

Description

The SX3401MI 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

$V_{DS} = -30V$ $I_D = -4.8A$

$R_{DS(ON)} < 50m\Omega$ @ $V_{GS}=10V$

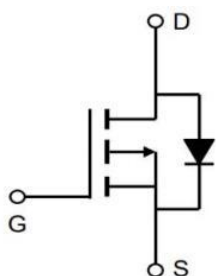
$R_{DS(ON)} < 55m\Omega$ @ $V_{GS}=4.5V$

Application

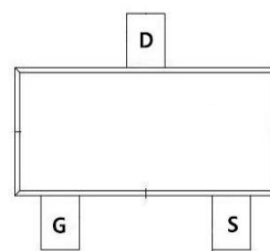
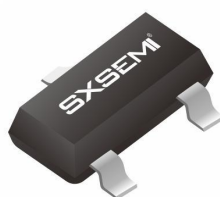
Battery protection

Load switch

Uninterruptible power supply



SOT-23-3L



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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	± 12	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-4.8	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, V_{GS} @ -10V ¹	-3.3	A
IDM	Pulsed Drain Current note ¹	-20.4	A
P _D	Power Dissipation $T_A = 25^\circ C$	2.15	W
R _{θJA}	Thermal Resistance Junction-Ambient ¹	125	$^\circ C/W$
R _{θJC}	Thermal Resistance Junction-Case ¹	104	$^\circ C/W$
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-30	-34	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = -30V, 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	-0.5	-1.0	-1.5	V
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =-10V, I _D =-5A	-	40	50	mΩ
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =-4.5V, I _D =-4A		45	55	mΩ
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =-2.5V, I _D =-1A	-	55	80	mΩ
C _{iss}	Input Capacitance	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz	-	745	-	pF
C _{oss}	Output Capacitance		-	70	-	pF
C _{rss}	Reverse Transfer Capacitance		-	57	-	pF
Q _g	Total Gate Charge	V _{DS} = -15V, I _D = -5.1A, V _{GS} = -10V	-	8	-	nC
Q _{gs}	Gate-Source Charge		-	1.8	-	nC
Q _{gd}	Gate-Drain(" Miller") Charge		-	2.7	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} = -15V, I _D = -1A, V _{GS} =-10V, R _{GEN} =2.5Ω	-	7	-	ns
t _r	Turn-on Rise Time		-	3	-	ns
t _{d(off)}	Turn-off Delay Time		-	30	-	ns
t _f	Turn-off Fall Time		-	12	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-4.8	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16.4	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = -5.1A	-	-0.8	-1.2	V

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 20Z copper.
- 2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

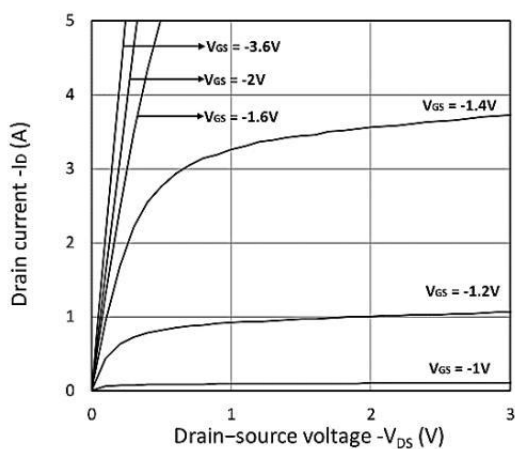


Figure 1. Output Characteristics

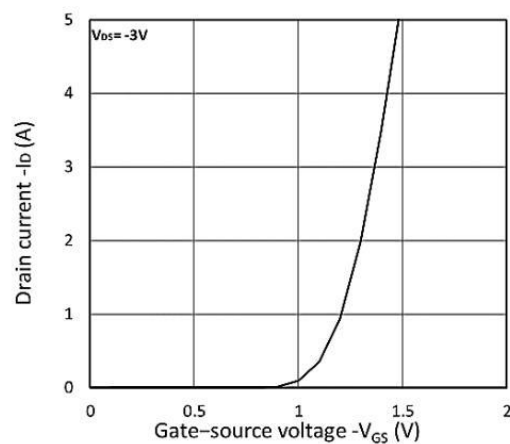


Figure 2. Transfer Characteristics

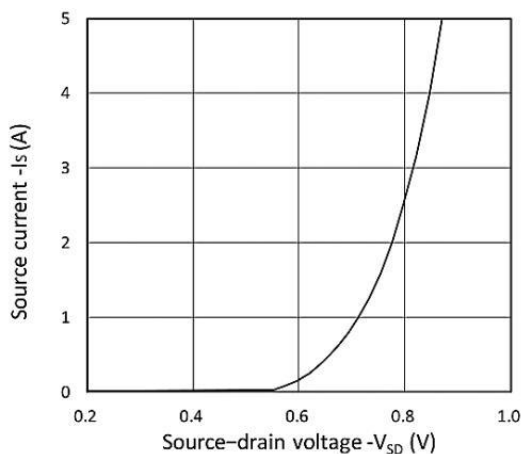


Figure 3. Forward Characteristics of Reverse

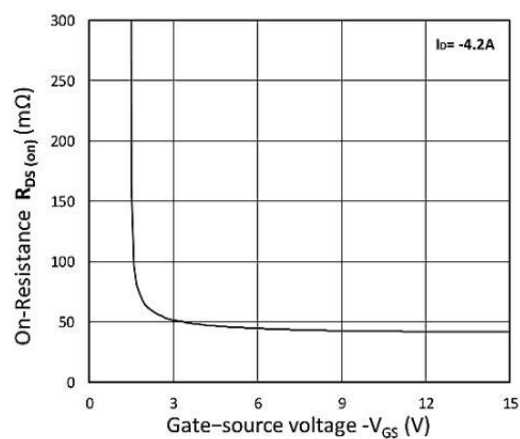


Figure 4. $R_{DS(on)}$ vs. V_{GS}

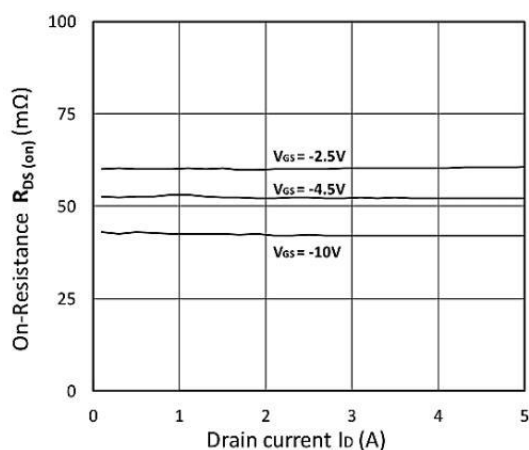


Figure 5. $R_{DS(on)}$ vs. I_D

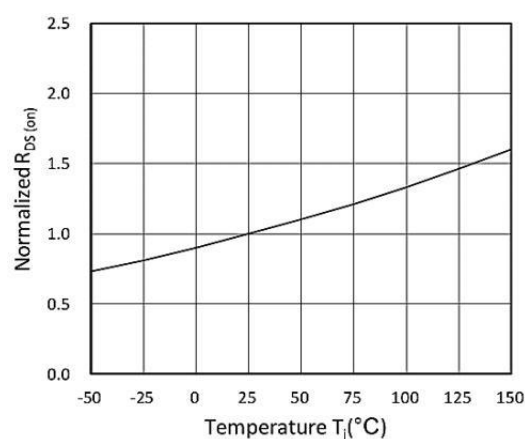


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics

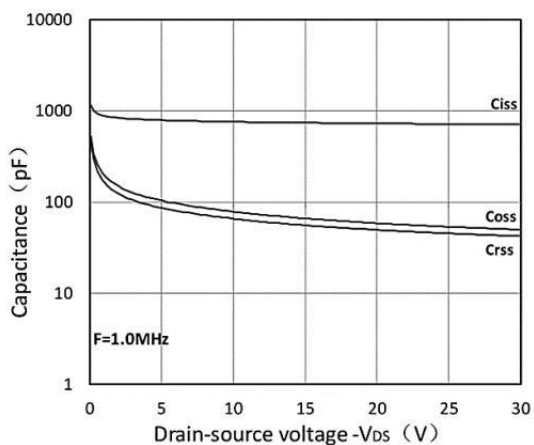


Figure 7. Capacitance Characteristics

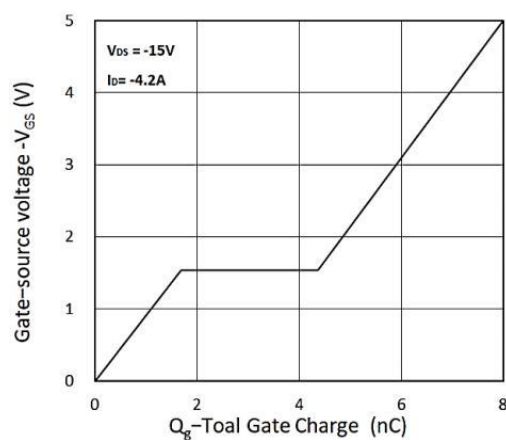


Figure 8. Gate Charge Characteristics

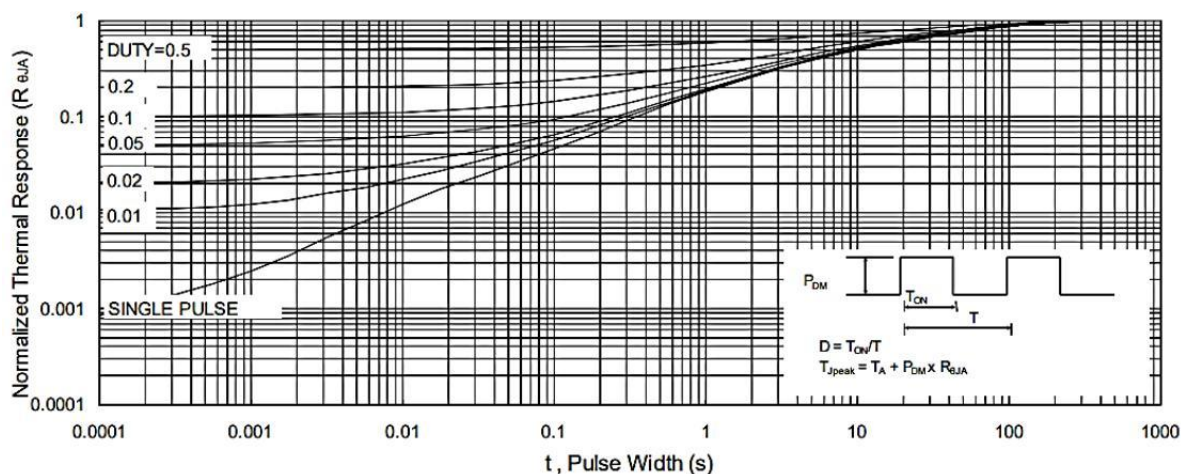


Figure 9 Normalized Maximum Transient Thermal Impedance

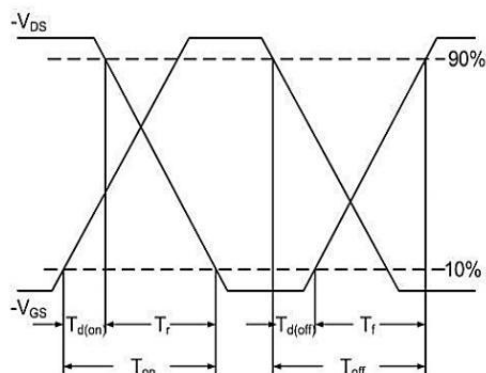


Figure.10 Switching Time Waveform

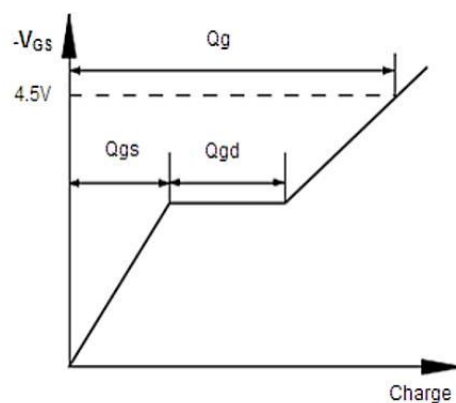
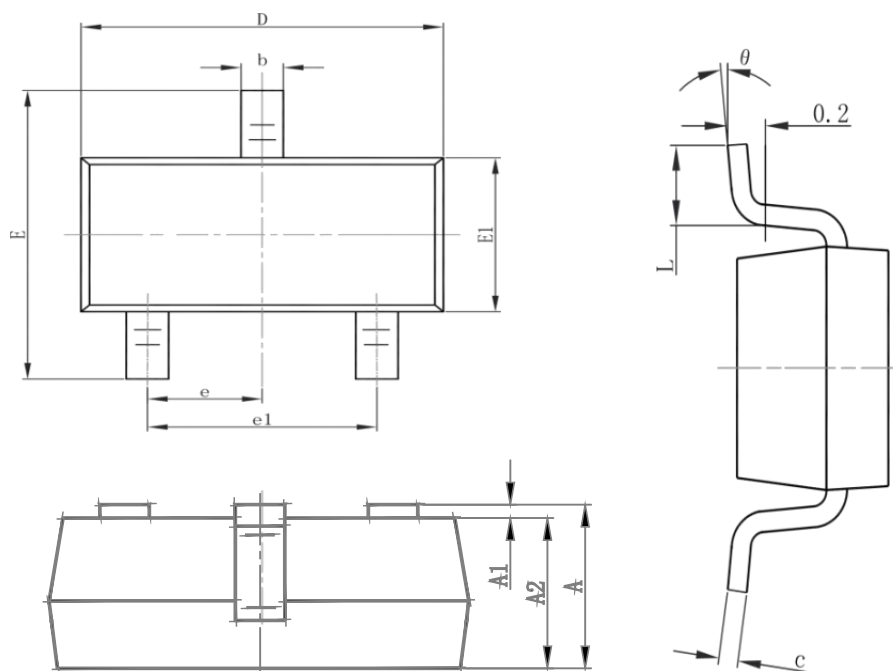


Figure.11 Gate Charge Waveform

Package Mechanical Data-SOT23-3-SLS-Single



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	SOT23-3L		3000