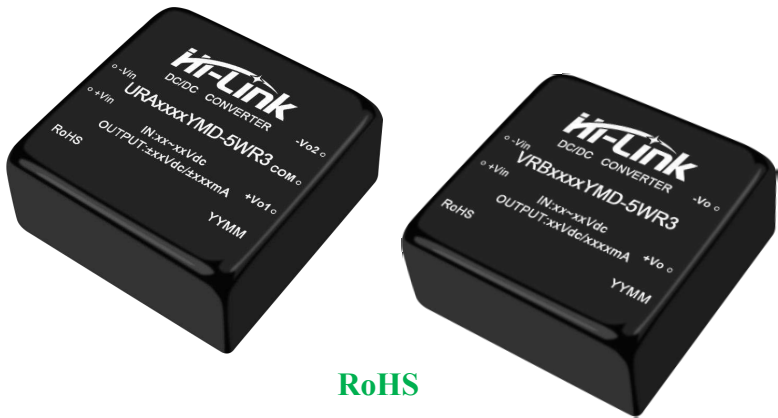


Typical Performance

- Wide voltage range input (2:1), output: 5W
- Conversion efficiency : 84% (Typ)
- Isolation voltage :1500Vdc
- Standby power consumption: 0.3W (typ.)
- Quick start: 100mS (typ.)
- Operating temperature range: -40~+85°C
- Output short circuit, over current, over voltage protection
- Metal shell, low output ripple
- International standard pins, PCB board in-line installation

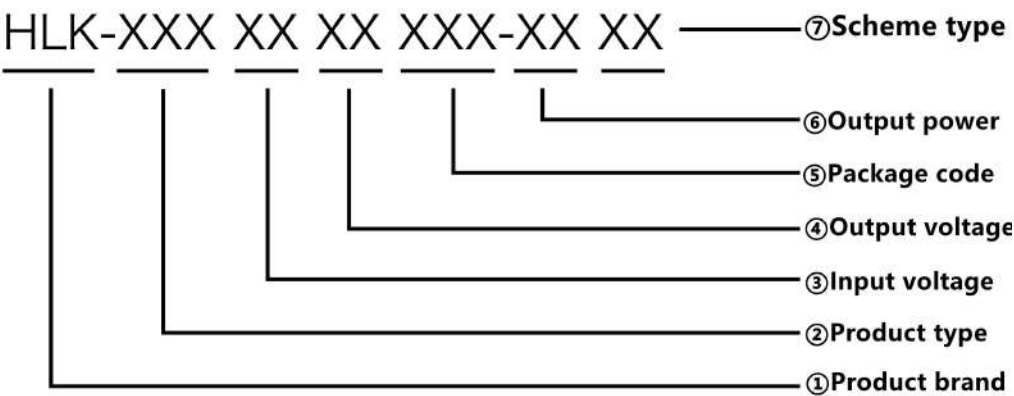
5W, wide voltage input, isolated regulated single/
dual output, DIP package,
DC-DC power supply module



RoHS

VR(A)B_YMD-5WR3 series product output power is 5W, 2:1 wide voltage input range, efficiency up to 84%, 1500VDC conventional isolation voltage, allowable operating temperature -40°Cto+85°C, with output overvoltage, overcurrent and short circuit protection. Can be widely used in medical, industrial control, electric power, instrumentation, communication, railway and other fields.

Product Coding Rules



Product Selection Table

	Model ^①	Input voltage range (Vdc)		Output voltage/current		Ripple and Noise	Maximum capacitive	Efficiency @ full load
		Nominal value ^② (range value)	Maximum value	Output voltage (Vdc)	Output current (mA) (Max.Min.)	Fully loaded (mVp-p) TPY/Max.	μF	(%) Min/TPY
	VRB1203YMD-5WR3	12 (9~18)	30	3.3	1200/0	30/50	2500	75/77
	VRB1205YMD-5WR3			5	1000/0	30/50	2200	76/78
	VRB1212YMD-5WR3			12	416/0	50/80	680	78/80
	VRB1215YMD-5WR3			15	333/0	50/80	470	79/81
	VRB1224YMD-5WR3			24	208/0	50/80	220	81/83
	VRA1205YMD-5WR3			±5	±500/0	30/50	1100	76/78
	VRA1212YMD-5WR3			±12	±208/0	50/80	330	78/80
	VRA1215YMD-5WR3			±15	±167/0	50/80	220	79/81
	VRA1224YMD-5WR3			±24	±104/0	50/80	100	81/83
	VRB2403YMD-5WR3	24 (18~36)	40	3.3	1200/0	30/50	2500	75/77
	VRB2405YMD-5WR3			5	1000/0	30/50	2200	76/78
	VRB2412YMD-5WR3			12	416/0	50/80	680	80/82
	VRB2415YMD-5WR3			15	333/0	50/80	470	80/82
	VRB2424YMD-5WR3			24	208/0	50/80	220	82/84
	VRA2405YMD-5WR3			±5	±500/0	30/50	1100	76/78
	VRA2412YMD-5WR3			±12	±208/0	50/80	330	80/82
	VRA2415YMD-5WR3			±15	±167/0	50/80	220	80/82
	VRA2424YMD-5WR3			±24	±104/0	50/80	100	82/84
	VRB4803YMD-5WR3	48 (36~72)	80	3.3	1200/0	30/50	2500	75/77
	VRB4805YMD-5WR3			5	1000/0	30/50	2200	76/78
	VRB4812YMD-5WR3			12	416/0	50/80	680	80/82
	VRB4815YMD-5WR3			15	333/0	50/80	470	80/82
	VRB4824YMD-5WR3			24	208/0	50/80	220	82/84
	VRA4805YMD-5WR3			±5	±500/0	30/50	1100	76/78
	VRA4812YMD-5WR3			±12	±208/0	50/80	330	80/82

VRA4815YMD-5WR3			±15	±167/0	50/80	220	80/82
VRA4824YMD-5WR3			±24	±104/0	50/80	100	82/84
VRB11003YMD-5WR3	110 (72-144)	180	3.3	1200/0	30/50	2500	75/77
VRB11005YMD-5WR3			5	1000/0	30/50	2200	76/78
VRB11012YMD-5WR3			12	416/0	50/80	680	80/82
VRB11015YMD-5WR3			15	333/0	50/80	470	80/82
VRB11024YMD-5WR3			24	208/0	50/80	220	82/84
VRA11005YMD-5WR3			±5	±500/0	30/50	1100	76/78
VRA11012YMD-5WR3			±12	±208/0	50/80	330	80/82
VRA11015YMD-5WR3			±15	±167/0	50/80	220	80/82
VRA11024YMD-5WR3			±24	±104/0	50/80	100	82/84

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. If the input voltage exceeds the maximum value, it may cause permanent damage to the product.

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	Working conditions		Min.	Typ.	Max.	Unit
Input current (full load/no load)	12VDC Nominal Input Series, Nominal Input Voltage	3.3V	-	428/25	440/30	mA
		Other	-	534/25	548/30	
	24VDC Nominal Input Series, Nominal Input Voltage	3.3V	-	214/13	220/15	
		Other	-	267/13	274/15	
	48VDC Nominal Input Series, Nominal Input Voltage	3.3V	-	107/7	110/8	
		Other	-	134/7	137/8	
	110VDC Nominal Input Series, Nominal Input Voltage	3.3V	-	47/3	48/4	
		Other	-	58/3	60/4	
Reflected Ripple Current	12VDC Nominal Input Series, Nominal Input Voltage		-	-	-	mA
	24VDC Nominal Input Series, Nominal Input Voltage		-	-	-	
	48VDC Nominal Input Series, Nominal Input Voltage		-	-	-	
	110VDC Nominal Input Series, Nominal Input Voltage		-	20	-	

Impulse voltage (Isec.max)	12VDC Nominal Input Series, Nominal Input Voltage	-0.7	-	30	VDC
	24VDC Nominal Input Series, Nominal Input Voltage	-0.7	-	50	
	48VDC Nominal Input Series, Nominal Input Voltage	-0.7	-	100	
	110VDC Nominal Input Series, Nominal Input Voltage	-0.7	-	200	
Starting voltage	12VDC Nominal Input Series, Nominal Input Voltage	-	-	9	
	24VDC Nominal Input Series, Nominal Input Voltage	-	-	18	
	48VDC Nominal Input Series, Nominal Input Voltage	-	-	36	
	110VDC Nominal Input Series, Nominal Input Voltage	-	-	72	
Input undervoltage protection	12VDC Nominal Input Series, Nominal Input Voltage	-	-	-	
	24VDC Nominal Input Series, Nominal Input Voltage	-	-	-	
	48VDC Nominal Input Series, Nominal Input Voltage	-	-	-	
	110VDC Nominal Input Series, Nominal Input Voltage	-	-	-	
Startup time	Nominal input voltage and constant resistance load	-	100	-	mS
Input filter type		PI type			
Hot plug		Not support			

Output Features

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, balanced load	-	±0.5%	±1%	-	±4.0%	±5.0%
Ripple & Noise	Pure resistive load, 20MHz bandwidth, peak-to-peak	-	50mVp-p	80mVp-p	-	50mVp-p	80mVp-p
Startup delay time		-	100ms	-	-	100ms	-
Output voltage regulation	Input voltage range	-	No adjustment end	-	-	No adjustment end	-

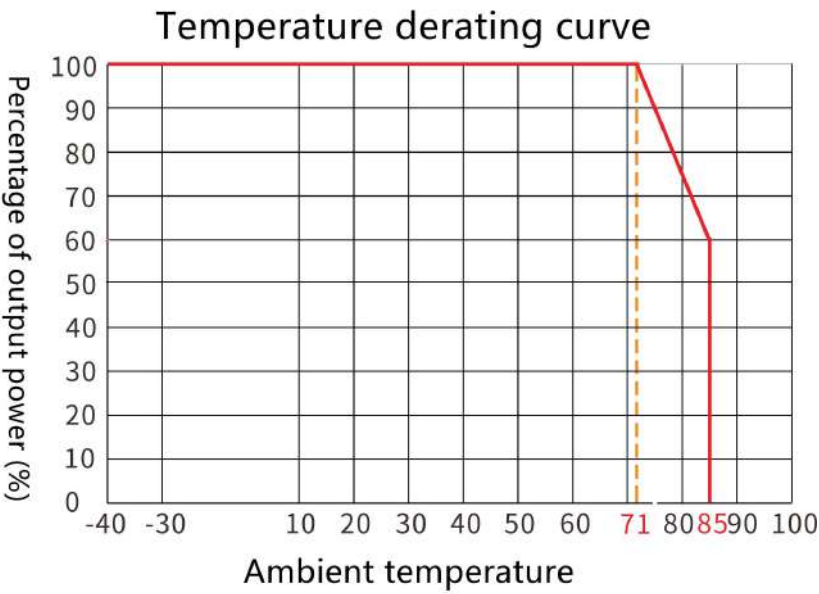
Dynamic response step deviation	25% nominal load step	-	±3.0%	±5.0%	-	±3.0%	±5.0%
Dynamic response recovery time		-	300μs	500μs	-	300μs	500μs
Output overvoltage protection	Full voltage range input	110%Vo	-	160%Vo			
Output overcurrent protection	Full voltage range input	110%Io	150%Io	200%Io			
Output short circuit protection	Full voltage range input	Sustainable, self-recovery					

Note: ① For product models with output voltage of ±5VDC and ±9VDC, under the condition of 0%-5% load, the maximum output voltage accuracy is ±5%;
 ② When tested under the working conditions of 0%-100% load, the index of the load adjustment rate is ±5%;
 ③ 0%-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.

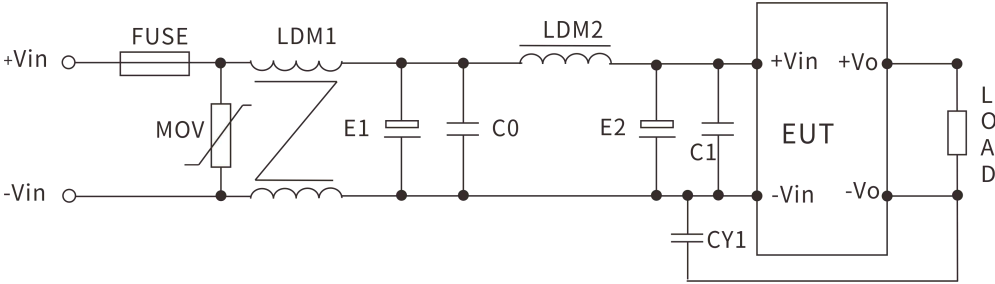
General Features

Project	Working conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-output, test time : 1 minute, leakage current is less than 1mA	1500	-	-	VDC
Insulation resistance	Input-output, insulation voltage	1000	-	-	MΩ
Isolation capacitor	Input-Output, 100KHz/0.1V	-	1000	-	pF
Working temperature	Reference temperature derating curve	-40	-	+85	°C
Storage temperature		-40	-	+125	
Working maximum case temperature		-	-	+100	
Storage humidity	No condensation	5	-	95	%RH
Pin soldering temperature	The solder joint is 1.5mm away from the shell, 10 seconds	-	-	+300	°C
On-off level	PWM mode	-	250	-	KHz
Vibration		10-55Hz,10G,30Min.alongX,YandZ			
Shell material		Aluminum shell			
Minimum time between failures	MIL-HDBK-217F@25°C	-	2X10 ⁵	-	Hrs

Temperature Characteristic Curve



EMC Peripheral Recommended Circuit

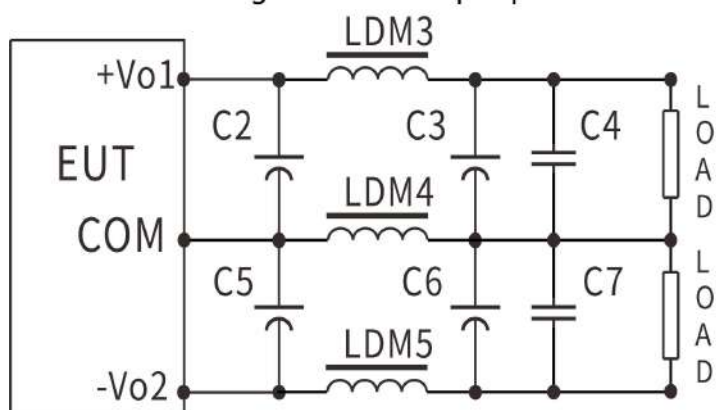


Parameter recommendation: The following are typical parameters, please adjust accordingly according to the actual use environment

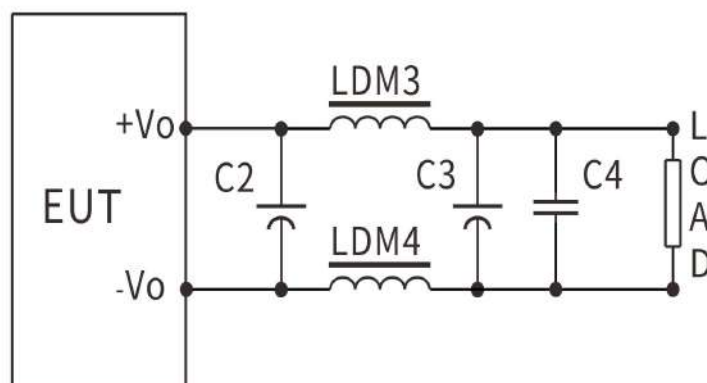
Device code	12V input product	24V input product	48V input product	110V input product
FMSE fuse	Access the corresponding fuse according to customer needs			
MOV varistor	14D330K	14D560K	14D101K	14D201K
LDM1 common mode inductance	10mH	10mH	15mH	30mH
E1、E2 electrolytic capacitor	100μF/50V	100μF/50V	100μF/100V	63μF/200V
C0、C1 ceramic capacitors	1μF/50V	1μF/50V	1μF/100V	0.47μF/250V
LDM2 differential mode inductance	10μH	10μH	15μH	68μH
CY1 safety Y2 capacitor	1nF/250Vac			

Output Filter Peripheral Recommended Circuit

Positive and negative dual output products



Single output product



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.

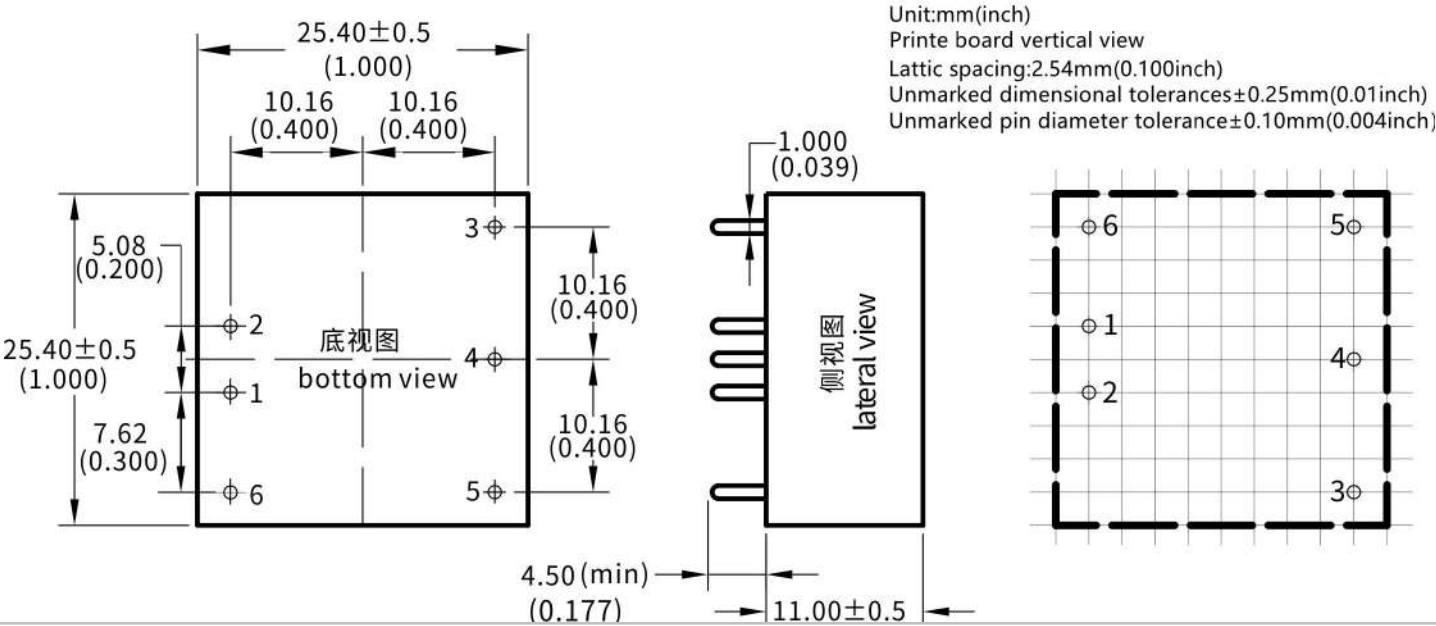
2. When the capacitive load is used, the minimum load of 3% must be guaranteed, otherwise the module output will be abnormal.

3. LDM5 is only used for dual output products.

Parameter recommendation:

Device code	3.3V Output	±5V or 5V output	±9V/12V or 9V/12V output	±15V or 15V output	±24V or 24V output
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 capacitor	220μF	220μF	100μF	100μF	68μF
C5、C6 electrolytic capacitor	220μF	220μF	100μF	100μF	68μF
C4、C7 electrolytic capacitor	1μF/50V				

Package Size and Pin Function Diagram



	1	2	3	4	5	6
Single (S)	-Vin	+Vin	+Vo	NP	GND	NC
	Input negative	Input positive	Output positive	No contact	Output ground	No contact
Double (D)	-Vin	+Vin	+Vo1	COM	-Vo2	NC
	Input negative	input positive	Output positive 1	Commons	Output negative 2	No contact

*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.

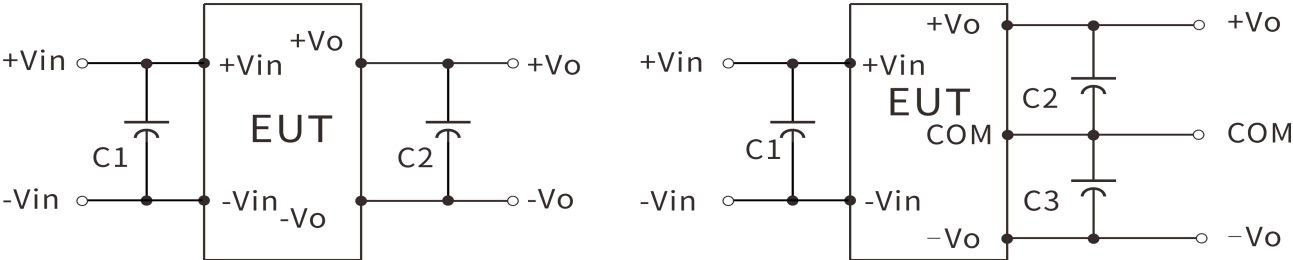
Package Description

Package code	L×W×H	
A3	25.4×25.4×11.0mm	1.000×1.000×0.433inch

Test Application Reference

Recommended test circuit 1. DC/DC test circuit:

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



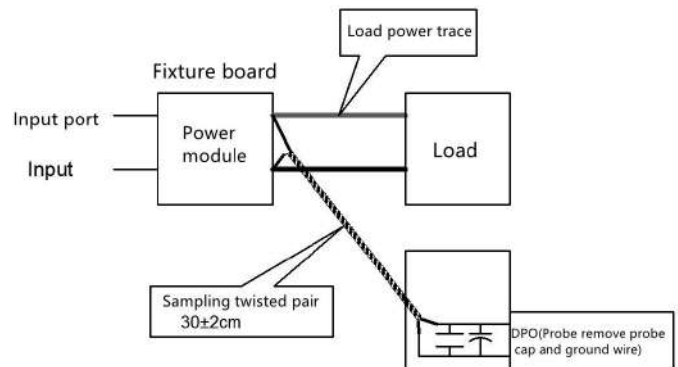
2、Ripple & noise test: (twisted pair method 20MHz bandwidth)

Testing method:

a) 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 .

b) 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±2cm sampling line to directly sample from the power output port for testing. According to the size of the output current, the power line selects the wire with the insulation sheath of the corresponding wire diameter.



Contact

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