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

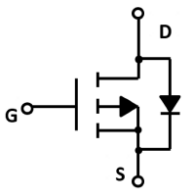
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	-60	V
$R_{DS(ON),\ max}$ @ V_{GS}=-10V	155	mΩ

Marking Information

Product Name	Package	Marking
OSH2309	SOT-23	E4XX

Package & Pin information



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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	-60	V
Gate-source voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-2.2	A
Pulsed Drain Current [1)]	$I_{D,pulse}$	-9	A
Power Dissipation	P_D	1.3	mW
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-Ambient	$R_{\theta JA}$	100	°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}	-60			V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	$V_{GS(th)}$	-1		-2.5	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		130	155	mΩ	V_{GS}=-10 V, I_D=-1.5 A
			145	190	mΩ	V_{GS}=-4.5 V, I_D=-1 A
Gate-source leakage current	I_{GSS}			100	μA	V_{GS}=20 V, V_{DS}=0 V
				-100		V_{GS}=-20 V, V_{DS}=0 V
Drain-source leakage current	I_{DSS}			-1	μA	V_{DS}=-60 V, V_{GS}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		970		pF	V_{GS}=0 V, V_{DS}=-30 V, f=1.0 MHz
Output capacitance	C_{oss}		33.4		pF	
Reverse transfer capacitance	C_{rss}		30		pF	
Turn-on Delay Time	$t_{d(on)}$		5.4		ns	V_{GS}=-10 V, V_{DD}=-30 V, I_D=-2.2 A, R_{GEN}=3 Ω
Turn-on Rise Time	t_r		4		ns	
Turn-Off Delay Time	$t_{d(off)}$		70		ns	
Turn-Off Fall Time	t_f		18.5		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		16.7		nC	V_{GS}=-10 V, V_{DS}=-30 V, I_D=-2.2 A
Gate-Source Charge	Q_{gs}		0.5		nC	
Gate-Drain Charge	Q_{gd}		1.6		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			-2.2	A	T_A=25°C
Diode forward voltage [2]	V_{SD}		-0.8	-1.2	V	I_S=-2.2 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

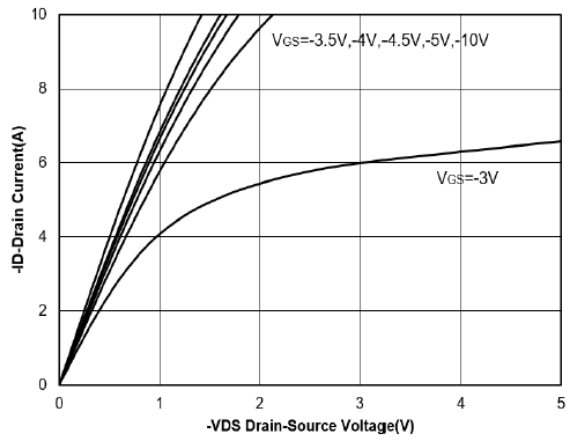


Figure 1. Output characteristics

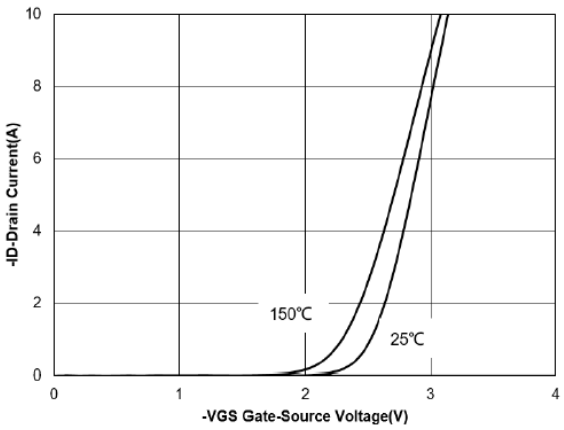


Figure 2. Transfer characteristics

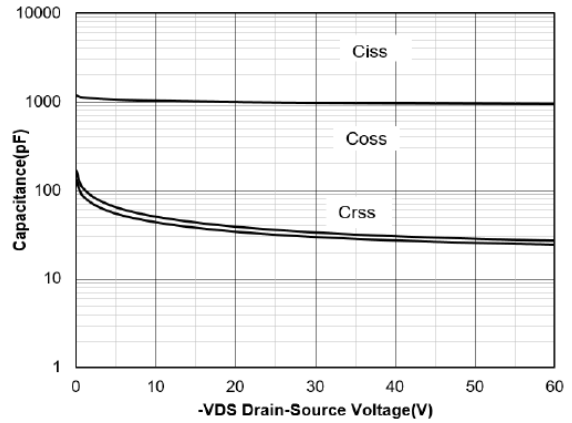


Figure 3. Capacitances

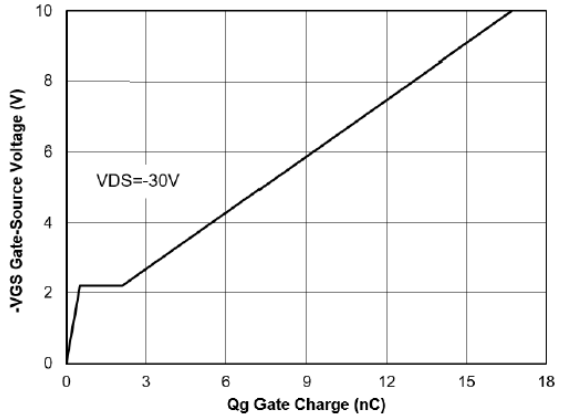


Figure 4. Gate charge

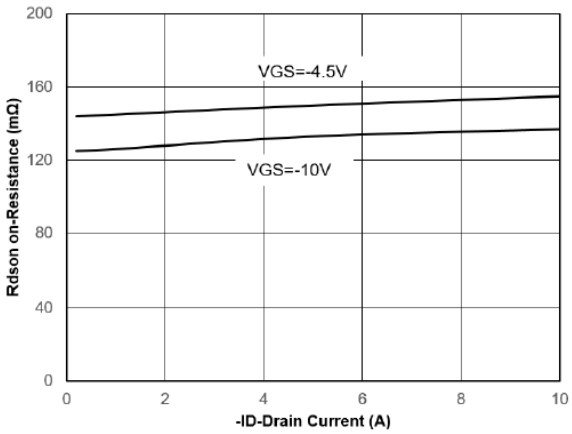


Figure 5. Drain-Source on Resistance

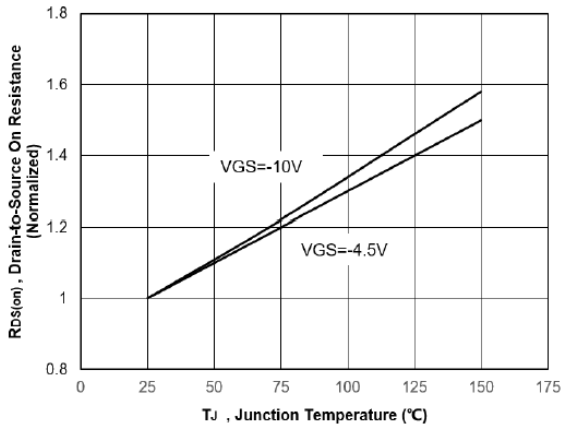
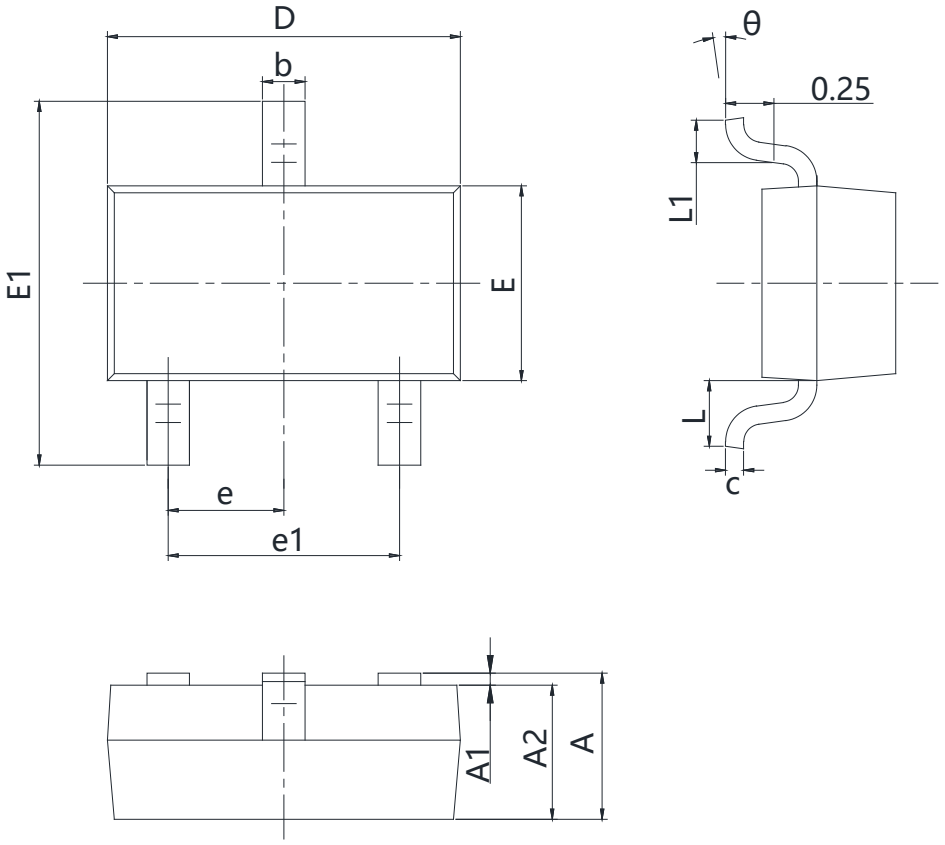


Figure 6. $R_{DS(ON)}$ vs junction temperature

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

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Oriental Semiconductor hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

For further information on technology, delivery terms and conditions and prices, please contact the Oriental Semiconductor sales representatives (www.orientalsemi.com).

ORIENTAL SEMICONDUCTOR

A Power Semiconductor Innovator