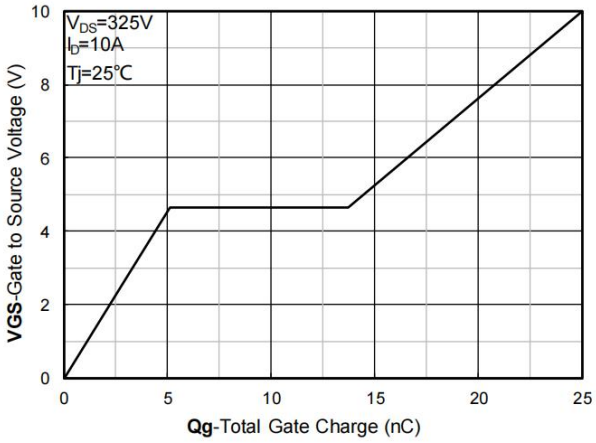


Figure 4. Gate Charge; typical values

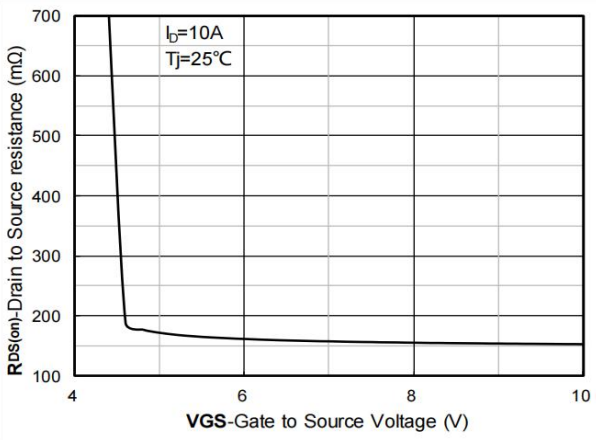


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

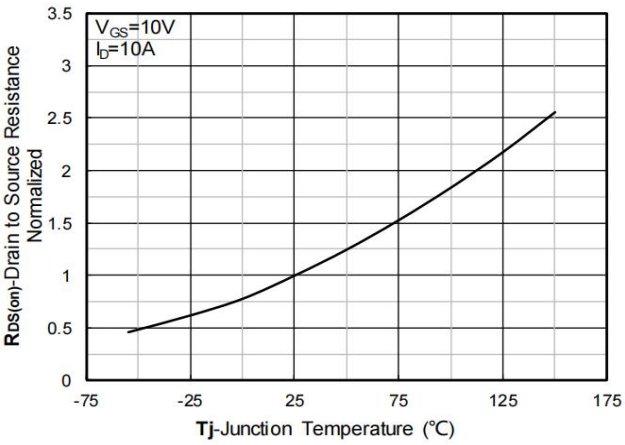


Figure 6. Normalized On-Resistance

Typical Characteristics

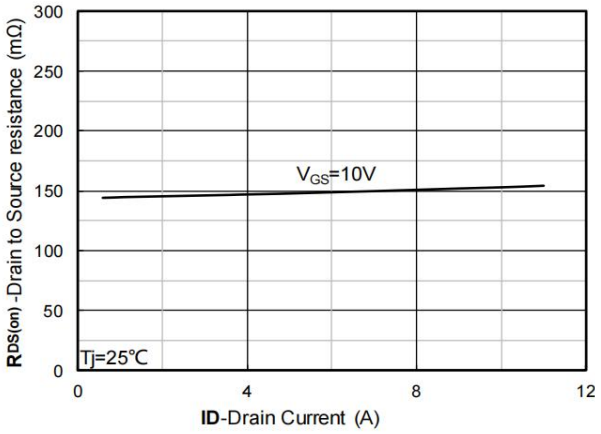


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

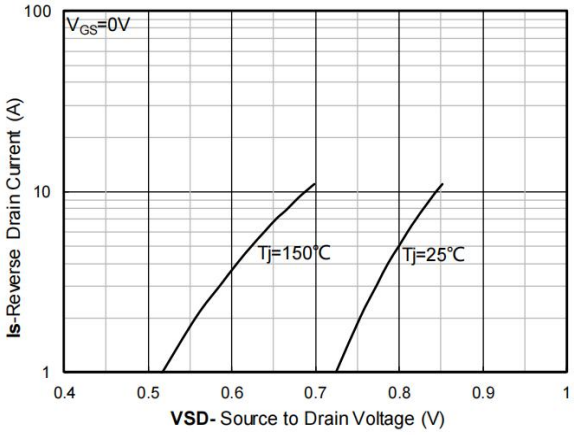


Figure 8.Forward characteristics of reverse diode; typical values

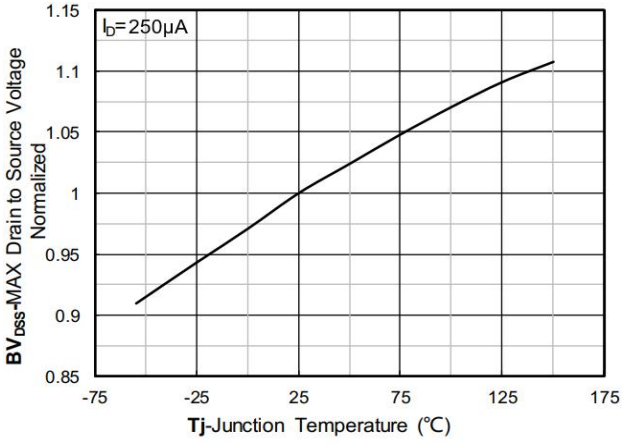


Figure 9. Normalized breakdown voltage

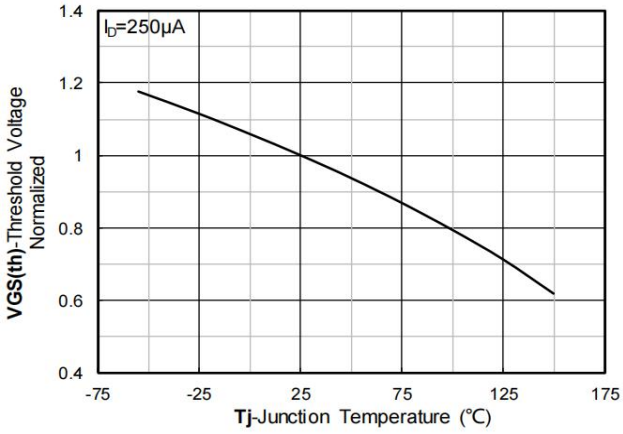


Figure 10. Normalized Threshold voltage

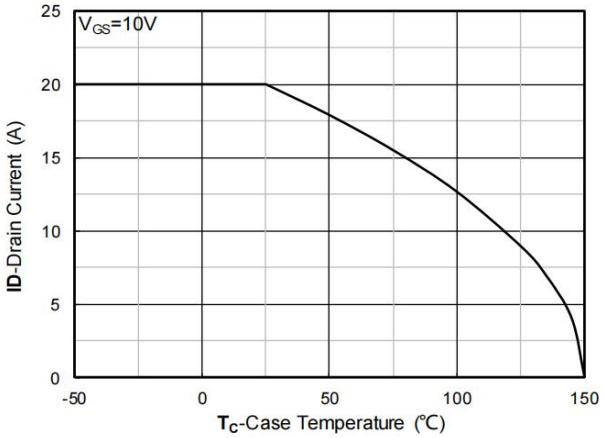


Figure 11. Current dissipation

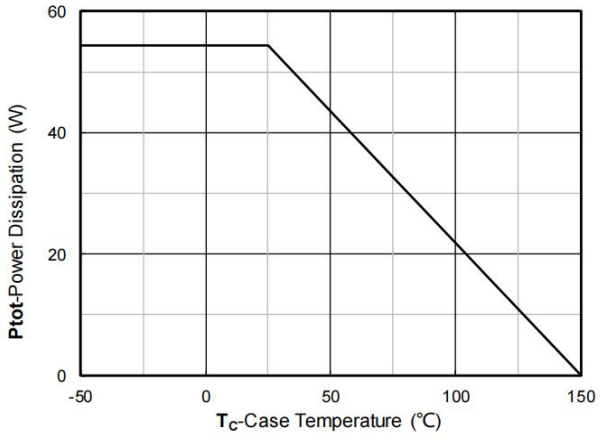


Figure 12. Power dissipation

Typical Characteristics

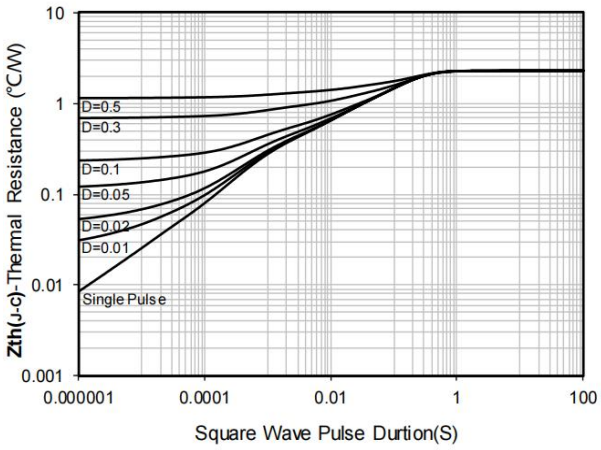


Figure 13. Maximum Transient Thermal Impedance

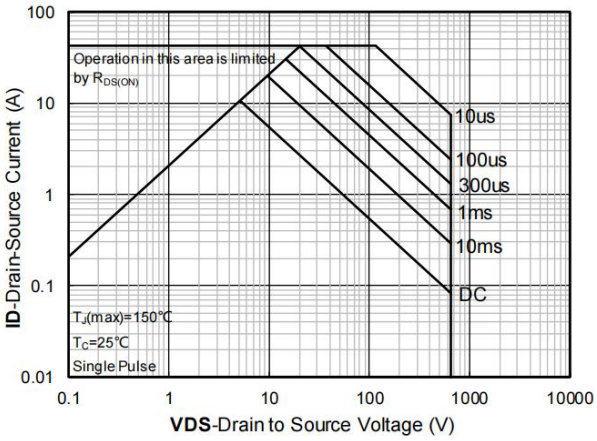
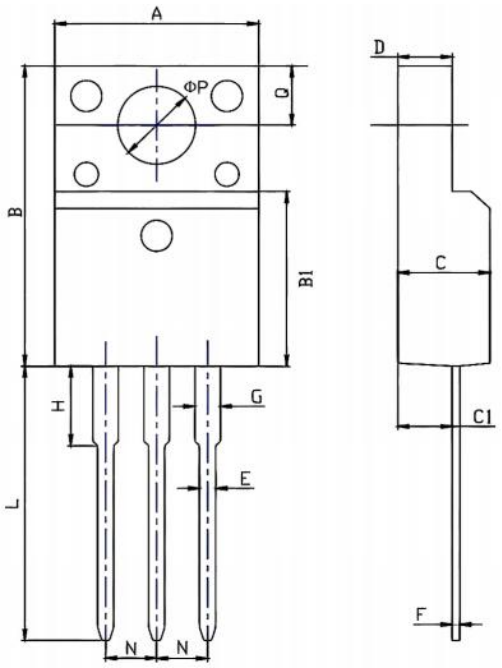


Figure 14. Safe Operation Area

ITO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	9.700	10.300	0.382	0.406
B	15.500	16.100	0.610	0.634
B1	8.990	9.390	0.354	0.370
C	4.500	4.900	0.177	0.193
C1	2.600	2.950	0.102	0.116
D	2.340	2.740	0.092	0.108
E	0.700	0.900	0.028	0.035
F	0.400	0.600	0.016	0.024
G	1.120	1.420	0.044	0.056
H	2.700	3.200	0.106	0.126
L	12.600	13.600	0.496	0.535
N	2.340	2.740	0.092	0.108
Q	3.150	3.500	0.124	0.140
ϕP	3.000	3.300	0.118	0.130