

Shenzhen Chainway Information Technology Co., Ltd.

Wearable BT UHF Reader

MR20 User Manual



Content

Content	1
Statement	2
Chapter 1 Product intro	3
1.1 Intro.....	3
1.2 Precaution before using battery	4
1.3 Charger	5
1.4 Notes.....	6
Chapter 2 Installation instructions	7
2.1 Appearance.....	7
2.3 Battery charge.....	8
2.4 Buttons and function area display	9
Chapter 3 Demo Test	10
3.1 Install demo-uhf-bt (1.0.8).....	10
3.2 Pairing Device.....	11
3.3 UHF Scan Function.....	13
3.4 UHF Configuration	14
3.5 UHF Tag Reading and Writing	15
3.6 UHF Tag Lock and Kill	16
Chapter 4 Device characteristic.....	18

Statement

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Chapter 1 Product intro

1.1 Intro

Chainway MR20 is our refined and new generation wearable Bluetooth UHF readers. Being a compact and portable device, it can be operated together with gloves, wristbands, or lanyards and make your work much more flexible and convenient. With a built-in UHF module, Chainway MR20 possesses a powerful data-collection and transmission function via a simple Bluetooth connection with Android/iOS devices. Removable battery and fast charging capability enable it to achieve work continuity for a long duration. Besides, this tiny device has the protection features like dustproof, waterproof, shockproof, and drop resistance. All these functions make the MR20 a most adaptable device in a wide spectrum of circumstances such as logistics & express delivery, retail store management, warehouse management, power patrol inspection, asset management, e-commerce picking, and tickets checking, etc. helping users free their hands and significantly improve work efficiency.

1.2 Precaution before using battery

- Do not leave battery unused for long time, no matter it is in device or inventory. If battery has been used for 6 months already, it should be checked for charging function or it should be disposed correctly.
- The lifespan of Li-ion battery is around 2 to 3 years, it can be circularly charged for 300 to 500 times. (One full battery charge period means completely charged and completely discharged.)
- When Li-ion battery is not in use, it will continue to discharge slowly. Therefore, battery charging status should be checked frequently and take reference of the related battery charging information on the manuals.
- Observe and record the information of a new unused and non-fully charged battery. On the basis of operating time of new battery and compare with a battery that has been used for long time. According to product configuration and application program, the operating time of battery would be different.
- Check battery charging status at regular intervals.
- When battery operating time drops below about 80%, charging time will be increased remarkably.
- If a battery is stored or otherwise unused for an extended period, be sure to follow the storage instructions in this document. If you do not follow the instructions, and the battery has no charge remaining when you check it, consider it to be damaged. Do not attempt to recharge it or to use it. Replace it with a new battery.
- Store the battery at temperatures between 5 °C and 20 °C (41 °F and 68 °F).

1.3 Charger

The charger type is NA010050020, output voltage/current is 5V DC/2A. The plug considered as disconnect device of adapter.

1.4 Notes

Note:

Using the incorrect type battery has danger of explosion.
Please dispose the used battery according to instructions.

Note:

Due to the used enclosure material, the product shall only be connected to a USB Interface of version 2.0 or higher. The connection to so called power USB is prohibited.

Note:

The adapter shall be installed near the equipment and shall be easily accessible.

Note:

The suitable temperature for the product and accessories is -20 °C to +50 °C

Note:

CAUTION RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

Chapter 2 Installation instructions

2.1 Appearance

MR20 appearances are showing as follows:



Indicating Lamps instruction

Lamps		Description
Indicating Lamps	Power	Red lamp lights up constantly (charging status) Green lamp lights up constantly (battery fully charged) Blue lamp lights up constantly (battery level higher than 20%) Blue lamp flashing (battery level lower than 20%)
	Bluetooth	Constant light up (Bluetooth connected)
	Work	Flash when read UHF tags

2.3 Battery charge

By using USB contact, the original adaptor should be used for charging the device. Make sure not to use other adaptors to charge the device.

2.4 Buttons and function area display

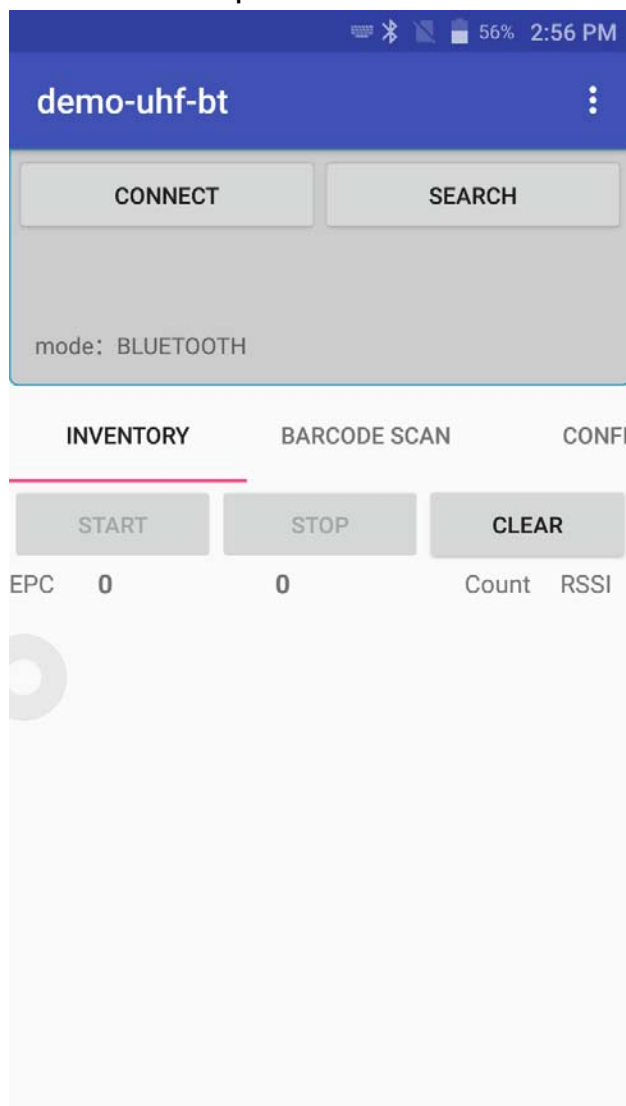
MR20 reader has 1 power button and 1 Type-C port, 1 SCAN button.



Chapter 3 Demo Test

3.1 Install demo-uhf-bt (1.0.8)

1. Copy demo-uhf-bt (1.0.8) into internal storage of smart phone or C7x device.
2. Click to install.
3. Click icon to open demo.



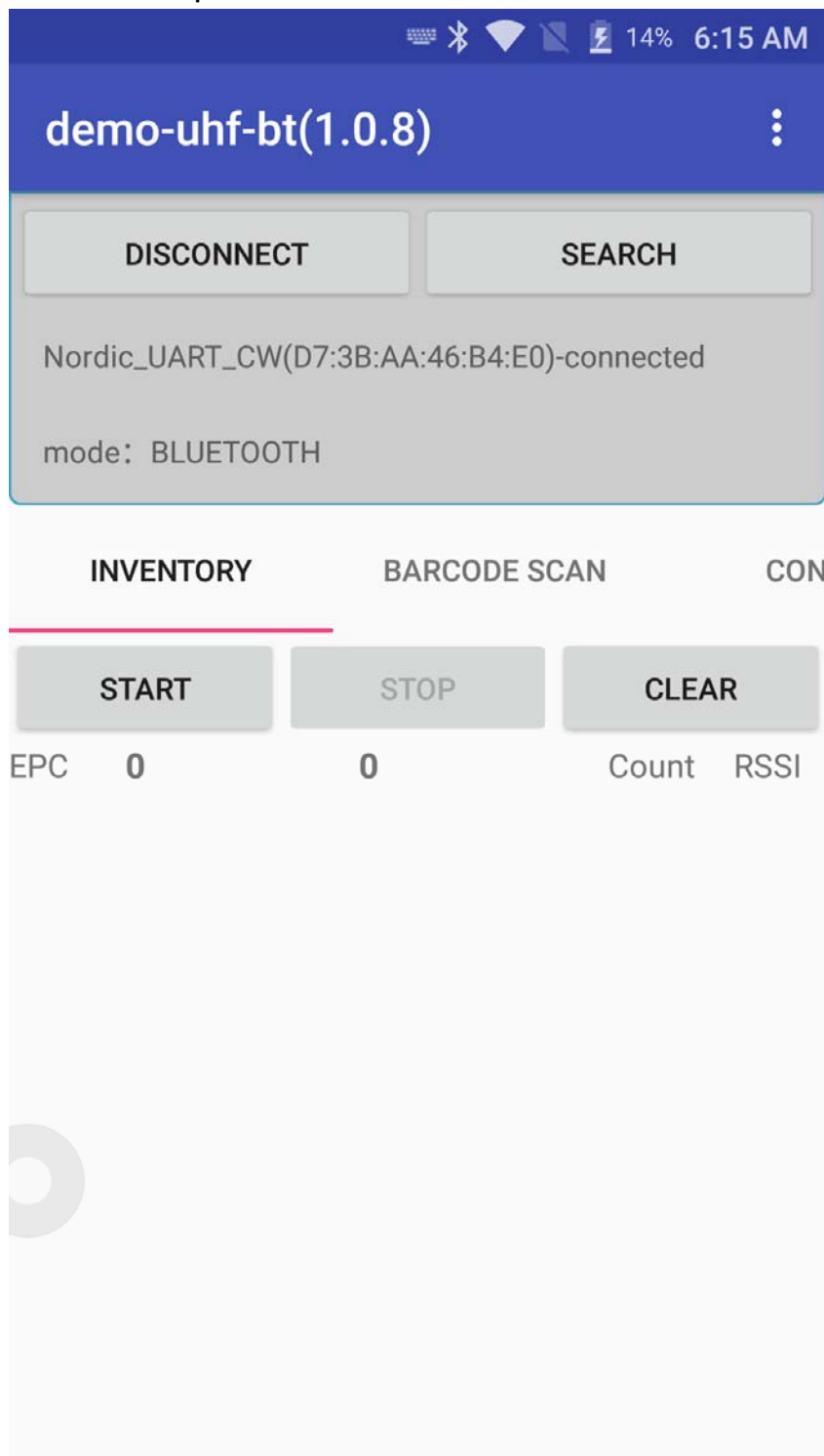
3.2 Pairing Device

1. Switch on Bluetooth function of smartphone or C7x device.
2. Power on MR20.
3. Click BLUETOOTH in the demo.
4. Click SEARCH to search for MAC of MR20.



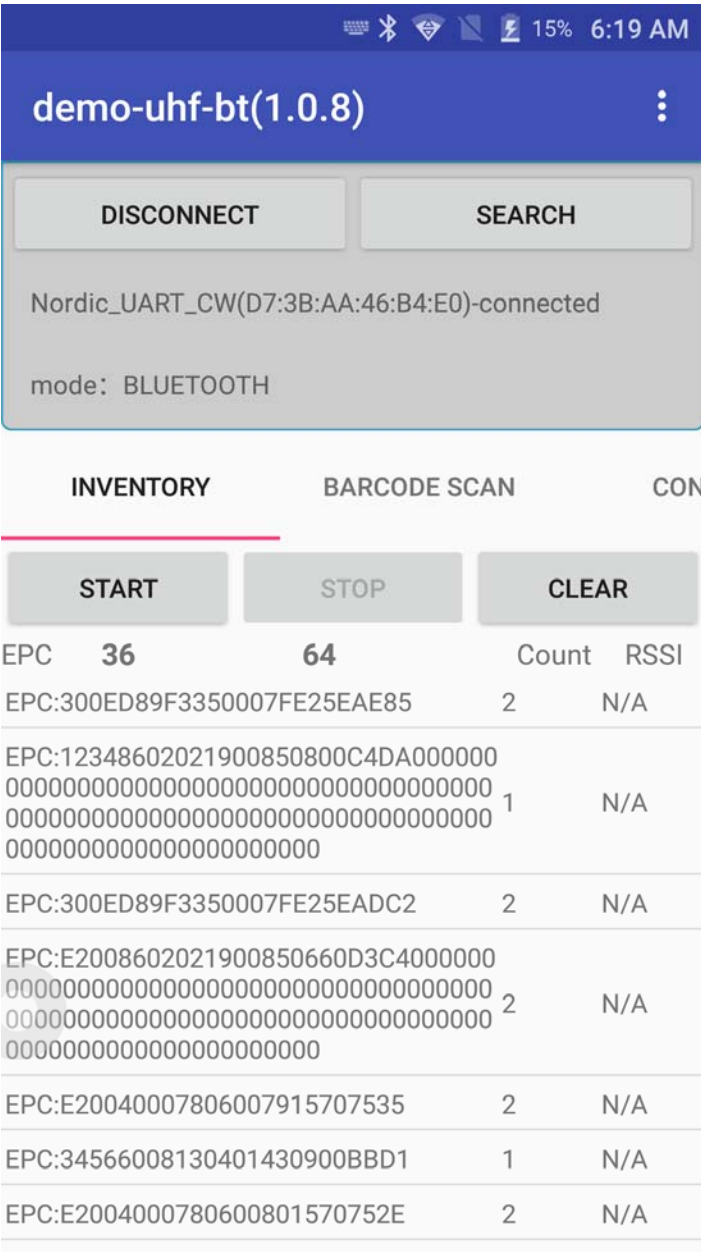
5. Click the correct MAC to connect.

6. After connecting successfully, user could click 3 dots on top right to check UHF version, battery percentage and UHF module temperature.



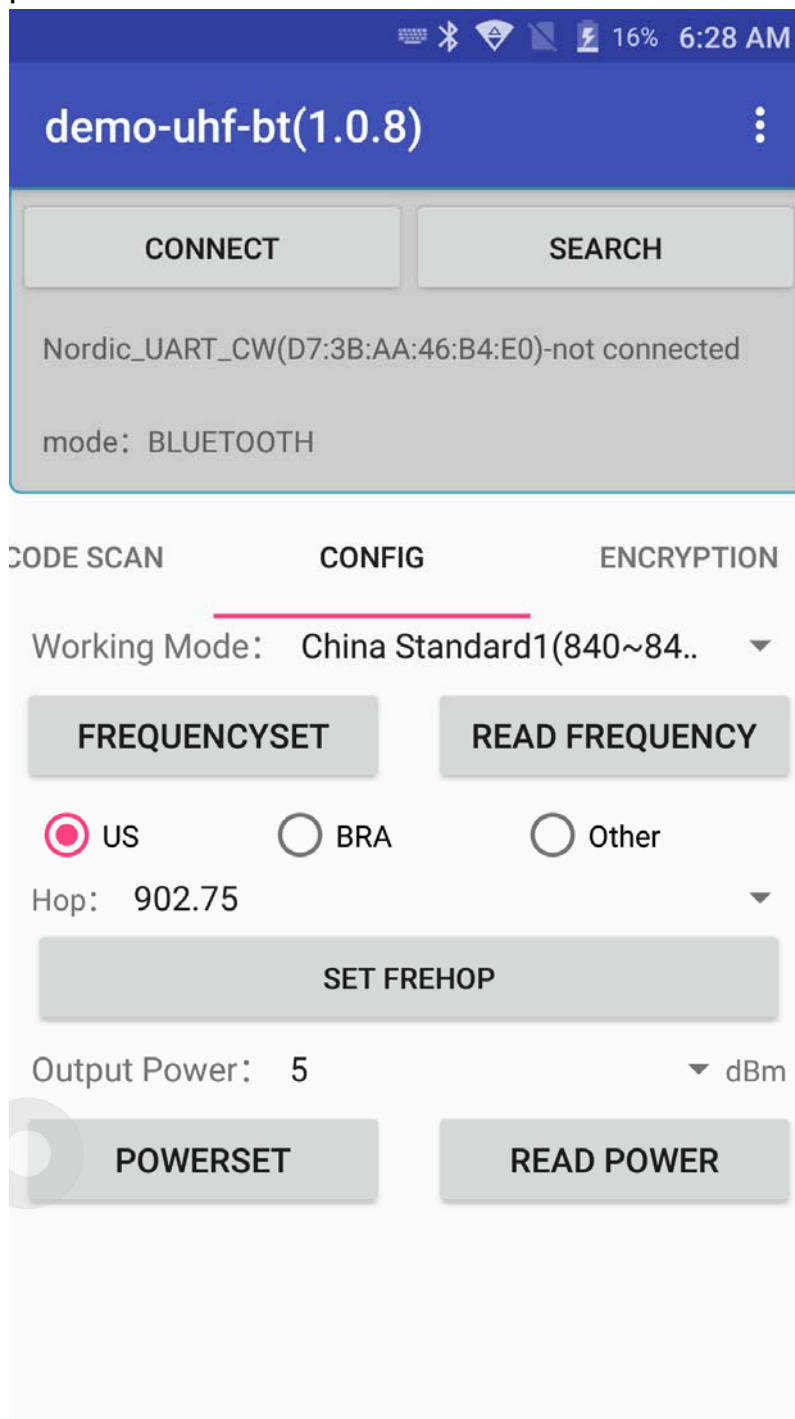
3.3 UHF Scan Function

1. Click START in demo or pull the trigger on R6, the UHF tags could be read.
2. Click STOP in demo to stop reading of UHF tags.
3. Click CLEAR to clean all EPC information.



3.4 UHF Configuration

1. Click CONFIG in demo to adjust working mode and output power.



3.5 UHF Tag Reading and Writing

1. The storage of one tag has 4 zones: RESERVED, EPC, TID and USER. Normally, the default password is 00000000. And TID zone can only be read, other zones can be read and written.

The image shows a screenshot of the 'demo-uhf-bt(1.0.9)' application interface on a mobile device. The interface is split into two identical side-by-side panels. At the top of each panel, there are 'CONNECT' and 'SEARCH' buttons, and a status indicator 'mode: BLUETOOTH'. Below this, there are tabs for 'ACTION', 'READ', and 'WRITE'. The 'READ' tab is currently selected. Under the 'READ' tab, there is a 'filter' section with an 'Enable' checkbox (unchecked), a 'Ptr' field set to '32' (bit), and a '长度' (length) field set to '0' (bit). Below the filter, there are three buttons: 'EPC' (highlighted with a blue border), 'TID', and 'USER'. Under these buttons, there is a 'Bank' dropdown menu set to 'RESERVED'. Below the bank, there are 'Ptr' and 'Len' fields, both set to '0' (word). Below these, there is an 'Access Pwd' field set to '00000000'. At the bottom, there is a 'Data' field. The right panel has a 'Write Data' field instead of 'Data'. The status bar at the top of the device shows 24% battery and 7:40 AM.

3.6 UHF Tag Lock and Kill

1. Lock Function:

For example. User could try to lock down EPC zone.

The screenshot shows the 'demo-uhf-bt' application interface. At the top, there's a status bar with icons for Android, signal, Bluetooth, and battery (56% at 3:04 PM). Below the title bar, there are 'DISCONNECT' and 'SEARCH' buttons. The main area shows 'Nordic_BT_CW_20181212(C1:21:31:CD:34:AB)-connected' and 'mode: BLUETOOTH'. A tabbed interface has 'WRITE', 'LOCK' (selected), and 'KILL' tabs. Under the 'LOCK' tab, there's a 'filter' section with an 'Enable' checkbox (unchecked), 'Ptr: 32 (bit)', 'Len: 0 (bit)', and a 'Data:' field. Below this are three buttons: 'EPC' (highlighted with a blue border), 'TID', and 'USER'. At the bottom, there's an 'Access Pwd:' field with the text 'Can't use the default password' and a 'Lock Code:' field. A large blue 'LOCK' button is at the very bottom.

demo-uhf-bt

DISCONNECT SEARCH

Nordic_BT_CW_20181212(C1:21:31:CD:34:AB)-connected

mode: BLUETOOTH

WRITE LOCK KILL

filter

☐ Enable

Ptr: 32 (bit) Len: 0 (bit)

Data:

EPC TID USER

Access Pwd: Can't use the default password

Lock Code:

LOCK

2. Kill Function:

Kill function can be used to kill the tag permanently. Input the correct access password and click kill.

The screenshot shows the 'demo-uhf-bt' application interface. At the top, there's a status bar with icons for keyboard, Bluetooth, signal, and battery (56%), along with the time 3:09 PM. The app title 'demo-uhf-bt' is in a blue header. Below the header are two buttons: 'CONNECT' and 'SEARCH'. The main area displays '(C1:21:31:CD:34:AB)-not connected' and 'mode: BLUETOOTH'. A tabbed interface at the bottom has three tabs: 'LOCK', 'KILL' (which is selected and highlighted with a red underline), and 'MODIFY BTNAME'. Under the 'KILL' tab, there's a 'filter' section with an 'Enable' checkbox (unchecked), 'Ptr: 32 (bit)', 'Len: 0 (bit)', and a 'Data:' field. Below these are three buttons: 'EPC' (highlighted with a blue border), 'TID', and 'USER'. At the bottom, there's an 'Access Pwd:' label followed by a text input field containing 'Can't use the default password'. A large blue 'KILL' button is at the very bottom.

demo-uhf-bt

CONNECT SEARCH

(C1:21:31:CD:34:AB)-not connected

mode: BLUETOOTH

LOCK KILL MODIFY BTNAME

filter

☐ Enable

Ptr: 32 (bit) Len: 0 (bit)

Data:

EPC TID USER

Access Pwd: Can't use the default password

KILL

Chapter 4 Device characteristic

Physical characteristics

Size	50 × 62 × 19 mm / 1.97 × 2.44 × 0.75 in.
Weight	64 g / 2.26 oz. (with glove: 90 g / 3.17 oz.)
Color	Yellow, Blue, Gray
Appearance material	Plastic
Product material	Plastic
Battery specification	1200 mAh (removable)
Indicator LED	Power, Work, Bluetooth
Buzzer	Y
Interfaces	Type-C

User environment

Operating temp.	-20°C to 50°C
Charging temp	-20°C to 40°C
Storage Temp.	-40°C to 70°C
Humidity	5%RH - 95%RH non condensing

UHF

Antenna	Linear Polarized Antenna (-2.38dBi)
Frequency	920-925MHz/902-928MHz/865-868MHz
Protocol	EPC C1 GEN2 / ISO18000-6C
Perp power	19.81dbm
R/W range	80 cm

CE statements:

Bluetooth(2402-2480 MHz) Max EIRP is 1.13dBm.

Hereby, Shenzhen Chainway Information Technology Co., Ltd. declares that the radio equipment type MR20 of Wearable BT UHF Reader is in compliance with Directive 2014/53/EU.

Specific Absorption Rate (SAR)

Your product is tested to comply with applicable requirements and regulations of the European Union of human exposure to radio wave.

Specific Absorption Rate (SAR) is used to measure radio waves absorbed by a body. The device complies with RF specifications when the device used at a distance of 0 mm from your body. The SAR limit is 2.0 W/kg averaged over 10 gram of tissue in the European Union.

This product was tested and recorded the maximum SAR value was 0.27 W/kg for the body.

FCC statements:

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes 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 SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue. Device types MR20(FCC ID: 2AC6AMR20) has also been tested against this SAR limit.

The exposure standard for wireless mobile hotspots employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg. Tests for SAR are conducted using standard operating (body-worn for 5mm) positions accepted by the FCC with the mobile hotspot transmitting at its highest certified power level in all tested frequency bands. The SAR guideline includes a considerable safety margin designed to assure the safety of all persons regardless of age and health.

The FCC has granted an Equipment Authorization for this model mobile hotspot with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines.