General Description

The WSD2018BDN22 is the highest performance trench N-Channel MOSFET with extreme high cell density , which provide excellent RDSON and gate charge for most of the small power switching and load switch applications.

The WSD2018BDN22 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

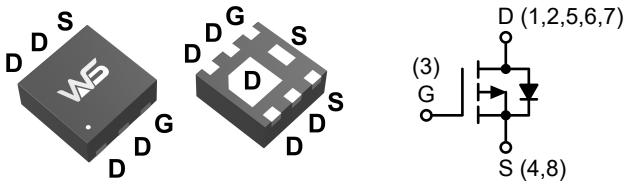
Product Summery

BV_{DSS}	R_{DSON}	I_D
12V	8.6mΩ	12.3A

Applications

- High Frequency Point-of-Load Synchronous Small power switching for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

DFN2X2-6S Pin Configuration



Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Symbol	Parameter		Ratings	Unit
V_{DSS}	Drain-Source Voltage		12	V
V_{GSS}	Gate-Source Voltage		±8	V
ID	Drain Current (Continuous) *C	TA=25°C	12.3	A
		TA=70°C	9.8	A
I_{DM}	Drain Current (Pulse) *B		49	A
P_D	Power Dissipation TA=25°C		2.8	W
T_J/T_{STG}	Operating Temperature/ Storage Temperature		-55~150	℃

Thermal Resistance Ratings

Symbol	Parameter		Maximum	Unit
R_{thJA}	Maximum Junction-to-Ambient *A	t ⩽ 10 s	45	°C/W

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static *D						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D= 250μA	12	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 10V, V_{GS} = 0V	---	---	1	μA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_{DS}= 250μA	0.4	0.6	1	V
I_{GSS}	Gate Leakage Current	V_{GS}= ±8V, V_{DS}=0V	---	---	±100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	V_{GS} = 4.5V, I_D = 8A	---	8.6	11.5	mΩ
$R_{DS(on)}$		V_{GS} = 2.5V, I_D = 4A	---	12	18	mΩ
V_{SD}	Diode Forward Voltage	I_{SD}= 1A , V_{GS}=0V	---	---	1	V
I_S	Diode Forward Current *C	T_A =25°C	---	---	2.8	A
Switching						
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=6V, I_D=6.5A	---	8.5	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	nC
Q_{gd}	Gate-Drain Charge		---	2.2	---	nC
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=4.5V, V_{DS}=10V, R_L=1.5 , R_{GEN}=3	---	8	---	ns
t_r	Turn-on Rise Time		---	5	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	14	---	ns
t_f	Turn-Off Fall Time		---	12	---	ns
Dynamic						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}= 6V, f=1MHz	---	850	---	pF
C_{oss}	Output Capacitance		---	180	---	pF
C_{rss}	Reverse Transfer Capacitance		---	95	---	pF

A: 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 value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating, package limited 8A.

D: Pulse Test：Pulse Wide≤ 300μs，Duty Cycle≤ 2%.

Typical Characteristics

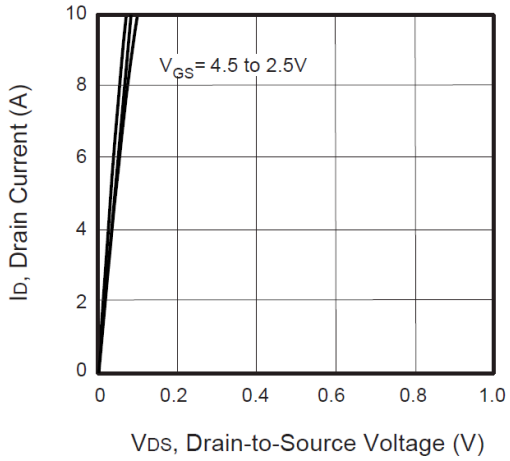


Figure 1. Output Characteristics

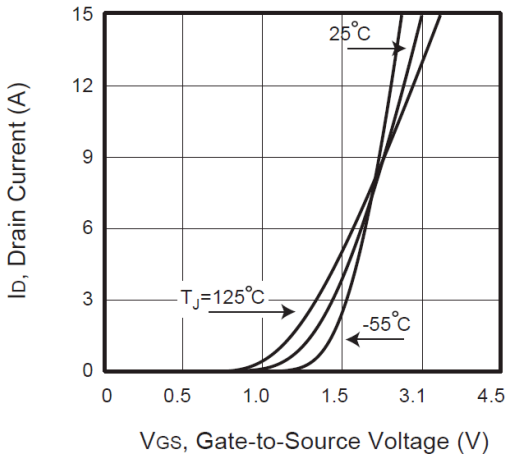


Figure 2. Transfer Characteristics

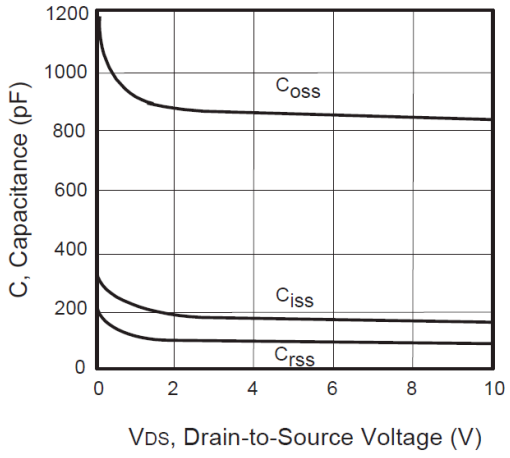


Figure 3. Capacitance

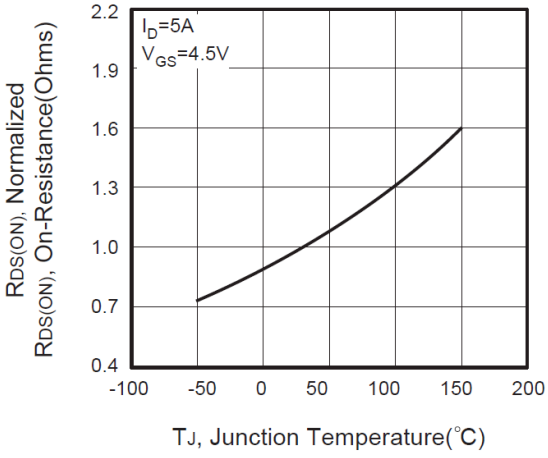


Figure 4. On-Resistance Variation with Temperature

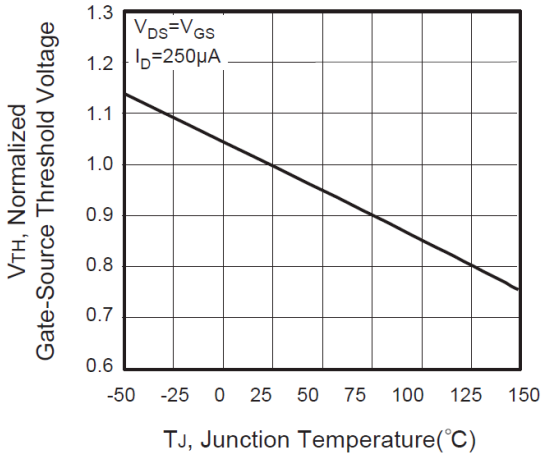


Figure 5. Gate Threshold Variation with Temperature

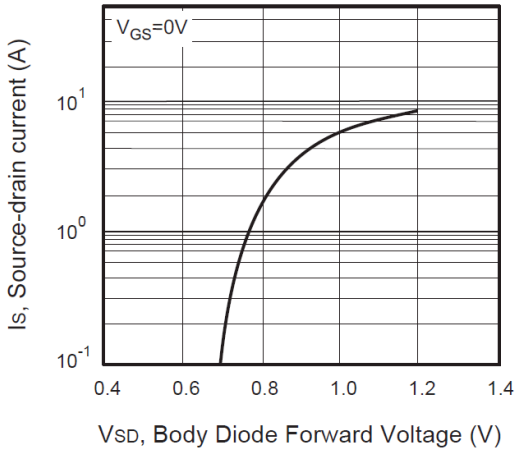


Figure 6. Body Diode Forward Voltage Variation with Source Current

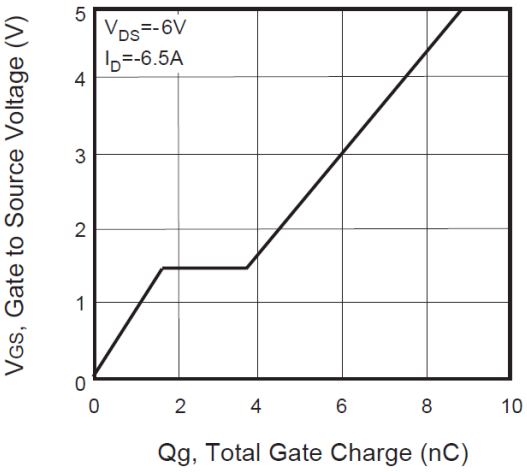


Figure 7. Gate Charge

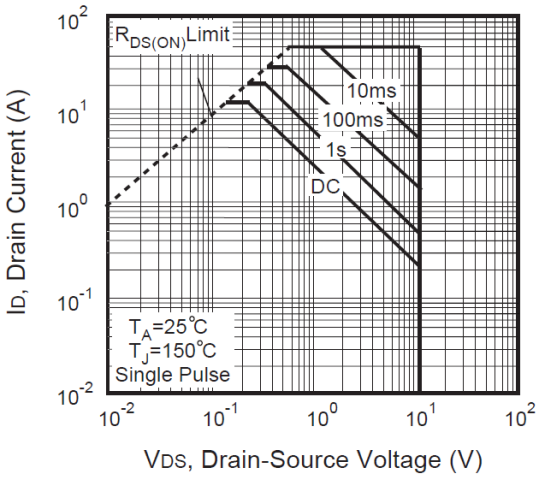


Figure 8. Maximum Safe Operating Area

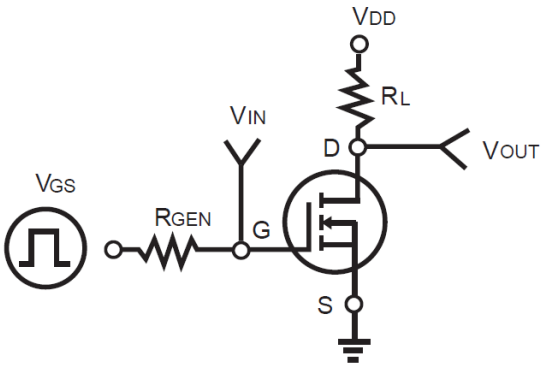


Figure 9. Switching Test Circuit

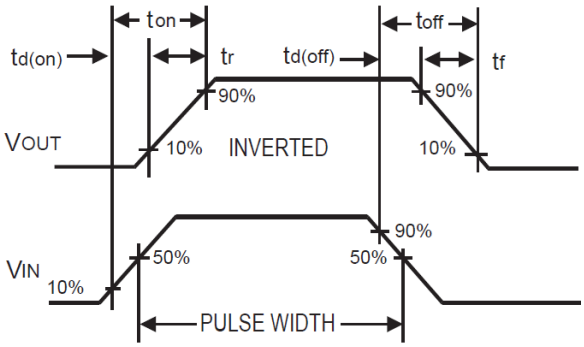


Figure 10. Switching Waveforms

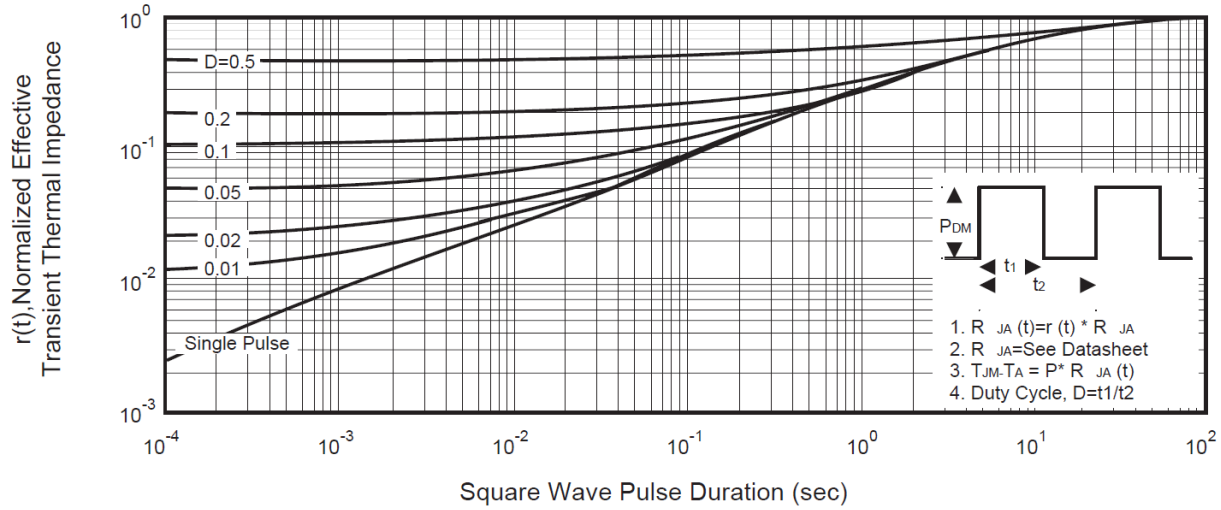
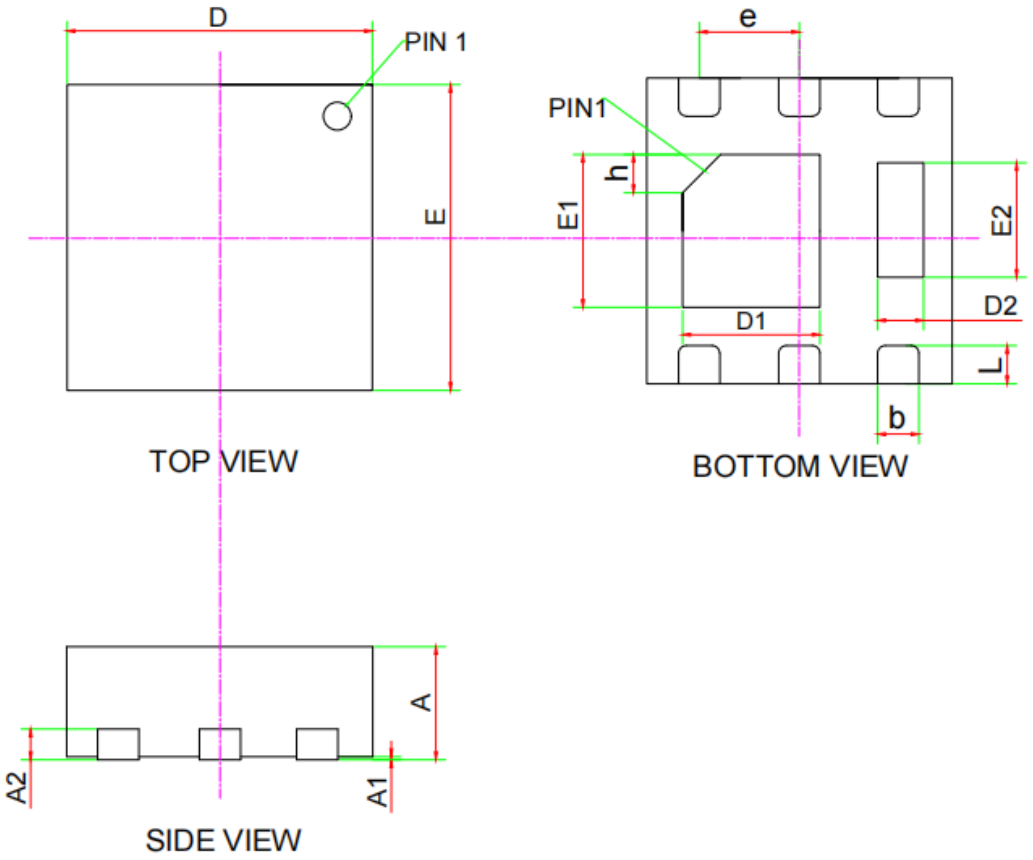


Figure 11. Normalized Thermal Transient Impedance Curve

Packaging information



SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.18	0.20	0.25
b	0.20	0.27	0.34
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D1	0.80	0.90	1.00
E1	0.90	1.00	1.10
D2	0.20	0.30	0.40
E2	0.65	0.75	0.85
L	0.20	0.25	0.35
h	0.20	0.25	0.30
e	0.65 BSC		

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