

Description

The SX2303AI 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

$V_{DS} = -17V$ $I_D = -3.3A$

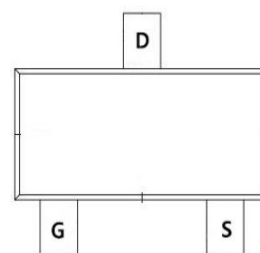
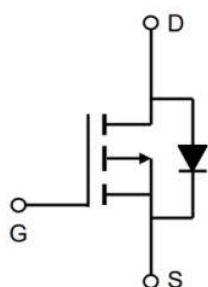
$R_{DS(ON)} < 100m\Omega$ @ $V_{GS} = -4.5V$

Application

Battery protection

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	-17	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-3.3	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-2.1	A
I_{DM}	Pulsed Drain Current ²	-10	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	1.0	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	125	$^\circ C/W$
$R_{\theta JC}$	Thermal resistance, junction-case	110	$^\circ C/W$

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-17	-20	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-0.7	-1.0	V
RDS(on)	Static Drain-Source on-Resistance	V _{GS} =-4.5V, I _D =-2.5A	-	85	120	mΩ
		V _{GS} =-2.5V, I _D =-1.5A	-	110	154	
Ciss	Input Capacitance	V _{DS} = -10V, V _{GS} = 0V, f = 1.0MHz	-	248	-	pF
Coss	Output Capacitance		-	42	-	pF
Crss	Reverse Transfer Capacitance		-	31	-	pF
Qg	Total Gate Charge	V _{DS} = -10V, I _D = -2.5A, V _{GS} = -4.5V	-	2.9	-	nC
Qgs	Gate-Source Charge		-	0.45	-	nC
Qgd	Gate-Drain("Miller") Charge		-	0.75	-	nC
td(on)	Turn-on Delay Time	V _{DD} = -10V, R _L =5Ω, R _{GEN} =3Ω, V _{GS} =-4.5V,	-	9.8	-	ns
tr	Turn-on Rise Time		-	4.9	-	ns
td(off)	Turn-off Delay Time		-	20.5	-	ns
tf	Turn-off Fall Time		-	7	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-2.5	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-10	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = -2.5A	-	-	-1.2	V

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 Δ 300us , duty cycle Δ 2%
- 3、The power dissipation is limited by 150℃ 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

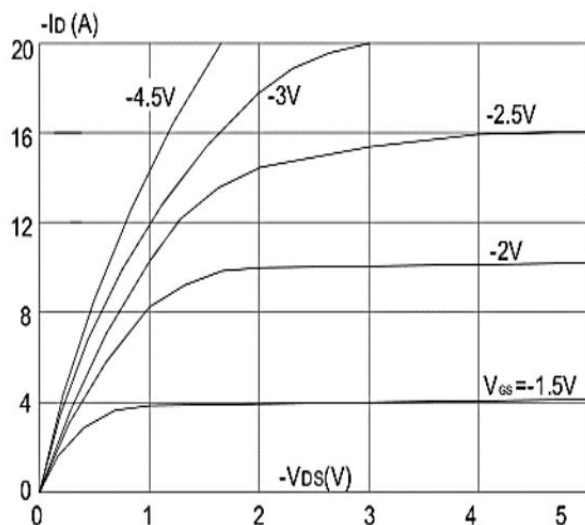


Figure1: Output Characteristics

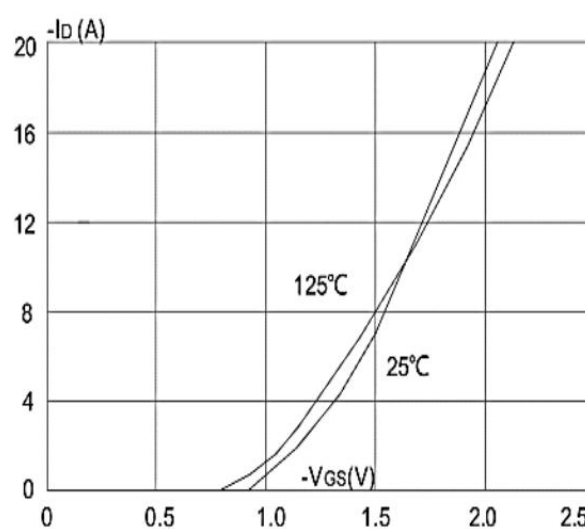


Figure 2: Typical Transfer Characteristics

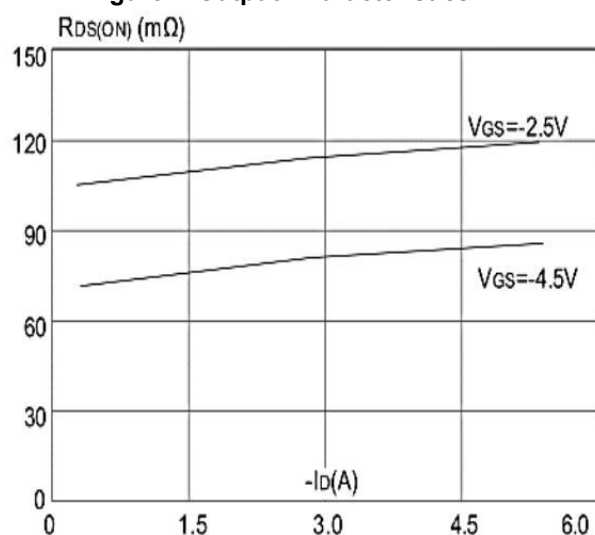


Figure 3: On-resistance vs. Drain Current

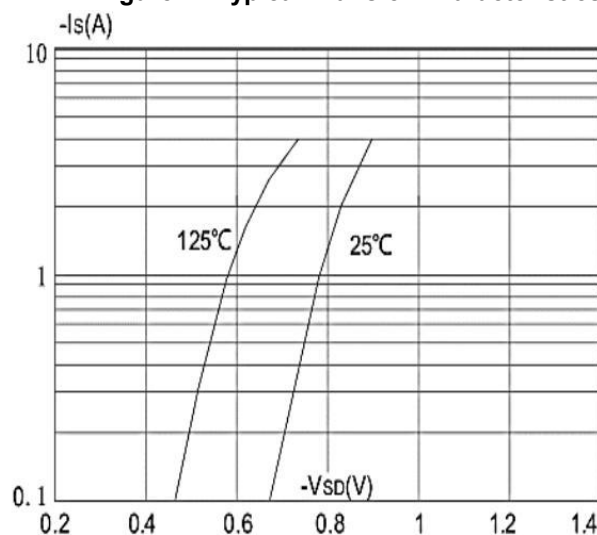


Figure 4: Body Diode Characteristics

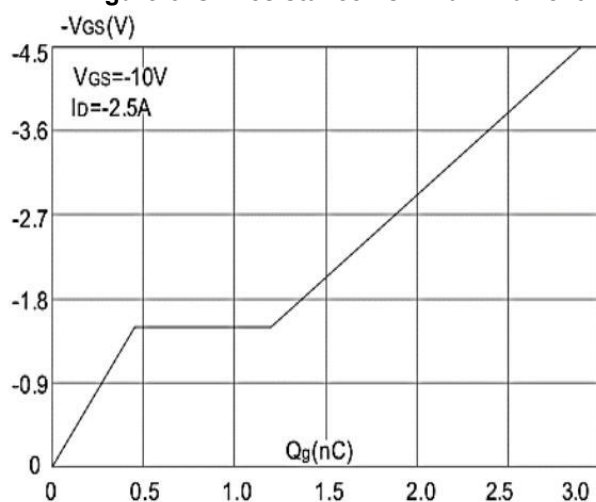


Figure 5: Gate Charge Characteristics

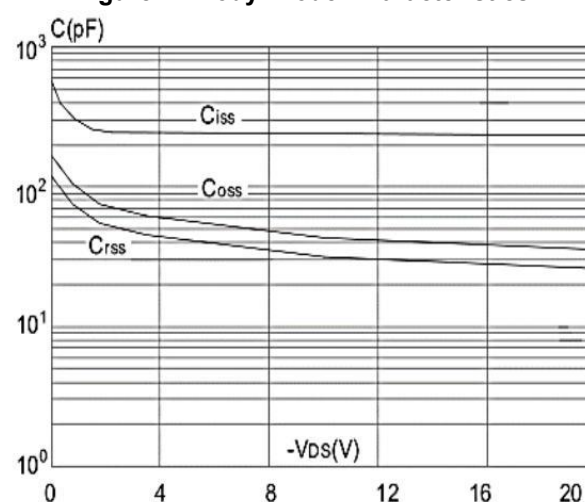


Figure 6: Capacitance Characteristics

Typical Characteristics

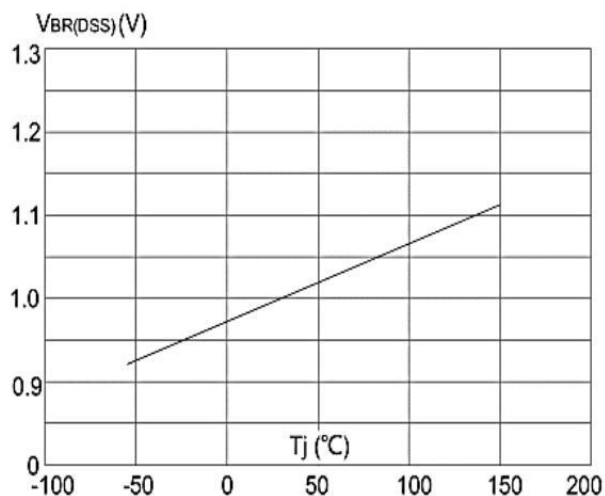


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

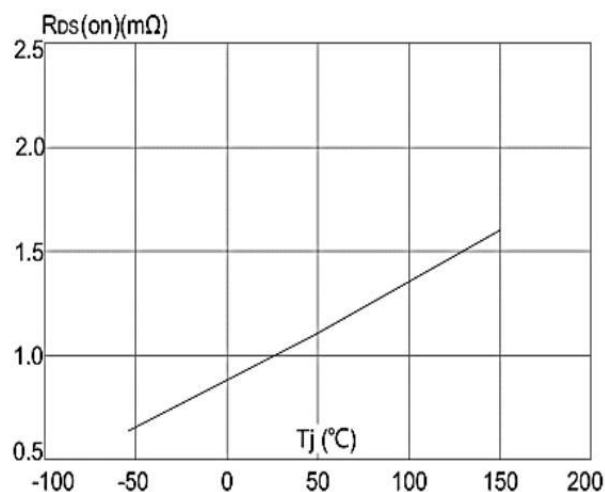


Figure 8: Normalized on Resistance vs. Junction Temperature

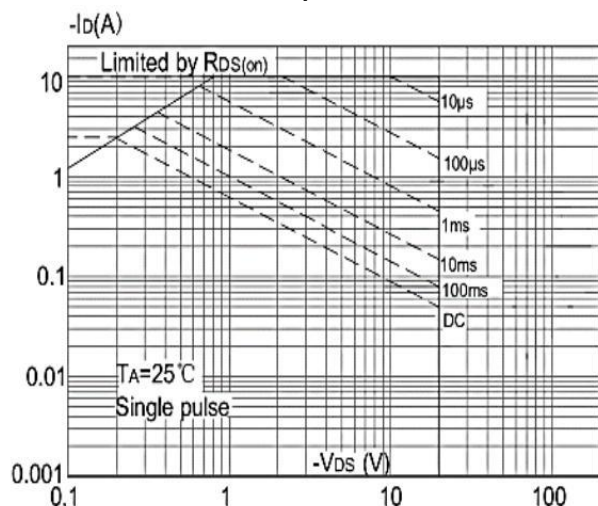


Figure 9: Maximum Safe Operating Area

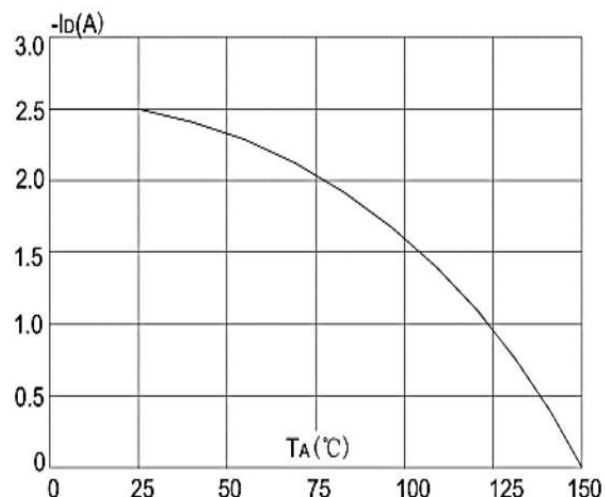


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

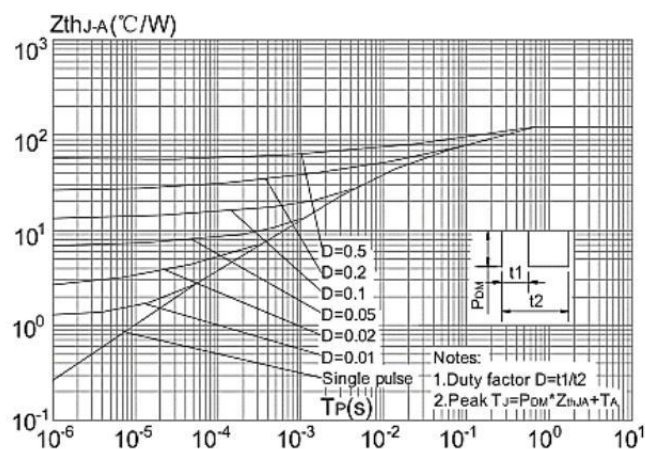
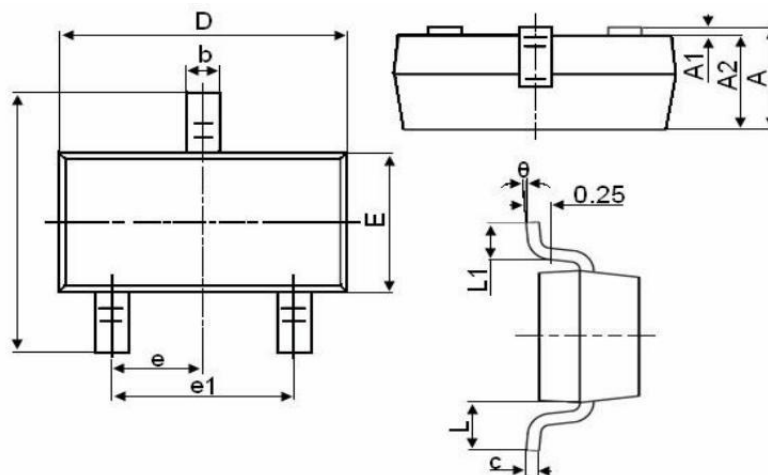


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambie

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