

General Description

The WSD28N10DN33 is the highest performance 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 WSD28N10DN33 meet the RoHS and Green Product requirement 100% E_{AS} guaranteed with full function reliability approved.

Features

- 100% UI S + Rg Tested
- Reli able a nd R ugged
- Lead F ree and Green Devices Available

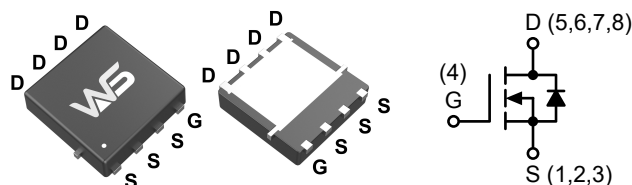
Product Summery

BV_{DSS}	$R_{DS(ON)}$	I_D
100V	45mΩ	25A

Applications

- Power Management in DC/DC Converter.
- POE Protection Switch.

DFN3X3-8L Pin Configuration



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current	25	A
$I_D @ T_C = 100^\circ\text{C}$		15.5	
I_{DM}^a	Pulsed Drain Current, $T_C = 25^\circ\text{C}$	75	
E_{AS}^b	Avalanche Energy, Single pulse, $L = 0.5\text{mH}$	16	mJ
I_{AS}^b	Avalanche Current, Single pulse, $L = 0.5\text{mH}$	8	A
$P_D @ T_C = 25^\circ\text{C}$	Total Power Dissipation	25	W
$P_D @ T_C = 100^\circ\text{C}$		10	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}^c$	Thermal Resistance Junction-Ambient	---	80	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	5	$^\circ\text{C/W}$

Note a : Pulse width limited by maximum junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

Note c : Surface Mounted on 1in^2 pad area.

Electrical Characteristics ($T_A = 25^\circ\text{C}$, 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 ^d	$V_{GS}=10V$, $I_{DS}=7A$	---	45	54	$m\Omega$
		$V_{GS}=4.5V$, $I_{DS}=7A$	---	55	70	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.0	1.7	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V$, $V_{GS}=0V$, $T_J=85^\circ\text{C}$	---	---	30	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_G	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.5	---	Ω
Q_g	Total Gate Charge	$V_{DS}=50V$, $V_{GS}=10V$, $I_{DS}=7A$	---	7.5	11	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	
Q_{gd}	Gate-Drain Charge		---	1.6	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V$, $R_L=30\Omega$, $I_{DS}=1A$, $V_{GEN}=10V$, $R_G=6\Omega$	---	6	11	ns
T_r	Rise Time		---	9	17	
$T_{d(off)}$	Turn-Off Delay Time		---	12	22	
T_f	Fall Time		---	14	26	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2116	---	pF
C_{oss}	Output Capacitance		---	117	---	
C_{rss}	Reverse Transfer Capacitance		---	97	---	

Diode Characteristics

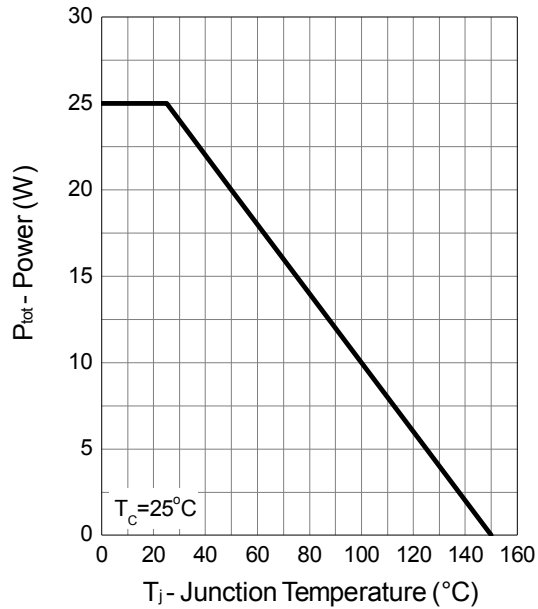
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	25	A
V_{SD}	Diode Forward Voltage ^d	$V_{GS}=0V$, $I_S=7A$	---	0.8	1.3	V
t_{rr}	Reverse Recovery Time	$I_F=7A$, $dI/dt=100A/\mu s$	---	30	---	nS
Q_{rr}	Reverse Recovery Charge		---	40	---	nC

Note d : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

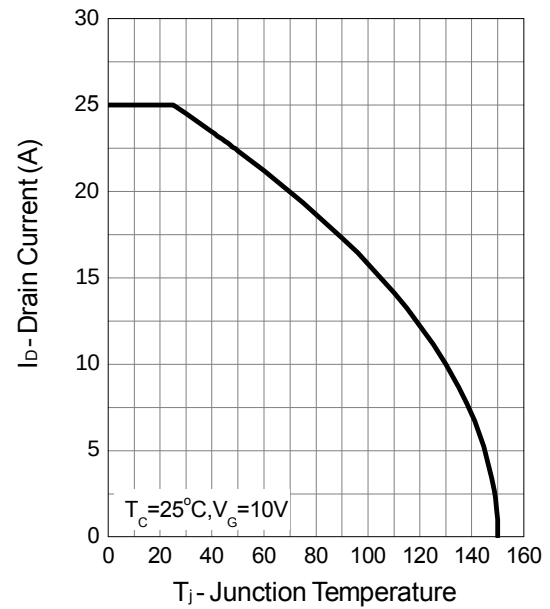
Note e : Guaranteed by design, not subject to production testing.

Typical Characteristics

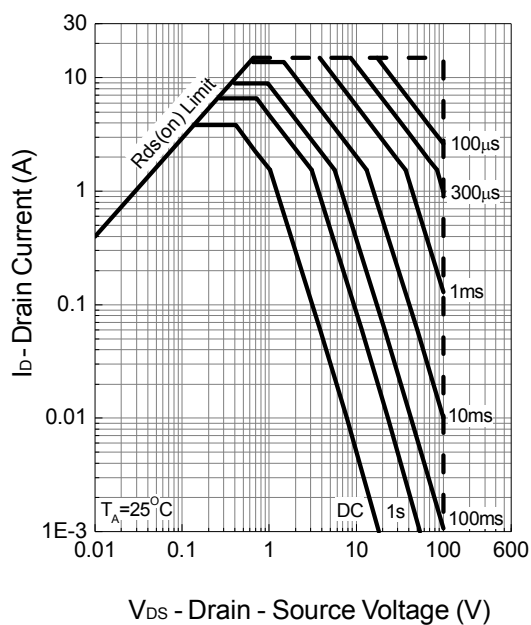
Power Dissipation



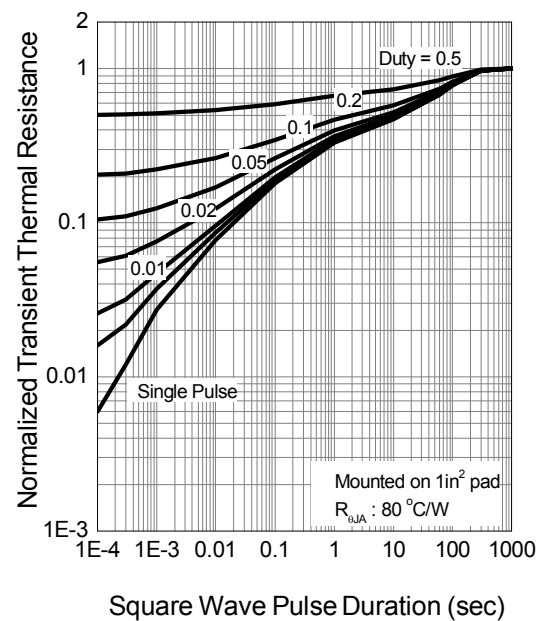
Drain Current



Safe Operation Area

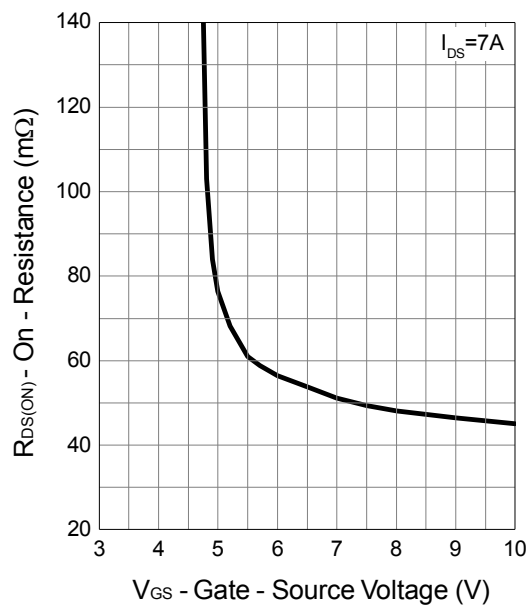


Thermal Transient Impedance

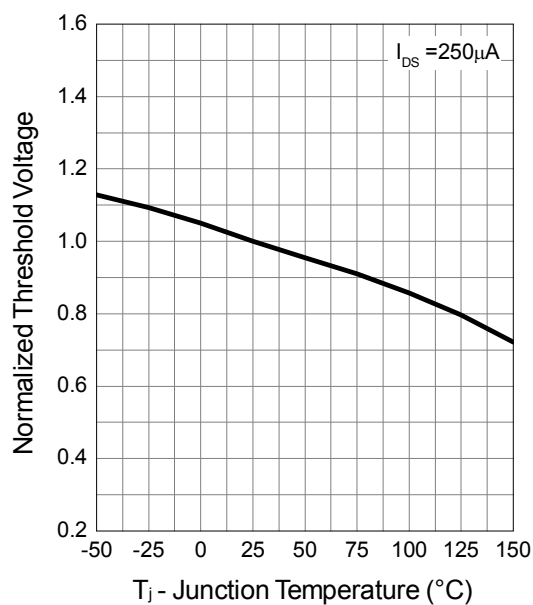


Typical Characteristics (Cont.)

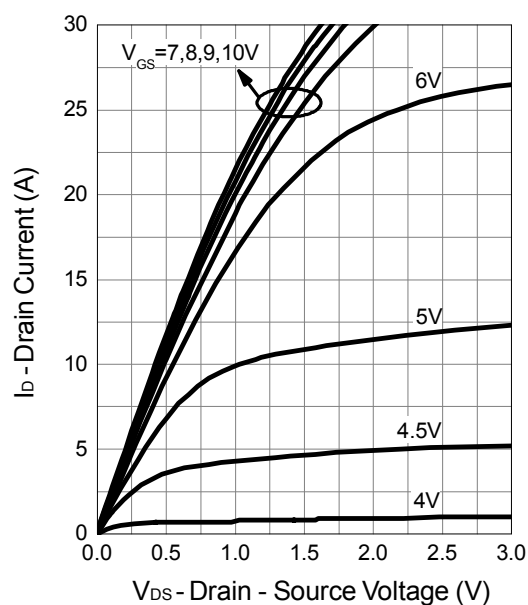
Gate-Source On Resistance



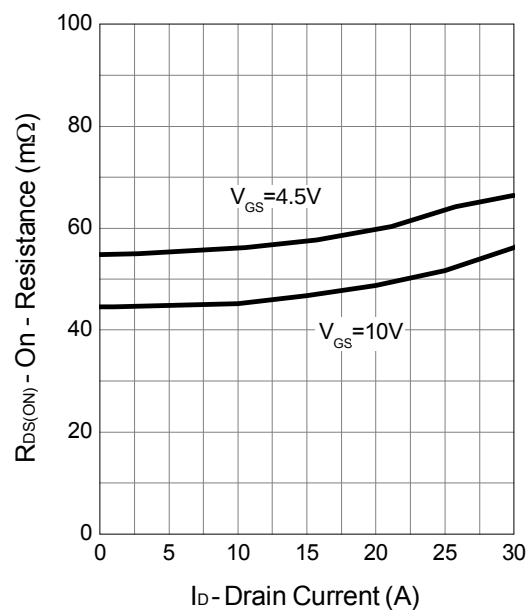
Gate Threshold Voltage

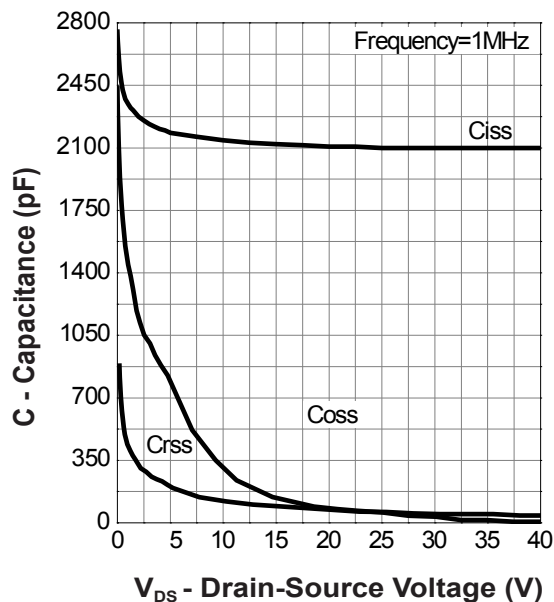
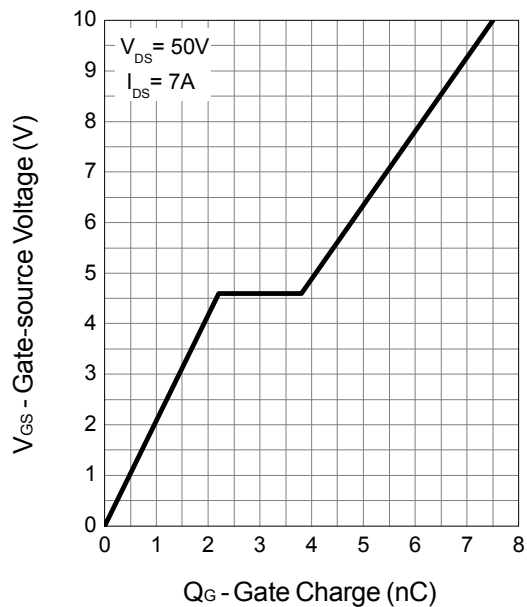
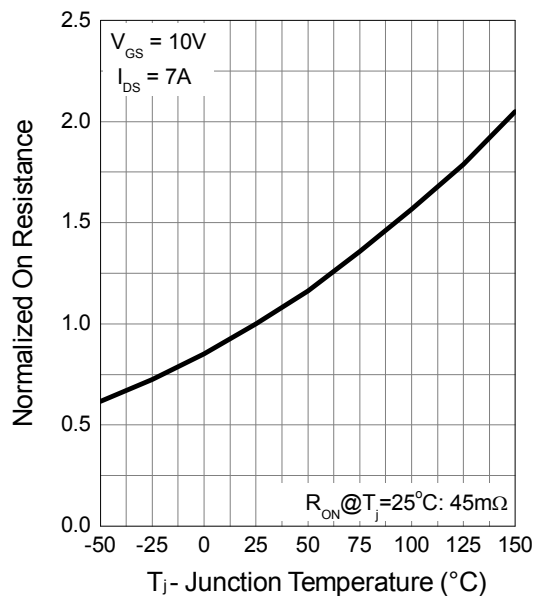
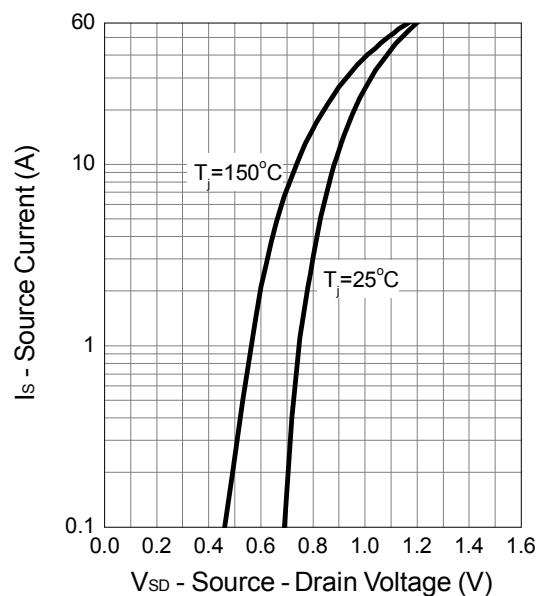


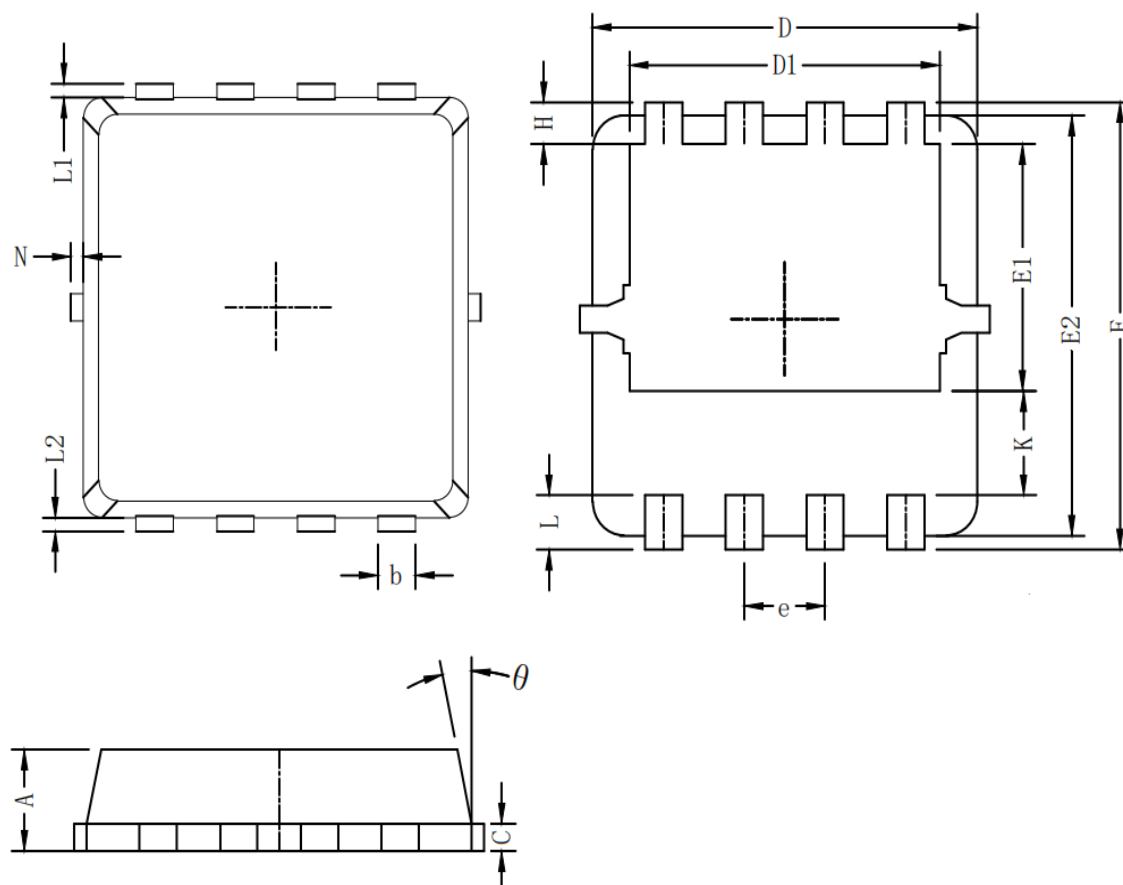
Output Characteristics



Drain-Source On Resistance



Typical Characteristics (Cont.)
Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


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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