Typical Characteristics

- Wide input range (4:1), Output: 6W
- Conversion efficiency: 88%(Typ.)
- Isolation voltage: 1500Vdc
- Ultra-low standby power consumption: 0.036W(Typ.)
- Ultra-fast startup: 1ms (Typ.)
- Working temperature: -40℃~+85℃
- Protection: input undervoltage, output short-circuit, overcurrent, overvoltage.
- Metal housing, low output ripple
- Industrial standard pin out, through-hole mounting on PCBs

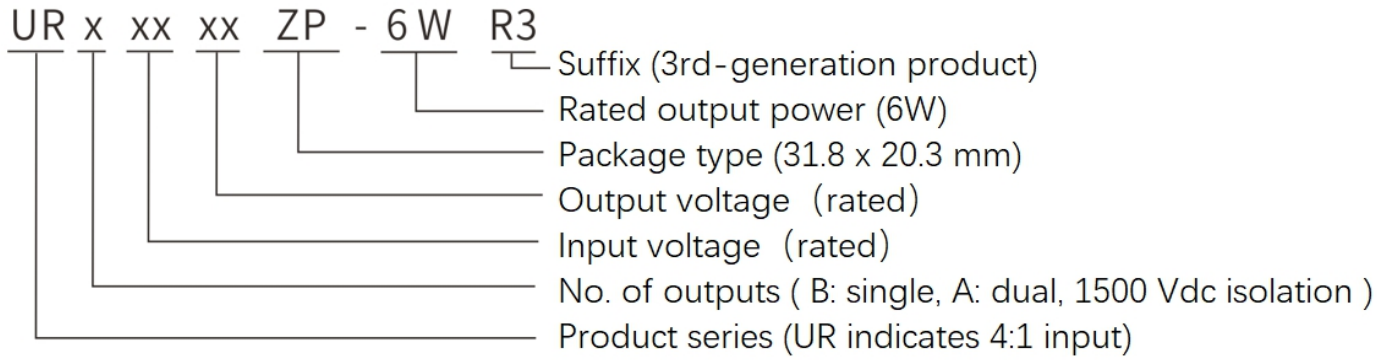
6W, ultra-wide voltage input, isolated regulated dual/ single channel, DIP package, DC/DC power module



RoHS

URB_ZP-6WR3 and URA_ZP-6WR3 series products deliver 6W of output power, feature a 4:1 wide input voltage range, and achieve up to 91% efficiency. a standard isolation voltage of 1500 VDC, an operating temperature range of -40° C to +85° C, and features input under-voltage protection as well as output over-voltage, over-current, and short-circuit protection. The bare board 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 load②	Efficiency@ Full load
		Rated② (range)	Max	Output V (Vdc)	Output I (mA) (Max. Min.)	Full load (mVp-p) (Typ. /Max.)	μF Max.	% Min. /Typ.
	URB2403ZP-6WR3	24 (9-36)	40	3.3	1500/0	30/50	1800	75/77
	URB2405ZP-6WR3			5	1200/0	30/50	1000	80/82
	URB2412ZP-6WR3			12	500/0	50/80	470	83/85
	URB2415ZP-6WR3			15	400/0	50/80	220	84/86

	URB2424ZP-6WR3			24	250/0	50/80	100	84/86
	URA2405ZP-6WR3			±5	±600/0	30/50	1100	80/82
	URA2412ZP-6WR3			±12	±250/0	50/80	330	83/85
	URA2415ZP-6WR3			±15	±200/0	50/80	220	86/88
	URA2424ZP-6WR3			±24	±125/0	50/80	100	84/86
	URB4803ZP-6WR3	48 (18-75)	80	3.3	1500/0	30/50	1800	78/80
	URB4805ZP-6WR3			5	1200/0	30/50	1000	82/84
	URB4812ZP-6WR3			12	500/0	50/80	470	85/87
	URB4815ZP-6WR3			15	400/0	50/80	220	86/88
	URB4803ZP-6WR3			24	250/0	50/80	100	85/87
	URA4805ZP-6WR3			±5	±600/0	30/50	680	81/83
	URA4812ZP-6WR3			±12	±250/0	50/80	330	85/87
	URA4815ZP-6WR3			±15	±200/0	50/80	1800	86/88
	URA4824ZP-6WR3			±24	±125/0	50/80	100	89/91
	URB1D03ZP-6WR3	110 (40-160)	180	3.3	1400/0	30/50	2500	80/82
	URB1D05ZP-6WR3			5	1200/0	30/50	2200	83/85
	URB1D12ZP-6WR3			12	500/0	50/80	680	87/89
	URB1D15ZP-6WR3			15	400/0	50/80	470	88/90
	URB1D24ZP-6WR3			24	250/0	50/80	220	89/91
	URA1D05ZP-6WR3			±5	±600/0	30/50	1100	83/85
	URA1D12ZP-6WR3			±12	±250/0	50/80	330	86/88
	URA1D15ZP-6WR3			±15	±200/0	50/80	220	88/90
	URA1D24ZP-6WR3			±24	±125/0	50/80	100	89/91

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℃.

Input characteristics

Items	Working conditions		Min.	Typ.	Max.	Unit
Input Current (Full Load/No Load)	24VDC rated input series, rated input voltage	3.3V	-	302/5	333/12	mA
		Other	-	294/1	301/2	
	48VDC rated input series, rated input voltage	3.3V	-	156/4	160/8	
		Other	-	147/0.5	151/1	
	110VDC rated input series, rated input voltage	3.3V	-	51/0.3	53/0.5	
		Other	-	64/0.3	66/0.5	
Reflected ripple current	24VDC rated input series, rated input voltage		-	40	-	mA
	48VDC rated input series, rated input voltage		-	30	-	
	110VDC rated input series, rated input voltage		-	20	-	

Impulse voltage (1 sec. max)	24VDC rated input series, rated input voltage	-0.7	-	50	VDC
	48VDC rated input series, rated input voltage	-0.7	-	100	
	110VDC rated input series, rated input voltage	-0.7	-	200	
Startup voltage	24VDC rated input series, rated input voltage	-	-	9	
	48VDC rated input series, rated input voltage	-	-	18	
	110VDC rated input series, rated input voltage	-	-	40	
Input undervoltage protection	24VDC rated input series, rated input voltage	5.5	6.5	-	
	48VDC rated input series, rated input voltage	12	15.5	-	
	110VDC rated input series, rated input voltage	32	36	-	
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	-	0	1	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	-	50mVp-p	80mVp-p	-	50mVp-p	80mVp-p
Startup delay		-	1ms	-	-	1ms	-
Output voltage adjustment	Input voltage range	-	Non-adjustable	-	-	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

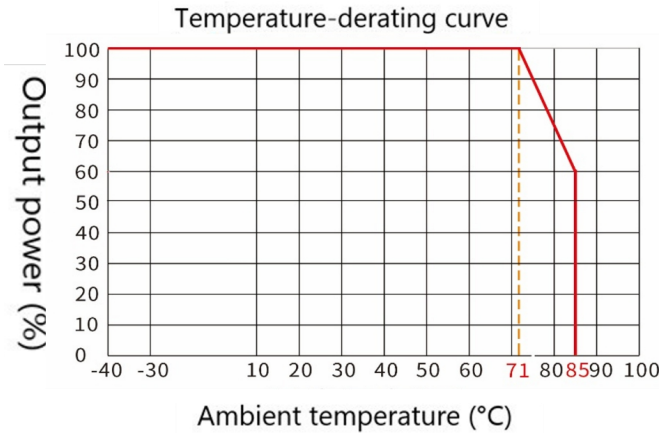
Output overvoltage protection	Full voltage range input	110% Vo	-	160%Vo			
Output overcurrent protection	Full voltage range input	110% Io	150% Io	200% Io			
Output short-circuit protection	Full voltage range input	Sustainable, self-recovering					

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%-100% load conditions, the load regulation is ±5%;
③ 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.

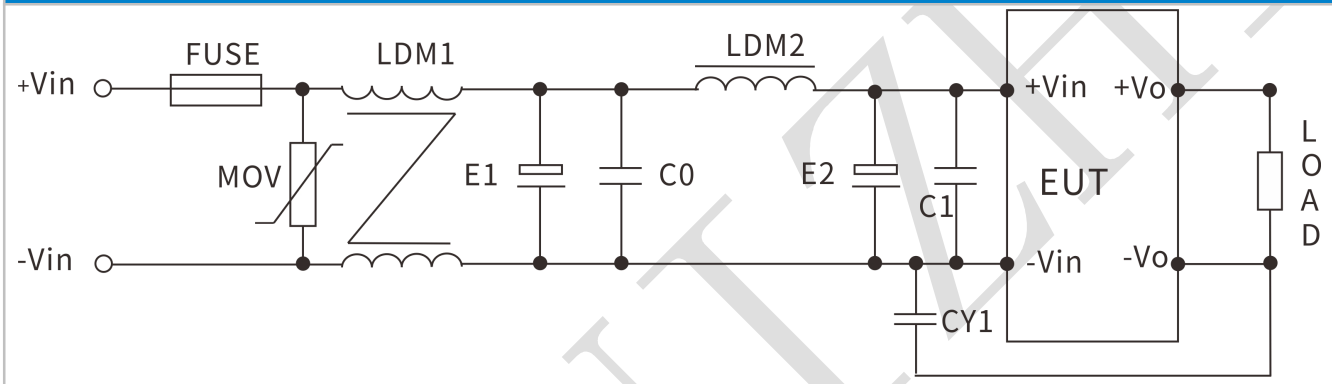
General characteristics

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	℃
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℃	--	$2X10^5$	--	Hrs

Temperature Characteristic Curve



EMC Peripheral Recommended Circuit

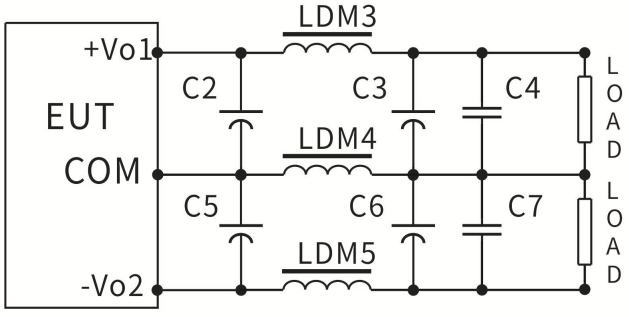


Recommended parameters: The following are typical parameters; please adjust them accordingly based on your specific operating environment.

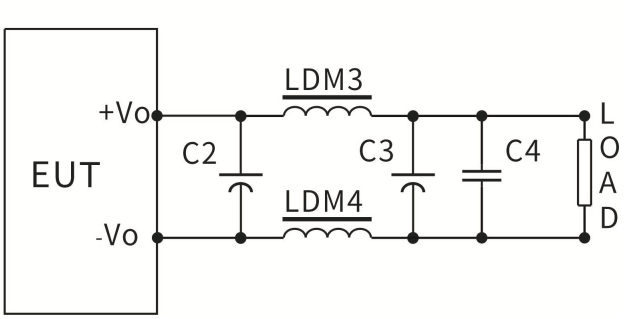
Component code	24V Input	48V Input	110V Input
FMSE fuse	Connect the appropriate fuse according to the customer's requirements.		
MOV varistor	14D560K	14D101K	14D201K
LDM1 common-mode inductor	10 mH	15 mH	30 mH
E1、E2 electrolytic capacitor	100μF/50V	100μF/100V	63μF/200V
C0、D1 ceramic capacitor	1μF/50V	1μF/100V	0.47μF/250V
LDM2 common-mode inductor	10 μH	15 μH	68 μH
CY1 safety Y2 capacitors	1nF/250Vac		

Recommended Peripheral Circuit for Output Filtering

Positive and negative dual output product



Single output product



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.

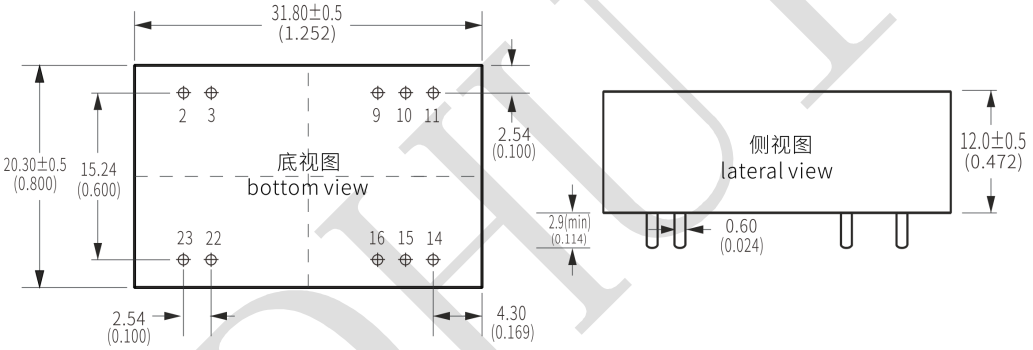
2. When applying a capacitive load, ensure a minimum load of 3%; otherwise, it will cause abnormal module output.

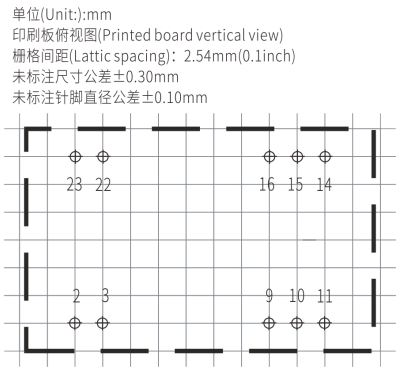
3. The LDM5 is intended for use only in dual-output products.

Recommended parameters:

Component code	3.3V Output	±5V or 5V Output	±/9V/12V or 9V/12V Output	±15V or 15V Output	±24V or 24V Output
LDM3 inductor	0.47μH	1μH	2.2 μH	2.2 μH	4.7 μH
LDM4 inductor	0.47μH	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	220μF	100μF	100μF	68μF
C5、C6 electrolytic capacitor	220μF	220μF	100μF	100μF	68μF
C4、C7 ceramic capacitor	1μF/50V				

Package Dimensions and Pin Function Diagram





	2	3	9	10	11	14	15	16	22	23
Single (URB)	-Vin	-Vin	NP	NP	NC	+Vo	NP	-Vo	+Vin	+Vin
	-input	-input	No pin	No pin	No Conn.	+ output	No pin	-input	+input	+input
Dual (URA)	-Vin	-Vin	COM	NP	-Vo2	+Vo	NP	COM	+Vin	+Vin
	-input	+input	Common	No Pin	-output 2	+ output 1	No pin	Common	+input	+input

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

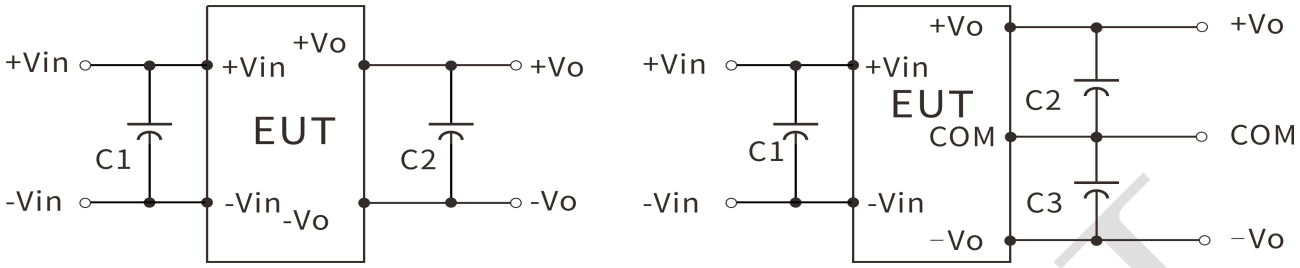
Package Description

Package code	L x W x H	
ZP	31.8 X20.3X12.0mm	1.252X 0.800 X0.472 inch

Test Application Reference

Recommended Test Circuit　　1、DC/DC Test Circuit：

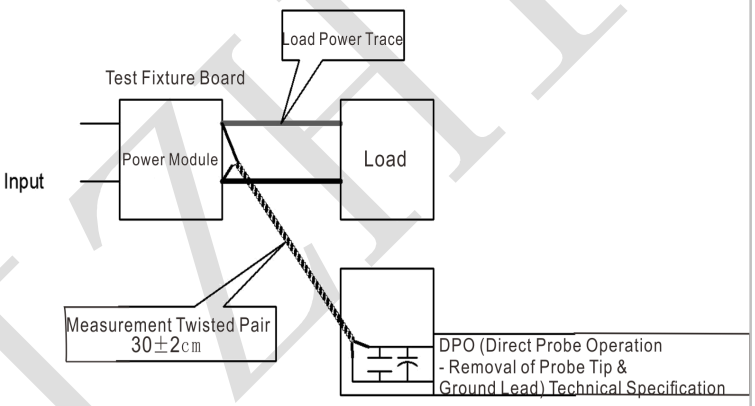
Recommended capacitors：C1：47-100μF；C2、C3：10-22μF 。



2. 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.

Contact

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