

Report No.: XEWM2311000559RG01

Rev.: 01

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# TEST REPORT

**Application No.:** XEWM2311000559RG  
**Applicant:** Beijing InHand Networks Technology Co., Ltd.  
**Address of Applicant:** Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing  
**Manufacturer:** Beijing InHand Networks Technology Co., Ltd.  
**Address of Manufacturer:** Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing  
**EUT Description:** 5G Fixed Wireless Access  
**Model No.:** FWA02  
FWA03  
FWA12  
FWA32  
FWA62  
FWA92  
**Trade Mark:**   
**FCC ID:** 2AANY-FWA  
**Standards:** FCC 47 CFR Part 2, Subpart J  
FCC 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2023/11/02  
**Date of Test:** 2023/11/05 to 2023/11/17  
**Date of Issue:** 2023/11/21

|                      |               |
|----------------------|---------------|
| <b>Test Result :</b> | <b>PASS *</b> |
|----------------------|---------------|

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Peter Tan  
Regulatory Technical Manager



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## 1 Version

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2023/11/21 |          | Original |

|             |                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------|
| Prepared By | <br>(Leah Chen) / Test Engineer |
| Checked By  | <br>(Andy Yao) / Reviewer       |

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## 2 Test Summary

| Test Item                                                               | FCC Rule No.            | Test Method                                          | Test Result | Result            |
|-------------------------------------------------------------------------|-------------------------|------------------------------------------------------|-------------|-------------------|
| Antenna Requirement                                                     | 15.203/15.247(b)        | --                                                   | Clause 4.1  | PASS              |
| AC Power Line<br>Conducted Emission                                     | 15.207                  | ANSI C63.10 2013<br>Section 6.2                      | Clause 4.2  | PASS              |
| Duty Cycle                                                              | --                      | ANSI C63.10 2013<br>Section 11.6                     | Clause 4.3  | Reporting<br>only |
| Conducted Output Power                                                  | 15.247 (b)(3)           | ANSI C63.10 2013<br>Section 11.9.1.3                 | Clause 4.4  | PASS              |
| DTS (6 dB) Bandwidth & 99%<br>Occupied Bandwidth                        | 15.247 (a)(2)           | ANSI C63.10 2013<br>Section 11.8 Option<br>2 / 6.9.3 | Clause 4.5  | PASS              |
| Power Spectral Density                                                  | 15.247 (e)              | ANSI C63.10 2013<br>Section 11.10.2                  | Clause 4.6  | PASS              |
| Band-edge for RF<br>Conducted Emissions                                 | 15.247(d)               | ANSI C63.10 2013<br>Section 11.11                    | Clause 4.7  | PASS              |
| RF Conducted Spurious<br>Emissions                                      | 15.247(d)               | ANSI C63.10 2013<br>Section 11.11                    | Clause 4.8  | PASS              |
| Radiated Spurious Emissions                                             | 15.247(d);15.205/15.209 | ANSI C63.10 2013<br>Section 11.12                    | Clause 4.9  | PASS              |
| Restricted bands around<br>fundamental frequency (Radiated<br>Emission) | 15.247(d);15.205/15.209 | ANSI C63.10 2013<br>Section 11.12                    | Clause 4.10 | PASS              |

### Remark:

According to the Declaration letter from client, these models are the same in these: appearance, PCB layout and basic software function; The only difference is that the products are used in different markets.

Therefore in this report only the Model No.(FWA02) was tested, and internal wiring were identical for all above items. Only different on model No. for marketing requirement.



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### 3 General Information

#### 3.1 Details of Client

|                          |                                                                                |
|--------------------------|--------------------------------------------------------------------------------|
| Applicant:               | Beijing InHand Networks Technology Co., Ltd.                                   |
| Address of Applicant:    | Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing |
| Manufacturer:            | Beijing InHand Networks Technology Co., Ltd.                                   |
| Address of Manufacturer: | Room 501, floor 5, building 3, yard 18, ziyue road, chaoyang district, Beijing |

#### 3.2 Test Location

|                |                                                                                                                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------|
| Company:       | SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.                                                                  |
| Address:       | 1/F, Unit D, Building 1, Kanghong Orange Science Park, No.137, Keyuan 3rd Road, Fengdong New Town, Xi' an, Shaanxi China |
| Post code:     | 710086                                                                                                                   |
| Test engineer: | Qiang Zhang, Ken Liu                                                                                                     |

#### 3.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 4854.01)**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095.

IC#: 25613.

• **FCC –Designation Number: CN1337**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN1337.

Test Firm Registration Number: 917410



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### 3.4 General Description of EUT

|                                                                                                                                                                              |                                                                                                      |                                                        |                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------|
| EUT Description:                                                                                                                                                             | 5G Fixed Wireless Access                                                                             |                                                        |                    |
| Model No.:                                                                                                                                                                   | FWA02<br>FWA03<br>FWA12<br>FWA32<br>FWA62<br>FWA92                                                   |                                                        |                    |
| Trade Mark:                                                                                                                                                                  |                     |                                                        |                    |
| Hardware Version:                                                                                                                                                            | V1.2                                                                                                 |                                                        |                    |
| Software Version:                                                                                                                                                            | V2.0                                                                                                 |                                                        |                    |
| Power Supply:                                                                                                                                                                | DC 12V                                                                                               |                                                        |                    |
| IMEI:                                                                                                                                                                        | RF Conducted                                                                                         | 862424050313294                                        |                    |
|                                                                                                                                                                              | RSE & AC power line                                                                                  | 862424050366003                                        |                    |
| Operation Frequency:                                                                                                                                                         | 802.11b/g/n(HT20)/ax(HE20):                                                                          |                                                        | 2412MHz to 2462MHz |
|                                                                                                                                                                              | 802.11n(HT40)/ax(HE40):                                                                              |                                                        | 2422MHz to 2452MHz |
| Modulation Type:                                                                                                                                                             | 802.11b:                                                                                             | DSSS (DBPSK, DQPSK, CCK)                               |                    |
|                                                                                                                                                                              | 802.11g/n:                                                                                           | OFDM (BPSK, QPSK, 16QAM, 64QAM)                        |                    |
|                                                                                                                                                                              | 802.11ax:                                                                                            | OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |                    |
| Number of Channels:                                                                                                                                                          | 802.11b/g/n(HT20)/ax(HE20): 11<br>802.11n(HT40)/ax(HE40): 7                                          |                                                        |                    |
| Channel Spacing:                                                                                                                                                             | 5MHz                                                                                                 |                                                        |                    |
| Smart System:                                                                                                                                                                | <input checked="" type="checkbox"/> SISO                                                             | 802.11b/g/n                                            |                    |
|                                                                                                                                                                              | <input checked="" type="checkbox"/> MIMO                                                             | 802.11ax: 4Tx & 4Rx                                    |                    |
|                                                                                                                                                                              | <input type="checkbox"/> Diversity                                                                   | 802.11b/g: 4Tx & 4Rx                                   |                    |
| Antenna Type:                                                                                                                                                                | Built in WiFi antenna                                                                                |                                                        |                    |
| Antenna Gain:                                                                                                                                                                | 4.13dBi (Ant1); 4.13dBi (Ant2); 4.13dBi (Ant3); 4.13dBi (Ant4)                                       |                                                        |                    |
|                                                                                                                                                                              | Note:<br>The antenna gain are derived from the gain information report provided by the manufacturer. |                                                        |                    |
| RF Cable:                                                                                                                                                                    | 1.2dB                                                                                                |                                                        |                    |
| Remark:<br>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information. |                                                                                                      |                                                        |                    |

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| Operation Frequency of each channel (802.11b/g/n HT20/ax HE20)                                                                                                                                                                                                                                    |           |                                              |           |         |                                       |         |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------|-----------|---------|---------------------------------------|---------|-----------|
| Channel                                                                                                                                                                                                                                                                                           | Frequency | Channel                                      | Frequency | Channel | Frequency                             | Channel | Frequency |
| 1                                                                                                                                                                                                                                                                                                 | 2412MHz   | 4                                            | 2427MHz   | 7       | 2442MHz                               | 10      | 2457MHz   |
| 2                                                                                                                                                                                                                                                                                                 | 2417MHz   | 5                                            | 2432MHz   | 8       | 2447MHz                               | 11      | 2462MHz   |
| 3                                                                                                                                                                                                                                                                                                 | 2422MHz   | 6                                            | 2437MHz   | 9       | 2452MHz                               |         |           |
| Operation Frequency of each channel (802.11n HT40/ax HE40)                                                                                                                                                                                                                                        |           |                                              |           |         |                                       |         |           |
| Channel                                                                                                                                                                                                                                                                                           | Frequency | Channel                                      | Frequency | Channel | Frequency                             | Channel | Frequency |
| 3                                                                                                                                                                                                                                                                                                 | 2422MHz   | 6                                            | 2437MHz   | 9       | 2452MHz                               |         |           |
| 4                                                                                                                                                                                                                                                                                                 | 2427MHz   | 7                                            | 2442MHz   |         |                                       |         |           |
| 5                                                                                                                                                                                                                                                                                                 | 2432MHz   | 8                                            | 2447MHz   |         |                                       |         |           |
| Remark:<br>In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:                                                     |           |                                              |           |         |                                       |         |           |
| Channel                                                                                                                                                                                                                                                                                           |           | Frequency for 802.11 b/g/n (HT20) /ax (HE20) |           |         | Frequency for 802.11n (HT40)/ax(HE40) |         |           |
| The Lowest channel                                                                                                                                                                                                                                                                                |           | 2412MHz                                      |           |         | 2422MHz                               |         |           |
| The Middle channel                                                                                                                                                                                                                                                                                |           | 2437MHz                                      |           |         | 2437MHz                               |         |           |
| The Highest channel                                                                                                                                                                                                                                                                               |           | 2462MHz                                      |           |         | 2452MHz                               |         |           |
| Remark:<br>802.11ax support OFDMA full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) test output power, the full RU power > partial RU, therefore the full RU perform full test to cover partial RU except for PSD/Duty cycle/BE. |           |                                              |           |         |                                       |         |           |

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### 3.5 Test Environment and Mode

| Environment Parameter                                   | 96.0~101.0 kPa Selected Values During Tests |            |
|---------------------------------------------------------|---------------------------------------------|------------|
| Relative Humidity                                       | 40-60 % RH Ambient                          |            |
| Value                                                   | Temperature(°C)                             | Voltage(V) |
| NTNV                                                    | 22~25                                       | 12         |
| Remark:<br>NV: Normal Voltage<br>NT: Normal Temperature |                                             |            |

### 3.6 Description of Support Units

| Description                                                        | Manufacturer    | Model No.     |
|--------------------------------------------------------------------|-----------------|---------------|
| Adapter                                                            | KUANTEN LIMITED | KT36W120300US |
| Remark: all above the information of table are provided by client. |                 |               |

### 3.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

| Modulation Type  | SISO - Data Rate | MIMO - Data Rate |
|------------------|------------------|------------------|
| 802.11b          | 1 Mbps           | /                |
| 802.11g          | 6 Mbps           | /                |
| 802.11n (HT 20)  | MCS0 (6.5 Mbps)  | /                |
| 802.11n (HT 40)  | MCS0 (13.5 Mbps) | /                |
| 802.11ax (HE 20) | /                | MCS0 (16 Mbps)   |
| 802.11ax (HE 40) | /                | MCS0 (32 Mbps)   |



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## 4 Test results and Measurement Data

### 4.1 Antenna Requirement

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Standard requirement:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 47 CFR Part 15C Section 15.203 /247(b) |
| <p>15.203 requirement:<br/>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p> <p>15.247(b) (4) requirement:<br/>The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p> |                                        |
| <p>The antenna is Built in WiFi antenna and no consideration of replacement.<br/>The best case gain of the antenna is 4.13dBi (Ant1); 4.13dBi (Ant2); 4.13dBi (Ant3); 4.13dBi (Ant4).*</p> <p><i>*Note:</i><br/>The antenna gain are derived from the gain information report provided by the manufacturer.</p> <p><i>Remark:</i><br/>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |



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**MIMO Model:**

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

If all antennas have the same gain,  $G_{ANT}$ , Directional gain =  $G_{ANT}$  + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

$$\text{Array Gain} = 10 \log(N_{ANT}/N_{SS} = 1) \text{ dB.}$$

- For power measurements on IEEE 802.11 devices:

$$\text{Array Gain} = 0 \text{ dB (i.e., no array gain) for } N_{ANT} \leq 4;$$

Directional gain may be calculated by using the formulas applicable to equal gain antennas with  $G_{ANT}$  set equal to the gain of the antenna having the highest gain.**The Power and PSD limit should be modified if the directional gain of eut is over 6dbi.**

The EUT supports CDD System.

All antennas have the same gain:

| ANT Gain1 (dBi) | ANT Gain2 (dBi) | ANT Gain3 (dBi) | ANT Gain4 (dBi) | Power DG (dBi) | PSD DG (dBi) | Power Limit Reduction(dB) | PSD Limit Reduction(dB) |
|-----------------|-----------------|-----------------|-----------------|----------------|--------------|---------------------------|-------------------------|
| 4.13            | 4.13            | 4.13            | 4.13            | 4.13           | 10.15        | 0                         | 4.15                    |

Power Limit Reduction = Directional gain – 6dBi, (Directional gain &lt; 6dBi ) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain &gt; 6dBi ) =10.15 – 6 = 4.15



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## 4.2 AC Power Line Conducted Emissions

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |           |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|
| Test Requirement:                                | 47 CFR Part 15C Section 15.207                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |           |
| Test Method:                                     | ANSI C63.10: 2013 Section 6.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |           |
| Test Frequency Range:                            | 150kHz to 30MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |           |
| Receiver Setup:                                  | RBW = 9kHz, VBW = 30kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |           |
| Limit:                                           | Frequency range (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Limit (dBuV) |           |
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Quasi-peak   | Average   |
|                                                  | 0.15-0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 66 to 56*    | 56 to 46* |
|                                                  | 0.5-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 56           | 46        |
|                                                  | 5-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 60           | 50        |
| * Decreases with the logarithm of the frequency. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |           |
| Test Procedure:                                  | <p>1) The mains terminal disturbance voltage test was conducted in a shielded room.</p> <p>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</p> <p>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</p> <p>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</p> |              |           |

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|                        |                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Test Setup:            |                                                                                                                              |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.<br>Adapter + Transmitting mode. |
| Final Test Mode:       | Refer to section 3.7 for details.<br>Only the worst case is recorded in the report.                                          |
| Instruments Used:      | Refer to section 6 for details.                                                                                              |
| Test Results:          | Pass                                                                                                                         |

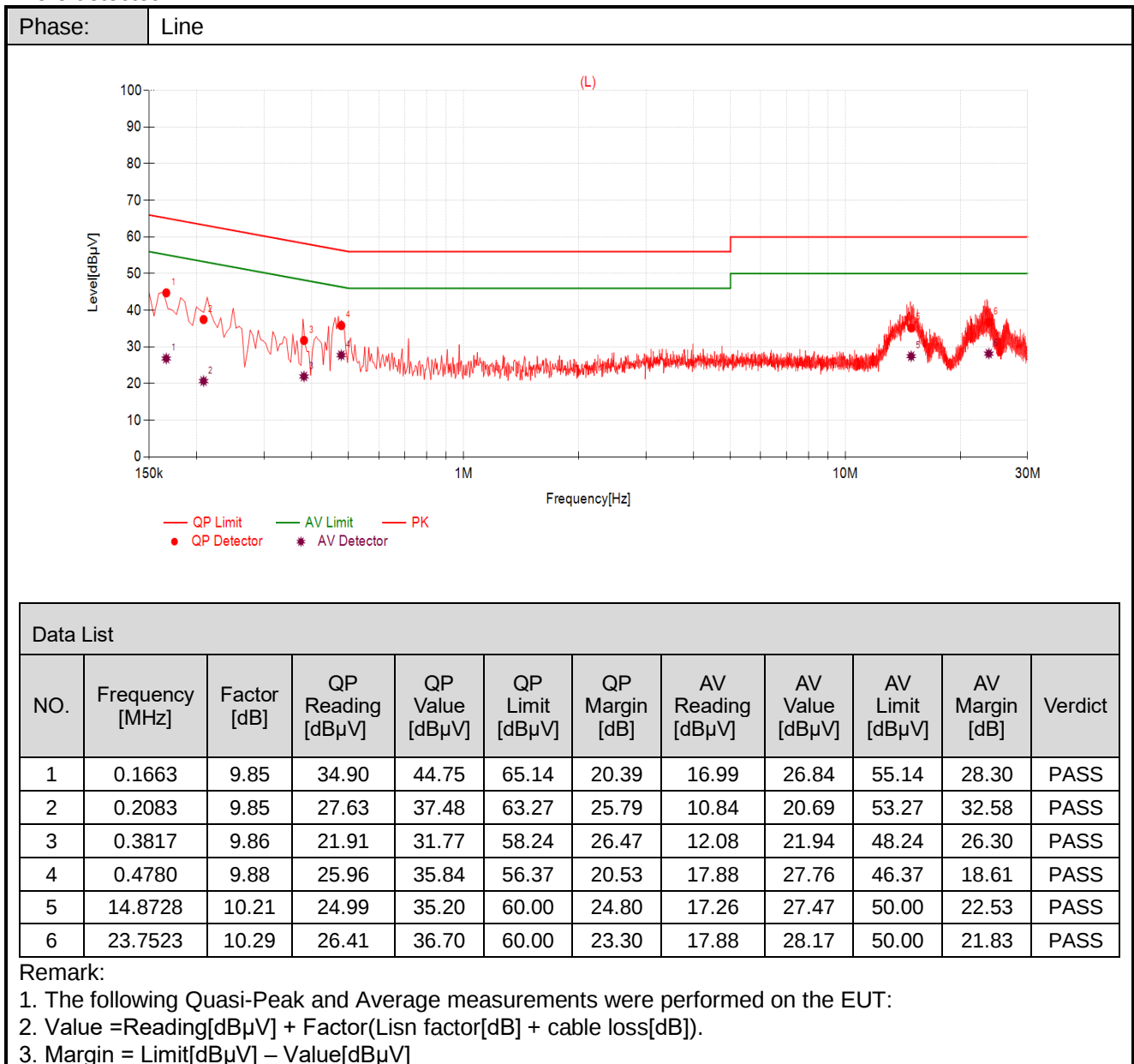
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### Measurement Data

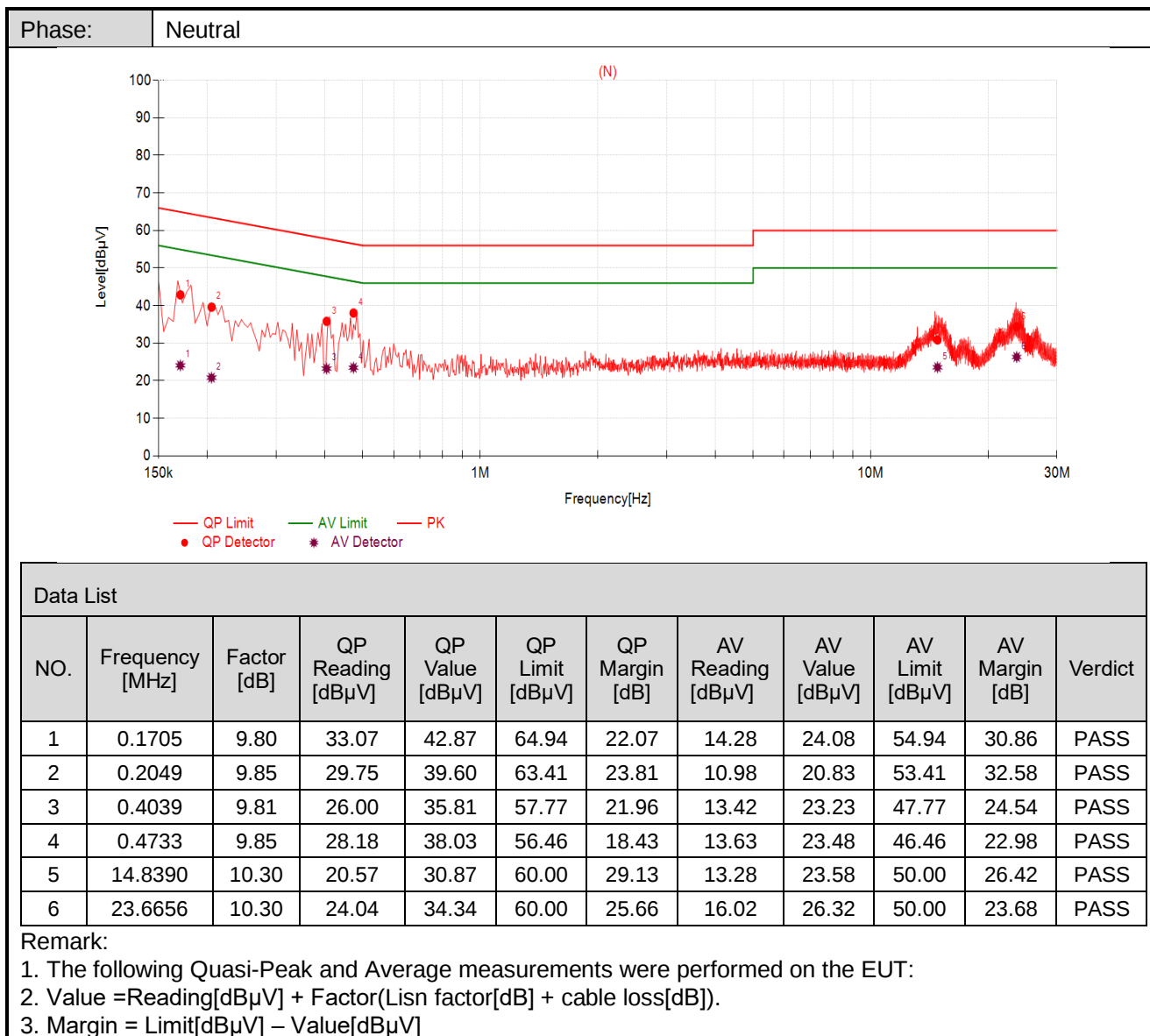
An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



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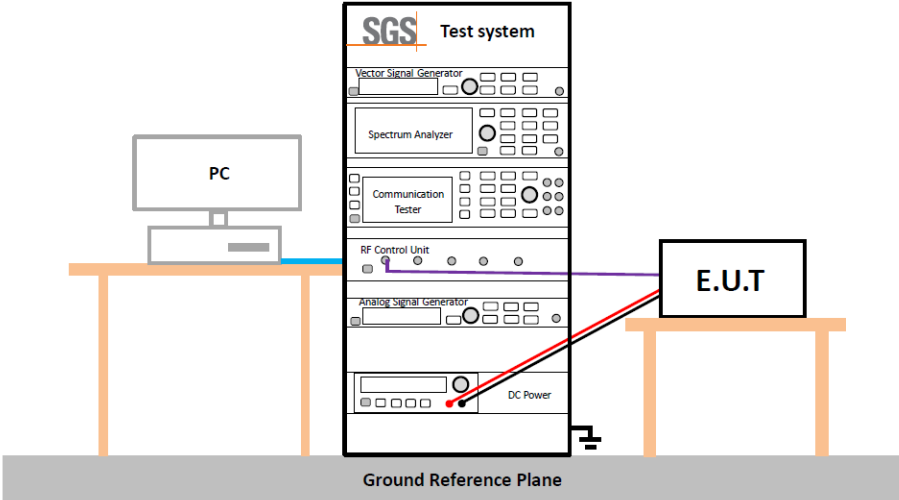


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### 4.3 Duty Cycle

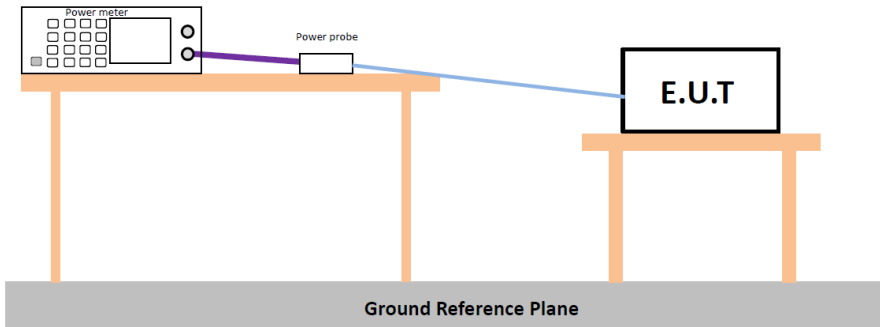
|                             |                                                                                     |
|-----------------------------|-------------------------------------------------------------------------------------|
| Test Requirement:           | ANSI C63.10:2013 Section 11.6                                                       |
| Test Method:                | ANSI C63.10:2013 Section 11.6                                                       |
| Test Setup:                 |  |
| Instruments Used:           | Refer to section 6 for details                                                      |
| Exploratory Test Mode:      | Transmitting with all kind of modulations, data rates                               |
| Final Test Mode:            | Refer to section 3.7 for details.                                                   |
| Limit:                      | No restriction limits                                                               |
| Test Results:               | For Report Purpose                                                                  |
| The detailed test data see: | <b>Appendix</b>                                                                     |

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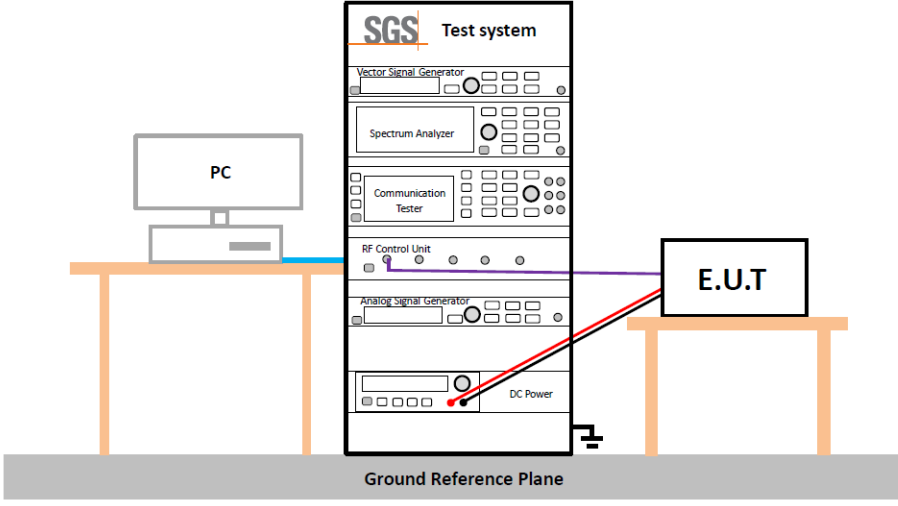
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## 4.4 Conducted Output Power

|                                             |                                                                                                                                             |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:                           | 47 CFR Part 15C Section 15.247 (b)(3)                                                                                                       |
| Test Method:                                | ANSI C63.10 :2013 Section11.9.1.3                                                                                                           |
| Test Setup:                                 |  <p>* Test with power meter (Detector function: Peak)</p> |
| Test Instruments:                           | Refer to section 6 for details.                                                                                                             |
| Exploratory Test Mode:                      | Transmitting with all kind of modulations, data rates                                                                                       |
| Final Test Mode:                            | Refer to section 3.7 for details.                                                                                                           |
| Limit:                                      | 30dBm                                                                                                                                       |
| Test Results:                               | Pass                                                                                                                                        |
| The detailed test data see: <b>Appendix</b> |                                                                                                                                             |

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#### 4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

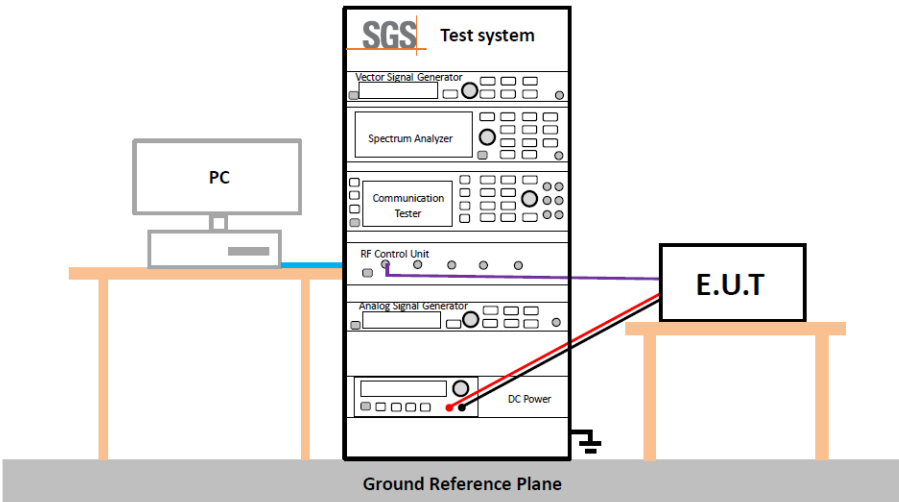
|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| Test Requirement:                           | 47 CFR Part 15C Section 15.247 (a)(2)                                               |
| Test Method:                                | ANSI C63.10: 2013 Section 11.8 Option 2 / 6.9.3                                     |
| Test Setup:                                 |  |
| Instruments Used:                           | Refer to section 6 for details.                                                     |
| Exploratory Test Mode:                      | Transmitting with all kind of modulations, data rates                               |
| Final Test Mode:                            | Refer to section 3.7 for details.                                                   |
| Limit:                                      | $\geq 500$ kHz for DTS Bandwidth                                                    |
| Test Results:                               | Pass                                                                                |
| The detailed test data see: <b>Appendix</b> |                                                                                     |

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## 4.6 Power Spectral Density

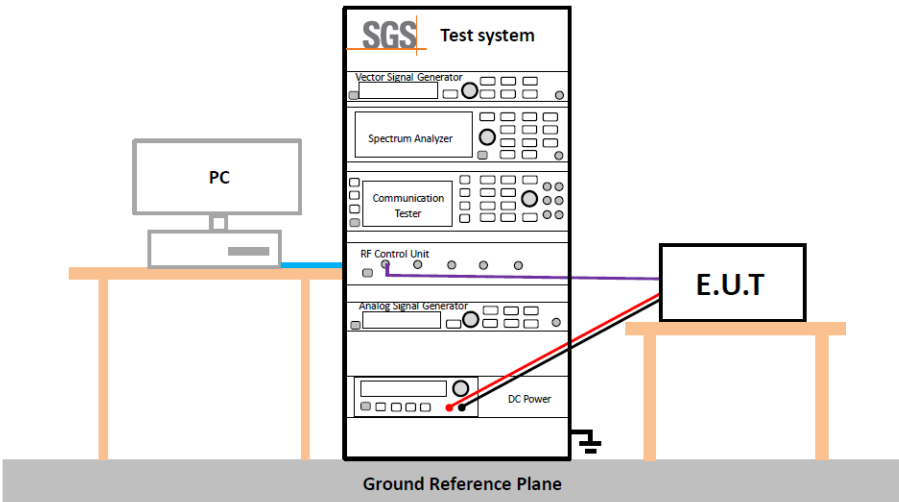
|                                             |                                                                                     |
|---------------------------------------------|-------------------------------------------------------------------------------------|
| Test Requirement:                           | 47 CFR Part 15C Section 15.247 (e)                                                  |
| Test Method:                                | ANSI C63.10 :2013 Section 11.10.2                                                   |
| Test Setup:                                 |  |
| Test Instruments:                           | Refer to section 6 for details.                                                     |
| Exploratory Test Mode:                      | Transmitting with all kind of modulations, data rates                               |
| Final Test Mode:                            | Refer to section 3.7 for details.                                                   |
| Limit:                                      | ≤8.00dBm/3kHz                                                                       |
| Test Results:                               | Pass                                                                                |
| The detailed test data see: <b>Appendix</b> |                                                                                     |

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## 4.7 Band-edge for RF Conducted Emissions

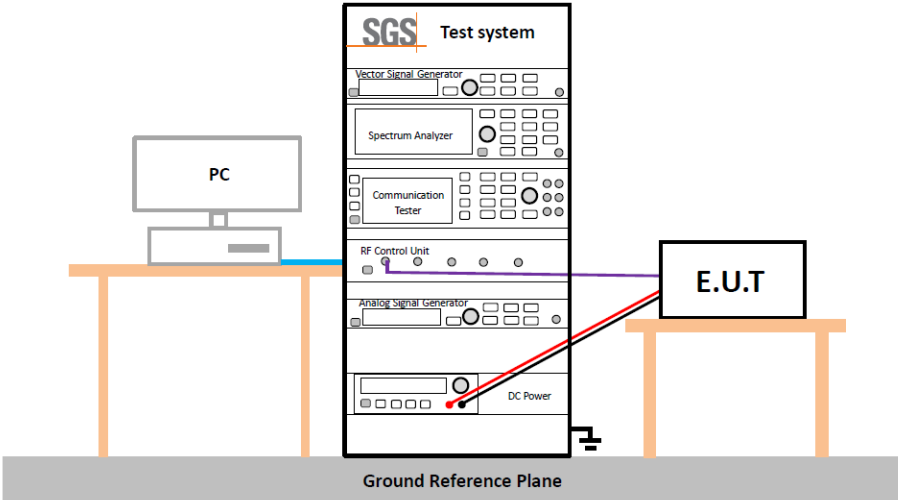
|                                             |                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:                           | 47 CFR Part 15C Section 15.247 (d)                                                                                                                                                                                                                                                                                                                                                      |
| Test Method:                                | ANSI C63.10: 2013 Section 11.11                                                                                                                                                                                                                                                                                                                                                         |
| Test Setup:                                 |                                                                                                                                                                                                                                                                                                      |
| Instruments Used:                           | Refer to section 6 for details.                                                                                                                                                                                                                                                                                                                                                         |
| Exploratory Test Mode:                      | Transmitting with all kind of modulations, data rates                                                                                                                                                                                                                                                                                                                                   |
| Final Test Mode:                            | Refer to section 3.7 for details.                                                                                                                                                                                                                                                                                                                                                       |
| Limit:                                      | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Test Results:                               | Pass                                                                                                                                                                                                                                                                                                                                                                                    |
| The detailed test data see: <b>Appendix</b> |                                                                                                                                                                                                                                                                                                                                                                                         |

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## 4.8 RF Conducted Spurious Emissions

|                                             |                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement:                           | 47 CFR Part 15C Section 15.247 (d)                                                                                                                                                                                                                                                                                                                                                      |
| Test Method:                                | ANSI C63.10: 2013 Section 11.11                                                                                                                                                                                                                                                                                                                                                         |
| Test Setup:                                 |                                                                                                                                                                                                                                                                                                      |
| Instruments Used:                           | Refer to section 6 for details.                                                                                                                                                                                                                                                                                                                                                         |
| Exploratory Test Mode:                      | Transmitting with all kind of modulations, data rates                                                                                                                                                                                                                                                                                                                                   |
| Final Test Mode:                            | Refer to section 3.7 for details.                                                                                                                                                                                                                                                                                                                                                       |
| Limit:                                      | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Test Results:                               | Pass                                                                                                                                                                                                                                                                                                                                                                                    |
| The detailed test data see: <b>Appendix</b> |                                                                                                                                                                                                                                                                                                                                                                                         |

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## 4.9 Radiated Spurious Emissions

|                                                                                                                                                                                                                                                                               |                                                  |                                  |                |            |                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------|----------------|------------|--------------------------|
| Test Requirement:                                                                                                                                                                                                                                                             | 47 CFR Part 15C Section 15.209 and 15.205        |                                  |                |            |                          |
| Test Method:                                                                                                                                                                                                                                                                  | ANSI C63.10 :2013 Section 11.12                  |                                  |                |            |                          |
| Test Site:                                                                                                                                                                                                                                                                    | Measurement Distance: 3m (Semi-Anechoic Chamber) |                                  |                |            |                          |
| Test Frequency:                                                                                                                                                                                                                                                               | 9kHz ~ 25GHz                                     |                                  |                |            |                          |
| Receiver Setup:                                                                                                                                                                                                                                                               | Frequency                                        | Detector                         | RBW            | VBW        | Remark                   |
|                                                                                                                                                                                                                                                                               | 0.009MHz-0.090MHz                                | Peak                             | 10kHz          | 30kHz      | Peak                     |
|                                                                                                                                                                                                                                                                               | 0.009MHz-0.090MHz                                | Average                          | 10kHz          | 30kHz      | Average                  |
|                                                                                                                                                                                                                                                                               | 0.090MHz-0.110MHz                                | Quasi-peak                       | 10kHz          | 30kHz      | Quasi-peak               |
|                                                                                                                                                                                                                                                                               | 0.110MHz-0.490MHz                                | Peak                             | 10kHz          | 30kHz      | Peak                     |
|                                                                                                                                                                                                                                                                               | 0.110MHz-0.490MHz                                | Average                          | 10kHz          | 30kHz      | Average                  |
|                                                                                                                                                                                                                                                                               | 0.490MHz -30MHz                                  | Quasi-peak                       | 10kHz          | 30kHz      | Quasi-peak               |
|                                                                                                                                                                                                                                                                               | 30MHz-1GHz                                       | Quasi-peak                       | 120kHz         | 300kHz     | Quasi-peak               |
|                                                                                                                                                                                                                                                                               | Above 1GHz                                       | Peak                             | 1MHz           | 3MHz       | Peak                     |
|                                                                                                                                                                                                                                                                               |                                                  | Peak                             | 1MHz           | 3MHz       | Peak                     |
| Limit:                                                                                                                                                                                                                                                                        | Frequency                                        | Field strength (microvolt/meter) | Limit (dBuV/m) | Remark     | Measurement distance (m) |
|                                                                                                                                                                                                                                                                               | 0.009MHz-0.490MHz                                | 2400/F(kHz)                      | -              | -          | 300                      |
|                                                                                                                                                                                                                                                                               | 0.490MHz-1.705MHz                                | 24000/F(kHz)                     | -              | -          | 30                       |
|                                                                                                                                                                                                                                                                               | 1.705MHz-30MHz                                   | 30                               | -              | -          | 30                       |
|                                                                                                                                                                                                                                                                               | 30MHz-88MHz                                      | 100                              | 40.0           | Quasi-peak | 3                        |
|                                                                                                                                                                                                                                                                               | 88MHz-216MHz                                     | 150                              | 43.5           | Quasi-peak | 3                        |
|                                                                                                                                                                                                                                                                               | 216MHz-960MHz                                    | 200                              | 46.0           | Quasi-peak | 3                        |
|                                                                                                                                                                                                                                                                               | 960MHz-1GHz                                      | 500                              | 54.0           | Quasi-peak | 3                        |
|                                                                                                                                                                                                                                                                               | Above 1GHz                                       | 500                              | 54.0           | Average    | 3                        |
| Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. |                                                  |                                  |                |            |                          |

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### Test Setup:

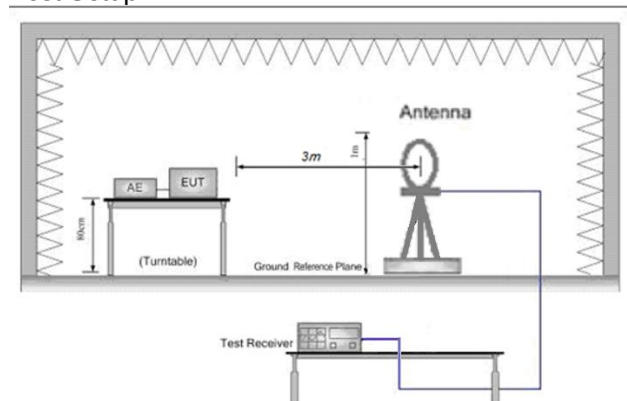


Figure 1. Below 30MHz

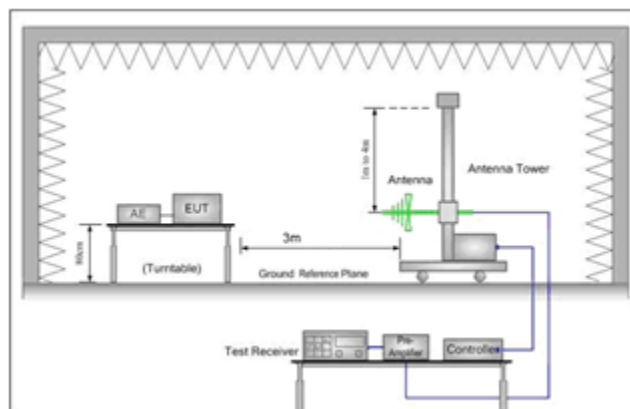


Figure 2. 30MHz to 1GHz

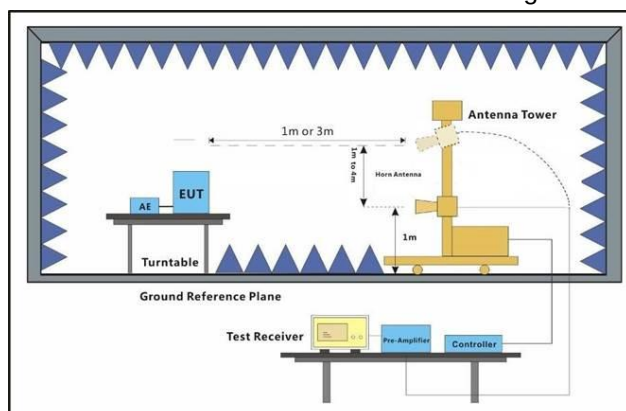


Figure 3. Above 1 GHz

### Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements >18GHz).
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test

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|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | <p>frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>g. Test the EUT in the lowest channel, the middle channel ,the Highest channel.</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported</p> <p>k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.</p> <p>l. At a measurement distance of 1 meter the limit line was increased by <math>20 \cdot \log(3/1) = 9.54 \text{ dB}</math>.</p>       |
| Test Configuration:    | <p>Measurements below 30MHz</p> <ul style="list-style-type: none"> <li>• RBW = 10 kHz</li> <li>• VBW = 30 kHz</li> <li>• Detector = Peak &amp; Average &amp; Quasi-peak</li> <li>• Trace mode = max hold</li> </ul> <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Quasi-peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW <math>\geq 3 \text{ MHz}</math></li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW = 10 Hz, when duty cycle is no less than 98 percent.</li> <li>• VBW <math>\geq 1/T</math>, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</li> </ul> |
| Exploratory Test Mode: | <p>Transmitting with all kind of modulations, data rates.</p> <p>Adapter + Transmitting mode.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Final Test Mode:       | <p>Refer to section 3.7 for details.</p> <p>For below 1GHz part, through pre-scan all channels, but only the worst case is recorded in the report.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |



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|                                             |                                 |
|---------------------------------------------|---------------------------------|
| Instruments Used:                           | Refer to section 6 for details. |
| Test Results:                               | Pass                            |
| The detailed test data see: <b>Appendix</b> |                                 |



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### 4.10 Restricted bands around fundamental frequency

|                   |                                                  |                |               |
|-------------------|--------------------------------------------------|----------------|---------------|
| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205        |                |               |
| Test Method:      | ANSI C63.10: 2013 Section 11.12                  |                |               |
| Test Site:        | Measurement Distance: 3m (Semi-Anechoic Chamber) |                |               |
| Limit:            | Frequency                                        | Limit (dBuV/m) | Remark        |
|                   | 30MHz-88MHz                                      | 40.0           | Quasi-peak    |
|                   | 88MHz-216MHz                                     | 43.5           | Quasi-peak    |
|                   | 216MHz-960MHz                                    | 46.0           | Quasi-peak    |
|                   | 960MHz-1GHz                                      | 54.0           | Quasi-peak    |
|                   | Above 1GHz                                       | 54.0           | Average Value |
|                   |                                                  | 74.0           | Peak Value    |

Test Setup:

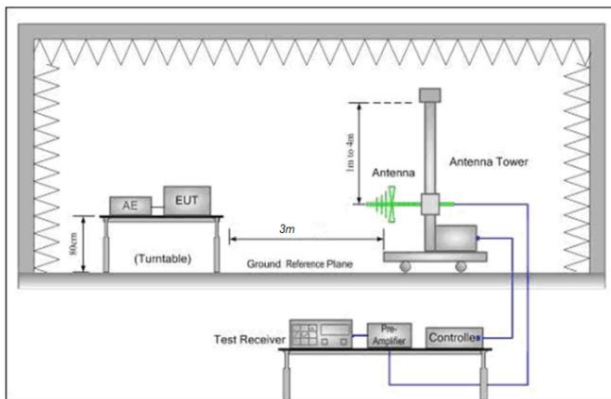


Figure 1. 30MHz to 1GHz

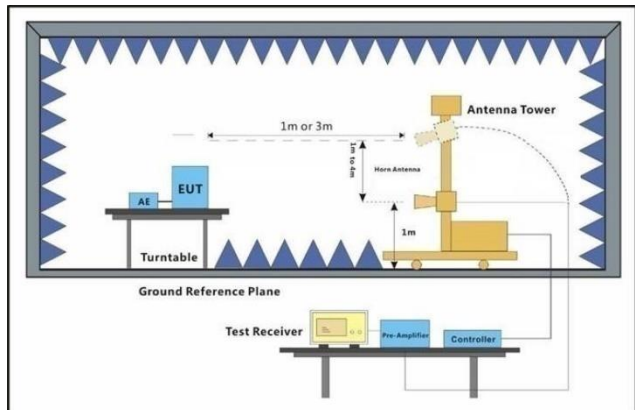


Figure 2. Above 1 GHz

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|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Procedure:        | <p>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</p> <p>h. Test the EUT in the lowest channel , the Highest channel</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p> |
| Test Configuration:    | <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Quasi-peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW ≥ 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW = 10 Hz, when duty cycle is no less than 98 percent.</li> <li>• VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Exploratory Test Mode: | <p>Transmitting with all kind of modulations, data rates.</p> <p>Adapter + Transmitting mode.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



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|                                             |                                   |
|---------------------------------------------|-----------------------------------|
| Final Test Mode:                            | Refer to section 3.7 for details. |
| Instruments Used:                           | Refer to section 6 for details.   |
| Test Results:                               | Pass                              |
| The detailed test data see: <b>Appendix</b> |                                   |



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## 5 Measurement Uncertainty (95% confidence levels, k=2)

| No. | Item                         | Measurement Uncertainty        |
|-----|------------------------------|--------------------------------|
| 1   | Radio Frequency              | $\pm 7.25 \times 10^{-8}$ GHz  |
| 2   | Duty cycle                   | $\pm 0.37\%$                   |
| 3   | Occupied Bandwidth           | $\pm 0.2\%$                    |
| 4   | RF conducted power           | $\pm 0.21$ dB                  |
| 5   | RF power density             | $\pm 2.84$ dB                  |
| 6   | Conducted Spurious emissions | $\pm 0.75$ dB                  |
| 7   | Conduction Emission          | $\pm 3.0$ dB (150kHz to 30MHz) |
| 8   | Radiated Emission            | $\pm 4.6$ dB (9kHz to 30MHz)   |
|     |                              | $\pm 4.9$ dB (30MHz to 1GHz)   |
|     |                              | $\pm 4.9$ dB (1GHz to 6GHz)    |
|     |                              | $\pm 4.7$ dB (6GHz to 18GHz)   |
|     |                              | $\pm 5.26$ dB (Above 18GHz)    |

### Remark:

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{CISPR/ETSI}$  (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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## 6 Equipment List

| RF Test System                 |              |                      |               |                           |                              |
|--------------------------------|--------------|----------------------|---------------|---------------------------|------------------------------|
| Test Equipment                 | Manufacturer | Model No.            | Inventory No. | Cal. date<br>(yyyy/mm/dd) | Cal.Due date<br>(yyyy/mm/dd) |
| MXA signal analyzer            | Agilent      | N9020A               | XAW01-06-07   | 2023/02/16                | 2024/02/15                   |
| MXG vector signal Generator    | Agilent      | N5182B               | XAW01-07-16   | 2023/02/16                | 2024/02/15                   |
| Measurement Software           | Tonscend     | JS1120-3<br>(3.2.18) | XAW02-14-01   | NCR                       | NCR                          |
| RF control unit                | Tonscend     | JS0806-2             | XAW03-37-01   | NCR                       | NCR                          |
| Power Meter                    | Anritsu      | ML2495A              | XAW01-25-03   | 2023/08/30                | 2024/08/29                   |
| Power Supply                   | Agilent      | 66311B               | XAW01-17-01   | 2023/02/16                | 2024/02/15                   |
| Temperature and humidity meter | MingGao      | T809                 | XAW01-01-16   | 2023/09/04                | 2024/09/03                   |

| CE Test System                 |               |                 |               |                           |                              |
|--------------------------------|---------------|-----------------|---------------|---------------------------|------------------------------|
| Test Equipment                 | Manufacturer  | Model No.       | Inventory No. | Cal. date<br>(yyyy/mm/dd) | Cal.Due date<br>(yyyy/mm/dd) |
| Shielding Room                 | Brilliant-emc | N/A             | XAW04-03-01   | N/A                       | N/A                          |
| Test receiver                  | ROHDE&SCHWARZ | ESR             | XAW01-08-01   | 2023/08/30                | 2024/08/29                   |
| Artificial network             | ROHDE&SCHWARZ | ENV216          | XAW01-04-01   | 2023/06/30                | 2024/06/29                   |
| Temperature and humidity meter | MingGao       | TH101B          | XAW01-01-02   | 2023/08/30                | 2024/08/29                   |
| Measurement Software           | Tonscend      | TS+<br>V4.0.0.0 | XAW02-07-01   | NCR                       | NCR                          |
| Radio communication analyzer   | ROHDE&SCHWARZ | CMW 500         | XAW01-03-02   | 2023/02/16                | 2024/02/15                   |
| Artificial network             | ROHDE&SCHWARZ | ENV216          | XAW01-04-02   | 2023/06/30                | 2024/06/29                   |



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| RSE Test System                     |                |              |               |                        |                           |
|-------------------------------------|----------------|--------------|---------------|------------------------|---------------------------|
| Test Equipment                      | Manufacturer   | Model No.    | Inventory No. | Cal. date (yyyy/mm/dd) | Cal.Due date (yyyy/mm/dd) |
| Semi-Anechoic Chamber               | Brilliant-emc  | N/A          | XAW03-35-01   | 2021/09/09             | 2024/09/08                |
| MXA signal analyzer                 | Keysight       | N9020A       | XAW01-06-01   | 2023/02/16             | 2024/02/15                |
| Spectrum Analyzer                   | ROHDE&SCHWARZ  | FSV3044      | XAW01-13-05   | 2023/05/15             | 2024/05/14                |
| Test receiver                       | ROHDE&SCHWARZ  | ESR          | XAW01-08-01   | 2023/08/30             | 2024/08/29                |
| Receiving antenna (30MHz-3GHz)      | Schwarzbeck    | VULB 9163    | XAW01-09-01   | 2022/07/28             | 2024/07/27                |
| Receiving antenna (1GHz~18GHz)      | Schwarzbeck    | BBHA 9120D   | XAW01-09-02   | 2022/07/28             | 2024/07/27                |
| Receiving antenna (15GHz~40GHz)     | Schwarzbeck    | BBHA 9170    | XAW01-09-03   | 2022/07/23             | 2024/07/22                |
| Directional antenna rack controller | Max-Full       | MF-7802BS    | XAW03-03-01   | NCR                    | NCR                       |
| High-speed antenna rack controller  | Max-Full       | MF-7802      | XAW03-04-01   | NCR                    | NCR                       |
| Filter bank                         | Tonscend       | JS0806-F     | XAW03-05-01   | NCR                    | NCR                       |
| Filter bank                         | Tonscend       | JS0806s      | XAW03-05-02   | NCR                    | NCR                       |
| Amplifier                           | Tonscend       | TAP9K3G32    | XAW01-41-01   | 2023/05/15             | 2024/05/14                |
| Amplifier                           | Tonscend       | TAP01018048  | XAW01-41-02   | 2023/08/30             | 2024/08/29                |
| Amplifier                           | Tonscend       | TAP18040048  | XAW01-41-03   | 2023/08/30             | 2024/08/29                |
| Amplifier                           | Shanghai Steed | YX28980930   | XAW01-41-06   | 2023/08/30             | 2024/08/29                |
| Temperature and humidity meter      | MingGao        | TH101B       | XAW01-01-02   | 2023/09/04             | 2024/09/03                |
| Measurement Software                | Tonscend       | TS+ V4.0.0.0 | XAW02-05-01   | NCR                    | NCR                       |
| Loop Antenna                        | Schwarzbeck    | FMZB 1519B   | XAW01-48-02   | 2022/05/26             | 2024/05/25                |



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## 7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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# Appendix



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## DTS Bandwidth Test Result

| TestMode  | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|----------------|--------------|----------|----------|------------|---------|
| 11b       | Ant1    | 2412           | 7.600        | 2408.440 | 2416.040 | 0.5        | PASS    |
|           | Ant2    | 2412           | 7.560        | 2408.480 | 2416.040 | 0.5        | PASS    |
|           | Ant3    | 2412           | 7.040        | 2408.960 | 2416.000 | 0.5        | PASS    |
|           | Ant4    | 2412           | 7.560        | 2408.480 | 2416.040 | 0.5        | PASS    |
|           | Ant1    | 2437           | 8.560        | 2432.480 | 2441.040 | 0.5        | PASS    |
|           | Ant2    | 2437           | 8.520        | 2432.480 | 2441.000 | 0.5        | PASS    |
|           | Ant3    | 2437           | 7.600        | 2432.960 | 2440.560 | 0.5        | PASS    |
|           | Ant4    | 2437           | 9.040        | 2432.480 | 2441.520 | 0.5        | PASS    |
|           | Ant1    | 2462           | 8.040        | 2458.480 | 2466.520 | 0.5        | PASS    |
|           | Ant2    | 2462           | 8.040        | 2458.480 | 2466.520 | 0.5        | PASS    |
|           | Ant3    | 2462           | 8.040        | 2458.440 | 2466.480 | 0.5        | PASS    |
|           | Ant4    | 2462           | 7.520        | 2458.480 | 2466.000 | 0.5        | PASS    |
| 11g       | Ant1    | 2412           | 14.480       | 2405.680 | 2420.160 | 0.5        | PASS    |
|           | Ant2    | 2412           | 14.240       | 2405.680 | 2419.920 | 0.5        | PASS    |
|           | Ant3    | 2412           | 15.720       | 2404.440 | 2420.160 | 0.5        | PASS    |
|           | Ant4    | 2412           | 12.560       | 2406.680 | 2419.240 | 0.5        | PASS    |
|           | Ant1    | 2437           | 15.320       | 2429.160 | 2444.480 | 0.5        | PASS    |
|           | Ant2    | 2437           | 13.640       | 2429.640 | 2443.280 | 0.5        | PASS    |
|           | Ant3    | 2437           | 15.400       | 2429.120 | 2444.520 | 0.5        | PASS    |
|           | Ant4    | 2437           | 14.520       | 2429.360 | 2443.880 | 0.5        | PASS    |
|           | Ant1    | 2462           | 14.400       | 2455.720 | 2470.120 | 0.5        | PASS    |
|           | Ant2    | 2462           | 15.080       | 2454.480 | 2469.560 | 0.5        | PASS    |
|           | Ant3    | 2462           | 15.400       | 2454.480 | 2469.880 | 0.5        | PASS    |
|           | Ant4    | 2462           | 15.000       | 2454.520 | 2469.520 | 0.5        | PASS    |
| 11n20SISO | Ant1    | 2412           | 14.400       | 2405.680 | 2420.080 | 0.5        | PASS    |
|           | Ant2    | 2412           | 16.000       | 2404.520 | 2420.520 | 0.5        | PASS    |
|           | Ant3    | 2412           | 15.680       | 2404.480 | 2420.160 | 0.5        | PASS    |
|           | Ant4    | 2412           | 13.840       | 2405.680 | 2419.520 | 0.5        | PASS    |
|           | Ant1    | 2437           | 16.120       | 2428.440 | 2444.560 | 0.5        | PASS    |
|           | Ant2    | 2437           | 16.320       | 2428.240 | 2444.560 | 0.5        | PASS    |
|           | Ant3    | 2437           | 16.520       | 2428.240 | 2444.760 | 0.5        | PASS    |
|           | Ant4    | 2437           | 15.640       | 2428.880 | 2444.520 | 0.5        | PASS    |
|           | Ant1    | 2462           | 14.640       | 2455.760 | 2470.400 | 0.5        | PASS    |
|           | Ant2    | 2462           | 14.920       | 2455.480 | 2470.400 | 0.5        | PASS    |
|           | Ant3    | 2462           | 15.040       | 2454.480 | 2469.520 | 0.5        | PASS    |
|           | Ant4    | 2462           | 15.080       | 2454.440 | 2469.520 | 0.5        | PASS    |
| 11n40SISO | Ant1    | 2422           | 32.560       | 2406.960 | 2439.520 | 0.5        | PASS    |
|           | Ant2    | 2422           | 33.760       | 2405.760 | 2439.520 | 0.5        | PASS    |
|           | Ant3    | 2422           | 35.040       | 2404.480 | 2439.520 | 0.5        | PASS    |
|           | Ant4    | 2422           | 33.840       | 2404.480 | 2438.320 | 0.5        | PASS    |
|           | Ant1    | 2437           | 35.040       | 2419.480 | 2454.520 | 0.5        | PASS    |
|           | Ant2    | 2437           | 35.040       | 2419.480 | 2454.520 | 0.5        | PASS    |
|           | Ant3    | 2437           | 35.120       | 2419.400 | 2454.520 | 0.5        | PASS    |
|           | Ant4    | 2437           | 35.040       | 2419.480 | 2454.520 | 0.5        | PASS    |
|           | Ant1    | 2452           | 35.520       | 2434.480 | 2470.000 | 0.5        | PASS    |
|           | Ant2    | 2452           | 35.120       | 2434.480 | 2469.600 | 0.5        | PASS    |
|           | Ant3    | 2452           | 35.280       | 2434.480 | 2469.760 | 0.5        | PASS    |
|           | Ant4    | 2452           | 34.960       | 2434.480 | 2469.440 | 0.5        | PASS    |



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|            |      |      |        |          |          |     |      |
|------------|------|------|--------|----------|----------|-----|------|
| 11ax20MIMO | Ant1 | 2412 | 16.360 | 2404.480 | 2420.840 | 0.5 | PASS |
|            | Ant2 | 2412 | 18.000 | 2403.400 | 2421.400 | 0.5 | PASS |
|            | Ant3 | 2412 | 16.520 | 2404.480 | 2421.000 | 0.5 | PASS |
|            | Ant4 | 2412 | 18.080 | 2402.960 | 2421.040 | 0.5 | PASS |
|            | Ant1 | 2437 | 18.040 | 2427.760 | 2445.800 | 0.5 | PASS |
|            | Ant2 | 2437 | 17.040 | 2427.520 | 2444.560 | 0.5 | PASS |
|            | Ant3 | 2437 | 18.320 | 2427.960 | 2446.280 | 0.5 | PASS |
|            | Ant4 | 2437 | 18.320 | 2427.520 | 2445.840 | 0.5 | PASS |
|            | Ant1 | 2462 | 18.840 | 2452.680 | 2471.520 | 0.5 | PASS |
|            | Ant2 | 2462 | 16.720 | 2454.520 | 2471.240 | 0.5 | PASS |
|            | Ant3 | 2462 | 17.520 | 2453.240 | 2470.760 | 0.5 | PASS |
|            | Ant4 | 2462 | 16.360 | 2454.440 | 2470.800 | 0.5 | PASS |
| 11ax40MIMO | Ant1 | 2422 | 35.040 | 2404.480 | 2439.520 | 0.5 | PASS |
|            | Ant2 | 2422 | 35.040 | 2404.480 | 2439.520 | 0.5 | PASS |
|            | Ant3 | 2422 | 35.040 | 2404.480 | 2439.520 | 0.5 | PASS |
|            | Ant4 | 2422 | 35.040 | 2404.480 | 2439.520 | 0.5 | PASS |
|            | Ant1 | 2437 | 36.400 | 2418.120 | 2454.520 | 0.5 | PASS |
|            | Ant2 | 2437 | 30.000 | 2419.480 | 2449.480 | 0.5 | PASS |
|            | Ant3 | 2437 | 38.000 | 2417.960 | 2455.960 | 0.5 | PASS |
|            | Ant4 | 2437 | 37.840 | 2418.200 | 2456.040 | 0.5 | PASS |
|            | Ant1 | 2452 | 37.200 | 2433.760 | 2470.960 | 0.5 | PASS |
|            | Ant2 | 2452 | 37.840 | 2433.120 | 2470.960 | 0.5 | PASS |
|            | Ant3 | 2452 | 36.320 | 2434.480 | 2470.800 | 0.5 | PASS |
|            | Ant4 | 2452 | 37.760 | 2433.280 | 2471.040 | 0.5 | PASS |



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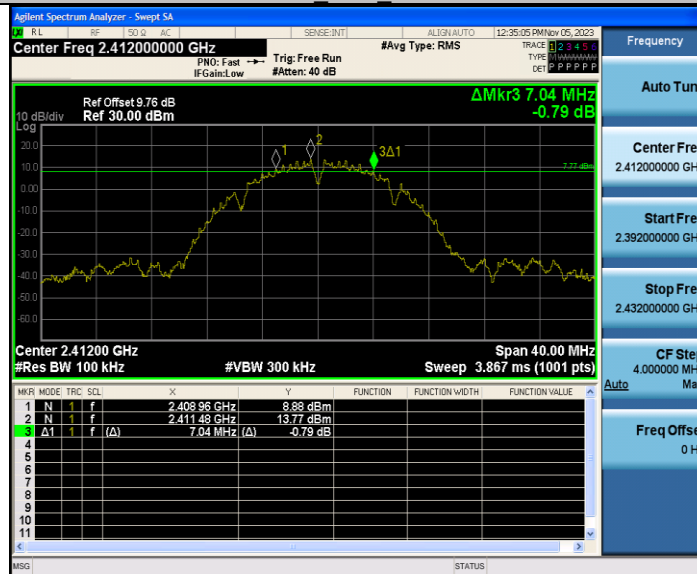
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### Test Graphs



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### 11b\_Ant4\_2412



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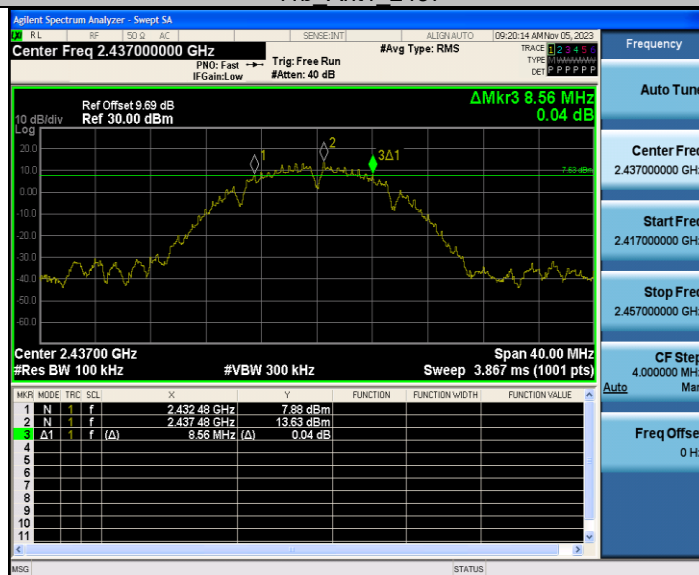
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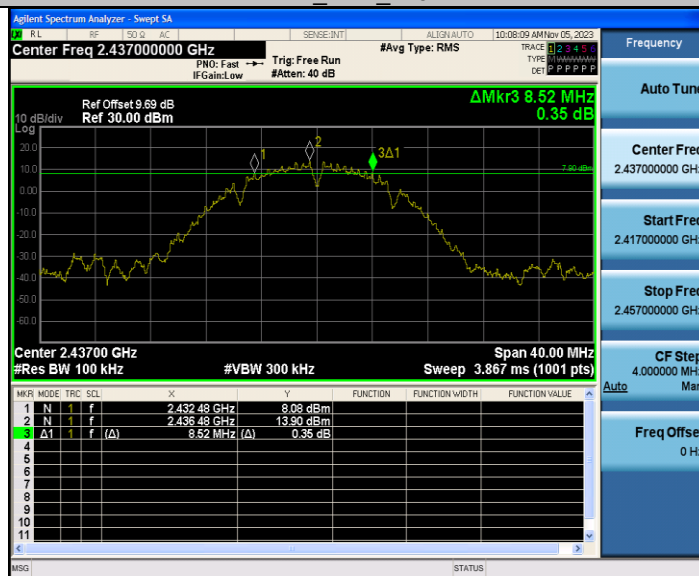
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### 11b\_Ant1\_2437



### 11b\_Ant2\_2437



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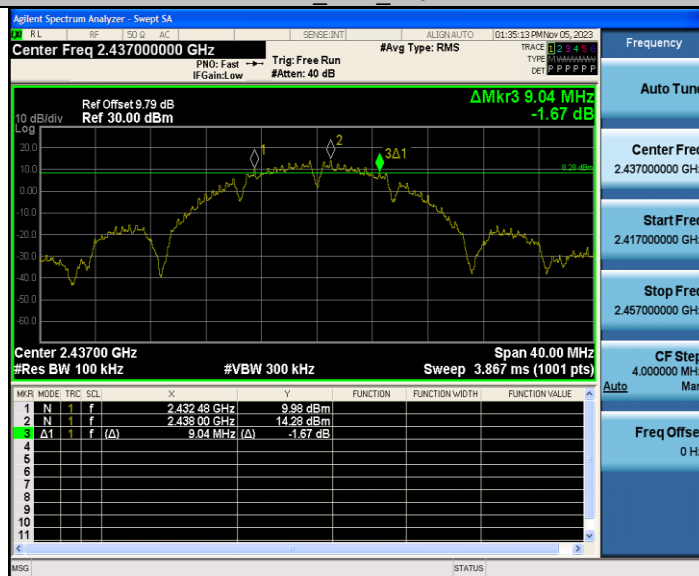
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### 11b\_Ant3\_2437



### 11b\_Ant4\_2437



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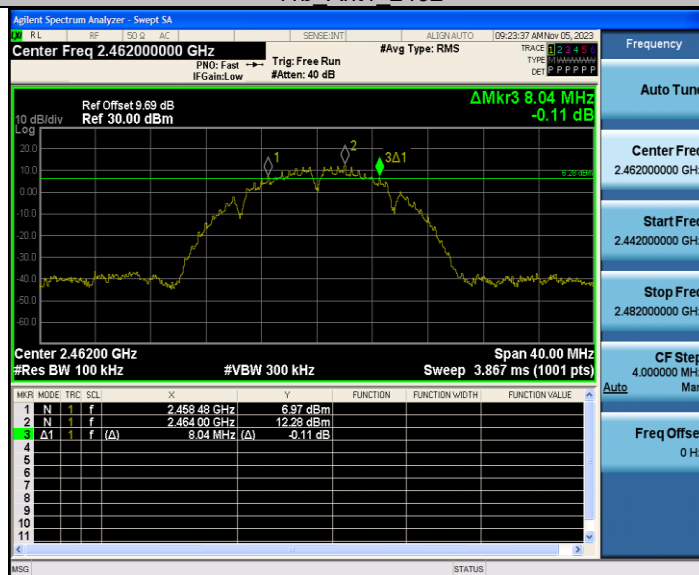
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11b Ant2 2462



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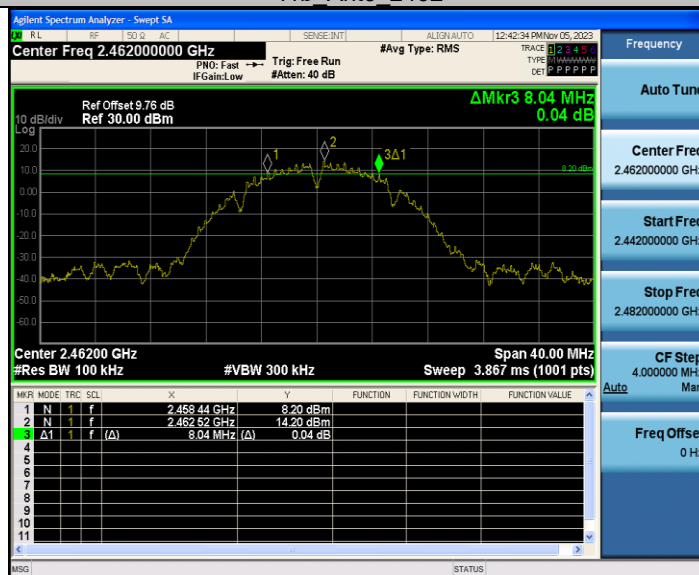
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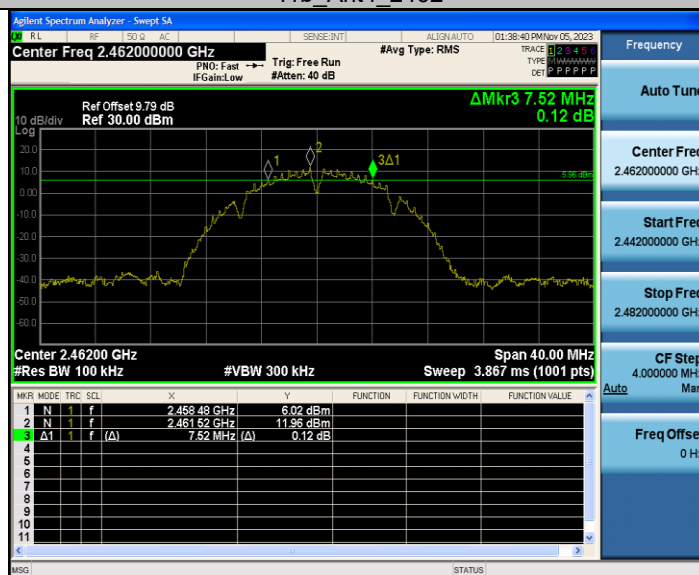
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11b Ant3 2462



11b Ant4 2462



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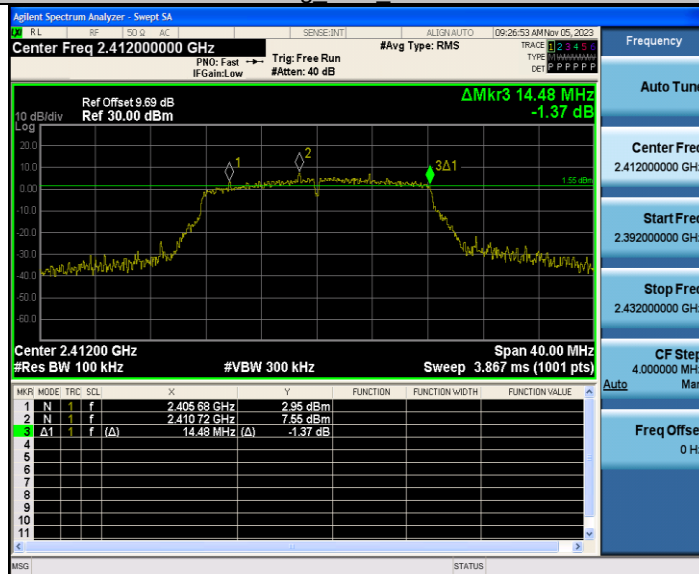
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### 11g\_Ant1\_2412



### 11g\_Ant2\_2412



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### 11g\_Ant3\_2412



### 11g\_Ant4\_2412



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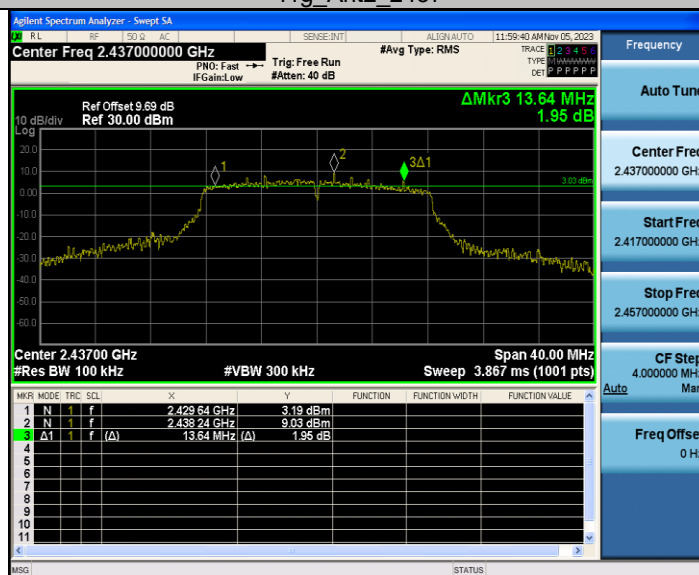
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### 11g\_Ant1\_2437



### 11g\_Ant2\_2437



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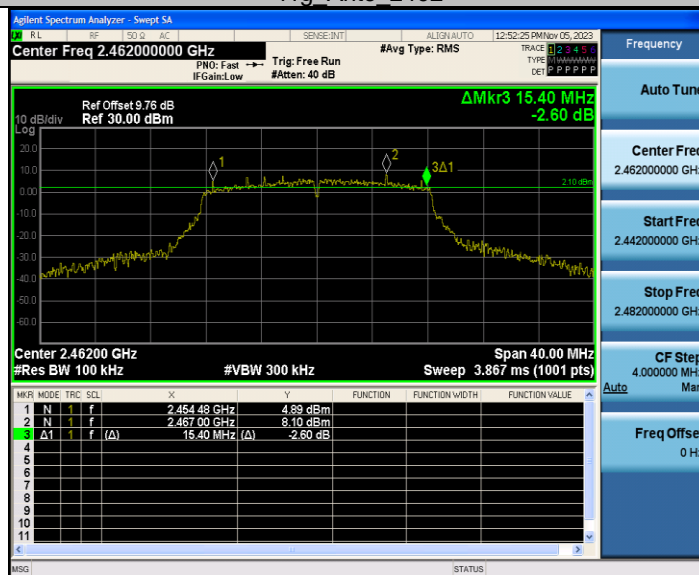
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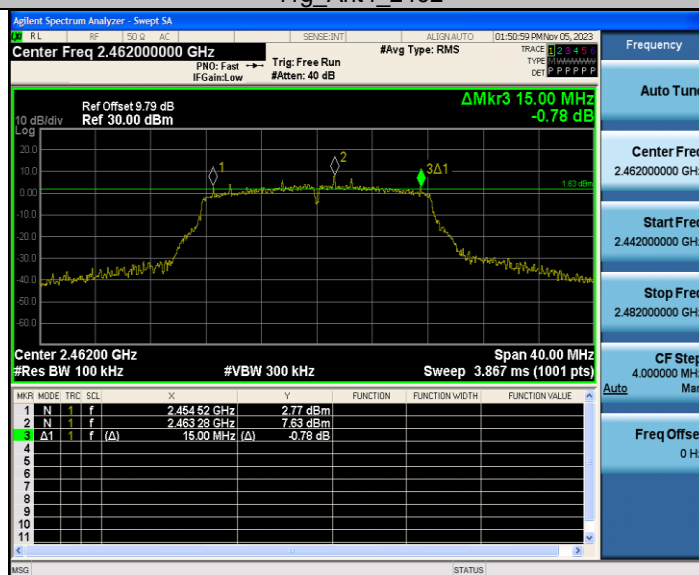
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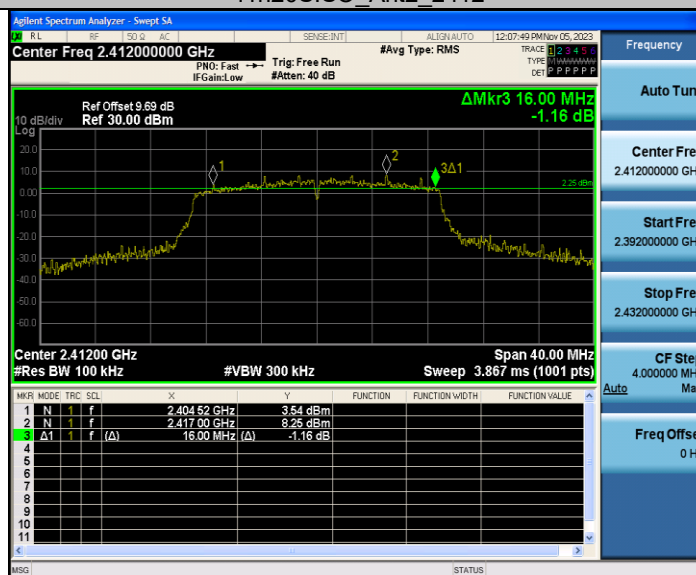
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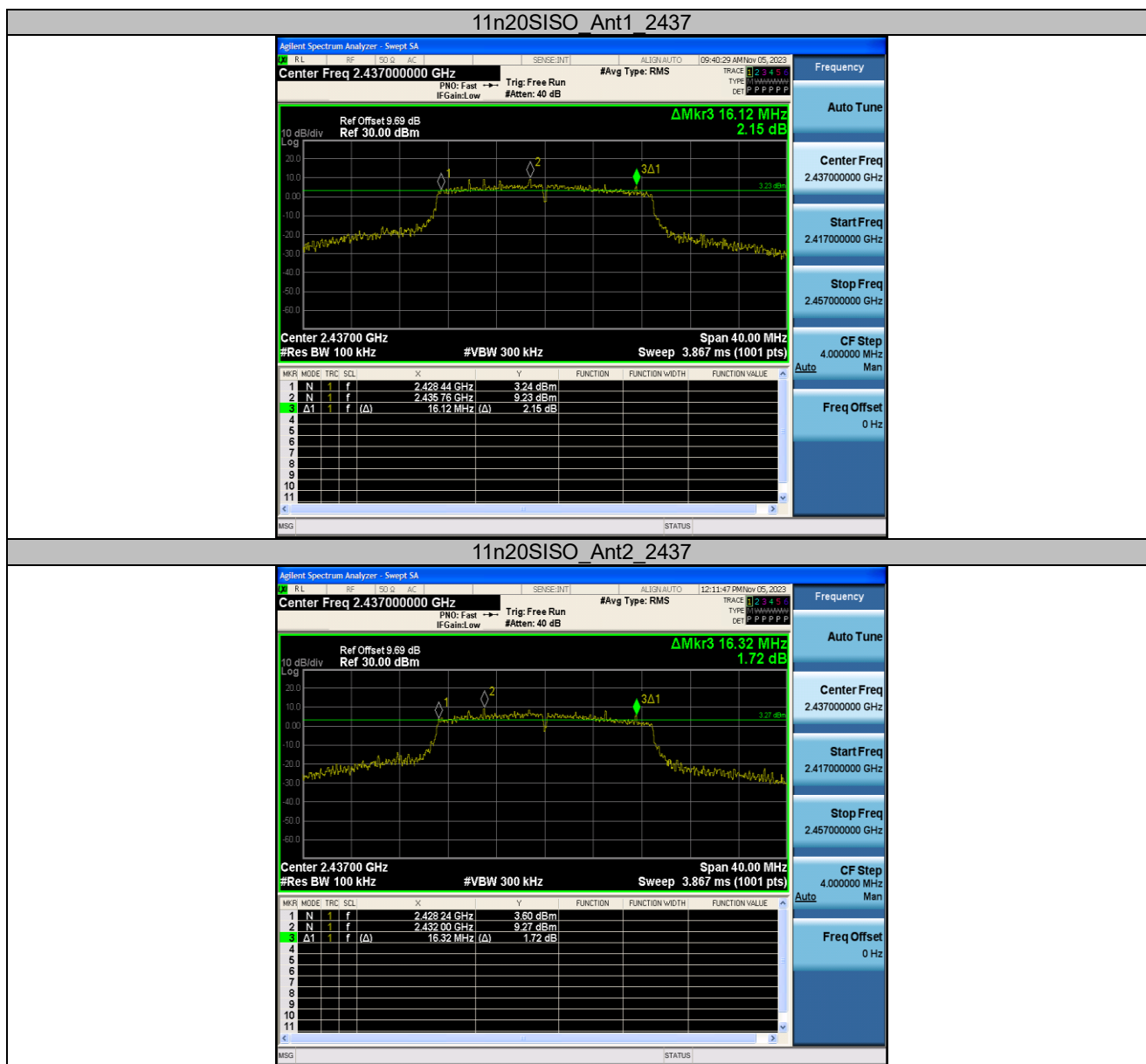


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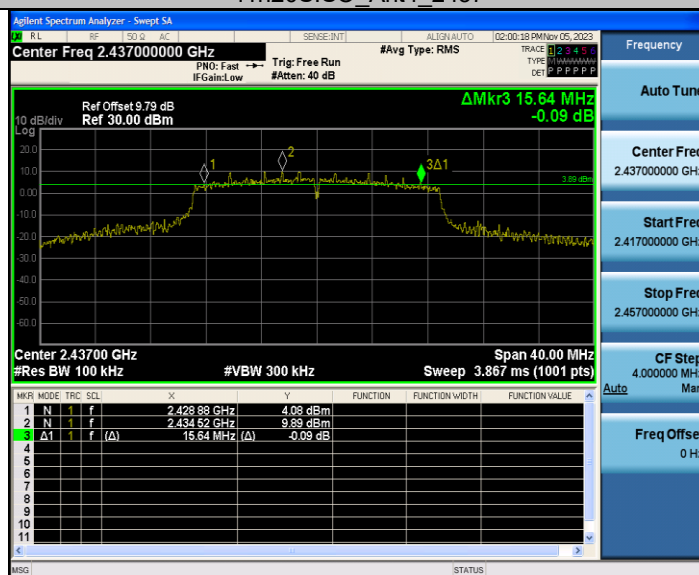
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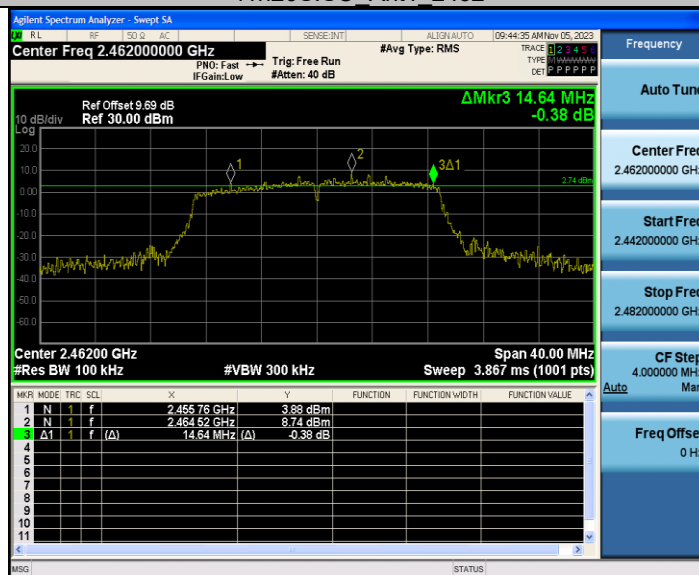
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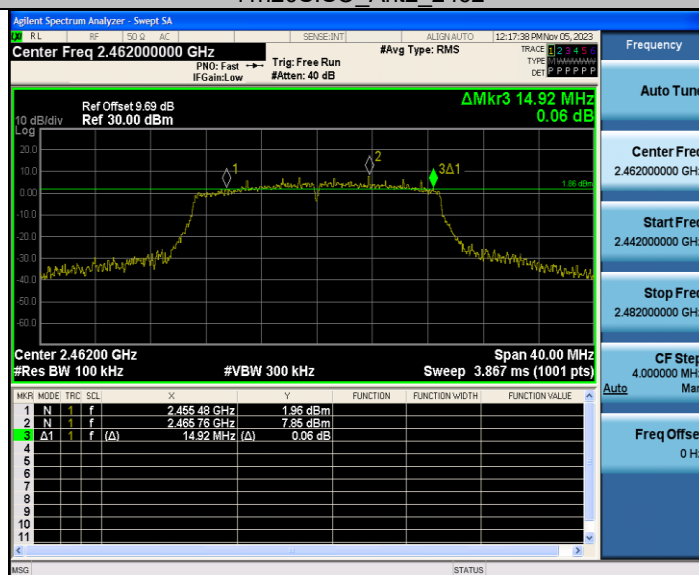
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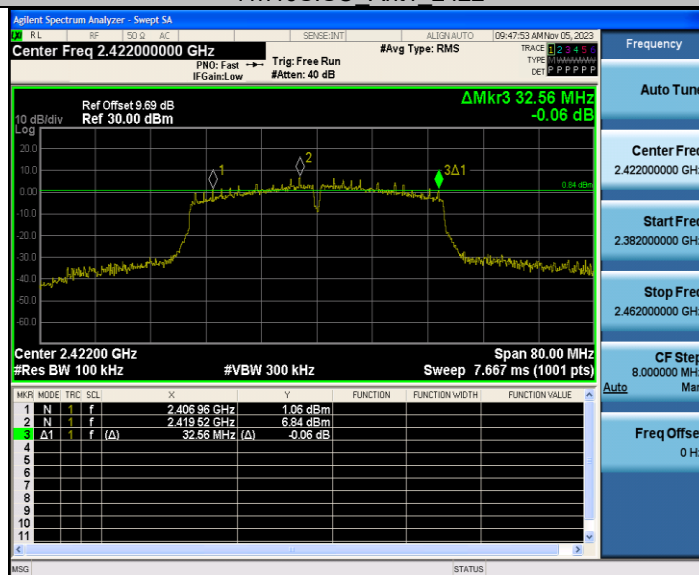
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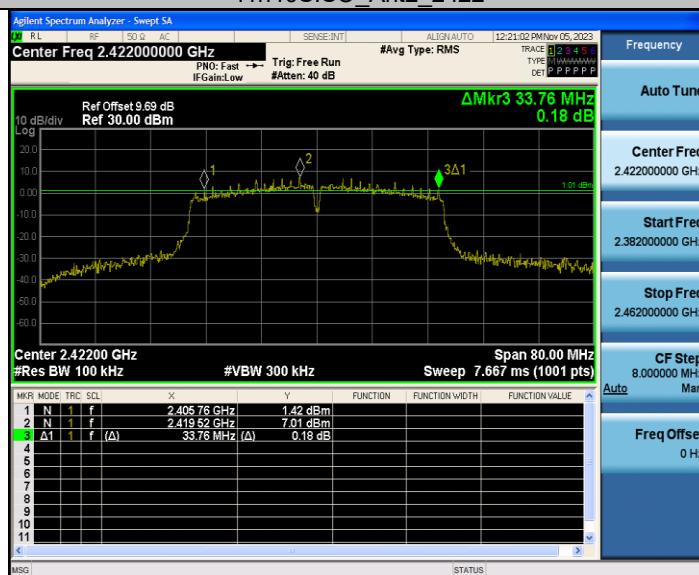
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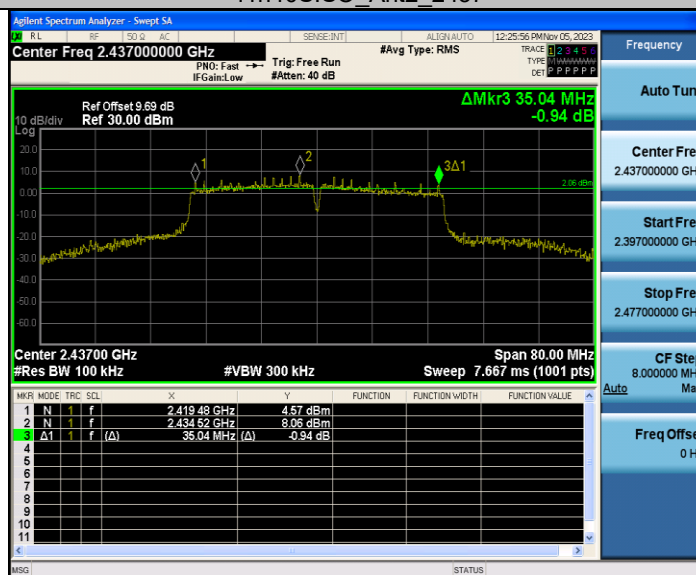
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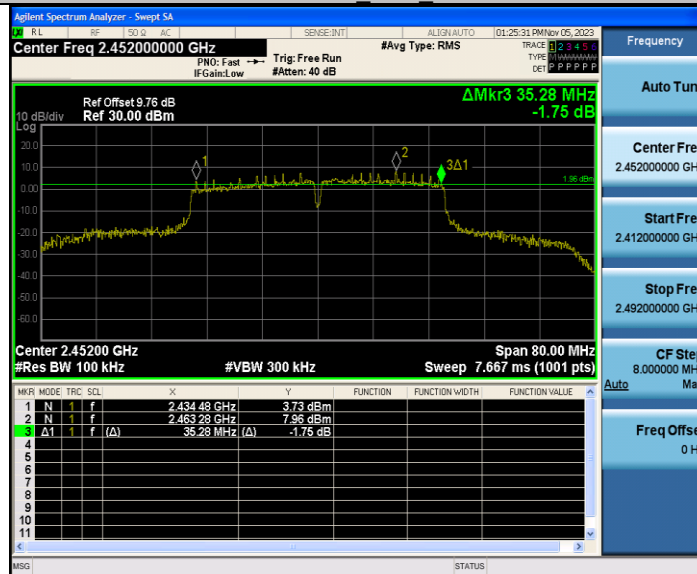
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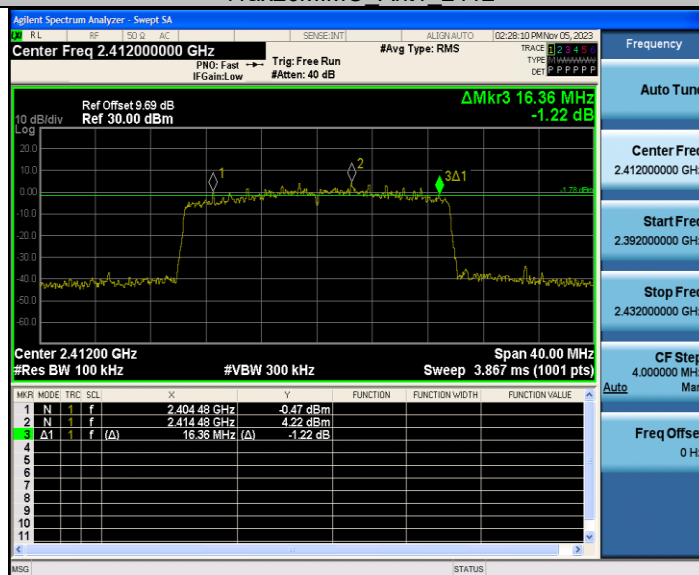
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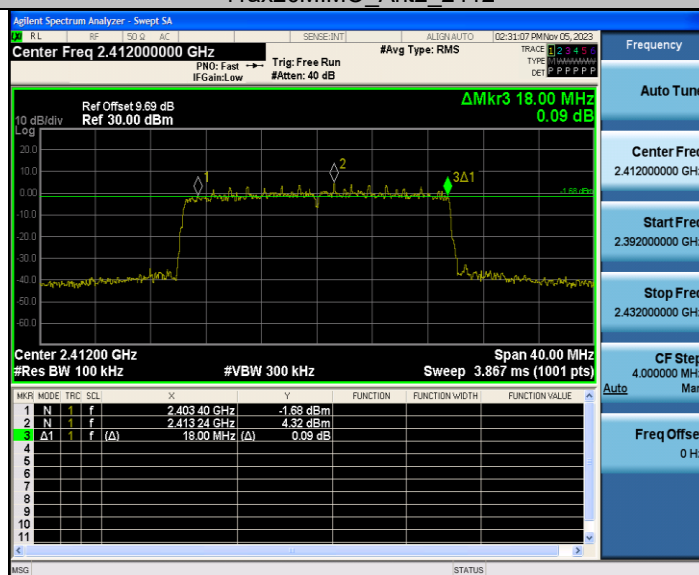
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### 11ax20MIMO\_Ant1\_2412



### 11ax20MIMO\_Ant2\_2412



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