

参考规格书

SPECIFICATION FOR REFERENCE

CUSTOMER/客户: _____

CUSTOMER P.N./客户物料号: _____

MODEL NO./产品型号 MS-Z4000R150-060B0-P

PRODUCT NO./产品编号: SCXXX-P0

SAMPLE DATE/送样日期: 2024-07-08

CUSTOMER AUTHORIZED SIGNATURE/客户承认签核		

Please return to us one copy of "SPECIFICATION FOR APPROVAL"
with you approved signature./客户确认签字,
盖章后请回传一份承认书给我司.

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1. SCOPE/简述

The document details the electrical, mechanical and environmental specifications of a SMPS, the power supply provide 60W continuous output power.

资料详细描述了一款 60W 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 **HSF** requirement.

此款电源符合 **HSF** 要求.

1.1. Description

- 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 (metal Case)/带铁壳型
 Others/其他

2. Input Characteristics/输入特性

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

The range of input voltage is from 90Vac to 264Vac single phase.

输入电压范围: 从 **90Vac** 到 **264Vac**, 单相输入.

	Minimum/最小	Nominal/额定值	Maximum/最大
Input Voltage/输入电压	90Vac	100Vac~240Vac	264Vac
Input Frequency/输入频率	47Hz	50Hz/60Hz	63Hz

2.2. Input AC Current/AC 输入电流

1.5A max. @ 100-240Vac input & Full load

输入电压 **100-240Vac** 满载时, 输入电流不超过 **1.5A**。

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

The energy of inrush current should not be over the $I^2 T$ of fuse & bridge diodes

冷启动时, 浪涌能量不能超过整流桥和保险丝的 $I^2 T$, 且不能有损坏。

2.4. Averaged Efficiency/平均效率

88% min. @ 230Vac input (@ 25%, 50%, 75% and 100% of max load).

输入电压 **230V 50Hz** 时, **25%、50%、75%和 100%**载时的平均效率不低于 **88%**。

2.5. Energy Consumption /空载功耗

No load Consumption $\leq 0.21W$ (230Vac/50Hz).

输入电压 **230Vac/50Hz** 时,空载功耗均小于 **0.21W**。

3. Output Characteristics/输出特性

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

Output Rate	Rated Load/额定负载		Output Range 输出电压范围	R+N 纹波与噪声	Remark 备注
	Min. Load	Max. Load			
+15.0V	0.0A	4.0A	14.25V ~ 15.75V	200mVp-p	100-240 V

Ripple & Noise: Measurement is done by 20MHz b width oscilloscope 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: 测量时,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)

3.2. 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	Max. Load	线性调整率	负载调整率	备注
+15.0V	0.0A	4.0A	±3%	±5%	

3.3. Turn - on Delay Time/开机延迟时间

3S max. @ 230Vac input & Full load

输入电压 **230V** 满载时, 开机延迟时间不超过 **3S**。

3.4. Hold-up Time/关机维持时间

10mS min. @ 115V/230V at 90 degree.

输入电压 **115V/230V** 时, 关机时间最差情况不小于 **10** 毫秒。

3.5. Rise Time/上升时间

50mS max. @ Rated load

额定负载时, 上升时间不超过 **50** 毫秒

3.6. Fall Time/下降时间

50mS max. @ Full load

满载时, 下降时间不超过 **50** 毫秒。

3.7. 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%**。

3.8. Output Load Transient Response/输出负载瞬态响应

Output voltage within 13.5V ~ 16.5V 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 **13.5V~ 16.5V** 时, 负载从 **25%** 到 **50%**到 **25%**, 或 **50%** 到 **75%**到 **50%**逐步变化, 斜率

0.5A/uS, 动态响应恢复时间 **200uS**, 动态响应过冲均保持±**10%**。

4. Protection Requirements/保护要求

4.1. Over Current Protection/过流保护

Over Current Point Limited/过流点限制: $I > 4.4A$.

The output shall hiccup when the over currents applied to the output rail, and shall be

self-recovery when the fault condition is removed

过流时, 输出将进入打嗝模式, 过流情况解除后, 产品将会自动恢复正常。

4.2. Short Circuit Protection/短路保护

The input power shall decrease when the output rail short, the power supply shall no

damage, and shall be self-recovery when the fault condition is removed.

当输出短路时,产品输入功率降低且不会损伤,当短路情况解除后,产品将会自动恢复正常。

4.3. Over Voltage protection/过压保护

The power supply has to be protected against over voltage conditions. No damage allowed.
The power supply must come back to nominal working without on/off powering after removal of the over voltage condition.

当过压保护时,产品输出功率不会损伤,当过压情况解除后,产品恢复正常。

5. Environment Requirements/环境要求

5.1. Operating Temperature and Relative Humidity/操作温/湿度要求

0°C to +40°C

10%RH to 90%RH

5.2. Storage Temperature and Relative Humidity/存储温/湿度要求

-20°C to +70°C, 5%RH to 95%RH non-condensing @ Sea level shall be low 5,000m.

海拔 5,000 米以下, 温度 -20°C to +70°C, 湿度 5% RH to 95% RH。

5.3. Vibration/振动

10 to 300Hz sweep at a constant acceleration of 1.0G(Breadth: 3.5mm) for 1Hour for each of the perpendicular axes X, Y, Z

扫描频率: 10 to 300Hz, 恒定加速度: 1.0G(位移: 3.5mm), X, Y, Z 三垂直坐标轴向各振动 1 小时

5.4. Drop in/跌落

Height: 1m; the product should be fell off on the hardwood with the thickness of 20mm ,6 Surfaces, The electric performance and Hi-Pot test must be OK after the drop tests.

跌落高度:1m, 产品应跌落到厚度为 20mm 的硬木上, 6 面, 跌落后产品电气性能及高压测试 OK。

6. Reliability Requirements/可靠性要求

6.1. Burn-in/老化

The power supply shall be burn-in for 2 hours under nominal input and 70%~80% load at ambient temperature of 40°C.

电源在额定输入和 70%~80%负载下, 在 40°C 环境温度下老化 2 小时。

6.2. MTBF Qualification/平均间隔故障时间估算

The MTBF of power supply shall be over than 50,000 Hours @ 25°C 100% Load .

平均间隔故障时间: 在 25°C, 额定输入与 100%负载条件下, 至少工作 50,000 小时。

MTBF calculation done according Bellcore SR-332.

MTBF 计算根据是:SR-332。

6.3. E-caps lifetime/电容寿命

The E-caps used in this PSU must be with lifetime of 3 years @ 25°C @ 230Vac/50Hz input.

在 25°C 环境下, 在 230Vac/50Hz 输入电压, 电容寿命至少达 3 年。

7. EMI/EMS Standards/EMI/EMS 标准

7.1. EMI Standards/EMI 标准

GB/T9254 GB17625.1 FCC Part15
EN55032 EN55035

7.2. EMS Standards/EMS 标准

7-2-1 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/试验标准
Air discharge/空气放电	+/-8KV	A
Contact discharge/接触放电	+/-4KV	A

7-2-2 EN 61000-4-3, radiated electromagnetic field susceptibility(rs)/辐射骚扰场强

Test level/测试条件	Test criteria/试验标准
3V/m (r.m.s)	A
80-1000MHz,80%AM(1KHz) sine-wave	

7-2-3 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/试验标准
AC-input/交流输入	1KV	A
AC-input/交流输入	2KV	B

7-2-4 EN 61000-4-5, surge capability requirement/浪涌抗扰度要求

Surge voltage/雷击电压	Test criteria/试验标准
Common mode/共模 +/-2KV	A
Differential mode/差模 +/-1KV	

7-2-5 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/试验标准
3V	A
0.15-80 MHz,80%AM(1KHz)	

7-2-6 Assessment criteria /评估标准

Acceptance criteria 可接受标准	Performance 性能
A	Agreed operational behavior within the specified limits 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. 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. 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

8. Safety Standards/安规标准

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

Primary to Secondary: 3000Vac /10mA max. / 60S (when safety testing).

初级对次级: 3000Vac / 10mA max. / 60 秒 (安规试验) .

Primary to Secondary: 3300Vac /5mA max. / 3S (when production).

初级对次级: 3300Vac / 5mA max. /3S(生产作业).

8.2. Leakage Current/漏电流

0.25Ma max. at 264Vac / 60Hz.

8.3. Insulation Resistance/绝缘阻抗

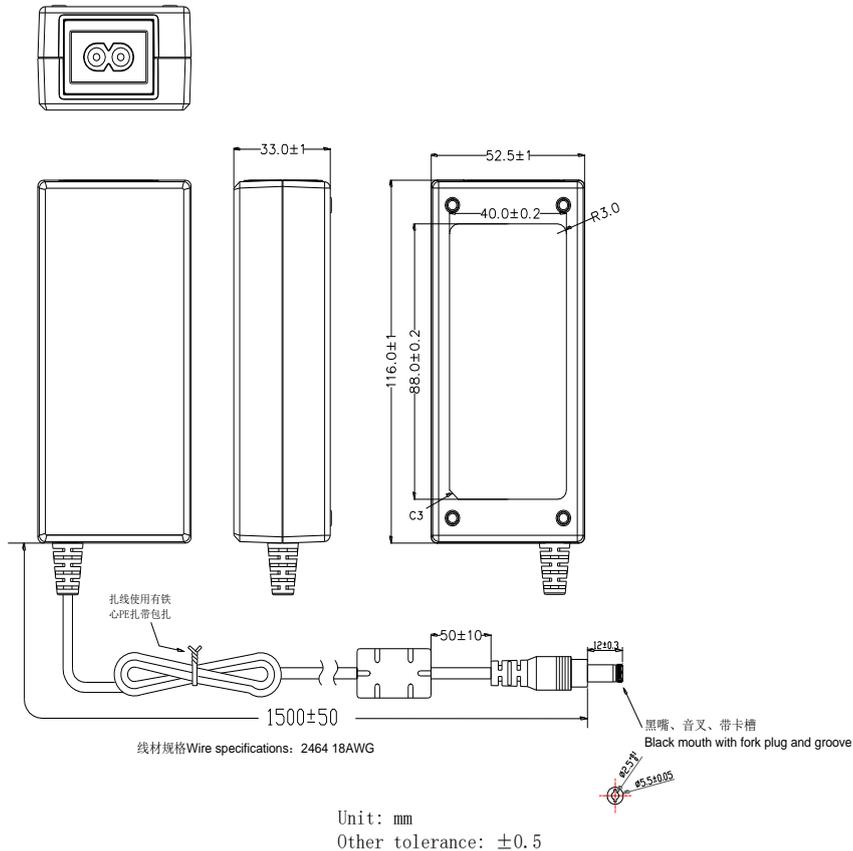
50MΩ min. at primary to secondary add 500Vdc test voltage.

在初级与次级之间加载测试电压 500V 测试, 绝缘阻抗最小 50MΩ.

8.4. 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	APPROVAL	
CE	Europe	EN62368-1	APPROVAL	
UL	USA	UL62368-1	APPROVAL	

9. Mechanical Outline Drawing/外观示意图



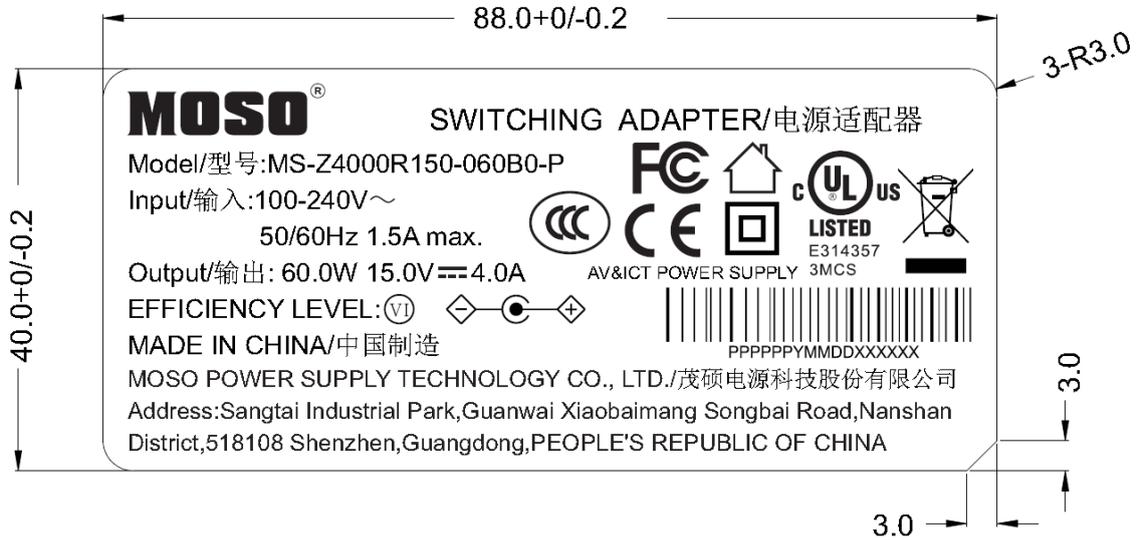
外壳材质: ■PC 耐温: 120°C

□PC+ABS 耐温: 95°C

备注: 1)PC 材质符合球压测试要求;

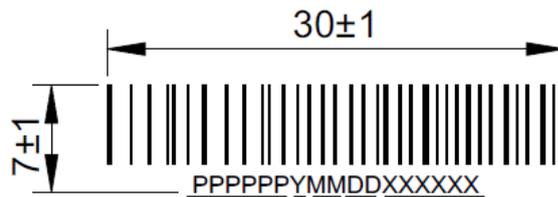
2)外壳与线材为黑色.

10. I/O Marking Drawing/铭牌示意图



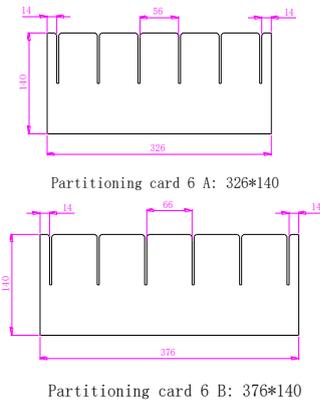
Remark:

1. Above label is laser engraved.
2. The dimension of double insulation mark can NOT less than 5mm.
3. The dimension of garbage bin mark can NOT less than 7mm.
4. The dimension of CE mark can NOT less than 5mm.



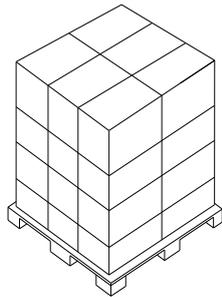
- product code(产品编码:实际S编码后六位, 如SC354-P0, 取C354P0)
- producing year(产品实际生产年份,年份最后一位, 如2023年, 取3)
- producing month(产品实际生产月份, 如11月, 取11)
- producing date(产品实际生产日期, 如12日, 取12)
- product listing number(产品序列号, 000001-999999)

11. Package Drawing/包装示意图

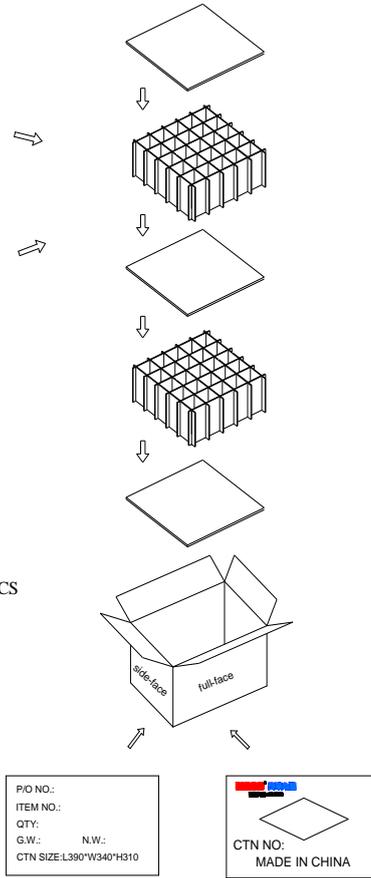


Packing Instruction:

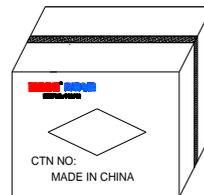
- 一、the product put in the PE bag , then the packing product put in the partitioning card groove, 25PCS/floor, 2 floors in all, 50PCS/box
such as: 25pcs/floor*2floor=50PCS/box
- 二、the usage of the packing materials:
 - 1、the usage of the partitioning card 376*326*140: 2PCS
 - 2、the usage of the PE bag 250*120: 50PCS
 - 3、the usage of the flat 376*326: 3PCS
 - 4、carton box 390*340*310: 1PCS
- 三、Pallet stacke instruction:
 - 1、Pallet size is:L1200*W800*H135mm
 - 2、per floor set 6pcs
 - 3、stacke per 4floor*6pcs carton total 24 pcs carton



The pallet stack drawing



CARTON BOX: 390L*340W*310H

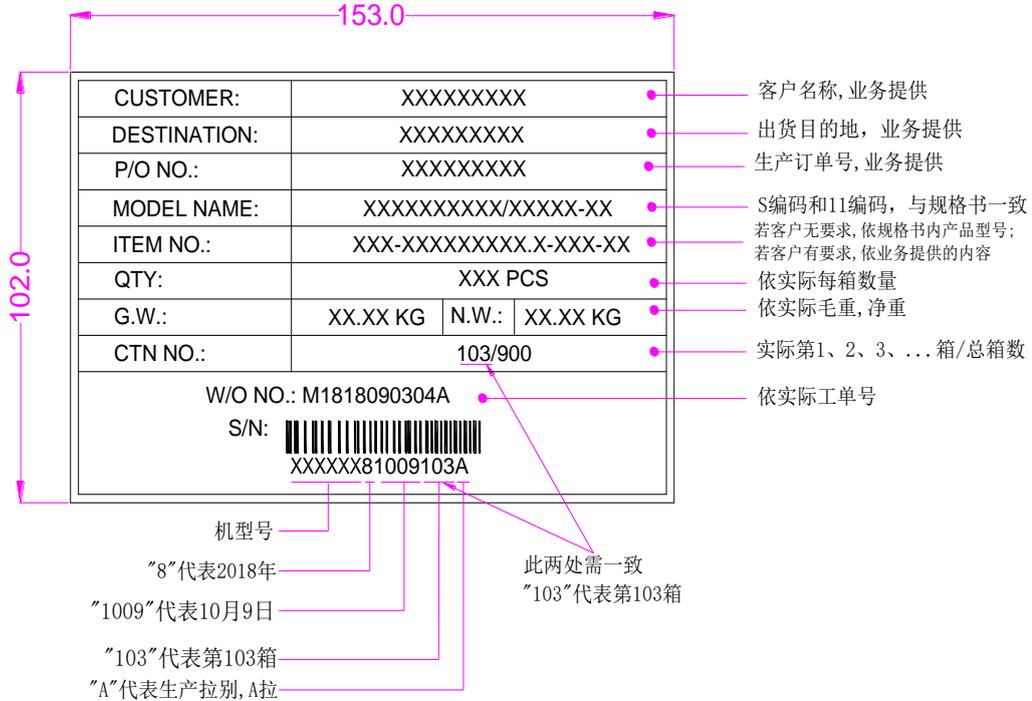


The product will be packed in the carton box and the box will be seled by the sticker

- PE 袋包装要求: PE 袋不用胶带封口;
 PE 袋用胶带封口;
 其它要求;

备注:若客户未进行选择 PE 袋包装要求或备注时,
 我司默认采用 PE 袋不用胶带封口包装方式.

Carton label



技术要求:

1. 材质: 80P铜版纸 (来料为空白标签)
2. 颜色: 白底黑字, 公司内部打印
3. 背附胶, 粘贴在纸箱上后, 无翘边等不良;
4. 符合ROHS标准及茂硕环保要求
5. 使用空白料号3230200011