

# TEST REPORT

**Reference No.**..... : WTD24D03066054W003  
**FCC ID** ..... : ZLZ-MRR8860  
**Applicant**..... : Shenzhen Mindray Bio-Medical Electronics Co., Ltd.  
**Address**..... : Mindray Building, Keji 12th Road South, Hi-tech Ind, Shenzhen  
China  
**Product**..... : Wireless LAN Router  
**Model(s)** ..... : MRR8860  
**Standards**..... : FCC 47CFR Part 2 Subpart J Section 2.1091  
**Date of Receipt sample** .... : 2024-03-28  
**Date of Test** ..... : 2024-03-28 to 2024-04-19  
**Date of Issue**..... : 2024-09-12  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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3. Revision History

| Test Report No.    | Date of Receipt Sample | Date of Test                   | Date of Issue | Purpose  | Comment | Approved |
|--------------------|------------------------|--------------------------------|---------------|----------|---------|----------|
| WTD24D03066054W003 | 2024-03-28             | 2024-03-28<br>to<br>2024-04-19 | 2024-09-12    | Original | -       | Valid    |

## 4. General Information

### 4.1. General Description of E.U.T.

|                      |                                                                       |
|----------------------|-----------------------------------------------------------------------|
| Product:             | Wireless LAN Router                                                   |
| Model(s):            | MRR8860                                                               |
| Test Sample No.:     | 1-1/2                                                                 |
| Model Description:   | N/A                                                                   |
| Wi-Fi Specification: | 2.4G-802.11b/g/n HT20/n HT40<br>5G-802.11a/n(HT20/40)/ac(VHT20/40/80) |
| Hardware Version:    | N/A                                                                   |
| Software Version:    | N/A                                                                   |

### 4.2. Details of E.U.T.

|                          |                                                                                                                                                                                                                                                                                                                                                                                     |                                           |  |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--|
| Operation Frequency:     | 2.4G Wi-Fi:<br>802.11b/g/n (HT20), 2412-2462MHz 11CH<br>802.11n (HT40), 2422-2452MHz 7CH<br>5G Wi-Fi:<br>U-NII-1<br>802.11a/n(HT20)/ac(VHT20), 5180-5240MHz 4CH<br>802.11n(HT40)/ac(VHT40), 5190-5230MHz 2CH<br>802.11ac(VHT80), 5210MHz 1CH<br>U-NII-3<br>802.11a/n(HT20)/ac(VHT20), 5745-5825MHz 5CH<br>802.11n(HT40)/ac(VHT40), 5755-5795MHz 2CH<br>802.11ac(VHT80), 5775MHz 1CH |                                           |  |
| Max. conducted RF power: | 2.4G Wi-Fi:<br>Ant 0: 25.60dBm, Ant 1: 25.34dBm, Total: 26.37dBm<br>5G Wi-Fi:<br>U-NII-1<br>Ant. 0: 20.37dBm, Ant. 1: 20.27 dBm, Total: 23.12 dBm<br>U-NII-3:<br>Ant. 0: 20.37dBm, Ant. 1: 20.16 dBm, Total: 23.28 dBm                                                                                                                                                              |                                           |  |
| Modulation Technology:   | 802.11b: DBPSK, DQPSK, CCK<br>802.11a/g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)                                                                                                                                                                                                                                                     |                                           |  |
| Antenna installation:    | External Antenna with Reverse Thread SMA connector                                                                                                                                                                                                                                                                                                                                  |                                           |  |
| Antenna Gain:            |                                                                                                                                                                                                                                                                                                                                                                                     | Operation Frequencies (MHz) /Antenna Gain |  |

**Note:**

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTERK lab has not verified the authenticity of its information.

Ratings: DC 9V~48V

Waltek Testing Group Co., Ltd.

<http://www.waltek.com.cn>

#### 4.3. Test Facility

The test facility has a test site registered with the following organizations:

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476.**

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

#### 4.4. Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

#### 4.5. Abnormalities from Standard Conditions

None.

## 5. Test Summary

| Test Items                                                        | Test Requirement       | Result |
|-------------------------------------------------------------------|------------------------|--------|
| Maximum Permissible Exposure<br>(Exposure of Humans to RF Fields) | 47 CFR Part 2 §2. 1091 | PASS   |

## 6. RF Exposure

Test Requirement: FCC 47CFR Part 2 Subpart J Section 2.1091  
 47 CFR Part 1 §1.1307  
 47 CFR Part 1 §1.1310  
 Evaluation Method: KDB 447498 D01 General RF Exposure Guidance v06

### 6.1. Definitions

According to § 2.1091(b), A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons.

This device belongs to mobile device and with multiple RF sources.

### 6.2. Method of Evaluation

**Determination of Exemption:**  
**For single RF sources**

#### Option A

##### Option A 1-mW Test Exemption

Applies to all frequencies and all distances

- a) Could be considered SAR-based and MPE-based exclusions
- b)  $P < 1\text{mW}$
- c) Limitation—when there are simultaneously operating transmitters this exclusion only applies when all simultaneously operating transmitters meet this exemption
- d) Refer 1.1307(b)(3)(i)(A) and 1.1307(b)(3)(ii)(A)

#### Option B SAR-Based Exemption

Frequency range 300 MHz -6 GHz,  $5\text{mm} \leq \text{distance} \leq 40\text{cm}$

- a) The maximum time-averaged power or effective radiated power (ERP), whichever is greater,  $\leq P_{th}$ .
- b)  $P_{th}$  is calculated based on separation distance  $d$  cm from transmitter to person for the device operating at  $f$  GHz.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20\text{ cm}} (d/20\text{ cm})^x & d \leq 20\text{ cm} \\ ERP_{20\text{ cm}} & 20\text{ cm} < d \leq 40\text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20\text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

**Option C MPE-Based Exemption**

1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance R between the person and the antenna / radiating structure, where  $R > \lambda / 2\pi$ .

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

| RF Source frequency (MHz)   | Threshold ERP (watts) |
|-----------------------------|-----------------------|
| 0.3-1.34                    | $1,920 R^2$ .         |
| 1.34-30                     | $3,450 R^2/f^2$ .     |
| 30-300                      | $3.83 R^2$ .          |
| 300-1,500                   | $0.0128 R^2f$ .       |
| 1,500-100,000               | $19.2R^2$ .           |
| Note: R in meters, f in MHz |                       |

**For multiple RF sources**

According to 47CFR 1.1307(b)(3)(ii), the calculation formula is as follow:

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$



### 6.3. Evaluation Results

This device belongs to mobile device (separation distance of at least 20 centimeters is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons) and with multiple RF sources.

**Option B** is applicable.

#### Single Source Transmissions

| Description                                    | Frequency GHz | Conducted Power dBm | Gain dBi | Tune-up dB | ERP mW | ERP <sub>th</sub> mW | Ratio   |
|------------------------------------------------|---------------|---------------------|----------|------------|--------|----------------------|---------|
| 2.4G Wi-Fi (Ant. 1)<br>802.11n HT40 TX         | 2.412         | 21.05               | 2.9      | ±1.0       | 190.61 | 3060                 | 0.06229 |
| 2.4G Wi-Fi (Ant. 2)<br>802.11n HT40 TX         | 2.412         | 20.78               | 2.9      | ±1.0       | 179.12 | 3060                 | 0.05854 |
| 5G Wi-Fi (Ant. 1) U-NII-1<br>802.11ac VHT20 TX | 5.18          | 20.37               | 3.3      | ±1.0       | 178.71 | 3060                 | 0.05840 |
| 5G Wi-Fi (Ant. 2) U-NII-1<br>802.11ac VHT20 TX | 5.18          | 19.61               | 3.3      | ±1.0       | 150.02 | 3060                 | 0.04903 |
| 5G Wi-Fi (Ant. 1) U-NII-3<br>802.11ac VHT20 TX | 5.745         | 20.37               | 3.9      | ±1.0       | 205.19 | 3060                 | 0.06706 |
| 5G Wi-Fi (Ant. 2) U-NII-3<br>802.11ac VHT20 TX | 5.745         | 20.16               | 3.9      | ±1.0       | 195.50 | 3060                 | 0.06389 |

Note:

EIRP= Conducted Power +Gain, ERP=EIRP-2.15

#### Simultaneous Transmissions

| Description                                             | Calculation | Limit |
|---------------------------------------------------------|-------------|-------|
| 2.4GWi-Fi (Ant. 1 + Ant. 2) + 5GWi-Fi (Ant. 1 + Ant. 2) | 0.25178     | ≤1.0  |

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum power to do MPE analysis.
3. 2.4G Wi-Fi and 5G Wi-Fi can transmit simultaneously.

#### Conclusion:

RF Exposure is FCC compliant.

=====End of Report=====