AF6N80S-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
800V	1.2Ω@10V	6A

Feature

- Super Junction High Voltage MOSFET technology
- Low Power Loss by High Speed Switching and Low On-Resistance
- Epoxy Meets UL 94 V-0 Flammability Rating
- Suffix "-Q1" for AEC-Q101

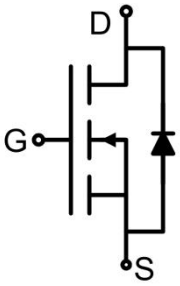
Application

- Power switching application
- Adapter
- PFC Power Supply Stages

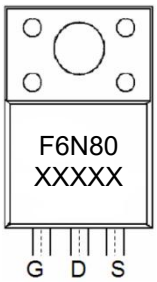
Package

ITO-220AB

Circuit diagram



Marking



AF6N80S-Q1

N-Channel Enhancement Mode MOSFET

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	800	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(T_C=25℃)	I_D	6	A
Continuous Drain Current(T_C=100℃)	I_D(100℃)	3.8	A
Pulsed Drain Current[1]	I_{DM}	12	A
Power Dissipation[3] (T_C=25℃)	P_D	50	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	2.5	℃/W
Single pulse avalanche energy[2]	E_{AS}	4.9	mJ
Junction Temperature	T_J	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	800			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =800V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±10	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.5	3.5	4.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =2.5A		0.95	1.2	Ω
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =100V,V_{GS} =0V, f =400kHz		380		pF
Output Capacitance	C_{oss}			18		
Reverse Transfer Capacitance	C_{rss}			1.1		
Total Gate Charge	Q_g	V_{DS} =640V,V_{GS} =10V, I_D =4.5A		11		nC
Gate-Source Charge	Q_{gs}			3.3		
Gate-Drain Charge	Q_{gd}			4.5		
Turn-on delay time	$t_{d(on)}$	V_{DD}=400V, V_{GS} =10V, R_{GEN}=25Ω, I_D=4.5A		16		nS
Turn-on rise time	t_r			24		
Turn-off delay time	$t_{d(off)}$			59		
Turn-off fall time	t_f			19		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				6	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=4.5A			1.2	V
Reverse Recovery Time	t_{rr}	I_F=6A,di/dt=100A/μs		380		nS
Reverse Recovery Charge	Q_{rr}			2		uC

Notes:

1) Repetitive rating; pulse width limited by max. junction temperature.

2) T_J=25℃, V_{DD}=50V, V_G=10V, L=5mH, IAS=1.4A.

3) P_d is based on max. junction temperature, using junction-case thermal resistance.

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

Typical Characteristics

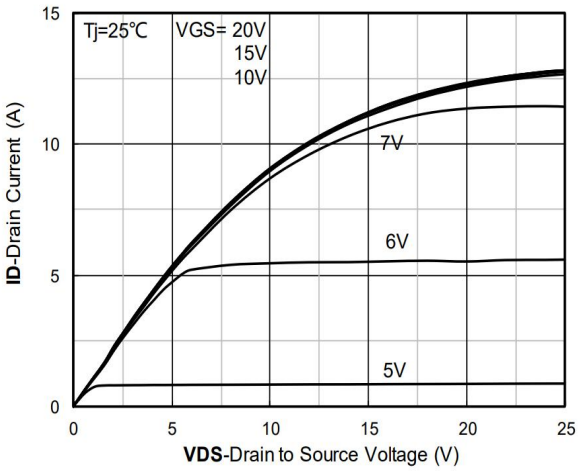


Figure 1. Output Characteristics

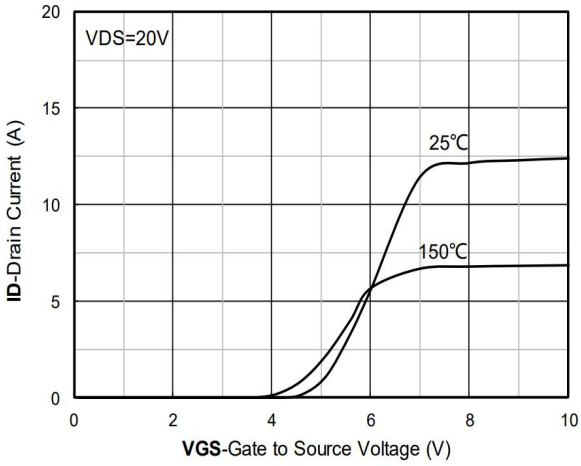


Figure 2. Transfer Characteristics

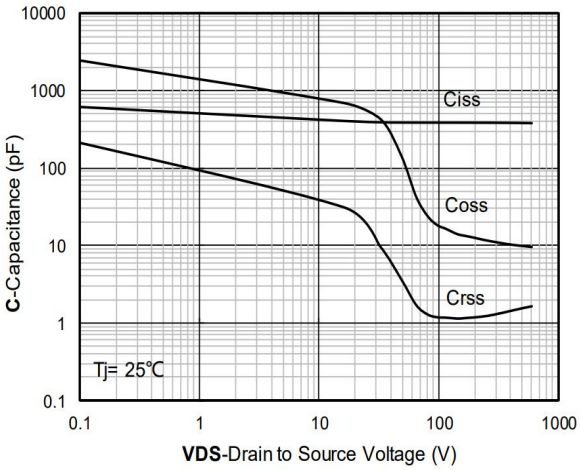


Figure 3. Capacitance Characteristics

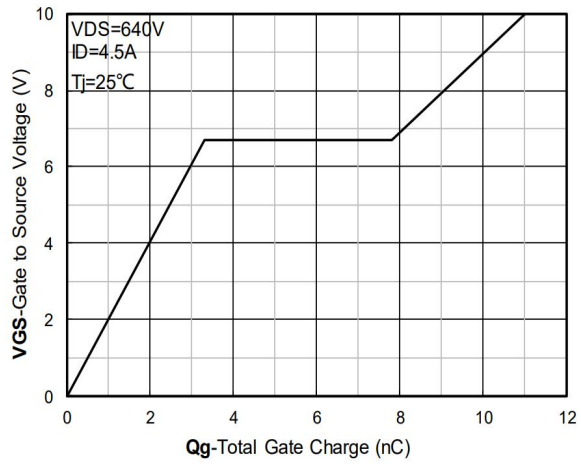


Figure 4. Gate Charge

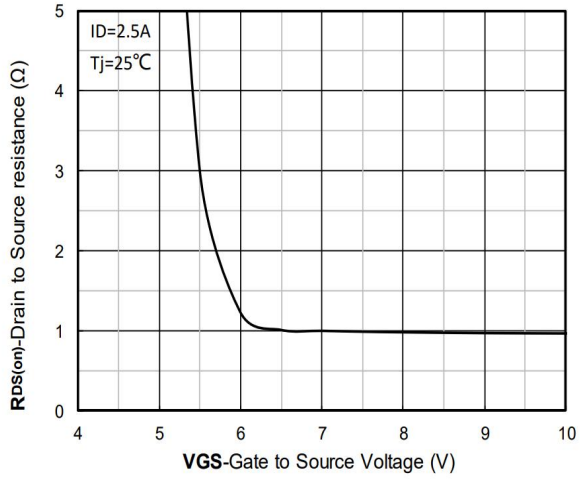


Figure 5. On-Resistance vs Gate to Source Voltage

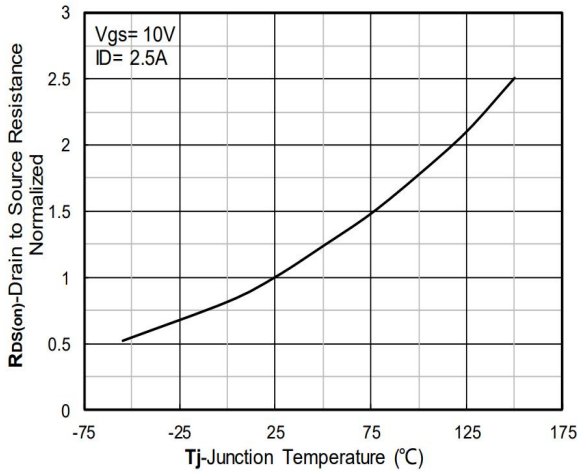


Figure 6. Normalized On-Resistance

Typical Characteristics

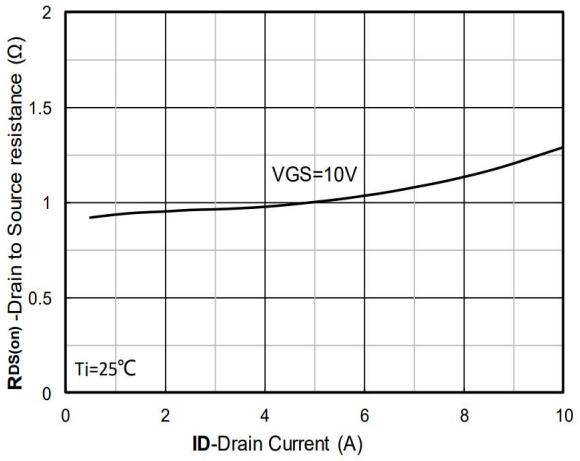


Figure 7. $R_{DS(on)}$ VS Drain Current

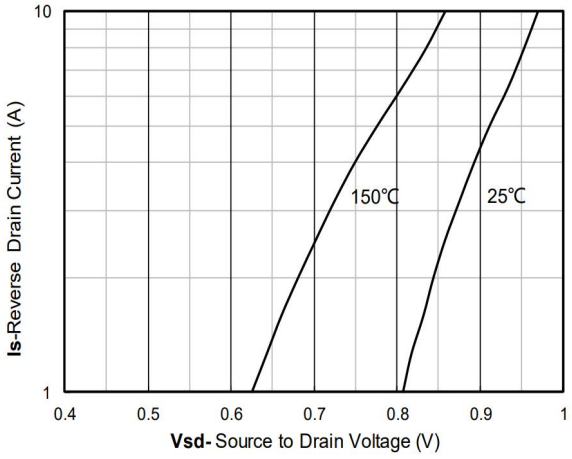


Figure 8. Forward characteristics of reverse diode

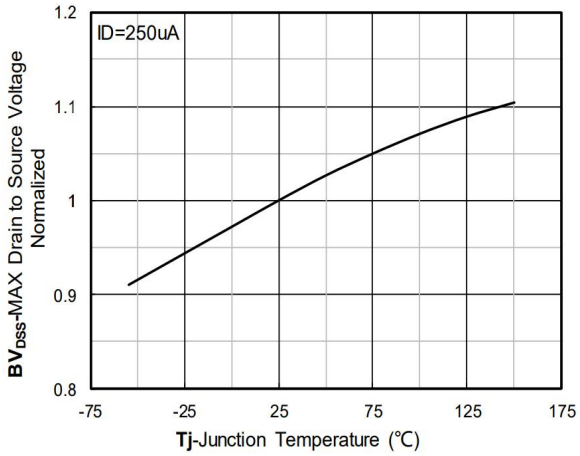


Figure 9. Normalized breakdown voltage

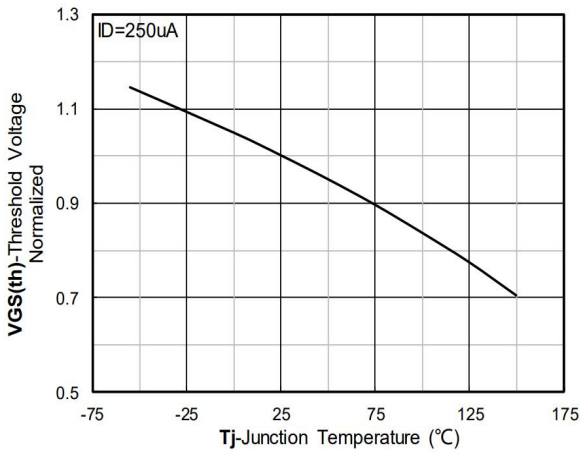


Figure 10. Normalized Threshold voltage

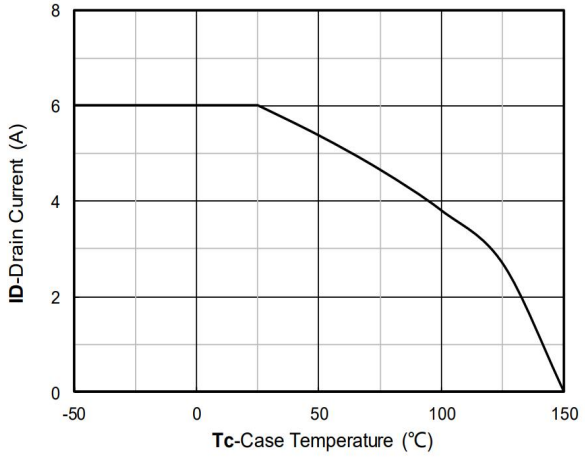


Figure 11. Current dissipation

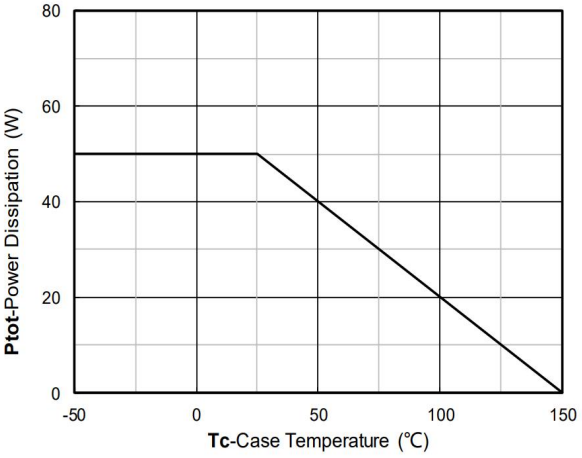


Figure 12. Power dissipation

Typical Characteristics

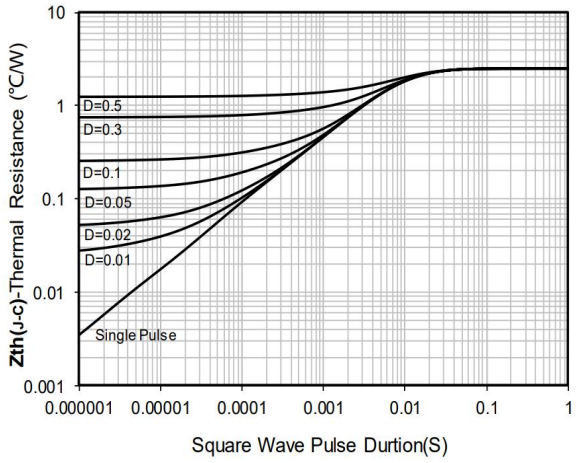


Figure 13. Maximum Transient Thermal Impedance

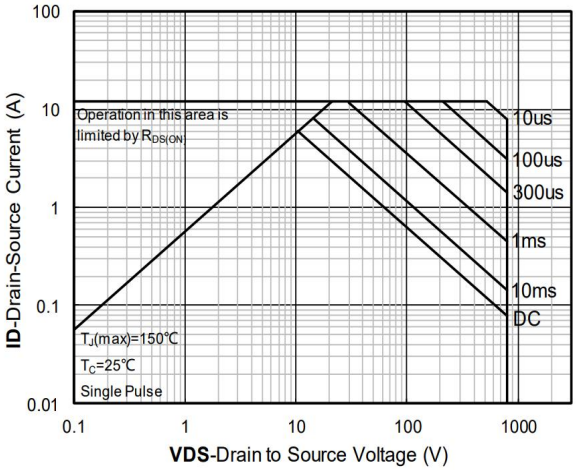
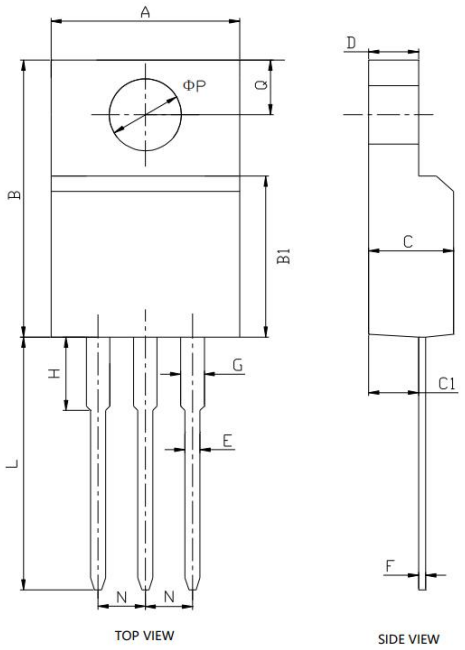


Figure 14. Safe Operation Area

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	4.400	4.800	0.173	0.189
C1	2.150	2.550	0.085	0.100
D	2.500	2.900	0.098	0.114
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	3.400	3.800	0.134	0.150
L	12.600	13.600	0.496	0.535
N	2.340	2.740	0.092	0.108
Q	3.150	3.550	0.124	0.140
ΦP	3.000	3.300	0.118	0.130