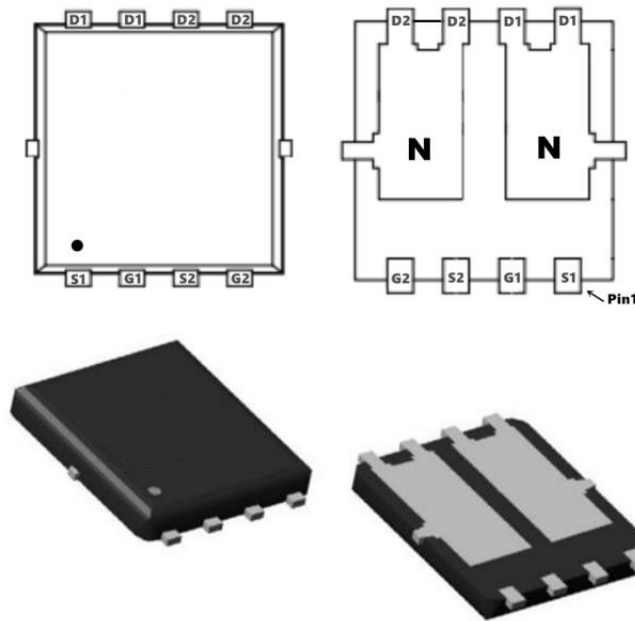


Description

The SX20H03NF 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

$V_{DS} = 30V$ $I_D = 24.7A$

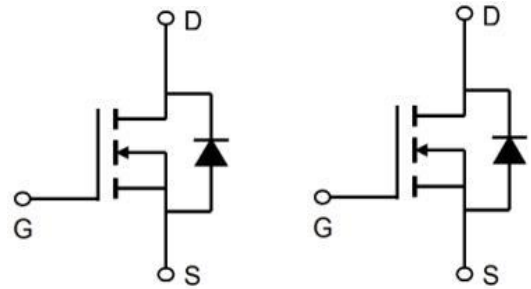
$R_{DS(ON)} < 12m\Omega$ @ $V_{GS}=10V$

Application

Lithium battery protection

Wireless impact

Mobile phone fast charging



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	24.7	A
$I_D @ T_C=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	10.6	A
I_{DM}	Pulsed Drain Current ²	92	A
E_{AS}	Single Pulse Avalanche Energy ³	57.8	mJ
I_{AS}	Avalanche Current	13	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation ⁴	19.2	W
$P_D @ T_A=25^\circ C$	Total Power Dissipation ⁴	1.42	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	6.5	$^\circ C/W$

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	33	---	V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.023	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =15A	---	8.5	12	mΩ
		V _{GS} =4.5V , I _D =10A	---	11.5	16.5	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	---	2.5	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-5.08	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =24V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =24V , 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 =15A	---	24.4	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	1.8	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V , V _{GS} =4.5V , I _D =12A	---	9.82	---	nC
Q _{gs}	Gate-Source Charge		---	2.24	---	
Q _{gd}	Gate-Drain Charge		---	5.54	---	
Td(on)	Turn-On Delay Time	V _{DD} =15V , V _{GS} =10V , R _G =1.5Ω I _D =20A	---	6.4	---	ns
T _r	Rise Time		---	39	---	
Td(off)	Turn-Off Delay Time		---	21	---	
T _f	Fall Time		---	4.7	---	
Ciss	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	896	---	pF
Coss	Output Capacitance		---	126	---	
Crss	Reverse Transfer Capacitance		---	108	---	
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	37	A
ISM	Pulsed Source Current ^{2,5}		---	---	75	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1	V

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 EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=13A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

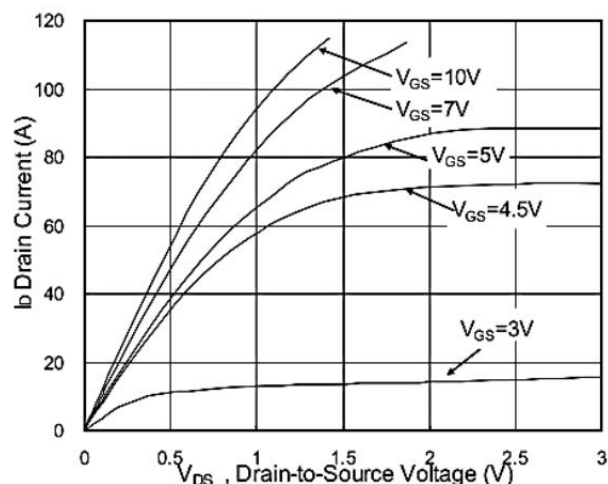


Figure1: Typical Output Characteristics

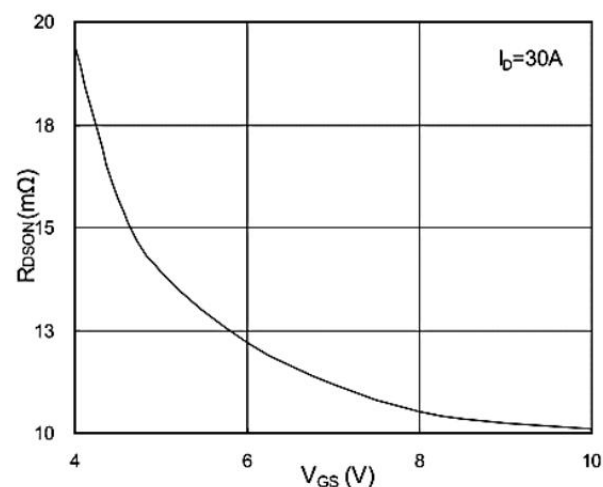


Figure2: On-Resistance vs. G-S Voltage

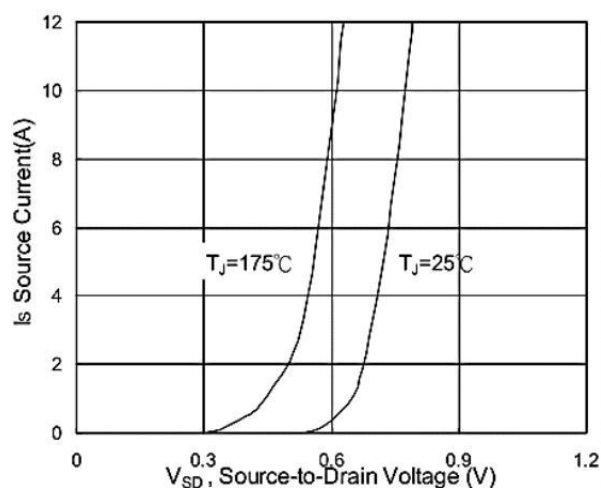


Figure3: Forward Characteristics of Reverse diode

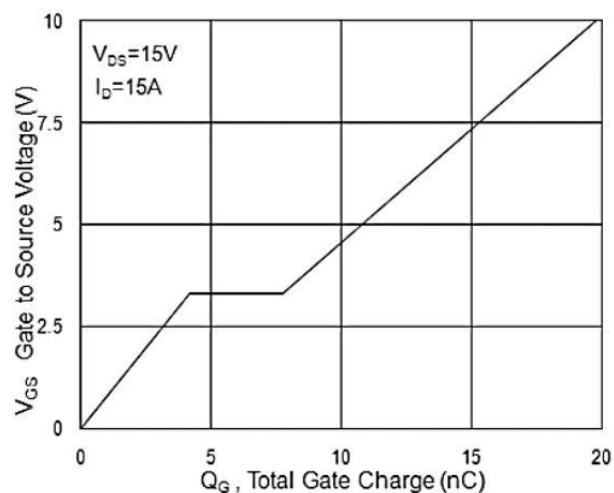


Figure 4: Gate-Charge Characteristics

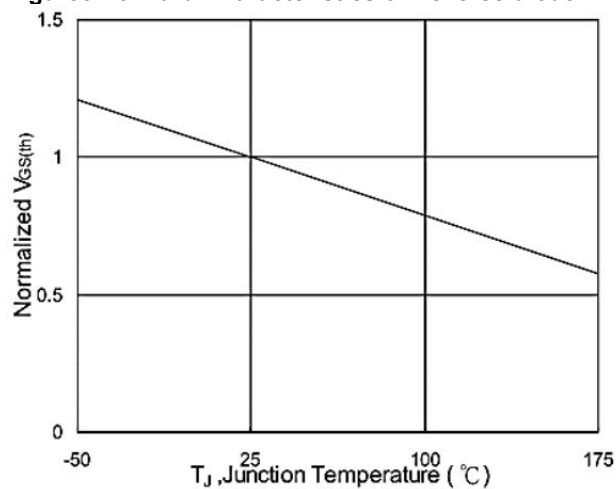


Figure5: Normalized $V_{GS(th)}$ vs. T_J

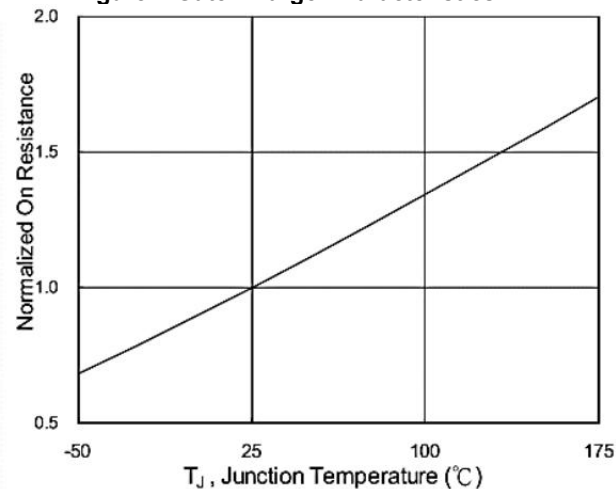


Figure6: Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

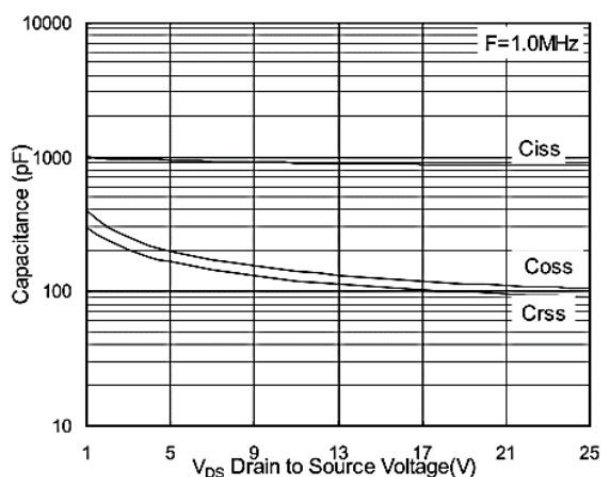


Figure7:Capacitance

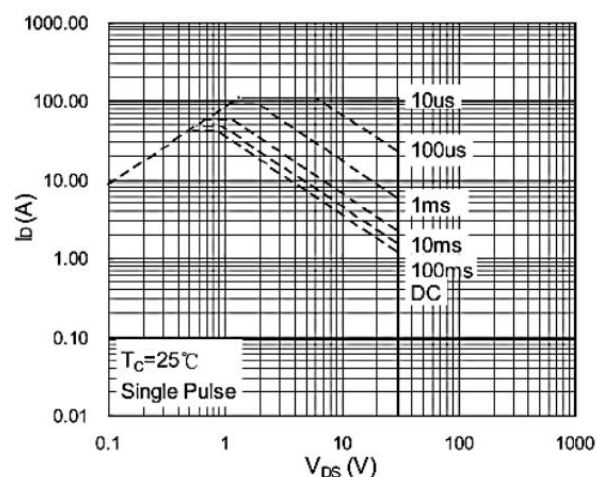


Figure8:Safe Operating Area

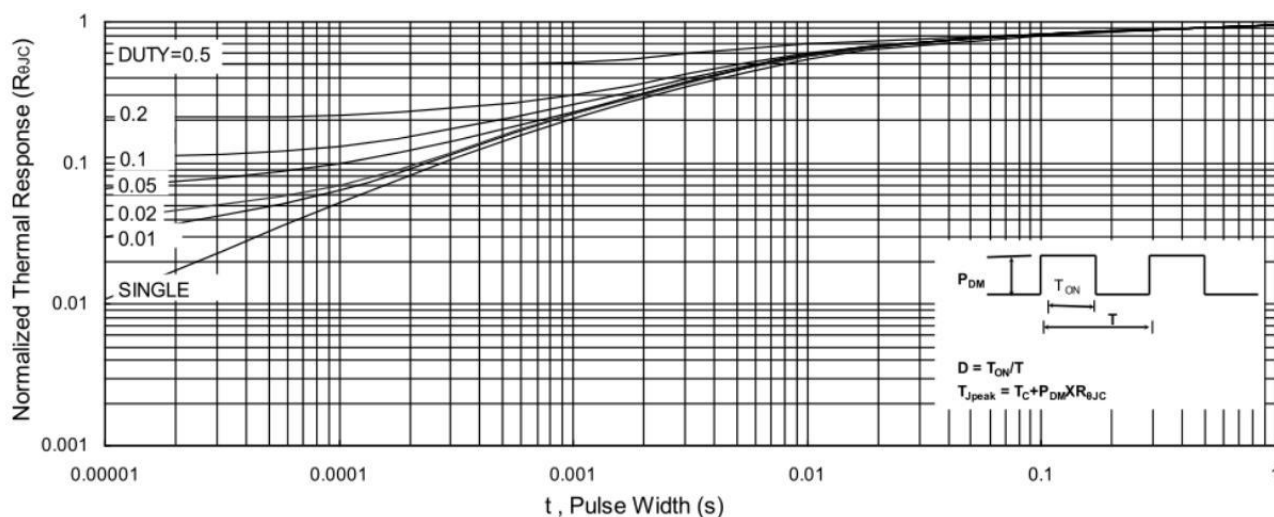


Figure9: Normalized Maximum Transient Thermal Impedance

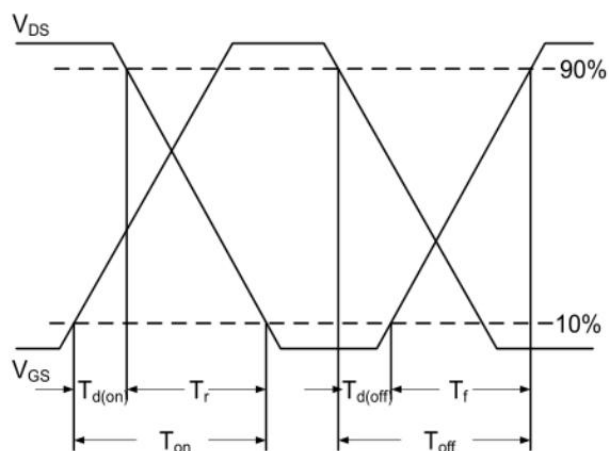


Figure10: Switching Time Waveform

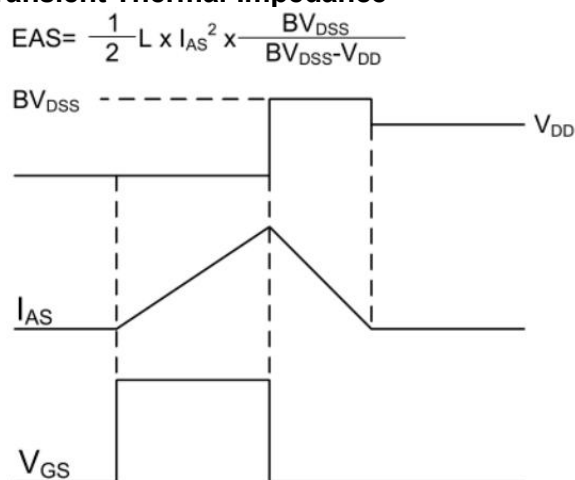
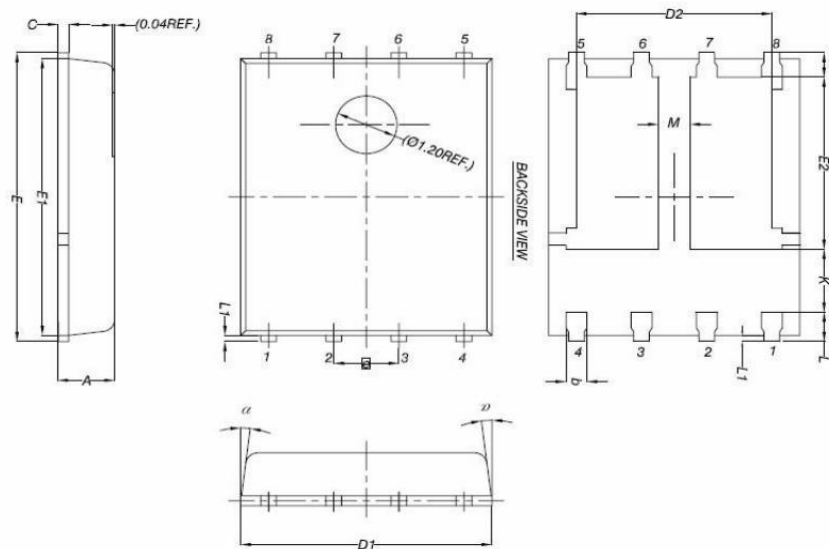


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-PDFN5*6-8L-JQ Double



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	3.30	3.45
E2	3.38	3.05	3.20
e	1.27BSC		
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	PDFN5*6-8L		5000