



样品承认规格书

PART SHEET FOR APPROVAL

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供应商名称 Supplier::	无锡威达智能电子股份有限公司 Wuxi Weida Intelligent Electronics Co., Ltd.
产品名称: Part Description:	蓝牙语音遥控器 Remote Control
规格型号: Model No:	WH-271
制造商 P/N: Manufacturer P/N:	WH-7850_BLE
客户型号: Cutomer item No:	B064-02-W7
华曦达编码: SDMC P/N	110400853
软件版本: Software version:	V1.0.7
日期: Issued Date:	2023.11.14

供应商确认 Supplier confirmation

承办 Made By	审核 Engineer	批准 Approver
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华曦达确认 SDMC confirmation

承认原因: Approval Reason:	☐ 新物料 New Part ☐ 替代料 Substitute Part		
承办 Made By	审核 Engineer		批准 Approver
	品质 Quality	研发 R&D	业务 Sales

备注：签名表明提交样品获得承认，图纸规格已经受控。Note: Signature indicates that the submitted sample is approved and the drawing/specification is now the controlling document.

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JL-8.3-13

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Wuxi Weida Intelligent Electronics Co., Ltd.

遥控器规格书

客户名称: Client's name:	华曦达 SDMC
客户料号: Customer Part Number:	110400853
威达料号: WeiDa Part Number:	WH-7850_BLE
类型: Types of:	蓝牙+语音+红外 Bluetooth + voice + infrared
日期: date:	2023.11.14
拟制: Drafting:	厉林玉 LiLinyu
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修订记录

Revision record

日期 Date	版本 Version	修改章节 Modify chapter	修改描述 Modify description	作者 Author
2023.11.14	V1.0		创建 create	厉林玉 LiLinyu

遥控器配置 Remote control configuration	语音传输协议： Voice Transmission Protocol:	谷歌标准语音 Google Standard voice
	主芯片型号： Main chip model:	AB1613
	硬件型号： Main chip model:	WH-7598_BLE V1.1
	MAC 地址管控： MAC address control:	不需要 Not needed
	软件版本： Software version:	V1.0.7

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一、遥控器测试条件及参数 Remote control test conditions and parameters

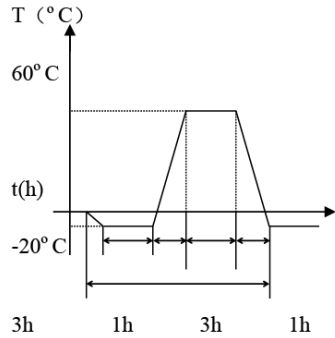
1、硬件要求 Hardware requirements

序号 Serial number	说明项目 Description item	技术规格 Technical specifications	备注 Remarks
1	按键数 Number of keys	22 键 22 keys	
2	遥控器尺寸 Remote control size	175*43*16.15mm (±0.5mm)	
3	按键自由高度 Free height of keys	≤2mm	
4	按键作用后高度 Height after key press	≥0.15mm	
5	按键作用力 Button force	160g±30gf	锅仔片
6	外壳塑胶材质 Shell plastic material	ABS 原料（无味、不掺回料），厚度≥2.0mm ABS raw material (odorless, no regrind), thickness ≥2.0mm	
7	外壳颜色 Shell color	黑色细纹 Black fine lines	
8	丝印 Silk screen	耐酸耐醇耐磨 Acid and alcohol resistant	
9	PCB 电路板材质 PCB circuit board material	环氧玻纤基板（FR-4） Epoxy glass fiber substrate (FR-4)	
10	PCB 布线线宽及间距 PCB wiring line width and spacing	≥7mil	
11	表面涂敷处理 Surface coating treatment	详细见遥控器《外观及工艺要求》 For details, see the remote control "Appearance and Process Requirements"	
		表面应平整牢固，不允许有划痕，斑疵、流挂、脱落和破损 The surface should be flat and firm, no scratches, spots, sagging, shedding and damage are allowed	
12	电路板制作要求 Circuit board production requirements	所有印刷电路板均应防腐蚀 All printed circuit boards should be corrosion resistant	
		不允许有飞线 No flying leads allowed	
		焊点饱满，无虚焊、脱焊、连锡 Full solder joints, no false soldering, desoldering, or even tin	
13	按键要求 Button requirements	按键胶边缘结构需增加“防水墙”，以达到按键装配后，用手指扣时不能脱出胶壳按键孔；按键面定位过孔采用硅胶包塑胶设计，使整个硅胶按键面没有破孔，以保证长时间使用板面整洁，硅胶按键需偏硬 The edge structure of the button glue needs to add a "waterproof wall" to ensure that after the button is assembled,	

		the button hole of the plastic shell cannot be removed when you use your fingers to buckle; The surface of the board is clean and tidy when used for a long time, and the silicone keys need to be hard	
14	导电胶材质 Conductive glue material	必须使用硅胶原料（不加粉），并且没有刺激性气味 Must use silica gel raw material (no powder), and no pungent odor	
15	锅仔片 Metal dome	遥控器所有按键采用 metal dome 按键，并且寿命必须 ≥ 50 万次，连续按压测试次数 ≥ 30 万次，可恢复到原荷重 All buttons on the remote control adopt metal dome buttons, and their lifespan must be $\geq 500,000$ times, and the number of continuous pressing tests $\geq 300,000$ times can be restored to the original load	

2、产品规格 Product specifications

序号 Serial number	项目 Project	规格参数 Specifications	备注 Remarks
1	工作温度 Operating temperature	0~50°C	
2	相对湿度 Relative humidity	$\leq 95\%$	
3	大气压力 Atmospheric pressure	86~106Kpa	
4	环境照度 Environmental illumination	自然光或荧光灯 200 $\pm$ 50LX Natural light or fluorescent light 200 $\pm$ 50LX	
5	主控 MCU Master MCU	AB1613	
6	电路板材质 Circuit board material	FR-4	
7	外壳材料 Shell material	ABS	
8	样品颜色 Sample color	参考客户需求规格 Refer to customer requirements specifications	
9	红外波长 Infrared wavelength	950 $\pm$ 50nm	红外 Infrared
10	红外载波频率 Infrared carrier frequency	38.0 $\pm$ 0.5KHz	红外 Infrared
11	蓝牙载波频率 Bluetooth carrier frequency	2.400GHz~2.4835GHz	蓝牙 Bluetooth
12	平均工作电流 Average working current	$\leq 20\text{mA}$	
13	平均静态电流 Average quiescent current	$\leq 10\mu\text{A}$	

14	工作电压范围 Operating voltage range	2.2~3.6V	
15	遥控距离 Remote control distance	$L \geq 10\text{M}$ (红外) $L \geq 10\text{M}$ (infrared)	红外 Infrared
16	按键负荷寿命 Button load life	≥ 50 万次 $\geq 500,000$ times	
17	自由跌落试验 Free drop test	从 80cm 高度, 六面依次自由跌落在不小于 3cm 厚木地板, 三个循环。 From the height of 80cm, the six sides will fall freely on the wooden floor not less than 3cm thick in three cycles.	
18	空气放电 Air discharge	$\pm 8\text{KV}$	
19	高温储存试验 High temperature storage test	60°C	
20	低温储存试验 Low temperature storage test	-20°C	
21	恒定湿热试验 Constant humidity test	40°C 相对湿度 $90 \pm 2\%$ 40°C relative humidity $90 \pm 2\%$	
22	温度循环变化试验 Temperature cycle change test	 The graph illustrates a temperature cycle change test. The vertical axis represents temperature T in $^{\circ}\text{C}$, with marked points at 60°C and -20°C. The horizontal axis represents time t in hours (h). The cycle consists of four segments: a 3-hour dwell at -20°C, a 1-hour ramp up to 60°C, a 3-hour dwell at 60°C, and a 1-hour ramp down to -20°C.	
23	验收标准 MIL-STD-105E-LEVEL(II)AQL Acceptance standard MIL-STD-105E-LEVEL(II)AQL	重缺陷 (A 类) $\text{AQL}=0.65$ 轻缺陷 (C 类) $\text{AQL}=1.5$ Serious defects (Class A) $\text{AQL}=0.65$ Minor defects (Class C) $\text{AQL}=1.5$	
24	遥控器运输及储存条件 Remote control transportation and storage conditions	运输途中应避免雨雪直接侵袭或者强烈冲击。遥控器应储存在环境温度 $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$, 相对湿度不大于 80%, 周围没有强磁场、腐蚀物质和其它有害气体的库房中, 储存期为一年。超过一年的产品经重新评估合格后, 方可流入市场。 Avoid direct rain or snow or strong impact during transportation. The remote control should be stored in a warehouse where the ambient temperature is $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$, the relative humidity is not more than 80%, and there is no strong magnetic field, corrosive substances and other harmful gases around. The storage period is	

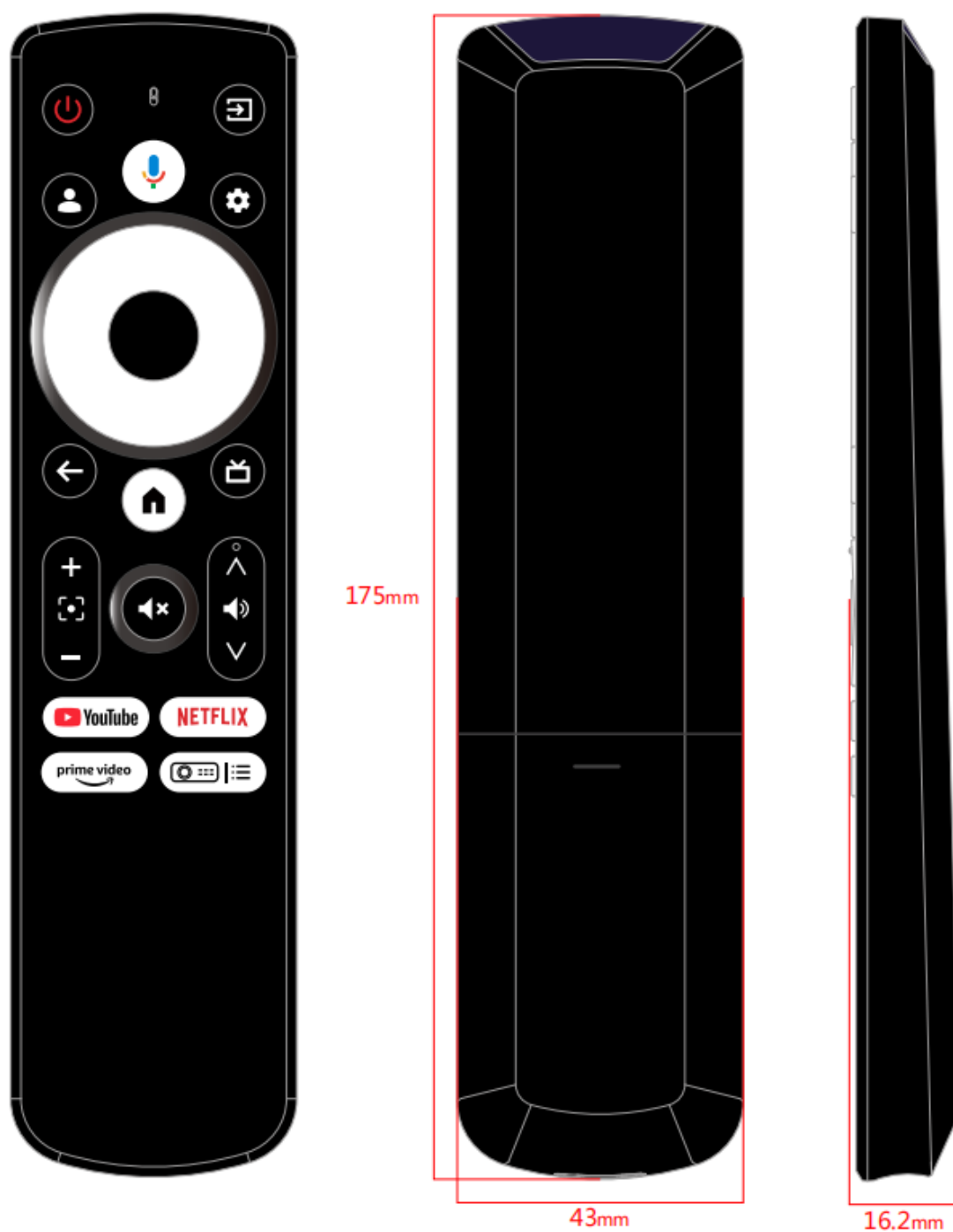
		one year. Products older than one year may enter the market only after being re-evaluated and qualified.	
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3、规格要求 Specification requirements

序号 Serial number	项目 Project	描述 Description	备注 Remarks
1	使用电池 Use battery	碱性环保电池 Alkaline environmental protection battery	
2	供电电压 Supply voltage	2.2-3.6V	
3	电流描述 Current description	$\leq 10 \mu A$ @休眠功耗 $\leq 3mA$ @待机功耗 $\leq 30mA$ @发射功耗（常规按键） $\leq 25mA$ @录音功能（语音功能） $\leq 10 \mu A$ @sleep power consumption $\leq 3mA$ @standby power consumption $\leq 30mA$ @transmission power consumption (conventional button) $\leq 25mA$ @Recording function (voice function)	蓝牙 Bluetooth
4	音频输出 Audio output	单声道、16K 采样率、16bit 精度音频输出 Mono, 16K sampling rate, 16bit precision audio output	蓝牙 Bluetooth
5	传输距离 Transmission distance	$\geq 12m$ （周围无遮挡物） $\geq 12m$ (no obstructions around)	蓝牙 Bluetooth
6	蓝牙协议 Bluetooth protocol	蓝牙 5.0 协议 Bluetooth 5.0 protocol	蓝牙 Bluetooth
7	信号要求 Signal requirements	满足通信传输距离要求，同时符合蓝牙 BQB 认证要求 Meet the requirements of communication transmission distance and meet the requirements of Bluetooth BQB certification	蓝牙 Bluetooth
8	语音要求 Voice requirements	语音软件识别率 $\geq 90\%$ （句），有干扰情况下：语音识别率 $\geq 85\%$ （句）（需要确认和机顶盒和软件正常状态） Speech software recognition rate $\geq 90\%$ (sentence), in the case of interference: voice recognition rate $\geq 85\%$ (sentence) (requires confirmation and normal state of the set-top box and software)	蓝牙 Bluetooth
9	连接响应 Connection response	$\leq 200ms$ ，这里是指恢复连接速度，通过遥控器端测试开始广播到被连接上的时间间隔 $\leq 200ms$, here refers to the time interval from the time when the connection speed is restored and the broadcast is started to be connected through the remote control test	蓝牙 Bluetooth
10	其他通用蓝牙设备影响 Impact of other general Bluetooth devices	HOST 端适配的驱动，要不影响原有的蓝牙通用设备支持，如蓝牙耳机/音响（HSP/HFP, A2DP 等），蓝牙键盘，蓝牙鼠标，游戏手柄等。 The driver adapted to the HOST end will not affect the original Bluetooth universal device support, such as Bluetooth headset/audio (HSP/HFP, A2DP, etc.), Bluetooth keyboard, Bluetooth mouse, game controller, etc.	蓝牙 Bluetooth

11	音频传输要求 Audio transmission requirements	音频传输无异常，无明显干扰、丢数据、截幅等现象 There is no abnormal audio transmission, no obvious interference, loss of data, clipping, etc.	蓝牙 Bluetooth
12	麦克风灵敏度 Microphone sensitivity	灵敏度 $-42\pm 3\text{dB}$ Sensitivity $-42\pm 3\text{dB}$	蓝牙 Bluetooth
13	麦克风信噪比 Microphone signal to noise ratio	不能低于 58dB Not less than 58dB	蓝牙 Bluetooth

二、遥控器效果图 Remote control renderings





Button color: black

Print color:  Pantone 1795 C

Button color: White

Print color:  Pantone 179C Pantone 2173C Pantone 7549C Pantone 2257CButton color:  Pantone white CPrint color:  Pantone Black CButton color:  Pantone white CPrint color:  Pantone 485 C Pantone Black CButton color:  Pantone white CPrint color:  Pantone 1795 CButton color:  Pantone white CPrint color:  Pantone Black CButton color:  Pantone white CPrint color:  Pantone Black C**Other Keys**

Button color: Black

Print color: White

三、遥控器功能需求描述 Description of remote control function requirements

1、遥控器键值 Remote control key value

系统码: System code:	0X08F7
码格式: Code format:	NEC

NO	Key Name	IR Code	Usage Page	Usage ID
1	Power	0x0A	0x0C	0x0030
2	Input	0x08	0x07	0x0041
3	Google Assistant	0x74	0x0C	0x0221
4	User Profile	0x59	0x0C	0x019C
5	Setting	0x61	0x07	0x006E
6	OK	0x1F	0x0C	0x0041
7	D-pad up	0x00	0x0C	0x0042
8	D-pad down	0x01	0x0C	0x0043
9	D-pad right	0x02	0x0C	0x0045
10	D-pad left	0x03	0x0C	0x0044
11	Back	0x1C	0x0C	0x0224
12	Home	0x0C	0x0C	0x0223
13	Guide (TV)	0x1E	0x0C	0x008D
14	Focus +	0x42	0x07	0x006C
15	Focus -	0x43	0x07	0x006D
16	Mute	0x0D	0x0C	0x00E2
17	VOL +	0x58	0x0C	0x00E9
18	VOL -	0x5D	0x0C	0x00EA
19	YouTube	0x4D	0x0C	0x0007
20	Netflix	0x4E	0x0C	0x0008
21	Prime Video	0x2E	0x07	0x003E
22		0x38	0x07	0x003F

2、遥控器操作说明 Remote control instructions

1. 遥控器基本要求 Basic requirements for remote control

1).当连上蓝牙，遥控器发送蓝牙键值；未连接上蓝牙，则发送红外键值。

1). When Bluetooth is connected, the remote control sends the Bluetooth key value; when Bluetooth is not connected, the infrared key value is sent.

2).指示灯：当连接 BT 工作时，按键闪烁蓝色灯；当未连接 BT，用 IR 工作时，按键闪烁红色灯。每按一次按键，指示灯闪一下。

2).Indicator light: When working with BT, the button flashes blue light; when not connected to BT, when working with IR, the button flashes red light. Each time the button is pressed, the indicator light flashes.

3). 低电压提醒：电量低于 $2.4\text{V} \pm 0.05\text{V}$ 时，按按钮，红色 LED 闪烁 3 下表示电池电量不足，需要及时更换电池。当电压低于 2.0V 时，遥控器不工作。

3). Low voltage reminder: When the power is lower than $2.4\text{V} \pm 0.05\text{V}$, press the button and the red LED flashes 3 times to indicate that the battery power is insufficient and the battery needs to be replaced in time. When the voltage is lower than 2.0V, the remote control does not work.

4).配对方法：

a.同时按住 HOME+BACK 键 3 秒，指示灯闪烁，配对成功指示灯常亮 3 秒后熄灭。

b.没配对成功时，如果还在按 HOME+BACK 键就要一直发配对广播，以使用户可以配对。

c.按一次 HOME+BACK 键就要能配对成功，不要反复清除配对再配对。一次按键配对成功后可以不再发配对广播，直到下次重新按键。

d. Connection interval < 12ms

4). Pairing method:

a. Press and hold the HOME+BACK keys at the same time for 3 seconds, the indicator light flashes, and the pairing success indicator light is always on for 3 seconds and then goes out.

b. When the pairing is not successful, if you still press the HOME+BACK key, you must keep sending the pairing broadcast so that the user can pair.

c. Press the HOME+BACK button once to be able to pair successfully, do not clear the pairing repeatedly and then pair. After a key pairing is successful, the pairing broadcast can no longer be sent until the key is pressed again next time.

d. Connection interval < 12ms

5).遥控距离：≥10m

5). Remote control distance: ≥10m

6). 蓝牙设备名称：RemoteB064

6). Bluetooth device name: RemoteB064

7).错误报告：一起按“OK+Back”键，支持上传错误报告。

7). Bug report : Press the "OK+Back" keys together support upload bug report .

8).支持连接蓝牙版本为 5.0 的设备

8). Support to connect to devices with Bluetooth version 5.0

9).同时按下“OK+音量+”取消蓝牙配对

9). Press "OK+Volume+" at the same time to cancel Bluetooth pairing

10).在不使用语音的时候 Interval 为 20ms,使用语音的时候 interval 为 10ms;语音采样为 16K

10). Interval is 20ms when voice is not used, and 10ms when voice is used; Voice sampling is 16K.

Connection Parameters		
Operating mode/parameters	Non-voice state	Voice state
Interval	20ms	10ms(Adjustment according to the program)
Slave latency	49	0
Supervision timeout	2.2	1

11).支持蓝牙状态下能玩 PAC Man 游戏（仅限 ATV 使用）

11). Play PAC Man games in Bluetooth mode(only required for ATV project)

12).蓝牙回连时不能存在闪屏

12).There must be no splash screen during Bluetooth connection

13) .语音协议使用标准语音协议

13).Voice protocols Use standard voice protocols

14).增加按键唤醒包

1、MTK 的开机广播格式：

请严格按照这张图片的格式来发广播包，红色的不能变，黄色一定要有变化。广播类型为不可连接广播ADV_NONCONN_UNDIRECT。

a.0x020x010x05(0x06)需要三 bytes

b.0x030x190x800x01需要四 bytes

c.0x030x020x120x18需要四 bytes

d.0x130xff 0x46 0x00需要,这后面就是manufacture data的具体内容了,主要是match这里的字段, 0x13是整个 manufacture 的长度

e.0x00seqnumber(可以按一次键在广播包里加1, 也可以比如200ms/500ms加1,用时间的目的就是只按一次按键如果没有唤醒, 如果广播包没有停可以继续唤醒, 模组拉GPIO后, 如果没被唤醒, seqnumber有变化会再去拉, 如果不变, 后面就不会去拉了, 所以这个可以和按一次按键发唤醒包的总时间做个合试的值, 如果用户连续按按键也请考虑进去)

f.FFFFFFFF FFFF对方device也就是box的地址

g.FFFF FFFF随意定义, 但需要4bytes

h.0x430x520x4b0x540x4dCRKTM 就是名字 MTKRC反过来的十六进制

2、Netflix

Keys	Manufacturer Data	Company ID	Vendor info	key	Mac addr	Key index
Netflix key	0xff	0xff0xff	0x41,0x6d,0x6c,0x6f,0x67,0x69,0x63	0x02	xx xx xx xx xx xx	累加

14).Add key wakeup package

1、MTK 的开机广播格式：

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2、Netflix

Keys	Manufacturer Data	Company ID	Vendor info	key	Mac addr	Key index
Netflix key	0xff	0xff0xff	0x41,0x6d,0x6c,0x6f,0x67,0x69,0x63	0x02	xx xx xx xx xx xx	累加

2. 遥控器其他要求 Remote control other requirements

1). 配对功能要求：不得存在扫描不到蓝牙设备或配对不上（包括短时间内连续按配对键）的问题，请验证 50 次确保无问题；

1). Pairing function requirements: there must be no problems that the Bluetooth device cannot be scanned or paired (including continuous pressing of the pairing key within a short period of time), please verify 50 times to ensure that there is no problem;

2). 回连功能要求:不得存在回连不上的问题，包括盒子断电回连，遥控器断电回连，静置 2 小时回连等，请验证 50 次确保无问题；

2). Reconnection function requirements: there must be no problems with the connection failure, including the box power failure and the connection, the remote control power failure and the connection, stand for 2 hours to reconnect, etc., please verify 50 times to ensure that there is no problem;

3). 抗干扰功能要求：不得存在非常影响主机 WIFI 吞吐量的问题，请确保连接遥控器时主机端 WIFI 吞吐量正常；

3). Anti-interference function requirements: there must be no problems that greatly affect the host's WIFI throughput, please ensure that the host's WIFI throughput is normal when connecting the remote control;

4). 性能要求：要求支持 $\geq 10m$ ，不得存在语音通话卡顿，丢失以及遥控器按键卡顿、丢码或连键等问题；

4). Performance requirements: It is required to support $\geq 10m$, and there must be no voice call jams, loss, and remote control button jams, missing codes, or continuous keys;

5). 功耗要求：遥控器可持续使用至少 6 个月以上

5). Power consumption requirements: the remote control can be used continuously for at least 6 months

6). 语音: 16Khz voice sample with 16-bit sampling, 短按语音键(彩色键)可以开始录音, 遥控器收到语音引擎下发的停止录音指令后停止录音。语音超时 30s 保护, 强制退出录音。

6). Voice: 16Khz voice sample with 16-bit sampling, short press the voice button (color button) to start recording, and the remote control will stop recording after receiving the stop recording command from the voice engine. The voice timeout is protected for 30s, and the recording is forced to exit.

7).盒子软件可以控制 MIC 打开及关闭。

7). The box software can control the opening and closing of the MIC.

8).支持遥控器 MIC 和其他 MIC (如手机 apk 上的录音键) 交替、切换语音输入。

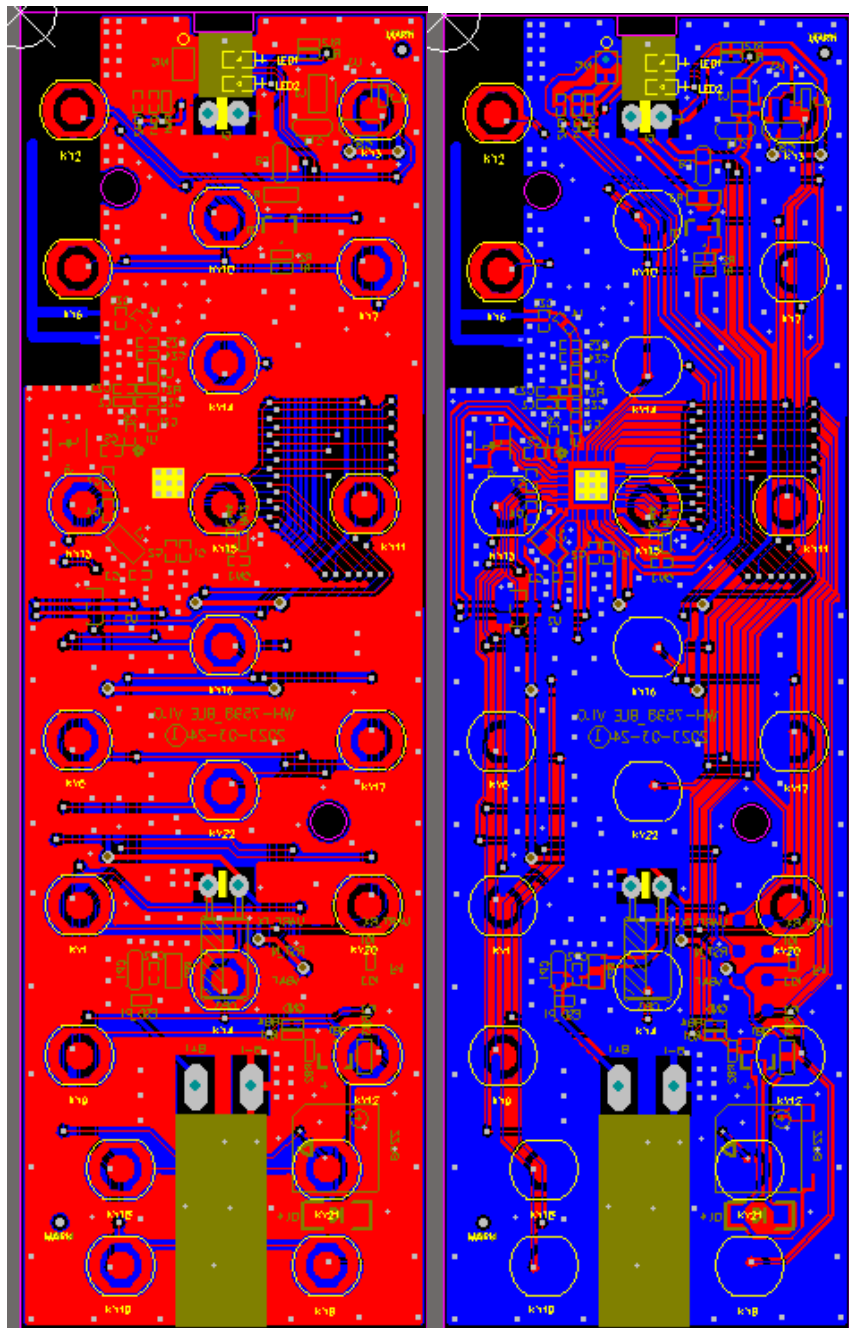
8). Support the remote control MIC and other MIC (such as the recording key on the phone apk) to alternate and switch voice input.

9)其他要求: 谐波 (THD) 必须小于 5%@1KHz; 在 200Hz 到 8KHz 的频率范围内的幅度+/-5dB; 94dB SPL 参考声压级 1KHz。

9) Other requirements: Harmonics (THD) must be less than 5%@1KHz; amplitude +/-5dB in the frequency range of 200Hz to 8KHz; 94dB SPL reference sound pressure level 1KHz.

四、遥控器零部件图档 Remote control parts drawings

1、遥控器 PCB 图档 Remote control PCB drawing file



FCC STATEMENT :

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

RF warning statement:

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

ISED Statement

- English: This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).

- French: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils

radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

L'appareil numérique du CIEM conforme canadien peut - 3 (b) / NMB - 3 (b).

This device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS 102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Cet appareil est conforme à l'exemption des limites d'évaluation courante dans la section 2.5 du CNR - 102 et conformité avec RSS 102 de l'exposition aux RF, les utilisateurs peuvent obtenir des données canadiennes sur l'exposition aux champs RF et la conformité.

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 0cm between the radiator & your body.

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé.

Cet équipement doit être installé et utilisé avec une distance minimale de 0 cm entre le radiateur et votre corps.