WSD14N10DN33

N-Channel MOSFET

General Description

The WSD14N10DN33 is the highest performance trench 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 WSD14N10DN33 meet the RoHS and Green Product requirement, 100% E_{AS} guaranteed with full function reliability approved.

Product Summery

BV_{DSS}	$R_{DS(ON)}$	I_D
100V	110mΩ	14A

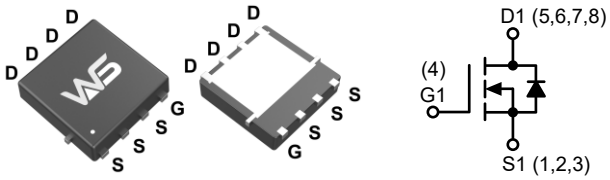
Applications

- Battery protection
- Load switch
- Uninterruptible power supply

Features

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

DFN3X3-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	
I_D@T_C=25°C	Continuous Drain Current	14	A
I_{DP}	Pulsed Drain Current	15	
E_{AS}	Avalanche Energy, Single pulse	1.2	mJ
P_D@T_C=25°C	Power Dissipation	17	W
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 [1]	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case [1]	---	7.4	

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance [2]	V_{GS}=10V , I_D=5A	---	110	140	mΩ
		V_{GS}=4.5V , I_D=3A	---	160	180	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	1.2	2.0	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25°C	---	---	1.0	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=50V , V_{GS}=10V , I_D=5A	---	4.3	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	
Q_{gd}	Gate-Drain Charge		---	1.1	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=50V , V_{GS}=10V , R_G=2Ω , I_D=5A	---	14.7	---	ns
T_r	Rise Time		---	3.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	20.9	---	
T_f	Fall Time		---	2.7	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f = 100KHz	---	350	---	pF
C_{oss}	Output Capacitance		---	28.9	---	
C_{rss}	Reverse Transfer Capacitance		---	1.4	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	7.0	A
I_{SP}	Pulsed Source Current		---	---	21	
V_{SD}	Diode Forward Voltage [2]	V_{GS}=0V , I_S=7A , T_J=25°C	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=5A, dI/dt=100A/μs, T_J=25°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 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.
5. V_{DD}=50V, R_G=50Ω, L=0.3mH, starting T_J=25°C.

Typical Characteristics

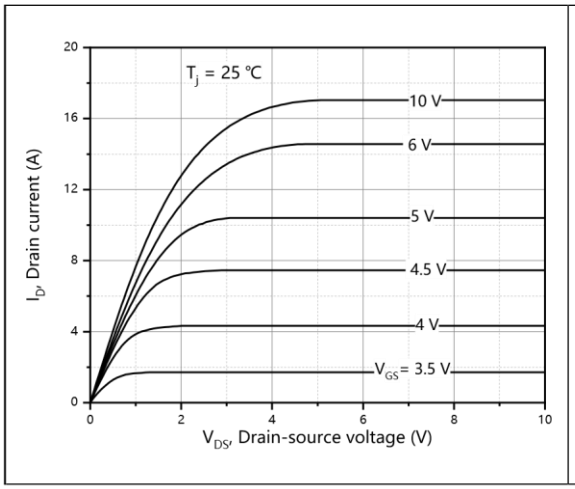


Figure 1, Typ. output characteristics

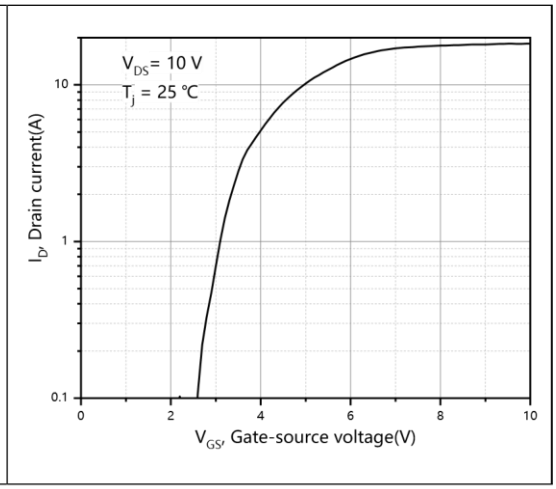


Figure 2, Typ. transfer characteristics

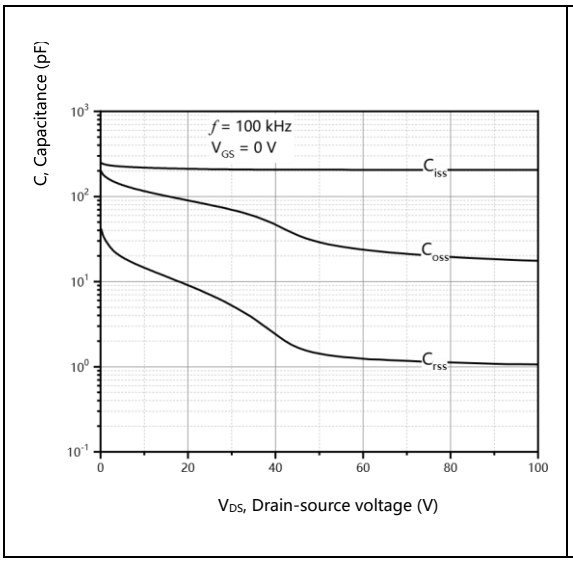


Figure 3, Typ. capacitances

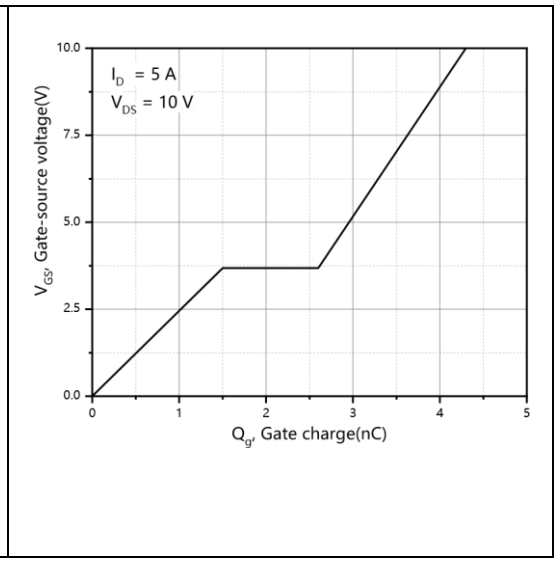


Figure 4, Typ. gate charge

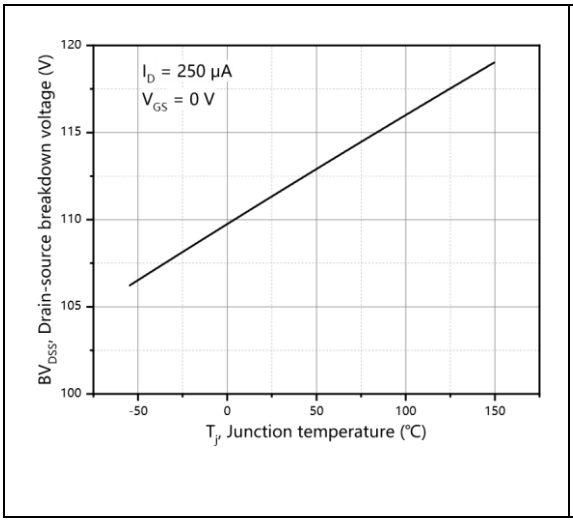


Figure 5, Drain-source breakdown voltage

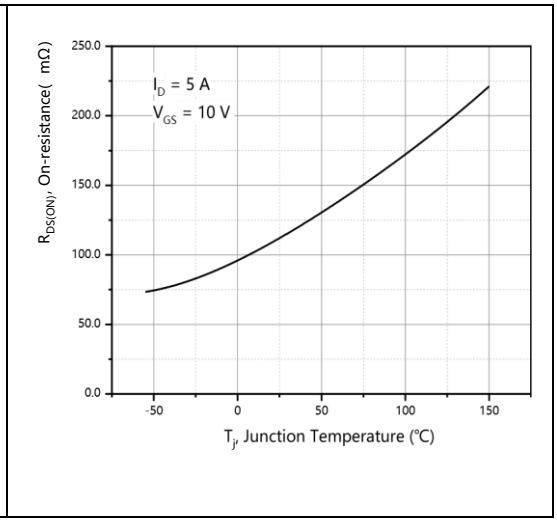


Figure 6, Drain-source on-state resistance

Typical Characteristics (Cont.)

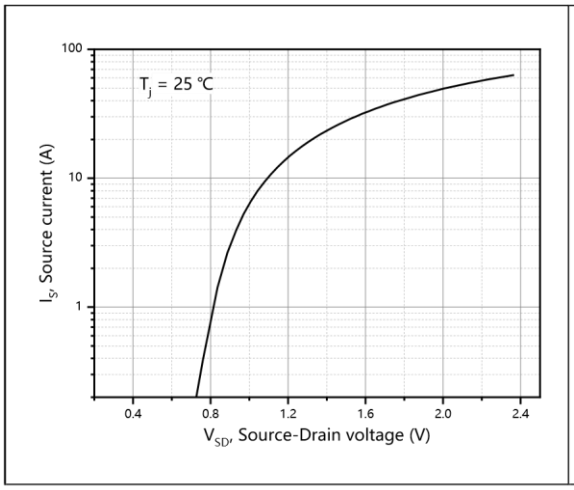


Figure 7, Forward characteristic of body diode

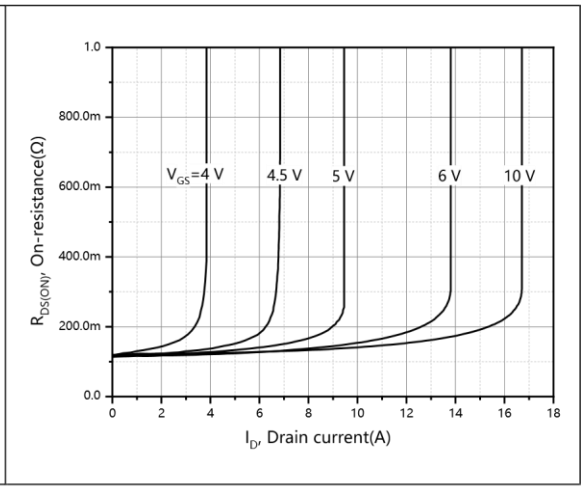


Figure 8, Drain-source on-state resistance

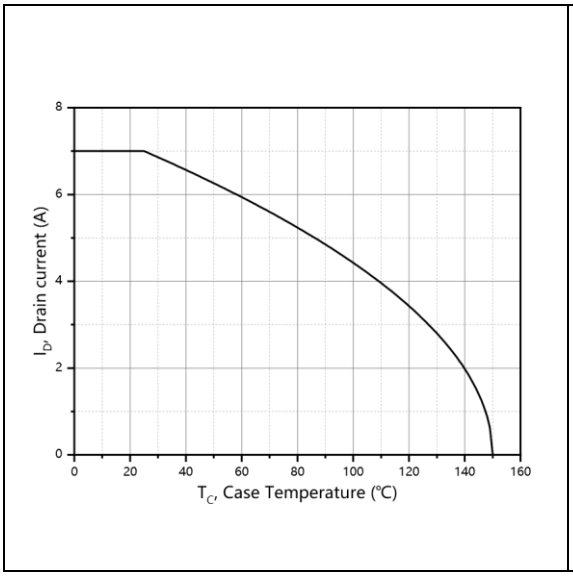


Figure 9, Drain current

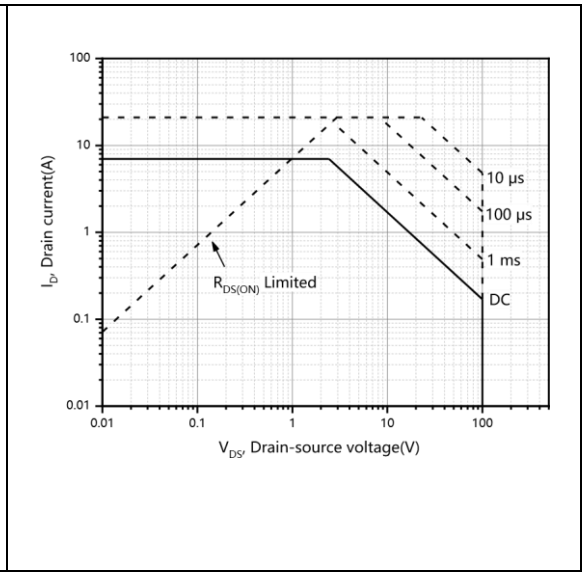
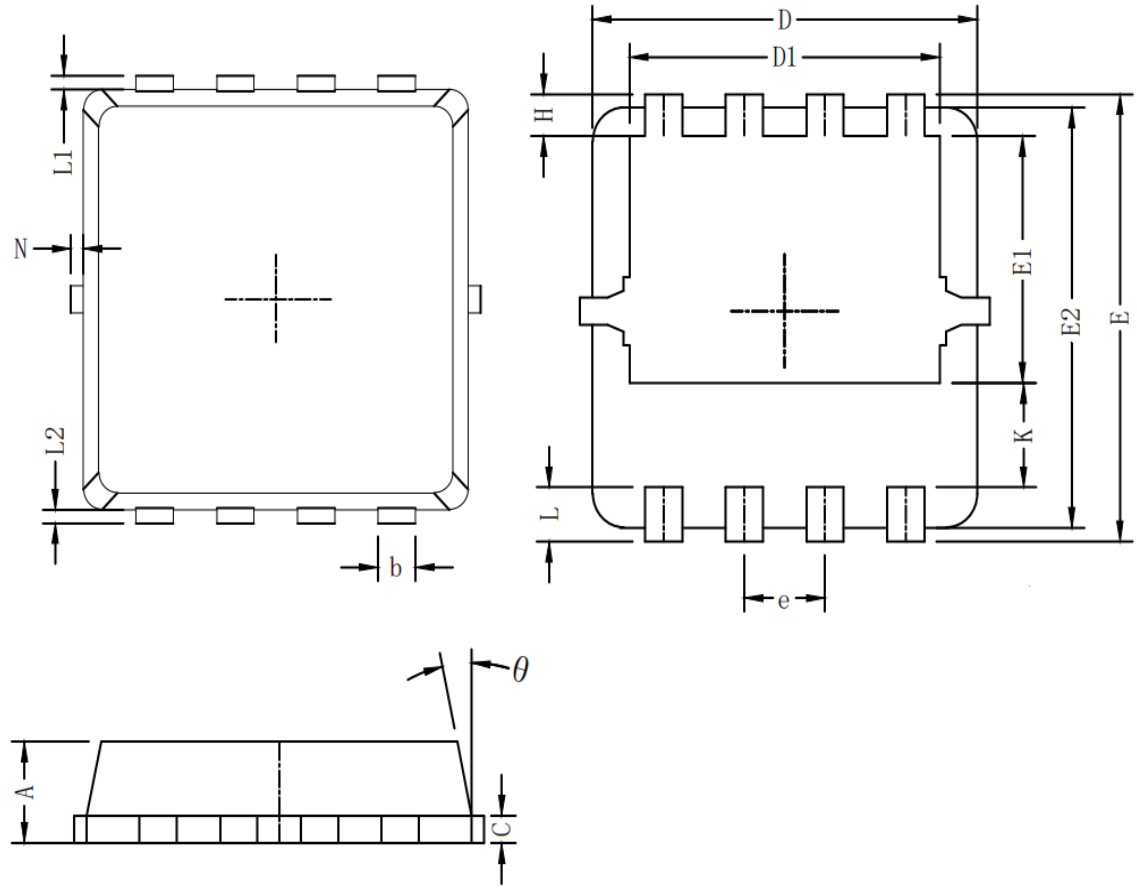


Figure 10, Safe operation area T_C=25 ℃

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
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

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