

Description

The SXG180N04NF 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

$V_{DS} = 40V$ $I_D = 180A$

$R_{DS(ON)} < 1.3m\Omega$ @ $V_{GS}=10V$

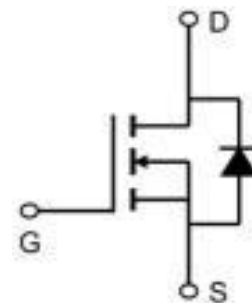
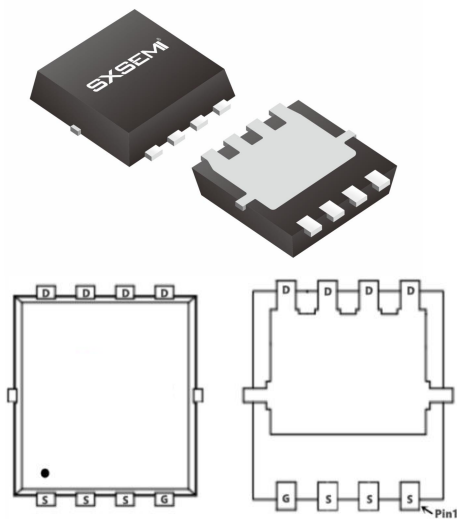
Application

BMS

BLDC

UPS

PDFN5*6-8L



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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	40	V
VGSS	Gate-Source Voltage	± 20	V
$I_{D@TC=25^\circ\text{C}}$	Continuous Drain Current, $V_{GS} @ 10V$	180	A
$I_{D@TC=100^\circ\text{C}}$	Continuous Drain Current, $V_{GS} @ 10V$	125	A
IDM	Pulsed Drain Current	750	A
EAS	Single Pulsed Avalanche Energy	420	mJ
IAS	Avalanche Current	70	A
PD@TC=25°C	Power Dissipation	68	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	25	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.4	$^\circ\text{C/W}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
TSTG	Storage Temperature Range	-55 to 150	$^\circ\text{C}$

N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
$I_{GSS} T_J=25^{\circ}\text{C}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
$I_{DSS} T_J=25^{\circ}\text{C}$	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	μA
$I_{DSS} T_J=100^{\circ}\text{C}$					100	
$V_{GS(th)}$	Gate-Threshold Voltage	$V_{DS} = V_{GS}, I_D=250\mu A$	1.0	1.6	2.2	V
$R_{DS(on)}$	Drain-Source on-Resistance ⁴	$V_{GS}=10V, I_D=20A$	-	1.0	1.3	m Ω
		$V_{GS}=4.5V, I_D=10A$	-	1.35	1.8	
g_{fs}	Forward Transconductance ⁴	$V_{DS}=10V, I_D=20A$	-	125	-	S
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	-	6870	-	pF
C_{oss}	Output Capacitance		-	1500	-	
C_{rss}	Reverse Transfer Capacitance		-	85	-	
R_G	Gate Resistance	$f=1MHz$	-	2.2	-	Ω
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V, I_D=20A$	-	116	-	nC
Q_{gs}	Gate-Source Charge		-	16	-	
Q_{gd}	Gate-Drain Charge		-	18	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DD}=20V, R_G=3\Omega, I_D=20A$	-	10.8	-	ns
t_r	Rise Time		-	11.9	-	
$t_{d(off)}$	Turn-off Delay Time		-	100	-	
t_f	Fall Time		-	44	-	
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$	-	68	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	54.4	-	nC
V_{SD}	Diode Forward Voltage ⁴	$I_S=20A, V_{GS}=0V$	-	-	1.2	V
I_S	Continuous Source Current $T_c=25^{\circ}\text{C}$	-	-	-	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The EAS data shows Max. rating . The test condition is $V_{DD} = 32V, V_{GS} = 10V, L=0.1mH, I_{AS} = 70A$
- 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

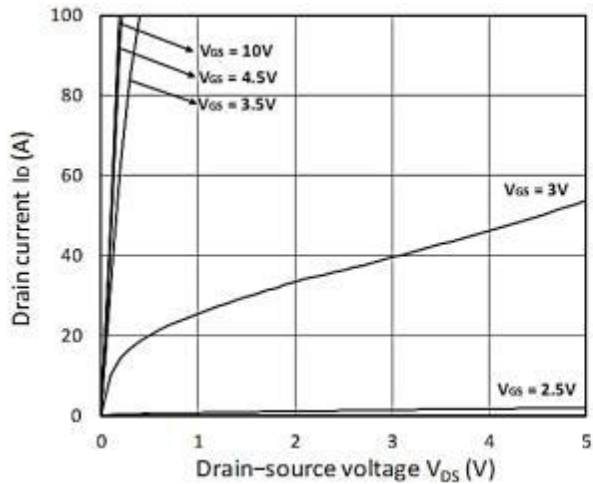


Figure 1. Output Characteristics

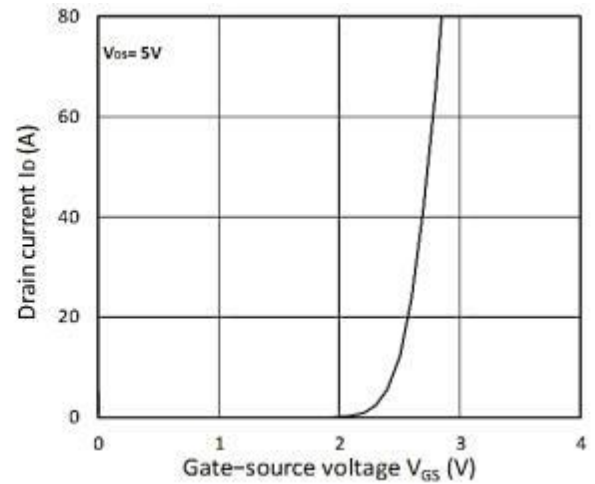


Figure 2. Transfer Characteristics

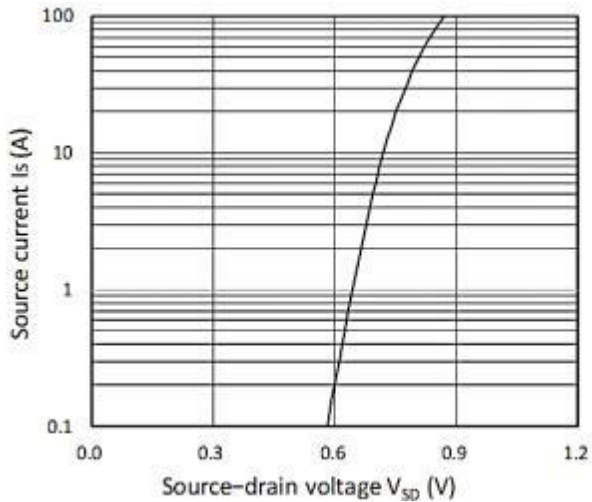


Figure 3. Forward Characteristics of Reverse

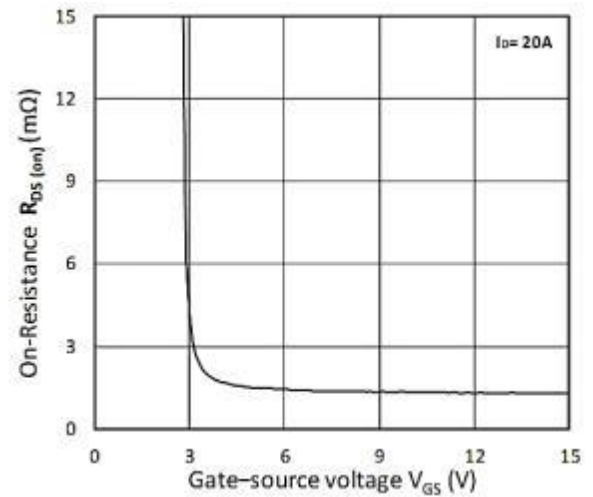


Figure 4. R_DS(ON) vs. V_GS

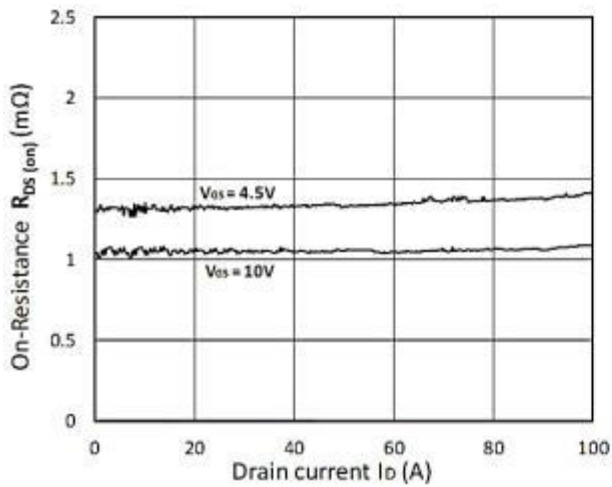


Figure 5. R_DS(ON) vs. I_D

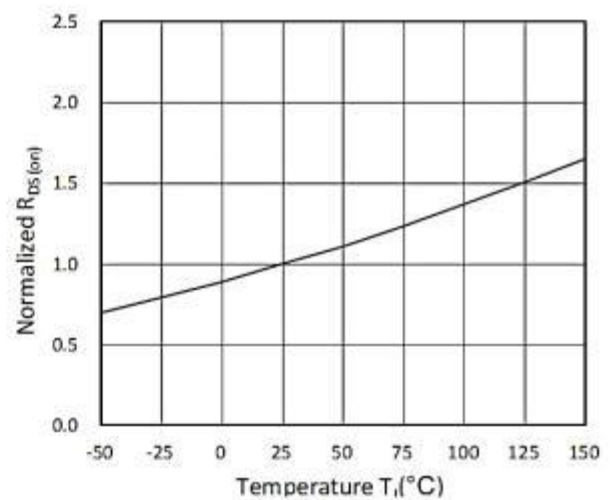


Figure 6. Normalized R_DS(on) vs. Temperature

Typical Characteristics

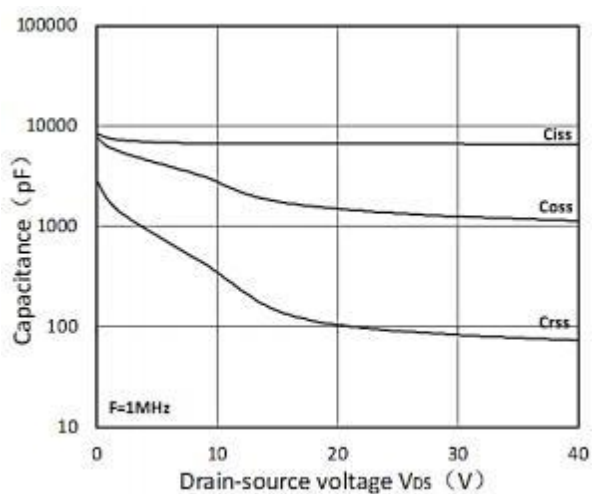


Figure 7. Capacitance Characteristics

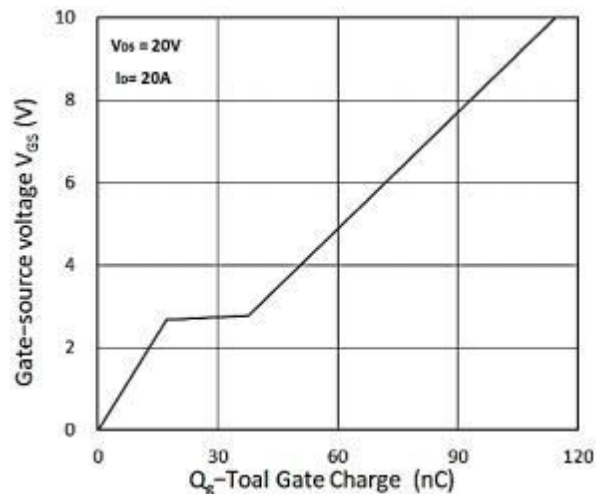


Figure 8. Gate Charge Characteristics

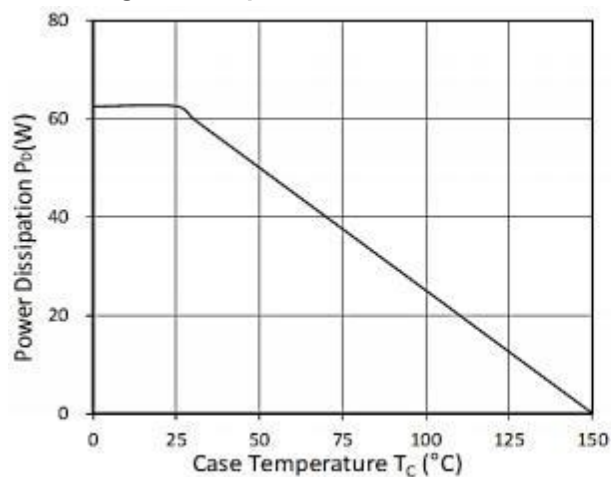


Figure 9. Power Dissipation

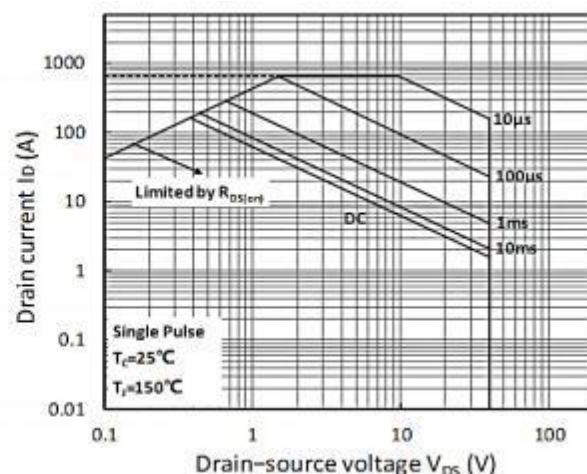


Figure 10. Safe Operating Area

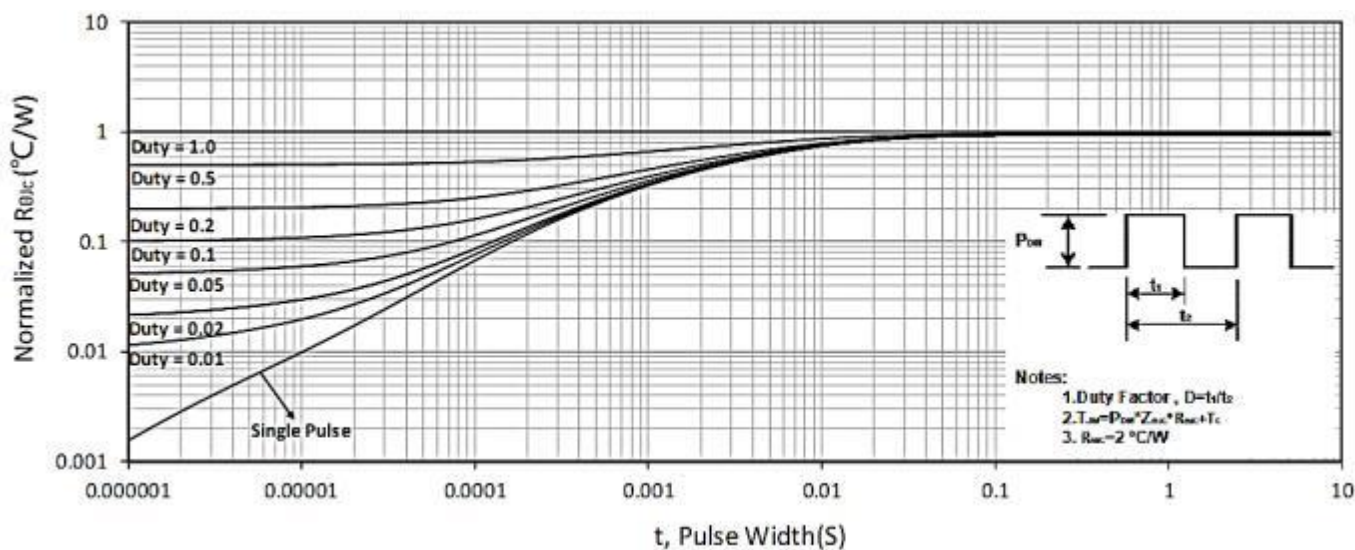
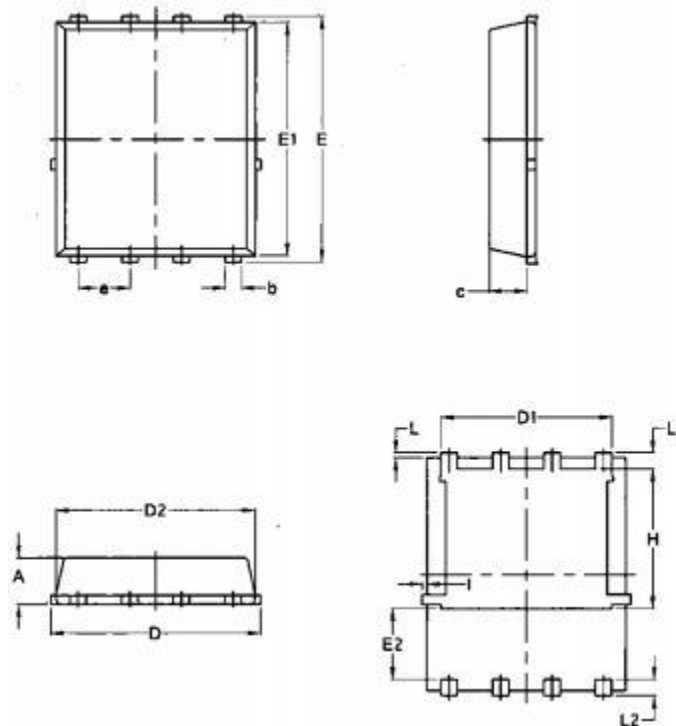


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-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