MORNSUN
mini power professional

B_XD-1W Series

FIXED INPUT ISOLATED & UNREGULATED 1W OUTPUT SINGLE OUTPUT DIP PACKAGE

RoHS
multi-country patent protection

FEATURES

- Efficiency to 81%
- Small Footprint
- Single Output Voltage
- 1KVDC Isolation
- Fixed Input Voltage
- Unregulated Output Voltage
- Temperature Range: -40°C~+85°C
- Industry Standard Pinout
- UL94-V0 Package
- No Heat Sink Required
- No External Component Required
- RoHS Compliance

APPLICATIONS

The B_XD-1W Series is specially designed for applications where a single power supply is 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 demanded.
Such as: purely digital circuits, ordinary low frequency analog circuits.
These products don't apply to:
1) Where the input supply voltage is varied (variation≥±10%), otherwise our company's WRB series is recommended;
2)Where the isolation voltage between input and output is required to be>1000VDC, otherwise our company's FS(D)-1W Series of products are recommended;
3)Circuits in which the output voltage regulation is demanded, otherwise our company's IB Series or WRB Series are recommended.

MODEL SELECTION

B0505XD-1W

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

PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%, Typ)	Package Style
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max	Min		
B0303XD-1W	3.3	3.0~3.6	3.3	300	30	72	DIP
B0305XD-1W	3.3	3.0~3.6	5	200	20	73	DIP
B0503XD-1W	5	4.5~5.5	3.3	300	30	74	DIP
B0505XD-1W	5	4.5~5.5	5	200	20	72	DIP
B0509XD-1W	5	4.5~5.5	9	111	12	74	DIP
B0512XD-1W	5	4.5~5.5	12	83	9	77	DIP
B0515XD-1W	5	4.5~5.5	15	67	7	79	DIP
B1203XD-1W	12	10.8~13.2	3.3	300	30	75	DIP
B1205XD-1W	12	10.8~13.2	5	200	20	73	DIP
B1209XD-1W	12	10.8~13.2	9	111	12	75	DIP
B1212XD-1W	12	10.8~13.2	12	83	9	79	DIP
B1215XD-1W	12	10.8~13.2	15	67	7	80	DIP
B2403XD-1W	24	21.6~26.4	3.3	300	30	76	DIP
B2405XD-1W	24	21.6~26.4	5	200	20	74	DIP
B2409XD-1W	24	21.6~26.4	9	111	12	76	DIP
B2412XD-1W	24	21.6~26.4	12	83	9	80	DIP
B2415XD-1W	24	21.6~26.4	15	67	7	81	DIP

COMMON SPECIFICATIONS

Short circuit protection	1 second
Temperature rise at full load	25°C MAX, 15°C TYP
Cooling	Free air convection
Operating temperature range	-40°C~+85°C
Storage temperature range	-55°C ~+125°C
Lead temperature	300°C (1.5mm from case for 10 seconds)
Storage humidity range	≤ 95%
Case material	Plastic (UL94-V0)
MTBF	>3,500,000 hours

ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	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%			1.2	%
Load regulation	10% to 100% full load		10	15	%
Output voltage accuracy	See tolerance envelope graph				
Temperature drift	100% full load			0.03	%/°C
Output ripple	20MHz Bandwidth		50	75	mVp-p
Switching frequency	Full load, nominal input		100		KHz

Note:
1.All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2.See below recommended circuits for more details.

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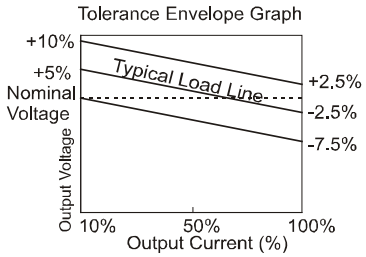
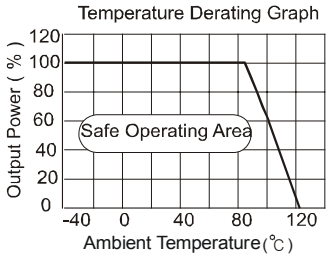
TYPICAL CHARACTERISTICS

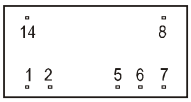




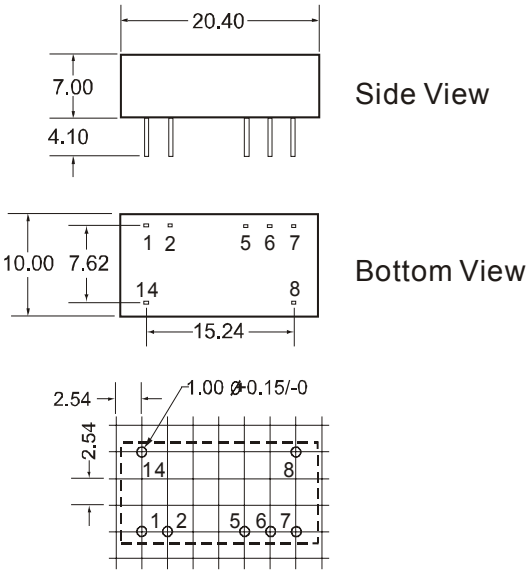
PIN CONNECTIONS

Pin	Function
1	Vin
2	GND
5	0V
6	+Vo
7,8	NC
14	NC

Top View



OUTLINE DIMENSIONS& RECONMENDED FOOTPRINT DETAILS



Note: All Pins on a 2.54mm pitch; all pin diameters are 0.50mm; all dimensions in mm.

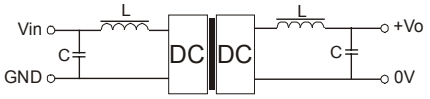
APPLICATION NOTE

Filtering

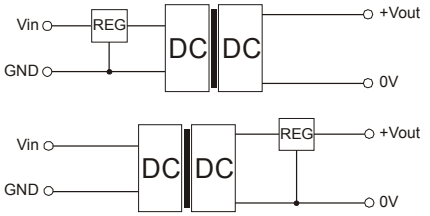
For some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. However, the capacitance of the output filter capacitor must proper. If the capacitance is too big, a startup problem might arise. For every channel of output, providing the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor refer to the **External Capacitor Table**. To get an extreme low ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, which may produce a more significant filtering effect. 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 (see figure 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 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 (B_XD -0.25W series).



<Figure 1>



<Figure 2>

Overload Protection

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

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 (see Figure 2).

External Capacitor Table

V_{in}	External capacitor	V_{out}	External capacitor
5VDC	4.7uF	5VDC	10uF
12VDC	2.2uF	9VDC	4.7uF
24VDC	1uF	12VDC	2.2uF
--	--	15VDC	1uF

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