

General Description

The WSD2018ADN22 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 WSD2018ADN22 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

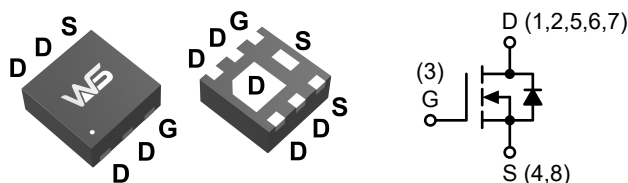
Product Summary

BV_{DSS}	$R_{DS(on)}$	I_D
20V	9.5mΩ	11A

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 10	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	11	A
$I_D @ T_C = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V^1$	9.5	A
I_{DM}	Pulsed Drain Current ²	40	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	2.0	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	167	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	65	$^\circ C/W$

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	$V_{GS}=4.5V$, $I_D=5A$	---	9.5	12	m Ω
		$V_{GS}=2.5V$, $I_D=5A$	---	11	14	
		$V_{GS}=1.8V$, $I_D=5A$	---	14.5	18	
$V_{GS(th)}$	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	---	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
g_{fs}	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)	$V_{DS}=4V$, $V_{GS}=5V$, $I_D=10A$	---	16	32	nC
Q_{gs}	Gate-Source Charge		---	1.3	---	
Q_{gd}	Gate-Drain Charge		---	1.6	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=4V$, $V_{GS}=4.5V$, $R_G=1\Omega$ $I_D=10A$, $R_L=0.4\Omega$	---	16	20	ns
T_r	Rise Time		---	25	45	
$T_{d(off)}$	Turn-Off Delay Time		---	124	150	
T_f	Fall Time		---	101	120	
C_{iss}	Input Capacitance	$V_{DS}=4V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1177	---	pF
C_{oss}	Output Capacitance		---	157	---	
C_{rss}	Reverse Transfer Capacitance		---	138	---	

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

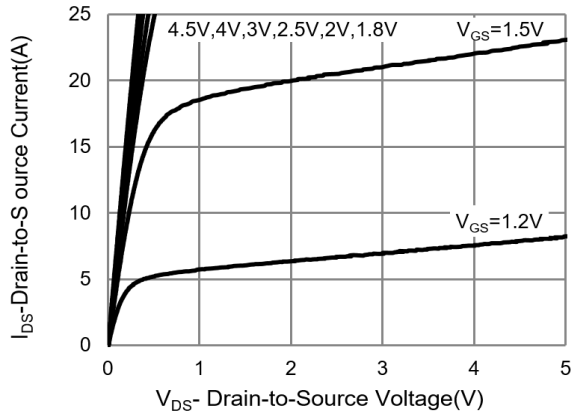


Fig.1 On-Region Characteristics

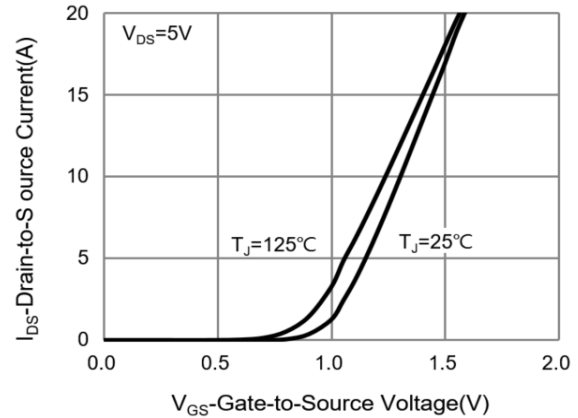


Fig.2 Transfer Characteristics

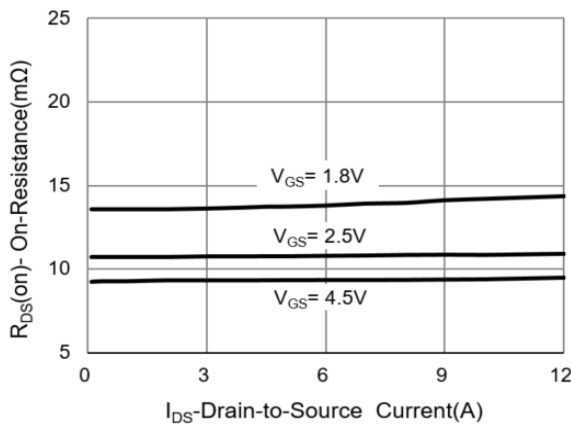


Fig.3 On-Resistance vs. Drain Current

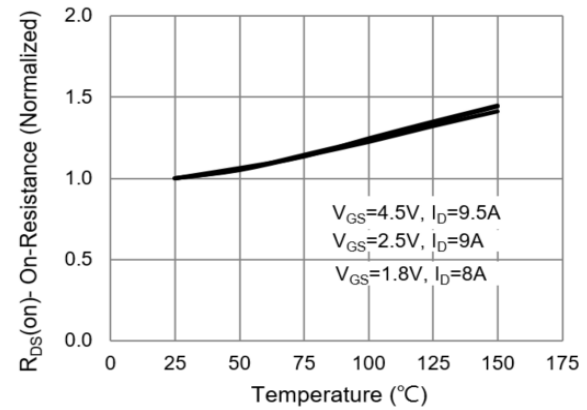


Fig.4 On-Resistance vs. Junction temperature

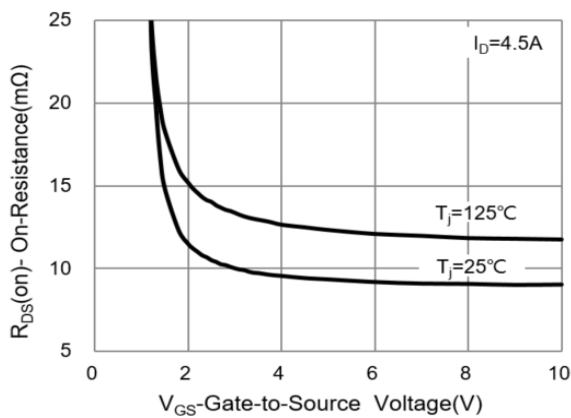


Fig.5 On-Resistance Variation with V_{GS}

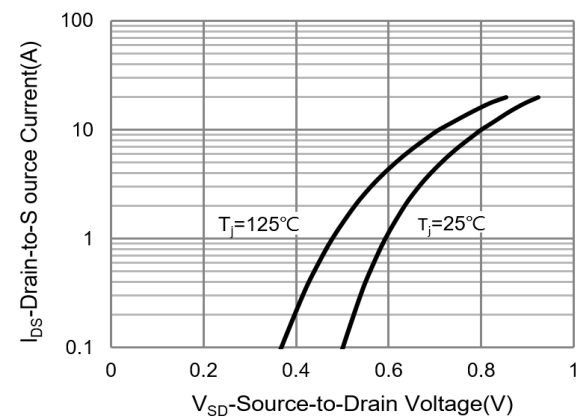


Fig.6 Body Diode Characteristics

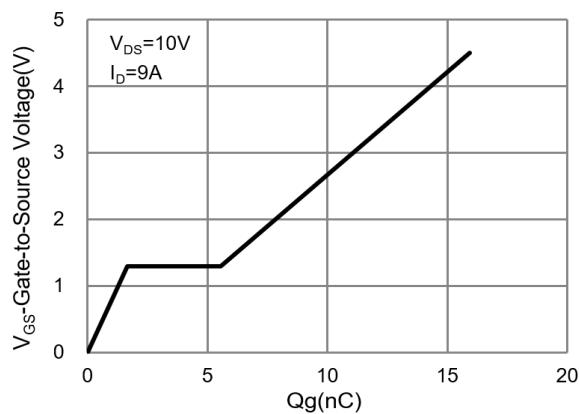


Fig.7 Gate-Charge Characteristics

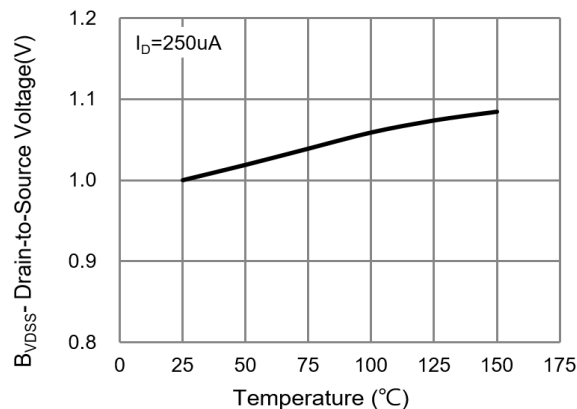


Fig.8 Breakdown Voltage Variation vs. Temperature

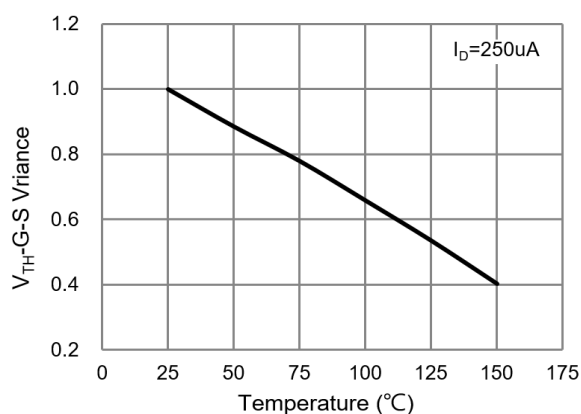


Fig.9 Threshold Voltage Variation with Temperature

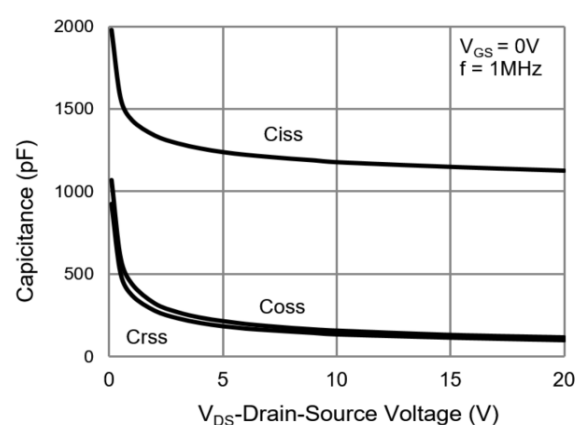
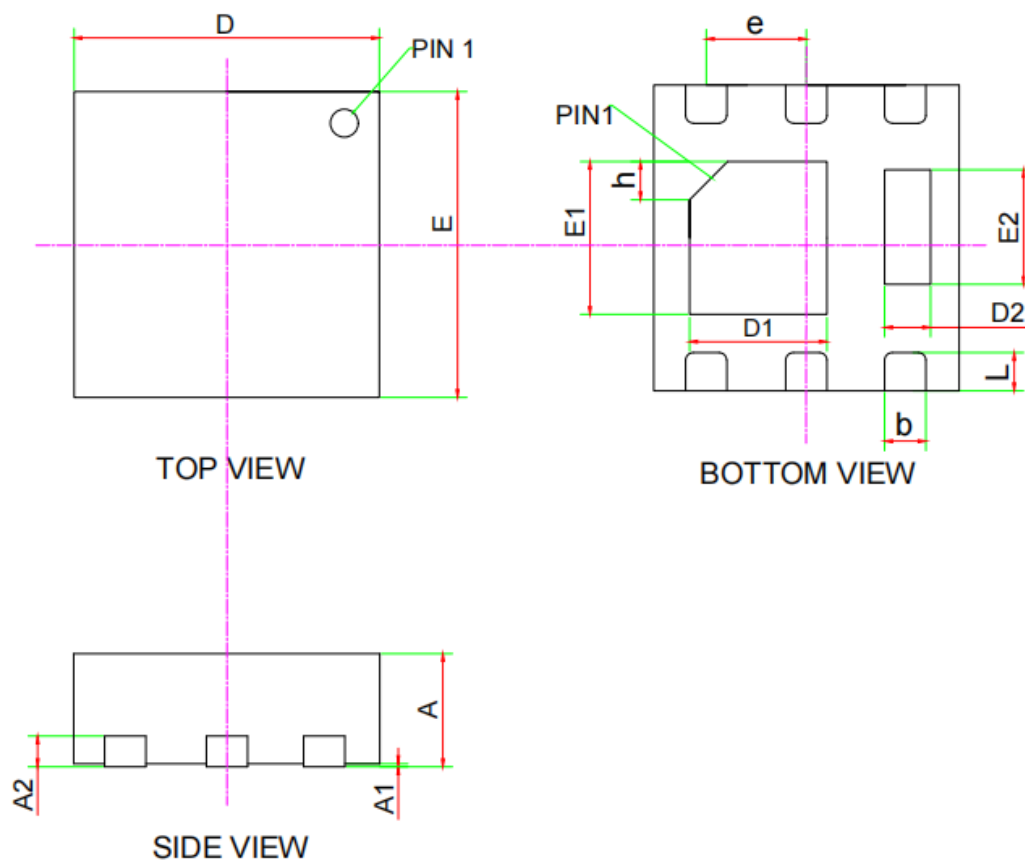


Fig.10 Capacitance vs. Drain-Source Voltage

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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