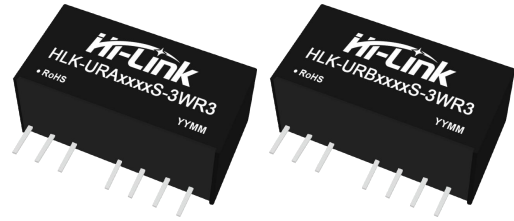


Typical performance

- Small SIP Package
- Wide input voltage range: 4:1
- Working temperature: -40°C ~ +85°C
- Isolation Voltage: 1500VDC
- Low ripple noise
- Short circuit protection (self-recovery)
- Efficiency: The highest efficiency is as high as 81%

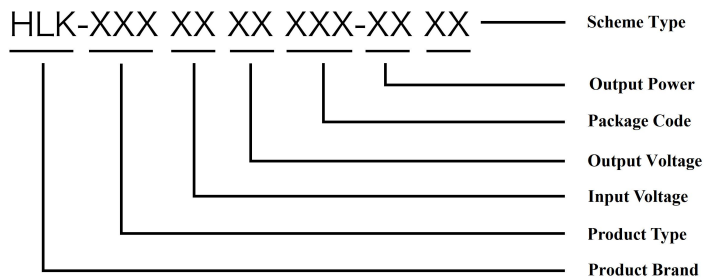
URA_S-3WR3/URB_S-3WR3 series products are 4:1 input, isolated regulated output 3W. This product is a SIP-8 pin package with high efficiency, meets the operating temperature of -40°C~+85°C, and has input under-voltage protection, output over-current and continuous short-circuit protection functions. It can be widely used in industrial control, electric power, instrumentation, communication and other fields.

3W, wide voltage input, isolated and regulated positive and negative dual/single output, DC/DC module power supply



Isolated Regulated Output/RoHS

Product coding rules



Product selection table

Certification	Product Model ^①	Input voltage range(Vdc)	Output voltage/current		Ripple and noise Full load (mVp-p) Typ./Max.	Efficiency @ full load %	Maximum capacitive load
		Nominal value ^② (range value)	Output voltage (Vdc)	Output current (mA)		(Min./Typ.)	uF
	URB1203S-3WR3	12.0 (4.5~18.0)	3.3	909	50/100	72/74	2200
	URB1205S-3WR3		5	600	50/100	76/78	2200
	URB1212S-3WR3		12	250	50/100	78/80	680
	URB1215S-3WR3		15	200	50/100	78/80	470
	URB1224S-3WR3		24	125	50/100	78/80	330
	URA1205S-3WR3		±5	±300	50/100	76/78	1000
	URA1212S-3WR3		±12	±125	50/100	78/80	470
	URA1215S-3WR3		±15	±100	50/100	78/80	220
	URA1224S-3WR3		±24	±62	50/100	78/80	100
	URB2403S-3WR3	24.0 (9.0~36.0)	3.3	909	50/100	73/75	2200
	URB2405S-3WR3		5	600	50/100	78/80	2200
	URB2412S-3WR3		12	250	50/100	79/81	680
	URB2415S-3WR3		15	200	50/100	79/81	470
	URB2424S-3WR3		24	125	50/100	79/81	330

URA2405S-3WR3		±5	±300	50/100	77/79	1000
URA2412S-3WR3		±12	±125	50/100	78/80	470
URA2415S-3WR3		±15	±100	50/100	79/81	220
URA2424S-3WR3		±24	±62	50/100	79/81	100
URB4803S-3WR3	48.0 (18.0~75.0)	3.3	909	50/100	72/74	2200
URB4805S-3WR3		5	600	50/100	76/78	2200
URB4812S-3WR3		12	250	50/100	78/80	680
URB4815S-3WR3		15	200	50/100	78/80	470
URB4824S-3WR3		24	125	50/100	78/80	330
URA4805S-3WR3		±5	±300	50/100	76/78	1000
URA4812S-3WR3		±12	±125	50/100	78/80	470
URA4815S-3WR3		±15	±100	50/100	78/80	220
URA4824S-3WR3		±24	±62	50/100	78/80	100

Note: 1. Due to 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.

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

Input characteristics

Project	Working conditions	Min.	Typ.	Max.	Unit
Input voltage range	12VDC Input Series	4.5	12	18	VDC
	24VDC Input Series	9	24	36	
	48VDC Input Series	18	48	75	
Input current(Full load/no load)	12VDC Input Series	--	320/15	328/30	mA
	24VDC Input Series	--	160/6	164/10	
	48VDC Input Series		80/4	82/6	
Reflected Ripple Current	12VDC Input Series		40	--	mA
	24VDC Input Series		55	--	
	48VDC Input Series		45	--	
Impulse voltage (Isec.max)	5VDC Input Series	-0.7	--	12	VDC
	12VDC Input Series	-0.7	--	25	
	24VDC Input Series	-0.7	--	50	
	24VDC Input Series	-0.7	--	100	
Starting voltage	5VDC Nominal Input Series,Nominal Input	-	-	4.5	
	12VDC Nominal Input Series,Nominal Input	-	-	9	
	24VDC Nominal Input Series,Nominal Input	-	-	18	
	48VDC Nominal Input Series,Nominal Input	-	-	36	
Input filter type		Capacitive filtering			
Hot plug		Not support			

Remote control foot (Ctrl)*	Module ON	Ctrl terminal floating or high resistance
	Module OFF	Connect to high level (relative to the input ground), so that the current flowing into the Ctrl terminal is 5-10mA

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

Output characteristics

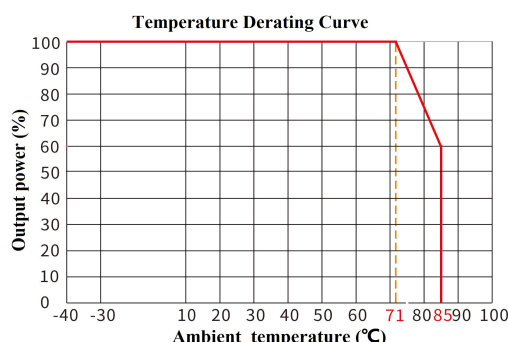
Project	Working and testing conditions		Min.	Typ.	Max.	Unit
Output voltage accuracy	5%~100% load, Input voltage range	3.3V/5V output	--	±3.0	±5.0	%
		other	--	±1.0	±3.0	%
No load output voltage accuracy	Input voltage range		--	±1.5	±5.0	%
Linear adjustment rate	Full load, Input voltage from low voltage to high voltage		--	±0.2	±0.5	%
Load Regulation	5%~100% load		--	±0.4	±1.0	%
Transient recovery time	25% load step change		--	0.5	2	mS
Transient Response Bias			--	±2.5	±5	%
Ripple & Noise	Pure resistive load, 20MHz bandwidth, peak-to-peak		--	50	100	mVp-p
Temperature Drift Coefficient	Full load		--	±0.02	±0.03	%/°C
Output short circuit protection			sustainable, self-healing			

Note: ①The test method of ripple and noise is twisted pair test method.

General characteristics

Project	Working conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-Output, the test time is 1 minute, the leakage current is less than 1mA	1500	--	--	VDC
Insulation resistance	Input-Output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation capacitor	Input-Output, 100KHz/0.1V	--	120	--	pF
Working temperature	Using the Reference Temperature Derating	-40	--	+85	°C
Storage temperature		-40	--	+125	
Shell temperature rise during operation		--	25	--	
Storage humidity	No condensation	5	--	95	%RH
Pin Soldering Temperature	The solder joint is 1.5mm away from the shell, 10s	--	--	+300	°C
On-off level	Full load, nominal voltage input	--	300	--	KHz
Shake		10-55Hz, 10G, 30Min.along X, Y and Z			
Shell material		Black flame retardant heat resistant plastic (UL94V-0)			
Mean time between failures	MIL-HDBK-217F@25°C	1000	--	--	KHrs

Product characteristic curve



Typical Application Reference Circuit (Recommended Parameters)

1. Typical application circuit

All DC/DC converters of this series are tested according to the recommended test circuit (Figure 2) before leaving the factory.

If it is required to further reduce the input and output ripple, the input and output external capacitors C_{in1} , C_s and C_{out} can be appropriately increased or a capacitor with a small series equivalent impedance value can be selected. C_s is used to reduce the ripple. If the ripple has met the requirements, then No need to add C_s anymore. However, an appropriate filter capacitor value should be selected. If the capacitor is too large, it may cause startup problems. For each output, under the condition of ensuring safe and reliable operation, the maximum capacitance of its filter capacitor must be less than the maximum capacitive load.

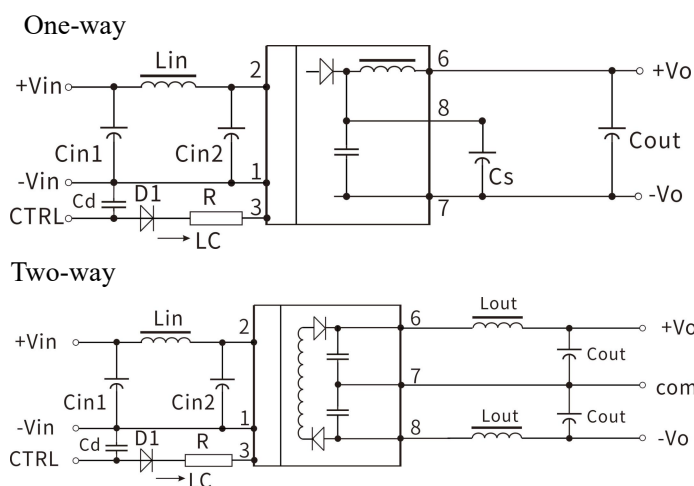


Figure 2

Input voltage	5VDC&12VDC	24VDC&48VDC
C_{in1}	100uF/25V	10uF/100V
C_{in2}	47uF/25V	1uF/100V
L_{in}	4.7uH-12uH	
C_s	10uF-22uF/50V	
C_{out}	100uF/50V(Typ)	
L_{out}	2.2uH-10uH	
C_d	47nF/100V	

2. EMC typical application circuit

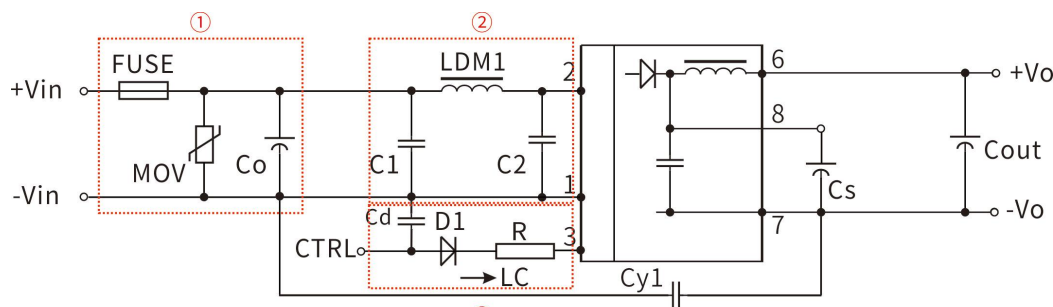


Figure 3

Device code	5V input product	12V input product	24V input product	48V input product
FMSE fuse	Slow blowing fuse, selected according to the actual input current of the customer			
MOV varistor	-	14D390K	14D560K	14D101K
LDM1 inductor	12uH	12uH	12uH	12uH
Co electrolytic capacitor	1000μF/16V	1000μF/25V	330μF/50V	330μF/100V
C1 ceramic capacitor	4.7μF/50V	4.7μF/50V	4.7μF/50V	4.7μF/100V
C2 ceramic capacitor	4.7μF/50V	4.7μF/50V	4.7μF/50V	4.7μF/100V
Cout ceramic capacitor	Refer to the Cout parameter in Figure 2			
CY1 safety capacitor	1nF/2KV			
D1 diode	RB160M-60V/1A			
R resistance	According to the formula: $R = ((V_c - V_d - 1.0) / I_c) - 300\Omega$			
Cd	47nF/100V			

Note:

- ① In Figure 3, Part ① is used for EMS testing; part ② is used for EMI filtering, which can be selected according to requirements;
- ② VC is the voltage of the Ctrl terminal relative to the input ground GND, VD is the forward voltage drop of D1, IC is the current flowing into the Ctrl terminal, generally 5-10mA, and the peripheral circuit of the Ctrl terminal is shown in Figure 3-③;
- ③ If there is no parameter description attached to the component in the figure, this component is not required in the periphery of this model.

3. Ctrl side

When floating or high resistance, the module outputs normally; when connected to a high level (relative to the input ground), the module is turned off; note that the current flowing into this pin is preferably 5-10mA, and the current exceeds its maximum value (usually 20mA) will cause permanent damage to the module. The R value can be calculated according to:

$$R = \frac{V_c - V_d - 1.0}{I_c} - 300$$

Calculated, the detailed parameters refer to the "EMC Typical Application Circuit" section.

4. Input current

When using an unstable power supply, please ensure that the output voltage fluctuation range and ripple voltage of the power supply do not exceed the specifications of the module itself. The output current of the input power supply must be sufficient to cope with the instantaneous start-up average current Iave of the DC/DC module (see Figure 5).

Generally : Vin=5V series, Iave=1335mA Vin=12V series, Iave=631mA
Vin=24V series, Iave=312mA Vin=48V series, Iave=159mA

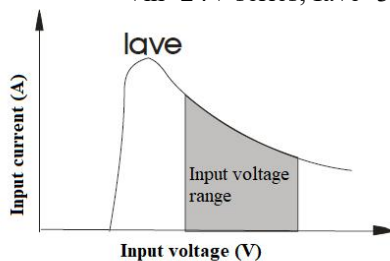


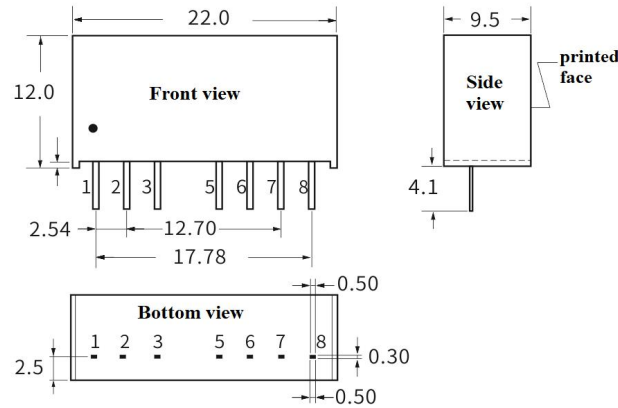
Figure 5

5. Output load requirements

When in use, the minimum output load of the module cannot be less than 5% of the rated load. In order to meet the performance indicators of this technical manual, please connect a 5% dummy load in parallel at the output end. The dummy load is generally a resistor. Please note that the resistor needs to be derated.

Product appearance size and pin definition, recommended printing layout

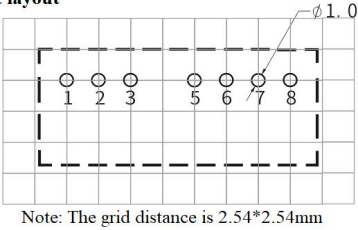
1. Physical dimension (unit: mm, tolerance: ± 0.25)



2. Pin definition

Pin method	1	2	3	4	5	6	7	8
One-way	-Vin	+Vin	CTRL	NP	NC	+Vout	-Vout	CS
Positive and negative dual	-Vin	+Vin	CTRL	NP	NC	+Vout	COM	-Vout

3. Recommended print layout



***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	
E	22.0x9.5x12.0mm	0.866x0.374x0.472inch

Test Application Reference

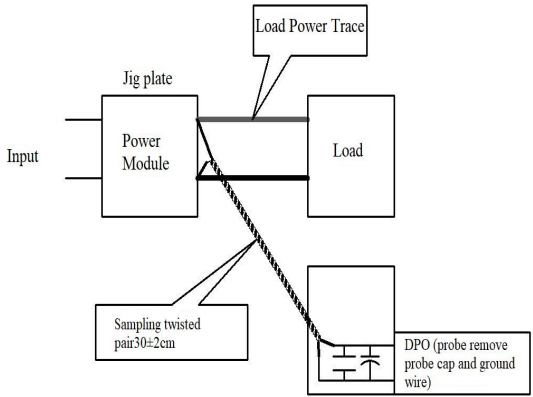
Ripple & noise test: (twisted pair method 20MHZ bandwidth)

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 a 0.1uF polypropylene capacitor and a 4.7uF high-frequency low-resistance electrolytic capacitor are connected in parallel on the probe end, and the oscilloscope sampling uses Sample sampling model.

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, and use a 30cm \pm 2cm sampling line to directly sample from the power output port for testing. The power line selects the wire with the insulation sheath of the corresponding wire diameter according to the magnitude of the output current.



Application Notes

1. It is recommended to use it at a load of more than 5%. If the load is lower than 5%, the ripple index of the product may exceed the specification, but it does not affect the reliability of the product;
2. It is recommended that the load unbalance of the dual output module: $\leq \pm 5\%$, if it exceeds $\pm 5\%$, the product performance cannot be guaranteed to meet all the performance indicators in this manual. For details, please contact our technical staff directly;
3. The maximum capacitive load is tested under the input voltage range and full load conditions;
4. Unless otherwise specified, all indicators in this manual are measured at $T_a=25^\circ\text{C}$, humidity $<75\%\text{RH}$, nominal input voltage and output rated load;
5. All index testing methods in this manual are based on the company's corporate standards;
6. Our company can provide product customization, and you can directly contact our technical staff for specific needs;
7. Product specifications are subject to change without notice.

Contact details

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