

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



FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40°C to +105°C
- High efficiency up to 85%
- Compact SMD package
- I/O isolation test voltage 1.5k VDC
- Industry standard pin-out

O5_XT-1WR3 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

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.		
UL/EN/BS EN/IEC	B0503XT-1WR3	5 (4.5-5.5)	3.3	303/30	70/74	2400
	B0505XT-1WR3		5	200/20	78/82	2400
	B0509XT-1WR3		9	111/12	79/83	1000
	B0512XT-1WR3		12	84/9	79/83	560
	B0515XT-1WR3		15	67/7	79/83	560
	B0524XT-1WR3		24	42/4	81/85	220

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load / no-load)	5VDC input	3.3VDC/5VDC output	--	270/5	286/10	mA
		9VDC/12VDC output	--	241/12	254/20	
		15VDC/24VDC output	--	241/18	254/30	
Reflected Ripple Current*		--	15	--		
Surge Voltage (1sec. max.)	5VDC input	-0.7	--	9	VDC	
Input Filter		Capacitance filter				
Hot Plug		Unavailable				

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy		See output regulation curve (Fig. 1)				
Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	1.5	%
		Other outputs	--	--	1.2	
Load Regulation	10%-100% load	3.3VDC output	--	15	20	%
		5VDC output	--	10	15	
		9VDC output	--	8	10	
		12VDC output	--	7	10	
		15VDC output	--	6	10	
		24VDC output	--	5	10	

Ripple & Noise*	20MHz bandwidth	Other outputs	--	30	75	mVp-p
		24VDC output	---	50	100	
Temperature Coefficient	Full load		--	±0.02	--	%/°C
Short-circuit Protection			Continuous, self-recovery			

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 ≥ 100°C, (see Fig. 2)	-40	--	105	°C	
Storage Temperature		-55	--	125		
Case Temperature Rise	Ta=25°C					
			3.3VDC output	--	25	--
			Others	--	15	--
Storage Humidity	Non-condensing	--	--	95	%RH	
Reflow Soldering Temperature		Peak temp. ≤ 245°C, maximum duration time ≤ 60s over 217°C.				
Switching Frequency	Full load, nominal input voltage	--	270	--	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 (UL94V-0)
Dimensions	13.20 x 11.40 x 7.25 mm
Weight	1.4g(Typ.)
Cooling methods	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±4kV perf. Criteria B

Typical Characteristic Curves

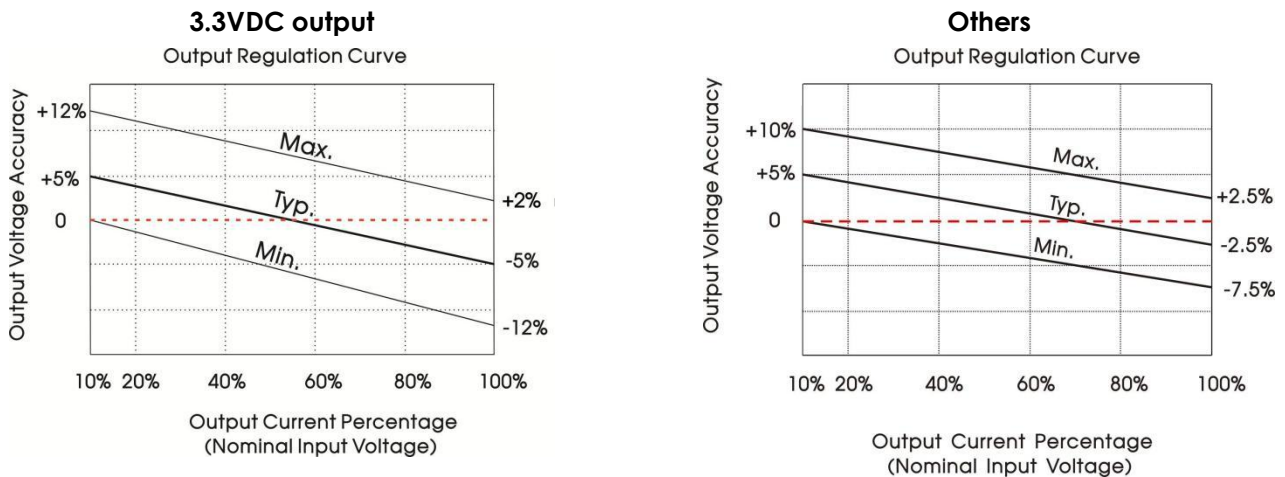


Fig. 1

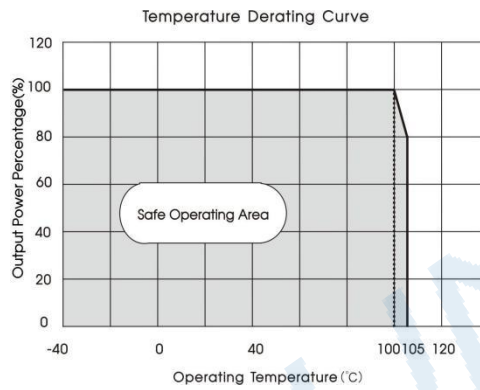
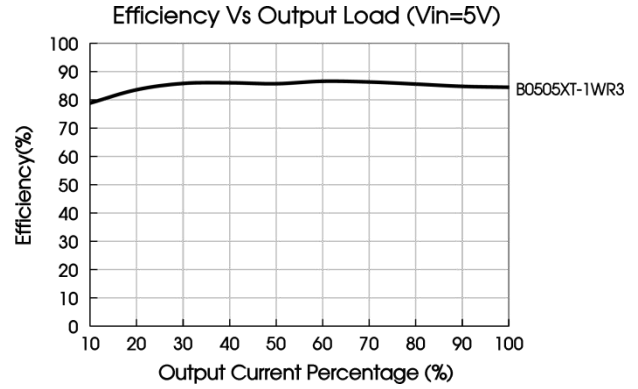
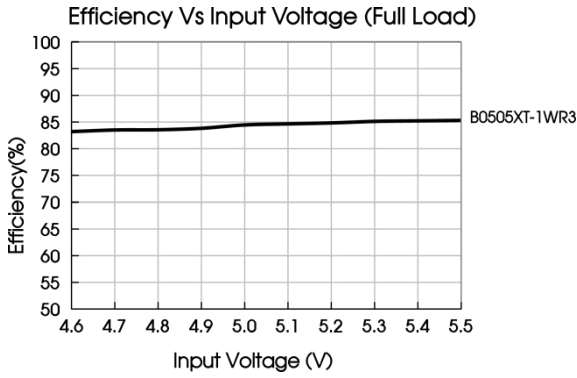


Fig. 2

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. 3.

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. 3

Recommended capacitive load value table (Table 1)

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

2. EMC (CLASS B) compliance circuit

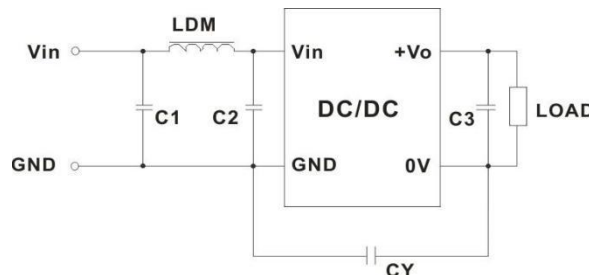


Fig. 4

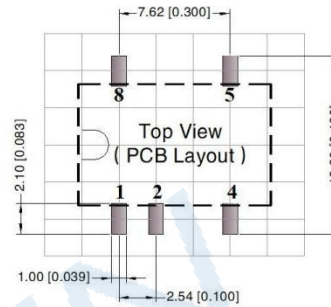
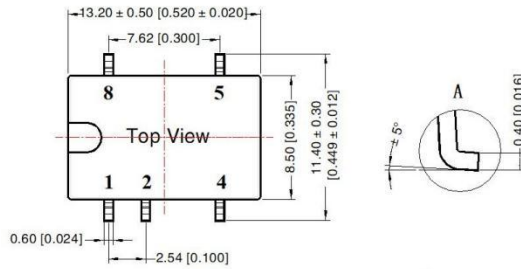
EMC recommended circuit value table (Table 2)

Input voltage 5VDC	Output voltage		3.3/5/9VDC	12/15/24VDC
	Emissions	C1/C2		4.7μF /25V
CY			--	1nF /2kVDC HEC C1206X102K202T JOHANSON 202R18W102KV4E
C3		Refer to the Cout in table 1		
LDM			6.8μH	6.8μH

Note: In the case of actual use, the requirements for EMI are high, it is subject to CY.

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

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

NC: Pin to be isolated from circuitry

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

Notes:

1. 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;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. 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;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;

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