



SE_S-2WR2 & SF_S-2WR2 Series

2W, FIXED INPUT, ISOLATED & UNREGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



Continuous Short Circuit Protection

Patent Protection RoHS

PRODUCT FEATURES

- Miniature package
- Efficiency up to 89%
- SIP package
- High power density
- Low Temperature drift
- 3000VDC Isolation Voltage
- Operating Temperature Range: -40°C ~ +105°C
- No External Component Required
- Industry Standard Pinout

APPLICATIONS

The SE_S-2WR2 & SF_S-2WR2 Series are designed for application where isolated output is required from a distributed power system.

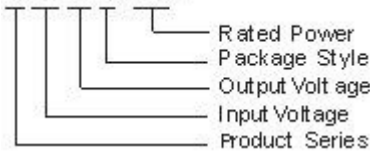
These products apply to where:

- 1) Input voltage variation $\leq \pm 10\%$;
- 2) input and output isolation voltage $\leq 3000\text{VDC}$
- 3) Regulated and low ripple noise is not required.

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

PART NUMBER SYSTEM

SE0505S-2WR2



SELECTION GUIDE

Model Number	Input Voltage(VDC) Nominal (Range)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA,typ.)	Max. Capacitive Load(μF)	Efficiency (% ,Typ.) @Max. Load	Approval
			Max.	Min.	@Max. Load	@No Load				
SE0505S-2WR2	5 (4.5-5.5)	± 5	± 200	± 20	476	25	10	220	84	
SE0512S-2WR2		± 12	± 83.3	± 8.3	476				84	
SE0515S-2WR2		± 15	± 66.6	± 6.7	476				84	
SE0524S-2WR2		± 24	± 41.6	± 4.2	476				84	
SF0505S-2WR2		5	400	40	450				89	
SF0512S-2WR2		12	166.6	16.6	476				84	
SF0515S-2WR2		15	133.3	13.3	476				84	
SF0524S-2WR2		24	83.3	8.3	476				84	
SE1205S-2WR2	12 (10.8-13.2)	± 5	± 200	± 20	198	15	220	84		
SE1212S-2WR2		± 12	± 83.3	± 8.3	196			85		
SE1215S-2WR2		± 15	± 66.6	± 6.7	198			84		
SF1205S-2WR2		5	400	40	198			84		
SF1212S-2WR2		12	166.6	16.6	198			84		
SF1215S-2WR2		15	133.3	13.3	198			84		
SE1505S-2WR2	15 (13.5-16.5)	± 5	± 200	± 20	159	10	220	84		
SE1515S-2WR2		± 12	± 83.3	± 8.3	157			85		
SF1515S-2WR2		15	166.6	16.6	159			84		
SE2405S-2WR2	24 (21.6-26.4)	± 5	± 200	± 20	99	8	220	84		
SE2412S-2WR2		± 12	± 83.3	± 8.3	99			84		
SE2415S-2WR2		± 15	± 66.6	± 6.7	99			84		
SF2405S-2WR2		5	400	40	99			84		
SF2412S-2WR2		12	166.6	16.6	99			84		
SF2415S-2WR2		15	133.3	13.3	99			84		
SF2424S-2WR2		24	83.3	8.3	98			85		

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	5VDC Input	-0.7	--	9	VDC
	12VDC Input	-0.7	--	18	
	15VDC Input	-0.7	--	21	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitance Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit	
Output Power		0.2	--	2	W	
Output Voltage Accuracy		See tolerance envelope curve				
Output Voltage Balance	Dual Output, Balanced Loads	--	±0.5	±1	%	
Line Voltage Regulation	For Vin change of ±1%	--	--	±1.2		
Load Regulation	10% to 100% load	5V output	--	10		15
		12V output	--	8		15
		15V output	--	7		15
		24V output	--	6	15	
Temperature Drift	100% load	--	--	±0.03	%/°C	
Ripple & Noise*	20MHz Bandwidth	Output Voltage ≤12V	--	60	--	mVp-p
		Output Voltage:15V, 24V	--	75	--	
Short Circuit Protection		Continuous, automatic recovery				
Note: *Ripple and noise tested by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.						

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit	
Isolation Voltage	Tested for 1 minute and leakage current less than 1 mA	3000	--	--	VDC	
Isolation Resistance	Test at 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input/Output,100KHz/0.1V	SE2415S-2WR2/SF2424S-2WR2	--	30	--	pF
		Others	--	20	--	
Switching Frequency	Full load, nominal input	--	100	300	KHz	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours	
Case Material		Plastic (UL94-V0)				
Weight		--	2.4	--	g	

ENVIRONMENTAL SPECIFICATIONS

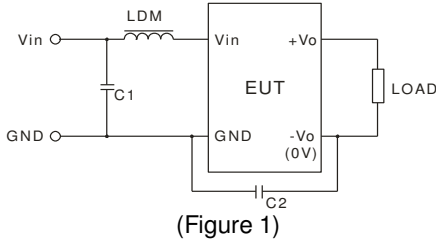
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above85°C)	-40	--	105	°C
Storage Temperature		-55	--	125	
Temp. rise at full load		--	25	--	
Soldering Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B (External Circuit Refer to Figure1)			
EMS	ESD	SE_S-2WR2	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B		
		SF_S-2WR2	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B		

EMC RECOMMENDED CIRCUIT

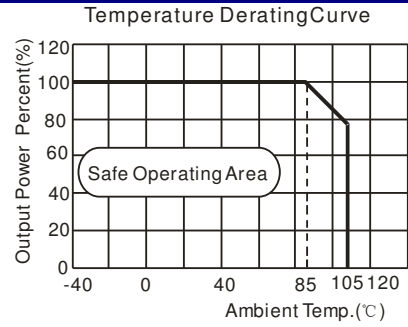
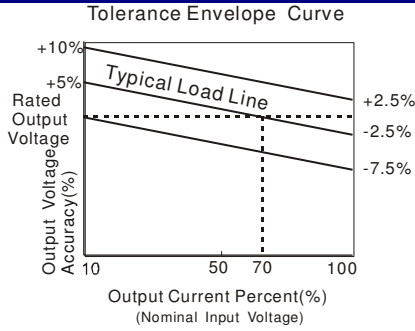
EMI Recommended External Circuit (CLASS B):



Recommended external circuit parameters:

- Vin: 5V/12V
- C1: 475K /50V
- LDM: 6.8μH
- Vin: 15V/24V
- C1: 475K /50V
- LDM: 6.8μH
- C2: 470pF/3KV

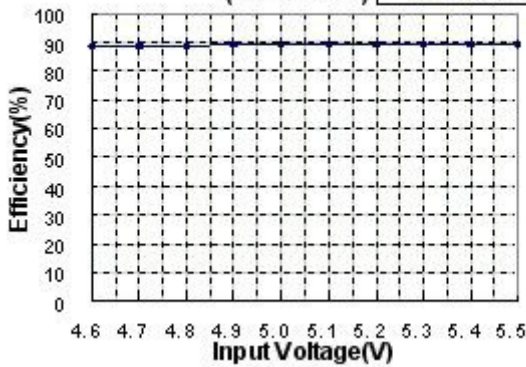
PRODUCT TYPICAL CURVE



Efficiency VS Input Voltage curve

(Full Load)

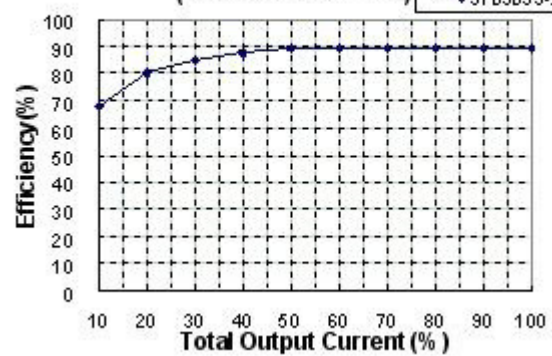
8F0505S-2WR2



Efficiency VS Output Load curve

(Vin=Vin-nominal)

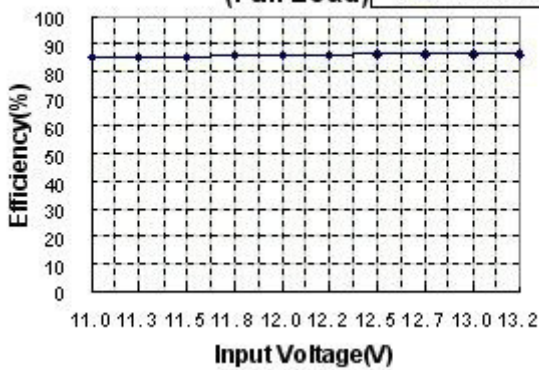
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Efficiency VS Input Voltage curve

(Full Load)

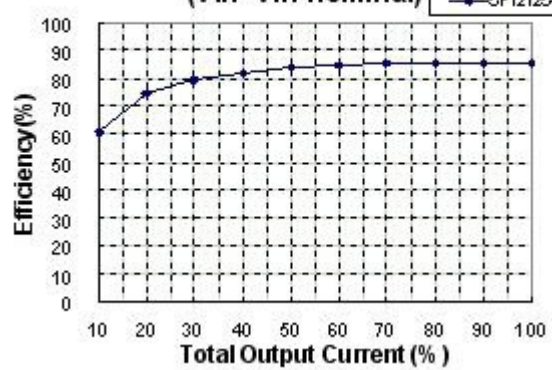
8F1212S-2WR2



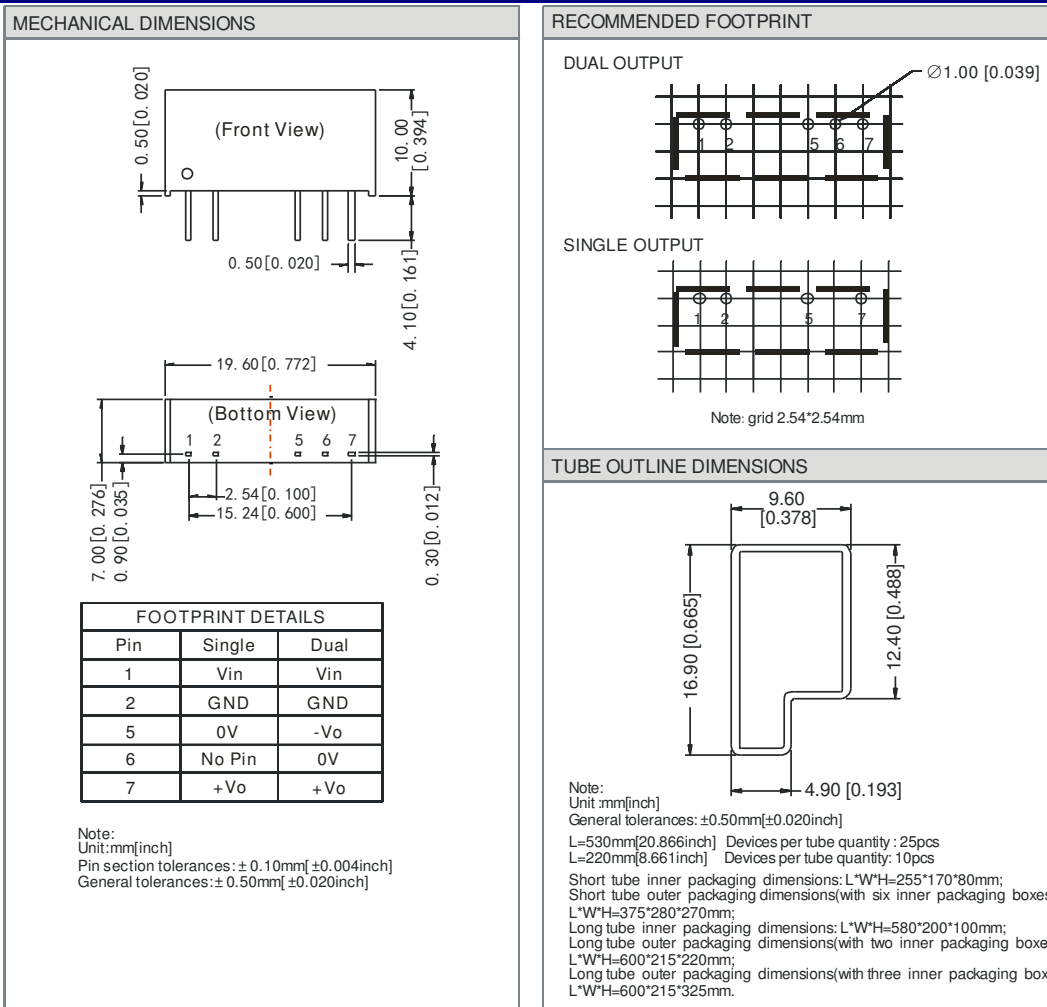
Efficiency VS Output Load curve

(Vin=Vin-nominal)

8F1212S-2WR2



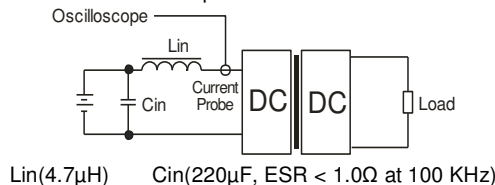
OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING



TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor L_{in} and Capacitor C_{in} to simulate source impedance.



DESIGN CONSIDERATIONS

1) Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load **could not be less than 10% of the full load**. If the actual output power is very small, please connect a resistor at the output end in parallel to increase the load, or use our company's products with a lower rated output power .

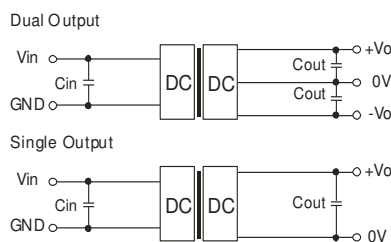
2) Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to add a circuit breaker to the circuit.

3) Recommended circuit

If you want to further decrease the input/output ripple, a capacitor filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 2).

It should also be noted that the capacitance of 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 recommended capacitance of its filter capacitor sees (Table 1).



(Figure 2)

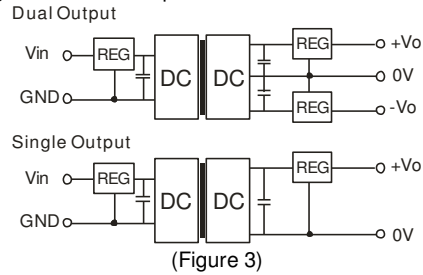
EXTERNAL CAPACITOR TABLE (Table 1)

Vin (VDC)	Cin (μF)	Single Vo (VDC)	Cout (μF)	Dual Vo (VDC)	Cout (μF)
5	4.7	5	10	±5	4.7
12	2.2	12	2.2	±12	1
15	2.2	15/24	1	±15/±24	0.47
24	1	--	--	--	--

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

4) Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear regulator and an capacitor filtering network with overheat protection that is connected to the input or output end in series (Figure 3), the recommended capacitance of its filter capacitor sees (Table 1), linear regulator based on the actual voltage and current required.



5) Cannot use in parallel and hot swap

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.
2. Max. Capacitive Load tested at input voltage range and full load.
3. All specifications measured at $T_a=25^{\circ}\text{C}$, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on our corporate standards.
5. All characteristics are for listed model only, non-standard models may perform differently, please contact our technical person for more detail.
6. Contact us for your specific requirement.
7. Specifications subject to change without prior notice.

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