

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

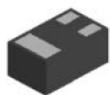
Parameter	Value	Unit
V_{DS}	-20	V
$R_{DS(ON), max} @ V_{GS}=4.5V$	850	mΩ

Marking Information

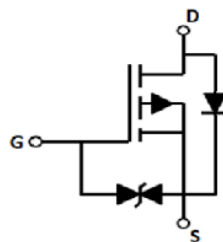
Product Name	Package	Marking
OSH3139KBV	DFN1006-3L	M5

Package & Pin information

DFN1006-3L



Bottom View



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}	± 10	V
Continuous Drain Current	I_D	-0.5	A
Pulsed Drain Current ¹⁾	$I_{D,pulse}$	-2.24	A
Power Dissipation	P_D	340	mW
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	$R_{\theta JA}$	366	$^{\circ}\text{C/W}$

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	$V_{GS(th)}$	-0.35		-1.2	V	$V_{DS}=V_{GS}, I_D=-250\text{ }\mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		610	850	$\text{m}\Omega$	$V_{GS}=-4.5\text{ V}, I_D=-0.5\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		930	1200	$\text{m}\Omega$	$V_{GS}=-2.5\text{ V}, I_D=-0.3\text{ A}$
Gate-source leakage current	I_{GSS}			10	μA	$V_{GS}=10\text{ V}, V_{DS}=0\text{ V}$
				-10		$V_{GS}=-10\text{ V}, V_{DS}=0\text{ V}$
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}		70		pF	$V_{GS}=0\text{ V}$, $V_{DS}=-10\text{ V}$, $f=1.0\text{ MHz}$
Output capacitance	C_{oss}		19		pF	
Reverse transfer capacitance	C_{rss}		14		pF	
Turn-on Delay Time	$t_{d(on)}$		4.5		ns	$V_{GS}=-4.5\text{ V}$, $V_{DD}=-10\text{ V}$, $R_L=2.5\ \Omega$, $R_{GEN}=2.5\ \Omega$
Turn-on Rise Time	t_r		18		ns	
Turn-Off Delay Time	$t_{d(off)}$		15		ns	
Turn-Off Fall Time	t_f		23		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		1.22		nC	$V_{GS}=-4.5\text{ V}$, $V_{DS}=-10\text{ V}$, $I_D=-0.5\text{ A}$
Gate-Source Charge	Q_{gs}		0.36		nC	
Gate-Drain Charge	Q_{gd}		0.26		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			-0.56	A	$T_A=25^\circ\text{C}$
Diode forward voltage ²⁾	V_{SD}			-1.2	V	$I_S=-0.56\text{ A}$, $V_{GS}=0\text{ V}$

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

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

Electrical Characteristics Diagrams

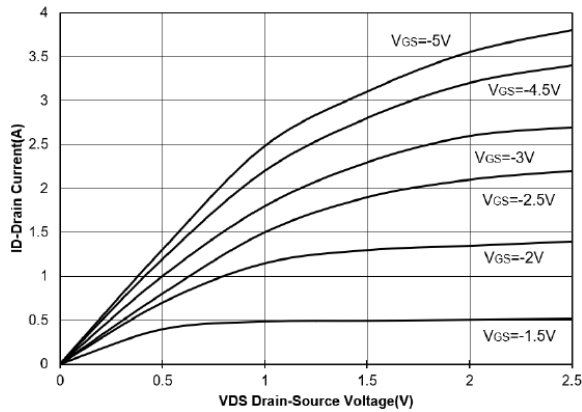


Figure 1. Typ. output characteristics

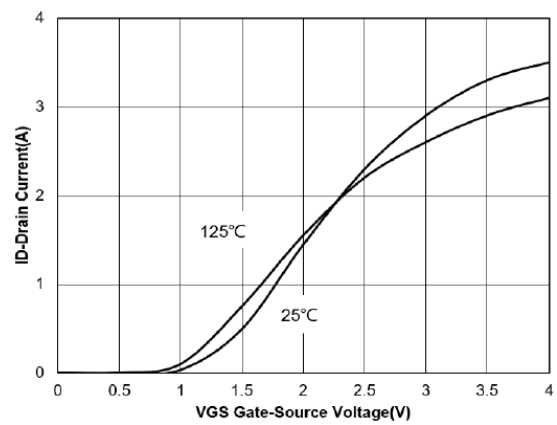


Figure 2. Typ. transfer characteristics

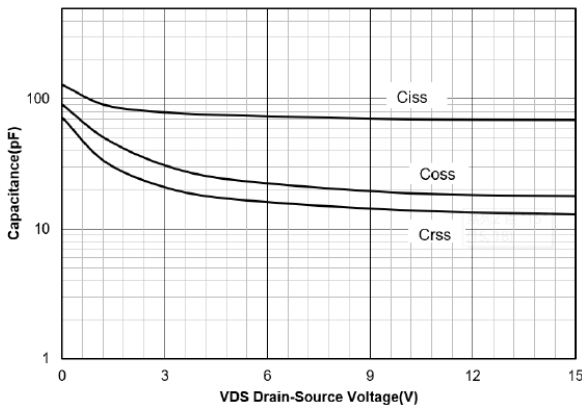


Figure 3. Typ. capacitances

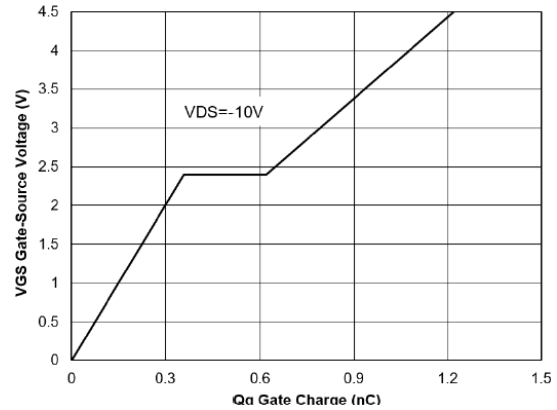


Figure 4. Gate charge

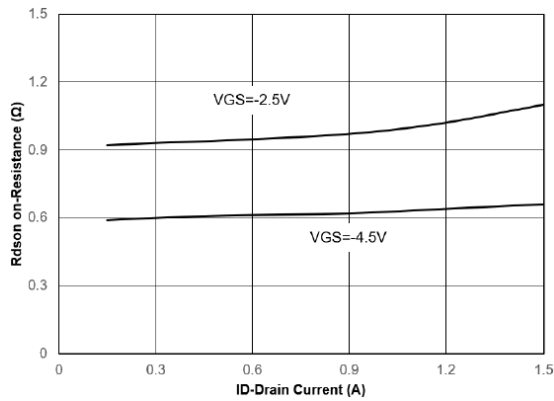


Figure 5. Drain-Source on Resistance

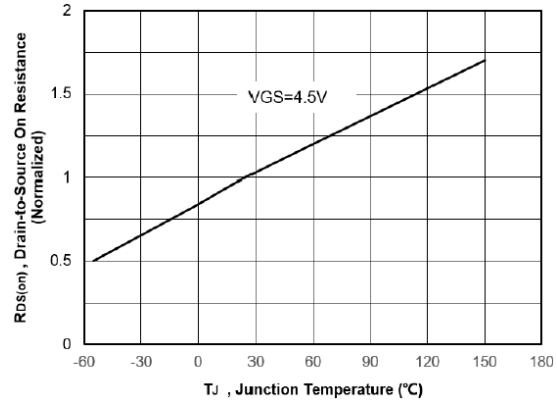
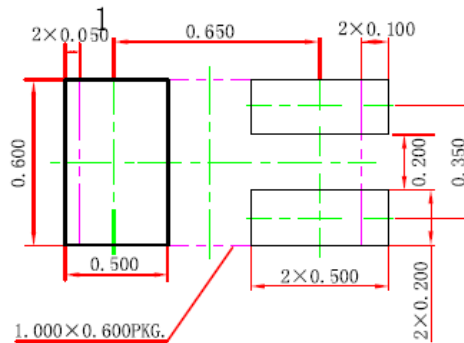
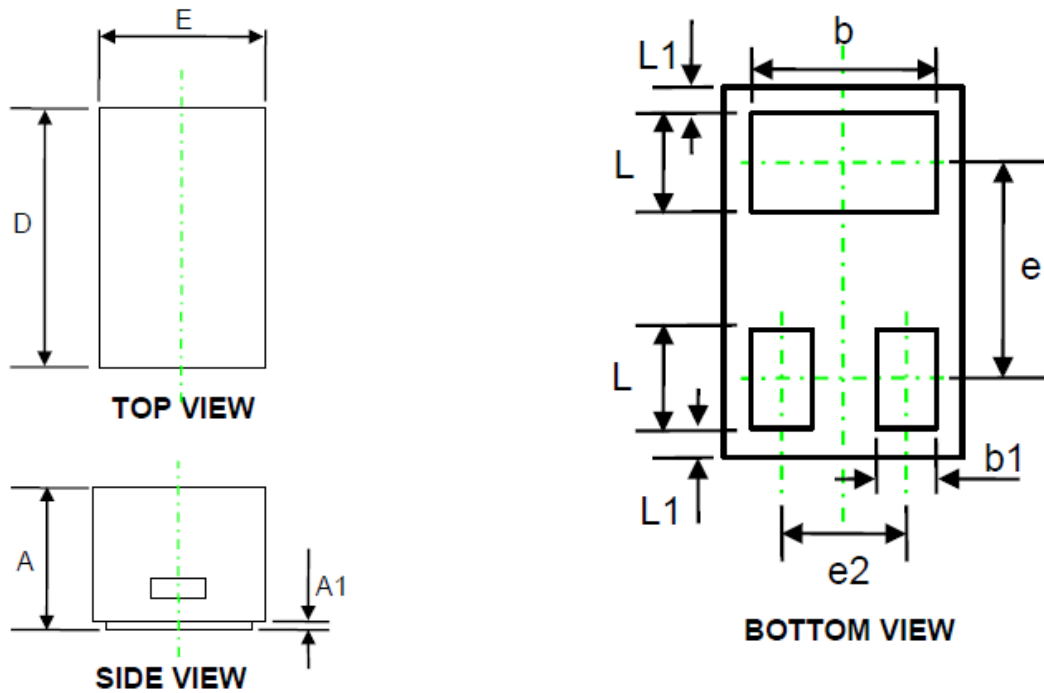


Figure 6. $R_{DS(ON)}$ vs junction temperature

Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.400	0.500	0.016	0.020
A1	0.000	0.050	0.000	0.002
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
b	0.450	0.550	0.018	0.022
e	0.650 REF.		0.026 REF.	
e2	0.350 REF.		0.014 REF.	
L1	0.050 REF.		0.002 REF.	
L	0.200	0.300	0.008	0.012
b1	0.100	0.200	0.004	0.008

Version: DFN1006-3L-V package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
DFN1006-3L	10000	15	150000	4	600000

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