

General Description

The WSD2209DN is the highest performance trench P-ch MOSFETs with extreme high cell density, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The WSD2209DN meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

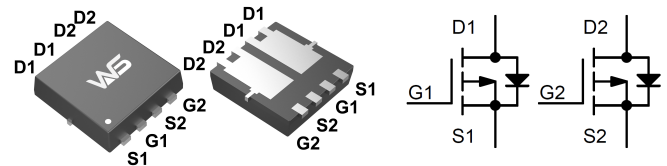
Product Summary

BVDSS	RDS(on)	ID
-20V	33mΩ	-7.5A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

DFN3X3-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	Steady State	
V _{DS}	Drain-Source Voltage	-20		V
V _{GS}	Gate-Source Voltage	±10		V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ -10V ¹	-7.5		A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ -10V ¹	-4.5		A
I _D @T _A =25°C	Continuous Drain Current, V _{GS} @ -10V ¹	-36	-30	A
I _D @T _A =70°C	Continuous Drain Current, V _{GS} @ -10V ¹	-28	-23	A
I _{DM}	Pulsed Drain Current ²	-25		A
EAS	Single Pulse Avalanche Energy ³	---		mJ
I _{AS}	Avalanche Current	---		A
P _D @T _C =25°C	Total Power Dissipation ⁴	2.5		W
P _D @T _A =25°C	Total Power Dissipation ⁴	1.6	1.7	W
T _{STG}	Storage Temperature Range	-55 to 150		°C
T _J	Operating Junction Temperature Range	-55 to 150		°C

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-20	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.132	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-4.5V, I _D =-4A	---	28	33	mΩ
		V _{GS} =-2.5V, I _D =-3A	---	37	45	
		V _{GS} =-1.8V, I _D =-2A	---	50	68	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.3	-0.6	-1	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	4.4	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-20V, V _{GS} =0V, T _J =55°C	---	---	-5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±8V, V _{DS} =0V	---	10	---	μA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-20A	---	9	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	3	---	Ω
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-8A	---	13.8	17.94	nC
Q _{gs}	Gate-Source Charge		---	4.1	5.33	
Q _{gd}	Gate-Drain Charge		---	5.6	7.28	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-10V, V _{GS} =-4.5V, R _G =3Ω, I _D =-1A, R _L =0.5Ω	---	6.2	---	ns
T _r	Rise Time		---	12.7	---	
T _{d(off)}	Turn-Off Delay Time		---	51.7	---	
T _f	Fall Time		---	16	---	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	1160	---	pF
C _{oss}	Output Capacitance		---	104	---	
C _{rss}	Reverse Transfer Capacitance		---	29	---	

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper,t≤10sec.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%

Typical Characteristics

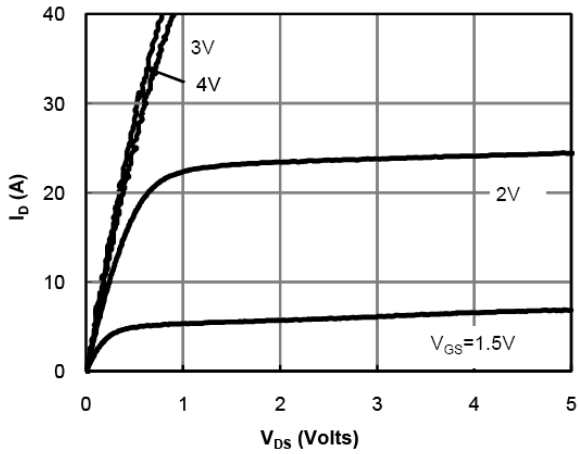


Fig 1: On-Region Characteristics

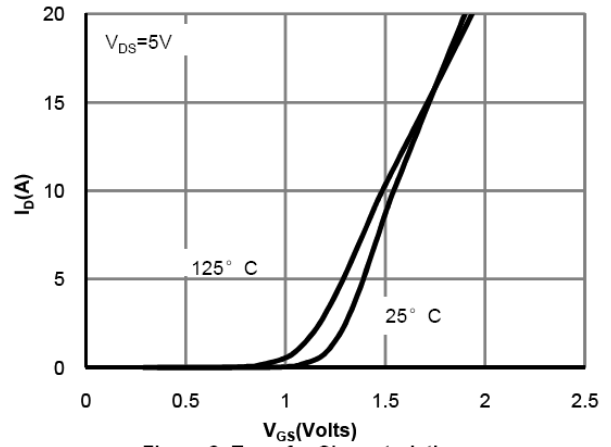


Figure 2: Transfer Characteristics

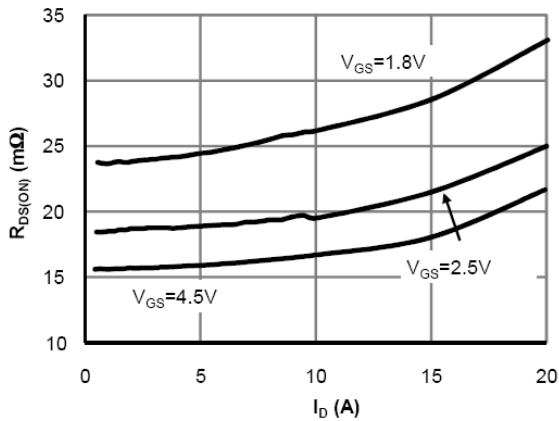


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

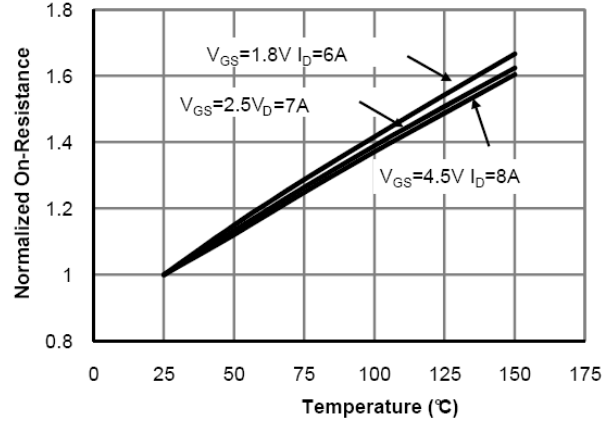


Figure 4: On-Resistance vs. Junction Temperature

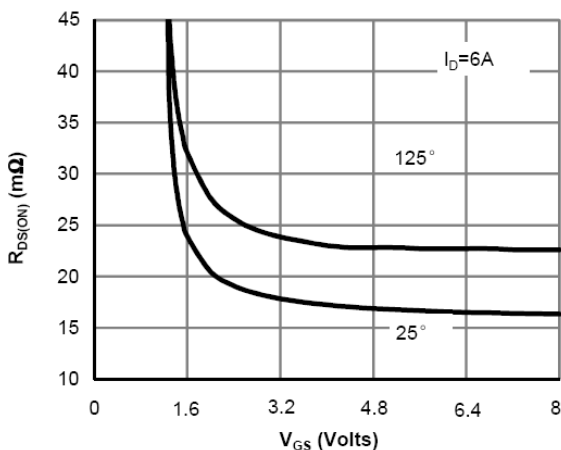


Figure 5: On-Resistance vs. Gate-Source Voltage

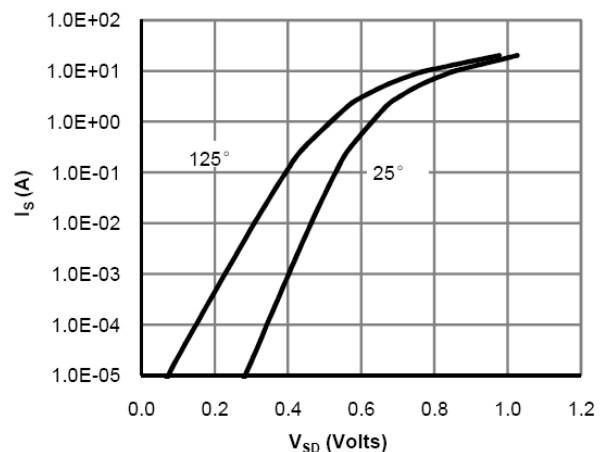


Figure 6: Body-Diode Characteristics

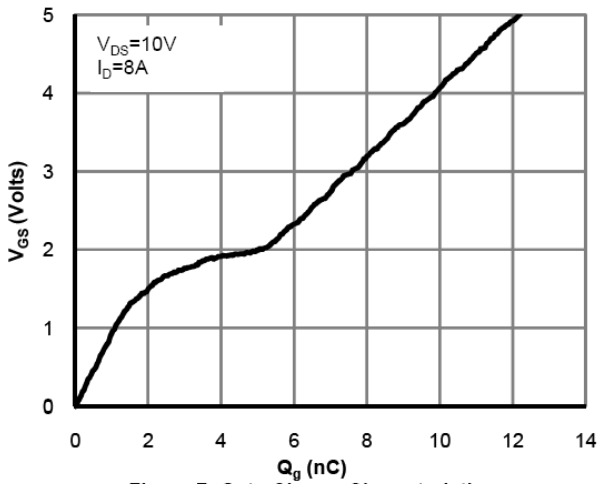


Figure 7: Gate-Charge Characteristics

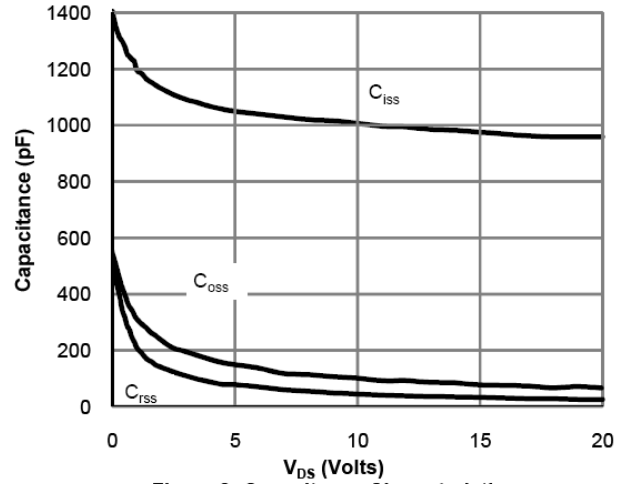


Figure 8: Capacitance Characteristics

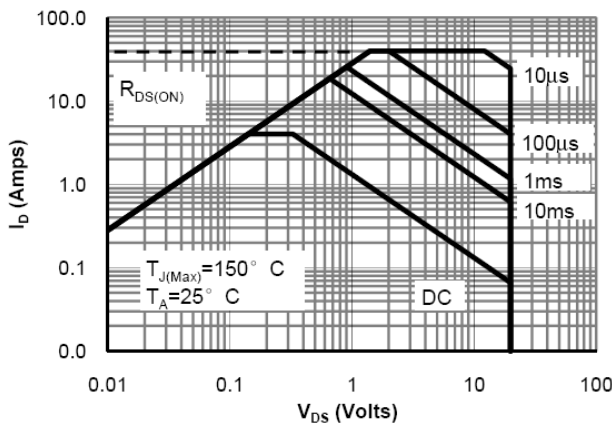


Figure 9: Maximum Forward Biased Safe Operating Area

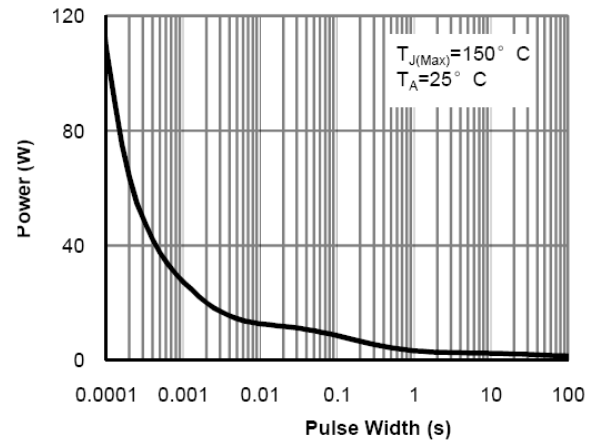


Figure 10: Single Pulse Power Rating Junction-to-Case

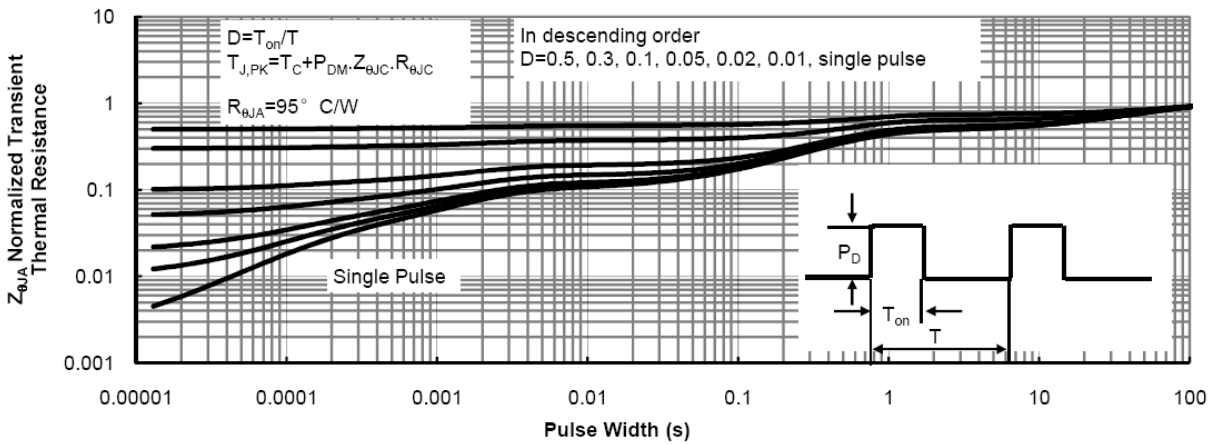


Figure 11: Normalized Maximum Transient Thermal Impedance



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