

Description

The SX20P01BF 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

$V_{DS} = -18V$ $I_D = -20A$

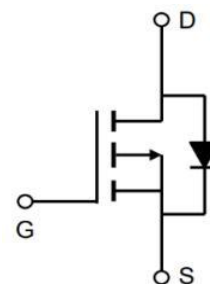
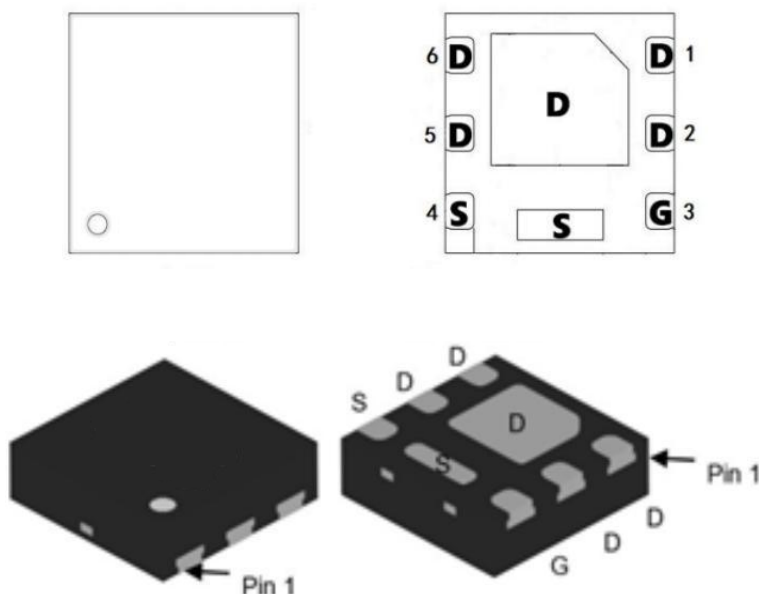
$R_{DS(ON)} < 18m\Omega$ @ $V_{GS}=10V$

$R_{DS(ON)} < 23m\Omega$ @ $V_{GS}=4.5V$

Application

Electronic cigarette

Load switch



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

Symbol	Parameter	Rating	Units
VDSS	Drain-Source Voltage	-18	V
VGSS	Gate-Source Voltage	± 12	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-20	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-10.6	A
IDM	Pulsed Drain Current ^{note1}	-36	A
$P_D @ T_c=25^\circ C$	Power Dissipation	1.6	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-12	-18	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =-12V, V _{GS} = 0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.65	-1.0	V
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =-10V, I _D =-6.0A	-	12	18	mΩ
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =-4.5V, I _D =-5.2A	-	14	23	mΩ
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =-2.5V, I _D =-4.2A		20	35	mΩ
C _{iss}	Input Capacitance	V _{DS} =-6V, V _{GS} =0V f=1.0MHz	-	1100	-	pF
C _{oss}	Output Capacitance		-	390	-	pF
C _{rss}	Reverse Transfer Capacitance		-	300	-	pF
Q _g	Total Gate Charge	V _{DS} =-4V, I _D =-4.1A, V _{GS} = -4.5V	-	11.5		nC
Q _{gs}	Gate-Source Charge		-	1.5	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	3.2	-	nC
td(on)	Turn-on Delay Time	V _{DD} =-4V, I _D =-3.3A, R _G =1.0Ω, V _{GEN} =-4.5V, R _L =1.2Ω	-	25	-	ns
t _r	Turn-on Rise Time		-	45	-	ns
td(off)	Turn-off Delay Time		-	72	-	ns
t _f	Turn-off Fall Time		-	60	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-6.0	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =-4.1A	-	-	-1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =-4.1A, di/dt=100A/μs	-	20	-	ns
Q _{rr}	Reverse Recovery Charge		-	9	-	nC

Note :

- 1、The data tested by surface mounted on a 1 inch² 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°C 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

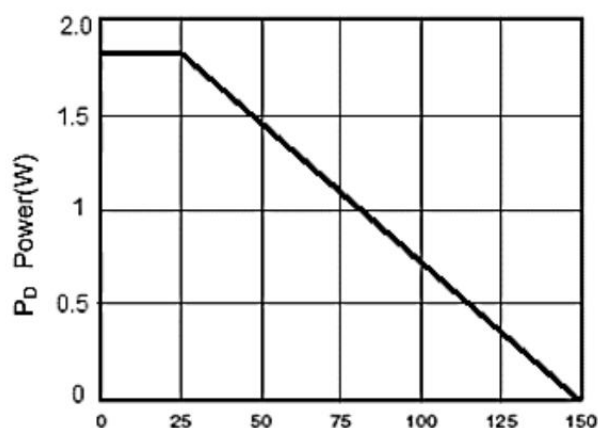


Figure 1 Power Dissipation

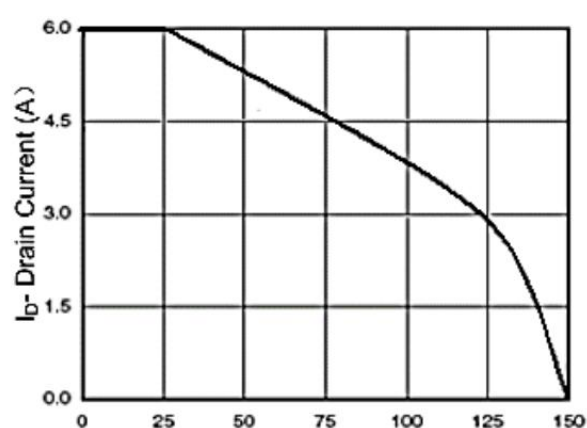


Figure 2 Drain Current

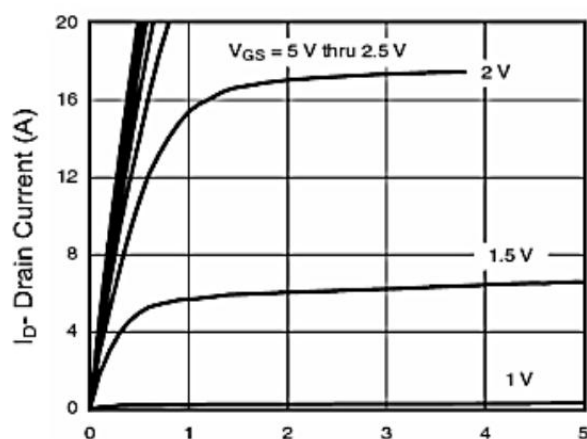


Figure 3 Output Characteristics

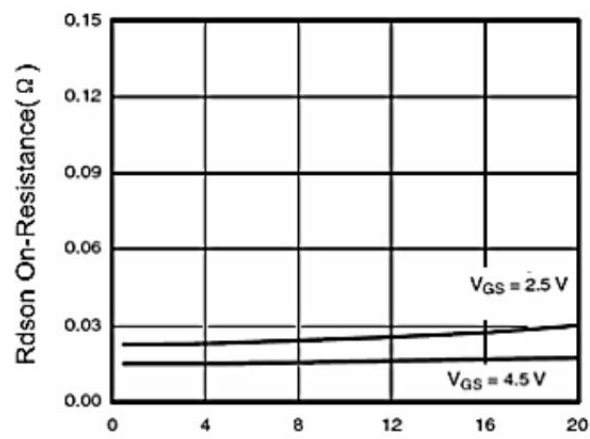


Figure 4 Drain-Source On-Resistance

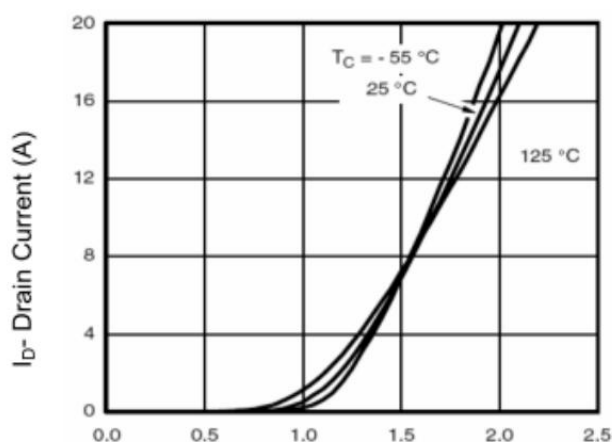


Figure 5 Transfer Characteristics

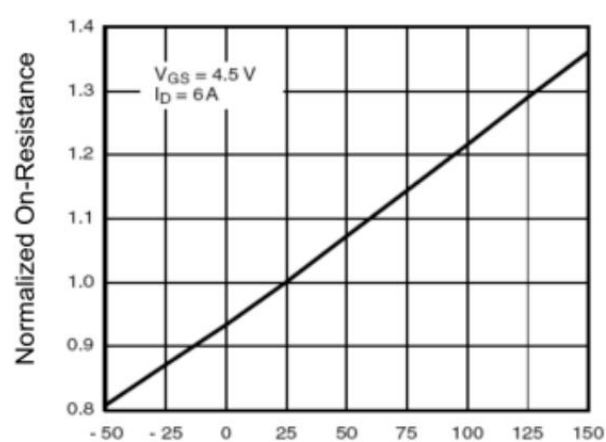
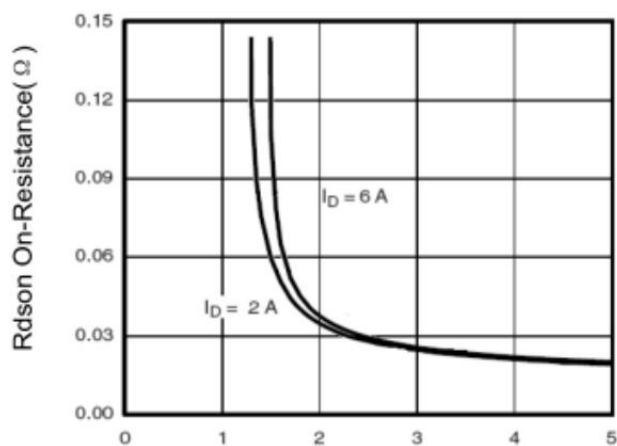
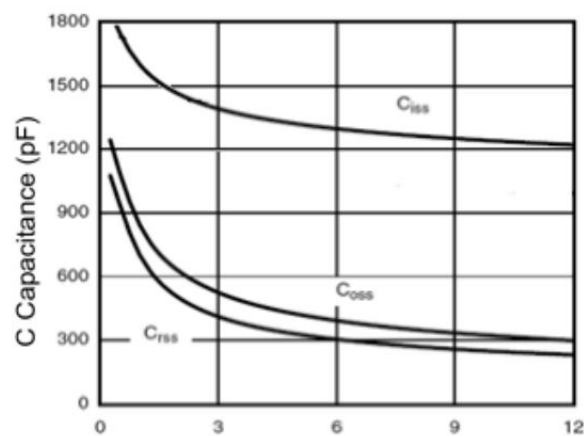


Figure 6 Drain-Source On-Resistance

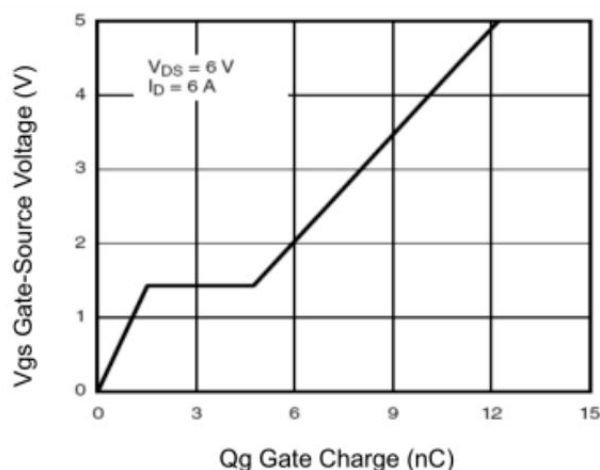
Typical Characteristics



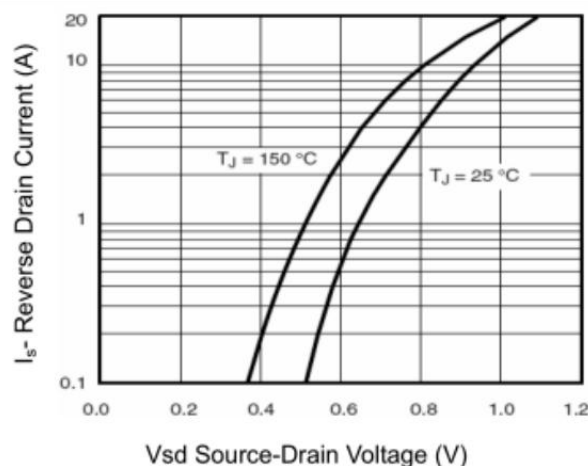
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 9 Gate Charge



Vsd Source-Drain Voltage (V)
Figure 10 Source- Drain Diode Forward

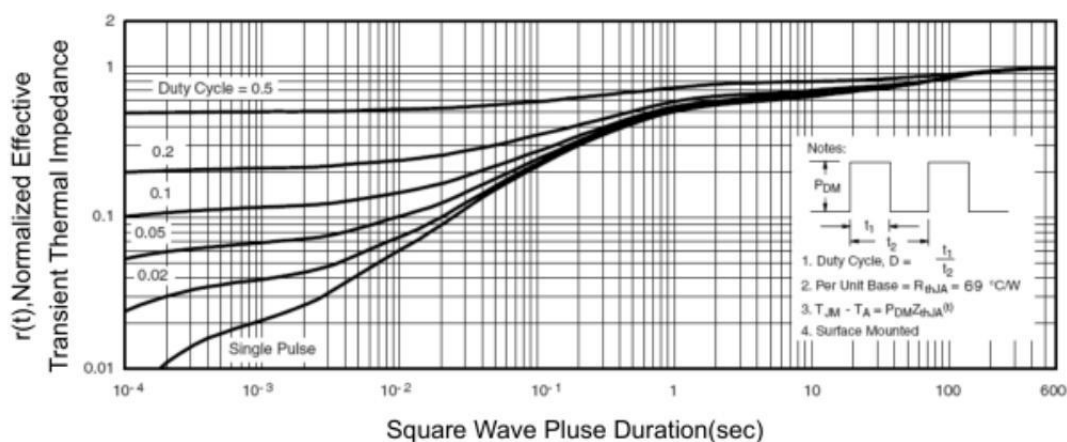
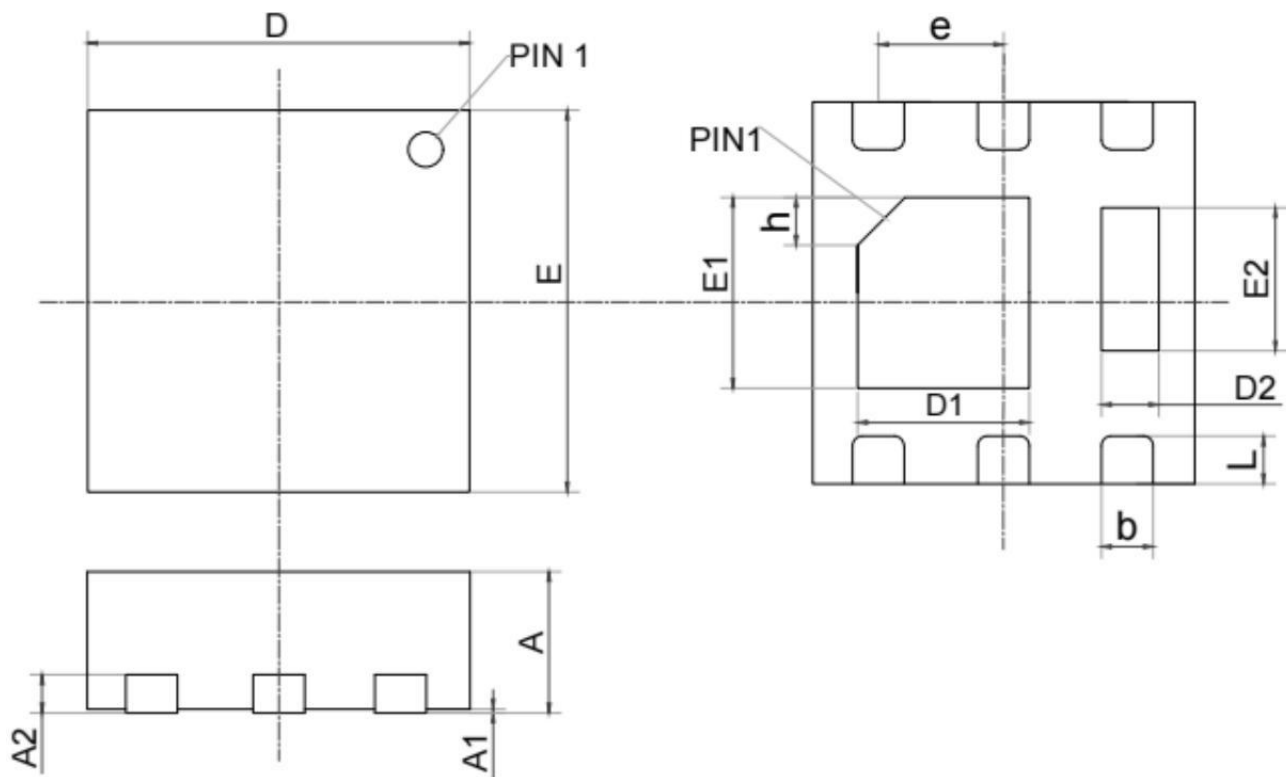


Figure 12 Normalized Maximum Transient Thermal Impedance

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