Description

The SX4N20MI 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} = 200V I_D =3.8A

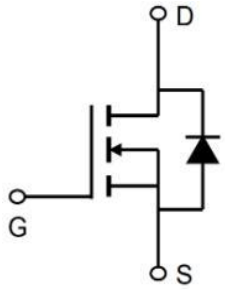
$R_{DS(ON)}$ < 580mΩ@ V_{GS}=10V

Application

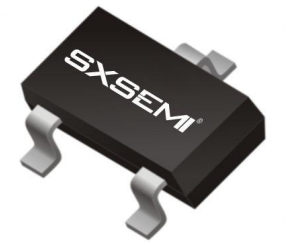
Automative lighting

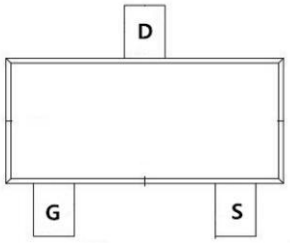
Load switch

Uninterruptible power supply



SOT-23-3L





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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	200	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	3.8	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	1.85	A
IDM	Pulsed Drain Current[1]	10	A
P_D@T_C=25℃	Total Power Dissipation	2	W
P_D@T_A=25℃	Total Power Dissipation[3]	1.1	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Maximum Thermal Resistance, Junctionambient	85	℃/W
RθJC	Maximum Thermal Resistance, Junction-case	3.9	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	200	230	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=1A	---	450	580	mΩ
		V_{GS}=4.5V , I_D=1A	---	680	850	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	2	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=200V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=1A	---	10	---	S
Q_g	Total Gate Charge (10V)	V_{DS}=160V , V_{GS}=10V , I_D=1A	---	15		nC
Q_{gs}	Gate-Source Charge		---	3.0		
Q_{gd}	Gate-Drain Charge		---	5.2		
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=100V , V_{GS}=10V , R_G=3 , I_D=1A	---	22		ns
T_r	Rise Time		---	34		
$T_{d(off)}$	Turn-Off Delay Time		---	45		
T_f	Fall Time		---	11		
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	900		pF
C_{oss}	Output Capacitance		---	130		
C_{rss}	Reverse Transfer Capacitance		---	4.6		
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	1	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	I_F=1A , di/dt=100A/μs , T_J=25℃	---	85	---	nS
Q_{rr}	Reverse Recovery Charge		---	257	---	nC

Note :

1、The data tested by surface mounted on a 1 inch 2 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℃ 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

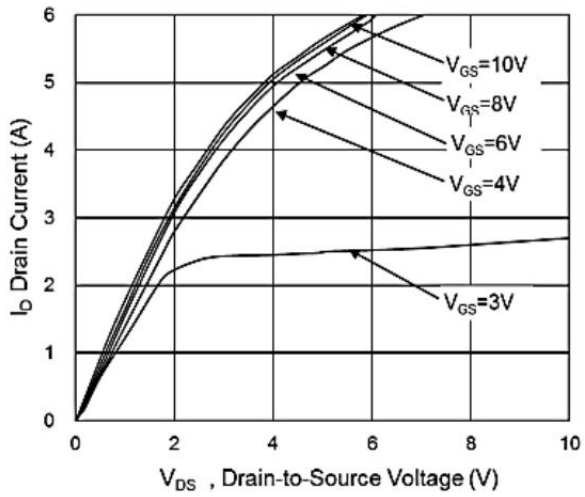


Fig.1 Typical Output Characteristics

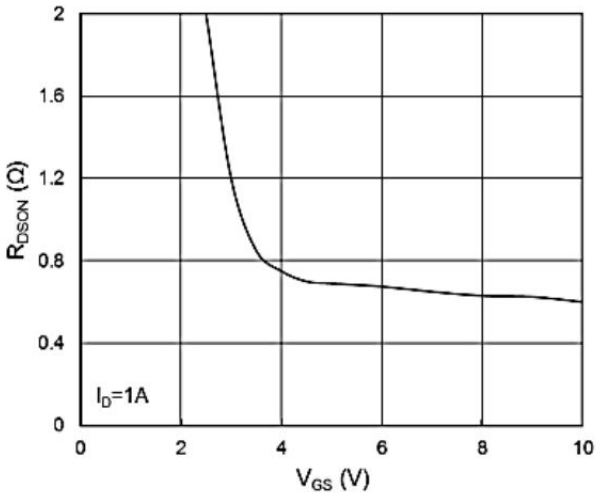


Fig.2 On-Resistance vs. G-S Voltage

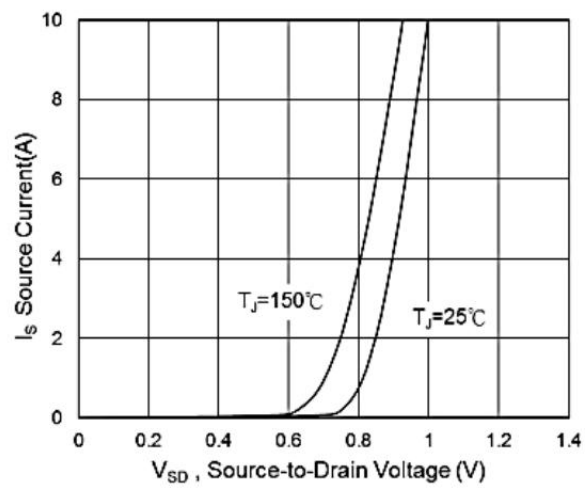


Fig.3 Forward Characteristics of Reverse

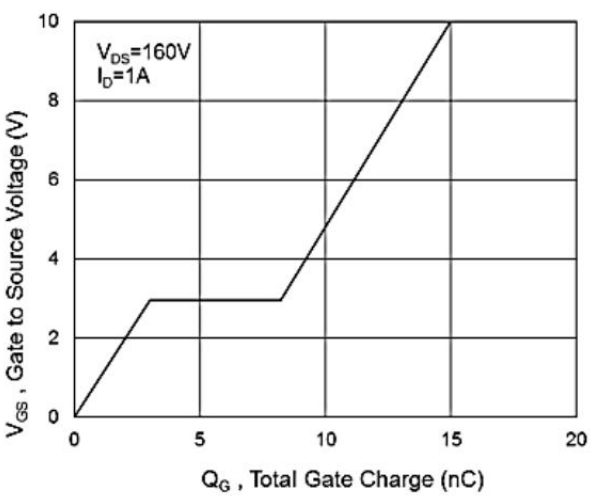


Fig.4 Gate-Charge Characteristics

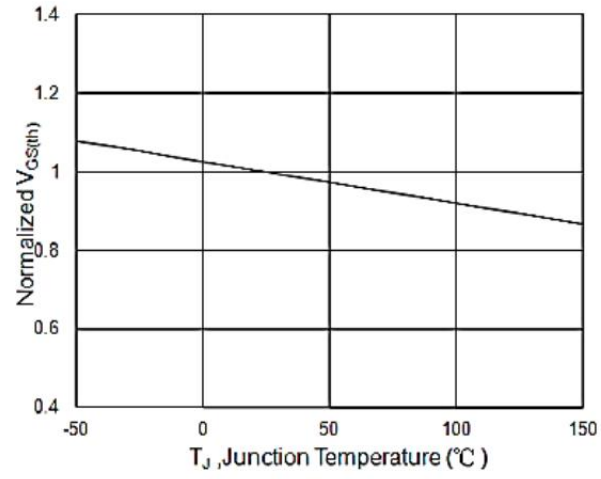


Fig.5 $V_{GS(th)}$ vs. T_J

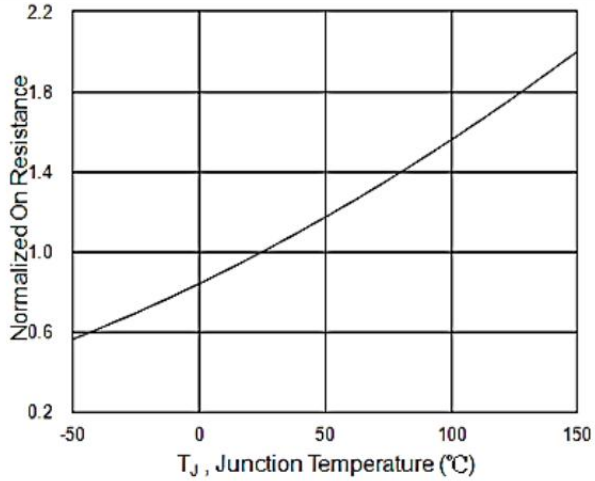


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

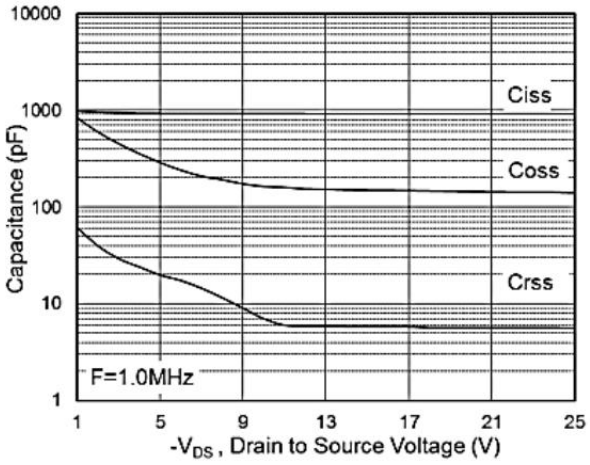


Fig.7 Capacitance

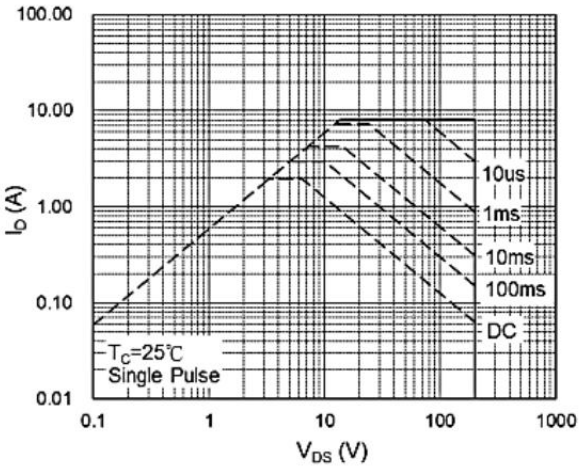


Fig.8 Safe Operating Area

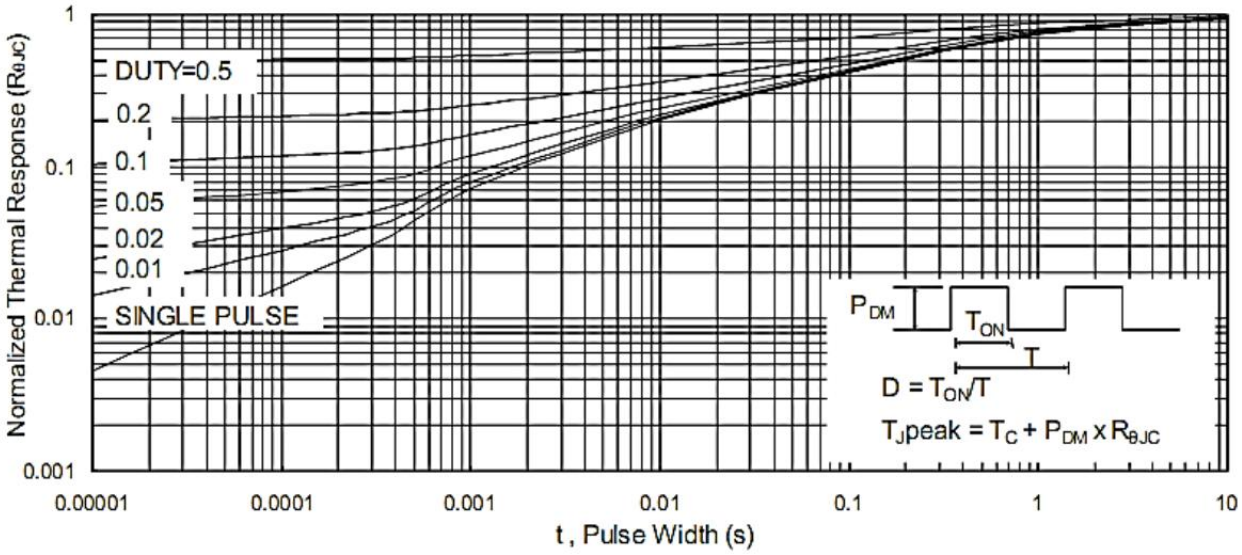


Fig.9 Normalized Maximum Transient Thermal Impedance

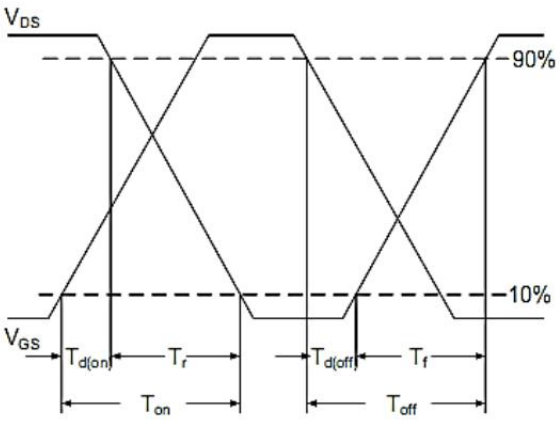


Fig.10 Switching Time Waveform

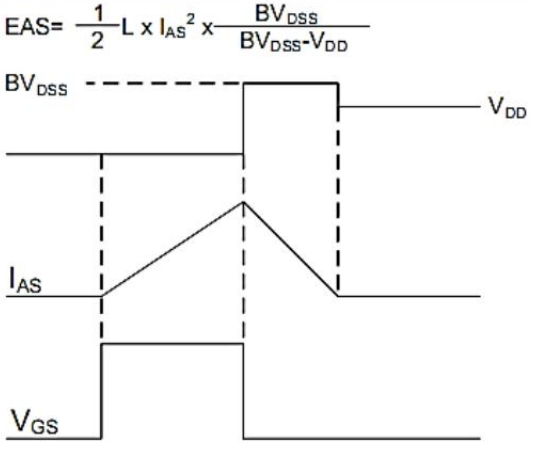
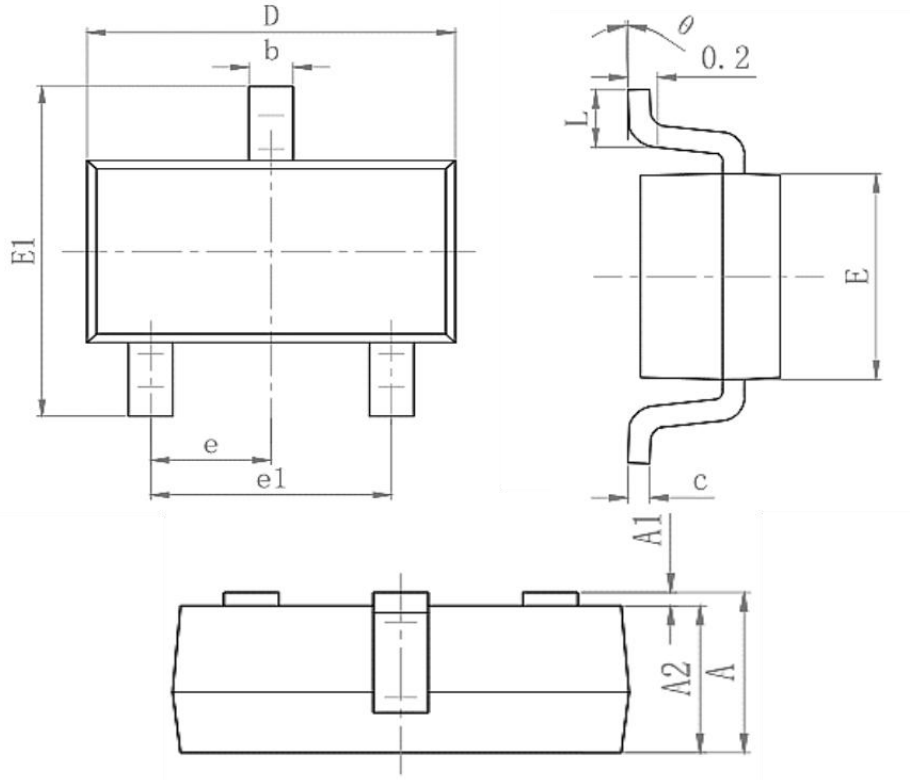


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-SOT23-3-XC-Single



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.25	0.45
c	0.100	0.200
D	2.820	3.020
E	1.5	1.7
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT23-3L		3000