HUAWEI VPM220W Microphone Array V100R001

User Guide

Issue   01

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About This Document

Purpose

This document is intended for the users of the microphone array and describes how to install, use, and maintain the microphone array.

Before you use the product, refer to the product vendor for version mapping information and to confirm compatibility with other videoconferencing equipment.

Related Versions

The following table lists the product versions related to this document.

Product Name	Version
HUAWEI VPM220W Microphone Array	V100R001

Intended Audience

This document is intended for:

- Users of the microphone array
- Installation engineers of the microphone array
- Administrators of videoconferencing systems
- Technical support engineers

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
⚠ DANGER	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.

Symbol	Description
⚠ WARNING	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
⚠ CAUTION	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
☞ TIP	Indicates a tip that may help you solve a problem or save time.
📖 NOTE	Provides additional information to emphasize or supplement important points of the main text.

Contents

1 Overview

About This Chapter

The HUAWEI VPM220W wireless microphone array (VPM220W) is a wireless audio pickup device that can seamlessly integrate with HUAWEI TEX0 series videoconferencing endpoints and HUAWEI DP300 videoconferencing endpoint.

The VPM220W uses three microphones spaced 120 degrees apart, offering 360-degree audio pickup at a radius of up to 6 meters. The VPM220W offers premium audio input to videoconferencing endpoints, significantly contributing to a more pleasant conference experience.

1.1 Features

Flexible Access

- The VPM220W connects to a videoconferencing endpoint over Wi-Fi. When you use the VPM220W for the first time, you will need to manually search for an available Wi-Fi network. The next time you use the VPM220W, it automatically connects to the same endpoint.
- The VPM220W can be easily moved based on the number of meeting participants and the layout of the venue. This avoids the inconvenience associated with wired microphones.
- The VPM220W network is simple and because its microphones directly communicate with the videoconferencing endpoint over Wi-Fi, it ensures stable signals and strong anti-interference capabilities. However, the VPM220W does not support cascading.

Reliable and Easy to Use

- The VPM220W has a mute button on top of the device. Tapping the mute button will mute or unmute all the VPM220Ws of the same site.
- You can use the VPM220W directly after it starts up without performing any additional configurations.
- The VPM220W is equipped with a rechargeable battery and comes with a charger base that can recharge one or more VPM220Ws simultaneously. A fully charged VPM220W provides up to 8 hours of active time and 24 hours of standby time.

- You can easily store and maintain the VPM220W without disconnecting cables. Incorrect cable disconnection may lead to microphone unavailability.

High-Quality Audio

- The VPM220W supports 360-degree audio pickup at a radius of up to 6 meters.
- The VPM220W delivers high-quality audio using frequency compensation technologies.
- The VPM220W supports both mono and stereo applications.

Low Power Consumption
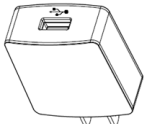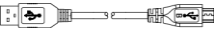
- The VPM220W utilizes an energy-efficiency design. It consumes less than 2 W of power in active mode and less than 0.7 W in standby mode.
- Videoconferencing endpoints, rather than the VPM220W, perform audio processing, which reduces the VPM220W's power consumption.

1.2 Components

Unpack the product and ensure that all the necessary components are included.

Table 1-1 lists the VPM220W components. If you have purchased optional accessories, check them against your order.

Table 1-1 VPM220W components

Name	Function
VPM220W (with battery)	Collects audio data and sends it to the videoconferencing endpoint.
Charger base	Recharges the VPM220W.
Power adapter	Connects your power supply to the charger base.
USB cable	Connects the power adapter to the charger base or connects a PC to the USB port on the charger base to recharge the VPM220W or connects multiple VPM220Ws to recharge them simultaneously.

1.3 Compatibility with Videoconferencing Endpoints

The VPM220W is compatible with the following videoconferencing endpoint models:

- HUAWEI TE30
- HUAWEI TE40
- HUAWEI TE50
- HUAWEI TE60
- HUAWEI TE80
- HUAWEI DP300

2 Installation

2.1 Appearance

Figure 2-1 shows the VPM220W.

Figure 2-1 VPM220W

The VPM220W is plate-shaped with three microphones spaced 120 degrees apart. On top is a mute button, a battery indicator, a Wi-Fi indicator, and three microphone indicators. You can mute or unmute all the VPM220Ws of the same site by tapping the mute button. The VPM220W has a power switch on its base. You can turn off this switch if the VPM220W is not to be used for a long period of time. For details about the indicator status, see 2.6 Checking Indicators.

2.2 Placing the VPM220W

The VPM220W has arc-shaped rubber pads on its base to prevent it from sliding. You can place the VPM220W on a conference table. To ensure optimal voice quality, pay attention to the following:

- Place the VPM220W on a stable surface and keep it away from obstacles so that it can effectively pick up sounds.
- Place multiple VPM220Ws in a large conference room to ensure that all participants can be heard.
- Speak into one of the VPM220W microphones, but do not move the unit.

2.3 Turning On or Off the Power Switch

Turn on the power switch to start the VPM220W.

After the VPM220W starts, it requests an IP address. All three microphone indicators turn blue and blink in a clockwise direction. Once the VPM220W obtains the IP address, the three microphone indicators become:

- Steady blue when microphone input is enabled on the videoconferencing endpoint.
- Steady red when microphone input is disabled on the videoconferencing endpoint.

To power off the VPM220W, press and hold the power button for 2 seconds or more.

2.4 Connecting to the Videoconferencing Endpoint

The VPM220W connects to a videoconferencing endpoint over Wi-Fi. Before connecting the VPM220W to the videoconferencing endpoint, you must enable the Wi-Fi hotspot and the Dynamic Host Configuration Protocol (DHCP) service on the videoconferencing endpoint to obtain the IP address of the VPM220W. The videoconferencing endpoint functions as the DHCP server, and the VPM220W serves as the DHCP client. For details about how to enable the DHCP service, see the user guide for the HUAWEI TEX0 videoconferencing endpoint.

Figure 2-2 shows the network of VPM220W.

Figure 2-2 VPM220W network

The VPM220W supports manual and automatic Wi-Fi connection.

- Manual connection: When you use the VPM220W for the first time or move it outside the connected Wi-Fi network range, the VPM220W automatically searches for an available Wi-Fi network. After you manually connect the VPM220W to the Wi-Fi network, you need to hold and press the 🎤 button on top of the VPM220W for at least 3 seconds and accept the connection request on the videoconferencing endpoint's remote controlled UI or web interface. The VPM220W then performs the Wi-Fi Protected Setup (WPS) Push Button Configuration (PBC) authentication with the videoconferencing endpoint in order to obtain an IP address. During WPS PBC authentication, the three microphone indicators blink blue in a clockwise direction.

- Automatic connection: After the VPM220W first obtains an IP address, it automatically reconnects after a restart.

2.5 Muting or Unmuting the VPM220W

The VPM220W has a 🎤 button on top of the device. For details about the button position, see Figure 2-1.

You can tap the 🎤 button to mute or unmute the VPM220W in the following scenarios:

- If you do not want to have your voice broadcast during a conference, you can tap this button to mute the VPM220W. The three indicators then turn red.

- If a participant wants to speak during a conference, you can tap this button to unmute the VPM220W. The three indicators then turn blue.

2.6 Checking Indicators

There are five indicators on top of the VPM220W and there is a charging status indicator on the charger base. The indicators display the VPM220W work status.

Table 2-1 lists the indicator status.

Table 2-1 Indicator status

Indicator Status	VPM220W Work Status
All three microphone indicators are steady red.	All the three microphones are turned off.
All three microphone indicators are steady blue.	All the three microphones are turned on.
All three microphone indicators are off.	The power switch of the VPM220W is turned off.
All three microphone indicators are blue on and off gradually.	The VPM220W is in sleep state.
All three microphone indicators are blinking blue in a clockwise direction.	• The VPM220W is connecting to the videoconferencing endpoint. • The VPM220W is restarting.
All three microphone indicators are blinking blue twice simultaneously.	The VPM220W is preparing to send a videoconferencing endpoint a request for Wi-Fi Protected Setup (WPS) Push Button Configuration (PBC) authentication.
All three microphone indicators are blinking blue simultaneously.	The VPM220W is upgrading.
All three microphone indicators are blinking red twice in a clockwise direction.	The VPM220W is about to power off.
The Wi-Fi indicator is off.	• The VPM220W is powered off. • The VPM220W is connecting to a videoconferencing endpoint over Wi-Fi, and the Wi-Fi signal is strong.
The Wi-Fi indicator is steady red.	The VPM220W is connecting to a videoconferencing endpoint over Wi-Fi, and the Wi-Fi signal is weak.
The Wi-Fi indicator is blinking red.	The VPM220W is searching for Wi-Fi hotspots.
The battery indicator is off.	• The battery level is sufficient (the battery can run another 30 minutes or more). • The VPM220W is powered off.
The battery indicator is steady red.	The battery level is insufficient (the battery can run less than 30 minutes).

Indicator Status	VPM220W Work Status
The charging status indicator is blue and is in breathing state.	The VPM220W is being recharged.
The charging status indicator is steady blue.	The VPM220W is fully charged.
The charging status indicator is off.	• The VPM220W is not placed on the charger base. • The VPM200W's power adapter is not connected to an AC power supply.

2.7 Switching the Work Mode

The VPM220W supports two work modes: active mode and sleep mode. Active mode is when the VPM220W is operating normally.

When the VPM220W is connected to a videoconferencing endpoint over Wi-Fi, the videoconferencing endpoint can send a sleep instruction to the VPM220W. Upon receiving the sleep instruction, the VPM220W enters the sleep mode and stops collecting and sending audio data, all the three microphone indicators are blue on and off gradually.

You can wake the VPM220W in either of the following two ways:

• Send a wakeup instruction to the VPM220W on the videoconferencing endpoint.

• Press the 🎤 button on top of the VPM220W.

When the VPM220W wakes up, the VPM220W starts to collect and send audio data. All three microphone indicators restore their previous status.

2.8 Checking the Volume

You are advised to check the volume in the following scenarios:

• After the VPM220W installation
• Before a conference
• During a conference

The volume is checked and adjusted on the videoconferencing endpoint. For details about how to adjust the volume, see the user guide for the videoconferencing endpoint.

2.9 Charging the VPM220W

You can recharge the VPM220W using the charger base.

Place the VPM220W on the charger base and use the USB cable to connect the charger base to a power adapter or a computer's USB port.

![WARNING icon] **WARNING**

When the VPM220W has no battery installed, do not connect its USB port to any power supply, as doing so may shorten the VPM220W's service life.

![CAUTION icon] **CAUTION**

- Risk of explosion if battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.

3 Mono and Stereo

About This Chapter

The VPM220W can work in mono or stereo mode. The VPM220W's audio collection capabilities when working in mono or stereo mode are described as follows:

- In mono mode, the VPM220W collects audio data and transmits it to a videoconferencing endpoint. The endpoint then processes the received audio data and sends it through one audio channel to the peer site.

- In stereo mode, the VPM220W collects audio data and transmits it to a videoconferencing endpoint. The endpoint then processes the received audio data and sends it through both the left and right audio channels to the peer site.

Stereo mode enables listeners to distinguish the direction from which the sound comes, thereby delivering a more true-to-life experience. A single VPM220W can work in stereo mode.

3.1 Mono and Stereo Configurations

You can configure the mono and stereo modes for the VPM220W on a videoconferencing endpoint.

For details about configurations, see Table 3-1.

Table 3-1 Channel mode configurations

Channel Mode	Audio Protocol (Configured on a Videoconferencing Endpoint)
Mono mode	G.711A/U, G.722, G.728, or G.7221C (supported at all rates)
	AAC-LD or HWA-LD (Mono mode is enabled.)
Stereo mode	AAC-LD or HWA-LD (Stereo mode is enabled.)

3.2 Mono and Stereo Collection

Mono Mode

When VPM220Ws are cascaded or a VPM220W works in mono mode, all the microphones in the VPM220W collect sounds from all directions. The VPM220W then transmits the best quality sounds collected by one of the microphones to the videoconferencing endpoint.

Stereo Mode

Figure 3-1 shows the application of the left and right audio channels when one VPM220W is working in stereo mode.

Figure 3-1 Sound collection
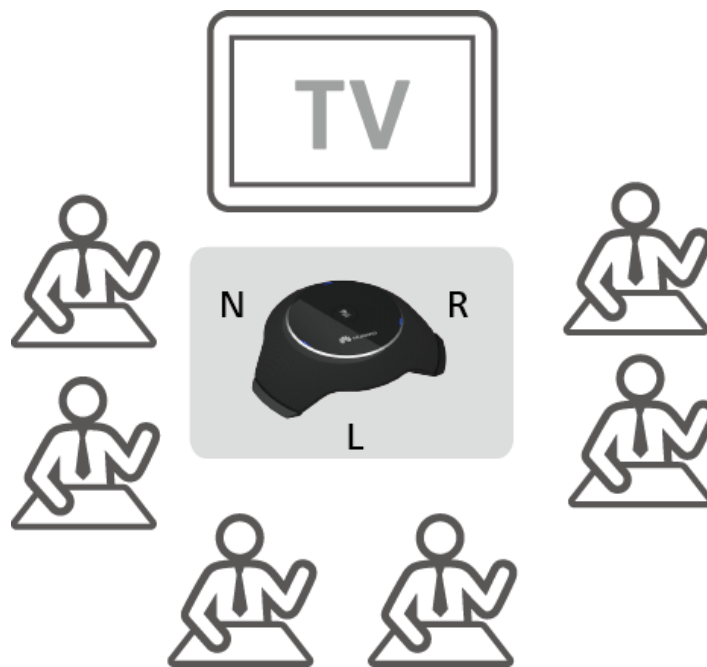
L: This microphone is used to collect sounds for the left audio channel.

R: This microphone is used to collect sounds for the right audio channel.

N: This microphone is not used.

In this figure, the letters **L**, **R**, and **N** indicate the three VPM220W microphones.

4 Upgrade

About This Chapter

The VPM220W supports two software upgrade methods: automatic upgrade and tool upgrade. You can upgrade the VPM220W after connecting it to the videoconferencing endpoint over Wi-Fi.

During the upgrade, all three microphone indicators are blinking blue at the same time.

⚠ **CAUTION**

- The upgrade must be performed by trained technical support engineers. If you perform the upgrade for the first time, contact technical support engineers for help.
- During the upgrade, ensure that the power supply is functioning properly to avoid damage to the VPM220W.

4.1 Automatic Upgrade

Context

You can enable the wireless MIC auto update function on a videoconferencing endpoint. When the videoconferencing endpoint is connected to the VPM220W, it automatically checks whether the upgrade software version saved on it is consistent with the version of the VPM220W. If the two versions are different, the videoconferencing endpoint upgrades the VPM220W.

Procedure

Step 1 Log in to the videoconferencing endpoint web interface. Choose **System Settings** > **Installation** > **Upgrade Settings**.

Step 2 Select **Enable wireless MIC auto update**.

Step 3 Click **Save**.

The VPM220W automatically restarts when the automatic upgrade is complete.

----End

4.2 Upgrade Using the Upgrade Tool

Prerequisites

Before the upgrade, ensure that:

- The target software is saved to the computer.
- The computer is connected to the videoconferencing endpoint using a straight-through cable, crossover cable, or switch.

Context

When the VPM220W is connected to a HUAWEI TE30, the upgrade tool cannot be used to upgrade the VPM220W.

Procedure

Step 1 Power on the computer and videoconferencing endpoint.

Step 2 Run **UpgMaster.exe** to display the upgrade tool window.

Step 3 Set the automatic upgrade parameters by referring to Figure 4-1.

- Click **Browser** and select the upgrade file.
- Select **Mic** for **Product Type**.
- Enter the videoconferencing endpoint IP address, such as 10.10.10.10.

Figure 4-1 Upgrade tool window
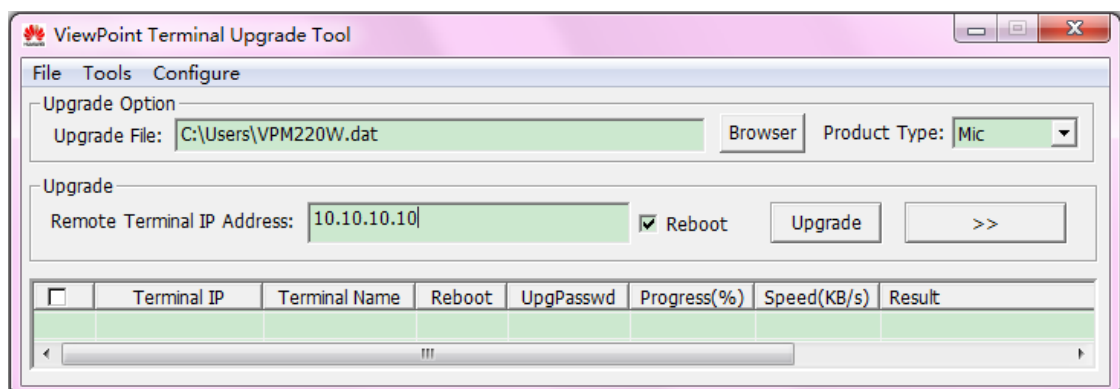
Step 4 Click **Upgrade**.

Restart the videoconferencing endpoint and VPM220W. After the restart, the VPM220W enters the normal work state.

----End

A Safety Precautions

Accessory Requirements

Use only the approved accessories (such as the battery and charger base). Using other types of accessories may violate the device warranty agreement and related regulations of the involved country and may cause security accidents. To obtain the approved accessories, contact your dealer.

General Requirements

- Before you install and use the VPM220W, read these safety precautions carefully and observe them during operation.
- During storage, transportation, and operation of the device, keep the device dry.
- During storage, transportation, and operation of the device, avoid any impact to the device.
- Do not attempt to dismantle the device by yourself. In case of any problems, contact your specified maintenance center for repair.
- Without prior written consent, no organization or individual is permitted to make any change to the structure or safety design of the device. Huawei Technologies Co., Ltd. is not liable for any consequences or legal issues resulting from such changes.
- While using this device, observe all applicable laws, directives, and regulations.

Environmental Requirements

- Place the VPM220W at a well-ventilated place. Do not expose the device to direct sunlight.
- Keep the device clean and free of dust.
- Do not place any objects on top of the device. Otherwise, the device may become excessively hot during operations. Also, heavy objects may damage the VPM220W.
- Keep at least 10 cm between the device and the closest object for heat dissipation.
- Do not place the device on or near any objects that can easily catch fire, such as paper or objects made of rubber.
- Keep the device far away from any heat sources or open flames, such as an electric heater or candle.
- Keep the device far away from any household appliances that have a strong magnetic or electromagnetic field, such as a microwave oven or a refrigerator.

Operating Requirements

- Do not let children operate the VPM220W without supervision.
- Do not let children play with the device or any accessories. Swallowing the accessories may lead to injury.
- Use only approved accessories.
- The device power supply must meet the requirements of the device input voltage. Use only the provided lightning protection power socket.
- While plugging or unplugging a cable, make sure that your hands are completely dry.
- Do not step on, pull, or overbend a cable. Otherwise, damage may cause the device to malfunction.
- Do not use an old or a damaged power cable.
- During a lightning storm, stop using the device and disconnect it from the power supply. Unplug the power cable to avoid damage resulting from a lightning strike.
- If the device is not used for a long time, disconnect it from the power supply and unplug the power cable.
- Immediately stop using the device, disconnect it from the power supply, and unplug the power cable if smoke is emitting from the device or an abnormal noise or smell is present. Contact the specified maintenance center for repair.
- Prevent any objects such as metal shavings from entering the device through the heat dissipation vents.
- Before connecting any other cables, connect the device ground cable. Do not disconnect the ground cable until you disconnect all other cables.
- Make sure that the three-phase power socket is correctly grounded. The neutral line and the live line must not be inversely connected.
- Do not scratch or damage the shell of the device. This may cause the device to malfunction. Any resulting paint flecks may lead to skin allergies.

Cleaning Requirements

- Before cleaning the VPM220W, stop using it and disconnect it from the power supply.
- Use a soft cloth to clean the device.
- Keep the power plug clean and dry. Using a dirty or wet power plug may lead to an electric shock or other hazards.

European Regulatory Compliance

	The VPM220W complies with the following European directives and regulations.
	- 1999/5/EC (R&TTE)
	- 2002/95/EC & 2011/65/EU (RoHS)
	- EC NO. 1907/2006 (REACH)
	- 2002/96/EC (WEEE)
	The VPM220W complies with Directive 2002/95/EC, 2011/65/EU and other similar regulations from the countries outside the European Union, on the RoHS in electrical and electronic equipment. The VPM220W does not contain lead, mercury, cadmium, and hexavalent chromium and brominated flame retardants (Polybrominated Biphenyls (PBB) or Polybrominated Diphenyl Ethers (PBDE)) except for those

	exempted applications allowed by RoHS directive for technical reasons.
	The VPM220W complies with Regulation EC NO. 1907/2006 (REACH) and other similar regulations from the countries outside the European Union. Huawei will notify to the European Chemical Agency (ECHA) or the customer when necessary and regulation requires.
	The VPM220W complies with Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Huawei is responsible for recycling its end-of-life devices, and please contact Huawei local service center when recycling is required. Huawei strictly complies with the EU Waste Electrical and Electronic Equipment Directive (WEEE Directive) and electronic waste management regulations enacted by different countries worldwide. In addition, Huawei has established a system for recycling and reuse of electronic wastes, and it can provide service of dismantling and recycling for WEEE. By Huawei recycling system, the waste can be handled environmentally and the resource can be recycled and reused fully, which is also Huawei WEEE stratagem in the word. Most of the materials in VPM220W are recyclable, and our packaging is designed to be recycled and should be handled in accordance with your local recycling policies.
	In accordance with Article 11(2) in Directive 2002/96/EC (WEEE), VPM220W were marked with the following symbol: a cross-out wheeled waste bin with a bar beneath as below:

FCC Part 15

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

If this device is modified without authorization from Huawei, the VPM220W may no longer comply with FCC requirements for Class B digital devices. In that a case, your right to use the VPM220W may be limited by FCC regulations. Moreover, you may be required to correct any interference to radio or television communications at your own expense.

This device 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 device generates, uses and radiates radio frequency energy. If it is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the VPM220W off and on, the user may take one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Reinforce the separation between the VPM220W and receiver.

- Connect the VPM220W into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for assistance.

Canada Regulatory Compliance

- RSS-Gen statement

  This device complies with Industry Canada licence-exempt RSS standard(s).

  Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

  Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

- RSS-210 statement:

  This device complies with Industry Canada RSS-210. Operation is subject to the following two conditions: (1) this device may not cause interference, and(2) this device must accept any interference, including interference that may cause undesired operation of the device.

  Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio RSS-210. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

- RSS-102 statement:

  The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

  Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

  This equipment complies with IC 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. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

  Cet équipement est conforme à l'exposition aux rayonnements IC limites établies pour unenvironnement non contrôlé. Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur.Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre le radiateur et votre corps.

B Technical Specifications

Category	Item	Specifications
Protocol and standards compliance	Network port	None
	Audio input/output interface	Huawei private audio protocol
Audio	Input interface	Micro USB
	Output interface	None
	Sampling rate	48 kHz
	Frequency response	3 dB: 0.2 kHz to 14 kHz 6 dB: 0.1 kHz to 20 kHz
	Acoustic Echo Cancellation (AEC)	Supported
	Acoustic Noise Suppression (ANS)	Supported
	Automatic Gain Control (AGC)	Supported
	Signal-to-noise ratio (SNR)	Not less than 70 dB
Microphone	Sensitivity	38±2 dB
	Audio pickup distance	6 m
	Audio pickup scope	360°
Power supply and power	Input voltage range	100 V to 240 V AC (50 Hz/60 Hz)
	Output voltage	5±5% V DC
	Operating power consumption	2 W
	Standby power	0.7 W

Category	Item	Specifications
	consumption	
Physical specifications	Operating temperature	0°C to 40°C
	Unpacked device dimensions (diameter x height)	146 mm x 27 mm (5.75 in. x 1.06 in.)
	Package dimensions (H x W x D)	77 mm x 295 mm x 193 mm (3.03 in. x 11.62 in. x 7.60 in.)
	Net weight	0.12 kg
	Gross weight (with the device, cables, and package)	0.58 kg
	Charger base weight	72.5 g