AJ180SN065NTD

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	180mΩ@10V	20A

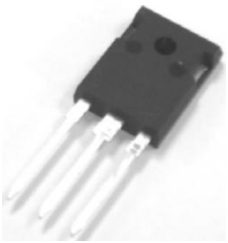
Feature

- Optimized body diode reverse recovery performance
- Low on-resistance and low conduction losses
- Ultra low gate charge cause lower driving requirements

Application

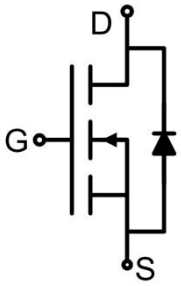
- Power factor correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible Power Supply (UPS)
- LLC Half-bridge

Package

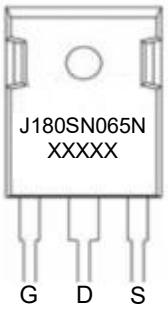


TO-247AB

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}	650	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	20	A
Continuous Drain Current (T_C=100℃)	I_D(100℃)	14	A
Pulsed Drain Current [1]	I_{DM}	60	A
Power Dissipation	P_D	194	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.77	℃/W
Operating Junction Temperature	T_J	-55 ~ +175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

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	650			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V, V_{GS} =0V, T_C =25℃			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3	3.5	4	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =10A		160	180	mΩ
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz		1550		pF
Output Capacitance	C_{oss}			60		
Reverse Transfer Capacitance	C_{rss}			5		
Total Gate Charge	Q_g	V_{DS} =480V, V_{GS} =10V I_D =10.5A		28.5		nC
Gate-Source Charge	Q_{gs}			11.7		
Gate-Drain Charge	Q_{gd}			5		
Turn-on delay time	$t_{d(on)}$	V_{DS} =380V, V_{GS} =10V, I_D =10A R_G =1.7Ω		32		nS
Turn-on rise time	t_r			18		
Turn-off delay time	$t_{d(off)}$			90		
Turn-off fall time	t_f			8		
Source-Drain Diode characteristics						
Diode Forward Current	I_S	T_C=25℃			20	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =20A, T_J =25℃			1.2	V
Reverse Recovery Time	T_{rr}	I_F =10A, di/dt =100A/μs T_J =25℃		300		nS
Reverse Recovery Charge	Q_{rr}			4.5		μC
Peak Reverse Recovery Current	I_{rrm}			30		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

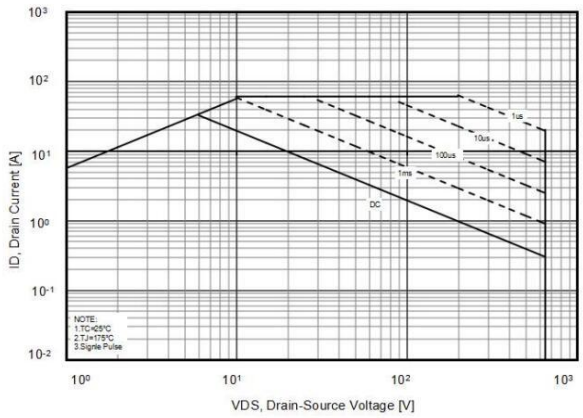


Figure2. Capacitance

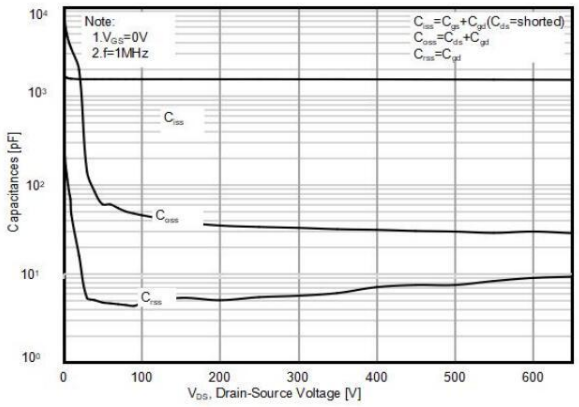


Figure3. Transfer characteristics

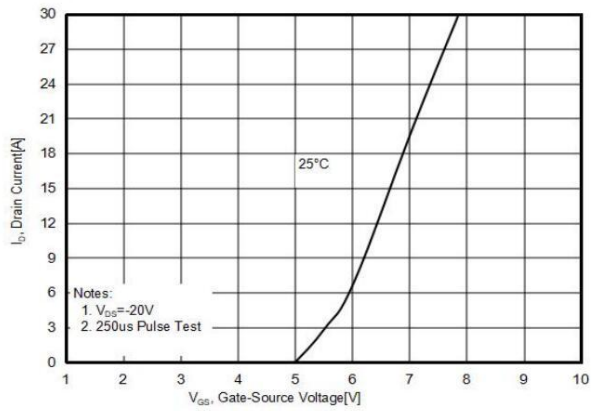


Figure4. Output characteristics

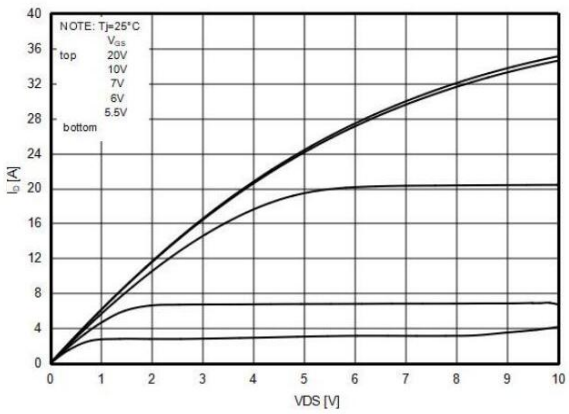


Figure5. $R_{DS(ON)}$ vs Junction Temperature

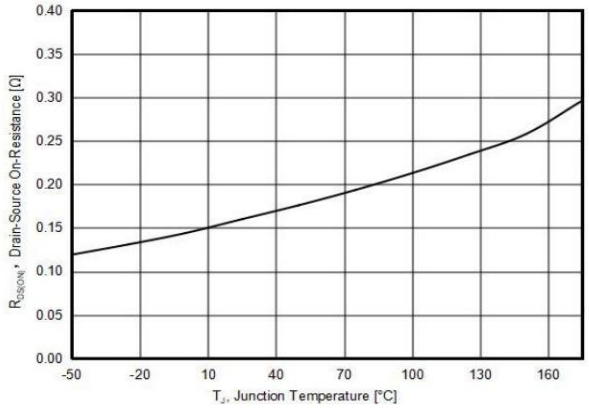
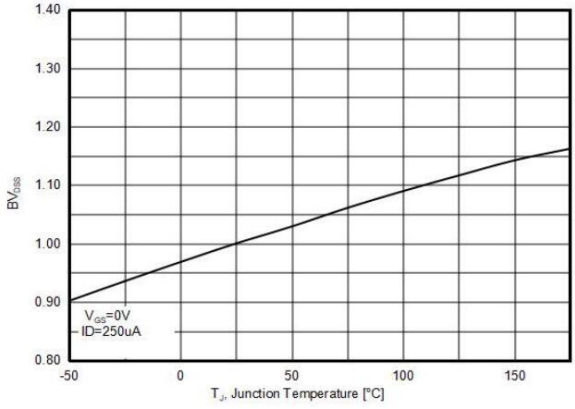


Figure6. BV_{DSS} vs Junction Temperature



Typical Characteristics

Figure7. Maximum I_D vs Junction Temperature

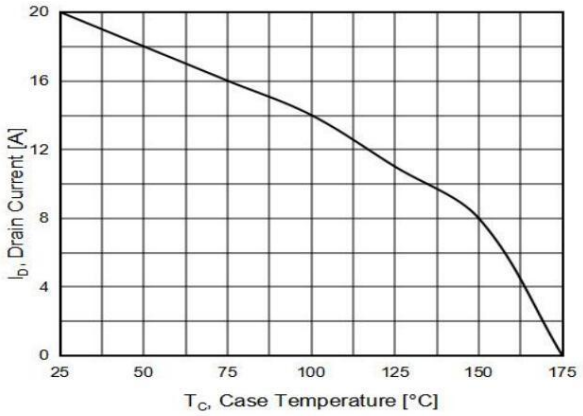


Figure8. Gate charge waveforms

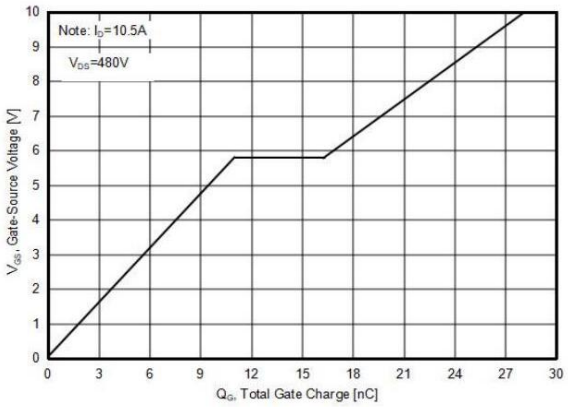


Figure9. Static drain-source on resistance

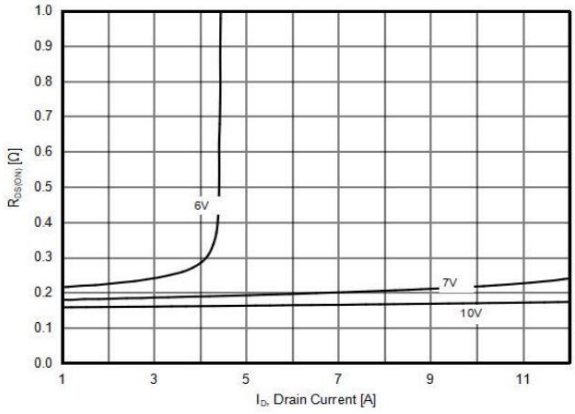
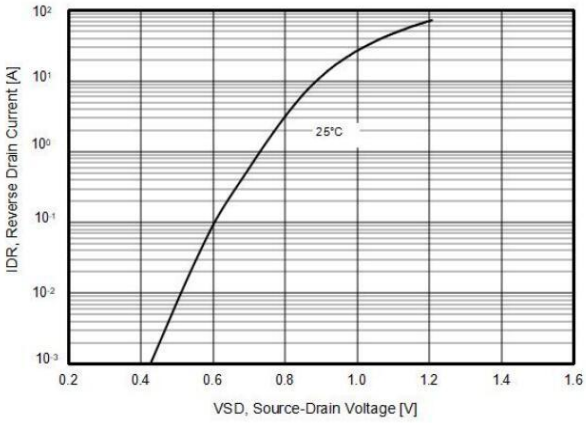
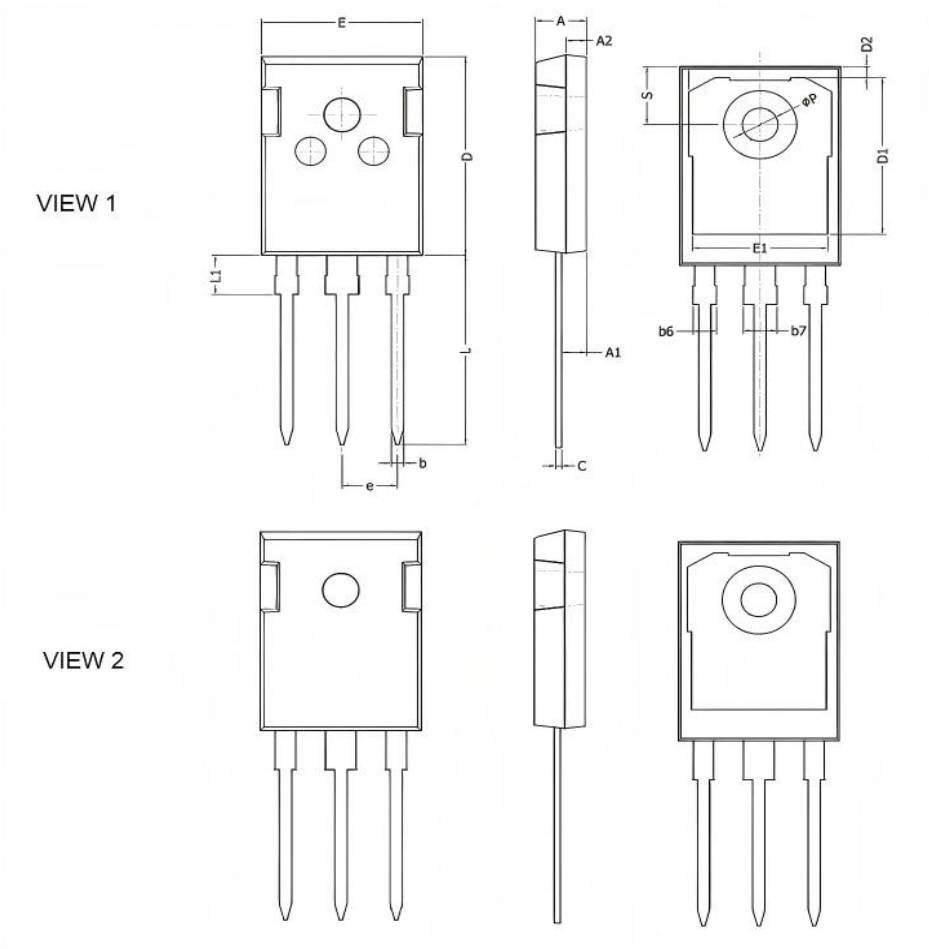


Figure10. Source-Drain Diode Forward Voltage



TO-247AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.830	5.210	0.190	0.205
A1	2.290	2.540	0.090	0.100
A2	1.900	2.160	0.075	0.085
b	1.070	1.330	0.042	0.052
b6	1.91	2.410	0.075	0.095
b7	2.87	3.380	0.113	0.133
C	0.550	0.680	0.022	0.027
D	20.800	21.100	0.819	0.831
D1	16.250	17.650	0.640	0.695
D2	0.950	1.350	0.037	0.053
E	15.700	16.130	0.618	0.635
E1	12.380	13.500	0.487	0.531
e	5.440 BSC.		0.214 BSC.	
L	19.800	20.320	0.780	0.800
L1	4.100	4.400	0.161	0.173
P	3.400	3.650	0.134	0.144
S	6.000	6.400	0.236	0.252