General Description

The WSD30L55DN33 is the highest performance trench Dual P-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 WSD30L55DN33 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
-30V	15mΩ	-15A

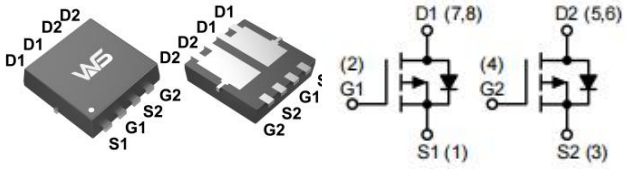
Applications

- Power Management for Industrial DC/DC Converters
- Motor Control

Features

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

DFN3x3-8L Pin Configuration



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

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±20	
I_D [7]	Continuous Drain Current	T_C=25°C	-15	A
		T_C=100°C	-11	
I_{DM} [3]	Pulse Drain Current		-45	
P_D [2]	Power Dissipation	T_C=25°C	42	W
		T_C=100°C	17	
I_{AS} [3]	Single pulse Avalanche Current		-15	A
E_{AS} [3]	Single pulse Avalanche Energy	L=0.3mH	12	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	43	°C/W
		Steady State	80	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		3	

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	-30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-5A	---	15	18	mΩ
		T_J=125°C	---	19	---	
		V_{GS}=-4.5V , I_D=-2A	---	18	21	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=-250μA	-1.2	-1.6	-2.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-24V , V_{GS}=0V	---	---	-1.0	μA
		T_J=55°C	---	---	-30	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V , V_{GS}=±20V	---	---	±100	nA
g_{fs}	Forward Transconductance	V_{DS}=-5V , I_D=-2.5A	---	8	---	S
R_G	Gate Resistance	f=1.0MHz	---	2.8	---	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-4A	---	14.3	21	nC
Q_g	Total Gate Charge (4.5V)		---	7	11	
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	2.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=-15V , V_{GS}=-10V ,I_D=-1A R_L=1Ω , R_{GEN}=6Ω	---	11	---	ns
T_r	Rise Time		---	7	---	
$T_{d(off)}$	Turn-Off Delay Time		---	29	---	
T_f	Fall Time		---	6	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1.0MHz	---	823	---	pF
C_{oss}	Output Capacitance		---	106	---	
C_{rss}	Reverse Transfer Capacitance		---	74	---	

Diode Characteristics

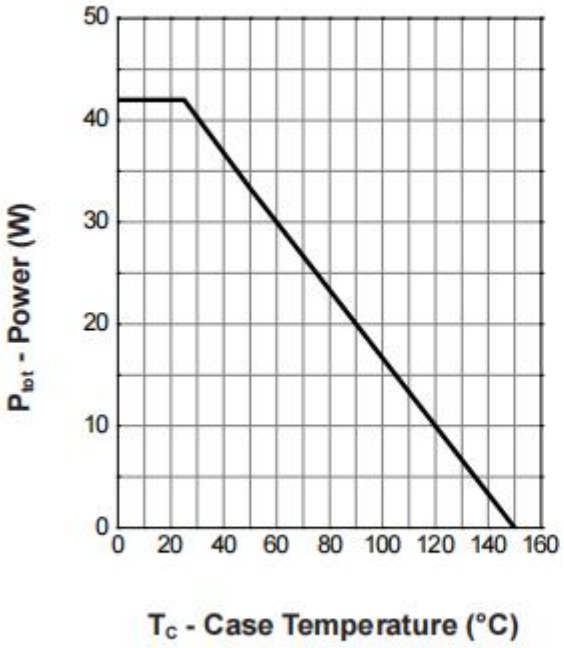
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S [7]	Continuous Source Current		---	---	-15	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A	---	-0.7	-1.0	V
t_{rr}	Reverse Recovery Time	I_F=-4A , di/dt=500A/μs	---	11	---	ns
Q_{rr}	Reverse Recovery Charge		---	2	---	nC

Note:

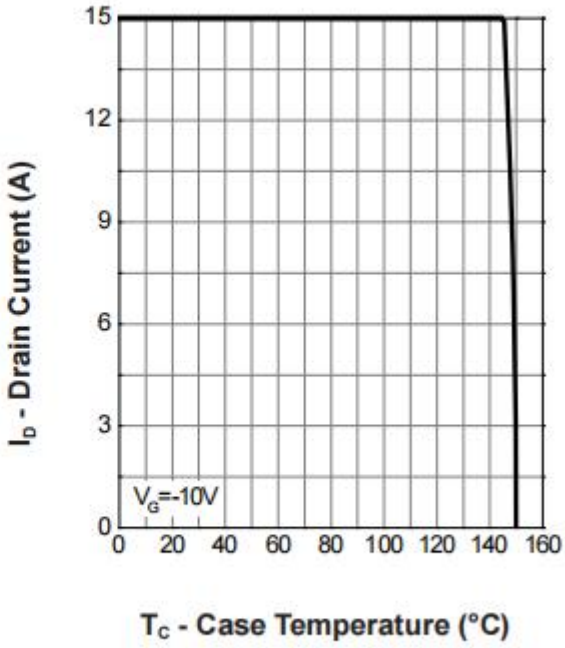
1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application 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

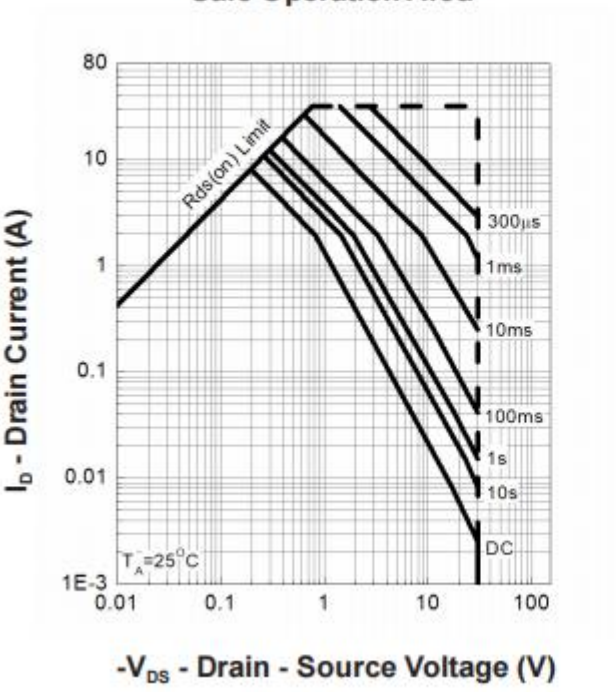
Power Dissipation



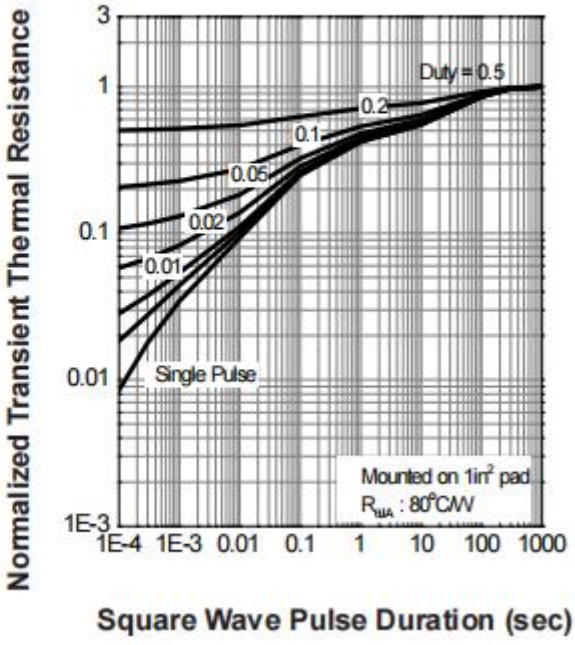
Drain Current



Safe Operation Area

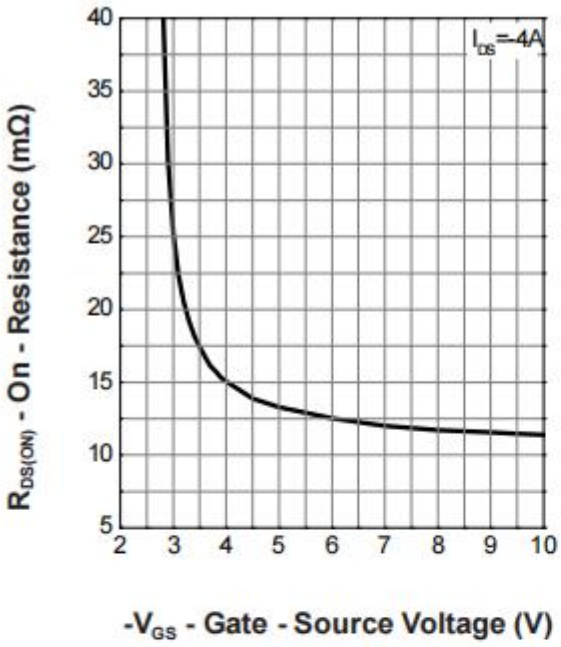


Thermal Transient Impedance

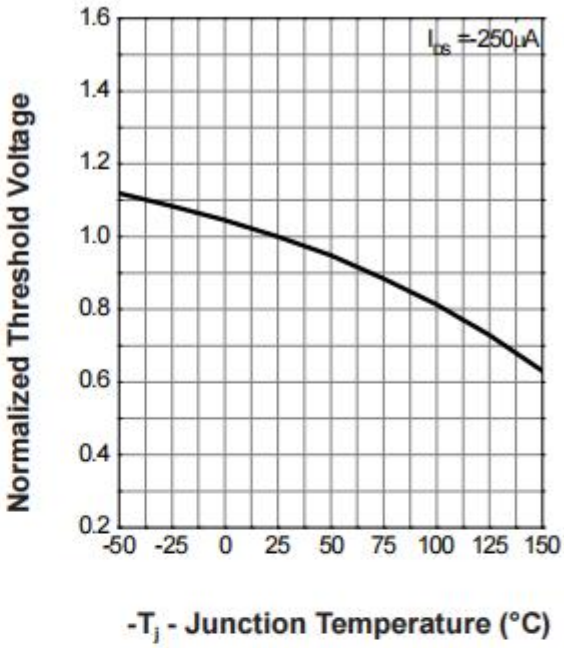


Typical Characteristics (Cont.)

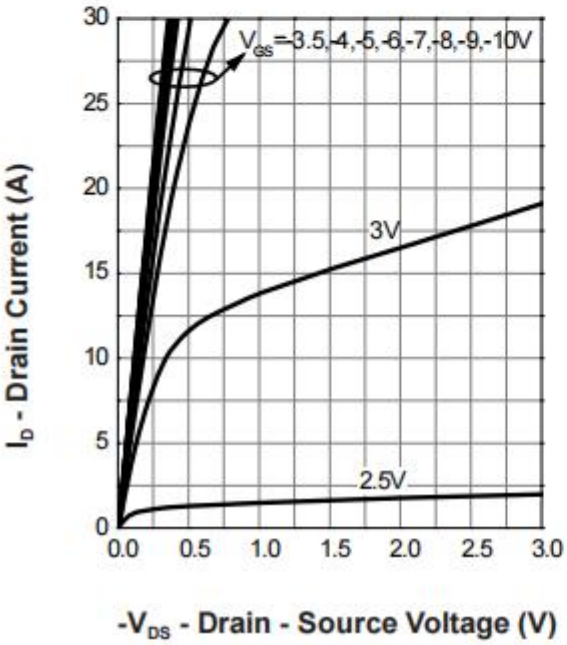
Gate-Source On Resistance



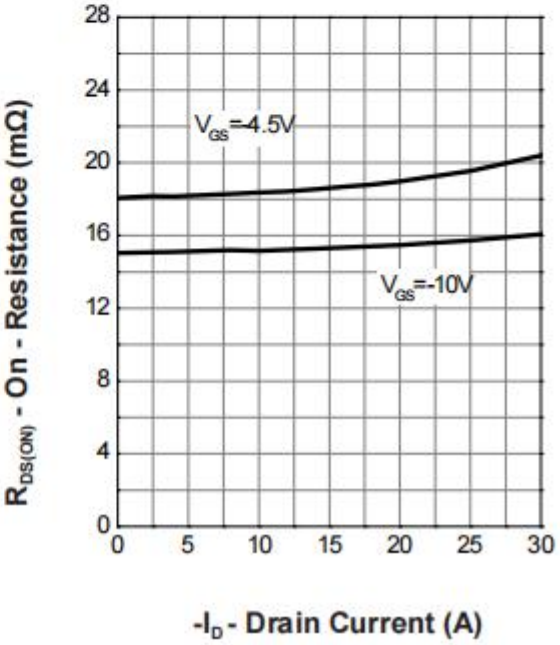
Gate Threshold Voltage



Output Characteristics

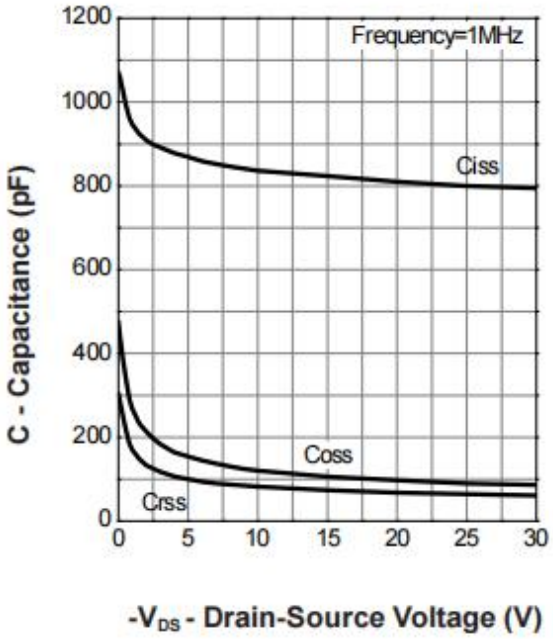


Drain-Source On Resistance

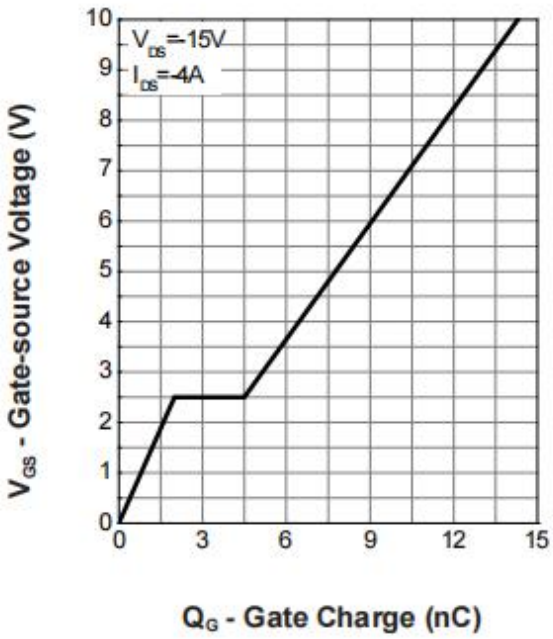


Typical Characteristics (Cont.)

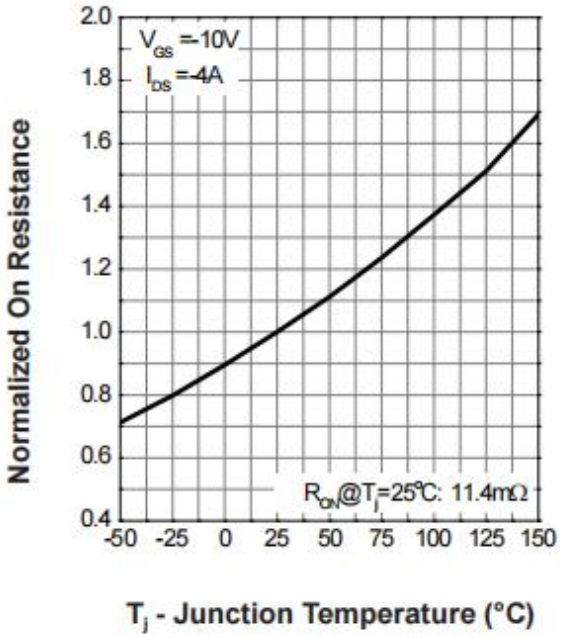
Capacitance



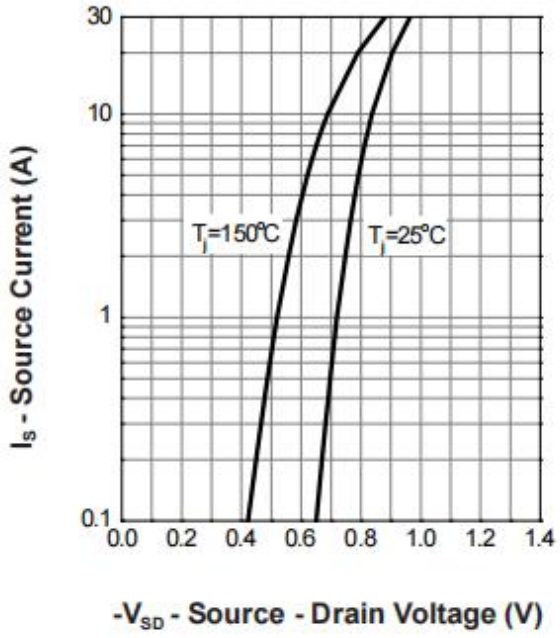
Gate Charge



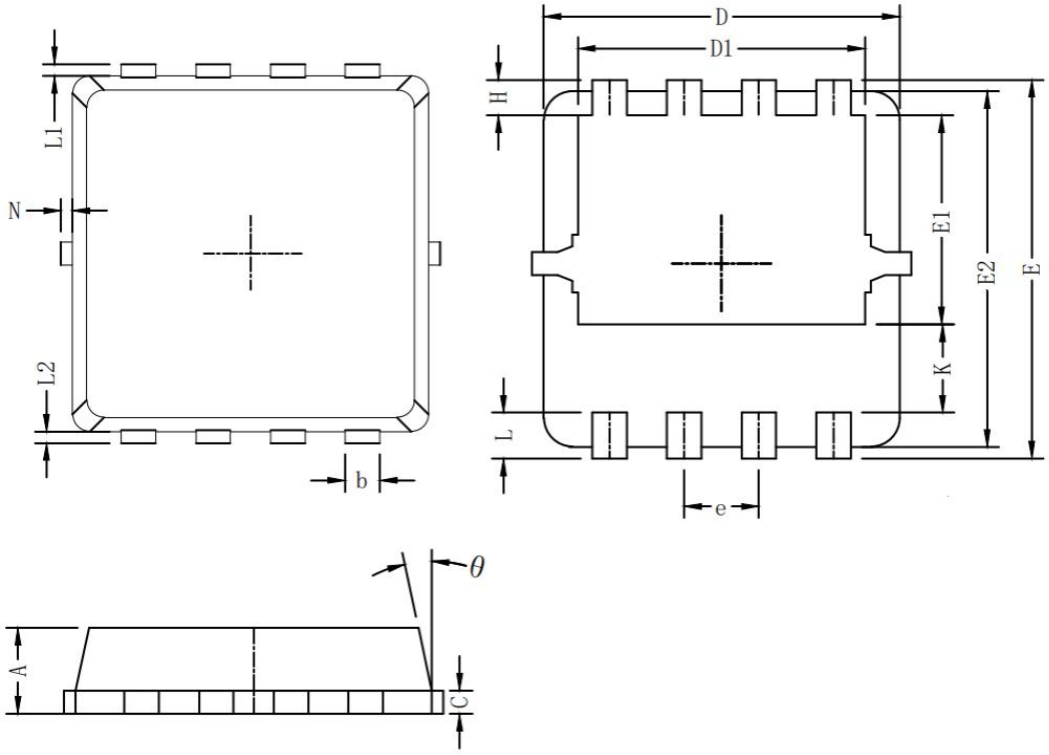
Drain-Source On Resistance



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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