



## RF Exposure Evaluation Declaration

Report No.: S2023090421420104

Issue Date: 09-14-2024

**Applicant:** Shenzhen Mindray Bio-Medical Electronics Co., Ltd.

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PEOPLE'S REPUBLIC OF CHINA

**FCC ID:** ZLZ-WXT5CM2803

**Product:** WiFi module

**Model No.:** WXT5CM2803

**Trade Mark:** mindray

**FCC Rule Part(s):** CFR 47, FCC Part 2.1091 Radio frequency radiation  
exposure evaluation: mobile devices.

**Item Receipt date:** Sep 04, 2023

**Test Date:** Sep 11 ~ Nov 08, 2023

Compiled By

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The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of Fangguang Inspection & Testing Co., Ltd. Wuxi Branch

The test report must not be used by the client to claim product certifications, approval, or endorsement by NVLAP, NIST or any agency of U.S. Government.



### Revision History

| Report No.        | Version | Description | Issue Date |
|-------------------|---------|-------------|------------|
| S2023090421420104 | Rev. 01 | /           | 09-14-2024 |
|                   |         |             |            |

## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

|                      |             |
|----------------------|-------------|
| Product Name:        | WiFi module |
| Model Name:          | WXT5CM2803  |
| Trade Mark:          | mindray     |
| Input Voltage Range: | DC 3.3V     |

Note:

There are three types of antennas for the WiFi module. The antennas are RD542109NB87-1, RD542109NB87-2 and RD542109NB87-3.

### 1.2. Product Specification Subjective to this Report

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Range:    | 802.11b/g/n20/ax20: 2412 ~ 2462MHz<br>802.11n40/ax40:2422 ~ 2452MHz<br>For 802.11a/n-HT20/ac-VHT20/ax-HE20:<br>5180~5240MHz, 5260~5320MHz, 5500~5700MHz, 5745~5825MHz<br>5925~6425MHz, 6425~6525MHz, 6525~6875MHz, 6875~7125MHz<br>For 802.11n-HT40/ac-VHT40/ax-HE40:<br>5190~5230MHz, 5270~5310MHz, 5510~5670MHz, 5755~5795MHz<br>5925~6425MHz, 6425~6525MHz, 6525~6875MHz, 6875~7125MHz<br>For 802.11ac-VHT80/ax-HE80:<br>5210MHz, 5290MHz, 5530MHz, 5610MHz ,5775MHz<br>5925~6425MHz, 6425~6525MHz, 6525~6875MHz, 6875~7125MHz                                                   |
| Type of Modulation: | 802.11b: DSSS<br>802.11g/n/ax: OFDM<br>802.11a/n/ac/ax:OFDM/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QAM/256QAM/<br>1024QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Antenna Type:       | FPC dipole                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Antenna Gain:       | 2.4G RD542109NB87-1 Antenna : Ant1 -0.68dBi, Ant2 -0.68dBi,<br>2.4G RD542109NB87-2 Antenna : Ant1 2.05dBi, Ant2 2.05dBi<br>2.4G RD542109NB87-3 Antenna : Ant1 2.45dBi ,Ant2 2.45dBi<br>5G RD542109NB87-1 Antenna : Ant1 3.29dBi, Ant2 3.29dBi<br>5G RD542109NB87-2 Antenna : Ant1 3.17dBi, Ant2 3.17dBi<br>5G RD542109NB87-3 Antenna : Ant1 2.77dBi, Ant2 2.77dBi<br>6G(5925-6425M) RD542109NB87-1 Antenna : Ant1 3.90dBi, Ant2 3.90dBi<br>6G(5925-6425M) RD542109NB87-2 Antenna : Ant1 3.36dBi, Ant2 3.36dBi<br>6G(5925-6425M) RD542109NB87-3 Antenna : Ant1 2.64dBi, Ant2 2.64dBi |

|  |                                                                    |
|--|--------------------------------------------------------------------|
|  | 6G(6425-7125M) RD542109NB87-1 Antenna : Ant1 4.92dBi, Ant2 4.92dBi |
|  | 6G(6425-7125M) RD542109NB87-2 Antenna : Ant1 3.61dBi, Ant2 3.61dBi |
|  | 6G(6425-7125M) RD542109NB87-3 Antenna : Ant1 1.93dBi, Ant2 1.93dB  |

## 2. RF Exposure Evaluation

### 2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz)                                     | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (Minutes) |
|-----------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures            |                               |                               |                                     |                        |
| 300-1500                                                  | --                            | --                            | f/300                               | 6                      |
| 1500-100,000                                              | --                            | --                            | 5                                   | 6                      |
| (B) Limits for General Population/ Uncontrolled Exposures |                               |                               |                                     |                        |
| 300-1500                                                  | --                            | --                            | f/1500                              | 6                      |
| 1500-100,000                                              | --                            | --                            | 1                                   | 30                     |

f= Frequency in MHz

Calculation Formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$r$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

## 2.2. Test Result of RF Exposure Evaluation

|           |                        |
|-----------|------------------------|
| Product   | WiFi module            |
| Test Item | RF Exposure Evaluation |

| Mode                      | Frequency (MHz) | Maximum Conducted Output Power (dBm) | Antenna Gain (dBi)     | PG    |        | MPE (mW/cm <sup>2</sup> ) | MPE Limits (mW/cm <sup>2</sup> ) |
|---------------------------|-----------------|--------------------------------------|------------------------|-------|--------|---------------------------|----------------------------------|
|                           |                 |                                      |                        | (dBm) | (mW)   |                           |                                  |
| WiFi                      | 2412 - 2462     | 17.83                                | 2.45                   | 20.28 | 106.66 | 0.021                     | 1.00                             |
| RLAN                      | 5150 - 5250     | 18.60                                | 3.29                   | 21.89 | 154.53 | 0.031                     | 1.00                             |
|                           | 5250 - 5350     |                                      |                        |       |        |                           |                                  |
|                           | 5470 - 5725     |                                      |                        |       |        |                           |                                  |
|                           | 5725 - 5850     |                                      |                        |       |        |                           |                                  |
| RLAN                      | 5925 - 6425     | 5.24                                 | 3.90                   | 9.14  | 8.20   | 0.002                     | 1.00                             |
| RLAN                      | 6425 - 7125     | 5.74                                 | 4.92                   | 10.66 | 11.64  | 0.002                     | 1.00                             |
| WiFi                      | 2412 - 2462     | 17.83                                | Directional Gain: 5.46 | 23.29 | 213.30 | 0.042                     | 1.00                             |
| RLAN                      | 5150 - 5250     | 18.60                                | Directional Gain: 6.30 | 24.90 | 309.03 | 0.062                     | 1.00                             |
|                           | 5250 - 5350     |                                      |                        |       |        |                           |                                  |
|                           | 5470 - 5725     |                                      |                        |       |        |                           |                                  |
|                           | 5725 - 5850     |                                      |                        |       |        |                           |                                  |
| RLAN                      | 5925 - 6425     | 5.24                                 | Directional Gain: 6.91 | 12.15 | 16.41  | 0.003                     | 1.00                             |
| RLAN                      | 6425 - 7125     | 5.74                                 | Directional Gain: 7.94 | 13.68 | 23.33  | 0.005                     | 1.00                             |
| Simultaneous Transmission | /               | /                                    | /                      | /     | /      | 0.112                     | 1.00                             |

Remark: 1. MPE use distance is 20cm from manufacturer declaration of user manual.

Remark: 2. Use the maximum gain of all bands when evaluating

Remark: 3. The simultaneous transmission is WiFi and RLAN transmission.

**CONCULISON:**

The Max Power Density at R (20 cm) =  $0.112\text{mW/cm}^2 < 1\text{mW/cm}^2$ .

So the EUT complies with the requirement.

\_\_\_\_\_ The End \_\_\_\_\_