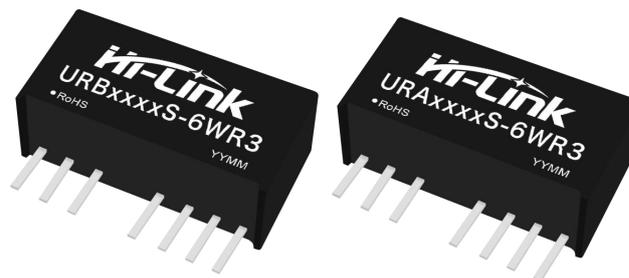


Typical Performance

- Ultra-compact SIP8 package
- Ultra-wide input voltage range: 4:1
- Operating temperature range: -40°C to +85°C
- Isolation voltage 1500VDC
- Low ripple noise
- Short circuit protection (self-restoring)
- No-load power consumption as low as 0.12W
- Input undervoltage protection, output short circuit and overcurrent protection

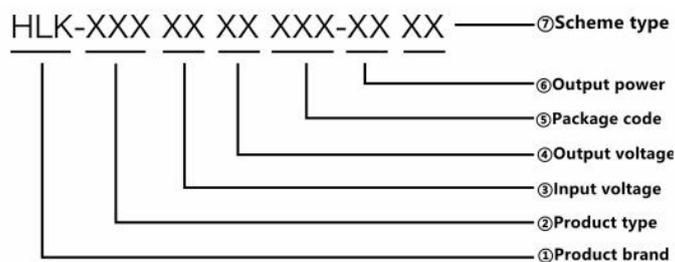
6W, Ultra Wide Voltage Input, Isolated Regulated Positive and Negative

Dual/Single Output, DC/DC Module Power Supply



The URB_S-6WR3 & URA_S-6WR3 series are isolated 6W DC-DC products with 4:1 input and regular voltage output. The products are smaller SIP-8 plastic pin package, high efficiency, meet -40°C to +85°C operating temperature, and have remote control and sustainable short circuit protection. The small size and cost-effective design make this converter an ideal solution for applications in communications equipment, instrumentation and industrial electronics.

Product Coding Rules



Product List

| Product model | Output voltage range (Vdc) | Output voltage/current | | Ripple and noise | Efficiency @ full load | Max. capacitive load |
|---------------|-----------------------------|------------------------|---------------------------------|-----------------------------|------------------------|----------------------|
| | Nominal value (range value) | Output voltage (Vdc) | Output current (mA) (Max./Min.) | Full load (mVp-p) Typ./Max. | % (Min./Typ.) | uF |
| URB2403S-6WR3 | 24.0 (9.0~36.0) | 3.3 | 1350 | 50/130 | 76/78 | 2200 |
| URB2405S-6WR3 | | 5 | 1200 | 50/130 | 80/83 | 2200 |
| URB2409S-6WR3 | | 9 | 667 | 50/130 | 83/85 | 680 |
| URB2412S-6WR3 | | 12 | 500 | 50/130 | 84/86 | 680 |
| URB2415S-6WR3 | | 15 | 400 | 50/130 | 85/87 | 470 |
| URB2424S-6WR3 | | 24 | 250 | 50/130 | 85/87 | 330 |
| URA2403S-6WR3 | | ±3.3 | ±625 | 50/130 | 76/78 | 1000 |
| URA2405S-6WR3 | | ±5 | ±600 | 50/130 | 80/83 | 1000 |
| URA2409S-6WR3 | | ±9 | ±333 | 50/130 | 83/85 | 1000 |
| URA2412S-6WR3 | | ±12 | ±250 | 50/130 | 84/86 | 470 |
| URA2415S-6WR3 | | ±15 | ±200 | 50/130 | 85/87 | 220 |

| | | | | | | | |
|--|----------------|---------------------|------|------|--------|-------|------|
| | URA2424S-6WR3 | | ±24 | ±125 | 50/130 | 85/87 | 100 |
| | *URB4803S-6WR3 | 48.0 (18.0~75.0) | 3.3 | 1350 | 50/130 | 76/78 | 2200 |
| | *URB4805S-6WR3 | | 5 | 1200 | 50/130 | 80/83 | 2200 |
| | *URB4809S-6WR3 | | 9 | 667 | 50/130 | 83/85 | 680 |
| | *URB4812S-6WR3 | | 12 | 500 | 50/130 | 84/86 | 680 |
| | *URB4815S-6WR3 | | 15 | 400 | 50/130 | 85/87 | 470 |
| | *URB4824S-6WR3 | | 24 | 250 | 50/130 | 85/87 | 330 |
| | *URA4803S-6WR3 | | ±3.3 | ±625 | 50/130 | 76/78 | 1000 |
| | *URA4805S-6WR3 | | ±5 | ±600 | 50/130 | 80/83 | 1000 |
| | *URA4809S-6WR3 | | ±9 | ±333 | 50/130 | 83/85 | 1000 |
| | *URA4812S-6WR3 | | ±12 | ±250 | 50/130 | 84/86 | 470 |
| | *URA4815S-6WR3 | | ±15 | ±200 | 50/130 | 85/87 | 220 |
| | *URA4824S-6WR3 | | ±24 | ±125 | 50/130 | 85/87 | 100 |

Note: 1. Due to limited space, the above is only a typical product list, if you need products other than those listed, please contact our sales department.

2. Maximum capacitive load indicates the maximum capacitive load that can be connected to +Vo or -Vo. If the value is exceeded, the product will not start normally.

3. The models marked with * are not yet developed for 48V input;

Test Conditions: Unless otherwise specified, all parameters are measured at nominal input voltage, purely resistive rated load and room temperature of 25°C.

Input Features

| Items | Working conditions | | Min. | Typ. | Max. | Unit |
|--------------------------------------|--------------------|---------------|---|-------|--------|------|
| Input current (full load/no load) | 24V input series | 3.3VDC output | -- | 238/5 | 245/12 | mA |
| | 24V input series | 5VDC output | -- | 305/5 | 313/12 | |
| | 24V input series | Others | -- | 305/5 | 313/12 | |
| | 48V input series | 3.3VDC output | -- | 119/3 | 123/6 | |
| | 48V input series | 5VDC output | -- | 152/3 | 162/6 | |
| | 48V input series | Others | -- | 152/3 | 162/6 | |
| Reflected ripple current | | | -- | 50 | -- | mA |
| Impulse voltage (Isec.max) | 24V input series | | -0.7 | -- | 50 | VDC |
| | 48V input series | | -0.7 | -- | 100 | |
| Start voltage | 24V input series | | - | - | 9 | |
| | 48V input series | | - | - | 18 | |
| Input under-voltage protection | 24V input series | | 5.5 | 7.0 | -- | |
| | 48V input series | | 13.0 | 16.0 | -- | |
| Input filter type | | | Capacitor filter | | | |
| Hot plug | | | Not support | | | |
| CNT (Ctrl)* | Module turned on | | Ctrl terminal dangling or high (> 0.8V) | | | |
| | Module turned off | | Ctrl connected low (< 0.6VDC) | | | |

Note: * Please refer to the "Typical Application Reference Circuit" section in this manual for the remote control pin (Ctrl) function description.

Output Features

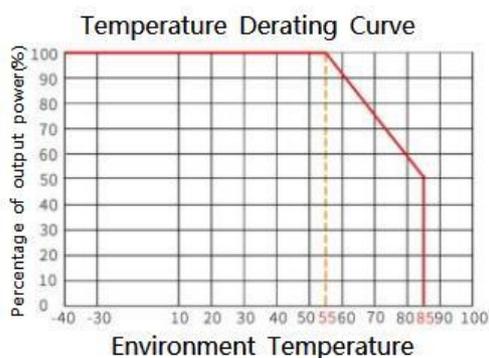
| Items | Working and testing conditions | Min. | Typ. | Max. | Unit | |
|---------------------------------|---|----------------------------|-------|-------|-------|---|
| Output voltage accuracy | 5%~100% load, input voltage range | 3.3V/5V output | -- | ±3.0 | ±5.0 | % |
| | | Others | -- | ±1.0 | ±2.0 | % |
| Linear rate of adjustment | Full load, input voltage from low to high voltage | -- | ±0.5 | ±1.0 | % | |
| Load adjustment ratio | 5%~100% load | -- | ±0.5 | ±1.5 | % | |
| Transient recovery time | 25% load step change | -- | ±5 | ±8 | mS | |
| Transient response | | -- | ±3 | ±5 | % | |
| Ripple & Noise | Pure resistive load,20MHz bandwidth,peak to peak | -- | 50 | 130 | mVp-p | |
| Temperature drift coefficient | Full load | -- | ±0.02 | ±0.03 | %/°C | |
| Output short circuit protection | | Sustainable, self-recovery | | | | |

Note: Ripple and noise test method twisted pair test method.

General Features

| Items | Working conditions | Min. | Typ. | Max. | Unit |
|---------------------------|---|--|------|------|------|
| Insulation voltage(E) | Input-output, test time: 1m, leakage current < 1mA | 1500 | -- | -- | VDC |
| Insulation voltage(E3) | Input-output, test time: 1m, leakage current < 1mA | 3000 | -- | -- | VDC |
| Insulation resistance | Input-output, insulation voltage: 500VDC | 1000 | -- | -- | MΩ |
| Isolation capacitance | Input-output, 100KHz/0.1V | -- | 120 | -- | pF |
| Working temperature | Use the reference temperature derating curve | -40 | -- | +85 | °C |
| Storage temperature | | -40 | -- | +125 | |
| Shell temperature rise | | -- | 25 | -- | |
| Storage humidity | No condensation | 5 | -- | 95 | %RH |
| Pin soldering temperature | The solder joint is 1.5mm away from the shell, 10 seconds | -- | -- | +300 | °C |
| Switching frequency | Full load, nominal voltage input | -- | 300 | -- | KHz |
| Vibration | | 10-55Hz, 10G, 30 Min. along X, Y and Z | | | |
| Shell material | Black flame retardant heat resistant plastic (UL94 V-0) | | | | |
| MTBF | MIL-HDBK-217F@25°C | 1000 | -- | -- | KHrs |

Product Characteristics Curve



Reference Circuit for Typical Applications (Recommended Parameters)

1. Typical application circuits:

All DC/DC converters of this series are tested in accordance with the recommended test circuit (Fig. 2) before leaving the factory.

If further reduction of input/output ripple is required, the input/output external capacitors C_{in1} , C_s and C_{out} can be appropriately enlarged or a capacitor with small series equivalent impedance value can be used, C_s is used to reduce the ripple, and there is no need to add C_s if the ripple has already met the demand. however, a suitable value of filtering capacitance should be used, as too large a capacitance is likely to cause start-up problems. For each output, the maximum capacitance of the filter capacitor must be less than the maximum capacitive load under the condition of ensuring safe and reliable operation.

Single

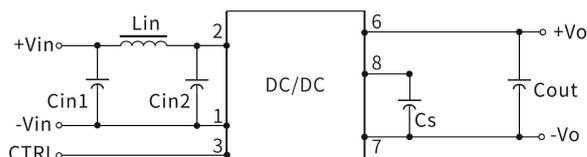


Figure 1

Dual

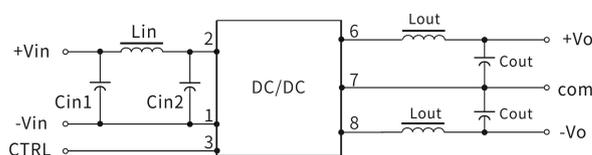


Figure 2

| Input voltage | 24VDC | 48VDC |
|---------------|-------------|-------------|
| C_{in1} | 100uF | 48uF |
| C_{in2} | 47uF | 22uF |
| L_{in} | 4.7uH-12uH | 4.7uH-12uH |
| C_s | 10uF-22uF | 10uF-22uF |
| C_{out} | 100uF(Typ.) | 100uF(Typ.) |
| L_{out} | 2.2uH-10uH | 2.2uH-10uH |

2. EMC typical application circuits

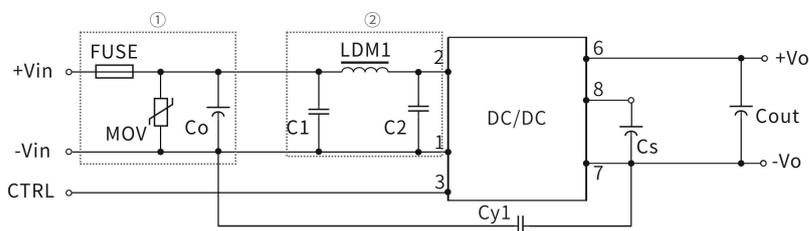


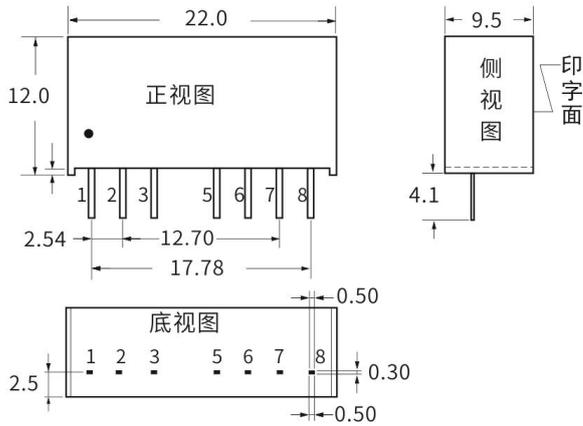
Figure 3

| | |
|---------------------------|--|
| Device code | 24V input products |
| FMSE fuses | Slow blow fuses, selected according to customer's actual input current |
| MOV piezoresistor | 14D560K |
| LDM1 inductors | 12 uH |
| Co-electrolytic capacitor | 330μF/50V |
| C1 ceramic capacitor | 4.7μF/50V |
| C2 ceramic capacitor | 4.7μF/50V |
| Cout ceramic capacitor | Refer to the Cout parameter in Figure 2 |
| CY1 safety capacitors | 1nF/2KV |

Note: ① in Figure 3 is for EMS test; ② is for EMI filtering, which can be selected according to the demand; Output Load Requirement: When using the module, the minimum load of the module output should not be less than 5% of the rated load. In order to comply with the performance index of this technical manual, please connect a 5% dummy load in parallel with the output terminal, the dummy load is usually a resistor, please note that the resistor should be derated.

Package Size and Pin Function Diagram

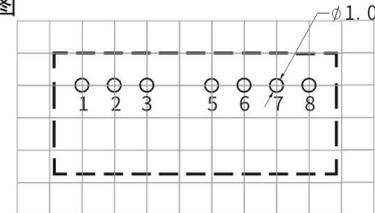
1) 外观尺寸(单位: mm,公差: xx ±0.25)



2) 引脚定义

| 引脚方式 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------|------|------|------|----|-----|-------|-------|-------|
| 单路 | -Vin | +Vin | CTRL | NP | NC | +Vout | -Vout | CS |
| | 输入负 | 输入正 | 遥控端 | 空脚 | 无电气 | 输出正 | 输出负 | 外接电容 |
| 正负双路 | -Vin | +Vin | CTRL | NP | NC | +Vout | COM | -Vout |
| | 输入负 | 输入正 | 遥控端 | 空脚 | 无电气 | 输出正 | 公共地 | 输出负 |

3) 建议印刷版图



备注: 栅格距离为: 2.54*2.54mm

*Note: If the definition of each pin of the power supply module does not match with the selection manual, the labeling on the physical label should prevail.

Package Description

| Package code | L x W x H | |
|--------------|----------------------|---------------------------|
| URB/URA | 22.0 x 9.5 x 12.0 mm | 0.866 × 0.374 × 0.472inch |

Test Application Reference

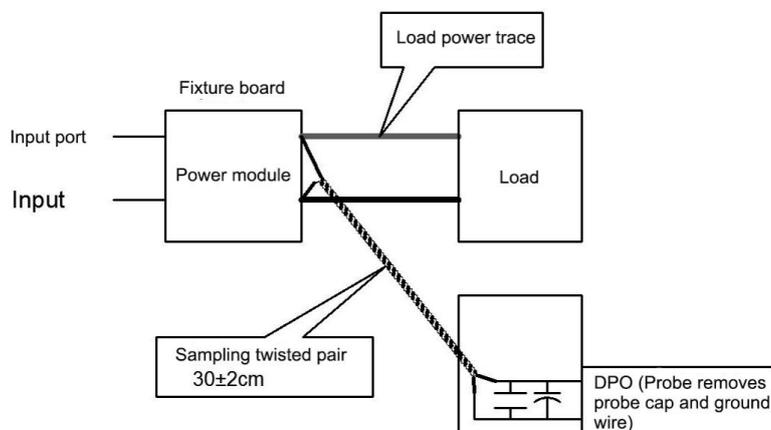
Ripple & Noise Test: (Twisted Pair Method 20MHZ Bandwidth)

Test method:

1. Ripple noise is the use of 12 # twisted pair connection, oscilloscope bandwidth is set to 20MHz, 100M bandwidth probe, and in parallel with the probe end of the 0.1uF polypropylene capacitors and 4.7uF high-frequency low-resistance electrolytic capacitors, the oscilloscope sampling Sample sampling mode.

2. Output ripple noise test diagram:

Connect the power input to the input power supply, the power output is connected to the electronic load through the fixture board, and the test is conducted with a 30cm±2 cm sampling line directly from the power output port. Power line according to the size of the output current to select the appropriate diameter of the wire with insulation.



Application Notes

1. It is recommended to use in more than 5% of the load, if less than 5% of the load, the product's ripple indicators may exceed the specifications, but does not affect the reliability of the product;
2. It is recommended that the load imbalance of the dual output module: $\leq \pm 5\%$, if it exceeds $\pm 5\%$, it can not be guaranteed that the performance of the product meets all the performance indicators in this manual, the specific circumstances can be directly contacted with the technical staff of our company;
3. Maximum capacitive loads are tested in the input voltage range, full load conditions;
4. Unless otherwise specified, all indicators in this manual are measured at $T_a=25^\circ\text{C}$, humidity $<75\%RH$, nominal input voltage and output rated load;
5. The test methods of all indicators in this manual are based on the company's corporate standards;
6. Our company can provide product customization, specific needs can be directly contacted our technical staff;
7. Product specifications are subject to change without notice.

Contact

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