WSD2209DN

Dual P-Ch MOSFET

General Description

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

The WSD2209 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

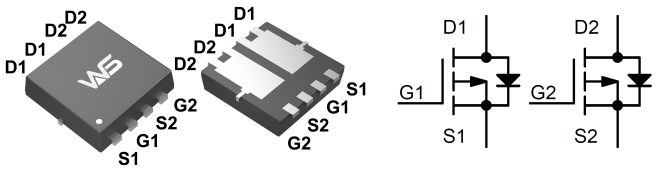
Product Summery

BVDSS	RDSON	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℃	Continuous Drain Current, V_{GS} @ -10V[1]	-7.5		A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-4.5		A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-36	-30	A
I_D@T_A=70℃	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℃	Total Power Dissipation[4]	2.5		W
P_D@T_A=25℃	Total Power Dissipation[4]	1.6	1.7	W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-20	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.132	---	V/℃
$R_{DS(ON)}$	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
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.4	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-20V , V_{GS}=0V , T_J=55℃	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±8V , V_{DS}=0V	---	10	---	μA
gfs	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 inch^2 FR-4 board with 2OZ copper,t≦10sec.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

Typical Characteristics

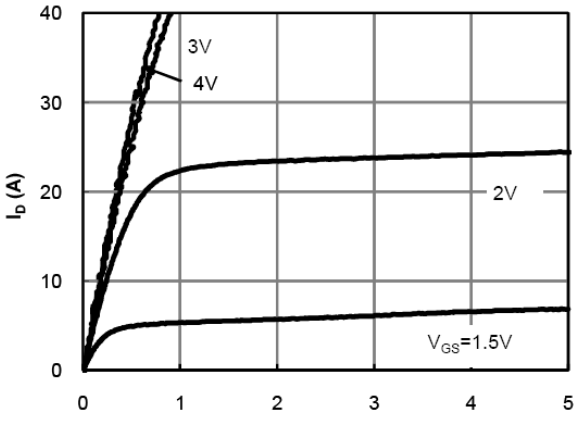


Fig 1: On-Region Characteristics

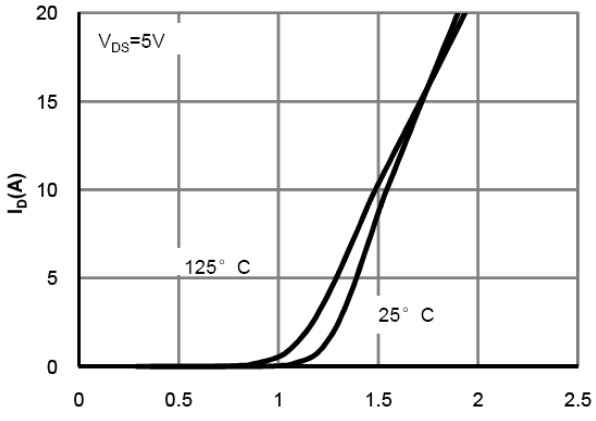


Figure 2: Transfer Characteristics

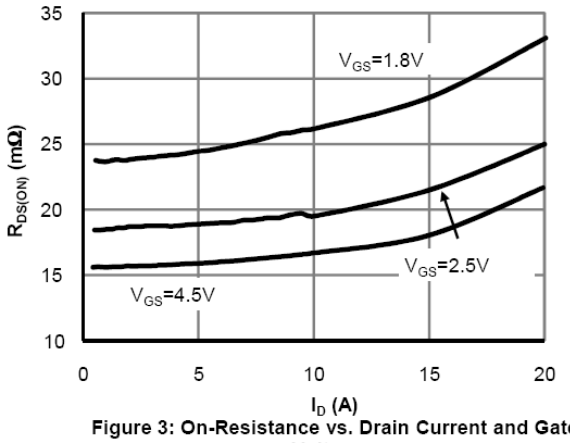


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

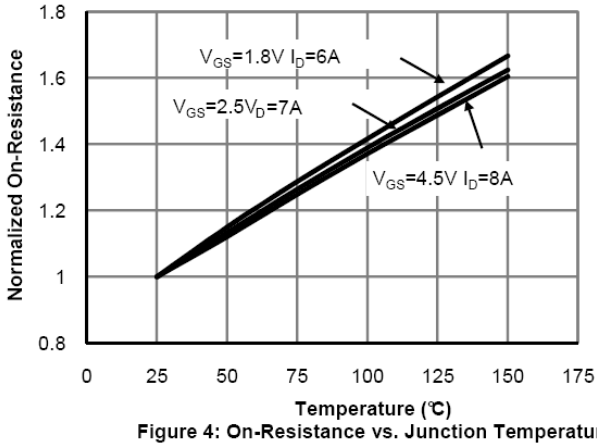


Figure 4: On-Resistance vs. Junction Temperature

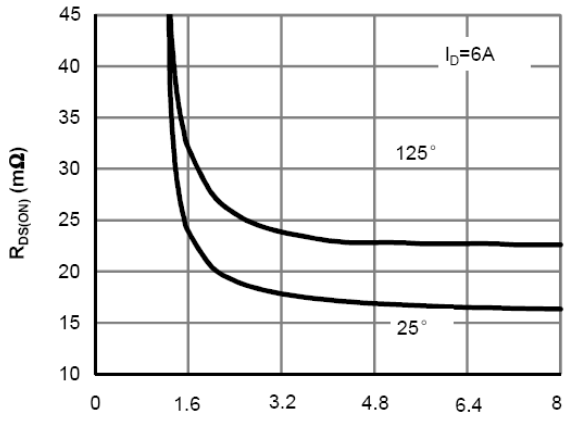


Figure 5: On-Resistance vs. Gate-Source Voltage

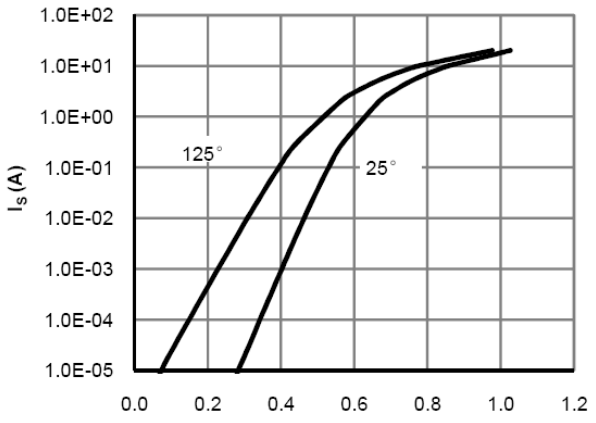


Figure 6: Body-Diode Characteristics

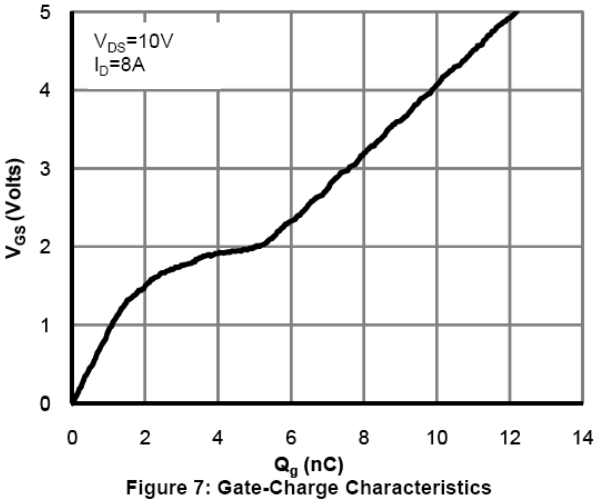


Figure 7: Gate-Charge Characteristics

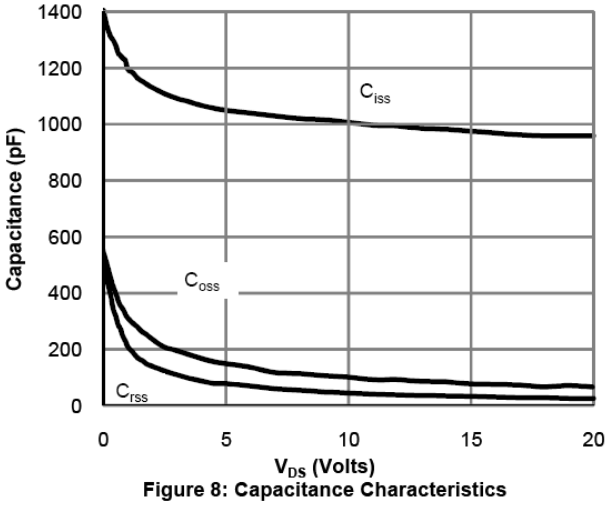


Figure 8: Capacitance Characteristics

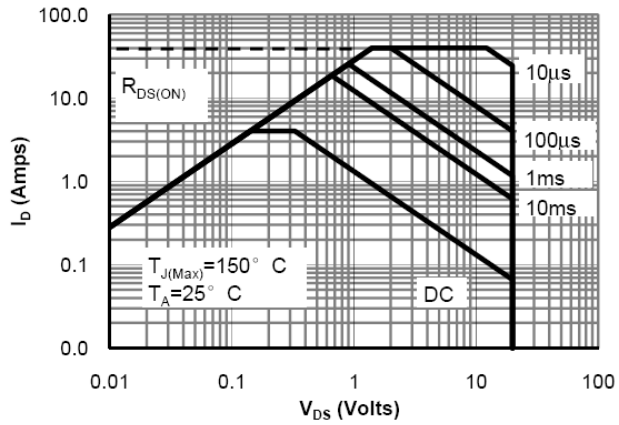


Figure 9: Maximum Forward Biased Safe Operating Area

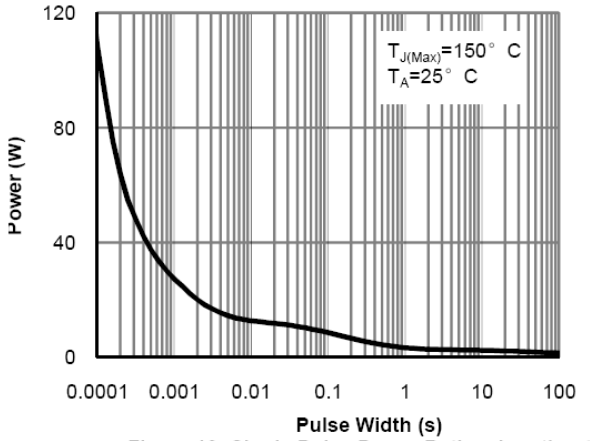


Figure 10: Single Pulse Power Rating Junction-to-Case

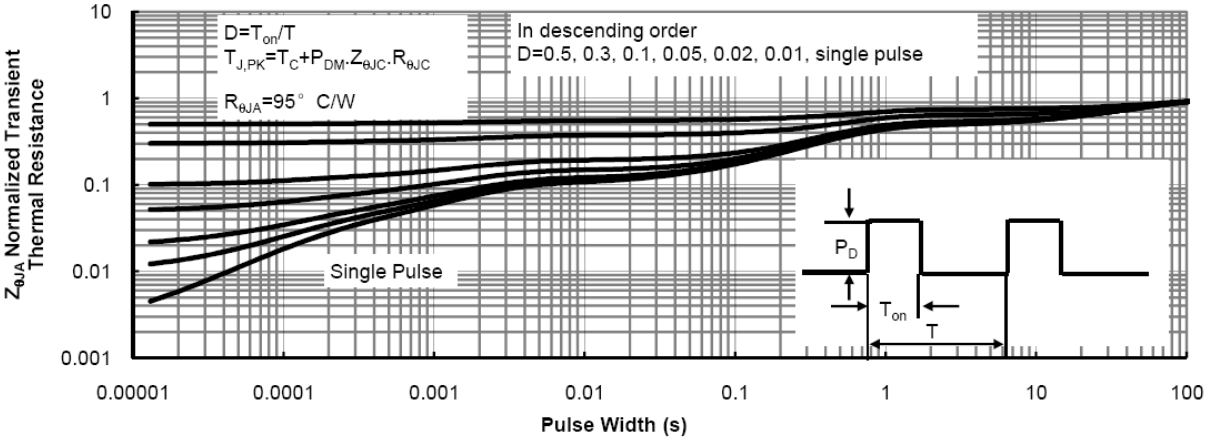


Figure 11: Normalized Maximum Transient Thermal Impedance

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