

Description

The SX120N15NF uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$$V_{DS} = 150V \quad I_D = 120A$$

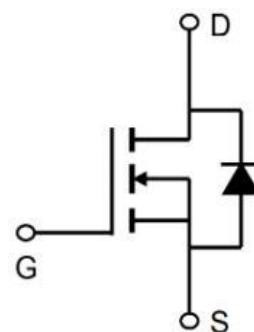
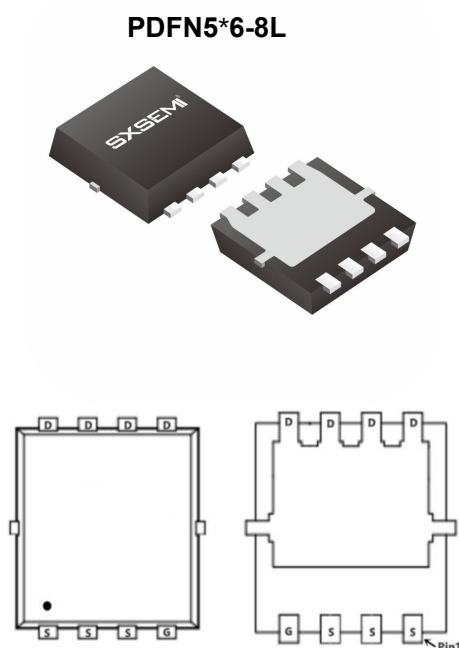
$$R_{DS(ON)} < 12m\Omega @ V_{GS}=10V$$

Application

DC/DC Converter

LED Backlighting

Power Management Switches



Absolute Maximum Ratings (T_c=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	150	V
VGS	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V	120	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V	80	A
IDM	Pulsed Drain Current	360	A
EAS	Single Pulse Avalanche Energy	406	mJ
IAS	Avalanche Current	43	A
P _D @T _C =25°C	Total Power Dissipation ⁴	160	W
TSTG	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C
R _{θJA}	Thermal Resistance Junction-Ambient	25	°C/W
R _{θJC}	Thermal Resistance Junction-Case	0.75	°C/W

Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	150	172	-	V
IGSS	Gate-body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
IDSS@T _J =25°C	Zero Gate Voltage Drain Current	V _{DS} = 150V, V _{GS} = 0V			1	μA
IDSS@T _J =100°C					100	
VGS(th)	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
RDS(on)	Drain-Source On-Resistance ⁴	V _{GS} = 10V, I _D = 20A	-	9.0	12	mΩ
gfs	Forward Transconductance ⁴	V _{DS} = 10V, I _D = 20A	-	69	-	S
Ciss	Input Capacitance	V _{DS} = 75V, V _{GS} = 0V, f = 1MHz	-	3310	-	pF
Coss	Output Capacitance		-	268	-	
Crss	Reverse Transfer Capacitance		-	9.4	-	
R _g	Gate Resistance	f = 1MHz	-	3.1	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10V, V _{DS} = 75V, I _D = 20A	-	45	-	nC
Q _{gs}	Gate-Source Charge		-	15	-	
Q _{gd}	Gate-Drain Charge		-	8.5	-	
td(on)	Turn-On Delay Time	V _{GS} = 10V, V _{DD} = 75V, R _G = 3Ω, I _D = 20A	-	16	-	ns
t _r	Rise Time		-	12	-	
td(off)	Turn-Off Delay Time		-	30	-	
t _f	Fall Time		-	18	-	
trr	Body Diode Reverse Recovery Time	I _F = 20A, dI/dt = 100A/μs	-	76	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	182	-	nC
VSD	Diode Forward Voltage ⁴	I _F = 20A, V _{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current	T _c = 25°C	-	-	75	A

Notes:

- 1、The data tested by surface mounted on a 1 inch2 FR-4 board with 20Z copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=43A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

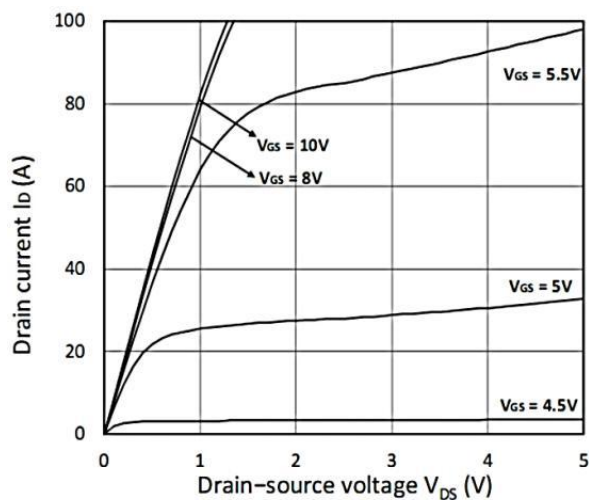


Figure 1. Output Characteristics

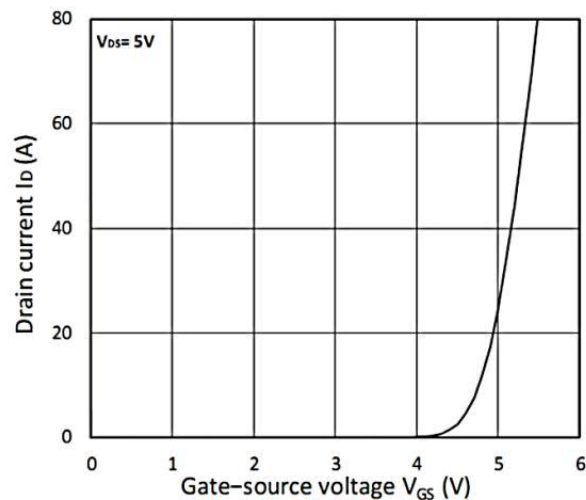


Figure 2. Transfer Characteristics

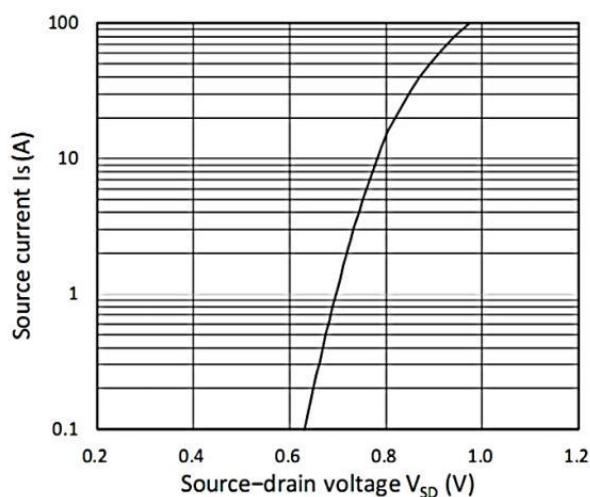


Figure 3. Forward Characteristics of Reverse

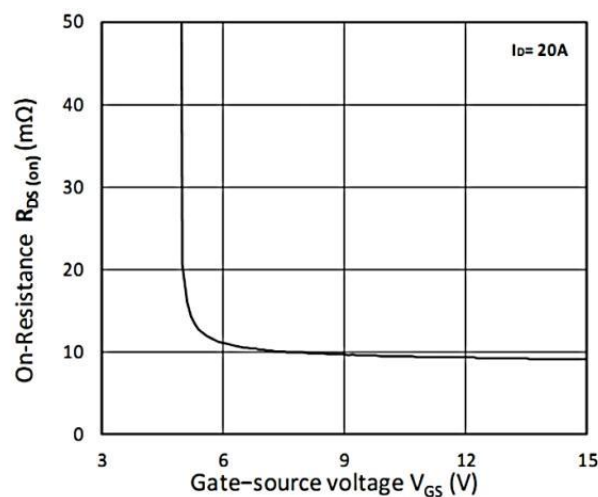


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

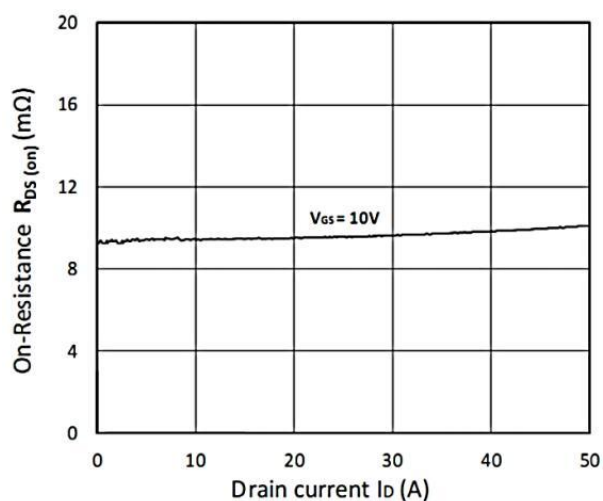


Figure 5. $R_{DS(ON)}$ vs. I_D

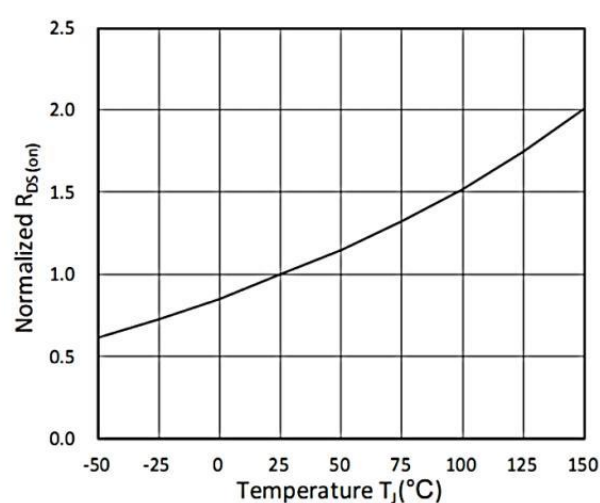


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics

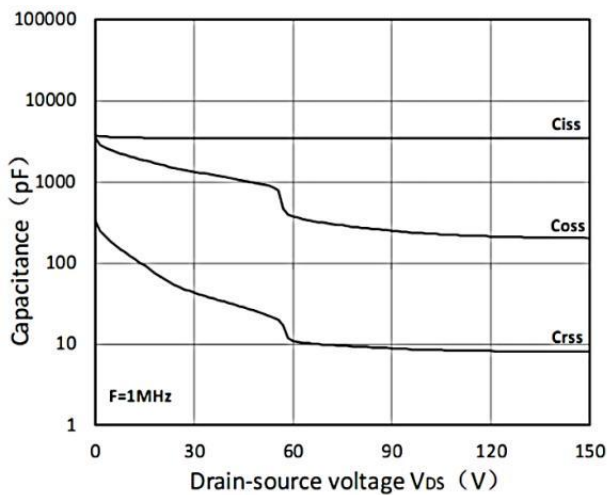


Figure 7. Capacitance Characteristics

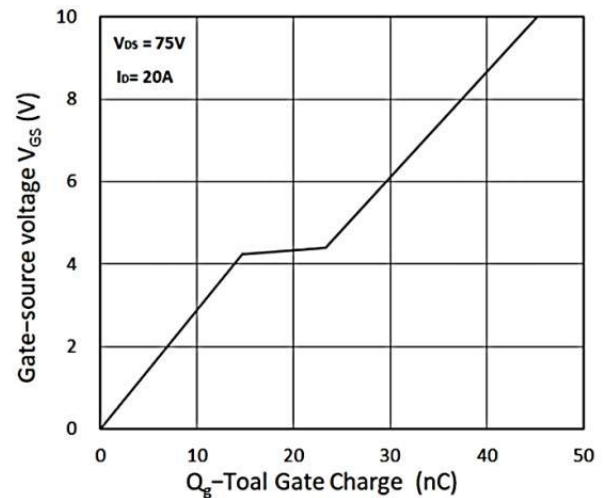


Figure 8. Gate Charge Characteristics

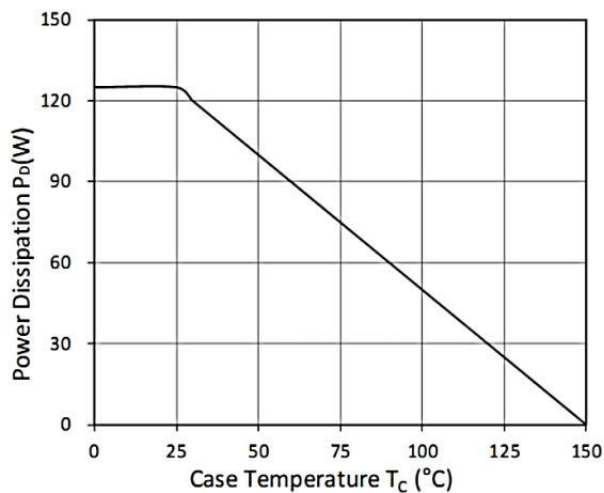


Figure 9. Power Dissipation

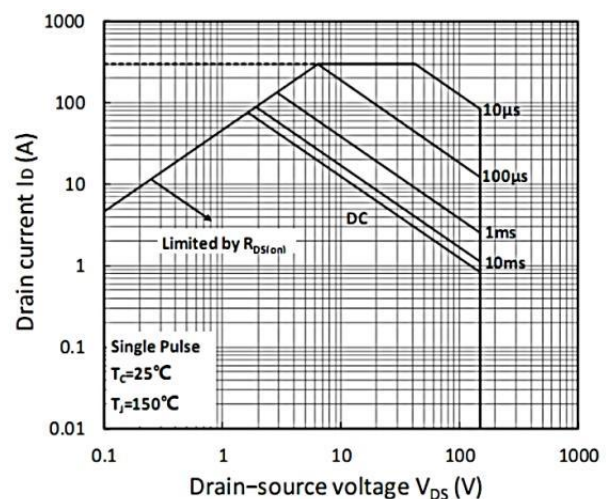


Figure 10. Safe Operating Area

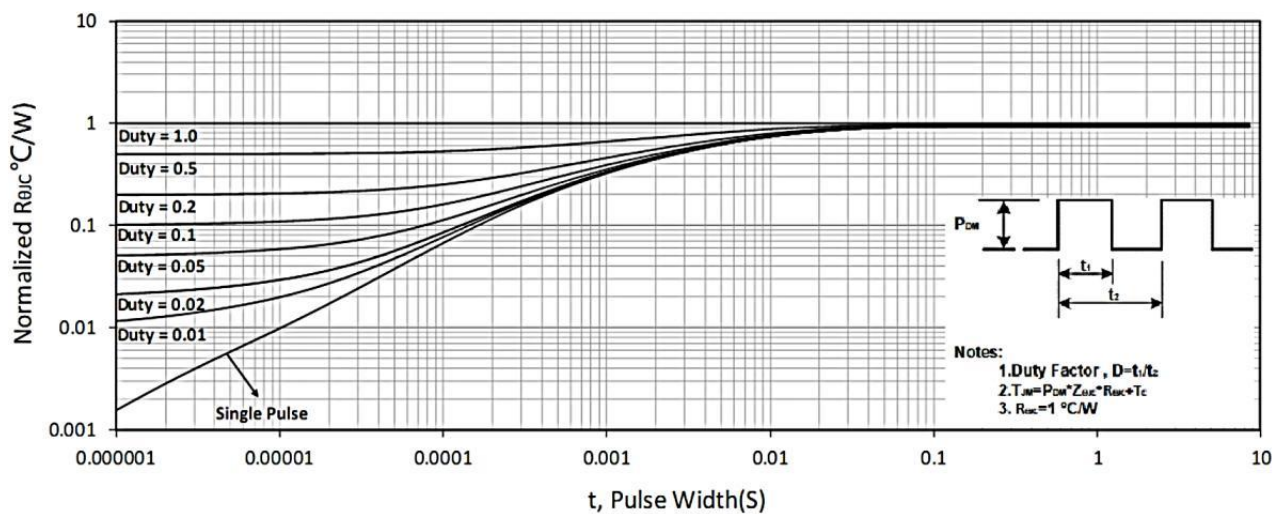
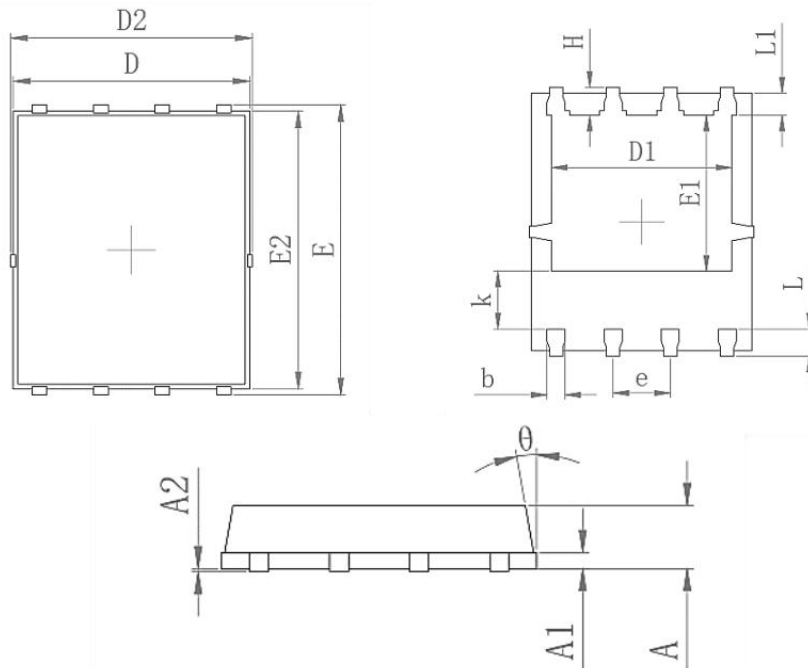


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5X6-8L-XZT Single


Symbol	Common	
	mm	
	Mim	Max
A	0.90	1.10
A1	0.254 REF	
A2	0-0.05	
D	4.824	4.976
D1	3.910	4.110
D2	4.944	5.076
E	5.924	6.076
E1	3.375	3.575
E2	5.674	5.826
b	0.350	0.450
e	1.270	
L	0.534	0.686
L1	0.424	0.576
K	1.190	1.390
H	0.549	0.701
Φ	8°	12°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	PDFN5*6-8L		5000