

## PWA\_CS-2W & PWB\_CS-2W Series 2W, ULTRAWIDE INPUT, ISOLATED & REGULATED DUAL/SINGLE OUTPUT, DC/DC CONVERTER

Patent Protection RoHS

### FEATURES

High Efficiency up to 79%  
I/O Isolation 1500VDC  
4:1 wide input range  
Short circuit protection(automatic recovery)  
Operating Temperature: -40°C to +85°C  
Remote ON/OFF control  
Internal SMD construction  
Low Ripple and Noise  
UL94-V0 package  
RoHS Compliance

### APPLICATIONS

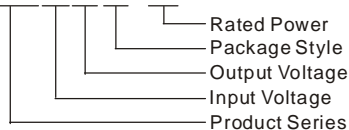
The PWA\_CS-2W & PWB\_CS-2W Series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage ranges  $\leq 4:1$ );
- 2) Where isolation is necessary between input and output(isolation  $\leq 1500$ VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

### MODEL SELECTION

PWA2405CS-2W



### PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (% Typ)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max*		Max	Min	
PWA2405CS-2W	24	9-36	40	±5	±200	±20	76
PWA2409CS-2W				±9	±111	±11	78
PWA2412CS-2W				±12	±83	±8	78
PWA2415CS-2W				±15	±67	±7	75
PWB2403CS-1W6				3.3	500	50	68
PWB2405CS-2W				5	400	40	76
PWB2409CS-2W				9	222	22	78
PWB2412CS-2W				12	167	16	79
PWB2415CS-2W				15	133	13	79
PWA4805CS-2W				48	18-72	80	±5
★PWA4809CS-2W	±9	±111	±11				78
PWA4812CS-2W	±12	±83	±8				78
PWA4815CS-2W	±15	±67	±7				79
PWB4803CS-1W6	3.3	500	50				72
PWB4805CS-2W	5	400	40				75
★PWB4809CS-2W	9	222	22				76
PWB4812CS-2W	12	167	16				78
PWB4815CS-2W	15	133	13				79

\* Input voltage over it may cause permanent damage to the device. ★Still not design.

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.

### ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1 mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation Capacitance	Input/Output, 100KHz/1V		80		PF

### OUTPUT SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Output power	See Below Products Program	0.2		2	W
Positive voltage accuracy	Refer To Recommended Circuit		±1	±3	%
Negative voltage accuracy	Refer To Recommended Circuit		±3	±5	
Load regulation	From 10% To 100% Load		±0.5	±1.5*	
Line regulation	Input Voltage From Low To High		±0.2	±0.75	
Temperature drift	Refer To Recommended Circuit			±0.03	%/°C
Ripple& Noise**	20MHz Bandwidth		50	100	mVp-p
Switching frequency	100% Load, Nominal Input Voltage		300		KHz

\*Dual output models unbalanced load:  $\pm 5\%$ .

\*\*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 TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

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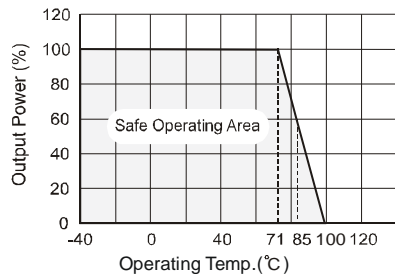
Tel: 86-20-38601850

Fax: 86-20-38601272

<http://www.mornsun-power.com>

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	
Cooling		Free air convection			
Short circuit protection		Continuous ,Automatic Recovery			
Case material		Plastic(UL94-V0)			
MTBF		1000			K hours
Weight			5.8		g

### TYPICAL TEMPERATURE CURVE



### OUTLINE DIMENSIONS & FOOTPRINT DETAILS

#### MECHANICAL DIMENSIONS

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

FOOTPRINT DETAILS		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	CTRL	CTRL
6	+Vo	+Vo
7	NC	0V
8	NC	NC
9	0V	-Vo

NC:No Connection

#### RECOMMENDED FOOTPRINT(TOP VIEW)

Dual Output & Single Output

Tube Outline Dimensions:

Note:  
Unit:mm(inch)  
General tolerances:±0.50mm[±0.020inch]  
L=530mm[20.866inch] Tube Quantity: 18pcs  
L=220mm[8.661inch] Tube Quantity: 7pcs

### APPLICATION NOTE

#### Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load is not less than 10% of the full load, and that this product should never be operated under no load! If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power.

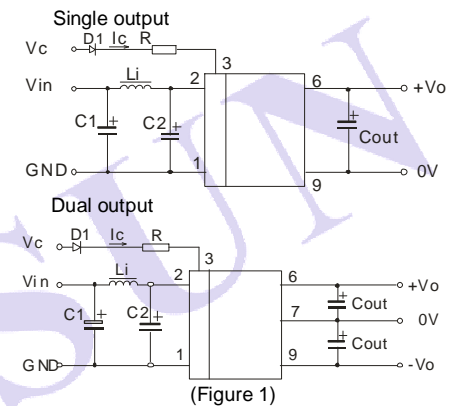
#### ① TRL Terminal

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 should between 5-10mA,exceeding the maximum 20mA will cause permanence damage to the converter. The value of R can be derived as follows:

$$R = \frac{V_C - V_D - 1.0}{I_C}$$

#### ② 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).



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:10-100uF

Cout:100uF

Lin:4.7-120uH

Output External Capacitor Table(Table 1)

Single Vout (VDC)	Cout (uF)	Dual Vout (VDC)	Cou (uF)
3.3	2200	±5	680
5	1000	±9	470
9	680	±12	330
12	470	±15	220
15	220	-	-

#### ③ Input current

Nominal input voltage range. The input current of the power supply must be sufficient to the startup current (Ip) of the DC/DC module (Figure 2).General: Ip ≤1.4\*In-max

#### ④ No parallel connection or plug and play.