

承认书

SPECIFICATION FOR APPROVAL

客户名称 (CUSTOMER): _____

客户料号 (PART NO): _____

客户品名 (DESCRIPTION): _____

送样日期 (DATA) : _____

承认签章后请回传

Please return to us one copy of "SPECIFICATION FOR APPROVAL" with your approved signatures

客户承认(CUSTOMER APPROVAL)			公司承认 (APPROVAL)		
工程师	审核	批准	工程师	审核	批准
ENGINEER	CHECKED BY	APPROVAL BY	ENGINEER	CHECKED BY	APPROVAL BY

变更履历表

Revision History

[illegible]

1. 电源概况 Power Supply Overview

本产品适用于全球 150 多个国家，功率大，可靠性高，本产品具有短路保护，过流保护等多项保护功能，DC 总输出功率 20W，USB 口智能识别充电设备，电流自动分配。TYPE-C 接口兼容 PD 和 QC 功能，手机、平板、MACBOOK 可实现快速充电。

This product is suitable for more than 150 countries in the world, with high power and high reliability. This product has many protection functions, such as short circuit protection, overcurrent protection and so on. The USB output is 20W(total). USB port intelligent identification charging equipment, automatic current distribution. The type-c interface is compatible with PD and QC functions. Mobile phones, tablets and macbooks can realize fast charging.

1.1 摘要 Description

外壳材质 Housing Material: PC

导体材质 Conductor Material: 铜 COPPER

防火等级 Fire Rating: 94V0

产品净重 Product NW: 134.0±10g

产品尺寸 Product Size: L64.3*W55.5*T54.3mm

2. 电气规格 Electrical Specification

2.1 AC 输入 AC Input

2.1.1 输入电压 Input Voltage

下表为 AC 输入电压范围，在此电压范围内，电源应正常工作并符合所有电气性能要求。

Lists the AC input operating voltage range. The power shall work normally and meet all electrical requirements throughout this range.

AC 输入电压限值 AC Input Voltage Limitations

最小值 Minimum	额定值 Nominal	最大值 Maximum
90Vac	100-240Vac	264Vac

2.1.2 输入频率 Input Frequency

列举 AC 输入频率范围，在此频率范围内，电源应正常工作并符合所有电气性能要求。

List the AC input operating frequency range. The power shall work normally and meet all electrical requirements throughout this range.

AC 输入频率限值 AC Input Frequency Limitations

最小值 Minimum	额定值 Nominal	最大值 Maximum
47Hz	50Hz/60Hz	63Hz

2.1.3 空载功耗 No load consumption

在额定电压 115/230Vac 输入时，空载功耗 $\leq 0.15W$ 。

No load power consumption $\leq 0.15W$ at rated voltage.

	DOE/ERPVI	单口输出 Single mouth output	组合输出 combinatorial output
空载功耗 No load consumption	单口输出 $\leq 49.0W$	$\leq 0.1W$	$\leq 0.3W$

2.1.4 冷机启动时间 Run-up time

在 90-264Vac 供电的条件下，满载启动的时间 $\leq 3S$ 。

Under the condition of 90-264vac power supply, the full load start time $\leq 3S$.

2.1.5 浪涌电流 Inrush Current

浪涌电流峰值在额定输入电压的0.9倍和1.1倍,冷启动(25℃)的情况下,瞬态电流 $\leq 150A$ 或 I^2t ;且在任何负载和输入条件下,不导致永久性损坏或危险。

Peak transient surge current 150A or I^2t at 0.9 times and 1.1 times the rated input voltage, cold start (25℃); and without permanent damage or danger under any load and input conditions.

2.1.6 USB 部分充电输入电流 USB charging input current

OCP 模式下，AC 输入电流 $\leq 0.6A$ 。

OCP mode, AC input current should be $\leq 0.6A$

2.1.7 AC 输入电流 AC Input Current Limiting

根据过流保护器电流参数，AC 额定输入电流 10A

According to current parameters of overcurrent protector, AC rated input current is 10A

2.2 输出规格 Output Specification

2.2.1 AC 额定输出电流 AC Output Current Limiting

		最小值 Minimum	最大值 Maximum	备注 Remark
AC 额定输出电流 AC Ouput Current Limiting		—	—	
保险丝熔断时间 Fusing time	100% *In	1000 小时 1000 Hours		输出额定电流 10A 时，保险丝熔断时间大于 1000 小时 When the rated current is 10A, the fusing time is more than 1000 hours
	160% *In	30 分钟 30min		输出额定电流 16A，保险丝最小熔断时间为 30 分钟 The output rated current 16A, and the minimum fusing time is 30 minutes
	190% *In		30 分钟 30min	输出额定电流 19A，保险丝最大熔断时间为 30 分钟 The output rated current is 19A, and the maximum fusing time is 30 minutes

2.2.2 多口输出模式 Multi-port Output

输出端口 Output Port	额定电压/额定电流 Rated voltage / rated current	单路功率 Single channel power	最大功率 Max Power
A1+C1/C2	A1+C1/C2: 共享 5.0V/3.0A	15.0W	15.0W
A1+C1+C2	A1+C1+C2: 共享 5.0V/3.0A	15.0W	15.0W

2.2.3 单口输出模式 Single Port Output

输出端口 Output Port	额定电压/额定电流 Rated voltage/Rated current	最大功率 Max Power
A1	5.0V/3.0A, 9.0V/2.0A, 12.0V/1.5A	18.0W
C1/C2	5.0V/3.0A, 9.0V/2.22A, 12.0V/1.67A	20.0W

2.2.4 输出纹波与噪声 Output Ripple and Noise

在额定输入 110V/60Hz 和 230V/50Hz 的条件下测试，测试时示波器设置为 20MHz 带宽，输出端并接一 0.1μF

瓷片电容和一 10uF 钽电解电容（低 ESR 值），测试纹波 $\leq 200\text{mVp-p}$ 。

Test under rated inputs of 110V/60Hz and 230V/50Hz, Measurements will be made with an oscilloscope set to 20MHz bandwidth limit. The outputs will be bypassed with one 0.1uF multilayer (type X7R) and one 10uF tantalum electrolytic (low ESR) capacitors, Output Ripple and Noise $\leq 200\text{mVp-p}$.

2.2.5 效率 Efficiency

效率	功率范围	单口输出	组合输出
Efficiency	power bracket	Single mouth output	combinatorial output
	单口输出	$\geq 85.48\%$	$\geq 78.57\%$
	20W		

2.2.6 输出动态负载响应 Output Dynamic Load Response

输出电压在下列表格定义的负载变化时，符合规格要求，负载变化率为 0.1Amps/uS，50Hz~10 KHz 之间。

The output voltages will remain within specified regulation limit of the nominal set voltage for changes in load as specified below under the following load steps defined below table . At a slew rate of 0.1Amps/uS between 50Hz to 10 KHz.

输出动态负载响应限值 Output dynamic load response limits

Dynamic Load 动态负载	DC Voltage Regulation 电压调整率
10%~90%~10%	$\pm 15\%$

2.2.7 电压过冲 Overshoot at turn-on/ turn-off

开机或关机时，电压过冲不得超过标称值的 10%。

Any overshoot at turn on or turn off shall be less than 10% of rated output voltage.

2.3 保护功能 Protection Function .

2.3.1 短路保护 Short Circuit Protection

输出端子、线材或设备短路时，电源输出口停止输出，当短路解除后，输出口自动恢复输出，短路过程中不会出现诸如元器件等损坏危险。

Terminal, wire or equipment short circuit, The power supply stop output, when the short circuit is lifted, output automatically restore, short circuit process will not appear such as components and other damage risk.

2.3.2 过流保护 Over Current Protection

电源过流点符合下表限值要求，而且过流保护无任何危险和损坏，在保护去除后，电源自动恢复。

The power supply shall meet the limitation requirement as below table without any damage, the unit

shall recover and function automatically after the protection is removed.

过流保护限值 Over Current Protection limits

	最大值 Max
A1/C1/C2	3.9A

2.3.3 噪声 Noise

输入电压为额定电压,负载为 0%25%50%75%100%,背景噪声与被测声源工作时的声压级差应至少 6dB,传声器与待测产品测试距离为 10cm,测量值<27dB。

The input voltage is the rated voltage, the load is 0% 25% 50% 75% 100%, the sound pressure difference between the background noise and the tested sound source should be at least 6dB, the distance between the microphone and the tested product is 10cm, and the measured value is less than 27dB.

2.3.4 USB D+/D-电压 D+/D- Voltage

在 110Vac/230Vac 输入,USB 正常输出,测试 USB D+/D-电压符合下表要求。

D+/D-电压值 D+/D- Voltage

	最小值 Minimum	额定值 Nominal	最大值 Maximum
D-电压 D- Voltage	2.50V	2.70V	2.90V
D+电压 D+ Voltage	2.50V	2.70V	2.90V

2.3.5 LED 指示灯颜色 LED color

DC 正常输出,LED 亮白色。

Normal output, LED bright white.

3. 环境要求 Environment Requirement

3.1 温度 Temperature

工作环境温度: 0℃~25℃ Operating Ambient: 0℃~25℃

贮存环境温度: -20℃~+85℃ Non-operating Ambient:-20℃~+85℃

3.2 湿度 Humidity

工作时: 25%~90%相对湿度(非冷凝) Operating: 25%~90% relative humidity (Non- condensing)

贮存时: 10%~90%相对湿度(非冷凝) Non-operating:10%~90% relative humidity (Non- condensing)

3.3 海拔高度 Altitude

工作时: ≤2000 米 Operating: ≤2000 meters

贮存时: ≤ 2000 米 Non-operating: ≤ 2000 meters

4. 可靠性 Reliability

4.1 USB 耐久性 The durability of the USB

以 150mm/1min 的速度,USB-A 连续插拔 5000 次, (插入力 $\leq 35\text{N}$, 拔出力 10-35N), USB-C:正反连续插拔各 5000 次 (插入力 5-20N, 拔出力 8-20N) (对 USB 充电接口进行插拔寿命前和寿命后, 应取寿命前和寿命后各 5 个周期做为试验前与试验后数据, 速率不超过 12.5mm/min。)

At a speed of 150mm/1min, USB-A is continuously plugged and unplugged 5000 times (insertion force $\leq 35\text{N}$, pull-out force 10-35N), USB-C is continuously plugged and unplugged 5000 times in both directions (insertion force 5-20N, pull-out force 8-20N) (Before and after plugging and unplugging the USB charging interface, 5 cycles before and after the lifespan should be taken as the data before and after the test, with a speed not exceeding 12.5mm/min.)

4.2 跌落测试 Drop test

跌落木板由三层组成其中两块为 19-20mm 的松木板, 上面至少为 13mm 硬木板, 从 1 米高度每个面跌落 1 次, 产品不破裂, 晃动产品内部无异声或明显部分松动, 电性能正常。

The falling wooden board consists of three layers, two of which are 19-20mm pine boards, with at least 13mm hardwood boards on top. The product is dropped once from a height of 1 meter on each side without breaking, and there is no abnormal sound or obvious looseness inside the product when shaken. The electrical performance is normal.

4.3 金属部件盐雾测试 Salt spray test for metal parts

对可接触金属部件放置在盐雾箱样品放置架上, 样品四周不能有物品遮挡, 确保雾气能进入样品, 但同时样品表面不能形成积水; 配置 5% $\pm$ 1% 的 NaCl 溶液、PH6.5~7.2 的盐水 5L (氯化钠 250g 与纯净水 4750g 混合), 以及设置盐雾箱放置区温度 35℃和压力桶温度 47℃; 启动盐雾箱, 等待试验环境达到要求开启喷雾并计时, 试验时间 (依标准要求) 达到要求后将样品取出, 在自来水下冲刷干净, 自然风干 (样品完全干燥) 后检查金属部件无腐蚀、生锈等异常现象。

Place the accessible metal parts on the sample holder of the salt spray box, with no objects blocking the sample around, to ensure that the mist can enter the sample, but at the same time, there should be no water accumulation on the surface of the sample; Configure 5% $\pm$ 1% NaCl melt, 5L of salt water with pH 6.5~7.2 (mixed with 250g of sodium chloride and 4750g of purified water), and set the temperature of the salt spray box storage area at 35 °C and the pressure tank temperature at 47 °C; Start the salt spray box, wait for the test environment to meet the requirements, start the spray and count the time. After the test time (according to the standard requirements) meets the requirements,

take out the sample, wash it under the tap water, and check that the metal parts are free of corrosion, rust and other abnormalities after natural air drying (the sample is completely dry).

4.4 防止多插头同时推出 Prevent multiple plugs from being pulled out simultaneously

当产品推出一种形式插头且能正常卡住不回弹，再推其它任意一种形式插头确保不能推出，依次交差进行。

When a product introduces a type of plug that can be properly clamped without rebounding, then push any other type of plug to ensure that it cannot be pushed out, and repeat the process in sequence.

4.5 落球冲击测试 Falling ball impact test

将产品以正常位置固定好，用质量为 $500\text{g} \pm 25\text{g}$ 的实心钢球使其从距离样品垂直距离为 1.3M 处自由落到样品上 A 级面（不含按键面），检查产品无明显破裂，电性能正常。

Fix the product in the normal position and use solid steel ball with weight of $500\text{g} \pm 25\text{g}$ to make it freely fall to the a-level surface (excluding the key surface) of the sample from the vertical distance of 1.3m, check the product is not broken, Normal electrical performance.

4.6 插脚插拔耐久性测试 Test the durability of plug

以 200 次/时的速度，将产品上的插头分别连续插拔 3000 次，插脚不可以松动，电性能正常。

At the speed of 200 times/hour, the plug on the product is successively plugged and unplugged for 3000 times, the plug can not be loose, Normal electrical performance.

5. 安规 Safety standard

5.1 耐压测试 Withstand voltage test

产品耐压满足下述要求，100%在线执行此项测试，测试时间 60S。

The product withstand voltage meets the following requirements, 100% of the test is performed online, and the test time is 60S.

测量位置 measurement position	测试条件 Test conditions	判定 determine
插座 L/N plug L/N	AC 2000V	绝缘无崩溃 No collapse of insulation
加强绝缘 Reinforced insulation	DC 4000V	绝缘无崩溃 No collapse of insulation
基本绝缘 basic insulation	DC 2500V	绝缘无崩溃 No collapse of insulation

5.2 绝缘强度 Dielectric strength

在 $25\pm 2^{\circ}\text{C}$ 环境下, 在 AC 插头与 USB 之间和 AC 插头与外壳之间输入 DC 500V 1 分钟, 绝缘阻抗 $\geq 5\text{M}\Omega$ 。

In $25\pm 2^{\circ}\text{C}$, between the AC plug&USB and AC plug&housing, the input is DC500V 1minute, Insulation resistance $\geq 5\text{M}\Omega$.

5.3 温升 The temperature rise of the copper

$25\pm 2^{\circ}\text{C}$ 环境下, 将产品插入标准试验插座, 测试端子触点温升不超 45K, 可接触塑胶外壳温升不超 77°C , 其它器件参考 IEC62368-1 给出的要求。

Under the environment of $25\pm 2^{\circ}\text{C}$, insert the product into the standard test socket, and the temperature rise of the test terminal contact shall not exceed 45 K, The temperature rise of the accessible plastic shell shall not exceed 77°C , Other devices refer to the requirements given in IEC62368-1.

5.4 应力消除 Heat resistance test

外壳测量的最高温度+10K, 但不低于 70°C 的加热箱内 7 小时然后放置室温, 试验结束后标志应清晰可见, 塑胶件无明显变形、开裂等现象。

The highest temperature measured by the shell is+10K, but not lower than 70°C , and then it is placed at room temperature for 7 hours. After the test, the mark should be clearly visible, and the plastic parts should be free of obvious deformation, cracking, and other phenomena.

5.5 接触电流 touch current

初级到次级与初级到可接触的外壳部分, 接触电流 $< 0.707\text{mA peak}$ 。

The shell parts from primary to secondary and from primary to touchable have a contact current of less than 0.707mA peak .

5.6 分断容量 Breaking capacity

将插头插入拔出插座 50 次(100 个)行程, 30 个行程每分钟。试验期间不得出现持续闪弧, 试验后不得出现影响进一步使用的损坏; 试验后插销的插入孔不得有影响安全性能的损坏

The plug is inserted and pulled out of the socket for 50 times (100 strokes) with 30 strokes per minute. During the test, there shall be no continuous flashover, and after the test, there shall be no damage affecting further use; After the test, the insertion hole of the pin shall not be damaged to affect the safety performance

5.7 正常操作 Normal operation

根据不同的国家标准, 进行不同的正常操作次数, 试验后探针不可接触到金属带电零部件, 温升与耐压满足标准要求。

Depending on different national standards, different normal operating cycles are carried out, and after the test, the probe must not come into contact with metal electrically charged components.

The temperature rise and withstand voltage must meet the standard requirements.

5.8 插座拔出力 peak pullout load

将最小尺寸量规的试验插头插入插座并从插座拔出 10 次, 然后, 再将最小尺寸量规插入并用适当的夹紧装置 D 将承载主砝码 F 和附加砝码 G 的砝码盘 E 挂在试验插头上进行确认, 需满足下表要求。

Insert the test plug of the minimum size gauge into the socket and pull it out 10 times. Then, insert the minimum size gauge and use the appropriate clamping device D to hang the weight plate E carrying the main weight F and additional weight G on the test plug for confirmation. The requirements in the table below must be met.

插座类别 Type of socket	额定电流(A) Rated current	极数 number of poles	要求 (N) request
中规 CN	10	2	40
		3	50
美规 US	15	2	13~67
		3	13~67
欧规 EU	2.5	2	50
		3	54
德规 DE	10	2	50
		3	54
英规 UK	13	3	36
澳规 AU	10	2	50
		3	54

5.9 单极最小拔出力 Minimum pulling force

将最小尺寸量规的试验插头插入插座并从插座拔出 10 次, 将样品垂直向下, 需满足下表要求。

Insert the test plug of the smallest size gauge into the socket and pull it out 10 times. Place the sample vertically downwards and meet the requirements in the table below.

插座类别 Type of socket	额定电流(A) Rated current	极数 number of poles	要求 (N) request
中规 CN	10	2	1.5
		3	1.5
美规 US	15	2	2.2

		3	L/N: 2.2 G: 1.1
欧规 EU	2.5	2	1.5
		3	1.5
德规 DE	10	2	1.5
		3	1.5
英规 UK	13	3	1.5
澳规 AU	10	2	1.5
		3	2.0

5.10 保护门的机械强度 Mechanical strength of protective doors

插座垂直朝上，使用最大尺寸量规垂直向下,对插孔的保护门施加 40N 的力达 1min 后量规不得插入插座。
防止单极插入的保护门施加 75N, 其它为 40N。

The socket should be vertically facing upwards, and the maximum size gauge should be used vertically downwards. After applying a force of 40N to the protective door of the socket for 1 minute, the gauge should not be inserted into the socket.

Apply 75N to the protective door to prevent single pole insertion, and 40N to others.

5.11 英规插销机械强度 Mechanical strength of British standard pin

将英规插销放置在水平位置，施加 1100N/1min 压力，插销不得出现变形断裂等现象。

Place the British standard plug in a horizontal position and apply a pressure of 1100N/1 minute.

The plug should not deform or break.

5.12 力矩 moment

使插座围绕着穿过带电插套轴的、在距离插座插合面后面 8mm(在转换器插座面需插入一根 0.75²*1m 的插头垂直向下)、并与这一插合面平行的水平轴线而旋转。 为使插合面维持在垂直平面而需要施加到插座的附加力矩小于 0.25N • m。

Rotate the socket around a horizontal axis passing through the live socket shaft, 8mm behind the socket mating surface (a 0.75² * 1m plug needs to be inserted vertically downwards on the converter socket surface), and parallel to this mating surface.

To maintain the mating surface in a vertical plane, an additional torque of less than 0.25N • m needs to be applied to the socket.

5.13 接地电阻 Ground resistance

在接地端子和每个易触及金属部件之间,轮流通过交流电源的 1.5 倍的额定电流或 25A 电流(二者取较大者)。

试验后, 电阻不得大于 0.05Ω

Between the ground terminal and each accessible metal part, a current of 1.5 times the rated current or 25A (whichever is greater) is alternately passed through the AC power supply.

After the test, the resistance shall not exceed 0.05Ω .

5.14 灼热丝 Glow wire

对载流部份和接地电路部件起固定作用的绝缘材料, 试验要在 750°C 的温度下进行, 在灼热丝移去后 30S 内, 试样上的火焰熄灭或辉光消失, 不得起火。对载流部份和接地电路部件不起固定作用的绝缘材料, 试验要在 650°C 的温度下进行, 在灼热丝移去后 30S 内, 试样上的火焰熄灭或辉光消失, 不得起火。

The test shall be carried out at a temperature of 750°C for the insulating materials used to fix the current carrying parts and grounding circuit components. Within 30s after the removal of the glow wire, the flame or glow on the sample shall be extinguished and no fire shall be allowed. The test shall be carried out at 650°C for insulating materials that do not play a fixed role in current carrying parts and grounding circuit components. Within 30s after the glow wire is removed, the flame or glow on the sample will extinguish, and no fire is allowed.

5.15 球压 ball pressure

在温度为 $(T-T_{amb}+T_{ma}+15^{\circ}\text{C}) \pm 2^{\circ}\text{C}$ 的加热箱内进行 (T、 T_{ma} 和 T_{amb} 的含义见 IEC62368-1 B.2.6.1)。但是, 载流的热塑性零部件要在至少 125°C 的温度下进行试验。 试验后压痕 $< 2.0\text{mm}$ 。

Conducted in a heating chamber with a temperature of $(T-T_{amb}+T_{ma}+15^{\circ}\text{C}) \pm 2^{\circ}\text{C}$ (the meanings of T, T_{ma} , and T_{amb} are defined in IEC62368-1 B.2.6.1). However, thermoplastic components carrying current must be tested at a temperature of at least 125°C . The indentation after the test is less than 2.0mm

6. 产品外观 Product Appearance Inspection

6.1 塑胶外壳 Plastic Shell

距离肉眼 30-45CM, 45° 度角, 检查时左右上下晃动 15° 目视检查, 外观面无明显缩水、缺胶、划痕、批锋及其它机械损伤。

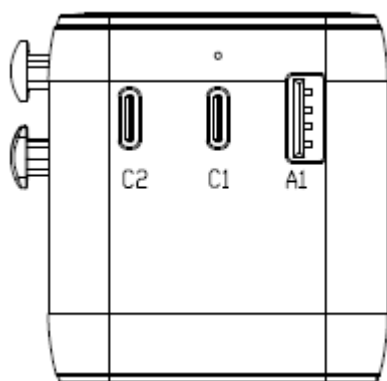
The eyes distance is 30-45cm, angle: 45° , right&left, up&down waggle is with 15° when inspecting, the appearance isn't shrunk obviously, light stock, scratch, without burr, and other mechanical damages.

6.2 喷涂 Spray-finishing

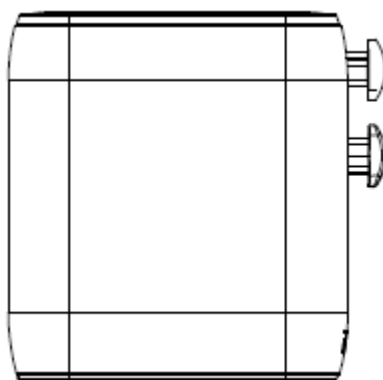
距离肉眼 30-45CM, 45° 度角, 检查时左右上下晃动 15° 目视检查, 喷涂无明显积油、少漆、露底色、脱漆、异

色点等不良。用 $\geq 99.5^{\circ}\text{C}$ 无醇酒精以 60 次/分钟来回擦拭 50 次，试验完成后允许字体有轻微的磨损及退色，但要求字体内容仍完整可辨认。

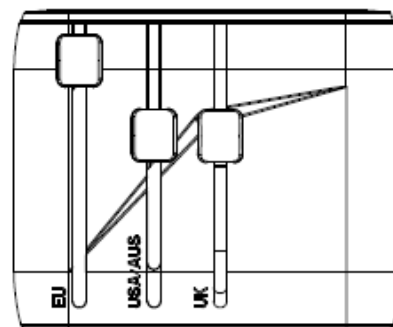
The eyesdistance is 30-45cm, angle: 45° , right&left, up&down waggle is with 15° when inspecting, the spray-finishing doesn't have obviously paint accumulation, lacking paint, leaked ground color, paint drop, unlikeness color dot etc. With $\geq 99.5^{\circ}\text{C}$ Alcoholic wipe 50 times back and forth to 60 times/min, after the completion of the test allows fonts have slight wear and discoloration, but required font content still complete can identify.



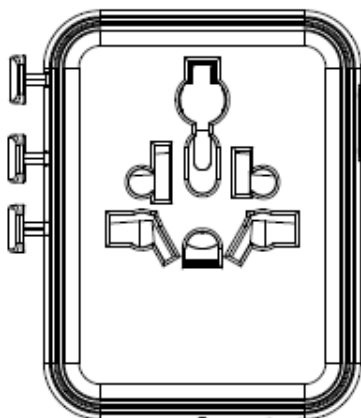
前视图



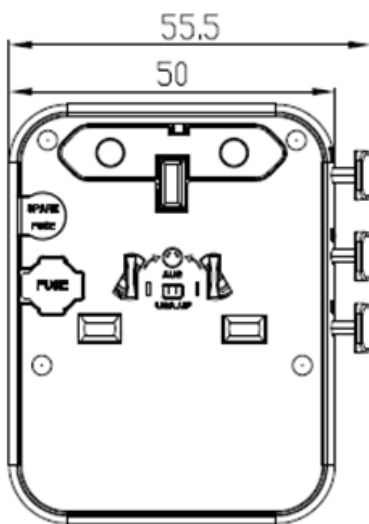
后视图



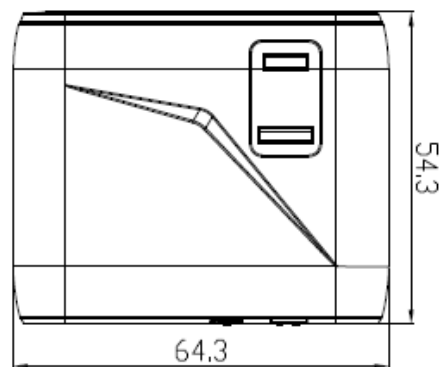
左视图



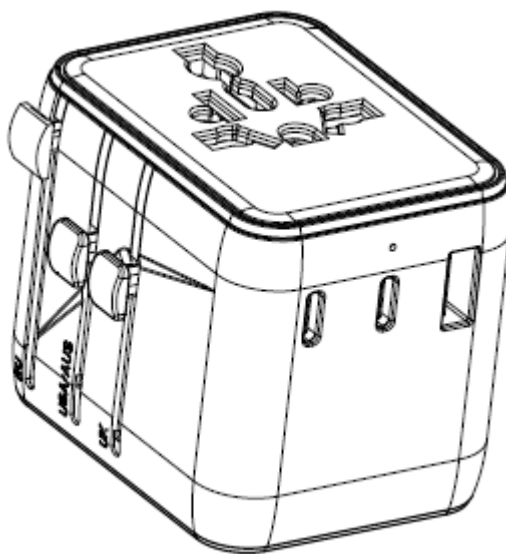
俯视图



仰视图



右视图



示意图