

FEATURES

- ◆ RoHS compliant
- ◆ Efficiency up to 86%
- ◆ SIP12 Package
- ◆ Wide temperature performance at full 1-2 Watt load, -40°C to 85°C
- ◆ UL 94V-0 package material
- ◆ Internal filtering
- ◆ Low noise and good EMC Features
- ◆ Industry standard pinout
- ◆ 100% burned in
- ◆ I/O Isolation 1500VDC
- ◆ Short Circuit Protection (automatic recovery)
- ◆ Internal SMD construction
- ◆ No external components required
- ◆ 2:1 wide input voltage range

MODEL SELECTION

WRB^①05^②05^③Y^④ES^⑤-1W^⑥

- ① Product Series ② Input Voltage
 ③ Output Voltage ④ Wide (2:1) Input Range
 ⑤ Lengthen SIP12 Package ⑥ Rated Power

DESCRIPTION

The WRB-YES-1W & WRB-YES-2W series are specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) where the voltage of the input power supply is wide range (voltage range $\leq 2:1$);
- 2) where isolation is necessary between input and output (isolation voltage $\leq 1500\text{VDC}$);
- 3) where the regulation of the output voltage and the output ripple noise are demanded.



SELECTION GUIDE

order code	Input			Output			Efficiency (%, Typ)
	Voltage (VDC)			Current (mA)		Voltage (VDC)	
	Nominal	Range	Max*	Max	Min		
WRB0505YES-1W	5	4.5-9.0	11	200	20	5	72
WRB0509YES-1W	5	4.5-9.0	11	111	11	9	74
WRB0512YES-1W	5	4.5-9.0	11	83	8	12	76
WRB0515YES-1W	5	4.5-9.0	11	67	7	15	75
WRB1205YES-1W	12	9.0-18.0	22	200	20	5	76
WRB1209YES-1W	12	9.0-18.0	22	111	11	9	78
WRB1212YES-1W	12	9.0-18.0	22	83	8	12	80
WRB1215YES-1W	12	9.0-18.0	22	67	7	15	80
WRB2405YES-1W	24	18.0-36.0	40	200	20	5	76
WRB2409YES-1W	24	18.0-36.0	40	111	11	9	78
WRB2412YES-1W	24	18.0-36.0	40	83	8	12	81
WRB2415YES-1W	24	18.0-36.0	40	67	7	15	81
WRB4805YES-1W	48	36.0-72.0	80	200	20	5	76
WRB4809YES-1W	48	36.0-72.0	80	111	11	9	78
WRB4812YES-1W	48	36.0-72.0	80	83	8	12	80
WRB4815YES-1W	48	36.0-72.0	80	67	7	15	80
WRB0505YES-2W	5	4.5-9.0	11	400	40	5	72
WRB0509YES-2W	5	4.5-9.0	11	222	22	9	74
WRB0512YES-2W	5	4.5-9.0	11	168	16	12	76
WRB0515YES-2W	5	4.5-9.0	11	133	13	15	75
WRB1205YES-2W	12	9.0-18.0	22	400	40	5	76
WRB1209YES-2W	12	9.0-18.0	22	222	22	9	78
WRB1212YES-2W	12	9.0-18.0	22	168	16	12	80
WRB1215YES-2W	12	9.0-18.0	22	133	13	15	80
WRB2405YES-2W	24	18.0-36.0	40	400	40	5	76
WRB2409YES-2W	24	18.0-36.0	40	222	22	9	78
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WRB2415YES-2W	24	18.0-36.0	40	133	13	15	81
WRB4805YES-2W	48	36.0-72.0	80	400	40	5	76
WRB4809YES-2W	48	36.0-72.0	80	222	22	9	78
WRB4812YES-2W	48	36.0-72.0	80	168	16	12	80
WRB4815YES-2W	48	36.0-72.0	80	133	13	15	80

* Input voltage can't exceed this value, or will cause the permanent damage.

OUTPUT SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Output power	Refer to product program	0.1		1	W
	Refer to product program	0.2		2	W
Line regulation	Input voltage from low to high			± 0.2	%
Load regulation	10% to 100% full load (WRB_YES-1W)			± 0.2	%
	10% to 100% full load (WRB_YES-2W)			± 0.2	%
Output voltage accuracy	Refer to recommended circuit		± 1	± 3.0	%
Temperature drift (Vout)	Refer to recommended circuit			± 0.03	%/°C
Output Ripple**	20MHz Bandwidth		100		MV p-p
Output Noise**	20MHz Bandwidth		25	75	MV p-p
Switching frequency	100% Full load, input voltage range	75	300		Khz

** Test ripple and noise by "parallel cable" method.

All specifications typical at nominal line, full load, and 25°C unless otherwise noted.

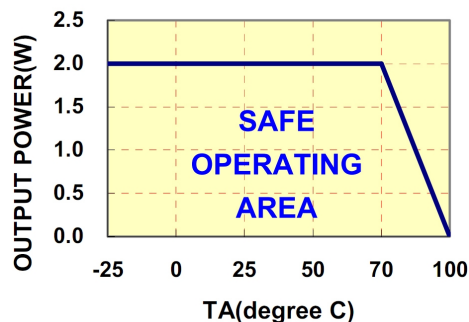
TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage humidity range				95	%
NO-load power consumption			120		°C
Operating temperature		-25		71	°C
Storage temperature		-55		125	°C
Lead temperature	1.5mm from case for 10 seconds			300	°C
Temp.rise at full load			15	35	°C
Cooling	Free air convection				
Case material	Non-Conductive Plastic(UL94-V0)				
Short circuit protection*	Continuous,automatic recovery				
MTBF		1000			K hours
Weight			6.6		g

*Supply voltage must be discontinued at the end of short circuit duration.

TYPICAL CHARACTERISTICS

Temperature Derating Graph



INPUT SPECIFICATIONS

Parameter	conditions
Input voltage	2:1 input range
Input filter	Pi network

ISOLATION SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at Viso=500VDC	1000			MΩ
Isolation capacitance	100KHz,1v		35	80	pF

APPLICATION NOTE

SIZE Graph

1) Recommended circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1). Lin However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1). General:

Cin: 5V,12V 100PF
 24V,48V 10uF
 Cout: 47PF(typ.)
 Lin: 4.7PH ~120PH
 Lout: 2.2PH ~10PH

2) Input current

While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current Ip.

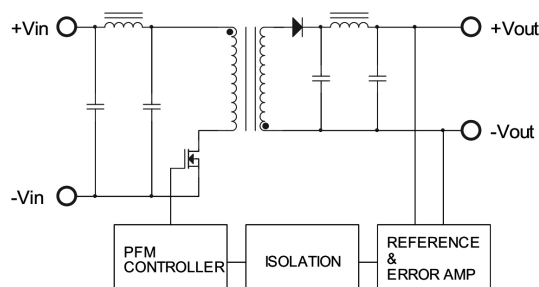
General: $I_p \leq 1.4 \cdot I_{in-max}$

3) No parallel connection or plug and play

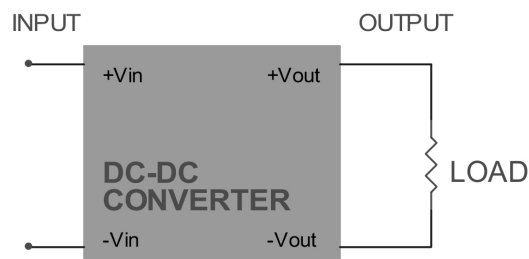
RECOMMENDED CIRCUIT

OUTPUT GRAPH

SIMPLIFIED SCHEMATIC



TYPICAL APPLICATIONS

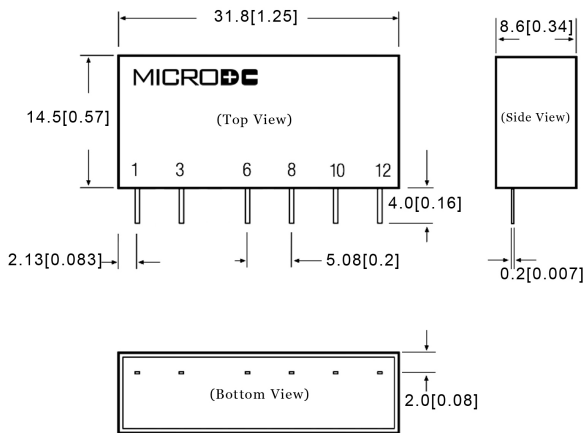


EXTERNAL CAPACITOR TABLE (TABLE 1)

Single Vout (VDC)	Cout (μF)
5	680
9	560
12	470
15	330

OUTLINE DIMENSIONS & FOOTPRINT DETAILS

MECHANICAL DIMENSIONS



Note:

Unit:mm[inch]

Pin section tolerances:±0.10mm[±0.004inch]

General tolerances:±0.25mm[±0.010inch]

FOOTPRINT DETAILS

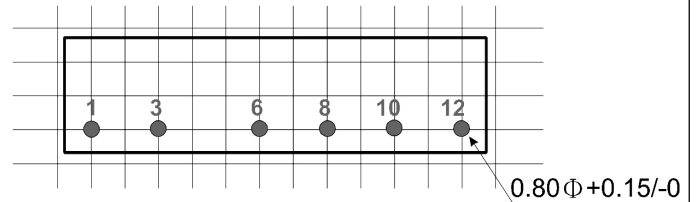
Pin	Single
1	+Vin
3	-Vin
6	NC
8	NC
10	+Vo
12	-Vo

NC:No connection

When the environment temperature is higher than 71°C, the product output power should be less than 60% of the rated power.

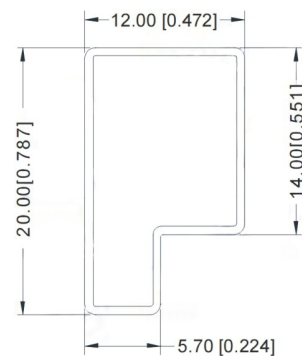
No parallel connection or plug and play.

RECOMMENDED FOOTPRINT



Top view,grid:2.54mm(0.1inch)
diameter:1.00mm(0.039inch)

TUBE OUTLINE DIMENSIONS



Note:

Unit :mm[inch]

General tolerances:±0.50mm[±0.020inch]

L=530mm[20.866inch]

Tube Quantity: 16pcs

L=220mm[8.661inch]

Tube Quantity: 6pcs

Note:

1. The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
2. Operation under 10% load will not damage the converter; However, they may not meet all specification listed.
3. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
4. In this data sheet, all the test methods of indications are based on corporate standards.
5. Only typical models listed, other models may be different, please contact our technical person for more details.