

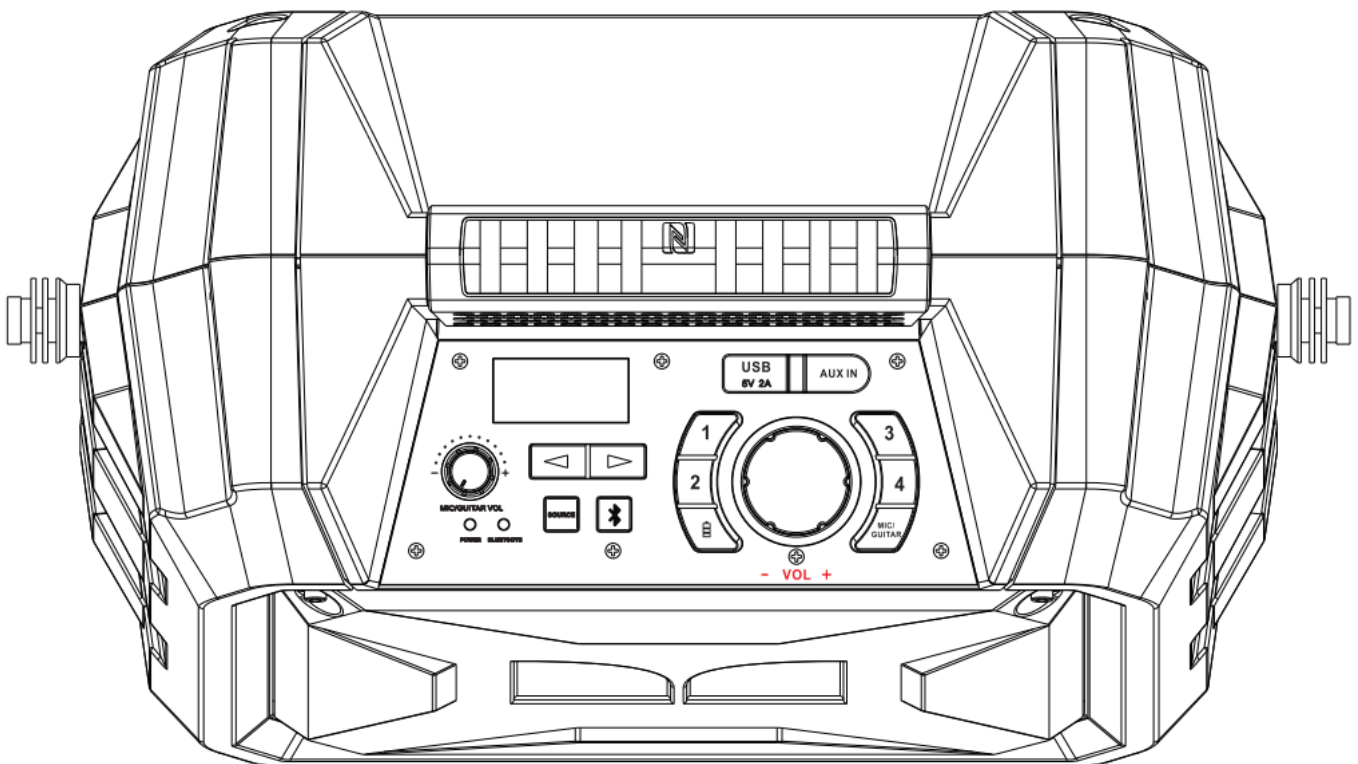
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User Interface Specification

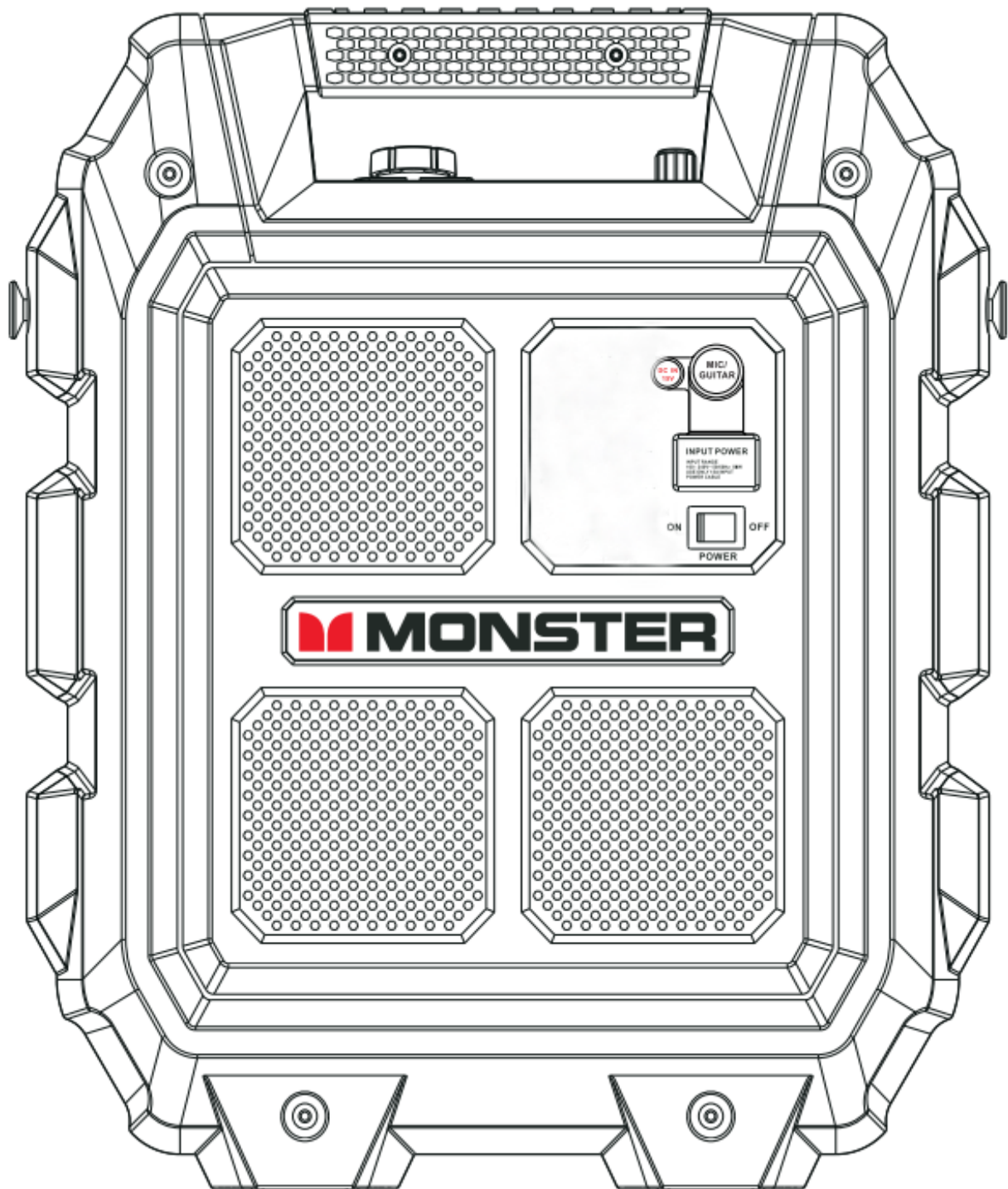
for MONSTER Mini Rockin Roller

Product figure:

The graphics of the Key /Connector/Knob/LED display is illustrated as below:



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A. Document Change History

No.	Version	Change Summary	Owner	Date of Changes
1	V1.1	Draft version	Hugo Wu	2015.7.27
2	V1.3	Modified Audio Tone and ID	Hugo Wu	2015.09.21

B. Function Owner List

No.	Function Owner	Name
1	Product Designer	Gavin Guo
2	Customer Marketing Manager	Dickson Liu
3	Project Manager	Alan Zeng
4	Electrical Manager	CE Chan
5	Software Manager	LWF
6	User interface Designer	Hugo Wu
7	Marketing Manager	Karl Fang

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C. Introduction

1) Purpose

This document defines the user interface requirement of MONSTER Mini Rockin Roller, The purpose of this document is to guide the development team to implement the user interface software.

2) Scope

This document covers the user scenarios, UI control flows and the display contents of the product.

D. Source Switching Key

Main unit has 3 sources (Bluetooth/Aux in/Radio), Press "Source" key once to change source between "BT"/"Aux in"/"FM" when main unit is at working mode;

Source sequence: BT==> Aux in==> FM==> BT....

The main unit supports 3 sources under audio mode:

- 1) Bluetooth source (default source)
- 2) AUX-IN source.
- 3) FM source

E. Bluetooth Device Name

Bluetooth Device Name	Mini Rockin Roller	
Bluetooth SSID	Mini Rockin Roller	

F. Bluetooth Paired, Bluetooth Reconnected Requirement

- 1) Bluetooth SSID name shows in BT source; Bluetooth SSID name can't show in FM source , Aux in source;
- 2) Bluetooth will auto reconnect last connected device after switch source between from BT source to Aux in source and to FM source, and return to BT source by press source key if it paired before;
- 3) Bluetooth will auto reconnect last connected device after power off and power on main unit if it paired before;
- 4) Bluetooth will auto reconnect last connected device after moving mobile phone and Bluetooth devices over Bluetooth received distance and return Bluetooth received distance with 3 minutes;
- 5) Bluetooth will auto reconnect last connected device after Bluetooth off and Bluetooth on in BT setting menu of mobile phone and Bluetooth devices if it paired before; that will based on mobile phone itself function;
- 6) Bluetooth will auto reconnect last connected device after power off and power on of mobile

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phone and devices if it paired before; that will based on mobile phone itself function;

- 7) Users do not need to pair/connect their Bluetooth device every time when they wish to reconnect it. If the Bluetooth device already pairing with main unit before, users just need to find the “Mini Rockin Roller” on their Bluetooth setting menu of mobile phone and Bluetooth devices, and then click the SSID name to confirm the connection.
- 8) BT paired and connected time is less than 15 seconds;
- 9) BT reconnect time is less than 10 seconds;

G. LED behaviour

No.	Previous status	LED behavior	LED flash frequency	Working Status
1	BT	BT Blue LED fast flash	4Hz	1. Enter BT pairing mode; 2. Enter BT disconnection or connecting mode or Recovering mode;
2		BT Blue LED solid	Solid	Bluetooth paired and connected successfully
3	Battery	Battery Red LED breathe in & breathe out method	0.5Hz	Battery work at charging mode
4		Battery Red LED fast flash	4Hz	Battery level is less than 15% capacity
5		Battery Red LED is on	Solid	Battery is fully charged
6	in Standby mode	Power RED LED is on	Solid	Work at standby mode

H. Power and BT key behaviour

Key	Previous status	Key behavior	LED behavior	Working Status
Power Key	Main unit is off mode	Switch "Power" key to Power on position to first power on main unit	1. the RED power LED will on 3s, and then off; 2. the Blue LED will flash; 3. the LED Screen will on;	Power on main unit and work at BT pairing mode and BT Blue LED fast flash if nothing has not been paired with;
	Main unit is off mode	Switch "Power" key to Power on position to power on main unit if main unit do BT paired and connected before	1. the RED power LED will on 3s, and then off; 2. the Blue LED on (flash or solid); 3. the LED Screen will on;	Power on main unit and main unit auto reconnect to last connected mobile device if it has been paired with;

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BT key	Main unit is standby mode	Switch "Power" key to Power off and switch to Power on position to wake up main unit	1. the RED power LED will on 3s, and then off; 2. the LED Screen will on;	Power on main unit and work the last source
	Main unit is on mode	Switch "Power" key to Power off position	All LED is off	Power off main unit and All LED is off;
	Main unit is on mode and work at BT disconnect or connected mode	Press and hold "BT" key for 2s to enter BT pairing mode;	Blue LED will fast flash	Main unit enter BT pairing mode and BT Blue LED fast flash;
	Main unit is on mode and work at BT music playing mode;	Press and hold "BT" key for 2s to disconnect current BT connecting and enter BT pairing mode;	Blue LED will fast flash	Main unit enter BT disconnect or pairing mode and BT Blue LED fast flash;
	Main unit is on mode and Playing music in BT source	Short press "BT" key once to pause current music	/	Pause current music playback
	Main unit is on mode and Pause current music playback in BT source	Short press "BT" key for once to resume music playback;	/	Resume music playback

I. Bluetooth Function:

1. First Connection

- a. Power on and switch "Source" key to BT source, The "BT" icon will light; the audio tone of "Bluetooth source" hints;
 - 1) If the unit is newly out of the box, it will directly enter pairing state, Blue LED will flash and no sound output;
 - 2) If the unit is previously paired with some other smart phone or Bluetooth device, Press and hold "BT" pairing key for 2s, it will enter BT pairing mode, Blue LED will flash, and unit gives "Bluetooth disconnected" sound;
- b. On Mobile side, launch a BT searching on the mobile device, you will find the main unit by

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its Bluetooth name “Mini Rockin Roller” displayed on the mobile device. Select the “Mini Rockin Roller” for pairing. For mobile devices which support BT v2.1 or later, there is no need to provide pairing password, for elder devices, users need to input “0000” as pairing password;

If the pairing and connection is successful, the unit will give “Bluetooth connected” sound and LED turns to solid blue, then user can start playback from mobile Apps and enjoy music with unit.

2. BT Pairing key

if main unit has paired with other mobile device, press and hold the BT Pairing key for 2s, Main unit will auto disconnect current mobile device connection, and then it will enter Bluetooth Pairing mode, Blue LED is flashing, and unit gives “Bluetooth disconnected” sound;

3. Disconnection

Current connection will disconnect when user

- 1) Turn off BT from mobile phone' BT setting menu;
- 2) Long press(2s) BT pairing key;
- 3) Bring the mobile out of the range(10m) ;
- 4) Switch to Aux source;
- 5) Switch to FM source ;
- 6) Main unit turn off the power;

4. Previous/Next key

- 1) It can auto jump to next track to play when press “Next” key in unit during playing music via Bluetooth;
- 2) It can auto jump to previous track to play when press “Previous” key in unit during playing music via Bluetooth;

J. Radio Function

1. FM mode

The main unit can be switched Source to FM mode by press Source key; The “FM” icon will light; Interactive of Key Pressing in Tuner Mode:

State	Event	Response
All	Press NEXT (pressing time < 2 sec)	Tune up radio frequency by one step
	Press PREV(pressing time < 2 sec)	Tune down radio frequency by one step
	Long press NEXT (Pressing time >= 2 sec)	Search for the next station and play it

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	Long press PREV (Pressing time $\geq$ 2 sec)	Search for the previous station and play it
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2. FM Frequency Range

The Frequency ranges of radio broadcast in different countries (areas) are listed in the below table:

Area	Band	Frequency Range (Hz)	Step (Hz)
Europe	FM	87.5 – 108.0M	50K
USA/Japan	FM	87.5 – 108.0M	100K

*** FM station will keep after power on/off and source switching

3. Manual Tune

- 1) When in FM mode, user can adjust the FM frequency by pressing the NEXT and PREV keys.
- 2) When NEXT/ PREVIOUS is pressed and hold for longer than (2s) seconds to auto searching in FM mode, unit will search for the next station at the nearest higher/lower frequency.

4. Tuning & Preset

Preset 1,2,3,4	Short press – play preset station Long press – store current station to preset
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- 1) When the radio sound is clear enough, press and hold the preset key until frequency number flash twice and radio mute for 1 second, release the key then preset station is saved;
- 2) By default the preset frequency should be 87.5MHz for FM;

K. Aux in Function

- 1) The main unit can be switched Source to Aux in source by press Source key; LED will show “AUH” when source switch to Aux in source; The “Aux in” icon will light;
- 2) Input sensitivity $650\text{mV} \pm 100\text{mV}$; $R_{in} \geq 22\text{k}$; output power $\geq 15\text{W}$ at 1%;

L. Microphone Function

- 1) The “Microphone” icon will light after inserted a supplied microphone plug into the port of main unit when main unit is working at Bluetooth/FM/Aux in source;
- 2) no obvious echo noise can be heard during speaking or sing in Bluetooth/FM/Aux in source by daily use;
- 3) Adjust Microphone/Guitar Volume knob to increase or decrease Microphone output

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volume level during speaking and sing song; anticlockwise rotate volume knob, the volume level will decrease; clockwise rotate volume knob, the volume level will increase;

Remarks: the default is Microphone after inserted the plug into “Microphone/Guitar” port;

M. Guitar Function

- 1) The “Guitar” icon will light after press “Mic/Guitar” key when main unit is working at Bluetooth/FM/Aux in source;
- 2) no obvious echo noise can be heard during used Guitar in Bluetooth/FM/Aux in source;
- 3) Adjust Microphone/Guitar Volume to increase or decrease Guitar output volume level during playing; anticlockwise rotate volume knob, the volume level will decrease; clockwise rotate volume knob, the volume level will increase;

2) Audio Tone

- 1) the Audio Tone level is fixed that can't be changed by volume level;
- 2) Unit will hints “Bluetooth connected”/“Bluetooth disconnected” when unit work at BT mode;

No.	Key behaviours	Audio Tone
1	Press “Source” key to Bluetooth source	Bluetooth
2	Press “Source” key to Aux in source	Aux in
3	Press “Source” key to FM source	Radio
4	Press “Mic/Guitar” key to Microphone mode	Microphone mode
5	Press “Mic/Guitar” key to Guitar mode	Guitar mode
4	unit enter bluetooth pairing mode	Bluetooth pairing
5	unit enter bluetooth pairing and connected successfully	Bluetooth connected
6	unit bluetooth pairing failure and bluetooth disconnected	Bluetooth disconnected
7	inserted Microphone cable into unit	Connected
8	inserted Guitar cable into unit	Connected
9	unplugged Microphone cable from unit	Disconnected
10	unplugged Guitar cable from unit	Disconnected

3) Volume Control Function

- 1) Volume range: 0-32; the numeral (0-32) will show synchronously in LED when adjust volume knob;
- 2) Default volume level is 16 (refer to 1w output); 0 is mute; Audio tone sound volume is always the

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default volume;

- 3) The volume will auto sync smart mobile phone and Bluetooth devices in BT/FM/AUX IN source;
- 4) it will return to default volume if volume is less than volume level 6 and power off/power on and wake up from standby mode again;
- 5) it will return to default volume if volume is more than volume level 26 and power off/power on and wake up from standby mode again;
- 6) it will keep last volume level if volume between from volume level 7 to volume level 26 and power off/power on and wake up from standby mode again;
- 7) the Power RED LED will flash once when reach max/min volume;
- 8) main unit is playing music, anticlockwise rotate volume knob, the volume level will decrease;
- 9) main unit is playing music, clockwise rotate volume knob, the volume level will increase;

4) Standby Function

Main unit will auto enter standby only for battery working mode to save battery;

only Power Red LED will on and other LED will off when main unit enter standby mode;

Main unit will auto enter standby mode by following method, all LED will off when main unit enter standby;

- 1) In Bluetooth source, when no BT connect, or BT connect fail, or disconnected for 15 minutes, the set goes to standby mode and BT LED is off.
- 2) for AUX in source: main unit will auto enter standby mode when main unit work at Aux in source and no Aux in cable inserted into main unit for 15 minutes;
- 3) for FM source, main unit can't enter standby mode when main unit work at more 15 minutes;
- 4) Main unit is working mode, press and hold volume knob key for 3s will auto enter STANDBAY status;

5) Wake up function description

- 1) Main unit at STANDBAY status, Switch "Power" key from Power off to Power on in main unit to wake up main unit from standby mode; Main unit will wake up and return last source mode, the Power Red LED will off when main unit is working ;
- 2) Main unit at STANDBAY status, Press "Source" key in main unit to wake up main unit from standby mode; Main unit will wake up and return last source mode, the Power Red LED will off when main unit is working ;
- 3) Main unit at STANDBAY status, press and hold volume knob key for 1s ; Main unit will wake up and return last source mode; the Power Red LED will off when main unit is working ;

Remarks:

Network configuration and Volume setting & Sound setting is keep on after wake up from standby mode;

6) Test Mode

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LED segment test mode:

Switch Source to AUX in position; press and hold "Next" key and press "Volume" key together to displays firmware version;

Action: Turn LCD icons on and off one by one, 0.25s for each icon on/off;

Display number "8888" for 0.5s on/off;

The icon of "Microphone"/"Guitar"/"Aux in"/"FM"/"BT" will light in turn; 0.5s for on/off;

7) Factory Reset Function

Switch Source to AUX in position; press and hold "Pairing" key and press "Volume" key together to do factory reset;

Action:

- Restore preset 1,2,3,4;
- Restore FM frequency to 87.5MHz;
- Restore Volume to 16;
- Clear BT pairing messages;
- Restore Microphone as default;

8) BT Reset function description

Main unit work at BT source;

Press and hold "BT" key for 8s to clear BT paired devices history, and clear Volume and network configuration messages too;

the BT/Power LED will flash 3s, LED will show "CLr" for 3s, and auto reboot the main unit ;

9) Firmware Upgrade

Firmware upgrade is available for production line only.

BT/MCU /DSP firmware upgrade via USB device upgrade method;

10) Firmware upgrade via USB:

- Copy new MCU /DSP firmware into USB device;
- Inserted USB device into main unit' USB port;
- Switch Source to "AUX in" position; press and hold "Previous" key and press "Volume" key together to enter SW upgrade mode ;
- the LED show "Lod" messages first ;
- and then LED display will off and Blue LED will flash during upgrading;
- the main unit will auto reboot after done SW upgraded;

11) Displays firmware version:

Switch Source to AUX in position; press and hold the number "1" key and press "Volume" key together to displays firmware version;

e.g. V1.2

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12) Open space Distance requirement

BT distance > 10m;

13) Battery Requirement (12V 4.5A)

- a. Battery fully charge time is about 5-6 hours in power off mode;
- b. Battery playtime is more 13 hours during playing “Hotel California” with max Volume;
- c. Battery playtime is more 24 hours during playing “Hotel California” with 75%Pmax;
- d. Battery playtime is more 48 hours during playing “Hotel California” with 50%Pmax;
- e. Main unit self-discharged current is less than 5 uA when main unit in power off mode; battery life time is over 6 months in Power off mode in storage;
- f. Main unit power consumption is less than xxmA when main unit in standby mode;
- g. Battery Cutoff Voltage $\leq 9.8V$; Low battery display voltage $\leq 10.2V$; Full charged Voltage $\geq 13.5V$; the red battery indication will flash (0.5S on, 0.5S off) if battery voltage is less than 10.2 V; it can play about 15 minutes to power off when red battery is flashing; the cut off battery voltage is less than 9.8V; main unit will auto power off when battery voltage is less than 9.8V for 15s;
- h. Battery level displays for discharge mode;
 1. Main unit in Power on mode;
If Battery level is less than 15%, the RED power LED will flash; LED screen will shows “Low bAt”;
 2. Main unit in Power off mode;
If Battery level is less than 15%, the RED power LED will flash;
- i. Battery level displays for charging mode;
 - A. Main unit in Power on mode;
 1. If Battery level is less than 15%, the RED power LED is flashing; LED screen will show “Low bAt” when press the “Battery” key in main unit;
 2. If Battery level is about 25%, the RED power LED is flashing; LED screen will show “b 25” when press the “Battery” key in main unit;
 3. If Battery level is about 50%, the RED power LED is flashing; LED screen will show “b 50” when press the “Battery” key in main unit;
 4. If Battery level is about 75%, the RED power LED is flashing; LED screen will show “b 75” when press the “Battery” key in main unit;
 5. If Battery level is about 100%, the RED power LED will solid; LED screen will show “b 100” when press the “Battery” key in main unit;

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B. Main unit in Power off mode;

1. If Battery level is less than 15%, the RED power LED is flashing;
2. If Battery level is about 25%, the RED power LED is flashing ;
3. If Battery level is about 50%, the RED power LED is flashing ;
4. If Battery level is about 75%, the RED power LED is flashing ;
5. If Battery level is about 100%, the RED power LED will solid ;

1) LED screen displays Battery Level method in Power on mode

No.	Action by press "Battery" key	LED displays impression drawing
1	Press "Battery" key when battery level is less than 15%	Low bAt
2	Press "Battery" key when battery level is about 25%	
3	Press "Battery" key when battery level is about 50%	
4	Press "Battery" key when battery level is about 75%	
5	Press "Battery" key when battery level is full	

14) Other

- 1) Background noise is less than 30 dB in BT/Aux in pause mode or standby mode;
- 2) Battery capacity can be shown in Apple device in BT connected mode;
- 3) USB max Output is 5V/2A for external device charging;

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End

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.

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