



APPENDIX H

: USER'S MANUAL

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1 - Mechanical Requirements

1.1 - Design

- Dimensions : 167 x 47 x 16.8mm



TOP CASE	MATERIAL	HIPS
	MATERIAL COLOR	BLACK
	PRINT COLOR1	WHITE
BOTTOM CASE BATTERY COVER	MATERIAL COLOR	BLACK
RUBBER BUTTON	MATERIAL	SILICONE RUBBER
	FORMING COLOR 1	BLACK
	FORMING COLOR 2	TRANSLUCENT CLEAR
	FORMING COLOR 3	WHITE
	PRINT COLORS	WHITE
	PRINT COLORS	PT 1795C (RED)
	PRINT COLORS	P.T 2173C(BLUE)
	PRINT COLORS	P.T 7738C(GREEN)
	PRINT COLORS	P.T 179C(RED)
	PRINT COLORS	P.T 1225C (YELLOW)
	SURFACE TREATMENT	SILICONE COATING

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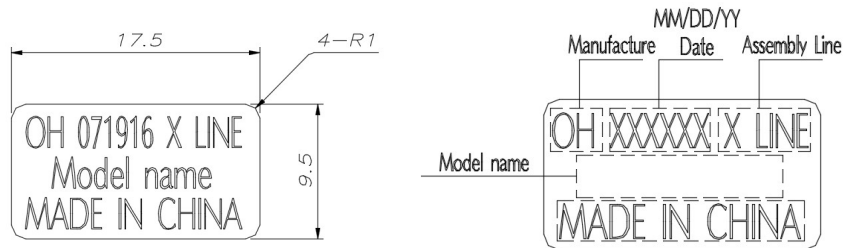
1.2 - Picture (for reference only)



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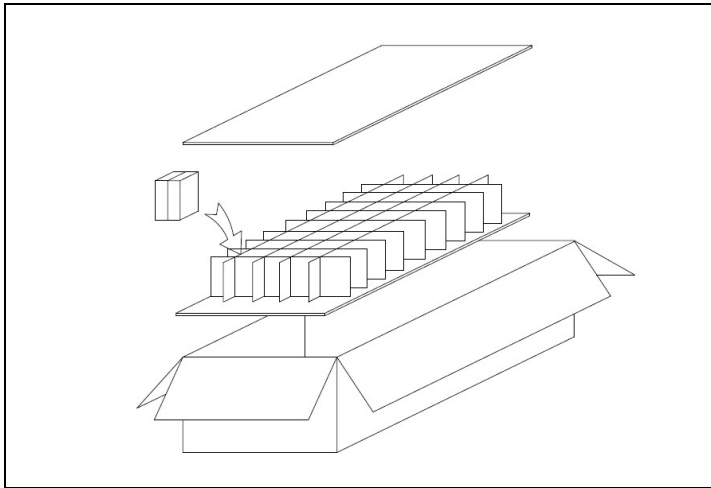
1.3 - Batch Number

Adhesive label is attached at the inside part of the battery cover



1.4 - Packing

1.4.1 - Packing Process



- PE bag dimensions : 83 x 286 mm (LDPE 0.05t)
- PE bag sealed with PASSED adhesive label
- Quantity Per Box: 140pcs
- Box dimensions : W 600 x D 400 x H 240 mm

1.4.2 - Pallet definition

- Pallet dimension : W 1200 x D 800 x H 170 mm
- Full pallet dimension : W 1200 x D 800 x H 1850 mm
- Quantity per pallet : 3,920pcs (4 boxes / layer - 7 layers)

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2 - Electrical Requirements

2.1 - Electrical Characteristic

Parameter		Condition	Spec	Unit
Frequency Range		Bluetooth Low Energy Specification	2.402 ~ 2.480	[GHz]
Channel			39	[Num]
RF Power			-2	[dBm]
Test channel		TC-3000 (RF measuring instrument)	19	[Num]
RF Power	PAvg		0±5	[dBm]
	PMax		+5	[dBm]
	Pmin		-5	[dBm]
Modulation Characteristics	Δf1 avg		225~275	[KHz]
	Δf2 avg		≥ 185	[KHz]
	Δf2/Δf1		0.8	
	Δf2min		≥ 92.5	[KHz]
	Δf2rate		≥ 99	[%]
Carrier Frequency Offset and Drift	fTx-fn		≤ 150	[KHz]
	Δf0-fn		≤ 50	[KHz]
	f1-f0		≤ 20	[KHz]
	Δfn-f(n-5)		≤ 20	[KHz]
Operating Voltage		RF (Bluetooth)	2.0~3.6	[V]
LVI Voltage		Low Voltage Indicate	2.25 ± 0.2	[V]
Operating current (IR)		Power: 3V	≤40	[mA]
Operating current (RF KEY)		Power: 3V Non-directional distance	≤12	[mA]
Operating current (RF+Voice)			≤25	[mA]
Leakage current			≤10	[μA]
RF range (distance)			≥10	[m]
IR Range		Direct	12	[m]
		Horizontal	7 (±30°)	[m]
VOICE	300Hz	Voice Inspection JIG	-15 ~ -5	[dB]
	2KHz		-21 ~ -2	[dB]
	3.8KHz		20 ~ 0	[dB]

3 - Software Requirements

3.1 - Bluetooth 4.2 LE identification

- a) Device Name: WOW Remote
- b) Vender ID: 0x02AF
- c) Product ID: 0x2037

3.2 - Advertising

- a) RCU send the un-direct advertising data for 90sec in Pairing Mode.
- b) RCU send the direct advertising data for 1.28sec when RCU try re-connection.
Then RCU send the un-direct advertising data containing RTK's magic code for STB wake-up for 10sec
- c) When RCU sends Undirected Advertising for Re-connection, it will prohibit connection with other STB using white list.

3.3 - Pairing mode

- a) At first time pairing or after Factory Reset, RCU works only in IR.
- b) Press [OK] and [HOME] keys for longer than 4 seconds. LED stays ON while pressing [OK] and [HOME] keys.
- c) After 4 seconds, the LED starts blinking so that to confirm the remote has entered into pairing mode.
- d) After RCU has entered pairing mode, RCU can send the IR signal of [Up], [Down], [Left], [Right], [OK], [Back], [Home] keys.
- e) If pairing is successfully made, the LED goes OFF and remote starts working in Bluetooth.
- f) If the user presses any key during pairing mode, the remote stops pairing and goes back to IR mode, excepted [Up], [Down], [Left], [Right], [OK], [Back], [Home] keys.
- g) If pairing is not successfully made for 90 seconds, the LED goes ON for 4 seconds and then goes OFF. The remote stops pairing and goes back to IR mode if first time pairing or after Factory Reset.
- h) If Pin or Key Missing, RCU send the un-direct advertising data for 90sec in Pairing Mode after disconnect.

3.4 - Re-pairing mode

- a) Press [OK] and [HOME] keys for longer than 4 seconds. LED stays ON while pressing [OK] and [HOME] keys.
- b) After 4 seconds, the LED starts blinking so that to confirm the remote has entered into pairing mode.
- c) After RCU has entered pairing mode, RCU can send the IR signal of [Up], [Down], [Left], [Right], [OK], [Back], [Home] keys.
- d) If pairing is successfully made, the existing pairing table is deleted, the LED goes OFF and the remote works in Bluetooth with the new device.
- e) If the user presses any key during pairing mode, excepted [Up], [Down], [Left], [Right], [OK], [Back], [Home] keys, the remote stops pairing and the previous paired status is restored.
- f) If pairing with new device is not successfully made for 90 seconds, the LED goes ON for 4 seconds and then goes OFF. The previous paired status is restored.
- g) If Pin or Key Missing, RCU send the direct advertising data in Pairing Mode after disconnect.

3.5 - Factory Reset mode

- a) Press [GUIDE] and [0] keys for longer than 4 seconds. LED stays ON while pressing [GUIDE] and [0] keys.
- b) The remote blinks 3 times to confirm that it is deleting the existing pairing table.
- c) When Factory Reset is completed, LED goes OFF and the remote works in IR mode.

3.6 - IR backup in paired mode

- a) If, for any reason, the RF connexion is lost, the remote sends the IR code of the corresponding pressed key.
- b) The remote tries to reconnect for sending the RF code.

3.7 - Voice Search initiated by the remote

- a) For Voice function, it is recommended to be within 5 meters from the receiver.
- b) Distance between mouth and microphone should be within 40 cm (15~20cm recommended).

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- c) Microphone key pressed and released, remote sends “key pressed event, key released event” to the STB and the STB sends back the START command to the remote.
- d) The LED starts blinking, the remote transmits the voice data for 10sec timeout duration.
- e) After timeout duration, the remote stops transmitting the voice data and the LED is turned off.
- f) Or When the remote receives stop command from STB, remote will stop the voice transmission and LED will turned off.

Note: if any key is pressed within the timeout duration, the remote stops transmitting the voice data and activate the pressed key event.

3.8 - Voice Search initiated by the launcher

- a) For Voice function, it is recommended to be within 5 meters from the receiver.
- b) Distance between mouth and microphone should be within 40 cm (15~20cm recommended)
- c) User selects and validates the voice search on the launcher by using navigation and OK keys.
- d) STB sends the voice search START command to the remote.
- e) The LED starts blinking, the remote transmits the voice data for 10sec timeout duration.
- f) After timeout duration, the remote stops transmitting the voice data and the LED is turned off.
- g) Or When the remote receives stop command from STB, remote will stop the voice transmission and LED will turned off.

Note: if any key is pressed within the timeout duration, the remote stops transmitting the voice data and activate the pressed key event.

3.9 – Setup for TV & Audio & Soundbar

- a) As long as the RCU is paired to the STB, the RCU can then automatically be set up by the STB for TV or Audio, Soundbar control.
- b) The STB can set the RCU's IR using the command defined in Appendix 1.
- c) When the setting is completed, the Volume, Mute key and the Power key output the IR

signal according to the set value.

- d) If the RCU receives the “send keycode” command, it outputs the IR signal of the corresponding key. However, the RCU will not store the set value.
- e) The TV database uses the set number from 0001 to 1999.
- f) The Audio database uses the set number from 3001 to 4999
- g) The Soundbar database uses the set number from 6001 to 7999.

3.10 – Remove the TV & Audio & Soundbar

- a) Press [OK] and [V-] keys for longer than 4 seconds. LED stays ON while pressing [OK] and [V-] keys.
- b) After 4 seconds, LED will be blink 3 times.
- c) Press 01 to remove the TV setting. Or press 02 to remove the Audio & Soundbar setting.
- d) LED will be blink 3 times to confirm the remote has remove the setting.

3.11 - Couch mode

- a) If a key or multiple keys are pressed continuously for more than 30s, the remote stops transmission (except pairing combination) in order to protect the battery discharge.

3.12 - OAD mode

- a) OAD proceeds according to the Realtek specification.

3.13 - Key codes

- a) In Bluetooth mode, HID Profile is used.
- b) In IR Mode, NEC format is used
 - Structure of the NEC format: Custom1 - Custom2 – Data – Inverse data
 - For MUTE to be seen as 0x16-0x20-0x25. Another alternative is 0x1620-0x25
 - Custom1: 0x16 Custom2: 0x20
- c) Code list is detailed in Table 1

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KEY LABEL CHART		Key Name	Event constant name	IR Code (Data)	HID		Linux Key Code
					Usage Page	Usage ID	
	K1	Power	KEYCODE_POWER	0x21	0x0C	0x0030	
	K2	Rewind	KEYCODE_MEDIA_REWIND	0x51	0x0C	0x00B4	0x00A8
	K3	Play/Pause	KEYCODE_MEDIA_PLAY_PAUSE	0x52	0x0C	0x00CD	0x00A4
	K4	Fast Forward	KEYCODE_MEDIA_FAST_FORWARD	0x53	0x0C	0x00B3	0x00D0
	K5	D-pad up	KEYCODE_DPAD_UP	0x15	0x0C	0x0042	
	K6	D-pad left	KEYCODE_DPAD_LEFT	0x17	0x0C	0x0044	
	K7	D-pad center	KEYCODE_DPAD_CENTER	0x19	0x0C	0x0041	
	K8	D-pad right	KEYCODE_DPAD_RIGHT	0x18	0x0C	0x0045	0x0181
	K9	D-pad down	KEYCODE_DPAD_DOWN	0x16	0x0C	0x0043	
	K10	Back	KEYCODE_BACK	0x48	0x0C	0x0224	0x009E
	K11	Home	KEYCODE_HOME	0x47	0x0C	0x0223	0x00AC
	K12	LIST	KEYCODE_MENU	0x67	0x0C	0x0040	0x008B
	K13	Volume +	KEYCODE_VOLUME_UP	0x23	0x07	0x0080	0x0073
	K14	Guide	KEYCODE_GUIDE	0xC0	0x0C	0x008D	0x016A
	K15	Channel +	KEYCODE_CHANNEL_UP	0x33	0x0C	0x009C	0x0192
	K16	Volume -	KEYCODE_VOLUME_DOWN	0x24	0x07	0x0081	0x0072
	K17	Google Mic	KEYCODE_ASSIST	0x46	0x0C	0x0221	0x00D9
	K18	Channel -	KEYCODE_CHANNEL_DOWN	0x34	0x0C	0x009D	0x0193
	K19	Mute	KEYCODE_VOLUME_MUTE	0x25	0x0C	0x00E2	0x0071
	K20	NETFLIX	KEYCODE_BUTTON_3	0x63	0x07	0x006C	0x00BB
	K21	RECORD	KEYCODE_MEDIA_RECORD	0x54	0x0C	0x00B2	0x00A7
	K22	1	KEYCODE_1	0x01	0x07	0x001E	0x0002
	K23	2	KEYCODE_2	0x02	0x07	0x001F	0x0003
	K24	3	KEYCODE_3	0x03	0x07	0x0020	0x0004
	K25	4	KEYCODE_4	0x04	0x07	0x0021	0x0005
	K26	5	KEYCODE_5	0x05	0x07	0x0022	0x0006
	K27	6	KEYCODE_6	0x06	0x07	0x0023	0x0007
	K28	7	KEYCODE_7	0x07	0x07	0x0024	0x0008
	K29	8	KEYCODE_8	0x08	0x07	0x0025	0x0009
	K30	9	KEYCODE_9	0x09	0x07	0x0026	0x000A
	K31	0	KEYCODE_0	0x0A	0x07	0x0027	0x000B
	K32	LAST	KEYCODE_LAST_CHANNEL	0x83	0x0C	0x0083	0x0195

Table 1: Code list

3.14 - Battery level

- a) RCU sends the information for battery level using Bluetooth battery service.
- b) Level of LVD is $2.25V \pm 0.2V$.
- c) If the battery voltage as reached the LVD value, RCU cannot enter the pairing mode.
- d) If the battery voltage is under 2.0V, RCU does not operate.
- e) When the battery voltage is 2.1V or more, the RCU operates again.

3.15 - Bug Report

- a) Press the [BACK] + [OK] key for the stb bug report function.
- b) In IR mode, the value of 0x96 is output.
- c) In RF mode, [Back] press event and [OK] press event is output.

4 - FCC Conformity

Assesment of compliance of the product to the requirements relating to Electromagnetic Compatibility is based on the following standards:

-. FCC Part 15 subpart C 15.247

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.

Caution

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Note : The manufacturer is not responsible for any Radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. End users must follow the specific operating instructions for satisfying RF exposure compliance.