

General Description

The WSD14N10DNG is the highest performance trench N-Ch MOSFET with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The WSD14N10DNG meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Features

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

Product Summary

BV_{DSS}	$R_{DS(on)}$	I_D
100V	140mΩ	14A

Applications

- Battery protection
- Load switch
- Uninterruptible power supply

DFN3X3_8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	14	A
I_{DP}	Pulsed Drain Current	15	A
EAS	Avalanche Energy, Single pulse	1.2	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	17	W
T_J / T_{STG}	Operating/Storage Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	7.4	$^\circ C/W$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=5A$	---	110	140	$m\Omega$
		$V_{GS}=4.5V, I_D=3A$	---	160	180	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	2.0	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Q_g	Total Gate Charge	$I_D=5A$	---	4.3	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=50V$	---	1.5	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$	---	1.1	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{GS}=10V$	---	14.7	---	ns
T_r	Rise Time	$V_{DS}=50V$	---	3.5	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=2\Omega$	---	20.9	---	
T_f	Fall Time	$I_D=5A$	---	2.7	---	
C_{iss}	Input Capacitance	$V_{GS}=0V$	---	350	---	pF
C_{oss}	Output Capacitance	$V_{DS}=50V$	---	28.9	---	
C_{rss}	Reverse Transfer Capacitance	$f=100\text{ kHz}$	---	1.4	---	
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	7.0	A
I_{SP}	Pulsed Source Current		---	---	21	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=7A, T_J=25^\circ\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=5A, dI/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	32.1	---	nS
Q_{rr}	Reverse Recovery Charge		---	39.4	---	nC

Note

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^\circ\text{C}$.
- 5) $V_{DD}=50V, R_G=50\Omega, L=0.3\text{ mH}$, starting $T_J=25^\circ\text{C}$.

Typical Operating Characteristics

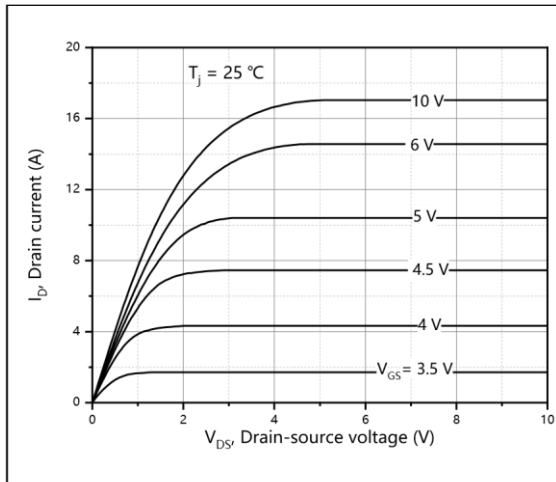


Figure 1, Typ. output characteristics

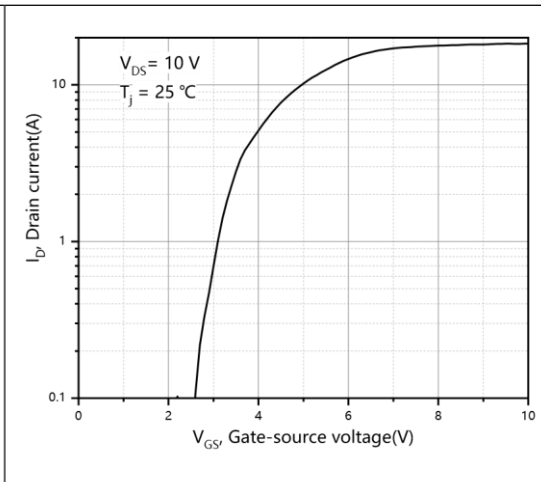


Figure 2, Typ. transfer characteristics

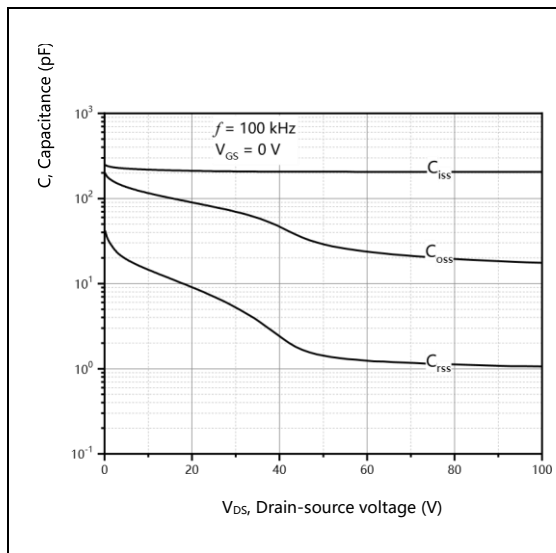


Figure 3, Typ. capacitances

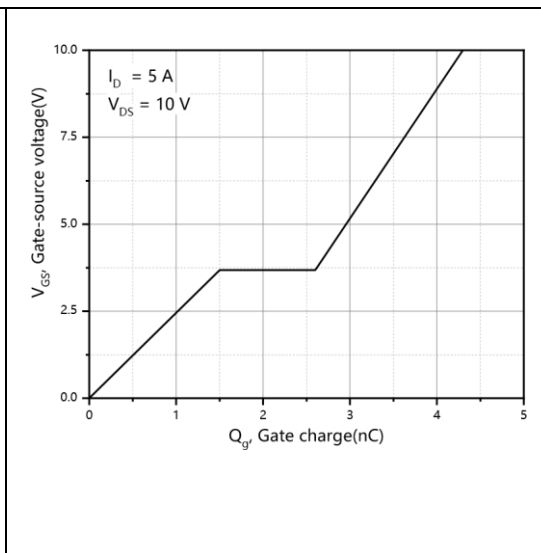


Figure 4, Typ. gate charge

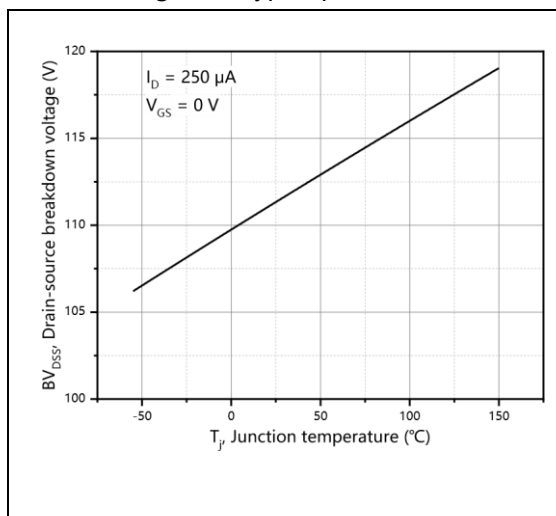


Figure 5, Drain-source breakdown voltage

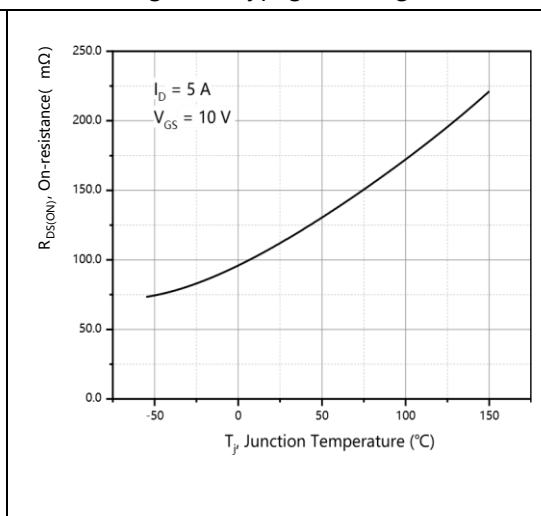


Figure 6, Drain-source on-state resistance

Typical Operating Characteristics (Cont.)

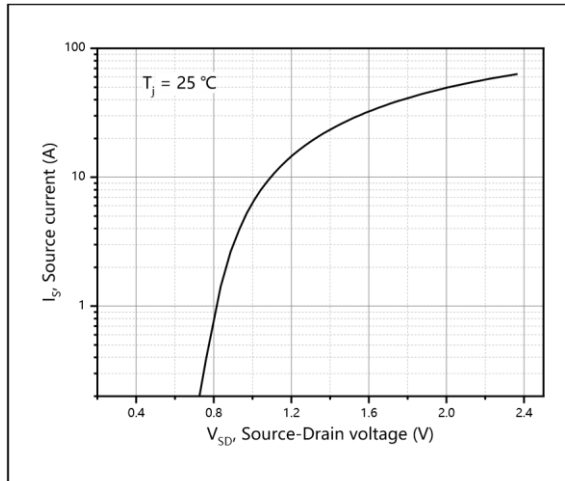


Figure 7, Forward characteristic of body diode

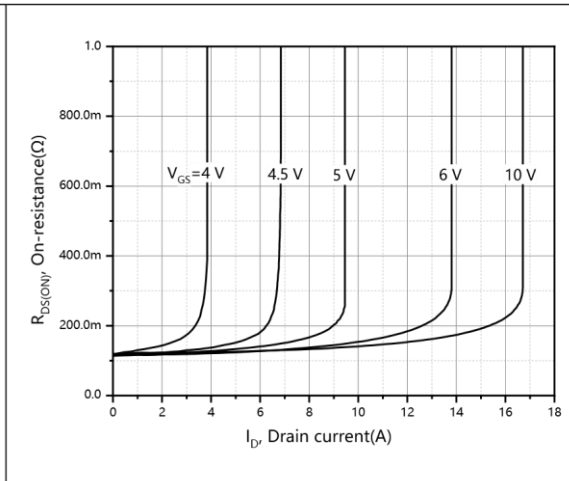


Figure 8, Drain-source on-state resistance

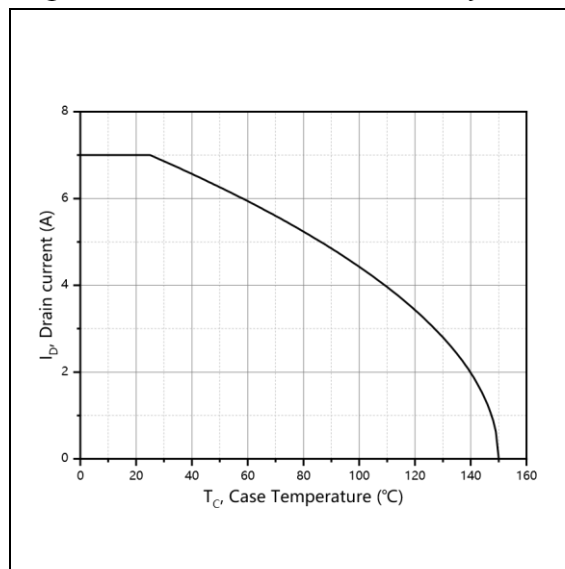


Figure 9, Drain current

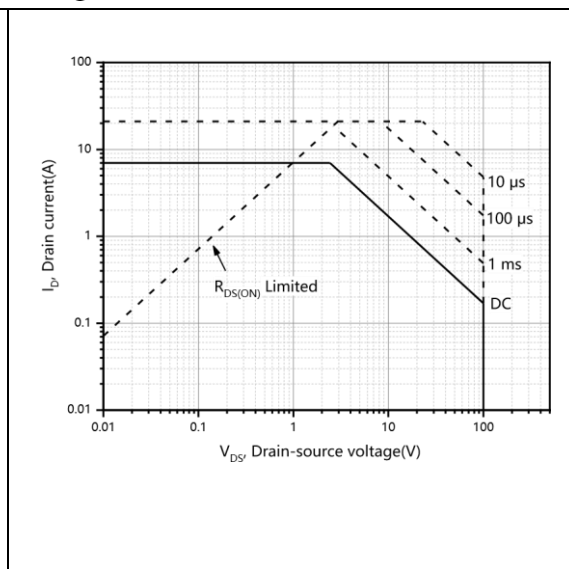
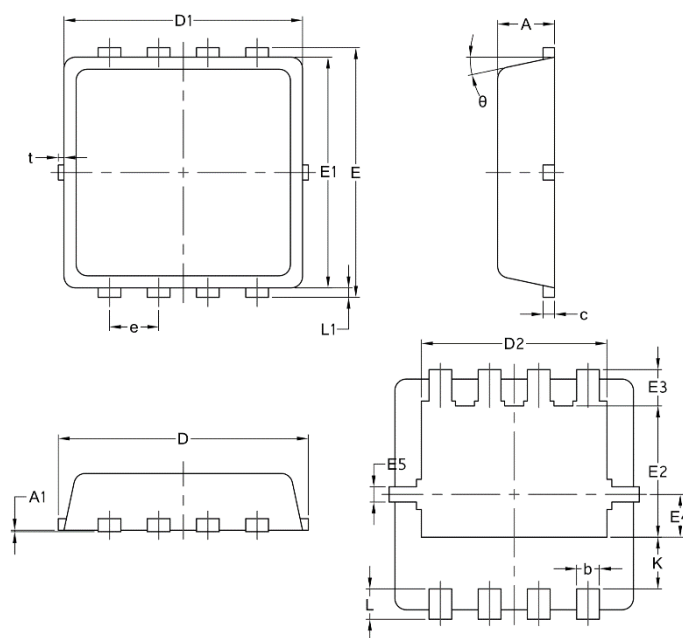


Figure 10, Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

Package: DFN3X3_8L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

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