

Description

The SX70N12NF uses advanced **SGT II** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 120V$ $I_D = 70A$

$R_{DS(ON)} < 13m\Omega$ @ $V_{GS}=10V$

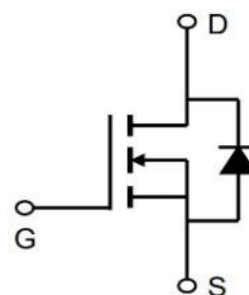
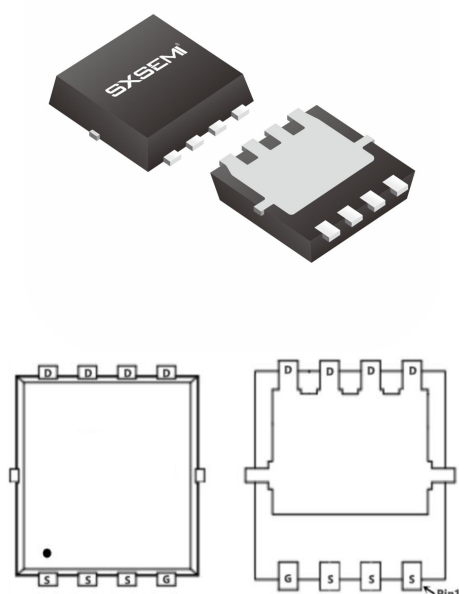
Application

Mobile phone fast charging

Brushless motor

Home appliance control board

PDFN5*6-8L



Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain source voltage	120	V
V_{GS}	Gate source voltage	± 20	V
$I_D @ T_A=25^\circ C$	Continuous drain current ¹⁾ , $T_C=25^\circ C$	70	A
$I_D @ T_A=70^\circ C$	Continuous drain current ¹⁾ , $T_C=75^\circ C$	35	A
I_D , pulse	Pulsed drain current ²⁾ , $T_C=25^\circ C$	150	A
P_D	Power dissipation ³⁾ , $T_C=25^\circ C$	140	W
EAS	Single pulsed avalanche energy ⁴⁾	53.8	mJ
T_{stg} , T_J	Operation and storage temperature	-55 to 150	$^\circ C$
$R_{\theta JC}$	Thermal resistance, junction-case	0.89	$^\circ C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁵⁾	25	$^\circ C/W$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test condition	Min	Typ	Max	Unit
BVDSS	Drain-source breakdown voltage	V _{GS} =0 V, I _D =250 μA	120	125		V
V _{GS(th)}	Gate threshold voltage	V _{DS} =V _{GS} , I _D =250 μA	1.2	1.8	2.5	V
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =10 V, I _D =30 A		10	13	mΩ
R _{DS(ON)}	Drain-source on-state resistance	V _{GS} =4.5 V, I _D =20 A		15	18	mΩ
I _{GSS}	Gate-source leakage current	V _{GS} =±20 V			±100	nA
I _{DSS}	Drain-source leakage current	V _{DS} =120 V, V _{GS} =0 V			1	uA
C _{iss}	Input capacitance	V _{GS} =0 V, V _{DS} =50 V, f=100 kHz		2640		pF
C _{oss}	Output capacitance			330		pF
C _{rss}	Reverse transfer capacitance			11		pF
t _{d(on)}	Turn-on delay time	V _{GS} =10 V, V _{DS} =50 V, R _G =2 Ω, I _D =25 A		22		ns
t _r	Rise time			10		ns
t _{d(off)}	Turn-off delay time			85		ns
t _f	Fall time			112		ns
Q _g	Total gate charge	I _D =25 A, V _{DS} =50 V, V _{GS} =10 V		33		nC
Q _{gs}	Gate-source charge			5.6		nC
Q _{gd}	Gate-drain charge			7.2		nC
V _{plateau}	Gate plateau voltage			3.1		V
I _S	Diode forward current	V _{GS} <V _{th}			50	A
I _{SP}	Pulsed source current	V _{GS} <V _{th}			150	A
V _{SD}	Diode forward voltage	I _S =12 A, V _{GS} =0 V			1.3	V
t _{rr}	Reverse recovery time	I _S =25 A, di/dt=100 A/μs		62.3		ns
Q _{rr}	Reverse recovery charge			135.3		nC
I _{rrm}	Peak reverse recovery current			3.5		A

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、The power dissipation is limited by 175°C junction temperature
- 4、EAS condition: T_J=25°C, V_{DD}= 50V, V_G= 10V, R_G=25Ω, L=0.5mH, I_{AS}= 30A
- 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

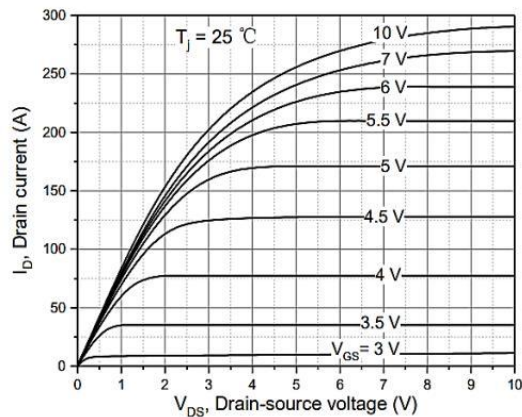


Figure 1. Typ. output characteristics

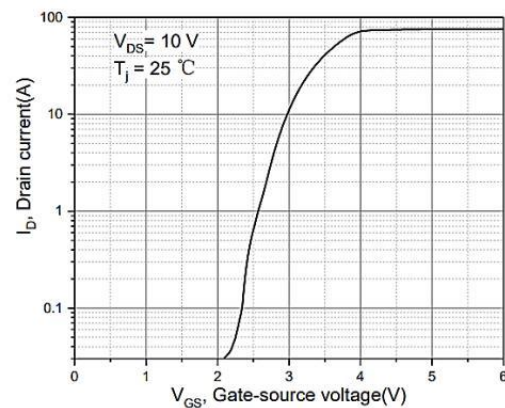


Figure 2. Typ. transfer characteristics

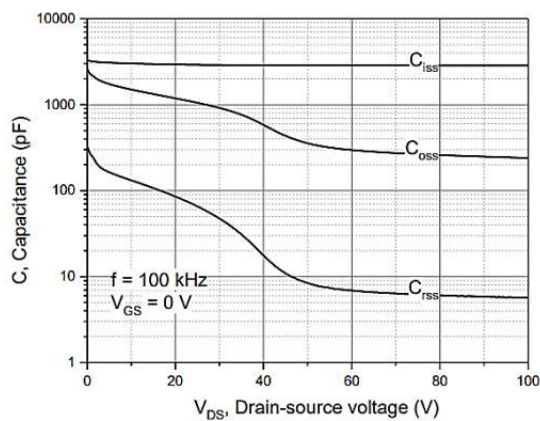


Figure 3. Typ. capacitances

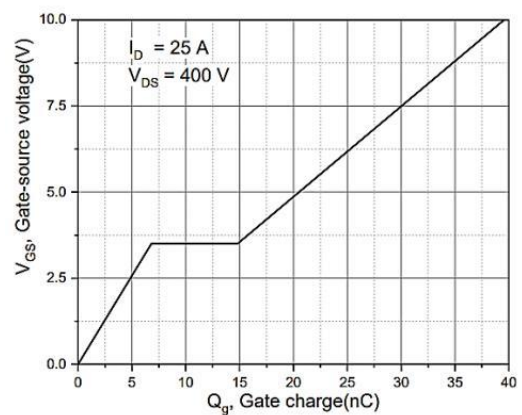


Figure 4. Typ. gate charge

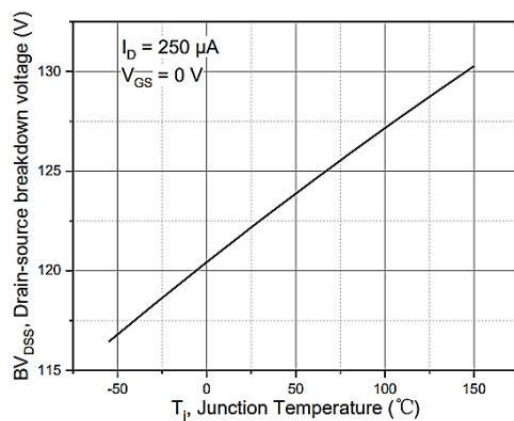


Figure 5. Drain-source breakdown voltage

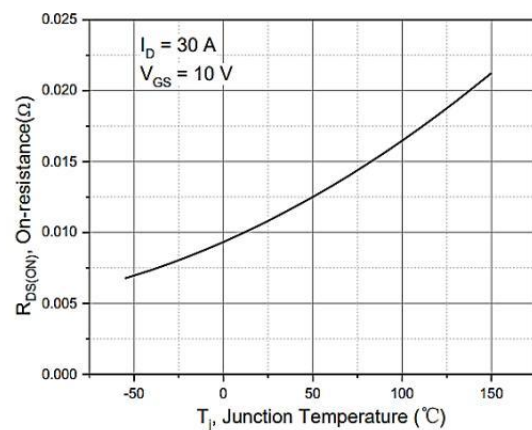


Figure 6. Drain-source on-state resistance

Typical Characteristics

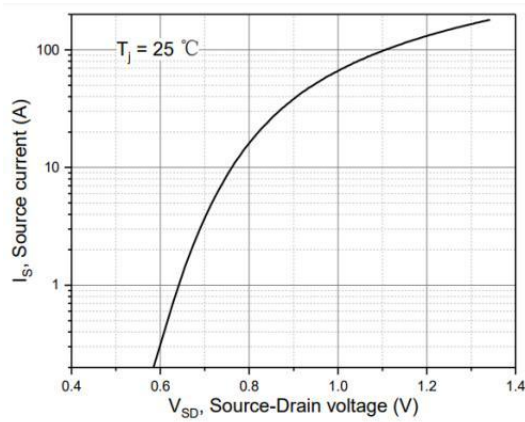


Figure 7. Forward characteristic of body diode

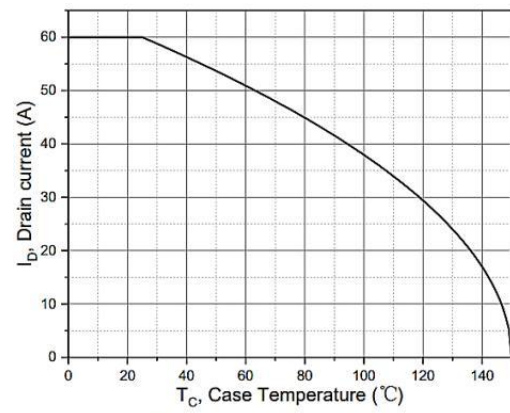


Figure 8. Drain current

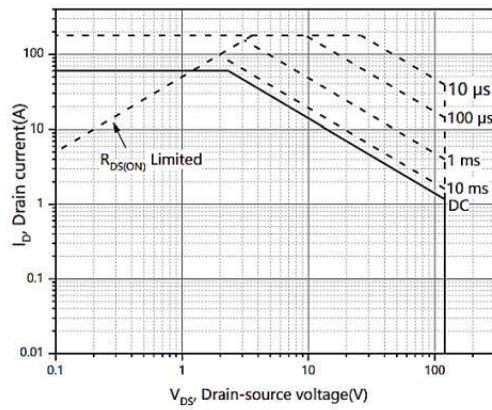
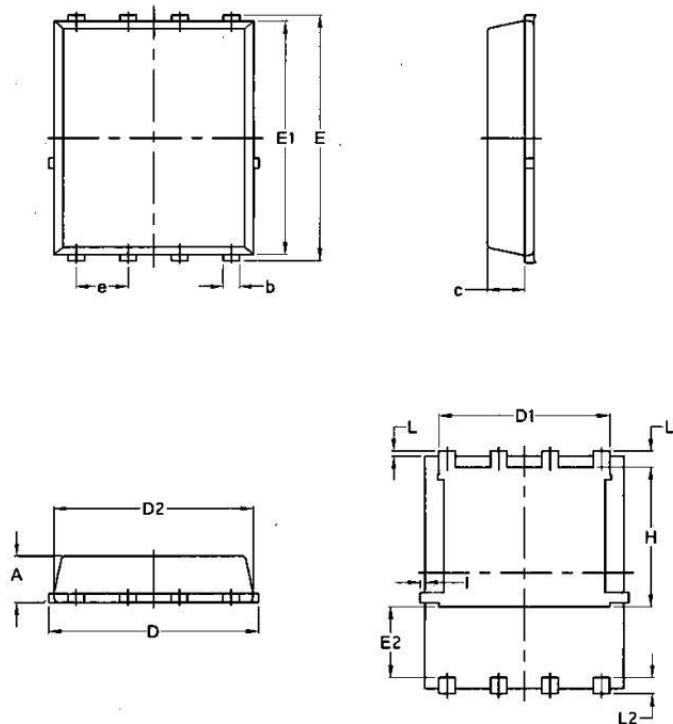


Figure 9. Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

Package Mechanical Data-PDFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

Package Marking and Ordering Information

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