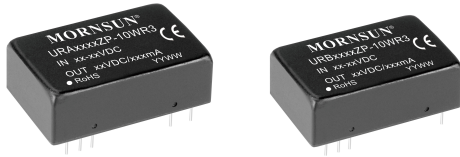


10W isolated DC-DC converter in DIP package  
Ultra-wide input, regulated single or dual output



### FEATURES

- Ultra-wide 4:1 input voltage range
- High efficiency up to 88%
- No-load power consumption as low as 0.12W
- I/O Isolation test voltage 1.5k VDC
- Operating ambient temperature range: -40°C ~ +85°C
- Input under-voltage protection, output short-circuit, over-current and over-voltage protection
- CISPR32/EN55032 CLASS A compliant without external components
- Industry standard pin-out
- EN62368 approved

URA\_ZP-10WR3 & URB\_ZP-10WR3 series are isolated 10W DC-DC converter products with an extremely wide voltage input range of 9-36VDC or 18-75VDC, input to output isolation voltage of 1500VDC, output over-voltage and output short-circuit protection. They meet CLASS A of CISPR32/EN55032 EMI standards without external components and they are widely used in applications such as industrial controls, electric power, instrumentation and communications.

### Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency <sup>②</sup> (%) Min./Typ.	Capacitive Load <sup>③</sup> (μF) Max.
		Nominal (Range)	Max. <sup>①</sup>	Voltage (VDC)	Current (mA) Max./Min.		
CE	URA2405ZP-10WR3	24 (9-36)	40	±5	±1000/0	81/83	1000
	URA2412ZP-10WR3			±12	±416/0	85/87	470
	URA2415ZP-10WR3			±15	±333/0	85/87	330
	URB2403ZP-10WR3			3.3	2400/0	85/87	1200
	URB2405ZP-10WR3			5	2000/0	86/88	1000
	URB2412ZP-10WR3			12	833/0	85/87	470
	URB2415ZP-10WR3			15	667/0	85/87	330
	URB2424ZP-10WR3			24	416/0	86/88	100
	URA4805ZP-10WR3	48 (18-75)	80	±5	±1000/0	81/83	1000
	URA4812ZP-10WR3			±12	±416/0	85/87	470
	URA4815ZP-10WR3			±15	±333/0	85/87	330
	URB4803ZP-10WR3			3.3	2400/0	84/86	1200
	URB4805ZP-10WR3			5	2000/0	85/87	1000
	URB4812ZP-10WR3			12	833/0	85/87	470
	URB4815ZP-10WR3			15	667/0	85/87	330
	URB4824ZP-10WR3			24	416/0	86/88	100

Notes:  
 ① Exceeding the maximum input voltage may cause permanent damage;  
 ② Efficiency is measured at nominal input voltage and rated output load;  
 ③ The specified maximum capacitive load for positive and negative output is identical;  
 ④ We suggest to connect an external electrolytic capacitor if there is a spike voltage at the input, details please refer to application circuit.

### Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load / no-load)	24VDC nominal input series, nominal input voltage	3.3VDC single output	--	379/12	388/25	mA
		5VDC single output	--	473/6	484/15	
		others	--	502/5	515/12	
	48VDC nominal input series, nominal input voltage	3.3VDC single output	--	192/5	197/20	
		5VDC single output	--	239/6	245/15	
		others	--	251/4	258/8	

Reflected Ripple Current	24VDC nominal input series, nominal input voltage	--	40	--	VDC
	48VDC nominal input series, nominal input voltage	--	30	--	
Surge Voltage (1sec. max.)	24VDC nominal input series	-0.7	--	50	
	48VDC nominal input series	-0.7	--	100	
Start-up Voltage	24VDC nominal input series	--	--	9	
	48VDC nominal input series	--	--	18	
Under-voltage Protection	24VDC nominal input series	5.5	6.5	--	
	48VDC nominal input series	12	15.5	--	
Input Filter		Pi filter			
Hot Plug		Unavailable			
Ctrl *	Module on	Ctrl pin open or pulled high (3.5-12VDC)			
	Module off	Ctrl pin pulled low to GND (0-1.2VDC)			
	Input current when off	--	6	10	mA

Note: \* The voltage of Ctrl pin is relative to input pin GND.

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy <sup>①</sup>	0%-100% load	3.3VDC/5VDC single output	--	± 0.5	± 2	%
		Others	--	± 1	± 3	
Linear Regulation	Full load, the input voltage is from low voltage to high voltage	Positive output	--	±0.2	±0.5	
		Negative output	--	±0.5	± 1	
Load Regulation <sup>②</sup>	5%-100% load	Positive output	--	±0.5	± 1	
		Negative output	--	±0.5	± 1.5	
Cross Regulation	Dual output, main circuit with 50% load, auxiliary circuit with 25%-100% load	--	--	± 5		
Transient Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
Transient Response Deviation		3.3VDC/5VDC single output	--	± 5	± 8	%
	Others	--	± 3	± 5		
Temperature Coefficient	Full load	--	--	±0.03	%/°C	
Ripple & Noise <sup>③</sup>	20MHz bandwidth	--	40	80	mV p-p	
Over-voltage Protection	Input voltage range	110	--	160	%Vo	
Over-current Protection	Input voltage range	3.3VDC/5VDC single output	110	160	230	%Io
		Others	110	140	190	
Short-circuit Protection	Input voltage range	Continuous, self-recovery				

Note:  
 ① At 0%-5% load, the Max. output voltage accuracy of ±5VDC output converter is ±5%, the Max. output voltage accuracy of 3.3VDC 5VDC output converter is ±3%;  
 ② Load regulation for 0% -100% load increases to ±5%;  
 ③ The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information. Ripple & Noise at <5% load is 5%Vo max.

## General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	2000	--	pF
Operating Temperature	see Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH

Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	°C
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency *	PWM mode	--	350	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

Note:\* Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

### Mechanical Specifications

Case Material	Aluminum alloy
Dimensions	32.00 x 20.00 x 10.80mm
Weight	14.0g(Typ.)
Cooling Method	Free air convection

### Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A (without external components)/ CLASS B (see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A (without external components)/ CLASS B (see Fig.3-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29	0%, 70%	perf. Criteria B

### Typical Characteristic Curves

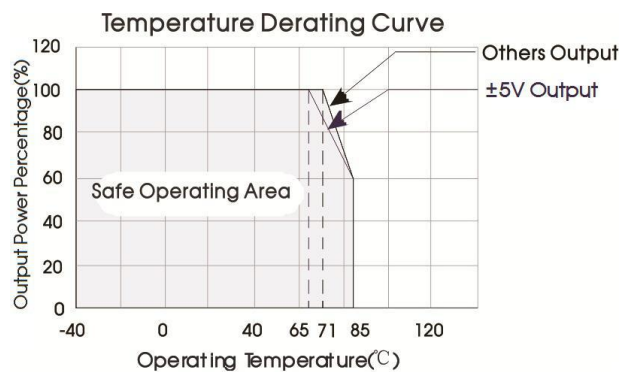
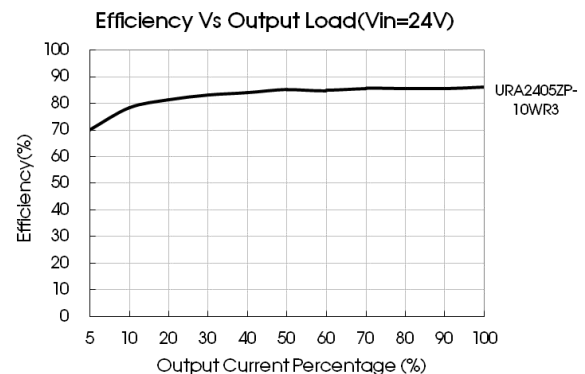
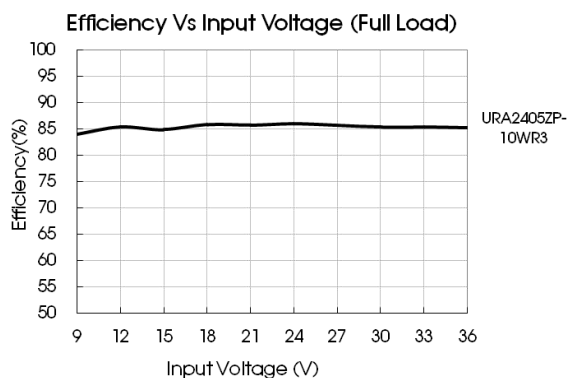
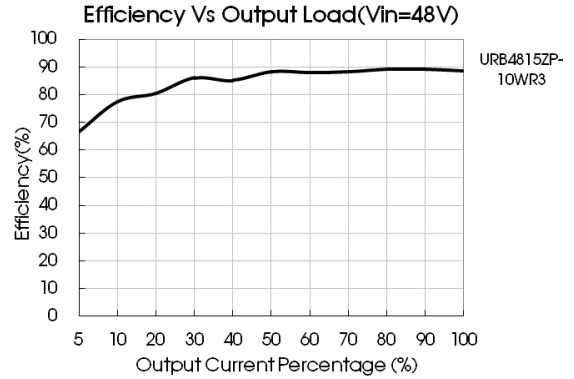
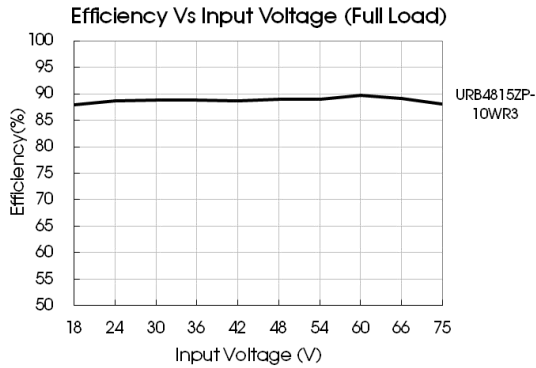
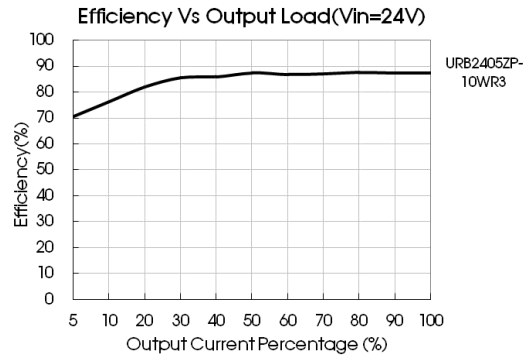
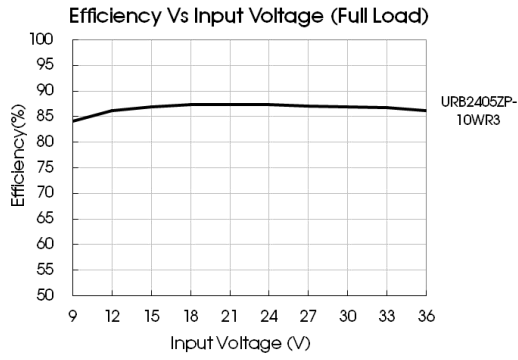


Fig. 1





## Design Reference

### 1. Typical application

All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values  $C_{in}$  and  $C_{out}$  and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.

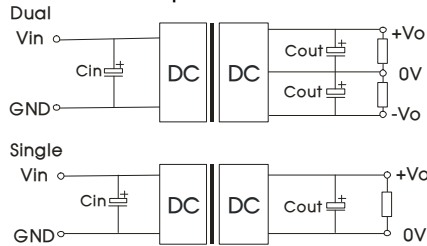
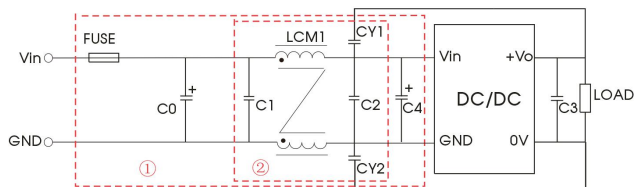


Fig. 2

Vin(VDC)	Cin	Cout
24	100 $\mu$ F	10 $\mu$ F
48	10 $\mu$ F -47 $\mu$ F	10 $\mu$ F

### 2. EMC solution-recommended circuit

3.3VDC/5VDC single output:



Others:

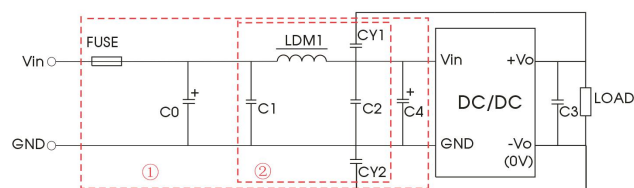


Fig. 3

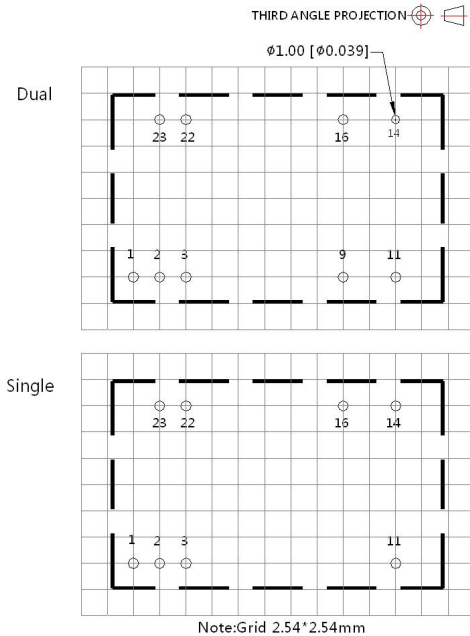
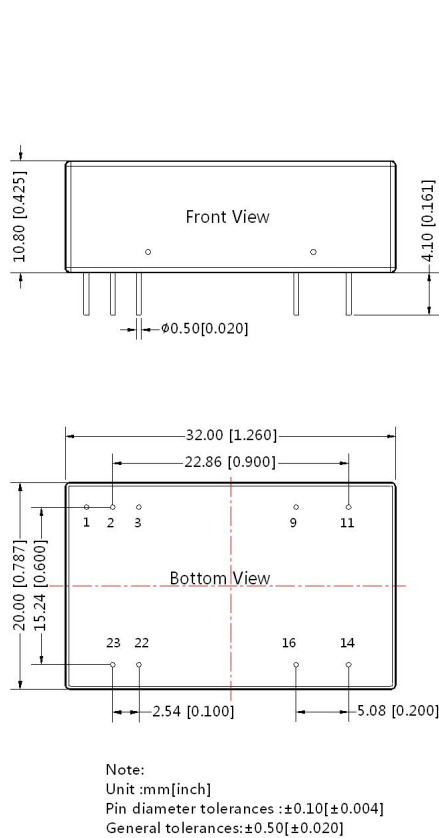
Note: Part ① in the Fig. 3 is used for EMC test and part ② for emissions filtering; Selecting based on needs.

Parameter description:

Model	Vin:24V	Vin:48V
FUSE	Select FUSE value according to actual input current	
C0, C4	330 $\mu$ F/50V	330 $\mu$ F/100V
C1, C2	10 $\mu$ F/50V	10 $\mu$ F/100V
LDM1	10 $\mu$ H	
LCM1	1.4-1.7mH (TN150P-RH12.7*12.7*7.9)	
C3	Refer to the Cout in Fig.2	
CY1	1nF/2KV	
CY2	1nF/2KV	

- The products do not support parallel connection of their output
- For additional information please refer to DC-DC converter application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



Pin-Out		
Pin	Single	Dual
1	Ctrl	Ctrl
2,3	GND	GND
9	No Pin	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22,23	Vin	Vin

NC: Pin to be isolated from circuit

Notes:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58210008;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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