

General Description

The WSD2018BDN22 is the highest performance trench N-Ch 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

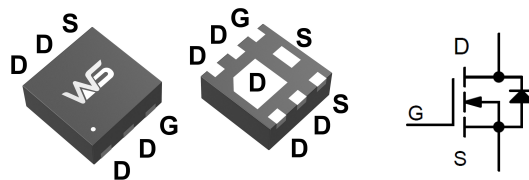
Product Summary

BVDSS	RDSON	ID
12V	11.5mΩ(MAX)	12.3A

Applications

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

DFNWB2×2-6L-J Pin Configuration



Absolute Maximum Ratings @TA=25°C unless otherwise noted

Symbol	Parameter	Ratings	Unit	
V _{DSS}	Drain-Source Voltage	12	V	
V _{GSS}	Gate-Source Voltage	±8	V	
I _D	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	°C	

Thermal Resistance Ratings

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

Electrical Characteristics @ $T_A=25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static *D						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	12	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 10V, V_{GS} = 0V$	---	---	1	μA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_{DS} = 250\mu A$	0.4	---	1	V
I_{GSS}	Gate Leakage Current	$V_{GS} = \pm 8V, V_{DS} = 0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS} = 4.5V, I_D = 8A$	---	8.6	11.5	m Ω
$R_{DS(on)}$		$V_{GS} = 2.5V, I_D = 4A$	---	12	18	m Ω
V_{SD}	Diode Forward Voltage	$I_{SD} = 1A, V_{GS} = 0V$	---	---	1	V
I_S	Diode Forward Current *C	$T_A = 25^{\circ}\text{C}$	---	---	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	$V_{GS} = 0V, V_{DS} = 6V, f = 1\text{MHz}$	---	850	---	pF
C_{oss}	Output Capacitance		---	180	---	pF
C_{riss}	Reverse Transfer Capacitance		---	95	---	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 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.

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

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

D: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Typical Characteristics

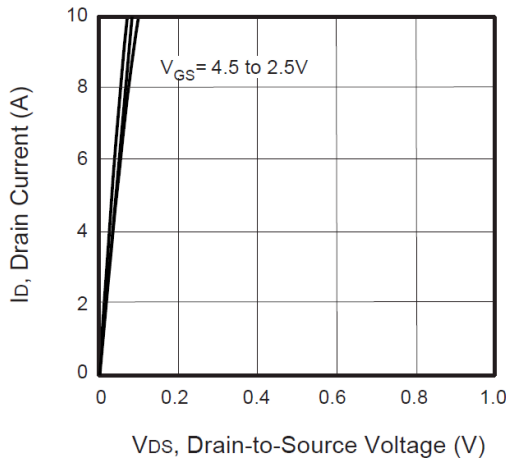


Figure 1. Output Characteristics

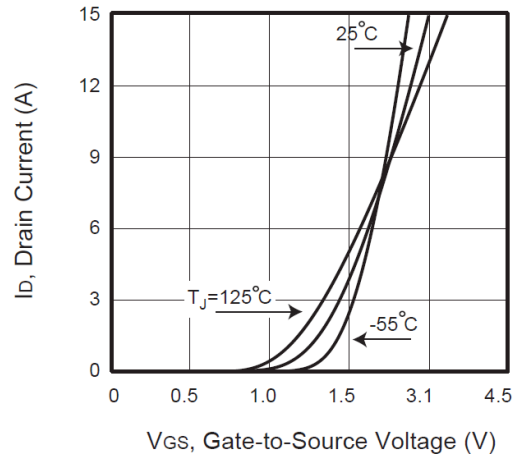


Figure 2. Transfer Characteristics

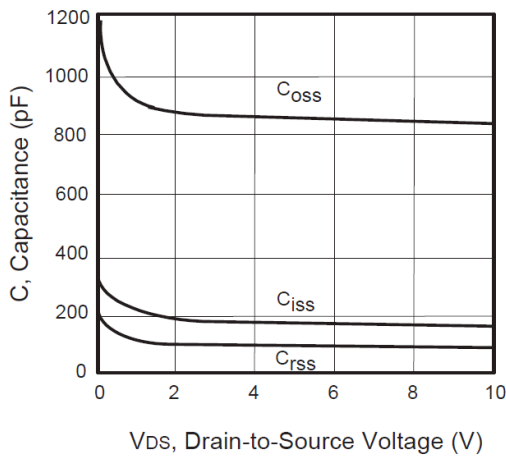


Figure 3. Capacitance

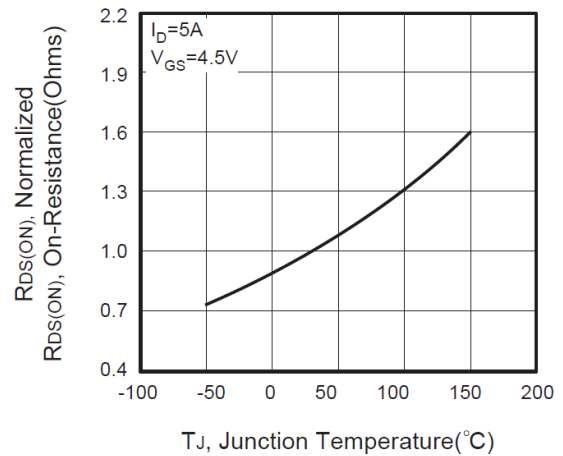


Figure 4. On-Resistance Variation with Temperature

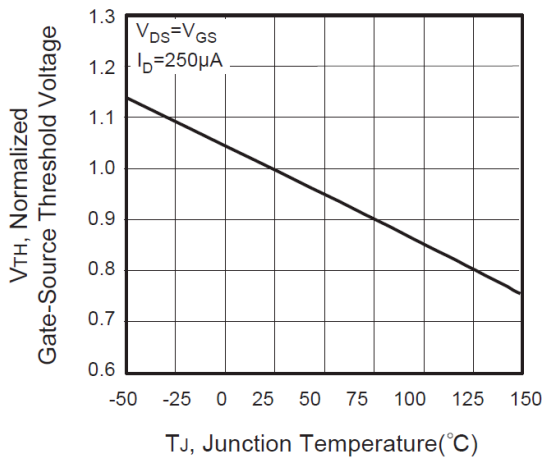


Figure 5. Gate Threshold Variation with Temperature

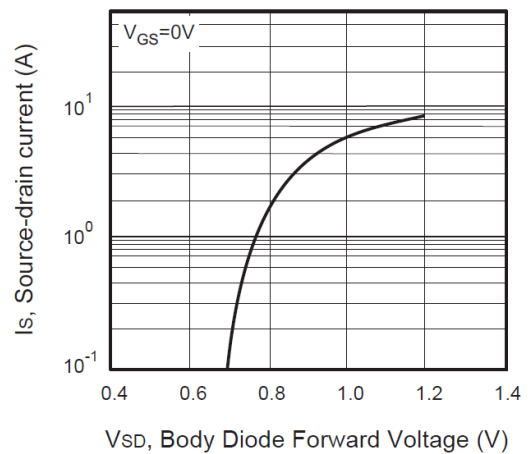


Figure 6. Body Diode Forward Voltage Variation with Source Current

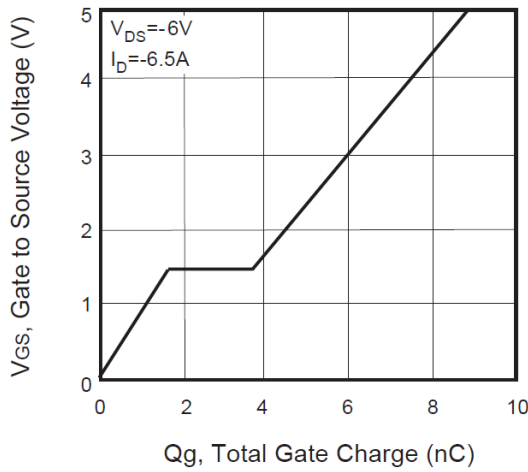


Figure 7. Gate Charge

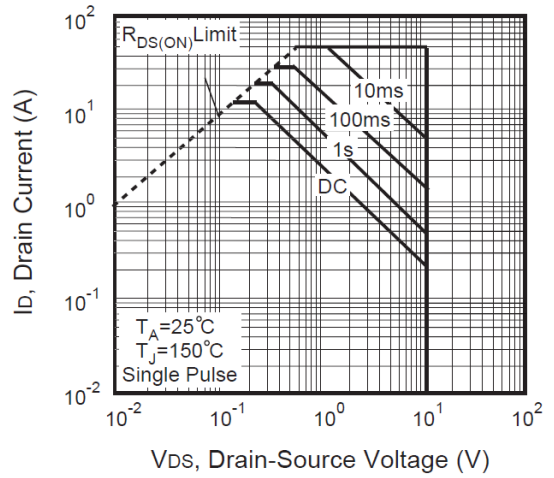


Figure 8. Maximum Safe Operating Area

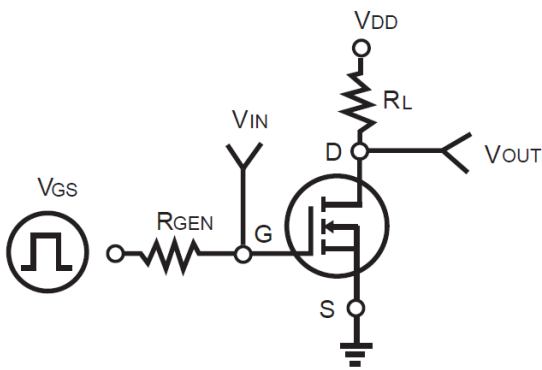


Figure 9. Switching Test Circuit

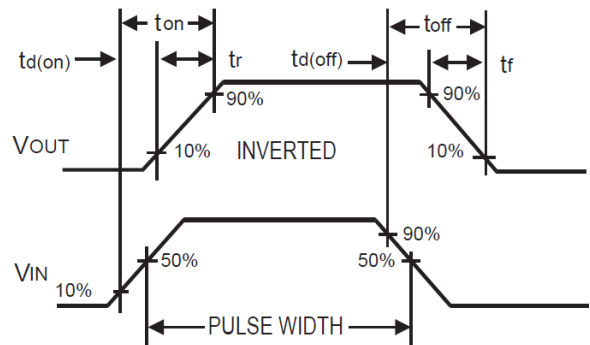


Figure 10. Switching Waveforms

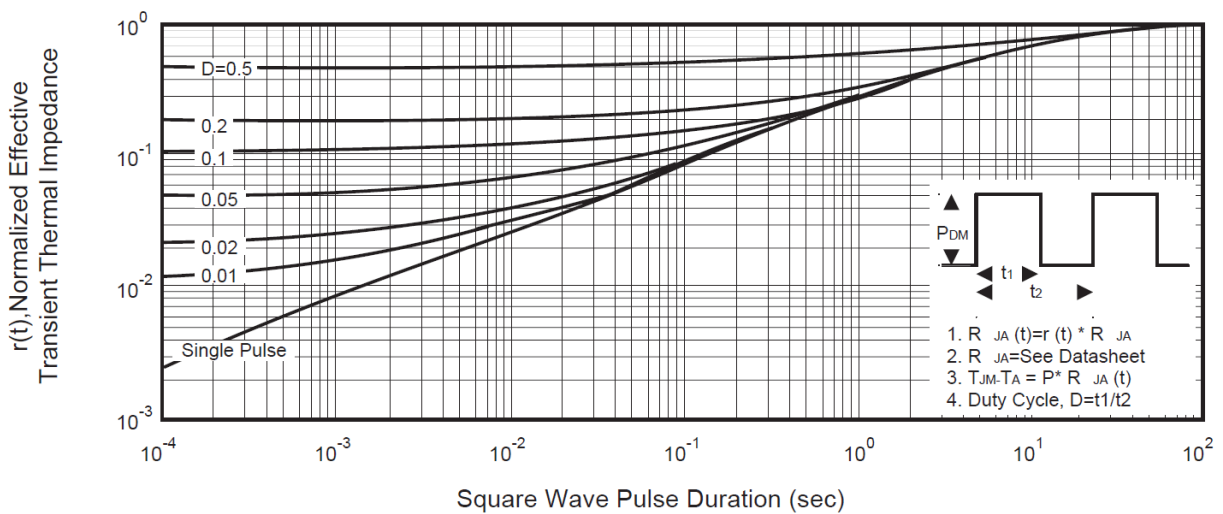
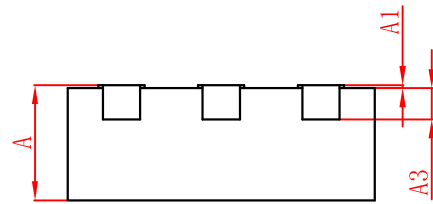
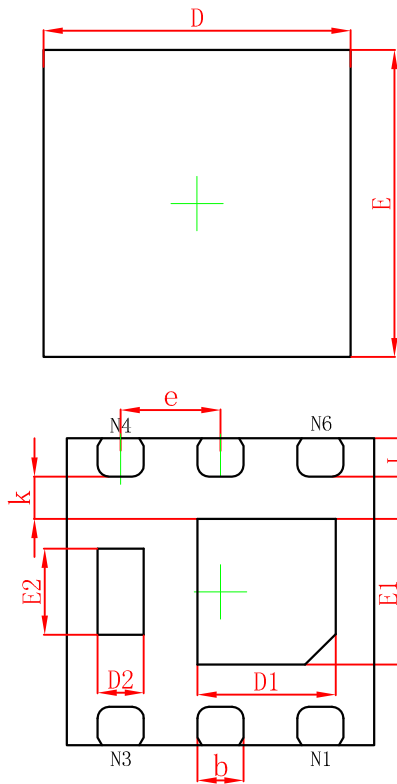


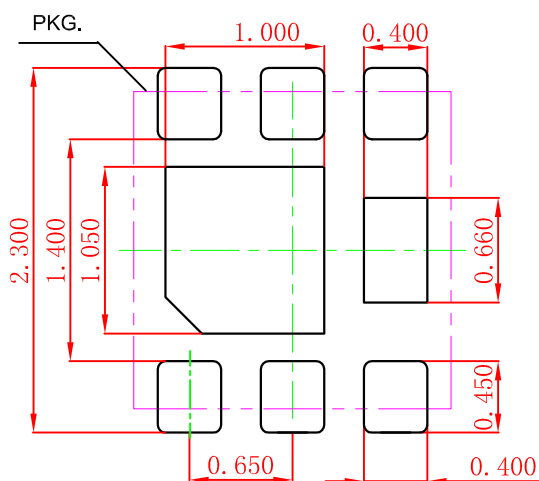
Figure 11. Normalized Thermal Transient Impedance Curve

DFNWB2X2-6L-J Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.032	0.032
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013

DFNWB2X2-6L-J Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.050 mm.
 3. The pad layout is for reference purposes only.

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