General Description

The WSD25N10DN33 is the highest performance SGT Dual 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 WSD25N10DN33 meet the RoHS and Green Product requirement, 100% E_{AS} guaranteed with full function reliability approved.

Features

- 100% UIS Tested.
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

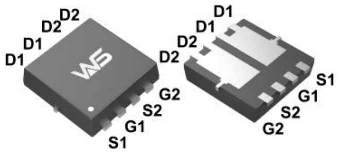
Product Summery

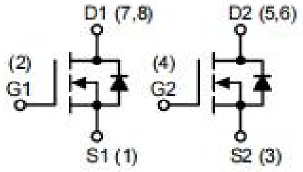
BV_{DSS}	$R_{DS(ON)}$	I_D
100V	19mΩ	25A

Applications

- Power Management for Industrial DC/DC Converters
- Ldeal for high-frequency switching and synchronous rectification

DFN3*3-8L Pin Configuration





Absolute Maximum Ratings (T_A=25°C, Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		±20	
I_D [7]	Continuous Drain Current	T_C=25°C	25	A
		T_C=100°C	18	
I_{DM} [3]	Pulse Drain Current		110	
P_D [2]	Power Dissipation	T_C=25°C	28	W
I_{AS} [3]	Single pulse Avalanche Current		18	A
E_{AS} [3]	Single pulse Avalanche Energy	L=0.5mH	95	mJ
T_{STG}	Storage Temperature Range		-55 to 150	°C
T_J	Operating Junction Temperature Range		-55 to 150	
$R_{\theta JA}$ [1,4]	Thermal Resistance-Junction to Ambient	t≤10s	30	°C/W
		Steady State	60.5	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		4.5	

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	V_{GS}=10V , I_D=10A	---	19	22	mΩ
		T_J=125°C	---	36	---	
		V_{GS}=4.5V , I_D=10A	---	22	25	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	1.3	1.8	2.3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V	---	---	1.0	μA
		T_J=55°C	---	---	5.0	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V , V_{GS}=±20V	---	---	±100	nA
g_{fs}	Forward Transconductance	V_{DS}=5V , I_D=10A	---	23	---	S
R_G	Gate Resistance	f=1.0MHz	---	4.5	---	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=50V , V_{GS}=10V , I_D=10A	---	12.5	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	3	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , I_D=10A R_L=1Ω , R_{GEN}=3Ω	---	15	---	ns
T_r	Rise Time		---	16	---	
$T_{d(off)}$	Turn-Off Delay Time		---	23	---	
T_f	Fall Time		---	7	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1.0MHz	---	580	---	pF
C_{oss}	Output Capacitance		---	167	---	
C_{rss}	Reverse Transfer Capacitance		---	6	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S [7]	Continuous Source Current		---	---	25	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A	---	0.7	1.2	V
t_{rr}	Reverse Recovery Time	I_F=20A , di/dt=500A/μs	---	45	---	ns
Q_{rr}	Reverse Recovery Charge		---	89	---	nC

Note:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.
6. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.
7. The maximum current rating is package limited.
8. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.
9. The maximum current rating is silicon limited

Typical Characteristics

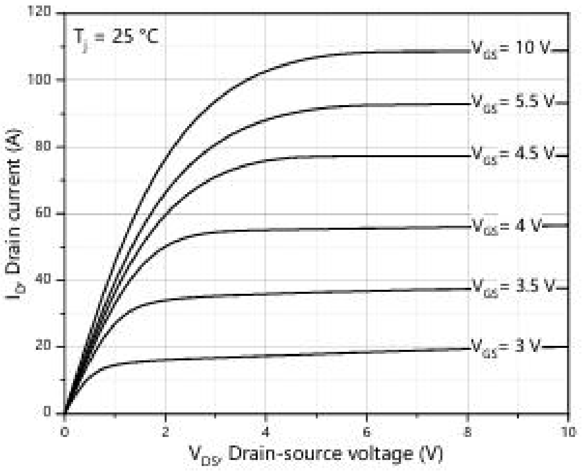


Figure 1. Typ. output characteristics

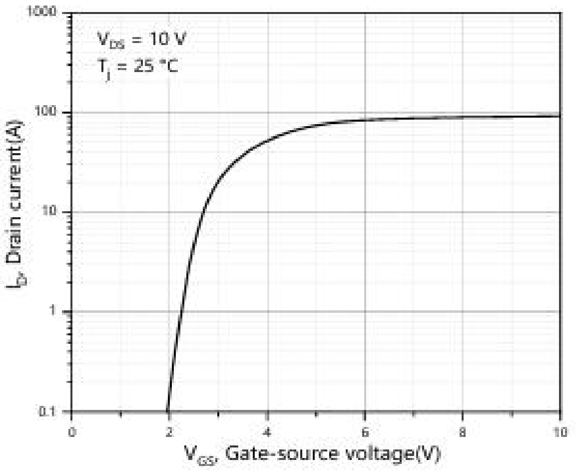


Figure 2. Typ. transfer characteristics

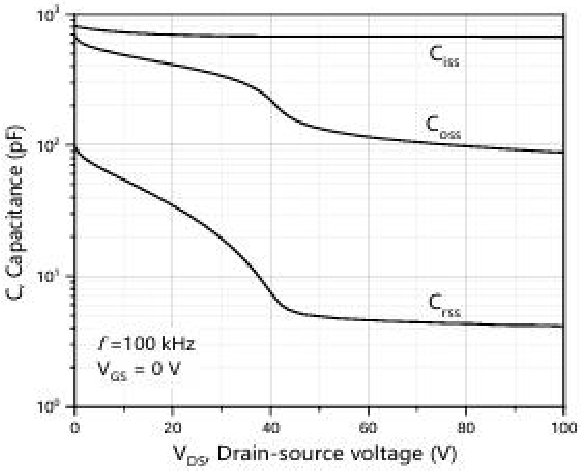


Figure 3. Typ. capacitances

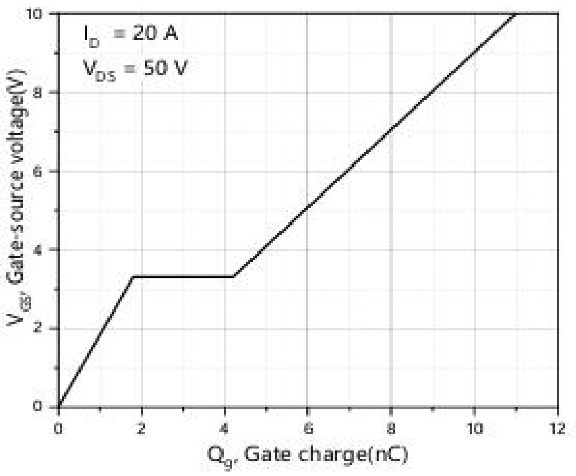


Figure 4. Typ. gate charge

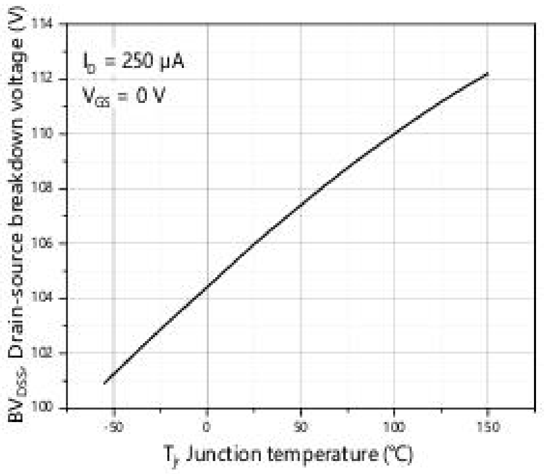


Figure 5. Drain-source breakdown voltage

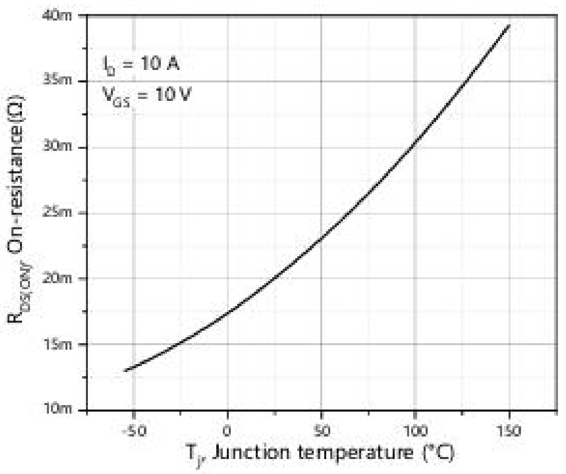


Figure 6. Drain-source on-state resistance

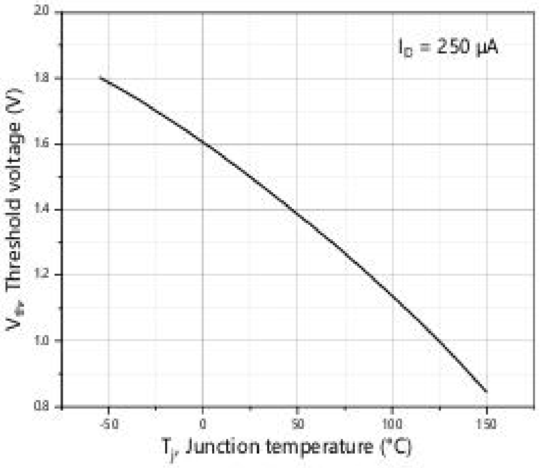


Figure 7. Threshold voltage

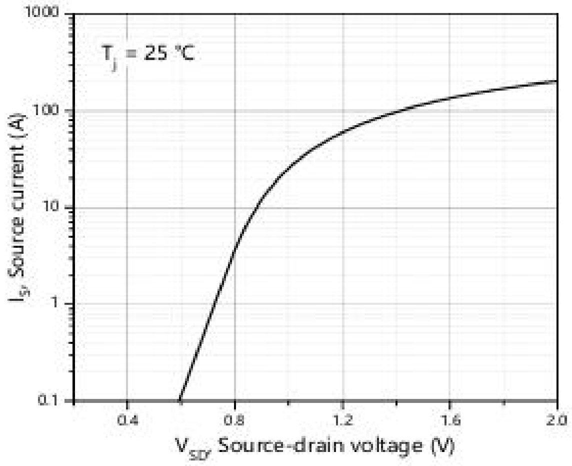


Figure 8. Forward characteristic of body diode

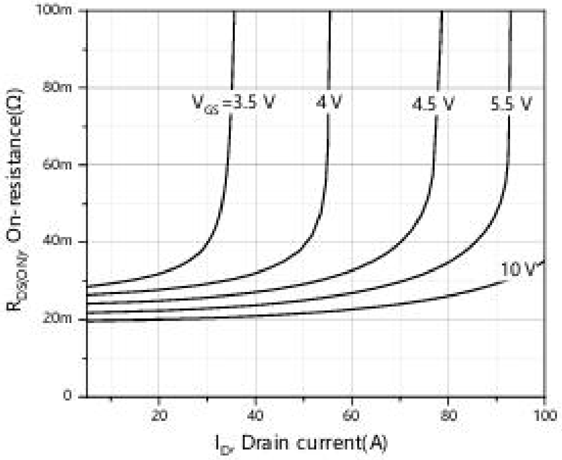


Figure 9. Drain-source on-state resistance

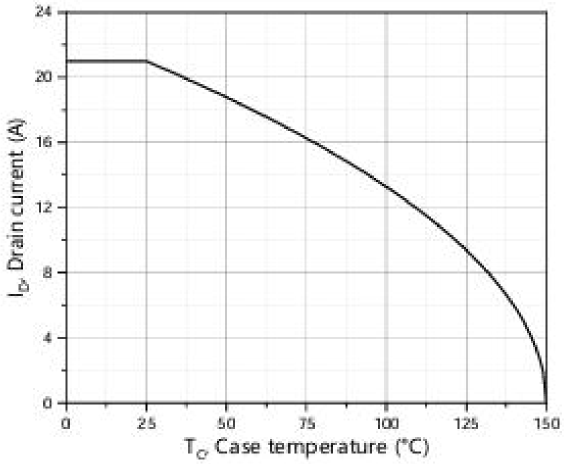


Figure 10. Drain current

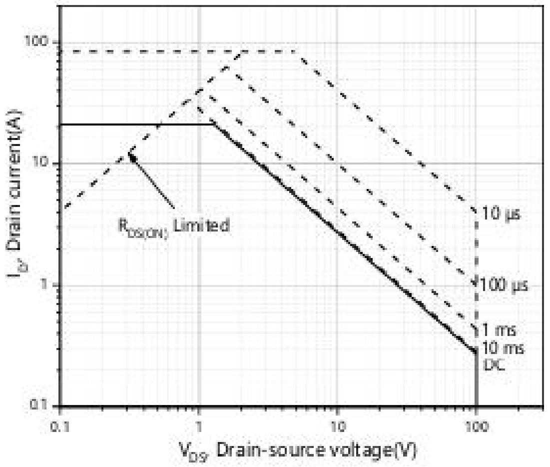


Figure 11. Safe operation area Tc=25℃

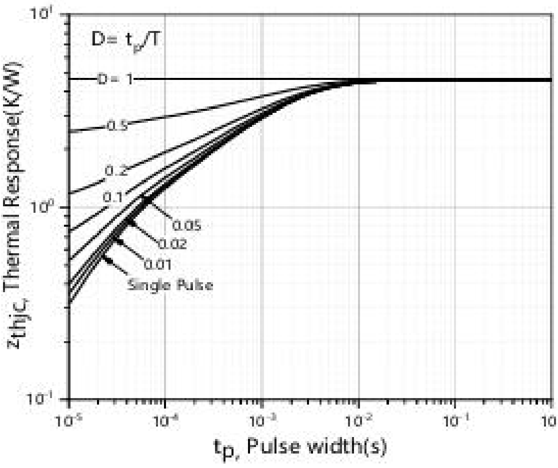
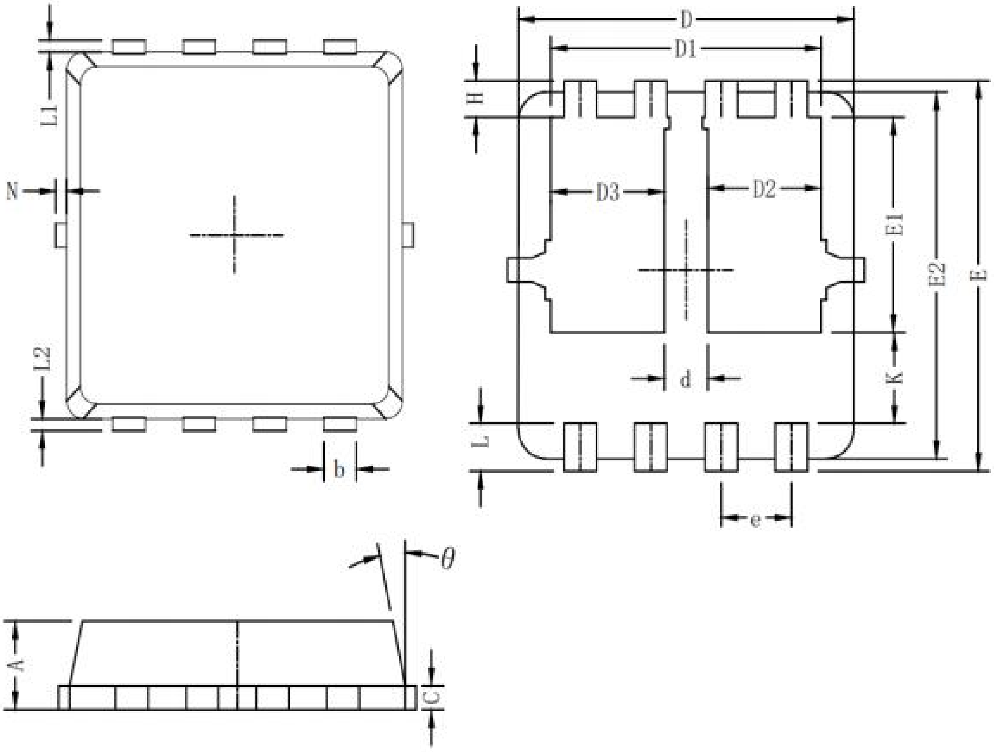


Figure 12. Max. transient thermal impedance

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
D2/D3	0.8	1	1.2
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
d	0.3	0.4	0.5

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