

General Description

The WSD4066DN33 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 WSD4066DN33 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

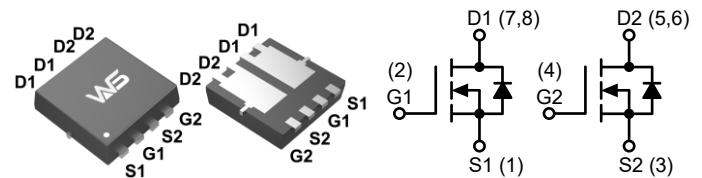
Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D
40V	17m Ω	14A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

DFN3X3-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	
I_S	Diode Continuous Forward Current	$T_A=25^\circ\text{C}$ 2	A
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$ 14	
		$T_A=70^\circ\text{C}$ 9.8	
I_{DM}^1	Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ 28	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 2.5	W
		$T_A=70^\circ\text{C}$ 1.68	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State 10	$^\circ\text{C/W}$
		$t \leq 10\text{s}$ 42.5	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	Steady State ² 75	$^\circ\text{C/W}$
I_{AS}^3	Avalanche Current, Single pulse	$L=0.5\text{mH}$ 10	A
E_{AS}^3	Avalanche Energy, Single pulse	$L=0.5\text{mH}$ 25	mJ
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Maximum Junction Temperature	150	

Electrical Characteristics ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

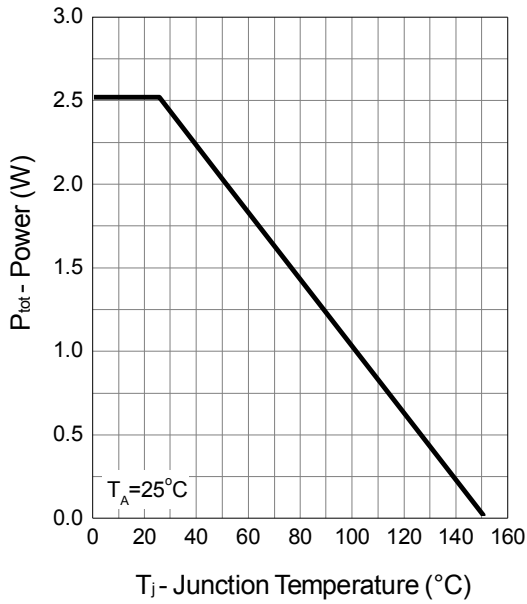
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=32V, V_{GS}=0V$	---	---	1.0	μA
		$T_J=85^\circ\text{C}$	---	---	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_{DS}=250\mu A$	1.0	1.5	2.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}^4$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=14A$	---	14	17	m Ω
		$V_{GS}=4.5V, I_D=12A$	---	17	20	
Diode Characteristics						
V_{SD}^4	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$	---	0.75	1.1	V
t_{rr}	Reverse Recovery Time	$I_{DS}=6A, di_{SD}/dt=100A/\mu s$	---	13	---	ns
Q_{rr}	Reverse Recovery Charge		---	8.7	---	nC
Dynamic Characteristics ⁵						
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, F=1.0\text{MHz}$	---	2.5	---	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=20V, \text{Frequency}=1.0\text{MHz}$	---	815	---	pF
C_{oss}	Output Capacitance		---	95	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=20V, R_L=20\Omega, I_{DS}=1A, V_{GEN}=10V, R_G=6\Omega$	---	7.8	---	ns
T_r	Turn-on Rise Time		---	6.9	---	
$T_{d(off)}$	Turn-off Delay Time		---	22.4	---	
T_f	Turn-off Fall Time		---	4.8	---	
Gate Charge Characteristics ⁵						
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_{DS}=6A$	---	15.7	22	nC
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=4.5V, I_{DS}=6A$	---	7.5	10.5	
Q_{gth}	Threshold Gate Charge		---	1.85	---	
Q_{gs}	Gate-Source Charge		---	3.24	---	
Q_{gd}	Gate-Drain Charge		---	2.75	---	

Note:

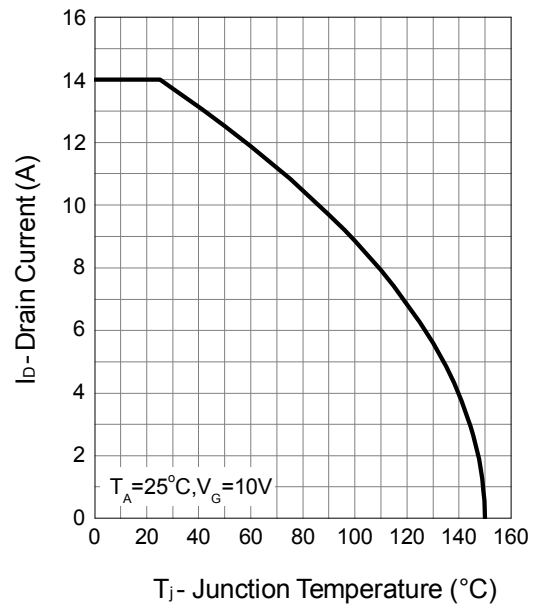
- Pulse width limited by max. junction temperature.
- Surface Mounted on 1in² pad area, t=999sec.
- UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J=25^\circ\text{C}$).
- Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

Typical Characteristics

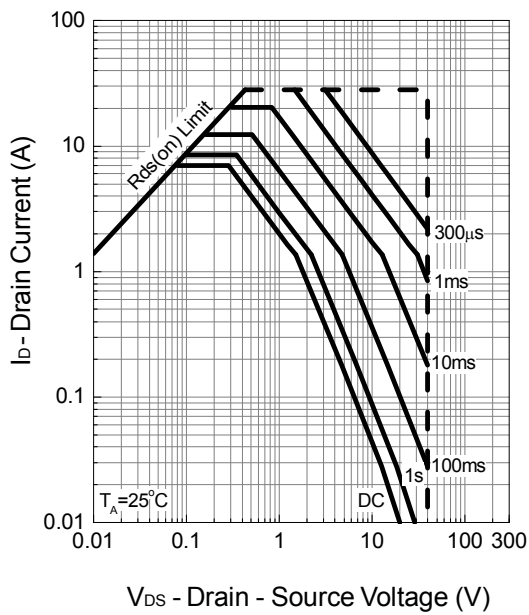
Power Dissipation



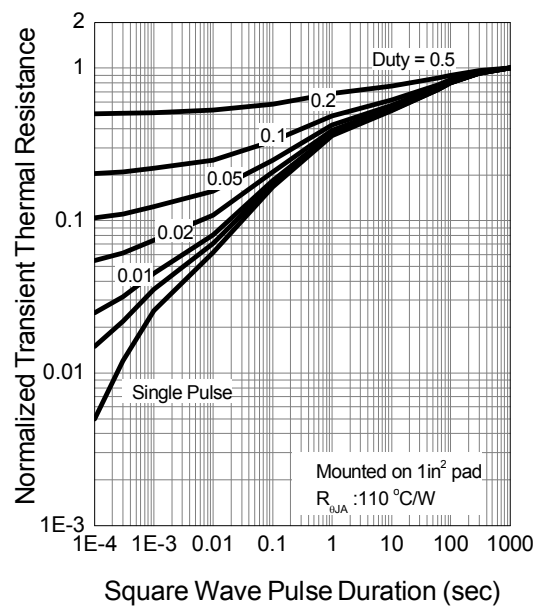
Drain Current



Safe Operation Area

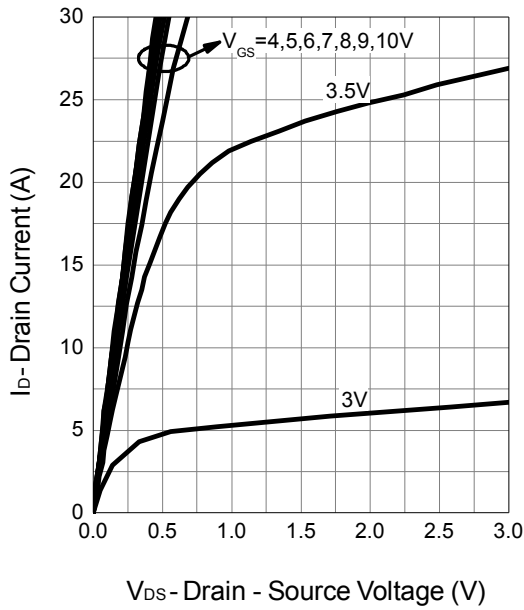


Thermal Transient Impedance

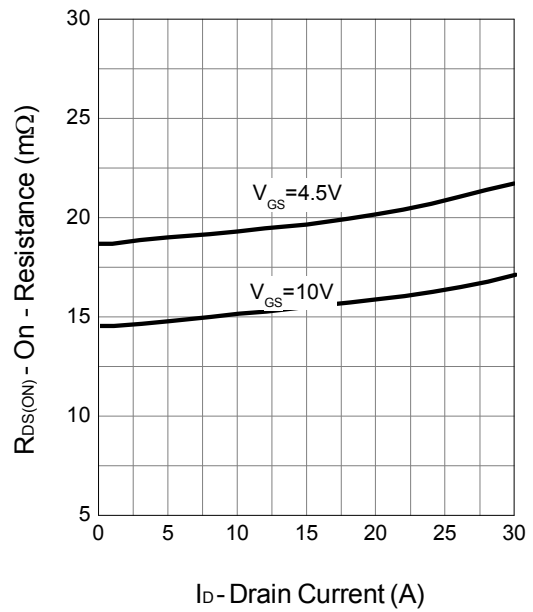


Typical Characteristics (Cont.)

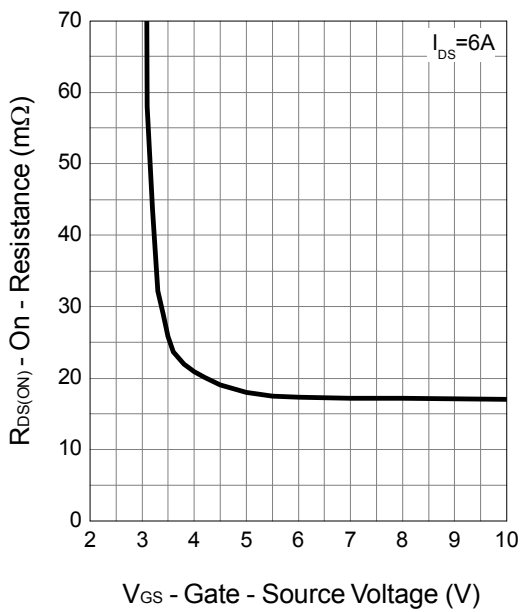
Output Characteristics



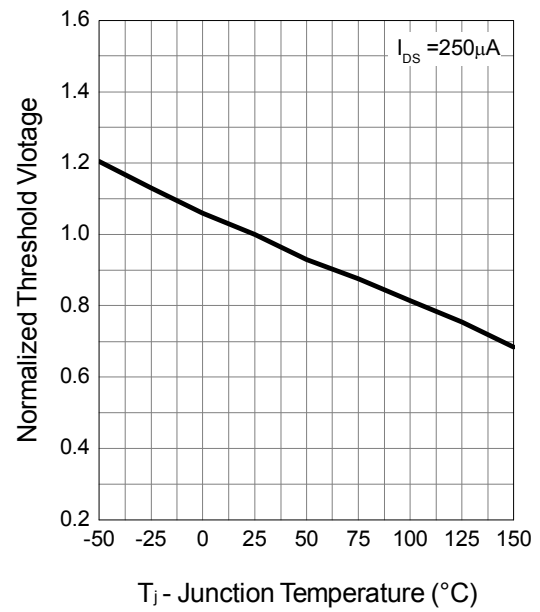
Drain-Source On Resistance



Gate-Source On Resistance

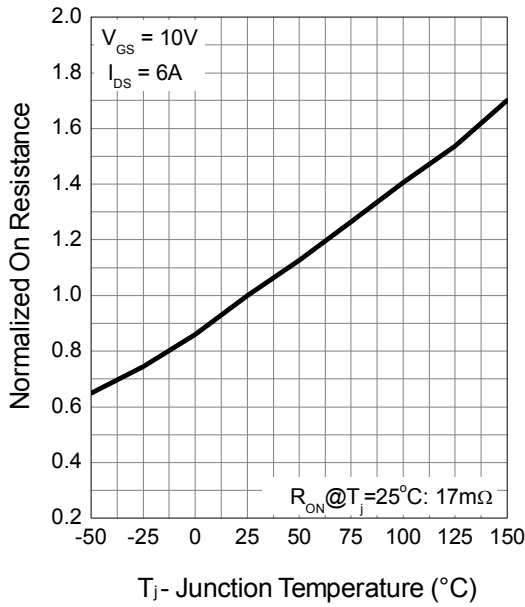


Gate Threshold Voltage

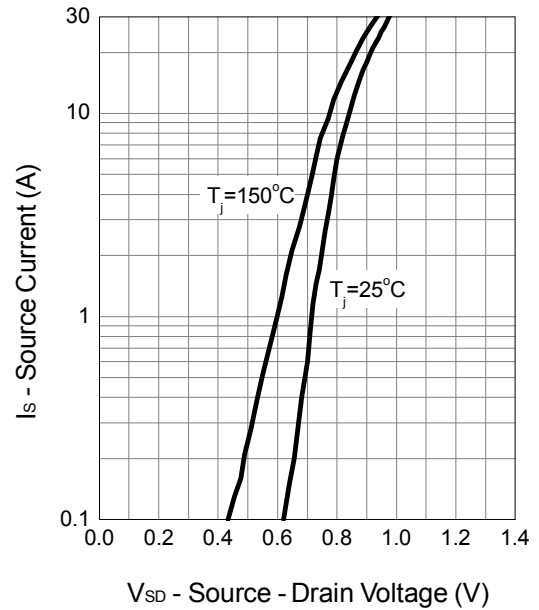


Typical Characteristics (Cont.)

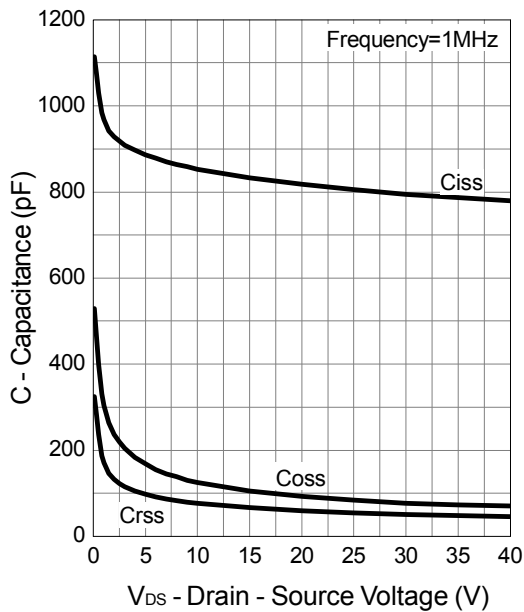
Drain-Source On Resistance



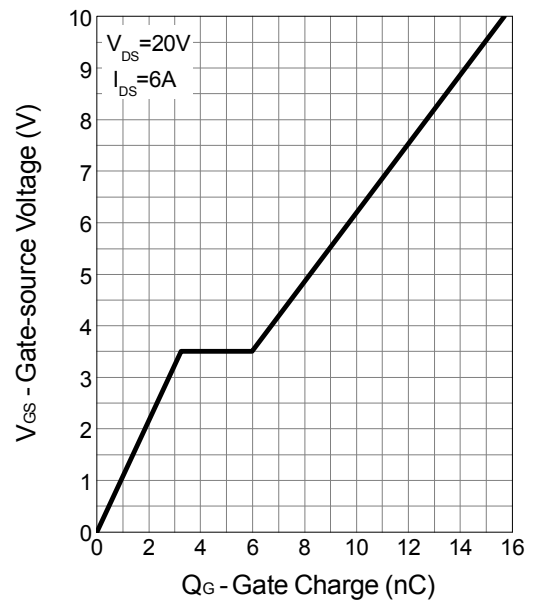
Source-Drain Diode Forward

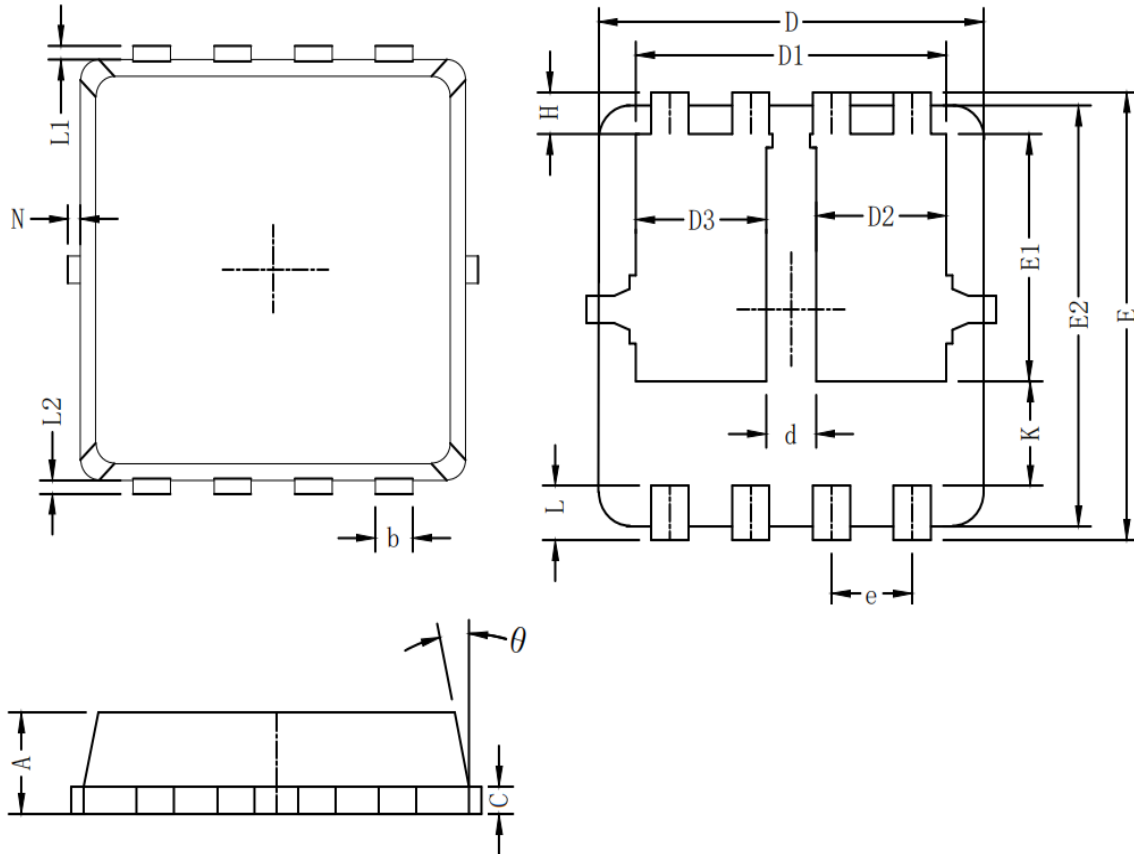


Capacitance



Gate Charge



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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