

Description

The SX135N03NF 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

$V_{DS} = 30V$ $I_D = 135A$

$R_{DS(ON)} < 1.6m\Omega$ @ $V_{GS}=10V$

Application

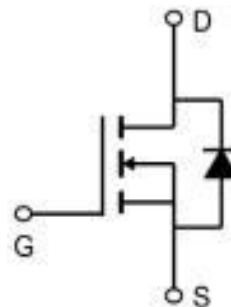
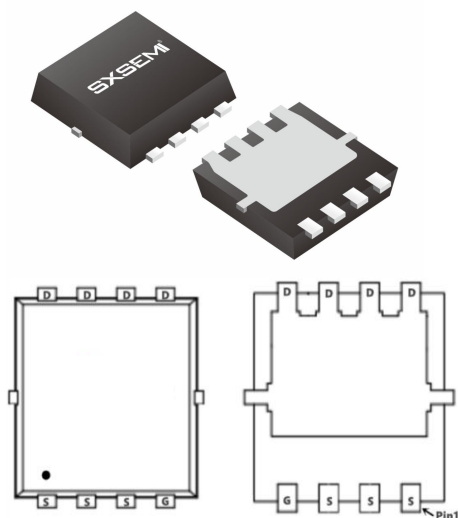
Boost driver

Brushless motor

BLDC

Clip packaging process

PDFN5*6-8L



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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	30	V
VGS	Gate-Source Voltage	± 20	V
ID@TC=25°C	Continuous Drain Current, VGS @ 10V1	135	A
ID@TC=100°C	Continuous Drain Current, VGS @ 10V1	110	A
IDM	Pulsed Drain Current2	485	A
EAS	Single Pulse Avalanche Energy3	101	mJ
IAS	Avalanche Current	45	A
PD@TC=25°C	Total Power Dissipation4	78	W
TSTG	Storage Temperature Range	-55 to 150	°C
TJ	Operating Junction Temperature Range	-55 to 150	°C
RθJA	Thermal Resistance Junction-Ambient 1	25	°C/W
RθJC	Thermal Resistance Junction-Case1	1.2	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	30	36	---	V
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =20A	---	1.3	1.6	mΩ
		V _{GS} =4.5V , I _D =15A	---	2.0	3.0	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.7	2.5	V
IDSS	Drain-Source Leakage Current	V _{DS} =30V , V _{GS} =0V , T _J =25°C	---	---	1	uA
IDSS	Drain-Source Leakage Current	V _{DS} =30V , V _{GS} =0V , T _J =55°C	---	---	5	
IGSS	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =5V , I _D =20A	---	100	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	1.4	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =20V , V _{GS} =4.5V , I _D =20A	---	39	---	nC
Q _{gs}	Gate-Source Charge		---	8.6	---	
Q _{gd}	Gate-Drain Charge		---	5.0	---	
Td(on)	Turn-On Delay Time	V _{DD} =20V , V _{GS} =10V , R _G =3Ω , I _D =20A	---	6.0	---	ns
T _r	Rise Time		---	9.0	---	
Td(off)	Turn-Off Delay Time		---	26	---	
T _f	Fall Time		---	10.0	---	
Ciss	Input Capacitance	V _{DS} =20V , V _{GS} =0V , f=1MHz	---	3050	---	pF
Coss	Output Capacitance		---	2650	---	
Crss	Reverse Transfer Capacitance		---	117	---	
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	135	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =78A , T _J =25°C	---	---	1.2	V

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 =32V,VGS =10V,L=0.1mH,IAS =54A
- 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

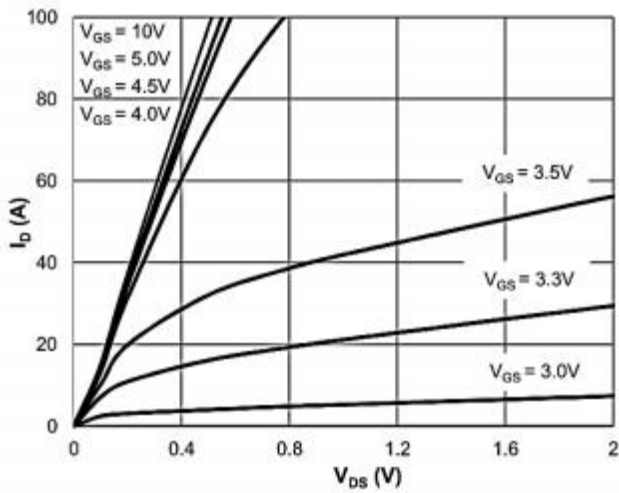


Figure 1: Saturation Characteristics

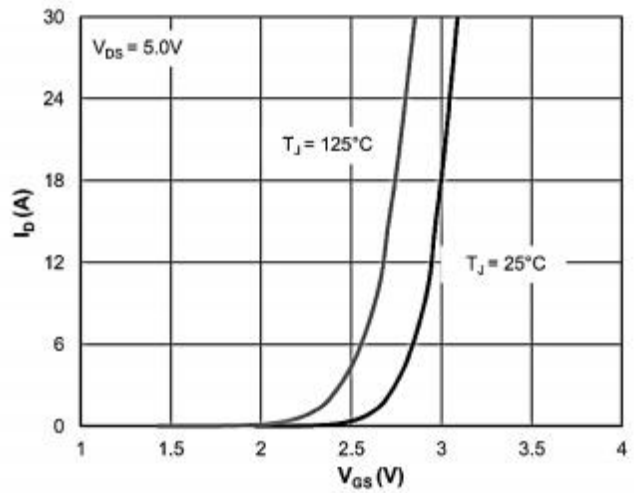


Figure 2: Transfer Characteristics

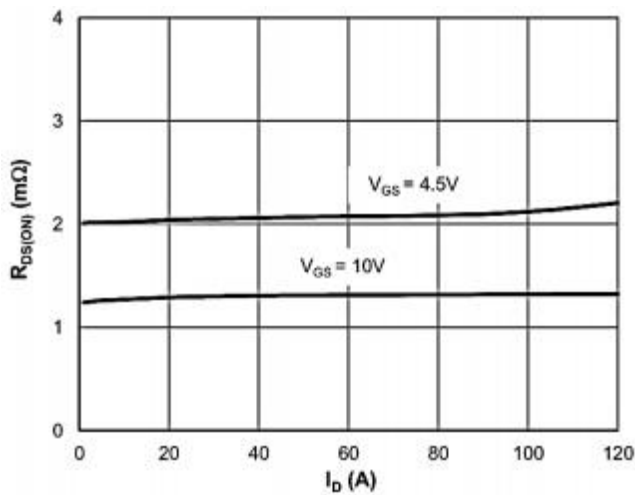


Figure 3: $R_{DS(ON)}$ vs. Drain Current

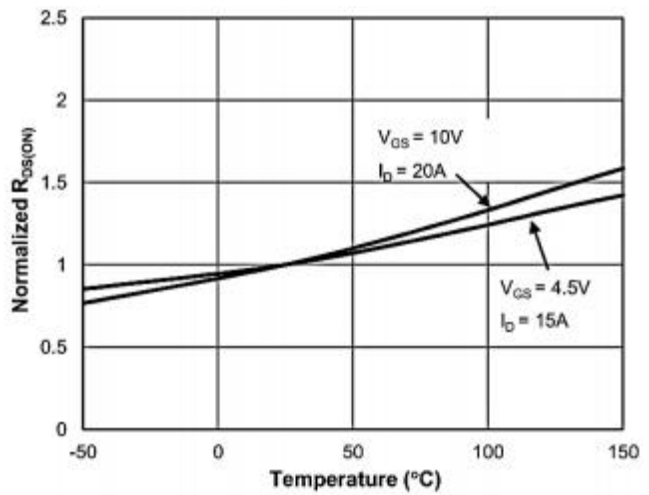


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

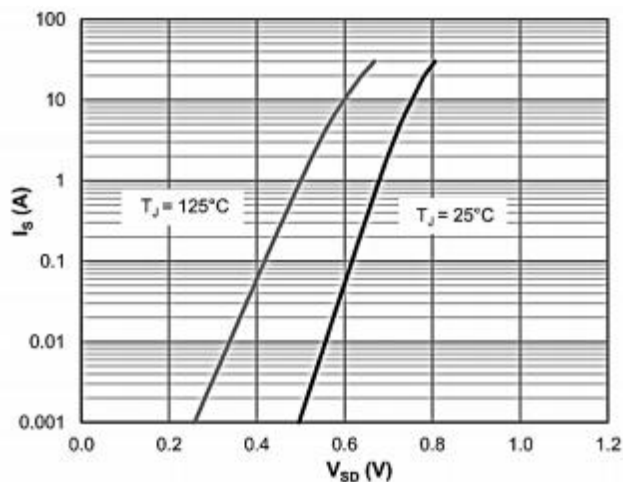


Figure 5: Body-Diode Characteristics

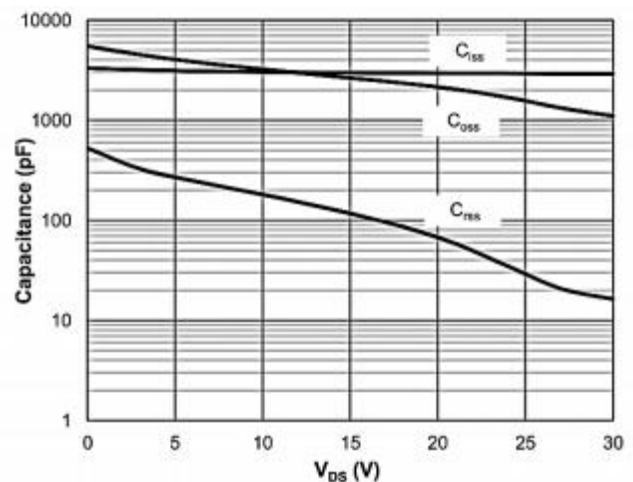


Figure 6: Capacitance Characteristics

Typical Characteristics

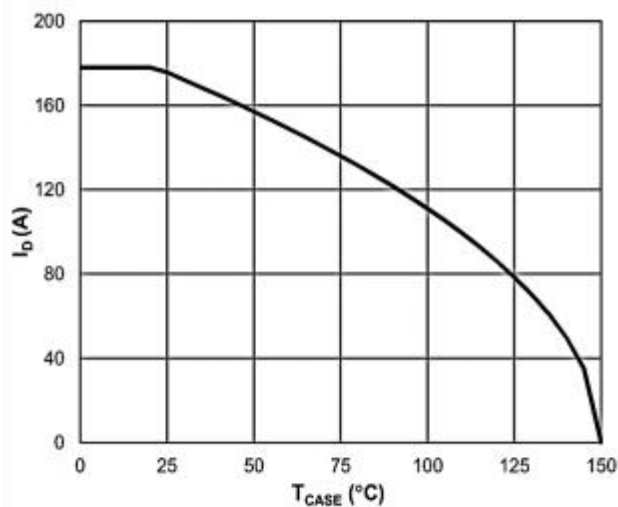


Figure 7: Current De-rating

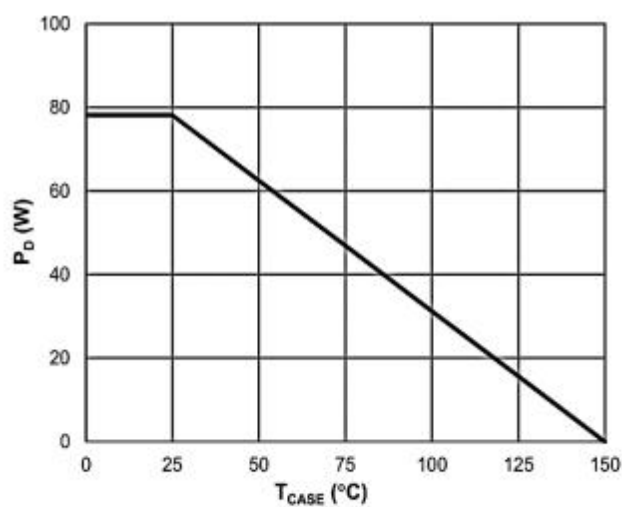


Figure 8: Power De-rating

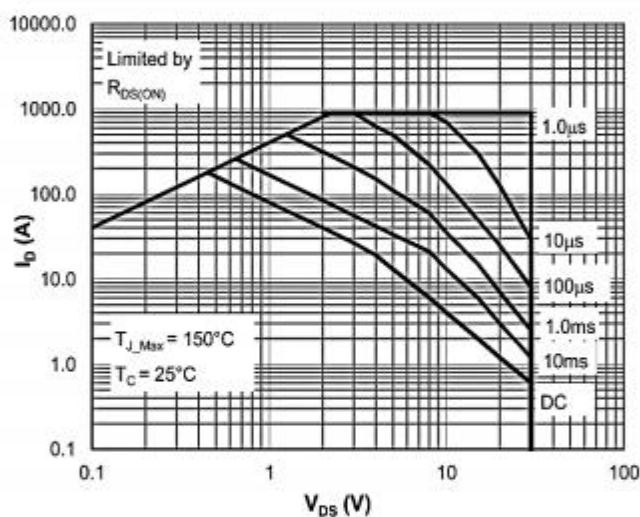


Figure 9: Maximum Safe Operating Area

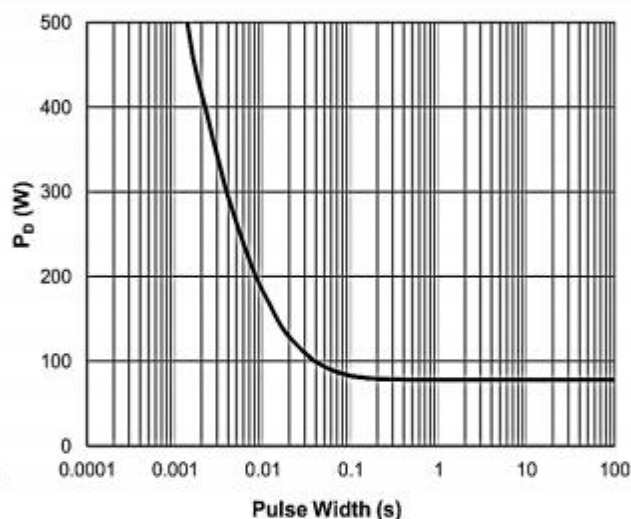


Figure 10: Single Pulse Power Rating, Junction-to-Case

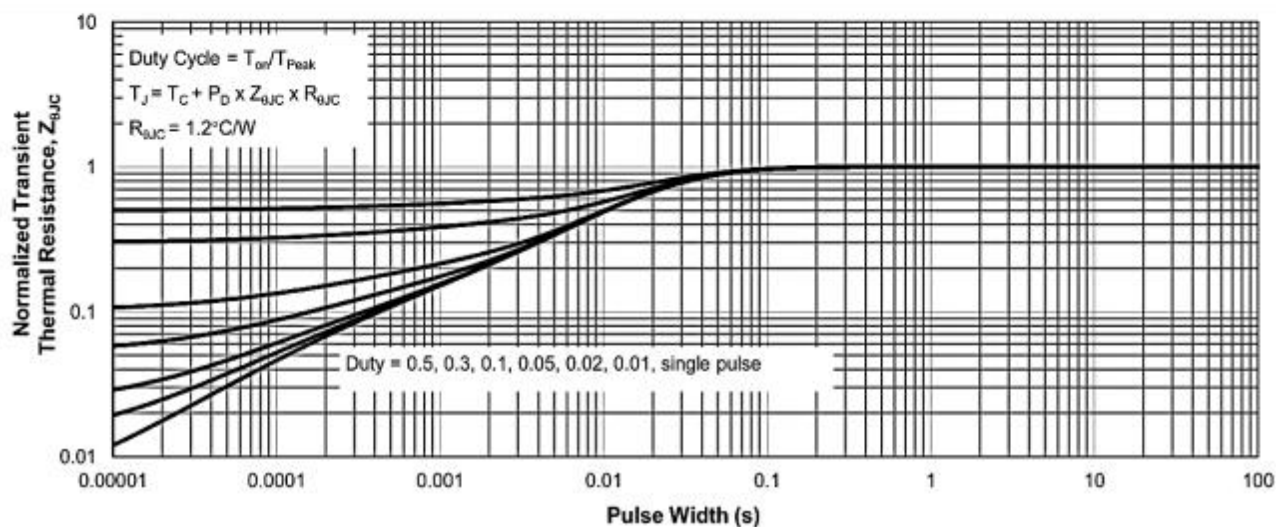
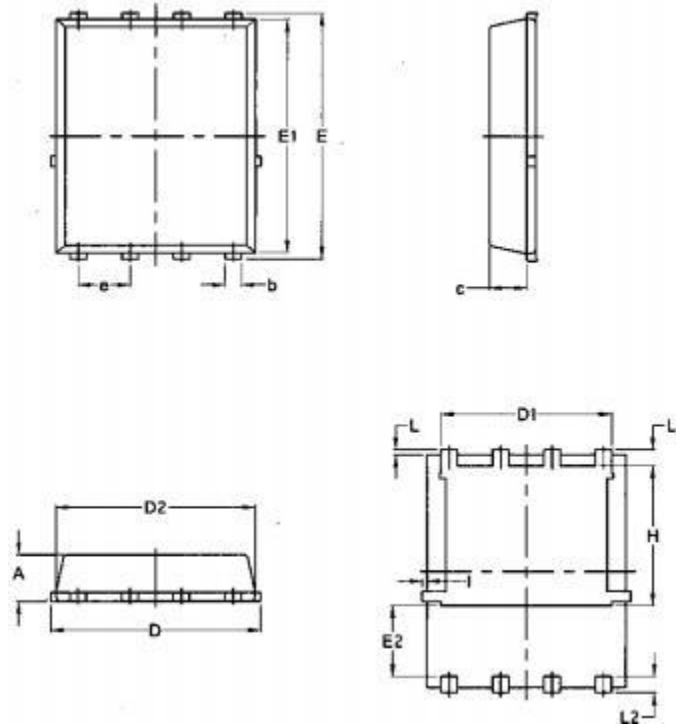


Figure 11: Normalized Maximum Transient Thermal Impedance

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