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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-T2500R120-030N0-N

PRODUCT NO./产品编号： SCXXX-N0/XXXXXX

SAMPLE DATE/送样日期： 2021-11-02

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，
盖章后请回传一份客户承认书给我司.

ADD: MOSO Industrial Park, Nanshan District, Shenzhen, Guangdong 518108, P. R. China
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拟　制：	安规工程师：	项目工程师：	批　准：

MOSO® 茂硕电源
股票代码：002660

茂硕电源科技股份有限公司
MOSO POWER SUPPLY TECHNOLOGY CO.,LTD

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E. C. LIST/变更履历表

Rev. 版本	Description of Change/变更内容描述		Changed Date/日期	ECN No.
	Before/变更前	After/变更后		
A1	Original Release（初次发行）	---	2021-11-02	---

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1. SCOPE/简述

The document details the electrical, mechanical and environmental specifications of a SMPS, the power supply provide 30W continuous output power.

资料详细描述了一款 30W 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. **Without red/yellow phosphorus**.

此款电源符合 RoHS 要求. 无红/黄磷.

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

1.2Amax. @ 100-240Vac input & Full load.

输入电压 100-240Vac 满载时，输入电流不超过 1.2A。

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

100Amax. @ 264Vac input

输入电压 264Vac 时，浪涌电流不超过 100A。

2.4. Averaged Efficiency/平均效率

86.95% min. @115V/60Hz,230V/50Hz input (@25%, 50%, 75% and 100% of max load).

输入电压 115V/60Hz,230V/50Hz 时，25%、50%、75%和 100%载时的平均效率不低于 86.95%.

2.5. Energy Consumption /空载功耗

No load Consumption≤0.1W(115Vac/60Hz,230Vac/50Hz).

输入电压 115Vac/60Hz,230Vac/50Hz 时,空载功耗均小于 0.1W。

3. Output Characteristics/输出特性

3.1. 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	Max. Load	输出电压范围	纹波与噪声	备 注
+12.0V	0.0A	2.5A	11.4V-12.6V	240mVp-p	100-240Vac

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)。

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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 线性调整率	Load Regulation 负载调整率	Remark 备 注
Rate	Min. Load	Max. Load			
+12.0V	0.0A	2.5A	±3%	±5%	

3.3. Turn - on Delay Time/开机延迟时间

3S max. @ 100-240Vac input & Full load

输入电压 **100-240Vac** 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. @ Full load &115Vac/60Hz input turn off at the 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。

20mS min. @ Full load &230Vac/50Hz input turn off at the worst case.

输入电压 **230Vac/50Hz** 满载时，关机时间最差情况不小于 **20** 毫秒。

3.5. Rise Time/上升时间

30mS max. @ Rated load

额定负载时，上升时间不超过 **30** 毫秒。

3.6. Fall Time/下降时间

30mS max. @ Full load

满载时，下降时间不超过 **30** 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 11.4-12.6V for load step from 20% to 80%, R/S: 0.8A/uS, Frequency: 100Hz duration and 8mS at 80%.

输出电压 **11.4-12.6V** 时，负载从 **20%** 到 **80%**，斜率 **0.8A/uS**，频率：在 **80%**负载 **100Hz** 持续 **8 mS.**

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: 5A＞I＞3A. (100-240Vac)

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 Adapter should be protected against continuous short cut on the DC output. No damage to PSU during short; unit should turn back to normal operation once 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

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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

-40℃ to +55℃

10%RH to 95%RH

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

-40℃ to +55℃

5%RH to 95%RH non-condensing @ Sea level shall be low 5,000 meters /海拔 5,000 米.

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 Test/跌落

Height: 1m; the product should be fell off on the hardwood with the thickness of 20mm, and the hardwood should be put on the base of the cement or on the ground without flexibility. Apply one times on all surfaces, total 6 times. The electric performance and Hi-Pot test must be OK after the drop tests.

跌落高度:1 米, 并跌落到厚度为 20mm 的硬木上,且硬木应放在水泥基座或等同的无弹性地面上,6 个面, 每面各 1 次, 在跌落后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 normal input and 80% rated load at 45℃±5℃. the electric performance and Hi-Pot test must be OK.

产品至少要在 45℃±5℃的环境及 80%额定负载条件下煲机 2 小时 ，电气性能及高压测试 OK.

6.2. MTBF Qualification/平均间隔故障时间估算

The MTBF of power supply shall be over than 500,000 Hours @ 25℃ 100%Load .

平均间隔故障时间: 在 25℃，额定输入与 100%负载条件下，至少工作 500,000 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 5 years at 25℃of 100% Load@100Vac/60Hz、240Vac/50Hz Input.

在 25℃环境下，在满载及 100Vac/60Hz&240Vac/50Hz 输入条件下，电容寿命达 5 年。

* Standard: Life Time=Lr *2 $^{(To-Tx)/10}$ * 2 $^{(\triangle To-\triangle T)/5}$

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$(\triangle To-\triangle T)/5=1-[Ia/(Is*Tf*Ff)]^2$

Note-3 CE Capacitor Life time ΔTo: Self Heat Coefficient (85 ℃ =10, 105℃ = 5)

Lr : Capacitor Life Spec Ia : Measured Ripple Current

T ○: Capacitor Temp Spec Is : Ripple Current spec

Tx : Capacitor case Temp Ff : Frequency Factor

ΔT : Capacitor Self Heat Tf : Temperature Factor

7. EMI/EMS Standards/EMI/EMS 标准

7.1. EMI Standards/EMI 标准

FCC Part15 Class B

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	judgment criteria/评定标准
Air discharge/空气放电	+/-15KV	A
Contact discharge/接触放电	+/-8KV	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	judgment criteria/评定标准
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	judgment criteria/评定标准
AC-input/交流输入	1KV	A
AC-input/交流输入	2KV	B

7-2-4 K.21,surge capability requirement/浪涌抗扰度要求

Surge voltage/雷击电压	judgment criteria/评定标准
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	judgment criteria/评定标准
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

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	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
UL	USA	UL62368-1	Meet	

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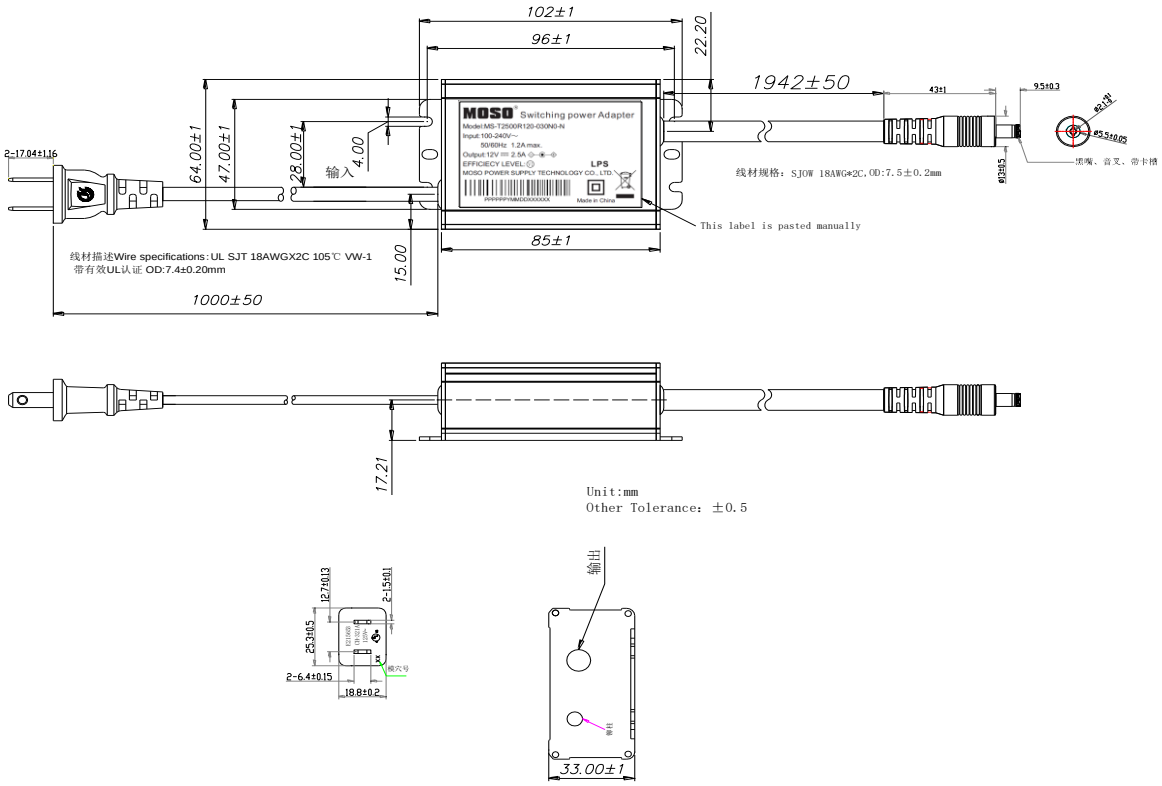
9. Mechanical Outline Drawing/外观示意图



备注： 1)X6-26W 型材外壳，外壳银灰色；
2)线材为黑色。

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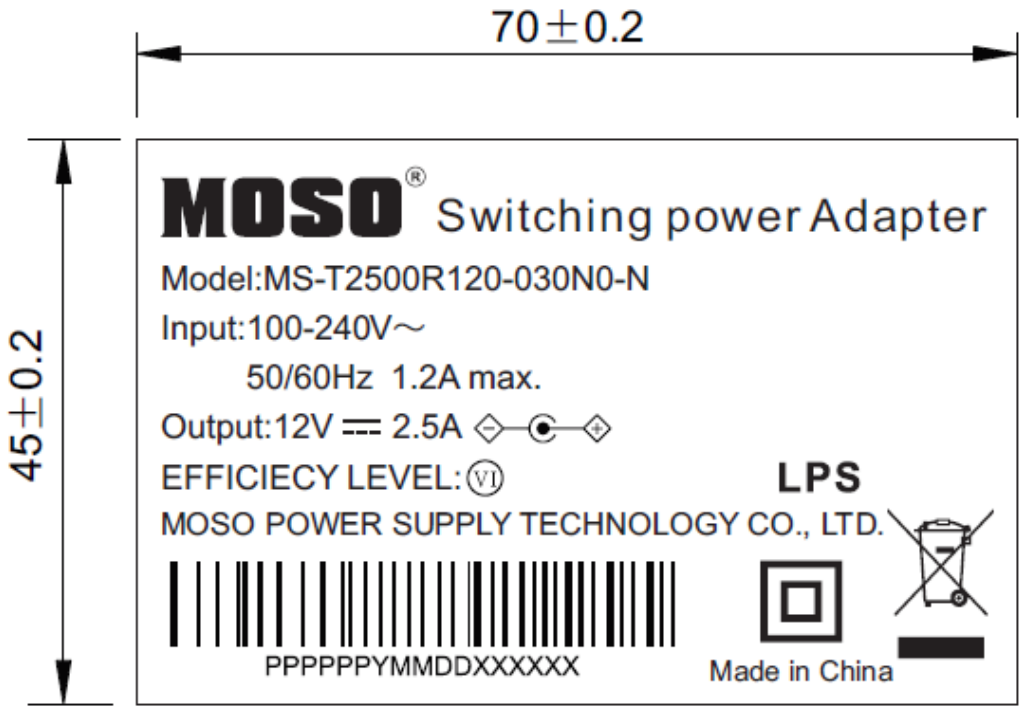
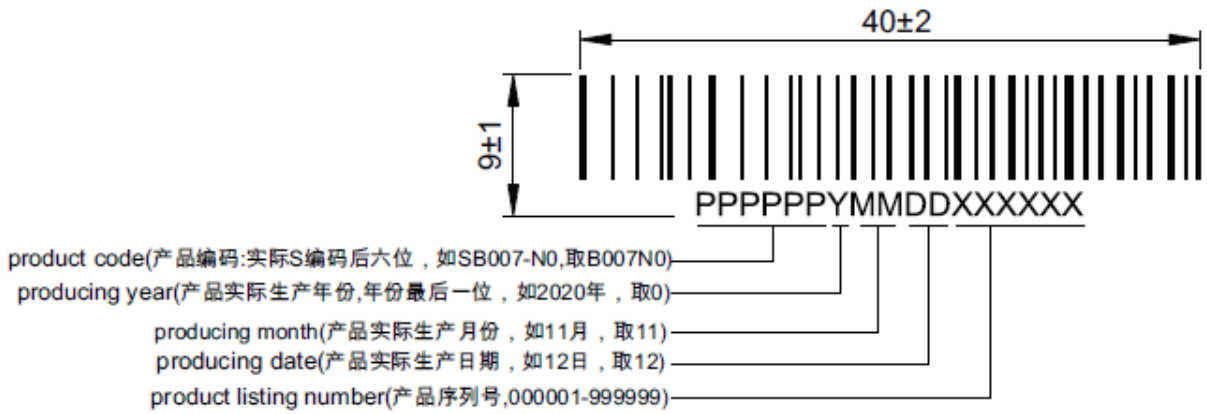
10. I/O Marking Drawing/铭牌示意图





条码格式：CODE 128

备注:
1、50#PET+光膜(条码膜内打印)，白底黑字;
2、垃圾桶标识尺寸高度不小于7mm
3、符合RoHS,REACH及茂硕环保要求
5、背胶耐温90℃,96h内不翘角，不脱落，不起泡.
6、酒精擦拭和清水各擦15秒，用100克的砝码包棉布擦，字体清晰可见，无其他不良(如卷边、翘角等)

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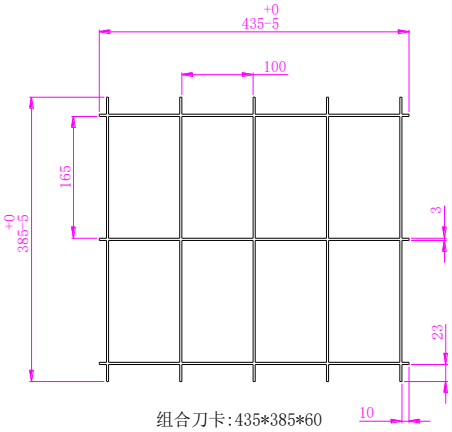
11. Package Drawing/包装示意图



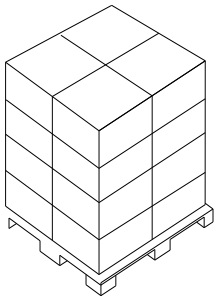
组合刀卡:435*385*60

包装说明：

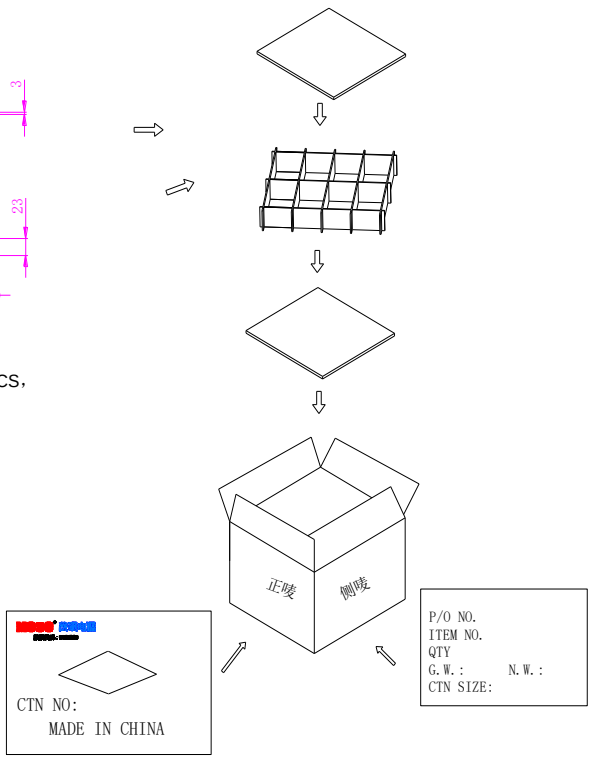
一、将产品每PCS装入PE袋中包好，
再将包装的产品放入刀卡槽中，每层装8PCS，
共装5层，每箱装40PCS
即： 8pcs/层*5层=40PCS/箱

二、包装材料使用说明为：
1、组合刀卡435*385用量：5PCS
2、PE袋250*175MM用量：40PCS
3、平卡435*375用量:6PCS
4、纸箱450*390*335：1PCS

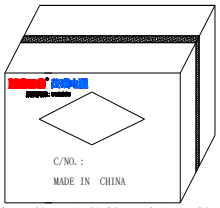
三、栈板堆放说明为：
1、栈板尺寸为：L1200*W950*H135mm
2、每层放2行*2列=4箱
3、竖直堆放4层*4箱共16箱



栈板堆放示意图



纸箱的外尺寸：450L*390W*335H



产品装入包装箱用胶袋封箱,位置参考图中所示.

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。