Typical Characteristics

- Wide input range (4:1), Output: 30W
- Conversion efficiency: 91%(Typ.)
- Isolation voltage: 1500Vdc
- Ultra-low standby power consumption: 0.036W(Typ.)
- Ultra-fast startup: 1ms (Typ.)
- Working temperature：-40°C~+85°C
- Protection: input undervoltage, output short-circuit. overcurrent，overvoltage
- Metal housing, low output ripple
- Industrial standard pin-out, through-hole mounting on PCBs

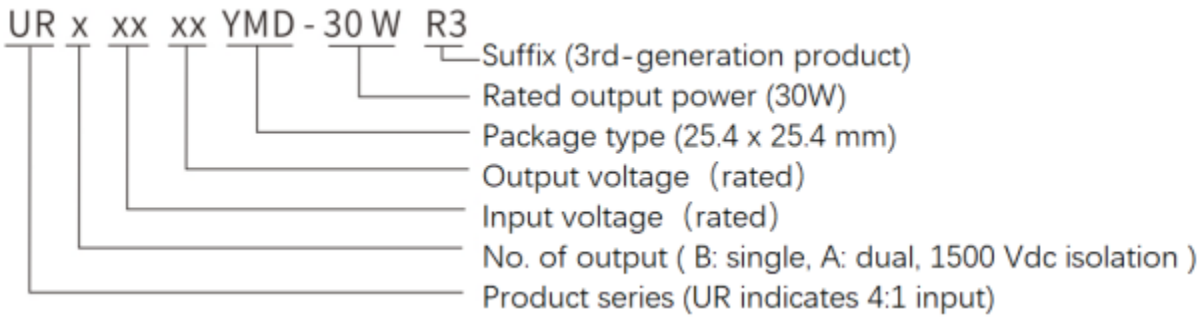
30W，ultra-wide voltage input, isolated regulated single output, YMD package, DC/DC power module



RoHS

URB_YMD-30WR3 series features an output power of 30W, a 4:1 wide input voltage range, and efficiency as high as 91%. a standard isolation voltage of 1500 VDC, an operating temperature range of -40°C to +85°C, and features input undervoltage protection as well as output overvoltage, overcurrent, and short-circuit protection. The bare unit complies with CISPR 32/EN 55032 Class A and is widely used in medical, industrial control, power, instrumentation, communications, and railway applications.

Model Number Description



Product selection table

Certification	Model number	Input voltage range（Vdc）		Output Voltage/Current		Ripple and Noise	Max. capacitive load ②	Efficiency@ Full load
		Rated ② (range)	Max.	Output V (Vdc)	Output I (mA) (Max.Min.)	Full load (mVp-p) (Typ./Max.)	μF Max.	% Min./Typ.
	URB4805YMD-30WR3	48 (18-75)	80	5	6000/0	30/50	7200	86/88
	URB4809YMD-30WR3			9	3333/0	50/80	10000	88/90
	URB4812YMD-30WR3			12	2500/0	50/80	2000	86/88
	URB4815YMD-30WR3			15	2000/0	50/80	1500	86/88
	URB4824YMD-30WR3			24	1250/0	50/80	470	86/88

Note: 1. Due to space limitations, the above is only a list of representative products. For products not included in this list, please contact our Sales Department.

2. The maximum capacitive load indicates the maximum capacitive load that can be connected to +Vo or -Vo; if this value is exceeded, the product will not start properly.

3. Exceeding the maximum input voltage may cause permanent damage to the product.

Test Conditions: Unless otherwise specified, all parameter measurements were taken at the rated input voltage, with a purely resistive rated load, and at an ambient temperature of 25°C.

Input characteristics

Items	Working conditions		Min.	Typ.	Max.	Unit
Input Current (Full Load/No Load)	48VDC rated input series, rated input voltage	5V	-	710/8	735/15	mA
		9V	-	694/0.8	710/1	
		12V	-	694/0.8	710/1	
		15V	-	687/0.8	702/1	
		24V	-	687/0.8	702/1	
Reflected ripple current	Rated input voltage		-	40	-	mA
Impulse voltage （1sec.max）	48VDC rated input series		-0.7	-	100	VDC
Startup voltage	48VDC rated input series		-	-	18	
Input undervoltage protection	48VDC rated input series		12	15.5	-	
Startup time	Rated input voltage and constant-resistance load		-	1	-	mS
Input filter type			PI type			
Hot swap			Not supported			
Remote control （Ctrl）*	Module on		Ctrl floating or connected to a TTL high level（3.5-12VDC）			
	Module off		Connect Ctrl to GND or a low level （0-1.2VDC）			
	Input current while turn-off		-	2	7	mA

Note: *The voltage on the Ctrl pin is relative to the input pin GND.

Output characteristics

Items	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%
Line Regulation	Input voltage range	-	±0.2%	±0.5%	-	±1.5%	±2%
Load Regulation	20% to 100% rated load, balanced load	-	±0.5%	±1%	-	±4.0%	±5.0%

Ripple & Noise	Pure resistive load, 20 MHz bandwidth, peak-to-peak value	-	50 mVp-p	80 mVp-p	-	50 mVp-p	80 mVp-p
Startup delay		-	1ms	-	-	1ms	-
Output voltage adjustment	Input voltage range	-	-	±10%	-	Non-adjustable	-
Dynamic response to a step disturbance	25% of the rated 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-recovering					

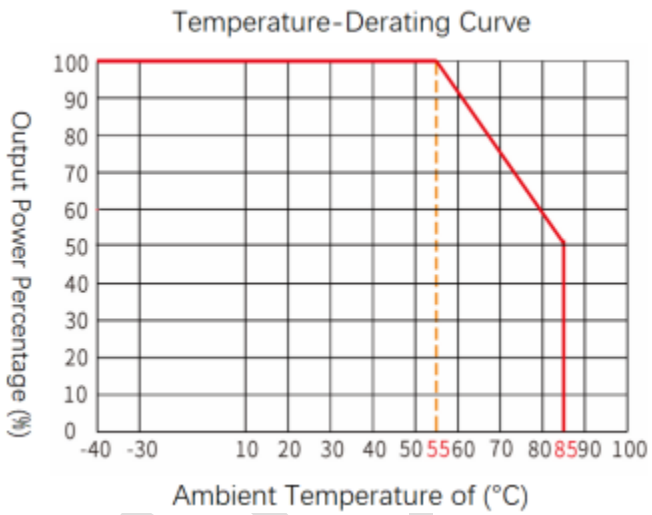
Note: ① For product models with output voltages of ±5 VDC and ±9 VDC, the maximum output voltage accuracy under 0%–5% load conditions is ±5%;
② When tested under 0%–5% load conditions, the load regulation is ±5%;
③ The load ripple and noise at 0%–5% load is less than or equal to 5% of Vo. The test method for ripple and noise is the twisted-pair test; a capacitive load can be applied to the output to reduce light-load ripple.

General characteristics

Items	Working conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-output, test duration: 1 minute, leakage current less than 1 mA.	1500	--	--	VDC
Insulation resistance	Input-output, insulation voltage 500 VDC.	1000	--	--	MΩ
Isolation capacitor	Input-Output, 100 kHz/0.1 V	--	1000	--	pF
Working temperature	Use the reference temperature derating curve	-40	--	+85	℃
Storage temperature		-40	--	+125	

Maximum operating case temperature		--	--	+100	
Storage humidity	No condensation	5	--	95	%RH
Pin soldering temperature resistance	The solder joint is 1.5 mm from the housing; 10 seconds	--	--	+300	°C
Switching frequency	PWM mode	--	250	--	KHz
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
Housing material		Aluminum alloy housing			
Minimum mean time between failures	MIL-HDBK-217F@25°C	--	$2X10^5$	--	Hrs

Temperature Characteristic Curve



Reference for Design

1、 Recommended Test Circuit

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

All DC/DC converters in this series are tested using the test circuit shown in Figure 1 before leaving the factory.

If further reduction of input and output ripple is required, the external input and output capacitors C1, C2, and C3 can be increased in value or capacitors with low equivalent series impedance can be selected; however, the capacitance must not exceed the product’ s maximum capacitive load.

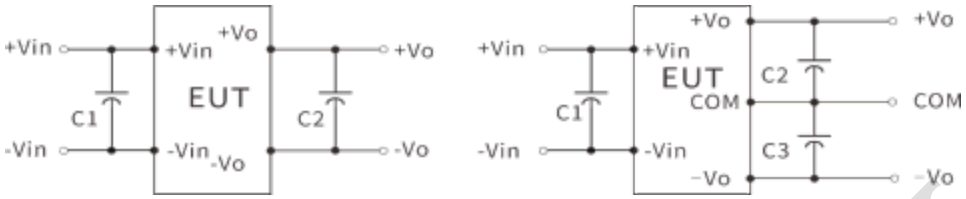
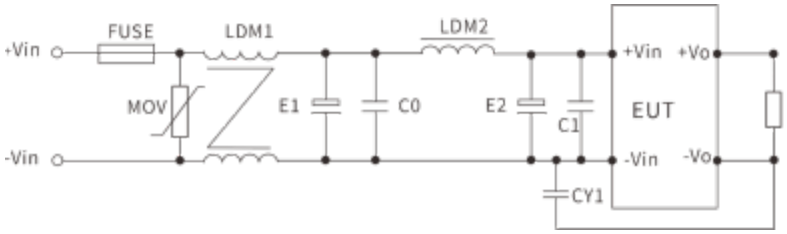


Figure 1

GDHUIZHI

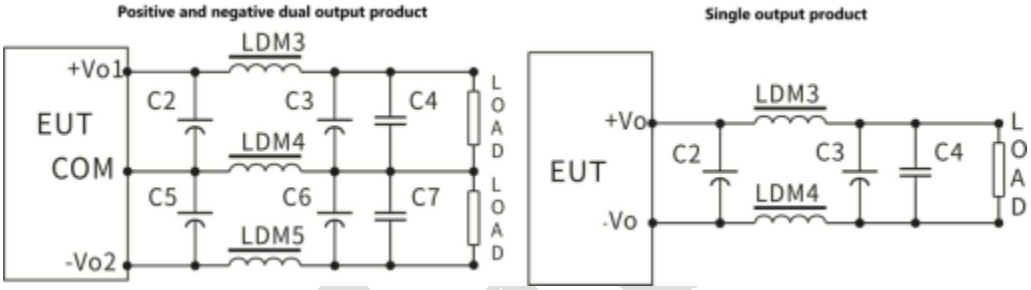
2、EMC Solutions—Recommended Circuits



Recommended parameters:

Component code	48V Input	
FMSE fuse	Connect the appropriate fuse according to the customer's requirements.	
MOV varistor	14D101K	
LDM1 common-mode inductor	15 mH	
E1、E2 electrolytic capacitor	100μF/100V	
C0、D1 ceramic capacitor	1μF/100V	
LDM2 common-mode inductor	15 μH	
CY1 safety Y2 capacitors	1nF/250Vac	

3、Recommended Peripheral Circuit for Output Filtering



For general ripple and noise requirements, it is recommended to use only C2 and C5 as external components; for strict ripple and noise requirements, it is recommended to use the circuit shown in the figure above.

Note: 1. Use high-frequency, low-impedance electrolytic capacitors for C2, C3, C5, and C6, and ensure the total capacitance does not exceed the maximum capacitive load specified in the manual; otherwise, the module will fail to start normally.

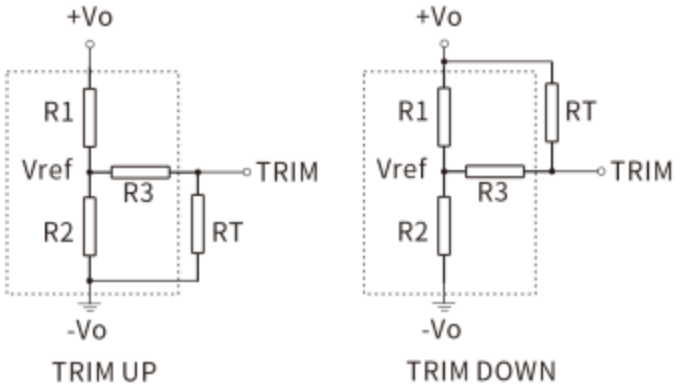
2. When applying a capacitive load, ensure a minimum load of 3%; otherwise, it will cause abnormal module output.

3. The LDM5 is intended for use only in dual-output products.

Recommended parameters:

Component code	5V output	9V/12V output	15V output	24V output	
LDM3 inductor	1μH	2.2 μH	2.2 μH	4.7 μH	
LDM4 inductor	1μH	2.2 μH	2.2 μH	4.7 μH	
LDM5 inductor	1μH	2.2 μH	2.2 μH	4.7 μH	
C2、C3 electrolytic capacitor	220μF	100μF	100μF	68μF	
C5、C6 electrolytic capacitor	220μF	100μF	100μF	68μF	
C4、C7 ceramic capacitor	1μF/50V				

4、The use of Trim and the calculation of Trim resistors



Trim's application circuit (the dotted box indicates the interior of the product)

Trim Formula for Calculating Resistance:

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

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

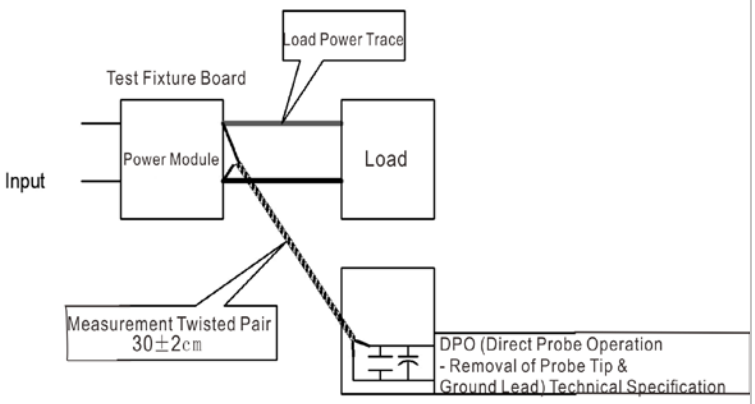
RT stands for TRIM resistor

® is a custom parameter with no practical significance.

Reference Descriptions:

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	120	2.5
12	56	14.571	84.5	2.5
15	56	11.218	154	2.5
24	84.5	9.791	84.5	2.5

6. Ripple & Noise Testing: (Twisted-pair Method, 20 MHz Bandwidth)

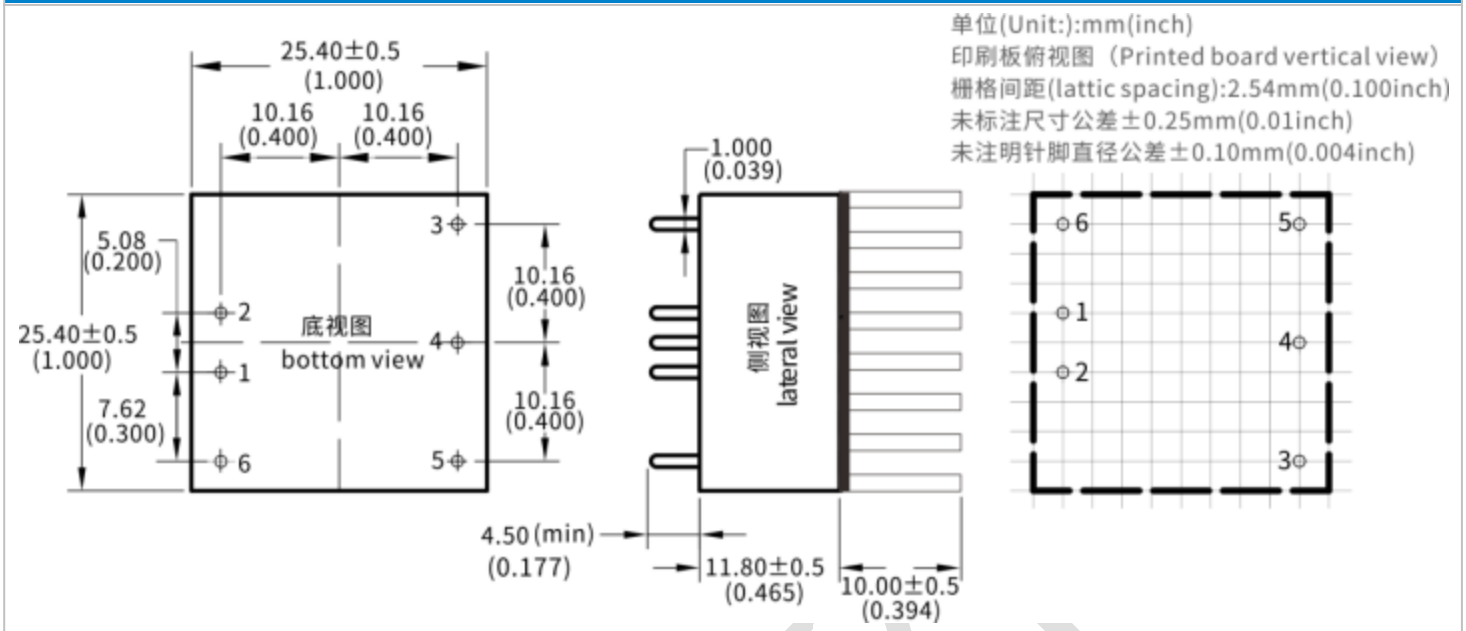


Test Method:

1. For ripple and noise testing, use a Category 12 twisted-pair cable. Set the oscilloscope bandwidth to 20 MHz and use a 100 MHz bandwidth probe. Connect a 0.1μF polypropylene capacitor and a 47μF high-frequency, low-impedance electrolytic capacitor in parallel at the probe tip. Set the oscilloscope to "Sample" mode.

2. Schematic diagram for output ripple and noise testing:
Connect the power supply input to the power source. Connect the power supply output to the electronic load via the fixture board. For testing, use a 30 cm ± 2 cm sampling lead to take a direct sample from the power supply output port. Select insulated wires with appropriate gauge based on the magnitude of the output current.

Package Dimensions and Pin Function Diagram



When operating at 30W, a 10mm-thick heat sink must be installed for cooling.

Single (S)	1	2	3	4	5	6
	-Vin	+Vin	+Vo	Trim	-Vo	CTRL
	输入负极	输入正极	输出正	电压调压端	输出地	遥控端

*Note: If the pin definitions of the power module differ from those in the selection guide, refer to the labels on the actual product.

Package Description

Package code	L x W x H	
YMD	25.4 X25.4X11.8mm	1.000X 1.000 X0.465 inch

Contact

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