30V N-Channel Enhancement Mode MOSFET

Description

The SX3404BI 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} = 30V I_D =6.2A

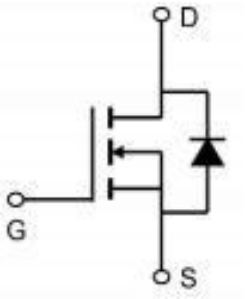
$R_{DS(ON)}$ < 25mΩ @ V_{GS}=10V

Application

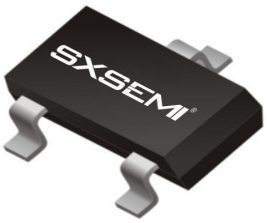
Lithium battery protection

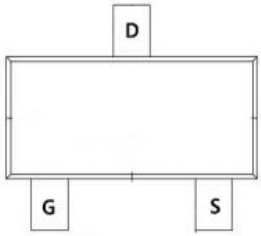
Wireless impact

Mobile phone fast charging



SOT-23





Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	30	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current	6.2	A
I_D@T_A=70℃	Continuous Drain Current	4.1	A
IDM	Pulsed Drain Current[2]	20	A
P_D@T_A=25℃	Total Power Dissipation[3]	1.25	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Thermal Resistance Junction-ambient [1]	125	℃/W
RθJA	Thermal Resistance Junction-Ambient [1] (t ≤10s)	85	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	30	33	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1.0	μA
IGSS	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.2	1.6	2.5	V
RDS(ON)	Static Drain-Source ON-Resistance	V_{GS} = 10V, I_D = 4A	-	19	25	mΩ
		V_{GS} = 4.5V, I_D = 3A	-	27	35	mΩ
Ciss	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz	-	388	-	pF
Coss	Output Capacitance		-	57	-	pF
Crss	Reverse Transfer Capacitance		-	45	-	pF
Q_g	Total Gate Charge	V_{GS}=0 to 10V V_{DS}=15V, I_D=3A	-	9	-	nC
Q_{gs}	Gate Source Charge		-	1.5	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	2	-	nC
td(on)	Turn-On DelayTime	V_{GS}=10V, V_{DD}=15V I_D=3A, R_{GEN} =3Ω	-	2	-	ns
t_r	Turn-On Rise Time		-	6	-	ns
td(off)	Turn-Off DelayTime		-	61	-	ns
t_f	Turn-Off Fall Time		-	34	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	20	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 5A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 3A, di/dt = 100A/us	-	6	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	2	-	nC

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

Typical Characteristics

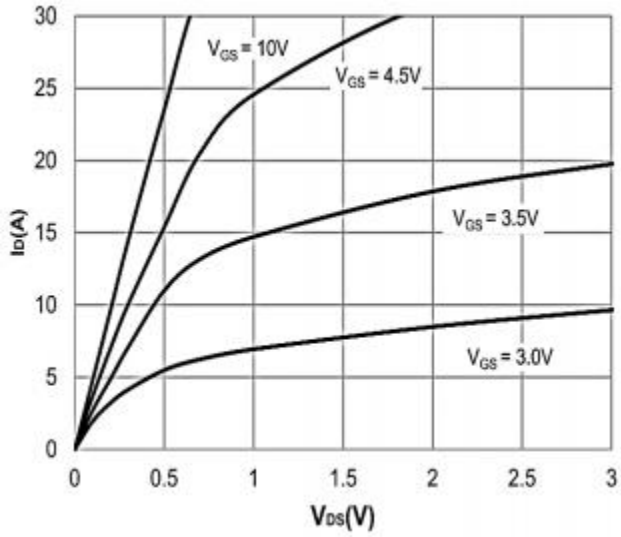


Figure 1: Output Characteristics

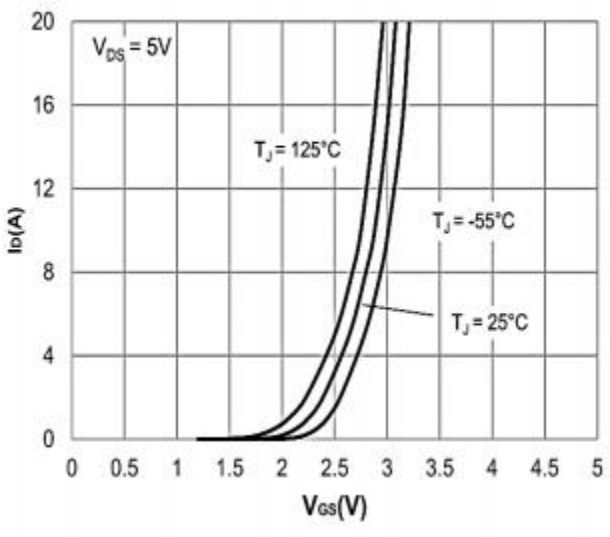


Figure 2: Typical Transfer Characteristics

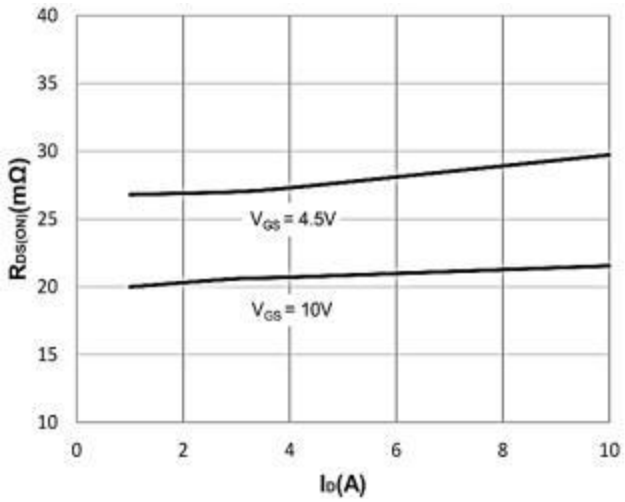


Figure 3: On-resistance vs. Drain Current

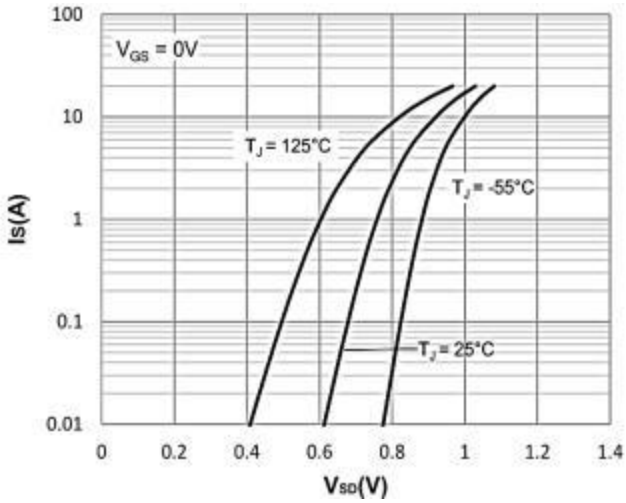


Figure 4: Body Diode Characteristics

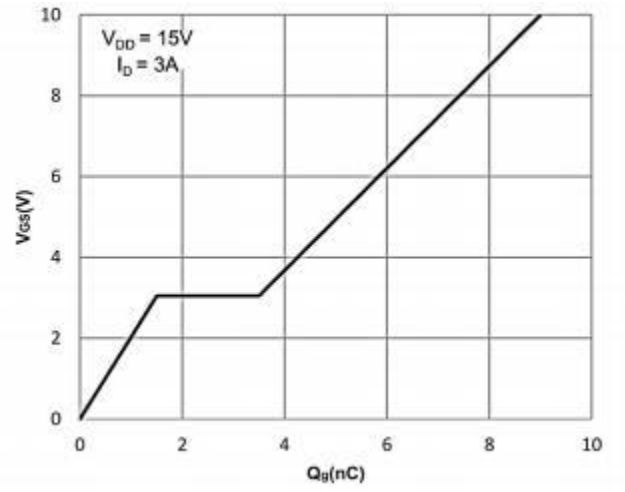


Figure 5: Gate Charge Characteristics

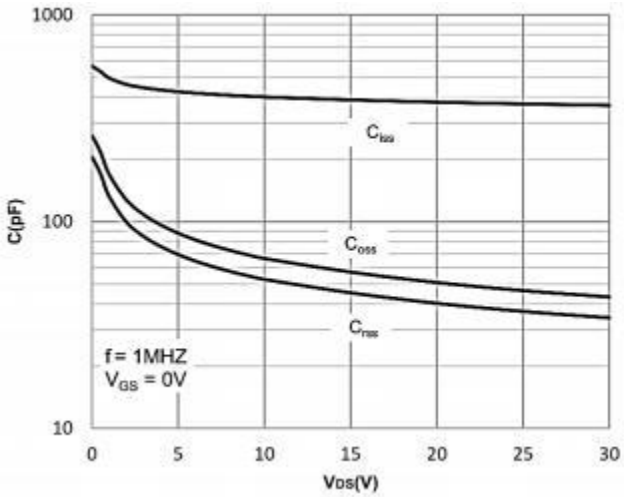


Figure 6: Capacitance Characteristics

Typical Characteristics

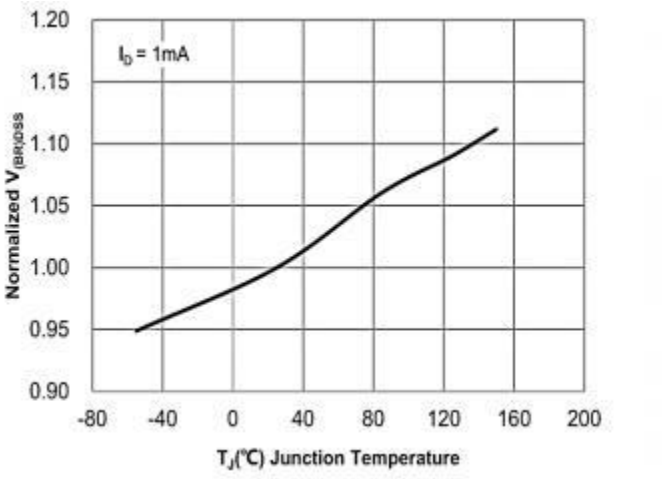


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

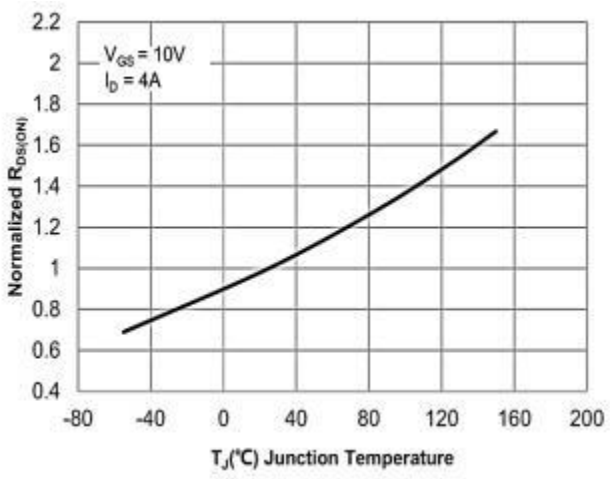


Figure 8: Normalized on Resistance vs. Junction Temperature

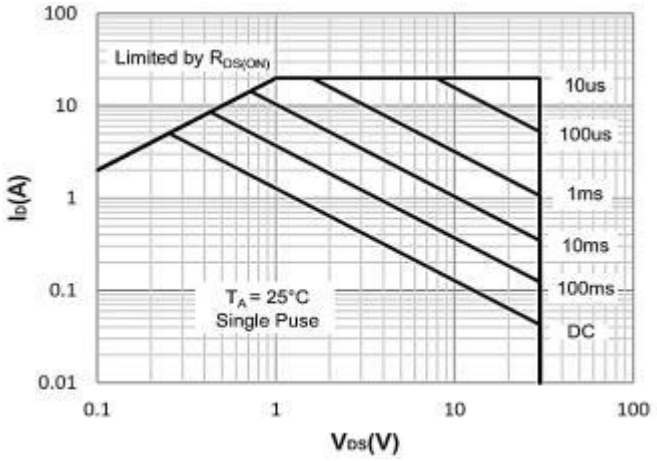


Figure 9: Maximum Safe Operating Area

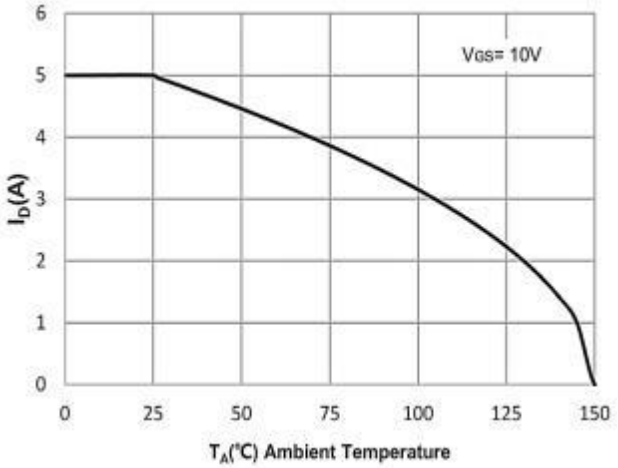


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

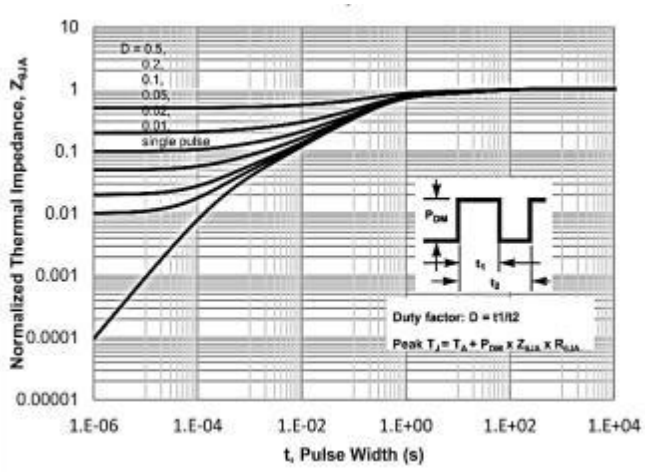


Figure 11: Normalized Maximum Transient Thermal Impedance

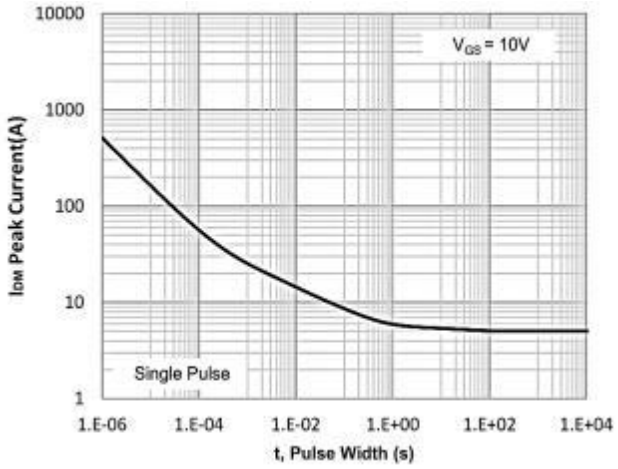
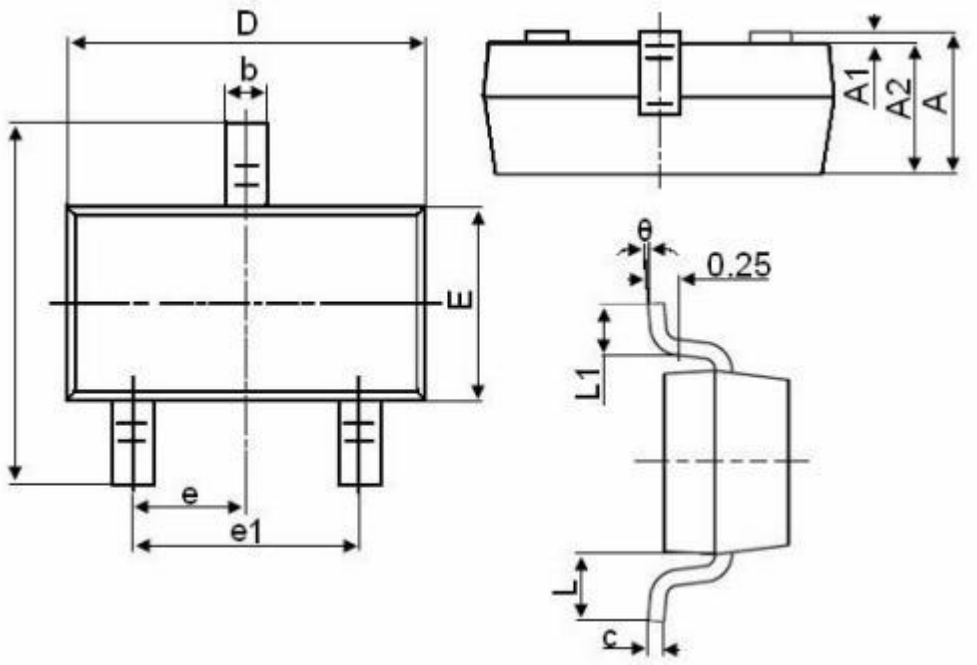


Figure 12: Peak Current Capacity

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