

Description

The SX4P15DF uses advanced trench 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

$V_{DS} = -150V$ $I_D = -4A$

$R_{DS(ON)} < 780m\Omega$ @ $V_{GS}=10V$

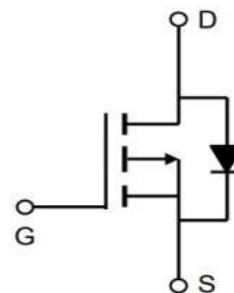
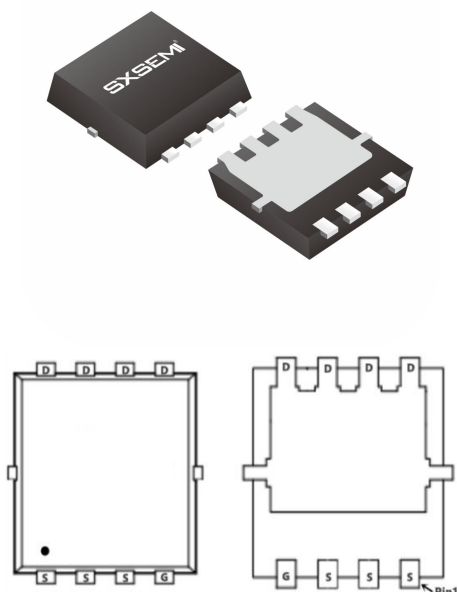
Application

Brushless motor

Load switch

Uninterruptible power supply

PDFN3*3-8L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current, $-V_{GS}$ @ -10V ¹	-4.0	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current, $-V_{GS}$ @ -10V ¹	-2.8	A
I_{DM}	Pulsed Drain Current ²	-12	A
E_{AS}	Single Pulse Avalanche Energy ³	56.5	mJ
I_{AS}	Avalanche Current	5	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation ⁴	2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	40	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	VGS=0V , ID=-250uA	-150	-168	---	V
RDS(ON)	Static Drain-Source On-Resistance	VGS=-10V , ID=-1A	---	620	780	mΩ
RDS(ON)	Static Drain-Source On-Resistance	VGS=-6V , ID=-0.5A	---	700	980	
VGS(th)	Gate Threshold Voltage	VGS=VDS , ID =-250uA	-2.0	-3.0	-4.0	V
IDSS	Drain-Source Leakage Current	VDS=120V ,VGS=0V ,TJ=25°C	---	---	1	uA
IDSS	Drain-Source Leakage Current	VDS=120V ,VGS=0V ,TJ=85°C	---	---	30	uA
IGSS	Gate-Source Leakage Current	VGS=±20V , VDS=0V	---	---	±100	nA
Rg	Gate Resistance	VDS=0V , VGS=0V , f=1MHz	---	12	---	Ω
Qg	Total Gate Charge	VDS=-75V , VGS=-10V , ID=-1A	---	10.8	---	nC
Qgs	Gate-Source Charge		---	3.1	---	nC
Qgd	Gate-Drain Charge		---	2.2	---	nC
Td(on)	Turn-On Delay Time	VDD=-30V , VGS=-10V , RG=6Ω, ID=-1A	---	21	---	ns
Tr	Rise Time		---	16	---	ns
Td(off)	Turn-Off Delay Time		---	40	---	ns
Tf	Fall Time		---	18	---	ns
Ciss	Input Capacitance	VDS=-75V , VGS=0V , f=1MHz	---	706	---	pF
Coss	Output Capacitance		---	23	---	pF
Crss	Reverse Transfer Capacitance		---	13	---	pF

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 VDD =-50V,VGS =-10V,L=0.5mH,IAS =-5A
- 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

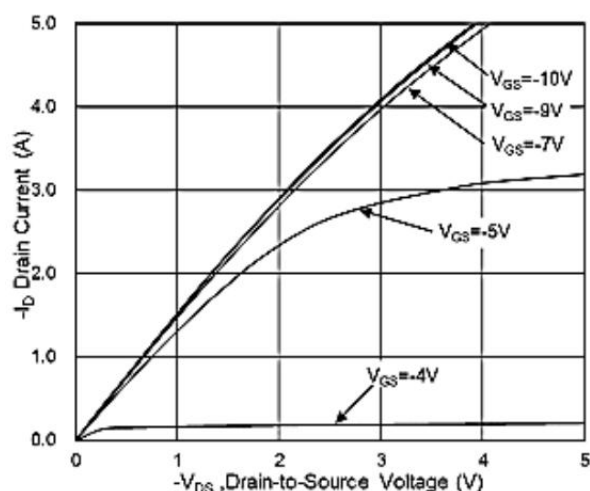


Fig.1 Typical Output Characteristics

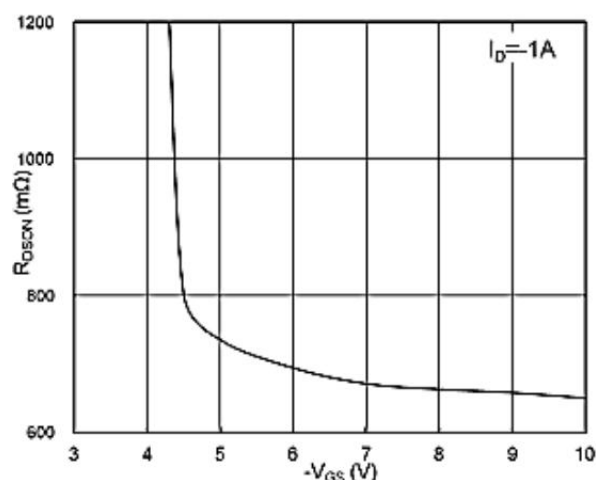


Fig.2 On-Resistance vs G-S Voltage

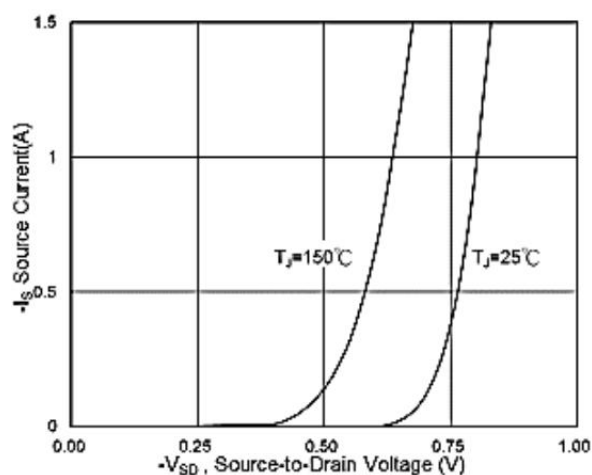


Fig.3 Source Drain Forward Characteristics

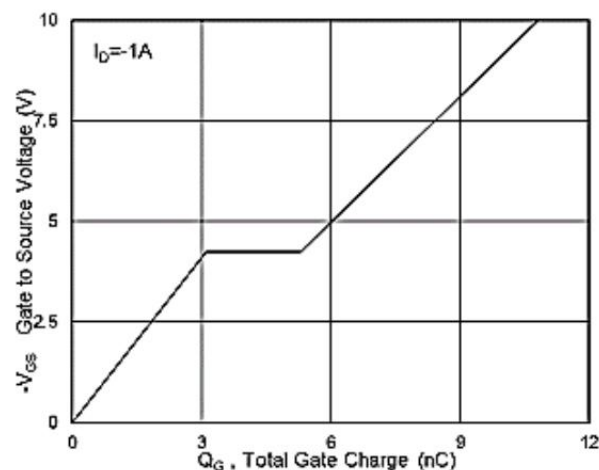


Fig.4 Gate-Charge Characteristics

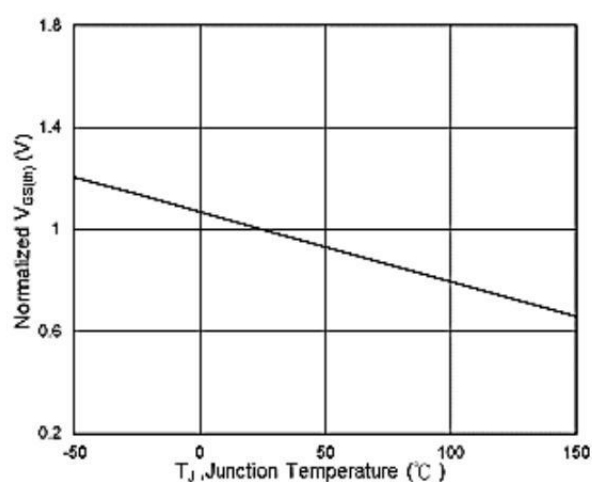


Fig.5 Normalized $V_{GS(th)}$ vs T_J

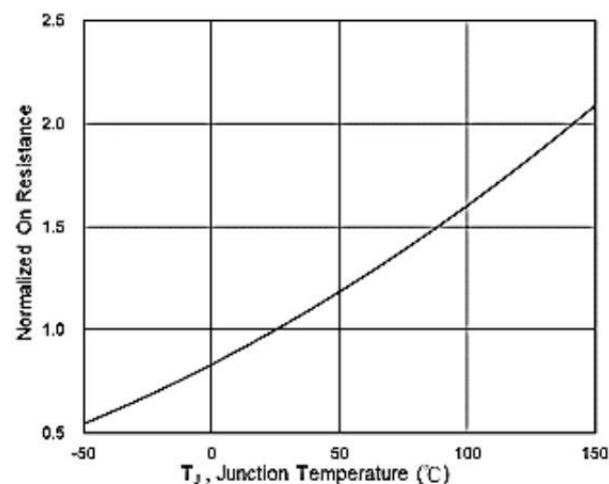


Fig.6 Normalized $R_{DS(on)}$ vs T_J

Typical Characteristics

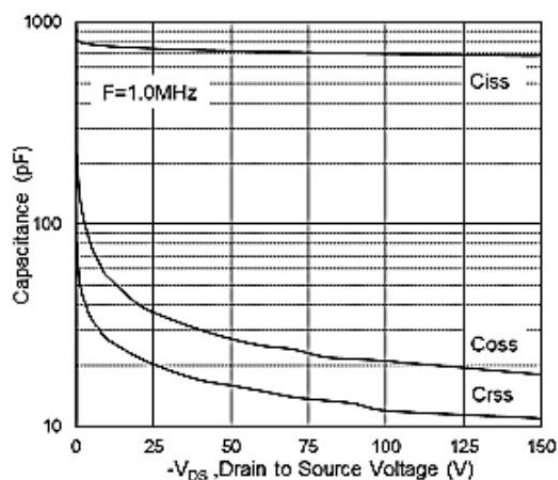


Fig.7 Capacitance

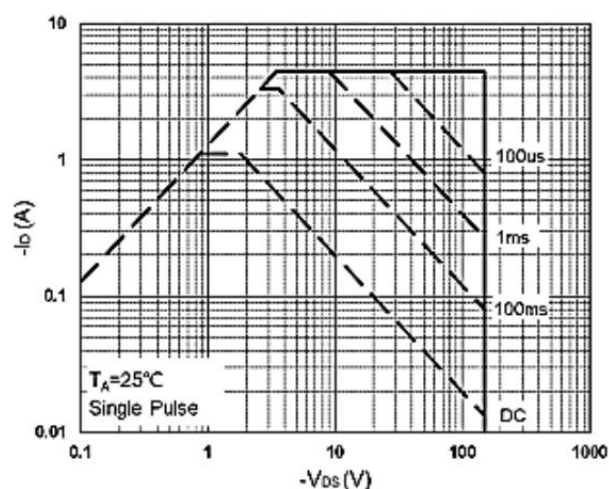


Fig.8 Safe Operating Area

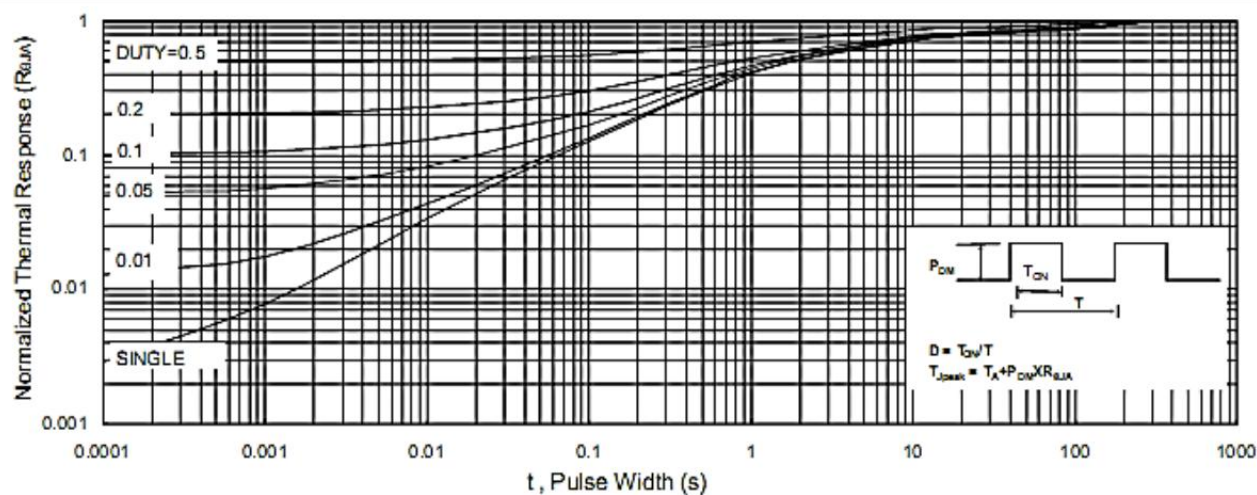


Fig.9 Normalized Maximum Transient Thermal Impedance

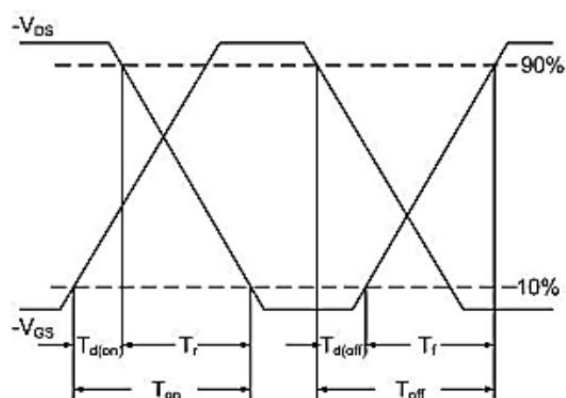


Fig.10 Switching Time Waveform

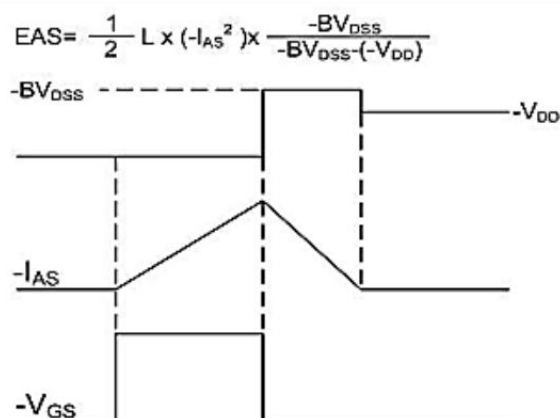
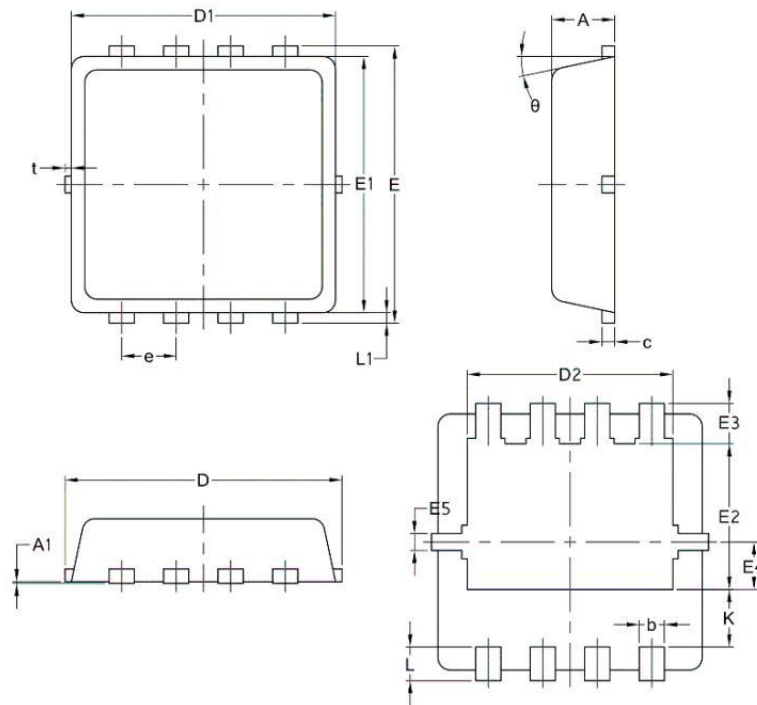


Fig.11 Unclamped Inductive Waveform

Package Mechanical Data- PDFN3*3-8L-JQ Single



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	PDFN3*3-8L		5000