

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% UIS + Rg Tested
- Reliable and Rugged
- Lead Free and Green Devices Available

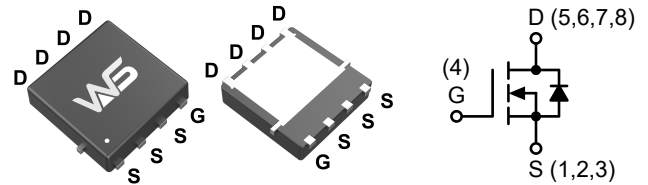
Product Summary

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

Applications

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

DFN3X3-8L Pin Configuration



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Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	
$I_D@T_C=25^\circ C$	Continuous Drain Current	25	A
$I_D@T_C=100^\circ C$		15.5	
I_{DM}^a	Pulsed Drain Current, $T_C=25^\circ C$	75	
E_{AS}^b	Avalanche Energy, Single pulse, $L=0.5mH$	16	mJ
I_{AS}^b	Avalanche Current, Single pulse, $L=0.5mH$	8	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	25	W
$P_D@T_C=100^\circ C$		10	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
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	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	5	$^\circ C/W$

Note a : Pulse width limited by maximum junction temperature.

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

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

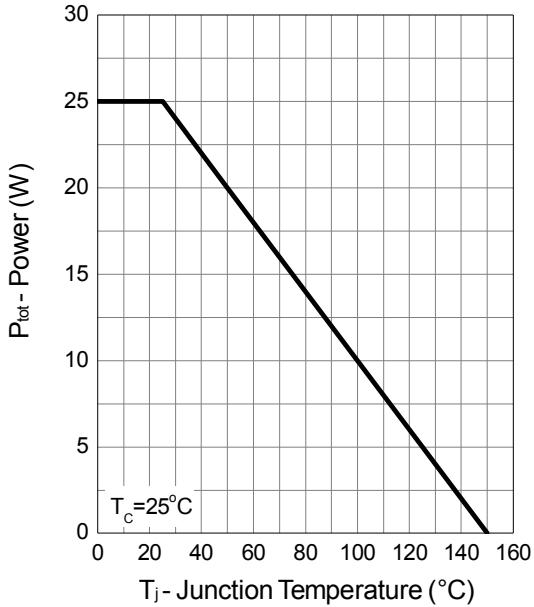
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	25	A
V_{SD}	Diode Forward Voltage ^d	$V_{GS}=0V, I_S=7A$	---	0.8	1.3	V
t_{rr}	Reverse Recovery Time	$I_F=7A, dI/dt=100A/\mu s$	---	30	---	nS
Q_{rr}	Reverse Recovery Charge		---	40	---	nC

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

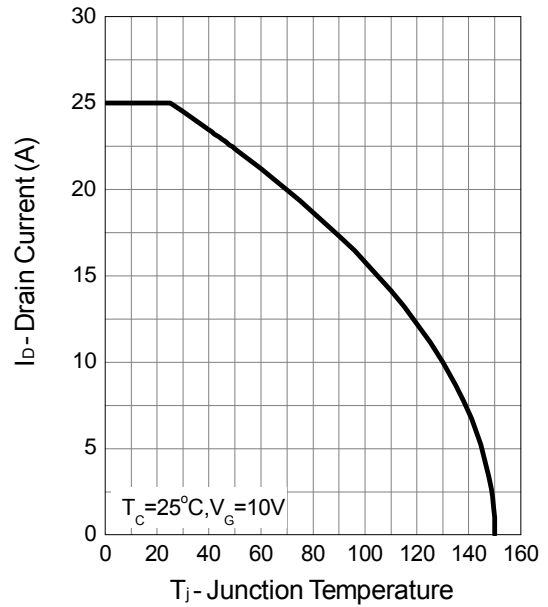
Note e : Guaranteed by design, not subject to production testing.

Typical Characteristics

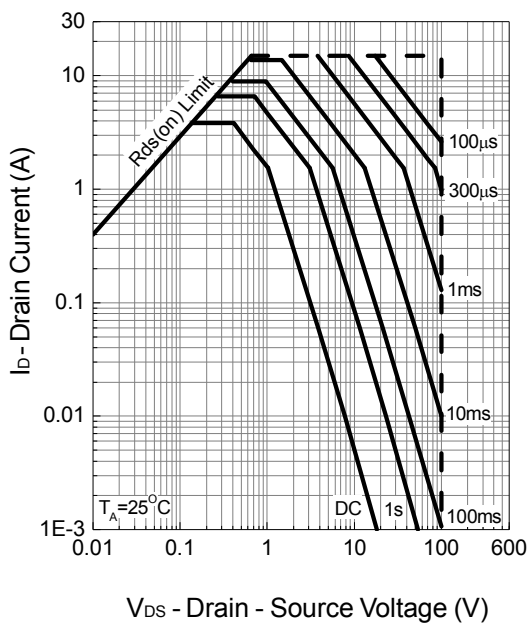
Power Dissipation



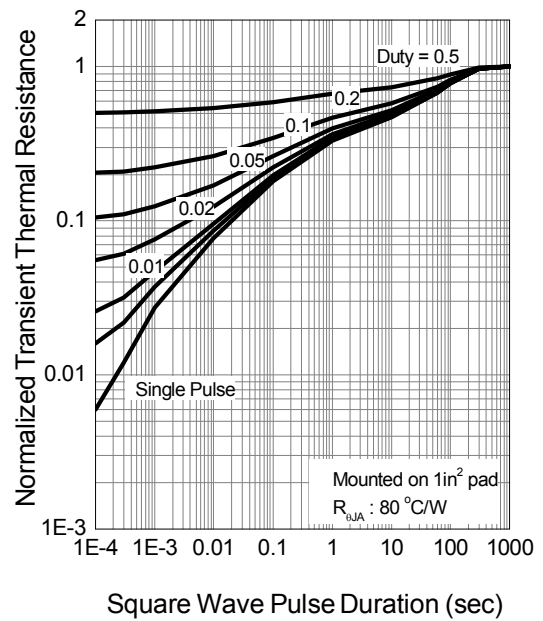
Drain Current



Safe Operation Area

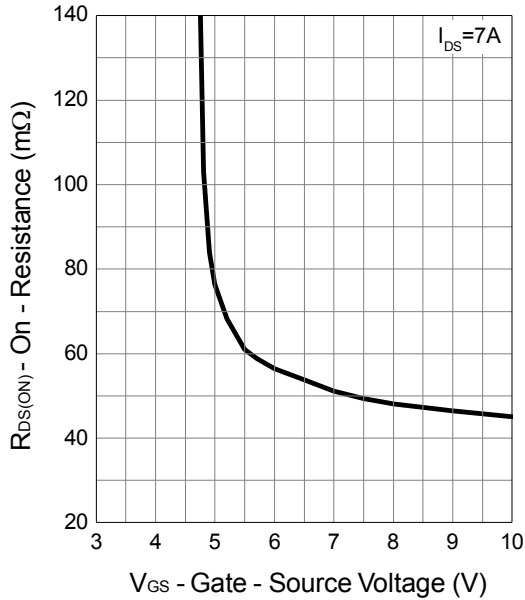


Thermal Transient Impedance

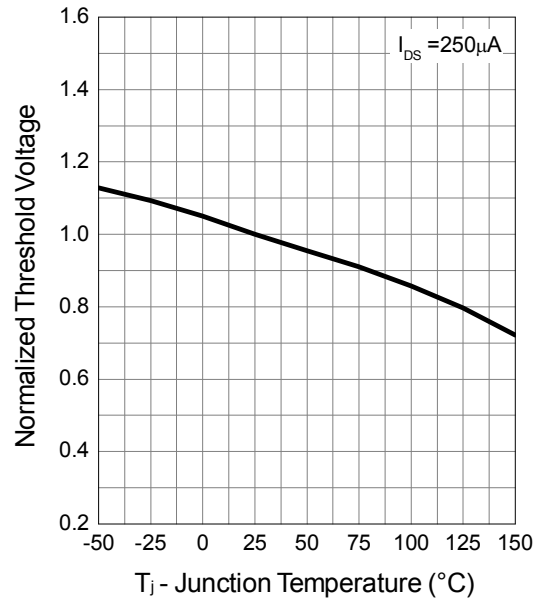


Typical Characteristics (Cont.)

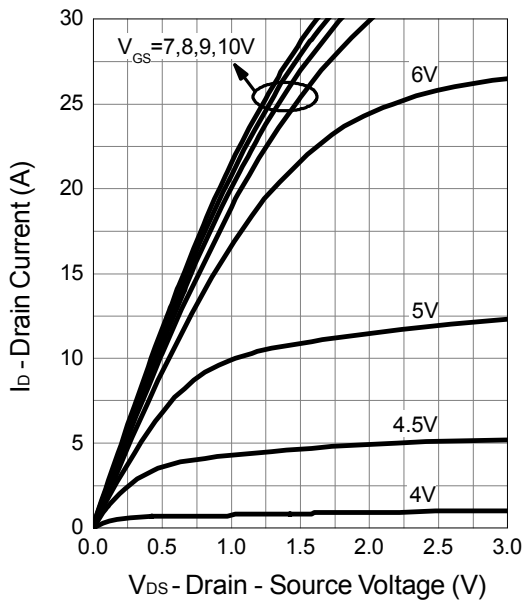
Gate-Source On Resistance



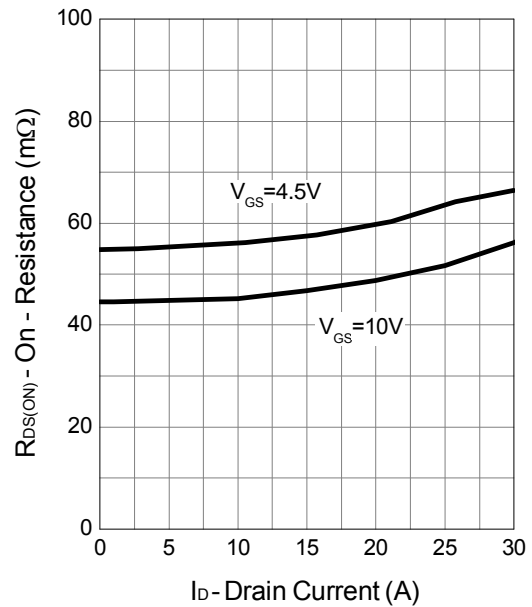
Gate Threshold Voltage



Output Characteristics

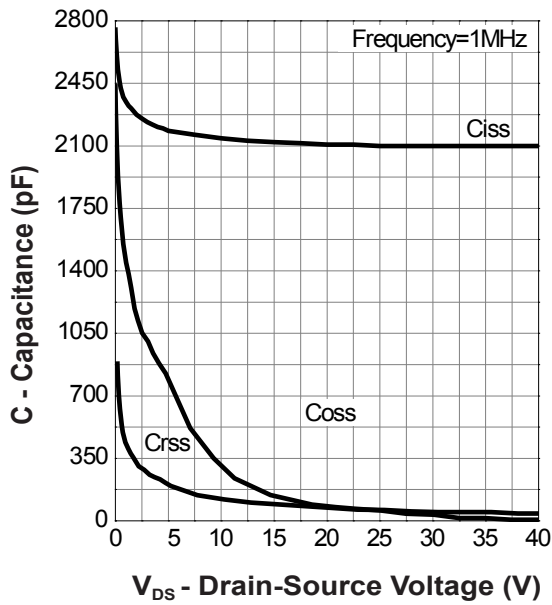


Drain-Source On Resistance

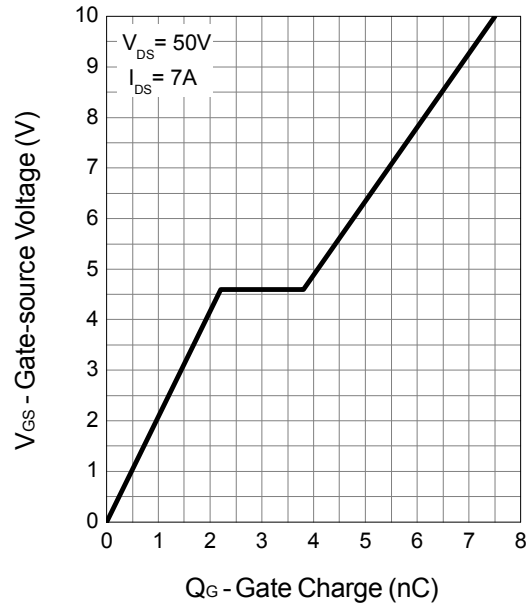


Typical Characteristics (Cont.)

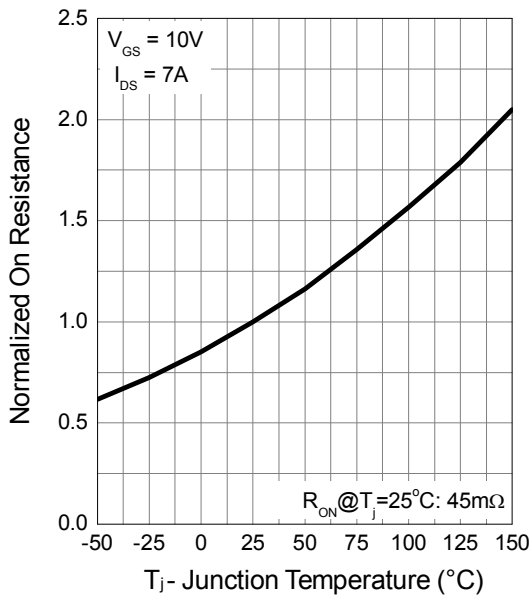
Capacitance



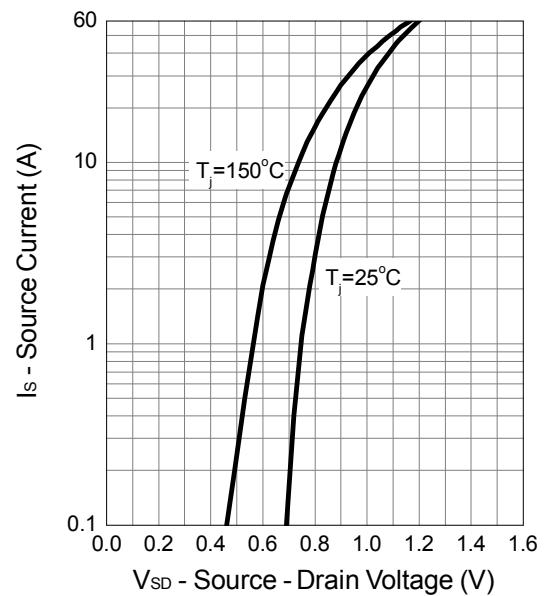
Gate Charge

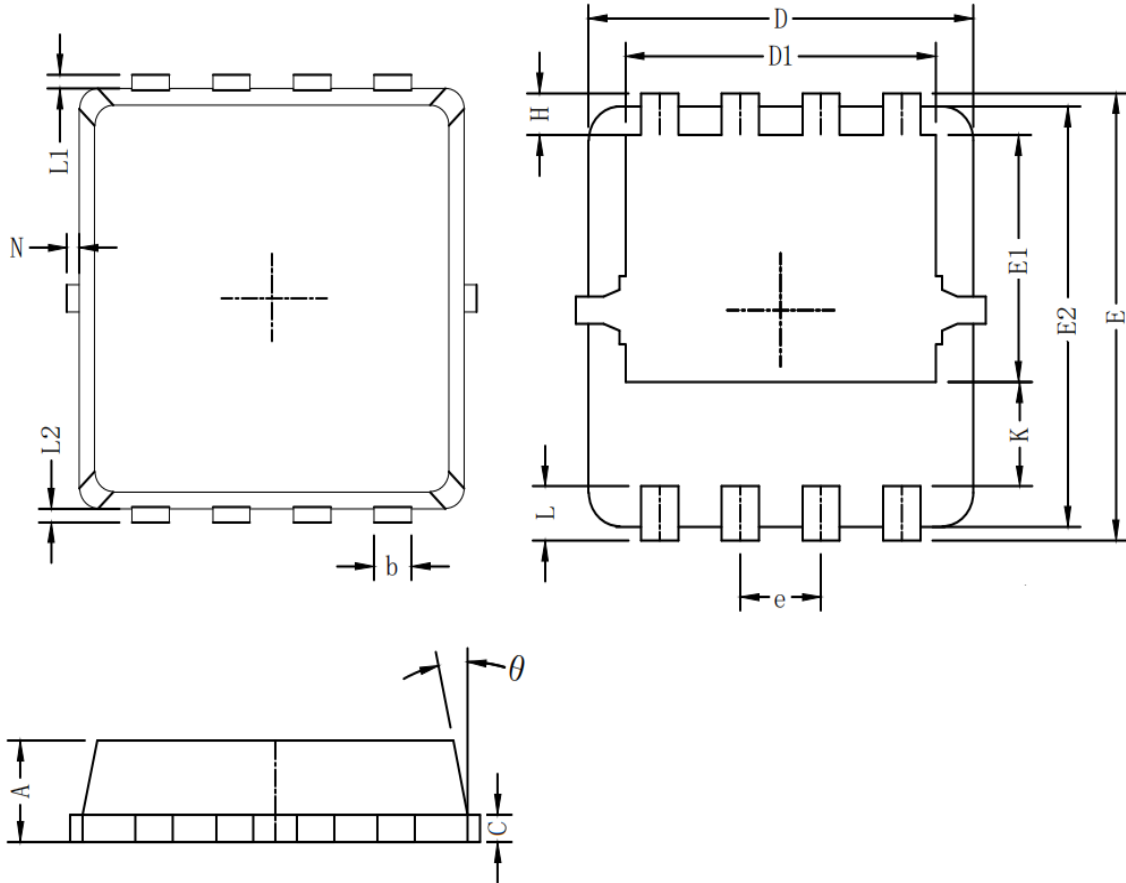


Drain-Source On Resistance



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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