

Description

The SX2311AI 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

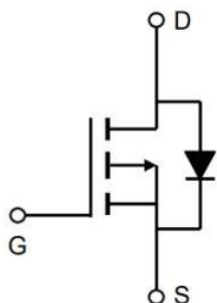
$V_{DS} = -12V$ $I_D = -8.1A$

$R_{DS(ON)} < 24m\Omega$ @ $V_{GS}=10V$

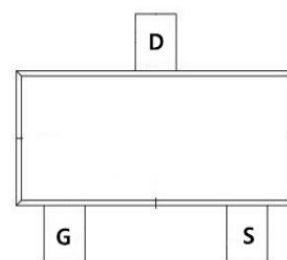
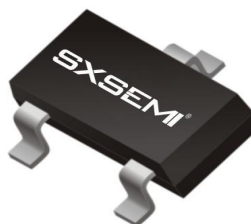
$R_{DS(ON)} < 26m\Omega$ @ $V_{GS}=4.5V$

Application

electronic cigarette
Load switch



SOT-23



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

Symbol	Parameter	Rating	Units
VDSS	Drain-Source Voltage	-12	V
VGSS	Gate-Source Voltage	± 12	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-8.1	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-4.6	A
IDM	Pulsed Drain Current ^{note1}	-22	A
$P_D @ T_c=25^\circ C$	Power Dissipation	1.6	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	125	$^\circ C/W$
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-12	-18	-	V
IDSS	Zero Gate Voltage Drain Current	$V_{DS}=-12V, V_{GS}=0V,$	-	-	-1	μA
IGSS	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	± 100	nA
VGS(th)	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.65	-1.0	V
RDS(on)	Static Drain-Source on-Resistance note2	$V_{GS}=-10V, I_D=-6.0A$	-	18	24	m Ω
RDS(on)	Static Drain-Source on-Resistance note2	$V_{GS}=-4.5V, I_D=-5.2A$	-	20	26	m Ω
RDS(on)	Static Drain-Source on-Resistance note2	$V_{GS}=-2.5V, I_D=-4.2A$		28	35	m Ω
Ciss	Input Capacitance	$V_{DS}=-6V, V_{GS}=0V$ $f=1.0MHz$	-	1100	-	pF
Coss	Output Capacitance		-	390	-	pF
Crss	Reverse Transfer Capacitance		-	300	-	pF
Qg	Total Gate Charge	$V_{DS}=-4V, I_D=-4.1A,$ $V_{GS}=-4.5V$	-	11.5		nC
Qgs	Gate-Source Charge		-	1.5	-	nC
Qgd	Gate-Drain("Miller") Charge		-	3.2	-	nC
td(on)	Turn-on Delay Time	$V_{DD}=-4V, I_D=-3.3A,$ $R_G=1.0\Omega, V_{GEN}=-4.5V,$ $R_L=1.2\Omega$	-	25	-	ns
tr	Turn-on Rise Time		-	45	-	ns
td(off)	Turn-off Delay Time		-	72	-	ns
tr	Turn-off Fall Time		-	60	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-6.0	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16	A
VSD	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=-4.1A$	-	-	-1.2	V
trr	Reverse Recovery Time	$V_{GS}=0V, I_S=-4.1A,$ $di/dt=100A/\mu s$	-	20	-	ns
Qrr	Reverse Recovery Charge		-	9	-	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 $\leq 300\mu s$, 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

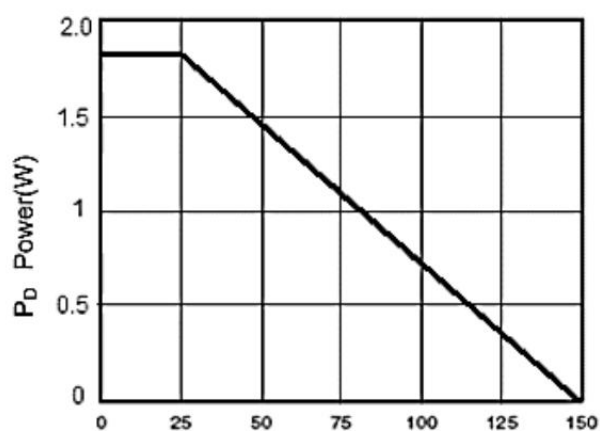


Figure 1 Power Dissipation

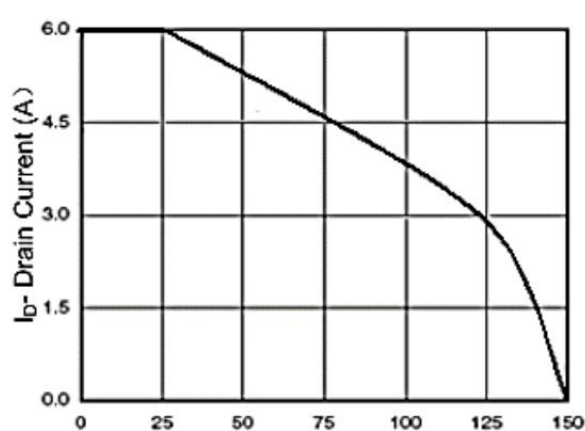


Figure 2 Drain Current

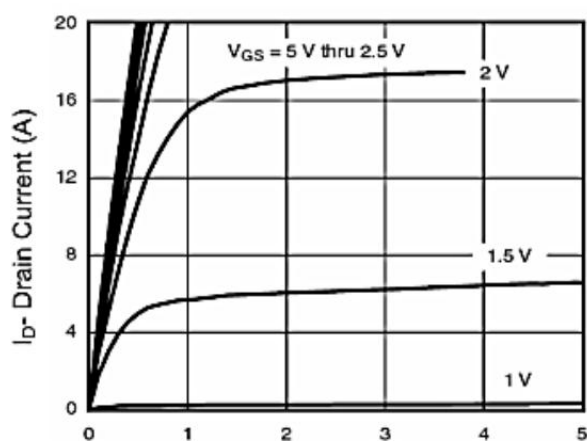


Figure 3 Output Characteristics

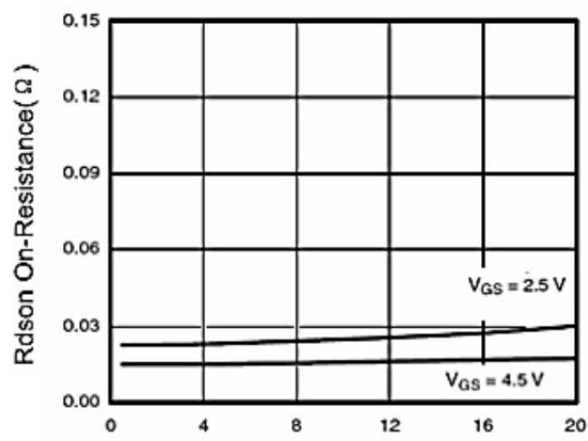


Figure 4 Drain-Source On-Resistance

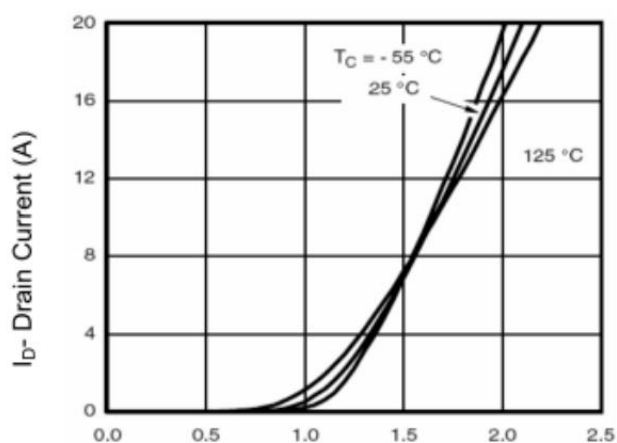


Figure 5 Transfer Characteristics

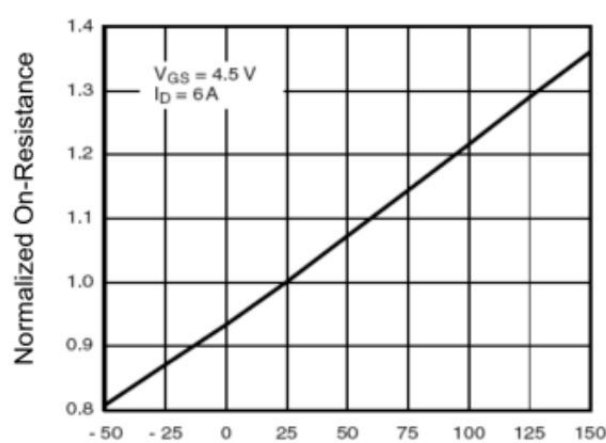
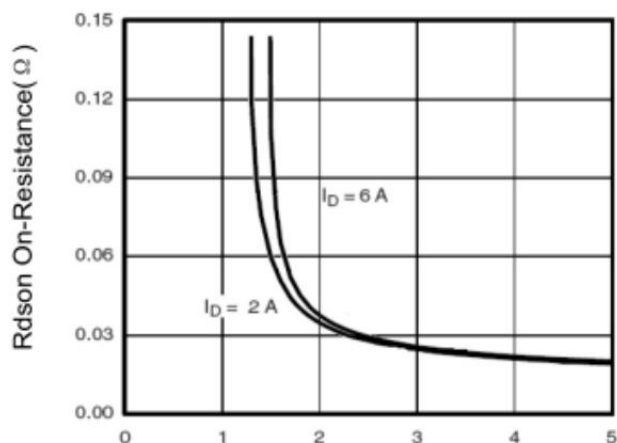
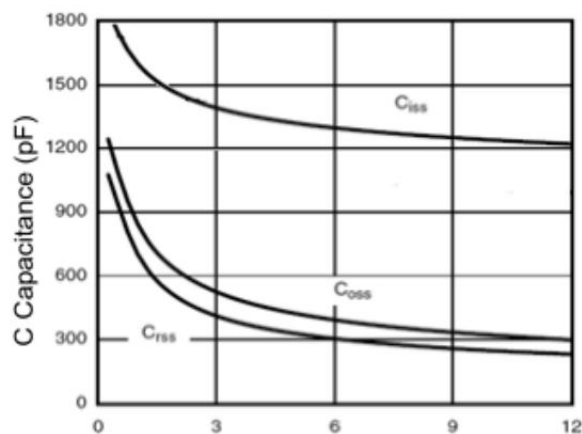


Figure 6 Drain-Source On-Resistance

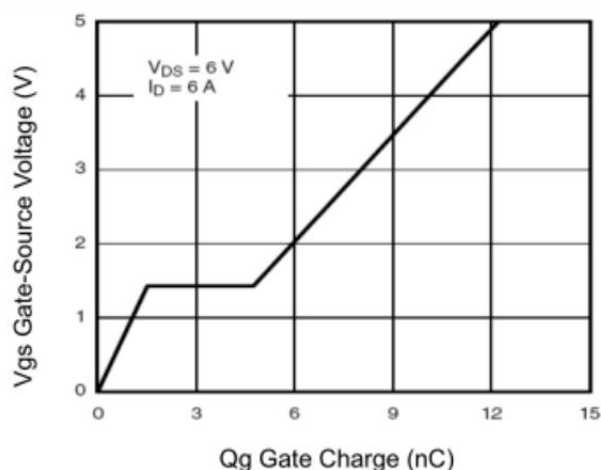
Typical Characteristics



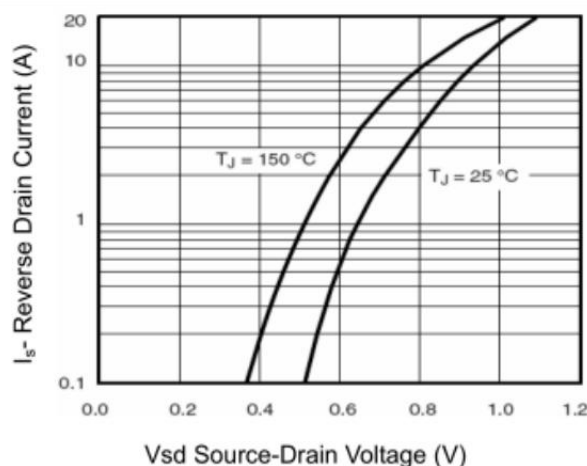
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 9 Gate Charge



Vsd Source-Drain Voltage (V)
Figure 10 Source- Drain Diode Forward

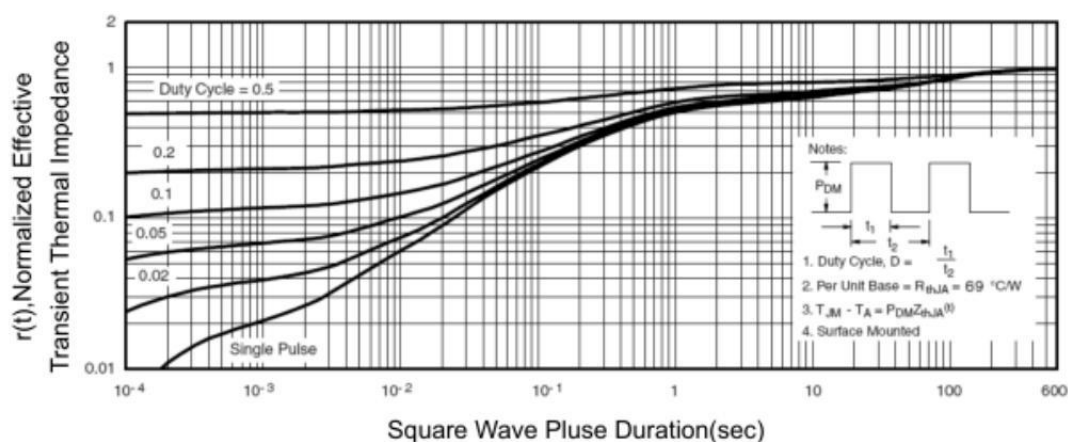
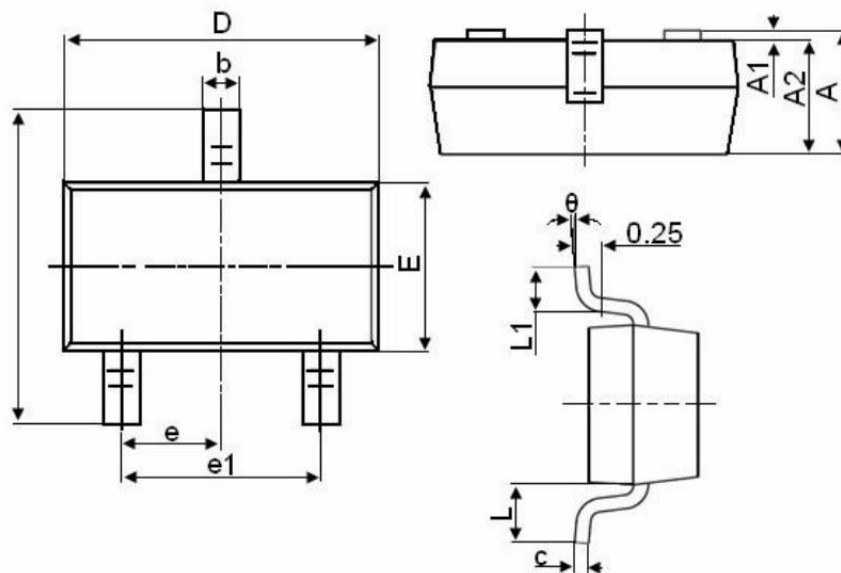


Figure 12 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-SOT23-XC-Single



Symbol	Dimensions in Millimeters	
	Mim.	Mim
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