

Description

The SX6N03LI 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

$V_{DS} = 30V$ $I_D = 6A$

$R_{DS(ON)} < 28m\Omega$ @ $V_{GS}=10V$

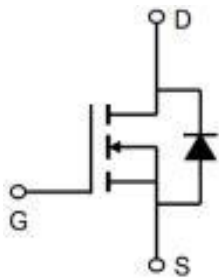
$R_{DS(ON)} < 32m\Omega$ @ $V_{GS}=4.5V$

Application

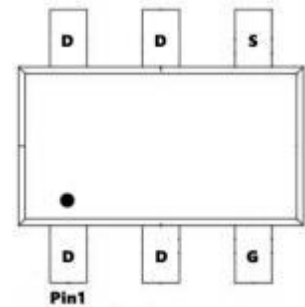
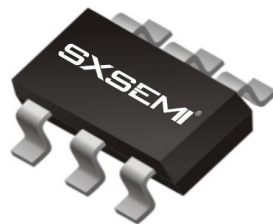
Battery protection

Load switch

Uninterruptible power supply



SOT-23-6L



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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	30	V
VGS	Gate-Source Voltage	± 12	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V ¹	6	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V ¹	4.7	A
IDM	Pulsed Drain Current ²	30	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1.5	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
TJ	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	30	$^\circ\text{C/W}$

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	33	---	V
ΔBVDSS/ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.021	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =5A	---	20	28	mΩ
RDS(ON)	Static Drain-Source On-Resistance	V _{GS} =4.5V , I _D =3A	---	25	32	mΩ
RDS(ON)	Static Drain-Source On-Resistance	V _{GS} =2.5V , I _D =1A	---	36	45	mΩ
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	0.9	1.5	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	-5	---	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 =5A	---	7	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	2.5	5	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =15V , V _{GS} =4.5V , I _D =5A	---	6	8.4	nC
Q _{gs}	Gate-Source Charge		---	2.5	3.5	
Q _{gd}	Gate-Drain Charge		---	2.1	2.9	
Td(on)	Turn-On Delay Time	V _{DD} =15V , V _{GS} =10V , R _G =3.3Ω I _D =5A	---	2.4	4.8	ns
T _r	Rise Time		---	7.8	14	
Td(off)	Turn-Off Delay Time		---	22	44	
T _f	Fall Time		---	4	8	
Ciss	Input Capacitance	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	572	800	pF
Coss	Output Capacitance		---	81	112	
Crss	Reverse Transfer Capacitance		---	65	91	
IS	Continuous Source Current ^{1,4}	V _{GS} =V _D =0V , Force Current	---	---	5.8	A
ISM	Pulsed Source Current ^{2,4}		---	---	30	A
VSD	Diode Forward Voltage ²	V _{GS} =0V , I _S =3A , T _J =25°C	---	---	1.2	V
trr	Reverse Recovery Time	I _F =5A , dI/dt=100A/μs , T _J =25°C	---	19	---	nS
Q _{rr}	Reverse Recovery Charge		---	1.04	---	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 ≤ 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

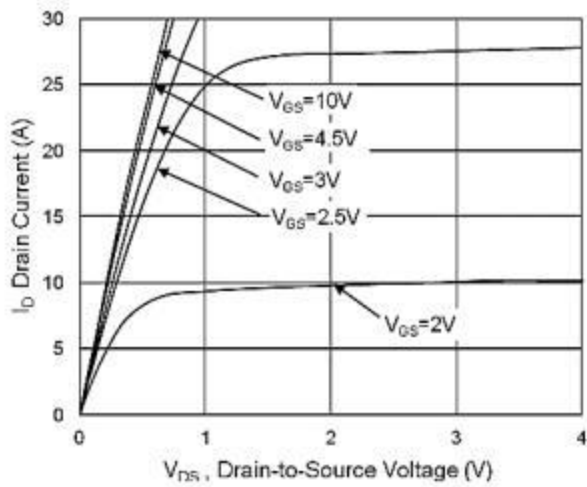


Fig.1 Typical Output Characteristics

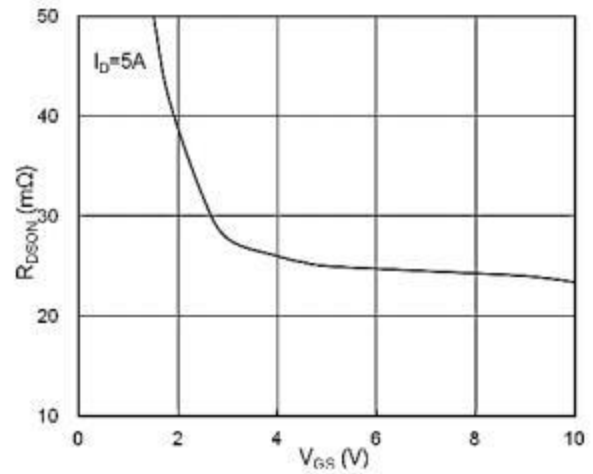


Fig.2 On-Resistance vs. Gate-Source

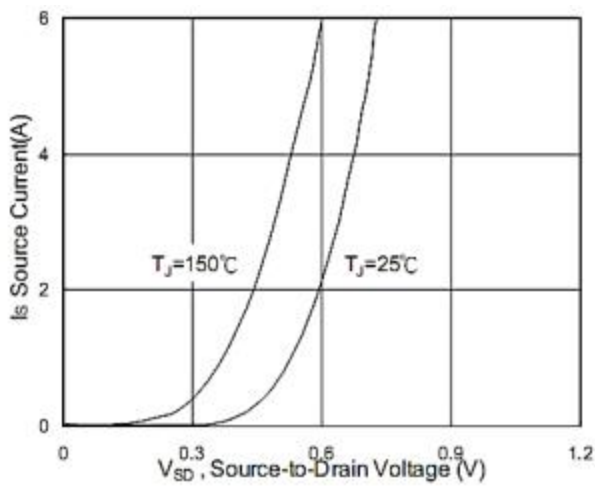


Fig.3 Forward Characteristics Of Reverse

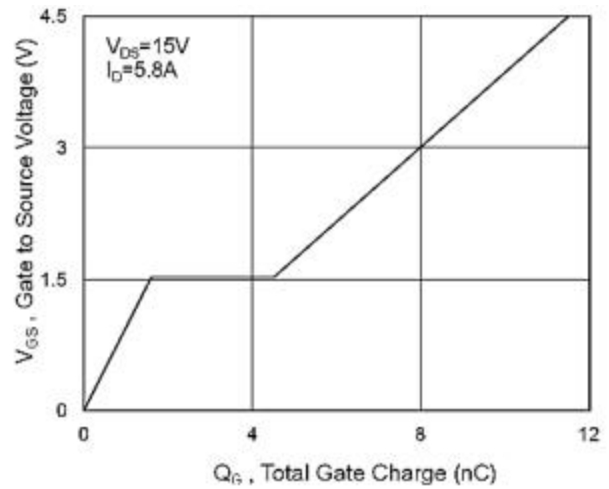


Fig.4 Gate-Charge Characteristics

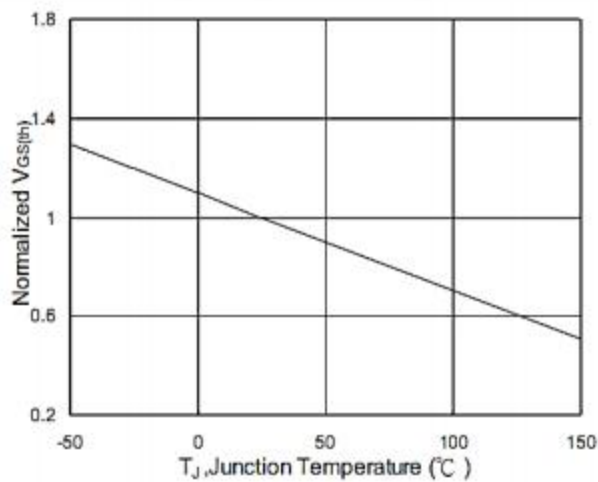


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

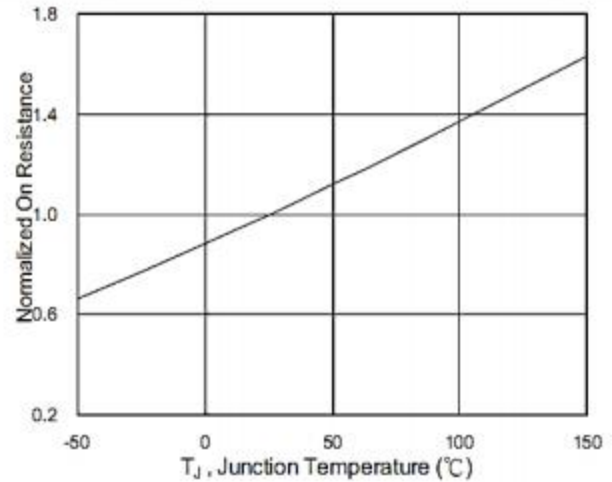
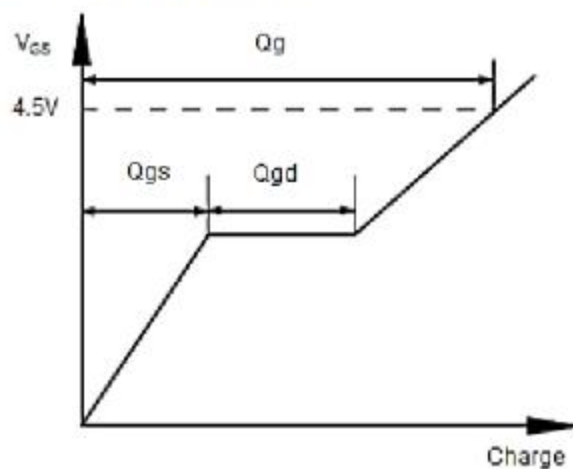
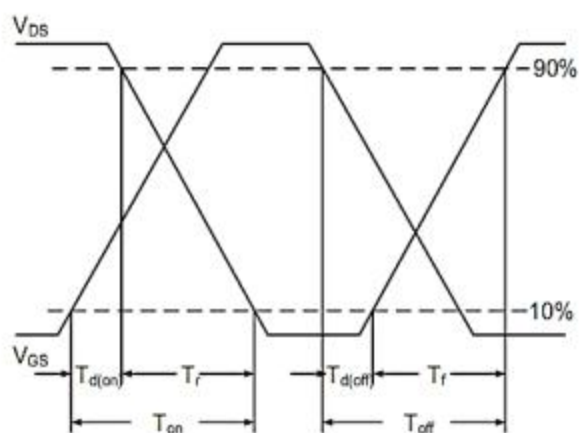
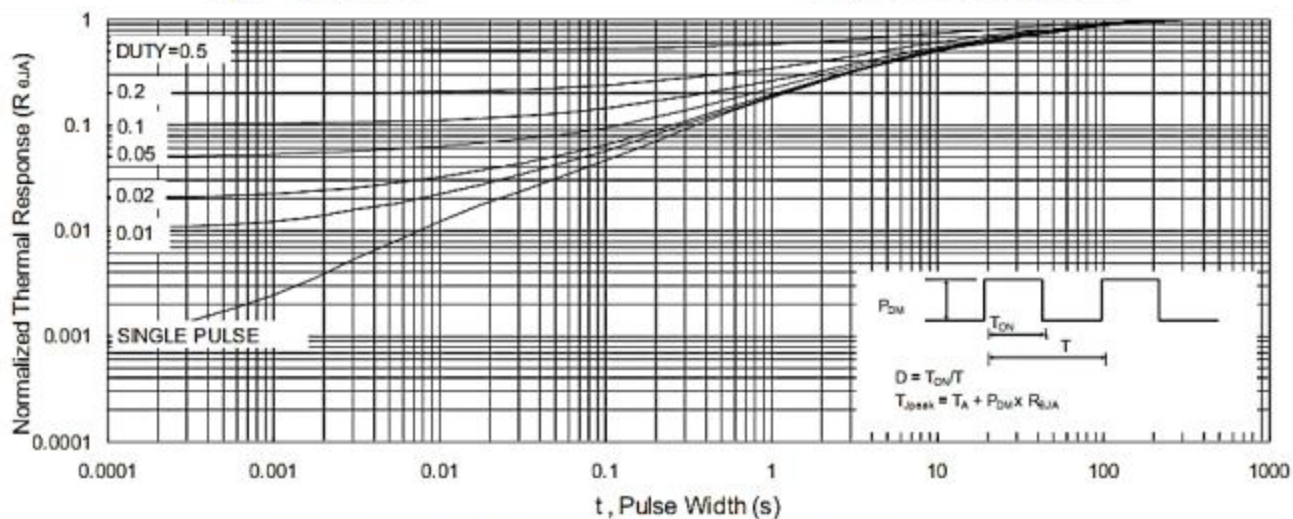
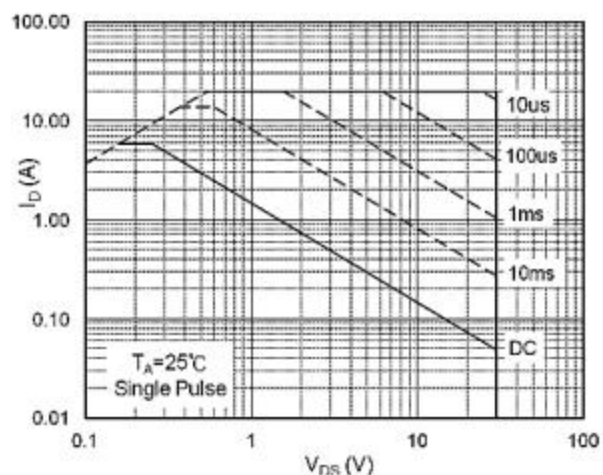
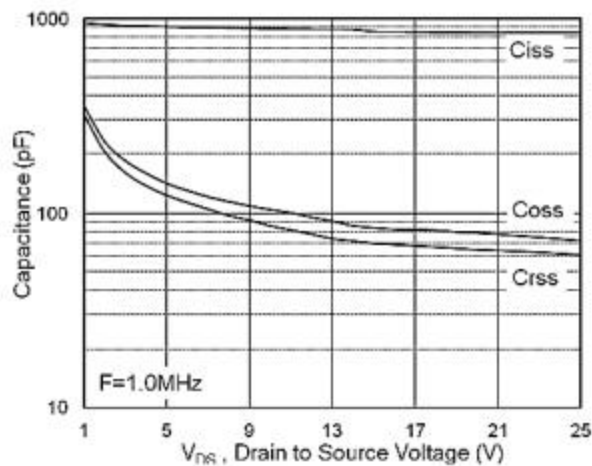
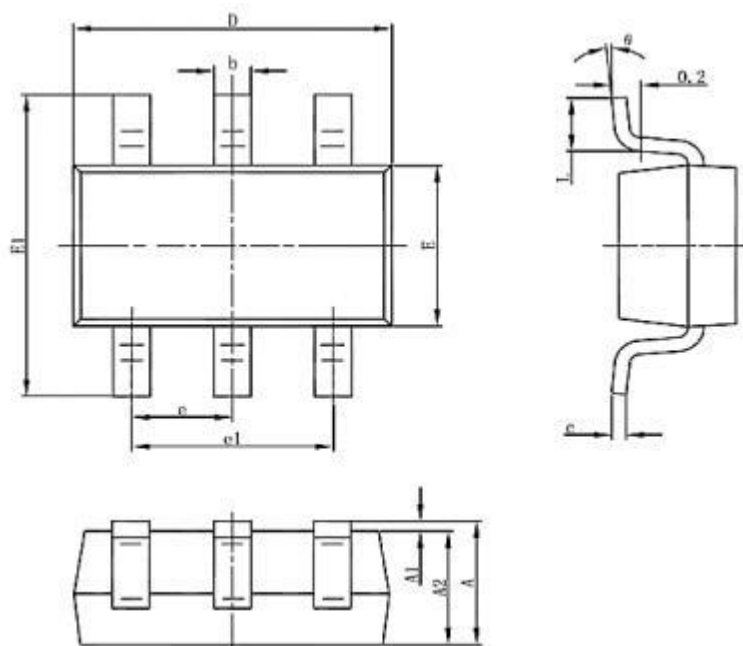


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics



Package Mechanical Data-SOT23-6-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
E	1.500	1.700	0.059	0.067
E1	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	SOT23-6L		3000