

General Description

The WSD2075DN33 is the highest performance trench Dual P-Channel MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The WSD2075DN33 meet the RoHS and Green Product requirement 100% E_{AS} guaranteed with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% E_{AS} Guaranteed
- Green Device Available

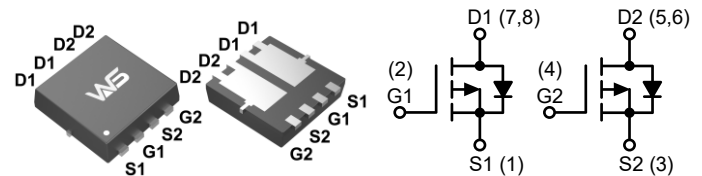
Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D
-20V	9.5m Ω	-36A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load 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	-20	V
V_{GS}	Gate-Source Voltage	± 12	
I_D	Continuous Drain Current ^{1,3}	$T_C=25^\circ\text{C}$	-36
		$T_C=100^\circ\text{C}$	-23
I_{DM}	Pulsed Drain Current ²	-108	A
P_D	Power Dissipation	$T_C=25^\circ\text{C}$	23
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.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	---	5.4	$^\circ\text{C/W}$

Electrical Characteristics ($T_A=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-6A$	---	9.5	12	m Ω
		$V_{GS}=-4.5V, I_D=-6A$	---	11	14	
		$V_{GS}=-2.5V, I_D=-4A$	---	14	18	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.4	-0.8	-1.2	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V$	---	---	-1.0	μA
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	---	---	± 100	nA
Q_g	Total Gate Charge	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-9.5A$	---	28	---	nC
Q_{gs}	Gate-Source Charge		---	3.5	---	
Q_{gd}	Gate-Drain Charge		---	5.6	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10V, V_{GEN}=-4.5V, R_G=1\Omega, I_D=-7.6A, R_L=1.3\Omega$	---	30	---	ns
T_r	Rise Time		---	54	---	
$T_{d(off)}$	Turn-Off Delay Time		---	135	---	
T_f	Fall Time		---	63	---	
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1.0\text{MHz}$	---	2565	---	pF
C_{oss}	Output Capacitance		---	260	---	
C_{rss}	Reverse Transfer Capacitance		---	240	---	

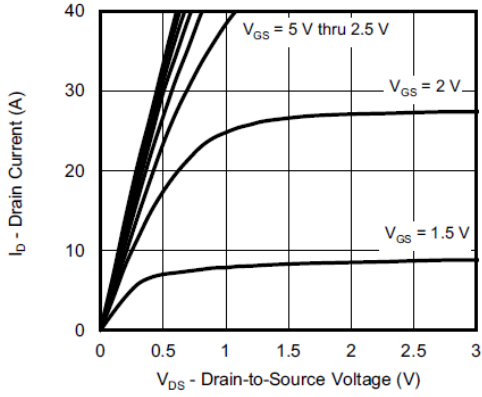
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current ^{1,3}	$T_C=25^\circ\text{C}$	---	---	-19	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=-1A$	---	-0.73	-1.2	V

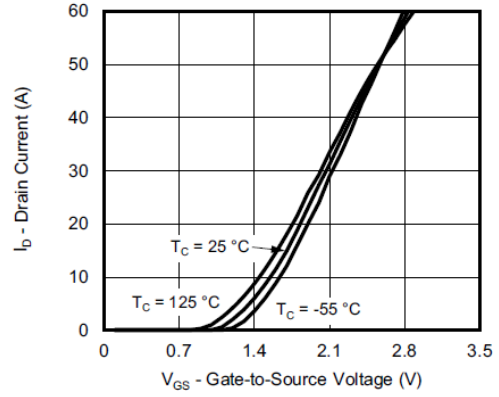
Note:

- The value of $R_{\theta JA}$ is measured with the device mounted on 1 inch² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.
- Repetitive rating, pulse width limited by junction temperature.
- The current rating is based on the $t \leq 10s$ junction to ambient thermal resistance rating, Wire Bond Limited 10A.

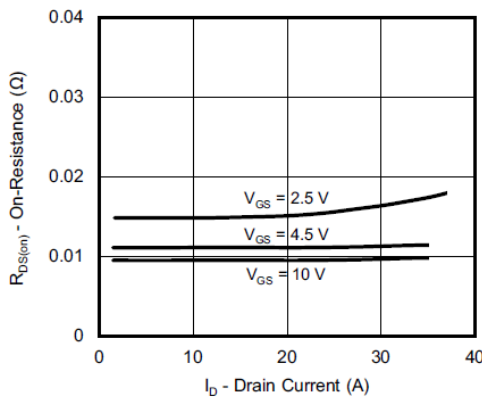
Typical Characteristics



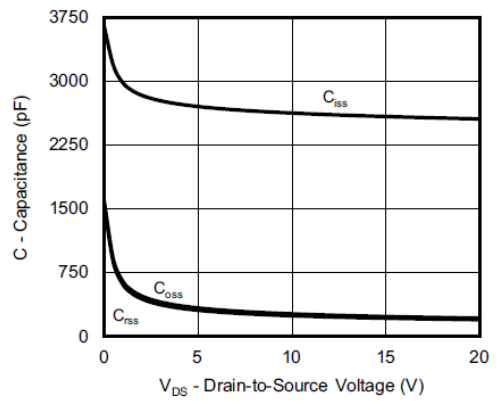
Output Characteristics



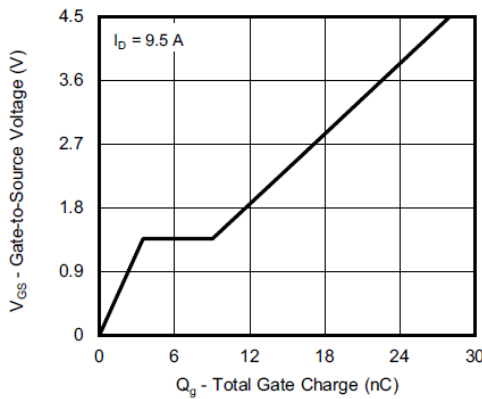
Transfer Characteristics



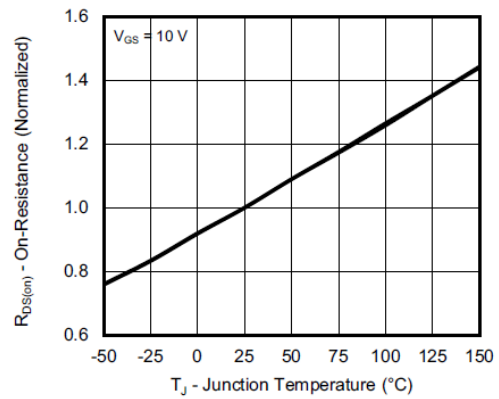
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

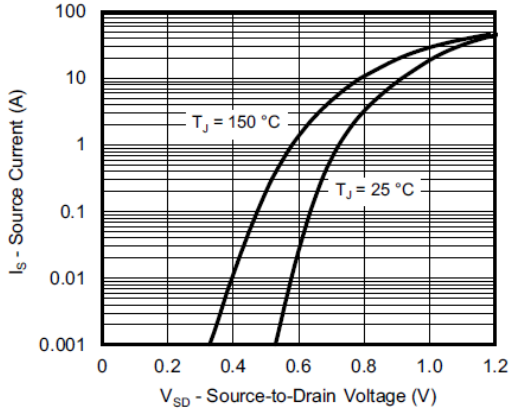


Gate Charge

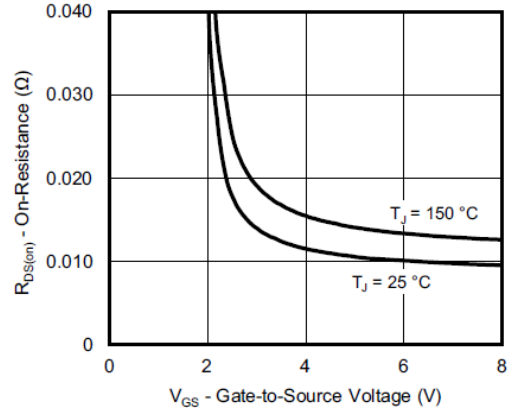


On-Resistance vs. Junction Temperature

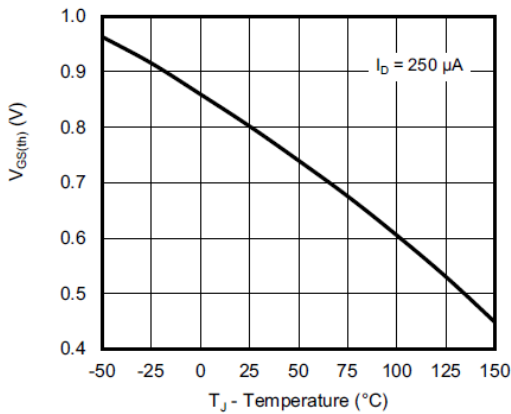
Typical Characteristics (Cont.)



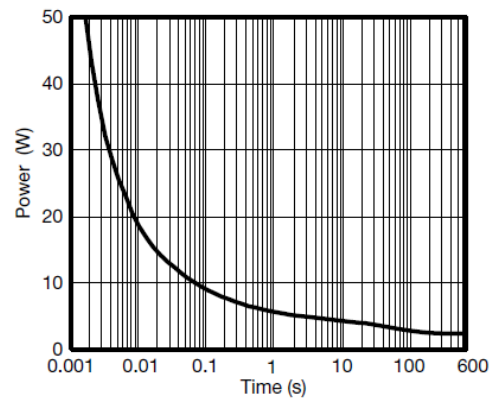
Source-Drain Diode Forward Voltage



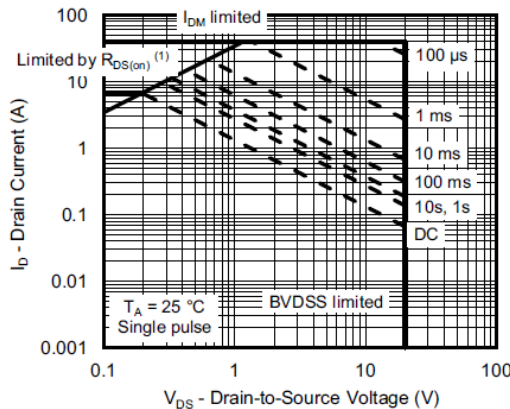
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

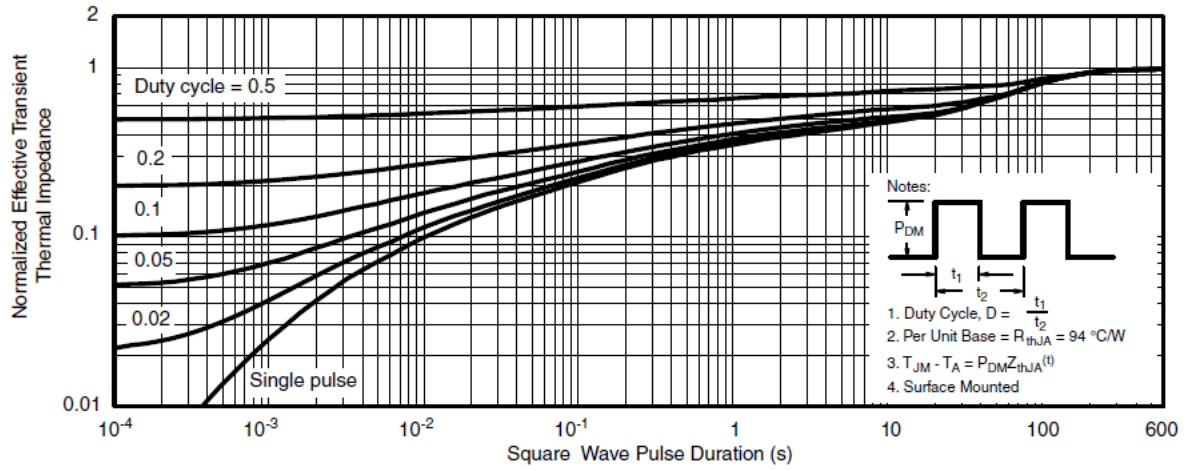


Single Pulse Power, Junction-to-Ambient

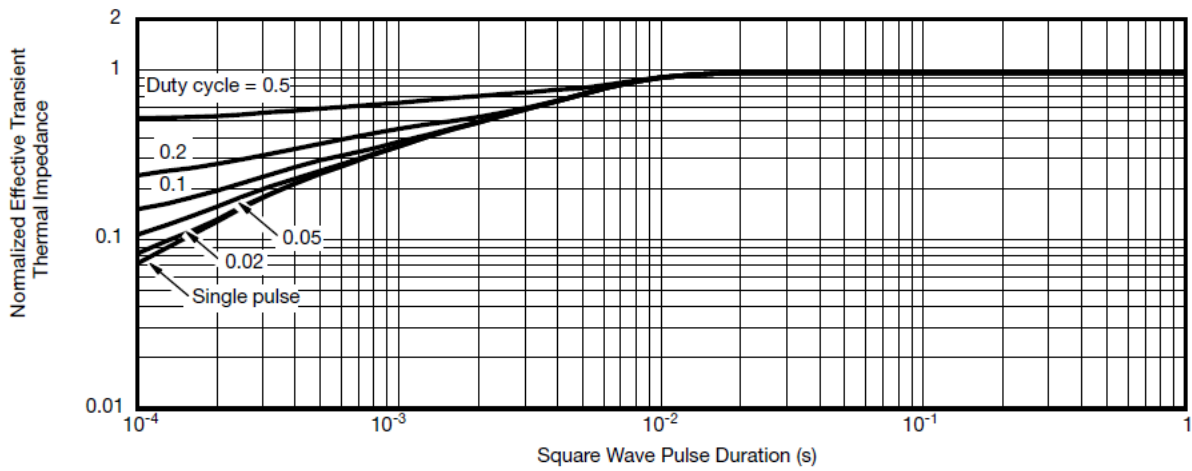


Safe Operating Area, Junction-to-Ambient

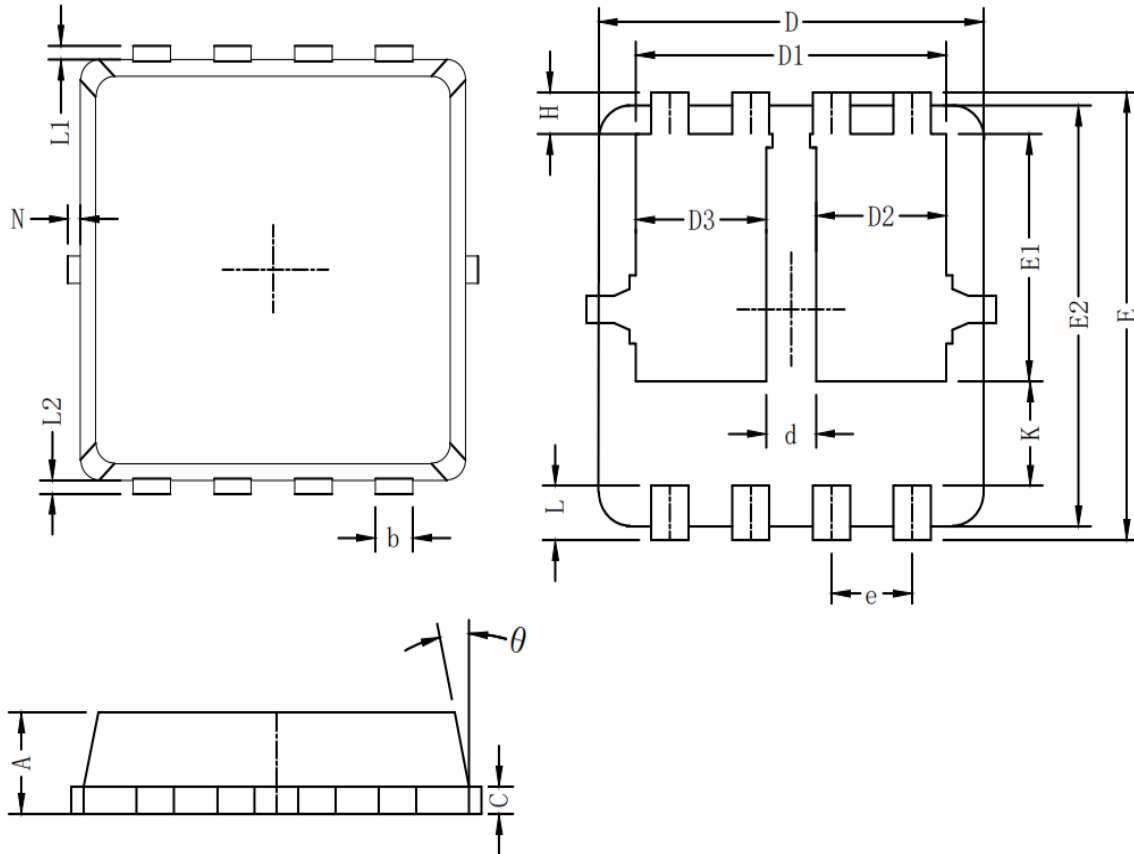
Typical Characteristics (Cont.)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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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