

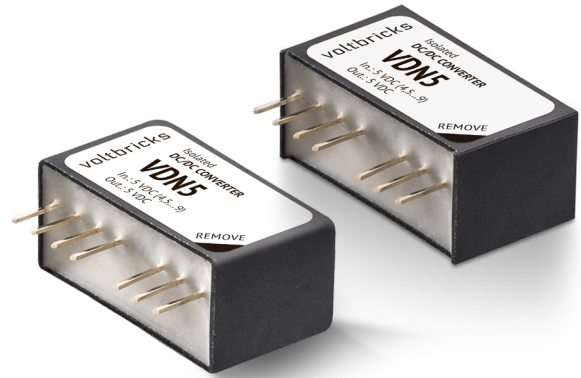
voltbricks

DATASHEET

VDN Series

VDN2, VDN5

SIP-package DC/DC converters



Description

VDN is a series of isolated DC/DC converters with output power up to 5 W and wide input voltage range (2:1). These products are produced in a compact SIP-8 package (22,3×11,6×9,8 mm) with small footprint.

An excellent efficiency allows –55...+105 °C case operating temperature. These units are designed for using in industrial and special purpose applications and are optimized for operating in harsh environment.

Engineered in accordance with

- MIL-STD-810G
- MIL-STD-461F (CE102)



Description of VDN Series on the manufacturer's website
<https://voltbricks.com/product/vdn>

Features

- 5 year warranty
- Compact SIP-8 package
- Wide input voltage range (2:1)
- Case operating temperature –55...+105 °C
- Remote on/off
- High efficiency

Order registration

+65 6950 0011, Global Operations Team

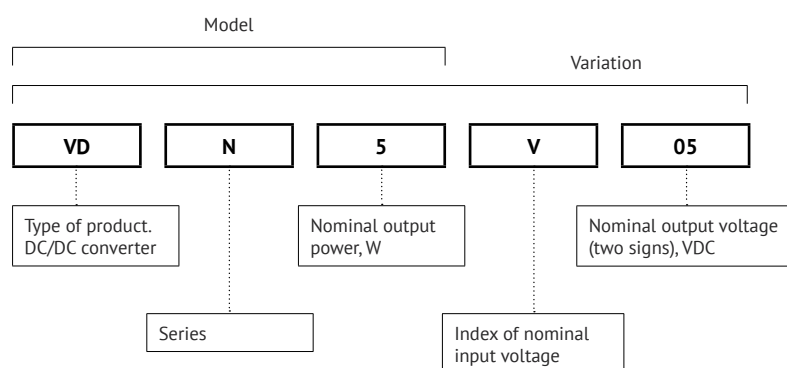
Technical support

support@voltbricks.com

Reliability test

https://support.voltbricks.com/Reliability-Test_ENG.pdf

Ordering information



For more information please
contact our Global Operations
Team

+65 6950 0011

Output power and current

Output power, W	2					5				
Output voltage, VDC	3,3	5	9	12	15	3,3	5	9	12	15
Maximal output current, A	0,6	0,4	0,22	0,16	0,13	1,5	1	0,56	0,42	0,33

A product with special output voltage rating can be made by customized order.

Index of nominal input voltage

Parameter	Index "I"	Index "A"	Index "V"
Nominal input voltage, VDC	5	12	24
Input voltage range, VDC	4,5...9	9...20	18...40
Transient deviation, 1 s, VDC	4...15	8...36	17...50
Typical efficiency for Uout.=15 VDC	84%	84%	84%

Specifications

All specifications valid for normal climatic conditions (ambient temp. 15...35°C; relative humidity 45...80%; air pressure 8,6×10⁴...10,6×10⁴ Pa), U_{in}. nom, I_{out}. nom, unless otherwise stated. It is important to note that the information herein is not full.

Output specifications

Parameter			Value
Total regulation			max ±2,5% Uout.nom
Voltage set accuracy			max ±2% Uout.nom
Ripple and noise (p-p)			max 2% Uout. nom
Maximum load capacity	VDN2	3-5 VDC >5-15 VDC	3000 uF 700 uF
	VDN5	3-5 VDC >5-15 VDC	7000 uF 1700 uF
Start up time	remote		max =0,1s
	from the moment thr voltage is applied, at Cout=min		max =0,1s
Start up time (remote)			50 ms
Output voltage transient deviation	Uin step change		max ±5%
Output voltage transient deviation	Iout step change		max ±10%
Transient deviation duration			N/A
Minimum load current			0 A

Protections*

Parameter			Value
Overload protection level	VDN2		2,5*I _{nom}
	VDN5		3,0*I _{nom}
Short circuit protection	VDN2		I _{out} limit 2,5*I _{nom}
	VDN5		I _{out} limit 3,0*I _{nom}
Overvoltage protection			no regulated
Thermal protection level			no regulated
Vibration proof			10...2000 Hz, 200 (20) m/s ² (g), 0,3 mm
Dust proof			yes
Salt fog resistant			yes

* Parameters are stated for the information purposes and could not be used at long term work, exceeding maximum output current, at work outside of a range of operating temperatures.

Specifications (cont.)

General specifications

Parameter		Value
Case temperature		-60...+105°C
Operating ambient temperature (on condition the case temperature is maintained)		-60...+105°C
Storage temperature		-60...+105°C
Switching frequency		600 kHz typ.
Isolation voltage (60 s)	input/output, input/case, output/case	1500 VDC
Isolation resistance @ 500 VDC	input/output, input/case, output/case	20 MOhm min
Thermal impedance		42°C/W
Remote on/off		more 2,5 VDC
Typical MTBF		min 50 000 hours in typ. mode
Warranty		5 years

Physical specifications

Parameter		Value
Form-factor		SIP-8
Case material		aluminium
Potting		silicone
Pin material		bronze
Weight		max 9 g
Soldering temperature		260°C @ 5 s
Dimensions		22,3×11,6×9,8 mm

Design topology

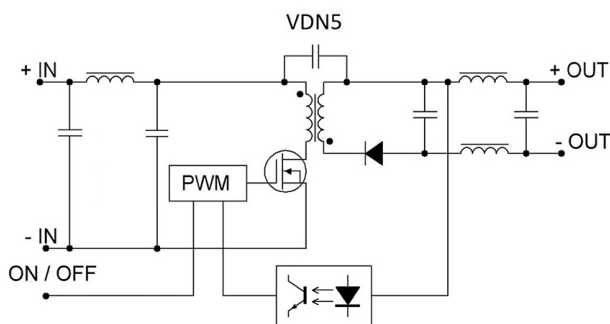


Figure 1. Design topology.

Service functions

Typical connection

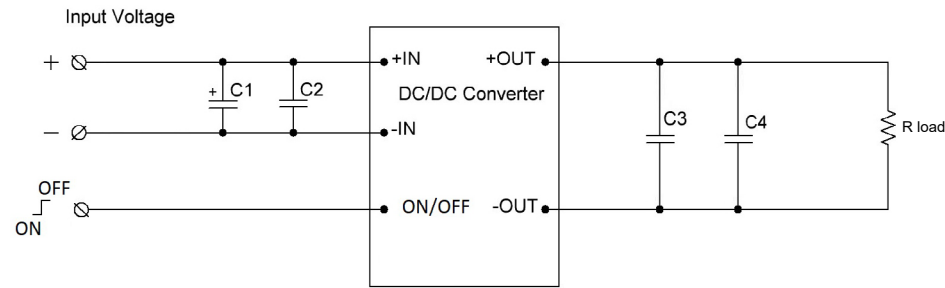


Figure 2. Typical connection diagram VDN5 Series.

C1	tantalum capacitor	Input voltage	=5 VDC =12 VDC =24 VDC	10 uF
C2	ceramic capacitor			4,7 uF
C3	ceramic capacitor	Output voltage	up 3,3 to 15 VDC on	4,7 uF
C4	tantalum capacitor			10 uF

Remote control

Remote off function is activated by feeding more 2,5 VDC to “-IN” and “ON” pins. The unit is powered on by removing this voltage.

To arrange remote power off/on of several units simultaneously it is not allowed to use additional elements in the circuit to connect pins “ON” and “-IN”.

If the function of remote power off/on is not used, “ON” output is allowed to be left unconnected.

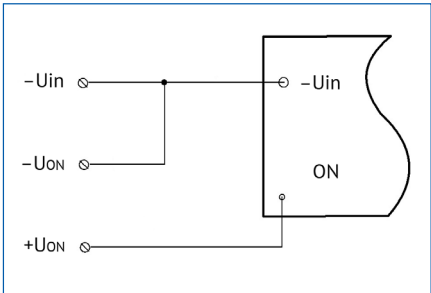


Figure 3. Logic voltage control.

Noise spectrogram

Testing according to MIL-STD-461F CE102. (Tcase=25°C, Vin.=+5 V, full load, unless otherwise specified)

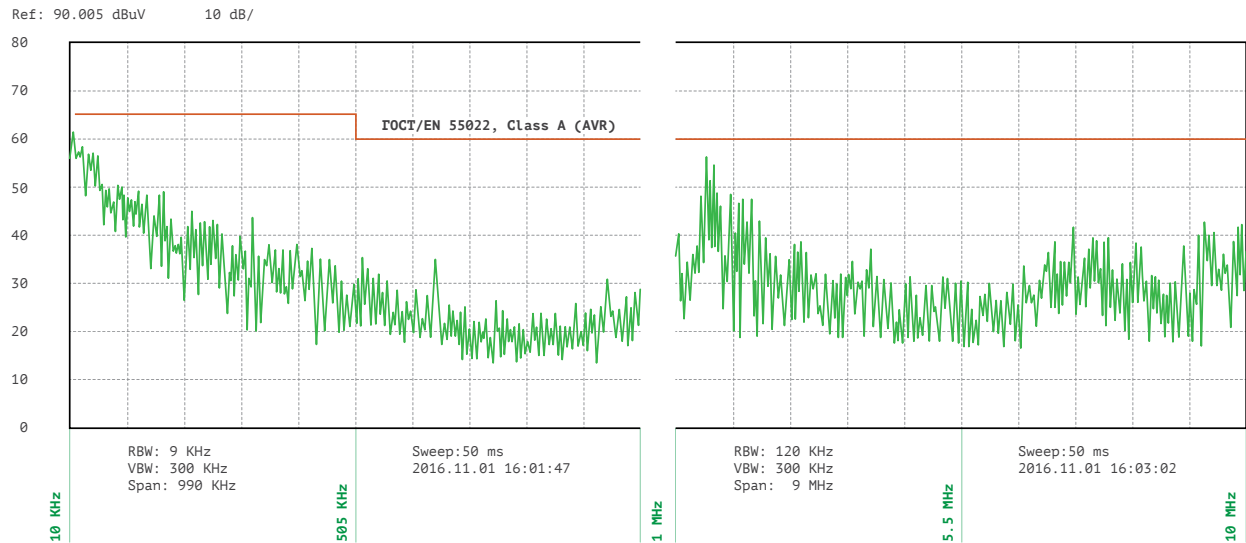


Figure 4. Spectrogram of VDN5I09 with typical connection diagram.

Efficiency

VS load

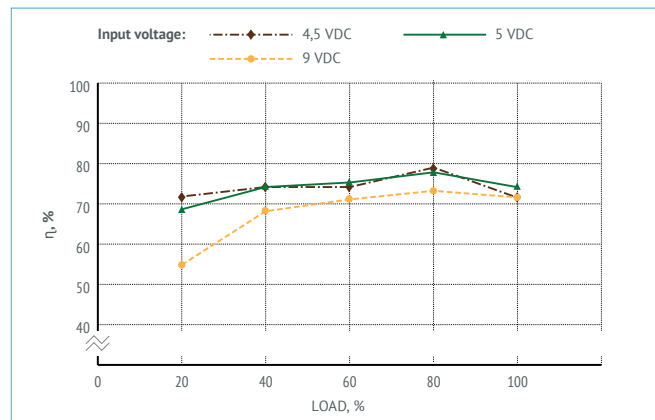


Figure 5 (a). Efficiency of VDN5I3,3.

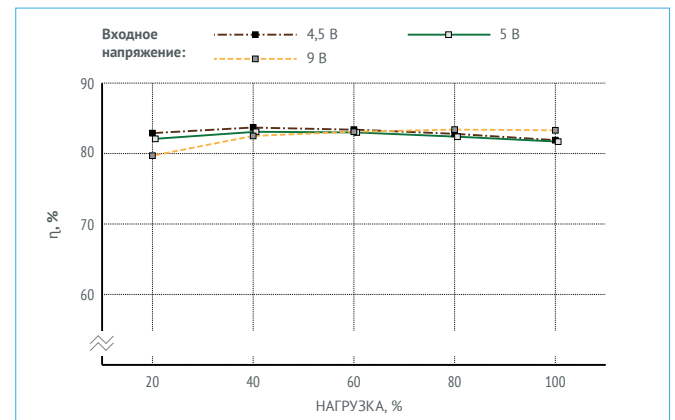


Figure 5 (b). Efficiency of VDN5I09.

Power derating VS ambient temperature

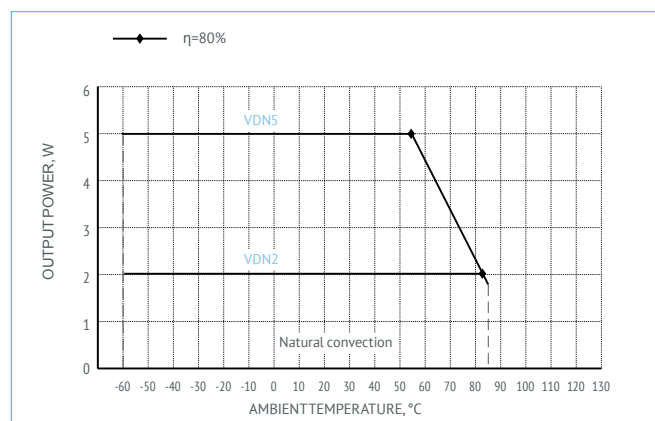


Figure 6. Power derating of VDN5.

Oscillograph charts

Testing conditions of VDN2: $U_{in}=27$ VDC, $I_{out}=0,22$ A, $T_{amb}=25^{\circ}\text{C}$, $U_{out}=9$ VDC, $C_{out}=4,7$ μF .

The database of regulated parameters of the manufactured products is available. Pls. contact your personal manager or customer support service to get necessary information.

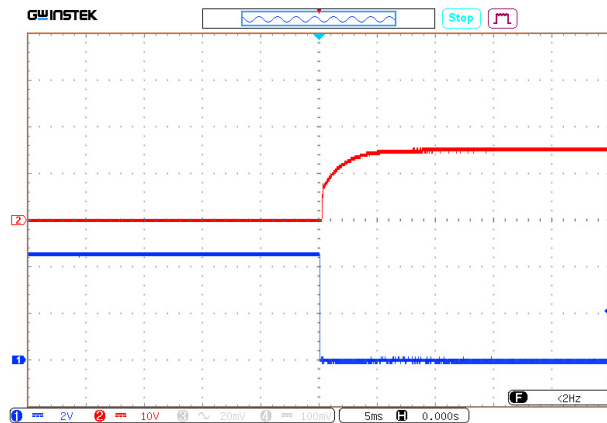


Figure 7 (a). Oscillograph chart of setting output voltage after supplying remote control signal to ON-output.

Ray 1 (blue) – output voltage. Scale 5 V/div.

Ray 2 (red) – voltage at ON-output. Scale 2 V/div.

Time scale $t=1$ ms/div

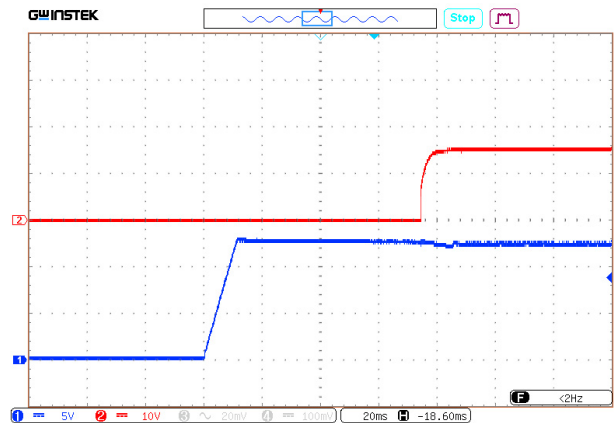


Figure 5 (b). Oscillograph chart of output voltage after supplying the input voltage.

Ray 1 (blue) – output voltage. Scale 5 V/div.

Ray 2 (red) – input voltage. Scale 10 V/div.

Time scale $t=500$ us/div.

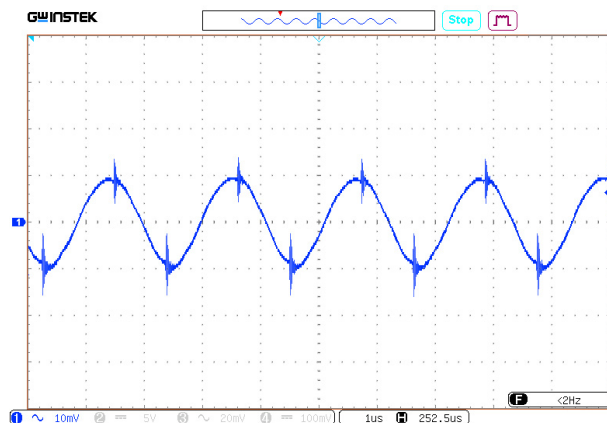


Figure 5 (a). Oscilloscope chart of output voltage ripple.

Ray 1 (blue) – ripple of output voltage. Scale 2 mV/div.

Time scale 1 us/div.

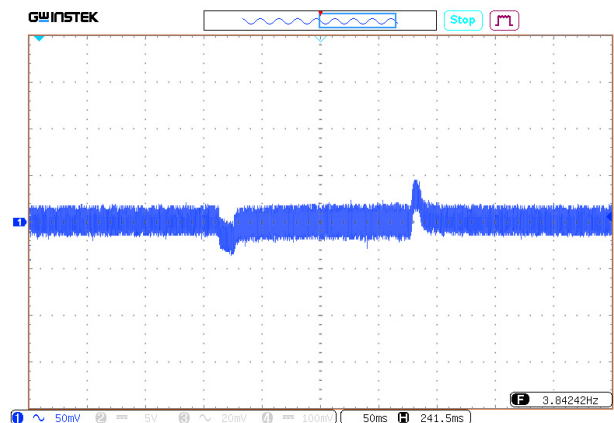


Figure 5 (b). Oscilloscope chart of voltage transient deviation during load “drop/rise”.

Ray 1 (blue) - output voltage. Scale 200 mV/div.

Time scale $t=50$ ms/div.

Modes:

- “drop” output current variation (10...100%) I_{nom} ;
- “rise” output current variation (10...100%) I_{nom} ;
- build-up time 500 us.

Outline dimensions

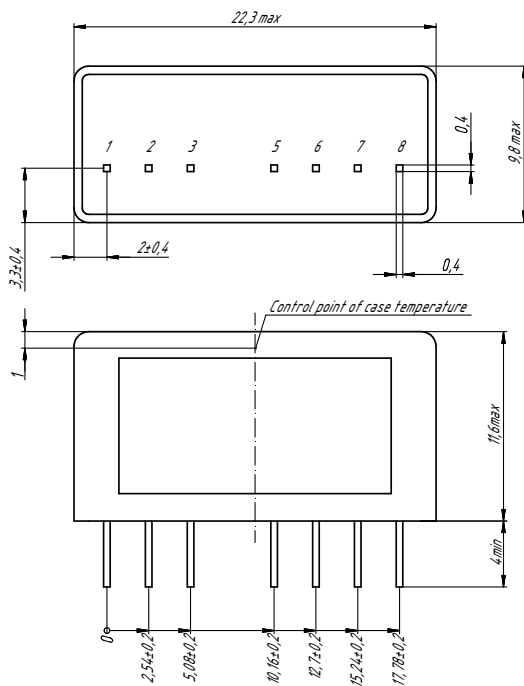


Figure. 4.

Pin out

Pin #	1	2	3	4	5	6	7	8
Function	-IN	+IN	ON	NO PIN	NOT USE	+OUT	-OUT	NOT USE

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Manufacturer of reliable DC/DC converters and power supply systems

This datasheet is valid for the following units: VDN2I3.3; VDN2I05; VDN2I09; VDN2I12; VDN2I15; VDN5I3.3; VDN5I05; VDN5I09; VDN5I12; VDN5I15; VDN2A3.3; VDN2A05; VDN2A09; VDN2A12; VDN2A15; VDN5A3.3; VDN5A05; VDN5A09; VDN5A12; VDN5A15; VDN2V3.3; VDN2V05; VDN2V09; VDN2V12; VDN2V15; VDN5V3.3; VDN5V05; VDN5V09; VDN5V12; VDN5V15; VDN2D3.3; VDN2D05; VDN2D09; VDN2D12; VDN2D15; VDN5D3.3; VDN5D05; VDN5D09; VDN5D12; VDN5D15;