DC/DC Converter
IB_XT-1WR2 Series

MORNSUN®

1W isolated DC-DC converter
Fixed input voltage, regulated single output

Continuous Short Circuit Protection

CE Patent Protection RoHS

FEATURES

- Continuous short-circuit protection
- High efficiency up to 75%
- Operating ambient temperature range -40℃ to +85℃
- I/O isolation test voltage 1.5k VDC
- Miniature SMD package
- No extra components required
- Industry standard pin-out
- EN60950 approved

IB_XT-1WR2 series are especially designed for distributed power supply systems where an isolated voltage is required with the following application characteristics:

1. The voltage to the input of the power supply is relatively stable with a variation of ±5%Vin nominal;

2. Input to Output isolation of up to 1500VDC is necessary;

3. Applications with a tight line and load regulation requirement combined with low ripple & noise on the output.

Selection Guide

Certification.	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency(%) Min./Typ.	Capacitive Load (μF) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
CE	IB0503XT-1WR2	5 (4.75-5.25)	3.3	243/25	54/58	220
	IB0505XT-1WR2		5	200/20	68/72	
	IB0512XT-1WR2		12	84/9	69/73	
	IB0515XT-1WR2		15	67/7	70/74	
	IB1205XT-1WR2	12 (11.4-12.6)	5	200/20	69/73	
	IB1212XT-1WR2		12	84/9	69/73	
	IB1215XT-1WR2		15	67/7	71/75	
	IB2405XT-1WR2	24 (22.8-25.2)	5	200/20	69/73	
	IB2412XT-1WR2		12	84/9	69/73	
	IB2415XT-1WR2		15	67/7	69/73	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	270/15	--	mA
	12V input	--	115/10	--	
	24V input	--	56/7	--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	24V input	-0.7	--	30	
Reflected Ripple Current		--	15	--	mA
Input Filter		Capacitance filter			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	100% load		--	--	±3	%
Linear Regulation	Input voltage change: ±1%		--	--	±0.25	
Load Regulation	10%-100% load	3.3VDC output	--	--	3	

Load Regulation	10%-100% load	Other output	--	--	2	%
Ripple*	20MHz bandwidth		--	10	--	mVp-p
Noise*			--	50	--	
Temperature Coefficient	100% load		--	--	±0.03	%/℃
Short-circuit Protection			Continuous, self-recovery			
Note: * The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.						

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	20	--	pF
Operating Temperature	Derating when operating temperature≥71℃ (See Fig. 1)	-40	--	85	℃
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta =25℃	--	25	--	
Reflow Soldering Temperature		Peak temperature ≤245℃, duration ≤60s max. over 217℃. See also IPC/JEDEC J-STD-020D.1.			
Storage Humidity	Non-condensing	--	--	95	%
Switching Frequency	100% load, nominal input voltage	--	100	300	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours

Mechanical Specifications

Case Material	Black Epoxy resin; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	15.24 x 11.20 x 7.25 mm
Weight	2.0g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 3 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 3 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV perf. Criteria B

Typical Characteristic Curves

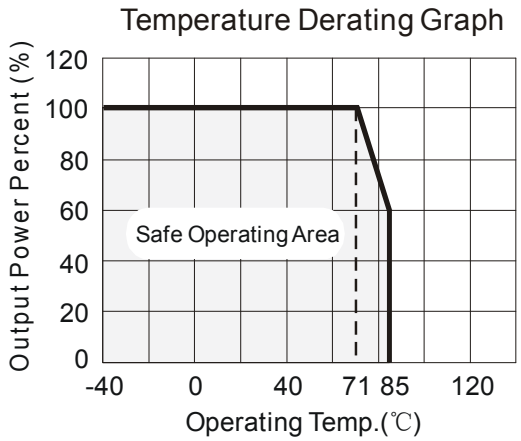
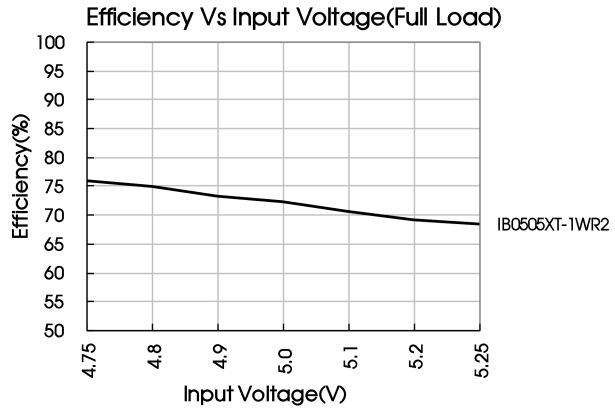
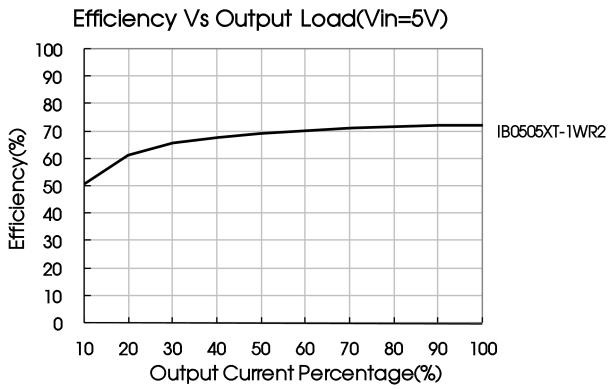
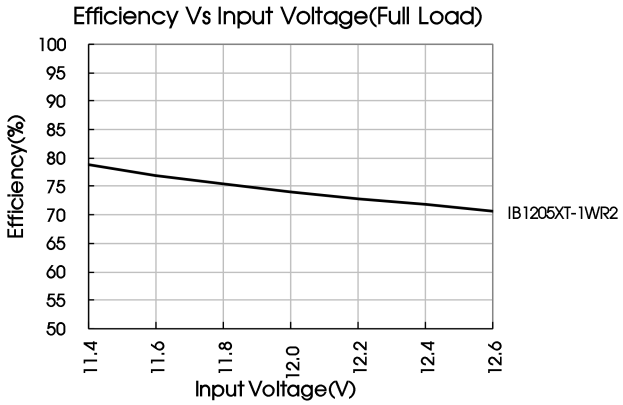
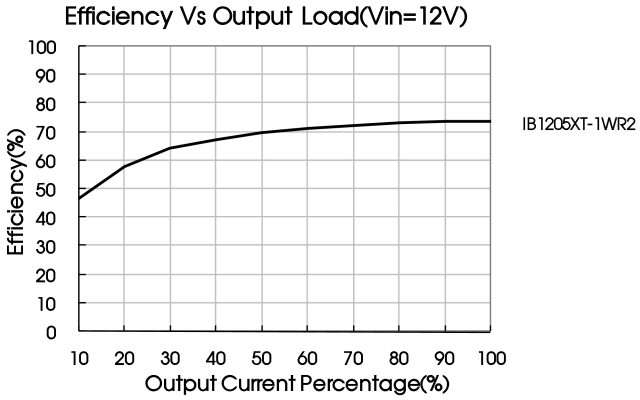


Fig. 1









Design Reference

1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.2.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

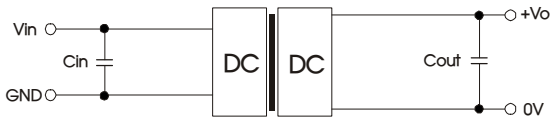


Fig.2

Table 1: Recommended input and output capacitor values

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3/5	10
12	2.2	12	2.2
24	1	15	1

It is not recommended to connect any external capacitor when output power is less than 0.5W.

2. EMC compliance circuit

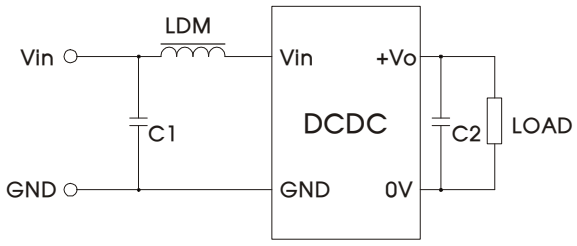


Fig. 3

Table 2: Recommended EMC filter values

Input voltage (V)		5/12/24
EMI	C1	4.7μF /50V
	C2	Refer to the Cout in Fig.2
	LDM	6.8μH

3. Minimum Output load requirements

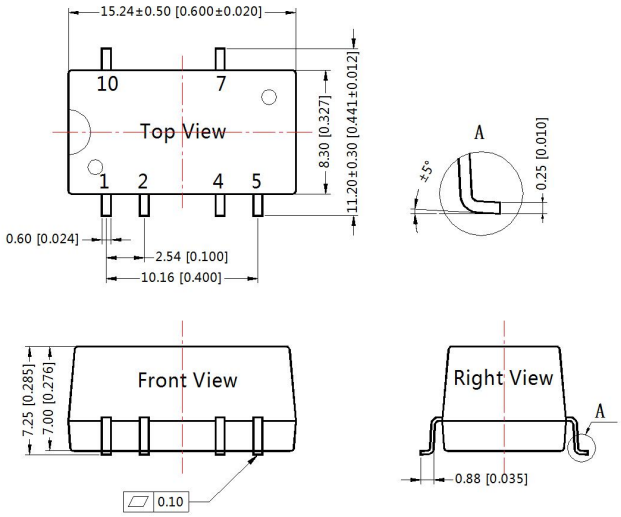
For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total required output power is below 10%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 10% minimum.

4. For additional information please refer to DC-DC converter application notes on

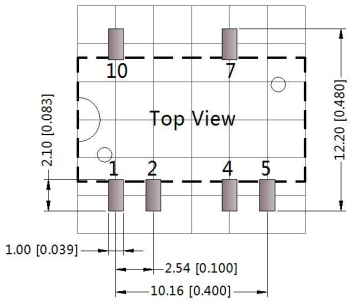
www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



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	Function
1	GND
2	Vin
4	0V
5	0V
7	+Vo
10	NC

NC: Pin to be isolated from circuitry

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number 58210023;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
7. We can provide product customization service, please contact our technicians directly for specific information;
8. Products are related to laws and regulations: see "Features" and "EMC";
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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