C D RF565A Remote Control User Manual

CORPORATE

RF565A Remote Control
User Manual

Contents

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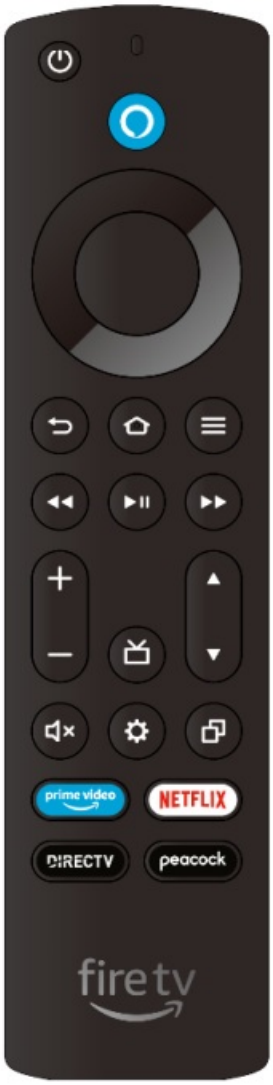


Shenzhen C&D Electronics Co., Ltd.
Remote Control

Introduction

1.1 Scope

This document is to specify the technical specifications of Bluetooth Low Energy Remote Control Unit based on RTL8762D platform, which complies with Bluetooth V5.0 Low Energy Specifications. The unit is powered by 2x AAA Alkaline batteries with power consumption as low as 10uA in Sleep mode when it is not in use. RC can be waken up from Sleep mode and re-connected with Host device(Amazon Fire TV, OS 7.0) within 500ms, when any of the RC
keys is pressed.
The following basic functions are supported in this Remote Control (RC) Unit:

- RC Keys(BLE+IR)
- Voice Control over BLE
- LED behavior
- Device Control System(DCS)
- Firmware OTA (Firmware upgraded Over the Air)

1.2 Power Supply:

- 2 x AAA Alkaline Batteries

1.3 Operating Conditions:

- Operating Supply Voltage Range: 3.0V, 0.1A
- Operating Temperature Range: -5℃ ~ +40℃
- Humidity 45% ~ 85%

1.4 Bluetooth Profile:

- HID over GATT Profile (HOGP)
- 1.5 RF Frequency Band:
- 2.4GHz ISM Band (2400MHz ~ 2483.5MHz, 40 channels@ 2MHz step).

1.6 Bluetooth Specification:

- Comply with Bluetooth V4.2 Low Energy(BLE) Specifications.

1.7 Pairing:

- The BLE RC needs to be paired with Host Device (Amazon Fire TV) before it can be used. The details pairing procedures can be found in Section 2.11.

1.8 Operation modes:
RC can enter into either Normal Operation Mode or Sleep Mode.

- Under Normal Operation Mode, the RC is connected with Host Device and sends HID Key codes when ake or Voice Control operation is triggered.
- Under Sleep mode, as soon as the any of RC keys is pressed, the RC shall be waken up and re-connected with Host device within 500ms.

1.9 Unit Weight and Dimension

- 49g±2g (Net Weight, excluding batteries)
- 38.16 x 158.03 x 17 mm

1.10 Hardware and Software Version:

- HW: PCB: RF565A-V1.0
- Out-of-box FW Ver. and Setting:

FW Ver.	SKUID	IRID	PID	Device code
Sunflower_FW18	**0x006A**	**0x0001**	**0x0424**	**2BN**

1.11 HW Specification

Feature	POR
Battery Type	2 AAA alkaline (replaceable)
Battery life time	More than 12 months
Dimensions	38.16 x 158.03 x 17 mm
Weight	49g±2 g (without batteries)
SoC chip	Realtek RTL8762DFA
Bluetooth	Bluetooth V5 Low Energy (BLE)
Voice	Single Mic (MSM38A3729Z8 or equivalent) + Near Field (push to talk)
Fire TV buttons	Power, Voice, Volume +, Volume – , Mute, D-Pad, Home, Back, Menu, PP/FF/RW, Guide, Prime Video, Mute, Channel Up, Channel Down
Host List	please refer to the host list
Content Partner Buttons	Netflix button, Prime Video, Disney+, Hulu(US)/Amazon Music(CA)
Certification	CE, BT Sig
LED	2 IR LED + 1 RGB LED
PCB	2-layer/FR4
SW	Sunflower_FW18
Plastic Material	– No PCR resin requirement, – material spec benchmark: ABS 758 Equivalent
	1. Requirements – UL94 Flame Class Compliance : HB (1.2mm ~ 6mm), HWI (1.5mm – 4, 3mm – 3, 6mm – 3), HAI 0 (1.5mm ~ 6mm), RTI Elec, Imp, Str (60) – ROHS Compliance 2. Texture FH : MT11500, SPI-A2, Amazon Badge MF : MT11500 main surfaces, S PI-A2, Lens area, battery surround BC : MT11500, SPI-A2, Eject Icon
Packaging	PE Bag / Carton box

1.12 REFERENCES

1. BS EN 60950-1:2006+A2:2013: Information technology equipment. Safety General requirements specifies requirements intended to reduce risks of fire, electric shock or injury for the OPERATOR and layman who may come into contact with the equipment and, where specifically stated, for a SERVICE PERSON.
2. ETSI EN 300 328 V1.8.1 (2012-06): Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive [Harmonized European Standard (Telecommunications series)]
3. FCC PART 15C- Intentional Radiators: American EMC Standard
4. IC RSS 247: Radio Standards Specification RSS-247, Issue 2, Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
5. ETSI EN 300 328 V1.9.1 (2015-02):Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using

wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive.

6. ETSI EN 301 489-1 V1.9.2 (2011-09): Electromagnetic compatibility and Radio spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.
7. ETSI EN 301 489-17 V2.2.1 (2012-09): Electromagnetic compatibility and Radio spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems
8. Bluetooth Core Specification V4.0(30 June 2010)

Electrical Performance

<table>
<tr><th>SN</th><th>Test Item</th><th>Requirement</th><th>Test Condition</th></tr>
<tr><td>2.1</td><td>Control Distance(RF)</td><td>≥10m for Key operation
≥10m for Voice Control</td><td>Test in the shielded room. Use BT Dongle as HOS T device, pairing with Remote Control (EUT). Teste d with new 2x AAA batteries, or 3V DC supply. Pre ss the key and observe the responses on the PC s creen and LED blinking on BT dongle.</td></tr>
<tr><td>2.2</td><td>Operation Power Supply Range</td><td>DC 2.1V ~ 3.3V</td><td>All the main functions (Key, Voice) of RC should be operating correctly within the defined supply Voltag e Range (DC power Supply Source).</td></tr>
<tr><td>2.3</td><td>Current Consumption in P ower models</td><td>w 50uA (typical) @ Conne cted Idle (TV Session)
w 2.5mA (Max) @ Short B utton Press (BLE)
w 22mA (Max) @ Voice O peration</td><td>RC is powered by 3V external DC power supply (c onnected through a 10Ω resistor to simulate the int ernal impedance of battery), Measure the average power supply current with a multi-meter in each of t he power model.</td></tr>
<tr><td>2.4</td><td>Current Consumption in Sl eep Standby with host off</td><td>≤20uA</td><td>RC is powered by external 3V DC power supply (c onnected through a 10Ω resistor to simulate the int ernal impedance of battery), Measure the average power supply current with a multi-meter in Sleep St andby(with host off)</td></tr>
<tr><td>2.5</td><td>IR Operating Dista nce: Transmission Level</td><td>Follow Amazon’s Spec.:
1. ≥15μW/cm2 or >10m
2. ≥15μW/cm2 or >10m
3. ≥15μW/cm2 or >10m</td><td>Test over standard approved Fire TV:
1. Remote control maximum operating range at zer o angle
2. Horizontal IR beam angle >30 Degrees (+/- 15 d egrees from center)
3. Vertical beam angle > 30 Degrees (0 degrees t o 30 degrees)</td></tr>
<tr><td>2.6</td><td>Contact Resistanc e</td><td>≤2KΩ (between Input and Output ports of MCU.)</td><td>Press and hold any of the keys, and measure the r esistance between Input and Output ports of the M CU.</td></tr>
<tr><td>2.7</td><td>Battery Life time</td><td>More than 12months</td><td>According to Amazon’s defined battery modeling
<table>
<tr><th>Usage Cases</th><th>Nbr of Events a Day()</th></tr>
<tr><td>Short Button Press Home Key (BLE)</td><td>10</td></tr>
<tr><td>Short Button Press Navigation Key (BLE)</td><td>600</td></tr>
<tr><td>IR Button Press (Power Off)</td><td>30</td></tr>
<tr><td>Single IR1 SIDE Blast System Level (Used for Input Switching projections)
1:Volume Control (IR) + Mute + Misc. DC
2:Channel Rocker and Numpad (New for Wilbur) - IR only mode for STB control</td><td>400</td></tr>
<tr><td>Home from any source Power after event (Used for Input Switching projections)</td><td>20</td></tr>
<tr><td>Power, Input Switching and Alexa
interactions via IR</td><td>40</td></tr>
<tr><td>Voice Search(include Blue LED light)</td><td>30</td></tr>
<tr><td>Connected Idle</td><td>1</td></tr>
<tr><td>Sleep Standy with host off</td><td>1</td></tr>
<tr><td>Voice Serch LED
LED blinks in Blue for 5 seconds after the user releases the voice button</td><td>300</td></tr>
<tr><td>Extra Blue Blinks per day, 100% Duty (PM Asks)</td><td>100</td></tr>
<tr><td>Extra Blue Blinks per day, 50% Duty (PM Asks)</td><td>0</td></tr>
<tr><td>Wakeup Events Power ON</td><td>10</td></tr>
</table></td></tr>
</table>

2.8	TX Power	-12dBm ≤TX Power ≤0dBm	Test Method: Radiated method. Test equipment: Lite Point 8852B. Test channels:2402MHz, 2442MHz, 2480MHz. Test point: Feed point of Antenna and its matching network (Note: in mass production, the antenna and its matching network need to be kept connected for continuous production). ta packets, Lite Point receives the packets and measure the RF performance. packets at a TX power of -70dBm, EUT (RC) receive the data packets and measure the BER via serial interface test points, BER shall not be more than 0.1%.
2.9	Initial Frequency error tolerance (f0)	-75KHz≤ f0≤75KHz	
2.10	RX Sensitivity	≤-70dBm @BER=0.1%	
2.11	Pairing Success Rate:	≥99%	To be tested in RF shielding room. RC is pairing with Host Device in a distance within 1 meter. 1) Virgin Pairing: Pre-condition: RC is Virgin and Pairing table is empty; On a Virgin RC, press “Home” key for 9s, the RC will enter into Advertising mode and execute pairing. A success Pairing can also be verified by RC controlling Host Device. In case the pairing is unsuccessful, the RC will discard all the data during pairing, exit from Advertising mode, clear the pairing table and go back to the Virgin mode. Repeat above procedures if another pairing is needed. 2) Re-Pairing: Pre-condition: RC is paired with a Host Device before. Press “LEFT+BACK+OPTION” Combi-key for 12s, the RC will clear the old pairing table, and then enter into Advertising mode and execute pairing. A success Pairing can also be verified by RC controlling Host Device. In case the pairing is unsuccessful, the RC will discard all the data during pairing, exit from Advertising mode, clear the pairing table and go back to the its original status. Repeat above procedures if another pairing is needed.

2.12	Timing of entering into Sleep mode	6-8 Minutes	For the STR mode, the required time is around 6-8 Minutes to get into STR mode and 8-10 second to wake up from STR mode.
2.13	Re-connection Ti me	≤ 4-5s	When RC is in Sleep Standby (with host off), trigge ring any key, RC shall be re-connected with Host D evice within 4-5 s.
2.14	Voice Sensitivity@ 1KHz	≥ -30dB	Tested in Anechoic Box, with BLE USB dongle and Electro-Acoustic Testing System Software.
2.15	Voice S/N@1KHz	≥ -30dB	
2.16	HD@1kHz	≤ 5%	
2.17	Connectivity KPI(RSSI)	Button press latency<KPI l imit (300ms) with RSSI str onger than -90dBm.	Testing at Neuhoff connectivity testing lab required This chart is for the reference test 

EMC/EMI/ESD/Safety Certifications

SN	Certification/Test Item	Regulation Authoritie s	Regulation Standards
5.1	ESD	IEC / ETSI	IEC 61000-4-2: 2008 / EN 61000-4-2: 2009 - Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostat ic discharge immunity test • Air discharge: ± 4kV ± 8kV ± 15kV, • Discharge Module: 150pF/330Ω. • No functional failures and no parts should be damage d after tests.

5.2	CE	ETSI	**SAFETY:** –EN 62368-1:2018 Audio/video, information and communication technology equipment – Part 1: Safety requirements (or latest amendment) –EN 62479 Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz) (or latest amendment) **ERM/EMC:** ETSI EN 301 489-1 V2.1.1 (2017-02) Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU (or latest amendment) ETSI EN 301 489-17 V3.1.1 (2017-02) Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU (or latest amendment) ETSI EN 300 328 V2.1.1 (2016-11) Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU (or latest amendment)
5.3	BQB	Bluetooth SIG	Bluetooth V5.0 Low Energy Specifications

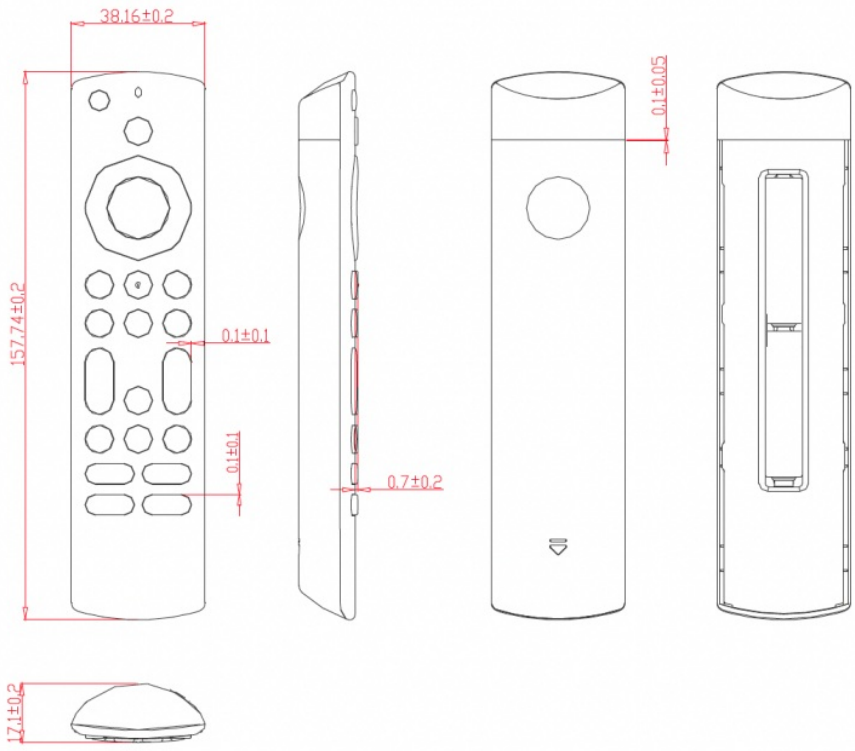
Note:

- The specific regulatory certifications depend on the individual region where the product will be marketed.
- The regulation standards could be changed at any time by different regulative authorities, so please check the details of newest official regulation standards at the beginning of each certification process.
- The Remote Control Unit must be labeled with the Approved ID numbers according to the specific requirement of individual regulation authorities.
- Declaration Statement of Conformity must be included in the user manual of Host end product according to the specific requirement of individual regulation authorities.

Appearance check

4.1 Checking Condition
Part checking position
Checking angle Customer viewing position = front side

Light intensity : 600 – 1000 lux
Checking distance: 50cm within 10 seconds:
Requirement



100% Visual inspection checking, Smooth at Foil edges
Finishing Defects in mm(=or less than)
The key symbol cannot offset more than 1°C horizontally or vertically.
The position of key symbol cannot offset more than 0.2mm horizontally or vertically.
*Not more than 2 defects visible are allowed in one surface (viewing at 50 cm)
*Distance between defects are allowed 50 mm (viewing at 50 cm)

Bluetooth RC(HID) Key code Table

No.	Key used	Icon of butt on	IR key code N EC CID:027D	BLE Ke code	ID
1	Power		0x46	0x07-0x0066	
2	VOICE		0xa0	0x0c-0x0221	
3	Up		0x48	0x07-0x0052	
4	Left		0x4e	0x07-0x0050	

5	OK(Select)		0x4a	0x07-0x0058
6	Right		0x49	0x07-0x004f
7	Down		0x4d	0x07-0x0051
8	Back		0x0d	0x07-0x00f1
9	Home		0x9f	0x0c-0x0223
10	Menu		0x45	0x0c-0x0040
11	REWIND		0x16	0x0c-0x00b4
12	Play/Pause		0x5b	0x0c-0x00cd
13	FAST/FORWARD		0x17	0x0c-0x00b3
14	Volume+		0x0c	0x0c-0x00e9
15	Channel+		0x0f	0x0c-0x009c
16	Volume-		0x19	0x0c-0x00ea
17	Guide		0x14	0x0c-0x008d
18	Channel-		0x5a	0x0c-0x009d
19	MUTE		0x4c	0x0c-0x00e2
20	Settings		0x96	0x0c-0x0033
21	Recants		0xb1	0x0c-0x0002
22	Partner Button 1	prime video	0xa1	0x09-0x00a1

23	Partner Button 2	NETFLIX	0x5f	0x09-0x00a2	
24	Partner Button 3	DIRECTV	0xa2	0x09-0x00a3	
25	Partner Button 4	peacock	0xa3	0x09-0x00a4	

Printing and Button Color

NO.	A1	A2	A3	A4	A5	A6
Component					Ok	
Material	ABS	ABS	ABS	ABS	ABS	
Process						
Surface effect	: MT11500 : VDI 30	MT11500 :VDI27 : VDI 30 SPI-A2	: MT11500 VDI 27 SPI-A2	:SPI-A2	: MT11500	Pu
Color	Injection color: Printing color: PANTONE Cool Gray 5C	Injection color: Laser color:	Injection color: Laser color:	Injection color: Laser color:	Injection color: Laser color:	Injection color: Silk color: PANTONE

RC Operation

7.1 Demo mode and User mode
7.1.1 The remote should by default work as the Demo mode. IR is working but the user cannot use the voice button.
7.1.2 If the user selects the “Demo Mode” from the first page of TV host, the remote will stay with IR mode.
7.1.3 If the user selects the “Home Mode”, if the remote is paired already, it will gets into the WIFI configuration directly. Otherwise, the user needs press “Home” key once or “Home” key for 9 seconds depends on the state to pair.
The Power key will stay the IR protocol when the TV is in the home mode, it will always send the IR code.
7.1.4 Once it is paired, the host will get into the WIFI setting page.
17.2 Pair
Press the Home button for 9 seconds, release the button, and the remote control begins to send broadcasting. After pairing with the host the remote control should be able to control the host.

BTW:
A: When you do the pairing, make sure that the host is turned on, and it is in pairing mode, and make the remote control to close the host as close as possible.
B: If the host is not paired with the host within 1 minutes, please check and confirm that the host side is in the pairing mode. After confirmation, repeat the A pairing operation.
17.3 Unpair Press the Left+ Back+Option button at the same time for 12 seconds, release the button, the remote cleared the existing pairing information and begins to send a pair broadcast and enter into demo mode.

7.4 Voice
After pressing the voice button, the remote controller begins o transmit the voice.
(When using the voice function, you should try to keep the remote control MIC close to the sound source.)

FCC

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

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

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.

IC

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

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

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

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Documents / Resources

	C D RF565A Remote Control [pdf] User Manual RF565A Remote Control, RF565A, Remote Control, Control

References

- User Manual