AFR250N80S

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
800V	250mΩ@10V	11A

Feature

- Multi-Epi Super Junction MOSFET
- Fast Switching
- Easy to Drive/Use

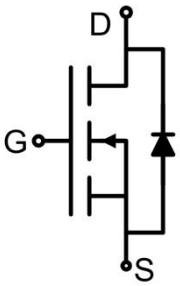
Application

- SMPS
- Motor drivers
- Charger/Power Supply
- UPS

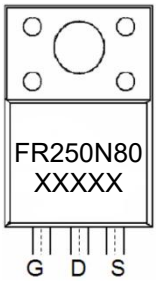
Package

ITO-220AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	800	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current(T_C=25℃)	I_D	11	A
Continuous Drain Current(T_C=100℃)	I_D(100℃)	7	
Pulsed Drain Current	I_{DM}	43	A
Power Dissipation(T_C=25℃)	P_D	114	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.1	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-40 ~ +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	800			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =800V,V_{GS} = 0V		1		μA
		V_{DS} =800V,V_{GS} = 0V,T_J=150℃		50		
Gate-body leakage current	I_{GSS}	V_{GS} =±30V, V_{DS} = 0V			±70	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3.4	4.0	4.6	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =5A		230	250	mΩ
		V_{GS} =10V, I_D =5A,T_J=150℃		585	650	
Dynamic characteristics[1)]						
Input Capacitance	C_{iss}	V_{DS} =400V,V_{GS} =0V,f=250kHz		2004		pF
Output Capacitance	C_{oss}			38		
Reverse Transfer Capacitance	C_{rss}			5		
Gate Resistance	R_g	f=1MHz,Open Drain		4.9		Ω
Total Gate Charge	Q_g	V_P =400V,V_{GS} =0~12V, I_D =5A		52		nC
Gate-Source Charge	Q_{gs}			15.7		
Gate-Drain Charge	Q_{gd}			15.9		
Gate Plateau Voltage	V_p			5.6		V
Turn-on delay time	$t_{d(on)}$	V_P=400V,V_{GS} =12V, I_{DS} =5A, R_G=10Ω		47		nS
Turn-on rise time	t_r			20		
Turn-off delay time	$t_{d(off)}$			124		
Turn-off fall time	t_f			25		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_F=5A		0.75		V
Reverse Recovery Time	t_{rr}	V_P=400V,V_{GS}=12V,I_S=5A, d_{iF}/dt=100A/us		244		nS
Reverse Recovery Charge	Q_{rr}			128		μC
Peak Reverse Recovery Current	I_{rrm}			22		A

Notes:

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

Typical Characteristics

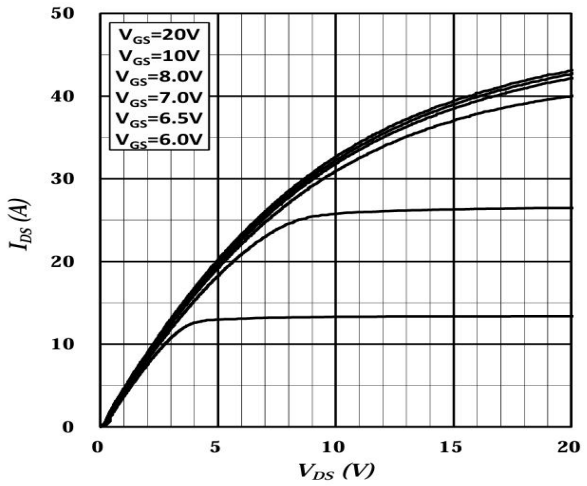


Fig.1 Typ. Output Characteristics T_j = 25 °C

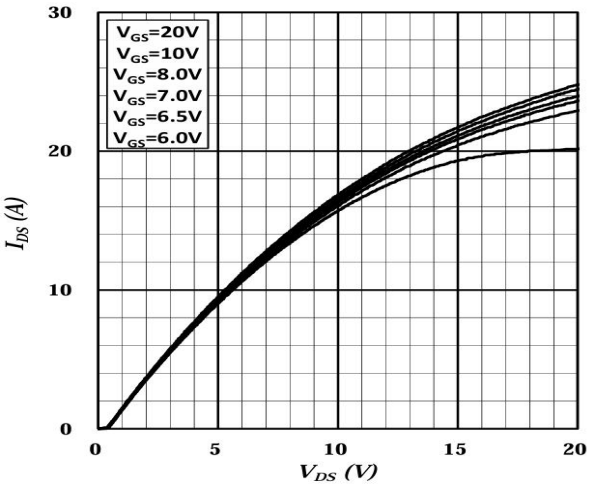
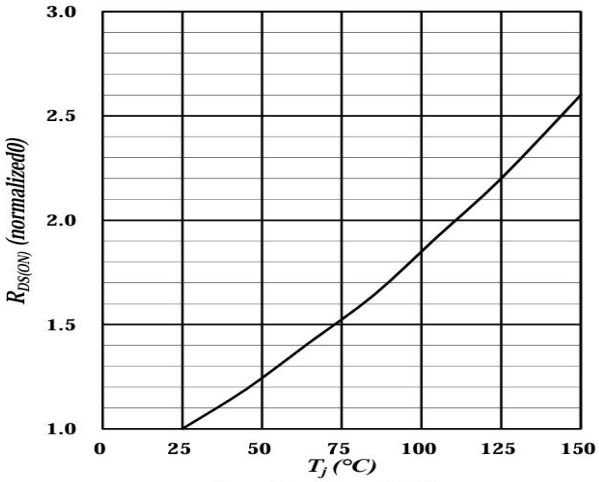


Fig.2 Typ. Output Characteristics T_j = 125 °C



I_{DS} =5A; V_{GS} = 10 V

Fig.3 $R_{DS(ON)}$ vs. Junction Temperature

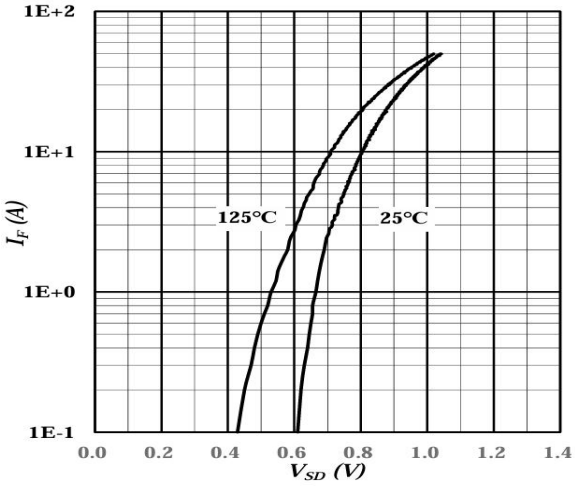


Fig.4 Forward Characteristics of Body Diode

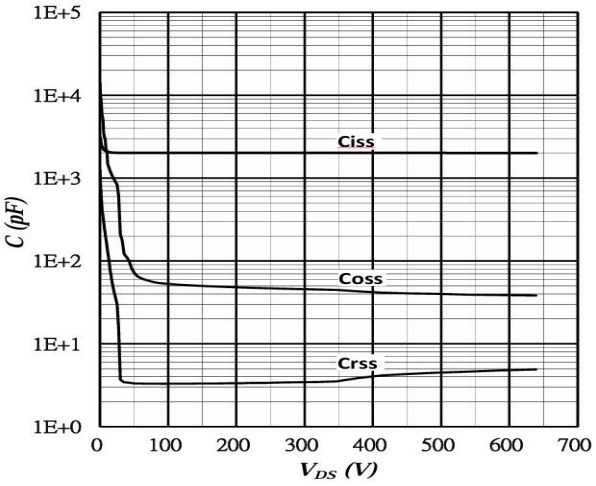
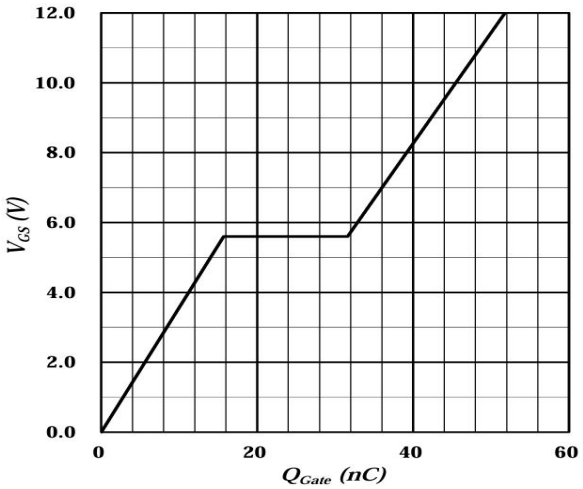


Fig.5 Typ. Capacitance vs. V_{DS}



I_{DS} =5A, V_{DS} =400V

Fig.6 Typ. Gate Charge

Typical Characteristics

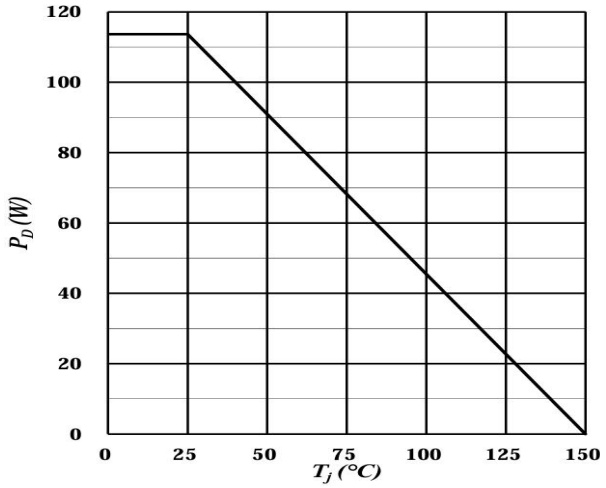


Fig.7 Power Dissipation Derating Curve

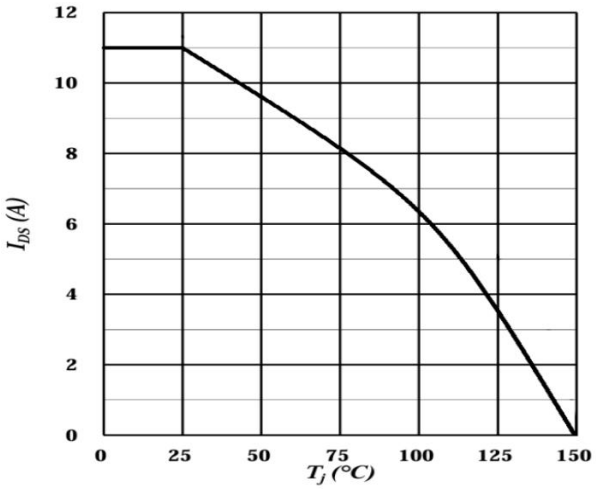


Fig.8 Drain Current Derating Curve

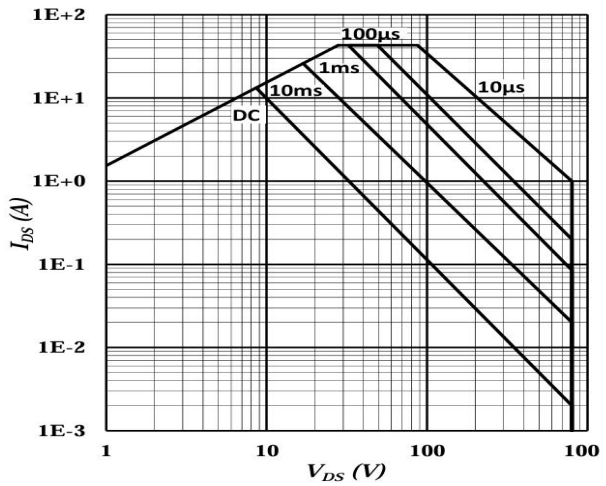


Fig.9 Safe Operating Area

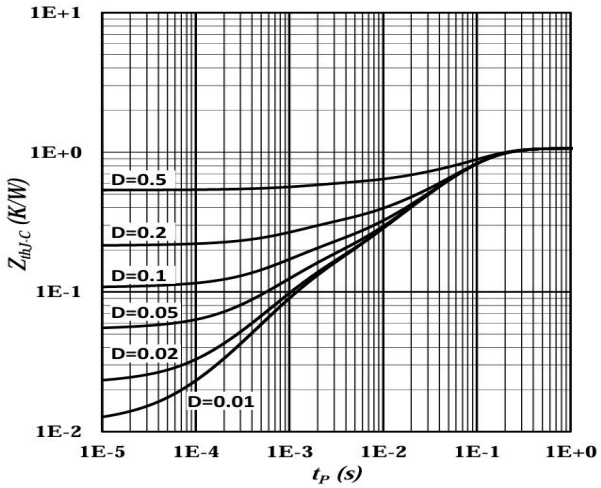


Fig.10 ZthJ-C, D = t_P / T

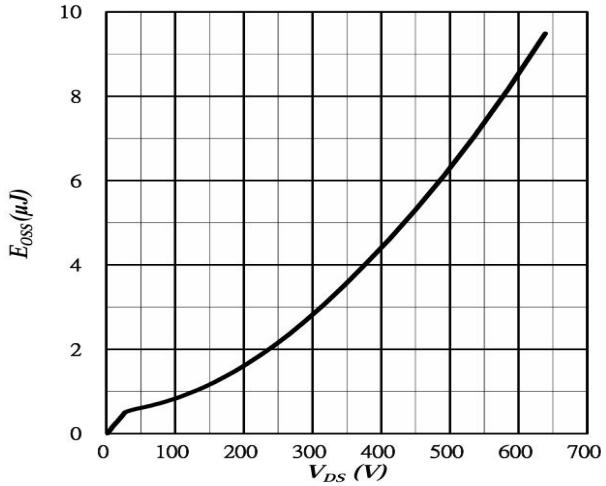


Fig.11 Eoss Curve

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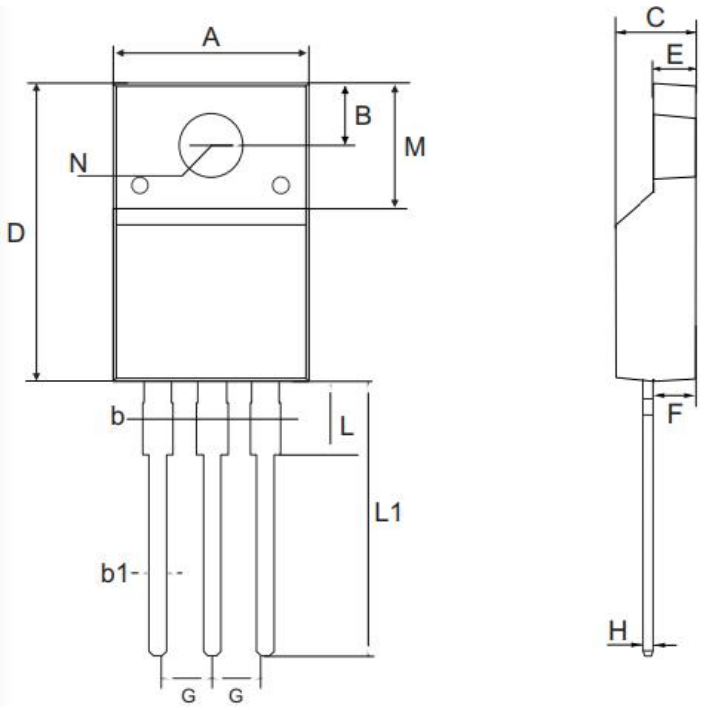
AS-3150601	2003/03/08	2024/11/12	B	5

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	2.700	3.300	0.106	0.130
b	0.090	1.290	0.004	0.051
b1	0.540	0.840	0.021	0.033
C	4.300	4.700	0.169	0.185
D	14.700	15.300	0.579	0.603
E	2.500	2.900	0.099	0.114
F	2.500	2.700	0.099	0.106
G	2.540 TYP		0.100 TYP	
H	0.490	0.790	0.019	0.031
L	2.200	2.800	0.087	0.110
L1	12.500	13.500	0.493	0.532
M	6.600	7.200	0.260	0.284
N	3.000	3.400	0.118	0.134