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

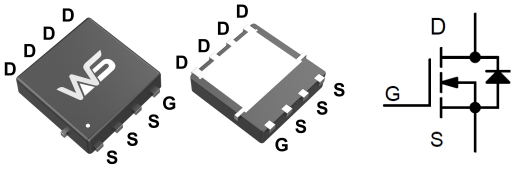
Product Summery

BV_{DSS}	R_{DSON}	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℃	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℃	Total Power Dissipation	17	W
T_J /T_{STG}	Operating/Storage Temperature Range	-55 to 150	℃

Thermal Data

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

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	VGS=10V,ID=5A.	---	110	140	mΩ
		VGS=4.5V,ID=3A.	---	160	180	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	2.0	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	I_D=5 A,	---	4.3	---	nC
Q_{gs}	Gate-Source Charge	V_{DS}=50 V,	---	1.5	---	
Q_{gd}	Gate-Drain Charge	V_{GS}=10 V	---	1.1	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=10 V,	---	14.7	---	ns
T_r	Rise Time	V_{DS}=50 V,	---	3.5	---	
$T_{d(off)}$	Turn-Off Delay Time	R_G=2 Ω,	---	20.9	---	
T_f	Fall Time	I_D=5 A	---	2.7	---	
C_{iss}	Input Capacitance	V_{GS}=0 V,	---	350	---	pF
C_{oss}	Output Capacitance	V_{DS}=50 V,	---	28.9	---	
C_{rss}	Reverse Transfer Capacitance	f=100 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℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	IF=5A,dI/dt=100A/μs,T_J=25℃	---	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) Pd 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 °C.
5) V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_j=25 °C.

Typical Operating Characteristics

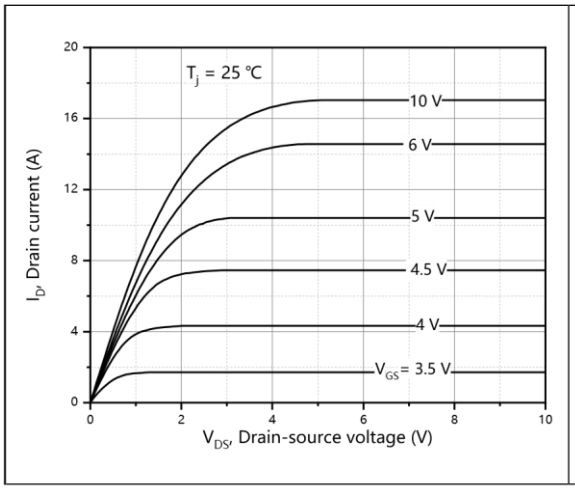


Figure 1, Typ. output characteristics

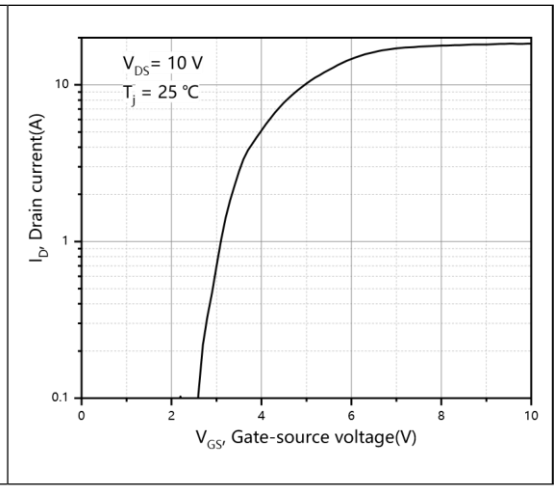


Figure 2, Typ. transfer characteristics

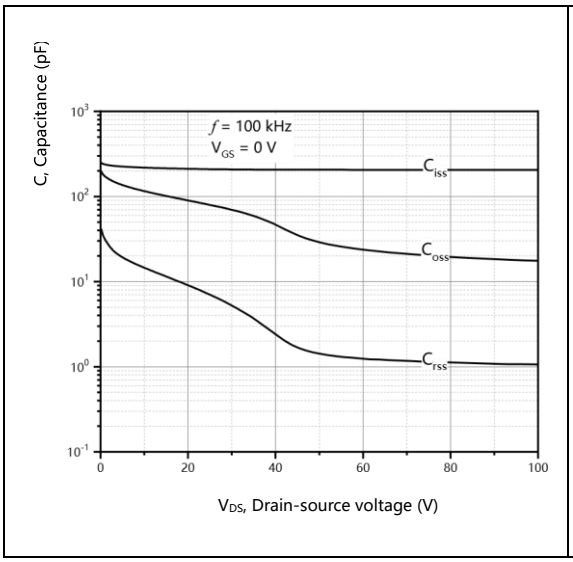


Figure 3, Typ. capacitances

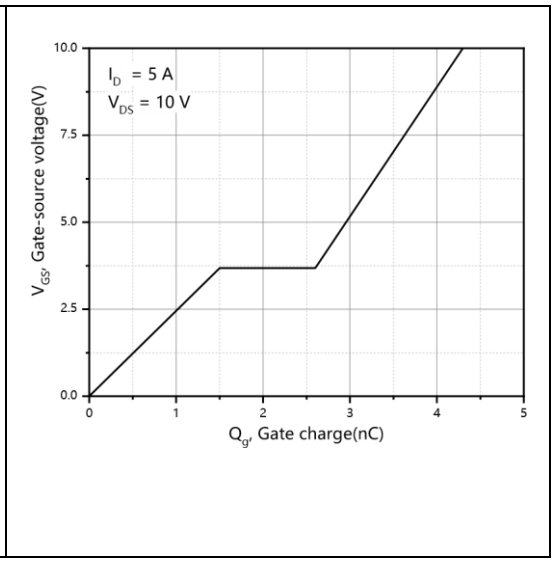


Figure 4, Typ. gate charge

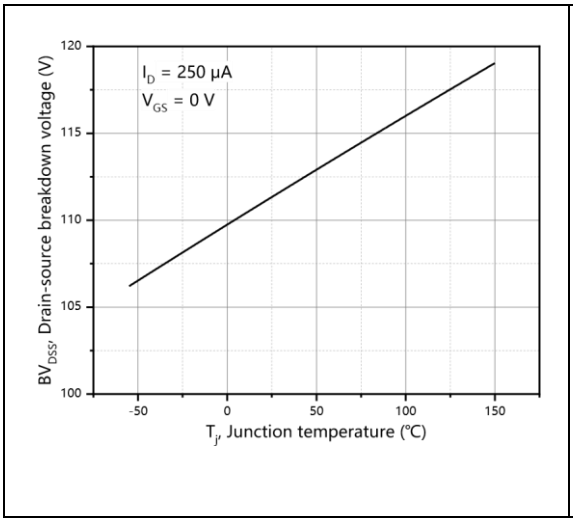


Figure 5, Drain-source breakdown voltage

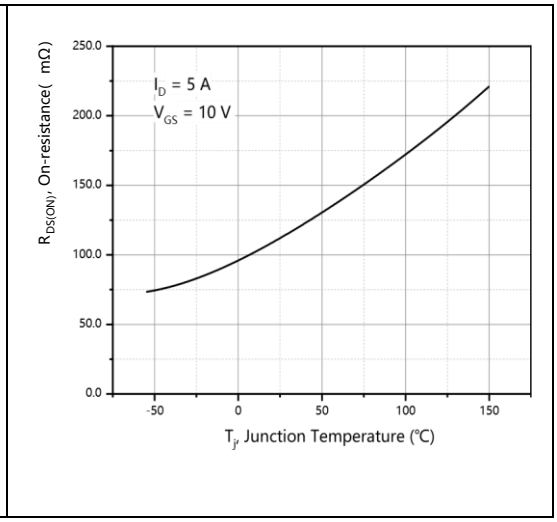


Figure 6, Drain-source on-state resistance

Typical Operating Characteristics (Cont.)

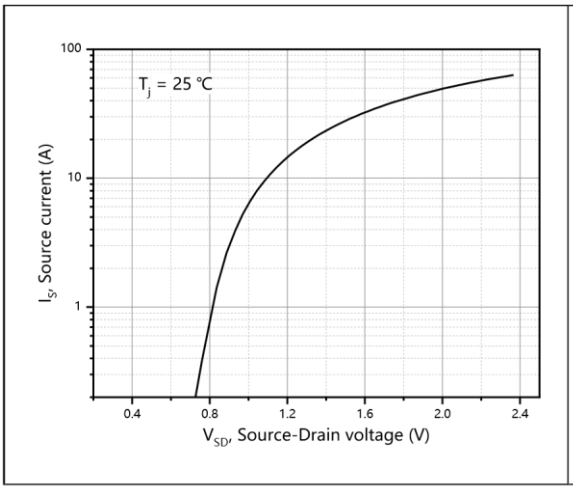


Figure 7, Forward characteristic of body diode

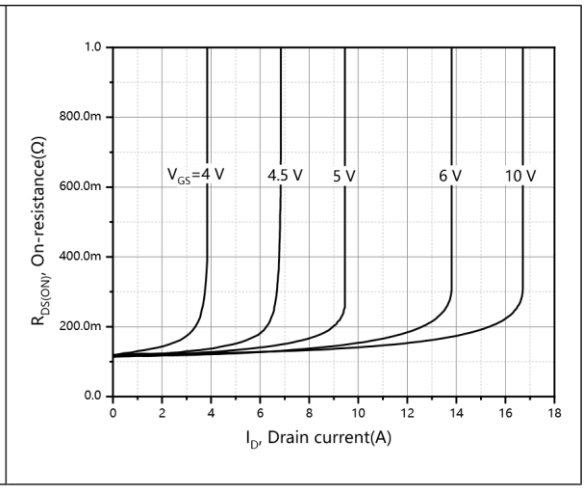


Figure 8, Drain-source on-state resistance

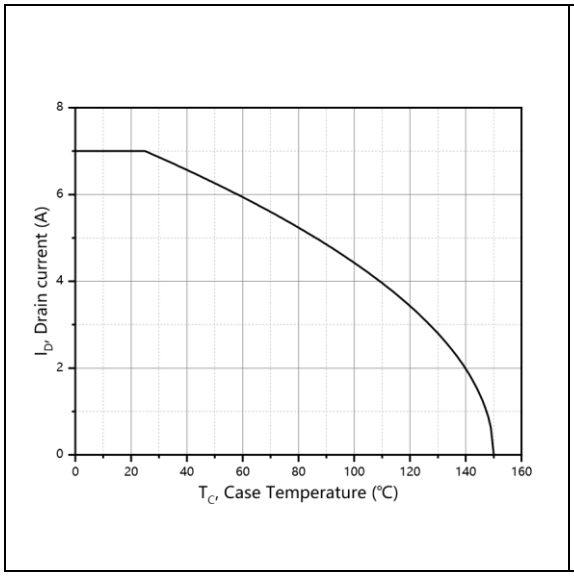


Figure 9, Drain current

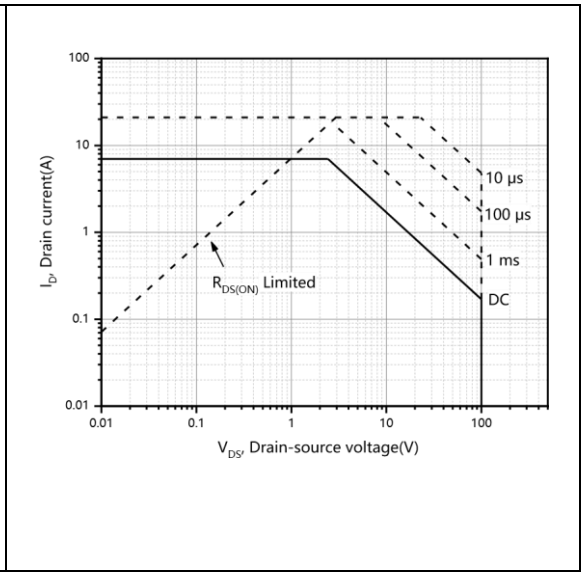


Figure 10, Safe operation area T_C=25 ℃

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