

Description

The SX180N03NF uses advanced 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

$V_{DS} = 30V$ $I_D = 180A$

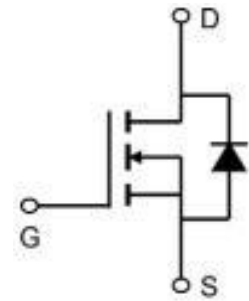
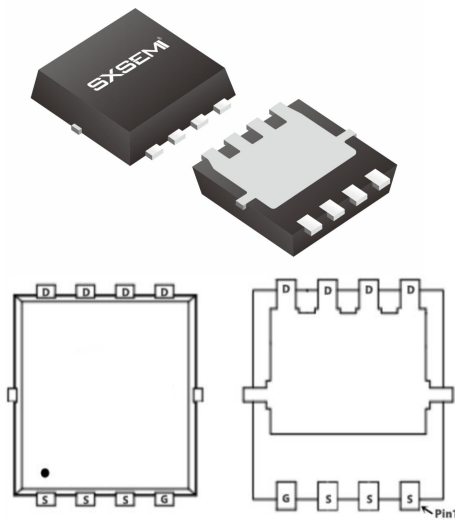
$R_{DS(ON)} < 1.2m\Omega$ @ $V_{GS}=10V$

Application

Buck

Boost

PDFN5*6-8L



Absolute Maximum Ratings ($T_c=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_{D@TC=25^{\circ}C}$	Continuous Drain Current, $V_{GS} @ 10V$	180	A
$I_{D@TC=100^{\circ}C}$	Continuous Drain Current, $V_{GS} @ 10V$	154	A
I_{DM}	Pulsed Drain Current	972	A
E_{AS}	Single Pulsed Avalanche Energy	260	mJ
I_{AS}	Avalanche Current	36	A
$PD@TC=25^{\circ}C$	Power Dissipation	113	W
T_J TSTG	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	25	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.1	$^{\circ}C/W$

Electrical Characteristics (T_J=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	30	-	-	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} =30V, V _{GS} =0V	-	-	1	μA
IDSS T _J =100°C			-	-	100	
VGS(th)	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.5	V
RDS(on)	Drain-Source on-Resistance ⁴	V _{GS} =10V, I _D =20A	-	0.95	1.2	mΩ
		V _{GS} =4.5V, I _D =10A	-	1.35	1.7	
gfs	Forward Transconductance ⁴	V _{DS} =10V, I _D =20A	-	126	-	S
Ciss	Input Capacitance	V _{DS} = 15V, V _{GS} =0V, f =1MHz	-	3370	-	pF
Coss	Output Capacitance		-	1340	-	
Crss	Reverse Transfer Capacitance		-	135	-	
R _G	Gate Resistance	f =1MHz	-	1	-	Ω
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D = 20A	-	53	-	nC
Q _{gs}	Gate-Source Charge		-	7.8	-	
Q _{gd}	Gate-Drain Charge		-	8.8	-	
td(on)	Turn-on Delay Time	V _{GS} =10V, V _{DD} = 15V, R _G =3Ω, I _D =20A	-	10	-	ns
t _r	Rise Time		-	6.5	-	
td(off)	Turn-off Delay Time		-	36.5	-	
t _f	Fall Time		-	11.3	-	
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, di/dt=100A/μs	-	58	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	29	-	nC
VSD	Diode Forward Voltage ⁴	I _S = 20A, V _{GS} =0V	-	-	1.2	V
IS	Continuous Source Current	T _C =25°C			180	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 ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is VDD =25V,VGS =10V,L=0.1mH,IAS =36A
- 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

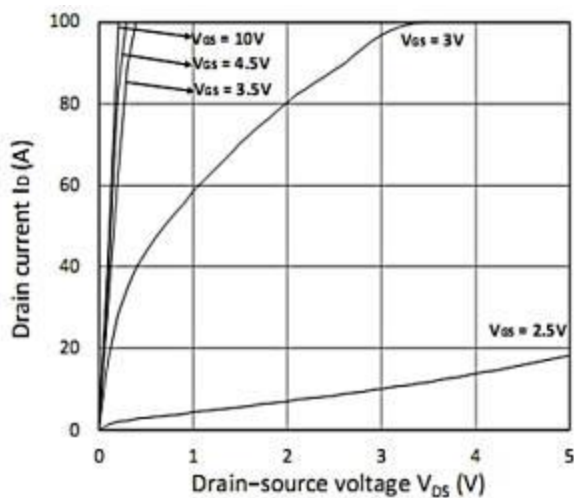


Figure 1. Output Characteristics

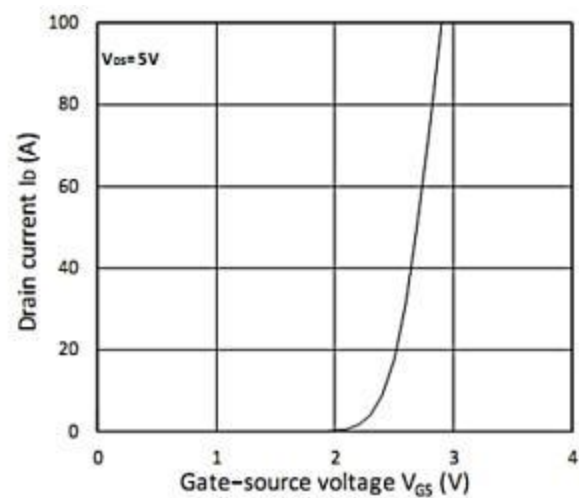


Figure 2. Transfer Characteristics

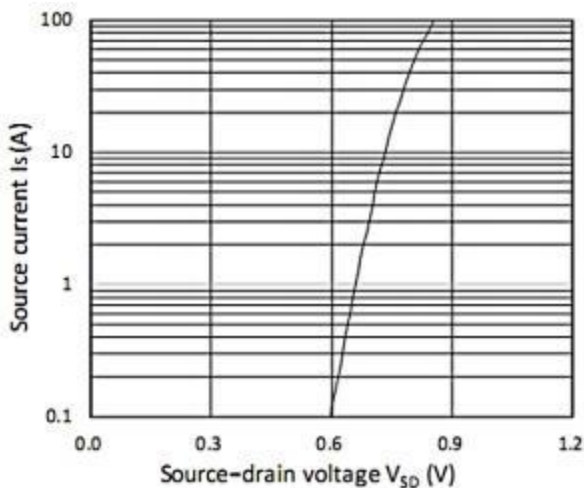


Figure 3. Forward Characteristics of Reverse

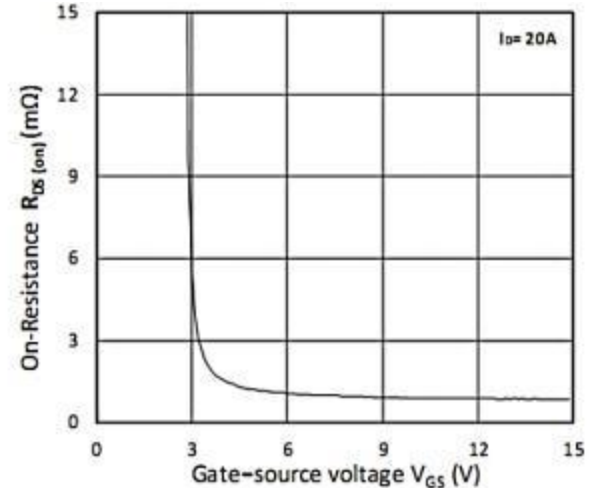


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

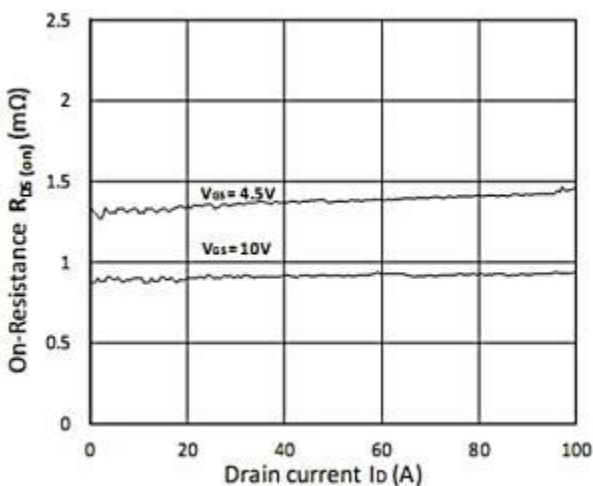


Figure 5. $R_{DS(ON)}$ vs. I_D

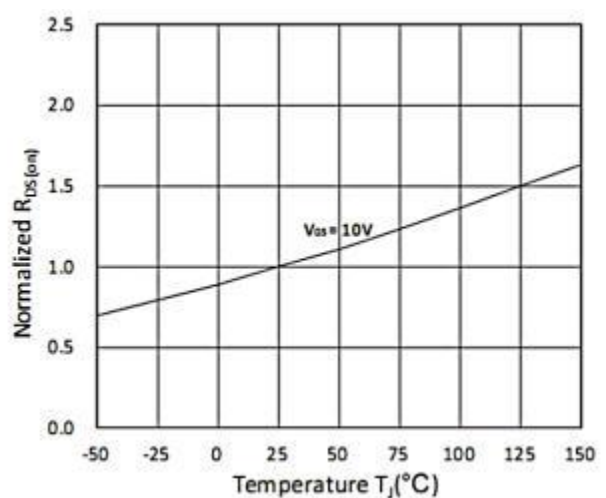


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

Typical Characteristics

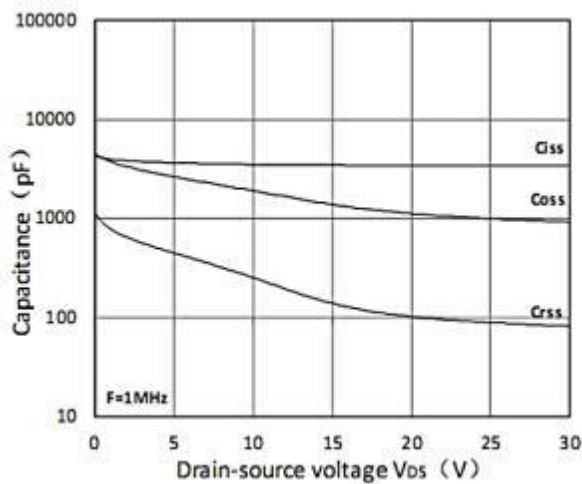


Figure 7. Capacitance Characteristics

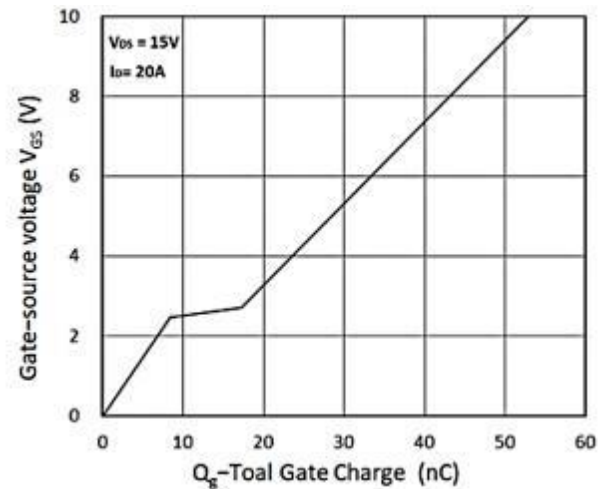


Figure 8. Gate Charge Characteristics

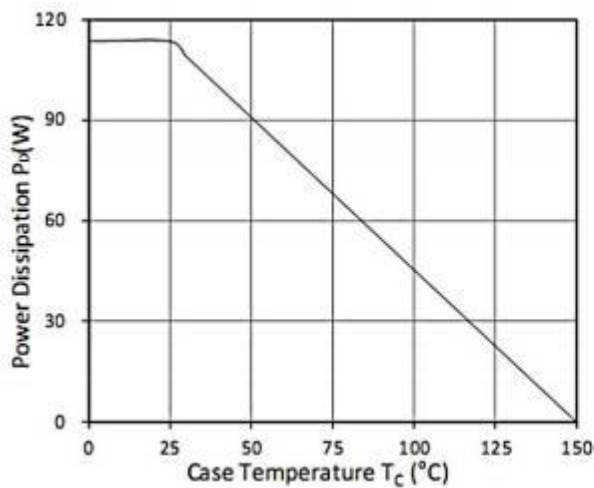


Figure 9. Power Dissipation

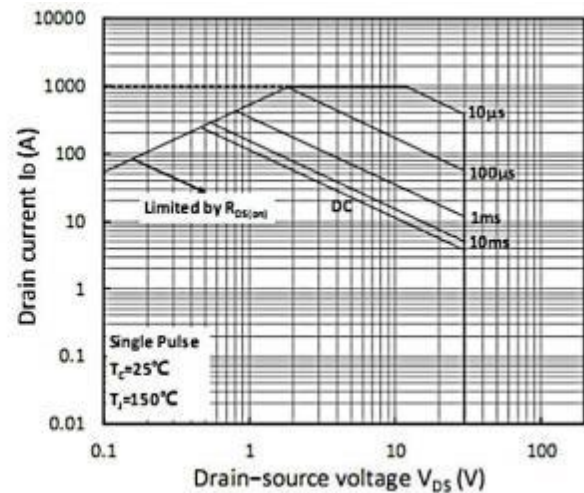


Figure 10. Safe Operating Area

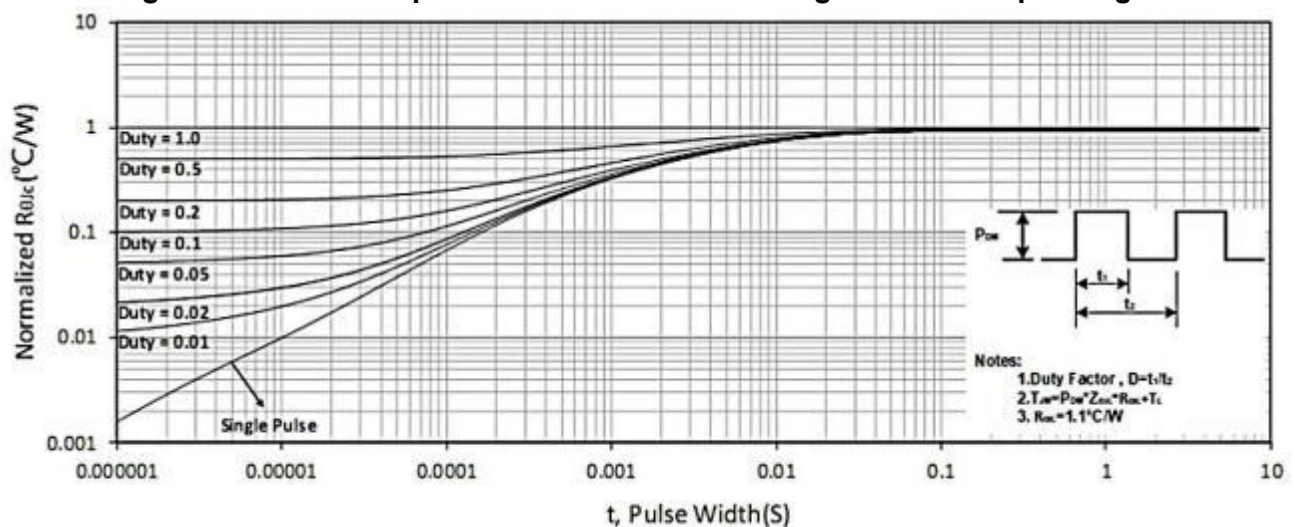
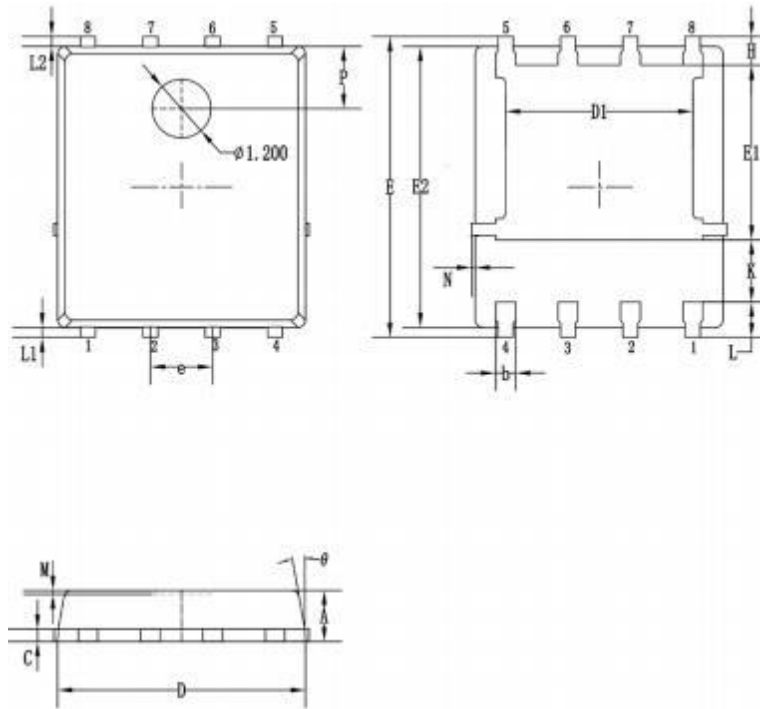


Figure 9 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-PDFN5*6-8L Single



Symbol	Dim in mm		
	Min	Typ	Max
A	0.9	1.05	1.2
b	0.3	0.4	0.5
C	0.2	0.25	0.35
D	4.9	5.05	5.2
D1	3.72	3.82	4.12
E	5.9	6.1	6.3
E1	3.3	3.5	3.7
E2	5.6	5.75	5.9
e	1.27BSC		
H	0.48	0.58	0.7
K	1.14	1.27	1.4
L	0.54	0.74	0.84
L1/L2	0.1	0.2	0.3
θ	8°	10°	12°
M	0.08REF		
N	0		0.15
P	1.28REF		

Package Marking and Ordering Information

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