Typical performance

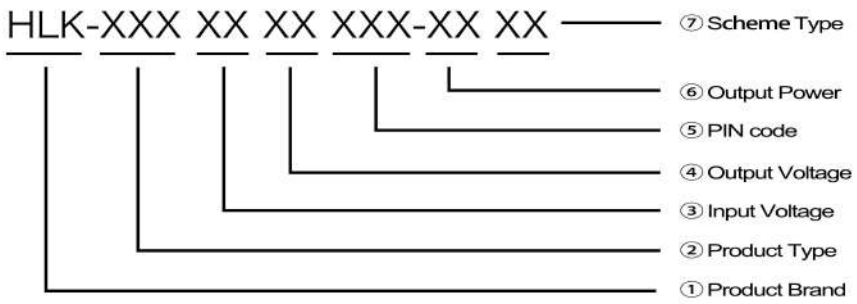
- Wide input voltage range(4:1),Output 30W
- Conversion efficiency91%(Typ)
- Isolation voltage 1500Vdc
- Ultra low power consumption:0.036W(Typ)
- Fast startup:1ms(Typ)
- Working temperature range：-40° C~+85℃
- Input undervoltage， output short circuit，overcurrent，overvolatge protection
- Metal case,low output ripple
- International standard pins,PCB board in-line

30W,Ultra-Wide Voltage Input, Isolated Regulated Single/Dual, DIP Package, DC-DC Power Module

RoHS

UR(A)B_LD-30WR3 series product output power is 30W， 4:1 wide voltage input range， efficiency up to 91%， conversional isolation volatge of 1500VDC， allowable operating temperature is -40℃to+85℃， with input under-voltage protection, output over-voltage, over-current,short-circuit protection function, bare metal meets CISPR32/EN55032CLASSA ， widely used in medical, industrial control, electri power, instrumentation,communication, railway and other fields.

Product Coding Rules



Product Mode List

Certification	Product Mode①	Input Voltage range (Vdc)		Output Voltage/Current		Ripple and Noise	Maximum capacitive	Efficiency @ full
		Nominal value② (range value)		Output Voltage (Vdc)	Output current (mA)(Max.	Full load (mVp-p) (Typ./Max.)	μF Max.n.)	%(Min./ Typ.)
	URB2403LD-30WR3	24 (9~36)	40	3.3	7000/0	30/50	10000	86/88
	URB2405LD-30WR3			5	6000/0	30/50	10000	88/90
	URB2412LD-30WR3			12	2500/0	50/80	1600	88/90
	URB2415LD-30WR3			15	2000/0	50/80	1000	89/91
	URB2424LD-30WR3			24	1250/0	50/80	500	89/91
	URA2405LD-30WR3			±5	±3000/0	30/50	2000	85/87
	URA2412LD-30WR3			±12	±1250/0	50/80	800	88/90
	URA2415LD-30WR3			±15	±1000/0	50/80	600	88/90

	URA2424LD-30WR3			±24	±625/0	50/80	300	87/89
	URB4803LD-30WR3	48 (18-75)	80	3.3	7000/0	30/50	2500	80/82
	URB4805LD-30WR3			5	6000/0	30/50	2200	88/90
	URB4812LD-30WR3			12	2500/0	50/80	680	87/89
	URB4815LD-30WR3			15	2000/0	50/80	470	88/90
	URB4824LD-30WR3			24	1250/0	50/80	470	88/90
	URA4805LD-30WR3			±5	±3000/0	30/50	2000	84/86
	URA4812LD-30WR3			±12	±1250/0	50/80	800	88/90
	URA4815LD-30WR3			±15	±1000/0	50/80	600	88/90
	URA4824LD-30WR3			±24	±625/0	50/80	300	87/89
	URB1D03LD-30WR3	110 (40-160)	180	3.3	7000/0	30/50	10000	85/87
	URB1D05LD-30WR3			5	6000/0	30/50	10000	86/88
	URB1D12LD-30WR3			12	2500/0	50/80	2200	88/90
	URB1D15LD-30WR3			15	2000/0	50/80	1000	89/91
	URB1D24LD-30WR3			24	1250/0	50/80	470	89/91
	URA1D05LD-30WR3			±5	±3000/0	30/50	4000	84/86
	URA1D12LD-30WR3			±12	±1250/0	50/80	1000	88/90
	URA1D15LD-30WR3			±15	±1000/0	50/80	470	89/91
	URA1D24LD-30WR3			±24	±625/0	50/80	220	89/91

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.
3. Input voltage exceeding the maximum value may cause permanent damange to the product

Test conditions: Without specified needs, all parameter tests are measured at nominal input voltage, purely resistive rated load and 25°C room temperature.

Input Characteristics

Items	Working Condtions		Min.	Typ.	Max.	Unit
Input current （fully loaded /unloaded）	24VDC nominal input series, nominal input voltage	3.3V	-	1106/5	1132/15	mA
		5V	-	1420/5	1453/15	
		12V	-	1388/1.5	1420/2	
		15V	-	1373/1.5	1404/2	
		24V	-	1373/1.5	1404/2	
		±5V	-	1436/5	1470/15	
		±12V	-	1388/1.5	1420/2	
		±15V	-	1373/1.5	1404/2	
		±24V	-	1373/1.5	1404/2	
	48VDC nominal input series, nominal input voltage	3.3V	-	553/0.8	566/1	
		5V	-	710/0.8	726/1	
		12V	-	694/0.8	710/1	

		15V	-	687/0.8	702/1	
		24V	-	687/0.8	702/1	
		±5V	-	710/0.8	726/1	
		±12V	-	694/0.8	710/1	
		±15V	-	687/0.8	702/1	
		±24V	-	687/0.8	702/1	
	110VDC nominal input series, nominal input voltage	3.3V	-	687/0.8	702/1	
		5V	-	310/1	317/2	
	110VDC nominal input series, nominal input voltage	12V	-	303/0.3	309/0.5	
		15V	-	299/0.3	309/0.5	
		24V	-	299/0.3	306/0.5	
		±5V	-	310/1	317/2	
		±12V	-	303/0.3	309/0.5	
		±15V	-	299/0.3	309/0.5	
		±24V	-	299/0.3	306/0.5	
Reflected ripple	Nominal input voltage		-	40	-	mA
Impulse voltage （Isec.max）	24VDC nominal input series		-0.7	-	50	VDC
	48VDC nominal input series		-0.7	-	100	
	110VDC nominal input series		-0.7	-	180	
Starting voltage	24VDC nominal input series		-	-	9	
	48VDC nominal input series		-	-	18	
	110VDC nominal input series		-	-	40	
Input undervoltage protection	24VDC nominal input series		5.5	6.5	-	
	48VDC nominal input series		12	15.5	-	
	110VDC nominal input series		30	34	-	
Start time	Nominal input voltage and constant resistance load		-	1	-	mS
Input filter type			PI version			
Hot plug			Not available			
Remote control （Ctrl）*	Module open		Ctrl floating or connected to TTL high level			
	Module close		Ctrl is connected to GND or low level			
	Input current at shutdown		-	0	1	mA

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

Output Characteristics

Project	Working 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,	-	±0.5%	±1%	-	±4.0%	±5.0%

	balanced load						
Ripple & Noise	Pure resistive load, 20MHz bandwidth, peak-to-peak	-	50mVp-p	80mVp-p	-	50mVp-p	80mVp-p
startup 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%Vo	-	160%Vo			
Output overcurrent protection	Full voltage range input	110%Io	150%Io	200%Io			
Output short circuit protection	Full voltage range input	sustainable, self-healing					

Notes:

①For product models with output voltages of ±5VDC and ±9VDC, under 0% - 5% load conditions, the maximum output voltage accuracy is ±5%;

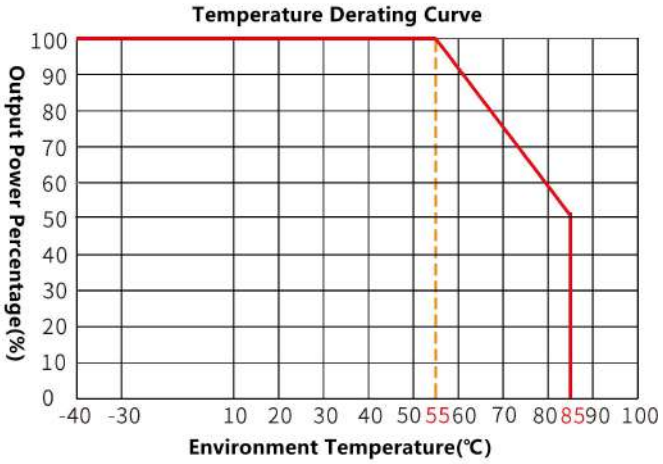
②When tested under 0%-00% load working conditions, the index of load regulation rate is ±5%;

③0%-5% load ripple & noise less than or equal to 5%Vo. Ripple and noise test method Twisted pair test method, which can add capacitive load at the output to reduce light load ripple.

General Characteristics

Items	Working conditions	Min.	Typ.	Max.	Units
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
Working temperature	Using the Reference Temperature Derating Curve	-40	--	+85	℃
Storage temperature		-40	--	+125	
Max operating case		--	--	+100	
Storage humidity	no condensation	5	--	95	%RH
Pin Soldering	Solder joint distance from shell 1.5mm,10 seconds	--	--	+300	℃
On-off level	PWM model	--	250	--	KHz
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
Shell material		Aluminum shell			
Minimum time between failures	MIL-HDBK-217F@25℃	--	$2X10^5$	--	Hrs

Temperature Characteristic curve

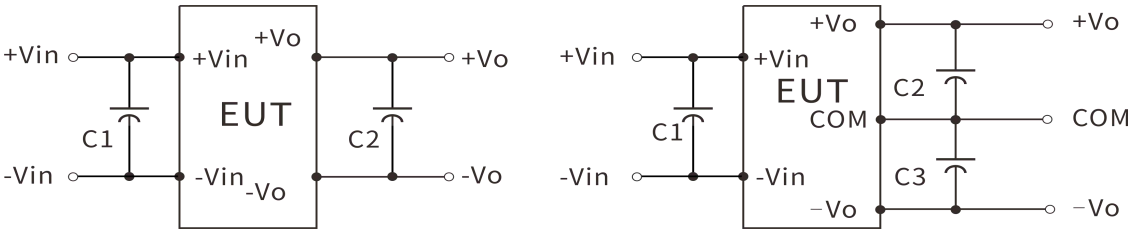


Reference Design

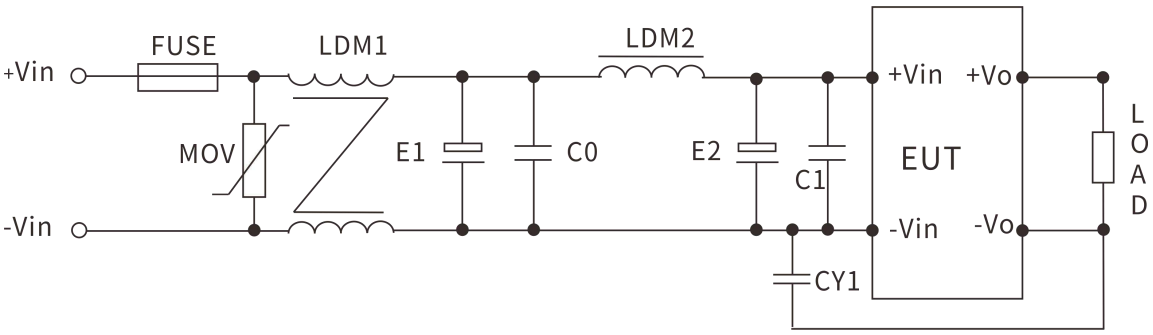
1、Recommended Test Circuit

General recommended capacitance: D1: 47-100 μ F; C2, C3: 10-22Mf; All DC/DC converters of this series are tested according to the recommended test circuit (Figure 1) before leaving the factory.

If you need to further reduce the input and output ripple, you can increase the input and output external capacitors D1, C2, C3 or choose a capacitor with a small series equivalent impedance, but the capacitance value cannot be greater than the maximum capacitive load of the product



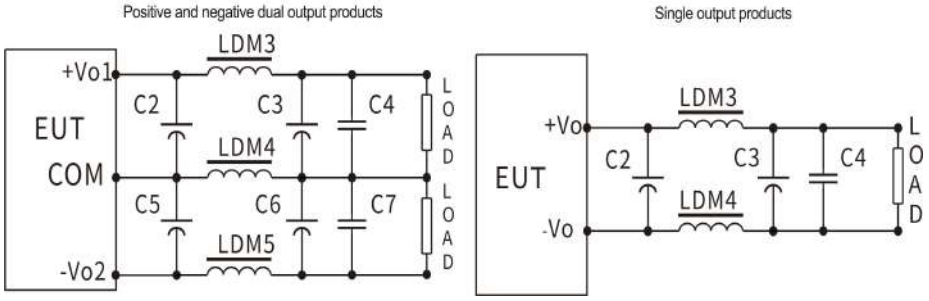
2、EMC Solutions - Recommended Circuits



Parameter recommendation:

Device code	24V input product	48V input product	110Vinput product
FMSE fuse	Access the corresponding fuse according to customer needs		
MOV Varistor	14D560K	14D101K	14D201K
LDM1 common mode inductance	10 mH	15 mH	30 mH
E1、E2 Electrolytic capacitor	100 μ F/50V	100 μ F/100V	63 μ F/200V
C0、C1 Ceramic capacitors	1 μ F/50V	1 μ F/100V	0.47 μ F/250V
LDM2 Differential Mode Inductance	10 μ H	15 μ H	68 μ H
CY1 safety Y2 capacitor	1nF/250Vac		

3、Output Filter Peripheral Recommended Circuit



When the requirements for ripple & noise are general, it is recommended to use only C2 and C5 for the periphery;
When the requirements for ripple & noise are strict; the circuit shown above is recommended.

Note: 1. C2, C3, C5, C6 use 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 be able to start normally.

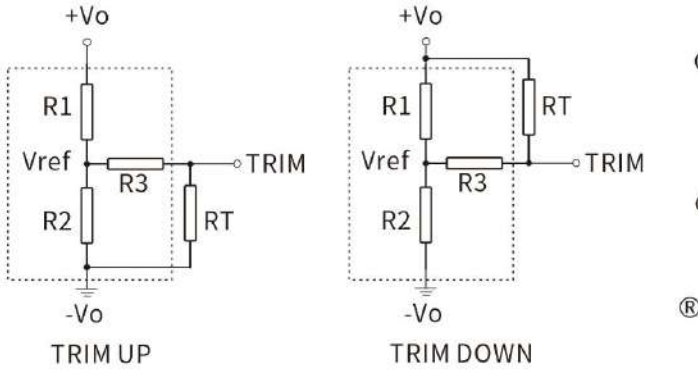
2. When the capacitive load is used, the minimum load of 3% must be guaranteed, otherwise the module output will be abnormal.

3. LDM5 is only used for dual output products.

Parameter recommendation:

Device code	3.3V	±5V or 5V	±/9V/12V	±15V or 15V	±24V or 24V
LDM3 inductance	0.47μH	1μH	2.2μH	2.2μH	4.7μH
LDM4 inductance	0.47μH	1μH	2.2μH	2.2μH	4.7μH
LDM5 inductance	-	1μH	2.2μH	2.2μH	4.7μH
C2/C3 Electrolytic	220μF	220μF	100μF	100μF	68μF
LDM3 inductance	220μF	220μF	100μF	100μF	68μF
C4/C7 ceramic	1μF/50V				

4、Use of Trim and Calculation of Trim Resistance



Trim's application circuit (dotted box is inside the product)

Calculation formula of Trim resistance:

UP: $RT=\frac{®*R2}{R2-®}-R3$ $®=\frac{Vref}{Vo-Vref}*R1$

down: $RT=\frac{®*R1}{R1-®}-R3$ $®=\frac{Vo-Vref}{Vref}*R2$

RT is Trim resistance

® is a custom parameter with no substantive meaning

Reference：

Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	30	18.261	84.5	1.25
5	45.3	14.778	84.5	1.25
9	30	11.441	84.5	2.5
12	56	14.571	84.5	2.5
15	56	11.218	84.5	2.5
24	84.5	9.791	84.5	2.5

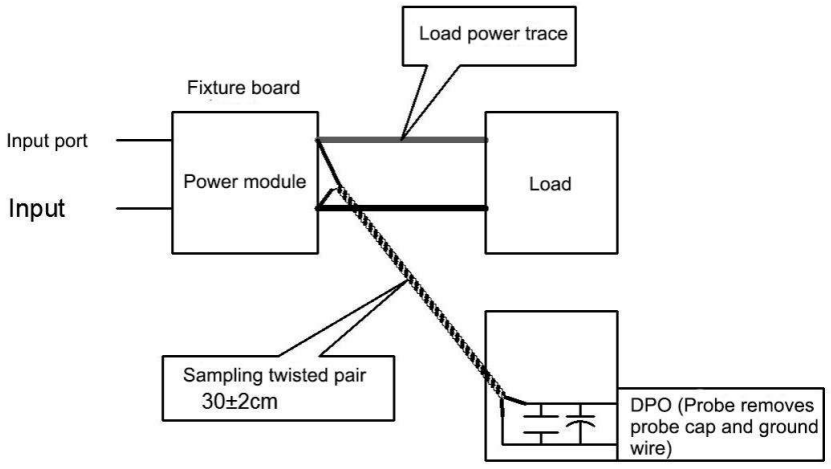
6、Ripple & noise test: (twisted pair method 20MHZ bandwidth)

Test way：

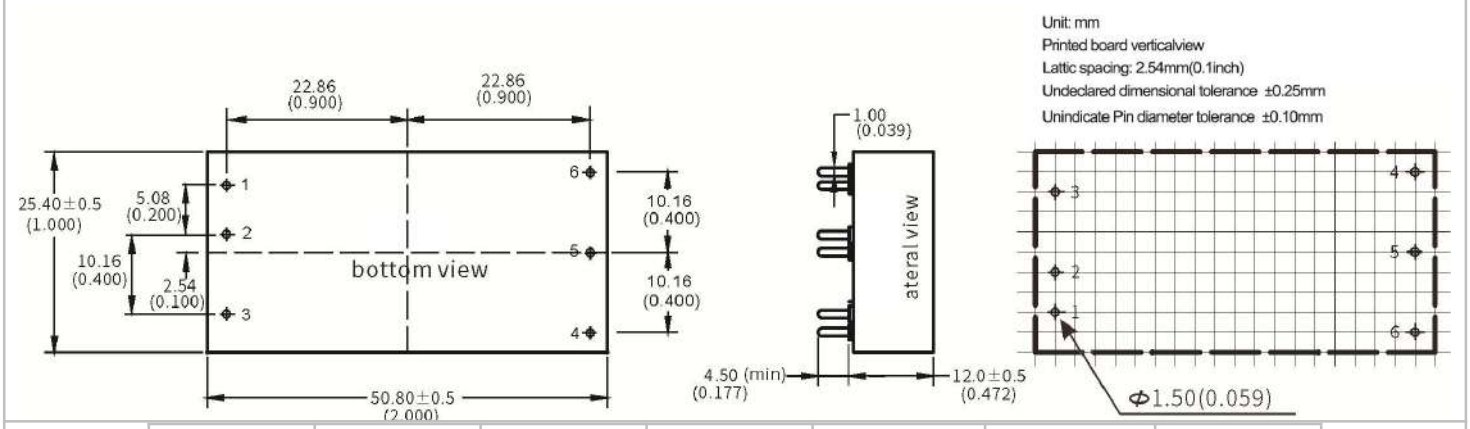
1. Ripple noise is connected by 12# twisted pair cable, the bandwidth of the oscilloscope is set to 20MHz, the bandwidth of the probe is 100M, and a 0.1uF polypropylene capacitor and a 47uF high-frequency low-resistance electrolytic capacitor are connected in parallel on the probe end, and the oscilloscope 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 the power output is connected to the electronic load through the fixture board. The test uses a 30cm±2 cm 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.



Package Size and Pin Function Diagram



Single(S)	1	2	3	4	5	6
	+Vin	-Vin	CTRL	Trim	-Vo	+Vo
	Input+	Input-	Remote control	Voltage regulator	Output-	Output+
Dual(D)	+Vin	-Vin	CTRL	-Vo2	COM	+Vo1
	Input-	Input-	**R**emote control	Output-2	Common ground	Output+1

*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	
B3S	50.8X25.4X11.8mm	2.000X1.000X0.464inch

Contact

Shenzhen Hi-Link Electronic Co.,Ltd

Add：Room 301, Building 1, 1970 Science & Technology Park, Minzhi Community, Minzhi Street, Longhua District, Shenzhen

Web： www.hlktech.com

Email：sales@hlktech.com

Tel：0755-23152658