

Description

The SX4N10MI 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

$V_{DS} = 100V$ $I_D = 3.8A$

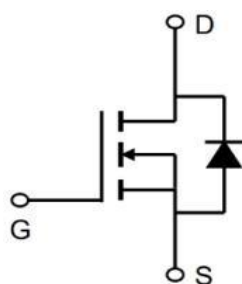
$R_{DS(ON)} < 250m\Omega$ @ $V_{GS}=10V$

Application

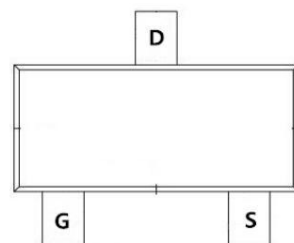
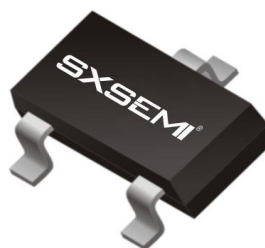
LED

Load switch

Uninterruptible power supply



SOT-23-3L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	3.8	A
$I_D @ T_A=100^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	2	A
I_{DM}	Pulsed Drain Current ²	8	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation ³	3.75	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	125	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	30	$^\circ C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS = 0 V, ID = 250μA	100	111	-	V
IGSS	Gate Leakage Current	VGS = ±20V, VDS = 0V	-	-	±100	nA
IDSS	Drain Cut-off Current	VDS = 100V, VGS = 0V	-	-	1	μA
VGS(th)	Gate Threshold Voltage	VGS = VDS, ID = 250μA	1.2	1.6	2.5	V
RDS(on)	Drain-Source on-state Resistance ³	VGS = 10V, ID = 2A	-	200	250	mΩ
		VGS = 4.5V, ID = 1.5A	-	220	280	
Ciss	Input Capacitance	VGS = 0V, VDS = 50V, f = 1MHz	-	440	-	pF
Coss	Output Capacitance		-	14	-	pF
Crss	Reverse Transfer Capacitance		-	10	-	pF
Qg	Total gate charge	VGS = 10V, VDS = 50V, ID = 2A	-	5.3	-	nC
Qgs	Gate-source charge		-	1.4	-	nC
Qgd	Gate-drain charge		-	1.8	-	nC
td(on)	Turn-on Time	VGS = 10V, VDD = 50V, RG = 1Ω, ID = 2A	-	14	-	ns
tf	Rise time		-	54	-	ns
td(off)	Turn-off Time		-	18	-	ns
tf	Fall time		-	11	-	ns
VSD	Body Diode Voltage ³	IS = 1A, VGS = 0V	-	-	1.2	V
IS	Continuous Source Current		-	-	2	A

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

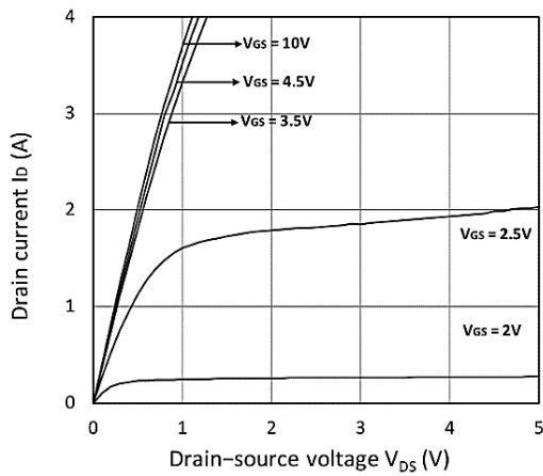


Figure 1. Output Characteristics

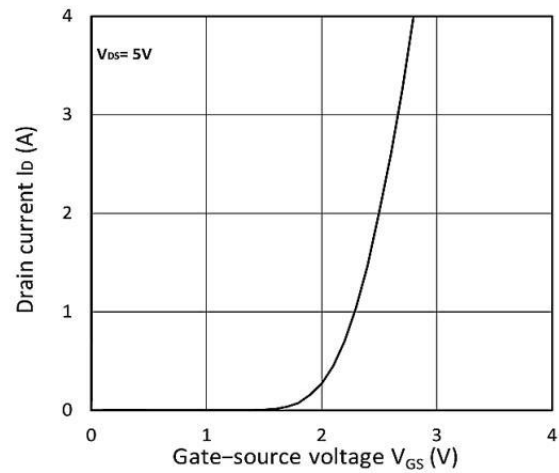


Figure 2. Transfer Characteristics

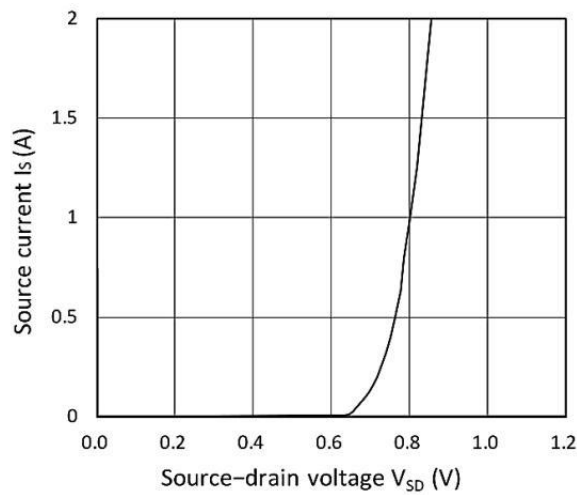


Figure 3. Forward Characteristics of Reverse

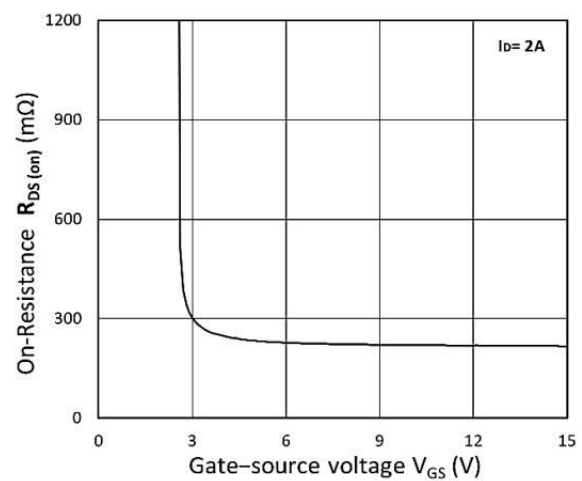


Figure 4. R_DS(ON) vs. V_GS

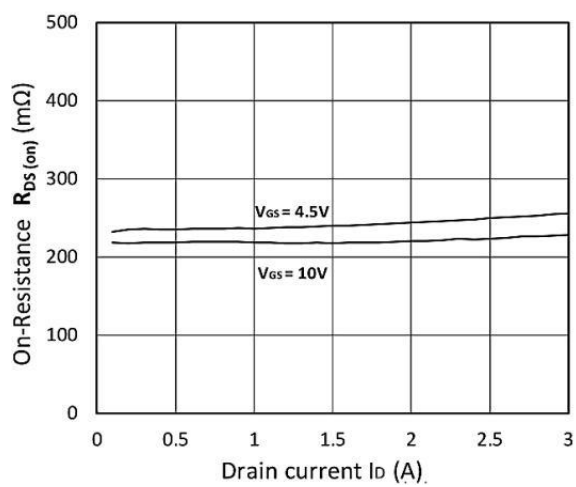


Figure 5. R_DS(ON) vs. I_D

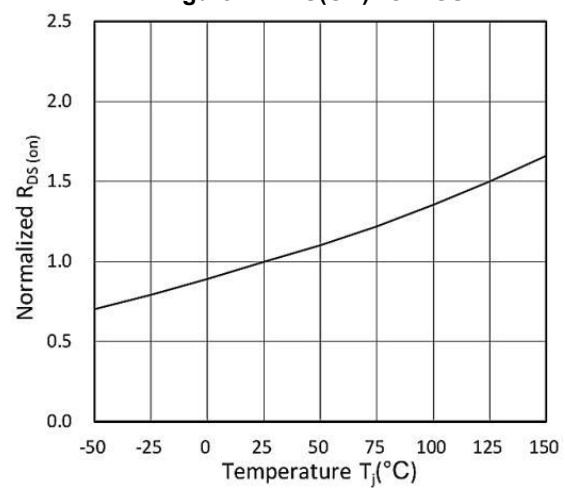


Figure 6. Normalized R_DS(on) vs. Temperature

Typical Characteristics

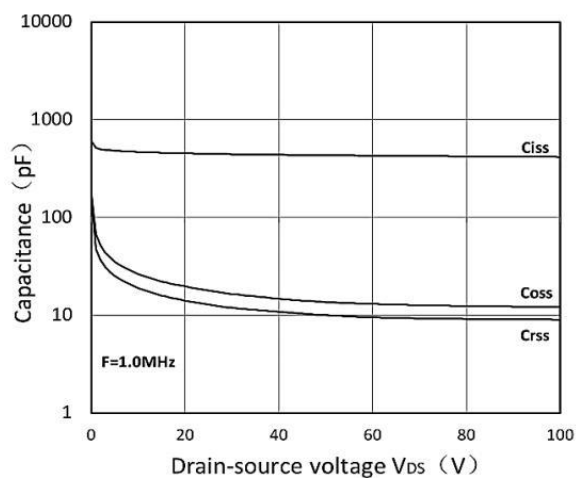


Figure 7. Capacitance Characteristics

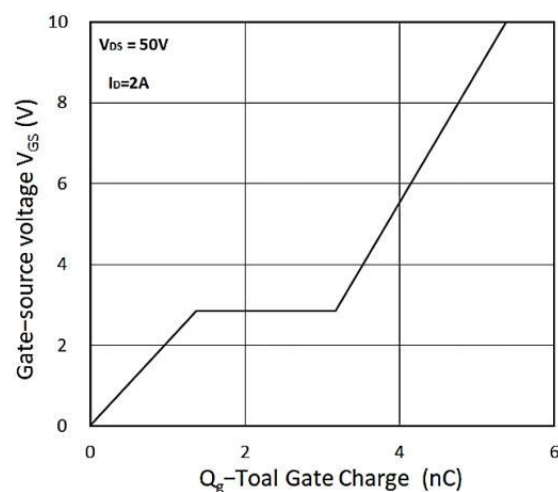


Figure 8. Gate Charge Characteristics

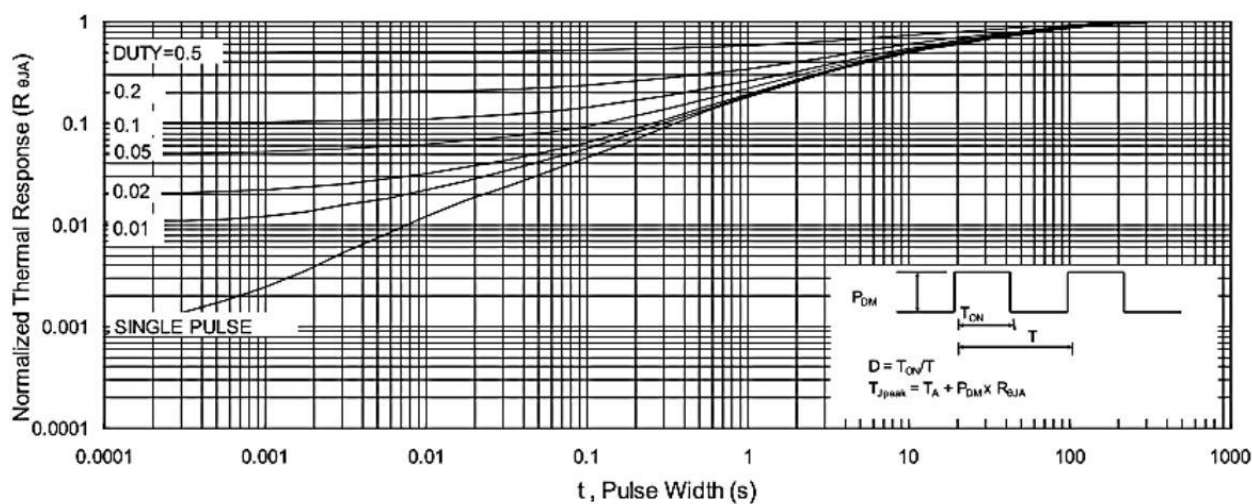


Fig.9 Normalized Maximum Transient Thermal Impedance

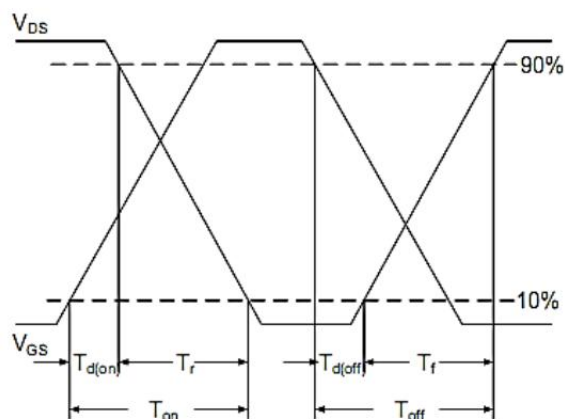


Fig.10 Switching Time Waveform

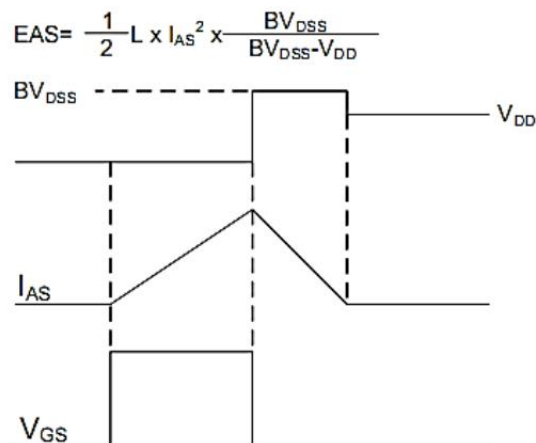
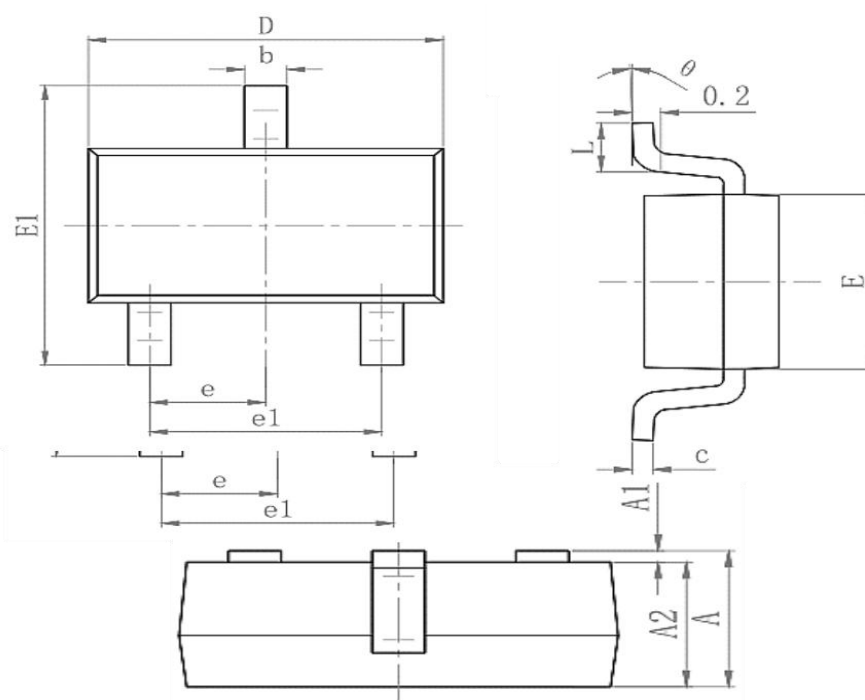


Fig.11 Unclamped Inductive Switching Waveform

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