

Description

The SX4N06AI 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

$V_{DS}=60V$ $I_D=4A$

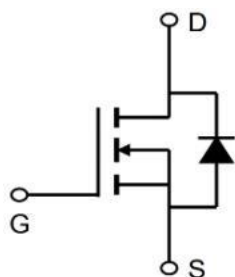
$R_{DS(ON)} < 85m\Omega$ @ $V_{GS}=10V$

Application

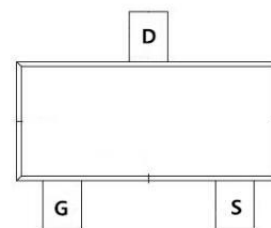
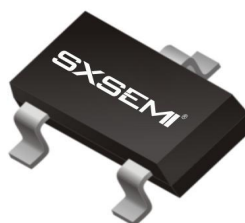
Battery protection

Load switch

Uninterruptible power supply



SOT-23



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	4	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	2.1	A
I_{DM}	Pulsed Drain Current ²	20	A
EAS	Single Pulse Avalanche Energy ³	11	mJ
I_{AS}	Avalanche Current	15	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	42	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	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	3	$^{\circ}C/W$

Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	60	66		V
IDSS	Zero Gate Voltage Drain Current	VDS=60V, VGS=0V			1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V, VDS=0V			±100	nA
		VGS=±10V, VDS=0V			±50	
VGS(th)	Gate Threshold Voltage	VDS= VGS, ID=250μA	0.9	1.3	2.0	V
RDS(ON)	Static Drain-Source On-Resistance	VGS=10V, ID=3A		62	85	mΩ
		VGS=4.5V, ID=2A		85	120	
Ciss	Input Capacitance	VDS=10V, VGS=0V, f=1MHZ		409		pF
Coss	Output Capacitance			50		pF
Crss	Reverse Transfer Capacitance			41		pF
Qg	Total Gate Charge	VGS=10V, VDS=30V, ID=3A		10.27		nC
Qgs	Gate-Source Charge			1.65		nC
Qgd	Gate-Drain Charge			2.11		nC
Qrr	Reverse Recovery Chrage	IF=3A, di/dt=100A/us		6.99		nC
trr	Reverse Recovery Time			32.6		ns
tD(on)	Turn-on Delay Time	VGS=10V, VDS=30V, RL=20Ω RGEN=3Ω		3.6		ns
tr	Turn-on Rise Time			17.6		ns
tD(off)	Turn-off Delay Time			13		ns
tf	Turn-off fall Time			23		ns
VSD	Diode Forward Voltage	IS=4A, VGS=0V			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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 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

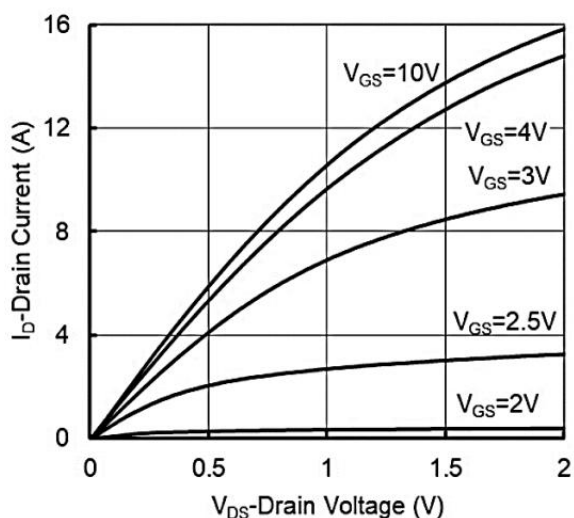


Figure1. Output Characteristics

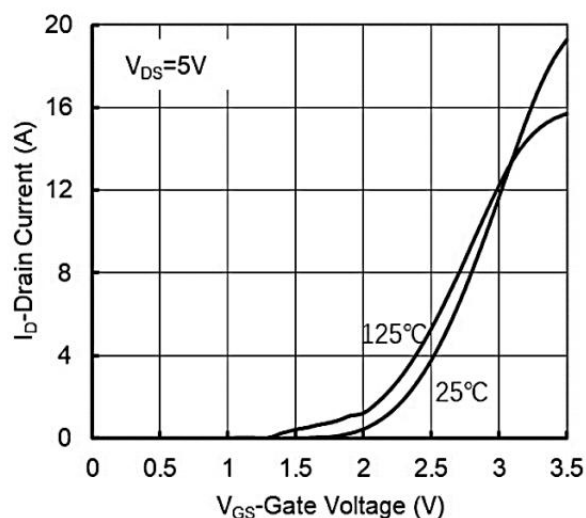


Figure2. Transfer Characteristics

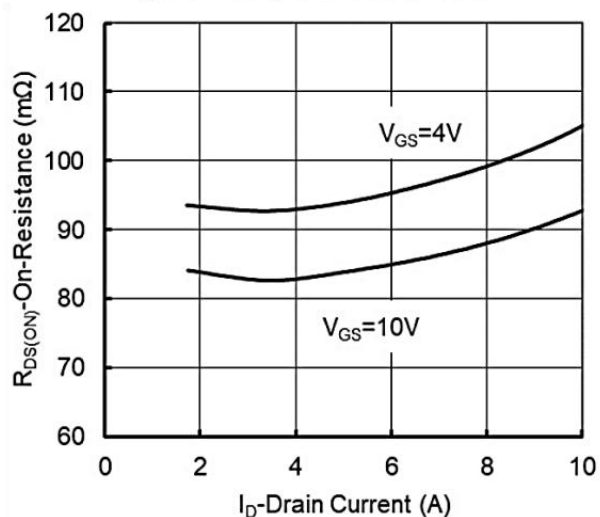


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

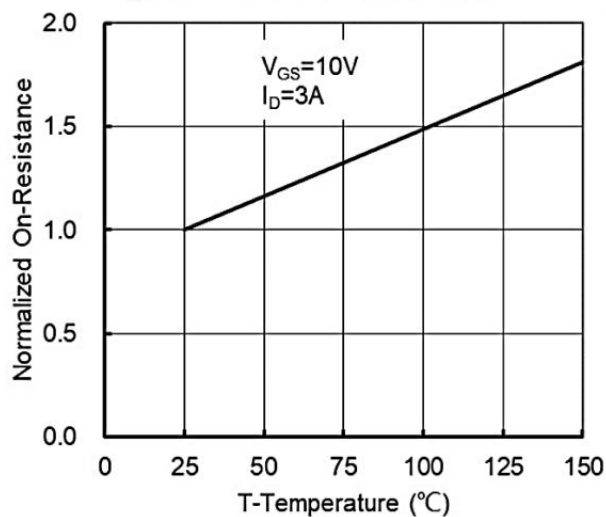


Figure 4: On-Resistance vs. Junction Temperature

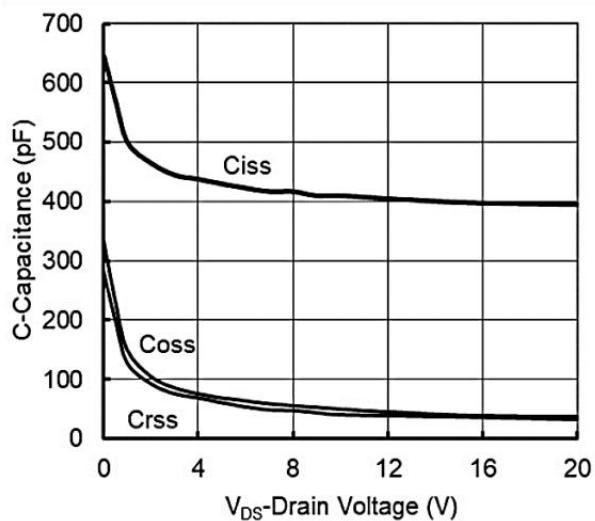


Figure5. Capacitance Characteristics

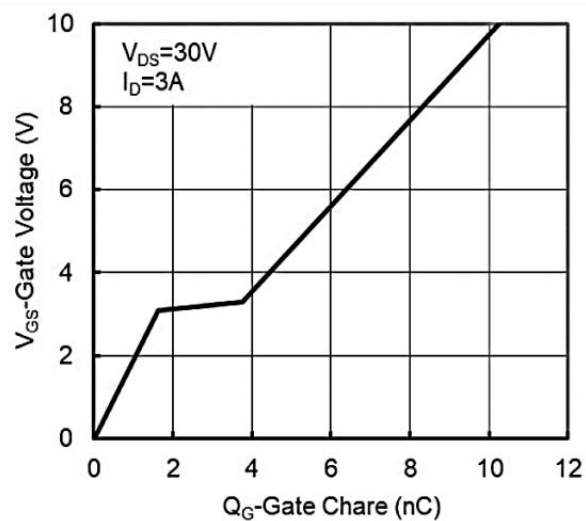


Figure6. Gate Charge

Typical Characteristics

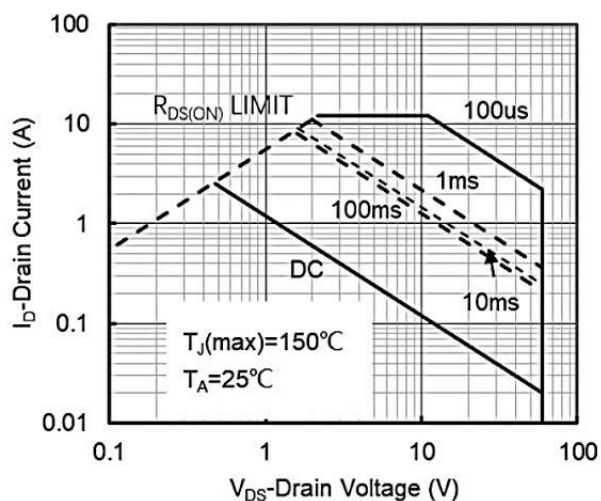


Figure7. Safe Operation Area

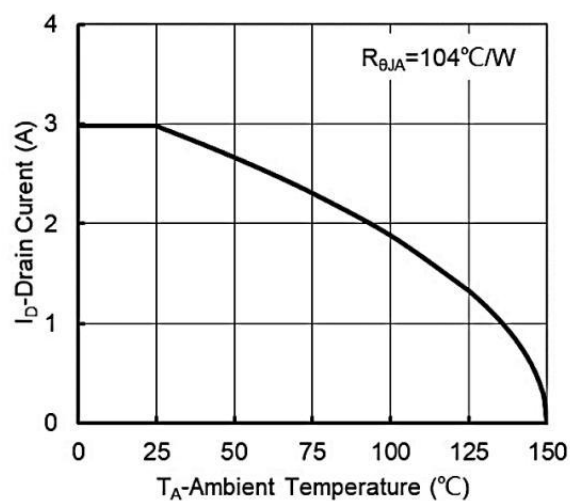


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

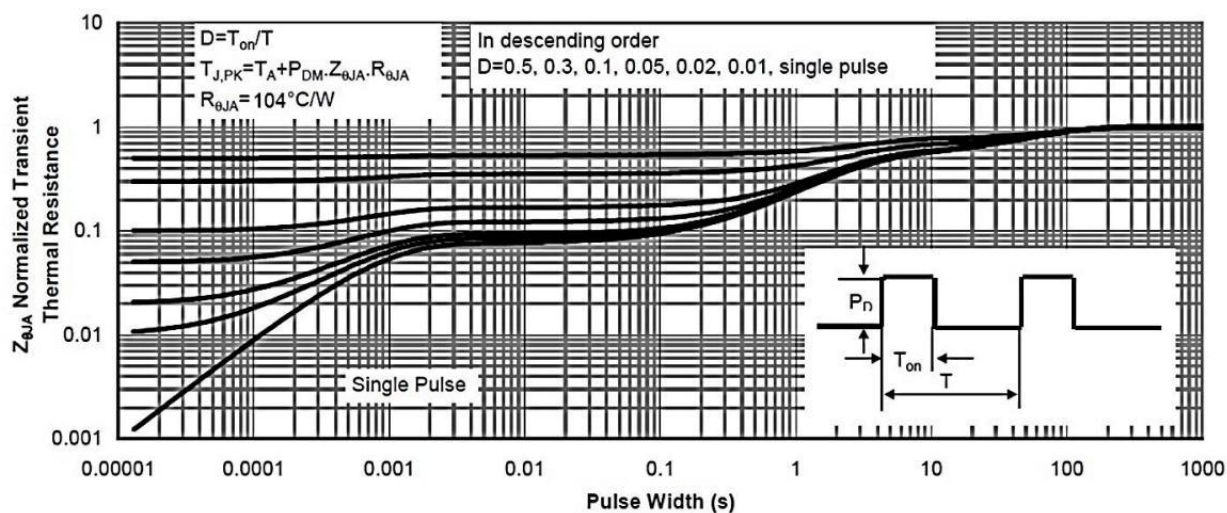


Figure9. Normalized Maximum Transient Thermal Impedance

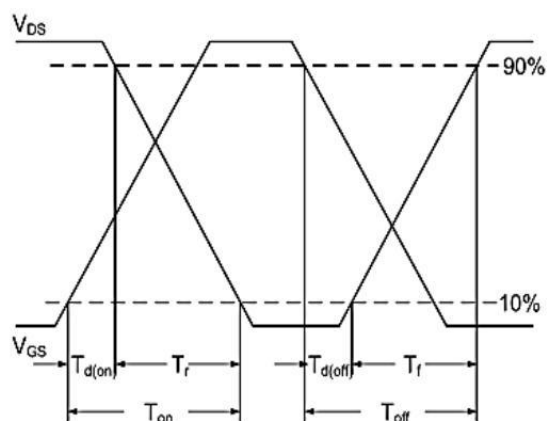


Fig.10 Switching Time Waveform

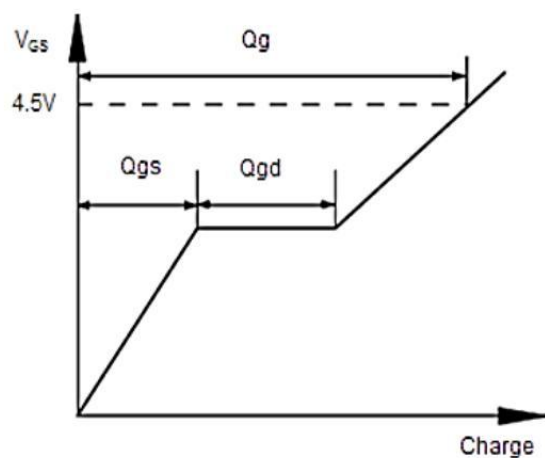
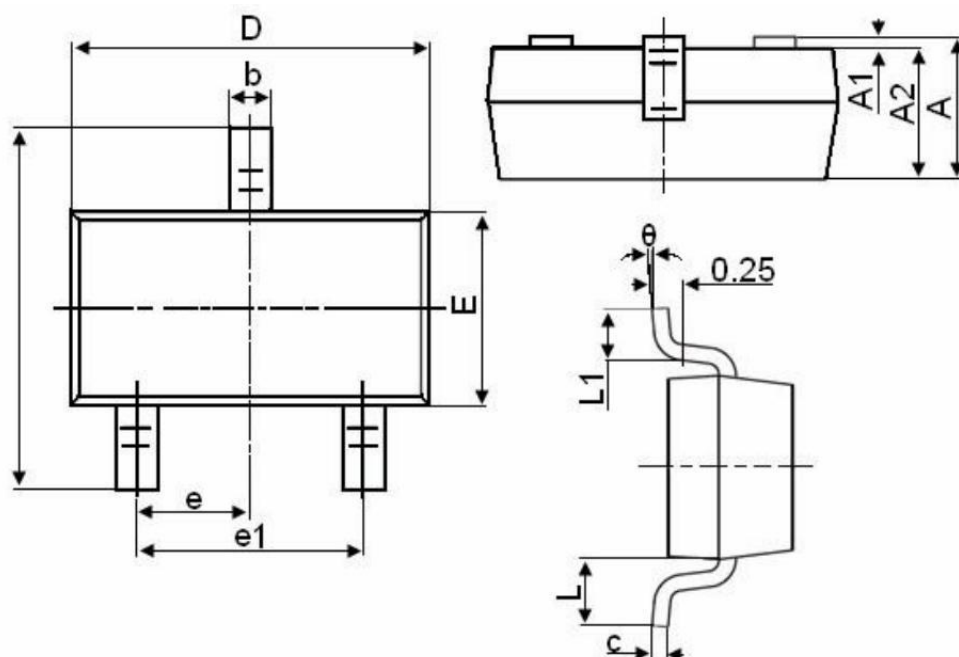


Fig.11 Gate Charge Waveform

Package Mechanical Data-SOT23-XC-Single



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT23		3000