

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

Applications

- Load switch
- Battery protection
- Power management



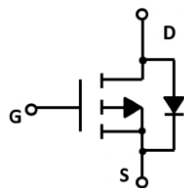
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	30	V
$R_{DS(ON), max} @ V_{GS}=10V$	38.4	m Ω

Marking Information

Product Name	Package	Marking
OSH3402	SOT-23	D7XX

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}	30	V
Gate-source voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	4.8	A
Pulsed Drain Current ¹⁾	$I_{D,pulse}$	19	A
Power Dissipation	P_D	1.4	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	$R_{\theta JA}$	90	$^{\circ}\text{C/W}$

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}	30			V	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	0.6		1.1	V	$V_{DS}=V_{GS}, I_D=250\text{ }\mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		32	38.4	$\text{m}\Omega$	$V_{GS}=10\text{ V}, I_D=4\text{ A}$
			35	42	$\text{m}\Omega$	$V_{GS}=4.5\text{ V}, I_D=3\text{ A}$
			42	55	$\text{m}\Omega$	$V_{GS}=2.5\text{ V}, I_D=1\text{ A}$
Gate-source leakage current	I_{GSS}			100	μA	$V_{GS}=12\text{ V}, V_{DS}=0\text{ V}$
				-100		$V_{GS}=-12\text{ V}, V_{DS}=0\text{ V}$
Drain-source leakage current	I_{DSS}			1	μA	$V_{DS}=30\text{ V}, V_{GS}=0\text{ V}$

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		590		pF	$V_{GS}=0\text{ V}$, $V_{DS}=15\text{ V}$, $f=1.0\text{ MHz}$
Output capacitance	C_{oss}		34		pF	
Reverse transfer capacitance	C_{rss}		29		pF	
Turn-on Delay Time	$t_{d(on)}$		2.04		ns	$V_{GS}=10\text{ V}$, $V_{DD}=10\text{ V}$, $I_D=4.8\text{ A}$, $R_{GEN}=3\ \Omega$
Turn-on Rise Time	t_r		3		ns	
Turn-Off Delay Time	$t_{d(off)}$		52.3		ns	
Turn-Off Fall Time	t_f		9.8		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		12.6		nC	$V_{GS}=10\text{ V}$, $V_{DS}=10\text{ V}$, $I_D=4.8\text{ A}$
Gate-Source Charge	Q_{gs}		0.98		nC	
Gate-Drain Charge	Q_{gd}		1.34		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			4.8	A	$T_A=25^\circ\text{C}$
Diode forward voltage ²⁾	V_{SD}			1.2	V	$I_S=4.8\text{ A}$, $V_{GS}=0\text{ V}$

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

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

Electrical Characteristics Diagrams

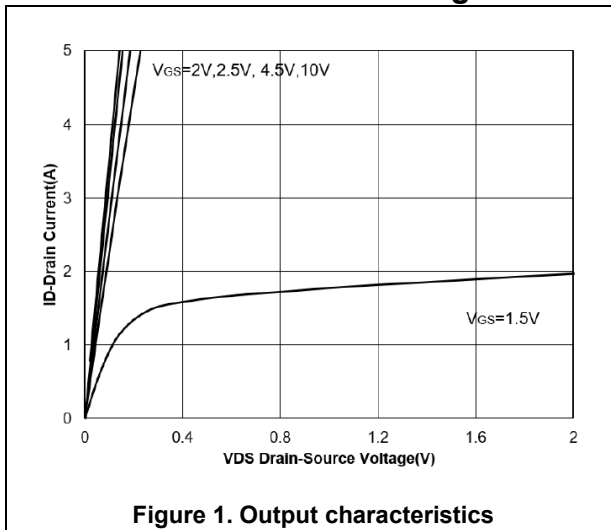


Figure 1. Output characteristics

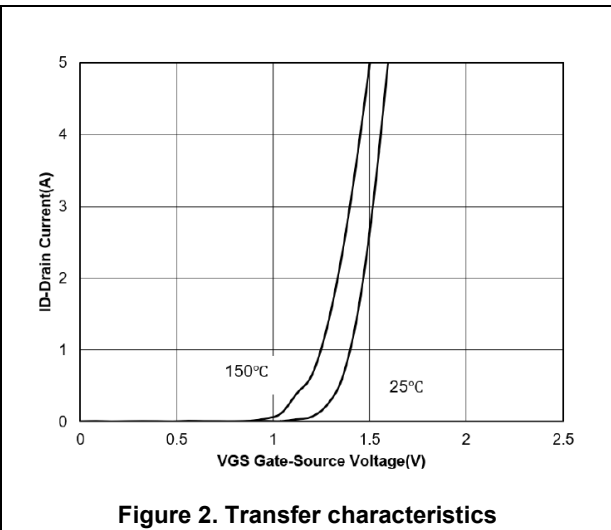


Figure 2. Transfer characteristics

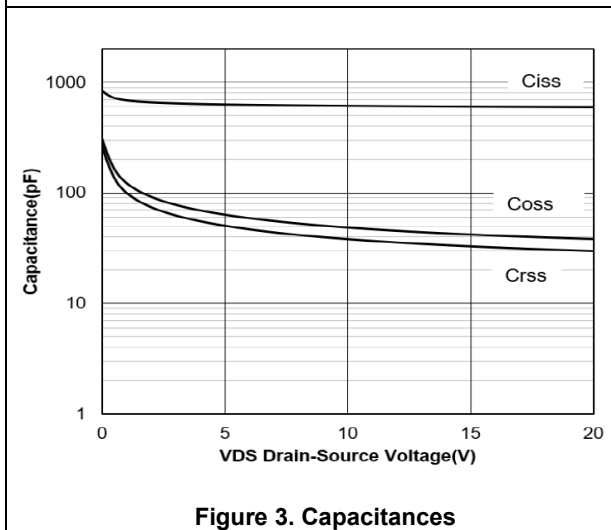


Figure 3. Capacitances

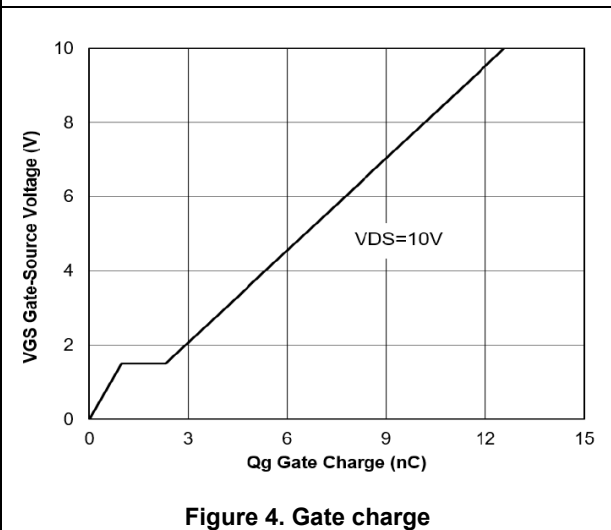


Figure 4. Gate charge

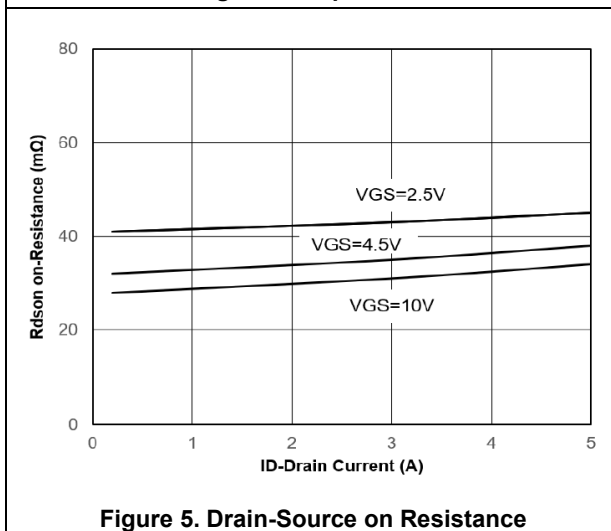


Figure 5. Drain-Source on Resistance

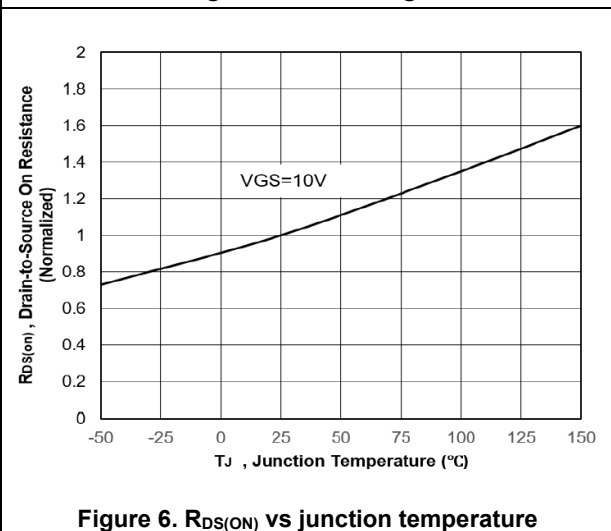
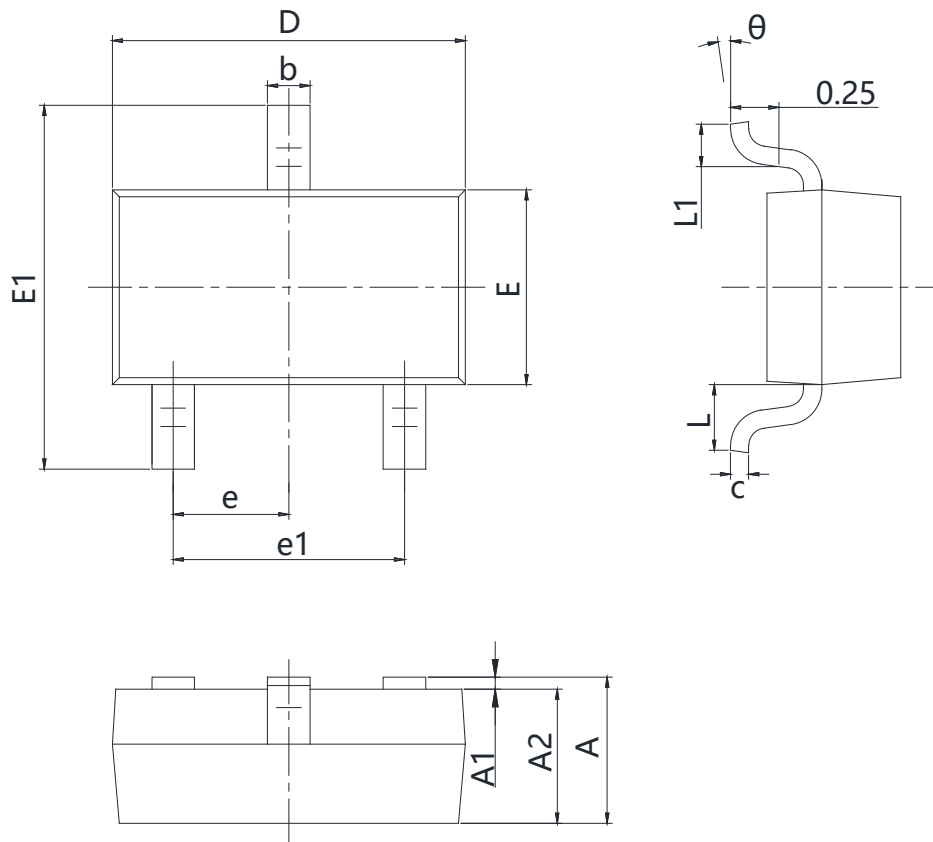


Figure 6. $R_{DS(ON)}$ vs junction temperature

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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