

0.25W, Fixed input voltage, isolated & unregulated single output



Continuous Short Circuit Protection



Patent Protection RoHS

## FEATURES

- Continuous short-circuit protection
- Operating temperature range: -40°C to +105°C
- Isolation voltage: 1.5K VDC
- Compact SMD package
- Internal surface mounted design
- International standard pin-out

B\_XT-W2R2 series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is suitable for:

1. Where the voltage of the input power supply is stable (voltage variation:  $\pm 10\%V_{in}$ );
2. Where isolation is necessary between input and output (isolation voltage  $\leq 1500VDC$ );
3. Where do not has high requirement of line regulation, load regulation and the ripple & noise of the output voltage; Such as: pure digital circuits, low frequency analog circuits, and relay-driven circuits.

## Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%Min./Typ.) @ Full Load	Max. Capacitive Load ( $\mu F$ )
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
B0303XT-W2R2	3.3 (2.97-3.63)	3.3	76/8	68/73	220
B0305XT-W2R2		5	50/5	68/73	
B0312XT-W2R2		12	21/2	68/73	
B0503XT-W2R2	5 (4.5-5.5)	3.3	76/8	69/74	
B0505XT-W2R2		5	50/5	72/77	
B0509XT-W2R2		9	28/3	69/74	
B0512XT-W2R2		12	21/2	69/74	
B0515XT-W2R2		15	17/2	68/73	
B1203XT-W2R2	12 (10.8-13.2)	3.3	76/8	68/73	
B1205XT-W2R2		5	50/5	72/77	
B1209XT-W2R2		9	28/3	68/73	
B1212XT-W2R2		12	21/2	72/77	
B2405XT-W2R2	24 (21.6-26.4)	5	50/5	66/71	

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3V input	--	104/20	--	mA
	5V input	--	68/15	--	
	12V input	--	27/10	--	
	24V input	--	15/8	--	
Surge Voltage (1sec. max.)*	3.3V input	-0.7	--	5	VDC
	5V input	-0.7	--	9	
	12V input	-0.7	--	18	
	24V input	-0.7	--	30	
Reflected Ripple Current	3.3V/5V input	--	20	--	mA
	12V/24V input	--	5	--	
Input Filter		Capacitor filter			
Hot Plug		Unavailable			

Note: \* Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.

### Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Line Regulation	Input voltage change: ±1%	3.3V output	--	--	±1.5	--
		other output	--	--	±1.2	
Load Regulation	10%-100% load	3.3V output	--	15	20	%
		5V/9V output	--	12	15	
		12V /15V output	--	7	10	
Ripple & Noise*	20MHz bandwidth		--	10&20	120	mVp-p
Temperature Drift Coefficient	Full load		--	--	±0.03	%/°C
Output Short Circuit Protection**	B03xxXT-W2R2		--	--	1	s
	Others		Continuous, self-recovery			

Note: \* Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.  
\*\* Supply voltage must be discontinued at the end of short circuit duration for B03xxXT-W2R2 series.

### General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Isolation Resistance	Input-output, Isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating if the temperature ≥100°C (see Fig. 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25°C	--	20	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Reflow Soldering Temperature		Peak temp. ≤245°C, maximum duration time ≤60s at 217°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	100	300	KHz
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours

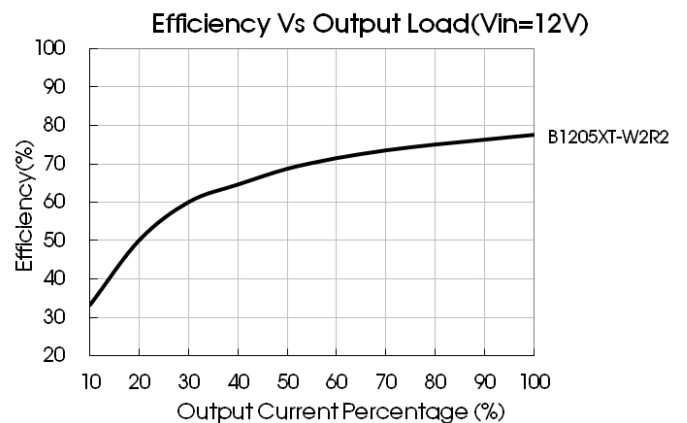
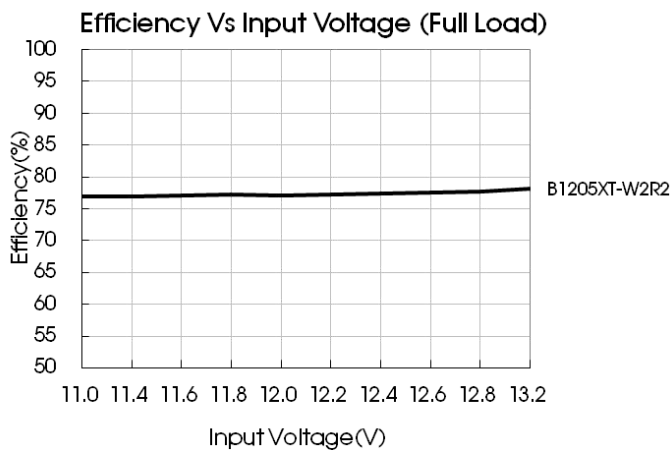
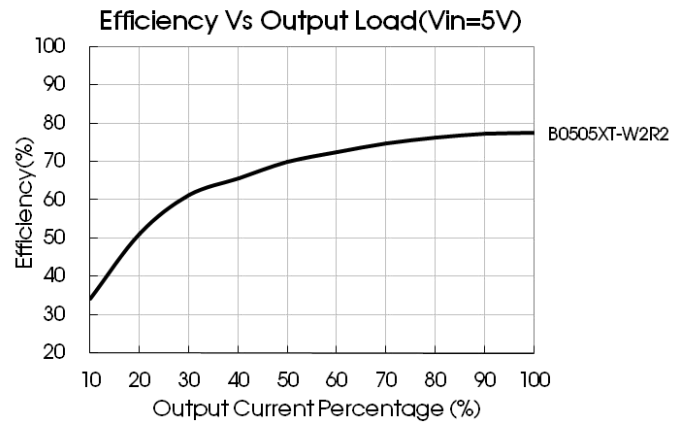
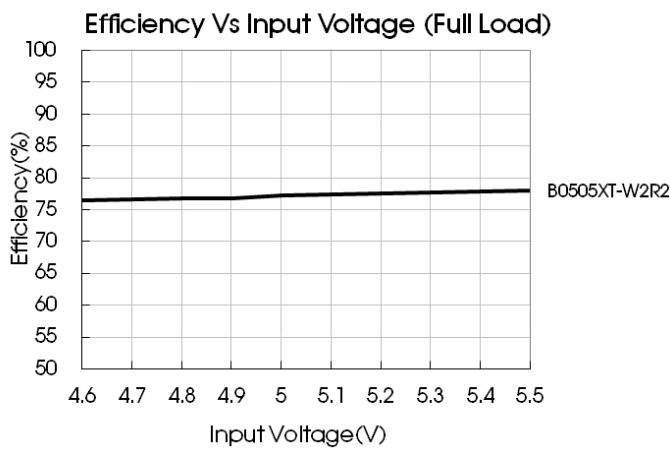
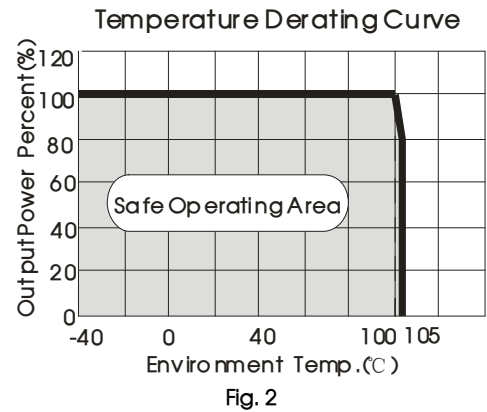
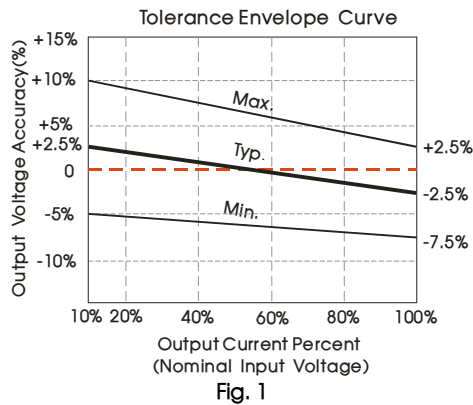
### Physical Specifications

Casing Material	Black flame-retardant heat-proof epoxy resin (UL94 V-0)
Package Dimensions	12.70*11.20*7.25 mm
Weight	1.5 g (Typ.)
Cooling Method	Free air convection

### EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022	CLASS B (see Fig. 5 for recommended circuit)
	Radiated emission	CISPR22/EN55022	CLASS B (see Fig. 5 for recommended circuit)
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±8KV perf. Criteria B

Product Characteristic Curve

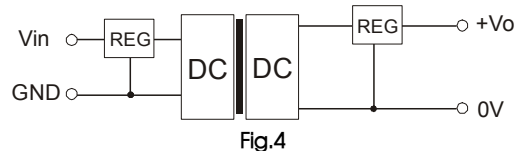
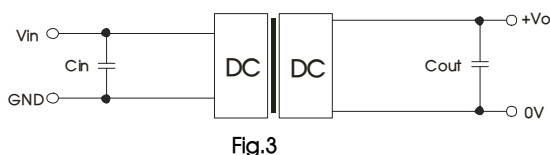


Design Reference

1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3. Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure the modules running well, the recommended capacitive load values as shown in Table 1.

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 Fig. 4).



Recommended capacitive load value table (Table 1)

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

2. EMC typical recommended circuit

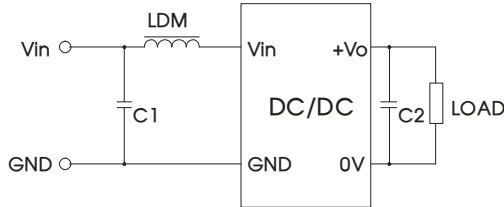


Fig. 5

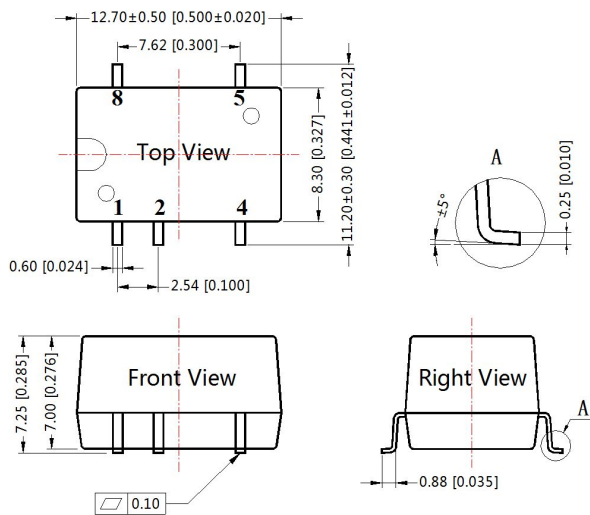
Input voltage (VDC)		3.3/5/12/24
EMI	C1	4.7μF /50V
	C2	Refer to the Cout in Fig.3
	LDM	6.8μH

3. Output load requirements

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%).

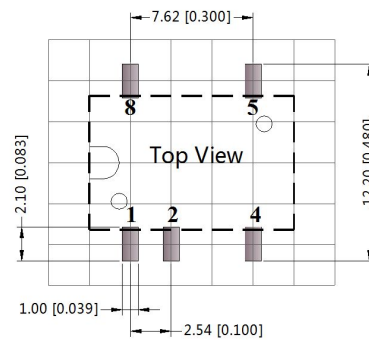
4. For more information please find the application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



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

THIRD ANGLE PROJECTION



Note: Grid 2.54\*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: Pin to be isolated from circuitry

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58210023, 58210024;
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  $T_a=25^{\circ}\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Specifications are subject to change without prior notice.

MORNSUN Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China

Tel: 86-20-38601850-8801

Fax: 86-20-38601272

E-mail: [info@mornsun.cn](mailto:info@mornsun.cn)