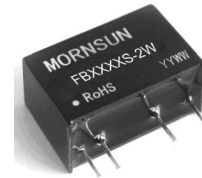


## FB\_S-2W Series

**2W, FIXED INPUT, 5200V ISOLATED & UNREGULATED  
SINGLE OUTPUT DC-DC CONVERTER**



multi-country patent protection **RoHS**

### FEATURES

- 5.2KVDC Isolation
- SIP Package, small footprint
- Temperature Range: -40°C to +85°C
- Continuous Short circuit protection
- No Heatsink Required
- No External Component Required
- Internal SMD Construction
- Industry Standard Pinout
- RoHS Compliance

### APPLICATIONS

The FB\_S-2W Series are specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

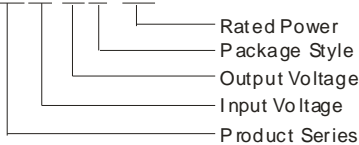
These products apply to:

- 1) Where the voltage of the input power supply is fixed (voltage variation  $\leq \pm 10\%$ );
- 2) Where isolation is necessary between input and output (isolation voltage  $\leq 5200\text{VDC}$ );
- 3) Where the regulation of the output voltage and the output ripple noise are not demanding.

Such as: purely digital circuits, ordinary low frequency analog circuits, and IGBT power device driving circuits.

### MODEL SELECTION

**FB0505S-2W**



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### PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% Typ)
	Voltage (VDC)		Voltage (VDC)	Current (mA)		
	Nominal	Range		Max	Min	
FB0505S-2W	5	4.5-5.5	5	400	40	74
FB0509S-2W			9	222	23	77
FB0512S-2W			12	167	17	77
FB0515S-2W			15	133	14	77
FB1205S-2W	12	10.8-13.2	5	400	40	75
FB1209S-2W			9	222	23	78
FB1212S-2W			12	167	17	80
FB1215S-2W			15	133	14	78
FB2405S-2W	24	21.6-26.4	5	400	40	75
FB2409S-2W			9	222	23	77
FB2412S-2W			12	167	17	80
FB2415S-2W			15	133	14	79

### ISOLATION SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	5200			VDC
Isolation resistance	Test at 1000VDC	1000			MΩ
Isolation capacitance				10	pF

### COMMON SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Storage humidity range				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Lead temperature	1.5mm from case for 10 seconds			300	
Temp. rise at full load			15	30	
Cooling		Free air convection			
Short circuit protection		Continuous			
Case material		Plastic(UL94-V0)			
MTBF		3500			K hours
Weight			4.3		g

Note:

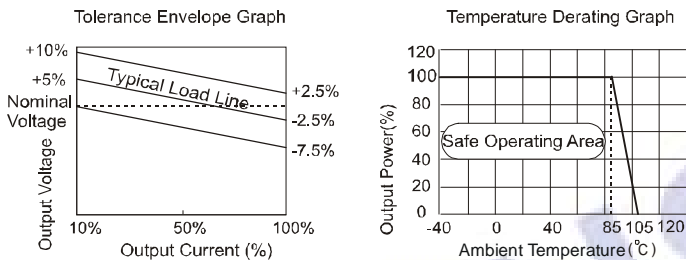
1. All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details

## OUTPUT SPECIFICATIONS

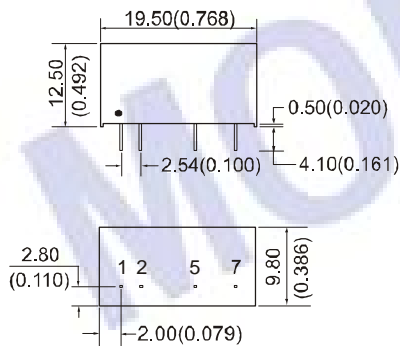
Item	Test conditions	Min	Typ	Max	Units
Output power		0.2		2	W
Line regulation	For Vin change of ±1%			±1.2	%
Load regulation	10% to 100% load(5V output)		10	15	%
	10% to 100% load (9V output)		8.3	15	
	10% to 100% load (12V output)		6.8	15	
	10% to 100% load (15V output)		6.3	15	
Output voltage accuracy	See tolerance envelope graph				
Temperature drift	100% full load			0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		150	250	mVp-p
Switching frequency	Full load, nominal input	(5V input)	45		KHz
		(12V/24V input)	50		

\*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

## TYPICAL CHARACTERISTICS



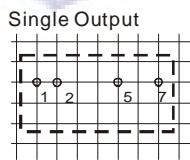
## OUTLINE DIMENSIONS & PIN CONNECTIONS



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

First Angle Projection

RECOMMENDED FOOTPRINT  
 Top view,grid:2.54mm(0.1inch)  
 diameter:1.00mm(0.039inch)



### FOOTPRINT DETAILS

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

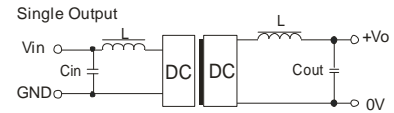
## APPLICATION NOTE

### 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 (FB\_S-1W).

### Recommended testing and application 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).



(Figure 1)

It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference. 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).

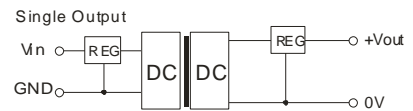
### EXTERNAL CAPACITOR TABLE (Table 1)

Vin (VDC)	Cin (uF)	Single Vout (VDC)	Cout (uF)
5	10	5	10
12	4.7	9	4.7
24	2.2	12	2.2
-	-	15	1

It's not recommend to connect any external capacitor in the application field with less than 0.5 watt output.

### Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).



(Figure 2)

### Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

### No parallel connection or plug and play.