

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



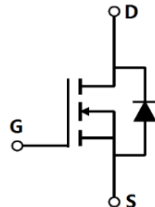
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	30	V
$R_{DS(ON), max} @ V_{GS}=10V$	5.5	m Ω

Marking Information

Product Name	Package	Marking
OSH03N05GF	PDFN5X6-8L	OSH03N05G

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}	± 20	V
Continuous Drain Current	I_D	83	A
Pulsed Drain Current ¹⁾	$I_{D,pulse}$	334	A
Power Dissipation	P_D	61	W
Single pulsed avalanche energy ²⁾	E_{AS}	132	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	2.03	$^{\circ}\text{C/W}$

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	$V_{GS(th)}$	1.0		2.2	V	$V_{DS}=V_{GS}, I_D=250\text{ }\mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		4.6	5.5	$\text{m}\Omega$	$V_{GS}=10\text{ V}, I_D=15\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		6.7	8	$\text{m}\Omega$	$V_{GS}=4.5\text{ V}, I_D=10\text{ A}$
Gate-source leakage current	I_{GSS}			100	nA	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$
				-100		$V_{GS}=-20\text{ V}, V_{DS}=0\text{ V}$
Drain-source leakage current	I_{DSS}			1	μA	$V_{DS}=30\text{ V}, V_{GS}=0\text{ V}$
Gate resistance	R_G		1.1		Ω	$f=1\text{ MHz}$, Open drain

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		1730		pF	$V_{GS}=0\text{ V}$, $V_{DS}=15\text{ V}$, $f=1.0\text{ MHz}$
Output capacitance	C_{oss}		192		pF	
Reverse transfer capacitance	C_{rss}		171		pF	
Turn-on delay time	$t_{d(on)}$		11		ns	$V_{GS}=10\text{ V}$, $V_{DS}=15\text{ V}$, $R_G=3\ \Omega$, $I_D=15\text{ A}$
Rise time	t_r		55		ns	
Turn-off delay time	$t_{d(off)}$		198		ns	
Fall time	t_f		120		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		25		nC	$V_{GS}=10\text{ V}$, $V_{DS}=15\text{ V}$, $I_D=15\text{ A}$
Gate-Source Charge	Q_{gs}		5		nC	
Gate-Drain Charge	Q_{gd}		10		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			85	A	$T_A=25^\circ\text{C}$
Diode forward voltage ³⁾	V_{SD}			1.2	V	$I_S=20\text{ A}$, $V_{GS}=0\text{ V}$
Reverse recovery time	t_{rr}		12		ns	$I_S=20\text{ A}$, $di/dt=100\text{ A}/\mu\text{s}$
Reverse recovery charge	Q_{rr}		4		nC	

Note: 1) Pulse width limited by maximum junction temperature.
 2) EAS condition: $V_{DD}=20\text{ V}$, $V_{GS}=10\text{ V}$, $L=0.5\text{ mH}$, starting $T_J=25^\circ\text{C}$
 3) Repetitive Rating: Pulse width limited by maximum junction temperature.

Electrical Characteristics Diagrams

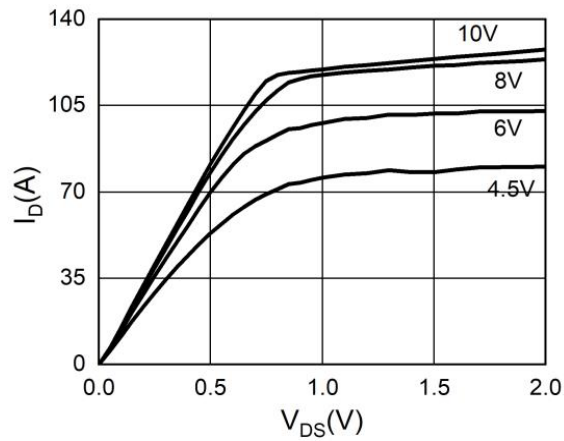


Figure 1. Typ. output characteristics

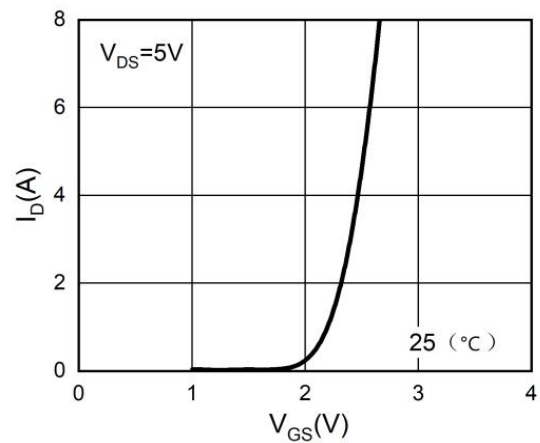


Figure 2. Typ. transfer characteristics

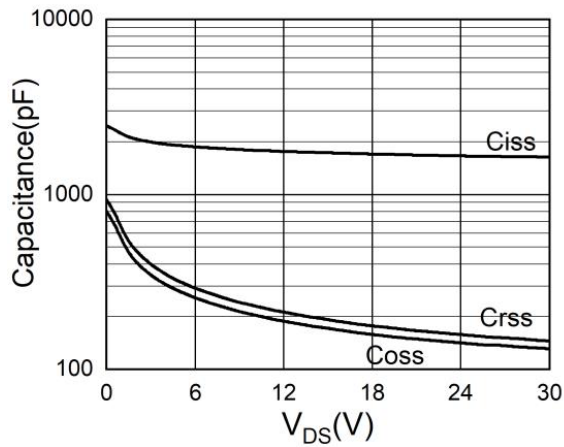


Figure 3. Typ. capacitances

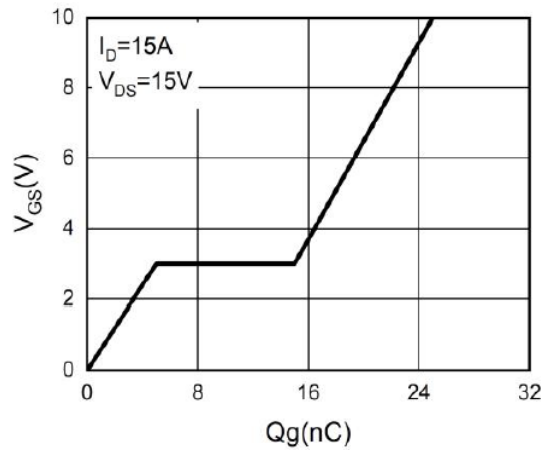


Figure 4. Gate charge

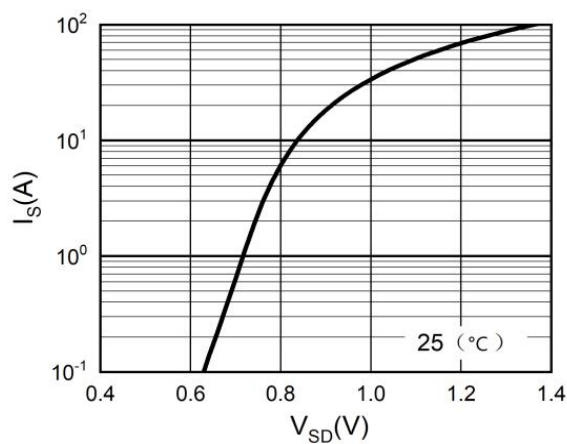


Figure 5. Body-diode characteristics

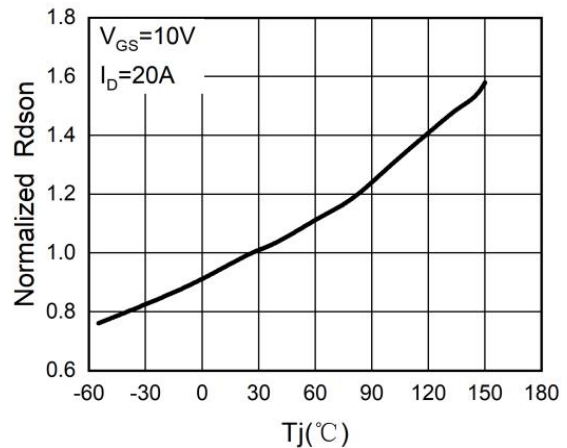
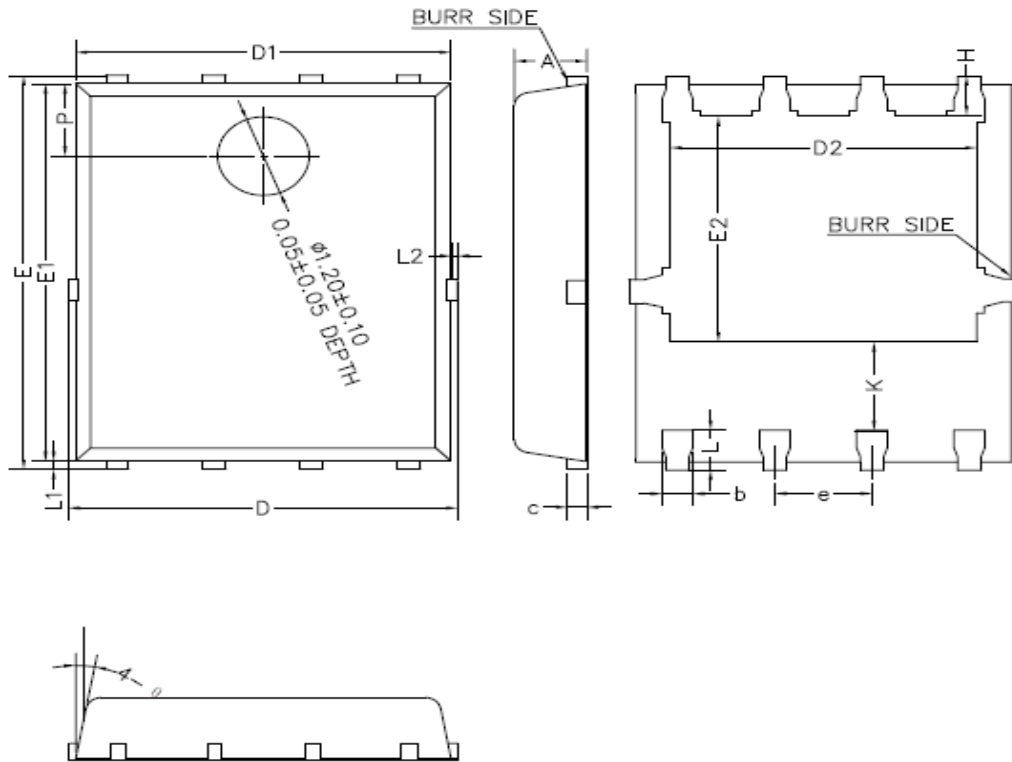


Figure 6. $R_{DS(ON)}$ vs junction temperature

Package Information



Symbol	mm		
	Min.	Typ.	Max.
A	1.000	1.100	1.200
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	-	-	5.100
D1	4.900	4.950	5.000
D2	3.910	4.010	4.110
e	1.17	1.27	1.37
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.340	3.440	3.540
H	0.510	0.610	0.710
K	1.100	-	-
L	0.510	0.610	0.710
L1	0.060	0.130	0.200
L2	-	-	0.150
P	1.00	1.10	1.20
θ	8°	10°	12°

Version : PDFN5X6-G package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
PDFN5X6-G	5000	2	10000	6	60000

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