

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 handling capability
- Lead free product is acquired

Applications

- Load switch
- Battery protection
- Power management



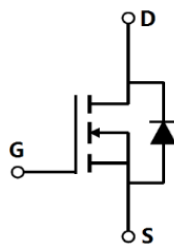
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	20	V
$R_{DS(ON), max} @ V_{GS}=4.5V$	32	$m\Omega$

Marking Information

Product Name	Package	Marking
OSH2302	SOT-23	2302

Package & Pin information



Absolute Maximum Ratings at $T_j=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	4.5	A
Pulsed Drain Current ¹⁾	$I_{D,pulse}$	18	A
Power Dissipation	P_D	1	W
Operation and storage temperature	T_{stg}, T_j	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-Ambient	$R_{\theta JA}$	125	$^{\circ}\text{C/W}$

Electrical Characteristics at $T_j=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	20			V	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	0.5	0.85	1.2	V	$V_{DS}=V_{GS}, I_D=250\text{ }\mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		26	32	$\text{m}\Omega$	$V_{GS}=4.5\text{ V}, I_D=3\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		31	48	$\text{m}\Omega$	$V_{GS}=2.5\text{ V}, I_D=2.5\text{ A}$
Gate-source leakage current	I_{GSS}			100	nA	$V_{GS}=12\text{ V}, V_{DS}=0\text{ V}$
				-100		$V_{GS}=-12\text{ V}, V_{DS}=0\text{ V}$
Drain-source leakage current	I_{DSS}			1	μA	$V_{DS}=20\text{ V}, V_{GS}=0\text{ V}$

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		502		pF	$V_{GS}=0\text{ V}$, $V_{DS}=10\text{ V}$, $f=1.0\text{ MHz}$
Output capacitance	C_{oss}		71		pF	
Reverse transfer capacitance	C_{rss}		63		pF	
Turn-on Delay Time	$t_{d(on)}$		10		ns	$V_{GS}=4.5\text{ V}$, $V_{DD}=10\text{ V}$, $I_D=3\text{ A}$, $R_{GEN}=6\text{ }\Omega$
Turn-on Rise Time	t_r		45		ns	
Turn-Off Delay Time	$t_{d(off)}$		16		ns	
Turn-Off Fall Time	t_f		9		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		6.1		nC	$V_{GS}=4.5\text{ V}$, $V_{DS}=10\text{ V}$, $I_D=3\text{ A}$
Gate-Source Charge	Q_{gs}		0.9		nC	
Gate-Drain Charge	Q_{gd}		2.2		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			4.5	A	$T_A=25^\circ\text{C}$
Diode forward voltage ²⁾	V_{SD}			1.2	V	$I_S=3\text{ A}$, $V_{GS}=0\text{ V}$

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

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

Electrical Characteristics Diagrams

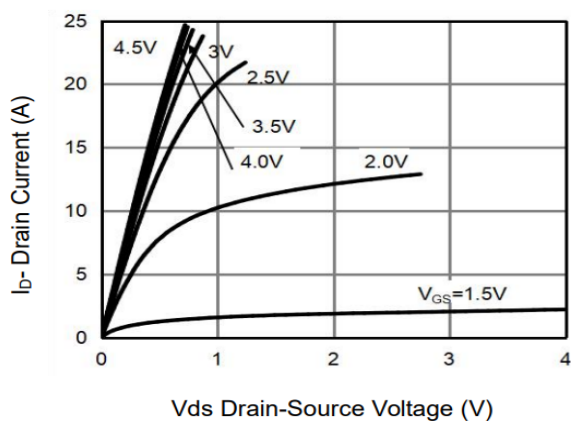


Figure 1. Typ. output characteristics

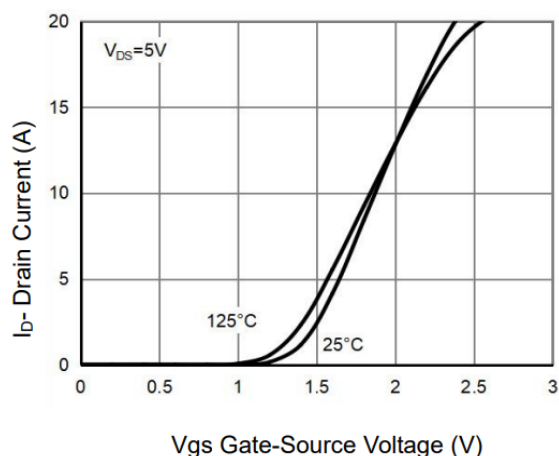


Figure 2. Typ. transfer characteristics

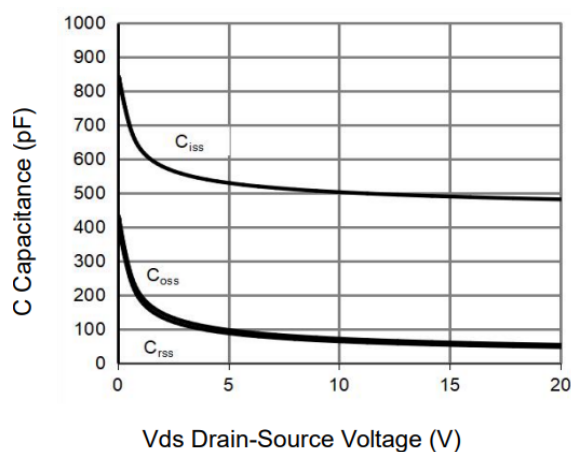


Figure 3. Typ. capacitances

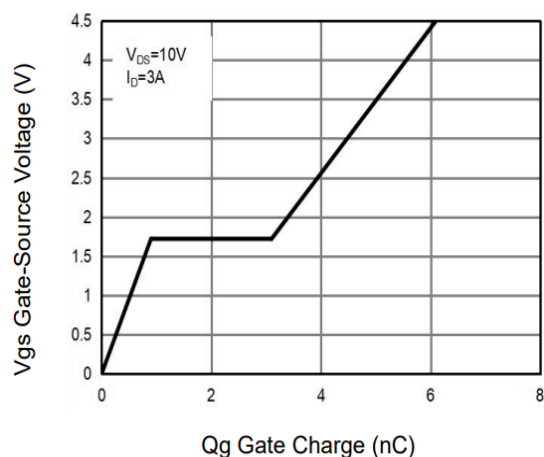


Figure 4. Gate charge

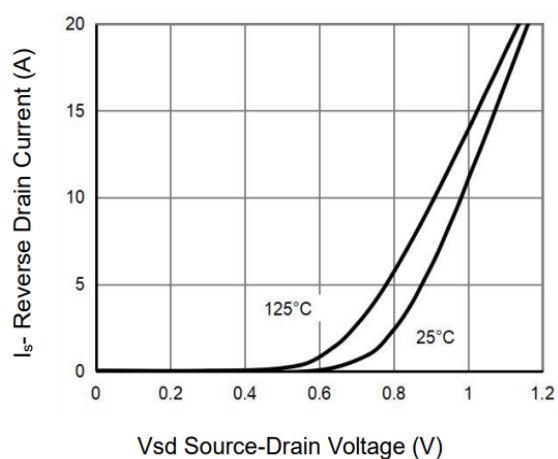


Figure 5. Body-diode characteristics

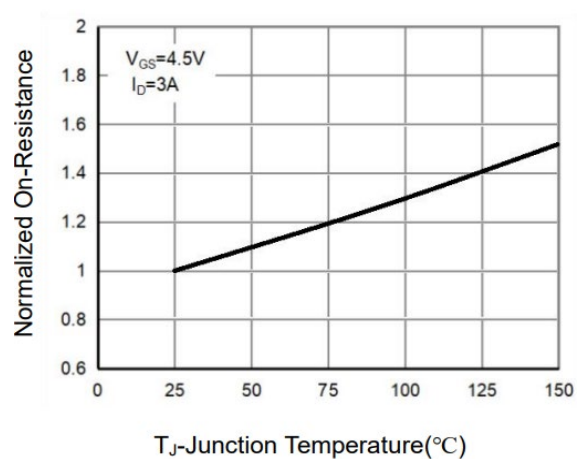
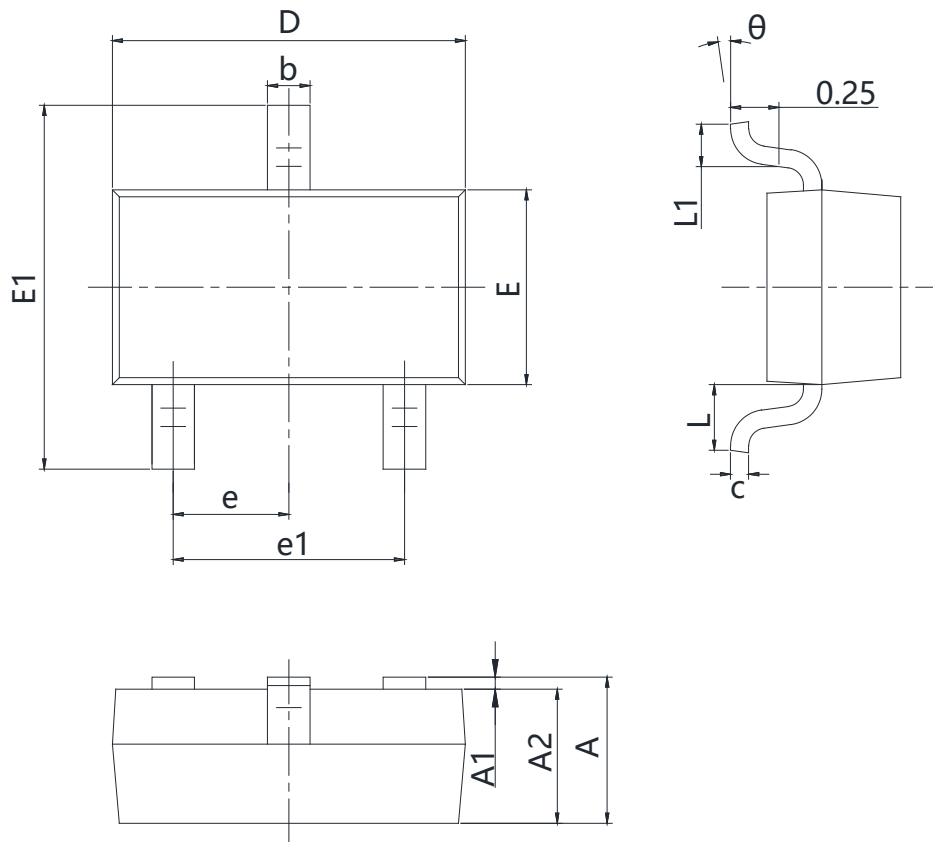


Figure 6. $R_{DS(ON)}$ vs junction temperature

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	15	45000	4	180000

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