

## Features

- ◆ Operating temperature: -40 to +85°C
- ◆ 4.5-9/9-18/18-36/36-75/9-36/18-75Vdc input
- ◆ 5V/9V/12V/15V/24V/±5V/±9V/±12V/±15V output
- ◆ Efficiency up to 89%
- ◆ Ultra-low noise & ripple
- ◆ Bare module meet CISPR22/EN55022 Class B
- ◆ 100% burn-In
- ◆ No external heat sink
- ◆ Continuous short circuit protection
- ◆ RoHS/CE multiple compliance
- ◆ With 3 years warranty
- ◆ Case size 31.8×20.3×11.5mm

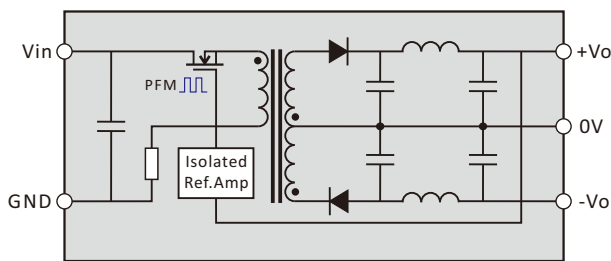
## General Description

W(M)-3W series power converter compact, high power density, can save valuable board space to reduce product volume. It has the characteristics of wide input voltage range, low starting current, good load characteristics and minimum noise characteristics.

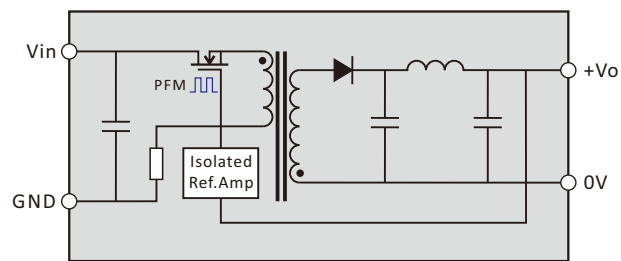
The chip ceramic capacitors and SMT are used in all series. These converters have characteristics of long life, excellent performance, stability and reliability.



## Functional Diagram



Dual Series



Single Series

## EMC Solution-Recommended Circuit

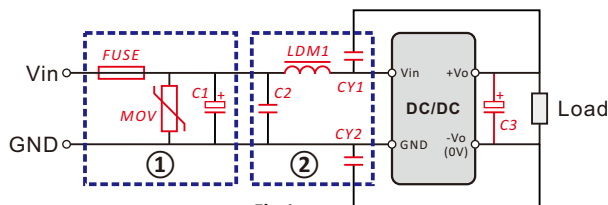


Fig.1

### Notes:

Part ① in the Fig.1 is used for EMS test and part ② for EMI filtering; selected based on needs.

### Parameter Description

Model	Vin:5V	Vin:12V	Vin:24V	Vin:48V
FUSE	Choose according to actual input current			
MOV	S14K11	S14K17	S14K35	S14K60
C1	1000uF/16V	680uF/25V	330uF/50V	330uF/100V
C2	1uF/25V	1uF/25V	1uF/50V	1uF/100V
CY1/CY2	1nF/2kV or 4.5kV			
LDM1	4.7uH			
C3	Refer to the Cout in Fig.3			

# W\_P-3W & M\_D-3W & W\_KP-3W Series

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



Input Specifications					
Item		Min	Typ	Max	Units
Input Impulse Voltage (1 sec max)	5V input models	-0.7		10	Vdc
	12V input models	-0.7		20	
	24V input models	-0.7		40	
	48V input models	-0.7		80	
Startup Voltage	5V input models			4.5	Vdc
	12V input models			9	
	24V input models			18	
	48V input models			36	
Startup Current @ 100% load, nominal input		<1.6 lin-max.			
Input Filter		"LC" filter			
Input Polarity Protection		KP series available/others no			

Output Specifications					
Item	Test Conditions	Min	Typ	Max	Units
Output Power	Ta=-40-+85°C			3	W
Line Regulation	100% load, input low to high		±0.05	±0.15	%
Load Regulation	10-100% load, nominal input		±0.1	±0.3	
Output Voltage Accuracy	100% load, nominal input	Master	±1	±3	
		Slave	±3	±5	
Balance of Vout	Dual output, balance load		±0.8	±2	mVp-p
Ripple & Noise	DC-20MHz bandwidth		20	60	
Temperature Drift	100% load, nominal input			±0.03	%/°C
Short Circuit Protection	Continuous, Self-Recovery				
Output Filter	"Π" filter				

Isolation Specifications					
Item	Test Conditions	Min	Typ	Max	Units
Isolation Voltage	W(M)A/B/D	1500			Vdc
	WE/F	3000			
Insulation Resistance	Test at 500Vdc	1000			MΩ
Isolation Capacitance	IN-OUT, 100kHz @ 0.1Vdc		1000		pF

Common Specification					
Item	Test Conditions	Min	Typ	Max	Units
Switching Frequency	100% load, input low to high	180		550	kHz
Operating Temperature	Ta>70°C derating	-45		+85	°C
Case Temp Rise	100% load, nominal input		35		
Lead Temperature	1.5mm from case for 10 seconds			+300	
Storage Temperature		-50		+130	
Storage Humidity				95	%
MTBF	Using MIL-HDBK 217 @ 25°C	1000			k hours
Hot Plug	Unavailable				
Case Material	Black Plastic (UL94V-0)				

EMC Specification			
EMI	CE	EN55022:2010	Class B ( Bare component )
	RE	EN55022:2010	Class B ( Bare component )
EMS	ESD	EN55024:2010/EN61000-4-2	perf. Criterion B
	RS	EN55024:2010/EN61000-4-3	perf. Criterion A

## 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 ( see Fig.2 ).

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

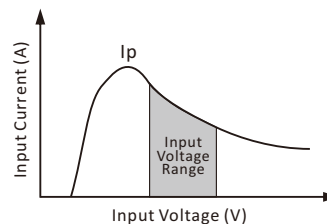


Fig.2

### 2. Typical application

All DC/DC converters of this series are tested according to the recommended circuit before delivery (see Fig.3, but without external capacitor  $C_{in}$  &  $C_{out}$ ).

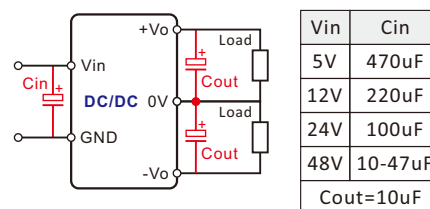


Fig.3

General applications, the **output** does not require any external filter components. If the required to further reduce input and output ripple, properly increase the input and output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance. Provided that the capacitance is no larger than the max capacitive load of the product, **avoid affect the product startup performance**.

### 3. EMC solution-recommended circuit

The WA/B/D/MA/B series products have a very good ripple and noise performance that bare module meet the EN55022 Class B.

The WE and WF series products, recommend Fig.1 for the EMC solution that meet the EN55022 Class B ( see Fig.1 ).

### 4. On derating

When the environmental temperature exceeds 70°C the module must be derating used, please refer to derating curve ( see Fig.4 ).

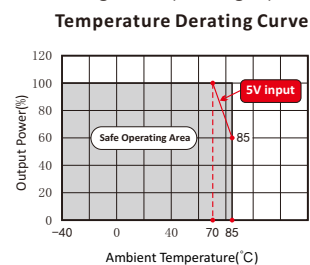


Fig.4

# WA\_P-3W & WB\_P-3W Series

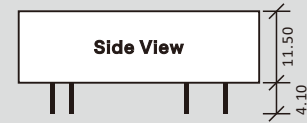
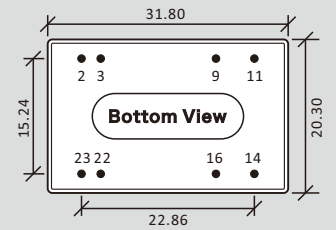
3w, wide input, 1500Vdc isolated & regulated dual/single output dc-dc converter



Product Program							
Certificate	Model	Eff (%)	Input		Output		
			Voltage(Vdc)		Vdc	mA	Max Capacitive Load (uF)
			Nominal	Range	Nominal	Max	
CE/RoHS	WA0505P-3W	75	5	4.5-9	±5	±300	
	WA0509P-3W	77			±9	±167	
	WA0512P-3W	78			±12	±125	
	WA0515P-3W	79			±15	±100	
	WA0524P-3W	75			±24	±63	
CE/RoHS	WA1205P-3W	82	12	9-18	±5	±300	
	WA1209P-3W	84			±9	±167	
	WA1212P-3W	86			±12	±125	
	WA1215P-3W	87			±15	±100	
	WA1224P-3W	82			±24	±63	
CE/RoHS	PWA2405P-3W	85	24	18-36 (9-36)	±5	±300	
	PWA2409P-3W	85			±9	±167	
	PWA2412P-3W	85			±12	±125	
	PWA2415P-3W	89			±15	±100	
	PWA2424P-3W	84			±24	±63	
CE/RoHS	PWA4805P-3W	82	48	36-75 (18-75)	±5	±300	
	PWA4809P-3W	84			±9	±167	
	PWA4812P-3W	89			±12	±125	
	PWA4815P-3W	86			±15	±100	
	PWA4824P-3W	84			±24	±63	
CE/RoHS	WB0505P-3W	74	5	4.5-9	5	600	
	WB0509P-3W	78			9	333	
	WB0512P-3W	79			12	250	
	WB0515P-3W	79			15	200	
	WB0524P-3W	77			24	125	
CE/RoHS	WB1205P-3W	82	12	9-18	5	600	
	WB1209P-3W	82			9	333	
	WB1212P-3W	85			12	250	
	WB1215P-3W	87			15	200	
	WB1224P-3W	85			24	125	
CE/RoHS	PWB2405P-3W	83	24	18-36 (9-36)	5	600	
	PWB2409P-3W	86			9	333	
	PWB2412P-3W	88			12	250	
	PWB2415P-3W	89			15	200	
	PWB2424P-3W	86			24	125	
CE/RoHS	PWB4805P-3W	85	48	36-75 (18-75)	5	600	
	PWB4809P-3W	85			9	333	
	PWB4812P-3W	89			12	250	
	PWB4815P-3W	86			15	200	
	PWB4824P-3W	84			24	125	

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

## Dimensions First Angle Proj



Pin	Single	Dual
2,3	GND	GND
22,23	Vin	Vin
9	NC	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V

**Note:**

All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
**Isolation: 1500Vdc**  
**Weight: 11g**

# WD\_P-3W Series

3w, wide input, 1500Vdc isolated & regulated twins output dc-dc converter



Product Program							
Certificate	Model	Eff (%)	Input		Output		
			Voltage(Vdc)		Vdc	mA	Max Capacitive Load (uF)
			Nominal	Range	Nominal	Max	
RoHS	WD0505P-3W	75	5	4.5-9	5/5	300/300	
	WD0512P-3W	78			12/12	125/125	
	WD0515P-3W	79			15/15	100/100	
	WD0524P-3W	75			24/24	63/63	
RoHS	WD1205P-3W	82	12	9-18	5/5	300/300	
	WD126v5P-3W	82			6.5/6.5	230/230	
	WD1212P-3W	86			12/12	125/125	
	WD1215P-3W	87			15/15	100/100	
	WD1224P-3W	82			24/24	63/63	
RoHS	WD2405P-3W	85	24	18-36	5/5	300/300	
	WD2412P-3W	85			12/12	125/125	
	WD2415P-3W	89			15/15	100/100	
	WD2424P-3W	84			24/24	63/63	
RoHS	WD4805P-3W	82	48	36-75	5/5	300/300	
	WD4812P-3W	89			12/12	125/125	
	WD4815P-3W	86			15/15	100/100	
	WD4824P-3W	84			24/24	63/63	

**Dimensions** First Angle Proj

22,23	2,3	16	14	9	11
Vin	GND	OV1	+Vo1	OV2	+Vo2

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
**Isolation: 1500Vdc**  
**Weight: 11g**

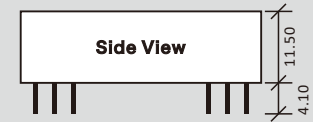
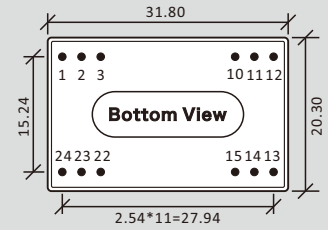
# MA\_D-3W & MB\_D-3W Series

3w, wide input, 1500Vdc isolated & regulated dual/single output dc-dc converter



Product Program							
Certificate	Model	Eff (%)	Input		Output		
			Voltage(Vdc)		Vdc	mA	Max Capacitive Load (uF)
			Nominal	Range	Nominal	Max	
RoHS	MA0505D-3W	75	5	4.5-9	±5	±300	
	MA0512D-3W	78			±12	±125	
	MA0515D-3W	79			±15	±100	
RoHS	MA1205D-3W	82	12	9-18	±5	±300	
	MA1212D-3W	86			±12	±125	
	MA1215D-3W	87			±15	±100	
RoHS	MA2405D-3W	85	24	18-36	±5	±300	
	MA2412D-3W	85			±12	±125	
	MA2415D-3W	89			±15	±100	
RoHS	MA4805D-3W	83	48	36-75	±5	±300	
	MA4812D-3W	89			±12	±125	
	MA4815D-3W	86			±15	±100	
RoHS	MB0505D-3W	74	5	4.5-9	5	600	
	MB0512D-3W	79			12	250	
	MB0515D-3W	79			15	200	
	MB0524D-3W	77			24	125	
RoHS	MB1205D-3W	82	12	9-18	5	600	
	MB1212D-3W	85			12	250	
	MB1215D-3W	87			15	200	
	MB1224D-3W	85			24	125	
RoHS	MB2405D-3W	83	24	18-36	5	600	
	MB2412D-3W	87			12	250	
	MB2415D-3W	89			15	200	
	MB2424D-3W	86			24	125	
RoHS	MB4805D-3W	85	48	36-75	5	600	
	MB4812D-3W	89			12	250	
	MB4815D-3W	86			15	200	
	MB4824D-3W	85			24	125	

## Dimensions First Angle Proj



Pin	Single	Dual
1,24	Vin	Vin
12,13	GND	GND
2,23	no Pin	-Vo
3,22	no Pin	0V
10,15	0V	0V
11,14	+Vo	+Vo

**Note:**

All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
**Isolation: 1500Vdc**  
**Weight: 11g**

# WE\_P-3W & WF\_P-3W Series

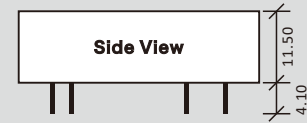
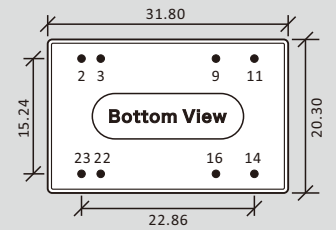
3w, wide input, 3000Vdc isolated & regulated dual/single output dc-dc converter



Product Program							
Certificate	Model	Eff (%)	Input		Output		
			Voltage(Vdc)		Vdc	mA	Max Capacitive Load (uF)
			Nominal	Range	Nominal	Max	
CE/RoHS	WE0505P-3W	75	5	4.5-9	±5	±300	
	WE0509P-3W	77			±9	±167	
	WE0512P-3W	78			±12	±125	
	WE0515P-3W	79			±15	±100	
	WE0524P-3W	75			±24	±63	
CE/RoHS	WE1205P-3W	82	12	9-18	±5	±300	
	WE1209P-3W	84			±9	±167	
	WE1212P-3W	86			±12	±125	
	WE1215P-3W	87			±15	±100	
	WE1224P-3W	82			±24	±63	
CE/RoHS	PWE2405P-3W	85	24	18-36 (9-36)	±5	±300	
	PWE2409P-3W	85			±9	±167	
	PWE2412P-3W	85			±12	±125	
	PWE2415P-3W	89			±15	±100	
	PWE2424P-3W	84			±24	±63	
CE/RoHS	PWE4805P-3W	82	48	36-75 (18-75)	±5	±300	
	PWE4809P-3W	84			±9	±167	
	PWE4812P-3W	89			±12	±125	
	PWE4815P-3W	86			±15	±100	
	PWE4824P-3W	84			±24	±63	
CE/RoHS	WF0505P-3W	74	5	4.5-9	5	600	
	WF0509P-3W	78			9	333	
	WF0512P-3W	79			12	250	
	WF0515P-3W	79			15	200	
	WF0524P-3W	77			24	125	
CE/RoHS	WF1205P-3W	82	12	9-18	5	600	
	WF1209P-3W	82			9	333	
	WF1212P-3W	85			12	250	
	WF1215P-3W	87			15	200	
	WF1224P-3W	85			24	125	
CE/RoHS	PWF2405P-3W	83	24	18-36 (9-36)	5	600	
	PWF2409P-3W	86			9	333	
	PWF2412P-3W	88			12	250	
	PWF2415P-3W	89			15	200	
	PWF2424P-3W	86			24	125	
CE/RoHS	PWF4805P-3W	85	48	36-75 (18-75)	5	600	
	PWF4809P-3W	85			9	333	
	PWF4812P-3W	89			12	250	
	PWF4815P-3W	86			15	200	
	PWF4824P-3W	84			24	125	

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

## Dimensions First Angle Proj



Pin	Single	Dual
2,3	GND	GND
22,23	Vin	Vin
9	NC	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V

**Note:**

All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
**Isolation: 3000Vdc**  
**Weight: 11g**

# WB\_KP-3W Series

3w, wide input, 1500Vdc isolated & regulated single output dc-dc converter



Product Program							
Certificate	Model	Eff (%)	Input		Output		
			Voltage(Vdc)		Vdc	mA	Max Capacitive Load (uF)
			Nominal	Range	Nominal	Max	
RoHS	WB0505KP-3W*		5	4.5-9	5	600	
	WB0512KP-3W*				12	250	
	WB0515KP-3W*				15	200	
	WB0524KP-3W*				24	125	
RoHS	WB1205KP-3W*		12	9-18	5	600	
	WB1212KP-3W*				12	250	
	WB1215KP-3W*				15	200	
	WB1224KP-3W*				24	125	
RoHS	WB2405KP-3W*		24	18-36	5	600	
	WB2412KP-3W*				12	250	
	WB2415KP-3W*				15	200	
	WB2424KP-3W*				24	125	
RoHS	PWB4805KP-3W	83	48	36-75	5	600	
	WB4812KP-3W*				12	250	
	WB4815KP-3W*				15	200	
	WB4824KP-3W*				24	125	

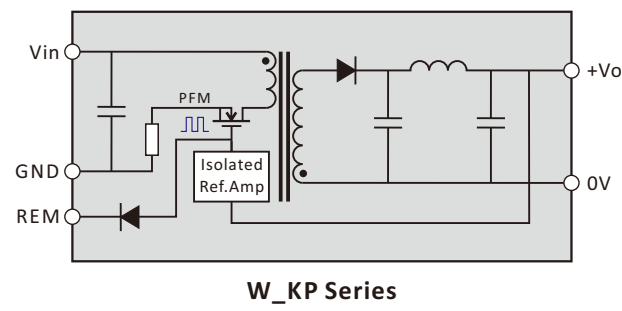
Note: The prefix "P" for 4:1 input range, \* for no product

**Dimensions** First Angle Proj

24,23	1,2	13	12	20
GND	Vin	+Vo	0V	REM

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
**Isolation: 1500Vdc**  
**Weight: 11g**

## Functional Diagram for KP Series



### Application Note for KP

- 1. Input Polarity Protection**  
 KP series dc/dc converter built-in reverse polarity protection diodes, with anti-reverse protection.
- 2. REM Pin**  
 This pin provides an external control function. Module operating normally when the pin is left open when the pin is tied low module is turned off.

# File Release Notes

DBN-403 Technical Data Sheet Version



No.	Version	Date	Description
1	V0	2011/11/01	First release
2	V1	2014/01/08	Increase "KP" series and "PWB4805KP-3W" model
3	A/0	2016/07/01	Fixed some wrong
4			
5			

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.

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

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