

1W, Fixed input voltage, isolated & unregulated single output



Patent Protection RoHS

FEATURES

- | Compact size, ultra-thin package
- | Continuous short circuit protection
- | Isolation voltage: 1.5K VDC
- | Operating temperature range: -40°C to +105°C
- | Excellent temperature performance
- | International standard pin-out

B_RN-1WR2 & B_RT-1WR2 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 and load regulation;
4. Such as: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%Min./Typ.) @ Full Load	Max. Capacitive Load (μF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA)(Max./Min.)		
B0505RN-1WR2	5	5	200/20	72/76	220
B0505RT-1WR2	(4.5-5.5)	5	200/20	72/76	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (no-load /full load)	5V input	--	25/250	--	mA
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
Reflected Ripple Current	5V input	--	15	--	mA
Input Filter	Capacitor filter				

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	See tolerance envelope graph (Fig. 1)				
Line Regulation	Input voltage change: $\pm 1\%$	--	--	± 1.2	--
Load Regulation	10%-100% load	--	12	15	%
Ripple & Noise*	20MHz bandwidth	--	60	100	mVp-p
Temperature Drift Coefficient	100% load	--	--	± 0.03	%/°C
Output Short Circuit Protection	Continuous, self-recovery				

Note: * Ripple and noise tested with "parallel cable" method, please see DC-DC Converter Application Notes for specific operation methods.

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	--	--	M Ω
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating if the temperature $\geq 85^\circ C$, (see Fig. 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25°C	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Reflow Soldering Temperature	Peak Temp. $\leq 245^\circ C$, 60 sec max at 217°C, Please refer to IPC/JEDEC J-STD-020D.1 for actual application.				

Storage Humidity	Non-condensing	--	--	95	%
Switching Frequency	100% load, nominal input voltage	--	100	300	KHz
MTBF	MIL-HDFK-217F@25°C	3500	--	--	K hours

Physical Specifications

Casing Material	Black flame-retardant heat-proof epoxy resin (UL94-V0)				
Package Dimensions	B_RN-1WR2	19.50*9.50*4.68mm			
	B_RT-1WR2	19.50*10.53*5.00mm			
Weight	1.4g(Typ.)				
Cooling Method	Free air convection				

EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)		
	Radiated emission	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)		
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±6KV	Air ±8KV	perf. Criteria B

Product Characteristic Curve

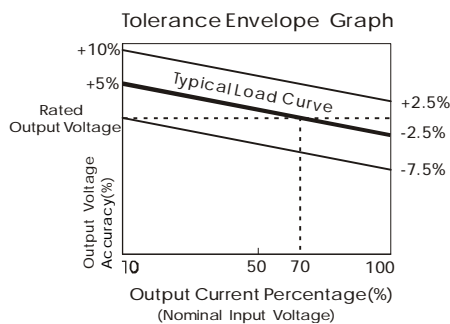


Fig. 1

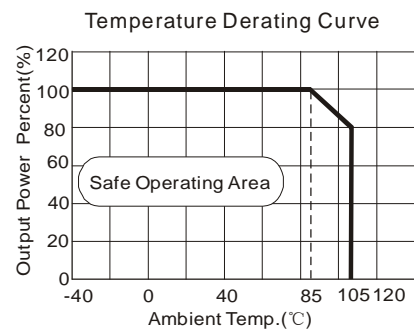
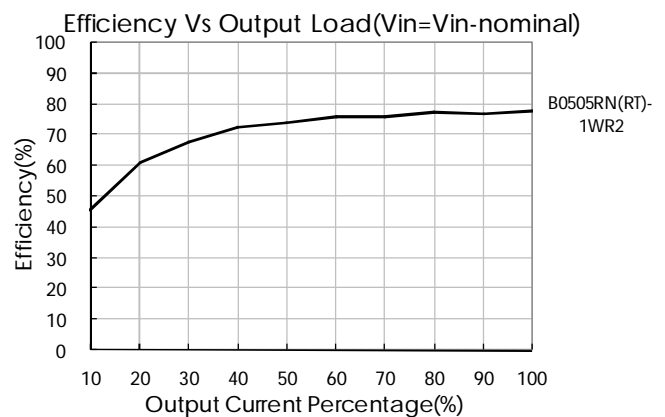
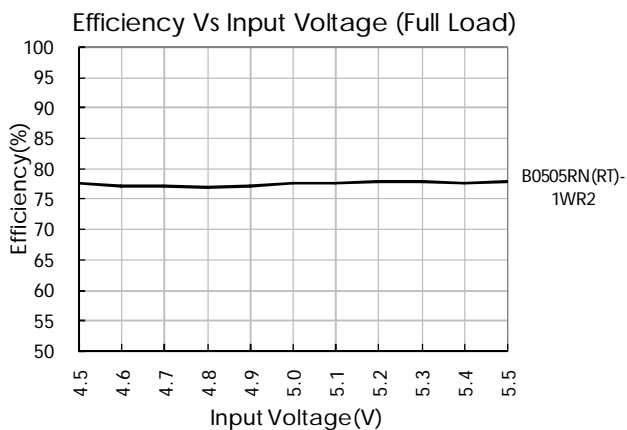


Fig. 2



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.

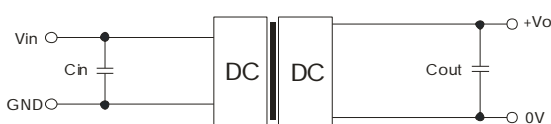


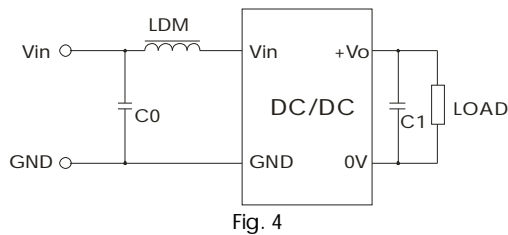
Fig.3

Recommended capacitive load value table (Table 1)

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	5	10

It is not recommended to connect any external capacitor when output power is less than 0.5W.

2. EMC typical recommended circuit (CLASS B)



Input voltage (V)	5	
EMI	C0	4.7μF /50V
	C1	10μF /50V
	LDM	6.8μH

3. Output load requirements

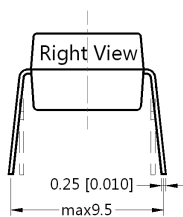
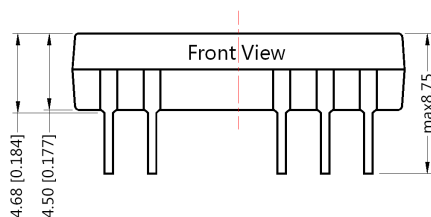
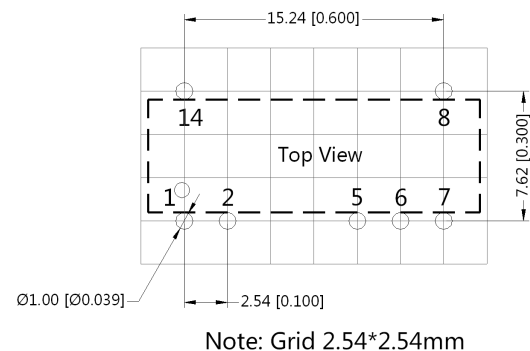
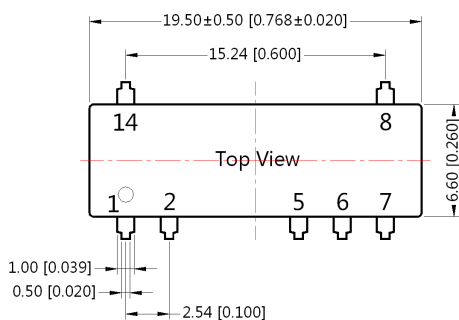
To ensure the module work efficiently and reliably, during the operation, the min. output load should be no less than 10% of the full load. If the actual output power is low, please connect a resistor to the output terminal in parallel, with a recommended resistance which is 10% of the rated power, and derating is required during operation.

4. For more information please find the application notes on www.mornsun-power.com

Dimensions and Recommended Layout

B_RN-1WR2 Series

THIRD ANGLE PROJECTION



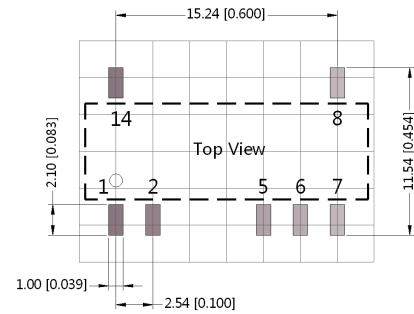
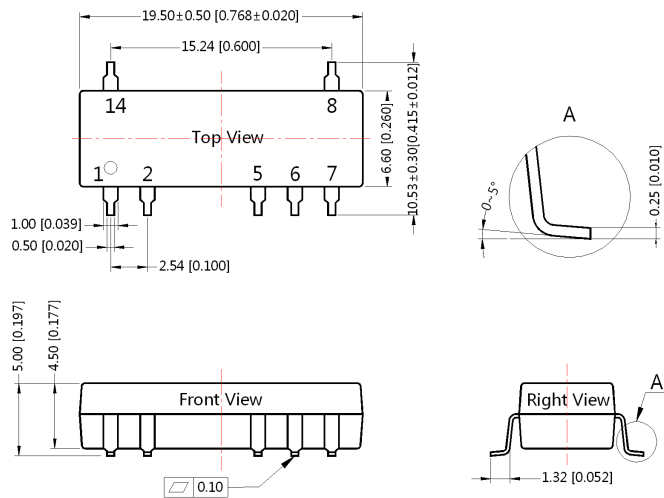
Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

Pin-Out	
Pin	Function
1	Vin
2	GND
5	0V
6	+Vo
Others	NC

NC: No Connection

B_RT-1WR2 Series

THIRD ANGLE PROJECTION 



Note: Grid 2.54*2.54mm

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

Pin-Out	
Pin	Function
1	Vin
2	GND
5	0V
6	+Vo
Others	NC

NC: No Connection

Notes:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58200027;
2. If the product is operated under the min. required load, the product performance cannot be guaranteed to comply with all performance indexes in this datasheet;
3. The max. capacitive load should be tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, data in this data sheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
7. We can provide product customization service;
8. Specifications of this product are subject to changes 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