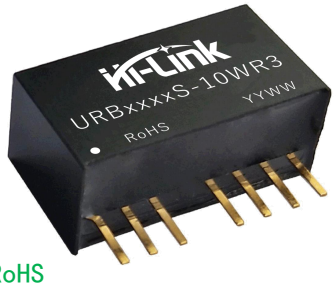
Typical Performance

- **Ultra wide range input (4:1), output 10W**
- **Conversion efficiency 88% (Typ)**
- **Isolated voltage 1500Vdc**
- **Ultra-low standby power consumption:0.036W (Typ)**
- **Ultra-fast startup: 5ms (Typ)**
- **Operating temperature range: -40℃~+85℃**
- **Input undervoltage, output short circuit, overcurrent protection**
- **Metal shell, low output ripple**

10W，ultra-wide voltage input, Isolation and voltage stabilization single channel DIP package, DC-DC power module



RoHS

The output power of URB(A)_S-10WR3 series products is 10W, 4:1 wide voltage input range, efficiency up to 88%, 1500VDC conventional isolation voltage, allowable operating temperature -40℃ to +85℃/-40 ℃ to+105 ℃, with input under-voltage protection, output short circuit， overcurrent protection function, widely used in medical, industrial control, electric power, instrumentation, communication and other fields.

Product Coding Rules

URB xx xx S -10W R3

- R3 — Suffix (3rd generation product)
- 10W — Rated output power (10W)
- S — Packaging form (22 × 9.5 × 12mm)
- xx — Output voltage (nominal)
- xx — Input voltage (nominal)
- B — Output channels (B single channel, A output, 1500Vdc isolation)
- UR — Product Series (UR stands for 4:1 input)

Product List

认证	Model①	Input Voltage range (Vdc)		Output Voltage/Current		Ripple and Noise	Maximum capacitive load	Efficiency @ full load
		Nominal value② (range value)	Max value	Output voltage (Vdc)	Output current (mA) (Max.Min.)	Full load (mVp-p) (TPY/Max.)	μF Max.	% (Min/TPY)
	URB2403S-10WR3	24 (9-36)	40	3.3	2400/0	30/50	2200	77/80
	URB2405S-10WR3			5	2000/0	30/50	2200	82/84
	URB2412S-10WR3			12	833/0	50/80	470	84/86
	URB2415S-10WR3			15	667/0	50/80	330	84/86

	URB2424S-10WR3			24	416/0	50/80	100	84/86
	***URB4803S-10WR3**	48 (18-75)	80	3.3	2400/0	30/50	2200	77/80
	***URB4805S-10WR3**			5	2000/0	30/50	2200	81/83
	***URB4812S-10WR3**			12	833/0	50/80	470	84/86
	***URB4815S-10WR3**			15	667/0	50/80	330	84/86
	***URB4824S-10WR3**			24	416/0	50/80	100	84/86

Note:
1. Due to the limited space, the above is just a list of typical products. If you need products other than the list, please contact the sales department of our company.
2. The maximum capacitive load indicates the maximum capacitive load that can be connected to +Vo or -Vo. If it exceeds this value, the product will not be able to start normally.
3. If the input voltage exceeds the maximum value, it may cause permanent damage to the product.
4. The marked * has not been developed yet; The above efficiency values were measured at the input nominal voltage and output rated load.

Test conditions: Unless otherwise specified, all parameter tests are measured under nominal input voltage, purely resistive rated load and 25°C room temperature.

Input Features

Project	Operating conditions		Min.	Typ.	Max.	Unit
Input current (full load/ no load)	24VDC Nominal Input Series, Nominal Input Voltage	3.3V	-	429/5	440/12	mA
		Other	-	484/5	496/12	
	48VDC Nominal Input Series, Nominal Input Voltage	3.3V	-	190/4	215/8	
		Other	-	242/4	248/8	
Reflected ripple	24VDC Nominal Input Series, Nominal Input Voltage		-	40	-	mA
	48VDC Nominal Input Series, Nominal Input Voltage		-	30	-	
Impulse voltage （Isec.max）	24VDC Nominal Input Series, Nominal Input Voltage		-0.7	-	50	VDC
	48VDC Nominal Input Series, Nominal Input Voltage		-0.7	-	100	
Starting voltage	24VDC Nominal Input Series, Nominal Input Voltage		-	-	9	
	48VDC Nominal Input Series, Nominal Input Voltage		-	-	18	
Input undervoltage protection	24VDC Nominal Input Series, Nominal Input Voltage		5.5	6.5	-	
	48VDC Nominal Input Series, Nominal Input Voltage		12	15.5	-	
Start time	Nominal input voltage and constant resistance load		-	10	-	mS
Input filter type			PI type			
Hot plug			**N**ot support			
Remote control terminal （Ctrl）*	Module turned on		Ctrl floating or connected to TTL high level （3.5-12VDC）			
	Module turned off		Ctrl is connected to GND or low level （0-1.2VDC）			
	Input current at shutdown		-	6	10	mA

Note: *Ctrl control pin voltage is relative to input pin GND

Output Features

Project	Operating and test conditions	+Vo1	-Vo2

		Min.	Typ.	Max.	Min.	Typ.	Max.
Output Load	Load percentage	0%	-	100%	0%	-	100%
Output Voltage Accuracy		-	±1.0%	±2.0%	-	±2.0%	±3.0%
Linear adjustment rate	Input voltage range	-	±0.2%	±0.5%	-	±1.5%	±2%
Load regulation	20%~100% rated load, balanced load	-	±0.5%	±1%	-	±4.0%	±5.0%
Ripple & Noise	Pure resistive load, 20MHz bandwidth, peak-to-peak	-	80mVp-p	120mVp-p	-	80mVp-p	120mVp-p
Start delay time		-	1ms	-	-	1ms	-
Output voltage regulation	Input voltage range	-	No adjustment end	-	-	No adjustment end	-
Dynamic response step deviation	25% nominal load step	-	±3.0%	±5.0%	-	±3.0%	±5.0%
Dynamic response recovery time		-	300μs	500μs	-	300μs	500μs
Output overvoltage protection	Full voltage range input	110% Io	150% Io	200% Io			
Output short circuit protection	Full voltage range input	Sustainable, self-healing					

Note:

①When tested under the working conditions of 0%-100% load, the index of the load adjustment rate is ±5%

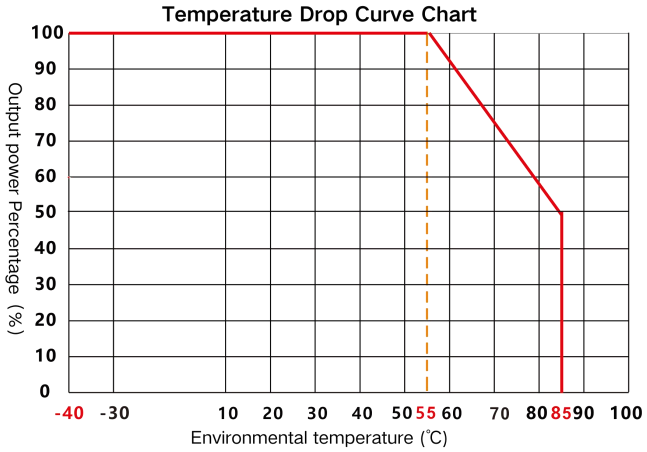
②0%-5% load ripple & noise is less than or equal to 5% Vo. Test method for ripple and noise The twisted pair test method can add capacitive load to the output to reduce light load ripple.

General Features

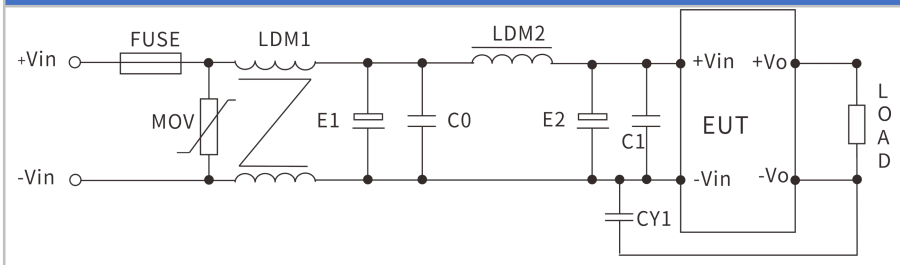
Project	Operating conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-output, test time is 1 minute, leakage current is less than 1mA	1500	--	--	VDC
Insulation resistance	Input output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation capacitor	Input output, 100KHz/0.1V	--	1000	--	pF
Operating temperature	Reference temperature derating curve	-40	--	+85	℃
Storage temperature		-40	--	+125	
Maximum		--	--	+100	
Storage humidity	No condensation	5	--	95	%RH
Pin soldering temperature	The solder joint is 1.5mm away from the shell, 10 seconds	--	--	+300	℃
Switch level	PWM mode	--	250	--	KHz
Viberation		10-55Hz, 10G, 30 Min. along X, Y and Z			

Shell material		Aluminum alloy shell plastic bottom cover			
Minimum time between failures	MIL-HDBK-217F@25℃	--	2X105	--	Hrs

Temperature Characteristic Curve Graph



EMC Peripheral Recommended Circuit

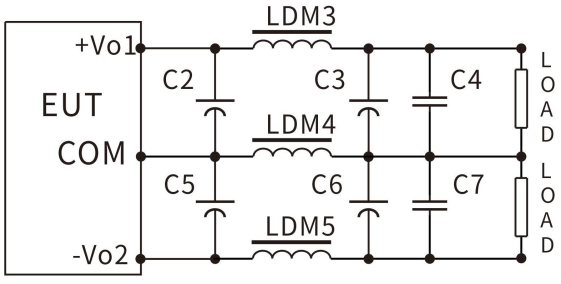


Parameter recommendation: The following are typical parameters, please adjust accordingly according to the actual use environment

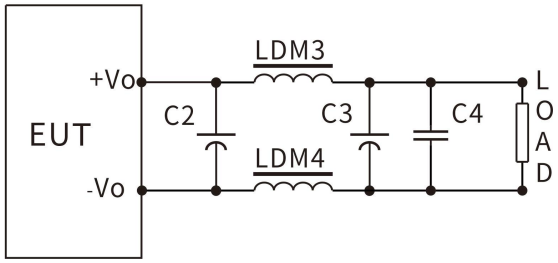
Device code	24V input product	48V input product	
FMSE fuse	Access the corresponding fuse according to customer needs		
MOV varistor	14D560K	14D101K	
LDM1 common mode inductance	10mH	15mH	
E1、E2 electrolytic capacitor	100μF/50V	100μF/100V	
C0、C1 ceramic capacitors	1μF/50V	1μF/100V	
LDM2 DM inductor	10μH	15μH	
CY1 safety Y2 capacitor	1nF/250Vac		

Output Filter Peripheral Recommended Circuit

Positive and negative dual output products



Single output products



When the requirements for ripple & noise are general, it is recommended to use only C2 for the periphery; when the requirements for ripple & noise are strict, the circuit shown above is recommended.

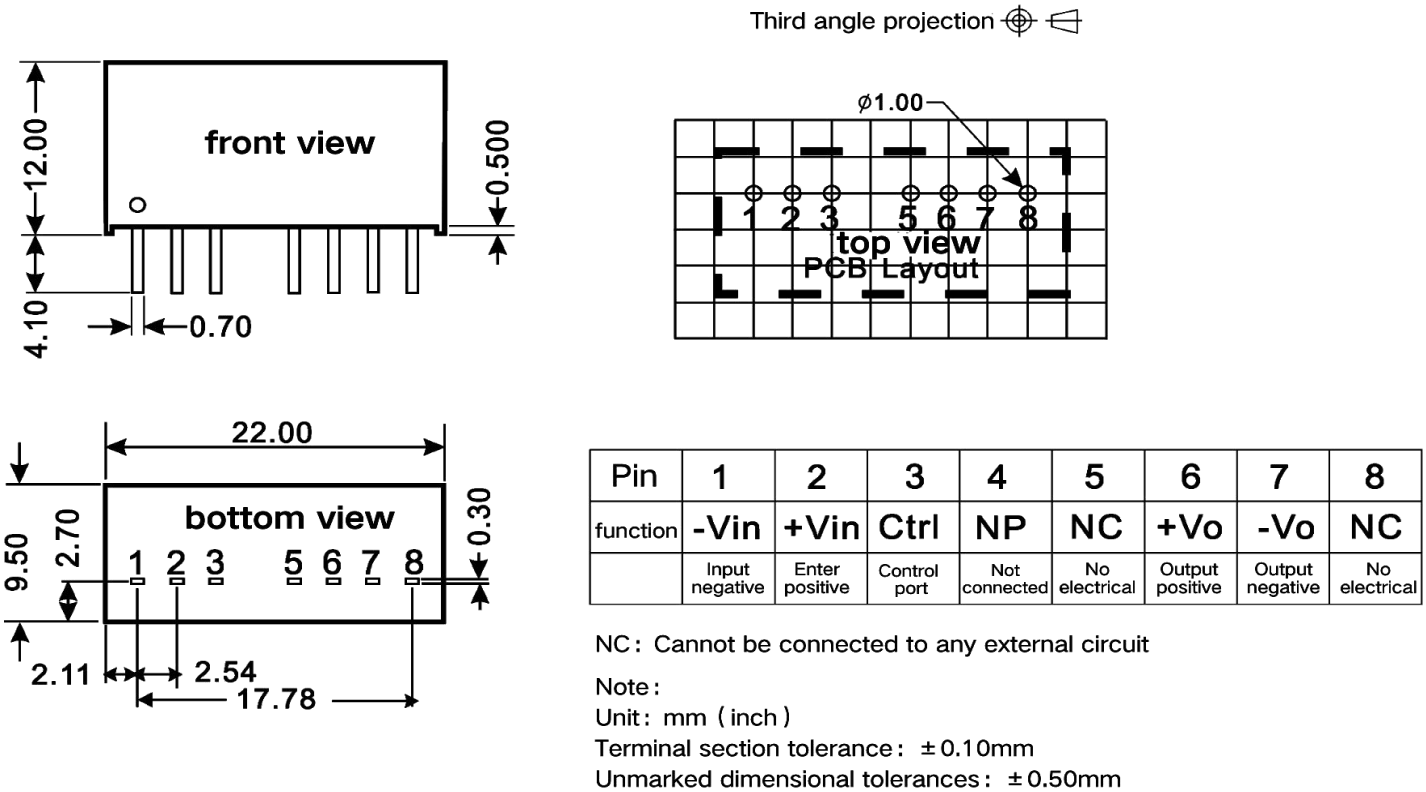
Note:

1. C2, C3 adopts high-frequency low-resistance electrolytic capacitors, and the total capacity cannot exceed the maximum capacitive load marked in the manual, otherwise the module will not start normally.
2. When capacitive load, a minimum load of 3% must be guaranteed, otherwise it will cause abnormal module output.

Parameter recommendation:

Device code	3.3V output	5V output	9V/12V output	15V output	24V output
LDM3 inductance	0.47 μ H	1 μ H	2.2 μ H	2.2 μ H	4.7 μ H
LDM4 inductance	0.47 μ H	1 μ H	2.2 μ H	2.2 μ H	4.7 μ H
C2、C3 electrolytic capacitor	220 μ F	220 μ F	100 μ F	100 μ F	68 μ F
C4 ceramic capacitors	1 μ F/50V				

Package Size and Pin Function Diagram



Pin	1	2	3	4	5	6	7	8
function	-Vin	+Vin	Ctrl	NP	NC	+Vo	-Vo	NC
	Input negative	Enter positive	Control port	Not connected	No electrical	Output positive	Output negative	No electrical

NC: Cannot be connected to any external circuit

Note:
Unit: mm (inch)
Terminal section tolerance: ±0.10mm
Unmarked dimensional tolerances: ±0.50mm

*Note: If the definition of each pin of the power module is inconsistent with the selection manual, the label on the physical label shall prevail.

Package Description

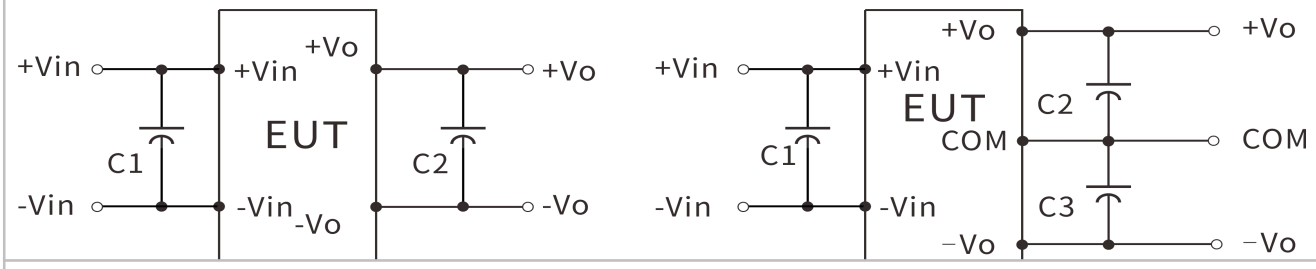
Package code	LxWxH	
S	**22.0 x 9.5 x 12.0 mm**	**0.866 ×0.374 ×0.472inch**

Test Application Reference

Recommended test circuit

1、DC/DC test circuit：

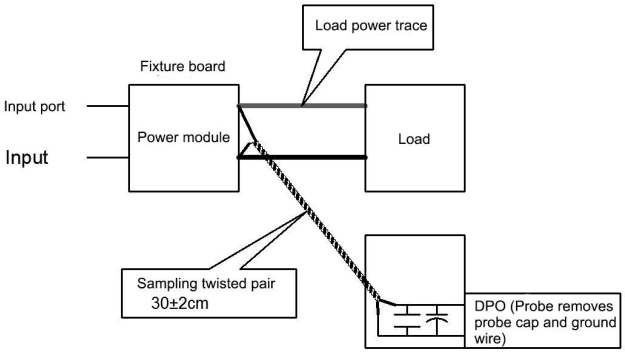
Generally recommended capacitors：C1：47-100μF；C2、C3：10-22μF。



2、Ripple & noise test: (twisted pair method 20MHZ bandwidth)

Testing method：

1、Ripple noise is connected by 12# twisted pair, the bandwidth of the oscilloscope is set to 20MHz, the bandwidth of the probe is 100M, and the 0.1uF polypropylene capacitor and the 47uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probe end, and the oscilloscope sampling uses the Sample sampling mode.



2、Schematic diagram of output ripple noise test:

Connect the power input terminal to the input power supply, and connect the power output to the electronic load through the fixture board. The test uses a 30cm±2cm sampling line to directly sample from the power output port. The power line selects the wire with the insulation sheath of the corresponding wire diameter according to the magnitude of the output current.

Contact

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