

Description

The SX100P02NF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = -20V$ $I_D = -100A$

$R_{DS(ON)} < -2.7m\Omega @ V_{GS} = -4.5V$

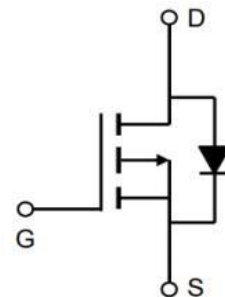
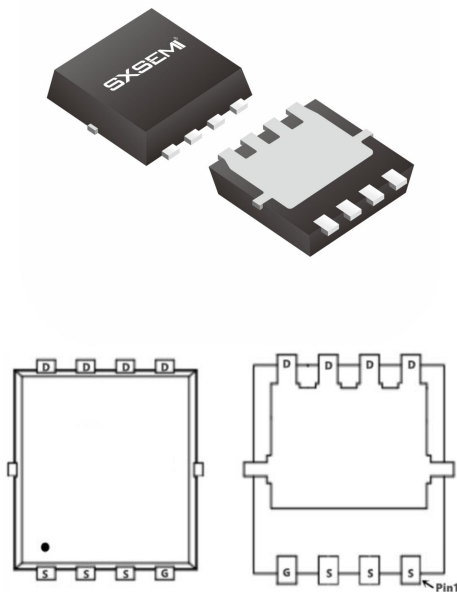
Application

Battery protection

Load switch

Uninterruptible power supply

PDFN5*6-8L



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

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	±12	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-100	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-66	A
IDM	Pulsed Drain Current ²	-340	A
EAS	Single Pulse Avalanche Energy ³	400	mJ
IAS	Avalanche Current	-50	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	52.1	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 ¹	25	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	1.8	°C/W

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

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-20	-	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} =0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-0.4	0.6	-1.0	V
RDS(on)	Static Drain-Source on-Resistance	V _{GS} = -4.5V, I _D = -30A	-	2.1	2.7	mΩ
RDS(on)	Static Drain-Source on-Resistance	V _{GS} = -2.5V, I _D = -20A	-	2.7	3.8	
RDS(on)	Static Drain-Source on-Resistance	V _{GS} = -1.8V, I _D = -15A	-	3.8	5.7	
Ciss	Input Capacitance	V _{DS} = -10V, V _{GS} =0V, f=1.0MHz	-	15	-	nF
Coss	Output Capacitance		-	1600	-	pF
Crss	Reverse Transfer Capacitance		-	1068	-	pF
Q _g	Total Gate Charge	V _{DS} = -10V, I _D = -20A, V _{GS} = -4.5V	-	100	-	nC
Q _{gs}	Gate-Source Charge		-	21	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	32	-	nC
td(on)	Turn-on Delay Time	V _{DD} = -10V, R _L =0.5Ω, V _{GS} = -4.5V, R _{GEN} =3Ω	-	20	-	ns
tr	Turn-on Rise Time		-	50	-	ns
td(off)	Turn-off Delay Time		-	100	-	ns
tr	Turn-off Fall Time		-	40	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-10	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-340	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S = -30A	-	-0.8	-1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ 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}=-16V,V_{GS}=-4.5V,L=0.1mH,I_{AS}=-50A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

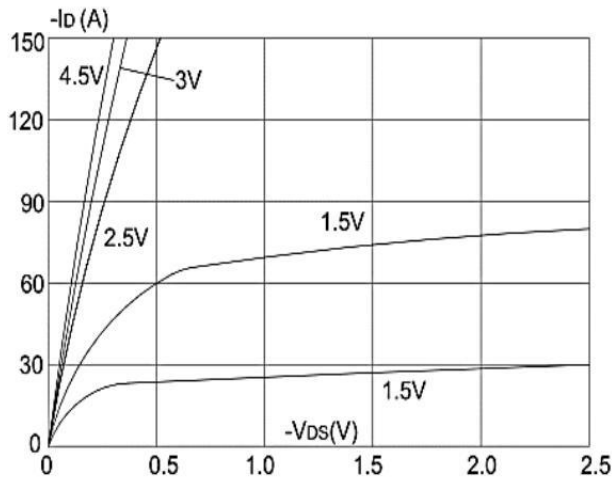


Figure 1: Output Characteristics

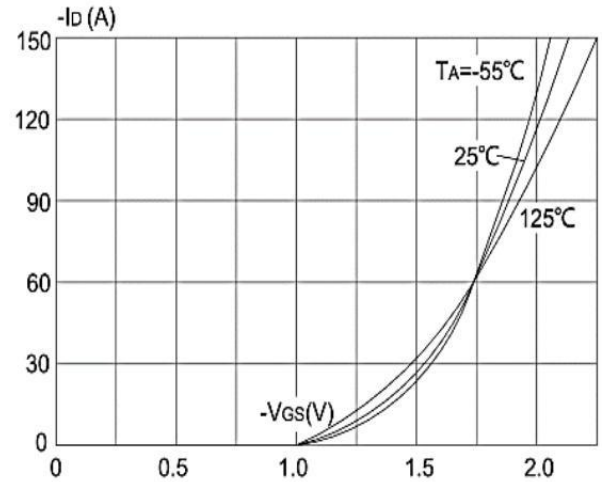


Figure 2: Typical Transfer Characteristics

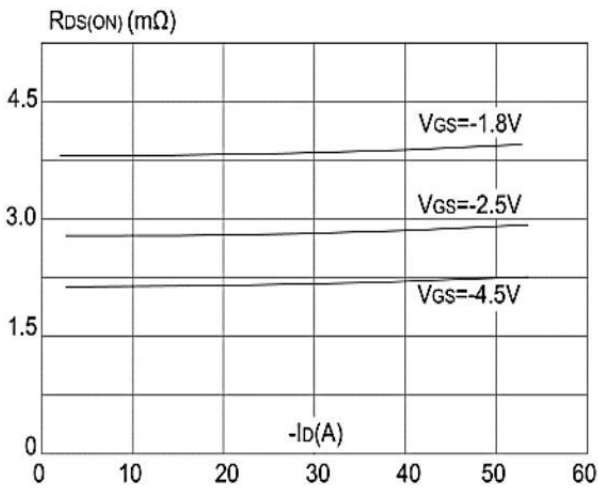


Figure 3: On-resistance vs. Drain Current

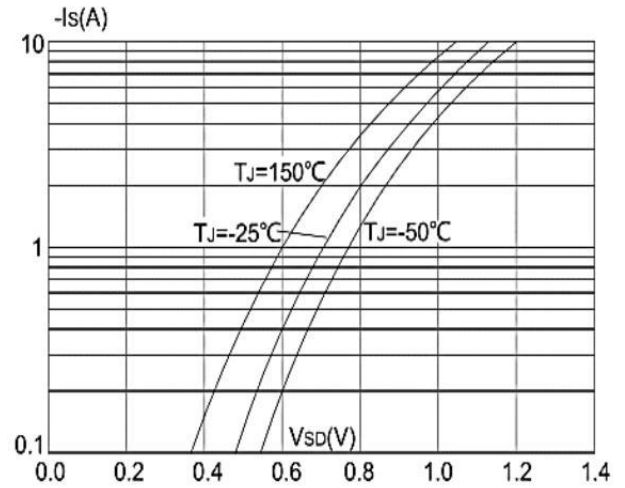


Figure 4: Body Diode Characteristics

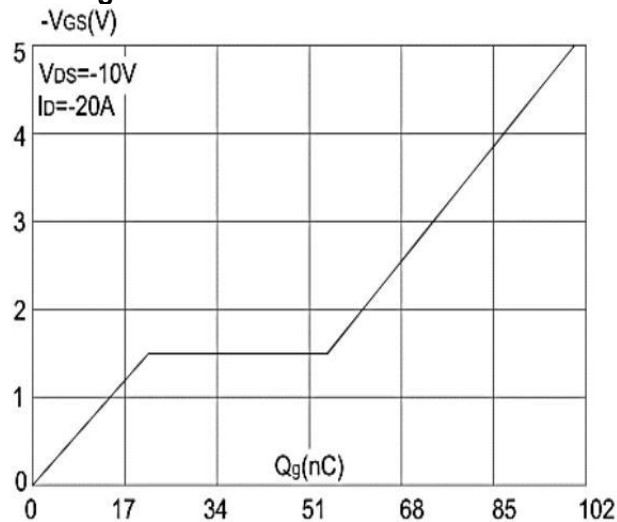


Figure 5: Gate Charge Characteristics

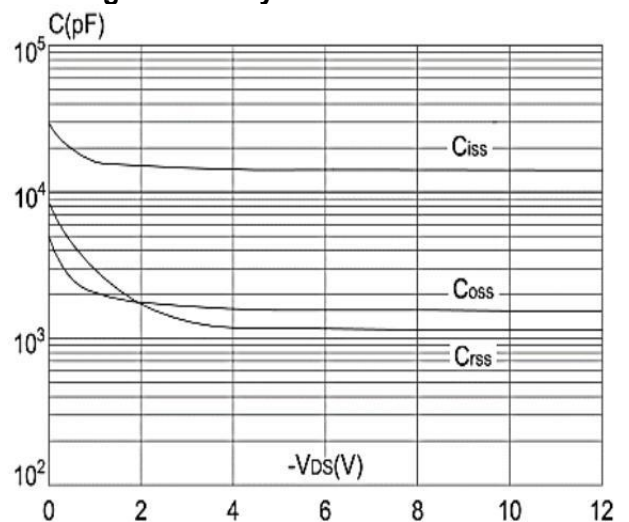


Figure 6: Capacitance Characteristics

Typical Characteristics

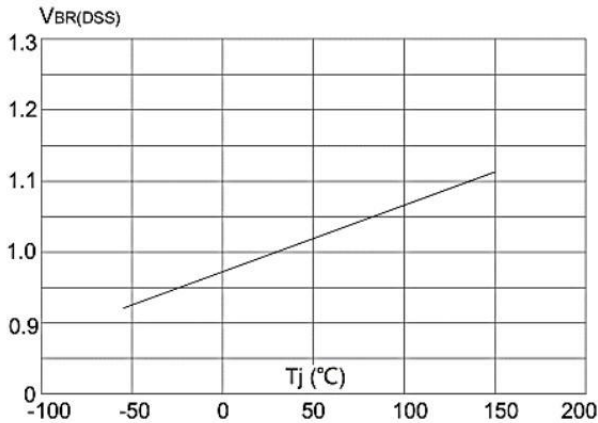


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

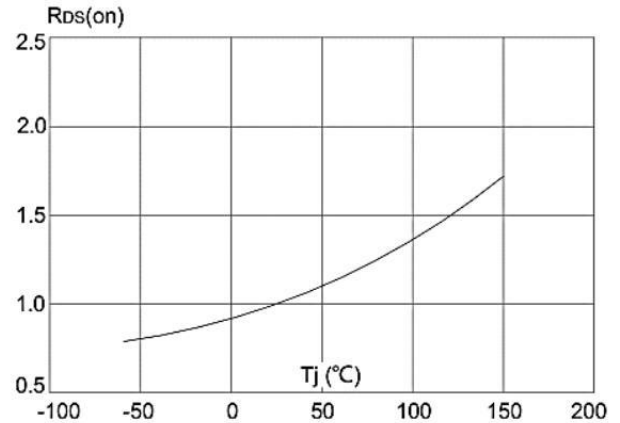


Figure 8: Normalized on Resistance vs. Junction Temperature

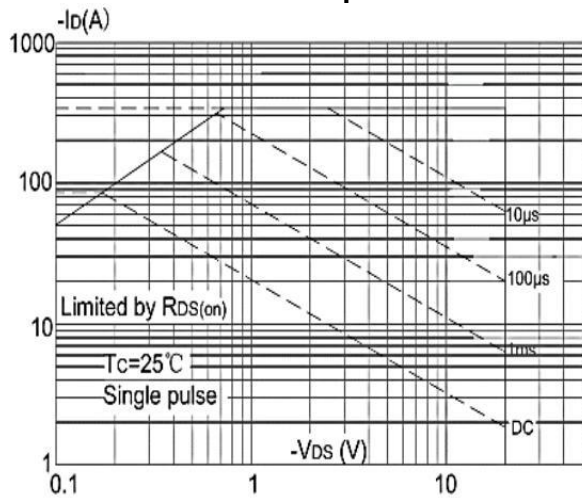


Figure 9: Maximum Safe Operating Area

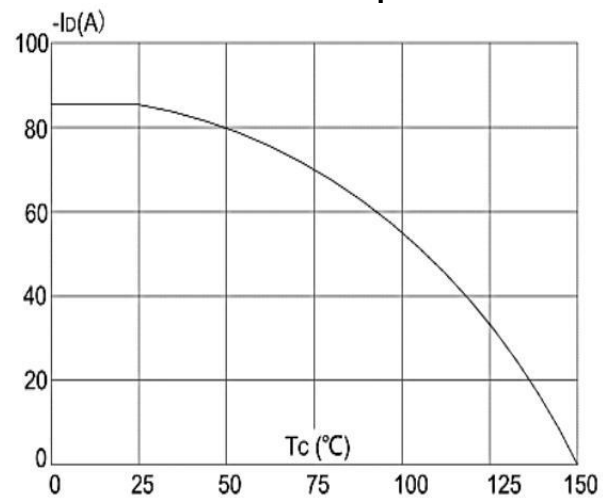


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

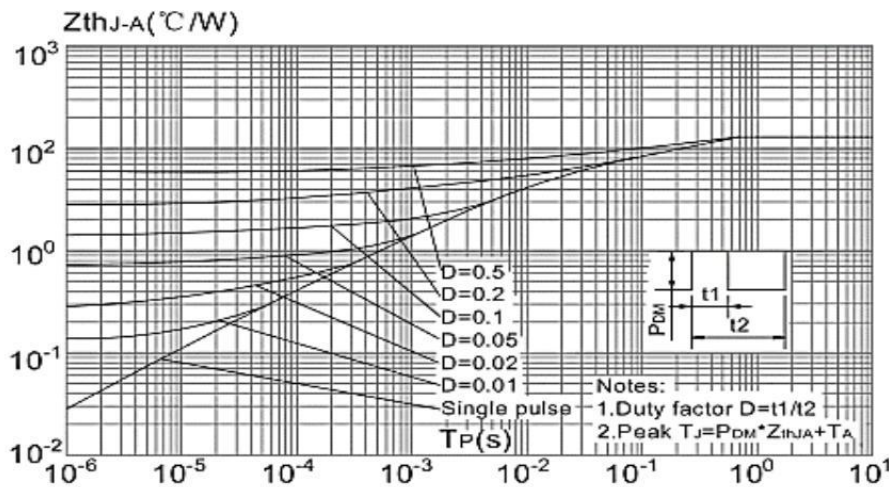
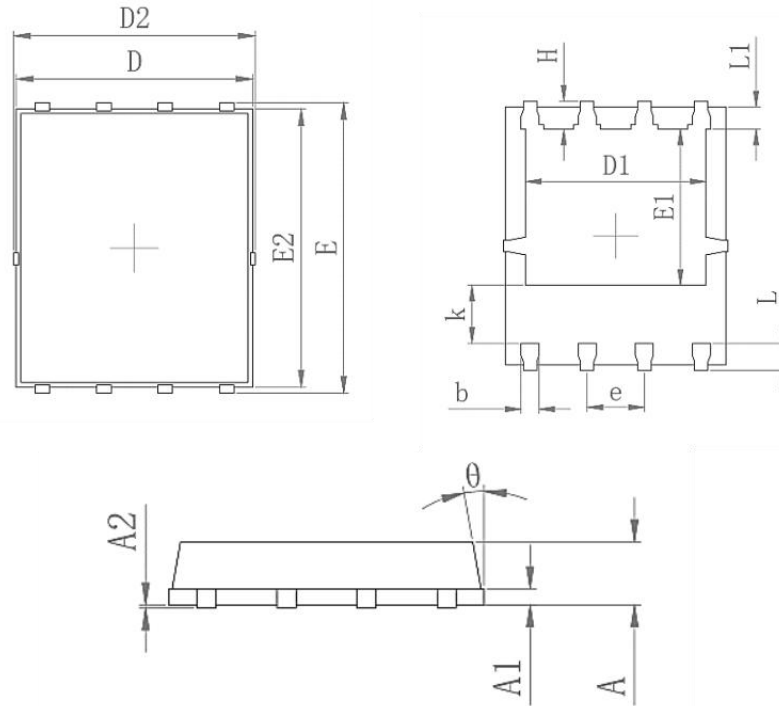


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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