

小耳朵（广东）电子科技股份有限公司

承认规格书

Specification for Approval

| | |
|-----------------------|---------------|
| 客户名称 CUSTOMER NAME | TBD |
| 产品类型 PRODUCT ITEM | 开关电源 SPS |
| 机种名称 MODEL NO. | EAR-RMD600-48 |
| 送样日期 SEND DATE | TBD |

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|----------|----|----|----------|
| 制造 | | | 客户 |
| APPROVAL | | | APPROVAL |
| 拟制 | 审核 | 批准 | |
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版本历史

REVISION HISTORY

| Spec Rev 规格书版本 | Sample Rrv 样品版本 | Date 日期 | Description 描述 | Safety 安规确认 | Mechanical 结构确认 | Electrical 电气确认 |
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| 1.0 | 1.0 | 2022-3-7 | 首版发行 | 冯杰 | 颜梅强 | 冯杰 |
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1. 电气性能指标 Power Supply Overview

1.1 输入特性 Input Electrical Characteristics Overview

1.1.1 输入电压 Input Voltage

标称输入电压:200~240Vac,单相

Normal Voltage Range: 200~240Vac, single phase;

变动输入电压: 180~264Vac,单相

Vibration Input Voltage Range: 180~264V ac, single phase;

1.1.2 输入频率 Input Frequency

标称频率范围: 50/60Hz

Normal Frequency Range: 50/60Hz

变动频率范围: 47~63Hz

Vibration Frequency Range: 47~63Hz

1.1.3 输入电流 Input Current

最大 7A, 在 220Vac 50Hz, 满载

7A MAX, At 220Vac 50Hz, Full load output.

1.1.2 效率及平均效率 Efficiency and Average Efficiency

在 230Vac 交流输入, 额定负载输出时, 效率 $\geq 92\%$,

At 230Vac input, 100% of full load output, efficiency $\geq 92\%$

平均效率满足 CEC Compliance Level 5;

Average efficiency meet CEC Compliance Level 5;

1.1.4 待机功耗 No Load Consumption

在 230Vac 输入时, 空载, 待机功耗 $\leq 0.5W$

At 230Vac input and no load condition, input power $\leq 0.5W$.

1.1.6 冲击电流 Inrush Current

最大 60A, 在 220Vac, 冷启动

60A MAX. At 220Vac, Cold Start.

1.1.7 功率因素 Power Factor

输入电压 220VAC, 满载条件, PF $\geq 40\%$

Input voltage 220Vac, Full load condition PF $\geq 40\%$

1.2 输出特性 Output Electrical Characteristics Overview

1.2.1 表 1 输出电压电流调整率 Table 1 Output Voltage、Current & Regulation

| Output Voltage 输出电压 | Regulation 调整率 | Min. current 最 小电流 | Rated current 额定电流 |
|------------------------|-------------------|-----------------------|-----------------------|
| 48V(空载) (No load) | 45.6-50.4V | 0.0A | 0A |
| 48V (满载) (Full load) | 45.6-50.4V | 0.0A | 12A Max |
| 12V(空载) (No load) | 10.8-13.2V | 0.0A | 0A |
| 12V (满载) (Full load) | 10.8-13.2V | 0.0A | 1A Max |
| 5V(空载) (No load) | 4.75-5.25V | 0.0A | 0 |
| 5V (满载) (Full load) | 4.75-5.25V | 0.0A | 2A Max |

1.2.2 表 2 输出纹波和噪声 Table 2 DC Output Ripple & Noise

| Output Voltage | Ripple & Noise (Max) |
|----------------|----------------------|
| 48V | ≤300mV |
| 12V | ≤150mV |
| 5V | ≤80mV |

Note: 1) Measurements shall be made with an oscilloscope with 20 MHz bandwidth.

示波器须设置在 20 兆赫兹的带宽

2) Output shall be bypassed at the connector with a 0.1uF ceramic capacitor and a 47uF/100V electrolytic simulate system loading.

输出并联 0.1uF 的陶瓷电容和 47uF 的电解电容。

1.2.3 表 3 输出动态响应 Table 3. Output Transient Response

测试条件 Test Conduction

| Voltage Tolerance Limit | Slew Rate | Load Change |
|-------------------------|-----------|-----------------|
| 48V ± 10% | 0.2A/uS | 40% to 80% Load |
| 12V ± 10% | 0.2A/uS | 40% to 80% Load |
| 5V ± 10% | 0.2A/uS | 40% to 80% Load |

Note: 以 50-10KHz 的频率跳变负载来测试;

Transient response measurements shall be made with a load changing repetition rate of 50Hz to 10KHz.

1.2.4 表4 输出保持时间 Table 4. DC Output Hold-Up Time

| Output Voltage | 115Vac/50Hz Input | 230Vac/50Hz Input |
|----------------|-------------------|-------------------|
| 48V | NC | ≥10Ms |
| 12V | NC | ≥10Ms |
| 5V | NC | ≥10Ms |

Note: 所有输出带满负载 All of DC output at full load.

1.2.5 表5 输出超调 Table5 DC Output Overshoot At Turn on & Turn Off

| Output Channel | Output (V) | Over Shoot Voltage(V)超调电压 | |
|----------------|------------|---------------------------|-------------|
| | | Turn On 开机 | Turn Off 关机 |
| 48V | 48V | 10% | 10% |
| 12V | 12V | 10% | 10% |
| 5V | 5V | 10% | 10% |

Note: 测试时负载范围: 由最小到最大 All of DC output current from Min. to Max.

1.2.6 表6 输出上升时间 Table 6. DC Output Rise Time

| Output Voltage | 115Vac/60Hz input & Full load | 230Vac/50Hz input & Full load |
|----------------|-------------------------------|-------------------------------|
| 48V | NC | ≤50mS |
| 12V | NC | ≤20mS |
| 5V | NC | ≤10mS |

Note: 输出电压从10%上升到90%

The Output Voltages shall be rise from 10% to 90% of their output voltage.

1.2.7 表7 开机时间 Table7 Turn-on delay Time

| Output Voltage | 90Vac/60Hz input & Full load | 115Vac/50Hz input & Full load | 230Vac/50Hz input & Full load |
|----------------|------------------------------|-------------------------------|-------------------------------|
| 48V | NC | NC | ≤3S |
| 12V | NC | NC | ≤3S |
| 5V | NC | NC | ≤3S |

1.3 保护功能 Protection

1.3.1 表8 过压保护 Over Voltage Protection Table 8.

| Output Voltage | Max. Over Voltage | Comments |
|----------------|-------------------|--------------------|
| 48V | 90V | Automatic recovery |
| 12V | 20V | Automatic recovery |
| 5V | 7.5V | Automatic recovery |

Note: 应该在最大交流输入电压264伏特和轻载、空载下测试

The power supply shall be test at Max AC voltage (240Vac) and min load or no load.

1.3.2 表9 过流保护 Over Current Protection Table 9.

| Output Voltage | Over Current | Comments |
|----------------|--------------|--------------------|
| 48V | 12.5-15A | Automatic recovery |
| 12V | 3A | Automatic recovery |
| 5V | 3A | Automatic recovery |

1.3.3 表10 短路保护 Short Circuit Protection Table 10.

| Output Voltage | Comments |
|----------------|--------------------|
| 48V | Automatic recovery |
| 12V | Automatic recovery |
| 5V | Automatic recovery |

1.3.4 保护功能复位 Reset After Shutdown

电源进入保护状态,故障去除后, 电源可自动恢复

Automatic recovery after Short Circuit fault being removed

2. 安规要求 Safety

The power supply shall compliance with the following Criterion.

电源安全性要满足以下标准

*GB4943-2011 ;

IEC62368

3. 电磁兼容性 EMC

3.1 电磁干扰 EMI

电源电磁干扰应满足下列规则:

The power supply shall comply the following Criterion.

3.2 电磁抗扰 EMS

电源电磁抗干扰应满足以下规则:

The power supply shall compliance with following Criterion:

1) 静电抗扰度 ESD

*GB17626.2-1998/IEC61000-4-2

Air Discharge/空气放电 15KV Class B

Contact Discharge/接触放电 8KV Class B

2) 脉冲群抗扰度 EFT

*GB17626.4-1998/IEC61000-4-4

3) 雷击浪涌 Surge

*GB17626.5-1998/IEC61000-4-5 3KV(Dif) L,N

6KV(Com) L,N-PE

4. 绝缘性能 Isolation

4.1 Table 11 绝缘阻抗

| | |
|-----------------|-------------------|
| Input to Output | DC 500V \geq 8M |
|-----------------|-------------------|

4.2 Table 12 绝缘耐压

| | |
|-----------------|------------------|
| Input to Output | AC3000V 10mA 60S |
|-----------------|------------------|

5. 寿命 LIFETIME

可靠性工作时间 3 万小时, 工作条件: 在额定负载内, +25°C 的室温

This unit to have a minimum lifetime of 100,000 hours at rated continuous load ,+25°C ambient temperature

6. 环境要求 Environmental Requirements

6.1 环境温度 Temperature

Operating: -10°C to +40°C

Store: -20°C to +85°C

6.2 湿度 Humidity

Operating: From 20% to 90% relative humidity (Non-condensing).

Store: From 10% to 95% relative humidity (Non-condensing).

6.3 海拔 Altitude

Operating: to 5000 meters

6.4 冷却方式 Cooling Method

Free air convection

6.5 振动耐受 Vibration

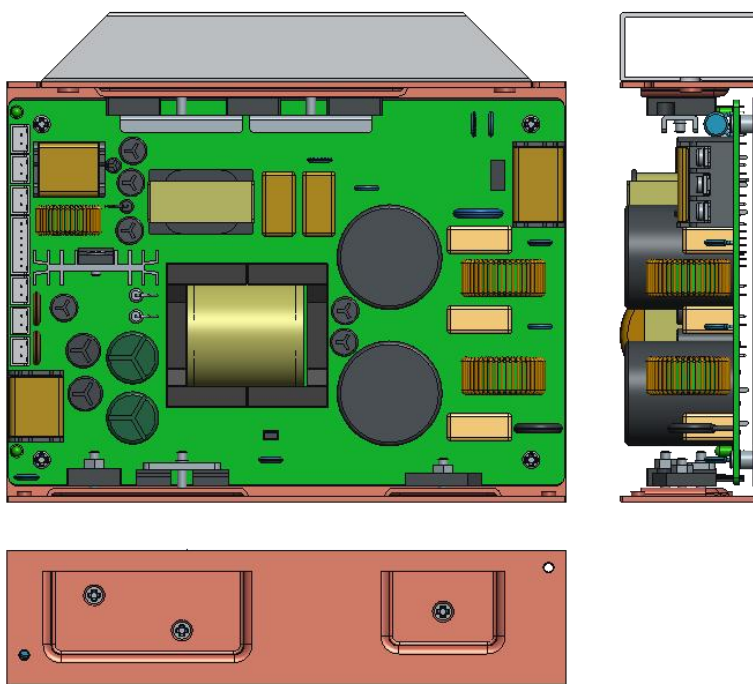
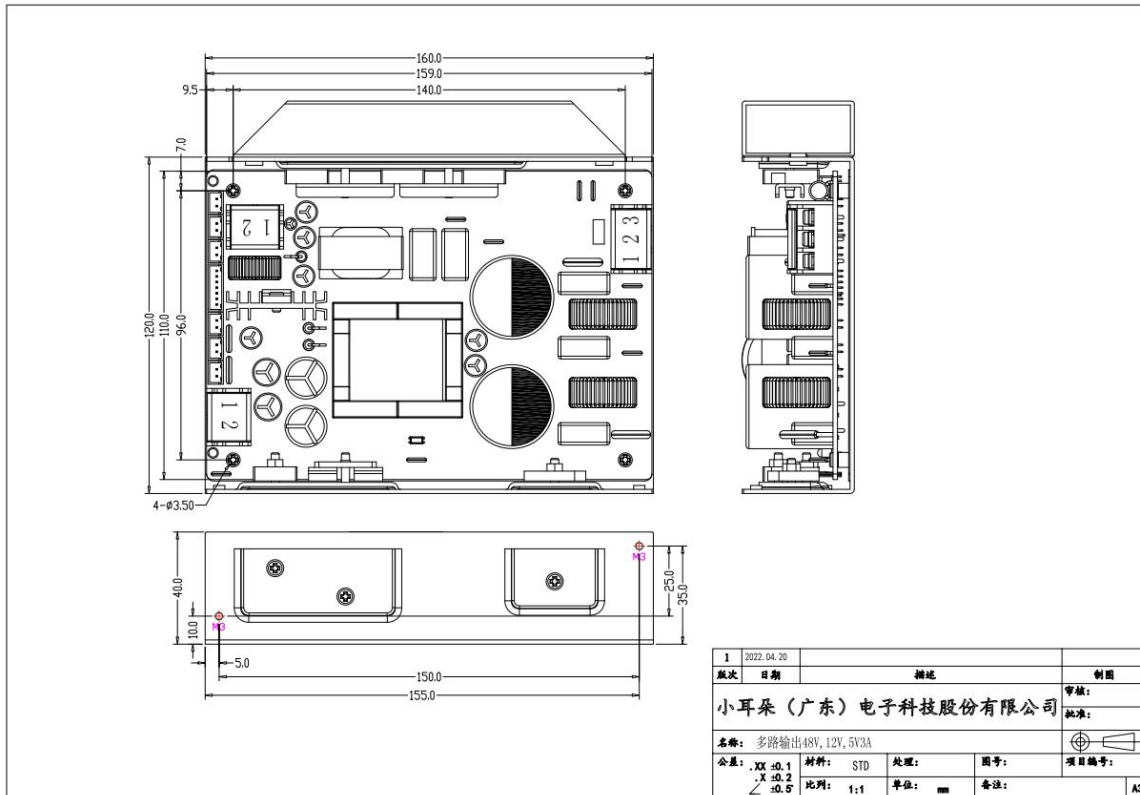
Operating: 5-44Hz, 0.005 inch displacement, 44-500Hz, 0.5g, 15 minutes duration

Storage: 5-17Hz, 0.01 inch displacement, 17-500Hz, 1.5g, 30 minutes duration

7. 重量 Weight

800±5g

8. 机械尺寸 Mechanical



9. 铭牌 LABEL

接线控制方式如下:

90mm

小耳朵® 开关电源
SWITCH POWER SUPPLY

型号 (MODEL): **EAR-RMD600-48**
交流输入 (AC INPUT): 200-240Vac 7A Max 50/60Hz
直流输出 (DC OUTPUT):
48V ≡ 12A Max (CN102)
12V ≡ 1A Max (CN108)
12V ≡ 1A Max (CN109)
5V ≡ 1A Max (CN104)
5V ≡ 1A Max (CN105)

整机总输出持续功率最大 **600W**.
Total maximum continue power not exceed 600W.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
注意: 请勿开盖, 以防电击!

CQC 10

端子控制接线方式 (高电平有效 3.3-5V)

小耳朵 (广东) 电子科技股份有限公司
Guangdong Steady Technology Co.,LTD

中国制造
MADE IN CHINA

90mm

消银龙 银底黑字 加强胶

10. 包装、运输、贮存 Package、Transport、Storage

10.1 包装 Package

包装箱上应有产品名称、型号、厂家标识、厂家质量部门的检验合格证、制造日期等。

Product name, part number, supplier's logo, QC stamp, Pb-Free display and data must be printed on the package case.

10.2 运输 Transport

适用于车、船、飞机运输，运输中应遮蓬、防晒、文明装卸。

This product can be transported through land, sea or air, Measures should be taken for water and sunproof also. it should be handled with care.

10.3 贮存 Storing

产品未使用时应存放在包装箱内，仓库环境温度为-20℃--85℃，相对湿度为10%--95%，仓库内不允许有有害气体，易燃、易爆的产品及有腐蚀性的化学物品，并且无强烈的机械振动，冲击和强磁场作用，包装箱应垫离地至少20mm高，距离墙壁、热源、窗口或空气入口处至少50cm，在本规定条件下的内存周期一般为2年，超过2年后应重新进行检验。

Keep the product staying in the package case before using, The temperature of the stock house should be between -20℃- 85℃ and the humidity should between 5-95%, keep the product away from hazardous gas, flammable or explosive substances racked 20cm above the ground and 50cm away from the wall, window, heat source or ventilation port. Generally the storage term of this product is 2 years. All the products should be double check after that time.