E. C. LIST/变更履历表

Rev. 版本	Description of Change/变更内容描述 Before/变更前	 After/变更后	Changed Date/日期	ECN No.
1	Original Release	---		---

HKC01809020-022

Contents/目录

1. Electrical Specification/电气特性

1.1.SCOPE/概述

The document details the electrical, mechanical and environmental specifications of a SMPS, the power supply provides 18 W continuous output power.

资料详细描述了一款 18W(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** requirements.

此款电源符合 RoHS 要求.

Description/描述：

- ■ 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)/带铁壳型
- □ Others/其他

1.2.Input Characteristics/输入特性

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

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

输入电压范围：从 90Vac 到 264Vac，单相输入.

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

1.2.2. Input DC Current/DC 输入电流

0.5Amax. @ 100Vac input & Full load/在 100Vac 输入和满载条件下最大 0.5

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

80Amax. @ 25℃,264Vac input/在 25℃环境，264Vac 输入条件下最大 80A

1.2.4. Average Efficiency /平均效率

When 5V output voltage/当 5V 输出电压时：

While input 115Vac and 230Vac, the average efficiency is more than 81.39%.The test point is at 25%, 50%, 75% and 100% of max load respectively (at Type-C end & after working 15 min).

在输入 115Vac 和 230Vac 条件下，平均效率不小于 81.39%。测试点分别是最大载的 25%,50%,75%和 100%（在 Type-C 端测试 & 热机 15 分钟）。

When 9V output voltage/当 9V 输出电压时：

While input 115Vac and 230Vac, the average efficiency is more than 85%.The test point is at 25%, 50%, 75% and 100% of max load respectively (at Type-C end & after working 15 min).

在输入 115Vac 和 230Vac 条件下，平均效率不小于 85%。测试点分别是最大载的 25%,50%,75%和 100%（在 Type-C 端测试 & 热机 15 分钟）。

1.2.5. No-Load Input Power Dissipation/输入空载功率损耗

While input 115Vac ~ 230Vac and the output (5V)is no load, the input power loss must be less than 0.1W.

在输入 115Vac~230Vac，5V 输出空载功耗小于 0.1W.

1.3.Output Characteristics/输出特性

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

Output	Rated Load/额定负载		Peak	Output Range	R+N	Remark
Rating	Min. Load	Max. Load	Load	输出电压范围(线端)	纹波与噪声	备 注
+5.0V	0A	3A	/	4.75V~5.4V	150mVp-p	
+9.0V	0A	2A	/	8.55V~9.45V	150mVp-p	

Ripple & Noise: Tested by a oscilloscope using 20MHz bandwidth and the output is paralleled a 0.1uF ceramic capacitor and a 10uF electrolysis capacitor. (Under the input Voltage 100~240Vac)

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(输入电压 100~240Vac)

1.3.2.Turn - on Delay Time/开机延迟时间

3S max. @ 100Vac input & 5V3A/在 100Vac 输入和 5V3A 输出条件下最大 3S.

1.3.3.Hold-up Time/关机维持时间

7mS min. @ Full load &115Vac/60Hz input turn off at worst case

在 115Vac 输入,满载同时最差情况下关机，最小 7mS

1.3.4.Rise Time/上升时间

30mS max. @ 5V3A/在 5V3A 条件下最大 30mS.

1.3.5.Output Overshoot / Undershoot/输出过冲/欠冲

10% max. When the power on or off/当电源开，关机时最大 10%.

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

When 5V output voltage/输出电压为 5V 时：

Output voltage is within 4.2-5.8V while the load step is from 25% to 50% and from 50% to 75% of max load, R/S: 0.25A/uS, frequency: 1KHz and 0.5mS duration at 50% of max load.

输出电压在 4.2-5.8V 之间，负载变化：从最大载的 25%到 50%和 50%到 75%，斜率：0.25A/uS，频率：1KHz，50%负载持续时间为 0.5mS。

When 9V output voltage/输出电压为 9V 时：

Output voltage is within 8.1-9.9V while the load step is from 25% to 50% and from 50% to 75% of max load, R/S: 0.25A/uS, frequency: 1KHz and 0.5mS duration at 90% of max load.

输出电压在 8.1-9.9V 之间，负载变化：从最大载的 25%到 75%和 50%到 75%，斜率：0.25A/uS，频率：1KHz,，50%负载持续时间为 0.5mS。

1.4.Protection Requirements/保护要求

1.4.1.Over Current Protection/过流保护

When 5V output,OCP Point Limited: 3.0A~3.6A/输出电压为 5V 时，保护点限制: 3.0A~3.6A.
When 9V output,OCP Point Limited: 2.0A~2.4A/输出电压为 9V 时，保护点限制: 2.0A~2.4A
The power supply must shut-down in an over current condition and automatically return to normal operating condition once the fault condition has been removed.
当过电流时,电源关断,当过流情况解除后,产品将会自动恢复正常.

1.4.2.Short Circuit Protection/短路保护

The power supply must shut-down in the event of a short circuit and automatically return to normal operating condition once the fault condition has been removed.
当输出发生短路时,电源关断,当短路情况解除后,产品将会自动恢复正常。

1.4.3.Over Voltage Protection/过压保护

When 5V&9V output,OVP point limit:<150%Vo/输出电压为 5V&9V 时，保护点限制：<150%Vo
The power supply shall be shut-down, when the output is over voltage, and the power supply shall not be damaged.
当输出过压时,产品保护且不会损伤

2. Environment Requirements/环境要求

2.1.Operating Temperature and Relative Humidity/操作温度和湿度要求

0℃ to +40℃
5%RH to 95%RH
Sea level shall below 5,000 meter/在海拔低于 5000 米的条件下，能正常工作。

2.2.Storage Temperature and Relative Humidity/存储温度和湿度要求

-20℃ to +60℃
5%RH to 95%RH （non-condensing） @ Sea level shall below 5,000 meter
在海拔低于 5,000 米的条件下，低温存储下限为-20℃（无结冰环境）；高温存储上限为+60℃,相对湿度为 5%RH to 95%RH。

3. Reliability Requirements/可靠性要求

3.1. Noise Requirement/噪声要求

The whole input voltage and load, the noise value should less than 30dB, the distance is 20CM.
在全电压和全负载范围内，在标准静音房测试小于 30dB，距离为 20CM。

3.2. MTBF Qualification/平均间隔故障时间估算

The MTBF shall be at least 50,000 hours at 25℃, Full load and normal input condition
平均间隔故障时间: 至少 50,000 小时,25℃环境及额定输入与满载条件下

3.3. Environmental reliability/环境可靠性

3.3.1. Low temperature storage/低温存储

Storage the power supply at -40℃ 24 hours, after 2 hours recovery, the power supply

can turn on normally and the output voltage is in the rated range.

在低温-40℃环境下存储 24 小时，恢复 2 小时后，电源能正常开机，输出电压范围在额定范围内。

3.3.2. High temperature storage/高温存储

Storage the power supply at 70℃ 24 hours, after 2 hours recovery, the power supply can turn on normally and the output voltage is in the rated range.

在高温 70℃环境下存储 24 小时，恢复 2 小时后，电源能正常开机，输出电压范围在额定范围内。

3.3.3. Low temperature operating/低温工作

Ambient temperature: -10℃, input voltage: 90Vac/264Vac & full load, in two input voltage for each work 12hours; No abnormality in electric and mechanical characteristic after 2 hours recovery at the room temperature.

环境温度为-10℃，输入电压为 90Vac 和 264Vac。工作负载为满载。在二种电压应力下分别工作 12 小时。测试结束后在常温下恢复 2 小时，电气性能和机械性能无异常。

3.3.4.High temperature operating/高温工作

Ambient temperature: 40℃, input voltage: 90Vac/264Vac & full load, in two input voltage for each work 12 hours; No abnormality in electric and mechanical characteristic after 2 hours recovery at the room temperature.

将环境温度设定为 40℃，输入电压分别为 90Vac 和 264Vac，工作负载为满载，在二种电应力下分别工作 12 小时；测试结束后在常温下恢复 2 小时，电气性能和机械性能无异常。

3.3.5.High and low temperature cycle work/高低温循环工作

Ambient temperature: -10~40℃, high-low temperature each settle 3 hours, temperature change: 1℃/min, aggregately cycle 2.

环境温度：-10~40℃，高低温各停留 3 小时，温度改变时间 1℃/min，共 2 个循环。

3.3.6. Burn-in/烘烤

Ambient temperature:40℃, input voltage:115Vac/230Vac&full load, work 4-24 hours.

环境温度：40℃，输入电压：15Vac/230Vac 下满载工作 4-24 小时。

3.4. Mechanical reliability/机械可靠性

3.4.1. Load test/载重测试

70Kgf @ 2S. /对外壳施加 70Kgf，保持 2S.

3.4.2.Working vibration test/工作振动测试

5 to 500Hz sweep at a shift gears for 20 minute for each of the perpendicular axes X, Y, Z

thereinto :acceleration frequency for 10 m2/s3 at 5~10HZ; acceleration frequency for 3m2/s3 at 10~200HZ; acceleration frequency for 1 m2/s3 at 200~500HZ

扫描频率: 5 to 500Hz 随机振动, X, Y, Z 三垂直坐标轴向各振动 20 分钟,其中: 5~10HZ 频率范围的加速度频率为 10 m2/s3，10~200HZ 频率范围的加速度频率为 3 m2/s3，200~500HZ 频率范围的加速度频率为 1m2/s3

3.4.3.Working impact test/工作冲击测试

3 Edges thrice, half sine wave, acceleration 30G, pulse breadth for 11 mS

半正弦波，加速度为 30G，脉冲宽度为 11mS，X、Y、Z 三方向，各三次

3.4.4. Plug endurance test/插拔耐久测试

5000times @ 20-30 times every minute

5000 次@20-30 次/min

3.4.5. Charger room temperature controlled drop test/常温受控跌落测试

6 Surfaces each one, Height: 100cm, on the marble plane

6 面各一次，跌落高度: 100 厘米，跌落到大理石地面上。

3.4.6. Inserting and Pulling out force test/插拔力测试

Insertion force：5N~~20N Pullout force：8N~~20N（before 1000times）

Pullout force：6N~~20N（after 1000times）

插入力：5N~~20N　拔出力：8N~~20N（1000 次循环前）拔出力：6N~~20N（1000 次循环后）

3.4.7. Label/Nameplate durability test/标示/铭牌耐久性测试

Dips in water cotton cloth to wipe 15S, then dip gasoline cotton cloth to wipe 15S.

蘸水棉布擦拭 15S，然后蘸汽油棉布擦拭 15S。

3.4.8. Salt spray test/盐雾测试

5%NaCl, 35℃, 8 hours, Dry 16 hours.

5%NaCl，35℃，8 小时，晾干 16 小时。

3.4.9. Case extrusion/外壳挤压测试

200N&10mm/min

施加 200N 的挤压力，测试速度 10mm/min。

3.5.Life time/寿命

The lifetime shall be at least 10950 hours at 40℃, 80% full load and 100Vac/240Vac input condition.

寿命至少 10950 小时，40℃工作温度环境，100Vac/240Vac 输入与 80%负载条件。

4. EMI/EMS Standards/EMI/EMS 标准

4.1.EMI Standards/EMI 标准

EN 55022
IEC 61000-3-2
IEC 61000-3-3
CISPR 22
AS/NZS CISPR 22
满足最新标准

4.2.EMS Standards/EMS 标准

The power supply shall comply with EN61000-4-2 standard.

满足 EN61000-4-2 标准。

Contact discharge/接触放电：±6KV

Air discharge/空气放电：±12KV

5. Safety Standards/安规标准

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

Primary to Secondary: 3000Vac / 3.5mA / 60second Or 4242Vdc / 3.5mA / 60second

初级对次级: 3000Vac / 3.5mA / 60 秒 或 4242Vdc / 3.5mA / 60 秒

5.2.Leakage Current/漏电流

20uA max. at 264Vac / 50Hz input/在输入 264Vac/50Hz 的条件下最大 20uA

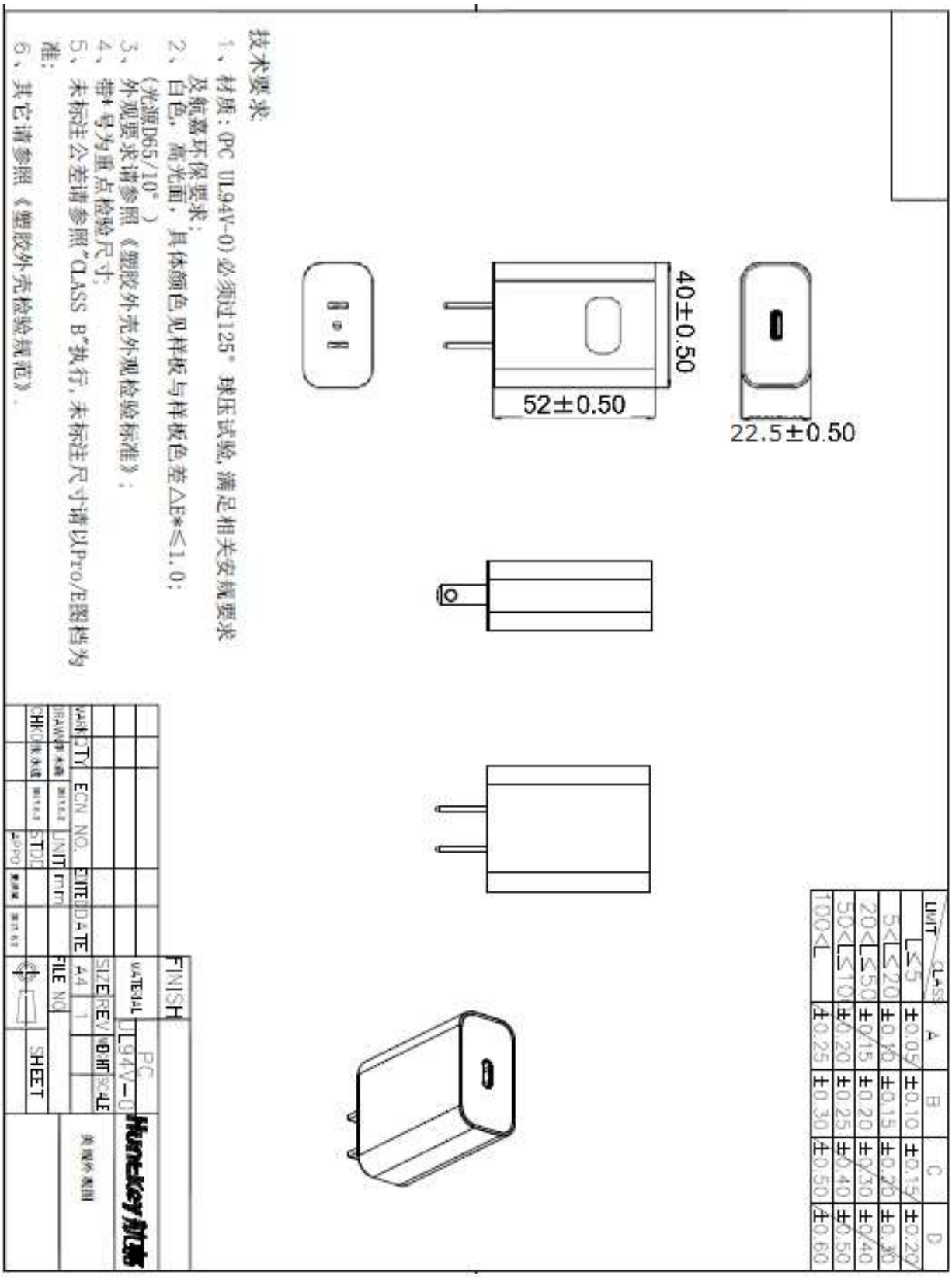
5.3. Insulation Resistance/绝缘阻抗

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

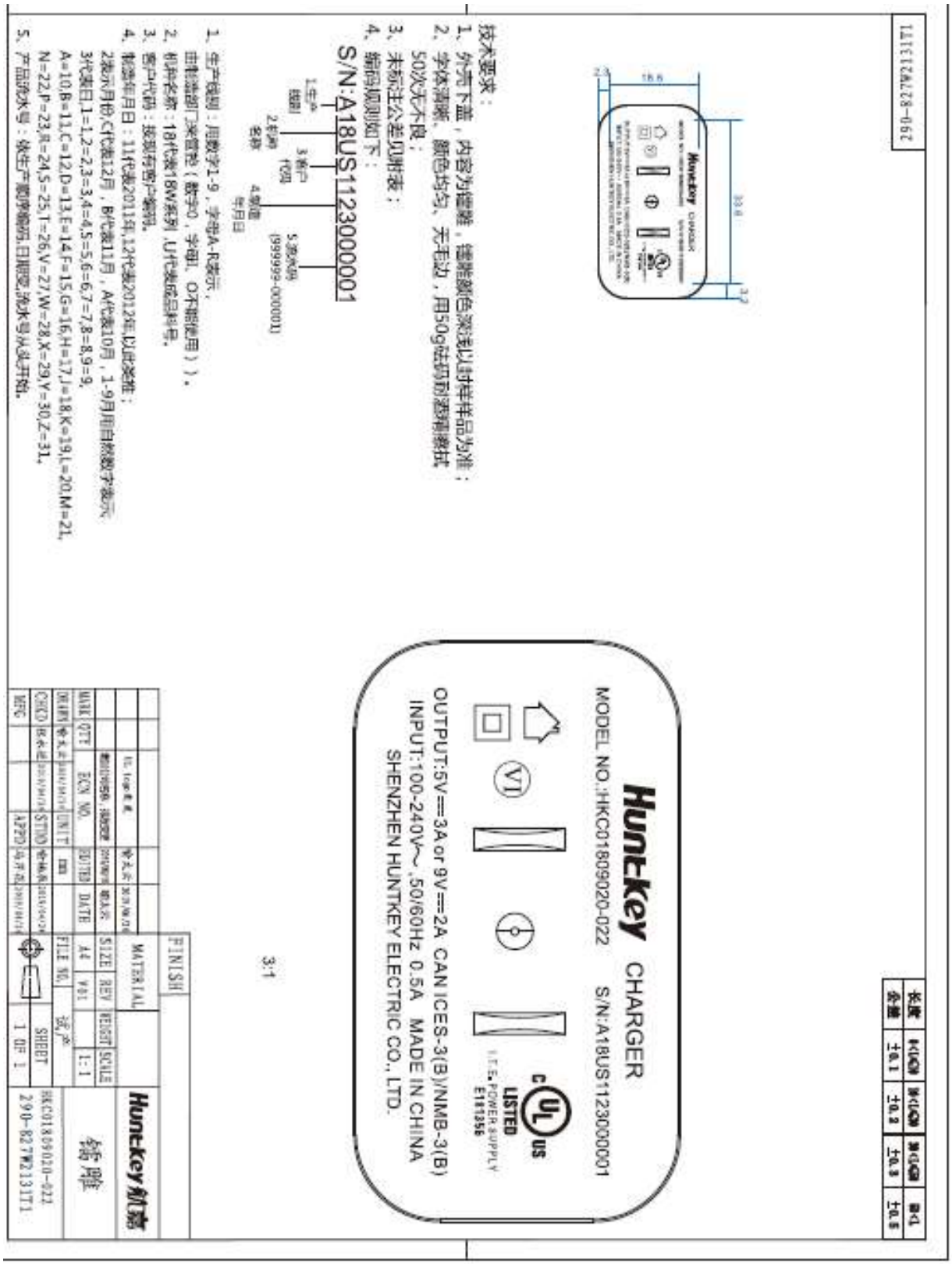
5.4.Regulatory Standards/安规标准

Type	Country	Standard		Type	Country	Standard
■UL/CUL	USA	UL62368-1		□ PSB	Singapore	IEC60950-1
□ TUV	Europe	EN60950-1		□ PSE	Japan	J60950
□ CCC	China	GB4943		□ NOM	Mexico	NOM-001
□ CE	Europe	EN60950-1		□ GOST	Russia	MEK60950

6. Mach. Outline Drawing/外观图



7. Label Drawing/标贴图



8. Package Drawing/包装示意图（净重）