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CNAS L16091

No.:  
FCCSZ2024-0030-H

## TEST REPORT

FCC ID : 2ANM3U8822C2

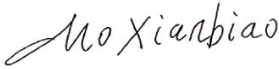
NAME OF SAMPLE : WiFi + BT Module

APPLICANT : Shenzhen Chuangwei-RGB Electronics Co., Ltd.

CLASSIFICATION OF TEST : N/A

**CVC Testing Technology (Shenzhen) Co., Ltd.**



|                                                                                                                                                                           |            |                                                                                                                                                                  |                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant</b>                                                                                                                                                          |            | Name: Shenzhen Chuangwei-RGB Electronics Co., Ltd.                                                                                                               |                                                                                                                                                                   |
|                                                                                                                                                                           |            | Address: 13F-16F, Unit A, Skyworth Building, Shennan Road South, Nanshan District, Shenzhen, Guangdong, China                                                    |                                                                                                                                                                   |
| <b>Equipment Under Test</b>                                                                                                                                               |            | Name: WiFi + BT Module                                                                                                                                           |                                                                                                                                                                   |
|                                                                                                                                                                           |            | Model/Type: U8822C2                                                                                                                                              |                                                                                                                                                                   |
|                                                                                                                                                                           |            | Brand: N/A                                                                                                                                                       |                                                                                                                                                                   |
|                                                                                                                                                                           |            | Serial NO.: N/A                                                                                                                                                  |                                                                                                                                                                   |
|                                                                                                                                                                           |            | Sample NO.: 4-2                                                                                                                                                  |                                                                                                                                                                   |
| Date of Receipt.                                                                                                                                                          | 2024-04-22 | Date of Testing                                                                                                                                                  | 2024-04-22 ~ 2024-05-20                                                                                                                                           |
| <b>Test Specification</b>                                                                                                                                                 |            | <b>Test Result</b>                                                                                                                                               |                                                                                                                                                                   |
| FCC Part 2 (Section 2.1091)<br>KDB 447498 D04 v01                                                                                                                         |            | PASS                                                                                                                                                             |                                                                                                                                                                   |
| <b>Evaluation of Test Result</b>                                                                                                                                          |            | The equipment under test was found to comply with the requirements of the standards applied.                                                                     |                                                                                                                                                                   |
|                                                                                                                                                                           |            | Seal of CVC<br>Issue Date: 2024-05-21                                                                                                                            |                                                                                                                                                                   |
| Compiled by:<br><br><b>Zhu Yulin</b><br>Name                      Signature            |            | Reviewed by:<br><br><b>Mo Xianbiao</b><br>Name                      Signature | Approved by:<br><br><b>Dong Sanbi</b><br>Name                      Signature |
| <b>Other Aspects: NONE.</b>                                                                                                                                               |            |                                                                                                                                                                  |                                                                                                                                                                   |
| Abbreviations:OK,    Pass= passed                      Fail = failed                      N/A= not applicable                      EUT= equipment, sample(s) under tested |            |                                                                                                                                                                  |                                                                                                                                                                   |

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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**RELEASE CONTROL RECORD**

| ISSUE NO.        | REASON FOR CHANGE | DATE ISSUED |
|------------------|-------------------|-------------|
| FCCSZ2024-0030-H | Original release  | 2024-05-21  |



## 1. GENERAL PRODUCT INFORMATION

|                                                                                                                                                                                                                                                                                                            |                                                                                                               |                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| PRODUCT                                                                                                                                                                                                                                                                                                    | WiFi + BT Module                                                                                              |                                                                                |
| BRAND                                                                                                                                                                                                                                                                                                      | N/A                                                                                                           |                                                                                |
| TEST MODEL                                                                                                                                                                                                                                                                                                 | U8822C2                                                                                                       |                                                                                |
| POWER SUPPLY                                                                                                                                                                                                                                                                                               | DC 3.3V from host unit                                                                                        |                                                                                |
| OPERATING FREQUENCY                                                                                                                                                                                                                                                                                        | 2402MHz~2480MHz for BT<br>2412MHz ~ 2462MHz for 2.4G WiFi<br>5180MHz ~ 5240MHz, 5745MHz ~ 5825MHz for 5G WiFi |                                                                                |
| PEAK OUTPUT POWER                                                                                                                                                                                                                                                                                          | See section 2                                                                                                 |                                                                                |
| ANTENNA TYPE AND GAIN<br>(Remark 4/5)                                                                                                                                                                                                                                                                      | BT                                                                                                            | FPC Antenna, with 3.56dBi gain                                                 |
|                                                                                                                                                                                                                                                                                                            | 2.4G WiFi                                                                                                     | ANT1: PIFA Antenna, with 2.19dBi gain<br>ANT2: PIFA Antenna, with 2.28dBi gain |
|                                                                                                                                                                                                                                                                                                            | 5G WiFi                                                                                                       | ANT1: PIFA Antenna, with 1.58dBi gain<br>ANT2: PIFA Antenna, with 1.82dBi gain |
| HARDWARE VERSION:                                                                                                                                                                                                                                                                                          | N012403-001013-001_VER00.01                                                                                   |                                                                                |
| SOFTWARE VERSION:                                                                                                                                                                                                                                                                                          | Win7_MP_Kit_RTL11ac_8822CU_USB_v13.00_20221115                                                                |                                                                                |
| I/O PORTS                                                                                                                                                                                                                                                                                                  | Refer to user's manual                                                                                        |                                                                                |
| CABLE SUPPLIED                                                                                                                                                                                                                                                                                             | N/A                                                                                                           |                                                                                |
| Remark:                                                                                                                                                                                                                                                                                                    |                                                                                                               |                                                                                |
| 1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.                                                                                                                                                                                         |                                                                                                               |                                                                                |
| 2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.                                                                                                                                                                                    |                                                                                                               |                                                                                |
| 3. EUT photo refer to the report (Report NO.: FCCSZ2024-0030-EUT).                                                                                                                                                                                                                                         |                                                                                                               |                                                                                |
| 4. Please refer to the antenna report.                                                                                                                                                                                                                                                                     |                                                                                                               |                                                                                |
| 5. Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion. |                                                                                                               |                                                                                |

## 2. OPERATING FREQUENCY AND MAX CONDUTED POWER

| Mode           | Frequency (MHz) | Maximum Output Power (dBm) |
|----------------|-----------------|----------------------------|
| BT             | 2402 ~ 2480     | 8.16                       |
| WLAN 2.4G ANT1 | 2412 ~ 2462     | 14.55                      |
| WLAN 2.4G ANT2 | 2412 ~ 2462     | 11.25                      |
| WLAN 5G ANT1   | 5180 ~ 5240     | 10.02                      |
|                | 5725 ~ 5825     | 12.61                      |
| WLAN 5G ANT2   | 5180 ~ 5240     | 9.72                       |
|                | 5725 ~ 5825     | 13.65                      |



## 3. RF EXPOSURE LIMIT

(Option B) According to FCC Part2.1091 and FCC Part1.1307b, the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P$  is given by:

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

Where:

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

and  $f$  is in GHz;

and

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

(Option C) Or using Table 1 and the minimum separation distance ( $R$  in meters) from the body of a nearby person for the frequency ( $f$  in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply,  $R$  must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

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

| RF Source Frequency (MHz) | Threshold ERP (W) |
|---------------------------|-------------------|
| 0.3 - 1.34                | $1920R^2$         |
| 1.34 - 30                 | $3450R^2 / f^2$   |
| 30 - 300                  | $3.38R^2$         |
| 300 - 1500                | $0.0128R^2 / f^2$ |
| 1500 - 100000             | $19.2R^2$         |



For multiple RF sources: Multiple RF sources are exempt if:

- a) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).
- b) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

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

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for Pth, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

Pi = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

Pth,i = the exemption threshold power (Pth) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

ERPj = the ERP of fixed, mobile, or portable RF source j.

ERPth,j = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Evaluatedk = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limitk = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310 of this chapter.



## 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 5. ANTENNA TYPE AND GAIN

The antennas provided to the EUT, please refer to the following table:

| Transmitter Circuit | Peak Gain (dBi) | Antenna Type |
|---------------------|-----------------|--------------|
| BT                  | 3.56            | FPC Antenna  |
| 2.4G WiFi ANT1      | 2.19            | PIFA Antenna |
| 2.4G WiFi ANT2      | 2.28            | PIFA Antenna |
| 5G WiFi ANT1        | 1.58            | PIFA Antenna |
| 5G WiFi ANT2        | 1.82            | PIFA Antenna |

Remark:

This is provided by the manufacturer. The laboratory is not responsible for technical data provided by the customer

## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

The measured Conducted Power

| Option | Mode           | Frequency (MHz) | Target Power (dBm) | Tolerance (dBm) | Lower Tolerance (dBm) | Upper Tolerance (dBm) |
|--------|----------------|-----------------|--------------------|-----------------|-----------------------|-----------------------|
| B      | BT             | 2402 ~ 2480     | 8                  | +1              | 7                     | 9                     |
|        | 2.4G WiFi ANT1 | 2412 ~ 2462     | 14                 | +1              | 13                    | 15                    |
|        | 2.4G WiFi ANT2 | 2412 ~ 2462     | 11                 | +1              | 10                    | 12                    |
|        | 5G WiFi ANT1   | 5180 ~ 5240     | 10                 | +1              | 9                     | 11                    |
|        |                | 5745 ~ 5825     | 13                 | +1              | 12                    | 14                    |
|        | 5G WiFi ANT2   | 5180 ~ 5240     | 10                 | +1              | 9                     | 11                    |
|        |                | 5745 ~ 5825     | 14                 | +1              | 13                    | 15                    |
|        |                |                 |                    |                 |                       |                       |



## 7. MAXIMUM PERMISSIBLE EXPOSURE

| Mode           | Frequency (MHz) | Maximum tune up power (dBm) | Maximum Antenna Gain (dBi) | EIRP (dBm) | ERP (dBm) | ERP (mW) | Part1.1307b Threshold (mW) | Ratio        |
|----------------|-----------------|-----------------------------|----------------------------|------------|-----------|----------|----------------------------|--------------|
| BT             | 2402 ~ 2480     | 9                           | 3.56                       | 12.56      | 10.41     | 10.99    | 3060                       | <b>0.004</b> |
| 2.4G WiFi ANT1 | 2412 ~ 2462     | 15                          | 2.19                       | 17.19      | 15.04     | 31.92    | 3060                       | 0.010        |
| 2.4G WiFi ANT2 | 2412 ~ 2462     | 12                          | 2.28                       | 14.28      | 12.13     | 16.33    | 3060                       | 0.005        |
| 5G WiFi ANT1   | 5180 ~ 5240     | 11                          | 1.58                       | 12.58      | 10.43     | 11.04    | 3060                       | 0.004        |
|                | 5745 ~ 5825     | 14                          | 1.58                       | 15.58      | 13.43     | 22.03    | 3060                       | <b>0.007</b> |
| 5G WiFi ANT2   | 5180 ~ 5240     | 11                          | 1.82                       | 12.82      | 10.67     | 11.67    | 3060                       | 0.004        |
|                | 5745 ~ 5825     | 15                          | 1.82                       | 16.82      | 14.67     | 29.31    | 3060                       | <b>0.010</b> |

**Note:** This device can operate simultaneously in BT, 2.4G WiFi or 5G WiFi.

### CONCLUSION:

Max: BT + 5G WiFi ANT1 + 5G WiFi ANT2:  $0.004 + 0.007 + 0.010 = 0.021 < 1$ , which is less than the "1" limit. So is compliant with the RF exposure requirements.

----- End of the Report -----



## Important

- (1) The test report is invalid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

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