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参考规格书

SPECIFICATION FOR REFERENCE

CUSTOMER/客户: _____

CUSTOMER P.N./客户编码: _____

MODEL NO./产品型号: **P40-V1670U120-020H0-US**

PRODUCT NO./产品编码: _____

SAMPLE DATE/送样日期: _____

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.

ADD: MOSO Industrial Park, Nanshan District, Shenzhen, Guangdong 518108, P. R. China
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Prepared By 拟 制:	Safetied By 安规:	Checked By 审核:	Approved By 批准:

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/变更描述		Changed Date/变更日期	ECN No.
	Before	After		
A.1	Original Release/首次发布		2024-04-28	---

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1. SCOPE/适用范围

The document detail the electrical, mechanical and environmental specifications of a Fast Charger, the Fast Charger provide 20 W continuous output power.
The Fast Charger shall meet the RoHS requirement.
本文详细介绍了一款 20W 连续输出功率的快充电源的电气、机械和环境指标。
此款快充电源应符合 RoHS 要求

1.1.Description/描述

☐ SMPS Adaptor(Wall mount) ☐ SMPS Adaptor(Desk-top)
☐ Open Frame ☐ SMPS Unit (With Case)
■ Fast charger ☐ Others

1.2.Supports fast charge protocol/支持快充协议:

PD2.0/PD3.0/PPS
QC2.0/QC3.0
SCP
FCP
AFC
DCP1.5A
APPLE 2.4A

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

0.6Amax. @ 100-240Vac input & Full load

输入电压 100-240Vac 满载时，输入电流不超过 0.6A。

2.3.Inrush Current (cold start)

There is no immediate damage or long-term impact on the reliability of the charger.

对充电器的可靠性没有立即损坏或长期影响。

2.4.Averaged Efficiency /平均效率

5V3.00A: 81.39% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)
9V2.22A:85.47% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)
12V1.67A:85.48% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)

2.5.Energy Consumption /空载功耗

Input Voltage115Vac 60Hz/230Vac 50Hz , Energy Consumption≤0.075W.

输入电压 115Vac/60Hz, 230Vac/50Hz 时,空载功耗均小于 0.075W。

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2.6.Protection /保护

The supply shall be subjected to the following tests while under maximum rated load. No component damage is permitted.

- Brownout: 100 Vac 50 Hz to 0 Vac @ 50 Hz in 1 volt decrements in 30s.
- Brownout recovery: 0 vac 50 Hz to 100 Vac @ 50 Hz in 1 volt increments in 30s.

After completion of the test, power will be reapplied within the rated line voltage ranges and normal operation is expected.

在最大额定负载下，电源应进行以下测试。 不允许组件损坏。

欠压：100 Vac 50 Hz 至 0 Vac @ 50 Hz，以 1 伏为单位在 30s 内递减。

掉电恢复：30 秒钟内以 1 伏为增量从 0 Vac 50 Hz 转换为 100 Vac @ 50 Hz。

测试完成后，将在额定线路电压范围内重新通电，并正常运行。

3. Output Characteristics/输出特性

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

Output Rate 输出等级	Rated Load/额定负载		Output voltage Range 输出电压范围	R+N 纹波与噪声	Remark 备注
	Min. Load 最小负载	Max. Load 最大负载			
5.00V	0.0A	3.00A	4.75-5.25V	200mVp-p	
9.00V	0.0A	2.22A	8.55-9.45V	200mVp-p	
12.00V	0.0A	1.67A	11.40-12.60V	200mVp-p	

Ripple & Noise: Measurement is done by 20MHz bandwidth oscilloscope and the output paralleled a 0.1uF ceramic capacitor and a 10uF electrolysis 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 Rate 输出等级	Load Condition /额定负载		Line Regulation 线性调整率	Load Regulation 负载调整率	Remark 备注
	Min. Load 最小负载	Max. Load 最大负载			
5.00V	0.0A	3.00A	±3%	±5%	
9.00V	0.0A	2.22A	±3%	±5%	
12.00V	0.0A	1.67A	±3%	±5%	

3.3.Turn - on Delay Time/开机延迟时间

3S max. @ 100Vac to 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/保持时间

5mS min. @ Full load &115Vac/60Hz input turn off at worst case

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

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输入电压 **115Vac/60Hz** 满载时，关机时间最差情况不小于 **5** 毫秒。

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.Dynamic load change response/动态负载变化响应

The output voltage shall stay within +/-10% of the nominal output voltage while the output load is stepped from 20% to 80% of the rated load. The nominal voltage must be recover in 10ms after overshoot.

输出电压应保持在额定输出电压的**+/- 10**%之内，而输出负载应从额定负载的 **20**%升至 **80**%。 过冲后，标准电压必须在 **10ms** 内恢复。

4. Protection Requirements/保护要求

4.1. Over Current Protection /过流保护

Output Rate 输出等级	Rated Load/额定负载		Over Voltage 过电压	Input Voltage 输入电压	Remark 备注
	Min. Load 最小负载	Max. Load 最大负载			
5.00V	0.0A	3.00A	3.3-4.2A	100-240VAC	
9.00V	0.0A	2.22A	2.4-3.9A	100-240VAC	
12.00V	0.0A	1.67A	1.8-3.9A	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.

当过流电流时,输出将进入打嗝模式,当过流情况解除后,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，输入功率应减小，电源应无损坏，并且当故障条件消除后，电源应可自动恢复。

4.3.Over Voltage Protection/过压保护

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Output Rate 输出等级	Rated Load/额定负载		Over Voltage 过电压	Input Voltage 输入电压	Remark 备注
	Min. Load 最小负载	Max. Load 最大负载			
5.00V	0.0A	3.0A	≥5.5V	100-240VAC	
9.00V	0.0A	2.22A	≥9.5V	100-240VAC	
12.00V	0.0A	1.67A	≥12.5V	100-240VAC	

5. Environment Requirements/环境要求

5.1.Operating Temperature and Relative Humidity/工作温度和相对湿度

-10℃ to +25℃

35%RH to 85%RH

温度-10℃ to +25℃，湿度 35% to 85%

5.2.Storage Temperature and Relative Humidity /储存温度和相对湿度

-20℃ to +80℃

5%RH to 95%RH

温度-20℃ to +80℃，湿度 5% to 95%

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, 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 4 Hours under normal input and 100% rated load at 25℃±5℃。

25℃±5℃，电源在正常输入电压和 100%额定负载条件下老化 4 小时后，电气性能及高压测试合格.

6.2.MTBF Qualification /平均间隔故障时间估算

The MTBF shall be at least 50,000hours at 25℃, Full load and nominal input condition.

产品在额定电压 100-240V 输入电压，输出 100%负载，常温 25 度环境下，平均无故障时间达到 5 千小时以上。

6.3.E-cap Lifetime/电解电容寿命

The life estimation of capacitor must be over 5,000hours at 25°, 80％ load and 100-240Vac input.

在 25℃,80%负载，输入 100-240Vac 条件下,电容寿命达 5000H.

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*Standard/标准:

Life Time/寿命=$Lr*2^{(To-Tx)/10}*_2{}^{(\triangle To-\triangle T)/5}$

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

ΔTo: Self Heat Coefficient /自热系数(85 ℃ =10, 105℃ = 5)

Lr : Capacitor Life Spec/电容寿命规格　　Ia : Measured Ripple Current/测量纹波电流

T ○: Capacitor Temp Spec/电容温度规格　　Is : Ripple Current spec/纹波电流规格

Tx : Capacitor case Temp/电容外壳温度　　Ff : Frequency Factor/频率系数

7. EMI/EMS Standards / EMI/EMS 标准

7.1.EMI Standards/ EMI 标准

EN55032

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 测试标准
Air discharge/空气放电	+/-8KV	B
Contact discharge/接触放电	+/-4KV	B

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/测试标准
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/测试标准
AC-input/交流输入	0.5KV	B
AC-input/交流输入	1KV	B

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

Surge voltage/浪涌电压	Test criteria /测试标准
Common mode 共模 +/-2KV	B
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 Test criteria /测试标准
3V	A
0.15-80 MHz,80%AM(1KHz)	

7-2-6 Assessment criteria /评估标准

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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, 干拢消除后, 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 / 60 second

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

Primary to Secondary: 3300Vac / 5mA Max /3S

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

100MΩ min. at primary to secondary add 500Vdc test voltage

在初级与次级间加 500Vdc/1min 进行测试，绝缘阻抗：正常大气下 100MΩ，湿热条件下 100 MΩ.

8.4.Regulatory Standards

Type	Country	Standard	Statue	Mark

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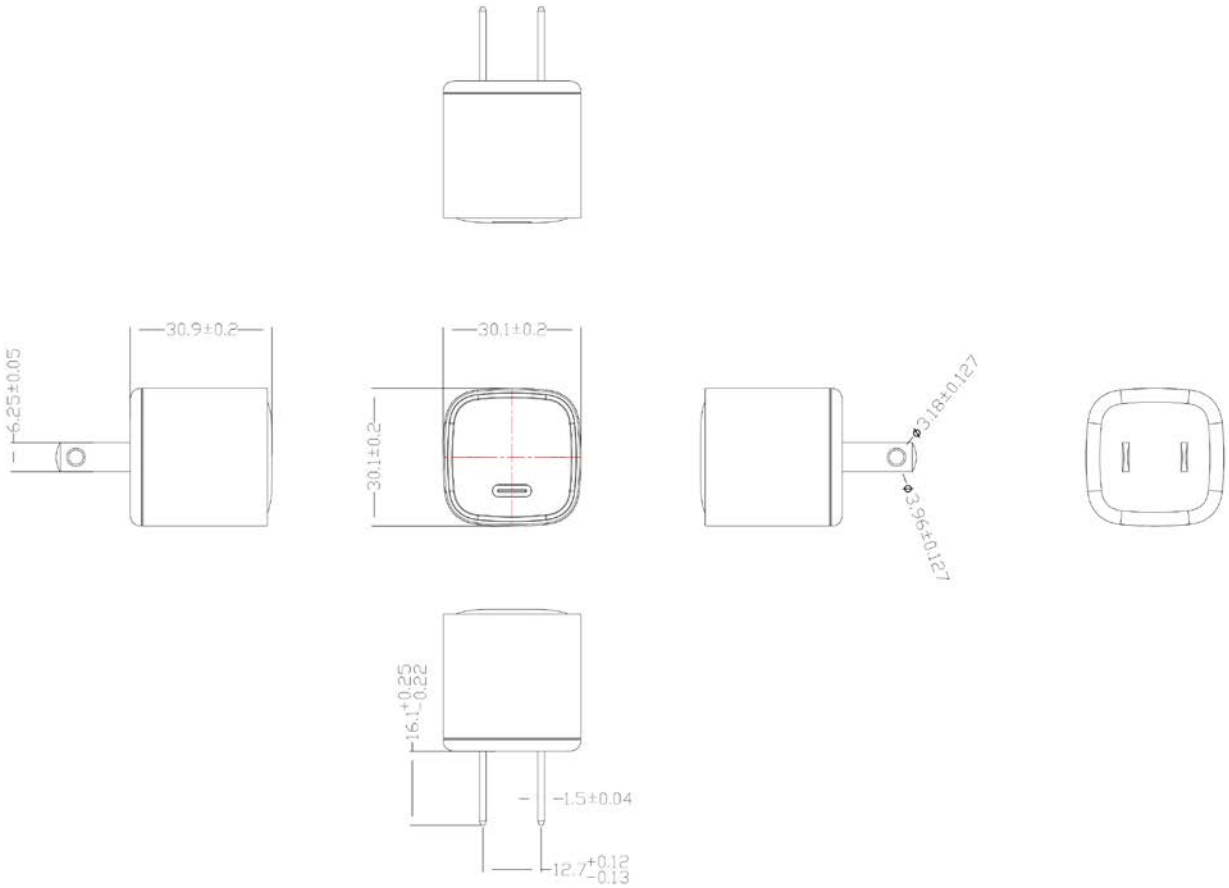
9. Mechanical Outline Drawing



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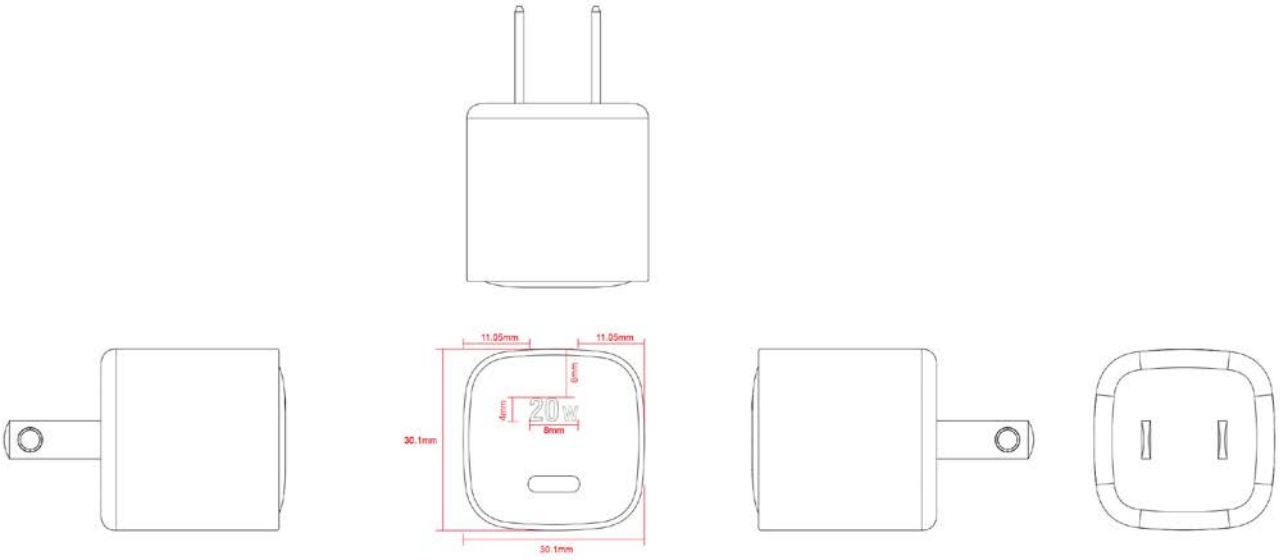
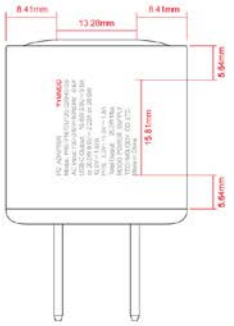
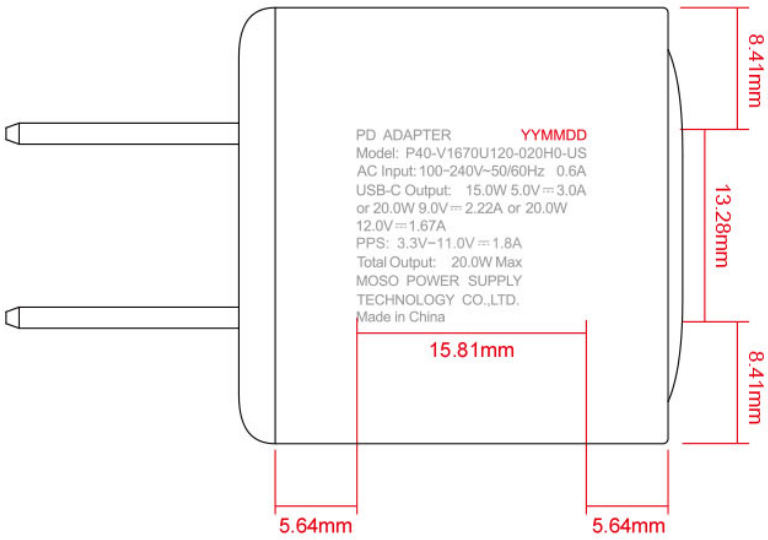
10. I/O Marking Drawing





YYMMDD说明:
Y Y: Producing year生产年份后两位;
MM: Producing month生产月份;
DD : Producing date生产日期。
字体：Arial

工艺：镭雕
20W美规铭牌
公差：±0.5mm



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11. Package Drawing