General Description

The WSD3046DN33 is the highest performance trench Dual N- Channel MOSFET with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The WSD3046DN33 meet the RoHS and Green Product requirement 100% E_{AS} guaranteed with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% E_{AS} Guaranteed
- Green Device Available

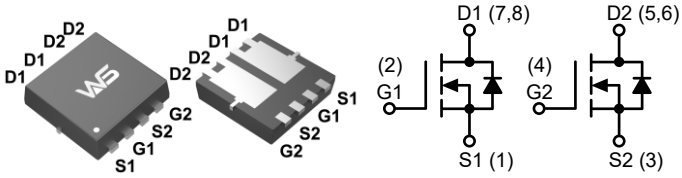
Product Summery

BV_{DSS}	$R_{DS(ON)}$	I_D
30V	9mΩ	32A

Applications

- POL Applications
- MB / VGA / Vcore
- Load Switch
- SMPS 2nd SR

DFN3X3-8L Pin Configuration



Absolute Maximum Ratings (T_A=25°C, Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		±20	
I_D	Drain Current (Continuous) [1,3]	T_C=25°C	32	A
		T_C=100°C	20	
I_{DM}	Drain Current (Pulse) [2]		135	
P_D	Power Dissipation	T_C=25°C	26	W
E_{AS}	Single Pulse Avalanche Energy		12	mJ
T_{STG}	Storage Temperature Range		-55 to 150	°C
T_J	Operating Junction Temperature Range		-55 to 150	

Thermal Data

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	---	3.6	

Electrical Characteristics (T_A=25°C, Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
Static						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V , V_{GS}=0V	---	---	1.0	μA
I_{GSS}	Gate Leakage Current	V_{DS}=0V , V_{GS}=±20V	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_{DS}=250μA	1.0	1.5	2.5	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V , I_D=15A	---	9	11	mΩ
		V_{GS}=4.5V , I_D=15A	---	13	15	
g_{fs}	Forward Transconductance	V_{DS}=5V , I_D=5A	---	6	---	S
Switching						
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f = 1.0MHz	---	3.0	---	Ω
Q_g	Total Gate Charge	V_{GS}=10V , V_{DS}=15V , I_D=5A	---	22	---	nC
Q_{gs}	Gate-Source Charge		---	4	---	
Q_{gd}	Gate-Drain Charge		---	6	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=10V , V_{DD}=15V , I_D=1A , R_G=6Ω	---	5	---	ns
T_r	Rise Time		---	3	---	
$T_{d(off)}$	Turn-Off Delay Time		---	14	---	
T_f	Fall Time		---	8	---	
Dynamic						
C_{iss}	Input Capacitance	V_{GS}=0V , V_{DS}=15V , f = 1.0MHz	---	1050	---	pF
C_{oss}	Output Capacitance		---	125	---	
C_{rss}	Reverse Transfer Capacitance		---	100	---	
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	32	A
I_{SM}	Pulsed Source Curren [3]		---	---	90	
V_{SD}	Diode Forward Voltage	I_{SD}=1A , V_{GS}=0V	---	---	1.2	V

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=16A, R_G=25, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≤ 300μs , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Characteristics

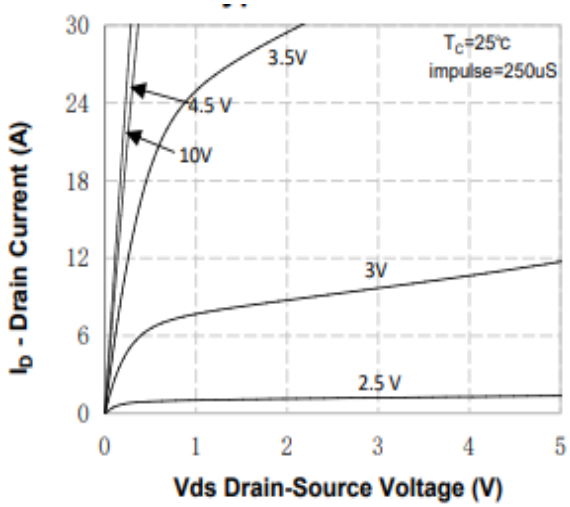


Figure 1. On-Region Characteristics

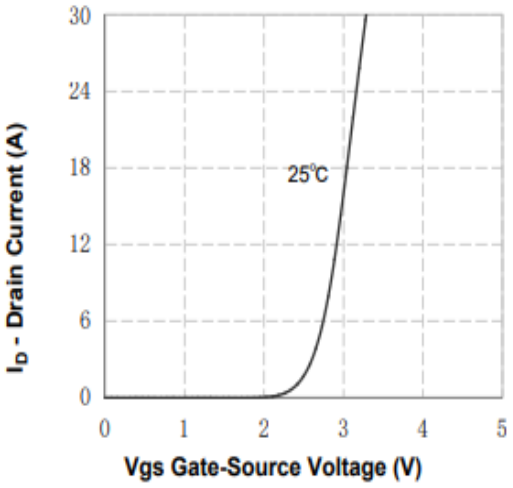


Figure 2. Transfer Characteristics

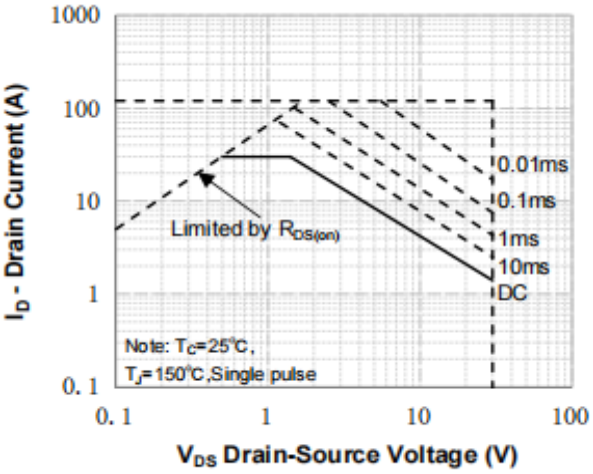


Figure 3. Maximum Safe Operating Area

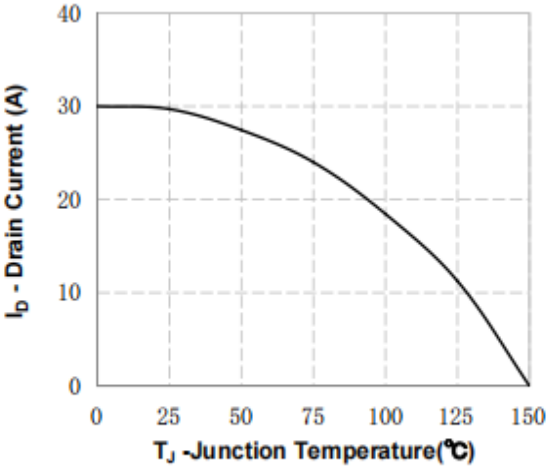


Figure 4. Maximum Continuous Drain Current vs Temperature

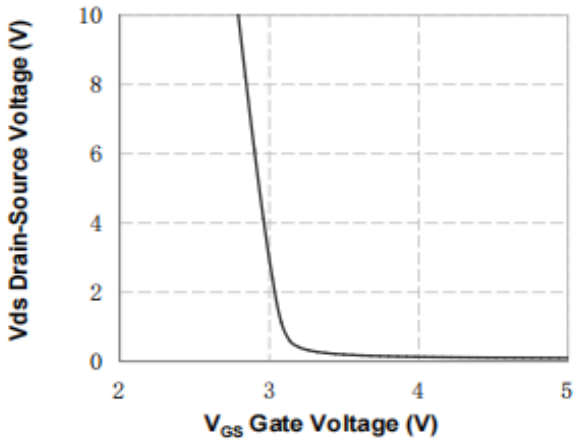


Figure 5. Vds Drain-Source Voltage vs Gate Voltage

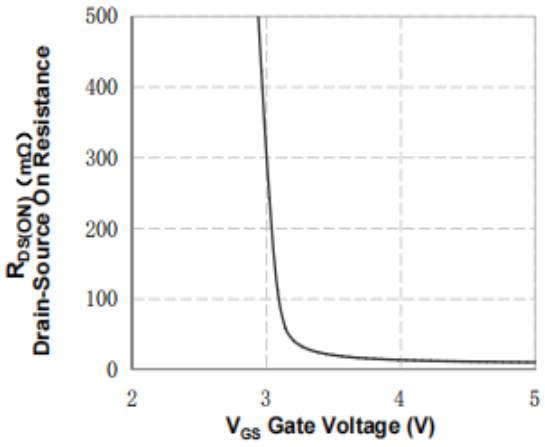


Figure 6. On-Resistance vs Gate Voltage

Typical Characteristics (Cont.)

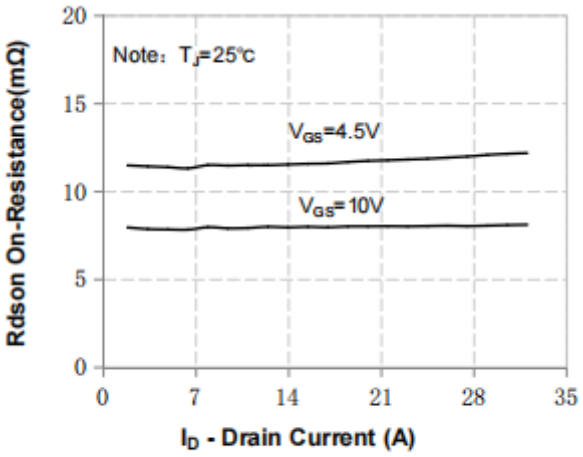


Figure 7. On-Resistance Variation vs Drain Current and Gate Voltage

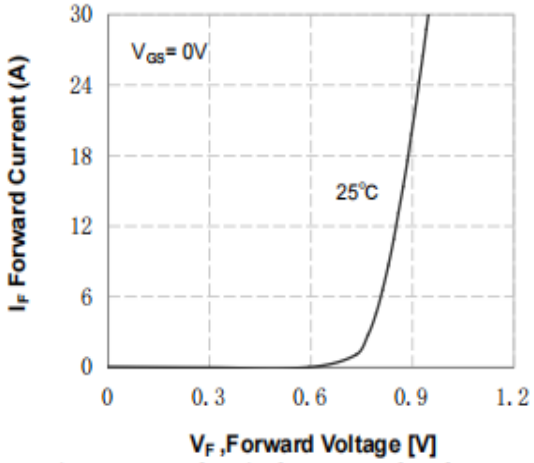


Figure 8. Body Diode Forward Voltage Variation vs Source Current

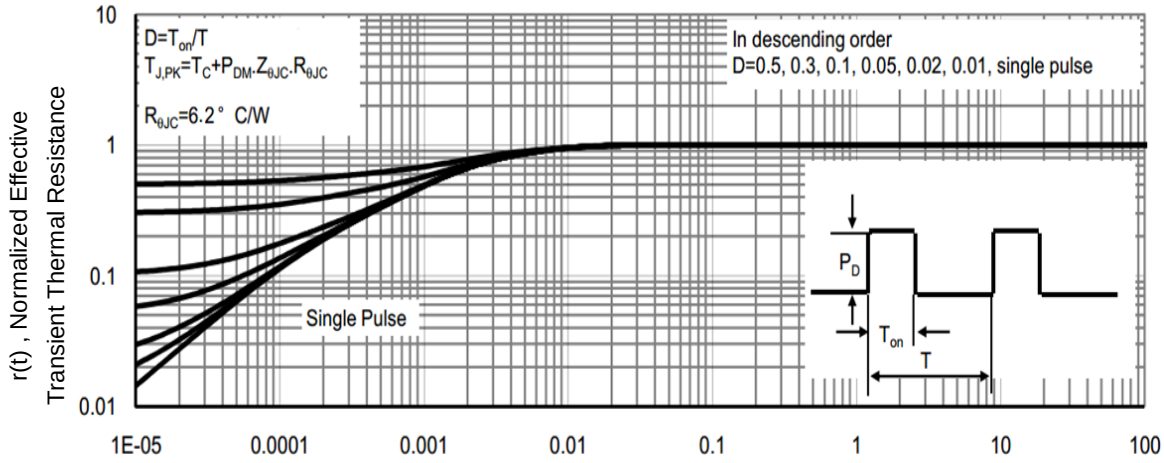


Fig9. T1 ,Transient Thermal Response Curve

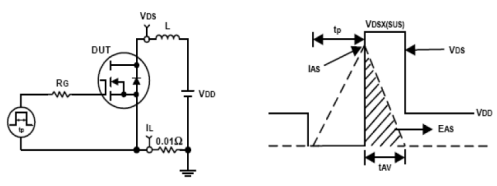


Fig10. Unclamped Inductive Test Circuit and waveforms

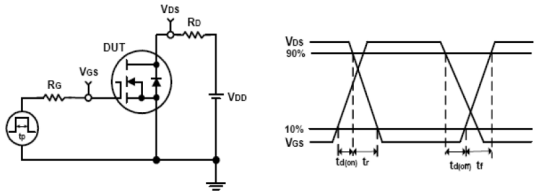
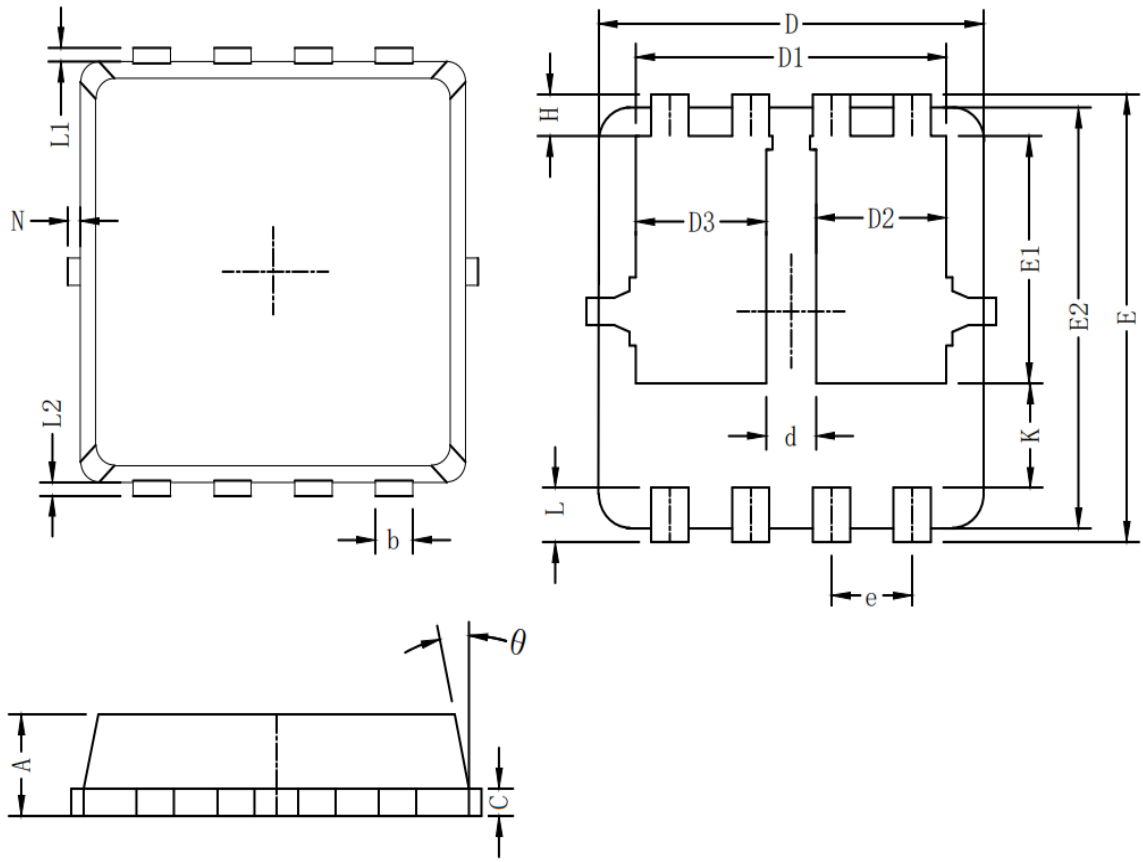


Fig11. Switching Time Test Circuit and waveforms

Packaging information



Symbol	Dim in mm		
	min	typ	max
A	0.6	0.75	0.9
b	0.2	0.3	0.4
C	0.15	0.2	0.25
D	3	3.1	3.2
D1	2.3	2.45	2.6
D2/D3	0.8	1	1.2
E	3.15	3.3	3.45
E1	1.43	1.73	1.93
E2	2.9	3.05	3.2
e	0.65BSC		
H	0.2	0.35	0.5
K	0.57	0.77	0.87
L	0.3	0.4	0.5
L1/L2	0.1REF		
θ	8°	10°	13°
N	0		0.15
d	0.3	0.4	0.5

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