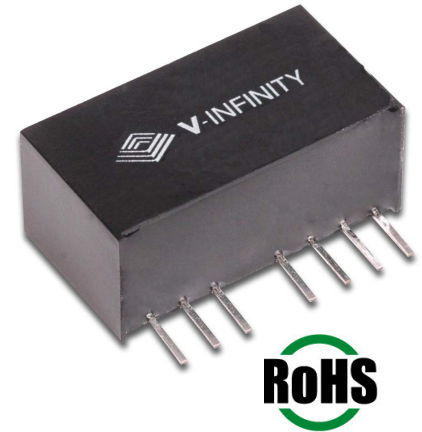


Description

Designed to convert a wide input voltage range into an isolated regulated voltage, the VWRAS1-SIP series is well suited for providing board-mount local supplies in a wide range of applications, including mixed analog/digital circuits, test & measurement equip., process/machine controls, datacom/telecom fields, etc...

Features

- Wide (2:1) input range
- High efficiency to 78%
- Regulated
- Dual voltage output
- I/O Isolation 1500VDC
- No heatsink required
- Short circuit protection
- Remote on/off
- MTBF >1,000,000 hrs
- Temperature range: -40°C~+85°C



| Model Number | Input Voltage | | | Output Voltage | Output Current | | Efficiency | Package Style |
|--------------------|---------------|---------------|--------|----------------|----------------|--------|------------|---------------|
| | Nominal | Range | Max. | | Max. | Min. | | |
| VWRAS1-D5-D5-SIP | 5 Vdc | 4.5~9.0 Vdc | 11 Vdc | ±5 Vdc | ±100 mA | ±10 mA | 71% | SIP |
| VWRAS1-D5-D9-SIP | 5 Vdc | 4.5~9.0 Vdc | 11 Vdc | ±9 Vdc | ±55 mA | ±5 mA | 72% | SIP |
| VWRAS1-D5-D12-SIP | 5 Vdc | 4.5~9.0 Vdc | 11 Vdc | ±12 Vdc | ±42 mA | ±4 mA | 73% | SIP |
| VWRAS1-D5-D15-SIP | 5 Vdc | 4.5~9.0 Vdc | 11 Vdc | ±15 Vdc | ±33 mA | ±3 mA | 73% | SIP |
| VWRAS1-D12-D5-SIP | 12 Vdc | 9.0~18.0 Vdc | 22 Vdc | ±5 Vdc | ±100 mA | ±10 mA | 75% | SIP |
| VWRAS1-D12-D9-SIP | 12 Vdc | 9.0~18.0 Vdc | 22 Vdc | ±9 Vdc | ±55 mA | ±5 mA | 76% | SIP |
| VWRAS1-D12-D12-SIP | 12 Vdc | 9.0~18.0 Vdc | 22 Vdc | ±12 Vdc | ±42 mA | ±4 mA | 77% | SIP |
| VWRAS1-D12-D15-SIP | 12 Vdc | 9.0~18.0 Vdc | 22 Vdc | ±15 Vdc | ±33 mA | ±3 mA | 76% | SIP |
| VWRAS1-D24-D5-SIP | 24 Vdc | 18.0~36.0 Vdc | 40 Vdc | ±5 Vdc | ±100 mA | ±10 mA | 76% | SIP |
| VWRAS1-D24-D9-SIP | 24 Vdc | 18.0~36.0 Vdc | 40 Vdc | ±9 Vdc | ±55 mA | ±5 mA | 77% | SIP |
| VWRAS1-D24-D12-SIP | 24 Vdc | 18.0~36.0 Vdc | 40 Vdc | ±12 Vdc | ±42 mA | ±4 mA | 78% | SIP |
| VWRAS1-D24-D15-SIP | 24 Vdc | 18.0~36.0 Vdc | 40 Vdc | ±15 Vdc | ±33 mA | ±3 mA | 78% | SIP |
| VWRAS1-D48-D5-SIP | 48 Vdc | 36.0~72.0 Vdc | 80 Vdc | ±5 Vdc | ±100 mA | ±10 mA | 75% | SIP |
| VWRAS1-D48-D9-SIP | 48 Vdc | 36.0~72.0 Vdc | 80 Vdc | ±9 Vdc | ±55 mA | ±5 mA | 76% | SIP |
| VWRAS1-D48-D12-SIP | 48 Vdc | 36.0~72.0 Vdc | 80 Vdc | ±12 Vdc | ±42 mA | ±4 mA | 78% | SIP |
| VWRAS1-D48-D15-SIP | 48 Vdc | 36.0~72.0 Vdc | 80 Vdc | ±15 Vdc | ±33 mA | ±3 mA | 78% | SIP |

Note:

- All specifications measured at TA=25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.

Output Specifications

| Item | Test conditions | Min. | Typ. | Max. | Units |
|-------------------------|--------------------------------|------|------|------|-------|
| 1W Output power | | | | 1 | W |
| Output voltage accuracy | Refer to recommended circuit | | ±1 | ±3 | % |
| Line Regulation | Input Voltage from low to high | | ±0.2 | ±0.5 | % |
| Load Regulation | 10% to 100% full load | | ±0.5 | ±1.0 | % |
| Temperature drift | Refer to recommended circuit | | | 0.03 | %/°C |
| Output ripple | 20 Hz Bandwidth | | 25 | 100 | mVp-p |
| Output noise | DC-20MHz Bandwidth | | 25 | 100 | mVp-p |
| Switching frequency | 100% load, nominal input | 180K | | 550K | Hz |

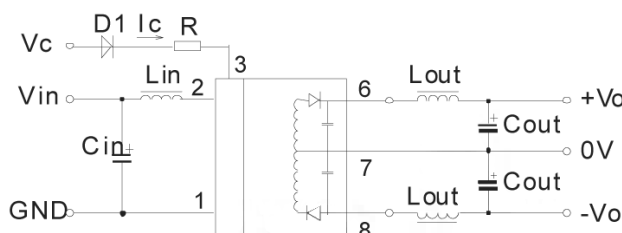
General Specifications

| | |
|---------------------------------|------------------------------------|
| Output short circuit protection | Continuous |
| Temperature rise at full load | 15°C typ., 35°C max. |
| Cooling | Free air convection |
| No-load power consumption | 100mW (typical) |
| Operating temperature range | -40°C to +85°C |
| Storage temperature range | -50°C to +125°C |
| Soldering temperature | 300°C (1.5mm from case for 10sec.) |
| Storage humidity range | <95% |
| Case material | Plastic (UL94-V0) |
| MTBF | >1,000,000 hrs. |

Isolation Specifications

| Item | Test Conditions | Min. | Typ. | Max. | Units |
|-----------------------|-------------------------|------|------|------|-------|
| Isolation Voltage | Flash tested for 1 min. | 1500 | | | Vdc |
| Isolation Resistance | Test at 500 Vdc | 1000 | | | M Ω |
| Isolation Capacitance | 100 K Hz, 1V | | 80 | | PF |

Typical Characteristics



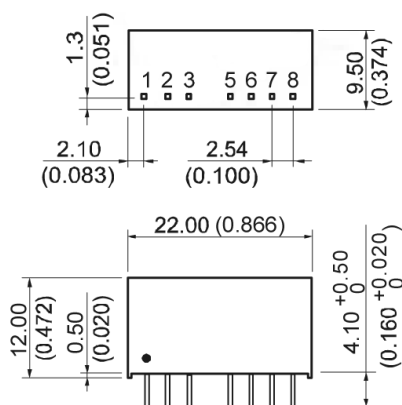
Recommended circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter as shown on the left.

General:

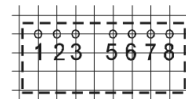
Cin: 5V, 12V 100μF
 24V, 48V 10μF or 22μF
 Cout: 100μF(typ)
 Lin: 4.7μH-120 μH
 Lout: 2.2μH-10 μH

Outline Dimensions & Recommended Layout Pattern



Note:
 Unit:mm(inch)
 Pin section:0.50*0.30mm(0.020*0.012inch)
 Pin tolerances:±0.10mm(±0.004inch)
 General tolerances:±0.25mm(±0.010inch)

RECOMMENDED FOOTPRINT
 Top view, grid: 2.54mm(0.1inch),
 diameter: 1.00mm
 Dual Output & Single Output



FOOTPRINT DETAILS

| Pin | Dual |
|-----|------|
| 1 | GND |
| 2 | Vin |
| 3 | CTRL |
| 5 | NC |
| 6 | +Vo |
| 7 | OV |
| 8 | -Vo |

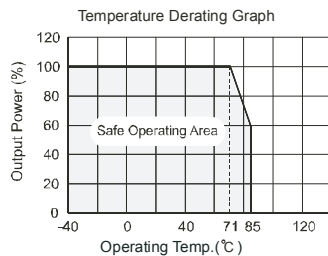
NC: No Connection

Application Notes:

- All of the VWRAS1-SIP Series have been tested according to the following recommended testing circuit before leaving the factory. This series should be tested under load(Figure 1). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high(Table 2).

Table 2

| Vout | Cout (Max) |
|------|------------|
| ±5 | ±330 |
| ±9 | ±220 |
| ±12 | ±100 |
| ±15 | ±47 |
| ±24 | ±22 |

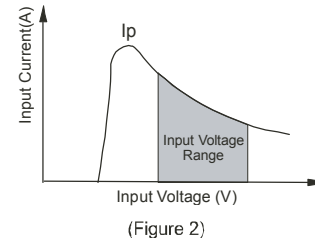
Figure 1


- CTRL Terminal

When open or high impedance, the converter will work well; When this pin is 'high'; the converter will shutdown; It should be noted that the input current should remain between 5-10mA,exceeding the maximum 20mA will cause permanent damage to the converter.

- Input current

While using the unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current I_p . (Figure 2)



No parallel connection or plug and play.