3W, 4:1wide input isolated & regulated single output

CE Report RoHS Patent Protection

EN62368-1 EN60950-1

FEATURES

- Ultra wide input voltage rang (4:1)
- High efficiency up to 83%
- Isolation voltage1.5KVDC
- Short circuit protection (automatic recovery)
- Operating temperature range: -40℃ to +85℃
- Meet CISPR32/EN55032 CLASS A, without external components
- EN60950 approval

The PWB_ZP-3WR2 Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to where:

1) Input voltage range ≤4:1;

2) 1.5KVDC input and output isolation;

3) Output regulated and low ripple noise is required.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load (μF)
		Nominal (Range)	Max.*	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
EN	PWB2403ZP-3WR2	24 (9-36)	40	3.3	909/45	73/75	2700
	PWB2405ZP-3WR2			5	600/30	78/80	2200
	PWB2409ZP-3WR2			9	333/17	78/80	1000
	PWB2412ZP-3WR2			12	250/13	79/81	680
	PWB2415ZP-3WR2			15	200/10	80/82	680
	PWB2424ZP-3WR2			24	125/6	80/82	470
	PWB4803ZP-3WR2	48 (18-75)	80	3.3	909/45	74/76	2700
	PWB4805ZP-3WR2			5	600/30	77/79	2200
	PWB4809ZP-3WR2			9	333/17	79/81	1000
	PWB4812ZP-3WR2			12	250/13	80/82	680
	PWB4815ZP-3WR2			15	200/10	81/83	680
	PWB4824ZP-3WR2			24	125/6	79/81	470

Note:*Absolute maximum rating without damage on the converter, but it isn't recommended.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load /no-load)	24VDC input	3.3V output	--	167/10	172/20	mA
		Others	--	155/10	161/20	
	48VDC input	3.3V output	--	83/8	85/15	
		Others	--	77/8	82/15	
Reflected Ripple Current	24VDC input		--	30	--	
	48VDC input		--	30	--	
Input impulse Voltage (1sec. max.)	24VDC input		-0.7	--	50	VDC
	48VDC input		-0.7	--	100	
Starting Voltage	24VDC input		4.5	7	9	
	48VDC input		11	16	18	
Input Filter			Pi filter			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5%-100% load	--	±1	±3	%
No load output Voltage Accuracy	Input voltage range	--	±1.5	±5	
Linear Regulation	Full load, the input voltage is from low voltage to high voltage	--	±0.2	±0.5	
Load Regulation	5%-100% load	--	±0.2	±1	
Transient Recovery Time	25% load step change	--	0.5	3	ms
Transient Response Deviation		--	±2	±5	%
Temperature Coefficient	Full load	--	±0.02	±0.03	%/℃
Ripple & Noise*	20MHz bandwidth	--	35	85	mV p-p
Output Power Protection	Input voltage range	120	--	--	%
Short circuit Protection		Continuous, self-recovery			

*Note: * Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation.*

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Insolation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	120	--	pF
Operating Temperature	Derating if the temperature is ≥71℃ (see Fig. 1)	-40	--	85	℃
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25℃	--	25	--	
Pin Soldering Resistance Temperature*	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
	Wave soldering,10 seconds	255	260	265	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency(PFM mode)	100% load, nominal input voltage	--	250	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours

Note:*The pin resistance temperature is not the actual set temperature of the soldering iron, but the temperature required for a good solder joint. The actual set temperature by the customer needs to be comprehensively set based on the thickness of the PCB, the size of the copper cladding, the power of the soldering iron, and the selection of the soldering iron tip.

Physical Specifications

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

EMC Specifications

EMI	Conducted emission	CISPR32/EN55032	CLASS A(Bare component)/CLASS B (see Fig.3-② for recommended circuit)	
	Radiated emission	CISPR32/EN55032	CLASS A(Bare component)/CLASS B (see Fig.3-② for recommended circuit)	
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±4KV/ Air ±8KV	perf. Criteria B
	Radiation immunity	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 immunity	IEC/EN61000-4-5	line to line ±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6	3 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

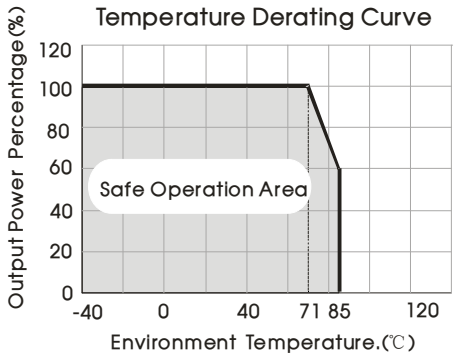
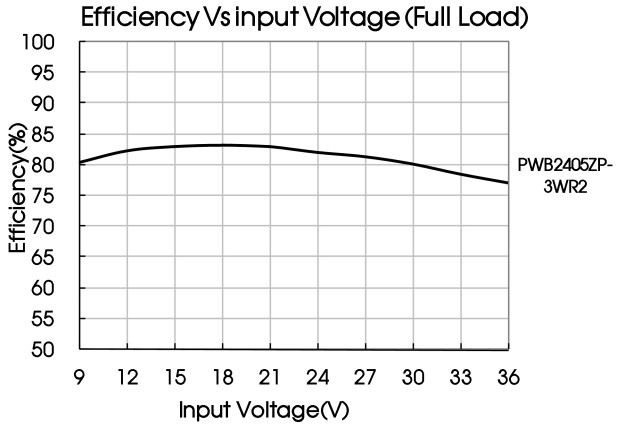
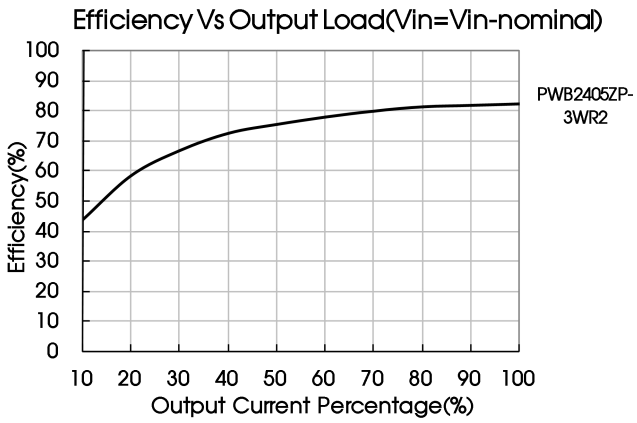
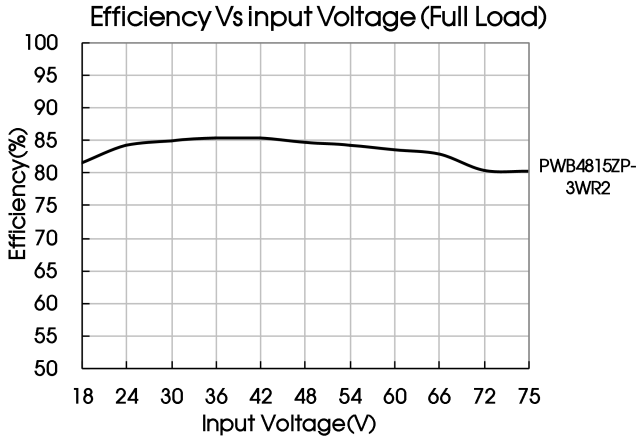
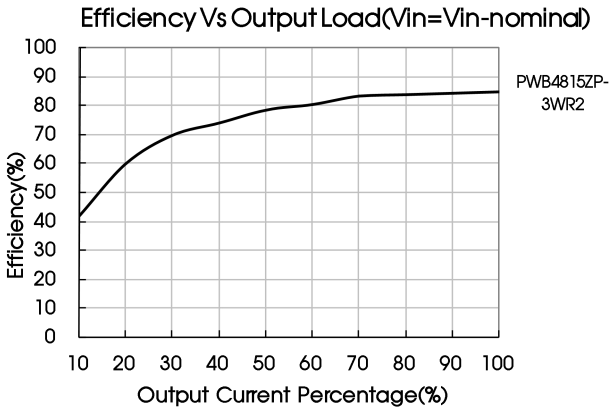


Fig. 1









Design Reference

1. Output load requirements

To ensure that the module can work efficiently and reliably, its output min. load shall be no lower than 5% of the rated load when using, or the output ripple may increase rapidly. Ensure that the product working load must be higher than 5% of the rated load.

2. 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	24V&48V
Cin	10μF~47μF
Cout	10μF

3. EMC solution-recommended circuit

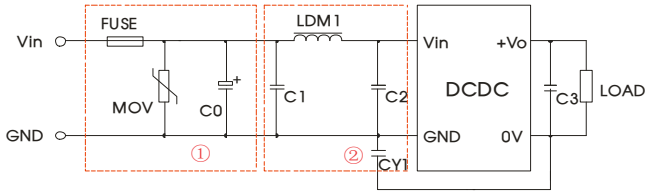


Fig. 3

Parameter description:

Model	Vin:24V	Vin:48V
FUSE	Slow blown fuses according to the actual input current selections of the clients	
MOV	S20K30	S14K60
C0	330μF/50V	330μF/100V
C1	4.7μF/50V	4.7μF/100V
LDM1	12μH	
C2	4.7μF/50V	4.7μF/100V
C3	10μF	
CY1	1nF/2KV	

Note: ①.Part ① in the Fig. 3 is used for EMS test and part ② for EMI filtering; selected based on needs.
②.If there is no recommended parameters, the model no require the external component.

4. Input current

When the electricity is provided by the unstable power supply, please make sure that the range of the output voltage fluctuation and the ripple voltage of the power supply do not exceed the indicators of the modules. Input current of power supply should afford the flash startup current of this kind of DC/DC module(see Fig.4).

Generally: Vin=24V Iave=640mA
Vin=48V Iave =316mA

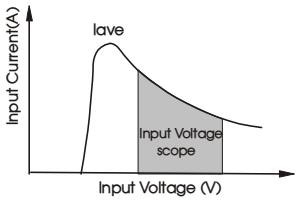
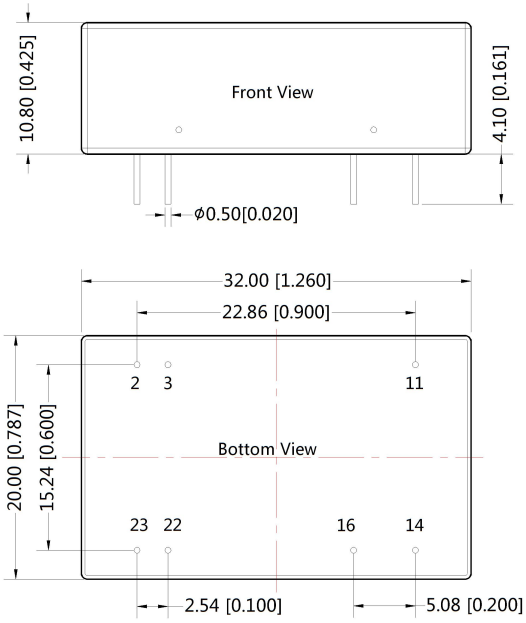


Fig. 4

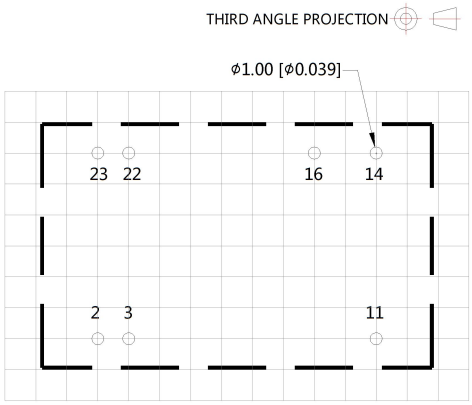
5. Cannot use in parallel and hot swap

6. For more information please find 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	Function
2,3	GND
11	NC
14	+Vo
16	0V
22, 23	Vin

NC: No Connection

Note:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58210008;
2. Recommend to use module with more than 5% load, if not, the ripple of the product may exceeds the specification, but does not affect the reliability of the product;
3. The max. capacitive load should be tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75%RH when inputting nominal voltage and outputting rated load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
7. We can provide product customization service;
8. Specifications of this product are subject to changes without prior notice.

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