

## Features

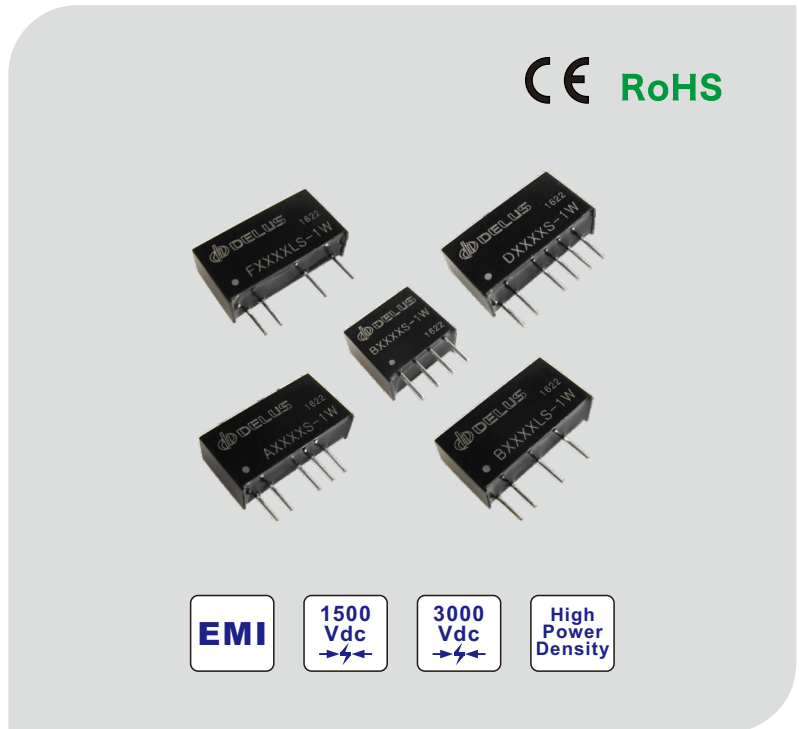
- ◆ Operating temperature: -40 to +85°C
- ◆ Efficiency up to 84%
- ◆ 1.5/3.0kVdc isolation
- ◆ Multiple package options
- ◆ International standard pin-out
- ◆ 100% burn-in
- ◆ No external component required
- ◆ UL94V-0 package
- ◆ RoHS/CE compliance
- ◆ With 3 year warranty

## General Description

The 1W series products are specially designed for the application of the power supply which is isolated from the input source in the distributed power supply system on the circuit board. Small size, high power density, can save valuable board space.

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

Suitable for occasions where the input power supply is relatively stable, input and output isolated is necessary and the output voltage regulation is not strictly required.



## EMC Solution-Recommended Circuit

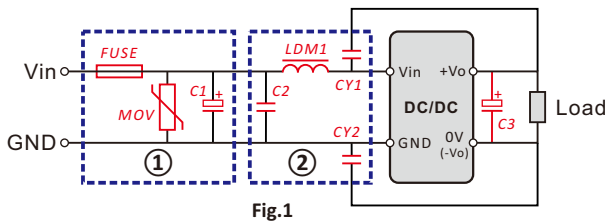


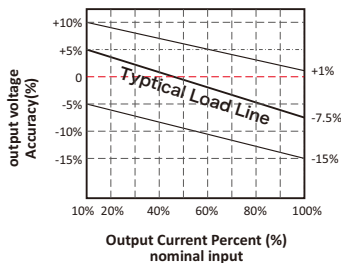
Fig.1

Note: Part ① is the recommended external circuit for EMS test and Part ② for EMI filtering. Choose according to requirements.

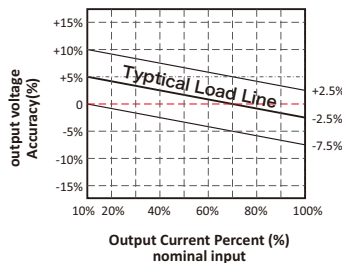
Parameter Description			
Vin	3.3V/5V/9V	12V/15V/24V	48V
C2	4.7uF/50V		2.2uF/100V
LDM1	6.8uH		
CY1	-		
CY2	1nF/2kV or 4.5kV		
C3	Choose according fig.3		
If there is no recommended parameters, no external component is required.			

## Typical Characteristic Curve

Tolerance Envelope Graph (3.3V)



Tolerance Envelope Graph (other)



Temperature Derating Curve

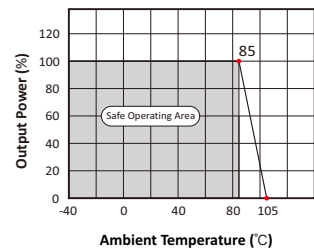


Fig.2

# A/B/D/E/F-1W Series

1w, fixed input, isolated & unregulated dual/single output dc-dc converter



Input Specifications					
Item	Test Conditions	Min	Typ	Max	Units
Input Surge Voltage (1 sec max)	3.3V input	-0.7		5	Vdc
	5V input	-0.7		7	
	9V input	-0.7		15	
	12V input	-0.7		15	
	15V input	-0.7		20	
	24V input	-0.7		30	
	48V input	-0.7		60	
Input Filter	"C" filter				
Reverse Polarity Input Current	no support				
Hot Plug	no support				

Output Specifications					
Item	Test Conditions	Min	Typ	Max	Units
Output Power	Ta=-40~+85°C	0.1		1	W
Output Voltage Accuracy	See Tolerance Envelope Graph				
Line Regulation	For vin change of ±1%			1.2	%
Load Regulation	Nominal, 10%-100% load	3.3V output	12	20	
		5V output	10	15	
		9V output	8	15	
		12V output	7	15	
		15V output	6	15	
	24V output	5	15		
Ripple & Noise	DC-20MHz bandwidth		100	300	mVp-p
Temperature Drift	Nominal, 100% load			±0.03	%/°C
Short Circuit Protection				1	s

Isolation Specifications					
Item	Test Conditions	Min	Typ	Max	Units
Isolation Voltage	A/B/D	1500			Vdc
	E/F	3000			
Insulation Resistance	Test at 500Vdc	1000			MΩ
Isolation Capacitance	IN-OUT, 100kHz @ 0.1Vdc		20		pF

Common Specification					
Item	Test Conditions	Min	Typ	Max	Units
Switching Frequency	100% load, input low to high		100		kHz
Operating Temperature		-40		+85	°C
Case Temp Rise	Ta=25°C		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
Case Material		Black Plastic (UL94V-0)			

EMC Specification			
EMI	CE	EN55022:2010	Class B ( See Fig.1 )
	RE	EN55022:2010	Class B ( See Fig.1 )
EMS	ESD	EN55024:2010/EN61000-4-2	perf. Criterion B
	RS	EN55024:2010/EN61000-4-3	perf. Criterion A

## Application Note

### 1. Requirement on Output Load

To ensure this DC/DC 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!**

When the actual output power is very small, if in the selection phase, it is recommended to select a lower power level model, else please connect a resistor with proper resistance at the output end in parallel to increase the load.

### 2. Typical Application Circuit

General applications, the circuit according to Fig.3 Typical recommended. The value of each component will be selected according to the following recommended list.

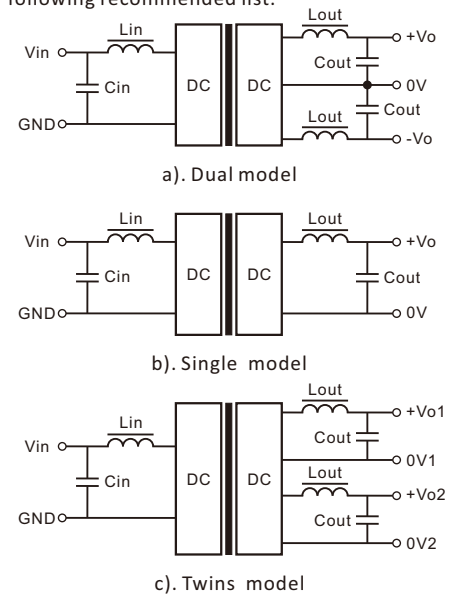


Fig.3

### Capacitor and Inductor values Recommended

Cin	Cout	Lin, Lout
10~100uF	3.3V	10uF
	5V	10uF
	9V	4.7uF
	12V	2.2uF
	15V	1uF
	24V	1uF
Dual & Twin models Cout capacitance value halved		

*If using a filter inductor, It should be noted "LC" filtering network natural frequency should be staggered with the DC/DC operating frequency to avoid mutual interference.*

### 3. Output regulation, over-current protection

This series of products does not have the voltage regulator function in itself. The easiest way to achieve output voltage regulation, input over-voltage and over-current protection is to connect a linear regulator with these functions to input or output end in series.

# A\_S-1W Series

1w, fixed input, 1500Vdc isolated & unregulated dual output dc-dc converter

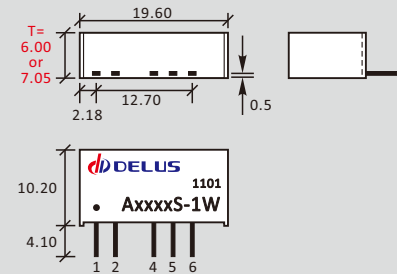


## Product Program

Certificate	Model	Eff (%)	Input		Output		Max Capacitive Load (uF)
			Voltage(Vdc)		Vdc	mA	
			Nominal	Range	Nominal	Max	
CE/RoHS	A0305S-1W	78	3.3	3.0-3.6	±5	±100	100
	A0315S-1W	80			±15	±33	
CE/RoHS	A0505S-1W	73	5	4.5-5.5	±5	±100	100
	A0507S-1W	79			±7.2	±70	
	A0509S-1W	80			±9	±56	
	A0512S-1W	81			±12	±42	
	A0515S-1W	81			±15	±33	
	A0524S-1W	79			±24	±21	
	A0905S-1W	71			9	8.1-9.9	
A0912S-1W	81	±12	±42				
CE/RoHS	A1205S-1W	75	12	10.8-13.2	±5	±100	100
	A1209S-1W	81			±9	±56	
	A1212S-1W	84			±12	±42	
	A1215S-1W	84			±15	±33	
	A1224S-1W	80			±24	±21	
CE/RoHS	A1505S-1W	80	15	13.5-16.5	±5	±100	100
	A1512S-1W	80			±12	±42	
	A1515S-1W	80			±15	±33	
CE/RoHS	A2405S-1W	74	24	21.6-26.4	±5	±100	100
	A2409S-1W	80			±9	±56	
	A2412S-1W	82			±12	±42	
	A2415S-1W	84			±15	±33	
	A2424S-1W	83			±24	±21	
CE/RoHS	A4812S-1W	71	48	43.2-52.8	±12	±42	100

## Dimensions

First Angle Proj

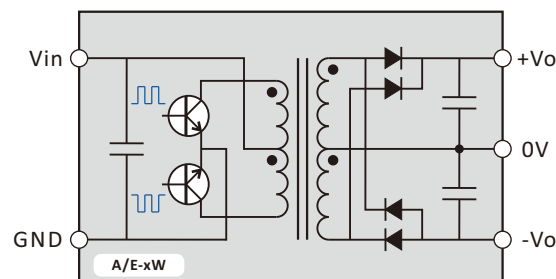


Pin	A_S
1	Vin
2	GND
4	-Vo
5	0V
6	+Vo

### Note:

All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
 if input or output voltage  $\geq$  24V,  
 $T=7.05\text{mm}$   
**Isolation: 1500Vdc**  
**Weight: 2.2g**

## Functional Diagram



# B\_LS-1W Series

1w, fixed input, 1500Vdc isolated & unregulated single output dc-dc converter



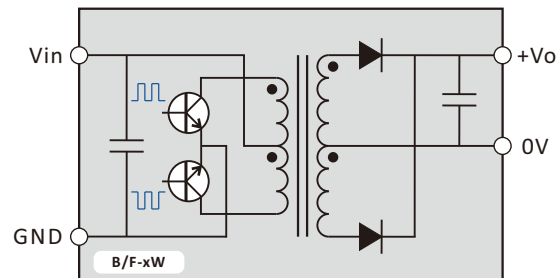
Product Program							
Certificate	Model	Eff (%)	Input		Output		Max Capacitive Load (uF)
			Voltage(Vdc)		Vdc	mA	
			Nominal	Range	Nominal	Max	
CE/RoHS	B0503LS-1W	78	5	4.5-5.5	3.3	300	220
	B0505LS-1W	72			5	200	
	B0509LS-1W	79			9	111	
	B0512LS-1W	78			12	83	
	B0515LS-1W	80			15	67	
	B0524LS-1W	81			24	42	
CE/RoHS	B0905LS-1W	73	9	8.1-9.9	5	200	220
	B0909LS-1W	81			9	111	
CE/RoHS	B1203LS-1W	74	12	10.8-13.2	3.3	300	220
	B1205LS-1W	73			5	200	
	B1209LS-1W	75			9	111	
	B1212LS-1W	82			12	83	
	B1215LS-1W	82			15	67	
	B1224LS-1W	80			24	42	
CE/RoHS	B1505LS-1W	80	15	13.5-16.5	5	200	220
	B1515LS-1W	82			15	67	
CE/RoHS	B2403LS-1W	74	24	21.6-26.4	3.3	300	220
	B2405LS-1W	73			5	200	
	B2409LS-1W	75			9	111	
	B2412LS-1W	82			12	83	
	B2415LS-1W	82			15	67	
	B2418LS-1W	82			18	56	
CE/RoHS	B2424LS-1W	80	48	43.2-52.8	24	42	220
	B4805LS-1W	77			5	200	

**Dimensions** First Angle Proj

Pin	B_LS
1	Vin
2	GND
4	0V
6	+Vo

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
 if input or output voltage >= 24V,  
 T=7.05mm  
**Isolation: 1500Vdc**  
**Weight: 2.2g**

## Functional Diagram



# B\_S-1W Series

1w, fixed input, 1500Vdc isolated & unregulated single output dc-dc converter



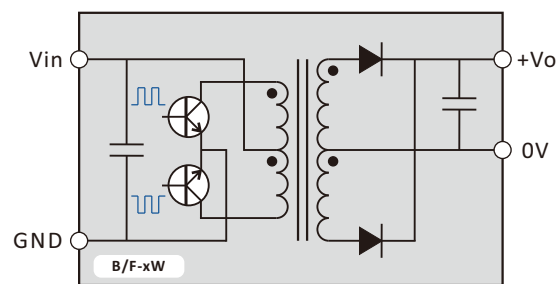
Product Program							
Certificate	Model	Eff (%)	Input		Output		Max Capacitive Load (uF)
			Voltage(Vdc)		Vdc	mA	
			Nominal	Range	Nominal	Max	
CE/RoHS	B0303S-1W	78	3.3	3.0-3.6	3.3	300	220
	B0305S-1W	83			5	200	
	B0312S-1W	83			12	83	
CE/RoHS	B0405S-1W	73	4	3.6-4.4	5	200	220
CE/RoHS	B0503S-1W	78	5	4.5-5.5	3.3	300	220
	B0505S-1W	72			5	200	
	B0509S-1W	79			9	111	
	B0512S-1W	80			12	83	
	B0515S-1W	80			15	67	
	B0524S-1W	81			24	42	
CE/RoHS	B0905S-1W	73	9	8.1-9.9	5	200	220
	B0909S-1W	81			9	111	
CE/RoHS	B1203S-1W	74	12	10.8-13.2	3.3	300	220
	B1205S-1W	73			5	200	
	B1209S-1W	78			9	111	
	B1212S-1W	81			12	83	
	B1215S-1W	84			15	67	
	B1224S-1W	82			24	42	
CE/RoHS	B1505S-1W	74	15	13.5-16.5	5	200	220
	B1515S-1W	78			15	67	
CE/RoHS	B2403S-1W	75	24	21.6-26.4	3.3	300	220
	B2405S-1W	72			5	200	
	B2409S-1W	79			9	111	
	B2412S-1W	82			12	83	
	B2415S-1W	82			15	67	
	B2418S-1W	82			18	56	
	B2424S-1W	82			24	42	

**Dimensions** First Angle Proj

Pin	B_S
1	GND
2	Vin
3	0V
4	+Vo

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
 if input or output voltage >= 24V,  
 T=7.55mm  
**Isolation: 1500Vdc**  
**Weight: 1.3g**

## Functional Diagram



# D\_S-1W Series

1w, fixed input, 1500Vdc isolated & unregulated twin output dc-dc converter



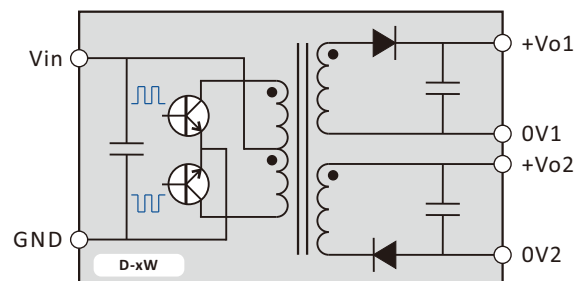
Product Program							
Certificate	Model	Eff (%)	Input		Output		Max Capacitive Load (uF)
			Voltage(Vdc)		Vdc	mA	
			Nominal	Range	Nominal	Max	
CE/RoHS	D0305S-1W	78	3.3	3.0-3.6	5/5	100/100	100
CE/RoHS	D0505S-1W	72	5	4.5-5.5	5/5	100/100	100
	D0509S-1W	75			9/9	56/56	
	D0512S-1W	78			12/12	42/42	
	D0515S-1W	81			15/15	33/33	
CE/RoHS	D1205S-1W	75	12	10.8-13.2	5/5	100/00	100
	D1209S-1W	78			9/9	56/56	
	D1212S-1W	82			12/12	42/42	
	D1215S-1W	82			15/15	33/33	
CE/RoHS	D1809S-1W	78	18	16.2-19.8	9/9	56/56	100
CE/RoHS	D2405S-1W	72	24	21.6-26.4	5/5	100/00	100
	D2409S-1W	80			9/9	56/56	
	D2412S-1W	82			12/12	42/42	
	D2415S-1W	78			15/15	33/33	
	D2418S-1W	80			18/18	28/28	

**Dimensions** First Angle Proj

Pin	D_S
1	Vin
2	GND
4	0V2
5	+Vo2
6	0V1
7	+Vo1

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
 if input or output voltage >= 24V,  
 T=7.05mm  
**Isolation: 1500Vdc**  
**Weight: 2.3g**

## Functional Diagram



# E\_S-1W Series

1w, fixed input, 3000Vdc isolated & unregulated dual output dc-dc converter



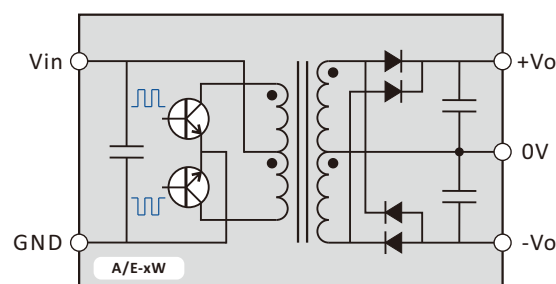
Product Program							
Certificate	Model	Eff (%)	Input		Output		Max Capacitive Load (uF)
			Voltage(Vdc)		Vdc	mA	
			Nominal	Range	Nominal	Max	
CE/RoHS	E0505S-1W	73	5	4.5-5.5	±5	±100	100
	E0509S-1W	80			±9	±56	
	E0512S-1W	81			±12	±42	
	E0515S-1W	81			±15	±33	
	E0524S-1W	79			±24	±21	
CE/RoHS	E0905S-1W	71	9	8.1-9.9	±5	±100	100
CE/RoHS	E1205S-1W	75	12	10.8-13.2	±5	±100	100
	E1207S-1W	81			±7.2	±70	
	E1209S-1W	81			±9	±56	
	E1212S-1W	84			±12	±42	
	E1215S-1W	84			±15	±33	
	E1224S-1W	80			±24	±21	
CE/RoHS	E2405S-1W	74	24	21.6-26.4	±5	±100	100
	E2409S-1W	80			±9	±56	
	E2412S-1W	82			±12	±42	
	E2415S-1W	84			±15	±33	
	E2418S-1W	83			±18	±28	
	E2424S-1W	71			±24	±21	

**Dimensions** First Angle Proj

Pin	E_S
1	Vin
2	GND
5	-Vo
6	0V
7	+Vo

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
 if input or output voltage >= 24V,  
 T=7.05mm  
**Isolation: 3000Vdc**  
**Weight: 2.2g**

## Functional Diagram



# F\_LS-1W Series

1w, fixed input, 3000Vdc isolated & unregulated single output dc-dc converter



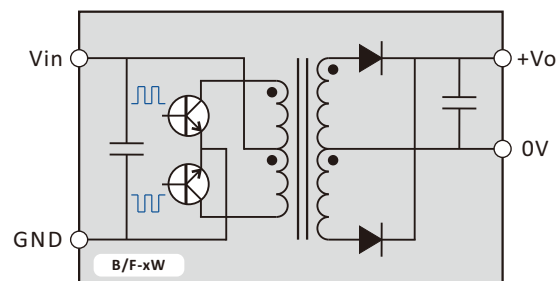
Product Program							
Certificate	Model	Eff (%)	Input		Output		Max Capacitive Load (uF)
			Voltage(Vdc)		Vdc	mA	
			Nominal	Range	Nominal	Max	
CE/RoHS	F0503LS-1W	78	5	4.5-5.5	3.3	300	220
	F0505LS-1W	72			5	200	
	F0507LS-1W	76			7.2	139	
	F0509LS-1W	79			9	111	
	F0512LS-1W	78			12	83	
	F0515LS-1W	80			15	67	
	F0524LS-1W	81			24	42	
CE/RoHS	F1203LS-1W	74	12	10.8-13.2	3.3	300	220
	F1205LS-1W	73			5	200	
	F1209LS-1W	75			9	111	
	F1212LS-1W	82			12	83	
	F1215LS-1W	82			15	67	
	F1224LS-1W	80			24	42	
CE/RoHS	F1512LS-1W	82	15	13.5-16.5	12	83	220
CE/RoHS	F2403LS-1W	74	24	21.6-26.4	3.3	300	220
	F2405LS-1W	73			5	200	
	F2409LS-1W	75			9	111	
	F2412LS-1W	82			12	83	
	F2415LS-1W	82			15	67	
	F2424LS-1W	80			24	42	

**Dimensions** First Angle Proj

Pin	F_LS
1	Vin
2	GND
5	0V
7	+Vo

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
 if input or output voltage >= 24V,  
 T=7.05mm  
**Isolation: 3000Vdc**  
**Weight: 2.2g**

## Functional Diagram





# F\_M-1W Series

1w, fixed input, 3000Vdc isolated & unregulated single output dc-dc converter



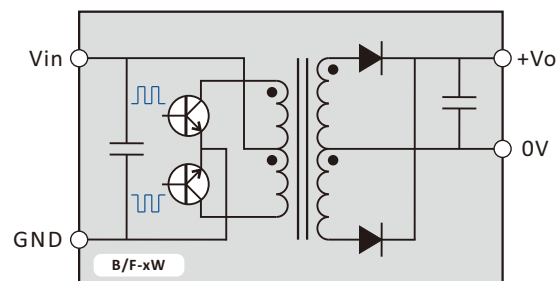
Product Program							
Certificate	Model	Eff (%)	Input		Output		Max Capacitive Load (uF)
			Voltage(Vdc)		Vdc	mA	
			Nominal	Range	Nominal	Max	
CE/RoHS	F0303M-1W	78	3.3	3.0-3.6	3.3	300	220
	F0305M-1W	83			5	200	
	F0312M-1W	83			12	83	
CE/RoHS	F0503M-1W	78	5	4.5-5.5	3.3	300	220
	F0505M-1W	72			5	200	
	F0509M-1W	79			9	111	
	F0512M-1W	78			12	83	
	F0515M-1W	80			15	67	
	F0524M-1W	81			24	42	
CE/RoHS	F1203M-1W	74	12	10.8-13.2	3.3	300	220
	F1205M-1W	73			5	200	
	F1209M-1W	78			9	111	
	F1212M-1W	81			12	83	
	F1215M-1W	84			15	67	
	F1224M-1W	82			24	42	
CE/RoHS	F2403M-1W	75	24	21.6-26.4	3.3	300	220
	F2405M-1W	72			5	200	
	F2409M-1W	79			9	111	
	F2412M-1W	82			12	83	
	F2415M-1W	82			15	67	
	F2418M-1W	82			18	56	
	F2424M-1W	82			24	42	

**Dimensions** First Angle Proj

Pin	F_M
1	GND
2	Vin
3	0V
4	+Vo

**Note:**  
 All size units mm,  
 Diameter of all terminal 0.5mm;  
 Distance between all adjacent terminal 2.54mm;  
 if input or output voltage >= 24V,  
 T=7.55mm  
**Isolation: 3000Vdc**  
**Weight: 1.3g**

## Functional Diagram



# File Release Notes

DBN-101 Technical Data Sheet Version



No.	Version	Date	Description
1	V0	2011/11/01	First release
2	A/0	2016/07/01	Change document version definition
3			
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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