



# RF EXPOSURE Test Report

**Report No.:** MTi230921016-05E4  
**Date of issue:** 2024-06-20  
**Applicant:** WIRELESS-TAG TECHNOLOGY CO., LIMITED  
**Product:** WIFI/BLE/lora Module  
**Model(s):** WTLRC262-SG3  
**FCC ID:** 2AFOS-WTLRC262-SG3

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.cn>



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| Test Result Certification  |                                                                                                                                         |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant:</b>          | WIRELESS-TAG TECHNOLOGY CO., LIMITED                                                                                                    |
| Address:                   | 801, Block A, Building 6, Shenzhen International Innovation Valley, Dashi Road, Xili Community, Xili Street, Nanshan District, Shenzhen |
| <b>Manufacturer:</b>       | WIRELESS-TAG TECHNOLOGY CO., LIMITED                                                                                                    |
| Address:                   | 801, Block A, Building 6, Shenzhen International Innovation Valley, Dashi Road, Xili Community, Xili Street, Nanshan District, Shenzhen |
| <b>Product description</b> |                                                                                                                                         |
| Product name:              | WIFI/BLE/lora Module                                                                                                                    |
| Trademark:                 | Wireless-tag                                                                                                                            |
| Model name:                | WTLRC262-SG3                                                                                                                            |
| Series Model:              | N/A                                                                                                                                     |
| Standards:                 | N/A                                                                                                                                     |
| Test procedure:            | KDB 447498 D01 v06                                                                                                                      |
| <b>Date of Test</b>        |                                                                                                                                         |
| Date of test:              | 2024-01-03 to 2024-05-25                                                                                                                |
| Test result:               | Pass                                                                                                                                    |

**Test Engineer :**

*Yanice Xie*

(Yanice Xie)

**Reviewed By: :**

*David. Lee*

(David Lee)

**Approved By: :**

*Leon Chen*

(Leon Chen)

## RF EXPOSURE EVALUATION

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> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposure</b>         |                               |                               |                                     |                          |
| 0.3-3.0                                                        | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30                                                         | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300                                                         | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500                                                      |                               |                               | f/300                               | 6                        |
| 1,500-100,000                                                  |                               |                               | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34                                                       | 614                           | 1.63                          | *100                                | 30                       |
| 1.34-30                                                        | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 30                       |
| 30-300                                                         | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1,500                                                      |                               |                               | f/1500                              | 30                       |
| 1,500-100,000                                                  |                               |                               | 1.0                                 | 30                       |

f = frequency in MHz \* = Plane-wave equivalent power density

### MPE Calculation Method

Friis transmission 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

$G$  = Numeric gain of the antenna relative to isotropic antenna

$\pi$  = 3.1415926

$R$  = distance between observation point and center of the radiator in cm (20cm)

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

## Measurement Result

### BLE&2.4G WIFI:

Operation Frequency:

BLE:2402-2480MHz

WIFI 802.11b/g/n HT20: 2412-2462MHz

Power density limited: 1mW/ cm<sup>2</sup>

Antenna Type: FPC Antenna;

Antenna gain:

BLE&2.4G WIFI: 5dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(5/10)}=3.16$

### LoRa:

Operation Frequency: 902.3~927.5MHz

Power density limited: 1mW/ cm<sup>2</sup>

Antenna Type: FPC Antenna;

Antenna gain: 3.3 dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(3.3/10)}=2.14$

### BLE:

| Channel Freq. (MHz) | modulation | conducted power | Tune-up power | Max           |       | Antenna |         | Evaluation result at 20cm | Power density Limits |
|---------------------|------------|-----------------|---------------|---------------|-------|---------|---------|---------------------------|----------------------|
|                     |            | (dBm)           | (dBm)         | tune-up power |       | Gain    |         | Power density(mW/cm2 )    | (mW/cm2)             |
|                     |            |                 |               | (dBm)         | (mW)  | (dBi)   | Numeric |                           |                      |
|                     |            | Ant A           | Ant A         | Ant A         | Ant A | Ant A   | Ant A   | Ant A                     |                      |
| 2402                | BLE-1M     | 5.15            | 5±1           | 6             | 3.981 | 5       | 3.16    | 0.0025                    | 1                    |
| 2440                |            | 4.53            | 5±1           | 6             | 3.981 | 5       | 3.16    | 0.0025                    | 1                    |
| 2480                |            | 4.38            | 5±1           | 6             | 3.981 | 5       | 3.16    | 0.0025                    | 1                    |
| 2402                | BLE-2M     | 5.18            | 5±1           | 6             | 3.981 | 5       | 3.16    | 0.0025                    | 1                    |
| 2440                |            | 4.74            | 5±1           | 6             | 3.981 | 5       | 3.16    | 0.0025                    | 1                    |
| 2480                |            | 4.70            | 5±1           | 6             | 3.981 | 5       | 3.16    | 0.0025                    | 1                    |

**2.4G WIFI:**

| Channel Freq. (MHz) | modulation  | conducted power | Tune-up power | Max           |         | Antenna |       | Evaluation result at 20cm | Power density Limits (mW/cm2) |
|---------------------|-------------|-----------------|---------------|---------------|---------|---------|-------|---------------------------|-------------------------------|
|                     |             | (dBm)           | (dBm)         | tune-up power |         | Gain    |       | Power density(mW/cm2 )    |                               |
|                     |             | Ant A           | Ant A         | Ant A         | Ant A   | Ant A   | Ant A | Ant A                     |                               |
| 2412                | 802.11b     | 19.04           | 19±1          | 20            | 100.000 | 5       | 3.16  | 0.06291                   | 1                             |
| 2437                |             | 19.28           | 19±1          | 20            | 100.000 | 5       | 3.16  | 0.06291                   | 1                             |
| 2462                |             | 18.99           | 19±1          | 20            | 100.000 | 5       | 3.16  | 0.06291                   | 1                             |
| 2412                | 802.11g     | 16.45           | 16±1          | 17            | 50.119  | 5       | 3.16  | 0.03153                   | 1                             |
| 2437                |             | 16.31           | 16±1          | 17            | 50.119  | 5       | 3.16  | 0.03153                   | 1                             |
| 2462                |             | 15.95           | 16±1          | 17            | 50.119  | 5       | 3.16  | 0.03153                   | 1                             |
| 2412                | 802.11n H20 | 16.09           | 16±1          | 17            | 50.119  | 5       | 3.16  | 0.03153                   | 1                             |
| 2437                |             | 16.08           | 16±1          | 17            | 50.119  | 5       | 3.16  | 0.03153                   | 1                             |
| 2462                |             | 15.86           | 16±1          | 17            | 50.119  | 5       | 3.16  | 0.03153                   | 1                             |

**LoRa:**

| Channel Freq. (MHz) | modulation | conducted power | Tune-up power | Max           |       | Antenna |       | Evaluation result at 20cm | Power density Limits (mW/cm2) |
|---------------------|------------|-----------------|---------------|---------------|-------|---------|-------|---------------------------|-------------------------------|
|                     |            | (dBm)           | (dBm)         | tune-up power |       | Gain    |       | Power density(mW/cm2 )    |                               |
|                     |            | Ant A           | Ant A         | Ant A         | Ant A | Ant A   | Ant A | Ant A                     |                               |
| 905.3               | LoRa       | 6.69            | 7±1           | 8             | 6.310 | 3.3     | 2.14  | 0.0027                    | 1                             |
| 914.2               |            | 6.86            | 7±1           | 8             | 6.310 | 3.3     | 2.14  | 0.0027                    | 1                             |
| 925.5               |            | 7.51            | 7±1           | 8             | 6.310 | 3.3     | 2.14  | 0.0027                    | 1                             |

**Conclusion:**

**Note: BLE, 2.4GWiFi and LoRa cannot work at the same time.**

For the max result:  $0.06291 \leq 1.0$  test exclusion threshold, No SAR is required.

----END OF REPORT----