

1W isolated DC-DC with Fixed input voltage, & unregulated Single output



Patent Protection RoHS

FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature -40°C to +105°C
- High efficiency up to 83%
- Compact SMD package
- I/O isolation test voltage 1500 VDC
- Industry standard pin-out
- Meets UL62368, EN62368 standards (Pending)

B05_T-1WR3 series are designed for use in distributed power supply systems and especially suitable in applications such as 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.	Max. Capacitive Load (µF)
		Nominal (Range)	Voltage (VDC)	Current(mA) Max./Min.		
UL/CE (Pending)	B0503T-1WR3	5 (4.5-5.5)	3.3	303/30	70/74	2400
	B0505T-1WR3		5	200/20	78/82	2400
	B0509T-1WR3		9	111/12	79/83	1000
	B0512T-1WR3		12	84/9	79/83	560

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	
Reflected Ripple Current*		--	15	--	mA	
Surge Voltage (1sec. max.)		-0.7	--	9	VDC	
Input Filter		Capacitor Filter				
Hot Plug		Unavailable				

* Note: Please refer to DC-DC Converter Application Note for detailed description of Reflected ripple current testing method.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		See Typical Performance curve (Fig. 1)				
Line 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	
Ripple & Noise*	20MHz bandwidth	--	30	75	mVp-p	
Temperature Coefficient	Full load	--	±0.02	--	%/°C	
Short Circuit Protection		Continuous, self-recovery				

Note: *Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation.

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	
Isolation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	20	--	pF	
Operating Temperature	For Derating with temperatures $\geq 100^{\circ}\text{C}$ see Fig. 2	-40	--	105	$^{\circ}\text{C}$	
Storage Temperature		-55	--	125		
Case Temperature Rise	$T_a=25^{\circ}\text{C}$					
			3.3VDC output	--	25	--
			Other outputs	--	15	--
Storage Humidity	Non-condensing	--	--	95	%RH	
Reflow Soldering Temperature*		Peak temperature $\leq 245^{\circ}\text{C}$, duration $\leq 60\text{s}$ max. over 217°C				
Switching Frequency	Full load, nominal input voltage	--	270	--	KHz	
MTBF	MIL-HDBK-217F@25 $^{\circ}\text{C}$	3500	--	--	K hours	
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 2				

Note: *Please refer to IPC/JEDEC J-STD-020D.1.

Physical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	13.20 x 11.40 x 7.25 mm
Weight	1.3g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2	Air $\pm 8\text{kV}$, Contact $\pm 4\text{kV}$ perf. Criteria B

Product Characteristic Curve

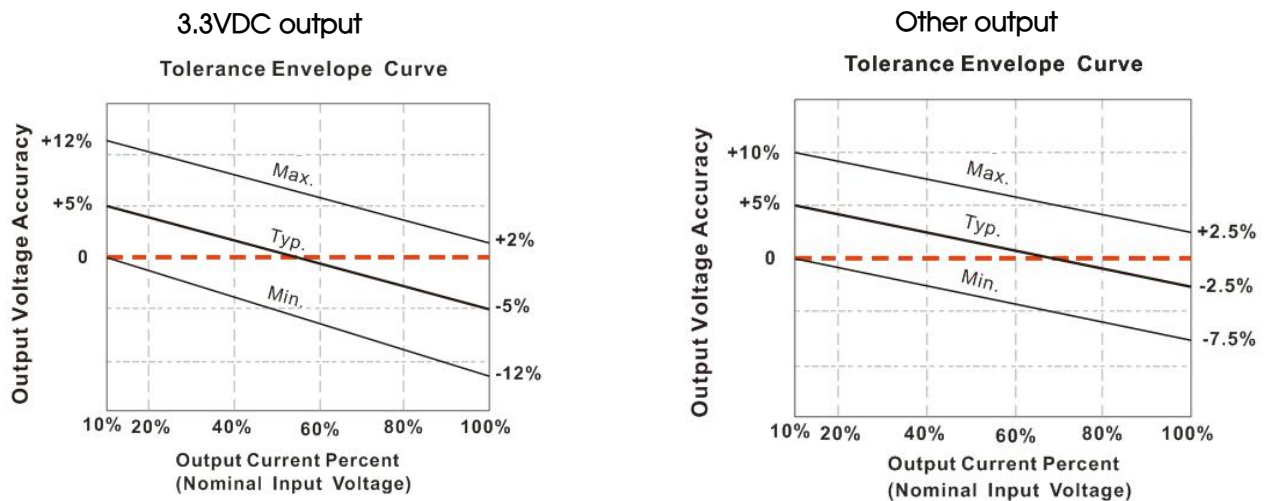


Fig. 1

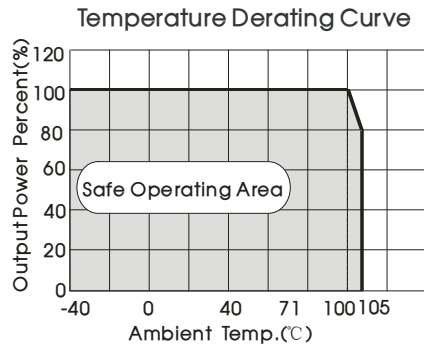
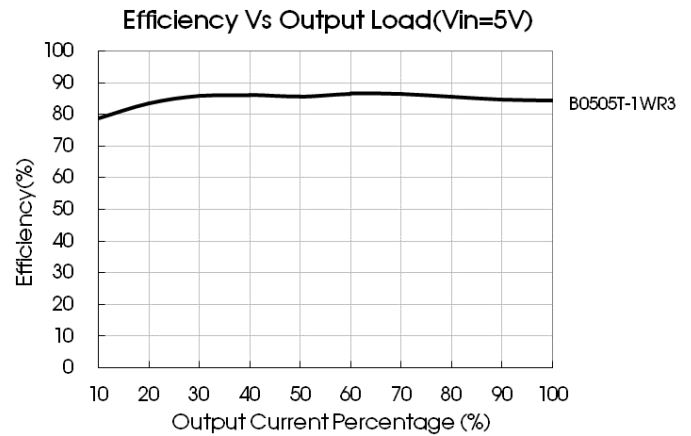
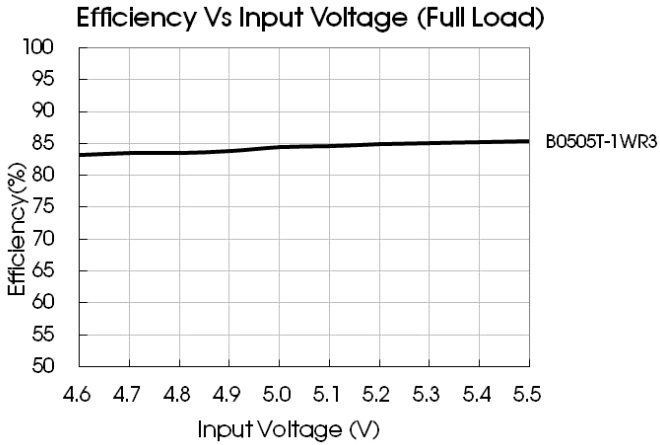


Fig. 2



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.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.

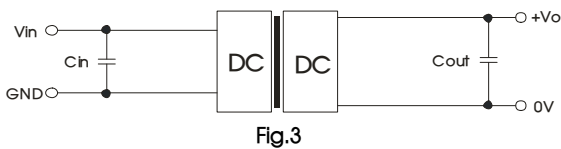


Table 1: Recommended input and output capacitor values

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3/5	10
		9	4.7
		12	2.2

2. EMC (CLASS B) compliance circuit

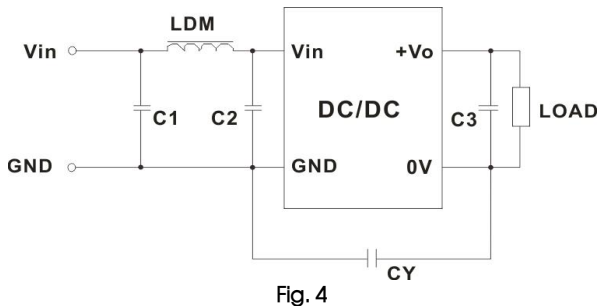


Table 2: Recommended EMC filter values

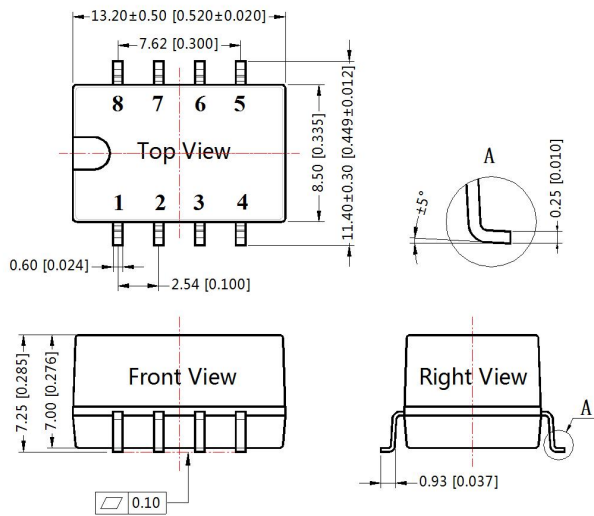
Input voltage 5VDC	EMI	Output voltage(VDC)	3.3/5/9	12
		C1/C2	4.7μF /25V	4.7μF /25V
		CY	--	1nF/2KVDC HEC C1206X102K202T JOHANSON 202R18W102KV4E
		C3	Refer to the Cout in table 1	
LDM		6.8μH	6.8μH	

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

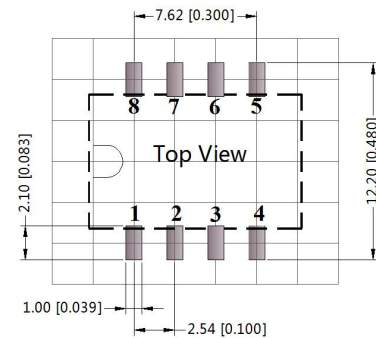
3. For more information please find DC-DC converter application notes on www.mornsun-power.com

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 2.54×2.54 mm

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
3, 6, 7, 8	NC

NC: Pin to be isolated from circuitry

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Tube Packaging bag number: 58210024, Roll Packaging bag number: 58200054;
- 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;
- The maximum capacitive load offered were tested at input voltage range and full load;
- 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;
- All index testing methods in this datasheet are based on our Company's corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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 Fax: 86-20-38601272 E-mail: sales@mornsun.cn www.mornsun-power.com