80V N-Channel Enhancement Mode MOSFET

Description

The SX100N08D 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} = 80V I_D =100A

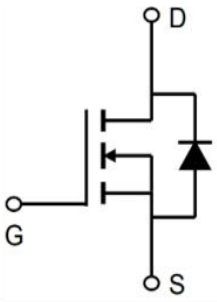
$R_{DS(ON)}$ < 6.8mΩ V_{GS}=10V

Application

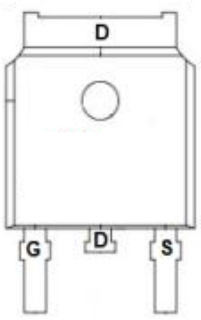
Battery protection

Load switch

Uninterruptible power supply



TO-252-3L



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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	80	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	100	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	60	A
IDM	Pulsed Drain Current[2]	400	A
EAS	Single Pulse Avalanche Energy[3]	506	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	158	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]	92	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	1.22	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	80	92	---	V
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=50A	---	5.5	6.8	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
IDSS	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	75	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.0	---	Ω
Qg	Total Gate Charge (10V)	VDS=40V , VGS=10V , ID=20A	---	56.6	---	nC
Qgs	Gate-Source Charge		---	21.4	---	
Qgd	Gate-Drain Charge		---	12.5	---	
Td(on)	Turn-On Delay Time	VDD=40V , VGS=10V , RG=3Ω, ID=20A	---	17.3	---	ns
Tr	Rise Time		---	33	---	
Td(off)	Turn-Off Delay Time		---	38.9	---	
Tf	Fall Time		---	18.1	---	
Ciss	Input Capacitance	VDS=40V , VGS=0V , f=1MHz	---	3475	---	pF
Coss	Output Capacitance		---	770	---	
Crss	Reverse Transfer Capacitance		---	25	---	
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	100	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=A , T_J=25℃	---	0.9	1.3	V
trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , T_J=25℃	---	68	---	nS
Q_{rr}	Reverse Recovery Charge		---	66	---	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 test cond ≦300us duty cycle ≦2%, duty cycle ition is V_{DD}=64V_{GS}=10V,L=0.1mH,I_{AS}=40A

4、The power dissipation is limited by 175℃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

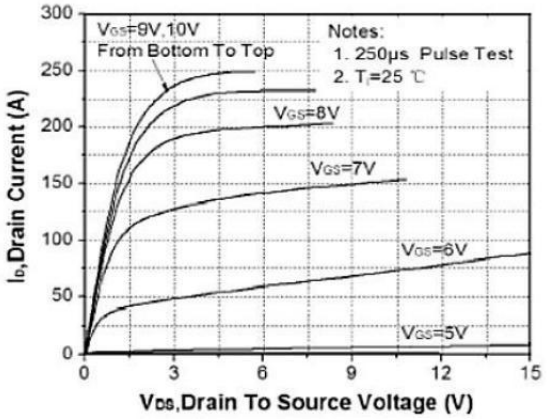


Figure 1. Typ. Output Characteristics (Tj=25 ℃)

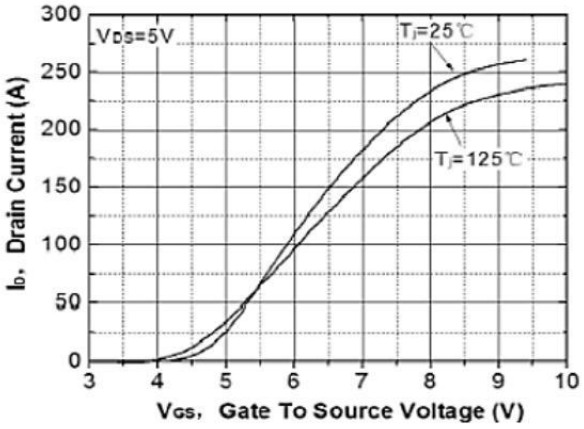


Figure 2. Transfer Characteristics

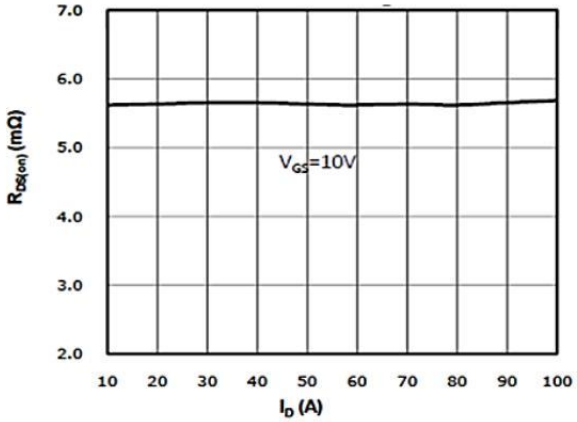


Figure 3. On-Resistance vs. Drain Current and Gate Voltage Figure

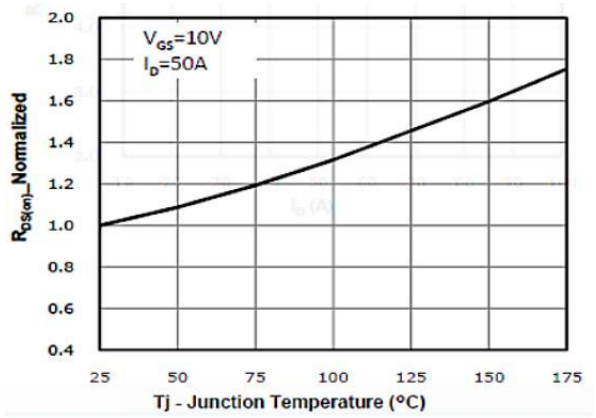


Figure 4. On-Resistance vs. Junction Temperature

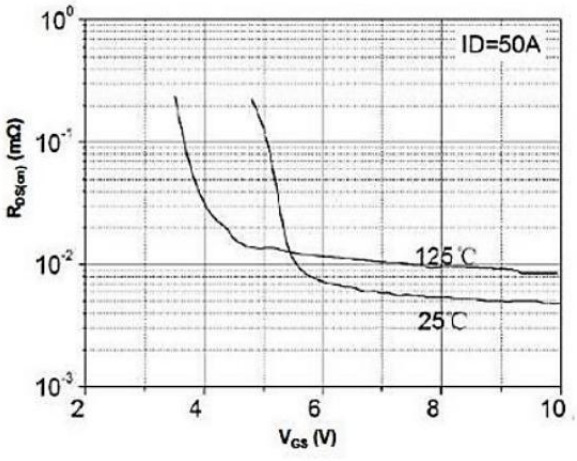


Figure 5. On-Resistance vs. Gate-Source Voltage

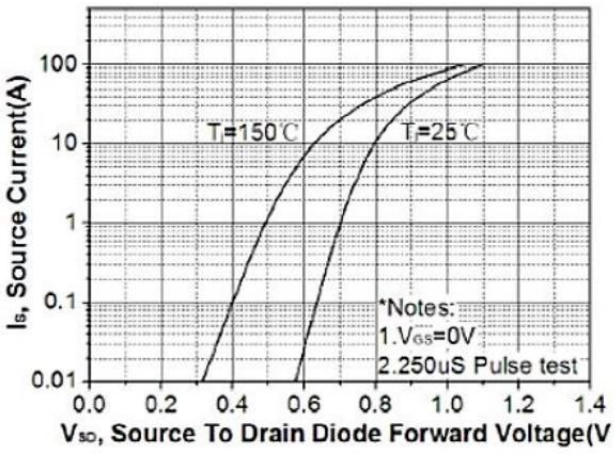


Figure 6 . Body-Diode Characteristics

Typical Characteristics

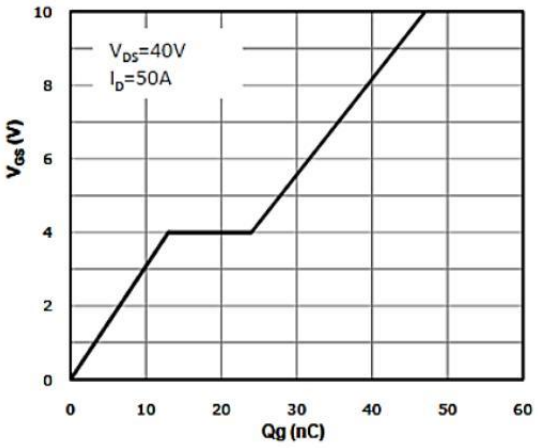


Figure 7. Gate-Charge Characteristics

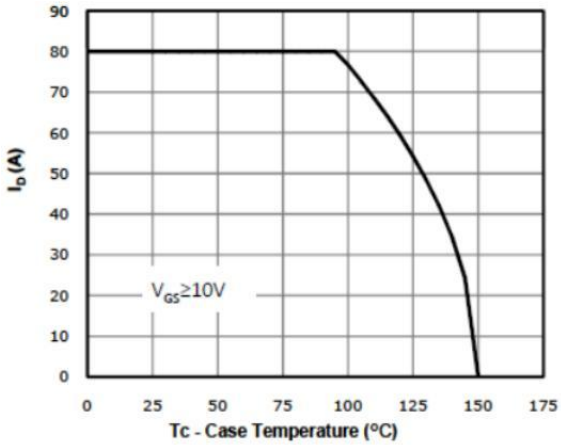


Figure 8. Drain Current Derating

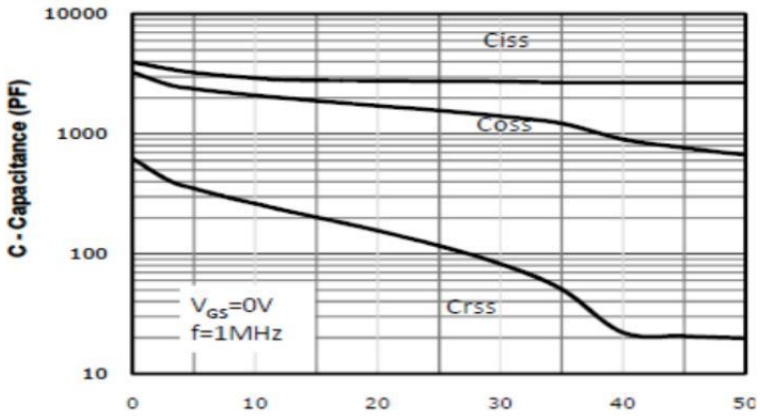


Figure 9: Normalized Maximum Transient Thermal Impedance

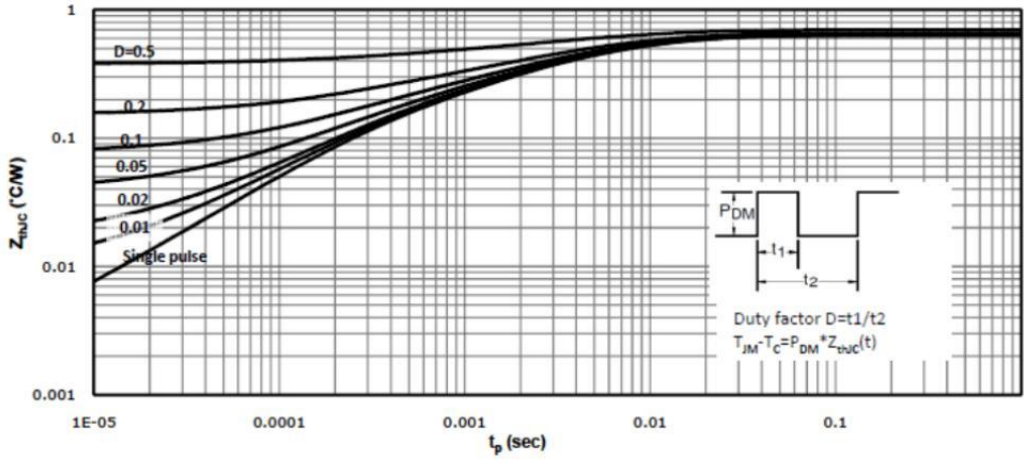
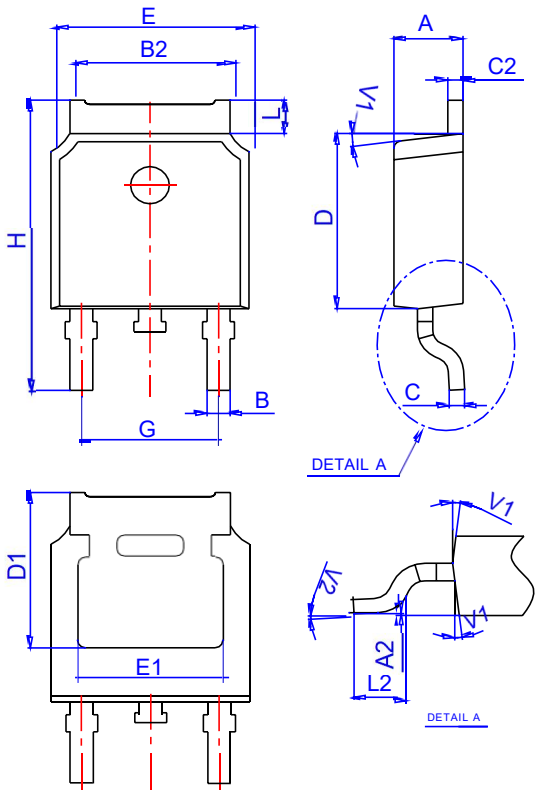


Figure 10. Capacitance Characteristics

Package Mechanical Data：TO-252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	TO-252-3L		2500