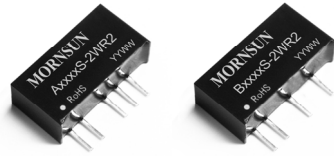


MORNSUN®

A_S-2WR2 & B_S-2WR2 SERIES 2W, FIXED INPUT, ISOLATED & UNREGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER

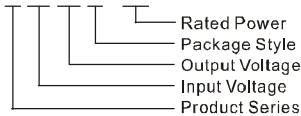


Continuous Short
Circuit Protection

Patent Protection RoHS

PART NUMBER SYSTEM

A0505S-2WR2



FEATURES

- Small Footprint
- Efficiency up to 89%
- SIP Package
- High power density
- Low Temperature rise
- 1500VDC Isolation
- Operating Temperature Range:
-40°C ~ +105°C
- No External Component Required
- Industry Standard Pinout

APPLICATIONS

The A_S-2WR2 & B_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) 1.5KVDC input and output isolation;
- 3) Regulated and low ripple noise is not required.

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

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# (μ F)	Efficiency (%, typ.) @Max. Load	Approval	
			Max.	Max.	@ Max. Load	@ No Load					
*A0505S-2WR2	5 (4.5-5.5)	± 5	± 200	± 20	476	25	10	100	84		
*A0512S-2WR2		± 12	± 83	± 8	476				84		
*A0515S-2WR2		± 15	± 67	± 7	476				84		
*A0524S-2WR2		± 24	± 42	± 4	476				84		
B0505S-2WR2		5	400	40	450				220	89	
*B0512S-2WR2		12	167	17	476					84	
*B0515S-2WR2		15	133	13	476					84	
*B0524S-2WR2		24	83	8	476					84	
*A1205S-2WR2	12 (10.8-13.2)	± 5	± 200	± 20	198	15	100	84			
A1212S-2WR2		± 12	± 83	± 8	196			85			
*A1215S-2WR2		± 15	± 67	± 7	198			84			
*B1205S-2WR2		5	400	40	198			220	84		
B1212S-2WR2		12	167	17	198				84		
*B1215S-2WR2		15	133	13	198				84		
*A1505S-2WR2	15 (13.5-16.5)	± 5	± 200	± 20	159	10	5	100	84		
*A1515S-2WR2		± 15	± 67	± 7	157			85			
*B1505S-2WR2		5	400	40	159			220	84		
*B1515S-2WR2		15	133	13	159				84		
*A2405S-2WR2	24 (21.6-26.4)	± 5	± 200	± 20	99	8	5	100	84		
*A2412S-2WR2		± 12	± 83	± 8	99				84		
*A2415S-2WR2		± 15	± 67	± 7	99				84		
*B2405S-2WR2		5	400	40	99				220	84	
B2412S-2WR2		12	167	17	99			84			
*B2415S-2WR2		15	133	13	99			84			
B2424S-2WR2		24	83	8	98			85			

Note: 1. *Designing.
2. # For each output.

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 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	Full load	--	--	±0.03	%/°C	
Ripple & Noise*	20MHz bandwidth	Output ≤12V	--	60	--	mVp-p
		15、24V output	--	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	1500	--	--	VDC	
Isolation Resistance	Test at 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input/Output, 100KHz/0.1V	A2415S-2WR2/B2424S-2WR2	--	30	--	pF
		Others	--	20	--	
Switching Frequency	100% load, Input voltage range	--	100	300	KHz	
MTBF	MIL-HDBK-217F @25°C	3500	--	--	K hours	
Case Material		Plastic (UL94-V0)				
Weight		--	2.4	--	g	

ENVIRONMENTAL SPECIFICATIONS

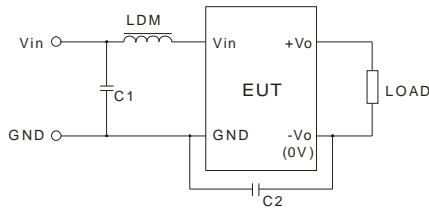
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 85°C)	-40	--	105	°C
Storage Temperature		-55	--	125	
Temp. rise at full load	Ta=25°C	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

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

EMC RECOMMENDED CIRCUIT

EMI Recommended External Circuit (CLASS B):

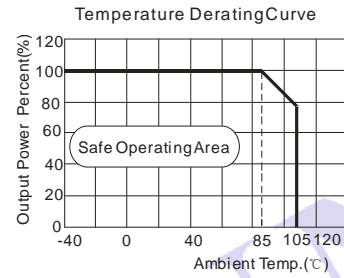
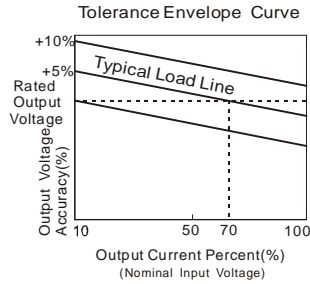


(Figure1)

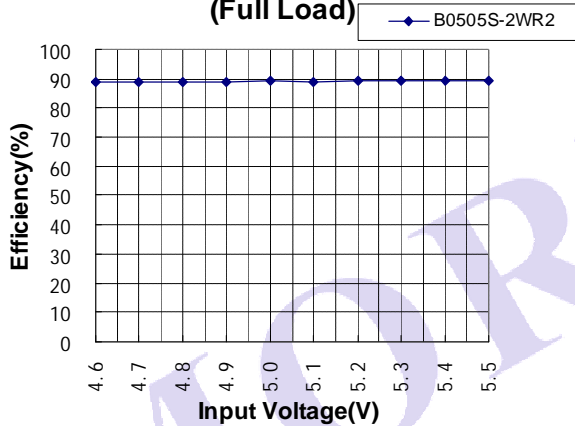
Recommended external circuit parameters:

Vin: 5V/12V
 C1: 4.7 μ F/50V
 LDM: 6.8 μ H
 Vin: 15V/24V
 C1: 4.7 μ F/50V
 LDM: 6.8 μ H
 C2: 470pF/3KV

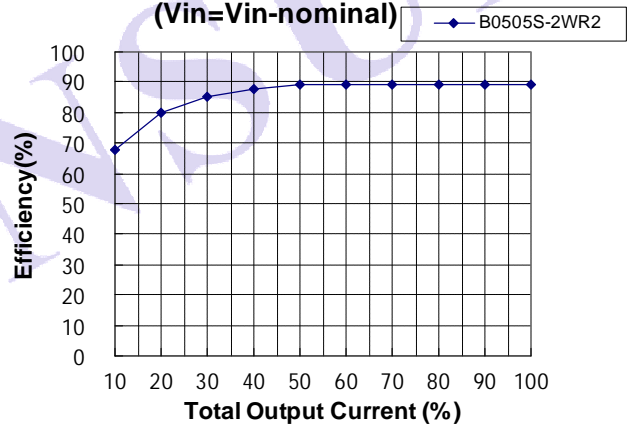
PRODUCT TYPICAL CURVE



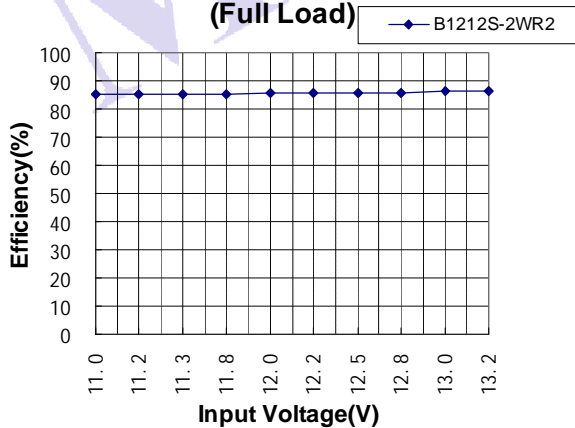
Efficiency VS Input Voltage curve (Full Load)



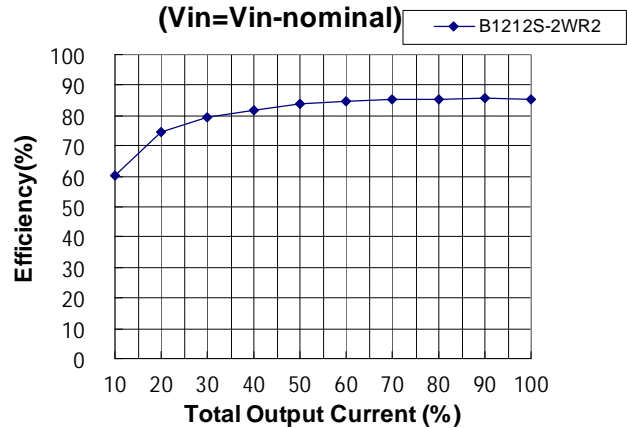
Efficiency VS Output Load curve (Vin=Vin-nominal)



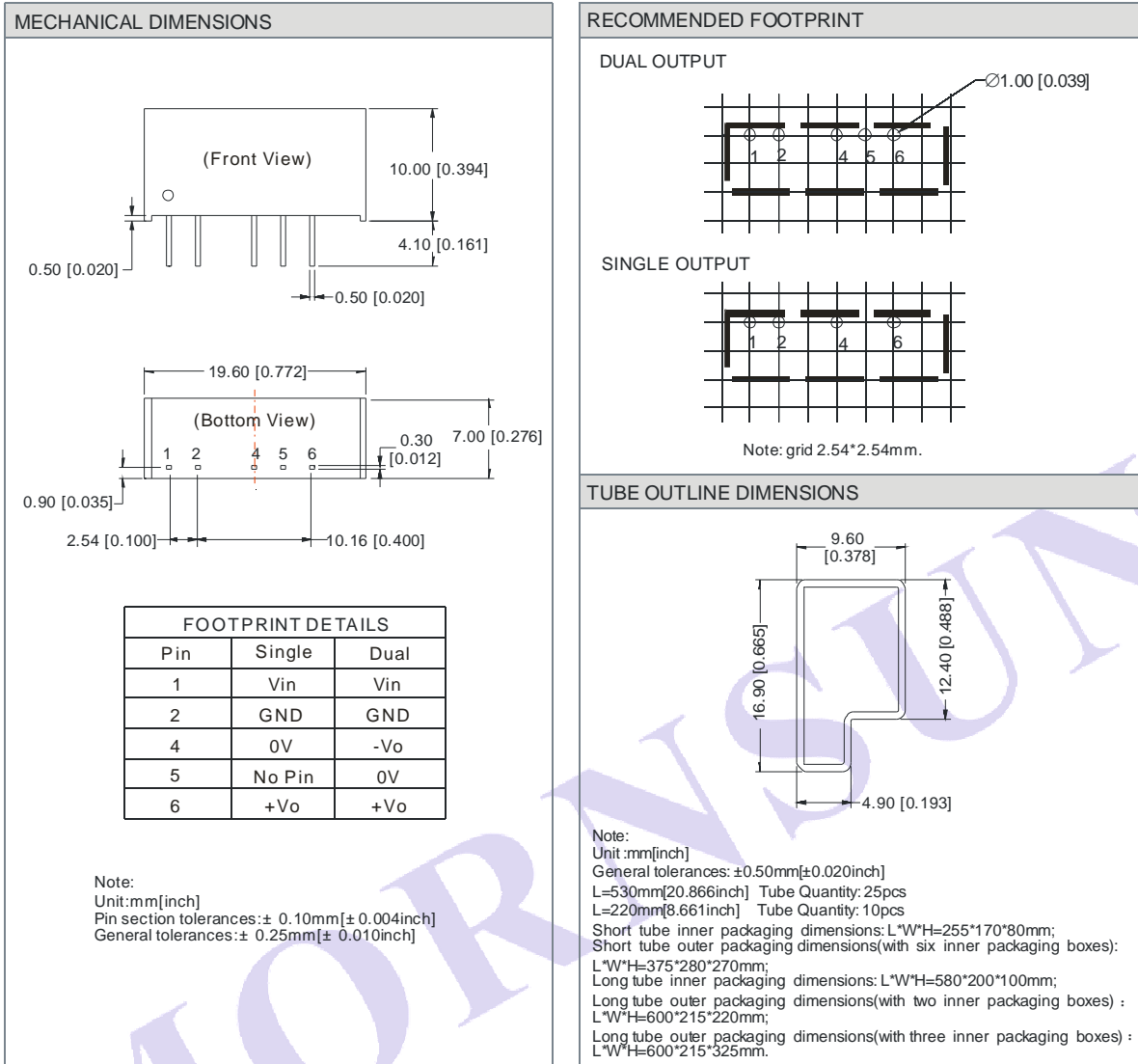
Efficiency VS Input Voltage curve (Full Load)



Efficiency VS Output Load curve (Vin=Vin-nominal)



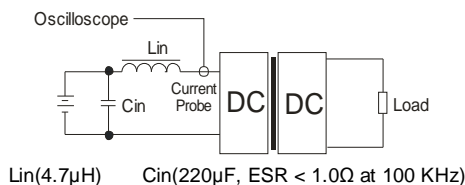
OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING



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 is not less than 10% of the full 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.

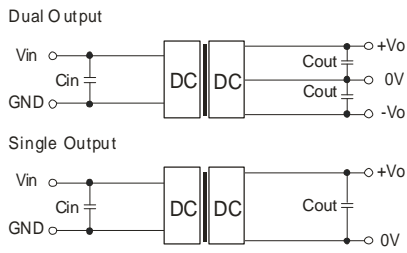
2) Overload Protection

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)

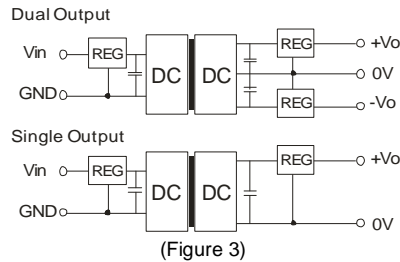
EXTERNAL CAPACITOR TABLE (Table 1)

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (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	--	--	--	--

Note: # For each output. 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.



(Figure 3)

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 data in the datasheet are measured according to nominal input voltage, rated output load, TA=25°C, humidity<75%, unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on our corporate standards.
5. The performance in the datasheet is just fit for the part number in the selection guide, and may be different from the customer-designed product, you can get more details from MORNSUN FAE.
6. Contact us for your specific requirement.
7. Specifications subject to change without prior notice.

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