Description

The SX30P02BF 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

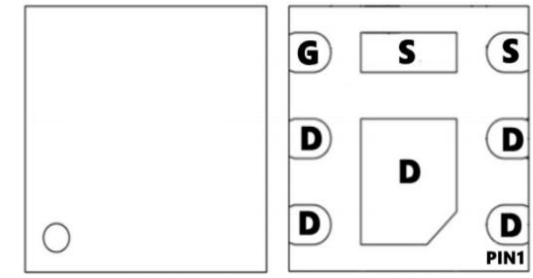
V_{DS} = -20V I_D =-30A

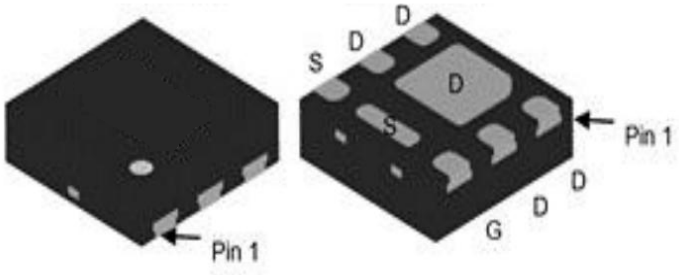
$R_{DS(ON)}$ < 12mΩ @ V_{GS}=-4.5V

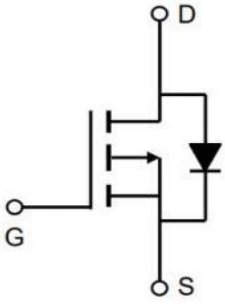
Application

electronic cigarette

Load switch







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=70℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-21.4	A
IDM	Pulsed Drain Current[2]	-90	A
P_D@T_C=25℃	Total Power Dissipation[3]	2.4	W
P_D@T_C=70℃	Total Power Dissipation[3]	19	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]	125	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	6.9	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-to-Source breakdown voltage	V_{GS} = 0V, ID = 250μA	-20	-24	—	V
$R_{DS(on)}$	Static Drain-to-Source on-resistance	V_{GS} =-4.5V, I_D =-10A	—	9.5	12	mΩ
		V_{GS} =-2.5V, I_D =-8.9A	—	12	16	
		V_{GS} =-1.8V, I_D =-4.5A	—	17	21	
VGS(th)	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 250μA	-0.4	0.6	-1	V
IDSS	Drain-to-Source leakage current	V_{DS} = -12V,V_{GS} = 0V	—	—	-1	μA
IGSS	Gate-to-Source forward leakage	V_{GS} = 8V	—	—	100	nA
		V_{GS} = -8V	—	—	-100	
gFS	Forward Transconductance	V_{DS} = -5V, I_D =-10A	-3	—	—	S
Q_g	Total gate charge	I_D = -10A, V_{DD}=-6V, V_{GS} = -4.5V	—	21	—	nC
Q_{gs}	Gate-to-Source charge		—	2.5	—	
Q_{gd}	Gate-to-Drain("Miller") charge		—	6	—	
$t_{d(on)}$	Turn-on delay time	V_{GS}=-4.5V, V_{DD}=-6V, I_D = -10A, R_{GEN}=6Ω	—	30	—	ns
t_r	Rise time		—	48	—	
$t_{d(off)}$	Turn-Off delay time		—	97	—	
t_f	Fall time		—	65	—	
C_{iss}	Input capacitance	V_{GS} = 0V V_{DS} = -6V f = 1MHz	—	2138	—	pF
Coss	Output capacitance		—	273	—	
C_{rss}	Reverse transfer capacitance		—	236	—	
I_S	Continuous Source Current (Body Diode)	MOSFET symbol showing the integral reverse p-n junction diode.	—	—	-30	A
ISM	Pulsed Source Current (Body Diode)		—	—	-90	A
V_{SD}	Diode Forward Voltage	I_S=-2A, V_{GS}=0V	—	-0.77	-1.2	V
t_{rr}	Reverse Recovery Time	T_J = 25°C, I_F =-10A, di/dt = 100A/μs	—	16	—	ns
Q_{rr}	Reverse Recovery Charge		—	5.9	—	uC

Notes:

1、The maximum current rating is limited by bond-wires.

2、Repetitive rating; pulse width limited by max. junction temperature.

3、The power dissipation PD is based on max. junction temperature, using junction-to-ambient thermal resistance.

4、The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

5、These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C.

Typical Characteristics

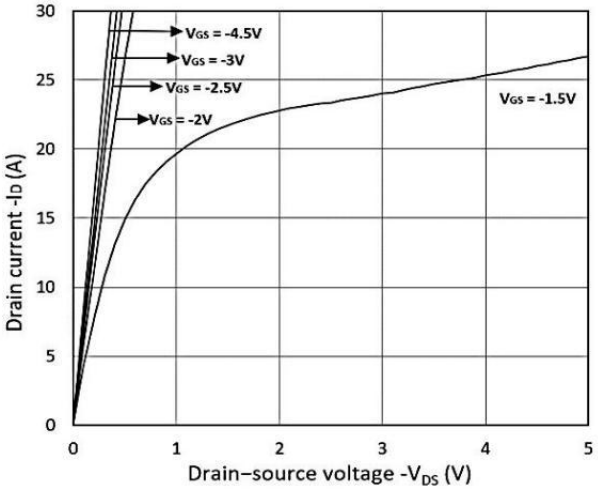


Figure 1. Output Characteristics

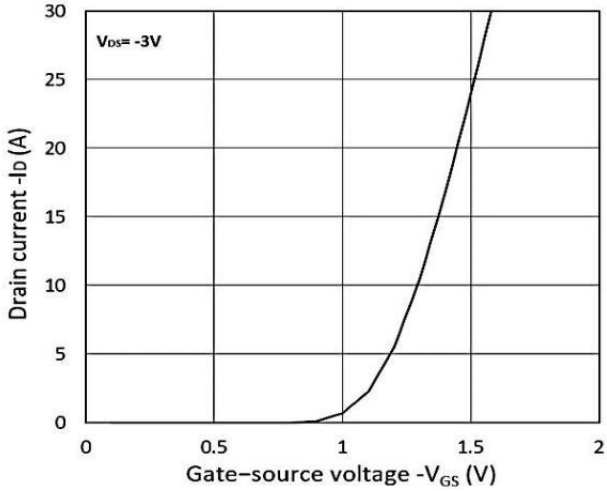


Figure 2. Transfer Characteristics

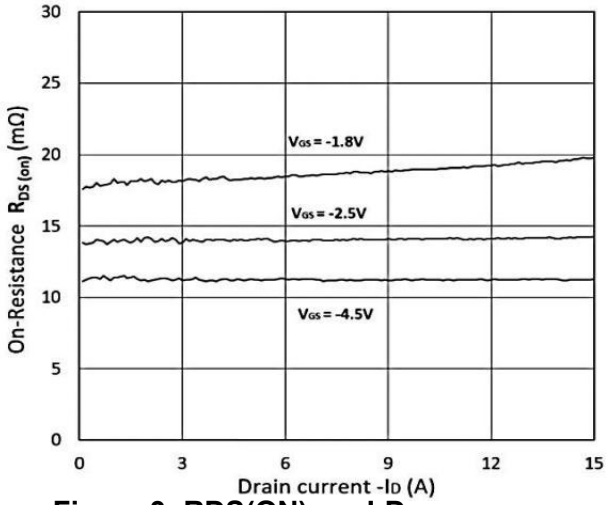


Figure 3. RDS(ON) vs. I D

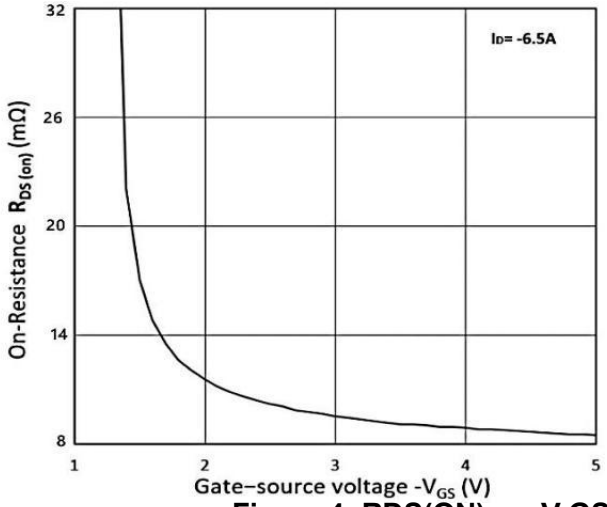


Figure 4. RDS(ON) vs. V GS

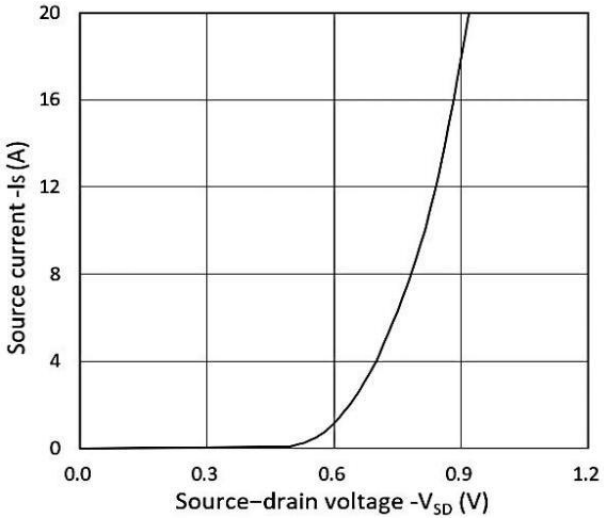


Figure 5. Forward Characteristics of Reverse

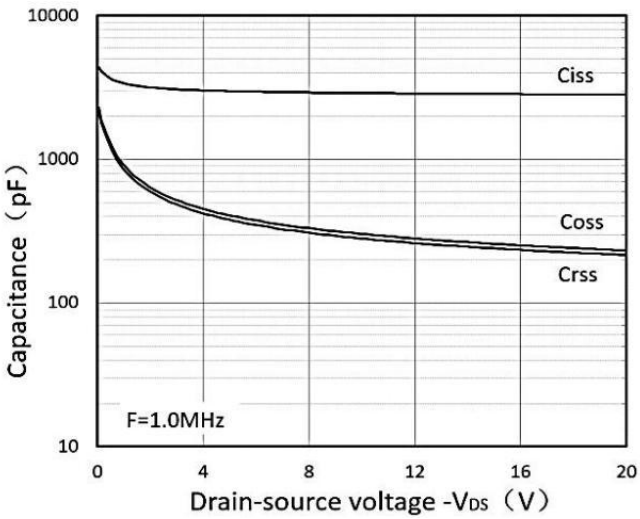


Figure 6. Capacitance Characteristics

Typical Characteristics

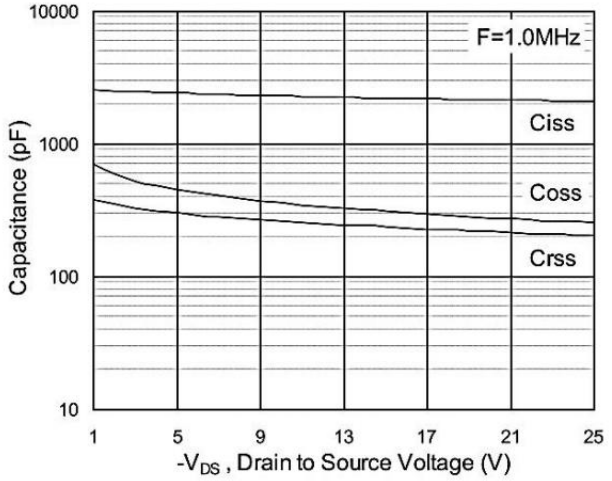


Fig.7 Capacitance

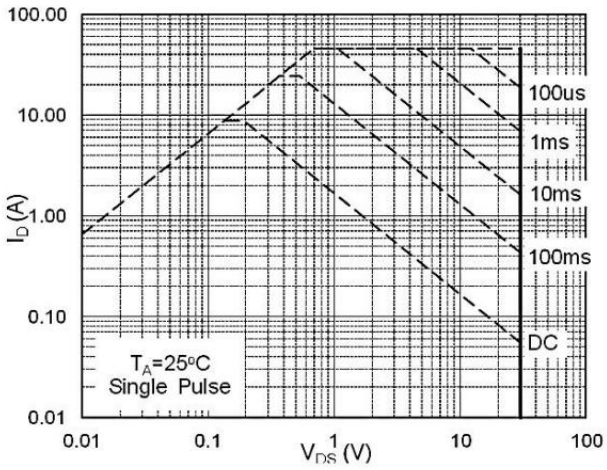


Fig.8 Safe Operating Area

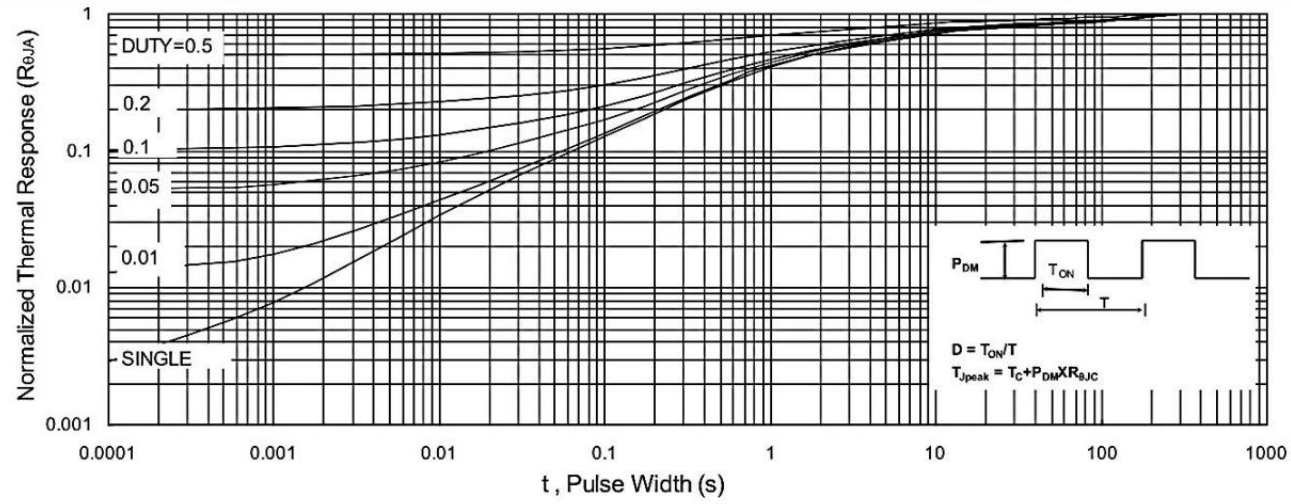


Fig.9 Normalized Maximum Transient Thermal Impedance

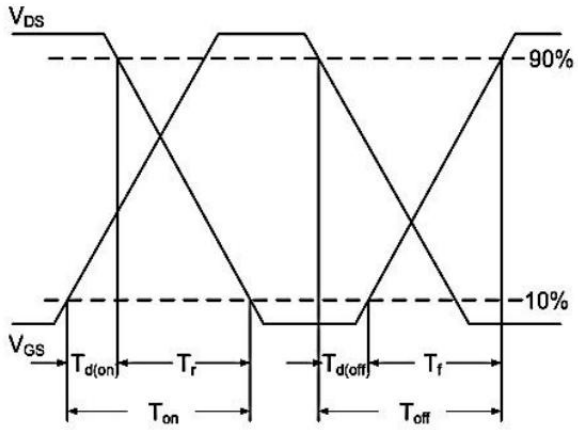


Fig.10 Switching Time Waveform

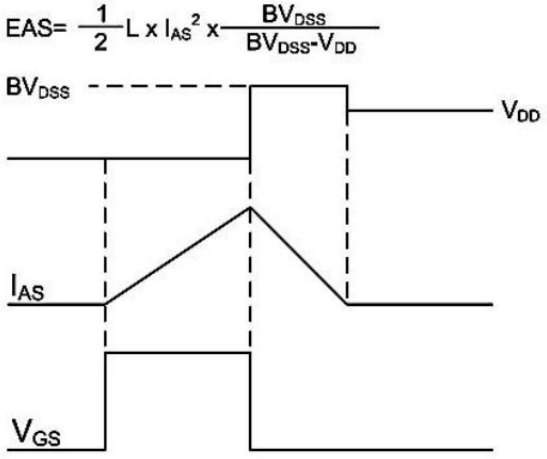
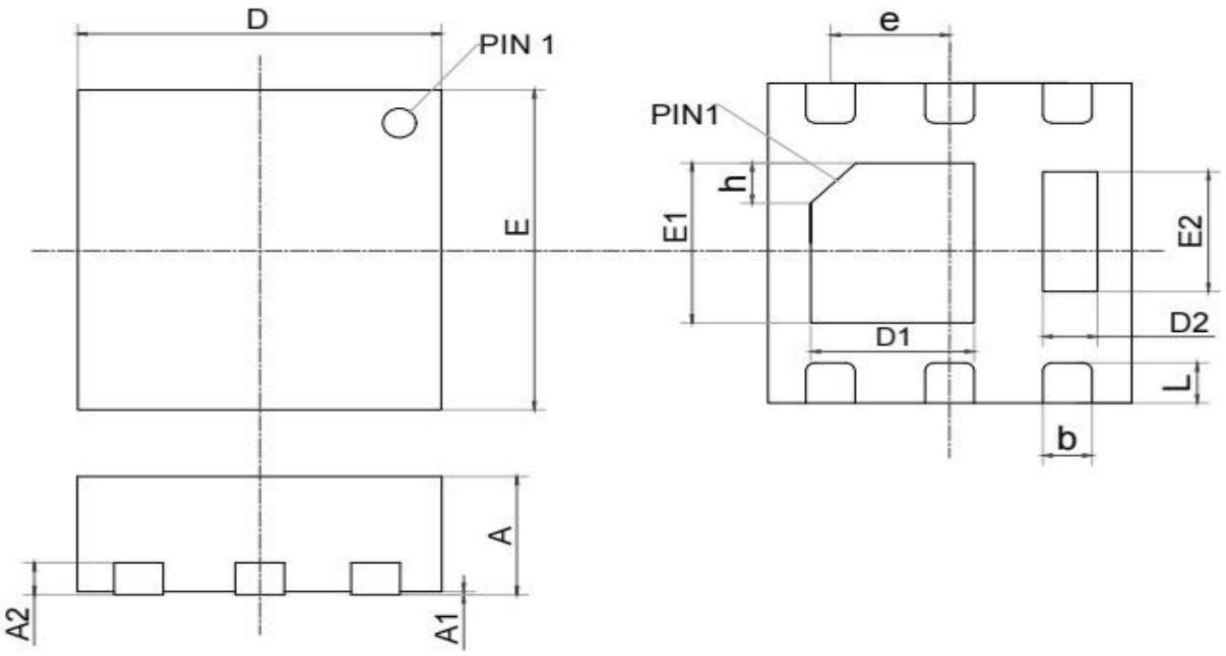


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data：QFN2*2-6L



Symbol			
	Min	Nom	Max
A	0.70	0.75	0.80
A1	--	0.02	0.05
A2	0.18	0.20	0.25
b	0.20	0.27	0.34
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D1	0.80	0.90	1.00
E1	0.90	1.00	1.10
D2	0.20	0.30	0.40
E2	0.65	0.75	0.85
L	0.20	0.25	0.35
h	0.20	0.25	0.30
e	0.65 BSC		

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	QFN2*2-6L		3000