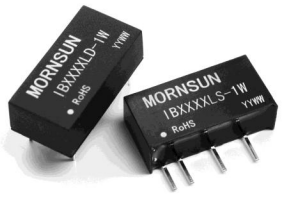
MORNSUN

IB_LD-1W & IB_LS-1W Series

1W, FIXED INPUT, ISOLATED & REGULATED SINGLE OUTPUT DC-DC CONVERTER



RoHS

FEATURES

- Small Footprint
- SIP/DIP Package
- Low Ripple and good EMC features
- Temperature Range: -40°C ~ +85°C
- No Heat Sink Required
- No External Component Required
- 1KVDC Isolation
- Internal SMD construction
- Continuous Short Circuit Protection
- Industry Standard Pinout
- RoHS Compliance

APPLICATIONS

The IB_LD-1W & IB_LS-1W series are specially designed for applications where a single power supply is highly 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 ≤±5%);
2) Where isolation is necessary between input and output (isolation voltage ≤1000VDC);
3) Where the regulation of the output voltage and the output ripple and noise are demanded.

MODEL SELECTION

IB0515LS-1W

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

PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%, Typ.)	Package
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max.	Min.		
IB0505LD-W75	5	4.75-5.25	5	150	15	68	DIP
IB0509LD-1W			9	111	12	70	DIP
IB0512LD-1W			12	83	9	71	DIP
IB0515LD-1W			15	67	7	73	DIP
IB0505LS-W75			5	150	15	68	SIP
IB0509LS-1W			9	111	12	70	SIP
IB0512LS-1W			12	83	9	71	SIP
IB0515LS-1W			15	67	7	73	SIP
IB1205LD-W75	12	11.4-12.6	5	150	15	68	DIP
IB1209LD-1W			9	111	12	72	DIP
IB1212LD-1W			12	83	9	70	DIP
IB1215LD-1W			15	67	7	74	DIP
IB1205LS-W75			5	150	15	68	SIP
IB1209LS-1W			9	111	12	72	SIP
IB1212LS-1W			12	83	9	70	SIP
IB1215LS-1W			15	67	7	74	SIP
IB1505LS-W75	15	14.25-15.75	5	150	15	70	SIP
IB1509LS-1W *			9	111	12	71	SIP
IB1512LS-1W *			12	83	9	71	SIP
IB1515LS-1W			15	67	7	72	SIP
IB2405LD-W75*	24	22.8-25.2	5	150	15	68	DIP
IB2409LD-1W			9	111	12	68	DIP
IB2412LD-1W			12	83	9	73	DIP
IB2415LD-1W			15	67	7	75	DIP
IB2405LS-W75			5	150	15	68	SIP
IB2409LS-1W			9	111	12	68	SIP
IB2412LS-1W			12	83	9	73	SIP
IB2415LS-1W			15	67	7	75	SIP

* Designing.

COMMON SPECIFICATIONS

Item	Test condition	Min.	Typ.	Max.	Units
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	
Short circuit protection		Continuous			
Cooling		Free air convection			
Case material		Plastic(UL94-V0)			
MTBF		3500			k hours
Weight	IB_LS-1W series		2.1		g
	IB_LD-1W series		2.4		

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ISOLATION SPECIFICATIONS

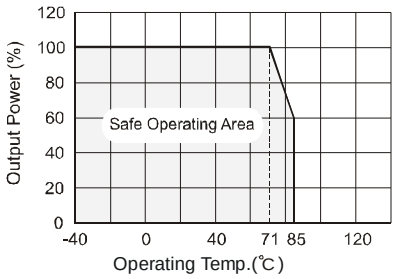
Item	Test condition	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1mA max	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Output power		0.1		1	W
Line regulation	For Vin change of ±5%			±0.25	%
Load regulation	10% to 100% load			±1	
Output voltage accuracy	100% full load			±3	
Temperature drift	100% full load			±0.03	%/°C
Ripple*	20MHz Bandwidth		10	20	mVp-p
Noise*	20MHz Bandwidth		50	75	
Switching frequency	Full load, nominal input		100		kHz

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

TYPICAL TEMPERATURE CURVE



APPLICATION NOTE

1) 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 (IB_LD -W25/IB_LS-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) Overload Protection

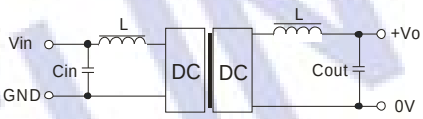
Under normal operating conditions, the output circuit of these products has no protection against over-current and short-circuits. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

4) Input Over-voltage Protection Circuit

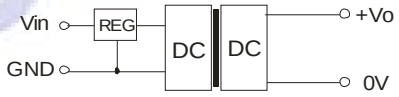
The simplest device for input over-voltage protection is a linear voltage regulator with overheat protection that is connected to the input end in series (Figure 2).

5) No parallel connection or plug and play

RECOMMENDED CIRCUIT



(Figure 1)



(Figure 2)

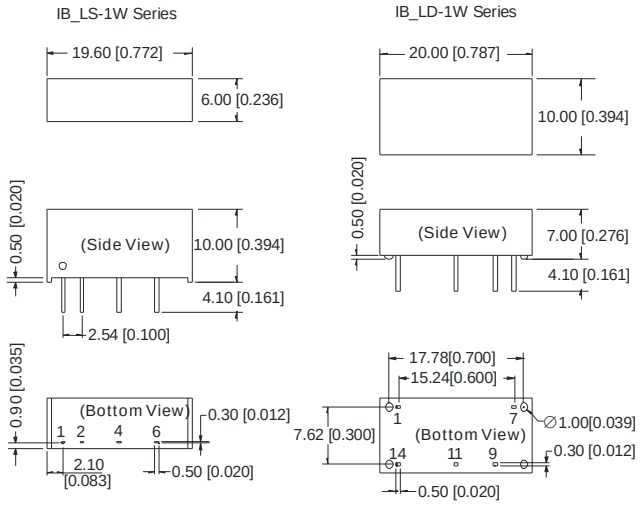
EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (uF)	Vout (VDC)	Cout (uF)
5	4.7	5	10
12	4.7	9	4.7
15	2.2	12	2.2
24	1	15	1

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

OUTLINE DIMENSION & PIN CONNECTIONS

MECHANICAL DIMENSIONS



FOOTPRINT DETAILS	
Pin	IB_LS-1W
1	Vin
2	GND
4	0V
6	+Vo

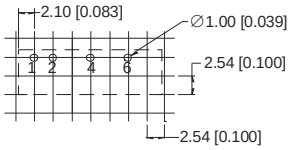
FOOTPRINT DETAILS	
Pin	IB_LD-1W
1	GND
7	NC
9	+Vo
11	0V
14	Vin

NC：No connection

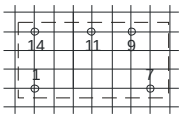
Note:
Unit:mm[inch]
Pin section tolerances:± 0.10mm[± 0.004inch]
General tolerances:± 0.25mm[± 0.010inch]

RECOMMENDED FOOTPRINT

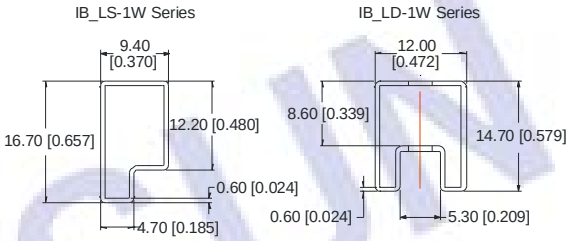
IB_LS-1W Series



IB_LD-1W Series



TUBE OUTLINE DIMENSIONS



Note:
Unit :mm[inch]
General tolerances: ±0.50mm[±0.020inch]

L=530mm[20.866inch] Devices per tube: 25pcs
L=220mm[8.661inch] Devices per tube: 10pcs

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.
2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. Only typical models listed, other models may be different, please contact our technical person for more details.
4. In this datasheet, all the test methods of indications are based on corporate standards.