

|                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                          |                                                                                           |                   |                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------|--------------------------------|
| <b>Prüfbericht-Nr.:</b><br><i>Test report no.:</i>                                                                                                                                                                                                                                                                                                                                                                                                         | <b>CN231C12 004</b>                                                                                                                                                                                      | <b>Auftrags-Nr.:</b><br><i>Order no.:</i>                                                 | <b>168416342</b>  | Seite 1 von 23<br>Page 1 of 23 |
| <b>Kunden-Referenz-Nr.:</b><br><i>Client reference no.:</i>                                                                                                                                                                                                                                                                                                                                                                                                | <b>N/A</b>                                                                                                                                                                                               | <b>Auftragsdatum:</b><br><i>Order date:</i>                                               | <b>2023-02-07</b> |                                |
| <b>Auftraggeber:</b><br><i>Client:</i>                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Shenzhen Chuangwei-RGB Electronics Co., Ltd</b><br>13F-16F, Unit A, Skyworth Building, Shennan Road, Nanshan District, Shenzhen, Guangdong, P.R.China                                                 |                                                                                           |                   |                                |
| <b>Prüfgegenstand:</b><br><i>Test item:</i>                                                                                                                                                                                                                                                                                                                                                                                                                | <b>WiFi+BT USB2.0 Module</b>                                                                                                                                                                             |                                                                                           |                   |                                |
| <b>Bezeichnung / Typ-Nr.:</b><br><i>Identification / Type no.:</i>                                                                                                                                                                                                                                                                                                                                                                                         | <b>NTUD-T12</b>                                                                                                                                                                                          |                                                                                           |                   |                                |
| <b>Auftrags-Inhalt:</b><br><i>Order content:</i>                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Test Report</b>                                                                                                                                                                                       |                                                                                           |                   |                                |
| <b>Prüfgrundlage:</b><br><i>Test specification:</i>                                                                                                                                                                                                                                                                                                                                                                                                        | CFR47 FCC Part15: Subpart E Section 15.407<br>CFR47 FCC Part15: Subpart C Section 15.207<br>CFR47 FCC Part15: Subpart C Section 15.209<br>RSS-247 Issue 2 February 2017<br>RSS-Gen Issue 5 February 2021 |                                                                                           |                   |                                |
| <b>Wareneingangsdatum:</b><br><i>Date of sample receipt:</i>                                                                                                                                                                                                                                                                                                                                                                                               | <b>2023-02-07</b>                                                                                                                                                                                        | Refer to Photo Documentation                                                              |                   |                                |
| <b>Prüfmuster-Nr.:</b><br><i>Test sample no.:</i>                                                                                                                                                                                                                                                                                                                                                                                                          | <b>T230207021-Y01/01</b>                                                                                                                                                                                 |                                                                                           |                   |                                |
| <b>Prüfzeitraum:</b><br><i>Testing period:</i>                                                                                                                                                                                                                                                                                                                                                                                                             | <b>2023-02-07 to 2023-02-22</b>                                                                                                                                                                          |                                                                                           |                   |                                |
| <b>Ort der Prüfung:</b><br><i>Place of testing:</i>                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Shenzhen Central Standard International Center Co., Ltd.</b>                                                                                                                                          |                                                                                           |                   |                                |
| <b>Prüflaboratorium:</b><br><i>Testing laboratory:</i>                                                                                                                                                                                                                                                                                                                                                                                                     | <b>TÜV Rheinland (Shenzhen) Co., Ltd.</b>                                                                                                                                                                |                                                                                           |                   |                                |
| <b>Prüfergebnis*:</b><br><i>Test result*:</i>                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Pass</b>                                                                                                                                                                                              |                                                                                           |                   |                                |
| <b>geprüft von:</b><br><i>tested by:</i> Lin Lin                                                                                                                                                                                                                                                                                                                                                                                                           | <b>X</b>                                                                                                                                                                                                 | <b>genehmigt von:</b><br><i>authorized by:</i> Winnie Hou                                 | <b>X</b>          |                                |
| <b>Datum:</b><br><i>Date:</i> 2023-02-28                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                          | <b>Ausstellungsdatum:</b><br><i>Issue date:</i> 2023-02-28                                |                   |                                |
| <b>Stellung / Position:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Engineer</b>                                                                                                                                                                                          | <b>Stellung / Position:</b>                                                               | <b>Reviewer</b>   |                                |
| <b>Sonstiges / Other:</b><br>FCC ID: 2ANM3NTUDT12<br>IC: 23165-NTUDT12<br>HVIN: NTUD-T12                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                          |                                                                                           |                   |                                |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br><i>Condition of the test item at delivery:</i>                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                          | <b>Prüfmuster vollständig und unbeschädigt</b><br><i>Test item complete and undamaged</i> |                   |                                |
| * Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft<br>P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet<br>* Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor<br>P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested                        |                                                                                                                                                                                                          |                                                                                           |                   |                                |
| <b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b><br><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i> |                                                                                                                                                                                                          |                                                                                           |                   |                                |

V05

## Test Summary

### 5.1.1 Antenna Requirement

*RESULT: Pass*

### 5.1.2 Maximum output power

*RESULT: Pass*

### 5.1.3 Power Spectral Density

*RESULT: Pass*

### 5.1.4 Frequency Stability

*RESULT: Pass*

### 5.1.5 26dB Bandwidth and 99% Bandwidth

*RESULT: Pass*

### 5.1.6 6dB Bandwidth

*RESULT: Pass*

### 5.1.7 Radiated Spurious Emission

*RESULT: Pass*

### 5.1.8 Dynamic Frequency Selection (DFS)

*RESULT: Pass*

### 5.1.9 Conducted Emission on AC Mains

*RESULT: Pass*

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## **1. General Remarks**

### **1.1 Complementary Materials**

All attachments are integral parts of this test report. This applies especially to the following appendixes:

Appendix A: Photographs of the Test Set-up

Appendix B: Test data of 5GHz bands Wi-Fi

## 2. Test Sites

### 2.1 Test Facilities

Shenzhen Central Standard International Center Co., Ltd.  
Room 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen.  
CNAS No.: L11671  
A2LA No.: 6426.01  
FCC Registration No.: 0031378433  
IC CAB identifier No.: CN0051

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

### 2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

| Radio Spectrum Testing         |              |                |              |               |
|--------------------------------|--------------|----------------|--------------|---------------|
| Equipment                      | Manufacturer | Model          | Serial No.   | Cal. until    |
| Spectrum Analyzer              | Agilent      | N9020A         | MY50200391   | Jun. 13, 2023 |
| Power sensor                   | KEYSIGHT     | U2021XA        | MY55080015   | Jun. 13, 2023 |
| Power sensor                   | KEYSIGHT     | U2021XA        | MY54250016   | Jun. 13, 2023 |
| Power sensor                   | KEYSIGHT     | U2021XA        | MY54250020   | Jun. 13, 2023 |
| Power sensor                   | KEYSIGHT     | U2021XA        | MY54210030   | Jun. 13, 2023 |
| Vector Signal Generator        | Agilent      | N5182A         | MY50140130   | Jun. 13, 2023 |
| Signal generator               | Agilent      | SML03          | 100925       | Jun. 13, 2023 |
| Temperature Humidity Chamber   | GZ-ESPEC     | ER-10AGT       | 0005091-2    | Jun. 10, 2023 |
| EXTENDED RANGE DC POWER SUPPLY | TAKASAGO     | ZX-400LA       | N/A          | Jun. 13, 2023 |
| Power sensor Box               | MWRFTtest    | N/A            | N/A          | N/A           |
| RF Switch Box                  | MWRFTtest    | MW100-RFCB     | N/A          | N/A           |
| MTS 8310                       | MWRFTtest    | V 2.0.0.0      |              |               |
| Unwanted Emission Testing      |              |                |              |               |
| Equipment                      | Manufacturer | Model          | Serial No.   | Cal. until    |
| Spectrum Analyzer              | Agilent      | N9020A         | MY50200391   | Jun. 13, 2023 |
| Bilog Antenna                  | Schwarzbeck  | VULB9168       | VULB9168-250 | Jul. 25, 2025 |
| Horn Antenna                   | AARONIAAG    | Powerlog 70180 | 3980         | Jul. 04, 2025 |
| Horn Antenna                   | A-INFOMW     | LB-180400-KF   | J211020657   | Sep. 26, 2023 |
| Loop Antenna                   | Schwarzbeck  | FMZB1519B      | 00023        | Nov. 15, 2023 |
| Amplifier                      | HP           | 8447F          | 2634A02050   | Jun. 13, 2023 |
| Amplifier                      | Agilent      | 8449B          | 4035A00116   | Jun. 13, 2023 |
| 3M Chamber                     | Maor         | 9*6*6          | --           | Jul. 26, 2023 |
| Conducted Emission             |              |                |              |               |
| Equipment                      | Manufacturer | Model No.      | Serial No.   | Cal. Until    |
| EMI Test Receiver              | R&S          | ESRP3          | 101936       | Jun. 13, 2023 |

|                |      |        |        |               |
|----------------|------|--------|--------|---------------|
| LISN           | R&S  | ENV216 | 100002 | Jun. 13, 2023 |
| Shielding Room | Maor | 8*4*3  | --     | May. 03, 2023 |
| EZ-EMC         | Fara | V 3.1  |        |               |

## 2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

## 2.5 Uncertainty of Measurement

The value of the measurement uncertainty of each parameter is listed as below:

Table 2: Measurement Uncertainty

| Parameter                                              | Uncertainty              |
|--------------------------------------------------------|--------------------------|
| Radio Frequency                                        | $\pm 2.7 \times 10^{-5}$ |
| RF Power (conducted)                                   | $\pm 0.66$ dB            |
| Radiated Emission of Transmitter, valid up to 26.5 GHz | $\pm 5.08$ dB            |
| Radiated Emission of Receiver, valid up to 26.5 GHz    | $\pm 5.08$ dB            |
| Conducted Emission, (150kHz to 30MHz)                  | $\pm 3.26$ dB            |
| Radiated Emission (3m SAC), 30MHz to 1000MHz           | $\pm 4.58$ dB            |
| Radiated Emission (3m SAC), above 1000MHz              | $\pm 5.10$ dB            |
| Temperature                                            | $\pm 2$ °C               |
| Humidity                                               | $\pm 5$ %                |
| Voltage (DC)                                           | $\pm 5$ %                |
| Voltage (AC, <10kHz)                                   | $\pm 5$ %                |

## 2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A and Appendix B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

## 2.7 Status of Facility Used for Testing

Shenzhen Central Standard International Center Co., Ltd.

Room 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen

### 3. General Product Information

#### 3.1 Product Function and Intended Use

The EUT is a RF Module which supports Bluetooth, 2.4G Wi-Fi 802.11 b/g/n, 5G Wi-Fi 802.11a/n/ac wireless technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

Note: This report is for 5G Wi-Fi 802.11a/n/ac mode only.

#### 3.2 Ratings and System Details

Table 3: Technical Specification

| Technical Specification                               | Value                                                                                                                                                               |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name                                          | WiFi+BT USB2.0 Module                                                                                                                                               |
| Model                                                 | NTUD-T12                                                                                                                                                            |
| Trade Mark                                            | /                                                                                                                                                                   |
| FCC ID                                                | 2ANM3NTUDT12                                                                                                                                                        |
| IC                                                    | 23165-NTUDT12                                                                                                                                                       |
| HVIN                                                  | NTUD-T12                                                                                                                                                            |
| FVIN                                                  | T12_3ANT_Golden_WiFi_20221028                                                                                                                                       |
| Operating Voltage:                                    | DC 3.3V                                                                                                                                                             |
| <b>Technical Specification of Wi-Fi 802.11 a/n/ac</b> |                                                                                                                                                                     |
| Operating Frequency Range                             | 5150-5350MHz, 5470-5725MHz, 5725-5850MHz                                                                                                                            |
| Operating Frequency / Channels / Protocol             | 5180-5320MHz, 14CHs, 802.11 a/n20/n40/ac20/ac40/ac80<br>5500-5700MHz, 21CHs, 802.11 a/n20/n40/ac20/ac40/ac80<br>5745-5825MHz, 8CHs, 802.11 a/n20/n40/ac20/ac40/ac80 |
| Channel Spacing                                       | 5MHz, 20MHz, 40MHz, 80MHz                                                                                                                                           |
| Modulation                                            | DSSS (DBPSK, DQPSK, CCK)<br>OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)                                                                                                 |
| Type of Product                                       | Adaptive equipment and does not support non-adaptive mode:<br>LBT based Detect and Avoid (load-based equipment)                                                     |
| Type of Product                                       | Client Device without Radar Detection                                                                                                                               |
| TX Power Control (TPC)                                | Not Supported                                                                                                                                                       |
| Antenna Number                                        | 2                                                                                                                                                                   |
| Antenna Type                                          | PIFA antenna                                                                                                                                                        |
| Antenna Gain                                          | ANT1: 2.89 dBi<br>ANT2: 2.83 dBi                                                                                                                                    |



**Table 4: RF Channel and Frequency of Wi-Fi 802.11 a/n/ac**

| Channel List for 802.11a/n20/ac20 |                 |            |                 |            |                 |            |                 |
|-----------------------------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| Channel                           | Frequency (MHz) | Channel    | Frequency (MHz) | Channel    | Frequency (MHz) | Channel    | Frequency (MHz) |
| <b>36</b>                         | <b>5180</b>     | <b>40</b>  | <b>5200</b>     | 44         | 5220            | <b>48</b>  | <b>5240</b>     |
| <b>52</b>                         | <b>5260</b>     | 56         | 5280            | <b>60</b>  | <b>5300</b>     | <b>64</b>  | <b>5320</b>     |
| <b>100</b>                        | <b>5500</b>     | 104        | 5520            | 108        | 5540            | 112        | 5560            |
| <b>116</b>                        | <b>5580</b>     | 120        | 5600            | 124        | 5620            | 128        | 5640            |
| 132                               | 5660            | 136        | 5680            | <b>140</b> | <b>5700</b>     | <b>149</b> | <b>5745</b>     |
| 153                               | 5765            | <b>157</b> | <b>5785</b>     | 159        | 5795            | <b>165</b> | <b>5825</b>     |

| Channel List for 802.11n40/ac40 |                 |            |                 |            |                 |           |                 |
|---------------------------------|-----------------|------------|-----------------|------------|-----------------|-----------|-----------------|
| Channel                         | Frequency (MHz) | Channel    | Frequency (MHz) | Channel    | Frequency (MHz) | Channel   | Frequency (MHz) |
| <b>38</b>                       | <b>5190</b>     | <b>46</b>  | <b>5230</b>     | <b>54</b>  | <b>5270</b>     | <b>62</b> | <b>5310</b>     |
| <b>102</b>                      | <b>5510</b>     | <b>110</b> | <b>5550</b>     | 118        | 5590            | 126       | 5630            |
| <b>134</b>                      | <b>5670</b>     | <b>151</b> | <b>5755</b>     | <b>159</b> | <b>5795</b>     |           |                 |

| Channel List for 802.11ac80 |                 |           |                 |            |                 |            |                 |
|-----------------------------|-----------------|-----------|-----------------|------------|-----------------|------------|-----------------|
| Channel                     | Frequency (MHz) | Channel   | Frequency (MHz) | Channel    | Frequency (MHz) | Channel    | Frequency (MHz) |
| <b>42</b>                   | <b>5210</b>     | <b>58</b> | <b>5290</b>     | <b>106</b> | <b>5530</b>     | <b>122</b> | <b>5610</b>     |
| <b>155</b>                  | <b>5775</b>     |           |                 |            |                 |            |                 |

Remark: 5600-5650 frequency band is not applicable for IC.

The channels in bold in the table are used for testing.

### 3.3 Independent Operation Modes

The basic operation modes are:

- A. Tx, (5GHz Bands, 802.11a/n/ac)
  - 1. Lowest channel
  - 2. Middle channel
  - 3. Highest channel
- B. WiFi on
- C. Off

### 3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

### 3.5 Submitted Documents

- |                      |                         |
|----------------------|-------------------------|
| - Application Form   | - Technical Description |
| - Circuit Diagram    | - Bill of Material      |
| - Instruction Manual | - Rating Label          |
| - Photo Documents    |                         |

## 4. Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

**Radio Spectrum:** The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Test Operation

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10:2013.

### 4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

| Description | Manufacturer | Model       | S/N        |
|-------------|--------------|-------------|------------|
| Notebook    | DELL         | Vostro 3400 | N/A        |
| Router      | SMART/RG     | SE80ad      | 17600060F1 |

Note: The Router FCC ID: VW7-SE80AC; IC ID: 11130A-SE80AC.

### 4.4 Countermeasures to Achieve ERM Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

## 4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

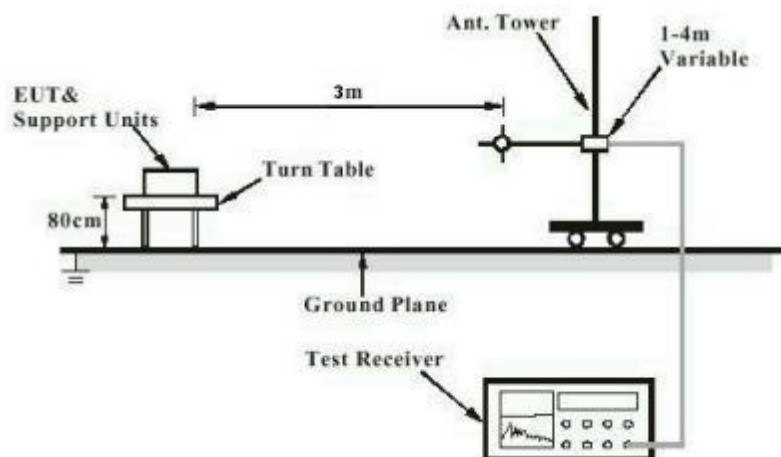


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

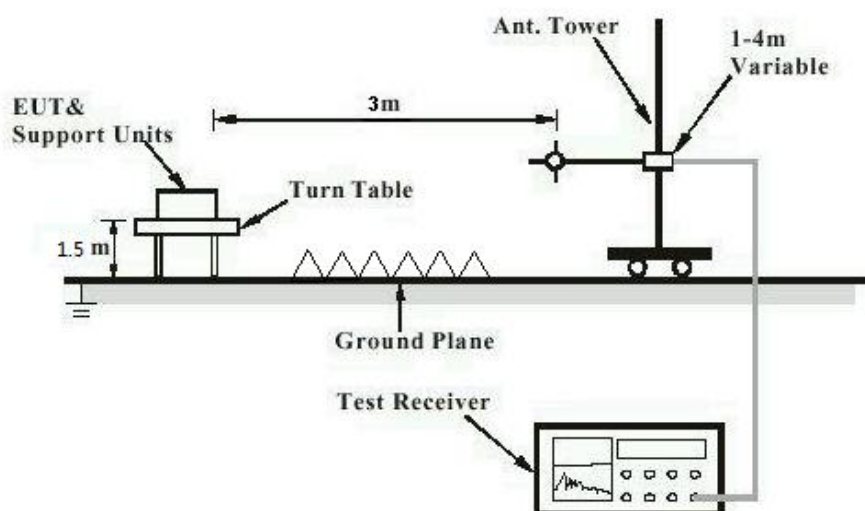


Diagram of Measurement Configuration for Mains Conduction Measurement

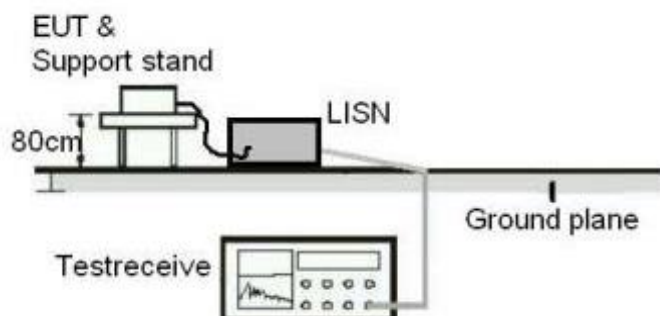


Diagram of Measurement Configuration for Conducted Transmitter Measurement

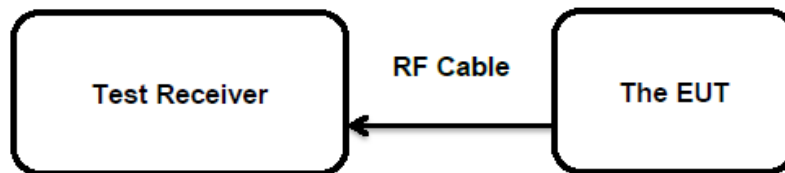
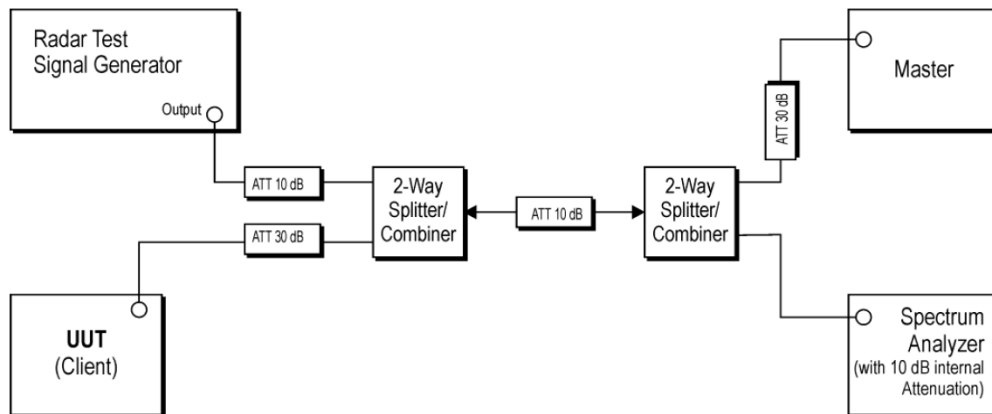


Diagram of Measurement Configuration for Dynamic Frequency Selection (DFS)



## 5. Test Results

### 5.1 Radio Test Requirement & Test Suites (5GHz Bands)

#### 5.1.1 Antenna Requirement

**RESULT:** **Pass**

**Test Specification**

Test standard : FCC Part 15.203

The EUT has two PIFA antennas, the maximum gain of antenna is 2.89 dBi(ANT1) and 2.83 dBi(ANT2), which that use of a non-standard antenna connector and no consideration of replacement. Therefore, the EUT is considered sufficient to comply with the provision.

Antennas 1 and 2 are uncorrelated, and MIMO antenna gain is the maximum of the two antennas.

Therefore, the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

**5.1.2 Maximum output power**
**RESULT:**
**Pass**
**Test Specification**

|                |   |                                                                                                        |
|----------------|---|--------------------------------------------------------------------------------------------------------|
| Test standard  | : | FCC Part 15.407 (a)                                                                                    |
|                | : | RSS-247 clause 6.2                                                                                     |
| Basic standard | : | ANSI C63.10:2013                                                                                       |
|                | : | FCC:                                                                                                   |
|                | : | <250mW (24dBm) (5150-5250MHz)                                                                          |
|                | : | *<250mW (24dBm) (5250-5350MHz, 5470-5725MHz)                                                           |
|                | : | *250 mW (24dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz, where is lesser. |
|                | : | <1W (30dBm) (5725-5850MHz)                                                                             |

|        |   |                                                                                                     |
|--------|---|-----------------------------------------------------------------------------------------------------|
| Limits | : | IC:                                                                                                 |
|        | : | * Max e.i.r.p.<200mW (23dBm) (5150-5250MHz)                                                         |
|        | : | *200 mW (23dBm) or 10 dBm + 10 logB, where B is the 99% emission bandwidth in MHz, where is lesser. |
|        | : | *Max conducted output power < 250mW (24dBm) (5250-5350MHz)                                          |
|        | : | *250 mW (24dBm) or 11 dBm + 10 logB, where B is the 99% emission bandwidth in MHz, where is lesser. |
|        | : | *Max e.i.r.p.<1W (30dBm) (5250-5350MHz)                                                             |
|        | : | *1 W (30dBm) or 17 dBm + 10 log B, where B is the 99% emission bandwidth in MHz, where is lesser.   |
|        | : | Max conducted output power <1W (30dBm) (5725-5850MHz)                                               |

|                   |   |               |
|-------------------|---|---------------|
| Kind of test site | : | Shielded Room |
|-------------------|---|---------------|

**Test Setup**

|                      |   |                         |
|----------------------|---|-------------------------|
| Date of testing      | : | 2023-02-07 – 2023-02-21 |
| Input voltage        | : | DC 3.3V                 |
| Operation mode       | : | A                       |
| Test channel         | : | Low / Middle / High     |
| Ambient temperature  | : | 25 °C                   |
| Relative humidity    | : | 56 %                    |
| Atmospheric pressure | : | 101 kPa                 |

Note: Per RSS-247 section 6.2.3, transmission on channels which overlap 5600-5650MHz is prohibited. This device operates under these frequencies only under the control of a certified master device and does not support active scanning on these channels. This device does not transmit any beacons or initiate any transmissions in 5250-5350MHz or 5470-5725MHz.

Antennas 1 and 2 are uncorrelated, and MIMO antenna gain is the maximum of the two antennas.

Refer to attached Appendix B for details of test data.

**Prüfbericht - Nr.: CN231C12 004**  
*Test Report No.***Seite 16 von 23**  
*Page 16 of 23***5.1.3 Power Spectral Density****RESULT:****Pass****Test Specification**

Test standard : FCC Part 15.407 (a)  
: RSS-247 clause 6.2  
Basic standard : ANSI C63.10:2013  
FCC:  
<11dBm/MHz (5150-5250MHz 5250-5350MHz, 5470-5725MHz)  
<30dBm/500KHz (5725-5850MHz)  
Limits :  
IC:  
e.i.r.p. spectral density <10dBm/MHz (5150-5250MHz)  
<11dBm/1MHz (5250-5350MHz)  
<30dBm/500KHz (5725-5850MHz)  
Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2023-02-07 – 2023-02-21  
Input voltage : DC 3.3V  
Operation mode : A  
Test channel : Low / Middle / High  
Ambient temperature : 25 °C  
Relative humidity : 56 %  
Atmospheric pressure : 101 kPa

Refer to attached Appendix B for details of test data.



**Prüfbericht - Nr.: CN231C12 004**  
*Test Report No.***Seite 17 von 23**  
*Page 17 of 23***5.1.4 Frequency Stability****RESULT:****Pass****Test Specification**

|                   |                         |
|-------------------|-------------------------|
| Test standard     | : FCC Part 15.407 (g)   |
|                   | : RSS-Gen Clause 6.11   |
| Basic standard    | : ANSI C63.10:2013      |
| Limits            | : Within assigned bands |
| Kind of test site | : Shielded Room         |

**Test Setup**

|                      |                           |
|----------------------|---------------------------|
| Date of testing      | : 2023-02-07 – 2023-02-21 |
| Input voltage        | : DC 3.3V                 |
| Operation mode       | : A                       |
| Test channel         | : Low / Middle / High     |
| Ambient temperature  | : 25 °C                   |
| Relative humidity    | : 56 %                    |
| Atmospheric pressure | : 101 kPa                 |

Refer to attached Appendix B for details of test data.

**Prüfbericht - Nr.: CN231C12 004**  
*Test Report No.***Seite 18 von 23**  
*Page 18 of 23***5.1.5 26dB Bandwidth and 99% Bandwidth****RESULT:****Pass****Test Specification**

|                   |   |                    |
|-------------------|---|--------------------|
| Test standard     | : | FCC Part 15.407    |
|                   | : | RSS-Gen Clause 6.6 |
| Basic standard    | : | ANSI C63.10:2013   |
| Limits            | : | N/A                |
| Kind of test site | : | Shielded Room      |

**Test Setup**

|                      |   |                         |
|----------------------|---|-------------------------|
| Date of testing      | : | 2023-02-07 – 2023-02-21 |
| Input voltage        | : | DC 3.3V                 |
| Operation mode       | : | A                       |
| Test channel         | : | Low / Middle / High     |
| Ambient temperature  | : | 25 °C                   |
| Relative humidity    | : | 56 %                    |
| Atmospheric pressure | : | 101 kPa                 |

Refer to attached Appendix B for details of test data.

**Prüfbericht - Nr.: CN231C12 004**  
*Test Report No.***Seite 19 von 23**  
*Page 19 of 23***5.1.6 6dB Bandwidth****RESULT:****Pass****Test Specification**

|                   |                                  |
|-------------------|----------------------------------|
| Test standard     | : FCC Part 15.407 (e)            |
|                   | : RSS-247 clause 6.2.4.1         |
| Basic standard    | : ANSI C63.10:2013               |
| Limits            | : At least 500KHz (5725-5850MHz) |
| Kind of test site | : Shielded Room                  |

**Test Setup**

|                      |                           |
|----------------------|---------------------------|
| Date of testing      | : 2023-02-07 – 2023-02-21 |
| Input voltage        | : DC 3.3V                 |
| Operation mode       | : A                       |
| Test channel         | : Low / Middle / High     |
| Ambient temperature  | : 25 °C                   |
| Relative humidity    | : 56 %                    |
| Atmospheric pressure | : 101 kPa                 |

Refer to attached Appendix B for details of test data.

**5.1.7 Radiated Spurious Emission**
**RESULT:**
**Pass**
**Test Specification**

Test standard

- : FCC Part 15.407(b) & FCC Part 15.205 & FCC Part 15.209
- : RSS-247 clause 6.2 & RSS-GEN clause 8.9 and 8.10
- : ANSI C63.10:2013

Basic standard

- For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

Limits

- : Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.
- For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- Restricted Bands meet the requirement of 15.209 limit and RSS-GEN

Kind of test site

- : 3m Semi-Anechoic Chamber (below 1GHz)
- : 3m Anechoic Chamber (above 1GHz)

**Test Setup**

Date of testing

- : 2023-02-07 – 2023-02-21

Input voltage

- : DC 3.3V

Operation mode

- : A

Test channel

- : Low / Middle / High

Ambient temperature

- : 23 °C

Relative humidity

- : 48 %

Atmospheric pressure

- : 101 kPa

Refer to attached Appendix B for details of test data.

**Prüfbericht - Nr.: CN231C12 004**  
*Test Report No.***Seite 21 von 23**  
*Page 21 of 23***5.1.8 Dynamic Frequency Selection (DFS)****RESULT:****Pass****Test Specification**

Test standard

: FCC Part 15.407(h)  
: RSS-247 clause 6.3  
5250-5350MHz, 5470-5725MHz  
Channel Move Time: Within 10 seconds.

Limits

: Channel Closing Transmission Time: 200ms+aggregate of  
60ms over remaining 10s period;  
Non-Occupancy Period: at least 30 minutes.

Kind of test site

: Shielded Room

**Test Setup**

Date of testing

: 2023-02-07 – 2023-02-21

Input voltage

: DC 3.3V

Operation mode

: A

Test channel

: CH58 and CH116

Ambient temperature

: 23 °C

Relative humidity

: 48 %

Atmospheric pressure

: 101 kPa

Note: DFS is not applicable to 5600-5650 frequency band for IC.

Refer to attached Appendix B for details of test data.

**Prüfbericht - Nr.: CN231C12 004**  
*Test Report No.***Seite 22 von 23**  
*Page 22 of 23***5.1.9 Conducted Emission on AC Mains****RESULT:****Pass****Test Specification**

|                   |   |                    |
|-------------------|---|--------------------|
| Test standard     | : | FCC Part 15.207    |
|                   | : | RSS-GEN clause 8.8 |
| Basic standard    | : | ANSI C63.10:2013   |
| Frequency range   | : | 0.15 - 30MHz       |
| Limits            | : | FCC Part 15.207    |
| Kind of test site | : | Shielded Room      |

**Test Setup**

|                      |   |                         |
|----------------------|---|-------------------------|
| Date of testing      | : | 2023-02-07 – 2023-02-21 |
| Input voltage        | : | AC 120V, 60Hz           |
| Operation mode       | : | B                       |
| Earthing             | : | Not connected           |
| Ambient temperature  | : | 25 °C                   |
| Relative humidity    | : | 56 %                    |
| Atmospheric pressure | : | 101 kPa                 |

Refer to attached Appendix B for details of test data.

## 6. Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

## 7. List of Tables

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