

Description

The SX5N10BI uses advanced 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

$V_{DS} = 100V$ $I_D = 5.0A$

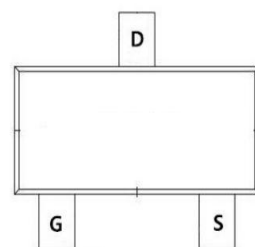
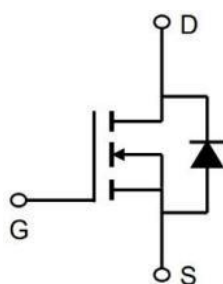
$R_{DS(ON)} < 130m\Omega$ @ $V_{GS} = 10V$

Application

LED

Load switch

Uninterruptible power supply



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	5	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, V_{GS} @ 10V ¹	3.2	A
I_{DM}	Pulsed Drain Current ²	16	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	3.1	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 (steady state) ¹	125	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ($t < 10s$) ¹	40	$^\circ C/W$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
IGSS	Gate-body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
IDSS	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	μA
VGS(th)	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.65	2.5	V
RDS(on)	Drain-Source On-state Resistance ³	$V_{GS} = 10V, I_D = 3A$	-	100	130	m Ω
RDS(on)	Drain-Source On-state Resistance ³	$V_{GS} = 4.5V, I_D = 1A$	-	135	190	
Ciss	Input Capacitance	$V_{GS} = 0V, V_{DS} = 50V, f = 1MHz$	-	200	-	pF
Coss	Output Capacitance		-	30	-	
Crss	Reverse Transfer Capacitance		-	2	-	
Qg	Total Gate Charge	$V_{DS} = 50V, V_{GS} = 10V, I_D = 3A$	-	4	-	nC
Qgs	Gate-Source Charge		-	0.6	-	
Qgd	Gate-Drain Charge		-	1.4	-	
td(on)	Turn-on Delay Time	$V_{DD} = 50V, V_{GS} = 10V, I_D = 3A, R_G = 3\Omega$	-	12.5	-	ns
t _r	Turn-on Rise Time		-	19.5	-	
td(off)	Turn-off Delay Time		-	20	-	
t _f	Turn- off Fall Time		-	29	-	
VSD	Body Diode Voltage ³	$I_S = 3A, V_{GS} = 0V$	-	-	1.2	V
IS	Continuous Source Current		-	-	3.3	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The power dissipation is limited by 150 $^{\circ}\text{C}$ 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

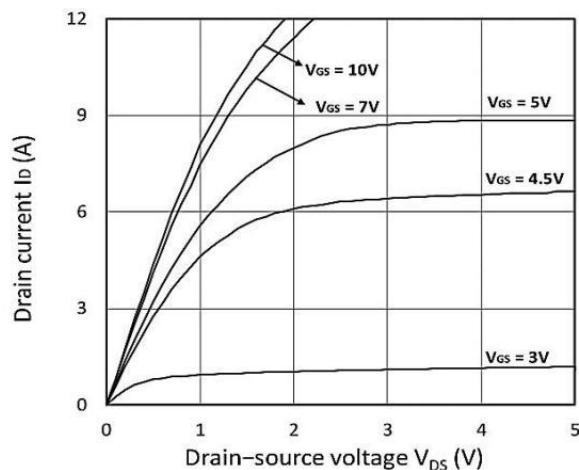


Figure 1. Output Characteristics

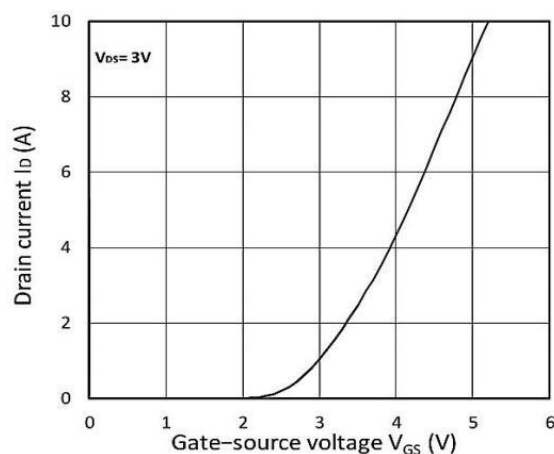


Figure 2. Transfer Characteristics

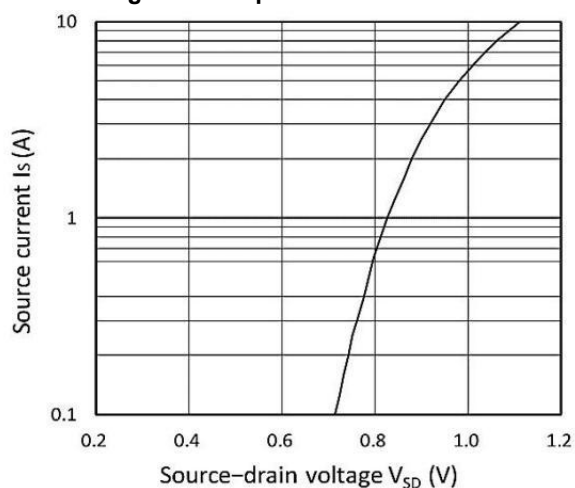


Figure 3. Forward Characteristics of Reverse

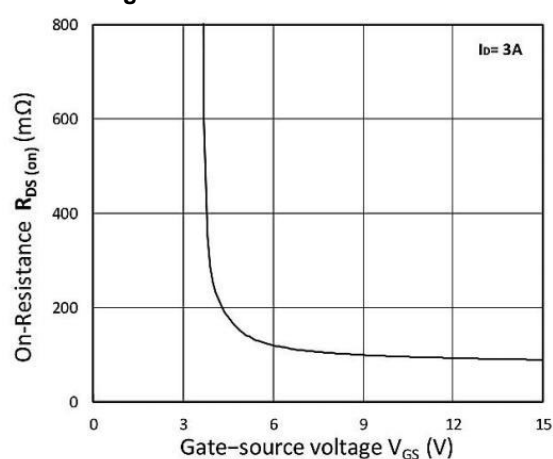


Figure 4. R_DS(ON) vs. V_GS

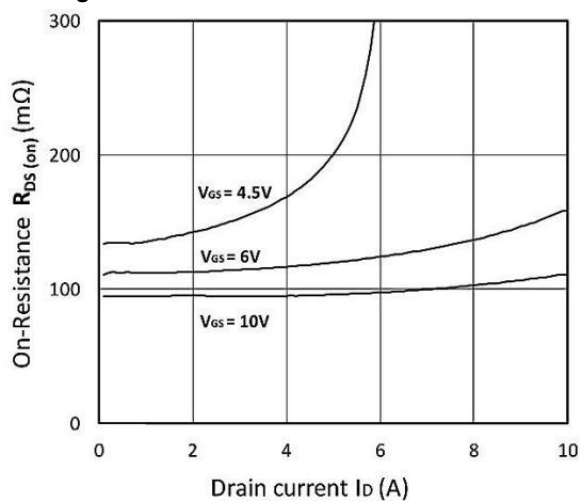


Figure 5. R_DS(ON) vs. I_D

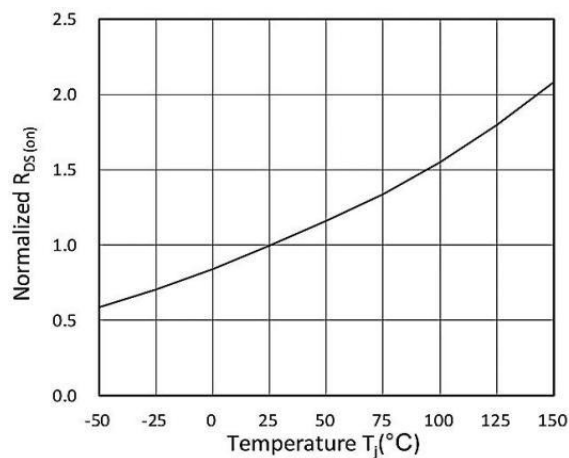


Figure 6. Normalized R_DS(on) vs. Temperature

Typical Characteristics

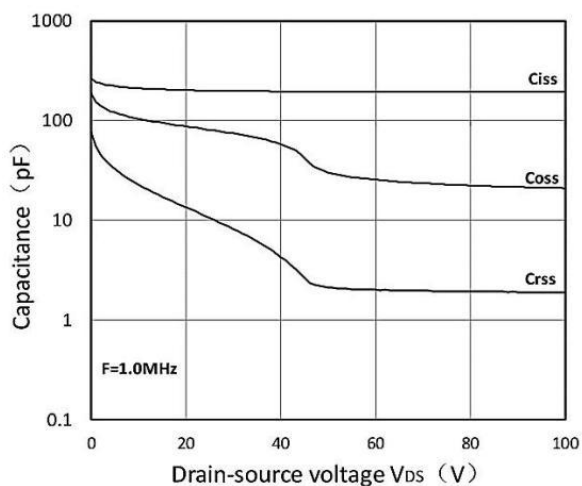


Figure 7. Capacitance Characteristics

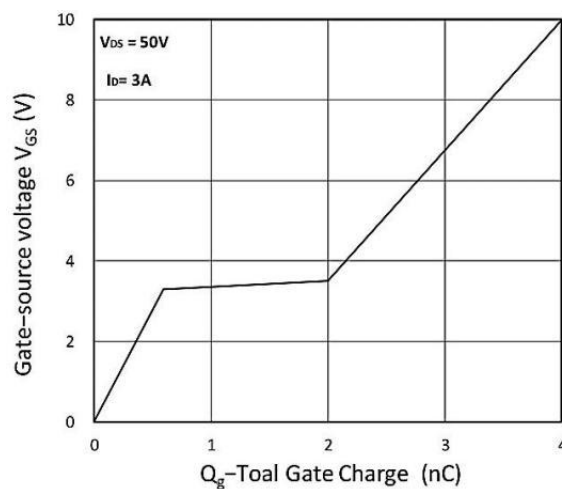


Figure 8. Gate Charge Characteristics

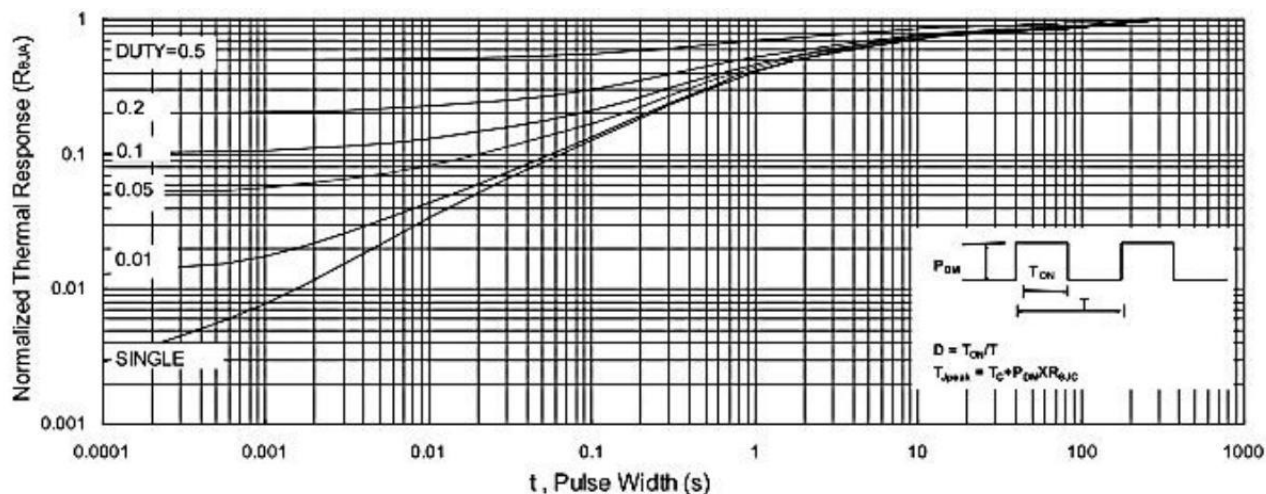


Fig.9 Normalized Maximum Transient Thermal Impedance

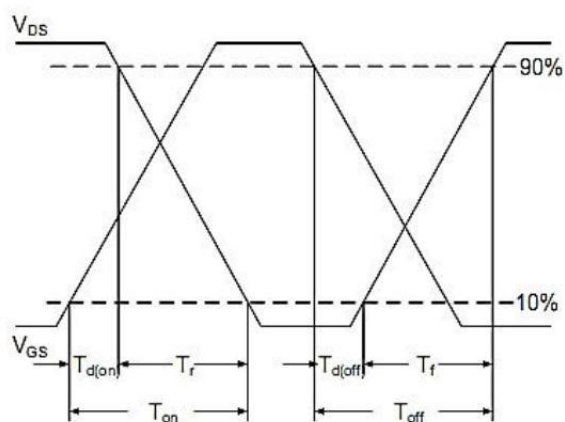


Fig.10 Switching Time Waveform

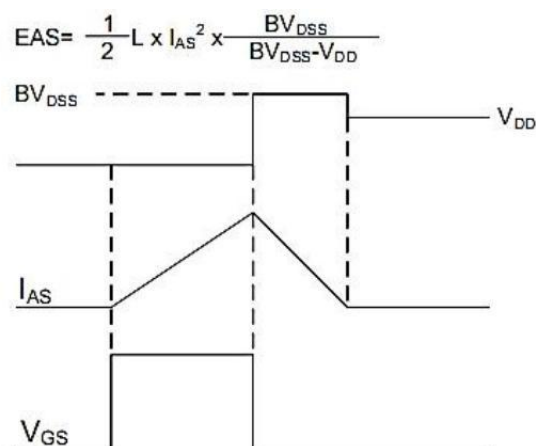
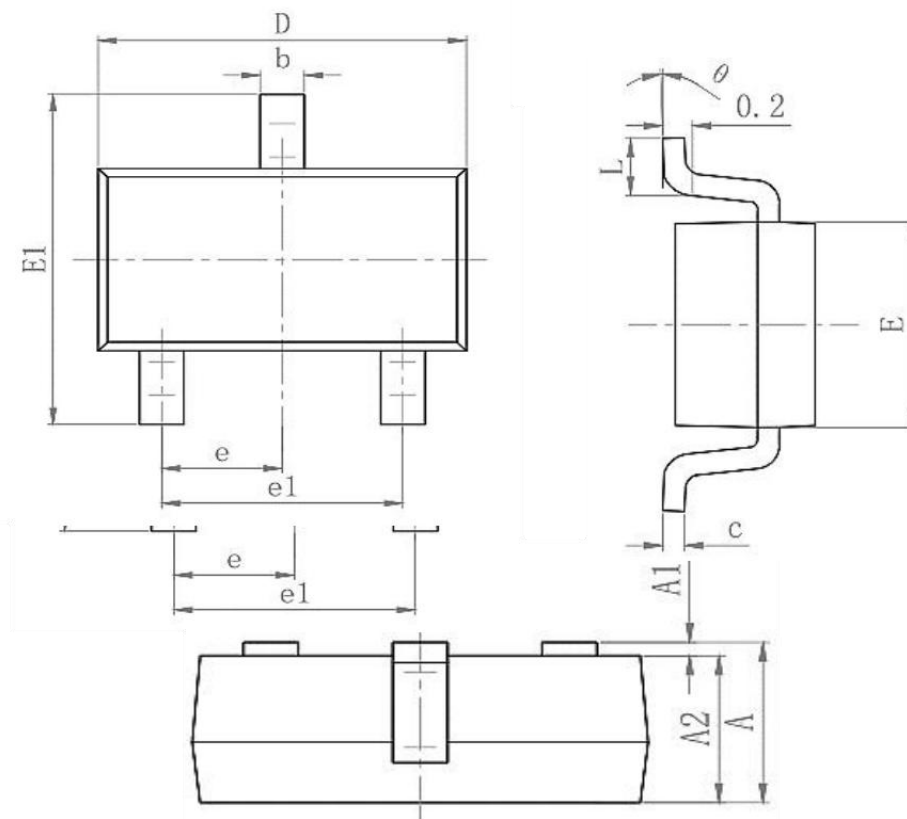


Fig.11 Unclamped Inductive Switching Waveform

MOSFET Package Mechanical Data-SOT23-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		3000