General Description

This MOSFET 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.

Features

- Low gate charge
- High power and current handing capability
- Lead free product is acquired

RoHS compliant

Applications

- Load switch
- Battery protection
- Power management

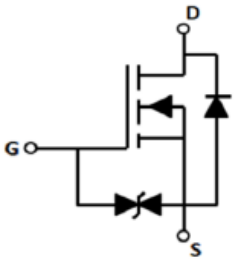
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	20	V
$R_{DS(ON),\ max}$ @ V_{GS}=4.5V	18	mΩ

Marking Information

Product Name	Package	Marking
OSH2312A	SOT-23	A9XX

Package & Pin information



Absolute Maximum Ratings at T_j=25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	7.2	A
Pulsed Drain Current [1)]	$I_{D,pulse}$	29	A
Power Dissipation	P_D	1.4	mW
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-Ambient	$R_{\theta JA}$	90	°C/W

Electrical Characteristics at T_j=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	20			V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	$V_{GS(th)}$	0.45		1.0	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		13.5	18	mΩ	V_{GS}=4.5 V, I_D=6.8 A
			17	22	mΩ	V_{GS}=2.5 V, I_D=3.0 A
			27	39	mΩ	V_{GS}=1.8 V, I_D=2.5 A
Gate-source leakage current	I_{GSS}			100	μA	V_{GS}=10 V, V_{DS}=0 V
				-100		V_{GS}=-10 V, V_{DS}=0 V
Drain-source leakage current	I_{DSS}			1	μA	V_{DS}=20 V, V_{GS}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		880		pF	V_{GS}=0 V, V_{DS}=10 V, f=1.0 MHz
Output capacitance	C_{oss}		116		pF	
Reverse transfer capacitance	C_{rss}		92		pF	
Turn-on Delay Time	$t_{d(on)}$		12		ns	V_{GS}=4.5 V, V_{DD}=10 V, R_L=1.5 Ω, R_{GEN}=3 Ω
Turn-on Rise Time	t_r		52		ns	
Turn-Off Delay Time	$t_{d(off)}$		17		ns	
Turn-Off Fall Time	t_f		10		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		11		nC	V_{GS}=4.5 V, V_{DS}=10 V, I_D=6.8 A
Gate-Source Charge	Q_{gs}		1.2		nC	
Gate-Drain Charge	Q_{gd}		2.9		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			7.2	A	T_A=25°C
Diode forward voltage [2]	V_{SD}		0.8	1.2	V	I_S=7.2 A, V_{GS}=0 V

Note: 1) Pulse width limited by maximum allowable junction temperature.

2) Repetitive Rating: Pulse width limited by maximum junction temperature.

Electrical Characteristics Diagrams

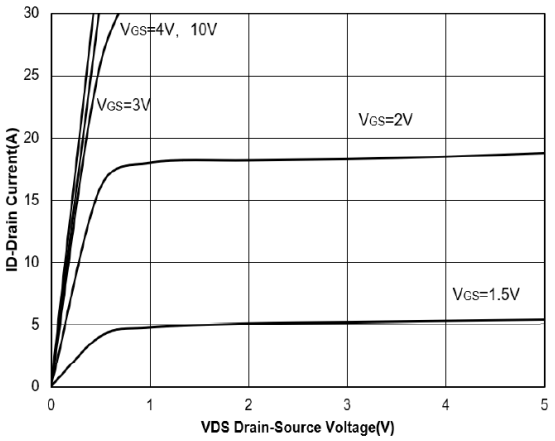


Figure 1. Output characteristics

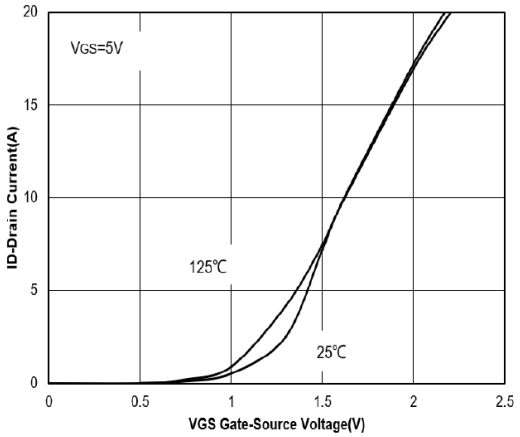


Figure 2. Transfer characteristics

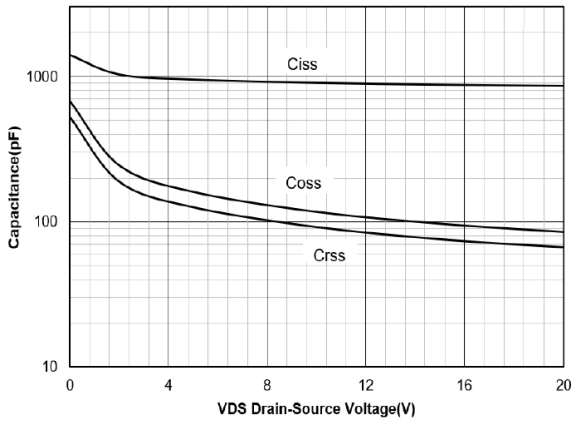


Figure 3. Capacitances

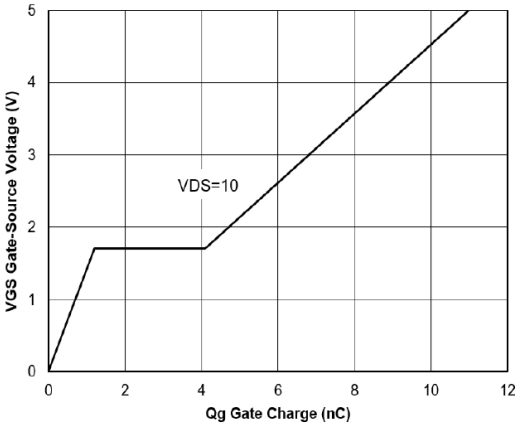


Figure 4. Gate charge

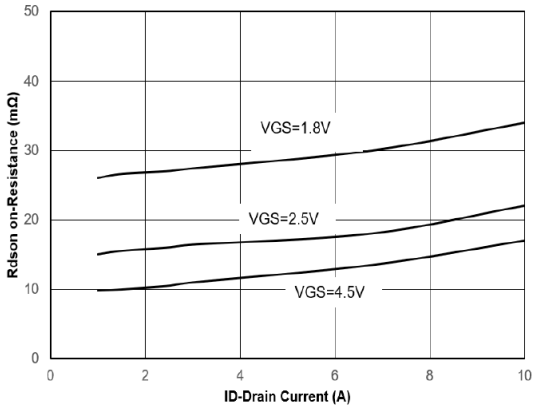


Figure 5. Drain-Source on Resistance

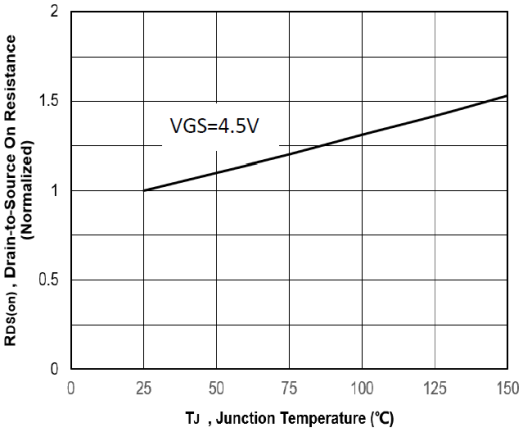
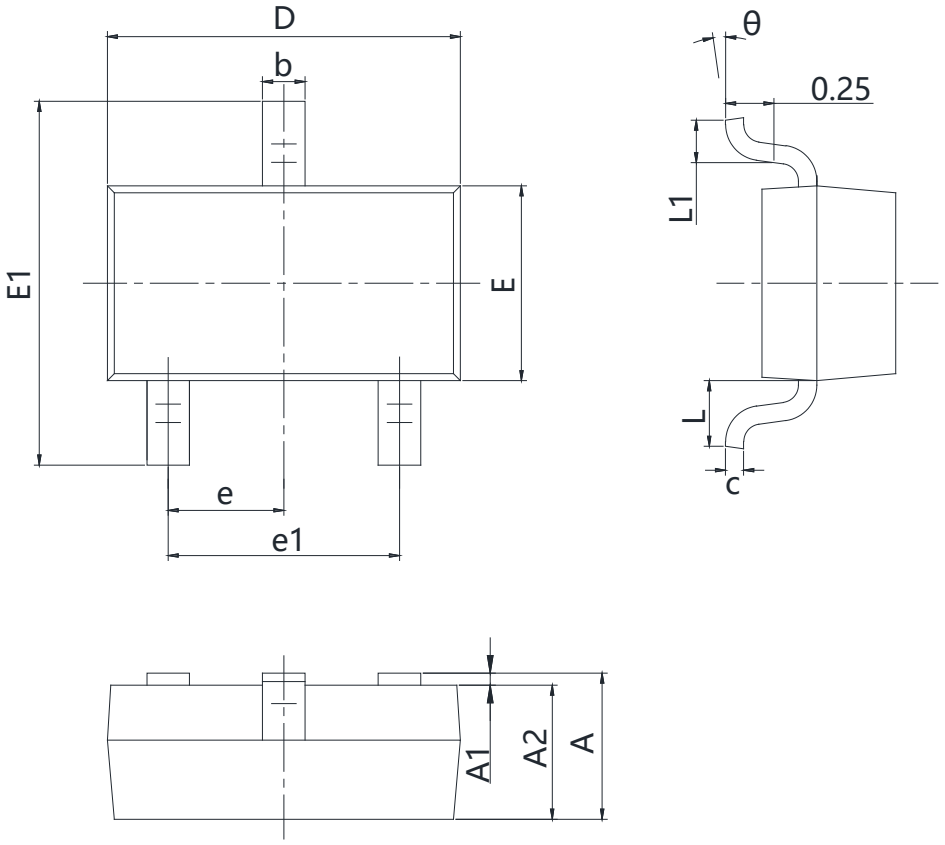


Figure 6. $R_{DS(ON)}$ vs junction temperature

Package Information



Symbol	mm	
	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
e	0.950 TYP	
e1	1.800	2.000
L	0.550 REF	
L1	0.300	0.500
θ	0°	8°

Version: SOT-23-V package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT-23	3000	10	30000	4	120000

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