-20V P-Channel Enhancement Mode MOSFET

Description

The SX30P02DF 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 =-30A

$R_{DS(ON)}$ < 16mΩ @ V_{GS}=-4.5V

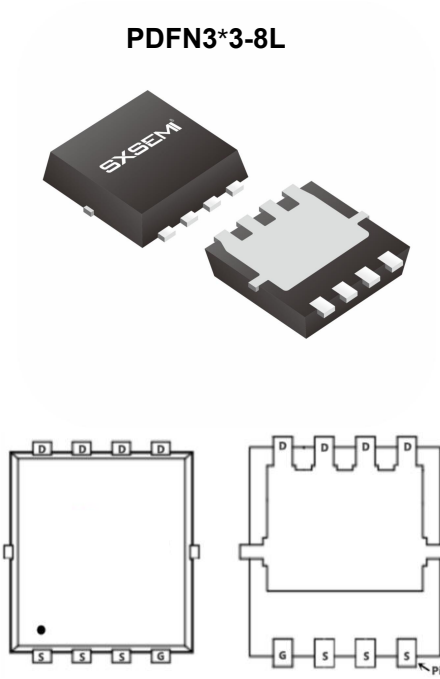
Application

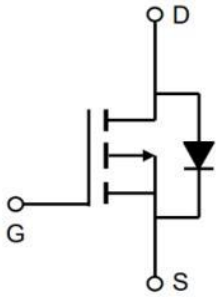
Battery protection

Load switch

Uninterruptible power supply

PDFN3*3-8L





Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-20	V
VGS	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-30	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-18	A
IDM	Pulsed Drain Current[2]	-90	A
P_D@T_C=25℃	Total Power Dissipation[3]	3	W
P_D@T_C=70℃	Total Power Dissipation[3]	1.6	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	85	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	24	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=-250μA	-20	-	-	V
IGSS	Gate-body Leakage current	VDS=0V, VGS=±12V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current TJ= 25°C	VDS=-20V, VGS=0V	-	-	-1	μA
	Zero Gate Voltage Drain CurrentTJ= 100°C		-	-	-100	
VGS(th)	Gate-Threshold Voltage	VDS=VGS, ID=-250μA	-0.5	-0.65	-1.2	V
RDS(on)	Drain-Source On-Resistance4	VGS=-4.5V, ID=-8A	-	12	16	mΩ
		VGS=-2.5V, ID=-6A	-	18	23	
gfs	Forward Transconductance4	VDS=-4.5V, ID=-8A	-	36	-	S
Ciss	Input Capacitance	VDS=-10V, VGS= 0V, f = 1MHz	-	1630	-	pF
Coss	Output Capacitance		-	211	-	
Crss	Reverse Transfer Capacitance		-	187	-	
Rg	Gate Resistance	f=1MHz	-	10	-	Ω
Qg	Total Gate Charge	VGS=-4.5V, VDS=-10V, ID=-8A	-	12	-	nC
Qgs	Gate-Source Charge		-	1.8	-	
Qgd	Gate-Drain Charge		-	3.2	-	
td(on)	Turn-On Delay Time	VGS=-4.5V, VDD=-10V, RG=3Ω, ID=-8A	-	17	-	ns
tr	Rise Time		-	25.5	-	
td(off)	Turn-Off Delay Time		-	32	-	
tf	Fall Time		-	15	-	
VSD	Diode Forward Voltage4	IS=-8A, VGS=0V	-	-	-1.2	V
IS	Continuous Source Current TA= 25°C		-	-	-9	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 power dissipation is limited by 150℃junction temperature

4、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Typical Characteristics

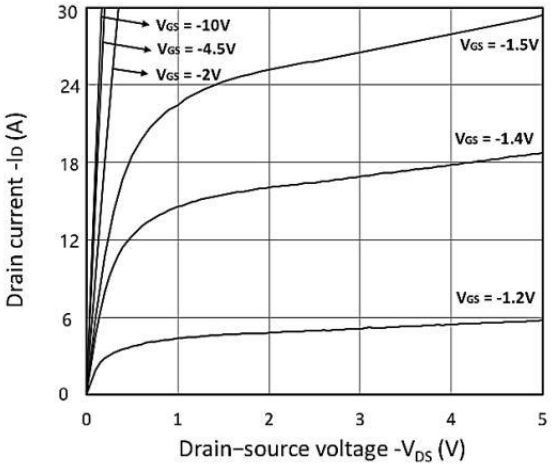


Figure 1. Output Characteristics

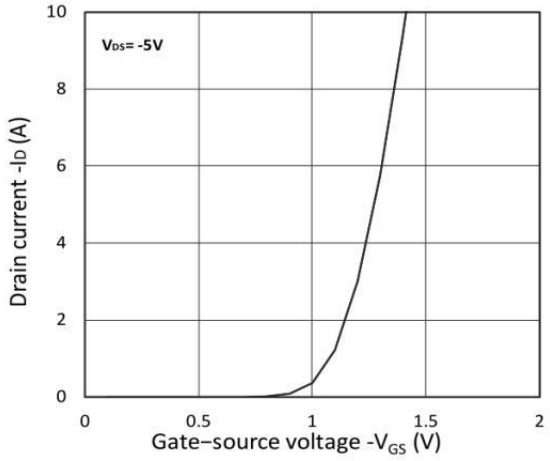


Figure 2. Transfer Characteristics

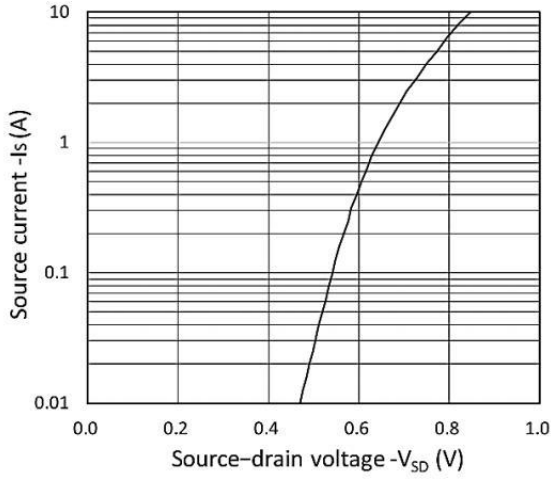


Figure 3. Forward Characteristics of Reverse

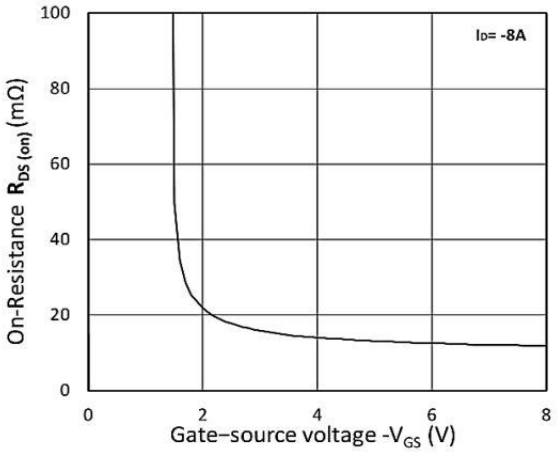


Figure 4. RDS(ON) vs. VGS

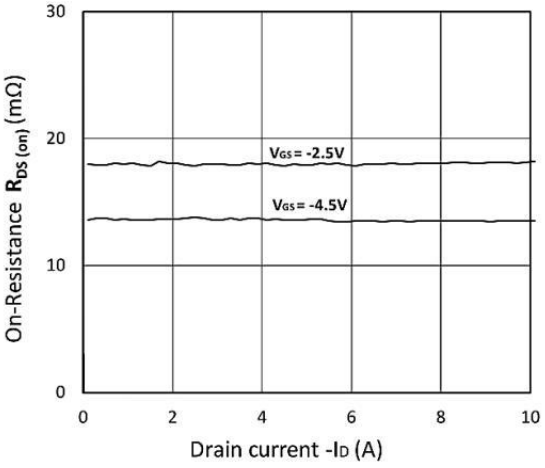


Figure 5. RDS(ON) vs. ID

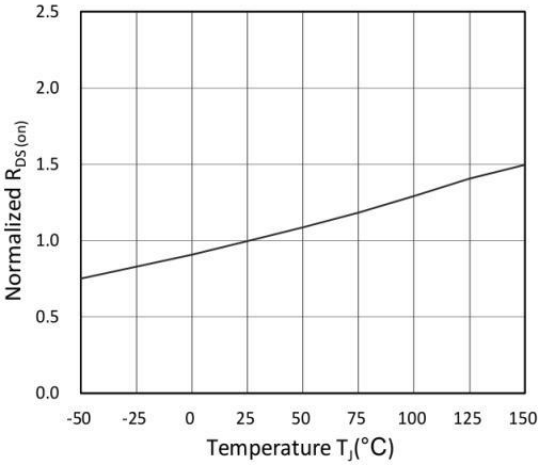


Figure 6. Normalized RDS(on) vs. Temperature

Typical Characteristics

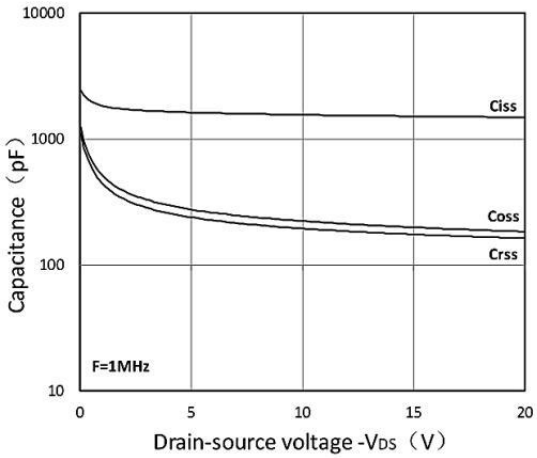


Figure 7. Capacitance Characteristics

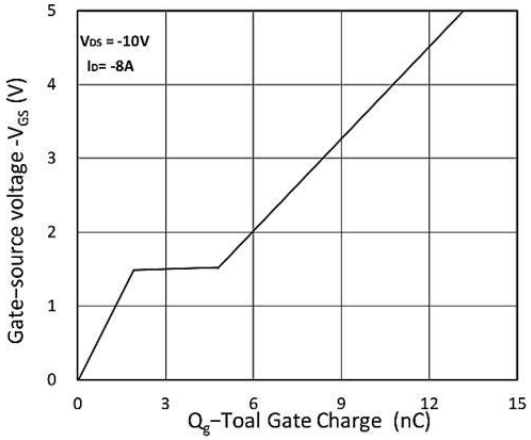


Figure 8. Gate Charge Characteristics

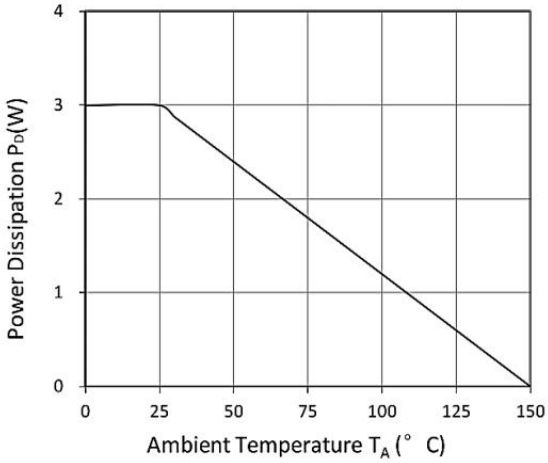


Figure 9. Power Dissipation

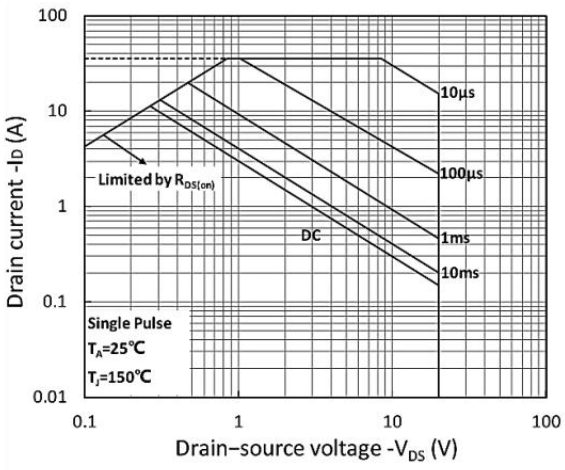


Figure10. Safe Operating Area

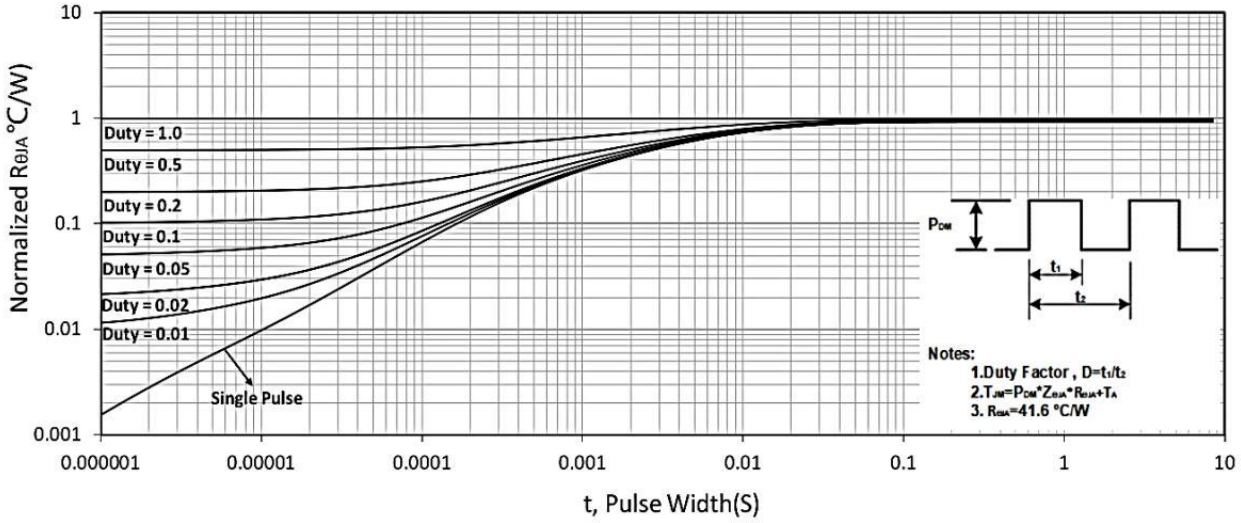
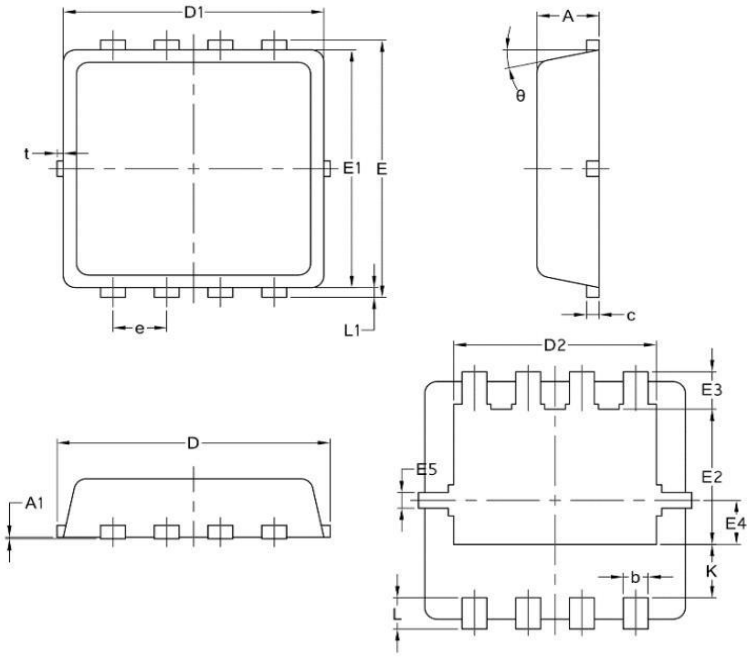


Figure11, Normalized Maximum Transient Thermal Impedance

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