SFP(B)120N80B

N-MOSFET 80V, 120A, 5.5mΩ

Features

- Adanced trench process technology
- Fully characterized Avalance voltage and current
- Good stablity and uniformity with hige EAS
- Fast Switching
- High Ruggedness

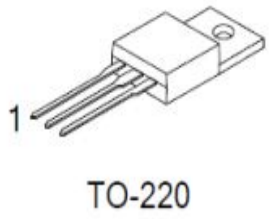
Product Summary

VDS	80V
$R_{DS(on)@VGS=10V}$	5.5 mΩ
I_D	120A

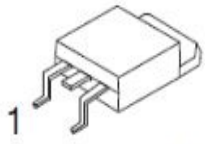
Application

- Power switching application
- UPS (Uninterruptible Power Supplies)
- DC/DC converter
- General purpose applications

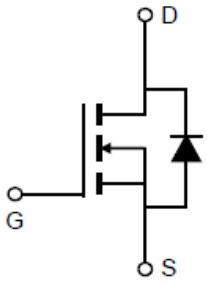
Part ID	Package Type	Marking
SFP120N80B	TO-220	120N80B
SFB120N80B	TO-263	120N80B



TO-220



TO-263



Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	80	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	120 90	A
Pulsed drain current T_C = 25°C, t_p limited by T_{jmax}	$I_{D\ pulse}$	450	
Avalanche energy, single pulse (L=1mH,Rg=25Ω, ID=sweep(14A~46A))	E_{AS}	1200	mJ
Gate-emitter voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C	P_{tot}	220	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	℃

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.66	℃/W
Thermal resistance, junction – ambient. Max	R_{thJA}	62.0	

Electrical Characteristic, at Tj = 25 °C, unless otherwise specified

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	80	88	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA T_j=25°C T_j=125°C	2.0 -	2.8	4.0 -	
Zero gate voltage drain current	I_{DSS}	V_{DS}=80V,V_{GS}=0V T_j=25°C T_j=125°C	- -	0.05 -	1 5	μA
Gate-source leakage current	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	1	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=40A, T_j=25°C T_j=125°C	- -	5.5 -	6.5 -	mΩ
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	5300	-	pF
Output Capacitance	C_{oss}		-	860	-	
Reverse Transfer Capacitance	C_{rss}		-	420		
Gate Total Charge	Q_G	V_{GS}=10V, V_{DS}=30V, I_D=30A, f=1MHz	-	125	-	nC
Gate-Source charge	Q_{gs}		-	20.0	-	
Gate-Drain charge	Q_{gd}		-	45.0	-	
Turn-on delay time	$t_{d(on)}$	T_j=25°C, V_{GS}=10V, V_{DS}=30V, R_L=15Ω	-	35.2	-	ns
Rise time	t_r		-	38.9	-	
Turn-off delay time	$t_{d(off)}$		-	45.1	-	
Fall time	t_f		-	22.8	-	
Body Diode Characteristic						
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=40A	-	0.75	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=40A, dI/dt=100A/μs		60		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=40A, dI/dt=100A/μs		76		nC

Typical Performance Characteristics

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

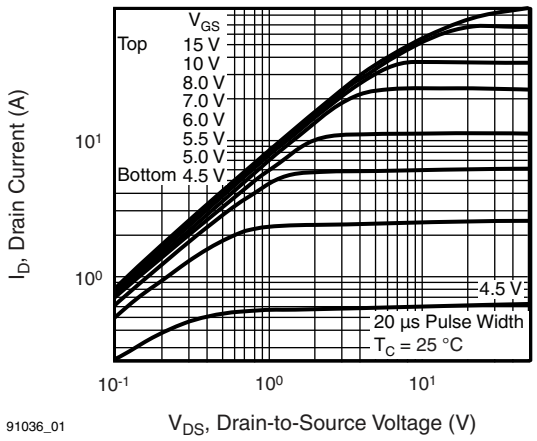


Fig. 1 - Typical Output Characteristics, T_C = 25 °C

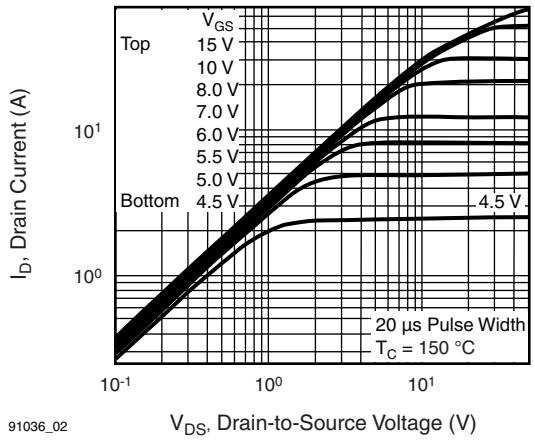


Fig. 2 - Typical Output Characteristics, T_C = 150 °C

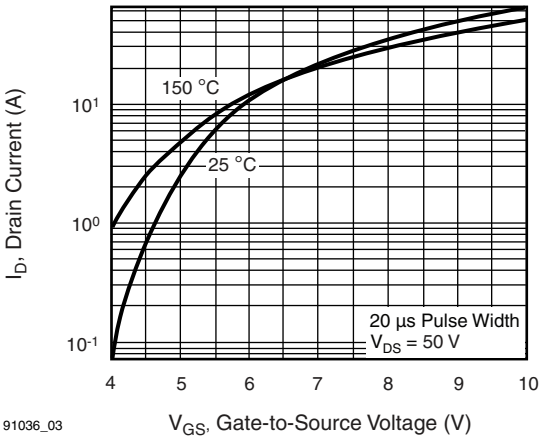


Fig. 3 - Typical Transfer Characteristics

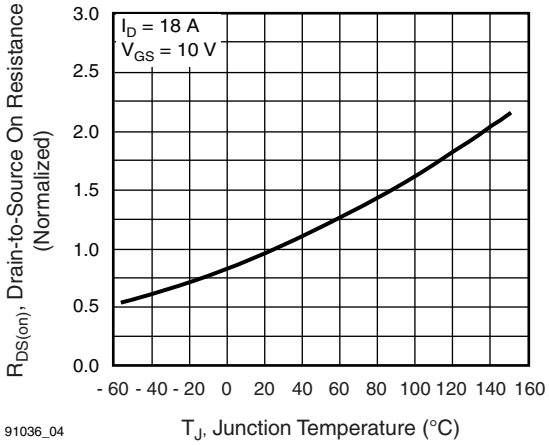


Fig. 4 - Normalized On-Resistance vs. Temperature

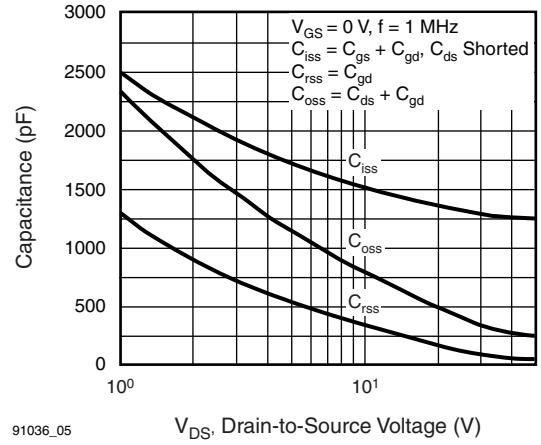


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

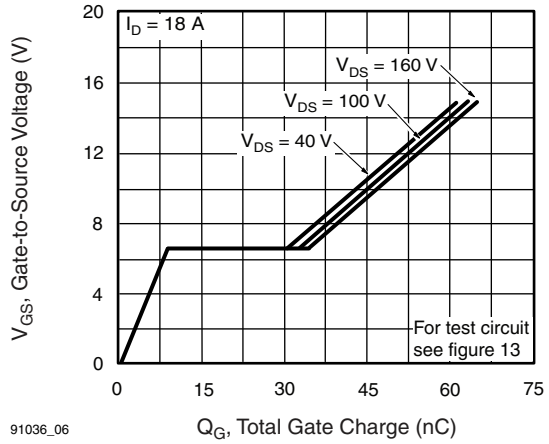


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

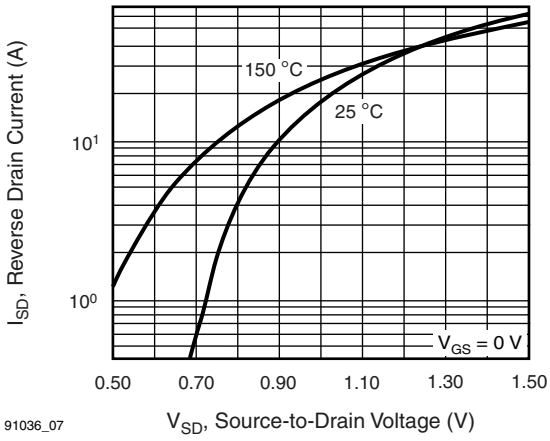


Fig. 7 - Typical Source-Drain Diode Forward Voltage

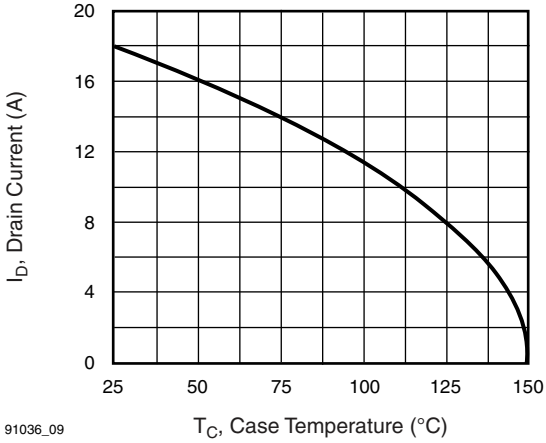


Fig. 9 - Maximum Drain Current vs. Case Temperature

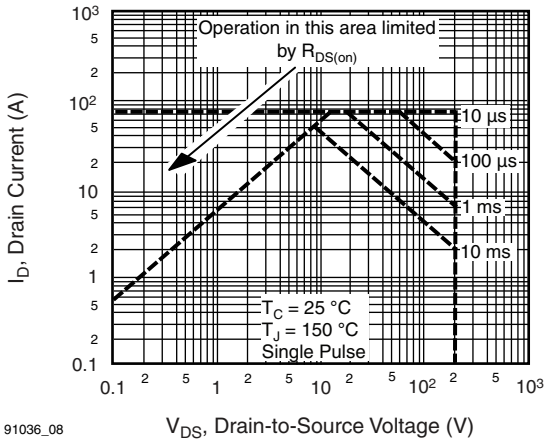


Fig. 8 - Maximum Safe Operating Area

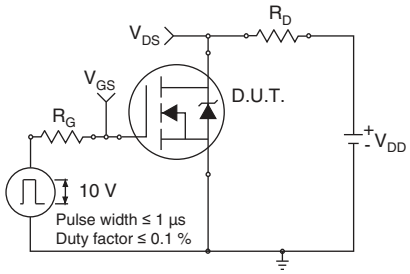


Fig. 10a - Switching Time Test Circuit

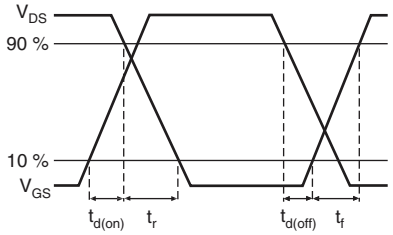


Fig. 10b - Switching Time Waveforms

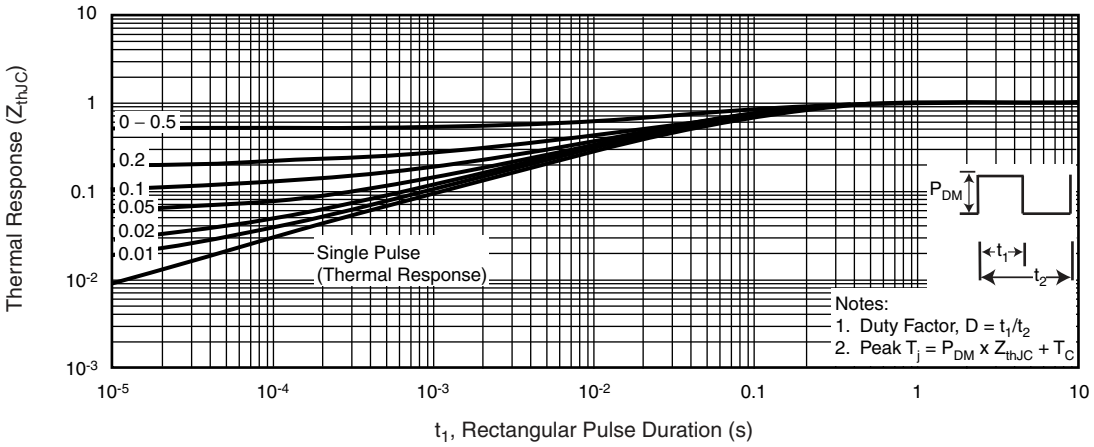


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

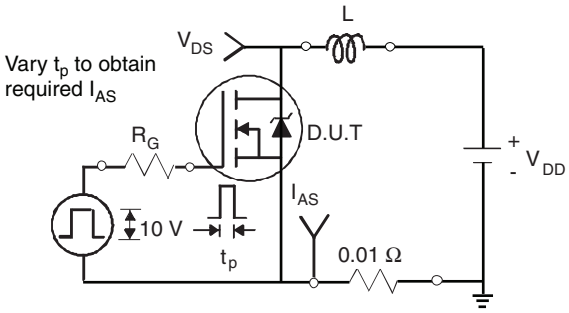


Fig. 12a - Unclamped Inductive Test Circuit

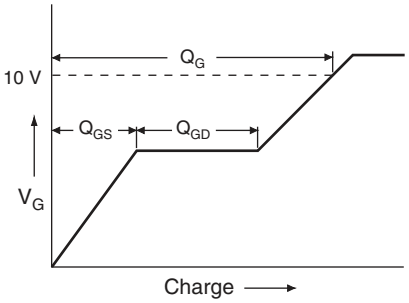


Fig. 13a - Basic Gate Charge Waveform

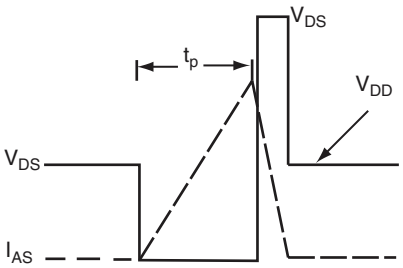


Fig. 12b - Unclamped Inductive Waveforms

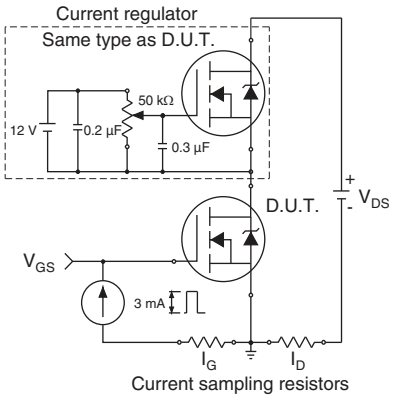


Fig. 13b - Gate Charge Test Circuit

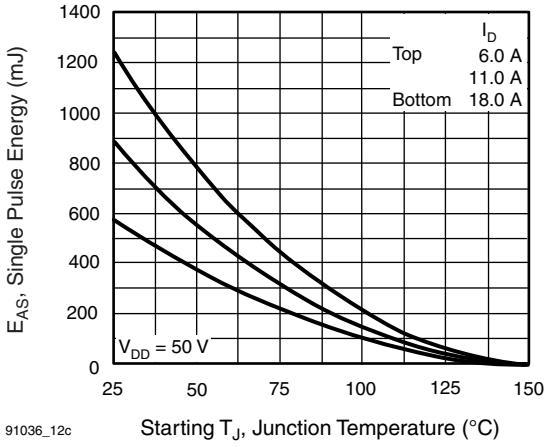
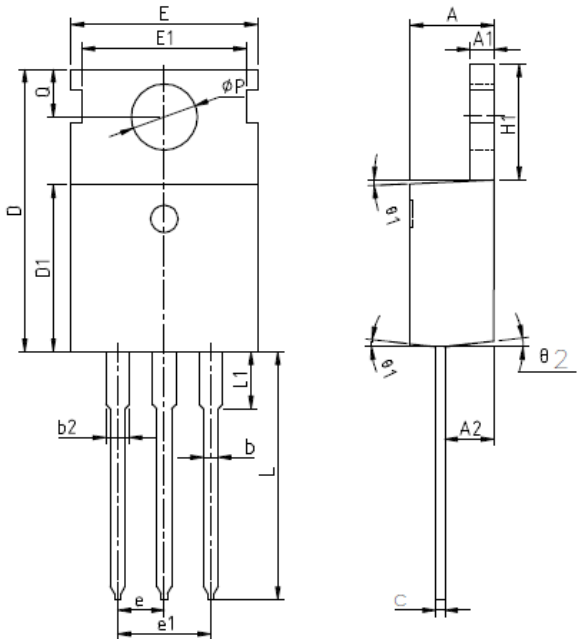


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

PACKAGE DIMENSION

TO-220



SYMBOL	MIN	NOM	MAX
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.10	2.40	2.70
b	0.70	0.80	1.00
b2	1.17	1.27	1.50
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.70	6.70	7.00
E	9.70	10.00	10.30
E1	-	8.70	-
E2	9.65	10.00	10.35
E3	7.00	8.00	8.40
e		2.54 BSC	
e1		5.08 BSC	
H1	6.00	6.50	6.85
L	12.75	13.50	13.90
L1	-	3.10	3.40
ΦP	3.45	3.60	3.75
Q	2.60	2.80	3.00
θ1	4°	7°	10°
θ2	0°	3°	6°

TO-263