MORNSUN
Industrial DC&AC converter professional

WRA_CS-3W & WRB_CS-3W Series

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

multi-country patent protection **RoHS**

FEATURES

Miniature SIP Package
Wide (2:1) Input Range
Regulated Outputs
I/0 Isolation 1500VDC
Short Circuit Protection(automatic recovery)
Internal SMD construction
Operating Temperature: -40°C to +85°C
External On/Off control
RoHS Compliance

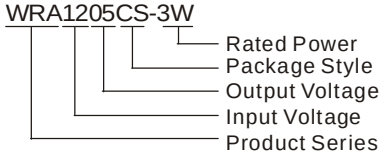
APPLICATIONS

The WRA_CS-3W & WRB-CS-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



MORNSUN Science& Technology co.,Ltd.
Address: 2th floor 6th building, Huangzhou Industrial District, Guangzhou, China
Tel: 86-20-38601850
Fax: 86-20-38601272
Http://www.mornsun-power.com

PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (%, Typ)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max*		Max	Min	
WRA1205CS-3W	12	9.0-18	22	±5	±300	±30	74
WRA1209CS-3W				±9	±167	±17	76
WRA1212CS-3W				±12	±125	±13	78
WRA1215CS-3W				±15	±100	±10	80
WRB1205CS-3W				5	600	60	74
WRB1209CS-3W				9	333	33	76
WRB1212CS-3W				12	250	25	78
WRB1215CS-3W				15	200	20	80
WRA2405CS-3W	24	18-36	40	±5	±300	±30	76
WRA2409CS-3W				±9	±167	±17	78
WRA2412CS-3W				±12	±125	±13	80
WRA2415CS-3W				±15	±100	±10	81
WRB2405CS-3W				5	600	60	76
WRB2409CS-3W				9	333	33	78
WRB2412CS-3W				12	250	25	80
WRB2415CS-3W				15	200	20	81

*Input voltage can't exceed this value, or will cause the permanent damage.
Note: The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
Operation under 10% load will not damage the converter; However, they may not meet all specification listed.

COMMON SPECIFICATION

Item	Test Conditions	Min	Typ	Max	Units
Storage Humidity				95	%
Operating Temperature		-40		85	°C
Storage Temperature		-55		125	
Temp. Rise at Full Load			15		
Lead Temperature	1.5mm from case for 10 seconds			300	
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	100KHz,1V		80		PF
No-load Power Consumption			100		mW
Cooling		Free Air Convection			
Case Material		Plastic (UL94-V0)			
Short Circuit Protection		Continuous, Automatic Recovery			
MTBF		1000			K hours
Weight			6		g

OUTPUT SPECIFICATIONS

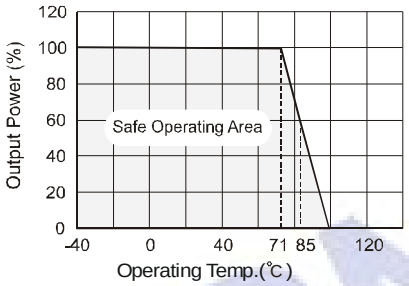
Item	Test Conditions	Min	Typ	Max	Units
Output Power	See below products program	0.3		3	W
Positive voltage accuracy	Refer to recommended circuit		±1	±3	%
Negative voltage accuracy	Refer to recommended circuit		±3	±5	
Load Regulation	10% To 100% Load (WRB_CS-3W)		±0.5	±0.75	
	10% To 100% Load (WRA_CS-3W)*		±0.5	±1.0	
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		300		KHz

*Dual output models unbalanced load (25/100%): ±5%Max.
**Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

Note:

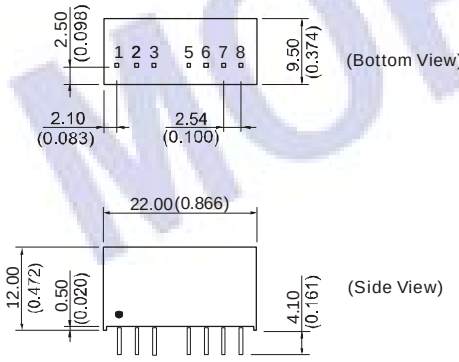
1. All specifications measured at T_A=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

TYPICAL TEMPERATURE CURVE



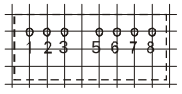
OUTLINE DIMENSIONS FOOTPRINT DETAILS

First Angle Projection



RECOMMENDED FOOTPRINT
Top view,grid:2.54mm(0.1inch)
diameter:1.00mm(0.039inch)

Dual Output & Single Output



FOOTPRINT DETAILS

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	CTRL	CTRL
5	NC	NC
6	+Vo	+Vo
7	0V	0V
8	CS	-Vo

NC:No Connection

Note:
Unit:mm(inch)
Pin section:0.50*0.30mm(0.020*0.012inch)
Pin section tolerances:±0.10mm(±0.004inch)
General tolerances:±0.25mm(±0.010inch)

APPLICATION NOTE

CTRL Terminal

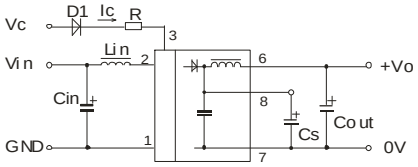
When open or high impedance, the converter work well; When this pin is 'high'; the converter shutdown; It should be note that the input current (Ic) should between 5-10mA, exceeding the maximum 20mA will cause permanence damage to the converter。The value of R Can be derived as follows:

$$R = \frac{Vc - V_D - 1.0}{Ic}$$

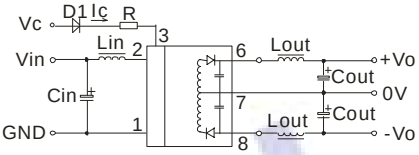
Recommended circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1).

Single Output



Dual Output



(Figure 1)

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).

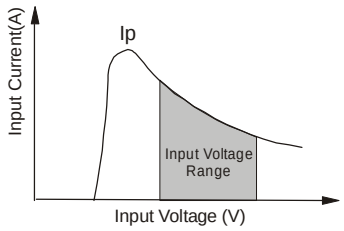
General: Cin: 12V 100uF
24V 10uF-47uF
Cout: 100uF(Typ.)
Lin: 4.7μH -120μH
Lout: 2.2μH-10μH
Cs: 10uF-47uF

External Capacitor Table(Table 1)

Single Vout (VDC)	Cout (uF) (Max)	Dual Vout (VDC)	Cout (uF) (Max)
5	1000	±5	680
9	680	±9	470
12	470	±12	330
15	330	±15	220

Input current

While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current Ip (Figure 2). General: Ip ≤1.4*Iin-max



(Figure 2)

No parallel connection or plug and play.