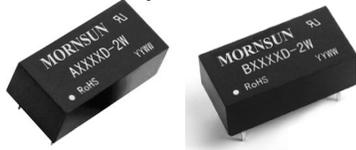


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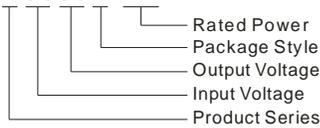
A_D-2W & B_D-2W Series 2W, FIXED INPUT, ISOLATED & UNREGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



Patent Protection RoHS  

PART NUMBER SYSTEM

A0505D-2W



FEATURES

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

APPLICATIONS

The A_D-2W & B_D-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) 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				
B0303D-2W	3.3 (3.0-3.6)	3.3	400	40	548	46	19	220	73	
B0305D-2W		5	400	40	767	46			79	
A0505D-2W	5 (4.5-5.5)	±5	±200	±20	482	31	25	100	82	UL
A0509D-2W		±9	±111	±12	465	35			85	UL
A0512D-2W		±12	±83	±9	477	40			86	UL
A0515D-2W		±15	±67	±7	461	35			82	UL
B0503D-2W		3.3	400	40	522	46			30	220
B0505D-2W	5	400	40	501	32	81	UL CE			
B0509D-2W	9	222	23	465	31	84	UL CE			
B0512D-2W	12	167	17	458	30	83	UL CE			
B0515D-2W	15	133	14	476	31	84	UL CE			
A1205D-2W	12 (10.8-13.2)	±5	±200	±20	194	17	25	100	81	UL
A1209D-2W		±9	±111	±12	186	18			84	UL
A1212D-2W		±12	±83	±9	190	17			86	UL
A1215D-2W		±15	±67	±7	195	16			82	UL
B1205D-2W		5	400	40	201	17	30	220	81	UL CE
B1209D-2W		9	222	23	196	21			82	UL CE
B1212D-2W		12	167	17	198	16			85	UL CE
B1215D-2W		15	133	14	197	20			82	UL CE
B1224D-2W		24	83	9	192	20			87	
A1505D-2W	15(13.5-16.5)	±5	±200	±20	161	15	30	100	80	
A2405D-2W	24 (21.6-26.4)	±5	±200	±20	103	11	40	100	80	UL
A2409D-2W		±9	±111	±12	96	9			84	UL
A2412D-2W		±12	±83	±9	95	8			84	UL

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				
A2415D-2W	24 (21.6-26.4)	±15	±67	±7	98	9	40	100	84	UL
★A2424D-2W		±24	±42	±5	98	9			85	
B2405D-2W		5	400	40	54	7	50	220	80	UL CE
B2409D-2W		9	222	23	97	9			83	UL CE
B2412D-2W		12	167	17	95	7			84	UL CE
B2415D-2W		15	133	14	95	8			84	UL CE
B2424D-2W		24	84	10	95	9			84	

Note: 1.★Designing .
2. # For each output.
3. The A_D-1W/B_D-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%	3.3VDC output	--	±1.5	
		Others	--	±1.2	
Load Regulation	10% to 100% load	3.3VDC output	--	12	
		5VDC output	--	12.8	
		9VDC output	--	8.3	
		12VDC output	--	6.8	
		15VDC output	--	6.3	
24VDC output	--	6.0			
Temperature Drift	100% load	--	--	±0.03	%/°C
Ripple & Noise*	20MHz bandwidth	--	100	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	B2424D-2W	--	100	--	pF
		Others	--	50	--	
Switching Frequency	Full load, nominal input	--	75	--	KHz	
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours	
Case Material		Plastic(UL94-V0)				
Weight		--	2.4	--	g	

ENVIRONMENTAL SPECIFICATIONS

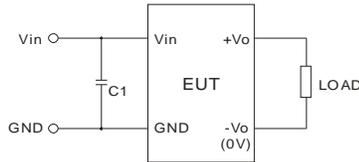
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 85°C)	-40	--	85	°C
Storage Temperature		-55	--	125	
Temp. rise at full load		--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

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

EMC RECOMMENDED CIRCUIT

EMI Recommended External Circuit:



(Figure 1)

A_D-2W Series

Recommended external circuit parameters:

①Vin: 12V

C1: 2.2μF/50V

②Vin: 15V

C1: 4.7μF/50V

Note: Product bare input of 5V、24V already meet CLASS A.

B_D-2W Series

Recommended external circuit parameters:

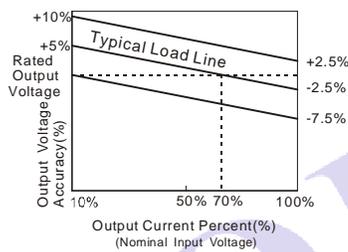
Vin: 3.3V/12V/24V

C1: 2.2μF/50V

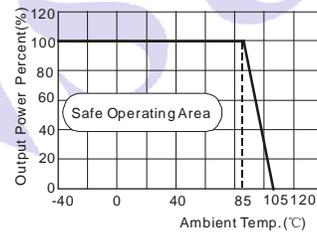
Note: Product bare input of 5V already meet CLASS A.

PRODUCT TYPICAL CURVE

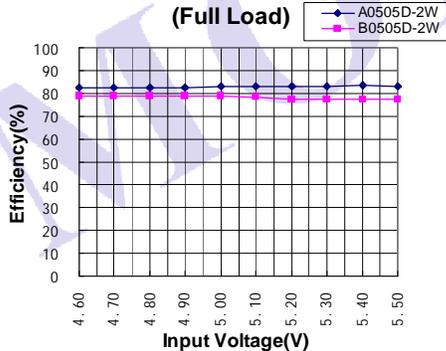
Tolerance Envelope Graph



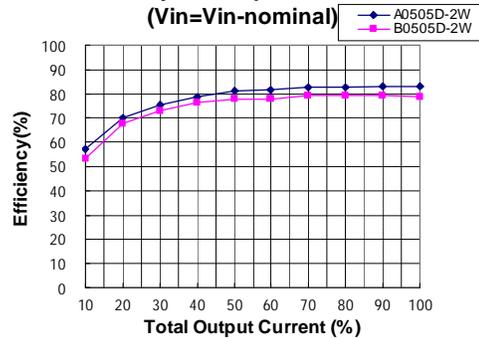
Temperature Derating Graph



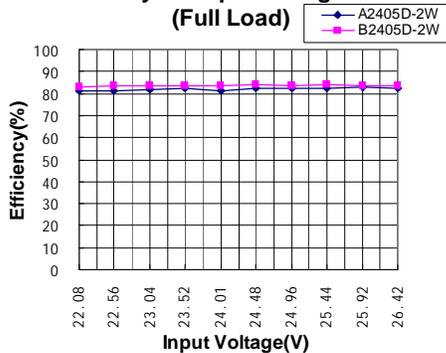
Efficiency VS Input Voltage curve (Full Load)



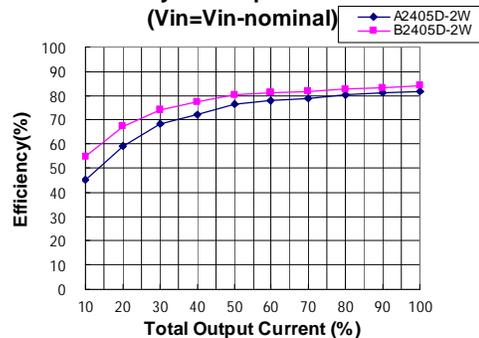
Efficiency VS Output Load curve (Vin=Vin-nominal)



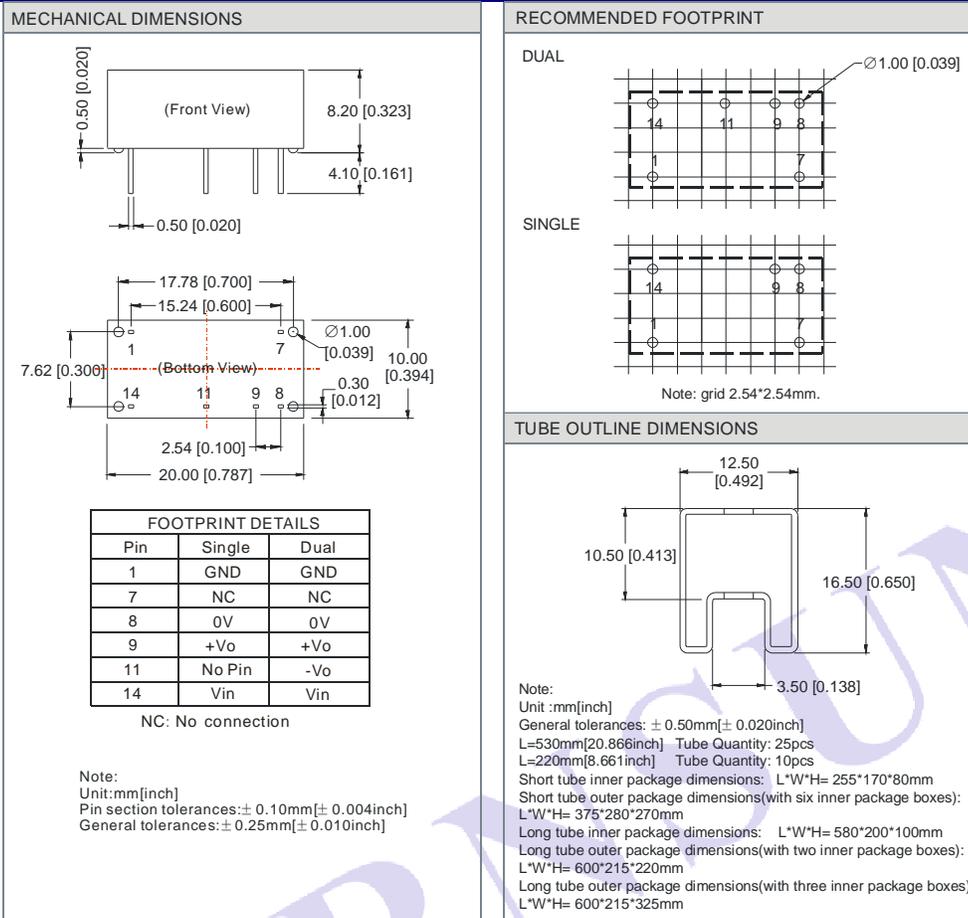
Efficiency VS Input Voltage curve (Full Load)



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



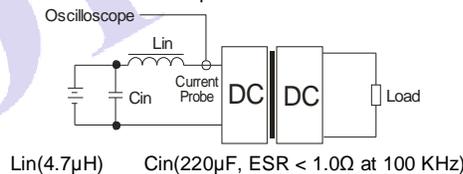
OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING



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 & APPLY 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_D -1W&B_D-1W Series).

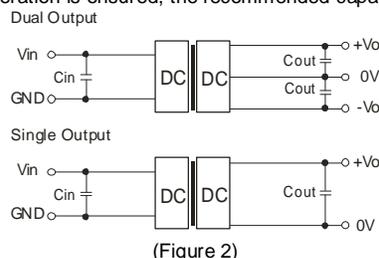
2) Overload Protection

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 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).



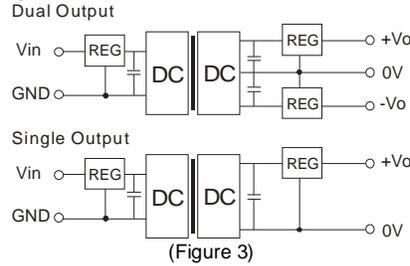
EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout [#] (μF)
3.3/5	4.7	3.3	10	±5	4.7
12	2.2	5	10	±9	2.2
15	2.2	9	4.7	±12	1
24	1	12	2.2	±15	0.47
--	--	15/24	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 3), 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 date 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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