# VD-8W Series

*8W 2:1 Regulated Single & Dual output*

## Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 85%
- -40 ~ 85°C Operation Temperature Range
- High Power Density: 8W in DIL-24 Package


The VD-8W series are a family of high performance 8W single & dual output DC/DC converters .These converters are consisted with nickle plated copper Dual in Line 24 pin package . The high performance features include : Synchronous Rectification , high efficiency and tight line/load regulation.Devices are encapsulated with high grade flameproof epoxy with UL94V-0 recognize. Input voltages of 12,24 and 48 with output voltage of 3.3 , 5 , 7.2 , 9 , 12 , 15 , ±5 , ±7.2 , ±9 , ±12 , ±15 . High performance features include high efficiency operation up to 85% and output voltage accuracy of ±1% maximum.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

### OUTPUT SPECIFICATIONS

| | |
|---|---|
| Voltage accuracy | ±1% |
| Line Regulation | ±0.5% |
| Load Regulation (Single , Io=0% to 100%) | ±0.5% |
| (Dual , Io=0% to 100%) | ±1.0% |
| ( Io=0% to 100%,only 3.3V) | ±1.5% |
| Cross Regulation (Dual Output) (1) | ±5% |
| Over Current Protection | 150% of FL, typ. |
| Ripple & noise (20 MHz bandwidth)(2) | 75mV pk-pk |
| Short circuit protection | Indefinite(hiccup) (Automatic Recovery) |
| Temperature coefficient | ±0.02%/°C |
| Capacitor load(3) | See table |

### INPUT SPECIFICATIONS

| | |
|---|---|
| Voltage Range | See table |
| Max. Input Current | See table |
| No-Load Input Current | See table |
| Input Filter | PI Type |
| Input Reflected Ripple Current(4) | 35mA pk-pk |

### GENERAL SPECIFICATIONS

| | |
|---|---|
| Efficiency | See table, typ. |
| I/O Isolation Voltage(60sec) | |
| Input/Output | 1500Vdc |
| Metal Case/Input & Output | 1000Vdc |
| I/O Isolation Capacitance | 1000 pF, typ. |
| I/O Isolation Resistance | 1000M Ohm |
| Switching Frequency | 330kHz, typ. |
| Humidity | 95% rel H |
| Reliability Calculated MTBF(MIL-HDBK-217 F) | >0.91 Mhrs |
| Safety Standard | UL/cUL 60950-1 , 62368-1<br>IEC/EN 60950-1 , 62368-1 |
| Safety Approvals | UL/cUL 60950-1 , 62368-1<br>IEC/EN 60950-1 , 62368-1 |

### EMC CHARACTERISTICS

| | | |
|---|---|---|
| Radiated Emissions | EN55032 | CLASS A |
| Conducted Emissions(7) | EN55032 | CLASS A |
| ESD | IEC61000-4-2 | Perf. Criteria A |
| RS | IEC61000-4-3 | Perf. Criteria A |
| EFT (8) | IEC61000-4-4 | Perf. Criteria A |
| Surge (8) | IEC61000-4-5 | Perf. Criteria A |
| CS | IEC61000-4-6 | Perf. Criteria A |
| PFMF | IEC61000-4-8 | Perf. Criteria A |

### PHYSICAL SPECIFICATIONS

| | |
|---|---|
| Case Material | Nickel-coated Copper |
| Pin Material | Φ0.5mm Brass Solder-coated |
| Potting Material | Epoxy (UL94V-0 rated) |
| Weight | 17.0g |
| Dimensions | 1.25"x0.8"x0.4" |

### ENVIRONMENT SPECIFICATIONS

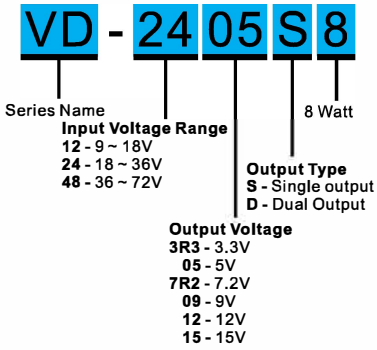
| | |
|---|---|
| Operating Temperature | -40°C~85°C(See Derating Curve)<br>-40°C~60°C(For 100% load ) |
| Maximum Case Temperature | 100°C |
| Storage Temperature | -40°C~125°C |
| Cooling | Nature Convection |

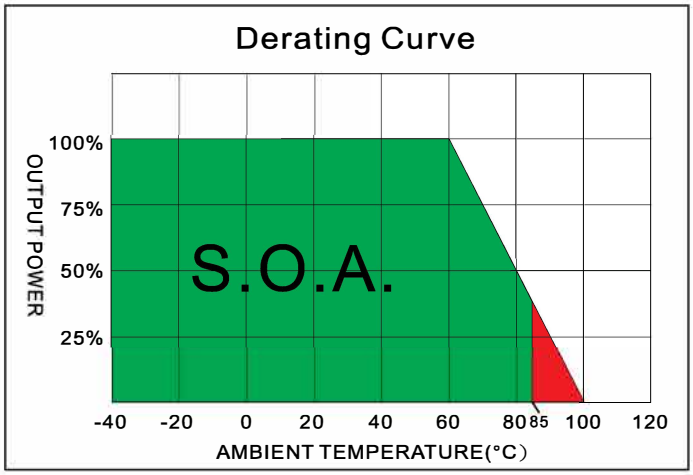
### ABSOLUTE MAXIMUM RATINGS(9)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

| | |
|---|---|
| Input Surge Voltage(100mS) | |
| 12 Models | 25 Vdc, max. |
| 24 Models | 50 Vdc, max. |
| 48 Models | 100 Vdc, max. |
| Soldering Temperature (1.5mm from case 10sec max.) | 260°C , max. |

## PART NUMBER STRUCTURE



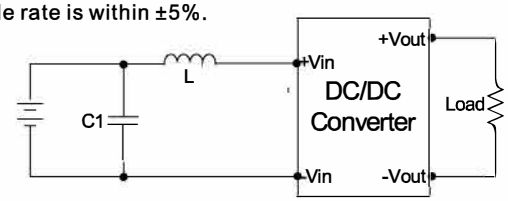




# MODEL SELECTION GUIDE

| MODEL NUMBER | INPUT Voltage Range (Vdc) | INPUT Current No-Load (mA, max.) | INPUT Current Full Load (mA, typ.) | OUTPUT Voltage (Vdc) | OUTPUT Current Min. load (mA) | OUTPUT Current Full load (mA) | EFFICIENCY @FL (%, typ.) | Capacitor Load @FL (μF, max.) |
|---|---|---|---|---|---|---|---|---|
| VD-123R3S8 | 9-18 | 20 | 687 | 3.3 | 0 | 2000 | 80 | 3300 |
| VD-1205S8 | 9-18 | 20 | 762 | 5 | 0 | 1500 | 82 | 2200 |
| VD-127R2S8 | 9-18 | 20 | 803 | 7.2 | 0 | 1111 | 83 | 1000 |
| VD-1209S8 | 9-18 | 20 | 794 | 9 | 0 | 888 | 84 | 470 |
| VD-1212S8 | 9-18 | 20 | 784 | 12 | 0 | 665 | 85 | 470 |
| VD-1215S8 | 9-18 | 20 | 803 | 15 | 0 | 535 | 83 | 220 |
| VD-1205D8 | 9-18 | 20 | 813 | ±5 | 0 | ±800 | 82 | ±1000 |
| VD-127R2D8 | 9-18 | 20 | 803 | ±7.2 | 0 | ±555 | 83 | ±470 |
| VD-1209D8 | 9-18 | 20 | 794 | ±9 | 0 | ±444 | 84 | ±330 |
| VD-1212D8 | 9-18 | 20 | 794 | ±12 | 0 | ±335 | 84 | ±220 |
| VD-1215D8 | 9-18 | 20 | 794 | ±15 | 0 | ±265 | 84 | ±100 |
| VD-243R3S8 | 18-36 | 15 | 344 | 3.3 | 0 | 2000 | 80 | 3300 |
| VD-2405S8 | 18-36 | 15 | 381 | 5 | 0 | 1500 | 82 | 2200 |
| VD-247R2S8 | 18-36 | 15 | 396 | 7.2 | 0 | 1111 | 84 | 1000 |
| VD-2409S8 | 18-36 | 15 | 387 | 9 | 0 | 888 | 86 | 470 |
| VD-2412S8 | 18-36 | 15 | 392 | 12 | 0 | 665 | 85 | 470 |
| VD-2415S8 | 18-36 | 15 | 397 | 15 | 0 | 535 | 84 | 220 |
| VD-2405D8 | 18-36 | 15 | 407 | ±5 | 0 | ±800 | 82 | ±1000 |
| VD-247R2D8 | 18-36 | 15 | 396 | ±7.2 | 0 | ±555 | 84 | ±470 |
| VD-2409D8 | 18-36 | 15 | 392 | ±9 | 0 | ±444 | 85 | ±330 |
| VD-2412D8 | 18-36 | 15 | 402 | ±12 | 0 | ±335 | 83 | ±220 |
| VD-2415D8 | 18-36 | 15 | 392 | ±15 | 0 | ±265 | 85 | ±100 |
| VD-483R3S8 | 36-72 | 15 | 172 | 3.3 | 0 | 2000 | 80 | 3300 |
| VD-4805S8 | 36-72 | 15 | 191 | 5 | 0 | 1500 | 82 | 2200 |
| VD-487R2S8 | 36-72 | 15 | 198 | 7.2 | 0 | 1111 | 84 | 1000 |
| VD-4809S8 | 36-72 | 15 | 198 | 9 | 0 | 888 | 84 | 680 |
| VD-4812S8 | 36-72 | 15 | 198 | 12 | 0 | 665 | 84 | 470 |
| VD-4815S8 | 36-72 | 15 | 198 | 15 | 0 | 535 | 84 | 220 |
| VD-4805D8 | 36-72 | 15 | 203 | ±5 | 0 | ±800 | 82 | ±1000 |
| VD-487R2D8 | 36-72 | 15 | 198 | ±7.2 | 0 | ±555 | 84 | ±1000 |
| VD-4809D8 | 36-72 | 15 | 198 | ±9 | 0 | ±444 | 84 | ±680 |
| VD-4812D8 | 36-72 | 15 | 196 | ±12 | 0 | ±335 | 85 | ±220 |
| VD-4815D8 | 36-72 | 15 | 196 | ±15 | 0 | ±265 | 85 | ±100 |

## NOTE

1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Ripple/Noise measured with a 1uF ceramic capacitor.
3. Test by nominal input voltage and constant resistor load.
4. Measured Input reflected ripple current with a simulated source inductance of 12uH.
5. Operation under no-load and 10% conditions will not damage these devices, however they may not meet all listed specifications.
6. It's necessary to add minimum capacitor in output for some models, please check single model datasheet for detail value.
7. Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as Possible to the module; and all leads should be minimized to decrease radiated noise.
8. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5. The filter capacitor suggest: Nippon - chemi - con KY series, 220uF/100V.
9. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

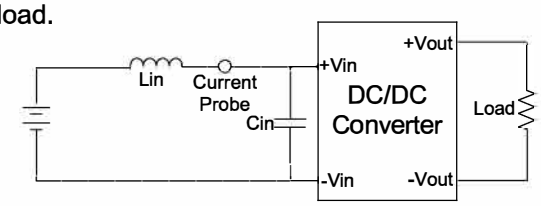



| | C1 | L |
|---|---|---|
| VD-12XXXXX | 100uF, 100V | 12uH |
| VD-24XXXXX | 100uF, 100V | 12uH |
| VD-48XXXXX | 100uF, 100V | 12uH |

## TEST CONFIGURATIONS

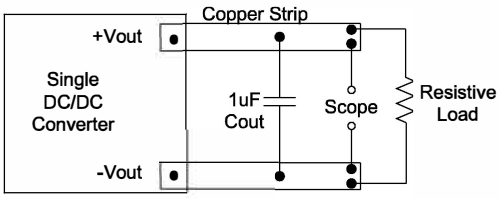
### Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12uH) and a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.

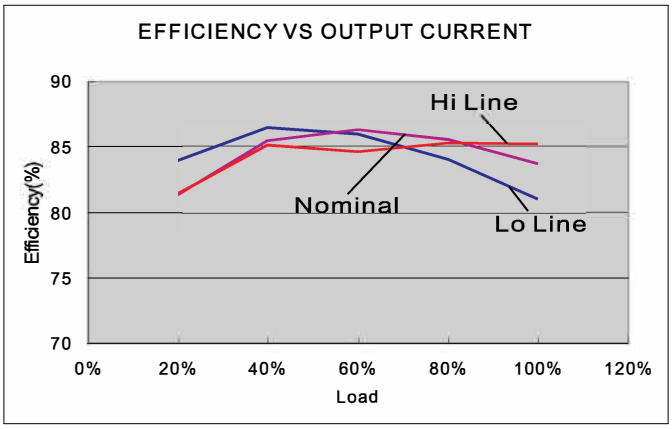



### Output Ripple & Noise Measurement Test

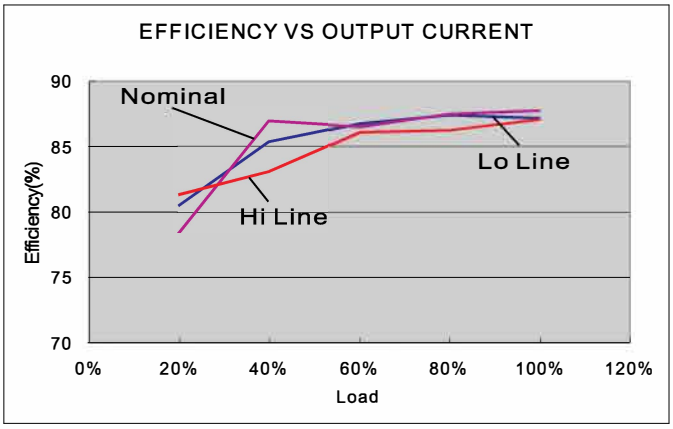
Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



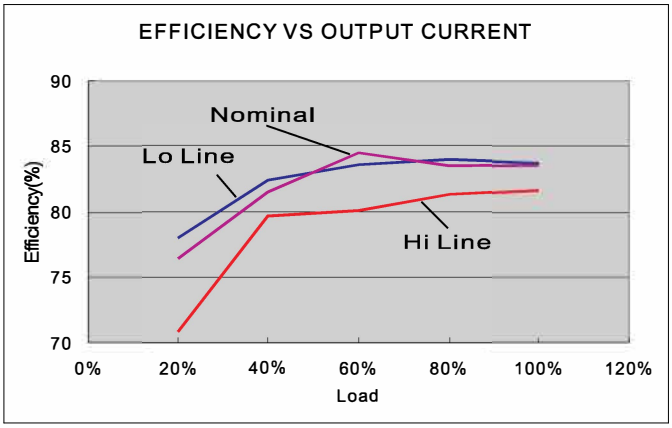

## ELECTRICAL CHARACTERISTIC CURVES




12 Models

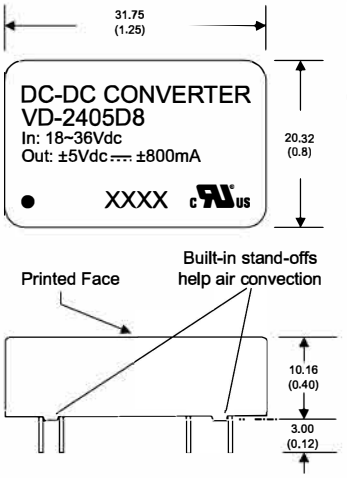


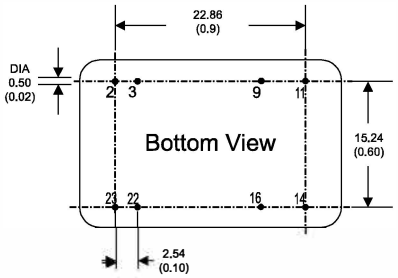

24 Models




48 Models

## MECHANICAL SPECIFICATIONS




24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters ( inches ).
1. Pin diameter: 0.5 ±0.05 ( 0.02 ±0.002 )
2. Pin pitch and length tolerance: ±0.35 ( ±0.014 )
3. Case Tolerance: ±0.5 ( ±0.02 )

| PIN CONNECTIONS | | |
|---|---|---|
| PIN NUMBER | SINGLE | DUAL |
| 2 | −V Input | −V Input |
| 3 | −V Input | −V Input |
| 9 | N.P. | Common |
| 11 | N.C. | −V Output |
| 14 | +V Output | +V Output |
| 16 | −V Output | Common |
| 22 | +V Input | +V Input |
| 23 | +V Input | +V Input |

ALL PSU LTD, Unit D6 Laser Quay, Culpeper Close
Medway City Estate, Rochester, Kent, ME2 4HU
Tel: 01634 725527, Email: sales@allpsu.co.uk, Web: www.allpsu.co.uk

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