

Features/产品特点

- 1. Wide voltage range input (2:1)
- 2. Standby power consumption: 0.3W
- 3. Working temperature range: -40 °C to+85 °C
- 4. Up to 85% efficiency
- 5. Output short circuit, overcurrent, overload protection
- 6. International standard pins, PCB board direct installation

- 1. 宽电压范围输入 (2:1)
- 2. 待机功耗: 0.3W
- 3. 工作温度范围: -40℃至+85℃
- 4. 效率高达85%
- 5. 输出短路, 过流, 过载保护
- 6. 国际标准引脚, PCB 板直插安装



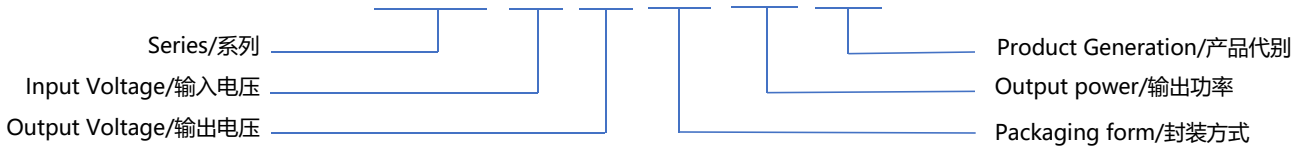
Description/概述

DC-DC module power supply, Wide voltage input, Power 1W, Isolated, Regulated, Single output, SIP packaging

DC-DC 模块电源, 宽电压输入, 功率1W, 隔离, 稳压, 单路输出, SIP 封装

Model Numbering/命名规则

WRBxxxxS-1WR2



Selection Guide/选型表

产品型号 Product model	输入电压 Input Voltage Standard value(range)	输出电压 Output Voltage	输出电流 Output Current (mA) (Max./Min.)	效率 Efficiency % (Min./Typ.)	最大容性负载 Maximum capacitive load (μF)
WRB0503S-1WR3(2)	5VDC (4.5-9)	3.3VDC	303/0	73/75	2700
WRB0505S-1WR3(2)	5VDC (4.5-9)	5VDC	200/0	75/77	2200
WRB0512S-1WR3(2)	5VDC (4.5-9)	12VDC	83/0	76/78	1000
WRB0515S-1WR3(2)	5VDC (4.5-9)	15VDC	67/0	78/80	680
WRB0524S-1WR3(2)	5VDC (4.5-9)	24VDC	42/0	74/76	470



深圳市维芯达电子有限公司

Power Solutions

DC-DC Converters/转换器

WRB_S-1WR3(2)

Series/系列



5-year quality assurance



3rd generation manufacturing process



3rd generation chip solution

5年
超长质保

第3代
制造工艺

第3代
芯片方案

<https://www.phink.net.cn>



产品型号 Product model	输入电压 Input Voltage Standard value(range)	输出电压 Output Voltage	输出电流 Output Current (mA) (Max./Min.)	效率 Efficiency % (Min./Typ.)	最大容性负载 Maximum capacitive load (μF)
WRB1203S-1WR3(2)	12VDC (9-18)	3.3VDC	303/0	73/75	2700
WRB1205S-1WR3(2)	12VDC (9-18)	5VDC	200/0	75/77	2200
WRB1209S-1WR3(2)	12VDC (9-18)	9VDC	111/0	77/79	1800
WRB1212S-1WR3(2)	12VDC (9-18)	12VDC	83/0	76/78	1000
WRB1215S-1WR3(2)	12VDC (9-18)	15VDC	67/0	78/80	680
WRB1224S-1WR3(2)	12VDC (9-18)	24VDC	42/0	74/76	470

产品型号 Product model	输入电压 Input Voltage Standard value(range)	输出电压 Output Voltage	输出电流 Output Current (mA) (Max./Min.)	效率 Efficiency % (Min./Typ.)	最大容性负载 Maximum capacitive load (μF)
WRB2403S-1WR3(2)	24VDC (18-36)	3.3VDC	303/0	73/75	2700
WRB2405S-1WR3(2)	24VDC (18-36)	5VDC	200/0	75/77	2200
WRB2409S-1WR3(2)	24VDC (18-36)	9VDC	111/0	77/79	1800
WRB2412S-1WR3(2)	24VDC (18-36)	12VDC	83/0	76/78	1000
WRB2415S-1WR3(2)	24VDC (18-36)	15VDC	67/0	78/80	680
WRB2424S-1WR3(2)	24VDC (18-36)	24VDC	42/0	74/76	470

产品型号 Product model	输入电压 Input Voltage Standard value(range)	输出电压 Output Voltage	输出电流 Output Current (mA) (Max./Min.)	效率 Efficiency % (Min./Typ.)	最大容性负载 Maximum capacitive load (μF)
WRB4803S-1WR3(2)	48VDC (36-75)	3.3VDC	303/0	73/75	2700
WRB4805S-1WR3(2)	48VDC (36-75)	5VDC	200/0	75/77	2200
WRB4809S-1WR3(2)	48VDC (36-75)	9VDC	111/0	77/79	1800
WRB4812S-1WR3(2)	48VDC (36-75)	12VDC	83/0	76/78	1000
WRB4815S-1WR3(2)	48VDC (36-75)	15VDC	67/0	78/80	680
WRB4824S-1WR3(2)	48VDC (36-75)	24VDC	42/0	74/76	470

Input Characteristics/输入特性

Parameter/参数	Conditions/测试条件	Min.	Typ.	Max.	Units
Input current (Rated Load) 输入电流 (额定负载)	5VDC Nominal voltage input 5VDC标称电压输入	--	281	290	mA
	12VDC Nominal voltage input 12VDC标称电压输入	--	111	114	mA
	24VDC Nominal voltage input 24VDC标称电压输入	--	55	57	mA
	48VDC Nominal voltage input 48VDC标称电压输入	--	27	28	mA

DC-DC Converters/转换器

Parameter/参数	Conditions/测试条件		Min.	Typ.	Max.	Units
Input current (No-load) 输入电流（空载）	5VDC Nominal voltage input 5VDC标称电压输入			40	60	mA
	12VDC Nominal voltage input 12VDC标称电压输入		--	15	30	mA
	24VDC Nominal voltage input 24VDC标称电压输入		--	6	10	mA
	48VDC Nominal voltage input 48VDC标称电压输入		--	4	6	mA
Reflected ripple current 反射纹波电流			30	40	55	mA
Input impulse voltage 输入冲击电压	5VDC Nominal voltage input 5VDC标称电压输入		-0.7	--	12	VDC
	12VDC Nominal voltage input 12VDC标称电压输入		-0.7	--	25	VDC
	24VDC Nominal voltage input 24VDC标称电压输入		-0.7	--	50	VDC
	48VDC Nominal voltage input 48VDC标称电压输入		-0.7	--	100	VDC
Starting voltage 启动电压	5VDC Nominal voltage input 5VDC标称电压输入		--	--	4.5	VDC
	12VDC Nominal voltage input 12VDC标称电压输入		--	--	9	VDC
	24VDC Nominal voltage input 24VDC标称电压输入		--	--	18	VDC
	48VDC Nominal voltage input 48VDC标称电压输入		--	--	36	VDC
Under voltage protect 输入欠压保护	5VDC Nominal voltage input 5VDC标称电压输入		3	3.5	--	VDC
	12VDC Nominal voltage input 12VDC标称电压输入		5.5	6.5	--	VDC
	24VDC Nominal voltage input 24VDC标称电压输入		12	15.5	--	VDC
	48VDC Nominal voltage input 48VDC标称电压输入		26	30	--	VDC
Start Time 启动时间			--	10	--	ms
Remote control foot 遥控脚（Ctrl） (Some models are applicable) (部分型号适用)	Module On 模块开启	Ctrl hovering or connected to TTL high level (3.5-12VDC) Ctrl 悬空或接TTL 高电平(3.5-12VDC)				
	Module shutdown 模块关断	Ctrl connected to GND or low level (0-1.2VDC) Ctrl 接 GND 或低电平(0-1.2VDC)				
	Input current during shutdown 关断时输入电流		--	6	10	mA
Input filter 输入滤波类型	电容滤波					

Remarks/备注: This product does not support hot plug /此产品不支持热插拔

Output Characteristic/输出特性

Parameter/参数	Conditions/测试条件	Min.	Typ.	Max.	Units
Output voltage accuracy 输出电压精度	0% -100% Load 0% -100%负载	--	+/-1	+/-3	%
Linear regulation rate 线性调节率	Input voltage variation+/- 1% 输入电压变化+/-1%	--	+/-0.2	+/-0.5	%
Load regulation rate 负载调节率	10% to 100% load 10%-100% 负载	--	+/-0.4	+/-0.75	%
Ripple & Noise 波纹和噪声	Pure resistive load, 20MHz bandwidth 纯电阻负载, 20MHz 带宽	--	30	85	mVp-p
Dynamic response step deviation 动态响应阶跃偏差		--	+/-3	+/-5	%
Dynamic response recovery time 动态响应恢复时间			300	500	μs
Temperature drift coefficient 温度漂移系数	100% load 满载	--	+/-0.02	+/-0.03	%/°C
Output overvoltage protection 输出过压保护	Full voltage range input 全电压范围输入	110	--	160	%Vo
Output overcurrent protection 输出过流保护	Full voltage range input 全电压范围输入	110	140	190	%Io
Short Circuit Protection 输出短路保护	Full voltage range input 全电压范围输入	Sustainable, Self-healing 可持续、自恢复			

Note: 1) For product models with output voltages of ± 5VDC and ± 9VDC, the maximum output voltage accuracy is ± 5% under 0% -5% load conditions;
2) When tested under 0% -100% load working conditions, the indicator of load adjustment rate is ± 5%;
3) 0% -5% load ripple&noise less than or equal to 5% Vo. The twisted pair test method for ripple and noise can add capacitive load at the output end to reduce light load ripple.

注: 1) 输出电压为±5VDC、±9VDC 的产品型号, 在 0%-5%负载条件下, 输出电压精度最大值为±5%;
2) 按 0%-100%负载工作条件测试时, 负载调整率的指标为±5%;
3) 0%-5%的负载纹波&噪声小于等于 5%Vo. 纹波和噪声的测试方法双绞线测试法, 可以在输出端加容性负载降低轻载纹波。

General Characteristics/通用特性

Parameter/参数	Conditions/测试条件	Min.	Typ.	Max.	Units
Isolation voltage 隔离电压	Input-output, Test time 1 minute, Leakage current less than 1 mA 输入-输出, 测试时间1分钟, 漏电流小于1 mA	1500	--	--	VDC
Insulation resistance 绝缘电阻	Input-output, Insulation voltage 500VDC 输入-输出, 绝缘电压500VDC	1000	--	--	MΩ
Isolation capacitance 隔离电容	Input-output, 100KHz/0.1V 输入-输出, 100KHz/0.1V	--	120	1000	pF
Working temperature 工作温度	Temperature ≥ 60 °C for derating (See Figure 4) 温度≥60°C时, 降额使用 (见图4)	-40	--	+85	°C
Storage temperature 储存温度		-55	--	+125	°C
Storage humidity 储存湿度	Non condensing 无凝结	--	--	95	%RH
Maximum temperature of the casing during operation 工作最大壳温	Ta=25 °C, Nominal input, Full output Ta=25°C, 标称电压输入, 满载	--	--	100	°C

Parameter/参数	Conditions/测试条件	Min.	Typ.	Max.	Units
Soldering temperature resistance of pins 引脚耐焊接温度	The distance from the welding spot to the shell is 1.5mm, 10 seconds 焊点到壳体的距离为1.5mm，10秒	--	--	300	℃
Switching frequency 开关频率	Full load, Nominal input voltage 满载，标称输入电压	--	200	--	kHz
Vibrate 振动		10- 55Hz,10G,30Min.alongX,YandZ			
Mean time between failures【MTBF】 平均无故障时间	MIL-HDBK-217F@25℃	1000	--	--	kHours

Physical Characteristics/物理特性

Parameter/参数	Content/内容
Housing material 外壳材料	Black flame retardant and heat-resistant plastic (UL94V-0) 黑色阻燃耐热塑料（UL94V-0）
Overall dimensions 外形尺寸	23.20 × 9.90 × 12.90 mm
Weight 重量	5.1g(Typ.)
Cooling mode 冷却方式	Natural air cooling 自然风冷

EMC Characteristics/EMC特性

Parameter	Category	Content	
EMI	Conductive disturbance 传导骚扰	CISPR32/EN55032 CLASS A（The recommended circuit is shown in Figure 2）	
	Radiation disturbance 辐射骚扰	CISPR32/EN55032 CLASS A（The recommended circuit is shown in Figure 2）	
EMS	Electrostatic Discharge 静电放电	IEC/EN61000-4-2 Contact ±4kV	perf. CriteriaB
	Radiated Immunity 辐射抗扰度	IEC/EN61000-4-3 10V/m	perf. CriteriaA
	Pulse group Immunity 脉冲群抗扰度	IEC/EN61000-4-4 ±2kV	perf. CriteriaB
	Surge Immunity 浪涌抗扰度	IEC/EN61000-4-5 line to line ±2kV	perf. CriteriaB
	Conducted disturbance immunity 传导骚扰抗扰度	IEC/EN61000-4-6 3 Vr.m.s	perf. CriteriaA
	Voltage dips, and short-term interruptions immunity 电压骤降和短期中断抗扰度	IEC/EN61000-4-29 0%, 70%	perf. CriteriaB

Circuit Design and Application/电路设计与应用

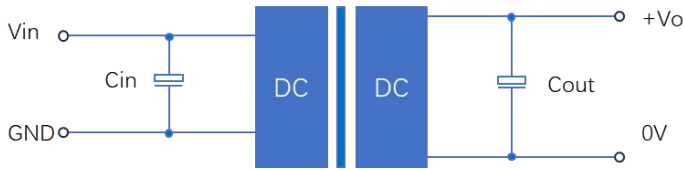


Figure 1: Application circuit

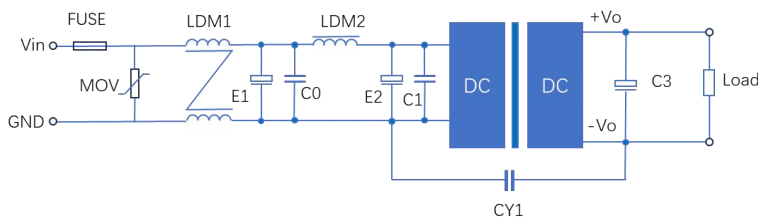
图1：应用电路

Table 1:
Recommended Capacitive Load Values
推荐电容负载值

Vin(VDC)	Cin(μF)	Vo(VDC)	Cout(μF)
Nominal voltage 标称电压	100	Nominal voltage 标称电压	10

Figure 2: EMC Typical Recommended Circuits

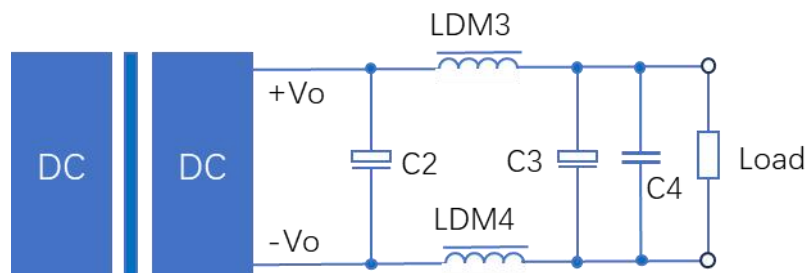
图2:EMC典型推荐电路

Table 2:
Recommended Circuit Parameter Values
推荐电路参数

Category	Component	Value
EMI	MOV	14D560K
	E1/E2	100μF
	C0/C1	1μF
	CY1	1nF/2KV
	LDM1	10mH
	LDM2	10μH

Figure 3: Ripple application and testing

图3:纹波应用及测试

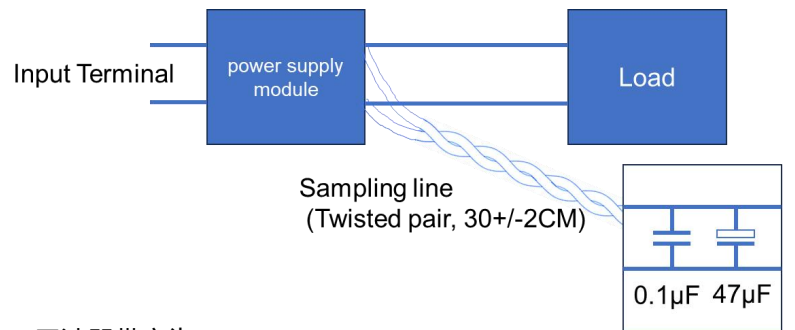


When using in situations with strict requirements for ripple and noise, it is recommended to use the circuit shown in the figure above.

在对纹波和噪声有严格要求的情况下使用时，建议使用上图所示的电路。

DC-DC Converters/转换器

The testing method for ripple and noise is to use a 12 # twisted pair connection, with an oscilloscope bandwidth of 20MHZ and a 100M bandwidth oscilloscope probe. The capacitor shown in the above figure is connected in parallel to the oscilloscope probe, and the sampling mode of the oscilloscope is SAMPLE.



纹波和噪声的测试方法是使用12#双绞线连接，示波器带宽为20MHZ，示波器探头带宽为100M。上图所示的电容器与示波器探头并联，示波器的采样模式为SAMPLE。

Remove the probe cap and ground clamp from the oscilloscope probe

Product Characteristic Curve/产品特性曲线

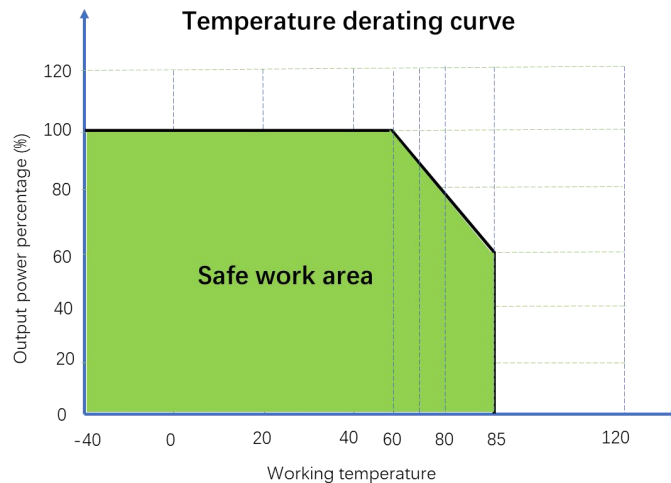


Figure 4: Temperature Derating Curve

图4：温度减额曲线

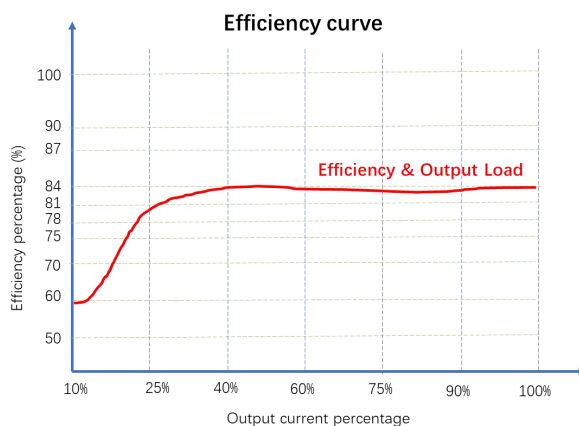


Figure 5: Efficiency VS Output Load (Nominal Voltage Input)

图5：效率与输出负载（标称电压输入）

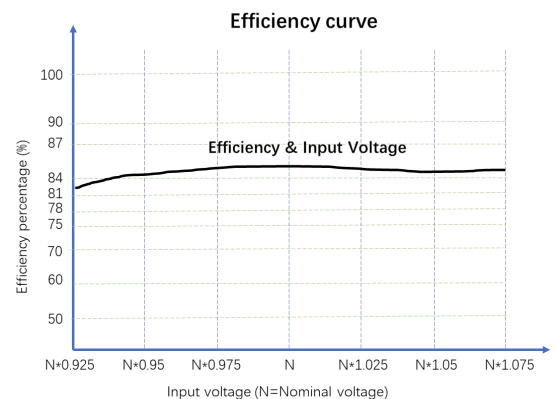


Figure 6: Efficiency VS Input Voltage (100% Load)

图6：效率与输入电压（100%负载）

Overall Dimensions and Pin Functions/外形尺寸和引脚功能

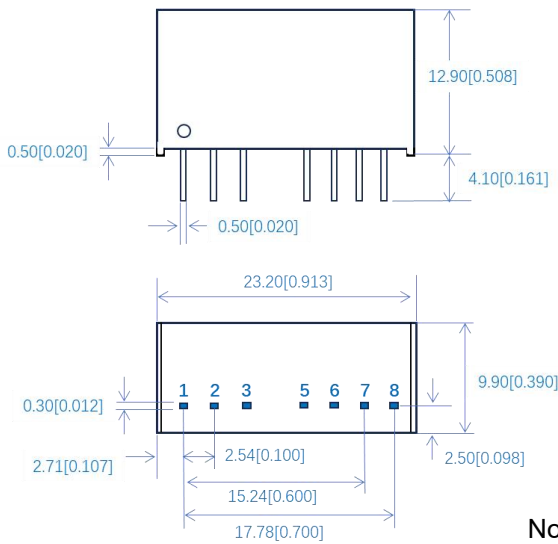


Figure 7: Overall dimensions

Note: The grid distance is 2.54mm * 2.54mm

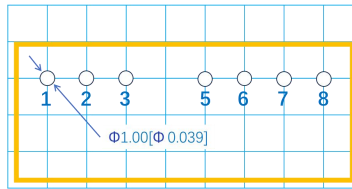


Table 3: Pin Function Table

Pin	Function
1	GND
2	Vin
3	Ctrl
5	NC
6	+Vo
7	0V
8	NC

*NC不能与任何外部电路连接

*NC cannot be connected to any external circuits

Note:

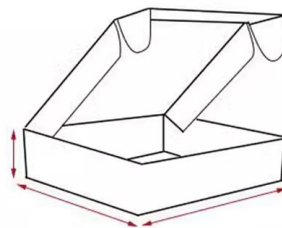
Dimensions in mm

Terminal diameter tolerance: ± 0.10 Undeclared tolerance: ± 0.50

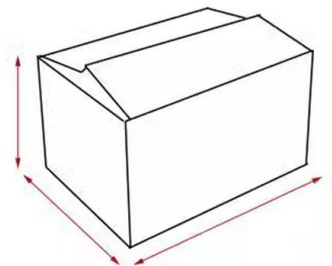
Packaging Method/包装方式



16 Pieces/Tube



432 Pieces/Inner box



2160 Pieces/Outer box

Notes & Instructions/注释和说明

1. The input voltage shall not exceed the specified range value, otherwise permanent and unrecoverable damage may be caused;
2. Unless otherwise specified, the parameters in this manual are measured at 25 °C, 40%~75% humidity, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on the company's enterprise standards.
4. Copyright and final interpretation of this product belong to Shenzhen Weixinda Electronics Co., Ltd.

1. 输入电压不得超过规定的范围值，否则可能造成永久性和不可恢复的损坏；
2. 除非另有规定，否则本手册中的参数是在25℃、湿度40%~75%、输入标称电压和输出纯电阻模式下满负荷测量的；
3. 所有指标测试方法均基于本公司的企业标准；
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