

Description

The SX20N06S uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 60V$ $I_D = 20A$

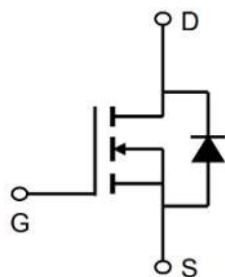
$R_{DS(ON)} < 10m\Omega$ @ $V_{GS}=10V$

Application

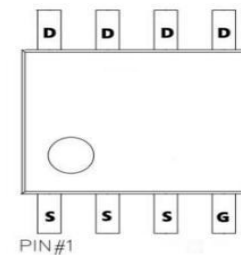
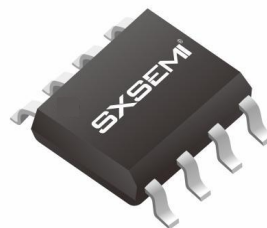
Battery protection

Load switch

synchronous rectification



SOP-8L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	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, $V_{GS} @ 10V^1$	13	A
IDM	Pulsed Drain Current ²	80	A
EAS	Single Pulse Avalanche Energy ³	140	mJ
$P_D @ T_c=25^{\circ}C$	Total Power Dissipation ⁴	116	W
TSTG	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	46	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	0.85	$^{\circ}C/W$

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	68	72	---	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 =10A	---	7.8	10	mΩ
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	3.0	4.0	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-4.2	---	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 =10A	---	5.5	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	2.3	---	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =30V, I _D =20A, V _{GS} =10V	---	35	---	nC
Q _{gs}	Gate-Source Charge		---	11	---	
Q _{gd}	Gate-Drain Charge		---	9	---	
Td(on)	Turn-On Delay Time	V _{DS} =30V, I _D =20A, R _{GEN} =6Ω, V _{GS} =10V	---	15	---	ns
T _r	Rise Time		---	94	---	
Td(off)	Turn-Off Delay Time		---	46	---	
T _f	Fall Time		---	32	---	
Ciss	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	4062	---	pF
Coss	Output Capacitance		---	261	---	
Crss	Reverse Transfer Capacitance		---	231	---	
IS	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	80	A
ISM	Pulsed Source Current ^{2,5}		---	---	320	A
VSD	Diode Forward Voltage ²	V _{GS} =0V, I _S =80A	---	---	1.2	V
trr	Reverse Recovery Time	T _J =25°C I _F =20A, dI/dt=100A/μs	---	78	---	nS
Q _{rr}	Reverse Recovery Charge		---	51	---	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 .The EAS data shows Max. rating .
- 3、The power dissipation is limited by 175°C junction temperature
- 4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

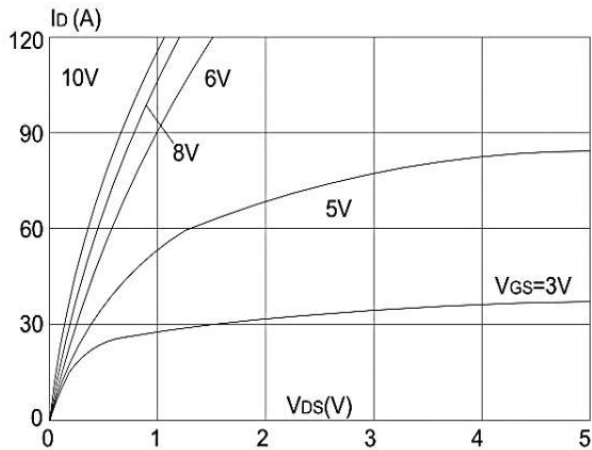


Figure 1: Output Characteristics

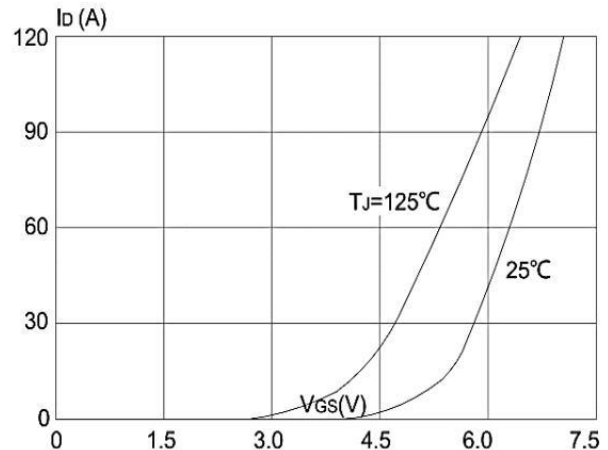


Figure 2: Typical Transfer Characteristics

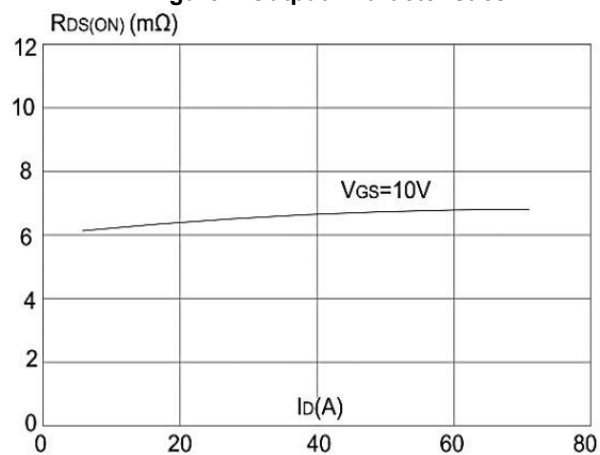


Figure 3: On-resistance vs. Drain Current

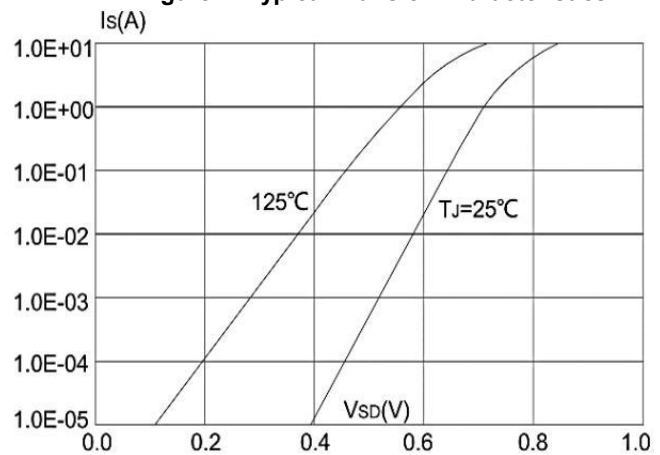


Figure 4: Body Diode Characteristics

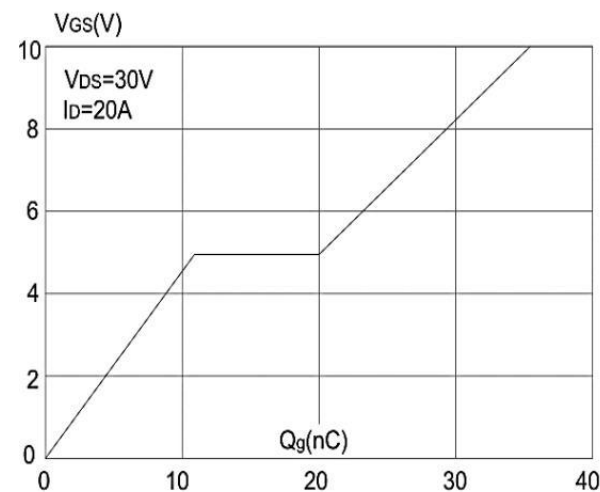


Figure 5: Gate Charge Characteristics

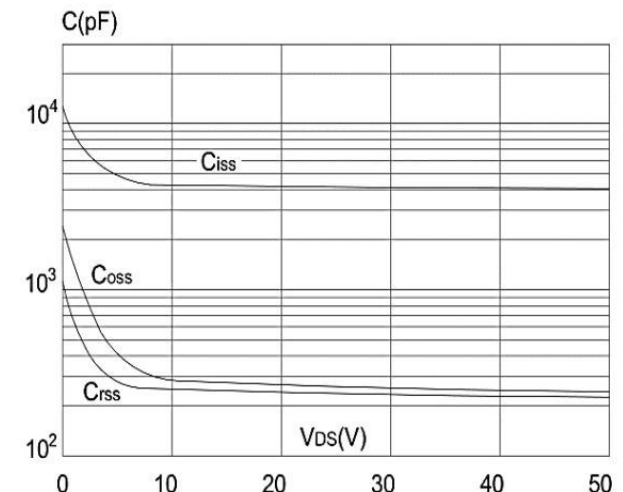


Figure 6: Capacitance Characteristics

Typical Characteristics

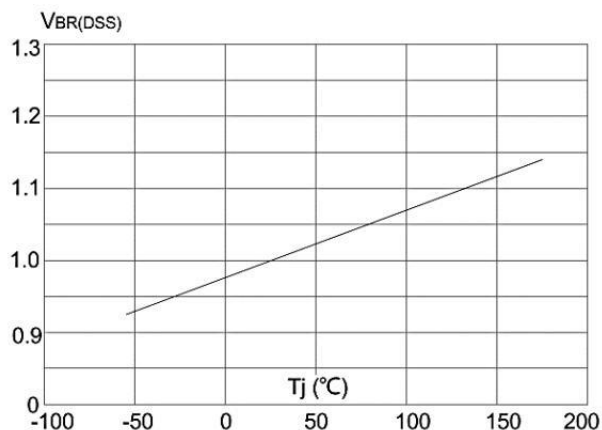


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

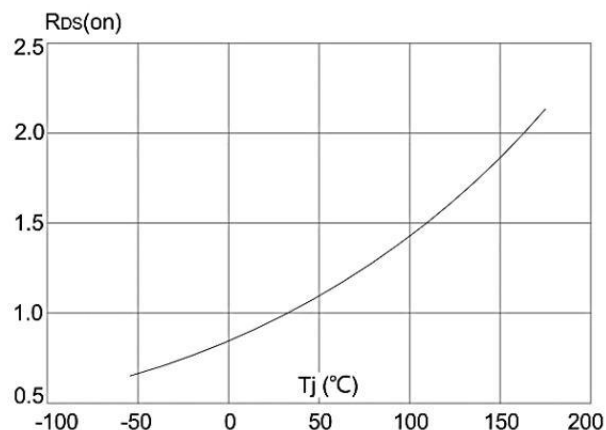


Figure 8: Normalized on Resistance vs. Junction Temperature

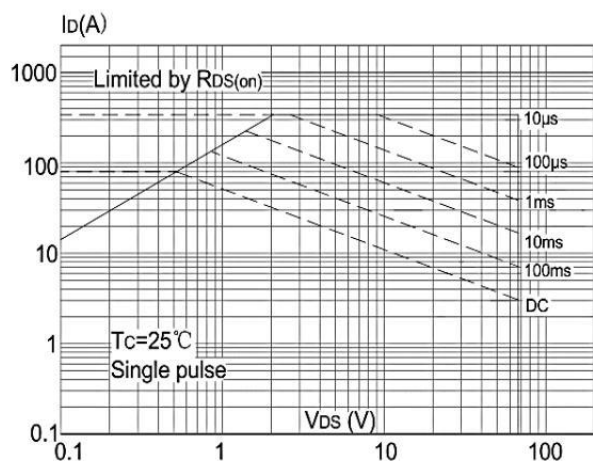


Figure 9: Maximum Safe Operating Area

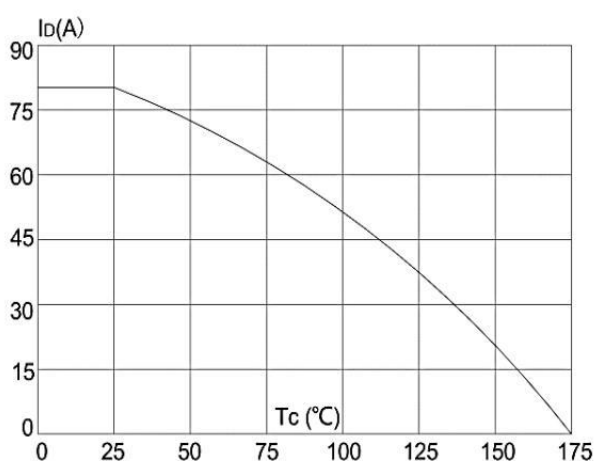


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

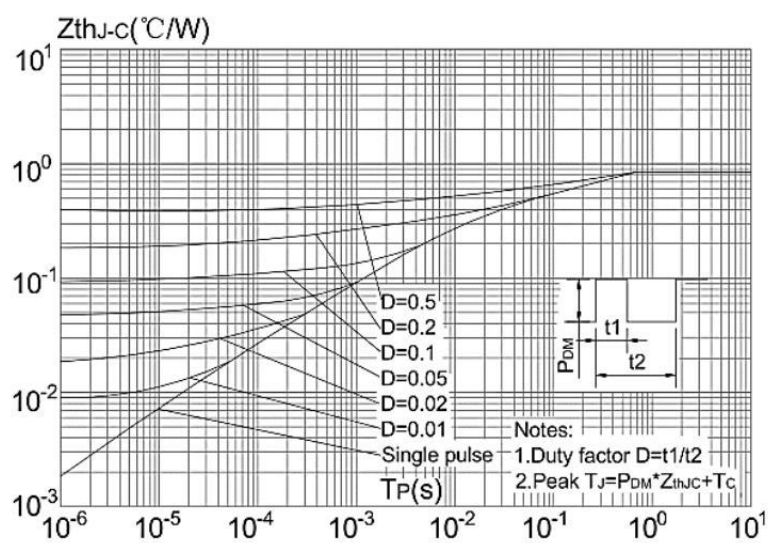
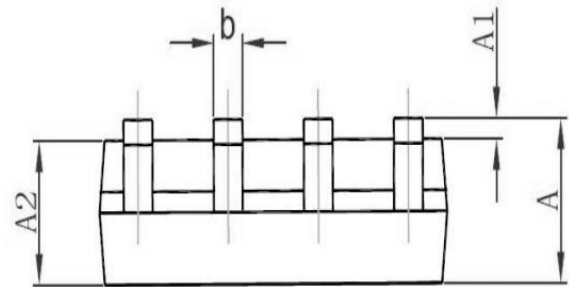
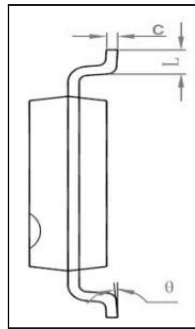
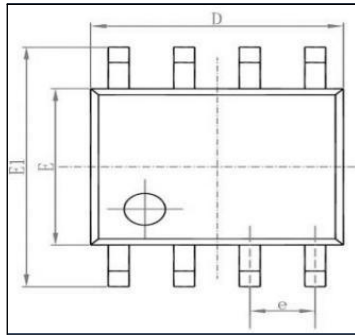
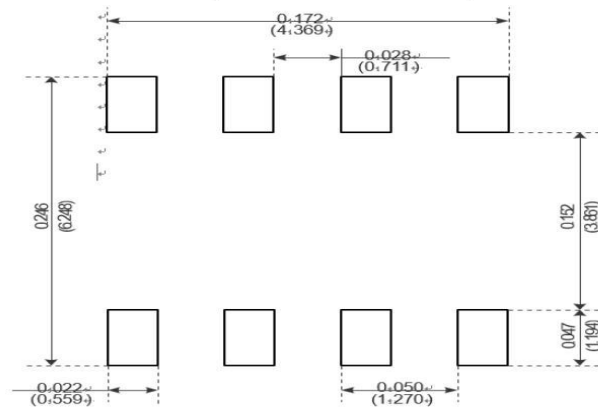


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Mechanical Data-SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOP-8L		3000