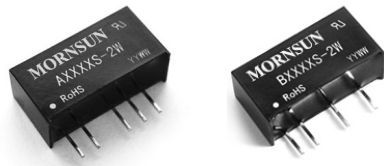


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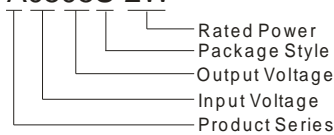
A_S-2W & B_S-2W Series 2W, FIXED INPUT, ISOLATED & UNREGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



Patent Protection RoHS CE C RU US

PART NUMBER SYSTEM

A0505S-2W



FEATURES

- Efficiency up to 86%
- 1KVDC isolation
- SIP package
- High power density
- Low temperature rise
- Operating temperature range: -40°C ~ +85°C
- No external component required
- Industry standard pinout

APPLICATIONS

The A_S-2W & B_S-2W 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) 1KVDC 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)	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
	Nominal (Range)		Max.	Min.	@Max. Load	@No Load				
B0303S-2W	3.3(2.97-3.63)	3.3	400	40	-	-	-	220	73	
B0305S-2W		5	400	40	749	46	32		78	
A0505S-2W	5 (4.5-5.5)	± 5	± 200	± 20	491	33	30	100	82	UL
A0509S-2W		± 9	± 111	± 12	466	36	22		85	UL
A0512S-2W		± 12	± 83	± 9	464	34	26		86	UL
A0515S-2W		± 15	± 67	± 7	459	19	33		82	UL
A0524S-2W		± 24	± 42	± 5	453	25	49		84	
B0503S-2W		3.3	400	40	355	35	43		220	74
B0505S-2W	5	400	40	490	44	44	81	UL CE		
B0509S-2W	9	222	23	467	33	19	84	UL CE		
B0512S-2W	12	167	17	463	33	20	83	UL CE		
B0515S-2W	15	133	14	466	33	20	84	UL CE		
B0524S-2W	24	84	10	465	34	59	82			
A1205S-2W	12 (10.8-13.2)	± 5	± 200	± 20	198	18	23	100	81	UL
A1209S-2W		± 9	± 111	± 12	191	17	30		84	UL
A1212S-2W		± 12	± 83	± 9	188	16	20		86	UL
A1215S-2W		± 15	± 67	± 7	197	20	21		82	UL
A1224S-2W		± 24	± 42	± 5	186	12	19		84	
B1205S-2W		5	400	40	204	16	31	220	81	UL CE
B1209S-2W		9	222	23	202	24	28		82	UL CE
B1212S-2W		12	167	17	190	16	22		85	UL CE
B1215S-2W		15	133	14	196	19	16		82	UL CE
B1224S-2W		24	84	10	189	15	13		84	

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				
A1505S-2W	15 (13.5-16.5)	±5	±200	±20	160	15	32	100	80	
A1515S-2W		±15	±67	±7	152	14	17		82	
B1505S-2W		5	400	40	159	14	30	220	80	
B1515S-2W		15	133	14	157	15	20		80	
A2405S-2W	24 (21.6-26.4)	±5	±200	±20	100	9	42	100	80	UL
A2409S-2W		±9	±111	±12	98	9	22		84	UL
A2412S-2W		±12	±83	±9	93	7	17		84	UL
A2415S-2W		±15	±67	±7	98	9	17		84	UL
A2424S-2W		±24	±42	±5	99	10	41	220	85	
B2403S-2W		3.3	400	40	55	7	26		76	
B2405S-2W		5	400	40	102	8	21		80	UL CE
B2409S-2W		9	222	23	98	8	28		83	UL CE
B2412S-2W		12	167	17	95	7	19		84	UL CE
B2415S-2W		15	133	14	95	7	27		84	UL CE
B2424S-2W	24	84	10	96	9	21	84			

Note: 1. Models listed with strike-through text have been officially discontinued.
2. # For each output.
3. The A_S_1W/B_LS_1W series also are available in our company.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	3.3VDC input	-0.7	--	5	VDC
	5VDC input	-0.7	--	9	
	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	±1.0	%	
Line Regulation	For Vin change of ±1%	--	--	±1.2		
Load Regulation	10% to 100% load	3.3VDC output	--	15		20
		5VDC output	--	12.8		15
		9VDC output	--	8.3		15
		12VDC output	--	6.8		15
		15VDC output	--	6.3		15
		--	5	15		
Temperature Drift	Full load	--	--	±0.03	%/°C	
Ripple & Noise*	20MHz Bandwidth	--	75	150	mVp-p	
Short Circuit Protection**		--	--	1	s	

Note: 1. Dual output models unbalanced load: ±5%.
2. **Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.
3. **Supply voltage must be discontinued at the end of short circuit duration.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit	
Isolation Voltage	Tested for 1 minute and leakage current less than 1 mA	1000	--	--	VDC	
Isolation Resistance	Test at 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input/Output, 100KHz/0.1V	A2424S-2W, B2424S-2W	--	100	--	pF
		Others	--	30	--	
Switching Frequency	Full load, nominal input	--	75	--	KHz	
MTBF	MIL-HDBK-217F @25°C	3500	--	--	K hours	
Case Material		Plastic (UL94-V0)				
Weight		--	2.8	--	g	

ENVIRONMENTAL SPECIFICATIONS

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

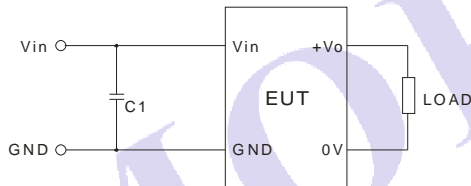
EMC SPECIFICATIONS

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

EMC RECOMMENDED CIRCUIT

B_S-2W Series

EMI Recommended External Circuit:



(Figure 1)

Recommended external circuit parameters:

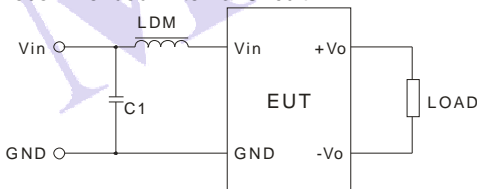
Vin: 5V/15V

C1: 2.2μF/50V

Note: Product bare input of 12V、24V already meet CLASS A.

A_S-2W Series

EMI Recommended External Circuit:



(Figure 2)

Recommended external circuit parameters:

①Vin: 5V

C1: 4.7μF/50V

LDM: 4.7μH

②Vin: 12V

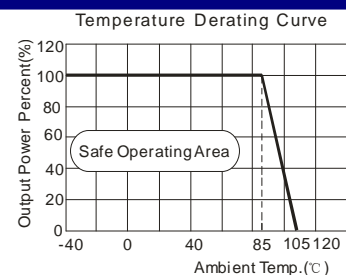
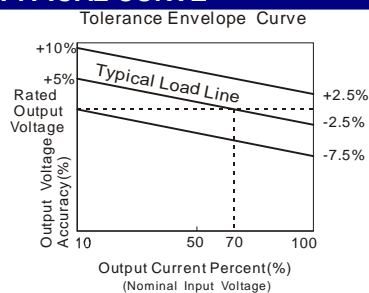
C1: 4.7μF/50V

③Vin: 15V

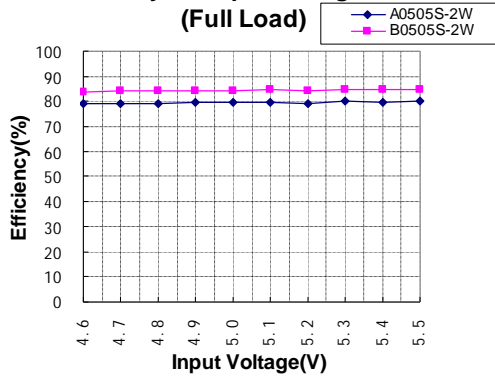
C1: 2.2μF/50V

Note: Product bare input of 3.3V、24V already meet CLASS A.

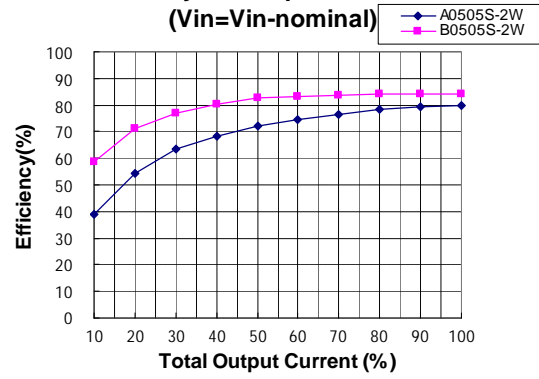
PRODUCT TYPICAL CURVE



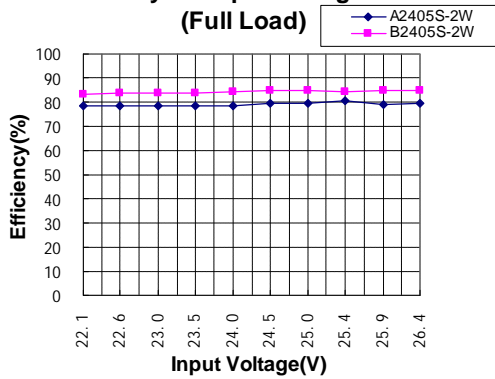
Efficiency VS Input Voltage curve (Full Load)



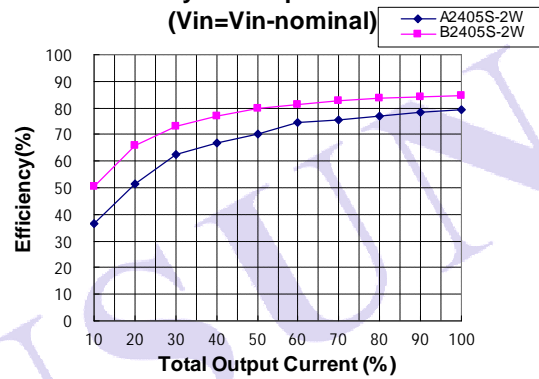
Efficiency VS Output Load curve (Vin=Vin-nominal)



Efficiency VS Input Voltage curve (Full Load)



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



OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

MECHANICAL DIMENSIONS

FOOTPRINT DETAILS

Pin	Single	Dual
1	Vin	Vin
2	GND	GND
4	0V	-Vo
5	No Pin	0V
6	+Vo	+Vo

Note:
Unit: mm[inch]
Pin section tolerances: ±0.10mm[±0.004inch]
General tolerances: ±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT

DUAL

SINGLE

Note: grid 2.54*2.54mm.

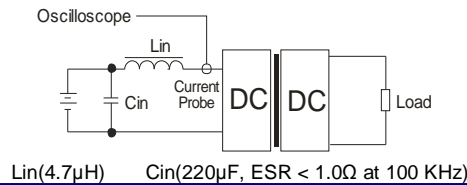
TUBE OUTLINE DIMENSIONS

Note:
Unit: mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=530mm[20.866inch] Tube Quantity: 25pcs
L=220mm[8.661inch] Tube Quantity: 10pcs
Short tube inner packaging dimensions: L*W*H=255*170*80mm;
Short tube outer packaging dimensions(with six inner packaging boxes):
L*W*H=375*280*270mm;
Long tube inner packaging dimensions: L*W*H=580*200*100mm;
Long tube outer packaging dimensions(with two inner packaging boxes):
L*W*H=600*215*220mm;
Long tube outer packaging dimensions(with three inner packaging boxes):
L*W*H=600*215*325mm.

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 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 (A_S-1W / B_LS-1W Series).

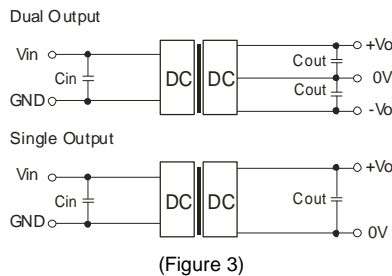
2) Overload Protection

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

3) Recommended circuit

If you want to further decrease the input/output ripple, an capacitor filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 3).

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).



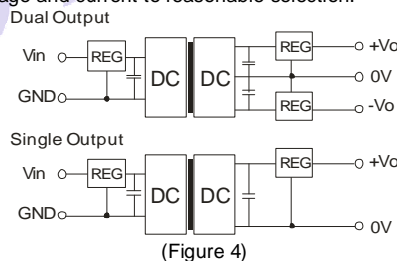
EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout# (μF)
3.3/5	4.7	3.3/5	10	± 5	4.7
12	2.2	9	4.7	± 9	2.2
15	2.2	12	2.2	± 12	1
24	1	15	1	± 15	0.47
--	--	24	1	± 24	0.47

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 4), the recommended capacitance of its filter capacitor sees (Table 1), linear regulator based on the actual voltage and current to reasonable selection.



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 data in the datasheet are measured according to nominal input voltage, rated output load, $T_A=25^\circ C$, 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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