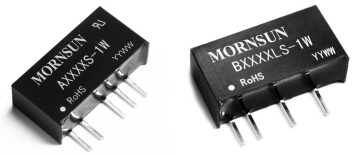
MORNSUN®

A_S-1W & B_LS-1W Series

1W, FIXED INPUT, ISOLATED & UNREGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



RoHS

PART NUMBER SYSTEM

A0505S-1W

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

FEATURES

- Efficiency up to 80%
- Small Size
- 1KVDC Isolation
- Operating Temperature Range: -40°C ~ +85°C
- No External Component Required
- Industry Standard Pinout

APPLICATIONS

The A_S-1W & B_LS-1W Series are designed for application where isolated output is required from a distributed power system.

These products apply to where:

1) Input voltage variation ≤ ±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) Max.	Output Current (mA) Min.	Input Current (mA)(typ.) @Max. Load	Input Current (mA)(typ.) @No Load	Reflected Ripple Current (mA,typ.)	Max. Capacitive Load# (μF)	Efficiency (%, typ.) @Max. Load	Approval
A0505S-1W	5 (4.5-5.5)	±5	±100	±10	273	33	20	100	72	UL
A0509S-1W		±9	±56	±6	268				77	UL
A0512S-1W		±12	±42	±5	253				79	UL
A0515S-1W		±15	±33	±4	229				80	UL
B0505LS-1W		5	200	20	273	35	21	220	70	UL CE
B0512LS-1W		12	83	9	250				78	UL CE
A1212S-1W	12 (10.8-13.2)	±12	±42	±5	105	17	15	100	79	UL
B1205LS-1W		5	200	20	116	14	22	220	71	UL CE
A2412S-1W	24 (21.6-26.4)	±12	±42	±5	52	8	43	100	80	UL

Note: 1. # For each output.
2.The A_S-W25/B_LS-W25 series also are available in our company.

INPUT SPECIFICATIONS

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

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Power			0.1	--	1	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	5VDC output	--	10.5	15	%
		9VDC output	--	8.3	15	
		12VDC output	--	6.8	15	
		15VDC output	--	6.3	15	
Temperature Drift	100% full load		--	--	±0.03	%/°C

Ripple & Noise*	20MHz Bandwidth	AXXXXS-1W	--	50	75	mVp-p
		BXXXXLS-1W	--	75	100	
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	--	30	--	pF
Switching Frequency	Full load, nominal input	--	100	--	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Case Material		Plastic(UL94-V0)			
Weight		--	2.1	--	g

ENVIRONMENTAL SPECIFICATIONS

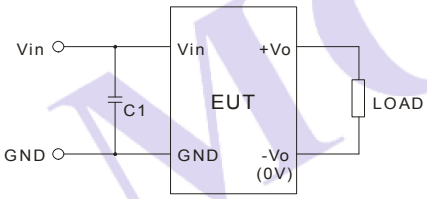
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 85℃)	-40	--	85	°C
Storage Temperature		-55	--	125	
Temp. rise at full load		--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE		CISPR22/EN55022	CLASS A（External Circuit Refer to Figure1）	
EMS	ESD	AxxxxS-1W Series	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria B
		BxxxxLS-1W Series	IEC/EN61000-4-2	Contact ±8KV	perf. Criteria B

EMC RECOMMENDED CIRCUIT

EMI Recommended External Circuit：

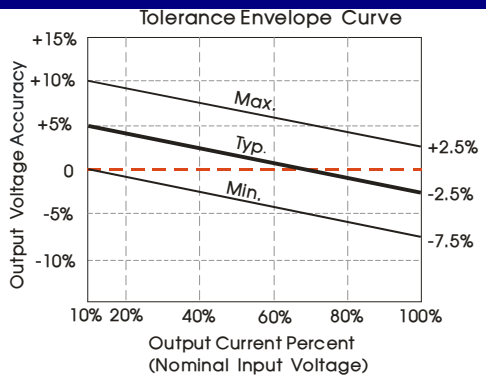


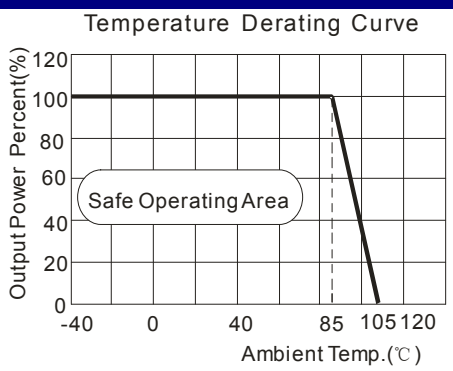
(Figure 1)

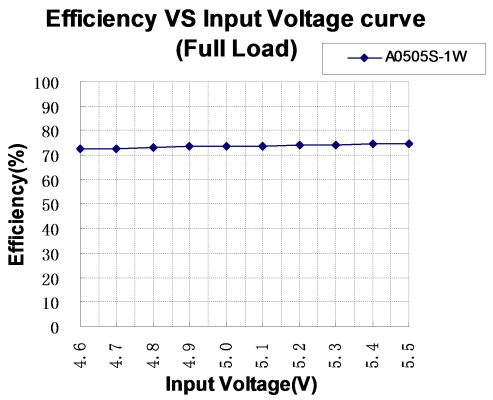
A_S-1W Series
Recommended external circuit parameters:
Vin：5V/12V
C1：4.7μF/50V
Vin：24V
C1：1μF/50V

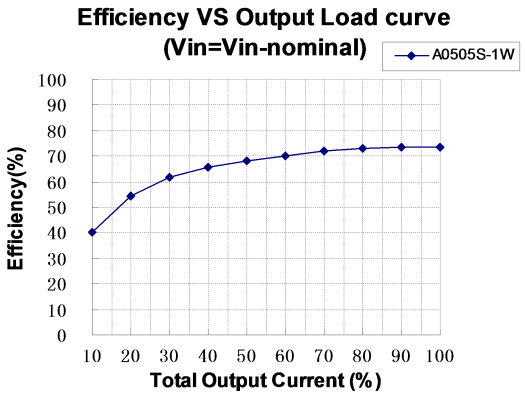
B_LS-1W Series
Recommended external circuit parameters:
Vin：5V/12V
C1：1μF/50V

PRODUCT TYPICAL CURVE

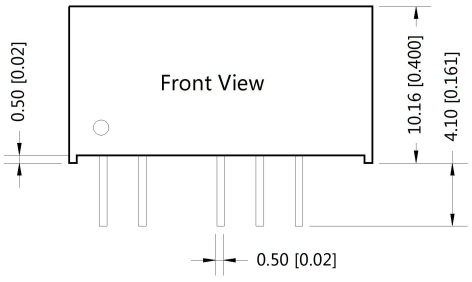


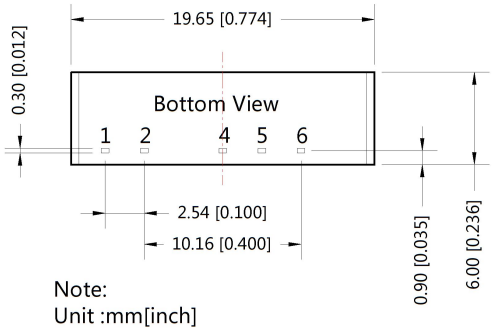




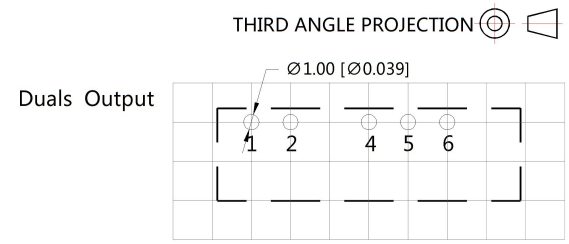


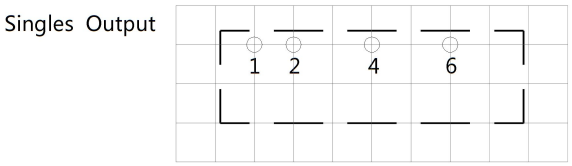
OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING





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





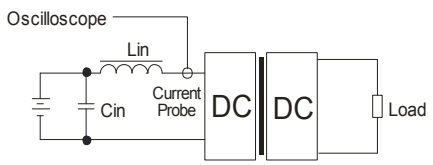
Note : Grid 2.54*2.54mm

Pin-Out		
Pin	Singles	Duals
1	Vin	Vin
2	GND	GND
4	0V	-Vo
5	No Pin	0V
6	+Vo	+Vo

TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate source impedance.



Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

DESIGN CONSIDERATIONS

1) Requirement on output load

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on t the output side (The sum of the efficient power and resistor consumption power is not less than 10%), or use our company's products with a lower rated output power (A_S -W25/B_LS-W25 series).

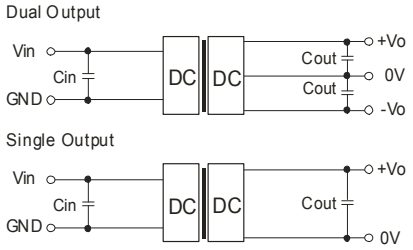
2) Overload Protection

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).



(Figure 2)

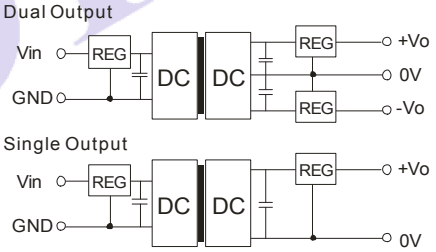
EXTERNAL CAPACITOR TABLE (TABLE 1)

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	--	--	±9	2.2
24	1	12	2.2	±12	1
-	-	--	--	±15	0.47

Note: # For each 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.



(Figure 3)

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℃, 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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