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

RoHS compliant

Applications

- DC/DC converter
- Ideal for high-frequency switching and synchronous rectification

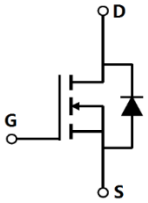
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(ON),\ max}$ @ V_{GS}=10V	11.5	mΩ

Marking Information

Product Name	Package	Marking
OSH06N12NF	PDFN3.3X3.3	OSH06N12N

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	47.5	A
Pulsed Drain Current [1)]	$I_{D,pulse}$	190	A
Power Dissipation	P_D	57	W
Single pulsed avalanche energy [2)]	E_{AS}	169	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	2.2	°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	$V_{GS(th)}$	1.0		2.5	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		9.7	12	mΩ	V_{GS}=10 V, I_D=20 A
Drain-source on-state resistance	$R_{DS(ON)}$		12	14.5	mΩ	V_{GS}=4.5 V, I_D=15 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}=60 V, V_{GS}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		2411		pF	V_{GS}=0 V, V_{DS}=30 V, f=1.0 MHz
Output capacitance	C_{oss}		124		pF	
Reverse transfer capacitance	C_{rss}		116		pF	
Gate resistance	R_g		1.4		Ω	V_{GS}=0 V, V_{DS}=0 V, f=1.0 MHz
Turn-on Delay Time	$t_{d(on)}$		4.3		ns	V_{GS}=10 V, V_{DS}=30 V, R_L=1.5 Ω, R_{GEN}=6 Ω
Turn-on Rise Time	t_r		16		ns	
Turn-Off Delay Time	$t_{d(off)}$		6.5		ns	
Turn-Off Fall Time	t_f		24		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		47.5		nC	V_{GS}=10 V, V_{DS}=30 V, I_D=20 A
Gate-Source Charge	Q_{gs}		14.5		nC	
Gate-Drain Charge	Q_{gd}		12.7		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			47.5	A	T_A=25°C
Diode forward voltage [3]	V_{SD}			0.99	V	I_S=20 A, V_{GS}=0 V
Reverse Recovery Time	trr		24		ns	I_F=20 A, di/dt=100 A/us
Reverse Recovery Charge	Qrr		9.3		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

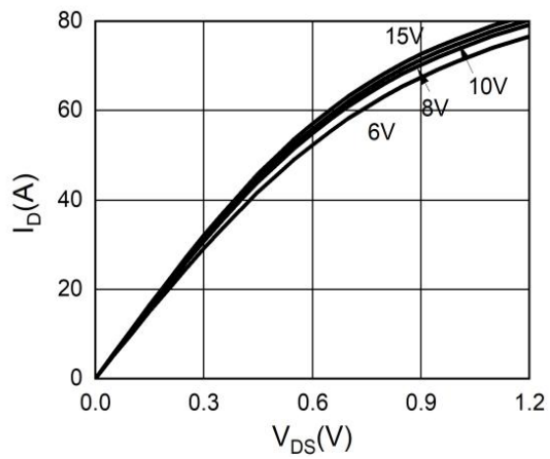


Figure 1. Typ. output characteristics

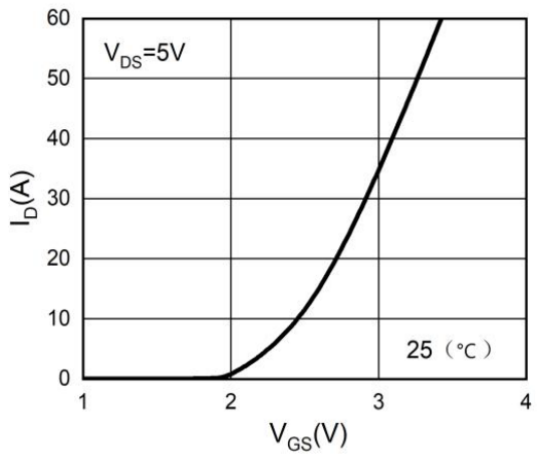


Figure 2. Typ. transfer characteristics

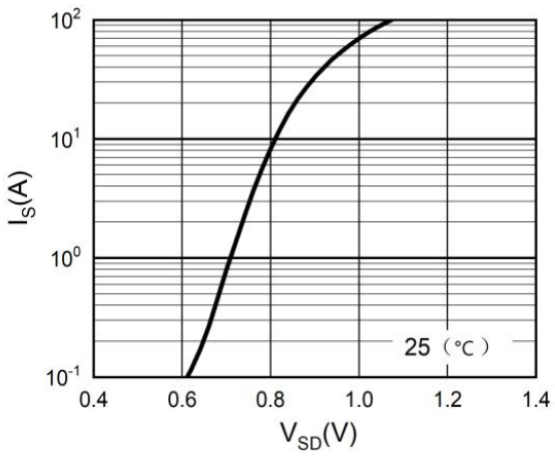


Figure 3. Body-diode characteristics

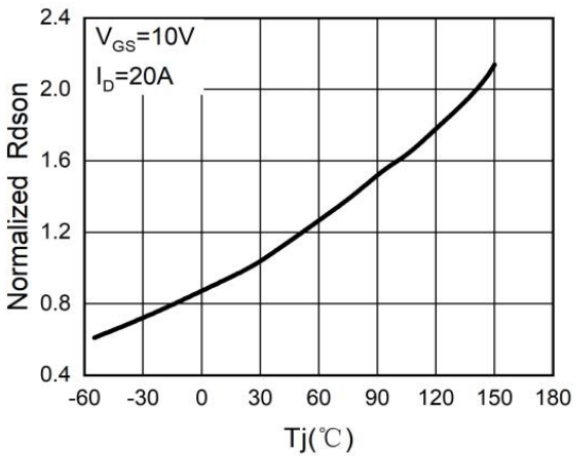


Figure 4. $R_{DS(ON)}$ vs junction temperature

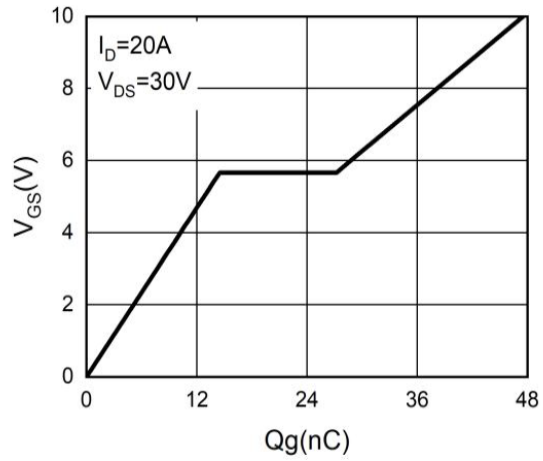


Figure 5. Gate charge waveforms

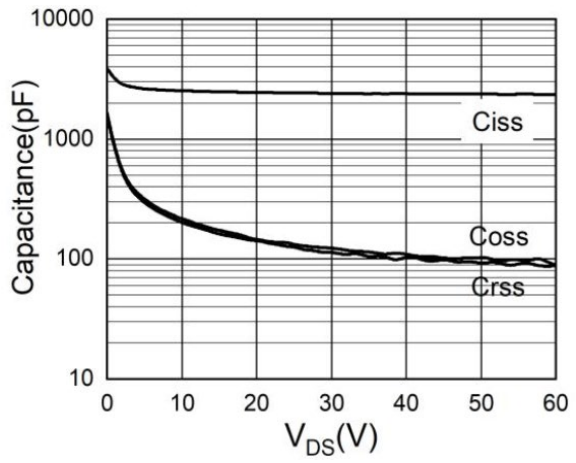
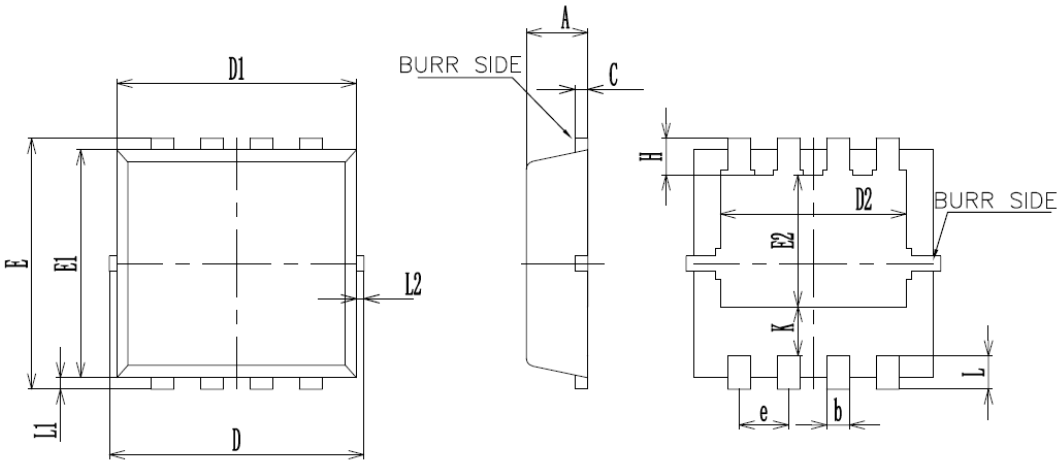
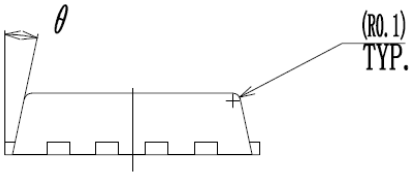


Figure 6. Capacitance

Package Information





Symbol	mm		
	Min.	Typ.	Max.
A	0.70	0.80	0.90
b	0.25	0.30	0.35
c	0.14	0.152	0.20
D	3.15	3.30	3.45
D1	3.05	3.15	3.25
D2	2.35	2.45	2.55
e	0.65BSC		
E	3.20	3.30	3.40
E1	2.90	3.00	3.10
E2	1.64	1.74	1.84
H	0.38	0.48	0.58
K	0.59	0.69	0.79
L	0.25	0.40	0.55
L1	0.10	0.15	0.20
L2	-	-	0.15
θ	8°	10°	12°

Version: PDFN3.3X3.3-G package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
PDFN3.3X3.3-G	5000	2	10000	6	60000

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