

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



Patent Protection **RoHS**

FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40°C to +85°C
- I/O isolation test voltage 1.5k VDC
- Industry standard pin-out
- Compact SMD package
- Designed to meet EN62368 safety standards

IB05_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

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load / no-load)	5VDC input	3.3VDC output	--	303/5	323/--	mA
		5VDC output	--	290/5	308/--	
		9VDC output	--	286/6	304/--	
		12VDC/15VDC output	--	282/9	299/--	
Reflected Ripple Current*		--	30	--		
Input Filter		Capacitance 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
Voltage Accuracy	full 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	full load	--	--	±0.03	%/°C
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 $\geq 71^{\circ}\text{C}$, (See Fig. 1)	-40	--	85	°C	
Storage Temperature		-55	--	125		
Case Temperature Rise	$T_a = 25^{\circ}\text{C}$	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		
Reflow Soldering Temperature*		Peak temp. $\leq 245^{\circ}\text{C}$, maximum duration time $\leq 60\text{s}$ over 217°C				
Storage Humidity	Non-condensing	--	--	95	%RH	
Switching Frequency	100% load, nominal input voltage	--	250	--	kHz	
MTBF	MIL-HDBK-217F@ 25°C	3500	--	--	k hours	
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1				

Note: * For actual application, please refer to IPC/JEDEC J-STD-020D.1.

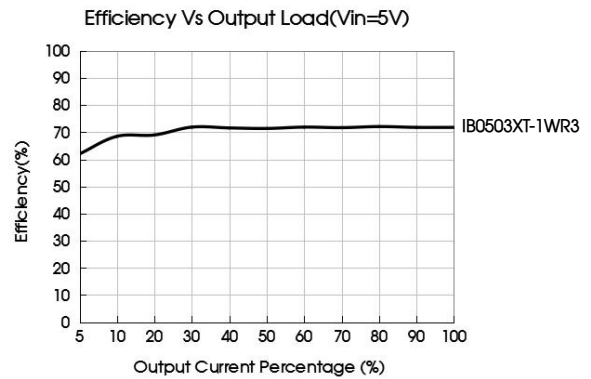
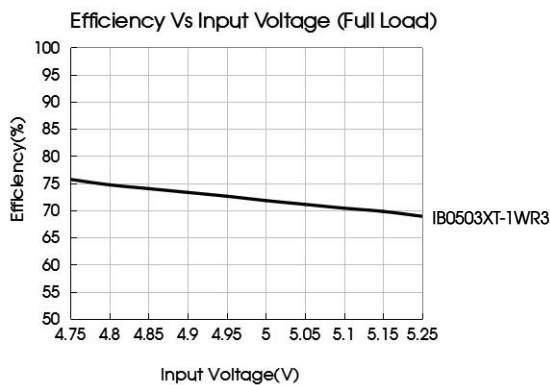
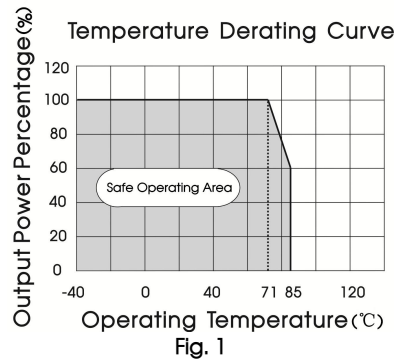
Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	15.24 x 11.40 x 7.25mm
Weight	1.2g(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 Air $\pm 8\text{kV}$, Contact $\pm 6\text{kV}$ perf. Criteria B

Typical Characteristic Curves



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.

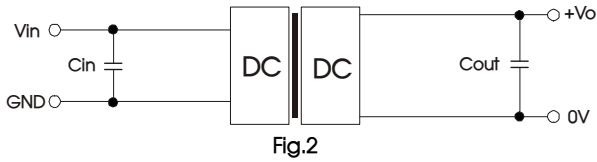


Table 1: Recommended capacitive load value table

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3/5	10μF/16V
--	--	9/12	2.2μF/25V
--	--	15	1μF/25V

2. EMC compliance circuit

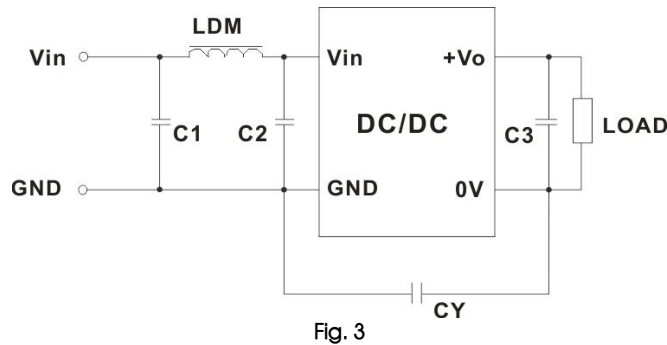
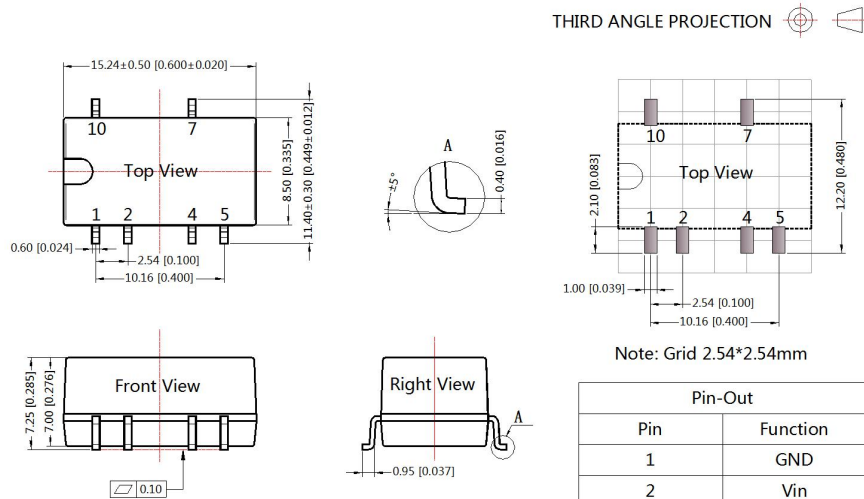


Table 2: Recommended EMC filter values

Input voltage 5VDC	Output voltage (VDC)		3.3/5/9	12/15
	EMI	C1/C2		4.7μF /25V
CY			47pF/2kVDC	1nF/2kVDC
C3			Refer to the Cout in table 1	
LDM			6.8μH	

3. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

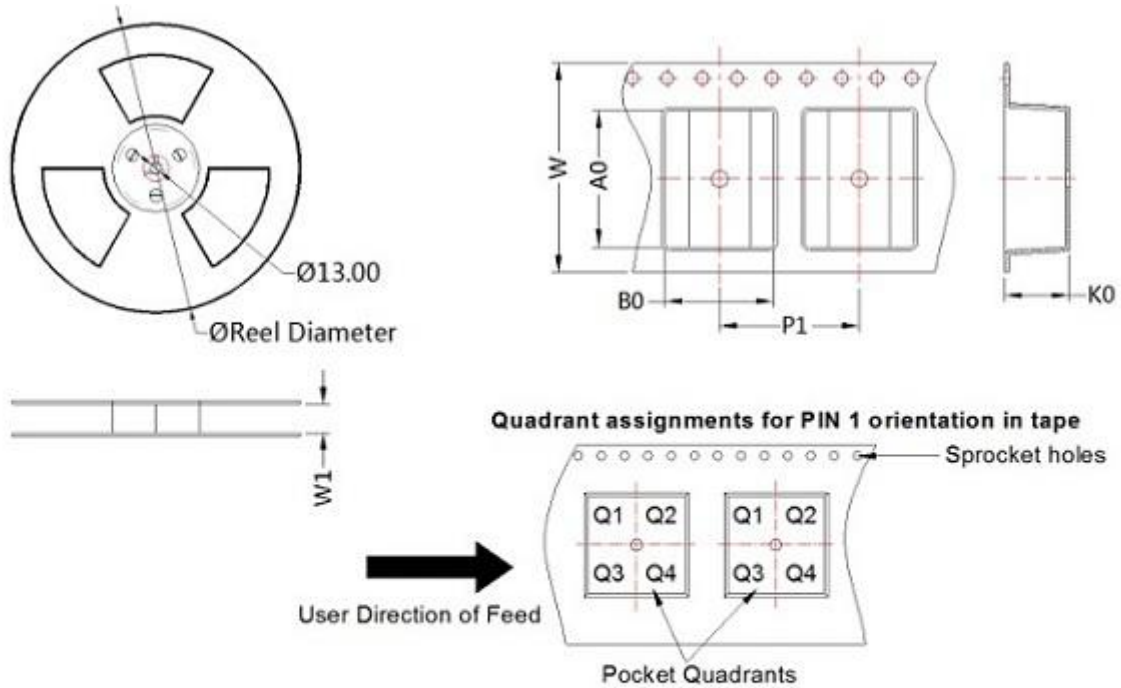
Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin section tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.25[\pm 0.010]$

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. 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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