

YDX-198 蓝牙语音遥控器

Bluetooth Voice Remote Control

使用手册 User Manuals

产品名称: Product Name:	蓝牙语音遥控器 Bluetooth Voice Remote Control
产品型号: Product Model:	YDX-198
产品规格: Product Spec.:	YDX-198蓝牙语音遥控器 YDX-198-Bluetooth Voice Remote Control

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YDX-198Product Specification

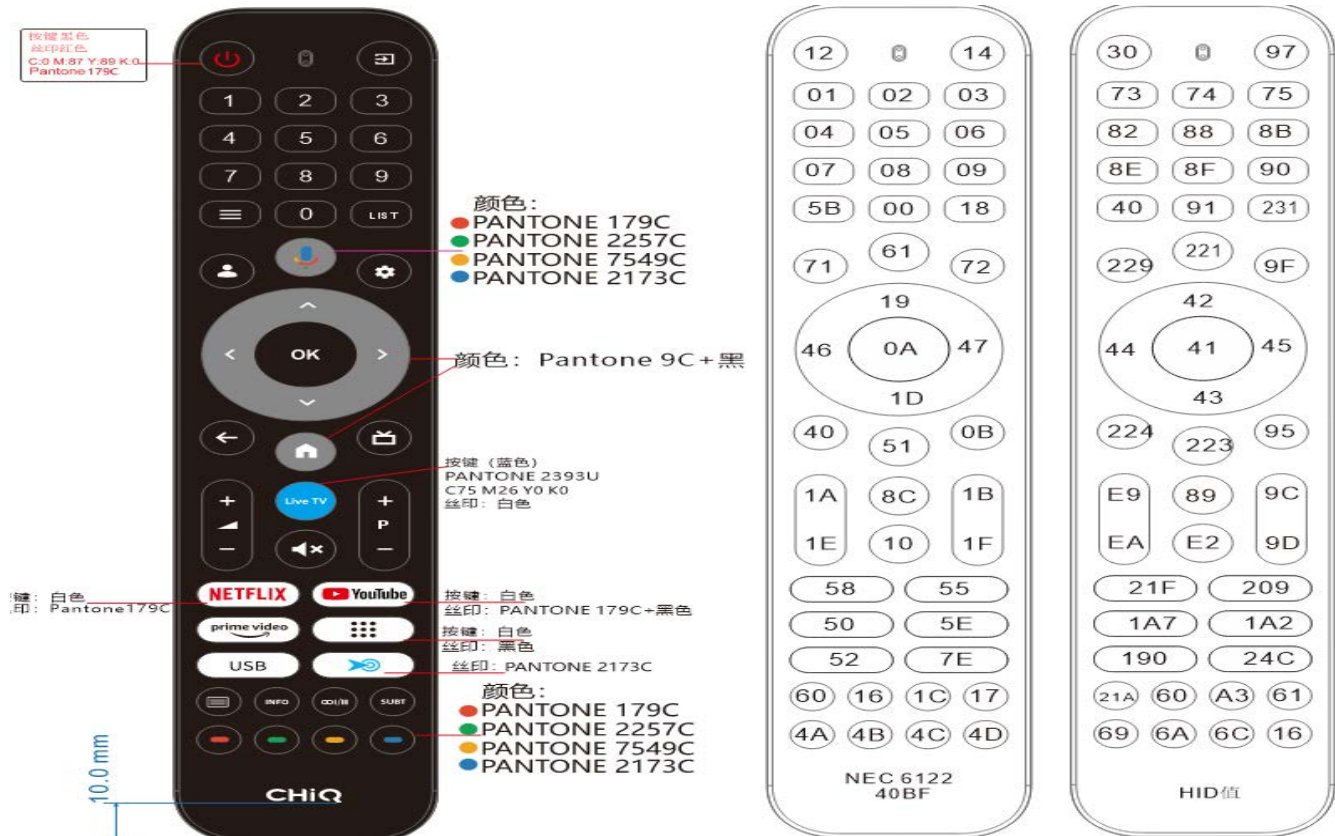
1 产品规格 Product specifications

序号 No.	说明 illustrate	技术规格 Technical specifications
1	按键数 Number of keys	45 键 45keys
2	产品尺寸 Product Size	
3	按键自由高度 Free height of keys	≤3mm
4	外壳塑胶材质 Shell plastic material	ABS 原料 ABS raw material
5	外壳颜色 Shell color	塑胶本色, 黑色 Plastic natural color, black
6	丝印要求 Silk screen requirements	耐酸耐醇耐磨 Acid and alcohol resistant
7	PCB 电路板材质 PCB circuit board material	双面板, 94HB 板材, 绿油白字, 碳油 OSP 工艺 Double-sided board, 94HBboard, green white lettering, carbon oil and OSP
8	表面涂敷处理 Surface coating treatment	遥控器外壳表面做 ABS 表面处理 The surface of the remote control shell is made of ABS surface treatment
		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, and no scratches, spots, sagging, falling off and damage are allowed
9	电路板制作要求 Circuit board production requirement	无飞线, 无零欧姆跳线 No flying lead, no zero ohm jumper
		焊点饱满, 无虚焊、脱焊、连锡 Full solder joints, no false soldering, desoldering, or even tin
		所有印刷电路板均应防腐蚀 All printed circuit boards should be corrosion resistant
10	按键要求 Button requirements	P+R 按键。塑胶外壳和硅胶内衬。 P+R button. Plastic shell and silicone lining
11	导电胶材质 Conductive glue material	使用硅胶原料 (不加粉), 无刺激性气味, 导电胶底下做锅仔片工艺 Using silica gel raw materials (no powder), no irritating odor, the process of making pot slices under the conductive glue
12	锅仔片 Pot slices	遥控器所有按键寿命≥30 万次 The service life of all keys on the remote control is ≥300,000 times

2 功能规格 Functional specifications

2.1 按键说明 Key Description

2.1.1 遥控器外观 Remote control appearance



2.1.2 红外协议 infrared protocol

红外协议: NEC, 用户码: 0x40BF

infrared protocol: NEC, user code: 0x40BF

2.2 供电说明 Power supply instructions

2.2.1 电池规格 Battery specifications

采用 2 节 7 号 (AAA) 电池供电。Powered by 2 AAA batteries

2.2.2 工作模式 Operating mode

遥控器插入电池后开始工作。

The remote control starts to work after inserting the batteries.

遥控器根据按键发码格式分为红外模式和蓝牙模式，当遥控器与主机端未连接或已配对未连接时，遥控器处于红外模式，按键后，发出的是红外键值码；当遥控器与主机端蓝牙连接时，按键后，发出的是蓝牙键值码。

The remote control is divided into infrared mode and bluetooth mode according to the key code format. When the remote control is not connected to the host or paired and not connected, the remote control is in infrared mode. After the key is pressed, the infrared key value code is emitted; when the remote control is When connecting with the host's Bluetooth, after pressing the key, the Bluetooth key value code is sent out.

2.2.3 休眠机制 Hibernation mechanism

红外模式下，当遥控器无操作 3s 后，遥控器进入深休眠状态。

In infrared mode, when the remote control is not operated for 3s, the remote control enters the deep sleep state.

蓝牙连接时，当遥控器无操作 3s 后，遥控器进入浅休眠状态。（浅休眠模式下，每隔 1s 发送一次蓝牙心跳包）

When Bluetooth is connected, when the remote control is not operated for 3s, the remote control enters the light sleep state. (In shallow sleep mode, a Bluetooth heartbeat packet is sent every 1s)

在休眠模式下，遥控器按键操作可唤醒系统进入正常工作状态。

In the sleep mode, the remote control button operation can wake up the system and enter the normal working state.

2.3 配对说明 Pairing instructions

蓝牙设备名称：Bluetooth remote

Bluetooth device name: Bluetooth remote

2.3.1 配对组合键 Paired key combination

配对组合键：【BACK】+ 【OK】

Pairing key combination: [BACK] + [OK] 取消配

对组合键：【BACK】+ 【OK】 Unpairing key

combination: [BACK] + [OK]

2.3.2 自动配对 Automatic pairing

按语音键，机顶盒弹出配对提示界面；

Press the voice button, the set-top box will pop up the pairing prompt interface; 同

时按下遥控器上的【BACK】+ 【OK】键 3s 以上，当遥控器指示灯闪烁时，松开配对

组合按键；

Press the [BACK] + [OK] buttons on the remote control at the same time

for more than 3 seconds. When the remote control indicator flashes,

release the pairing combination button;

机顶盒的配对提示界面会显示当前配对状态，配对成功后，提示界面消失；

The pairing prompt interface of the set-top box will display the current pairing status. After the pairing is successful, the prompt interface disappears;

2.3.3 手工配对步骤 Manual pairing steps

机顶盒开机进入 launcher 界面

Boot the STB into the launcher interface.

使用遥控器打开机顶盒设置界面，点击蓝牙设置，打开蓝牙搜索按钮；或者按语音键

直接进入配对界面

Use the remote control to open the set-top box setting interface, click Bluetooth settings to open the Bluetooth search button; or press the voice key to directly enter the pairing interface.

同时按下遥控器上的【BACK】+【OK】键 3s 以上，当遥控器指示灯闪烁时，松开配对组合按键

Press the [BACK] + [OK] buttons on the remote control at the same time for more than 3 seconds, when the remote control indicator flashes, release the pairing combination button.

在机顶盒的蓝牙设备列表选择 Bluetooth remote设备，点击连接，完成遥控器配对绑定

Select the RemoteB016 device in the Bluetooth device list of the set-top box, click connect to complete the remote control pairing and binding.

当遥控器配对成功时，遥控器指示灯慢闪 2 次后熄灭

When the remote control is successfully paired, the remote control indicator flashes slowly for 2 times and then goes out

2.3.4 取消配对 Unpair

同时按下【BACK】+【OK】键 3s 以上，取消蓝牙配对。

Press [BACK] + [OK] keys at the same time for more than 3 seconds to cancel Bluetooth pairing.

2.3.5 上报功能 Report function

无上报功能

No reporting function

2.3.6 回连机制 Back-connection mechanism

当遥控器与机顶盒完成配对后，在遥控器与机顶盒端断开蓝牙连接状态下，每次按键，遥控器会在发送按键红外键值码后，发送一次回连广播，当机顶盒端接收到回连广播后，遥控器与机顶盒重新建立连接关系，从红外模式转换到蓝牙模式。

After the remote control and the set-top box are paired, when the remote control and the set-top box are disconnected from the Bluetooth connection state, each time you press a key, the remote control will send a loopback broadcast after sending the infrared key value code of the button. When the set-top box receives the response After the broadcast is connected, the remote control and the set-top box re-establish the connection relationship and switch from infrared mode to Bluetooth mode.

2.4 语音说明 Voice description

遥控器通过麦克风进行语音采集，采样率为 16KHz，采样精度为 16bit，采样声道为单声道；

The remote control uses a microphone for voice collection, the sampling rate is 16KHz, the sampling accuracy is 16bit, and the sampling channel is mono;

遥控器与主机内置的蓝牙建立蓝牙连接；

The remote control establishes a Bluetooth connection with the built-in Bluetooth of the host;

采样的语音数据使用 google voice 标准进行编码;

The sampled voice data is encoded using the google voice standard;

语音超时 30s 保护, 强制退出录音, 盒子软件可以控制 MIC 打开以及关闭;

The voice timeout is protected for 30s, the recording is forced to exit, and the box software can control the MIC to open and close;

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

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

	Transmission O/P power	Voice	D-Pad	Voice Operation Range	D-Pad Operation Range
TICC2541	2 dBm	25 mA	1200 uA	7m	10m
TICC2560	5 dBm	11 mA	300 uA	10m	15m

2.5 指示灯说明 Indicator light description

2.5.1 红外模式 Infrared mode

按键按下时, 指示灯亮 0.2s 后熄灭

When the button is pressed, the indicator light turns on for 0.2s and then goes out

2.5.2 蓝牙模式 Bluetooth mode

按键按下时, 指示灯亮 0.2s 后熄灭

When the button is pressed, the indicator light is on, when the button is lifted, the indicator light is off

2.5.3 配对状态 Pairing status

进入配对状态时，指示灯快速闪烁（0.2s 间隔 ON/OFF）

When entering the pairing state, the indicator light flashes quickly (0.2s interval ON/OFF)

配对成功时，指示灯长亮 1s 熄灭；

When the pairing is successful, the indicator light stays on for 1s and goes out;

配对超时或配对失败时，指示灯直接熄灭

When pairing timeout or pairing fails, the indicator light will go out directly

2.5.4 录音状态 Recording status

当按下遥控器语音键且开始录音时，指示灯常亮；松开语音键且停止录音时，指示灯熄灭

When the remote control voice key is pressed and the recording is started, the indicator light is always on; when the voice key is released and the recording is stopped, the indicator light is off.

3 材料清单 BOM

Report Date:	2025/12/11	15:21			
Print Date:	11-Dec-25	4:58:50 PM			
#	Comment	Designator	Description	Footprint	Quantity
1	4.7uF	C1		0402C	1
2	33pF	C2		0402C-X	1
3	0.1uF	C3		0402C-X	1
4	27pF	C4		0402C-X	1
5	2.2uF	C5, C6		0402C-X	2
6	198款 F4有边大功率(新绿)号脚	D1		DIP-198-LED-D4	1
7	0R	JR1, JR2, JR3, JR4, JR5, JR6, JR7, JR8		0805R-X	8
8	LED\0805\红色\侧贴	LED1		0805-LED-31	1
9	MIC	MIC		MIC4015	1
10	S8550	Q1		SOT-23A	1
11	200K	R1		0402R-X	1
12	680	R2		0402R-X	1
13	2.2K	R3, R7		0402R-X	2
14	1K	R5		0402R	1
15	1R	R6		0603R-X	1
16	SSOP24	U1		SSOP24-W305A-31	1
17	S3225/24MHZ、12PF	Y1		Y13	1

4 性能规格 Performance specifications

4.1 性能 Performance

语音支持 $\geq 10\text{m}$ 使用, 不得存在语音通话卡顿, 丢失及遥控器按键卡顿、丢码或连键等问题

Voice support $\geq 10\text{m}$ use, there must be no voice call jam, loss, and remote control button freeze, lost code or continuous key issues, etc.

红外遥控距离 $\geq 10\text{M}$, 响应 $\leq 20\text{ms}$.

Infrared remote control distance $\geq 10\text{M}$, response $\leq 20\text{ms}$.

蓝牙遥控器距离 $\geq 10\text{M}$, 响应 $\leq 20\text{ms}$, 唤醒连接响应(回连)时间 $< 2\text{s}$.

Bluetooth remote control distance $\geq 10\text{M}$, response $\leq 20\text{ms}$, wake-up connection response(Reconnect) $< 2\text{s}$.

遥控器功耗可连续使用至少 6 个月以上。

The power consumption of the remote control can be used continuously for at least 6 months.

配对功能: 不存在扫描不到蓝牙设备或配对连接不上(包括短时间内连续按配对键)的问题, 连续 50 次以上无问题

Pairing function: There is no problem that the Bluetooth device cannot be scanned or the pairing connection (including pressing the pairing key continuously

for a short period of time) is not present, and there is no problem for more than 50 consecutive times.

回连功能：不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，连续 50 次以上无问题

Reconnection function: There is no problem of failure to reconnect, including the box power failure and reconnection, the remote control power failure reconnection, standing for 2 hours to reconnect, etc., no problem for more than 50 consecutive times.

4.2 麦克风参数 Microphone parameters

序号 No.	项目 Project	指标要求 Index requirements
1	灵敏度 Sensitivity	-38±3dB (f=1KHz,Pin=1Pa)
2	信噪比 Signal to Noise Ratio	≥58dB(94dB SPL@1KHz,A-weighted)
3	总谐波失真 Total Harmonic Distortion	≤1%(100dB SPL@1KHz)
4	采样率 Sampling rate	≥16K
5	频率响应 Frequency Response	300Hz-6kHz, 平坦度±3dB
6	动态范围 Dynamic Range	> 60dB

4.3 电气参数 Electrical parameters

序号 No.	项目 Project	指标要求 Index requirements
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1	工作温度 Operating temperature	-20℃-55℃
2	存储温度 Storage temperature	-25℃-60℃
3	相对湿度 Relative humidity	≤93%
4	工作电压 Operating Voltage	2.2-3.6V
5	动态电流 (蓝牙) Dynamic current (BLE)	短按按键平均电流: 小于 10mA Short press the button average current: less than 10mA 长按按键平均电流: 小于 10mA Long press button average current: less than 10mA 短按语音键平均电流: 小于 10mA Short press the voice button average current: less than 10mA 长按语音键平均电流: 小于 15mA Long press the voice button average current: less than 15mA
6	动态电流 (红外) Dynamic current (Infrared)	短按按键平均电流: 小于 30mA Short press the button average current: less than 30mA 长按按键平均电流: 小于 25mA Long press button average current: less than 25mA
7	静态电流 Quiescent Current	蓝牙连接≤65uA 蓝牙断开≤6uA Bluetooth connection≤65uA Bluetooth disconnection≤6uA
8	红外波长 Infrared wavelength	940±50nm
9	红外载波频率 Infrared carrier frequency	37.9±0.6KHz
10	蓝牙工作频率 Bluetooth operating frequency	2400~2483.5MHz

11	蓝牙频率偏差 Bluetooth frequency deviation	$\pm 30\text{KHz}$
12	蓝牙发射功率 Bluetooth TX power	+4dBm
13	接收灵敏度（典型值） Receiving sensitivity (typical)	-92.5dBm
14	静电放电(ESD) Electrostatic discharge(ESD)	接触放电 $\pm 4\text{KV}$ ，空气放电 $\pm 8\text{KV}$ Contact discharge $\pm 4\text{KV}$, air discharge $\pm 8\text{KV}$

4.4 可靠性测试 Reliability test

序号 No.	检测项目 Test items	检测仪器 Testing equipment	检测方法 Detection method
1	高温储存测试 High temperature storage test	恒温恒湿机 Constant temperature and humidity machine	遥控器在不包装、不装电池的状态下，放入室温的试验箱中，然后以 0.7-1.0℃/分钟的平均速率逐渐升温到 $60\pm 3^\circ\text{C}$ 后，保持 24 小时，再以 0.7-1.0℃/分钟的平均速率逐渐减低到室温范围，取出遥控器，并将遥控器在室温下搁置 2 小时后，测试遥控器的各项功能和性能情况；要求各项功能和性能正常 The remote control is placed in a test box at room temperature without packaging and batteries, and then gradually heating up to $60\pm 3^\circ\text{C}$ at an average rate of 0.7-1.0℃ per minute, and then maintaining it for 24 hours, and then at 0.7-1.0℃. The average rate of °C per minute is gradually reduced to the room temperature range, take out the remote control, and leave the remote control at room temperature for 2 hours, then test the functions and performance of the remote control; all functions and performance are required to be normal.

2	低温储存测试 Low temperature storage test	恒温恒湿机 Constant temperature and humidity machine	遥控器在不包装、不装电池的状态下，放入室温的试验箱中（为防止结露，可使用塑料薄膜密封）。然后以 0.5-1.0℃/分钟的平均速率逐渐降温到 -25±3℃后，保持 24 小时，再以 0.5-1.0℃/分钟的平均速率逐渐上升到室温范围，取出遥控器，并将遥控器在室温下搁置 2 小时后，测试遥控器的各项功能和性能情况；要求各项功能和性能正常 The remote control should be placed in a test box at room temperature without packaging and batteries (to prevent condensation, it can be sealed with a plastic film). Then gradually cool down to -25±3℃ at an average rate of 0.5-1.0℃ per minute, keep it for 24 hours, and then gradually rise to the room temperature range at an average rate of 0.5-1.0℃ per minute, take out the remote control, and place the remote control After leaving it at room temperature for 2 hours, test the functions and performance of the remote control; all functions and performance are required to be normal.
3	恒定温湿储存测试 Constant temperature and humidity storage test	恒温恒湿机 Constant temperature and humidity machine	遥控器放入室温的试验箱中。然后将温度调整至 40±2℃，在温度稳定后，调整湿度到相对湿度(93+2/-3)%,在此条件下放置 96 小时。测试结束，先在 0.5 小时内降低相对湿度到 75%±3%，再在 0.5 小时内将温度降低到室温环境，取出遥控器，恢复 2 小时后，测试遥控器各项功能和性能；要求各项功能和性能正常；（如在测试后，遥控器上有水珠或结露，应待其消失后再测试） The remote control is placed in a test chamber at room temperature. Then adjust the temperature to 40±2℃. After the temperature stabilizes, adjust the humidity to (93+2/-3)% of the relative humidity, and leave it under this condition for 96 hours. At the end of the test, first reduce the relative humidity to 75%±3% within 0.5 hours, then reduce the temperature to room temperature within 0.5 hours, take out the remote control, and after recovering for 2 hours, test the functions and performance of the remote control; The function and performance of the item are normal; (if there is water droplets or condensation on the remote control after the test, you should wait for it to disappear before testing).

4	温度变化测试 Temperature change test	恒温恒湿机 Constant temperature and humidity machine	遥控器在不包装、不装电池的状态下，放入室温的试验箱中。然后以 $1\pm0.5^{\circ}\text{C}$ 每分钟的速率调整温度至 $-25\pm3^{\circ}\text{C}$，恒温 3 小时后，以 $1\pm0.2^{\circ}\text{C}$ 每分钟的速率调整温度至 $60\pm2^{\circ}\text{C}$，恒温 3 小时后，以 $1\pm0.2^{\circ}\text{C}$ 每分钟的速率调整温度至室温环境，以上为一次循环。以上述方式依次连续循环 5 个试验循环。试验结束后，遥控器各项功能和性能正常。（如在测试后，遥控器上有水珠或结露，应待其消失后再测） The remote control is placed in a test box at room temperature without packaging and batteries. Then adjust the temperature to $-25\pm3^{\circ}\text{C}$ at a rate of $1\pm0.5^{\circ}\text{C}$ per minute. After 3 hours of constant temperature, adjust the temperature to $60\pm2^{\circ}\text{C}$ at a rate of $1\pm0.2^{\circ}\text{C}$ per minute. After constant temperature for 3 hours, Adjust the temperature to room temperature at a rate of $1\pm0.2^{\circ}\text{C}$ per minute, the above is one cycle. Repeat 5 test cycles successively in the above manner. After the test, the functions and performance of the remote control were normal. (If there is water droplets or condensation on the remote control after the test, you should wait for it to disappear before testing).
5	盐雾测试 Salt spray test	盐雾试验机 Salt spray test machine	将金属部件放入盐水浓度(质量百分比)$5\%\pm0.1\%$，试验室温度 $35^{\circ}\text{C}\pm2^{\circ}\text{C}$，饱和空气桶温度 47°C，喷雾气压 $1\text{KG}/\text{CM}$ 的试验箱内测试 8 小时。要求测试后，金属部件无氧化、生锈现象。 Put the metal parts into the salt water concentration (mass percentage) $5\% \pm 0.1\%$, the temperature of the test room Test for 8 hours in a test box with a temperature of $35^{\circ}\text{C}\pm2^{\circ}\text{C}$, a saturated air barrel temperature of 47°C, and a spray air pressure of $1\text{KG}/\text{CM}$. After the test is required, the metal parts shall be free of oxidation and rust.
6	按键复位测试 Button reset test	测力计 Dynamometer	在遥控器按键的约 $1/4$ 的位置的左端、右端以及按键的左右前后侧，加以 10N 的力，按压 2min。要求测试后被测按键无断裂，能正常复位，该键功能正常。 检验图示： On the left and right ends of the remote control button about $1/4$ of the position, and the left and right front and back of the button On the side, apply a force of 10N and press for 2 minutes. It is required that the tested key is not broken after the test, can be reset normally, and the key

			function is normal. Inspection icon:
7	按键负荷力测试 Button load test	测力计 Dynamometer	按压按键，遥控器工作时，导电胶大四方向键的按压力为 $310 \pm 50\text{g}$，其他按键为 $235 \pm 50\text{g}$，综合手感判定。 Press the button, when the remote control is working, the pressing force of the conductive adhesive big four direction button is $310 \pm 50\text{g}$, other keys are $235 \pm 50\text{g}$, judged by comprehensive hand feeling.
8	按键按压强度测试 Key press strength test	测力计 Dynamometer	在遥控器按键平面中央，垂直加 30N 的按压力，按压 3min；要求测试后，各键应无破损，各键功能正常 In the center of the remote control key plane, apply a vertical pressure of 30N and press for 3 minutes; after the test is required, the keys should not be damaged and the keys function normally.

4.5 遥控器升级 Remote control upgrade

遥控器支持 OTA 升级功能。

Support OTA upgrade function.

5 申明 Notice

联邦通信委员会通知

本设备符合 FCC 规则的第 15 部分。操作需满足以下两个条件：(1) 本设备不会造

成有害干扰，以及 (2) 本设备必须接受接收到的任何干扰，包括可能导致意外操作的干扰。

任何未经合规责任方明确批准的更改或修改都可能导致用户操作设备的权限失效。

注意：根据 FCC 规则第 15 部分，本设备已经过测试，符合 B 类数字设备的限制。这些限制旨在提供合理的保护，防止住宅安装中的有害干扰。本设备会产生用途并辐射射频能量，如果未按照说明安装和使用，可能会对无线电通信造成有害干扰。但是，不能保证在特定安装中不会发生干扰。如果此设备确实对无线电或电视接收造成有害干扰，可以通过关闭和打开设备来确定，鼓励用户尝试通过以下一项或多项措施来纠正干扰：

- 重新调整或摆放接收天线。
- 增加设备和接收器之间的距离。
- 将设备连接到与接收器所连接的电路不同的电路上的插座。
- 向经销商或有经验的无线电/电视技术人员寻求帮助。

该设备已经过评估，符合一般射频暴露要求。该设备可以不受限制地在便携式暴露条件下使用。

Federal Communications Commission Notice

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.

Any 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.

The device has been evaluated to meet general RF exposure requirement.

The device can be used in portable exposure condition without restriction.