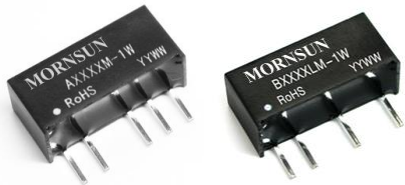


MORNSUN®

A_M-1W & B_LM-1W Series

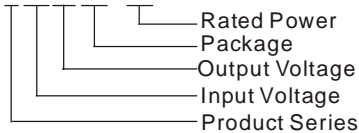
**1W, FIXED INPUT, ISOLATED & UNREGULATED
DUAL/SINGLE OUTPUT, SUPERMINIATURE SIP
PACKAGE**



Patent Protection RoHS

MODEL SELECTION

B0505LM-1W



FEATURES

- | Efficiency up to 80%
- | Miniature SIP Package Style
- | Temperature Range: -40°C to +85°C
- | Internal SMD Construction
- | Industry Standard Pinout
- | No Heat sink Required
- | No External Component Required
- | RoHS Compliance

APPLICATIONS

The A_M-1W & B_LM-1W 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 $\leq \pm 10\%$);
- 2) Where isolation is necessary between input and output (isolation voltage $\leq 1000\text{VDC}$);
- 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.

Product Program

Model	Input		Output			Efficiency (%, Typ)Output
	Voltage (VDC)		Voltage (VDC) Voltage	Voltage		
	Nominal	Range		(VDC)	Min	
A0505M-1W			± 5	± 100	± 10	70
A0509M-1W			± 9	± 56	± 6	75
A0512M-1W			± 12	± 42	± 5	78
A0515M-1W			± 15	± 33	± 4	79
B0505LM-1W	5	4.5-5.5	5	200	20	70
B0509LM-1W			9	111	12	75
B0512LM-1W			12	83	9	79
B0515LM-1W			15	67	7	80
B0524LM-1W			24	42	5	84
A1205M-1W			± 5	± 100	± 10	72
A1209M-1W			± 9	± 56	± 6	75
A1212M-1W			± 12	± 42	± 5	77
B1205LM-1W	12	10.8-13.2	5	200	20	72
B1209LM-1W			9	111	12	75
B1212LM-1W			12	83	9	77
B1215LM-1W			15	67	7	79
B1224LM-1W			24	42	5	84
A2405M-1W			± 5	± 100	± 10	70
A2412M-1W			± 12	± 42	± 5	79
A2415M-1W			± 15	± 33	± 4	81
B2405LM-1W	24	21.6-26.4	5	200	20	70
B2409LM-1W			9	111	12	73
B2412LM-1W			12	83	9	75
B2415LM-1W			15	67	7	78
B2424LM-1W			24	42	5	77

Note: Models listed with strike-through text have been officially discontinued.

OUTPUT SPECIFICATION

Item	Test Conditions	Min	Typ	Max	Unit
Output power		0.1	--	1	W
Line regulation	For Vin change of 1%	--	--	1.2	%
Load regulation	10% to 100% full load(5V output)	--	10	15	
	10% to 100% full load(9V output)	--	8.3	10	
	10% to 100% full load(12V output)	--	6.8	10	
	10% to 100% full load(15V output)	--	6.3	10	
	10% to 100% full load(24V output)	--	5	10	
Temperature drift	100% full load	--	--	0.03	%/°C
Output voltage accuracy		See tolerance envelope grap			
Ripple & Noise*	20MHz Bandwidth(AXXXXM-1W)	--	50	75	mVp-p
	20MHz Bandwidth(BXXXXLM-1W)	--	75	100	
Switching frequency	100% load, nominal input(5V,12V)	--	100	--	KHz
	100% load, nominal input(24V)	--	500	--	

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at DC-DC Application Notes.

COMMON SPECIFICATION

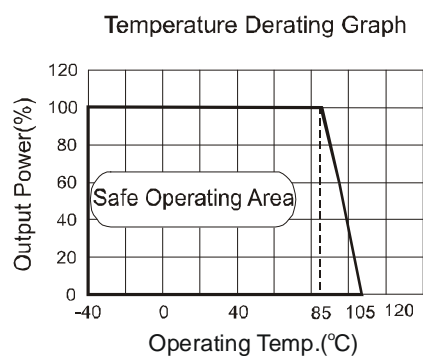
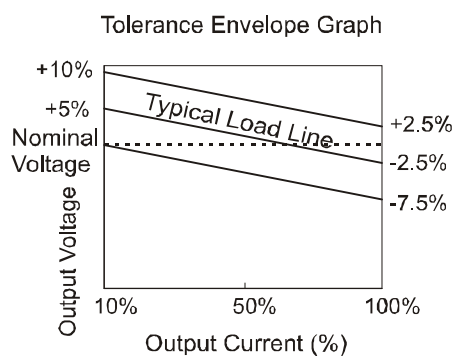
Item	Test Conditions	Min	Typ	Max	Unit
Storage humidity		--	--	95	%
Operating temperature		-40	--	85	°C
Storage temperature		-55	--	125	
Temp. rise at full load		--	15	25	
Lead temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			
Case material		Plastic(UL94-V0)			
Short circuit protection*		--	--	1	S
MTBF		350	--	--	K hours
Weight		--	2.1	--	g

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

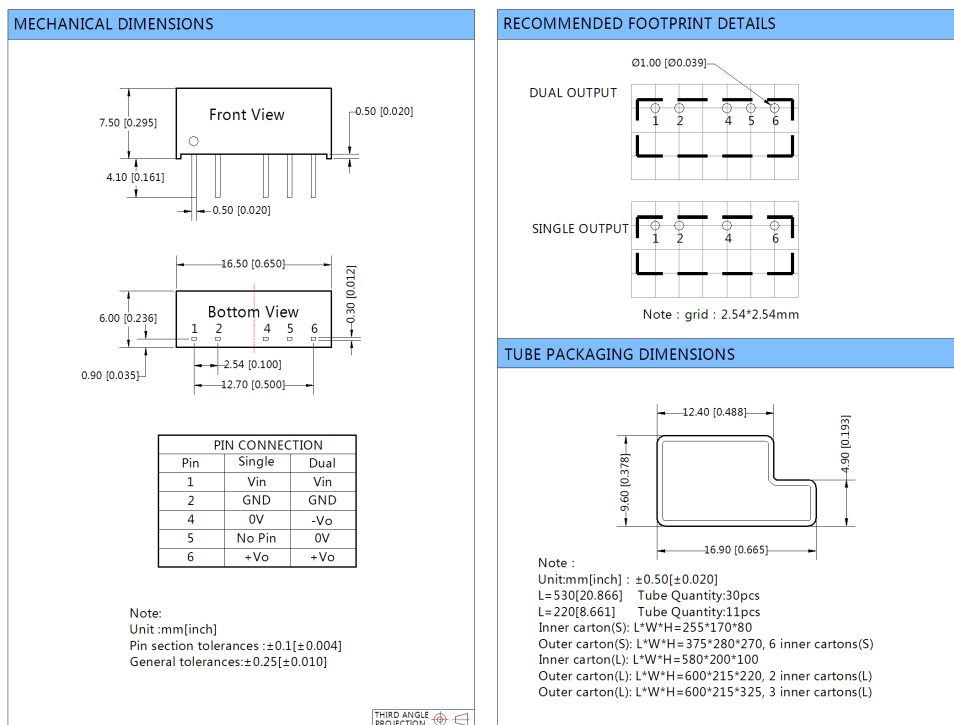
Isolation Specifications

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

TYPICAL CHARACTERISTICS



OUTLINE DIMENSIONS & PIN CONNECTIONS



APPLICATION NOTE

1) Requirement On Output Load

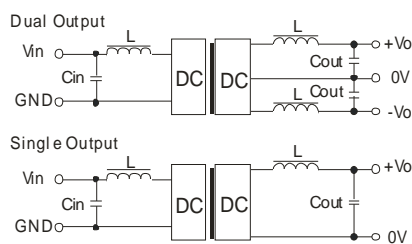
To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded the minimum output load could not be less than 10% 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_M-W2 & B_LM-W2 Series).

2) 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.

3) 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).



(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 recommended capacitance of its filter capacitor sees (Table 1).

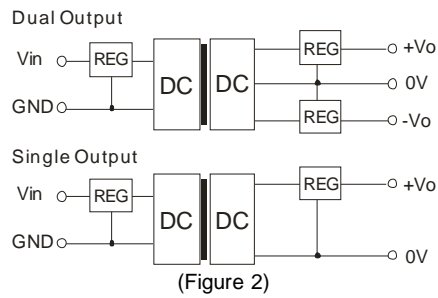
EXTERNAL CAPACITOR TABLE (Table 1)

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

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 voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).



5) It is not recommended to increase the output power capability by connecting two or more converters in parallel. The product is not hot-swappable.

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specifications.
2. Max. Capacitive Load is tested at nominal input voltage and full load.
3. Unless otherwise noted, All specifications are measured at $T_a=25^{\circ}\text{C}$, humidity<75%, nominal input voltage and rated output load.
4. In this datasheet, all test methods are based on our corporate standards.
5. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.
6. Please contact our technical support for any specific requirement.
7. Specifications of this product are subject to changes without prior notice.

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