

Description

The SX3407AI 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

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

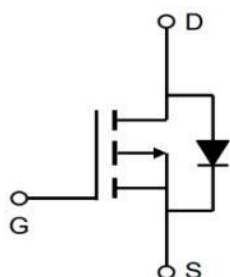
$R_{DS(ON)} < 55m\Omega$ @ $V_{GS} = 10V$

Application

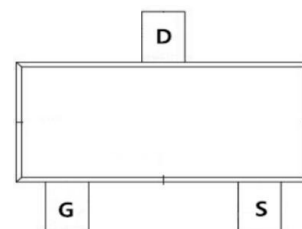
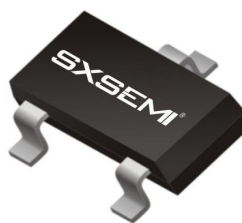
Battery protection

Load switch

Uninterruptible power supply



SOT-23



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

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	-30	V
V_{GSS}	Gate-Source Voltage	± 20	V
$I_D @ T_c = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -10V^1$	-4.8	A
$I_D @ T_c = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -10V^1$	-3.3	A
IDM	Pulsed Drain Current ^{note1}	-20.4	A
P_D	Power Dissipation $T_A = 25^\circ\text{C}$	2.15	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	104	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance from Junction to Ambient ²	125	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} = 0V	-	-	-1	μA
IGSS	Gate-Source Leakage	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate-Source Threshold voltage	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.5	-2.5	V
RDS(on)	Drain-Source on-State Resistance ³	V _{GS} = -10V, I _D = -4.1A	-	40	55	mΩ
		V _{GS} = -4.5V, I _D = -3A	-	54	65	
Ciss	Input Capacitance	V _{GS} = 0V , V _{DS} = -15V, f = 1.0MHz	-	530	-	pF
Coss	Output Capacitance		-	70	-	
Crss	Reverse Transfer Capacitance		-	56	-	
Qg	Total Gate Charge	V _{GS} = -10V, V _{DS} = -15V, I _D = -4.1A	-	6.8	-	nC
Qgs	Gate-Source Charge		-	1.0	-	
Qgd	Gate-Drain Charge		-	1.4	-	
td(on)	Turn-on Delay Time	V _{GS} = -10V, V _{DS} = -15V , R _L = 15Ω, R _{GEN} = 2.5Ω	-	14	-	ns
t _r	Rise Time		-	61	-	
td(off)	Turn-off Delay time		-	19	-	
t _f	Fall Time		-	10	-	
VSD	Diode Forward Voltage ³	I _S = -4.1A, V _{GS} = 0V	-	-	-1.2	V
IS	Continuous Source Current		-	-	-4.1	A

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°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

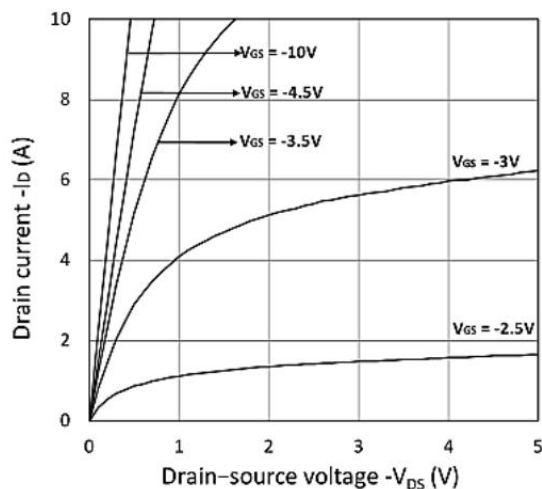


Figure 1. Output Characteristics

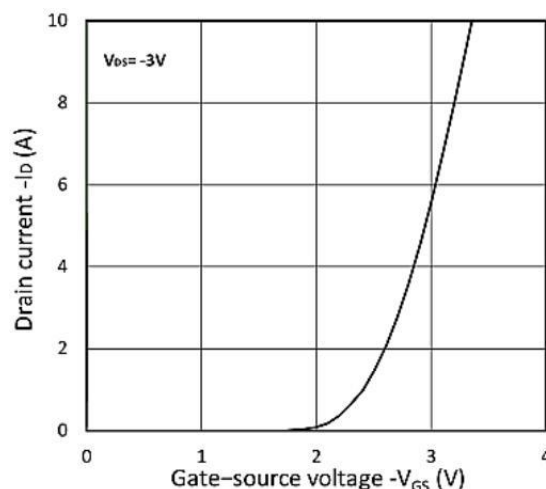


Figure 2. Transfer Characteristics

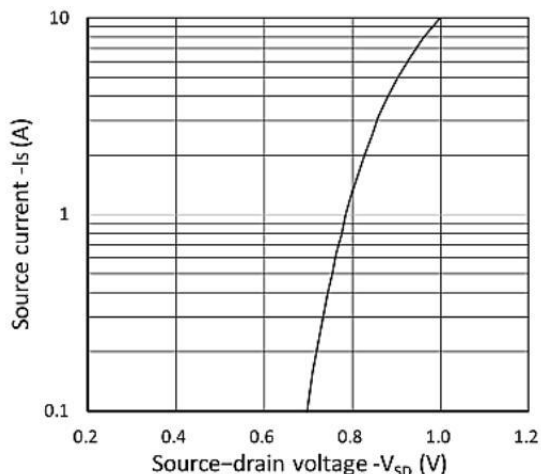


Figure 3. Forward Characteristics of Reverse

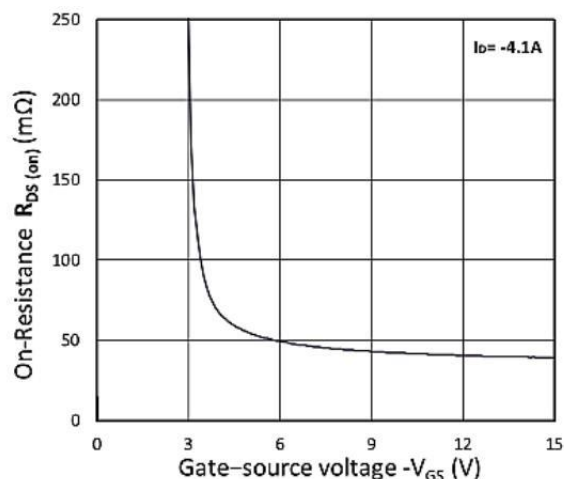


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

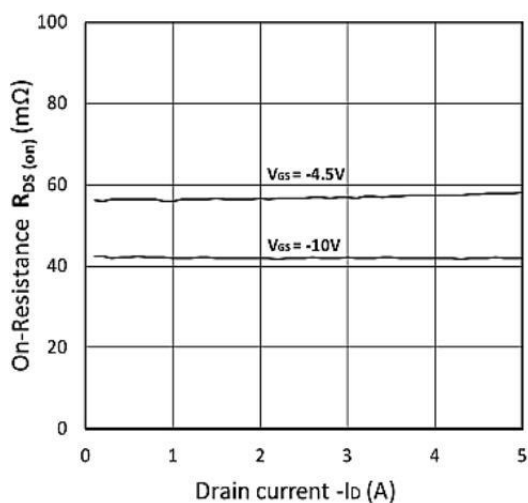


Figure 5. $R_{DS(ON)}$ vs. I_D

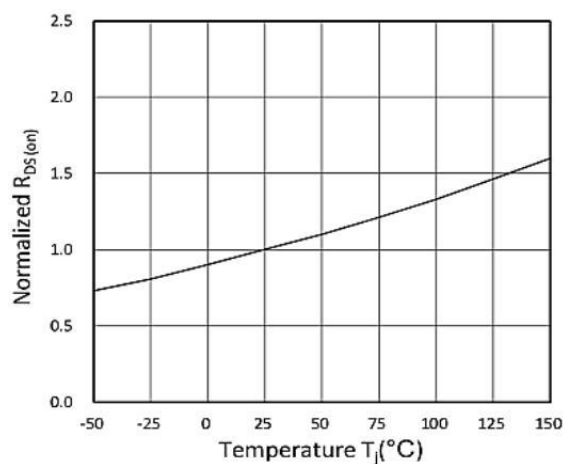


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

Typical Characteristics

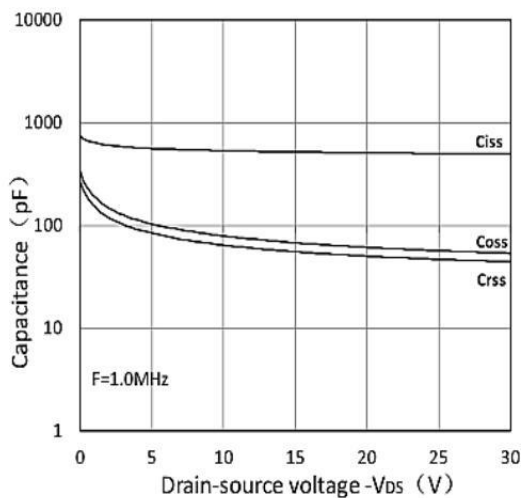


Figure 7. Capacitance Characteristics

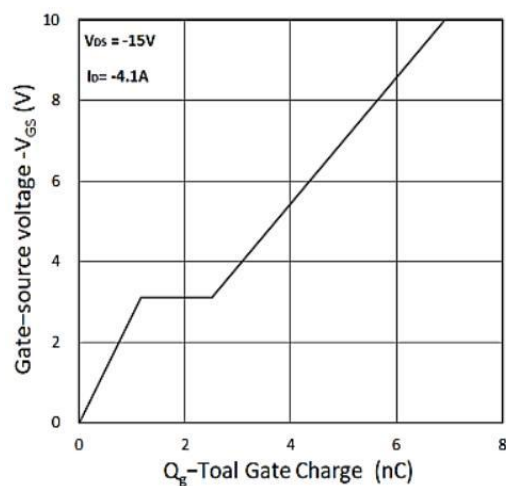


Figure 8. Gate Charge Characteristics

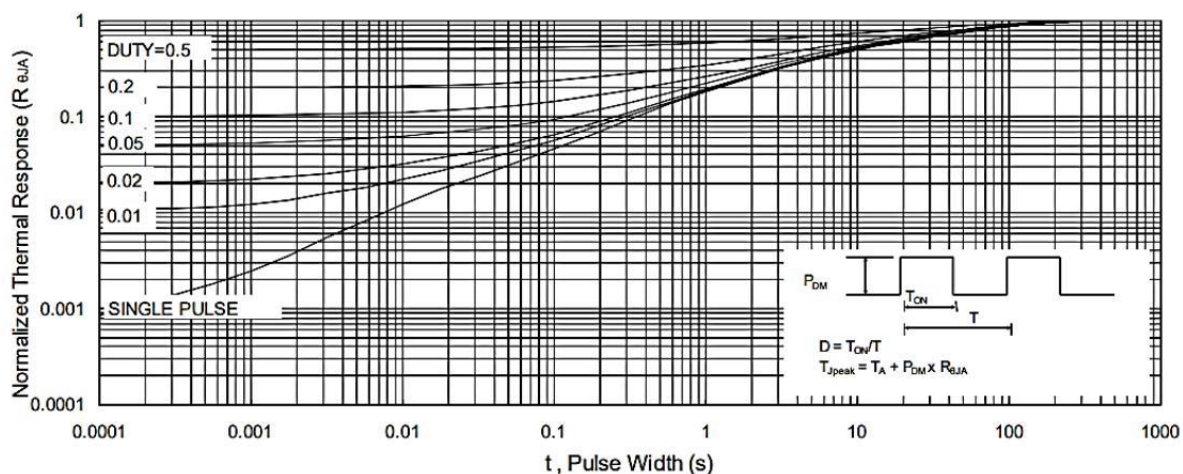


Figure 9 Normalized Maximum Transient Thermal Impedance

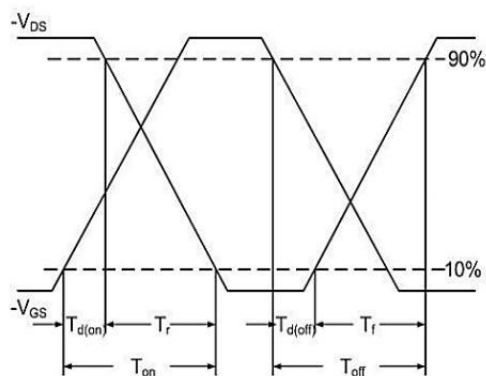


Figure.10 Switching Time Waveform

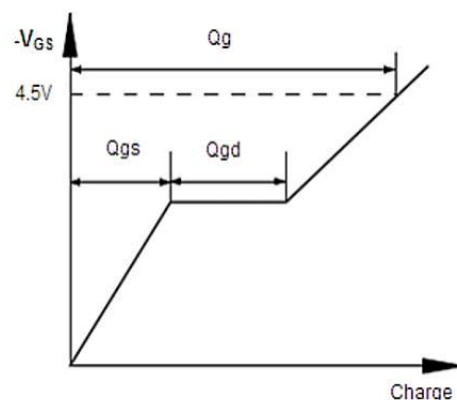
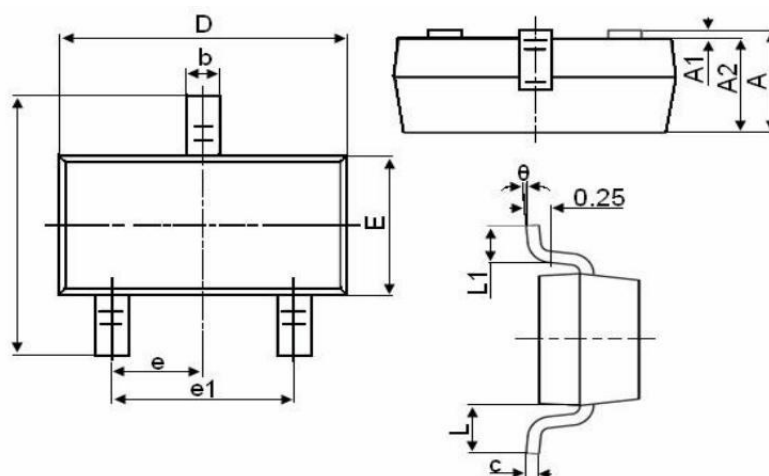


Figure.11 Gate Charge Waveform

Package Mechanical Data-SOT23-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