MORNSUN®

A_D-1W &B_LD-1W Series

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

Patent Protection **RoHS** CE cULus

FEATURES

- High efficiency up to 81%
- Compact size
- Isolation voltage:1K VDC
- DIP package
- Good temperature characteristic
- Operating temperature range: -40℃ to +85°C
- No external component required
- International standard pin-out
- RoHS Compliance

APPLICATIONS

The A_D-1W &B_LD-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 ≤ ±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

A0505D-1W

- 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.		
B0303LD-1W	3.3	2.97-3.63	3.3	303	31	72	--
A0505D-1W	5	4.5-5.5	±5	±100	±10	72	UL
A0509D-1W			±9	±56	±6	77	UL
A0512D-1W			±12	±42	±5	79	UL
A0515D-1W			±15	±33	±4	80	UL
B0505LD-1W			5	200	20	70	UL CE
B0509LD-1W			9	111	12	78	UL CE
A1205D-1W	12	10.8-13.2	±5	±100	±10	72	UL
A1212D-1W			±12	±42	±5	79	UL
B1205LD-1W			5	200	20	71	UL CE
B1212LD-1W			12	83	9	78	UL CE
A2409D-1W	24	21.6-26.4	±9	±56	±6	79	UL
A2412D-1W			±12	±42	±5	80	UL
A2415D-1W			±15	±33	±4	80	UL
B2405LD-1W			5	200	20	73	UL CE
B2412LD-1W			12	83	9	78	UL CE
B2424LD-1W			24	42	4	81	--

Note: Note:The B_LD-W25 series also are available in our company.

COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%RH
Operating temperature		-40		85	℃
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		Black flame-retardant and heat-resistant plastic (UL94 V-0)			
MTBF		3500			K hours
Weight			2.1		g

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

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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

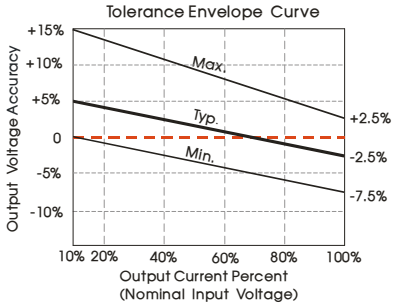
OUTPUT SPECIFICATIONS

Item	Test conditions		Min.	Typ.	Max.	Units
Output power			0.1		1	W
Line regulation	For Vin change of 1%	(3.3V output)			±1.5	%
		(Other output)			±1.2	
Load regulation	10% to 100% load	(3.3V output)		12	20	%
		(5V output)		10.5	15	
		(9V output)		8.3	15	
		(12V output)		6.8	15	
		(15V output)		6.3	15	
		(24V output)		5.0	15	
Output voltage accuracy			See tolerance envelope graph			
Temperature drift	100% full load				±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth	(AXXXXD-1W)		50	75	mVp-p
		(BXXXXLD-1W)		75	100	
		(BXX24LD-1W)		100	150	
Switching frequency	Full load, nominal input			100		KHz

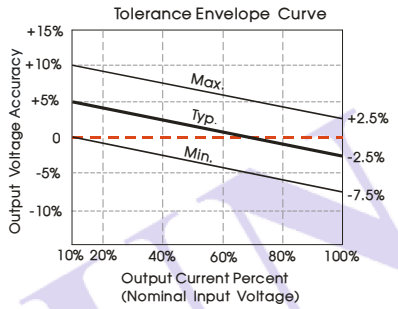
* Ripple and noise are measured by “parallel cable” method, please see DC-DC Converter Application Notes for specific operation

TYPICAL CHARACTERISTICS

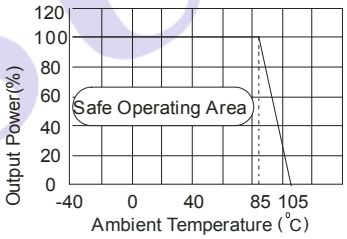
3.3、5VDC output



Other output



Temperature Derating Graph



APPLICATION NOTE

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 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 (B_LD-W25 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

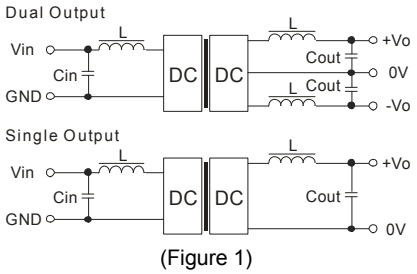
The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).

4) Overload Protection

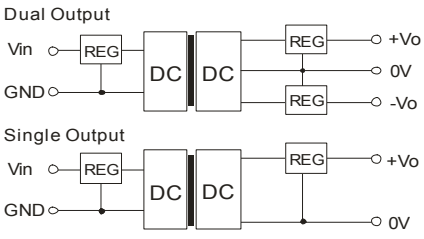
Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

5) No parallel connection or plug and play

RECOMMENDED CIRCUIT



(Figure 1)

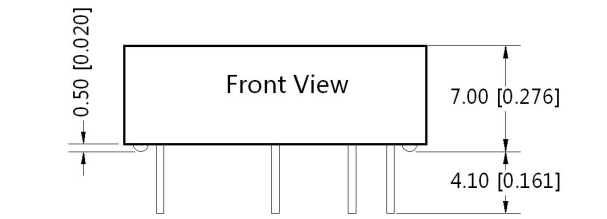


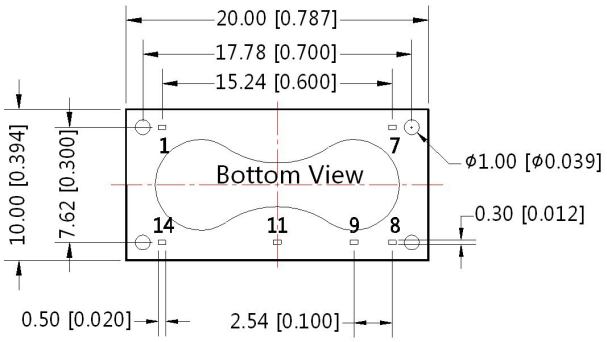
(Figure 2)

EXTERNAL CAPACITOR TABLE (TABLE 1)

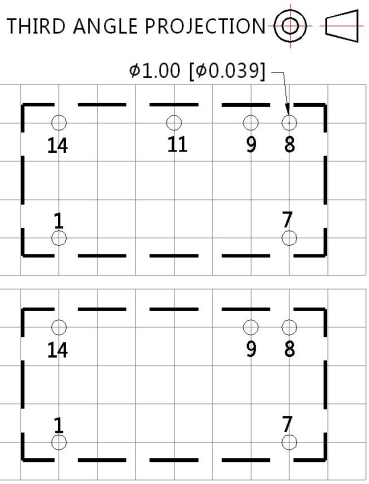
Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
3.3/5	4.7	3.3	10	±5	4.7
12	2.2	5	10	±9	2.2
24	1	9	4.7	±12	1
-	-	12	2.2	±15	0.47
-	-	24	1	-	-

OUTLINE DIMENSIONS & PIN CONNECTIONS





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	Single	Dual
1	GND	GND
7	NC	NC
8	0V	0V
9	+Vo	+Vo
11	No Pin	-Vo
14	Vin	Vin

NC:No connection

Note:
1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58200009;
2. 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.
3. All specifications measured at Ta=25°C, humidity<75%RH, nominal input voltage and rated output load unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on corporate standards.
5. Only typical models listed, other models may be different, please contact our technical person for more details.