

## A\_D-2W & B\_D-2W Series

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



### FEATURES

- High Efficiency up to 86%
- 1KVDC Isolation
- DIP Package
- Internal SMD Construction
- Temperature Range: -40°C to +85°C
- No Heat sink Required
- Internal SMD construction
- Industry Standard Pinout
- RoHS Compliance

### APPLICATIONS

The A\_D-2W & B\_D-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.

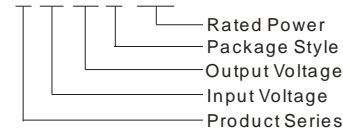
These products apply to:

- Where the voltage of the input power supply is fixed (voltage variation  $\leq \pm 10\%$ );
- Where isolation is necessary between input and output (isolation voltage  $\leq 1000\text{VDC}$ );
- 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-2W



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### PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (% Typ)	Certificate
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max	Min		
B0303D-2W	3.3	3.0-3.6	3.3	400	40	73	
A0505D-2W	5	4.5-5.5	$\pm 5$	$\pm 200$	$\pm 20$	82	UL
A0509D-2W			$\pm 9$	$\pm 111$	$\pm 12$	85	UL
A0512D-2W			$\pm 12$	$\pm 83$	$\pm 9$	86	UL
A0515D-2W			$\pm 15$	$\pm 67$	$\pm 7$	82	UL
B0503D-2W			3.3	400	40	74	
B0505D-2W	5	400	40	81	UL CE		
B0509D-2W	9	222	23	84	UL CE		
B0512D-2W	12	167	17	83	UL CE		
B0515D-2W	15	133	14	84	UL CE		
A1205D-2W	12	10.8-13.2	$\pm 5$	$\pm 200$	$\pm 20$	81	UL
A1209D-2W			$\pm 9$	$\pm 111$	$\pm 12$	84	UL
A1212D-2W			$\pm 12$	$\pm 83$	$\pm 9$	86	UL
A1215D-2W			$\pm 15$	$\pm 67$	$\pm 7$	82	UL
B1205D-2W			5	400	40	81	UL CE
B1209D-2W	9	222	23	82	UL CE		
B1212D-2W	12	167	17	85	UL CE		
B1215D-2W	15	133	14	82	UL CE		
A1505D-2W	15	13.5-16.5	$\pm 5$	$\pm 200$	$\pm 20$	80	
A2405D-2W	24	21.6-26.4	$\pm 5$	$\pm 200$	$\pm 20$	80	UL
A2409D-2W			$\pm 9$	$\pm 111$	$\pm 12$	84	UL
A2412D-2W			$\pm 12$	$\pm 83$	$\pm 9$	84	UL
A2415D-2W			$\pm 15$	$\pm 67$	$\pm 7$	84	UL
A2424D-2W			$\pm 24$	$\pm 42$	$\pm 5$	85	
B2405D-2W	5	400	40	80	UL CE		
B2409D-2W	9	222	23	83	UL CE		
B2412D-2W	12	167	17	84	UL CE		
B2415D-2W	15	133	14	84	UL CE		
B2424D-2W	24	84	10	84			

Note: The A\_S\_1W/B\_LS\_1W series also are available in our company.

### COMMON SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Operating Temp. Range		-40		85	°C
Storage Temp. Range		-55		125	
Storage humidity range				95	%
Cooling		Free air convection			
Temp. rise at full load			15	25	°C
Lead temperature	1.5mm from case for 10 seconds			300	
Isolation voltage	Tested for 1 minute and 1 mA max	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Short circuit protection*				1	s
Case material		Plastic (UL94-V0)			
MTBF		3500			K hours

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

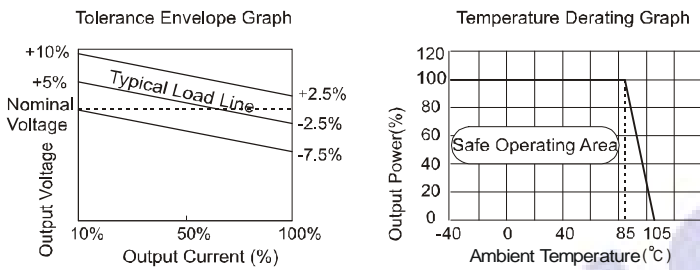
## OUTPUT SPECIFICATIONS

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	(5V output)	12.8	15	%
		(9V output)	8.3	15	
		(12V output)	6.8	15	
		(15V output)	6.3	15	
Output voltage accuracy	See tolerance envelope graph				
Temperature drift	100% full load			0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		100	150	mVp-p
Switching frequency	Full load, nominal input		75		KHz

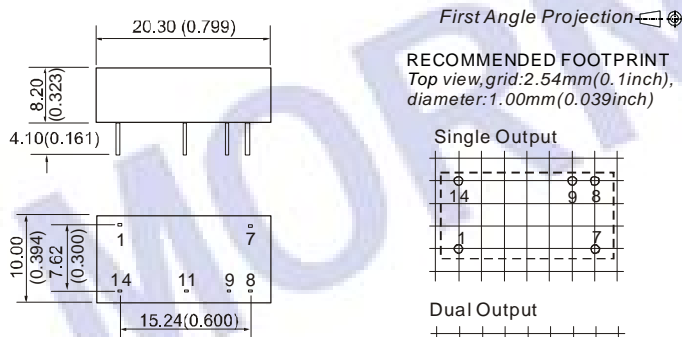
Note:

- All specifications measured at  $T_A=25^\circ\text{C}$ , humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- Dual output models unbalanced load:  $\pm 0.5\%$ .

## TYPICAL CHARACTERISTICS



## OUTLINE DIMENSIONS & PIN CONNECTIONS

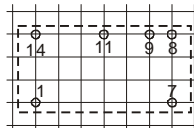


RECOMMENDED FOOTPRINT  
Top view, grid: 2.54mm (0.1inch),  
diameter: 1.00mm (0.039inch)

Single Output



Dual Output



### FOOTPRINT DETAILS

Pin	Singles	Duals
1	GND	GND
7	NC	NC
8	0V	0V
9	+Vo	+Vo
11	No pin	-Vo
14	Vin	Vin

Note:

Unit:mm(inch)  
Pin section: 0.50\*0.30mm (0.020\*0.012inch)  
Pin tolerances:  $\pm 0.10\text{mm}$  ( $\pm 0.004\text{inch}$ )  
General tolerances:  $\pm 0.25\text{mm}$  ( $\pm 0.010\text{inch}$ )

## APPLICATION NOTE

### Requirement on output load

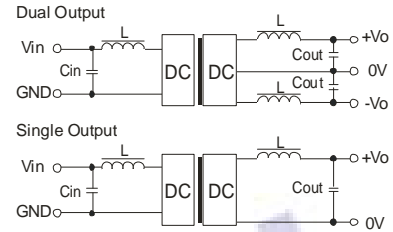
To ensure this module can operate efficiently and reliably, During operation, the minimum output load is **not less than 10%** of the full load, and that **this product should never be operated under no load!** If the actual output power is very small, please connect a resistor with proper resistance 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-1Wseries).

### 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.

### 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 greatest capacitance of its filter capacitor sees (Table 1).

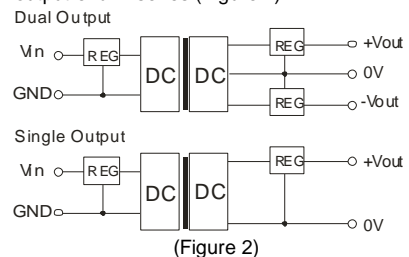
### EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (uF)	Single Vout (VDC)	Cout (uF)	Dual Vout (VDC)	Cout (uF)
5	4.7	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	1	±24	0.47

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

### 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 that is connected to the input or output end in series (Figure 2).



(Figure 2)

**No parallel connection or plug and play.**