

General Description

The WSD2018DN22 is the highest performance trench N-Ch MOSFET with extreme high cell density, which provide excellent R_{DS(on)} and gate charge for most of the small power switching and load switch applications.

The WSD2018DN22 meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent C_{dv/dt} effect decline
- Green Device Available

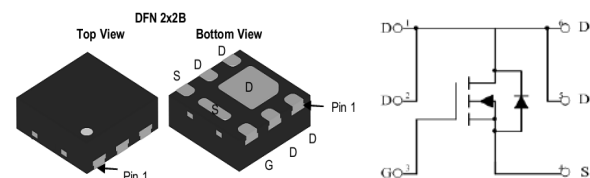
Product Summary

| BVDSS | R _{DS(on)} | I _D |
|-------|-----------------------|----------------|
| 20V | 15mΩ _(MAX) | 12A |

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

| Symbol | Parameter | Rating | Units |
|--------------------------------------|---|------------|-------|
| 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} @ 4.5V ¹ | 12 | A |
| I _D @T _C =70°C | Continuous Drain Current, V _{GS} @ 4.5V ¹ | 10 | A |
| I _{DM} | Pulsed Drain Current ² | 40 | A |
| P _D @T _A =25°C | Total Power Dissipation ³ | 1.5 | W |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R _{θJA} | Thermal Resistance Junction-ambient ¹ | --- | 167 | °C/W |
| R _{θJC} | Thermal Resistance Junction-Case ¹ | --- | 65 | °C/W |

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

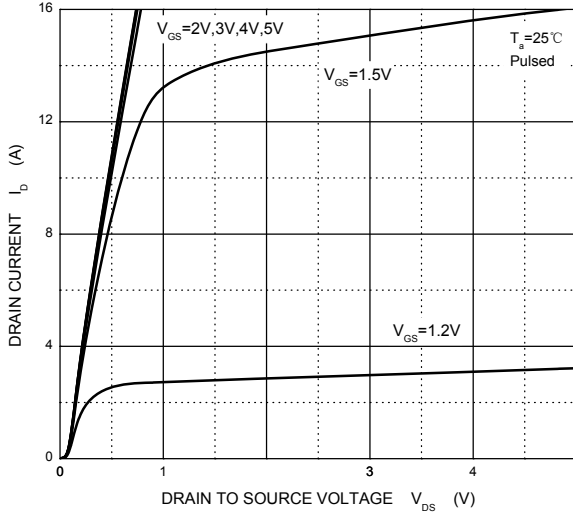
| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|--|---|------|-------|-----------|----------------------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 20 | --- | --- | V |
| $\Delta BV_{DSS}/\Delta T_J$ | BVDSS Temperature Coefficient | Reference to 25°C , $I_D=1\text{mA}$ | --- | 0.027 | --- | $V/^\circ\text{C}$ |
| $R_{DS(on)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=4.5V, I_D=5A$ | --- | 10 | 15 | m Ω |
| | | $V_{GS}=2.5V, I_D=5A$ | --- | 13 | 18 | |
| | | $V_{GS}=1.8V, I_D=5A$ | | 18 | 30 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\mu A$ | 0.4 | 0.7 | 1.0 | V |
| $\Delta V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | 2.56 | --- | $\text{mV}/^\circ\text{C}$ |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=16V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | 1 | μA |
| | | $V_{DS}=16V, V_{GS}=0V, T_J=55^\circ\text{C}$ | --- | --- | 5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 12V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| gfs | Forward Transconductance | $V_{DS}=4V, I_D=9.7A$ | 20 | --- | --- | S |
| R_g | Gate Resistance | $f=1\text{MHz}$ | --- | 2.5 | --- | Ω |
| Q_g | Total Gate Charge (4.5V) | $V_{DS}=4V, V_{GS}=5V, I_D=10A$ | --- | --- | 32 | nC |
| Q_{gs} | Gate-Source Charge | | --- | 2.5 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 6.5 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=4V, V_{GS}=4.5V, R_G=1\Omega$ $I_D=10A, R_L=0.4\Omega$ | --- | 12 | 20 | ns |
| T_r | Rise Time | | --- | 10 | 25 | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 65 | 70 | |
| T_f | Fall Time | | --- | 20 | 60 | |
| C_{iss} | Input Capacitance | $V_{DS}=4V, V_{GS}=0V, f=1\text{MHz}$ | --- | 1800 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 650 | --- | |
| C_{riss} | Reverse Transfer Capacitance | | --- | 450 | --- | |

Notes :

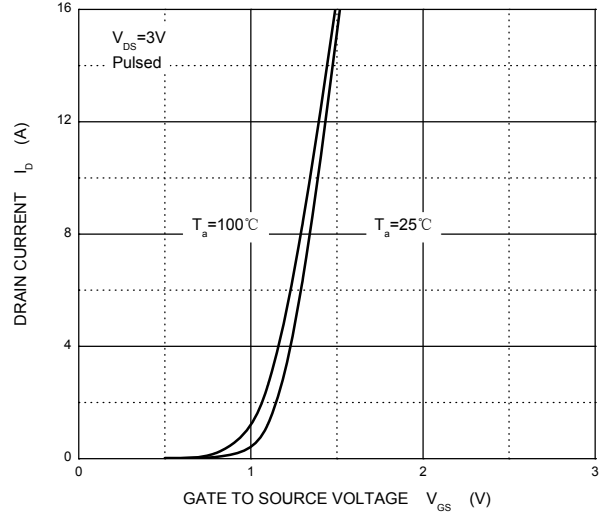
- 1.Surface mounted on FR4 board using 1 square inch pad size,1oz copper.
- 2.Surface mounted on FR4 board using the minimum pad size,1oz copper.
3. Pulse test : Pulse width=300 μs , duty cycle $\leq 2\%$.
4. These parameters have no way to verify.

Typical Characteristics

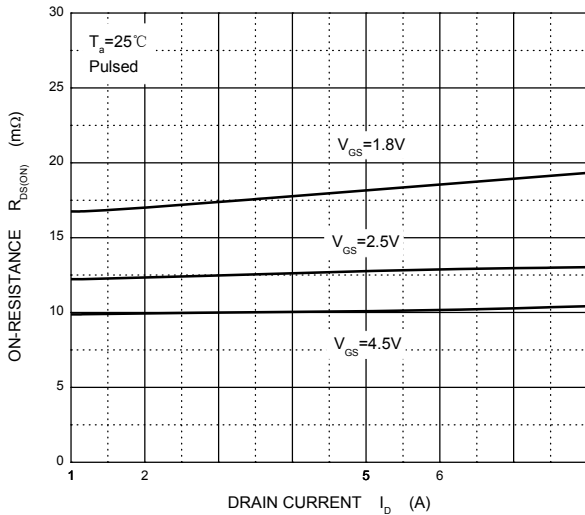
Output Characteristics



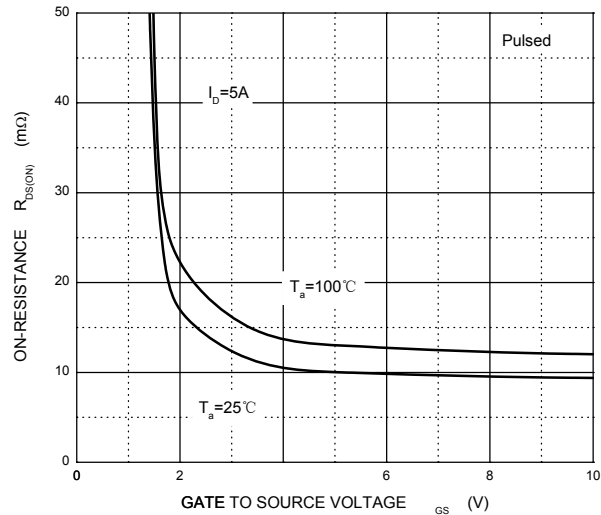
Transfer Characteristics



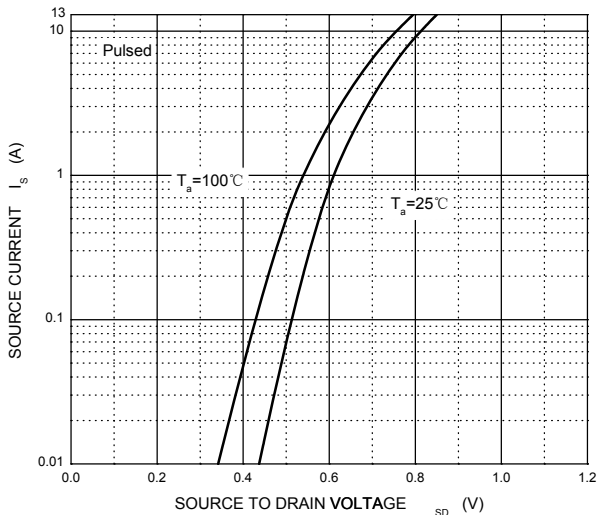
$R_{DS(ON)}$ — I_D



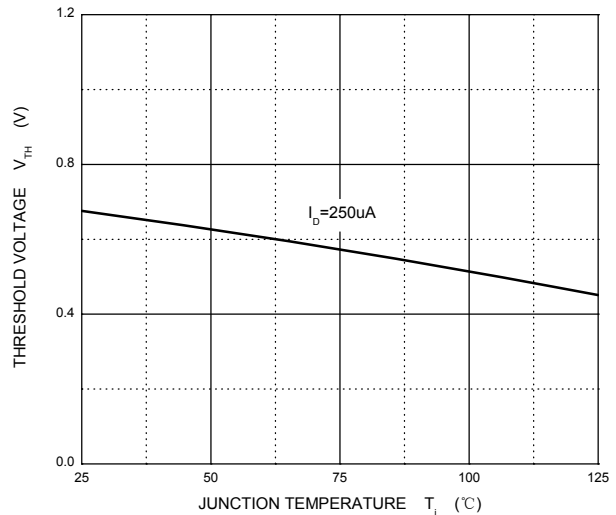
$R_{DS(ON)}$ — V_{GS}



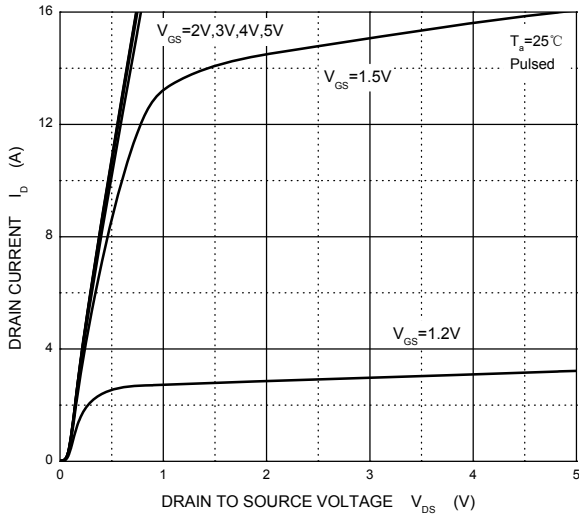
I_S — V_{SD}



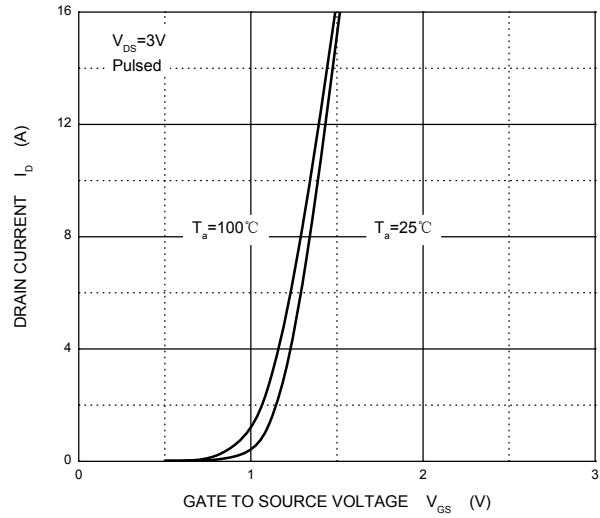
Threshold Voltage



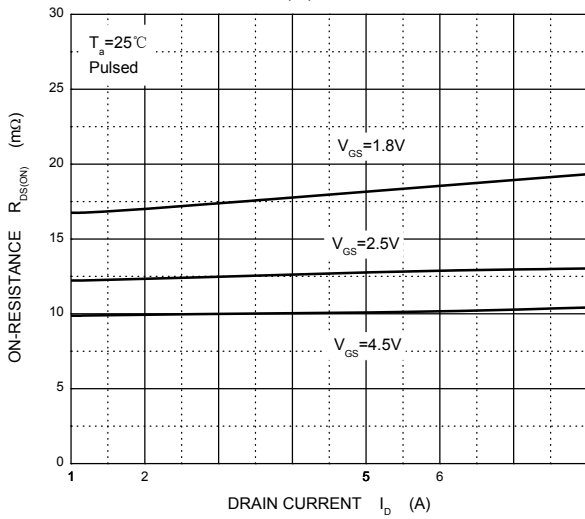
Output Characteristics



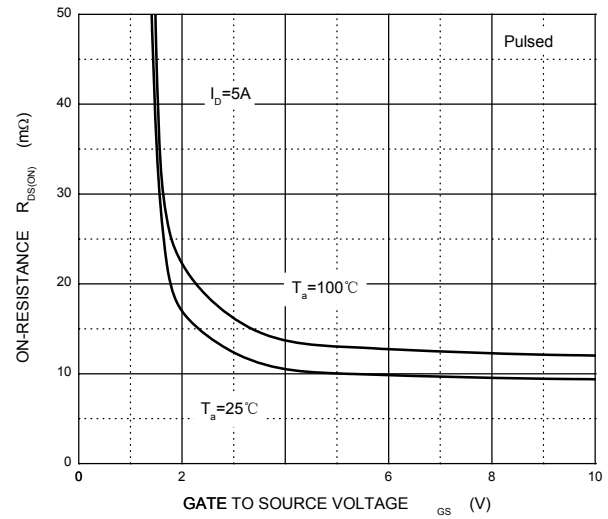
Transfer Characteristics



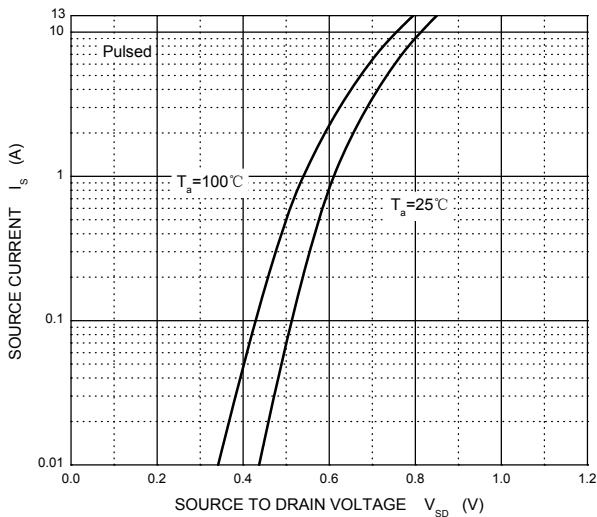
$R_{DS(ON)}$ — I_D



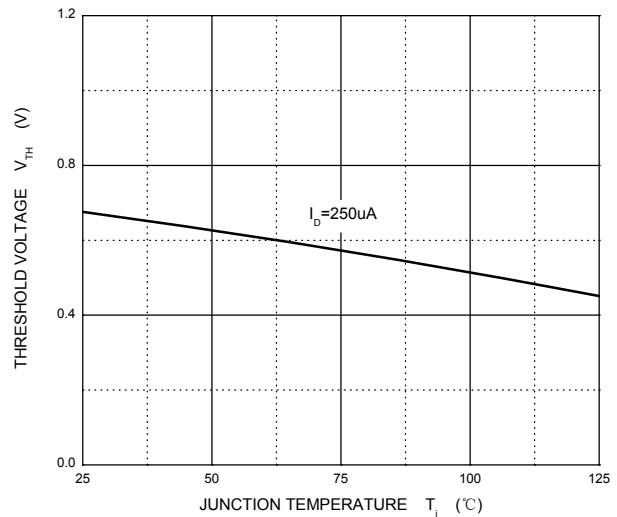
$R_{DS(ON)}$ — V_{GS}



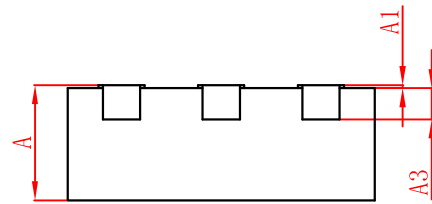
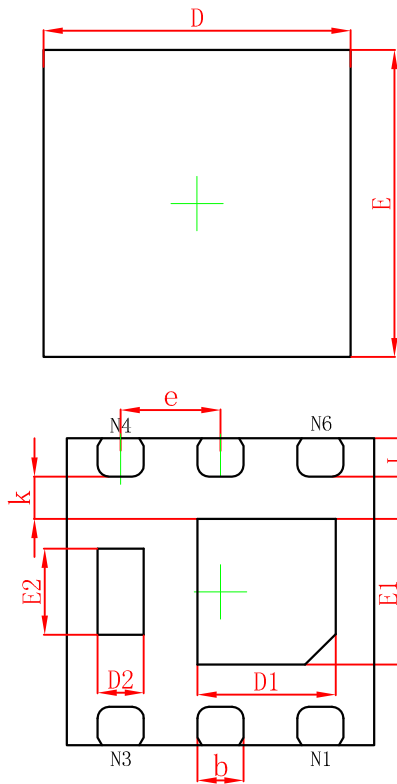
I_S — V_{SD}



Threshold Voltage

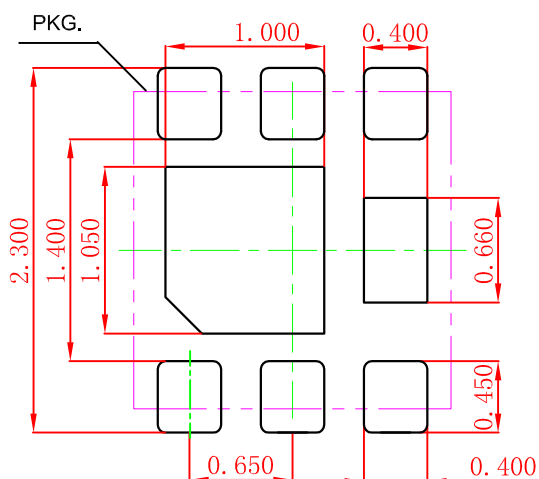


DFNWB2X2-6L-J Package Outline Dimensions



| 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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