100V N-Channel Enhancement Mode MOSFET

Description

The SX5N10SI 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 =5A

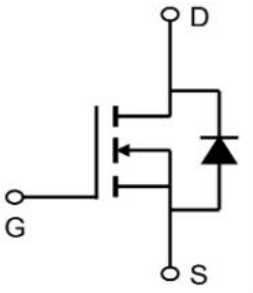
$R_{DS(ON)}$ < 110mΩ @ V_{GS}=10V

Application

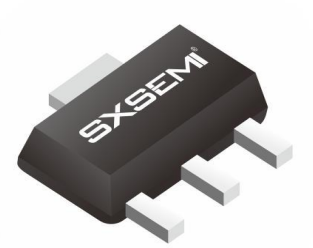
Lithium battery protection

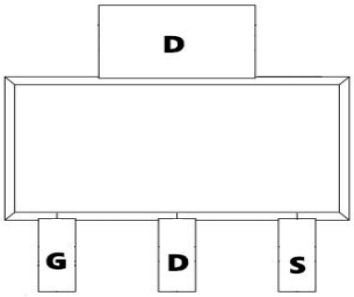
Wireless impact

Mobile phone fast charging



SOT-89-3L





Absolute Maximum Ratings (T_C=25℃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℃	Continuous Drain Current, V_{GS} @ 10V[1]	5	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	3.6	A
I_{DM}	Pulsed Drain Current[2]	15	A
P_D@T_A=25℃	Total Power Dissipation[3]	3.5	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	85	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	40	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.122	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=3A	---	88	110	mΩ
		V_{GS}=4.5V , I_D=2A	---	95	125	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.6	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.84	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	---	---	10	uA
		V_{DS}=100V , V_{GS}=0V , T_J=55℃	---	---	100	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=2A	---	10.2	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.3	4.6	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=60V , V_{GS}=10V , I_D=2A	---	25.5	---	nC
Qgs	Gate-Source Charge		---	4.2	---	
Qgd	Gate-Drain Charge		---	4.3	---	
Td(on)	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3.3Ω I_D=1A	---	17.3	---	ns
T_r	Rise Time		---	2.8	---	
Td(off)	Turn-Off Delay Time		---	50	---	
T_f	Fall Time		---	2.8	---	
Ciss	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	677	---	pF
Coss	Output Capacitance		---	46	---	
Crss	Reverse Transfer Capacitance		---	32	---	
IS	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	2	A
ISM	Pulsed Source Current[2,4]		---	---	4	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

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 asI_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

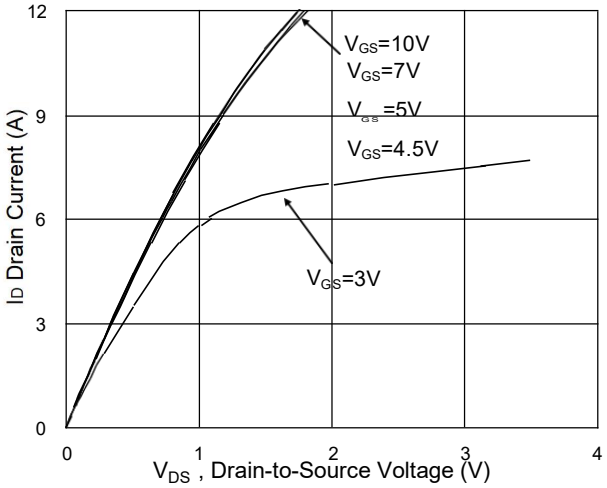


Fig.1 Typical Output Characteristics

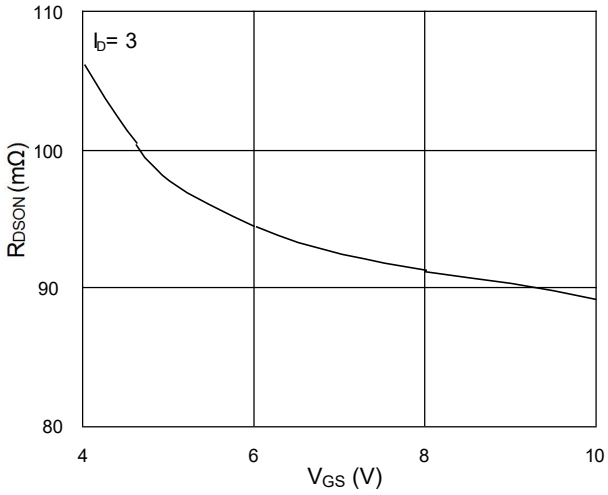


Fig.2 On-Resistance vs. Gate-Source

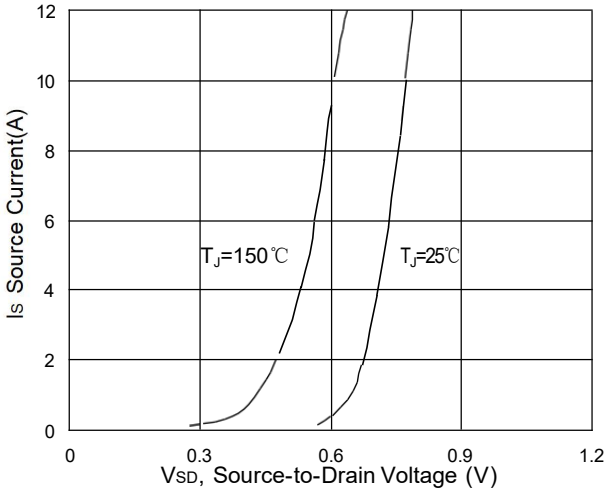


Fig.3 Forward Characteristics Of Reverse

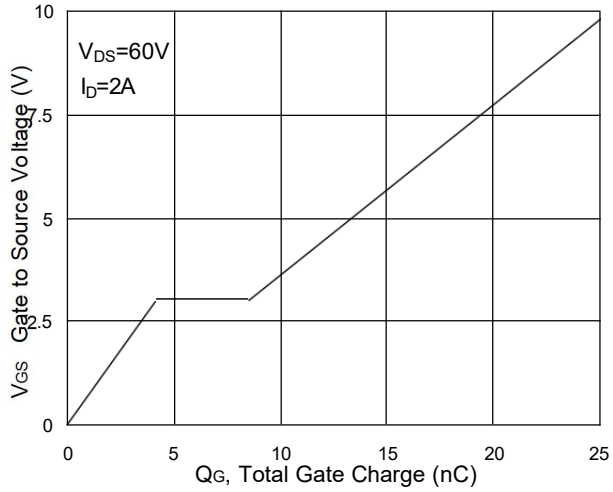


Fig.4 Gate-Charge Characteristics

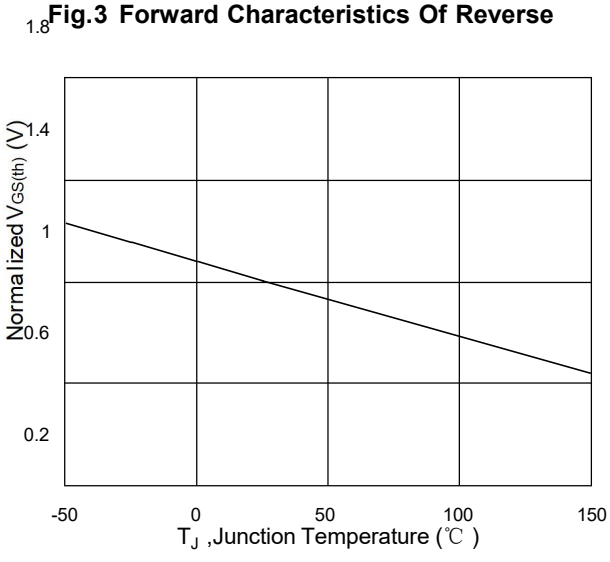


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

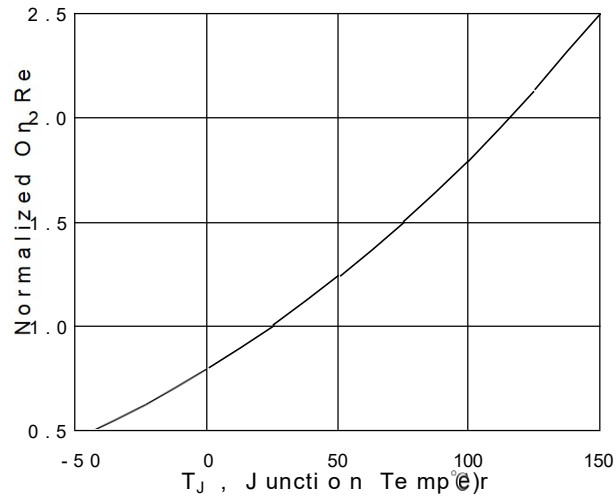


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

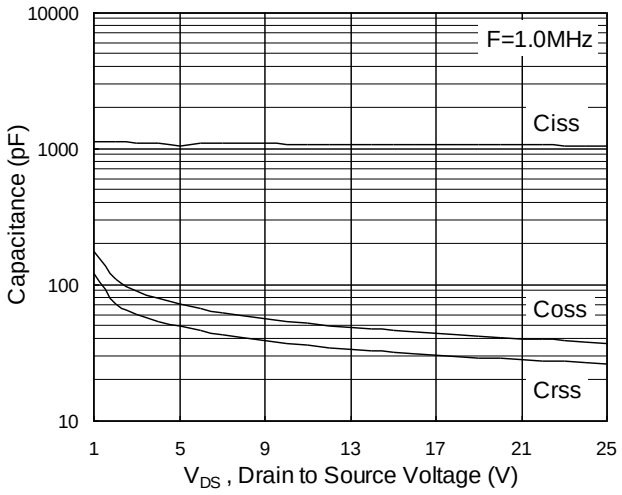


Fig.7 Capacitance

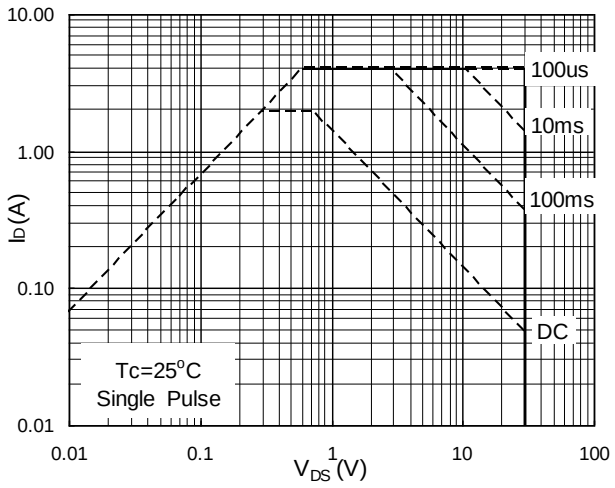


Fig.8 Safe Operating Area

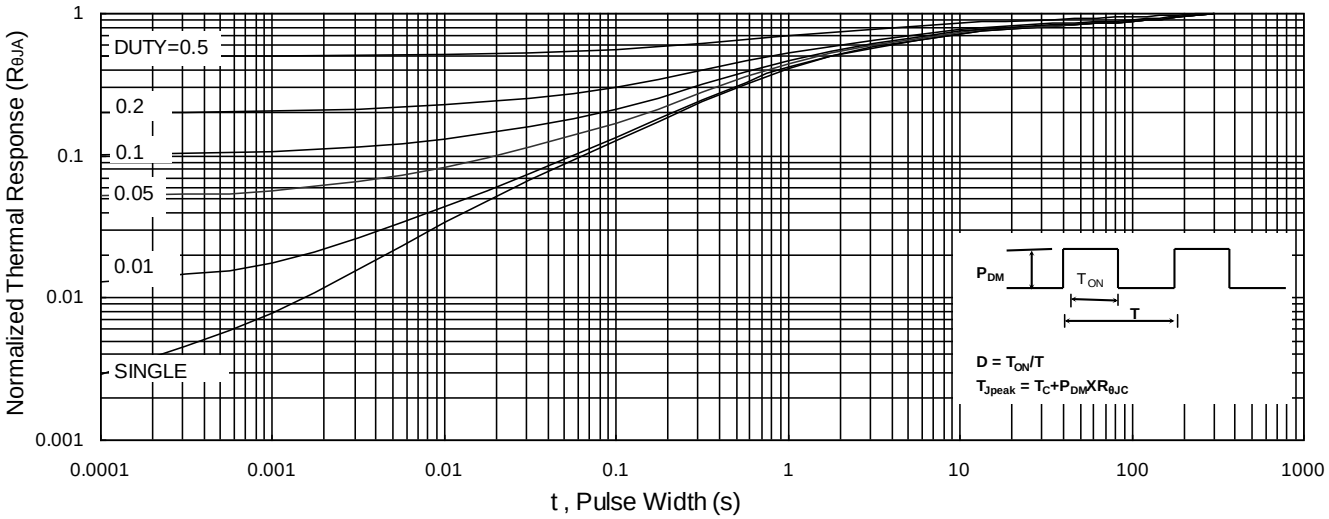


Fig.9 Normalized Maximum Transient Thermal Impedance

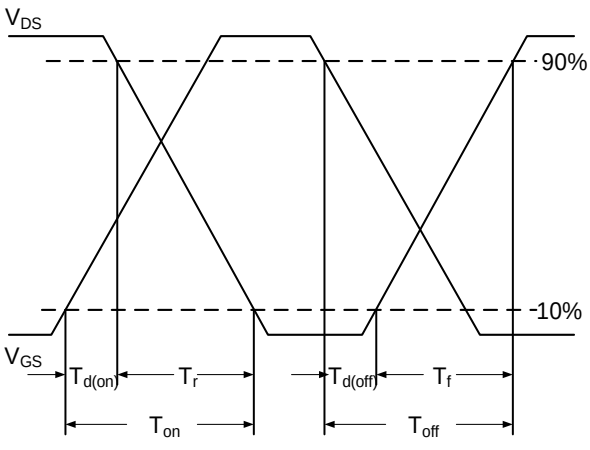


Fig.10 Switching Time Waveform

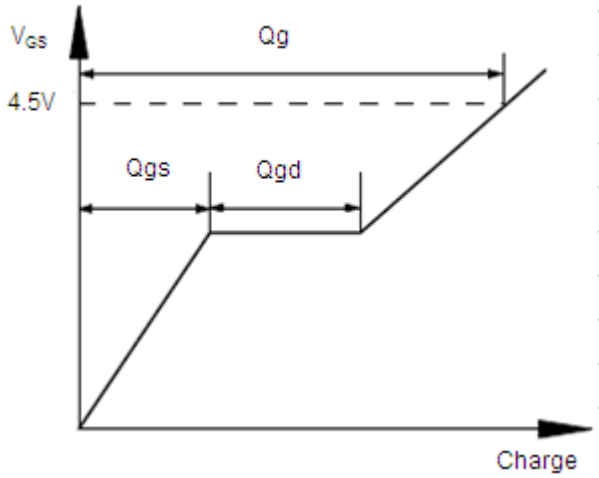
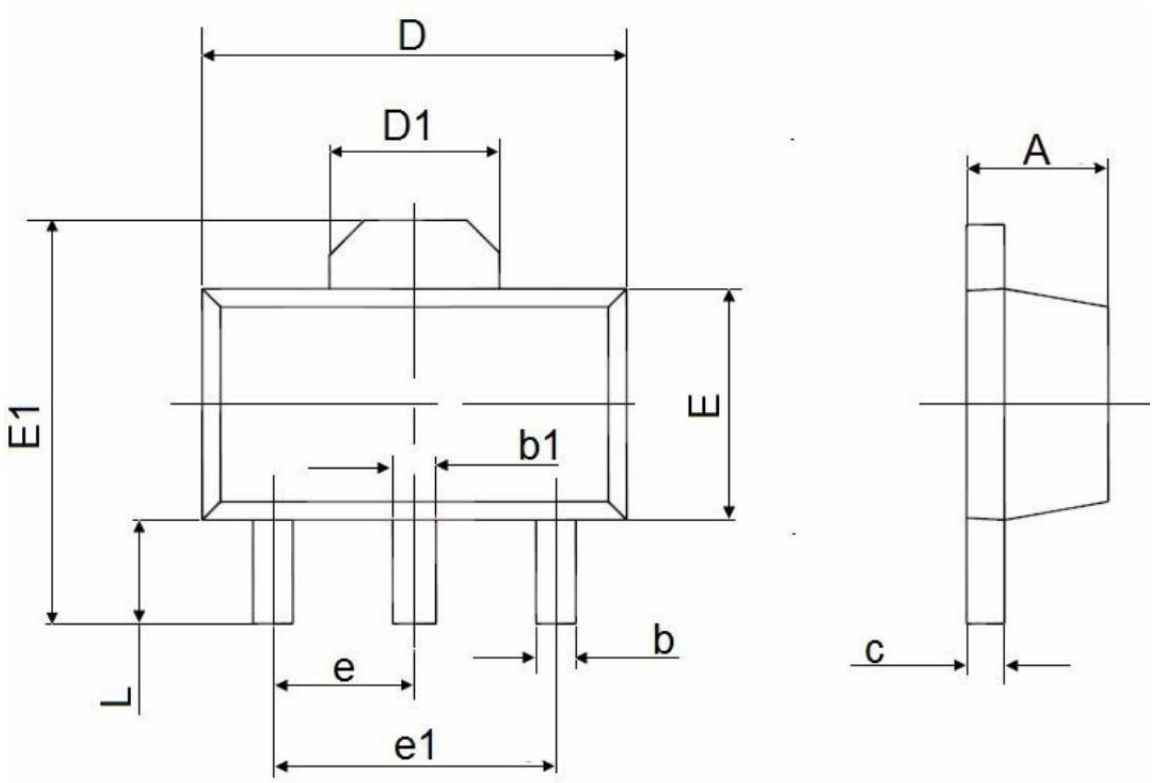


Fig.11 Gate Charge Waveform

Package Mechanical Data-SOT89-3L-YX



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT89-3L		3000