

## Features

- ◆ Operating temperature: -40 to +85°C
- ◆ 4.5-9/9-18/18-36/36-72/9-36/18-72Vdc input
- ◆ 5V/9V/12V/15V/24V/±5V/±9V/±12V/±15V output
- ◆ Efficiency up to 86%
- ◆ 100% burn-in
- ◆ No external heat sink
- ◆ Continuous short circuit protection
- ◆ UL94V-0 package
- ◆ RoHS compliance
- ◆ Case size 22.00×12.00×9.50mm

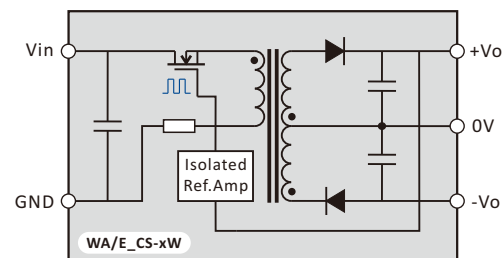
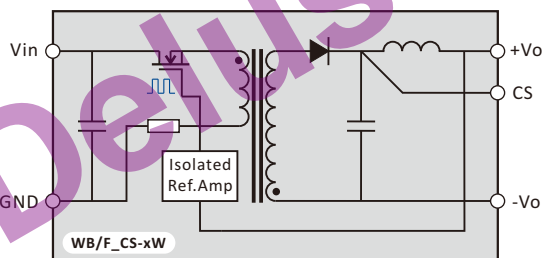
## General Description

WA/B/E/F\_CS-1W5/3W series high power density, can help you save valuable board space. Wide input voltage range, low starting current, good load characteristics, and minimum noise characteristics.

The products used in all ceramic capacitors, all SMT processing technology, excellent performance, stable and reliable.



## Functional Diagram



## Selection Guide

**WB1205CS-1W5**

Product Series	Input Voltage	Output Voltage	Package Style	Rated Power
WA: wide input isolated 1.5kVdc dual WE: wide input isolated 3.0kVdc dual WB: wide input isolated 1.5kVdc single WF: wide input isolated 3.0kVdc single	05 = 4.5-9 Vdc Range 12 = 9-18 Vdc Range 24 = 18-36 Vdc Range 48 = 36-75 Vdc Range	05 = 5Vdc ±5Vdc 09 = 9Vdc ±9Vdc 12 = 12Vdc ±12Vdc 15 = 15Vdc ±15Vdc 24 = 24Vdc ±24Vdc ↑     ↑ WB    WA WF    WE	CS: 22.00×9.50×12.00	1W5 = 1.5Watts 3W = 3Watts

# W\_CS-1W5 & W\_CS-3W Series

1.5 & 3w, wide input, isolated & regulated dual/single output dc-dc converter



## Input Specifications

CTRL (Reference point: GND)	Models on	open circuit
	Models off	0-1.2Vdc

## Output Specifications

Item	Test Conditions	Min	Typ	Max	Units
Output Power	CS-1W5	Ta=-40~+71°C		1.5	W
	CS-3W			3	
Line Regulation	100% load, input low to high		±0.1	±0.3	%
Load Regulation	Nominal, 10%-100% load		±0.3	±0.5	
Output Voltage Accuracy	Nominal, 100% load		±1	±3	
Temperature Drift	Nominal, 100% load			0.03	%/°C
Ripple & Noise	DC-20MHz bandwidth		50	120	mVp-p
Switching Frequency	Nominal, 100% load	180		550	KHz
Short Circuit Protection		Continuous, Automatic Recovery			

## Isolation Specifications

Item	Test Conditions	Min	Typ	Max	Units
Isolation Resistance	Test at 500Vdc	1000			MΩ
Isolation Voltage	Tested for 1S and 1mA max	WA/WB	1500		Vdc
		WE/WF	3000		
Isolation Capacitance	100kHz/0.1Vdc		1000		pF

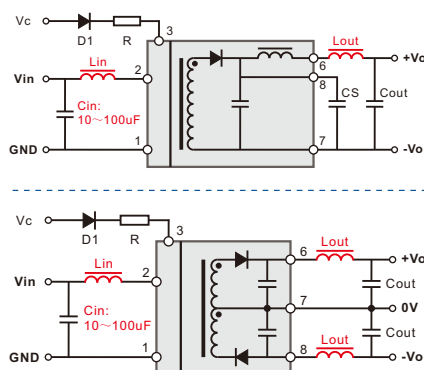
## Common Specification

Item	Test Conditions	Min	Typ	Max	Units
Operating Temperature	Ta>71°C Derating	-45		+85	°C
Maximum Case Temp.			70		
Storage Temperature		-50		+130	
Lead Temperature	1.5mm from case for 10 seconds			+300	
Storage Humidity				95	%
Case Material		Black Plastic (UL94V-0)			

## Absolute Maximum

Input Voltage Maximum	05V input models	0~12Vdc
	12V input models	0~20Vdc
	24V input models	0~40Vdc
	48V input models	0~80Vdc

## Standard Recommended Circuit



### Plus Capacitance

Vout	CS	Cout
3.3V	22uF	22uF
5V	22uF	22uF
9V	10uF	10uF
12V	10uF	10uF
15V	4.7uF	4.7uF
24V	2.2uF	2.2uF

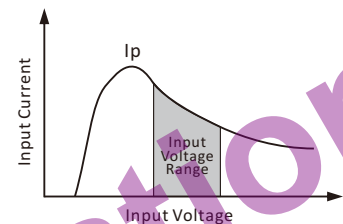
Input and output inductors are not required, if use, the recommended values 4.7-10uH

## Application Note

### 1. The power requirements

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 startup current of this kind of DC/DC module.

General:  $I_p < 1.6 I_{in-max}$ .



### 2. Input polarity protection

The series product no positive & negative reverse polarity protection, solution is the input series in a diode.

### 3. Plus capacitance

General application, press the typical recommended circuit external capacitor.

### 4. CS Pin

The terminal provides a connection DC / DC converter output filter capacitor inside the main connection point (the reference standard recommended circuits, capacitors positive), by 7 feet of the terminal and the terminal (anode connected capacitor) is indirectly a low ESR Capacitance can be further improved output ripple and noise values, the maximum capacity of not more than the value of 100uF.

### 5. CTRL Pin

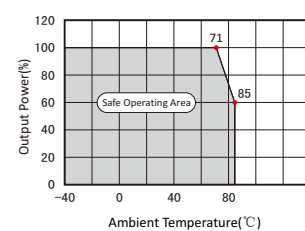
This pin provides an external control. When the pin is left floating or connected high-impedance (Z) the module is working properly, when this pin high when the module is closed. Use, please refer to the "standard recommended circuit", which sink on  $R \leq 10mA$ , R selection of the following formula:

$$R \geq \frac{VC - VD1 - 0.7}{10} (K\Omega)$$

### 6. On derating

When the environmental temperature exceeds 71°C the module must be derating use, please refer to derating curve.

### Temperature Derating Curve



7. This product cannot be used in parallel, can not hot-swappable.

# WB\_CS-1W5 & WF\_CS-1W5 Series

1.5w, wide input, isolated & regulated single output dc-dc converter



Product Program														
Model	Input		Output				Eff (%)	Certificate	Mechanical Dimensions First Angle Projection					
	Voltage(Vdc)		Voltage(Vdc)	Current(mA)		Ripple (mVp-p)								
	Nominal	Range	Nominal	Max	Min									
WB0505CS-1W5	5	4.5-9.0	5	300	30		72	<p>Weight: 4.2g</p>						
WB0509CS-1W5			9	167	17		73							
WB0512CS-1W5			12	125	13		77							
WB0515CS-1W5			15	100	10		78							
WB0524CS-1W5			24	63	7		75							
WB1205CS-1W5	12	9-18	5	300	30		74							
WB1209CS-1W5			9	167	17		75							
WB1212CS-1W5			12	125	13		79							
WB1215CS-1W5			15	100	10		80							
WB1224CS-1W5			24	63	7		77							
PWB2405CS-1W5	24	18-36 (9-36)	5	300	30		74							
PWB2409CS-1W5			9	167	17		75							
PWB2412CS-1W5			12	125	13		80							
PWB2415CS-1W5			15	100	10		80							
PWB2424CS-1W5			24	63	7		77							
PWB4805CS-1W5	48	36-72 (18-72)	5	300	30		74							
PWB4809CS-1W5			9	167	17		75							
PWB4812CS-1W5			12	125	13		80							
PWB4815CS-1W5			15	100	10		80							
PWB4824CS-1W5			24	63	7		77	Pin	1	2	3	5	6	7
							WB	GND	Vin	CTRL	NC	+Vo	-Vo	CS

WF0505CS-1W5	5	4.5-9.0	5	300	30		72	<p>Weight: 4.2g</p>						
WF0509CS-1W5			9	167	17		73							
WF0512CS-1W5			12	125	13		77							
WF0515CS-1W5			15	100	10		78							
WF0524CS-1W5			24	63	7		75							
WF1205CS-1W5	12	9-18	5	300	30		74							
WF1209CS-1W5			9	167	17		75							
WF1212CS-1W5			12	125	13		79							
WF1215CS-1W5			15	100	10		80							
WF1224CS-1W5			24	63	7		77							
PWF2405CS-1W5	24	18-36 (9-36)	5	300	30		74							
PWF2409CS-1W5			9	167	17		75							
PWF2412CS-1W5			12	125	13		80							
PWF2415CS-1W5			15	100	10		80							
PWF2424CS-1W5			24	63	7		77							
PWF4805CS-1W5	48	36-72 (18-72)	5	300	30		74							
PWF4809CS-1W5			9	167	17		75							
PWF4812CS-1W5			12	125	13		80							
PWF4815CS-1W5			15	100	10		80							
PWF4824CS-1W5			24	63	7		77	Pin	1	2	3	5	6	7
							WF	GND	Vin	CTRL	NC	+Vo	-Vo	CS

Note: The prefix "P" for 4:1 input range

# WA\_CS-1W5 & WE\_CS-1W5 Series

1.5w, wide input, isolated & regulated dual output dc-dc converter



## Product Program

Model	Input		Output				Eff (%)	Certificate	Mechanical Dimensions First Angle Projection															
	Voltage(Vdc)		Voltage(Vdc)	Current(mA)		Ripple (mVp-p)																		
	Nominal	Range	Nominal	Max	Min																			
WA0505CS-1W5	5	4.5-9.0	±5	±150	±15		72	<p>Weight: 4.2g</p>																
WA0509CS-1W5			±9	±83	±9		73																	
WA0512CS-1W5			±12	±63	±7		77																	
WA0515CS-1W5			±15	±50	±5		78																	
WA1205CS-1W5	12	9-18	±5	±150	±15		74																	
WA1209CS-1W5			±9	±83	±9		75																	
WA1212CS-1W5			±12	±63	±7		79																	
WA1215CS-1W5			±15	±50	±5		80																	
PWA2405CS-1W5	24	18-36 (9-36)	±5	±150	±15		75																	
PWA2409CS-1W5			±9	±83	±9		77																	
PWA2412CS-1W5			±12	±63	±7		82																	
PWA2415CS-1W5			±15	±50	±5		83																	
PWA4805CS-1W5	48	36-72 (18-72)	±5	±150	±15		75																	
PWA4809CS-1W5			±9	±83	±9		77																	
PWA4812CS-1W5			±12	±63	±7		82																	
PWA4815CS-1W5			±15	±50	±5		82																	
								<p>Isolation: 1500Vdc</p> <p>Note: all size units mm, diameter of all terminal 0.5mm, distance between all adjacent terminal 2.54mm</p> <table border="1"> <tr> <td>Pin</td> <td>1</td> <td>2</td> <td>3</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>WA</td> <td>GND</td> <td>Vin</td> <td>CTRL</td> <td>NC</td> <td>+Vo</td> <td>0V</td> <td>-Vo</td> </tr> </table>	Pin	1	2	3	5	6	7	8	WA	GND	Vin	CTRL	NC	+Vo	0V	-Vo
Pin	1	2	3	5	6	7	8																	
WA	GND	Vin	CTRL	NC	+Vo	0V	-Vo																	

WE0505CS-1W5	5	4.5-9.0	±5	±150	±15		72	<p>Weight: 4.2g</p>																
WE0509CS-1W5			±9	±83	±9		73																	
WE0512CS-1W5			±12	±63	±7		77																	
WE0515CS-1W5			±15	±50	±5		78																	
WE1205CS-1W5	12	9-18	±5	±150	±15		74																	
WE1209CS-1W5			±9	±83	±9		75																	
WE1212CS-1W5			±12	±63	±7		79																	
WE1215CS-1W5			±15	±50	±5		80																	
PWE2405CS-1W5	24	18-36 (9-36)	±5	±150	±15		75																	
PWE2409CS-1W5			±9	±83	±9		77																	
PWE2412CS-1W5			±12	±63	±7		82																	
PWE2415CS-1W5			±15	±50	±5		83																	
PWE4805CS-1W5	48	36-72 (18-72)	±5	±150	±15		75																	
PWE4809CS-1W5			±9	±83	±9		77																	
PWE4812CS-1W5			±12	±63	±7		82																	
PWE4815CS-1W5			±15	±50	±5		82																	
								<p>Isolation: 3000Vdc</p> <p>Note: all size units mm, diameter of all terminal 0.5mm, distance between all adjacent terminal 2.54mm</p> <table border="1"> <tr> <td>Pin</td> <td>1</td> <td>2</td> <td>3</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>WE</td> <td>GND</td> <td>Vin</td> <td>CTRL</td> <td>NC</td> <td>+Vo</td> <td>0V</td> <td>-Vo</td> </tr> </table>	Pin	1	2	3	5	6	7	8	WE	GND	Vin	CTRL	NC	+Vo	0V	-Vo
Pin	1	2	3	5	6	7	8																	
WE	GND	Vin	CTRL	NC	+Vo	0V	-Vo																	

Note: The prefix "P" for 4:1 input range



# WA\_CS-3W & WE\_CS-3W Series

3w, wide input, isolated & regulated dual output dc-dc converter



Product Program									
Model	Input		Output				Eff (%)	Certificate	Mechanical Dimensions First Angle Projection
	Voltage(Vdc)		Voltage(Vdc)	Current(mA)		Ripple (mVp-p)			
	Nominal	Range	Nominal	Max	Min				
WA1205CS-3W	12	9-18	±5	±300	±30		77	<p>Weight: 4.2g</p> <p>Isolation: 1500Vdc Note: all size units mm, diameter of all terminal 0.5mm, distance between all adjacent terminal 2.54mm</p>	
WA1209CS-3W			±9	±167	±17		77		
WA1212CS-3W			±12	±125	±13		79		
WA1215CS-3W			±15	±100	±10		80		
			±24	±63	±7		80		
PWA2405CS-3W	24	18-36 (9-36)	±5	±300	±30		77		
PWA2409CS-3W			±9	±167	±17		78		
PWA2412CS-3W			±12	±125	±13		82		
PWA2415CS-3W			±15	±100	±10		85		
			±24	±63	±7		85		
PWA4805CS-3W	48	36-72 (18-72)	±5	±300	±30		77		
PWA4809CS-3W			±9	±167	±17		78		
PWA4812CS-3W			±12	±125	±13		82		
PWA4815CS-3W			±15	±100	±10		84		
			±24	±63	±7		84		
Pin	1	2	3	5	6	7	8		
WA	GND	Vin	CTRL	NC	+Vo	0V	-Vo		

WE1205CS-3W	12	9-18	±5	±300	±30		77	<p>Weight: 4.2g</p> <p>Isolation: 3000Vdc Note: all size units mm, diameter of all terminal 0.5mm, distance between all adjacent terminal 2.54mm</p>
WE1209CS-3W			±9	±167	±17		77	
WE1212CS-3W			±12	±125	±13		79	
WE1215CS-3W			±15	±100	±10		80	
			±24	±63	±7		80	
PWE2405CS-3W	24	18-36 (9-36)	±5	±300	±30		77	
PWE2409CS-3W			±9	±167	±17		78	
PWE2412CS-3W			±12	±125	±13		82	
PWE2415CS-3W			±15	±100	±10		85	
			±24	±63	±7		85	
PWE4805CS-3W	48	36-72 (18-72)	±5	±300	±30		77	
PWE4809CS-3W			±9	±167	±17		78	
PWE4812CS-3W			±12	±125	±13		82	
PWE4815CS-3W			±15	±100	±10		84	
			±24	±63	±7		84	
Pin	1	2	3	5	6	7	8	
WE	GND	Vin	CTRL	NC	+Vo	0V	-Vo	

Note: The prefix "P" for 4:1 input range

# File Release Notes

DBN-401 Technical Data Sheet Version



No.	Version	Data	Description
1	V0	2011/11/01	First release
2			
3			
4			
5			

Delus Corporation

1. All data in addition to particular things, are Ta = 25°C, humidity<75%, nominal input voltage and output measured at rated load;  
2. Non-standard models with some of the following indicators may be different from the specific circumstances of the Secretary to direct contact with me;  
3. In the use of this manual, if some of them do not quite understand terms please refer to our <<DC / DC Converter Application Guide>>;  
4. The Company focused on technological improvements, product specifications and parameter updates without notice, to pay attention to the latest information on website: [www.delus.cn](http://www.delus.cn)

All Delus Corporation's products are manufactured, assembled and tested utilizing ISO9001 quality systems.  
For information regarding Delus Corporation and its products please see [www.delus.cn](http://www.delus.cn)