# Roding Ruiruite Electronic Technology Co. **DC/DC Converters**

## **WRA-CS-3W** Series

DC-DC Modular Power Supply/1500V Isolated Wide Voltage Input/Regulated Dua


Product Features.
Isolated voltage:1500Vdc
Isolated operating temperature:-45℃-85℃
Stable performance and high reliability MTBF≥1 million hours
Flame-retardant shell package Meet UL94-V0 requirements
International standard pinout (1, 2, 3, 6, 7, 8 pins) Internal chip design
No external components required
Meets the requirements of the RoHS directive

## Module Selection Guide

| Product Model | importation | | exports | | | conversion efficiency (%) |
|---|---|---|---|---|---|---|
| | nominal voltage (V) | voltage range (V) | rated voltage (V) | minimum current (mA) | Maximum current (mA) | |
| **WRA1205CS- 3W** | 12 | 9.0-18 | ±5 | ±20 | ±200 | 76 |
| **WRA1209CS- 3W** | | | ±9 | ±11 | ±111 | 76 |
| **WRA1212CS- 3W** | | | ±12 | ±9 | ±83 | 74 |
| **WRA1215CS- 3W** | | | ±15 | ±7 | ±67 | 75 |
| **WRA1224CS- 3W** | | | ±24 | ±5 | ±42 | 73 |
| **WRA2405CS- 3W** | 24 | 18-36 | ±5 | ±20 | ±200 | 78 |
| **WRA2409CS- 3W** | | | ±9 | ±11 | ±111 | 76 |
| **WRA2412CS- 3W** | | | ±12 | ±9 | ±83 | 78 |
| **WRA2415CS- 3W** | | | ±15 | ±7 | ±67 | 76 |
| **WRA2424CS- 3W** | | | ±24 | ±5 | ±42 | 77 |
| **WRA4805CS- 3W** | 48 | 36-72 | ±5 | ±20 | ±200 | 76 |
| **WRA4809CS- 3W** | | | ±9 | ±11 | ±111 | 76 |
| **WRA4812CS- 3W** | | | ±12 | ±9 | ±83 | 77 |
| **WRA4815CS- 3W** | | | ±15 | ±7 | ±67 | 75 |

The company reserves the right to change the above parameters, the final product parameters will be based on the specific product specifications provided by the company.

| | | | | | | |
|---|---|---|---|---|---|---|
| **WRA4824CS- 3W** | | | ±24 | ±5 | ±42 | 76 |
| **WRA ****CS-3W** | * * Can be customized according to actual needs * * | | | | | |

The company reserves the right to change the above parameters, the final product parameters will be based on the specific product specifications provided by the company.

## General Characteristics

| | | |
|---|---|---|
| switching frequency | 300KHz | Input nominal voltage, 100% load |
| Output Short Circuit Duration | Sustainable, self-recovery | |
| The case heats up when the product is in operation | 15°C (Typ.) | 35°C(Max) |
| temperature coefficient | 0.03%/°C | 100% full load |
| Solder Resistance Temperature | 300°C | Welding time ≤ 3 seconds |
| Isolation Voltage (Input & Output) | 1000VDC | Test time 1 minute, leakage current less than 1mA |
| electrical insulation resistance | 1000MΩ | Insulation voltage 500V |
| Isolation Capacitors | 35pF | Input/Output 100KHz/V |
| No-load power consumption | 120mW(Typ.) | |
| operating temperature | -40 to +85°C | Operating Temperature |
| Storage temperature | -55 to +125°C | |
| Storage humidity | <95% | non-condensing |
| Cooling method | natural air cooling | |
| weights | 5g | (an official) standard |

## Input Characteristics

| Input Voltage Range (Vdc) | | Maximum value (Vdc) | No-load current(Typ,mA) | * The input voltage must not exceed this value, otherwise permanent damage to the module may result. |
|---|---|---|---|---|
| 2:1 | 9-18 | 22 | 20 | |
| | 18-36 | 40 | 10 | |
| | 36-72 | 80 | 3 | |

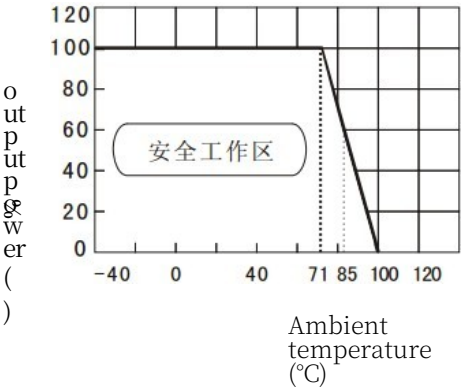
## Output Characteristics

| sports event | test condition | typical value | maximum values |
|---|---|---|---|
| Linear voltage regulation rate | Input voltage from minimum to maximum | ± 0.2% | ± 0.5% |
| Load regulation rate | 10% to 100% load | ± 0.5% | ±1.0% |
| Output Voltage Accuracy | Specified input range and load | ±1% | ±3% |
| Ripple and Noise | 20MHz bandwidth | 45mVp-p | 120mVp-p |

Note: For positive and negative dual output series, the load regulation rate of dual output module is ±5% ma x when the load (25/100%) is unbalanced.

Unless otherwise specified, all other parameters are tested under the following conditions: specified input voltage range, purely resistive loads and room temperature of 25℃.

## Typical Characteristic Curve



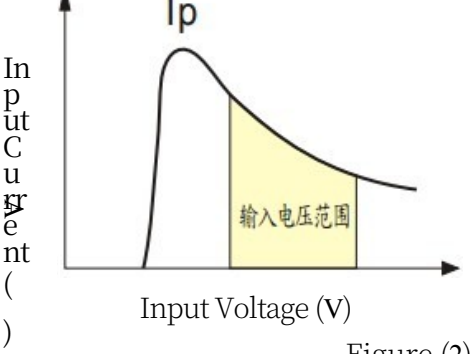




Figure (2)

## caveat

Recommended Circuit: If you want to further reduce the input and output ripple, you can connect an "LC" filter network at the input and output terminals, apply the circuit as shown in (Figure 1) and select the appropriate filter capacitors. It is recommended to use ceramic capacitors or high-frequency low-impedance electrolytic capacitors for the Cout, as the use of tantalum capacitors may cause damage to the module. The capacitors should not be too large as this may cause startup problems. For each output, the maximum capacitance of the filtering capacitors is shown in the table of maximum capacitance of filtering capacitors to ensure safe and reliable operating conditions. Usually:

**Cin: 5V, 12V 100μF; 24V, 48V 10μF** **Lin: 4.7μH to 120μH** **Lout: 2.2μH to 10μH Cout: 47μF (Typ.))**

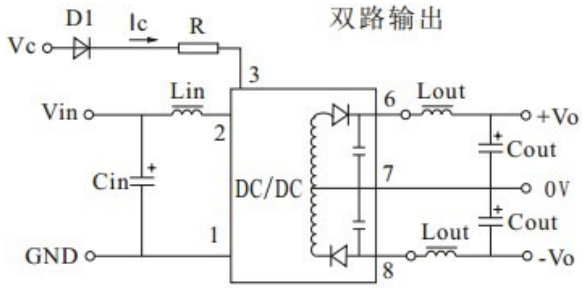
2, **CTRL** terminal: hanging or high resistance, the module normal output; connected to a high level (relative to the input ground), the module shutdown; note that the current flowing into the pin (Ic) in the 5-10mA is appropriate, the current exceeds its maximum value (generally 20mA) will cause permanent damage to the module! The R value can be calculated as R=(Vc-VD-1.0) / Ic.

3. Input Current: When using an unstable power supply, make sure that the fluctuation range and ripple voltage of the power supply do not exceed the input requirements of the module itself. The input current of the power supply must be sufficient to handle the instantaneous startup current Ip (Figure 2) of the DC/DC module, which is about .

**1.4** times, i.e., Ip ≤ 1.4*iin-max

4, load requirements: the minimum load should not be less than 10%, otherwise the output ripple will increase rapidly; if the product works in the minimum required load below, the module will not be damaged, but can not guarantee that are in line with all the performance indicators in this manual.

**5**, this product can not be used in parallel, does not support hot-swap.




(Figure 1)

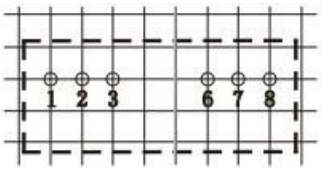
Basic application circuit recommendations:

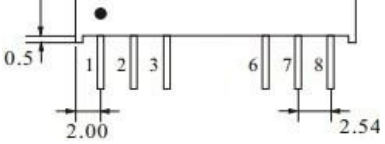

Table of maximum capacitance values for filter

| output voltage (VDC) | External capacitors (uF) | output voltage (VDC) | External capacitors (uF) |
|---|---|---|---|
| ±5 | 330 | ±15 | 150 |
| ±9 | 330 | ±24 | 100 |
| ±12 | 220 | | |

Note: It is recommended to use ceramic capacitors and high-frequency low-resistance electrolytic capacitors for the output capacitors.

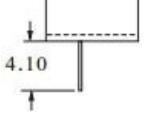
Suggested Printing Plates.






Front view

view




side

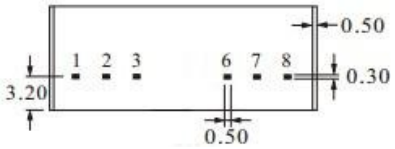
typeface

Top view, grid spacing 2.54mm

Opening Diameter 1.00mm

(Unit: mm)

(Tolerance: ±0.25)




bottom view

| **WRA ****CS-2W** (positive and negative dual output) | | | | | | |
|---|---|---|---|---|---|---|
| pinout | 1 | 2 | 3 | 6 | 7 | 8 |
| define | -Vin | +Vin | CTRL | +Vo | 0V | -Vo |
| clarification | Input Negative | input positive | control pin | output positive | output land | negative output |

## External Dimensions and Pin Definitions

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