

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

## Data Sheet

#### 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

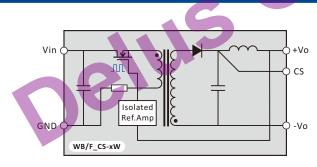
#### **General Description**

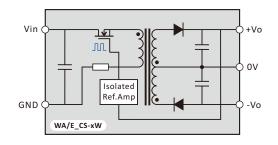
WA/B/E/F\_CS-1W5/3W series high power density, can help you save valuable board space. Wide input voltage range, low starting current, good load characteristics, and minimum noise characteristics.

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



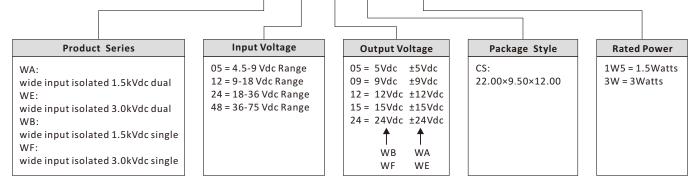
#### **Functional Diagram**





#### **Selection Guide**

## WB1205CS-1W5



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- All specifications are subject to change without notice

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

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



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

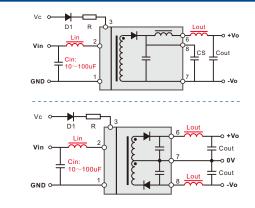
Output Sp	ecificatio	ons				
Item		Test Conditions	Min	Тур	Max	Units
Output	CS-1W5	Ta=-40-+71°C			1.5	14/
Power	CS-3W	1a40-+71C			3	vv
Line Regulati	on	100% load, input low to high		±0.1	±0.3	
Load Regulat	ion	Nominal, 10%-100% load		±0.3	±0.5	%
Output Voltag	ge Accuracy	Nominal, 100% load		±1	±3	
Temperature	Drift	Nominal, 100% load		1.5     W       ±0.1     ±0.3       ±0.3     ±0.5       ±1     ±3       0.03     %/°C	%/°C	
Ripple & Noi	se	DC-20MHz bandwidth		50	120	mVp-p
Switching Fre	equency	Nominal, 100% load	180		550	KHz
Short Circuit	Protection		Contin	uous, Aut	omatic Re	covery

Isolation	Specificat	tions				
Tested for 1S and 1mA m	Test Conditions	Min	Тур	Max	Units	
Isolation Re	sistance	Test at 500Vdc	1000			ΜΩ
Isolation	WA/WB	Tastad fan 10 an d 1m Amary	1500			Vdc
Isolation Voltage	WE/WF	Tested for 15 and 1mA max	3000			Vac
Isolation Ca	pacitance	100kHz/0.1Vdc		1000		рF
			7			

Common Specificat	tion				
Item	Test Conditions	Min	Тур	Max	Units
Operating Temperature	Ta>71°C Derating	-45		+85	
Maximum Case Temp.			70		°C
Storage Temperature		-50		+130	C
Lead Temperature	1.5mm from case for 10 seconds			+300	
Storage Humidity				95	%
Case Material		В	lack Plasti	c (UL94V-	0)

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

#### **Standard Recommended Circuit**



	Plu	s Capaci	tance
V	out	CS	Cout
-			

vout	0.5	cour
3.3V	22uF	22uF
5V	22uF	22uF
9V	10uF	10uF
12V	10uF	10uF
15V	4.7uF	4.7uF
24V	2.2uF	2.2uF

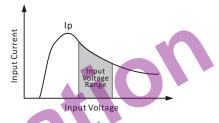
Input and output inductors are not required, if use, the recommended values 4.7-10uH

#### **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: lp < 1.6lin-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

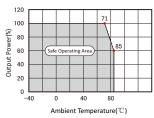
This pin provides an external control. When the pin is left floating or connected highimpedance (Z) the module is working properly, when this pin high when the module is closed. Use, please refer to the "standard recommended circuit ", which sink on  $R\!\leqslant\!10mA,$  R selection of the following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

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

#### 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

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Product Progra	m															
	In	put		Outp	ut		Eff									
Model	Volta	ge(Vdc)	Voltage(Vdc) Current(mA)		nt(mA)	Ripple	(%)	Certificate	Mechanical Dimensions							€
	Nominal	Range	Nominal	Max	Min	(mVp-p)	(,,,)					,			· · · ·	
WB0505CS-1W5			5	300	30		72							V	Veight	:4.2g
WB0509CS-1W5			9	167	17		73									
WB0512CS-1W5	5	4.5-9.0	12	125	13		77									
WB0515CS-1W5			15	100	10		78									
WB0524CS-1W5			24	63	7		75			22.00				0.50		
WB1205CS-1W5			5	300	30		74		-				╡	/	9.50	
WB1209CS-1W5			9	167	17		75			🕩	DEL	-US				
WB1212CS-1W5	12	9-18	12	125	13		79		12.00	<b> </b> • v	VBxxxx	CS-1W5				
WB1215CS-1W5			15	100	10		80		4.1	╘┕┰╶┨		ИŤ	-1			
WB1224CS-1W5			24	63	7		77		~	上 I 2	3	5678				
PWB2405CS-1W5			5	300	30		74			1-	×2.54=	17.78			2.5	
PWB2409CS-1W5		10.20	9	167	17		75									
PWB2412CS-1W5	24	18-36 (9-36)	12	125	13		80									
PWB2415CS-1W5		(3 3 3 7)	15	100	10		80									
PWB2424CS-1W5			24	63	7		77				a: 1500Vdc					
PWB4805CS-1W5			5	300	30		- 74						liamet	erofa	llterm	inal
PWB4809CS-1W5		26 72	9	167	17		75			0.5m	m, dis	tance b				
PWB4812CS-1W5	48	36-72 (18-72)	12	125	13		80			olation: 1500Vdc ote: all size units mm, diameter of all terminal 0.5mm, distance between all adjacent terminal 2.54mm						
PWB4815CS-1W5		(10 / 2)	15	100	10		80		Pin	1	2	3	5	6	7	8
PWB4824CS-1W5			24	63	7		77		WB	GND	Vin	CTRL	NC	+Vo	-Vo	CS

WF0505CS-1W5     5     300     30     72						
				V	Veight	:4.2g
<b>WF0509CS-1W5</b> 9 167 17 73						
WF0512CS-1W5     5     4.5-9.0     12     125     13     77						
<b>WF0515CS-1W5</b> 15 100 10 78						
WF0524CS-1W5     24     63     7     75						
WF1205CS-1W5     5     300     30     74     22.00		╡	·	,	9.50	$\uparrow$
WF1209CS-1W5     9     167     17     75	.US					
WF1212CS-1W5     12     9-18     12     125     13     79     12.00     • <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						
WF1215CS-1W5     15     100     10     80	ТП	т <sup>ј</sup>			<u> </u>	
	678	8				
PWF2405CS-1W5     5     300     30     74	17.78	ł		,	2.5	
PWF2409CS-1W5     9     167     17     75						
PWF2412CS-1W5     24     18-36 (9-36)     12     125     13     80						
PWF2415CS-1W5     15     100     10     80						
PWF2424CS-1W5     24     63     7     77	л. –					
PWF4805CS-1W5     5     300     30     74     Isolation: 3000Vc Note: all size units		dia	amet	erofa	ll term	ninal
PWF4809CS-1W5 9 167 17 75 0.5mm, dist	,					
PWF4812CS-1W5     48     36-72 (18-72)     12     125     13     80     terminal 2.5	54mm	1				
PWF4815CS-1W5     15     100     10     80     Pin     1     2	3		5	6	7	8
PWF4824CS-1W5     24     63     7     77     WF     GND     Vin	CTRL	- 1	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

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	In	put		ut												
Model	Voltage(Vdc)		Voltage(Vdc)	Voltage(Vdc) Current(mA)		Ripple	Eff (%)	Certificate	Mechanical Dimensions First Angle Projection							}
	Nominal	Range	Nominal	Max	Min	(mVp-p)	()0)				.8.0.					
WA0505CS-1W5			±5	±150	±15		72							V	Veight	4.2
WA0509CS-1W5			±9	±83	±9		73		]							
WA0512CS-1W5	5	4.5-9.0	±12	±63	±7		77									
WA0515CS-1W5			±15	±50	±5		78									
											22.0	•			0.50	
WA1205CS-1W5			±5	±150	±15		74		_				*	/	9.50	
WA1209CS-1W5			±9	±83	±9		75		10.00		DEL	.US				
WA1212CS-1W5	12	9-18	±12	±63	±7		79		12.00		VAxxxx	CS-1W5				
WA1215CS-1W5			±15	±50	±5		80		4.1	רוי⁺			-1			
									-	∎ <u>ا</u>	3 5	678				
WA2405CS-1W5			±5	±150	±15		75			ł	×2.54=	17.78			2.5	
WA2409CS-1W5		18-36	±9	±83	±9		77									
WA2412CS-1W5	24	(9-36)	±12	±63	±7		82									
WA2415CS-1W5			±15	±50	±5		83									
									Isola	tion	5001	dc				
WA4805CS-1W5			±5	±150	±15		75		Isolation: 1500Vdc Note: all size units mm, diameter of all termina						inal	
WA4809CS-1W5		36-72	±9	±83	±9		77		0.5mm, distance between all adjacent terminal 2.54mm							
WA4812CS-1W5	48	(18-72)	±12	±63	±7		82									
WA4815CS-1W5		. ,	±15	±50	±5		82		Pin	1	2	3	5	6	7	8
									WA	GND	Vin	CTRL	NC	+Vo	0V	-Vo

WE0505CS-1W5			±5	±150	±15	72						V	/eight:	:4.2g			
WE0509CS-1W5			±9	±83	±9	73											
WE0512CS-1W5	5	4.5-9.0	±12	±63	±7	77											
WE0515CS-1W5							±15	±50	±5	78							
													0.50				
WE1205CS-1W5			±5	±150	±15	74			22.0		$\frac{1}{1}$		, 9.50	4			
WE1209CS-1W5			±9	±83	±9	75			DEL	.US							
WE1212CS-1W5	12	9-18	±12	±63	±7	79	12.00		NExxxx	CS-1W5							
WE1215CS-1W5			±15	±50	±5	80	4.1	רויץ		ПП	-J						
									3	5678							
PWE2405CS-1W5			±5	±150	±15	75		<u>∤</u>	7×2.54=	17.78	/		2.5				
PWE2409CS-1W5		10.20	±9	±83	±9	77											
PWE2412CS-1W5	24	18-36 (9-36)	±12	±63	±7	82											
PWE2415CS-1W5		(5 5 5 7)	±15	±50	±5	83											
PWE4805CS-1W5			±5	±150	±15	75		tion: i		dc s mm, c	liamet	erofa	ll term	inal			
PWE4809CS-1W5		26 72	±9	±83	±9	77				tance b							
PWE4812CS-1W5	48	36-72 (18-72)	±12	±63	±7	82		term	inal 2.	54mm							
PWE4815CS-1W5		(10 / 2)	±15	±50	±5	82	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

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## WB\_CS-3W & WF\_CS-3W Series

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

	In	put		Outp	ut												
Model	Volta	ge(Vdc)	Voltage(Vdc)	Curren	nt(mA)	Ripple	Eff (%)	Certificate			cal Dimer		ŧ	∃ €	}		
	Nominal	Range	Nominal	Max	Min	(mVp-p)	(///		First Angle Projection								
WB1205CS-3W			5	600	60		77						W	/eight:	4.2		
WB1209CS-3W			9	333	34		77										
WB1212CS-3W	12	9-18	12	250	25		79										
WB1215CS-3W			15	200	20		80										
WB1224CS-3W			24	125	13		80										
PWB2405CS-3W			5	600	60		77		_		22.00	$ \rightarrow$	/	, 9.50	7		
PWB2409CS-3W		18-36 (9-36)	9	333	34		78		12.00 • WBxxxxCS-3W								
PWB2412CS-3W	24		12	250	25		82										
PWB2415CS-3W		(0.00)	15	200	20		85			T <sup>1</sup>							
PWB2424CS-3W			24	125	13		85					8					
PWB4805CS-3W			5	600	60		77			1 7×2	2.54=17.78	×		2.5			
PWB4809CS-3W		26 72	9	333	34		78										
PWB4812CS-3W	48	36-72 (18-72)	12	250	25		82										
PWB4815CS-3W		(10 / 1)	15	200	20		84										
PWB4824CS-3W			24	125	13		84				0014						
										ation: 15 atisize	UUVdc units mm	diame	terofa	ll term	inal		
										djacent							
										termin	al 2.54mn	۱					
									Pin	1	2 3	5	6	7	8		
									WB	GND \	Vin CTR	L NC	+Vo	-Vo	C:		

WF1205CS-3W   WF1209CS-3W   P   S   G00   G0   75   Metric (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0																		
WF1212CS-3W   12   9-18   12   25   78   III     WF1215CS-3W   III   15   200   20   78   IIII     PWF240SCS-3W   IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	WF1205CS-3W			5	600	60	75						V	/eight:	:4.2g			
WF1215CS-3W   15   200   20   78   10     WF1224CS-3W   24   125   13   78   11     PWF2405CS-3W   24   125   13   78   11     PWF2405CS-3W   24   25   600   60   77   11     PWF2405CS-3W   24   12   250   25   79   11	WF1209CS-3W			9	333	34	77											
WF1224CS-3W   24   125   13   78     PWF2405CS-3W   PWF2405CS-3W   9   333   34   77   0     PWF2405CS-3W   PWF2412CS-3W   9   333   34   77   0     PWF2412CS-3W   PWF2415CS-3W   9   333   34   77   0     PWF2424CS-3W   PWF2424CS-3W   15   200   20   80   0   0   1   0	WF1212CS-3W	12	9-18	12	250	25	78											
PWF2405CS-3W PWF2409CS-3W PWF2412CS-3W PWF2412CS-3W PWF2412CS-3W PWF2412CS-3W PWF2424CS-3W PWF4805CS-3W PWF4805CS-3W PWF4805CS-3W PWF4805CS-3W PWF4815CS-3W     4.1     2.00     2.0     80       1     2     2.00     2.0     80	WF1215CS-3W						15	200	20	78								
PWF2405CS-3W   PWF2409CS-3W     PWF2409CS-3W   PWF2412CS-3W     PWF2412CS-3W   24     PWF2415CS-3W   12   250   25   79     PWF2424CS-3W   15   200   20   80   12   10	WF1224CS-3W			24	125	13	78							0.50				
18-36 (9-36)   24   18-36 (9-36)   12   250   25   79   10     PWF2412CS-3W PWF2424CS-3W   12   250   25   79   10   14   120	PWF2405CS-3W			5	600	60	77											
PWF2412CS-3W   24   (9-36)   12   250   25   79   Mail and the second	PWF2409CS-3W		10.20	9	333	34	77											
PWF2415CS-3W   Indiana   Indiana </th <th>PWF2412CS-3W</th> <th>24</th> <th></th> <th>12</th> <th>250</th> <th>25</th> <th>79</th> <th>12.00</th> <th></th> <th></th>	PWF2412CS-3W	24		12	250	25	79	12.00										
PWF2424CS-3W     Constrained by the second	PWF2415CS-3W			15	200	20	80	4.1	҂ <sup>ь</sup> тт		-1							
PWF4809CS-3W   9   333   34   78     PWF4812CS-3W   9   333   34   78     PWF4815CS-3W   12   250   25   82     PWF4824CS-3W   15   200   20   84     Image: Second Seco	PWF2424CS-3W			24	125	13	80		⊬╹╹									
PWF4812CS-3W     48     36-72 (18-72)     12     250     25     82     Image: Constraint of the state of the sta	PWF4805CS-3W			5	600	60	77		¥-,	'×2.54=	17.78	/	/	- 2.5				
PWF4812CS-3W     48     (18-72)     12     250     25     82       PWF4815CS-3W     15     200     20     84	PWF4809CS-3W		26.72	9	333	34	78											
PWF4815CS-3W     15     200     20     84     Image: Constraint of the second seco	PWF4812CS-3W	48		12	250	25	82											
Image: state	PWF4815CS-3W		(10 / 2)	15	200	20	84											
Image: Second	PWF4824CS-3W			24	125	13	84											
Image: state												diamet	erofa	ll termi	inal			
								0.5mm, distance between all adjacent										
									term	inal 2.	54mm							
Pin 1 2 3 5 6 7 8								Pin	1	2	3	5	6	7	8			
Image: Constraint of the second sec								WF	GND	Vin	CTRL	NC	+Vo	-Vo	CS			

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

	In	put		Outp	ut		Eff												
Model	Voltage(Vdc)		Voltage(Vdc)	Currer	nt(mA)	Ripple	Eff (%)	Certificate	Mechanical Dimensions First Angle Projection							<i>b</i>			
	Nominal	Range	Nominal	Max	Min	(mVp-p)	(70)												
WA1205CS-3W						±5	±300	±30		77							N	/eight:	4.2
WA1209CS-3W			±9	±167	±17		77												
WA1212CS-3W	12	9-18	±12	±125	±13		79												
WA1215CS-3W			±15	±100	±10		80		-										
			±24	±63	±7		80					_							
PWA2405CS-3W			±5	±300	±30		77		_		22.0		ł		, 9.50	4			
PWA2409CS-3W		18-36 (9-36)	±9	±167	±17		78												
PWA2412CS-3W	24		±12	±125	±13		82		12.00	• WAxxxxCS-3W									
PWA2415CS-3W			±15	±100	±10		85		4.1	4.1 4.1		-1							
			±24	±63	±7		85												
PWA4805CS-3W			±5	±300	±30		77		7×2.54=17.78			17.78			<2.5 →				
PWA4809CS-3W		26 72	±9	±167	±17		78												
PWA4812CS-3W	48	36-72 (18-72)	±12	±125	±13		82												
PWA4815CS-3W		(10 / 2)	±15	±100	±10		84												
			±24	±63	±7		84												
									Isolation: 1500Vdc Note: all size units mm, diameter of all te										
									0.5mm, distance between all adjace										
										term	inal 2.	54mm							
									Pin	1	2	3	5	6	7	8			
									WA	GND	Vin	CTRL	NC	+Vo	0V	-Vo			

WE1205CS-3W			±5	±300	±30	77						N	/eight:	:4.2g		
WE1209CS-3W			±9	±167	±17	77										
WE1212CS-3W	12	9-18	±12	±125	±13	79										
WE1215CS-3W					±15	±100	±10	80								
			±24	±63	±7	80			22.0	0			0.50			
PWE2405CS-3W			±5	±300	±30	77				9.50						
PWE2409CS-3W		18-36	±9	±167	±17	78										
PWE2412CS-3W	24	(9-36)	±12	±125	±13	82	12.00									
PWE2415CS-3W		()	±15	±100	±10	85	4.1	҂ <sup>ь</sup> тт			-J					
			±24	±63	±7	85	-,	⊬∎∎	3 5							
PWE4805CS-3W			±5	±300	±30	77		17	×2.54=	17.78	/	1	✓ 2.5			
PWE4809CS-3W		36-72	±9	±167	±17	78										
PWE4812CS-3W	48	(18-72)	±12	±125	±13	82										
PWE4815CS-3W		(10 / 2)	±15	±100	±10	84										
			±24	±63	±7	84	11			а.						
								a <mark>tion:</mark> 3 e: all siz			diamet	erofa	ll term	inal		
								0.5m	m, dis	tance b						
								termi	nal 2.	54mm						
							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			

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All data in addition to particular things, are Ta = 25°C, humidity<75%, nominal input voltage and output measured at rated load;</li>
Non-standard models with some of the following indicators may be different from the specific circumstances of the Secretary to direct contact with me;
In the use of this manual, if some of them do not quite understand terms please refer to our <<DC / DC Converter Application Guide>>;
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

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