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- ## Bluetooth headset

WS-S8

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The serial number	versions	content	To write (modify) a person	Date
1	V1.0	**Initial information writing**		20180806
2	V2.0			20180821

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1、 Introduction (functional description)

It is a Bluetooth headset

Market positioning:

1. The product is positioned in the markets of India, Russia, China, Canada, the United States, France, Mexico, Britain and Germany.The Chinese market is preferred and needs to focus on performance indicators, reliability specifications, rf indicators, certification requirements and other customized specifications related to the regional markets.

The product features

2. The product is positioned at the sports earphones, which can guarantee the wearing and comfort of the earphones, such as the ear hangers and earplugs. Besides, it can hear external sounds while appreciating music to improve the safety of sports.

3. The continuous use time of the battery shall be no less than 3.5 hours.

4. Adopt the ronda chip.

1.1 Major characteristic

project	describe
Product type	Bluetooth headset
Bluetooth version	BT5.0
Frequency range	2.402GHz-2.480GHz
Support protocol	Handset, Hands-free，A2DP，AVRCP，AAC
The bluetooth chip	reaches1526P
Battery capacity headset:	headset：55mAh charging seat：500 mAh
play time	About 3.5 hours
call duration	About 4 hours
stand-by time	70 hours
charging time	Headphones: about an hour. Charge case: about 2 hours
Headphone output	≤2.5mW
effective range	Within 10 meters [barrier-free and open ground]
keypad	One side press the button
microphone	2 silicon mic all point to -42 plus or minus 2dB
trumpet	2 个Φ6.0MM，16Ohm。
Horn sensitivity	93+/-3dB
LED	Headphones: red, blue double color LED rechargeable case; 4 white LED power indicators.
USB	Charge case: a Micro USB
antenna	LDS antenna
Headphone body material	Silicone shell, ABS shell material, metal shell
Charging case material	Aluminum alloy shell, ABS shell material, stainless steel

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The headset size	22.20mm*ф 14.0mm
weight	The headset heavy5.6 g Charging case a heavy52.4 g
storage temperature	-20℃ ～ +50℃
operating temperature	-10℃ ～ +50℃

2. Appearance characteristics

Appearance of performance

Bluetooth headset, Charging case and USB cable

The WS-S8 Bluetooth headset is ergonomically designed and USES a true wireless in-ear headset. Designed for fans who love music, the headset features stereo sound on the right and left ears, giving users a feast for their ears. Its in-ear ergonomic design makes the user comfortable to wear.

WS-S8 USES contact charging and is equipped with a charging case. It not only extends the user's usage time, but also has the function of receiving, which is convenient for the user to carry, and also brings the biggest protection for the headset. WS-S8 has specially designed a two-color LED indicator light. When the power is low, the red light flashes and a prompt tone informs the user of charging in advance.

The main body of WS-S8 is made of fine grain and matched with the metal lower shell, so the whole is more textured. After strict ergonomic testing, the headset meets all aspects of man-machine application experience.

2.1 appearance performance

The WS-S8 Bluetooth headset is designed with ergonomic structure.
The WS-S8 Bluetooth headset has a button, the main function button, to control the Bluetooth headset switch, answer, hang up, refuse to answer, music pause/play, music up and down, volume addition and subtraction, and Siri functions.

3、 brief introduction of the function

3.1 basic functions

1. Display name of product :L: WS-S8-l R: WS-S8-r

2. A button switch.

3. Open the charging case, and the main and auxiliary earphones will be connected automatically, and then enter the host earphones to be paired with the mobile phones. During the second use, the headset and the phone will automatically reconnect.

4. Power display function.

5. TWS function.

6. Independent function of single headset.

Clear the pairing list (restore factory Settings).

8. Low voltage detection function.

9. It has the function of volume adjustment.

10. It has the function of pausing.

11. Have the function of last song and next song.

12. It has the function of answering and rejecting calls

13. When no bluetooth device is connected to the headset, the headset will automatically shut down within 5-10 minutes (the single headset will shut down automatically after 5 minutes when using mode; Turn off automatically after 10 minutes.

14. Support fast charging function.

15. Equipped with special charging case for charging.

16. Siri enabled

3.2 Operation list

1、 The headset part

function table		
function list	operation	remark
starting up	In the state of power off, long press the switch to start up for 2 seconds, the blue light flashes slowly, with the prompt tone（POWER ON）。	
shutdown	In the starting state, long press the switch for 6 seconds, the red light goes on for 1 time, and the machine prompts sound（POWER OFF）。	
Manual power on/single ear pairing	Monaural use: 1, the host do press switch 2 seconds long boot, boot after let go, blue lights flashing, then double-click the switch and enter a state of single ear search, matching the red and blue lights flashing (red and blue lights destroyed 400 ms and 400 ms), click on the bluetooth pairing called WS - RKS8 - R CONNECTED to the bluetooth device, and a prompt (PARING SUCCESSFUL), after the success of the bluetooth connection, and a prompt (CONNECTED), the host 1 blue lights will shine for 5 seconds. 2, deputy machine with single ear use: press switch 2 seconds long boot, boot after let go, blue lights flashing, then double-click the switch and enter a state of single ear search, matching the red and blue lights flashing (red and blue lights destroyed 400 ms and 400 ms), click on the bluetooth pairing called WS - RKS8 -I CONNECTED to the bluetooth device, and a prompt (PARING SUCCESSFUL), after the success of the bluetooth connection, and a prompt (CONNECTED), vice machine flashing blue lights 5 seconds twice.	
Automatic startup/single ear pairing	1, the host automatic matching single ear: put a single headphones in charge warehouse close the lid, and then gently pop up charge warehouse (5 v power supply disconnect), headset automatically boot, blue lights flashing, and then double-click the press buttons, enter a state of single ear search, matching the red and blue lights flashing (red and blue lights destroyed 400 ms and 400 ms), click on the bluetooth pairing called WS - RKS8 - R CONNECTED to the bluetooth device, a prompt (PARING SUCCESSFUL), after the success of the bluetooth connection, a prompt (CONNECTED), the host 1 blue lights will shine for 5 seconds. 2, vice machine automatic matching single ear: put a single headphones in charge warehouse close the lid, and then open the charging bin (5 v power supply disconnect), headset automatically boot, blue lights flashing, then press the button 2, enter a state of single ear search, matching the red and blue lights flashing (red and blue lights destroyed 400 ms and 400 ms), click on the bluetooth pairing called WS - RKS8 -I	

	CONNECTED to the bluetooth device, and a prompt (PARING SUCCESSFUL), after the success of the bluetooth connection, and a prompt (CONNECTED), vice machine flashing blue lights 5 seconds twice.
Manual ear pairing (host is R, sub-machine L)	In shutdown state, at the same time hold the headset switch 8 seconds, waiting for the red and blue lights will shine soon (red and blue lights destroyed 200 ms and 200 ms), the ears after the connection is successful, the main and vice machine blue light long on the host to enter into the state of bluetooth pairing, slow alternating red and blue lights flashing (red and blue lights destroyed 400 ms and 400 ms) vice machine cannot enter with bluetooth pairing, vice machine flashing blue lights 5 seconds twice. Click the bluetooth pairing name WS-S8-r to connect with the bluetooth device, and there is PARING SUCCESSFUL. After the connection of the bluetooth device, there is CONNECTED sound (CONNECTED, LEFT CHANNEL,RIGHT CHANNEL,Second device CONNECTED). The host blue light flashes once for 5 seconds and the auxiliary blue light flashes twice for 5 seconds。
Automatic power on/pair pairing (host is R, donkey engine L)）	The main and auxiliary ears are put into the charging bin to close the lid, and then tap to pop out the charging bin (5V power supply is cut off), automatically start up, and the blue light of the main and auxiliary earphone flashes. 1. The host entry is followed by a paired recording device。 2. It automatically enters the pairing state of the ears. Red and blue lights flash quickly (red and blue lights are on for 200ms and off for 200ms). Yes After the ear connection is successful, the blue light of main and auxiliary machine will be on for a long time. 3. If there is no matching recording equipment back to even, host and bluetooth devices in the matching condition, vice machine cannot enter paired with bluetooth devices, at this point, the deputy machine flashing blue lights 5 seconds twice, host matching, slow alternating red and blue lights flashing (red and blue lights destroyed 400 ms and 400 ms), click on the bluetooth pairing called Nokia Earbuds CONNECTED to the bluetooth device, and a prompt (PARING SUCCESSFUL), bluetooth connection is SUCCESSFUL, after the prompt (CONNECTED, LEFT CHANNEL,RIGHT CHANNEL, Second device connected), the host blue light flashes once in 5 seconds, and the auxiliary blue light flashes twice in 5 seconds.
Automatic reconnection equipment	1. After long press the switch for 2 seconds, the machine will start up, and the ear will automatically connect to the equipment that has been matched last time. 2. Tap the pop-up charging chamber and the ear will automatically reconnect to the device that was paired last time.	1. When the single headset is used, when it is not connected to the bluetooth device for 5 minutes, the headset is automatically shut down. 2, the use of headphones when 10 minutes when not connected to the bluetooth device, the headset automatically power off.
Telephone answering	In the ringing of incoming call, the blue light flashes once every 200 milliseconds. Press the switch and the phone is connected. During the call, it flashes every 5 seconds。
hang up	n a call, press the button, hang up the phone, and prompt tone （CALL END）

Refuse to listen to	In the status of incoming call, press 2 switch to refuse to answer the phone, and prompt tone（CALL REJECT）	
Pause/play	When listening to music, press the switch once, music will stop automatically, and then press the button again, music will play automatically.	
Last one, next one	When the headset plays music, the host long presses the switch for 2 seconds to switch to the next song, and hears the 'toot' sound to release the hand. The first officer presses the switch for 2 seconds to switch to the top song, and hears the 'toot' sound to release the hand.	1. Long press the switch for 2 seconds to switch to the top song, the next song. If you hear a "beep" sound, you need to release your hand. 2. Single ear use does not have this function.
Volume up control	When the headset plays music, press 2 to switch the host volume, and there is prompt tone at the maximum。	Single ear use does not have this function
Volume reduction	When the headset plays music, press 2 to switch the volume to decrease。	Single ear use does not have this function
Automatic connection and manual connection	1) manually shut off the device before starting it, and it will automatically connect to the bluetooth device that was successfully matched last time. If after successful connection, away from the headset, bluetooth device and disconnect with headphones, 1. The single headset is used, which will be connected to the bluetooth device automatically within 5 minutes if it returns to the bluetooth device. If the earphone is shut down automatically for more than 5 minutes, it can be reconnected by manual operation. 2. The use of headphones, bluetooth device you leave more distant and disconnected, 10 minutes, if return a bluetooth device, the headset automatically connected to the bluetooth device. If the earphone is shut down automatically after 10 minutes, it can be reconnected by manual operation. 2) headphones on charging case, open the charging lifted the lid, the ear to automatically connect to the last successful pairing bluetooth devices。	
charge lamp	When charging, the red LED indicator is always on. After charging, the LED indicator is all off。	
Low voltage alarm	When the BATTERY voltage is lower than 3.45v, the red LED indicates flashes [60S flashes 3 times, 200mS each time], and there is LOW BATTERY, PLEASE CHARGE prompt sound. After one minute, the ear will play a voice prompt. When the BATTERY voltage is lower than 3.2v, the bluetooth will automatically shut down。	
Clear pairing list	1. In the shutdown state, long press the switch for 8 seconds to enter the primary and secondary pairing state, the red and blue light flashes quickly, and then press the red and blue light for 2 times. When the red and blue light flashes for 2 times, the pairing list will be emptied (restore the factory setting), and it will be shut down automatically after clearing the pairing list. 2. The red and blue light flashes quickly. Then press the switch twice, and the red and blue light flashes twice at the same time. At this time, the pairing list is cleared (restore the factory setting)。	The main and secondary headphones empty the list of pairs at the same time, and the pair must be repaired to connect the two headphones。
start Siri	1. Start the function of Siri. Press the switch twice and hold it for 1 second to start Siri. In TWS mode, start Siri using the main headset. 2. Headset startup Siri function when	

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	used alone can also be the same way。	

2.Charging stand

- 1, In any state,5V Always On。

  2, When USB is inserted,MCU should detect power input.MCU then enters charging state indicator light

electric quantity　C（%）	LED1	LED2	LED3	LED4
be full of	bright	bright	bright	bright
75%≤C	bright	bright	bright	twinkle
50%≤C≤75%	bright	bright	twinkle	destroy
25%≤C≤50%	bright	twinkle	destroy	destroy
C≤25%	twinkle	destroy	destroy	destroy

3. Discharge mode 4 LED display

electric quantity　C（%）	LED1	LED2	LED3	LED4
Full	bright	bright	bright	bright
75%≤C	bright	bright	bright	destroy
50%≤C≤75%	bright	bright	destroy	destroy
25%≤C≤50%	twinkle	destroy	destroy	destroy
C≤25%	destroy	destroy	destroy	destroy

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- ### 3.3 Battery charge

- ### 3.3.1 description

  WS-NKS8 A 480mAh lithium polymer battery is built into the charging seat. When charging is needed, put the headset into the charging socket and push the headphone cavity into the charging state. Please recharge the headset before using it。

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- ### 3.4.2 graphical representation

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3.4 product feature

3.4.1 environmental requirement

Operating temperature range: - 10 ℃ to + 50 ℃ to work normally

Storage temperature range: - 20 ℃ ~ + 50 ℃ storage for a long time

3.4.2 electrical specification

3.4.2.1 battery characteristics

NOKIA WS-NKS8 Battery technical requirements are as follows：

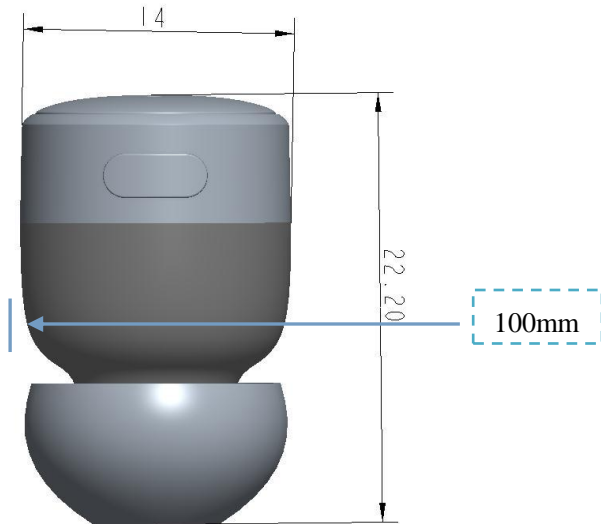| type of battery	Li-polymer
battery capacity	headset ≥ 55mAH Charging case ：≥500mAH
cell voltage	3.7 V（nominal）
working voltage	3.2V~4.2V
service life	>300 次

3.4.3

- Mechanical Requirement

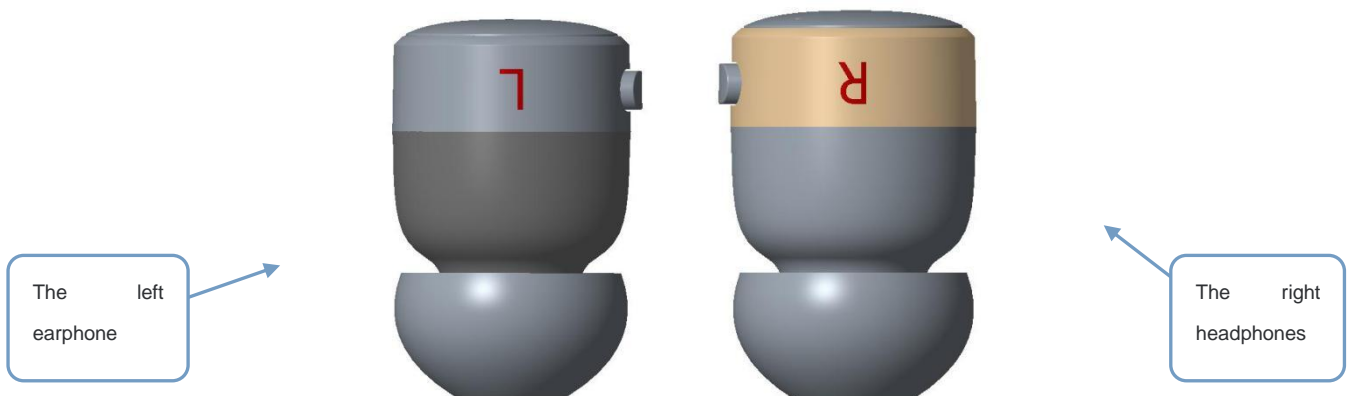NOKIA WS-NKS8 The dimensions are shown below

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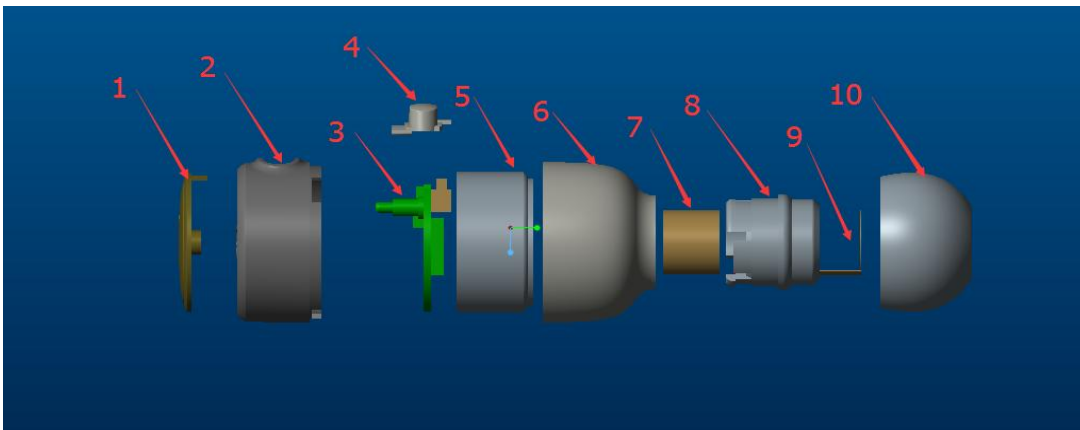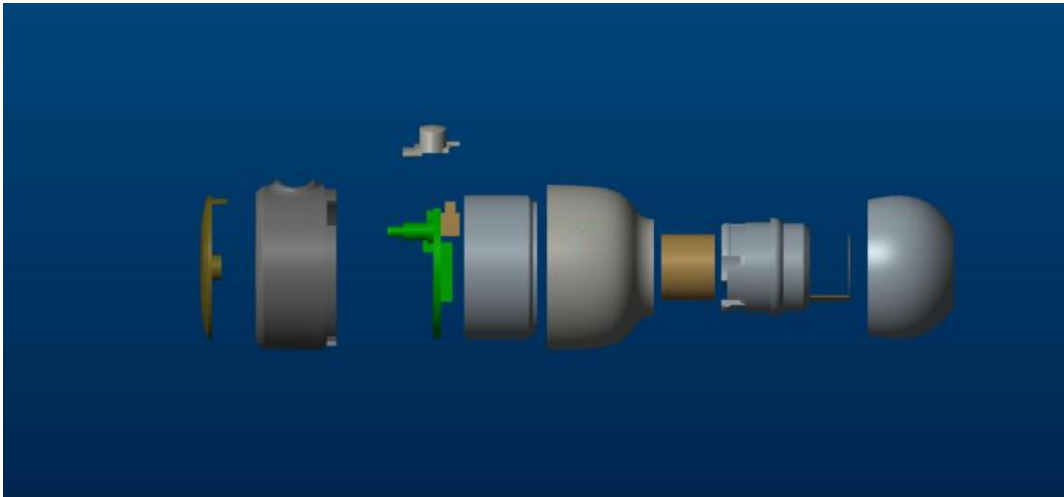
22.20

100mm

4.product mix

4.1 product formation

WS-NKS8 The bluetooth headset consists of two parts: the left earphone and the right earphone。

The left earphone

The right headphones

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4.2 Product explosion diagram

map 2.1.2.1.1

- 1. finishing component   2. Headphones shell   3.pcbmainboard   4. Keypad   5. button cell
- 6. The headset in the shell   7. Trumpet   8. The receiver mouth   9. The receiver network   10. earmuff

4.2.1 Product structure device（**BOM**）

see details—— 《WS-NKS8construction BOM》。

4.3 Product electronic devices（**BOM**）

see details—— 《WS-NKS8 electronic   BOM》。

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4.Electrical properties

4.4.1 Headphone power specification

project	Most small	Standard type	The most big	Single bit
] working voltage	3.2	3.8	4.2	V
Low battery voltage prompt	3.4	3.5	———	V
Low voltage shutdown	3.2	3.3		V
InputCharging Voltage	4.8	5	5.5	V
Full battery voltage	4.1	4.15	4.25	V
Quick charge current (single headset, battery voltage below 3.7V）	100	120	130	mA
Slow charge current (single headset, battery voltage below 3.7V）	50	60	70	mA
Standby current (connected to cell phone) jump	0.5	0.6	0.8	mA
Standby current (switched on and not connected to mobile phone)	2	5	10	mA
Pairing current (jumping)	5	12	18	mA
Operating current (normal call)3.7V time	10	13	16	mA
Working current (play music 1KHz/ -12db Output) 3.7v time	12	15	18	mA
Static current (shutdown)		5	15	uA
Unconnected automatic shutdown time (single ear use)		5	8	Min.
Unconnected automatic shutdown time (for both ears)		10	15	Min.
Matching search time		5		Min.
charging time	1	1 hour 10 minutes	1 hour 20 minutes	H
Standby time (connected)		＞70		H
call duration		＞/=4		H

pink noise，Iphone 70% volume）		〉／=3		H
distance test　（360 limit）		〉／=10		m

4.4.2 Audio specification of headset

project	Most small	Standard type	The most big	Single bit
(Output Power at　Max powe at 1KHz signal）	4	6	8	mW
ChannelSeparationwithunweighted 20Hz~20KHz LPF)	70	75	————	dB
Channel balance	———	1	1.5	dB
THD　@ 1mW Output	———	0.1	0.3	%
THD　@ Max power	———	0.3	0.5	%
S/N Ratio @ Max power (A-weighted）20Hz~20KHz LPF)	80	85		dB
Hum and Noise Level		16	20	uV

4.4.3 Earphone radio frequency specification

Output Power (PAV)		
2402MHz	$7 < P_{AV} < 10$	dBm
2441MHz		
2480 MHz		
Modulation haracteristics		
2402MHz	140kHz<f<175kHz	kHz
2441MHz		
2480 MHz		

Sensitivity – single slot packets (BER < 0.1%)		
2402MHz	Prx less than or equal to -88	dBm
2441MHz		
2480 MHz		

Sensitivity – multi slot packets (BER < 0.1%)		
2402MHz	Prx less than or equal to -88	dBm
2441MHz		
2480 MHz		
Maximum Input Power Level (BER < 0.1%)		
2402MHz	*Prx greater than or equal to -20*	*dBm*
2441MHz		
2480 MHz		
Initial Carrier **&Carrier Drift**		
2402MHz	*less than or equal to* $+/-6$	*KHz*
2441MHz		
2480MHz		

4.4.4 Charging case electrical specification

project	Most small	Standard type	The most big	Single bit
Protection current (single load）	200	250	300	mA
Protective current (two loads）	260	350	500	mA
turn off current		―――	―――	mA
Standby current (no load）		100	200	uA
Standby current (with load）		1	1.5	mA
charge current		300	400	mA
Charging output voltage	4.8	5	5.5	V
charging time	1 hour 30 minutes	2hour	2hour30minute	H

4.4.5 product function（function table）

See the ws-nks8 function table for details》。

4.4.6 radio-frequency performance

ask for

Radiofrequency needs to be greater than or equal to 8 meters on the opposite side. Within 8 meters, no music, call card, interruption, tone change and other phenomena shall occur during human use。

4.4.7 battery testing

4.4.7.1 ask for

Referring to national standards：GB/T 18287-2000

4.4.7.2 discharge current：

Discharge should be conducted according to 0.2c5a, and the discharge time should be no less than 5h。

Discharge in accordance with 1C5A should be no less than 51min。
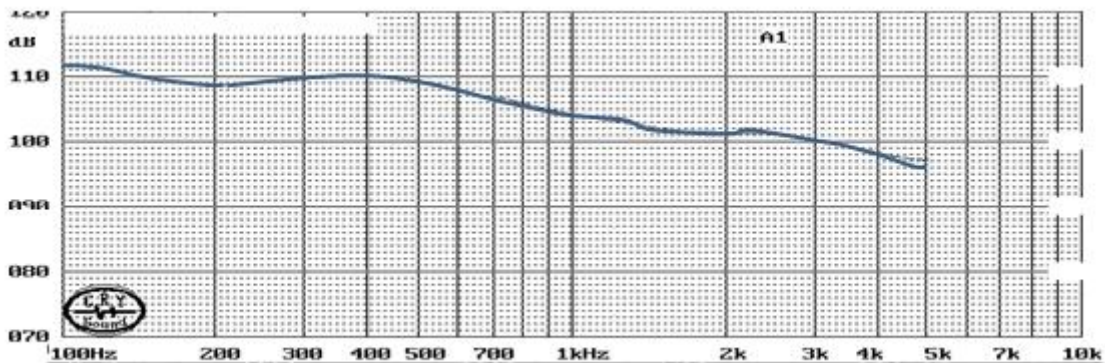
4.4.7.3 overcharge protection

The battery shall not explode, catch fire, smoke or leak when the constant voltage and constant current of 2C5A current is charged for 8h。

-
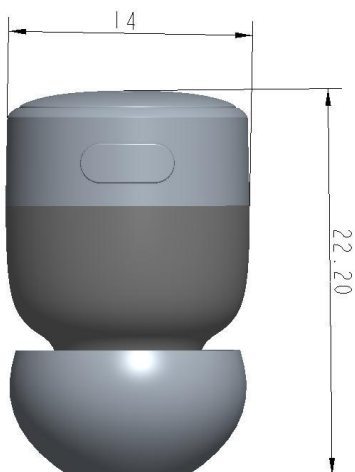- ### 4.4.7.4 over discharge protection

The battery shall not explode, catch fire, smoke or leak for 24 hours after discharge with a constant current of 0.2c5a, other than according to the company's testing standard for lithium battery of electronic products。

4.4.8 Transmitter (horn) detection

4.4.8.1 Frequency response curve (component)

Headphone size map：

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FCC WARNING

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

FCC ID: 2AO8ZWS-S8