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 -4.5V. This device is suitable for use as a wide variety of applications.

Features

- Low gate charge
- 100% UIS tested, 100% DVDS tested
- High power and current handing capability
- Lead free product is acquired

Applications

- Load switch
- PWM Applications
- Power Management

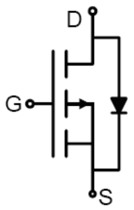
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	-40	V
$R_{DS(ON),\ max}$ @ V_{GS}=-10V	14	mΩ

Marking Information

Product Name	Package	Marking
OSH04P13BF	SOP8	OSH04P13B

Package & Pin information



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

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	-40	V
Gate-source voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-11	A
Pulsed Drain Current 1)	$I_{D,pulse}$	-44	A
Power Dissipation	P_D	3	W
Single pulsed avalanche energy 2)	E_{AS}	272	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	**Symbol**	**Value**	**Unit**
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	42	°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}	-40			V	V_{GS}=0 V, I_D=-250 μA
Gate threshold voltage	$V_{GS(th)}$	-1.0		-2.5	V	V_{DS}=V_{GS}, I_D=-250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		11.7	14	mΩ	V_{GS}=-10 V, I_D=-20 A
Drain-source on-state resistance	$R_{DS(ON)}$		15.4	18.5	mΩ	V_{GS}=-4.5 V, I_D=-20 A
Gate-source leakage current	I_{GSS}			100	nA	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}=-40 V, V_{GS}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		3241		pF	V_{GS}=0 V, V_{DS}=-20 V, f=1.0 MHz
Output capacitance	C_{oss}		228		pF	
Reverse transfer capacitance	C_{rss}		205		pF	
Gate resistance	R_g		4.5		Ω	V_{GS}=0 V, V_{DS}=0 V, f=1.0 MHz
Turn-on Delay Time	$t_{d(on)}$		18		ns	V_{GS}=-10 V, V_{DS}=-20 V, R_L=1 Ω, R_{GEN}=3 Ω
Turn-on Rise Time	t_r		4.8		ns	
Turn-Off Delay Time	$t_{d(off)}$		88.8		ns	
Turn-Off Fall Time	t_f		26.4		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		60		nC	V_{GS}=-10 V, V_{DS}=-20 V, I_D=-20 A
Gate-Source Charge	Q_{gs}		8.6		nC	
Gate-Drain Charge	Q_{gd}		13.9		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			-51	A	T_A=25°C
Diode forward voltage [3]	V_{SD}			-1.2	V	I_S=-20 A, V_{GS}=0 V
Reverse Recovery Time	trr		17.3		ns	I_F=-10 A, di/dt=100 A/us
Reverse Recovery Charge	Qrr		9.5		nC	

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

2) E_{AS} condition: T_J=25℃, V_{DD}=-40V, V_G=-10V, Rg=25Ω, L=0.5mH.

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

Electrical Characteristics Diagrams

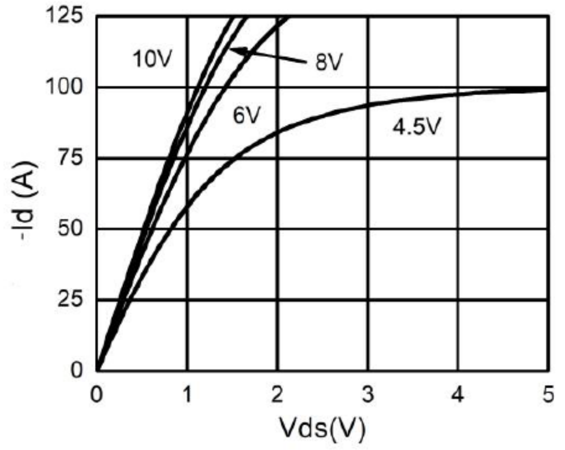


Figure 1. Typ. output characteristics

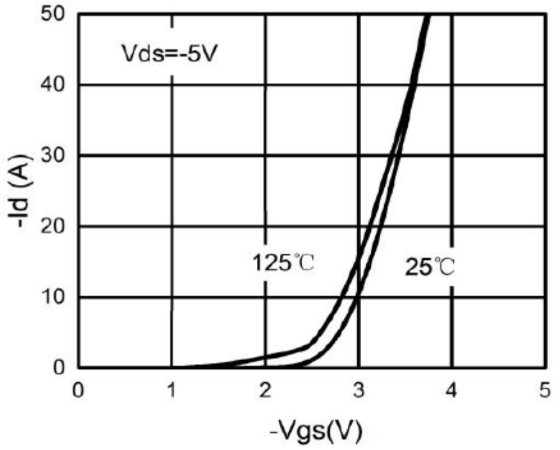


Figure 2. Typ. transfer characteristics

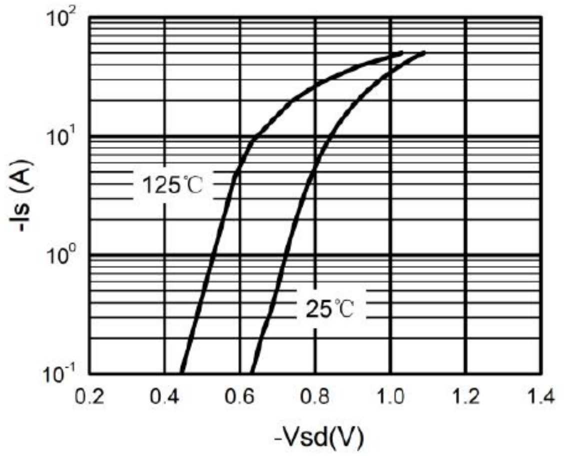


Figure 3. Body-diode characteristics

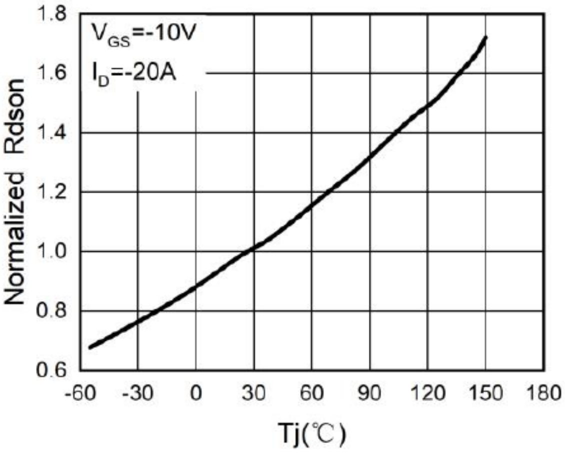


Figure 4. $R_{DS(ON)}$ vs junction temperature

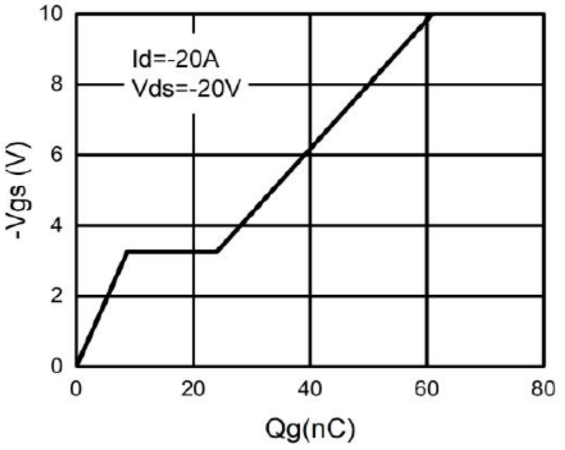


Figure 5. Gate charge waveforms

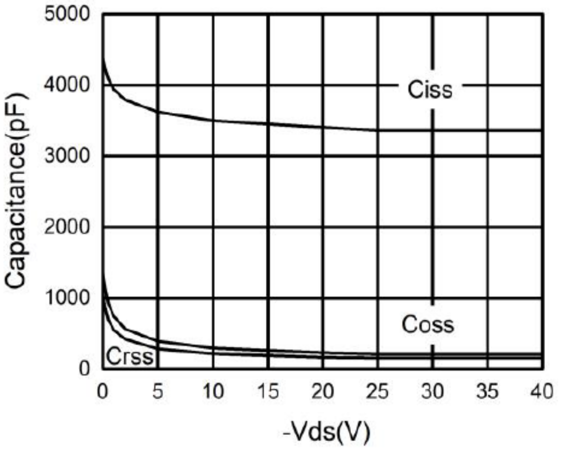
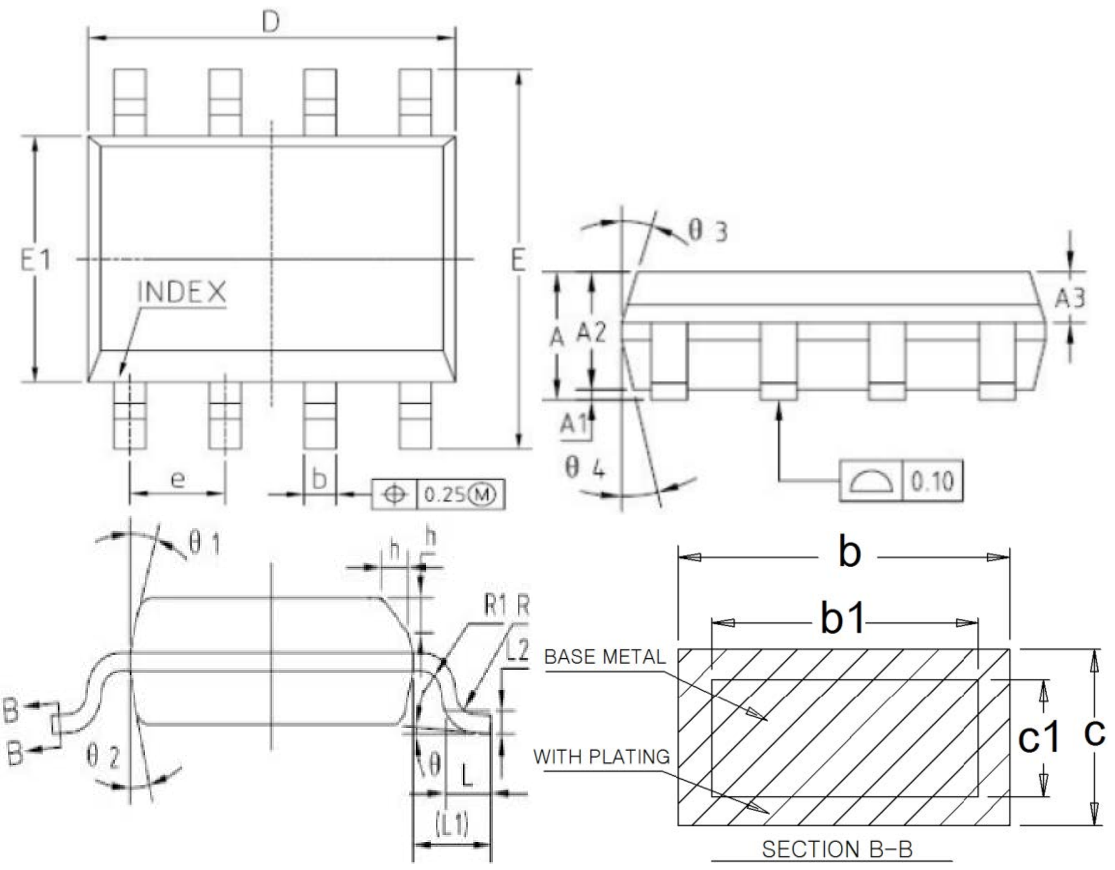


Figure 6. Capacitance

Package Information



Symbol	mm		
	Min.	Typ.	Max.
A	1.45	1.55	1.65
A1	0.10	0.15	0.20
A2	1.353	1.40	1.453
A3	0.55	0.60	0.65
b	0.38	-	0.51
b1	0.37	0.42	0.47
c	0.17	-	0.25
c1	0.17	0.20	0.23
D	4.85	4.90	4.95
E	5.85	6.00	6.15
E1	3.85	3.90	3.95
e	1.245	1.27	1.295
L	0.45	0.60	0.75
L1	-	1.040REF	-
L2	-	0.250BSC	-

Version1: SOP-8-G package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOP-8-G	4000	2	8000	6	48000

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