

深圳市华曦达科技股份有限公司
SHEN ZHEN SDMC Technology Co., LTD



遥控器规格书

名称:	华曦达
Name:	SDMC
料号 1:	
Part Number 1:	110400765
料号 2:	
Part Number 2:	WH-7435_BLE
类型:	蓝牙+语音+红外
Types of:	Bluetooth + voice + infrared
日期:	
date:	2022-11-14
拟制:	厉林玉
Drafting:	LiLinyu
审核:	黄伟
Review:	Gause Huang
批准:	郑文戈
Approve:	ZhengWenge

承制方名称: 深圳市华曦达科技股份有限公司
Name of contractor: SHEN ZHEN SDMC Technology Co., LTD
地址: 深圳市南山区高新园科技南十二路 18 号长虹科技大厦 19 层
Address: 19/F, Changhong Science & Technology Mansion, No.18, Keji South 12th Road, High-tech Industrial Park, Nanshan District, Shenzhen, China

网址(Web): www.sdmctech.com

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
2022-11-14	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:	XH9820
	硬件型号： Main chip model:	WH-7229-XH9820_BLE V1.0
	MAC 地址管控： MAC address control:	不需要 Not needed
	软件版本： Software version:	

目录

Table of Contents

一、遥控器测试条件及参数 Remote control test conditions and parameters.....	5
1、硬件要求 Hardware requirements	5
2、产品规格 Product specifications	6
3、规格要求 Specification requirements	8
二、遥控器效果图 Remote control renderings	10
三、遥控器功能需求描述 Description of remote control function requirements	12
1、遥控器键值 Remote control key value	12
2、遥控器操作说明 Remote control instructions.....	13
四、遥控器零部件图档 Remote control parts drawings	16
1、遥控器 PCB 图档 Remote control PCB drawing file	16

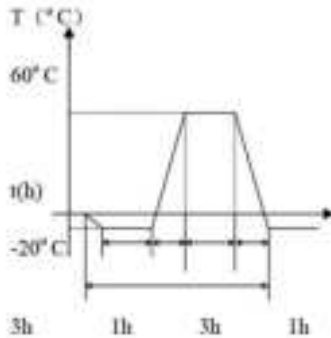
一、遥控器测试条件及参数 Remote control test conditions and parameters**1、硬件要求 Hardware requirements**

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	16 键 16 keys	
2	遥控器尺寸 Remote control size	160*42*21mm	
3	按键自由高度 Free height of keys	≤2mm	
4	按键作用后高度 Height after key press	≥0.5mm	
5	按键作用力 Button force	160g±30gf	
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	塑胶本色，黑色 Plastic natural color, black	
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℃	
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	XH9820	
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	电池规格 Battery specifications	AAA 1.5*2	
10	红外波长 Infrared wavelength	950 \pm 50nm	红外 Infrared
11	红外载波频率 Infrared carrier frequency	38.0 \pm 0.5KHz	红外 Infrared
12	蓝牙载波频率 Bluetooth carrier frequency	2.400GHz~2.4835GHz	蓝牙 Bluetooth
13	平均工作电流 Average working current	≤ 20 mA	

14	平均静态电流 Average quiescent current	$\leq 10\mu A$	
15	工作电压范围 Operating voltage range	2.2~3.6V	
16	遥控距离 Remote control distance	$L \geq 10M$ (红外) $L \geq 10M$ (infrared)	红外 Infrared
20	按键负荷寿命 Button load life	≥ 50 万次 $\geq 500,000$ times	
21	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.	
22	空气放电 Air discharge	$\pm 8KV$	
23	高温储存试验 High temperature storage test	60°C	
24	低温储存试验 Low temperature storage test	-20°C	
25	恒定湿热试验 Constant humidity test	40°C 相对湿度 $90 \pm 2\%$ 40°C relative humidity $90 \pm 2\%$	
26	温度循环变化试验 Temperature cycle change test		
27	验收标准 MIL-STD-105E-LEVEL(II) AQL Acceptance standard MIL-STD-105E-LEVEL(II) AQL	重缺陷 (A 类) AQL=0.65 轻缺陷 (C 类) AQL=1.5 Serious defects (Class A) AQL=0.65 Minor defects (Class C) AQL=1.5	
28	遥控器运输及储存条件 Remote control transportation and storage conditions	<p>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°C~+60°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。</p> <p>Avoid direct rain or snow or strong impact during transportation.</p> <p>The remote control should be stored in a warehouse where the ambient temperature is -20°C~+60°C, the relative humidity is not more than 80%, and there is</p>	

		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.	
--	--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

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	蓝牙 Bluetooth

		Bluetooth universal device support, such as Bluetooth headset/audio (HSP/HFP, A2DP, etc.), Bluetooth keyboard, Bluetooth mouse, game controller, etc.	
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



1. Remote Device: RemoteB037
2. Protocol: NEC; User code :08f7;
3. Button: 16 keys; Size:160×42×20.5mm
4. Color



Button color: black

Print color: ■ Pantone 179C

■ Pantone 2173C

■ Pantone 7549C

■ Pantone 2257C



Button color: ☐ Pantone white C

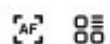
Print color: ■ Pantone 485 C

■ Pantone Black C



Button color: ☐ Pantone white C

Print color: ■ Pantone 1795 C



Button color: ☐ Pantone white C

Print color: ■ Pantone black C

Other Keys

Button color: Black

Print color: ☐ Pantone white C

公司名称	华曦达科技			使用机型	
档案名称	B037-02-W1_遥控器.ai			型 号	B037-02-W1
__ 印刷	见图档			物料编号	110400765
材质规格	见图档			版 本	Ver 1
工艺处理	见图档			日 期	2022.12.1
软件程序				缩放比例	100% (1:1)
备 注				订单编号	
设计制作	刘景	审核		页 面	

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

红外码：NEC 系统码：0X08F7						
NO.	ICON	Key Name	IR Code	Usage	Usage ID	备注
1		Power	0x0A	NA	NA	按下，只发IR码
2		source	0x0D	NA	NA	按下，只发IR码
3		OK	0x1F	NA	NA	按下，只发IR码
4		D-pad up	0x00	NA	NA	按下，只发IR码
5		D-pad down	0x01	NA	NA	按下，只发IR码
6		D-pad right	0x02	NA	NA	按下，只发IR码
7		D-pad left	0x03	NA	NA	按下，只发IR码
8		Back	0x1C	NA	NA	按下，只发IR码
9		Google Assistant	0x21	0x0C	0x0221	在蓝牙模式下，同步发送IR码，其他按键只有IR模式
10		Home	0x0C	0x0C	0x0223	在蓝牙模式下，同步发送IR码，其他按键只有IR模式
11		VOL +	0x58	NA	NA	按下，只发IR码
12		VOL -	0x5D	NA	NA	按下，只发IR码
13		Netflix	0x4E	0x0C	0x0008	在蓝牙模式下，同步发送IR码，其他按键只有IR模式
14		Prime Video	0x2E	0x07	0x003E	在蓝牙模式下，同步发送IR码，其他按键只有IR模式
15		Projector Focus	0x74	NA	NA	按下，只发IR码
16		OSD Menu	0x08	NA	NA	按下，只发IR码

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：红色，每按一次按键，指示灯闪一下。

2). Indicator light: red, each time you press the button, the indicator light flashes.

3). 低电压提醒：电量低于 2.4V 时，指示灯快速闪烁，只要还在操作，就一直保持闪耀状态，当不再对遥控器进行操作后，闪烁 5 次或闪烁 3 秒后，停止并熄灭。

3). Low voltage reminder: When the battery is lower than 2.4V, the indicator light flashes quickly, as long as it is still in operation, it will keep flashing. When the remote control is no longer operated, it flashes 5 times or flashes for 3 seconds and then stops And goes out.

4).配对方法：

a.同时按住“OK”+“VOL-”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 OK+VOL-键 30s 之后停止发包。

c.按一次 OK+VOL-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 "OK" + "VOL-" 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 OK+VOL- key, you must keep sending the pairing broadcast so that the user can pair.

c. Press the OK+VOL- 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，响应要≤20ms

5). Remote control distance: ≥10m, Response to ≤20ms

6). 蓝牙设备名称：RemoteB037

6). Bluetooth device name: RemoteB037

7).支持 OK+Back 上报功能

7). Support OK+Back reporting function

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

连接参数		
工作模式\参数	非语音状态	语音状态
Interval	20ms	10ms(根据方案调整)
Slave latency	49	0
Supervison timeout	2.2	1

11).蓝牙回连时不能存在闪屏

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

12) .使用谷歌标准语音

12) .Use Google Standard Voice

2. 遥控器其他要求

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 $\leq 10\text{m}$ ，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 $\leq 10\text{m}$, 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 $5\% @ 1\text{KHz}$;在 200Hz 到 8KHz 的频率范围内，振幅为 $\pm 5\text{dB}$; 94dB SPL 参考声压级 1KHz
- 9). Other requirements: Harmonic (THD) must be less than $5\% @ 1\text{KHz}$; in the frequency range of 200Hz to 8KHz, the amplitude is $\pm 5\text{dB}$; 94dB SPL reference sound pressure level 1KHz

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.

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 exposure warning

The equipment complies with FCC RF exposure limits set forth for an uncontrolled environment.

The equipment must not be co-located or operating in conjunction with any other antenna or transmitter.

NOTE: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.