

## FEATURES

- ◆ 5.2KVDC Isolation
- ◆ SIP Package
- ◆ Temperature Range: -40°C to +85°C
- ◆ No Heat Sink Required
- ◆ Internal SMD Construction
- ◆ Low Isolation Capacitance
- ◆ No External Component Required
- ◆ Industry Standard Pinout
- ◆ RoHS Compliance

## MODEL SELECTION

**FB<sup>①</sup>05<sup>②</sup>05<sup>③</sup>X<sup>④</sup>S<sup>⑤</sup>-1W<sup>⑥</sup>**

- ① Product Series
- ② Input Voltage
- ③ Output Voltage
- ④ Fixed Input
- ⑤ Package Style
- ⑥ Rated Power

## APPLICATIONS

The EA-XS-1W&FB-XS-1W Series are specially designed for applications where 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.



## PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% Typ)
	Voltage (VDC)		Voltage (VDC)	Current (mA)		
	Nominal	Range		Max	Min	
EA0505XS-1W	5	4.5-5.5	±5	±100	±10	70
EA0509XS-1W	5	4.5-5.5	±9	±56	±6	71
EA0512XS-1W	5	4.5-5.5	±12	±42	±5	72
EA0515XS-1W	5	4.5-5.5	±15	±33	±4	74
FB0505XS-1W	5	4.5-5.5	5	200	20	70
FB0509XS-1W	5	4.5-5.5	9	111	12	71
FB0512XS-1W	5	4.5-5.5	12	83	9	72
FB0515XS-1W	5	4.5-5.5	15	67	7	74
EA1205XS-1W	12	10.8-13.2	±5	±100	±10	70
EA1209XS-1W	12	10.8-13.2	±9	±56	±6	72
EA1212XS-1W	12	10.8-13.2	±12	±42	±5	74
EA1215XS-1W	12	10.8-13.2	±15	±33	±4	75
FB1205XS-1W	12	10.8-13.2	5	200	20	70
FB1209XS-1W	12	10.8-13.2	9	111	12	71
FB1212XS-1W	12	10.8-13.2	12	83	9	72
FB1215XS-1W	12	10.8-13.2	15	67	7	74
EA2405XS-1W	24	21.6-26.4	±5	±100	±10	72
EA2409XS-1W	24	21.6-26.4	±9	±56	±6	74
EA2412XS-1W	24	21.6-26.4	±12	±42	±5	76
EA2415XS-1W	24	21.6-26.4	±15	±33	±4	78
FB2405XS-1W	24	21.6-26.4	5	200	20	72
FB2409XS-1W	24	21.6-26.4	9	111	12	74
FB2412XS-1W	24	21.6-26.4	12	83	9	76
FB2415XS-1W	24	21.6-26.4	15	67	7	78

## 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				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	25	
Short circuit protection*	5V input voltage			1	Second
	12V/24V input voltage	Continuous			
Cooling		Free air convection			
Case material		Plastic(UL94-V0)			
MTBF		3500			K hours
Weight			4.2		g

\*supply voltage must be discontinued at the end of short circuit duration.

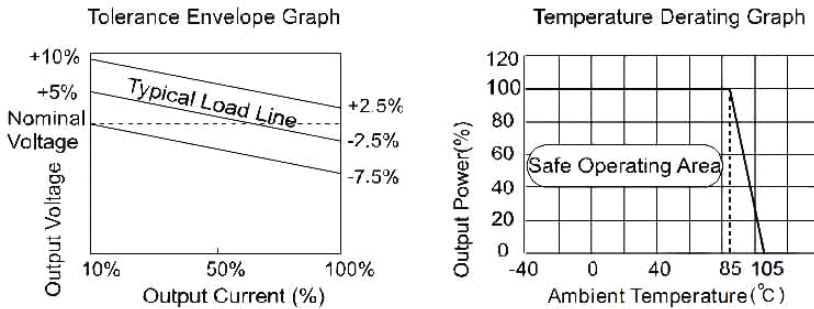
### OUTPUT SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Output power		0.1		1	W
Line regulation	For Vin change of 1%			± 1.2	%
Load regulation	10% to 100% load(5V output)		12.8	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 accurac		See tolerance envelope graph			
Temperature drift	100% full load			0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		150	200	mVp-p
Switching frequency	Full load, nominal input	(5V input)	250		KHz
		(others input)	42		

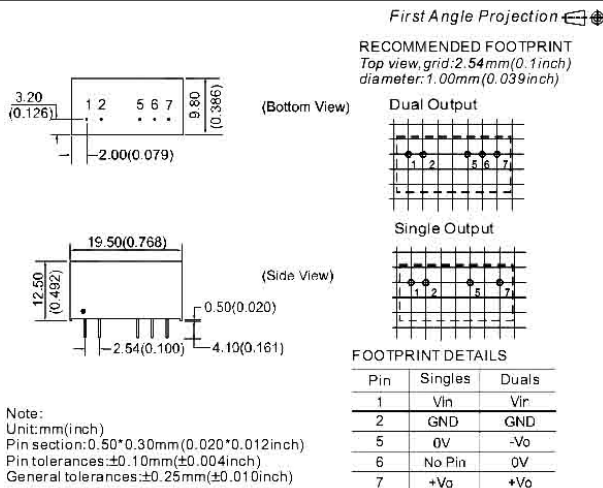
\*Test ripple and noise by "parallel cable"method. See detailed operation instructions at Testing of Power Converter section, application notes.

- Note:  
 1. All specifications measured at TA=25 , humidity<75%, nominal input voltage and rated output load unless otherwise specified.  
 2. Dual output models unbalanced load: ±5%.

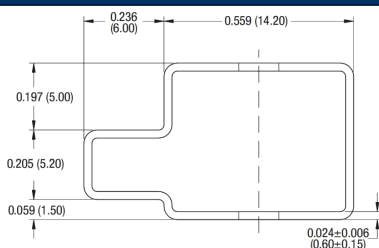
### TYPICAL CHARACTERISTICS



### OUTLINE DIMENSIONS & PIN CONNECTIONS



### TUBE OUTLINE DIMENSIONS

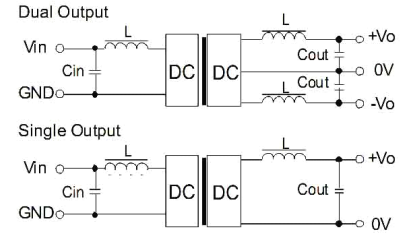


Unless otherwise stated all dimensions in inches ±0.02(mm ±0.5mm).  
 Tube length(7 Pin SIP):20.669(525mm±2mm). Tube Quantity:25

### APPLICATION NOTE

#### 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).

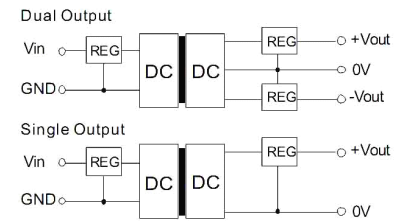
#### EXTERNAL CAPACITOR TABLE (TABLE 1)

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

It not recommended 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.