

Description

The SX3400MI-LI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

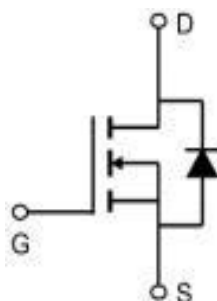
$V_{DS} = 30V$ $I_D = 5.8A$

$R_{DS(ON)} < 35m\Omega$ @ $V_{GS}=4.5V$

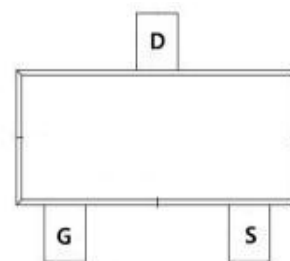
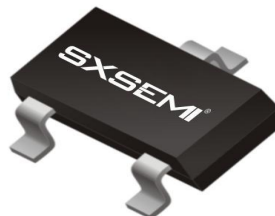
Application

Load switch

Uninterruptible power supply



SOT-23-3L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 4.5V ¹	5.8	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 4.5V ¹	3.1	A
I_{DM}	Pulsed Drain Current ²	16	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	125	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	80	$^\circ\text{C/W}$

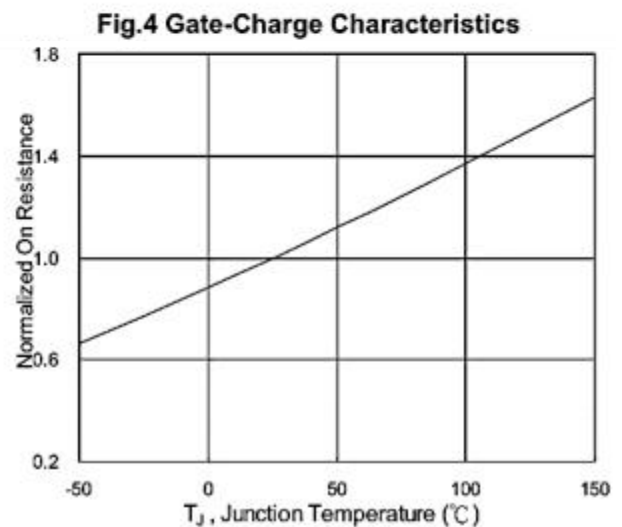
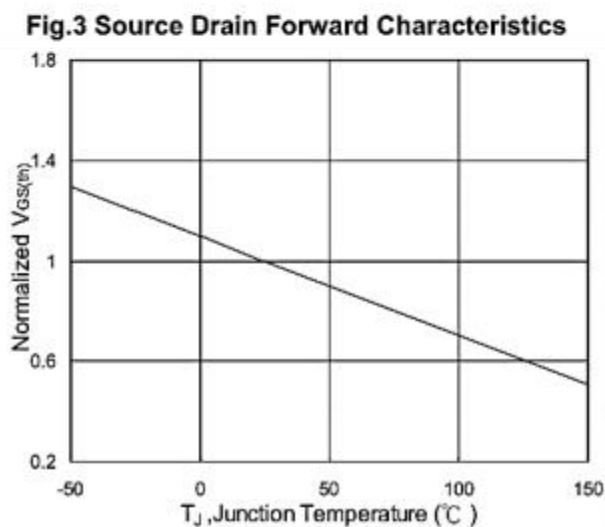
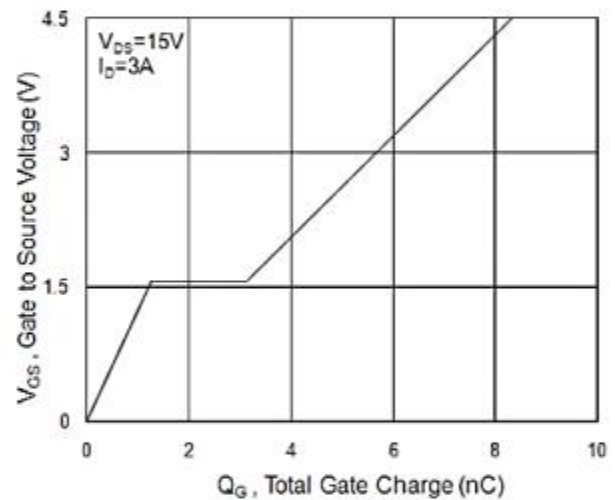
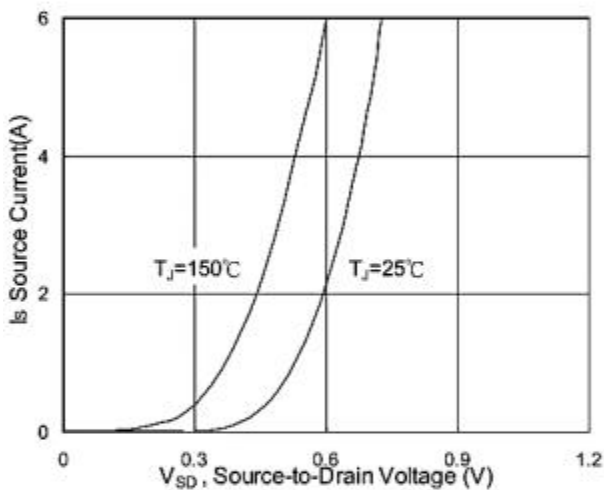
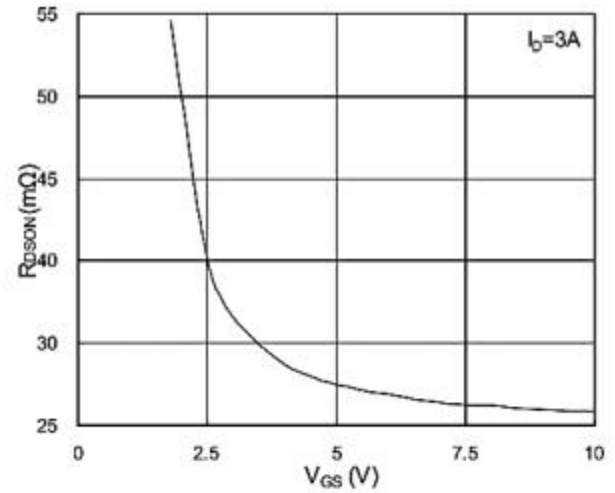
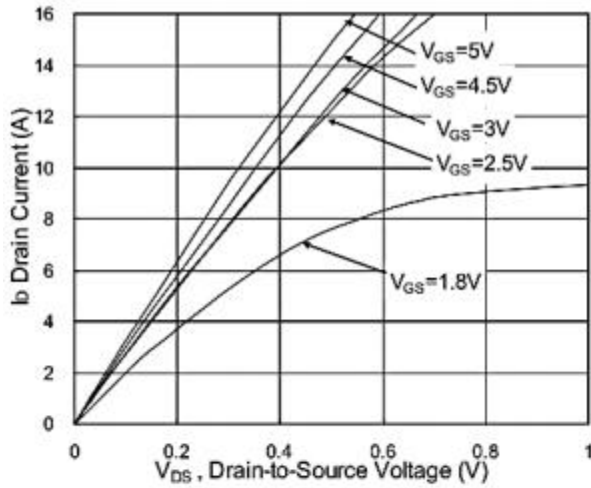
Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	30	32	---	V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.029	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =4A		27	30	mΩ
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =4.5V , I _D =3A	---	28	35	mΩ
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =2.5V , I _D =2A	---	38	50	mΩ
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	0.95	1.2	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-2.82	---	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} =±12V , V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =5V , I _D =3A	---	19	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	1.5	3	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V , V _{GS} =4.5V , I _D =3A	---	8.34	11.7	nC
Q _{gs}	Gate-Source Charge		---	1.26	1.8	
Q _{gd}	Gate-Drain Charge		---	1.88	2.6	
Td(on)	Turn-On Delay Time	V _{DD} =15V , V _{GS} =4.5V , R _G =3.3Ω I _D =3A	---	3.2	6.4	ns
T _r	Rise Time		---	41.8	75	
Td(off)	Turn-Off Delay Time		---	21.2	42	
T _f	Fall Time		---	6.4	12.8	
Ciss	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	662	927	pF
Coss	Output Capacitance		---	51.3	72	
Crss	Reverse Transfer Capacitance		---	43.6	61	
IS	Continuous Source Current ^{1,4}	V _G =V _D =0V , Force Current	---	---	3.9	A
ISM	Pulsed Source Current ^{2,4}	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	16	A
VSD	Diode Forward Voltage ²		---	---	1.2	V
trr	Reverse Recovery Time	IF=3A , dI/dt=100A/μs , T _J =25°C	---	6.8	---	nS
Q _{rr}	Reverse Recovery Charge		---	2.3	---	nC

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 20Z 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



Typical Characteristics

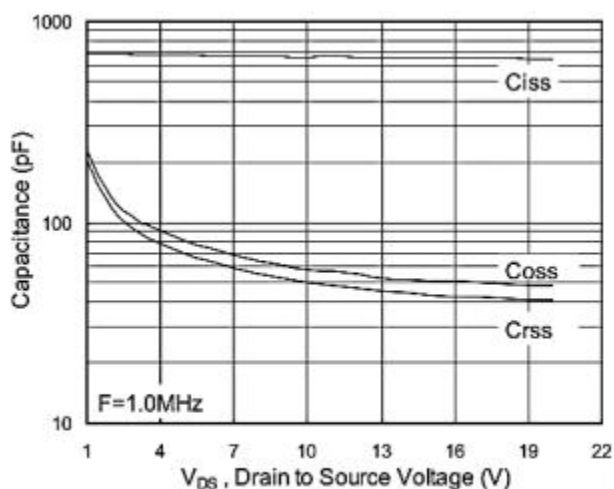


Fig.7 Capacitance

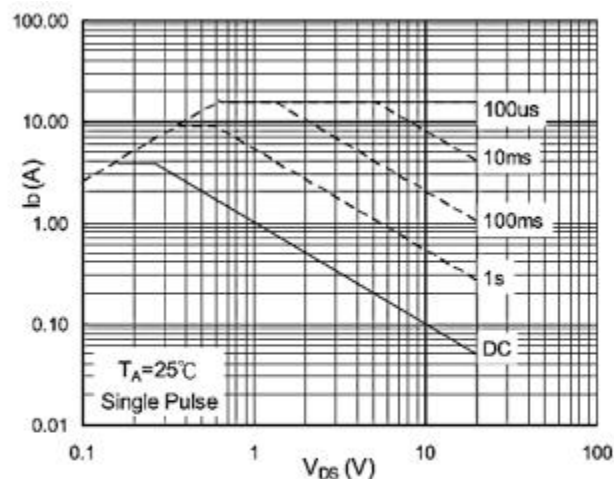


Fig.8 Safe Operating Area

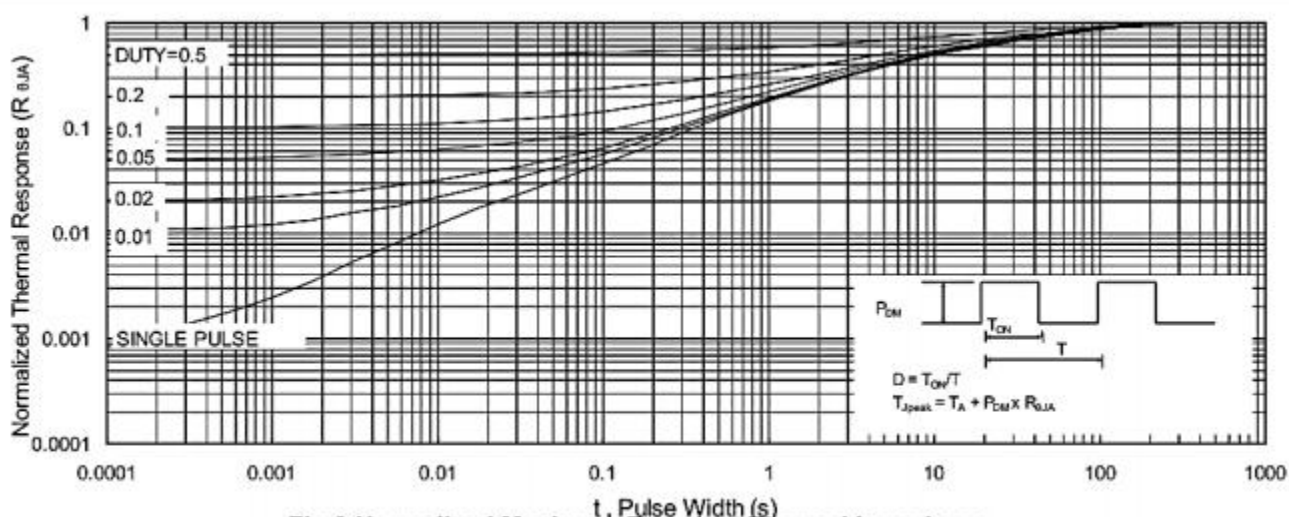


Fig.9 Normalized Maximum Transient Thermal Impedance

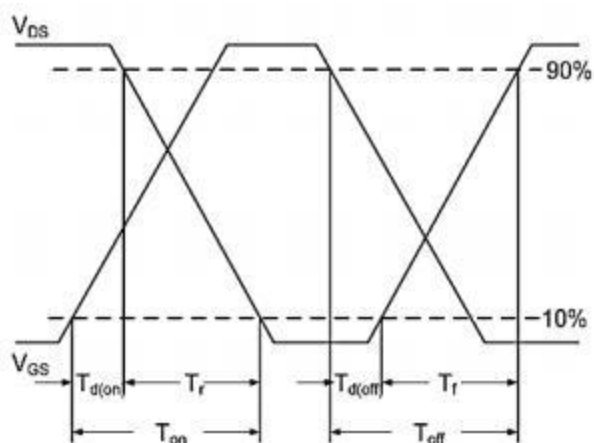


Fig.10 Switching Time Waveform

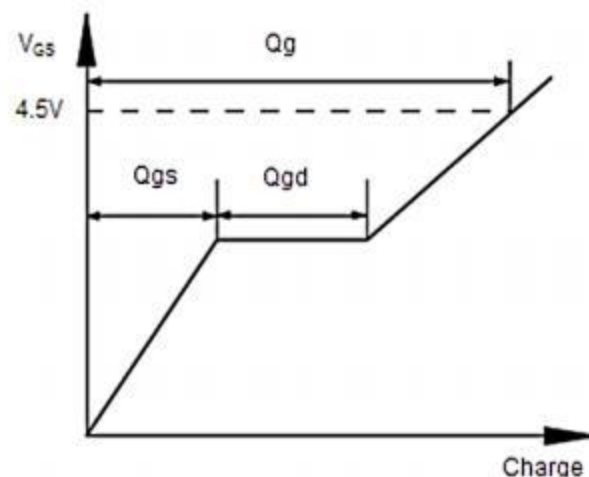
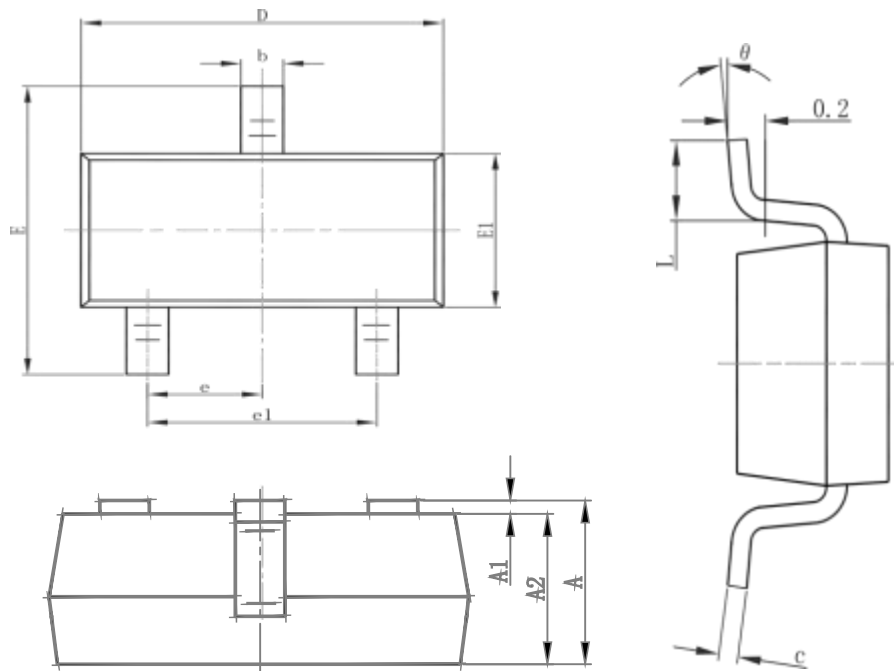


Fig.11 Gate Charge Waveform

Package Mechanical Data-SOT23-3L-SLS-Single



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Package Marking and Ordering Information

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