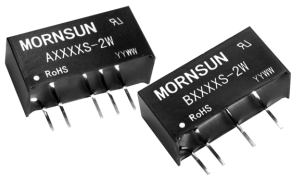
MORNSUN®



A_S-2W & B_S-2W Series

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

RoHS

FEATURES

- High efficiency up to 86%
- 1KVDC Isolation
- SIP package
- Internal SMD construction
- Temperature range: -40°C ~ +85°C
- No heat sink required
- No external component required
- Industry standard pinout
- RoHS Compliance

APPLICATIONS

The A_S-2W & B_S-2W Series are specially designed for applications where a 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 ≤ ±10%);
2) Where isolation is necessary between input and output (isolation voltage ≤1000VDC);
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.

MODEL SELECTION

A0505S-2W

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%, Typ)	Certificate
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max.	Min.		
B0303S-2W	3.3	2.97-3.63	3.3	400	40	73	
B0305S-2W			5	400	40	78	
A0505S-2W	5	4.5-5.5	±5	±200	±20	82	UL
A0509S-2W			±9	±111	±12	85	UL
A0512S-2W			±12	±83	±9	86	UL
A0515S-2W			±15	±67	±7	82	UL
A0524S-2W			±24	±42	±5	84	
B0503S-2W			3.3	400	40	74	
B0505S-2W			5	400	40	81	UL CE
B0509S-2W			9	222	23	84	UL CE
B0512S-2W			12	167	17	83	UL CE
B0515S-2W			15	133	14	84	UL CE
B0524S-2W			24	84	10	82	
A1205S-2W	12	10.8-13.2	±5	±200	±20	81	UL
A1209S-2W			±9	±111	±12	84	UL
A1212S-2W			±12	±83	±9	86	UL
A1215S-2W			±15	±67	±7	82	UL
A1224S-2W			±24	±42	±5	84	
B1205S-2W			5	400	40	81	UL CE
B1209S-2W			9	222	23	82	UL CE
B1212S-2W			12	167	17	85	UL CE
B1215S-2W			15	133	14	82	UL CE
B1224S-2W			24	84	10	84	
A1505S-2W	15	13.5-16.5	±5	±200	±20	80	
A1515S-2W			±15	±67	±7	82	
B1505S-2W			5	400	40	80	
B1515S-2W			15	133	14	80	
A2405S-2W	24	21.6-26.4	±5	±200	±20	80	UL
A2409S-2W			±9	±111	±12	84	UL
A2412S-2W			±12	±83	±9	84	UL
A2415S-2W			±15	±67	±7	84	UL
A2424S-2W			±24	±42	±5	85	
B2403S-2W			3.3	400	40	76	
B2405S-2W			5	400	40	80	UL CE
B2409S-2W			9	222	23	83	UL CE
B2412S-2W			12	167	17	84	UL CE
B2415S-2W			15	133	14	84	UL CE
B2424S-2W			24	84	10	84	

Note: The A_S_1W/B_LS_1W series also are available in our company.

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ISOLATION SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1 mA max	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output power		0.2		2	W
Line regulation	For Vin change of 1%			±1.2	%
Load regulation	10% to 100% load (3.3V output)		15	20	
	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	
	10% to 100% load (24V output)		5	15	
Output voltage accuracy		See tolerance envelope graph			
Temperature drift	100% full load			0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		75	150	mVp-p
Switching frequency	Full load, nominal input		75		KHz

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

Note: Dual output models unbalanced load: ±5%.

COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Storage humidity range				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Temp. rise at full load			15	25	
Lead temperature	1.5mm from case for 10 seconds			300	
Short circuit protection*				1	s
Cooling		Free air convection			
Case material		Plastic (UL94-V0)			
MTBF		3500			K hours
Weight			2.8		g

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

APPLICATION NOTE

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) 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).

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).

3) 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).

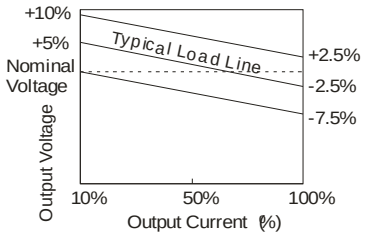
4) Overload Protection

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.

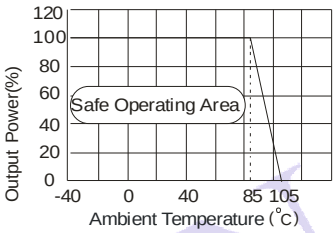
5) No parallel connection or plug and play

TYPICAL CHARACTERISTICS

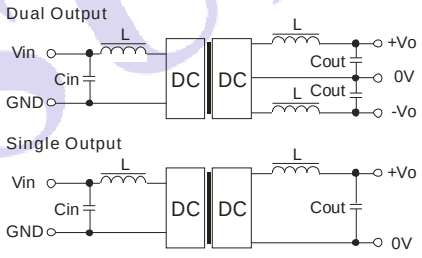
Tolerance Envelope Graph



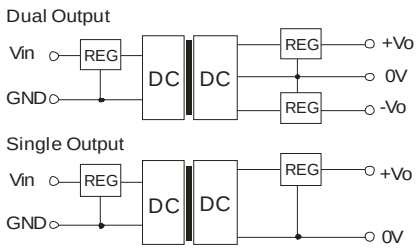
Temperature Derating Graph



RECOMMENDED CIRCUIT



(Figure 1)



(Figure 2)

EXTERNAL CAPACITOR TABLE (TABLE 1)

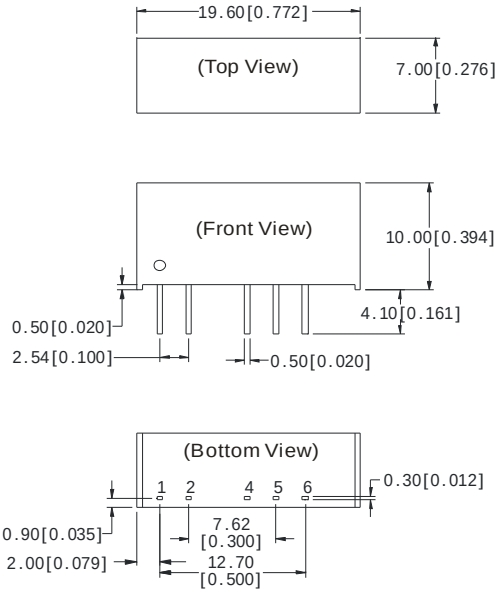
Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
3.3/5	4.7	3.3/5	10	±5	4.7
12	2.2	9	4.7	±9	2.2
15	2.2	12	2.2	±12	1
24	1	15	1	±15	0.47
-	-	24	1	±24	0.47

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

OUTLINE DIMENSIONS & PIN CONNECTIONS

MECHANICAL DIMENSIONS

A_S-2W&B_S-2W series

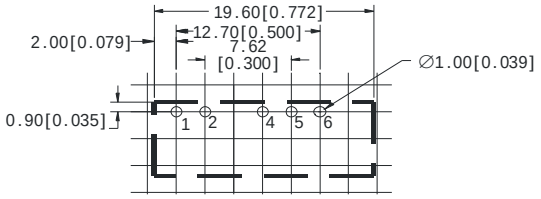


Note:
Unit:mm[inch]
Pin section tolerances: ±0.10mm[±0.004inch]
General tolerances:± 0.25mm[± 0.010inch]

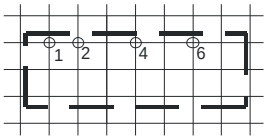
FOOTPRINT DETAILS		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
4	0V	-Vo
5	No Pin	0V
6	+Vo	+Vo

RECOMMENDED FOOTPRINT

DUAL OUTPUT

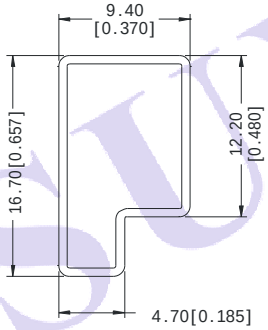


SINGLE OUTPUT



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 two inner packaging boxes):
L*W*H=600*215*325mm

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed, and that will reduce the life of product.
2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.
4. Only typical models listed, other models may be different, please contact our technical person for more details.