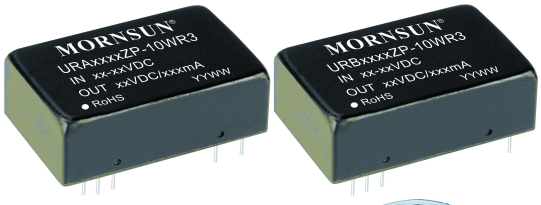
DC/DC Converter

URA_ZP-10WR3 & URB_ZP-10WR3 Series

MORNSUN®

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



Patent Protection RoHS

3 years Warranty

FEATURES

- Ultra wide input voltage range (4:1)
- High efficiency up to 88%
- No-load power consumption as low as 0.12W
- Isolation voltage: 1.5K VDC
- Operating temperature range: -40℃ to +85℃
- Input under-voltage protection, Output short circuit, over-current, over–voltage protection
- Meet CISPR32/EN55032 CLASS A, without external components
- International standard pin-out

URA_ZP-10WR3 & URB_ZP-10WR3 series products are of 10W output power, extremely wide range of voltage input of 9-36VDC, 18-75VDC, isolation voltage of 1500VDC, output over-voltage protection and output short circuit protection with the bare component in compliance with CISPR32/EN55032 CLASS A; these products are widely used in fields such as industrial control, electric power, instruments and communication.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Efficiency ② (%,Min./Typ.) @ Full Load	Max. Capacitive Load ③ (μF)
		Nominal (Range)	Max. ①	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
--	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 Absolute maximum rating without damage on the converter, but it isn't recommended;
② Efficiency is measured In nominal input voltage and rated output load;
③ The capacitive loads of positive and negative outputs are 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	--	
	48VDC nominal input series, nominal input voltage		--	30	--	

Input impulse Voltage (1sec. max.)	24VDC nominal input series	-0.7	--	50	VDC
	48VDC nominal input series	-0.7	--	100	
Starting Voltage	24VDC nominal input series	--	--	9	
	48VDC nominal input series	--	--	18	
Input 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 switch on	Ctrl suspended or connected to TTL high level (3.5-12VDC)			
	Module switch off	Ctrl pin connected to GND or low level (0-1.2VDC)			
	Input current when switched 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
Output Voltage Accuracy①	0%-100% load	3.3VDC/5VDC single output	--	± 0.5	± 2	%
		others	--	±1	±3	
Line Regulation	Full load, the input voltage is from low voltage tohigh voltage	Positive output	--	±0.2	±0.5	
		Negative output	--	±0.5	±1	
Load Regulation②	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 Drift Coefficient	Full load		--	--	±0.03	%/℃
Ripple*&Noise③	20MHz bandwidth		--	40	80	mV p-p
Output Over-voltage Protection	Input voltage range		110	--	160	%Vo
Output 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:
①At 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%;
②When testing from 0%-100%load working conditions，load regulation index of ±5%；
③0%-5% load ripple&Noise is no more than 5%Vo.Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Operating Temperature	see Fig. 1	-40	--	+85	℃
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	+300	℃

Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency *	PWM mode	--	350	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours

Note：* This series of products using reduced frequency technology, the switching frequency is test value of full load,When the load is reduced to below 50%, the switching frequency decreases with decreasing load.

Physical Specifications

Casing Material	Aluminum alloy
Package Dimensions	32.00*20.00*10.80mm
Weight	14g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	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)	
EMS	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.3-①for 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

Product Characteristic Curve

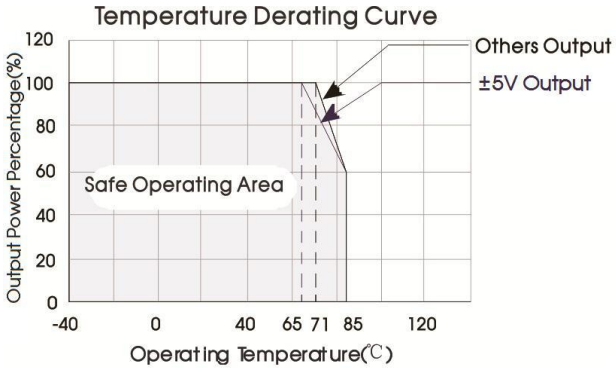
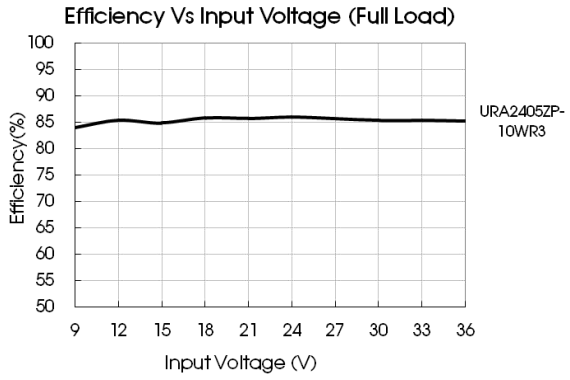
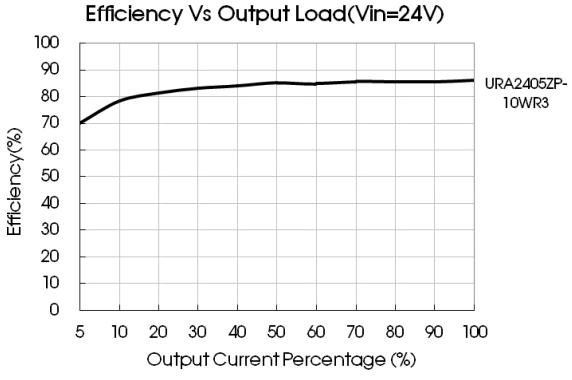
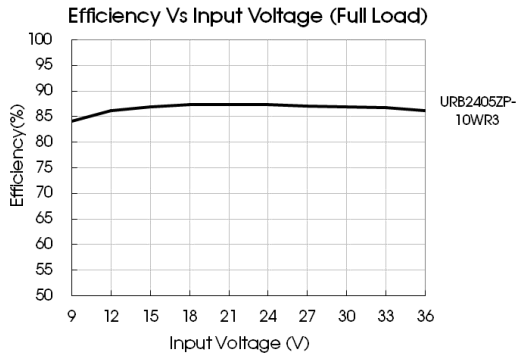
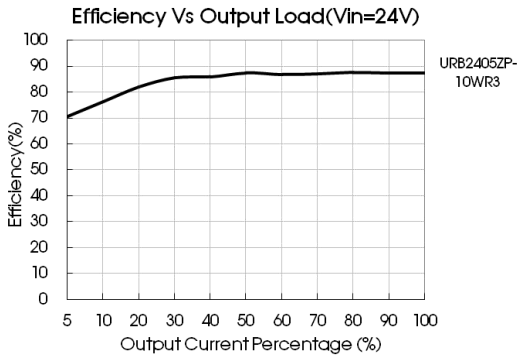


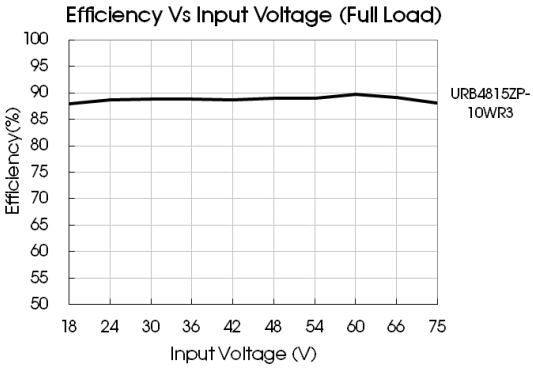
Fig. 1

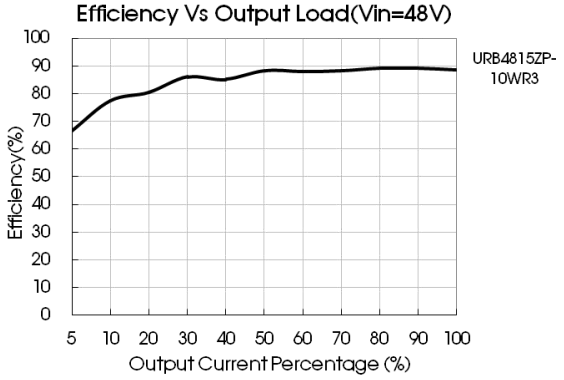












Design Reference

1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

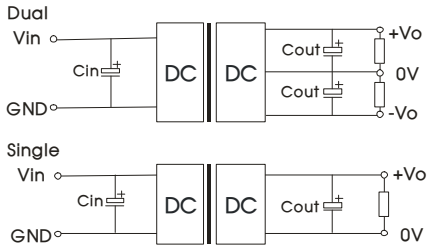
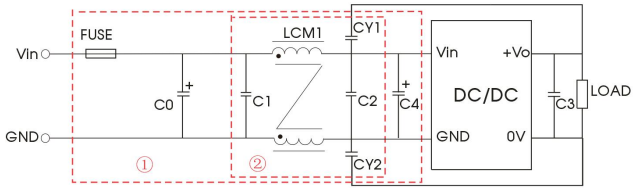


Fig. 2

Vin(VDC)	Cin	Cout
24	100μF	10μF
48	10μF -47μF	10μF

2. EMC solution-recommended circuit

3.3VDC/5VDC single output：



others:

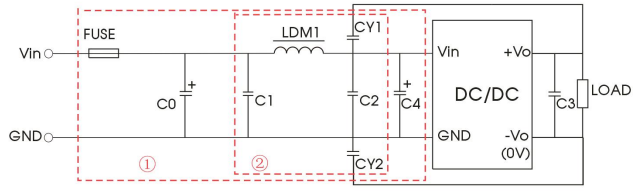


Fig. 3

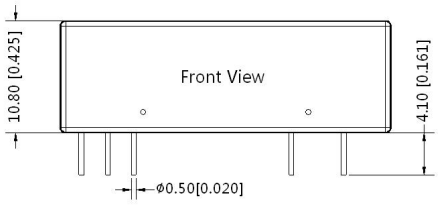
Notes: Part ① in the Fig. 3 is used for EMC test and part ② for EMI filtering; selected based on needs.

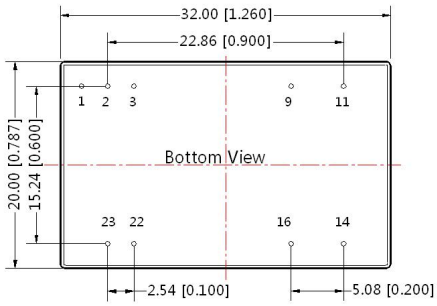
Parameter description:

Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
C0、C4	330μF/50V	330μF/100V
C1、C2	10μF/50V	10μF/100V
LDM1	10μH	
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	

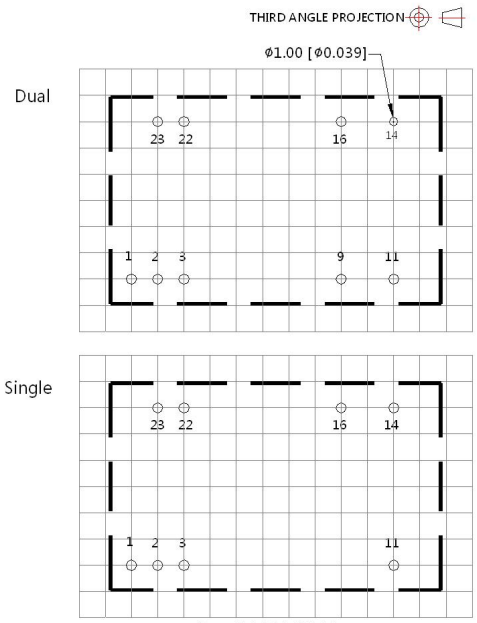
3. The product does not support output in parallel with power per liter
4. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout





Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]



Note:Grid 2.54*2.54mm

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:
1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58210008;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on Company's corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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