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# 客户承认书

## SPECIFICATION FOR APPROVAL

**CUSTOMER/客户:** \_\_\_\_\_

**CUSTOMER P.N./客户物料号:** \_\_\_\_\_

**MODEL NO./产品型号:** \_\_\_\_\_ **YAX-PW1203** \_\_\_\_\_

**PRODUCT NO./产品编号:** \_\_\_\_\_ **36W 12V/3A** \_\_\_\_\_

**SAMPLE DATE/送样日期:** \_\_\_\_\_ **2025-7-29** \_\_\_\_\_

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| 拟 制: | 安规工程师: | 项目工程师: | 批 准: |
|      |        |        |      |

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## 1. Functional description/功能描述

YAX-PW1203 is a 36W output closed-type power supply with a 36mm thin design and a wide input voltage range of 90 ~ 264Vac. The output voltage is single channel 12V, and the peak efficiency is as high as 88%. It is designed with an aluminum casing for good heat dissipation. The power supply has a variety of protection functions, such as input under-voltage protection, output over-current protection, output over-voltage protection and temperature protection. It conforms to the harmonics requirement of en 61000-3-2. It provides a high performance and cost-effective solution for various engineering applications.

YAX-PW1203 是一款 **36W** 12V 输出封闭型电源供应器, 具有 **36mm** 薄外型设计, 宽输入电压范围 **90~264Vac**。输出电压为 12V, 峰值效率高达 **88%**; 采用铝外壳设计且具有很好的散热效果。该电源具有多种保护功能, 如输入欠压保护、输出过流保护、输出过压保护; 符合 **EN61000-3-2** 谐波要求; 为各种工程应用提供了一个高性能和高性价比的解决方案。

## 2. SCOPE/简述

The document detail the electrical, mechanical and environmental specifications of a SMPS, the power supply provide 500W continuous output power.

资料详细描述了一款 **36W** (连续输出功率) 开关电源的电气性, 结构性及环境等要求。

The power supply shall meet the **RoHS** requirement.

此款电源符合 **RoHS** 要求。

### 2.1. Description/产品类型

|                                 |                                                                                                                |
|---------------------------------|----------------------------------------------------------------------------------------------------------------|
| SMPS Adaptor(Wall mount)/插墙式适配器 | SMPS Adaptor(Desk-top)/桌面型适配器                                                                                  |
| Open Frame/开放式结构                |  SMPS Unit (With Case)/带铝壳型 |
| Others/其他                       |                                                                                                                |

## 3. Input Characteristics/输入特性

### 3.1. Input Voltage & Frequency/输入电压与频率

The range of input voltage is from 90Vac to 264Vac single phase, switching the input voltage through a switch.

输入电压范围: 从 **90Vac** 到 **264Vac**, 单相输入, 通过开关切换输入电压。

| Items              | Min/最小 | Nom/额定值     | Max/最大  |
|--------------------|--------|-------------|---------|
| Input Voltage/输入电压 | 90 Vac | 100~240 Vac | 264 Vac |

|                      |       |          |       |
|----------------------|-------|----------|-------|
| Input Frequency/输入频率 | 47 Hz | 50~60 Hz | 63 Hz |
|----------------------|-------|----------|-------|

### 3.2. Input AC Current/AC 输入电流

|                          |          |        |           |
|--------------------------|----------|--------|-----------|
| Input Voltage/输入电压       | 115Vac   | 230Vac | Full load |
| Input AC Current/AC 输入电流 | 1.5A Max | 1A Max | Full load |

### 3.3. Inrush Current (cold start)/浪涌电流(冷启动)

The energy of inrush current should not be over the  $I^2T$  of fuse & bridge diodes.  
冷启动时, 浪涌能量不能超过整流桥和保险丝的  $I^2T$ , 且不能有损坏。

### 3.4. Type Efficiency/典型效率

86% min.(average efficiency). @115Vac/60Hz input .

88% min.(average efficiency).@230Vac/50Hz input.

输入电压 115V/60Hz 时, 平均效率不低于 86%。

输入电压 230V/50Hz 时, 平均效率不低于 88%。

### 3.5. Energy Consumption /空载功耗

No load Consumption  $\leq 0.3W$ (230Vac/50Hz).

在额定输入 230Vac/50Hz 时,空载功耗 $\leq 0.3W$ 。

## 4. Output Characteristics/输出特性

### 4.1. Static Output Characteristics <Vo & R+N>/静态输出特性

| Output | Rated Load/额定负载 |           | Output Range  | R+N      | Remark |
|--------|-----------------|-----------|---------------|----------|--------|
| Rate   | Min. Load       | Rate.Load | 输出电压范围        | 纹波与噪声    | 备 注    |
| +12V   | 0.0A            | 3A        | 11.4V ~ 12.6V | 200mVp-p |        |

Ripple & Noise: Measurement is done by 20MHz bandwidth oscilloscope and the output paralleled a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor. (test under the condition of rated input and rated output).

纹波与噪声: 量测时示波器选用 20MHz 带宽限制,输出端要并联一颗 0.1uF 的陶瓷电容和一颗 10uF 的电解电容. (在额定输入及输出的条件下检测) 。

### 4.2. Line/ Load Regulation/线性/负载调整率

| Output | Load Condition/负载条件 |           | Line Regulation | Load Regulation | Remark |
|--------|---------------------|-----------|-----------------|-----------------|--------|
| Rate   | Min. Load           | Rate.Load | 线性调整率           | 负载调整率           | 备 注    |
| + 12V  | 0.0A                | 3A        | $\pm 3 \%$      | $\pm 3 \%$      |        |
|        |                     |           |                 |                 |        |

### 4.3. Turn - on Delay Time/开机延迟时间

3S max. @115Vac to 230Vac input & Full load.

输入电压 115Vac to 230Vac 满载时, 开机延迟时间不超过 3S。

### 4.4. Hold-up Time/关机维持时间

10mS min. @ Full load &115Vac/60Hz input turn off at worst case.

输入电压 115Vac/60Hz 满载时, 关机时间最差情况不小于 10 毫秒。

10mS min. @ Full load &230Vac/50Hz input turn off at worst case.

输入电压 230Vac/50Hz 满载时, 关机时间最差情况不小于 10 毫秒。

### 4.5. Rise Time/上升时间

80 mS max. @ Full load &115Vac/60Hz and 230Vac/50Hz input.

在 115Vac/60Hz 和 230Vac/50Hz 输入满载时, 上升时间不超过 80 毫秒。

### 4.6. Fall Time/下降时间

30 mS max. @ Full load.

满载时, 下降时间不超过 30 毫秒。

#### **4.7. Output Overshoot / Undershoot/输出过冲/欠冲**

10 % max. When the power on or off, when it is the full input voltage and full load.

开关机时, 输出过冲/欠冲均不大于 10%。

#### **4.8. Output Load Transient Response/输出负载瞬态响应**

Output voltage within 11.4~12.6V for load step from 25% to 50% to 25%, 50% to 75% to 50% R/S: 0.25A/uS, Transient Response Recovery Time :200uS, Dynamic response overshoot 10%.

输出电压在 11.4~12.6V V 之间,负载变化: 从 25% to 50% to 25%, 50% to 75% to 50%斜率: 0.25A/uS, 动态响应恢复时间: 20mS, 动态响应过冲±10%。

### **5. Protection Requirements/保护要求**

#### **5.1. Over Current Protection/过流保护**

Over Power Point Limited: 105%~150% Full load (@115/230Vac)

过流保护点限制:105%~150% 满载 (115~230Vac)

The output shall hiccup when the over current applied to the output rail, and shall be self-recovery when the fault condition is removed.

当过流作用于输出时, 输出将锁死, 当故障情况消除时, 重新启动恢复。

#### **5.2. Short Circuit Protection/短路保护**

The input power shall decrease when the output short.the power supply shall no damage, and shall be auto-recovery when the fault condition is removed.

当输出短路时, 输入功率应减小。电源不应损坏, 故障排除后重新启动恢复。

#### **5.3. Over Voltage Protection/过压保护**

In the case of 90 ~ 264Vac input space time load and full load,13V < OVP < 17V, and can not be damaged.

在 90~264Vac 输入时空载和满载情况下, 输出过压保护大于 13V,小于 17V, 且不能损坏。

#### **5.4. Over temperature protection/过温保护**

When the temperature exceeds 110±5℃, turn off the output voltage and automatically recover when the temperature drops to 75℃.

当温度超过 110±5℃时, 关闭输出电压, 温度下降到 75℃后自动恢复。

### **6. Environment Requirements/环境要求**

#### **6.1. Operating Temperature and Relative Humidity/操作温/湿度要求**

Operating temperature:-30℃ to +70℃

工作温度: -30℃ to +70℃

Operating Relative humidity:10%RH to 90%RH

工作湿度: 10%RH to 90%RH

#### **6.2. Storage Temperature and Relative Humidity/存储温/湿度要求**

Storage Temperature:-40℃ to +80℃

储存温度: -40℃ to +85℃

Storage relative humidity:10%RH to 95%RH non-condensing

存储湿度: 10%RH to 95%RH

**6.3. Sea level shall be low 2.000 meters/低于 2000 米.**

**6.4. Vibration/振动**

10 to 500Hz sweep at a constant acceleration of 2.0G(Displacement amplitude: 3.5mm), 10 minutes per cycle, 60 minutes on the X, Y and Z axis.

以 **2.0G** 恒定加速度(位移幅值:3.5mm)扫频 **10 - 500Hz**, 每循环 **10** 分钟, **X、Y、Z** 轴 **60** 分钟。

**7. Reliability Requirements/可靠性要求**

**7.1. Burn-in/老化**

The power supply shall be burn-in for 2 Hours under rated input and 80% Full load at 40°C ±5°C.

电源在 **40°C ±5°C** 额定输入、**80%**满负荷情况下老化 **2** 小时。

**7.2. E-caps lifetime**

The E-caps used in this power supply must be with lifetime of 3 years @ 25°C of full load. @ 200Vac / 60Hz and / or 240Vac / 50Hz.

本电源使用的电解电容寿命必须在 **25°C** 满负荷时使用寿命为 **3** 年。@ **200Vac / 60Hz** 和/或 **240Vac / 50Hz**。

**7.3. MTBF :**

≥200 K Hrs MIL-HDBK-217F (25°C).

平均无故障时间 **20** 万小时以上, 标准 **MIL-HDBK-217F (25°C)**。

**8. EMI/EMS Standards/EMI/EMS 标准**

**8.1. EMI Standards/EMI 标准**

| EMI                 | Standards                          | Margin Measurements |
|---------------------|------------------------------------|---------------------|
| Radiated Emission   | EN55032 EN55035 GB/T9254 GB17625.1 | ≥3dB                |
| Conduction Emission | EN55032 EN55035 GB/T9254 GB17625.1 | ≥3dB                |

**8.2. EMS Standards/EMS 标准**

**8.2.1. EN 61000-4-2, electrostatic discharge(ESD) requirement/静电抗扰度要求**

| Discharge characteristic/静电规格 | Test level/测试条件 | Test criteria/测试标准 |
|-------------------------------|-----------------|--------------------|
| Air discharge/空气放电            | +/- 8KV         | A                  |
| Contact discharge/接触放电        | +/- 4KV         | A                  |

**8.2.2. EN 61000-4-3, radiated electromagnetic field susceptibility(rs)/辐射骚扰场强**

| Test level/测试条件                    | Test criteria/测试标准 |
|------------------------------------|--------------------|
| 10V/m (r.m.s)                      | A                  |
| 30-1000MHz, 80% AM(1KHz) sine-wave |                    |

**8.2.3. EN 61000-4-4, electric fast transients(burst) immunity requirement/电快速瞬变脉冲群**

| Coupling/测试端口 | Test level/测试条件 | Test criteria/测试标准 |
|---------------|-----------------|--------------------|
| AC-input/交流输入 | 0.5KV           | A                  |
| AC-input/交流输入 | 1KV             | A                  |

**8.2.4. EN 61000-4-5, surge capability requirement/浪涌抗扰度要求**

|                             |                    |
|-----------------------------|--------------------|
| Surge voltage/雷击电压          | Test criteria/测试标准 |
| Common mode/共模 +/- 2KV      | A                  |
| Differential mode/差模 +/-4KV |                    |

#### 8.2.5.EN 61000-4-6, Induced radio frequency fields conducted disturbances immunity requirement/电源端子传导骚扰实验

|                         |                    |
|-------------------------|--------------------|
| Test level/测试条件         | Test criteria/测试标准 |
| 3V                      | A                  |
| 0.15-30 MHz,80%AM(1KHz) |                    |

#### 8.2.6. Assessment criteria /评估标准

| Acceptance criteria<br>可接受标准 | Performance<br>性能                                                                                                                                                                                                                 |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A                            | Agreed operational behavior within the specified limits<br>性能不允许变化；如果性能会发生变化，则变化的范围在产品规格书规定的范围内。                                                                                                                                  |
| B                            | Time limited functional diminishment or malfunction during the tests is permitted. The function is self-reactivated by the unit following completion of the tests.<br>设备在测试过程中,性能降低允许在产品规格书要求范围内,干扰消除后,设备能恢复正常,不允许出现复位和任何方式的人工干预。 |
| C                            | Malfunction is permitted .The function can be reactivated either by reconnection to the mains or by operator intervention.<br>在测试过程中，设备允许出现业务中断，测试完毕后允许自行恢复或者人工干预恢复（包括硬件上干预）；测试中只允许初级防护器件损坏，并且更换损坏的初级防护器件后，设备能恢复正常                |

## 9. Safety Standards/安规标准

### 9.1. Dielectric Strength(Hi-pot)/介电耐压强度(高压)

I/P- O/P: 3KVac / 5mA max. / 60 second .

输入对输出: **3KVac / 5mA max. / 60 秒.**

I/P-FG: 2KVac / 5 mA max. / 60 second .

输入对地: **2KVac / 5 mA max. / 60 秒**

O/P-FG: 0.5K Vac / 5 mA max. / second.

输出对地: **0.5KVac / 5 mA max. / 60 秒.**

### 9.2. Leakage Current/漏电流

3.5mA max. at 250Vac / 50Hz.

输入 **250V AC**,漏电流小于 **3.5mA**。

### 9.3. Insulation Resistance/绝缘阻抗

I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C/ 70% RH

输入对输出、输入对地、输出对地，在 25℃ 70%的湿度分别施加 500Vdc 进行测试，阻抗大于 100 兆欧姆。

#### 9.4. Regulatory Standards/安规标准

| Type/安规 | Country/国家 | Standard/标准 | State/状况 | Note/备注 |
|---------|------------|-------------|----------|---------|
| CCC     | China      | GB4943.1    | Meet     |         |
| CE      | Europe     | EN62368-1   | Meet     |         |
| FCC     | Europe     | EN62368-1   | Meet     |         |

## 10. Mechanical Outline Drawing/外观示意图

110L\*78W\*36H mm