MORNSUN®

WRB_T-3W Series

3W, WIDE INPUT, ISOLATED & REGULATED SINGLE OUTPUT DC/DC CONVERTER

Patent Protection **RoHS**

FEATURES

- Efficiency up to 81%
- Operating temperature: -40 ~ +85°C
- 1500VDC isolation
- UL94-V0 package
- No external component required
- Industry standard pinout
- MTBF>1,000,000 hours
- RoHS Compliance

APPLICATIONS

The WRB_T-3W 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.

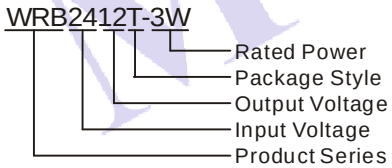
These products apply to:

1) Where the voltage of the input power supply is wide range (voltage range ≤ 2:1);

2) Where isolation is necessary between input and output (Isolation Voltage ≤1500VDC);

3) Where the regulation of the output voltage and the output ripple noise are demanded.

MODEL SELECTION



PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (%, Typ.)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max*		Max.	Min.	
WRB1205T-3W	12	9-18	20	5	600	60	75
WRB1212T-3W				12	250	25	78
WRB1215T-3W				15	200	20	79
WRB2405T-3W	24	18-36	40	5	600	60	76
WRB2412T-3W				12	250	25	80
WRB2415T-3W				15	200	20	80
~~WRB4805T-3W~~	48	36-72	80	~~5~~	~~600~~	~~60~~	~~77~~
WRB4812T-3W				12	250	25	80
WRB4815T-3W				15	200	20	81

Note:
1.Models listed with strike-through text have been officially discontinued.
2.* Input voltage can't exceed this value, or will cause the permanent damage.

COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	℃
Storage temperature		-55		125	
Temp. Rise at full load			15		
Lead temperature	1.5mm from case for 10 seconds			300	
Cooling		Free air convection			
Short circuit protection		Continuous, automatic recovery			
Case material		Epoxy Resin (UL94-V0)			
MTBF		1000			k hours
Weight			11		g

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ISOLATION SPECIFICATIONS

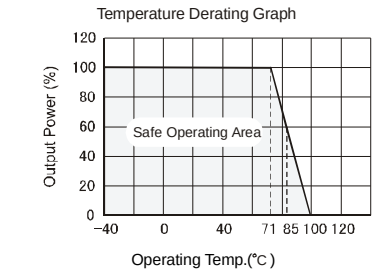
Item	Test Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/1V		100		pF

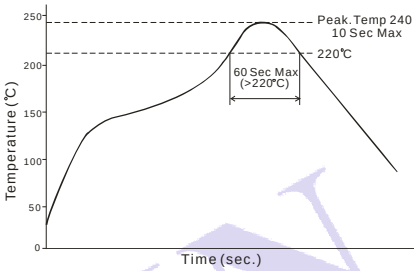
OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Output power	Refer to products program	0.3		3	W
Output voltage accuracy	Refer to recommended circuit		±1	±3	%
Load regulation	From 10% to 100% load		±0.1	±1	
Line regulation	Input voltage from low to high		±0.2	±0.5	
Temperature drift (Vout)	Refer to recommended circuit			±0.03	%/°C
Ripple & noise*	20MHz Bandwidth		50	100	mVp-p
Switching frequency	100% load, input voltage range		300		kHz

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

TYPICAL CHARECTERISTICS





Remark:
The curve applies only to the hot air reflow soldering

APPLICATION NOTE

1) Requirement On Output Load

In order to ensure the product operate efficiently and reliably, in addition to a max load (namely full load), a minimum load is specified for this kind of DC/DC converter. Make sure the specified range of input voltage is not exceeded, the minimum output load ***no less than 10% load.*** If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading, or contact our company for other lower output power products.

2) Recommended Circuit

All the WRB_T-3W series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load (See Figure 1).

If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1). General:

Cin: 12V 100μF
24V&48V 10μF-47μF
Cout: 10μF/100mA

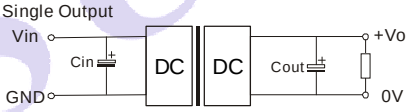
3) Input Current

When it is used in unregulated power supply, be sure that the fluctuating range of the power supply and the rippled voltage do not exceed the module standard. Input current of power supply should afford the flash startup current of this kind of DC/DC module (Figure 2)

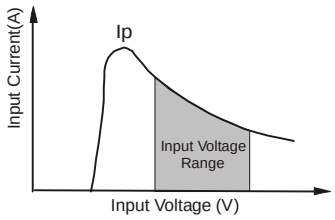
General: Ip ≤1.4*Iin-max

4) No parallel connection or plug and play

RECOMMENDED CIRCUIT



(Figure 1)



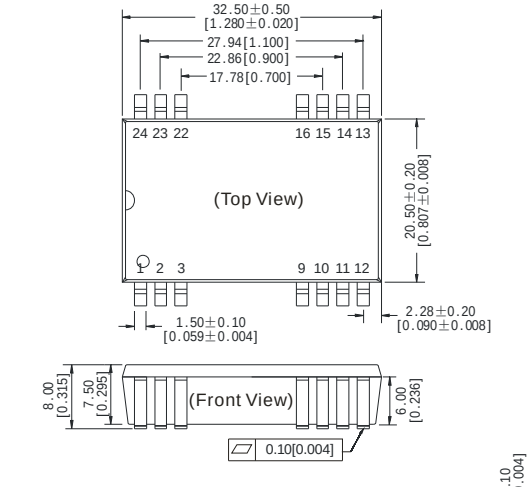
(Figure 2)

Output External Capacitor Table (Table 1)

Single Vout (VDC)	Cout (μF)
5	1000
12	470
15	330

OUTLINE DIMENSIONS & FOOTPRINT DETAILS

MECHANICAL DIMENSIONS

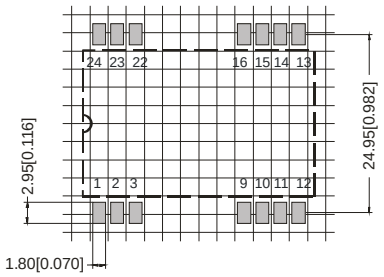


FOOTPRINT DETAILS	
Pin	Function
2,3	GND
14	+Vo
16	0V
22,23	Vin
Others	NC

NC: No connection

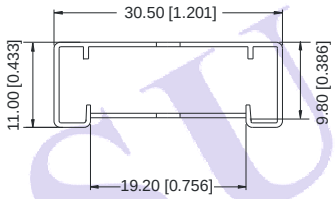
Note:
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT



Note: grid 2.54*2.54mm.

TUBE OUTLINE DIMENSIONS



Note:
Unit :mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=530mm[20.866inch] pcs/tube: 15
L=220mm[8.661inch] pcs/tube: 6
Short tube inner package dimensions: L*W*H= 255*170*80mm
Short tube outer package dimensions(with six inner package boxes):
L*W*H= 375*280*270mm
Long tube inner package dimensions: L*W*H= 580*200*100mm
Long tube outer package dimensions(with two inner package boxes):
L*W*H= 600*215*220mm
Long tube outer package dimensions(with three inner package boxes):
L*W*H= 600*215*325mm

Note:

1. The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
2. Operation under 10% load will not damage the converter; However, they may not meet all specification listed.
3. Capacitor MAX load tested at input voltage range and full load.
4. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
5. Only typical models listed, other models may be different, please contact our technical person for more details.
6. In this datasheet, all the test methods of indications are based on corporate standards.