

budi

产品规格书

Specification

产品名称 (name): 15W 无线充

产品型号 (Model): WL4500

版本 (Version): V1.0

| Revision 版本 | Changed date 变更日期 | CHANGE RECORD (变更记录) | Arbiter 确认者 |
|----------------|-------------------------|-------------------------|----------------|
| V1.0 | 2023-06-5 | | |
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东莞市倍优电子有限公司
Dongguan Budi Electronic Co.,Ltd

DESCRIPTION: (规格书)
SPECIFICATION

Room 301, Building 2, No. 30 Xingguang Road, Shijie
Town, Dongguan City, Guangdong, China. 523306

Model No. :
WL4500

| DATE | PREPARED | CHECKED | APPROVED | Document No. : | REV: |
|-----------|----------|---------|----------|----------------|------|
| 2023-06-5 | 彭石森 | | | | 1.0 |
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1. 概要 Summary

此承认书详细描述了 4500 三合一无线充发射器的物理功能和电气特性，该发射器具备 QC3.0/PD 协议识别功能，符合 WPC-Qi V1.2.4 标准，支持发射至接收的双向通讯。

本模块使用电磁感应原理能同时对苹果、三星、华为等手机进行快速无线充电，对苹果耳机充电，对苹果手表充电。

This acknowledgement details the physical and electrical characteristics of the 4500 3-in-1 wireless charging transmitter, which has QC3.0/PD protocol identification, complies with the WPC-Qi V1.2.4 standard, and supports two-way transmit-to-charge communication.

This module uses the principle of electromagnetic induction to quickly wireless charge Apple, Samsung, Huawei and other mobile phones, charge Apple headphones, and charge Apple Watch.

2. 苹果手表充电 Apple Watch charging

- ◆ 支持苹果 iWatch (3W 快充) 无线充 Support Apple iWatch (3W fast charge) wireless charge
- ◆ 支持 DC 5V 输入 Supports DC 5V input
- ◆ 兼容 S2~S8 手表设备 Compatible with S2~S8 watch devices
- ◆ 兼容系统版本 (见下表 1) Compatible system versions (see Table 1 below)

| | | | | | |
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可以兼容系统版本，测试环境温度

| 手表型号 | 版本系统 | 充电时长 | 连接WiFi | 连接手机 | APP运行 | 充电环境下操作屏幕 | 开机以后是否进入快充 |
|----------------|-------|-----------|--------|-------|-------|----------------|------------|
| iWatch S2 38mm | 7.3.2 | 2小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S2 44mm | 7.5 | 2小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S3 38mm | 7.5 | 2小时10分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S3 44mm | 8.3 | 2小时05分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S4 | 8.0.1 | 1小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S7 | 8.4.1 | 2小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S7 | 8.4 | 2小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch SE | 8.3 | 1小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S6 | 8.4.2 | 1小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S5 | 7.3.2 | 1小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S4 蜂窝版 | 8.3 | 1小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S6 蜂窝版 | 8.4.2 | 1小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S5 蜂窝版 | 8.5 | 1小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S7 蜂窝版 | 8.5 | 2小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S6 | 7.5 | 1小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S6 | 7.3.2 | 1小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S7 | ~8.0 | 2小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S7 | 8.3 | 2小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S7 | 8.5 | 2小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S5 蜂窝版 | 8.3 | 1小时40分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S4 | 6.1.3 | 1小时20分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |
| iWatch S7 | 8.5.1 | 2小时30分钟左右 | 操作无影响 | 操作无影响 | 操作无影响 | 屏幕操作灵敏, 无功能性失效 | 可以 |

注：最新系统版本持续测试更新中……

3. 规格参数 Specifications

| 参数 argument | 符号symbol | 额定值 Rated value | 单位 unit |
|-----------------------------------|------------------|-----------------|---------|
| 工作环境温 Working ambient temperature | Ta | -10 ~ +50 | ° C |
| 储存温度 Storage temperature | Tstg | -20 ~ +60 | ° C |
| 储藏湿度 Storage humidity | Tstr | < 80% | RH |
| 供电电压 Supply voltage | Vcc | 4.7 ~ 9.5 | V |
| 过压保护 Overvoltage protection | Vmax | 13.5 | V |
| 供电电流 Supply current | I _{max} | 2.2A | A |

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4. 测试数据 Test data

测试条件:环境温度 25° C Test conditions: Ambient temperature 25° C

| 规格 specification | 测试条件 Test condition | 额定值 Rated value | 最小值 Minimum value | 最大值 Maximum value | 单位 |
|---|--|-----------------------|-------------------------|-------------------------|-----|
| 正常模式功耗 Normal mode power consumption | V _{cc} =5V | 100 | 50 | 150 | mW |
| 充电 / 电流 Charge/current | V _{cc} =9V | 450 | 5 | 600 | mW |
| 工作频率 Operating frequency | 调节负载及距离 Adjust load and distance | / | 110 | 205 | KHz |
| 传输效率 Transmission efficiency | bq51013xEV 测试 bq51013xEV test | 75 | 50 | 80 | % |
| 工作电压 Operating voltage | 5W输出 5W output | 5 | 4.5 | 5.5 | V |

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|---------------------------------|------------------------------------|----|-----|------|----|
| 工 作 电 压 Operating voltage | 10W输出 10W output | 9 | 8.5 | 9.5 | V |
| 输出功率Output power | 快速模式 | 10 | 9 | 10.5 | W |
| 工 作 距 离 Working distance | bq51013xEVM 测 试 bq51013xEV test | 5 | 1 | 8 | mm |

5. 兼容测试 Compatibility test

| 设备型号 Equipment type | 支 持 功 率 Support power | 是否支持无线 Whether wireless is supported |
|---|--------------------------|---|
| iwatch, Airpods and other series | 3W | 支持慢充 Support slow charge |
| iphoneX, 12Pro, 13ProMax and other series | 10W | 支持快充 Support slow charge |
| Huawei Mate 20 Pro, Mate 30, Mate 30 pro and other series | 10W | 支持快充 Support slow charge |
| Samsung S10, Xiaomi, LG and other series | 10W | 支持快充 Support slow charge |

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凌阳测试架兼容性测试 Sun test rack compatibility test

| | | |
|----------------------|------|--------------------------|
| 凌阳 5W The Sun 5W | 5W | 支持 support |
| 凌阳 7.5W The Sun 7.5W | 7.5W | 支持快充 Support fast charge |
| 凌阳 10W The Sun 10W | 10W | 支持快充 Support fast charge |
| 凌阳 15W The Sun 15W | 15W | 支持快充 Support fast charge |

6. 金属检测 Metal detection

当发射器线圈中心上方的产品表面探测到大于一元硬币大小金属物，蓝灯灯闪烁，发射器停止工作，金属物移除后，发射器恢复正常工作。

When a metal object larger than a dollar coin is detected on the product surface above the center of the transmitter coil, the blue light flashes, the transmitter stops working, and the transmitter returns to normal operation after the metal object is removed.

7. 顶点关断 (VRVS) Vertex Shutdown (VRVS)

When the transmitter and receiver are working normally, the receiver coil is offset from the transmitter coil, causing the transmitter coil voltage to be too high, and the transmitter enters the current limiting mode to protect the transmitter. If the receiver coil position is offset too much, the transmitter will stop working.

8. LED 指示 LED indication

产品指示灯工作方式如下：

| | | | | | |
|---|----------|---------|----------|--|------|
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The product indicator works as follows:

| 蓝色 LED 状态 Blue LED status | 通电 electrify | 待机 Bide one's time | 充电中 Charging | 充满 Be filled with |
|------------------------------|-----------------------------------|-----------------------------------|--|--|
| 3.3V | 长亮蓝灯 Long bright blue light | 长亮蓝灯 Long bright blue light | 长亮蓝灯/慢闪 Steady blue/Blinking slowly | 长亮蓝灯 Steady blue/Blinking slowly |

注意! Attention!

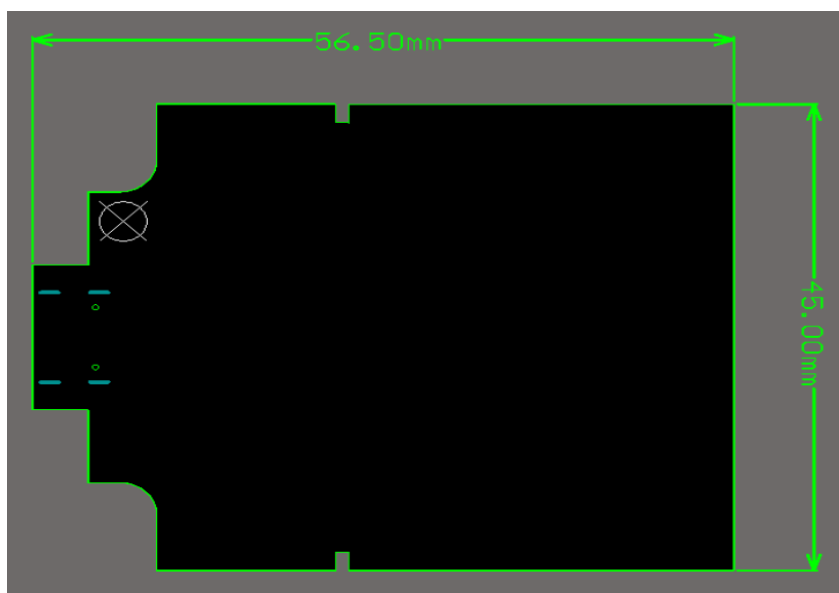
苹果手机和外置接收贴无充满指示状态, 一直保持充电状态, 可以从手机本身看充电状态。

The iPhone and the external receiver sticker do not have a full indicator state, and the charging state is always maintained, and the charging state can be viewed from the phone itself.

9. PCBA 板框图与线圈规格 PCBA board diagram and coil specifications

9.1 PCBA 主板尺寸; 45mmx56.5mmx1.0mm PCBA motherboard size; 45 mmx56.5 mmx1.0 mm

0 mm



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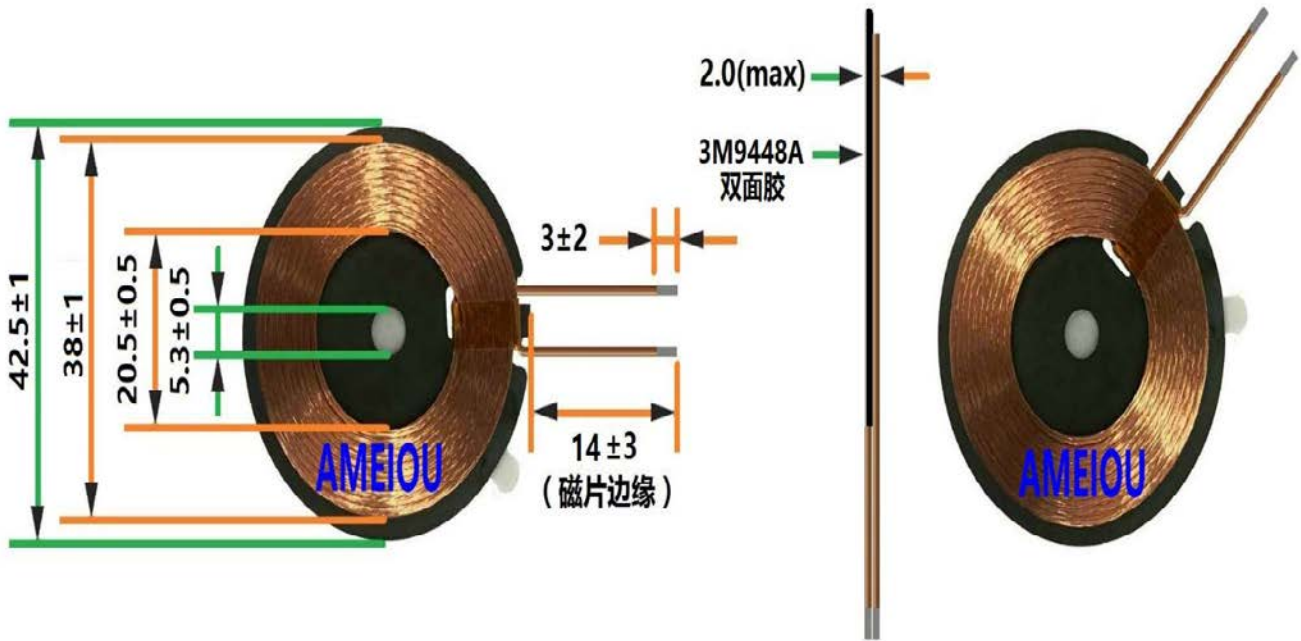
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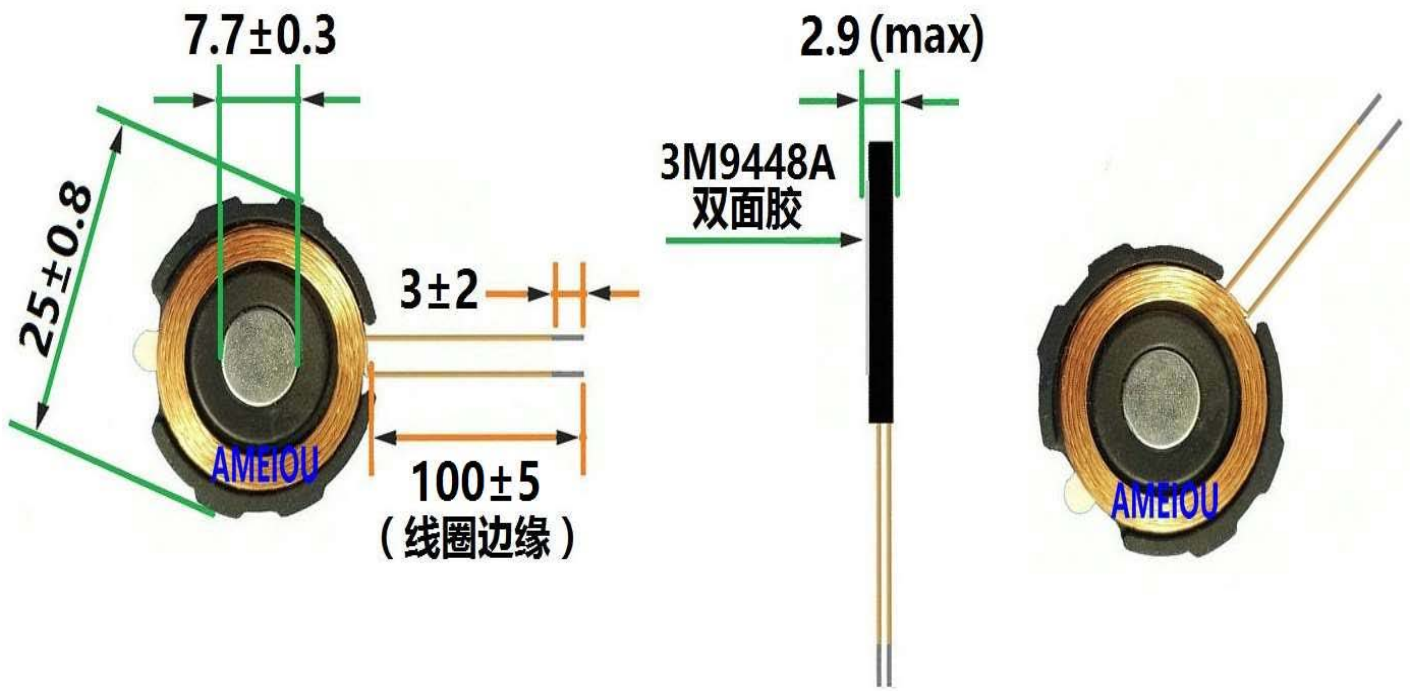
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■ 产品电气特性 Product Electrical characteristics

| 参数 (Parameter): | 数值 (Value) |
|----------------------------|--|
| 产品名称 (Product name) | 无线充电线圈模组 |
| 产品编号 (Product number): | HY425Y205C10G72-14M |
| 铁氧体型号 (Ferrite type): | Φ42.5*Φ5.3*0.8mm (带双槽) |
| 线材型号 (Coil type): | 多股漆包铜线 0.08*72P |
| 线圈匝数 (Coil Turns): | 10TS |
| 绕线方向 (Coil direction): | 顺时针 (以最外圈为准) |
| 电感 (Inductance): | 6.5 μH ±10% |
| 测试仪器 (Testing Instrument): | TH2816B @100kHz、1Vrms; TH2512B At 25°C |
| 备注 (Note): | 背面贴 3M9448A 双面胶 |

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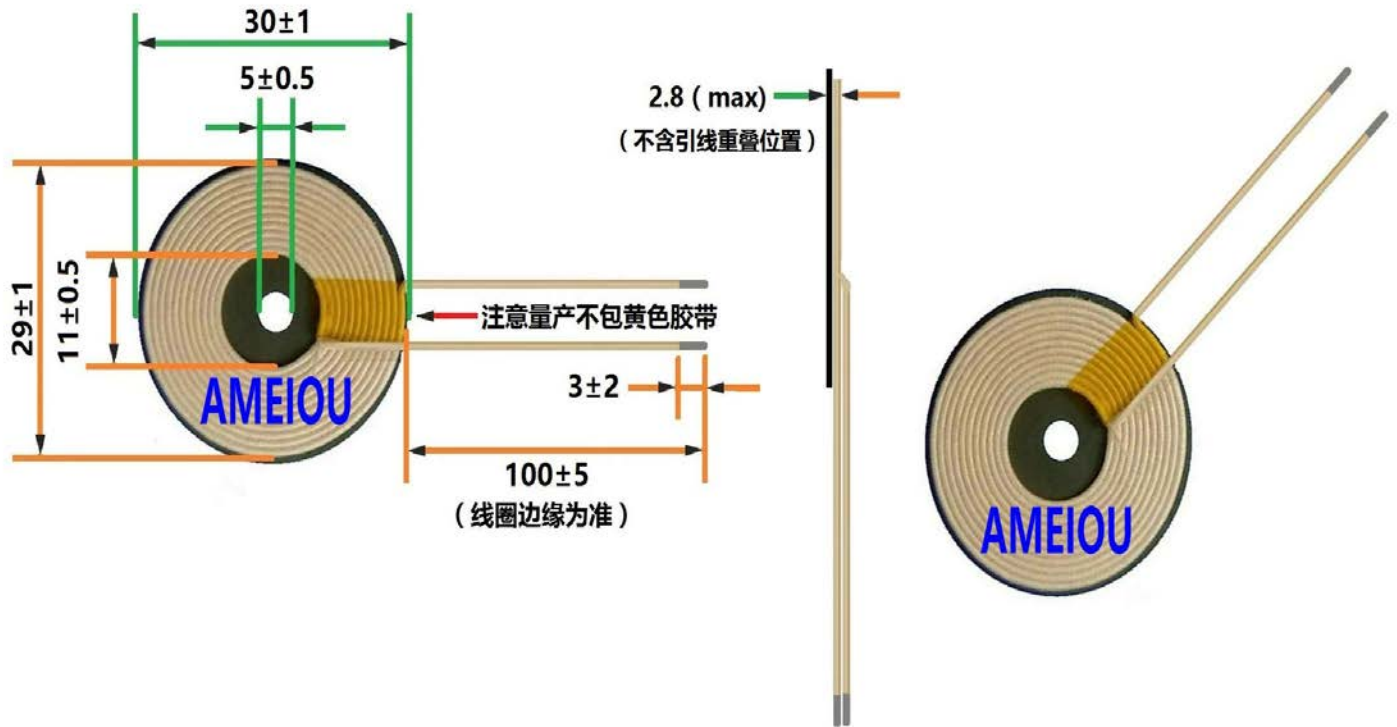


■ 产品电气特性 Product Electrical characteristics

| 参数 (Parameter): | 数值 (Value) |
|----------------------------|---|
| 产品名称 (Product name) | 无线充电线圈模组 |
| 产品编号 (Product number): | SC250Y150A12G24-100MC |
| 铁氧体型号 (Ferrite type): | SC25*7.7*2.5mm (带缺口) |
| 线材型号 (Coil type): | 多股漆包铜线 0.08*24P |
| 线圈匝数 (Coil Turns): | 13TS |
| 电感 (Inductance): | 7.8 μ H \pm 10% |
| 测试仪器 (Testing Instrument): | TH2816B @100kHz、1Vrms; TH2512B At 25 $^{\circ}$ C |
| 备注 (Note): | 产品背面贴 3M9448A 双面胶 |

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9.4 耳机线圈规格 Headphone coil specifications



产品电气特性 Product Electrical characteristics

| 参数 (Parameter): | 数值 (Value) |
|----------------------------|---------------------------------------|
| 产品名称 (Product name) | 无线充电线圈模组 |
| 产品编号 (Product number): | HY300Y110A14G45-100 |
| 铁氧体型号 (Ferrite type): | Φ30*Φ5*1mm (带孔) |
| 线材型号 (Coil type): | 丝包多股铜线 0.08*45P |
| 线圈匝数 (Coil Turns): | 14TS |
| 电感 (Inductance): | 6.5 μH±10% |
| 测试仪器 (Testing Instrument): | TH2816B @100kHz、1Vrms; TH2512B At 25℃ |
| 备注 (Note): | |

| | | | | | |
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10. 真机充电测试 Real machine charging test

10.1 测试 iphone12 Pro, 环境温度 25C 下, iphone 12 Pro 直充测试, 3 小时 17 分充满, 如下充电曲线图。Test iphone12 Pro, under the ambient temperature of 25C, iphone12 Pro direct charge test, 3 hours and 17 minutes full, as shown in the following charging curve



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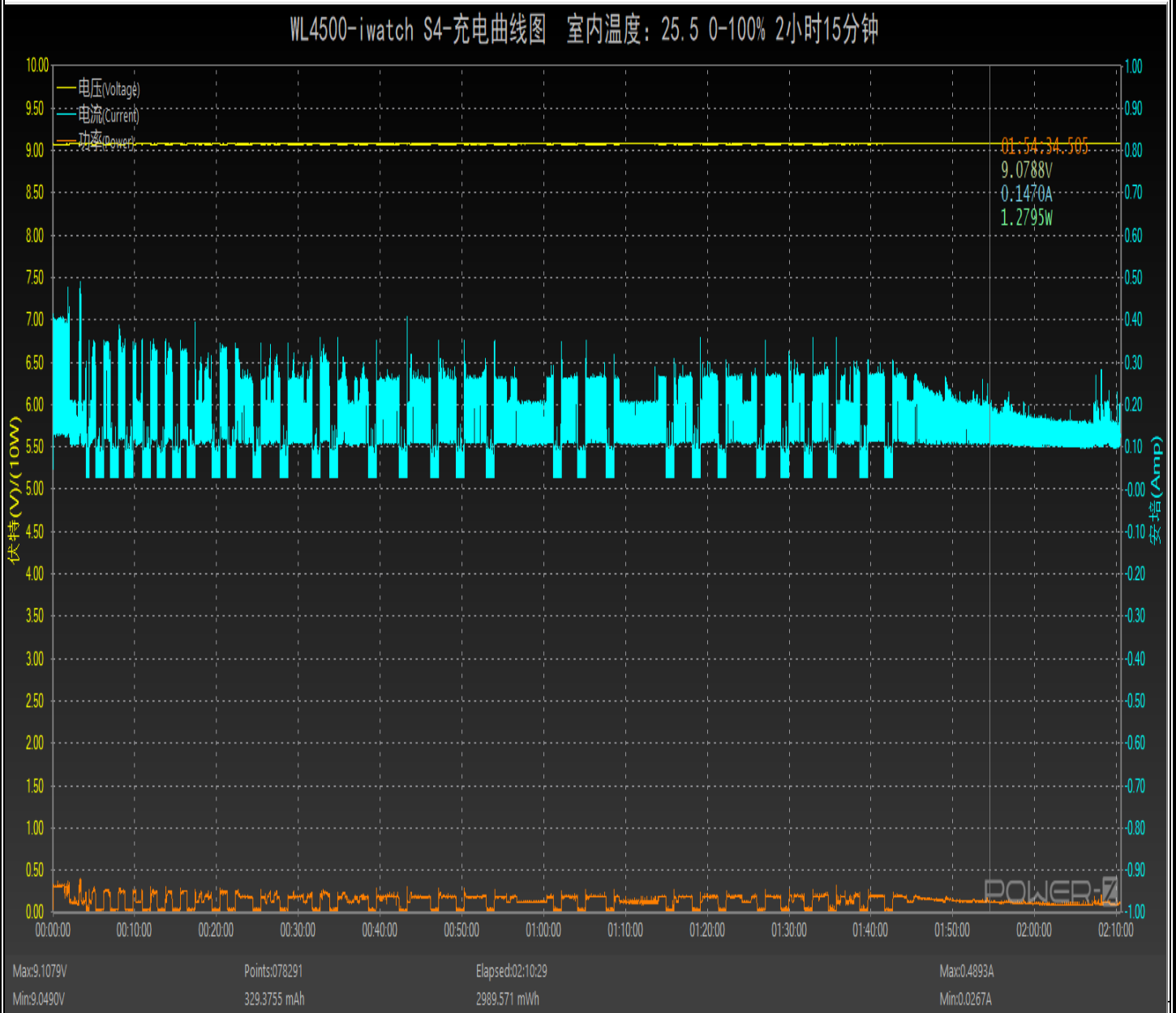
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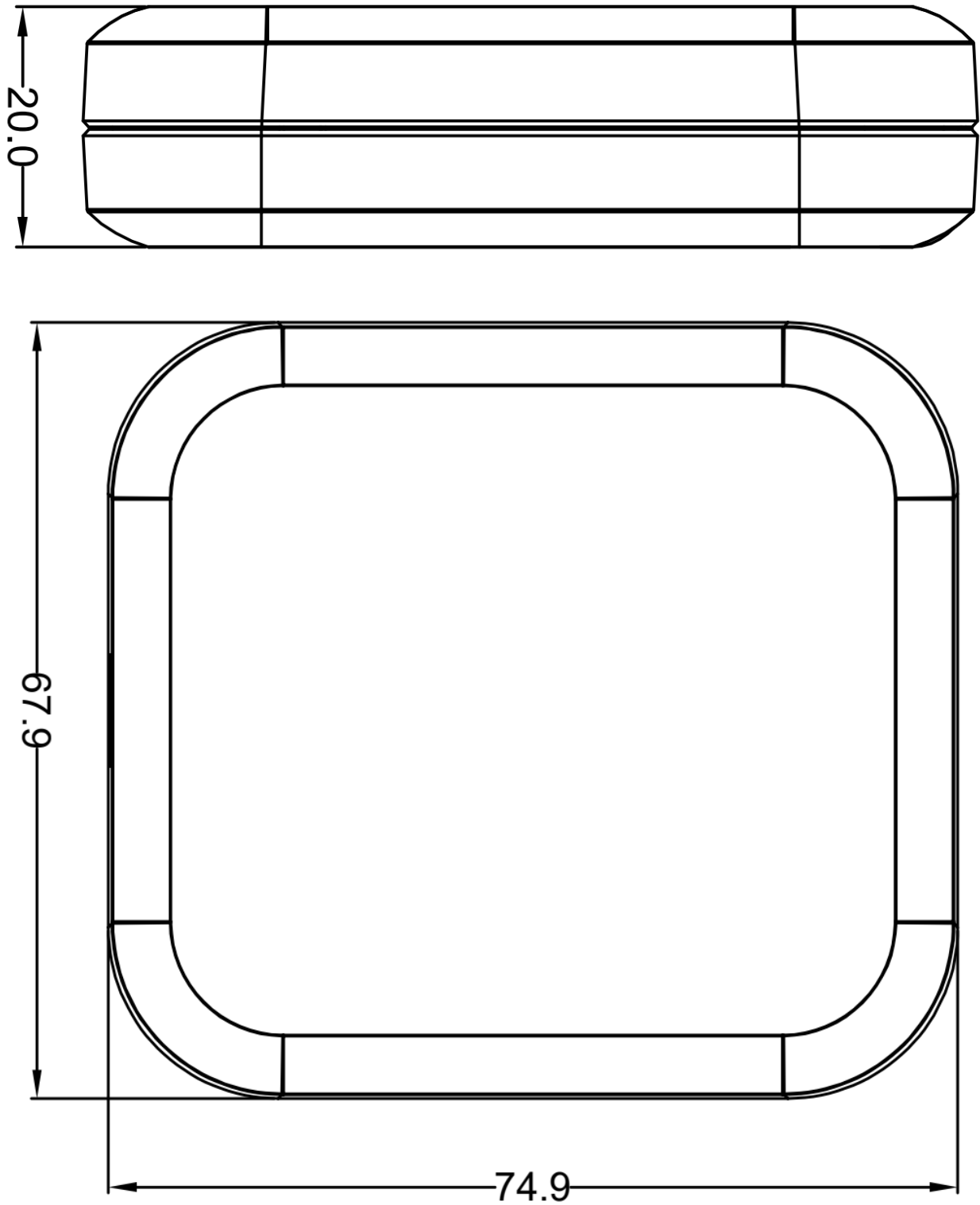
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10.2 测试 iwatch S4, 环境温度 25C 下, 电量 0~100%充电时间 2.5 小时. Test iwatch S4, the ambient temperature of 25C, charge 0-100% charge time of 2.5 hours.



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|---|----------|---------|----------|--|--|
| 东莞市倍优电子有限公司 Dongguan Budi Electronic Co.,Ltd | | | | DESCRIPTION: (规格书) SPECIFICATION | |
| Room 301, Building 2, No. 30 Xingguang Road, Shijie Town, Dongguan City, Guangdong, China. 523306 | | | | Model No. : WL4500 | |
| DATE | PREPARED | CHECKED | APPROVED | Document No. : | |
| 2023-06-5 | 彭石森 | | | | |
| | | | | REV: 1.0 | |

11: 成品尺寸图 Finished dimensioning



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|---|----------|---------|----------|--|------|
| 东莞市倍优电子有限公司 Dongguan Budi Electronic Co.,Ltd | | | | DESCRIPTION: (规格书) SPECIFICATION | |
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| 2023-06-5 | 彭石森 | | | | 1.0 |
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