

DC/DC Converter

IB_XT-1WR3 Series

MORNSUN®

1W Isolated DC-DC converter
Fixed input voltage and regulated single output



Patent Protection RoHS

Continuous Short
Circuit Protection

FEATURES

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temperature range: -40°C to +85°C
- High efficiency up to 71%
- Compact SMD package
- I/O isolation test voltage 1.5k VDC
- Industry standard pin-out

IB_XT-1WR3 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for occasions of: pre-interference isolation, ground interference elimination, pure digital circuit, voltage isolation conversion circuits, general low frequency analog circuit, relay drive circuit, etc.

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.		
--	IB0503XT-1WR3	5 (4.75-5.25)	3.3	250/25	62/66	2400
	IB0505XT-1WR3		5	200/20	65/69	2400
	IB0509XT-1WR3		9	111/12	66/70	1000
	IB0512XT-1WR3		12	84/9	67/71	560
	IB0515XT-1WR3		15	67/7	67/71	560
--	IB1205XT-1WR3	12 (11.4-12.6)	5	200/20	65/69	2400
	IB1212XT-1WR3		12	84/9	67/71	560
	IB1215XT-1WR3		15	67/7	67/71	220
	IB1505XT-1WR3	15 (14.25-15.75)	5	200/20	64/68	2400
	IB2405XT-1WR3	24 (22.8-25.2)	5	200/20	63/69	2400
	IB2412XT-1WR3		12	84/9	65/71	560
	IB2415XT-1WR3		15	67/7	65/71	220

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	3.3VDC output	--	303/8	323/--	mA
		5VDC output	--	290/8	308/--	
		9VDC output	--	286/8	304/--	
		12VDC/15VDC output	--	282/9	299/--	
	12VDC input	5VDC output	--	121/8	128/--	
		12VDC/15VDC output	--	117/8	124/--	
	15VDC input		--	99/8	105/--	
	24VDC input	5VDC output	--	60/4	66/--	
		12VDC/15VDC output	--	59/4	64/--	
Reflected Ripple Current*			--	30	--	
Input Filter			Capacitance Filter			
Hot Plug			Unavailable			

Note: * Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

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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	
		All other output voltages	--	--	±2	
Ripple & Noise*	20MHz bandwidth		--	30	100	mVp-p
Temperature Coefficient	100% load	5VDC input	--	--	±0.03	% / °C
		12/15/24VDC input	--	±0.02	--	
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℃	3.3VDC output	--	30	--	
		All other output voltages	--	25	--	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		--	--	300	
Storage Humidity	Non-condensing	5VDC input	--	--	95	%RH
		12/15/24VDC input	5	--	95	
Vibration			10-150Hz, 5G, 30 Min. along X, Y and Z			
Reflow Soldering Temperature*			Peak temp. ≤245℃, maximum duration time ≤60s over 217℃			
Switching Frequency	100% load, nominal input voltage	5VDC input	--	250	--	kHz
		12/15/24VDC input	--	260	--	
MTBF	MIL-HDBK-217F@25℃		3500	--	--	k hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1		Level 1			
Note: *Please refer to IPC/JEDEC J-STD-020D.1.						

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)				
Dimensions	15.24 x 11.40 x 7.25 mm				
Weight	1.2g(Typ.)				
Cooling Method	Free air convection				

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B			
	RE	CISPR32/EN55032 CLASS B			
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B			

Note: Refer to Fig.3 for recommended circuit test.

Typical Characteristic Curves

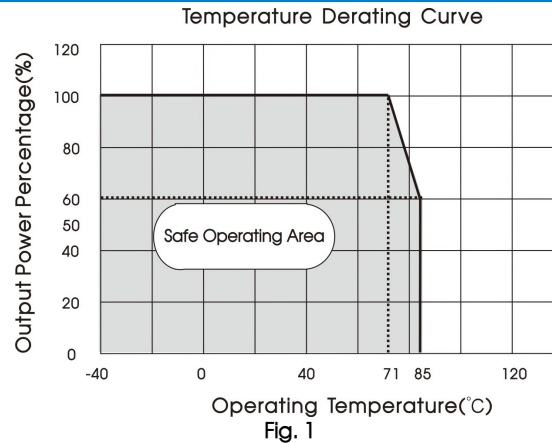
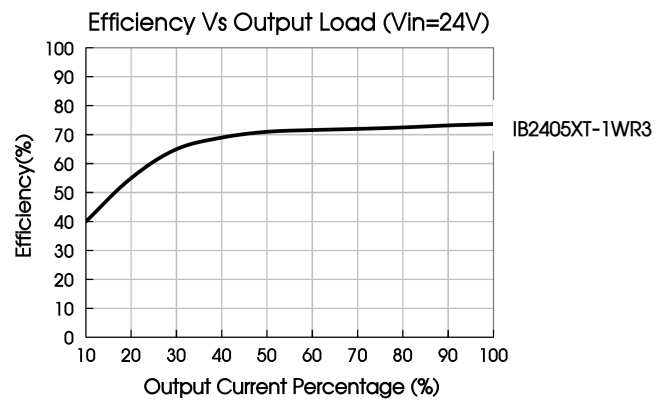
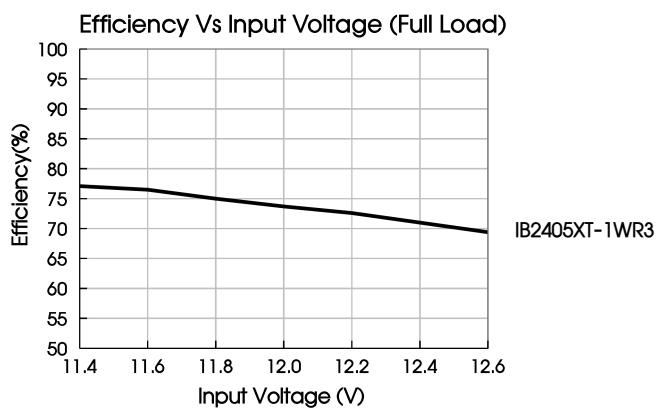
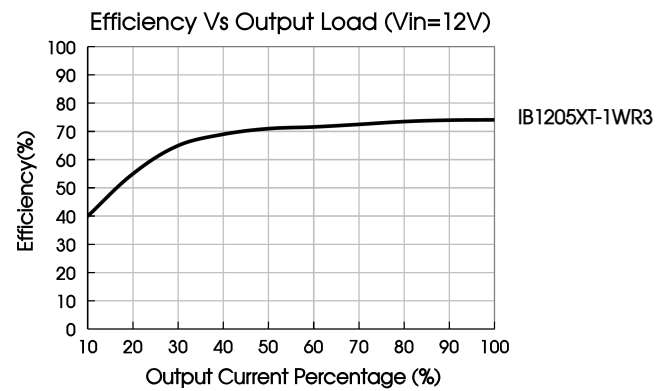
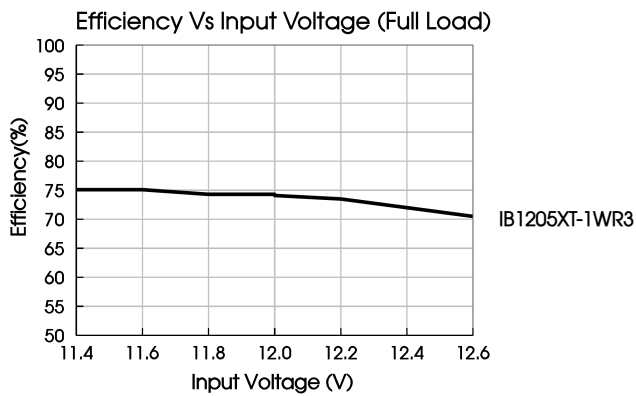
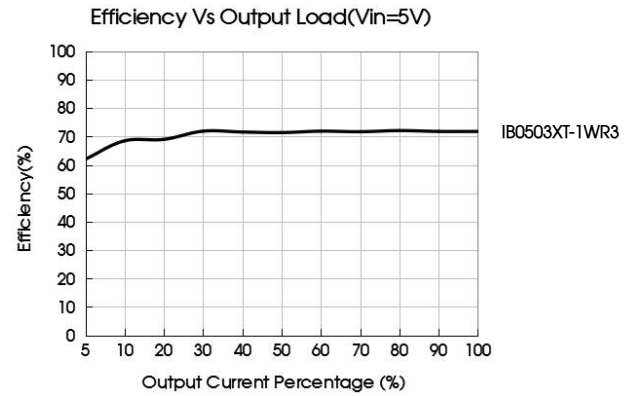
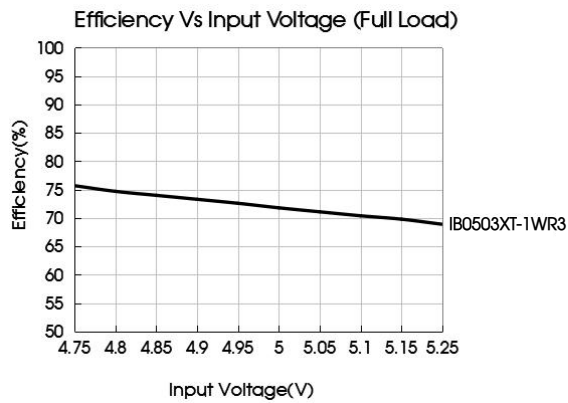


Fig. 1



Design Reference

1. Typical application circuit

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	Cin	Vo	Cout
5VDC	4.7μF/16V	3.3/5VDC	10μF/16V
		9/12VDC	2.2μF/25V
		15VDC	1μF/25V
12VDC	2.2μF/16V	5VDC	10μF/16V
		12VDC	2.2μF/25V
		15VDC	0.47μF/50V
15VDC	1μF/25V	5VDC	10μF/16V
24VDC	1μF/50V	5VDC	10μF/16V
		12VDC	2.2μF/25V
		15VDC	0.47μF/50V

2. EMC compliance circuit

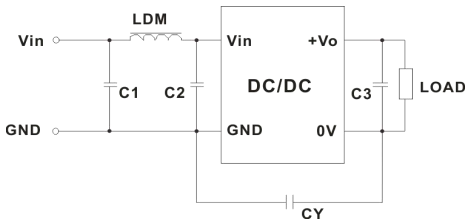


Fig. 3

Table 2: Recommended EMC filter values

input voltage		5VDC		12/15/24VDC
Output voltage		3.3/5/9VDC	12/15VDC	5/12/15VDC
Emissions	C1/C2	4.7μF /25V	4.7μF /25V	4.7μF /50V
	CY	47pF/2kVDC	1nF/2kVDC	270pF /2kVDC
	C3	Refer to the Cout in table 1		
	LDM	6.8μH		

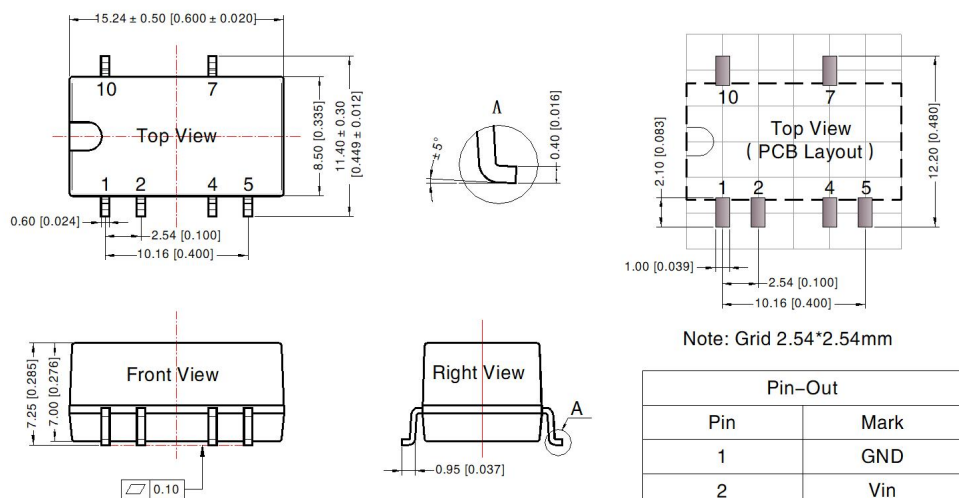
Note: To further improve EMI performance, we recommend the use a Y-capacitor CY

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

www.mornsun-power.com

Dimensions and Recommended Layout

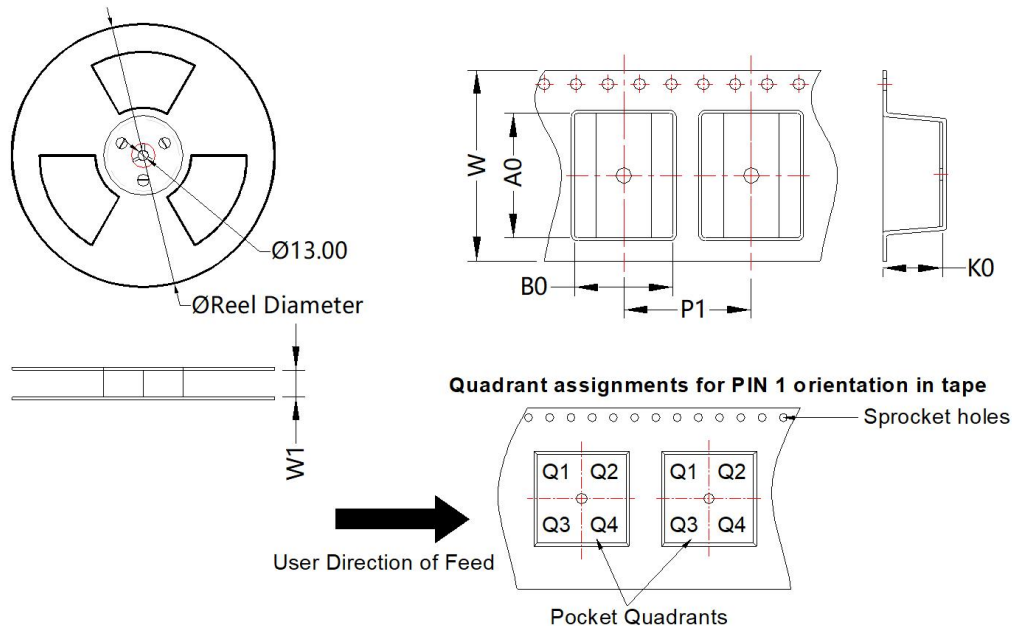
THIRD ANGLE PROJECTION



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

NC: Pin to be isolated from circuitry

Tape/Reel packaging



Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
IB_XT-1WR3	SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Tube Packaging bag number: 58210023 , Roll Packaging bag number: 58210034 ;
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 corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. 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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