

# TEST REPORT

**Applicant:** CTOUCH Europe B.V.

**Address of Applicant:** Achtseweg Zuid 153R, 5651 GW Eindhoven, The Netherlands

**Manufacturer/Factory:** CTOUCH Europe B.V.

**Address of Manufacturer/Factory:** Achtseweg Zuid 153R, 5651 GW Eindhoven, The Netherlands

**Equipment Under Test (EUT)**

**Product Name:** Wireless AC Module

**Model No.:** 01WIMRA

**Trade Mark:** CTOUCH

**FCC ID:** 2APQQ-01WIMRA

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart E Section 15.407

**Date of sample receipt:** March 28, 2022

**Date of Test:** March 30-April 21, 2022

**Date of report issue:** April 21, 2022

**Test Result :** PASS \*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Luo

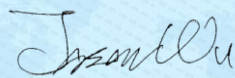
Laboratory Manager

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

## 2 Version

| Version No. | Date      | Description |
|-------------|-----------|-------------|
| 00          | 2022-4-21 | Original    |
|             |           |             |
|             |           |             |
|             |           |             |
|             |           |             |

Prepared By:

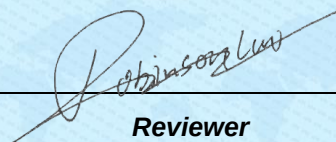


Date:

2022-4-21

Project Engineer

Check By:



Date:

2022-4-21

Reviewer

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## 4 Test Summary

| Test Item                        | Section in CFR 47           | Result         |
|----------------------------------|-----------------------------|----------------|
| Antenna requirement              | 15.203                      | PASS           |
| AC Power Line Conducted Emission | 15.207                      | Not Applicable |
| Peak Transmit Power              | 15.407(a)(1)                | PASS           |
| Power Spectral Density           | 15.407(a)(1)                | PASS           |
| Undesirable Emission             | 15.407(b)(1), 15.205/15.209 | PASS           |
| Radiated Emission                | 15.205/15.209               | PASS           |
| Band Edge                        | 15.407(b)(1)                | PASS           |
| Frequency Stability              | 15.407(g)                   | PASS           |

Remark:

Pass: The EUT complies with the essential requirements in the standard.

### 4.1 Measurement Uncertainty

| No. | Item                             | Measurement Uncertainty  |
|-----|----------------------------------|--------------------------|
| 1   | Radio Frequency                  | 1 x 10 <sup>-7</sup>     |
| 2   | Duty cycle                       | 0.37%                    |
| 3   | Occupied Bandwidth               | 2.8dB                    |
| 4   | RF conducted power               | 0.75dB                   |
| 5   | RF power density                 | 3dB                      |
| 6   | Conducted Spurious emissions     | 2.58dB                   |
| 7   | AC Power Line Conducted Emission | 3.44dB (0.15MHz ~ 30MHz) |
| 8   | Radiated Spurious emission test  | 3.1dB (9kHz-30MHz)       |
|     |                                  | 3.8039dB (30MHz-200MHz)  |
|     |                                  | 3.9679dB (200MHz-1GHz)   |
|     |                                  | 4.29dB (1GHz-18GHz)      |
|     |                                  | 3.30dB (18GHz-40GHz)     |

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

## 5 General Information

### 5.1 General Description of EUT

|                        |                                                                                              |                     |                       |                    |
|------------------------|----------------------------------------------------------------------------------------------|---------------------|-----------------------|--------------------|
| Product Name:          | Wireless AC Module                                                                           |                     |                       |                    |
| Model No.:             | 01WIMRA                                                                                      |                     |                       |                    |
| Serial No.:            | N/A                                                                                          |                     |                       |                    |
| Hardware Version:      | 6PH0914610                                                                                   |                     |                       |                    |
| Software Version:      | MT7663BU_mp1.4.1_202105142505501                                                             |                     |                       |                    |
| Test sample(s) ID:     | GTSL202204000115-1                                                                           |                     |                       |                    |
| Sample(s) Status:      | Engineer sample                                                                              |                     |                       |                    |
| Operation Frequency:   | Band                                                                                         | Mode                | Frequency Range (MHz) | Number of channels |
|                        | U-NII Band I                                                                                 | IEEE 802.11a        | 5180-5240             | 4                  |
|                        |                                                                                              | IEEE 802.11n 20MHz  | 5180-5240             | 4                  |
|                        |                                                                                              | IEEE 802.11n 40MHz  | 5190-5230             | 2                  |
|                        |                                                                                              | IEEE 802.11ac 20MHz | 5180-5240             | 4                  |
|                        |                                                                                              | IEEE 802.11ac 40MHz | 5190-5230             | 2                  |
|                        |                                                                                              | IEEE 802.11ac 80MHz | 5210                  | 1                  |
| Modulation technology: | OFDM<br>MIMO: 802.11n/ac<br>SISO: 802.11a                                                    |                     |                       |                    |
| Antenna Type:          | External Antenna                                                                             |                     |                       |                    |
| Antenna gain:          | ANT1:2.0dBi<br>ANT2:2.0dBi<br>(PSD directional gain=5.01dBi, Power directional gain=5.01dBi) |                     |                       |                    |
| Power supply:          | DC 5V (Powered by USB Port)                                                                  |                     |                       |                    |

*Remark: The EUT is only designed to be used in large-screen TVs and other products, not directly connected to a computer*

| Channel list |           |         |           |         |           |         |           |
|--------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel      | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 36           | 5180MHz   | 40      | 5200MHz   | 44      | 5220MHz   | 48      | 5240MHz   |
| 38           | 5190MHz   | 42      | 5210MHz   | 46      | 5230MHz   |         |           |

Note: 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:

| Test channel    | Frequency (MHz) |                |                |                  |                  |                  |
|-----------------|-----------------|----------------|----------------|------------------|------------------|------------------|
|                 | 802.11 a        | 802.11 n(HT20) | 802.11 n(HT40) | 802.11 ac(VHT20) | 802.11 ac(VHT40) | 802.11 ac(VHT80) |
| Lowest channel  | 5180            | 5180           | 5190           | 5180             | 5190             | 5210             |
| Middle channel  | 5200            | 5200           | /              | 5200             | /                | /                |
| Highest channel | 5240            | 5240           | 5230           | 5240             | 5230             | /                |

## 5.2 Test mode

|                                                                                                                                                                                                                                              |                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Transmitting mode                                                                                                                                                                                                                            | Keep the EUT in transmitting with modulation. |
| <i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i> |                                               |
| We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:                                 |                                               |
| Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.                                                                                                                                         |                                               |
| Mode                                                                                                                                                                                                                                         | Data rate                                     |
| 802.11a                                                                                                                                                                                                                                      | 6Mbps                                         |
| n(HT20)                                                                                                                                                                                                                                      | MCS0                                          |
| n(HT40)                                                                                                                                                                                                                                      | MCS0                                          |
| ac(VHT20)                                                                                                                                                                                                                                    | MCS0                                          |
| ac(VHT40)                                                                                                                                                                                                                                    | MCS0                                          |
| ac(VHT80)                                                                                                                                                                                                                                    | MCS0                                          |

## 5.3 Test Facility

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

- **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

## 5.4 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, sBaoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480 Fax: 0755-27798960

## 5.5 Description of Support Units

Notebook PC Mode Number: 500RSH

*Remark: The computer used for auxiliary testing is only used for fixed-frequency control, and the product cannot work normally if directly connected to the computer. USB extension cable is used to connect EUT in the test, and the fixed-frequency computer is placed outside the shielding room.*

## 5.6 Deviation from Standards

None.

## 5.7 Additional Instructions

|               |            |                   |         |
|---------------|------------|-------------------|---------|
| Test Software | QATool_Dbg | Power level setup | Default |
|---------------|------------|-------------------|---------|

## 6 Test Instruments list

| Radiated Emission: |                                     |                                |                             |               |                     |                         |
|--------------------|-------------------------------------|--------------------------------|-----------------------------|---------------|---------------------|-------------------------|
| Item               | Test Equipment                      | Manufacturer                   | Model No.                   | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                  | 3m Semi- Anechoic Chamber           | ZhongYu Electron               | 9.2(L)*6.2(W)* 6.4(H)       | GTS250        | July. 02 2020       | July. 01 2025           |
| 2                  | Control Room                        | ZhongYu Electron               | 6.2(L)*2.5(W)* 2.4(H)       | GTS251        | N/A                 | N/A                     |
| 3                  | EMI Test Receiver                   | Rohde & Schwarz                | ESU26                       | GTS203        | June. 24 2021       | June. 23 2022           |
| 4                  | BiConiLog Antenna                   | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163                    | GTS214        | June. 24 2021       | June. 23 2022           |
| 5                  | Double -ridged waveguide horn       | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA 9120 D                 | GTS208        | June. 24 2021       | June. 23 2022           |
| 6                  | Horn Antenna                        | ETS-LINDGREN                   | 3160                        | GTS217        | June. 24 2021       | June. 23 2022           |
| 7                  | EMI Test Software                   | AUDIX                          | E3                          | N/A           | N/A                 | N/A                     |
| 8                  | Coaxial Cable                       | GTS                            | N/A                         | GTS213        | June. 24 2021       | June. 23 2022           |
| 9                  | Coaxial Cable                       | GTS                            | N/A                         | GTS211        | June. 24 2021       | June. 23 2022           |
| 10                 | Coaxial cable                       | GTS                            | N/A                         | GTS210        | June. 24 2021       | June. 23 2022           |
| 11                 | Coaxial Cable                       | GTS                            | N/A                         | GTS212        | June. 24 2021       | June. 23 2022           |
| 12                 | Amplifier(100kHz-3GHz)              | HP                             | 8347A                       | GTS204        | June. 24 2021       | June. 23 2022           |
| 13                 | Amplifier(2GHz-20GHz)               | HP                             | 84722A                      | GTS206        | June. 24 2021       | June. 23 2022           |
| 14                 | Amplifier (18-26GHz)                | Rohde & Schwarz                | AFS33-18002<br>650-30-8P-44 | GTS218        | June. 24 2021       | June. 23 2022           |
| 15                 | Band filter                         | Amindeon                       | 82346                       | GTS219        | June. 24 2021       | June. 23 2022           |
| 16                 | Power Meter                         | Anritsu                        | ML2495A                     | GTS540        | June. 24 2021       | June. 23 2022           |
| 17                 | Power Sensor                        | Anritsu                        | MA2411B                     | GTS541        | June. 24 2021       | June. 23 2022           |
| 18                 | Wideband Radio Communication Tester | Rohde & Schwarz                | CMW500                      | GTS575        | June. 24 2021       | June. 23 2022           |
| 19                 | Splitter                            | Agilent                        | 11636B                      | GTS237        | June. 24 2021       | June. 23 2022           |
| 20                 | Loop Antenna                        | ZHINAN                         | ZN30900A                    | GTS534        | June. 24 2021       | June. 23 2022           |
| 21                 | Breitband hornantenne               | SCHWARZBECK                    | BBHA 9170                   | GTS579        | Oct. 17 2021        | Oct. 16 2022            |
| 22                 | Amplifier                           | TDK                            | PA-02-02                    | GTS574        | Oct. 17 2021        | Oct. 16 2022            |
| 23                 | Amplifier                           | TDK                            | PA-02-03                    | GTS576        | Oct. 17 2021        | Oct. 16 2022            |
| 24                 | PSA Series Spectrum Analyzer        | Rohde & Schwarz                | FSP                         | GTS578        | June. 24 2021       | June. 23 2022           |

| Conducted Emission |                           |                         |                      |               |                     |                         |
|--------------------|---------------------------|-------------------------|----------------------|---------------|---------------------|-------------------------|
| Item               | Test Equipment            | Manufacturer            | Model No.            | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                  | Shielding Room            | ZhongYu Electron        | 7.3(L)x3.1(W)x2.9(H) | GTS252        | May.15 2019         | May.14 2022             |
| 2                  | EMI Test Receiver         | R&S                     | ESCI 7               | GTS552        | June. 24 2021       | June. 23 2022           |
| 3                  | Coaxial Switch            | ANRITSU CORP            | MP59B                | GTS225        | June. 24 2021       | June. 23 2022           |
| 4                  | ENV216 2-L-V-NETZNACHB.DE | ROHDE&SCHWARZ           | ENV216               | GTS226        | June. 24 2021       | June. 23 2022           |
| 5                  | Coaxial Cable             | GTS                     | N/A                  | GTS227        | N/A                 | N/A                     |
| 6                  | EMI Test Software         | AUDIX                   | E3                   | N/A           | N/A                 | N/A                     |
| 7                  | Thermo meter              | KTJ                     | TA328                | GTS233        | June. 24 2021       | June. 23 2022           |
| 8                  | Absorbing clamp           | Elektronik-Feinmechanik | MDS21                | GTS229        | June. 24 2021       | June. 23 2022           |
| 9                  | ISN                       | SCHWARZBECK             | NTFM 8158            | GTS565        | June. 24 2021       | June. 23 2022           |
| 10                 | High voltage probe        | SCHWARZBECK             | TK9420               | GTS537        | July. 09 2021       | July. 08 2022           |

| RF Conducted Test: |                                                |              |                  |            |                     |                         |
|--------------------|------------------------------------------------|--------------|------------------|------------|---------------------|-------------------------|
| Item               | Test Equipment                                 | Manufacturer | Model No.        | Serial No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                  | MXA Signal Analyzer                            | Agilent      | N9020A           | GTS566     | June. 24 2021       | June. 23 2022           |
| 2                  | EMI Test Receiver                              | R&S          | ESCI 7           | GTS552     | June. 24 2021       | June. 23 2022           |
| 3                  | Spectrum Analyzer                              | Agilent      | E4440A           | GTS533     | June. 24 2021       | June. 23 2022           |
| 4                  | MXG vector Signal Generator                    | Agilent      | N5182A           | GTS567     | June. 24 2021       | June. 23 2022           |
| 5                  | ESG Analog Signal Generator                    | Agilent      | E4428C           | GTS568     | June. 24 2021       | June. 23 2022           |
| 6                  | USB RF Power Sensor                            | DARE         | RPR3006W         | GTS569     | June. 24 2021       | June. 23 2022           |
| 7                  | RF Switch Box                                  | Shongyi      | RFSW3003328      | GTS571     | June. 24 2021       | June. 23 2022           |
| 8                  | Programmable Constant Temp & Humi Test Chamber | WEWON        | WHTH-150L-40-880 | GTS572     | June. 24 2021       | June. 23 2022           |

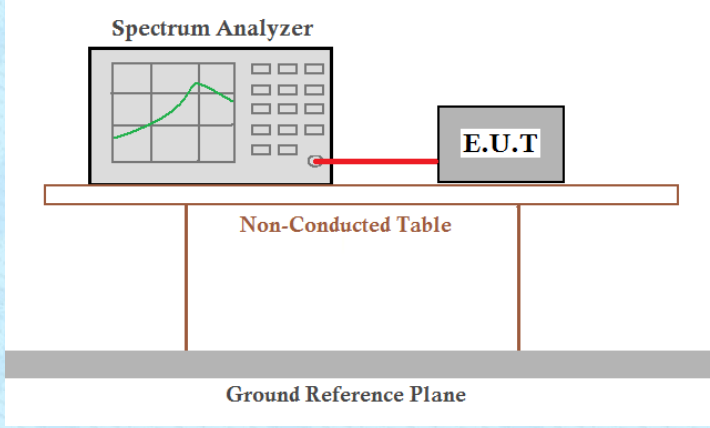
| General used equipment: |                                 |              |           |               |                     |                         |
|-------------------------|---------------------------------|--------------|-----------|---------------|---------------------|-------------------------|
| Item                    | Test Equipment                  | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1                       | Humidity/ Temperature Indicator | KTJ          | TA328     | GTS243        | June. 24 2021       | June. 23 2022           |
| 2                       | Barometer                       | ChangChun    | DYM3      | GTS255        | June. 24 2021       | June. 23 2022           |

## 7 Test results and Measurement Data

### 7.1 Antenna requirement:

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Standard requirement:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FCC Part15 C Section 15.203 |
| <p><i>15.203 requirement:</i></p> <p><i>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.</i></p> |                             |
| <b>E.U.T Antenna:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                             |
| <p><i>The antennas are external antenna, the best case gain of the antennas are 2.0dBi, reference to the appendix II for details</i></p>                                                                                                                                                                                                                                                                                                                                                           |                             |

## 7.2 Emission Bandwidth and 99% Occupied Bandwidth

|                   |                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC Part15 E Section 15.407                                                                                                                                                                                                                                                                                                                              |
| Test Method:      | KDB 789033 D02 General U-NII Test Procedures New Rules v02r01                                                                                                                                                                                                                                                                                            |
| Limit:            | N/A                                                                                                                                                                                                                                                                                                                                                      |
| Test setup:       |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p> |
| Test procedure:   | According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.                                                                                                                                                                                                                                                                              |
| Test Instruments: | Refer to section 6 for details                                                                                                                                                                                                                                                                                                                           |
| Test mode:        | Refer to section 5.2 for details                                                                                                                                                                                                                                                                                                                         |
| Test results:     | Pass                                                                                                                                                                                                                                                                                                                                                     |

**Measurement Data:**

| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | 26dB Occupied Bandwidth (MHz) |       |
|---------|-----------------|------------------------------|--------|-------------------------------|-------|
|         |                 | 802.11a                      |        | 802.11a                       |       |
|         |                 | ANT1                         | ANT2   | ANT1                          | ANT2  |
| 36      | 5180            | 16.46                        | 16.38  | 19.53                         | 19.82 |
| 40      | 5200            | 16.697                       | 16.473 | 28.87                         | 19.94 |
| 48      | 5240            | 16.69                        | 16.43  | 26.32                         | 19.88 |

| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | 26dB Occupied Bandwidth (MHz) |       |
|---------|-----------------|------------------------------|--------|-------------------------------|-------|
|         |                 | 802.11n(HT20)                |        | 802.11n(HT20)                 |       |
|         |                 | ANT1                         | ANT2   | ANT1                          | ANT2  |
| 36      | 5180            | 17.56                        | 17.57  | 19.97                         | 19.87 |
| 40      | 5200            | 17.606                       | 17.567 | 20.39                         | 19.87 |
| 48      | 5240            | 17.63                        | 17.56  | 22.20                         | 20.03 |

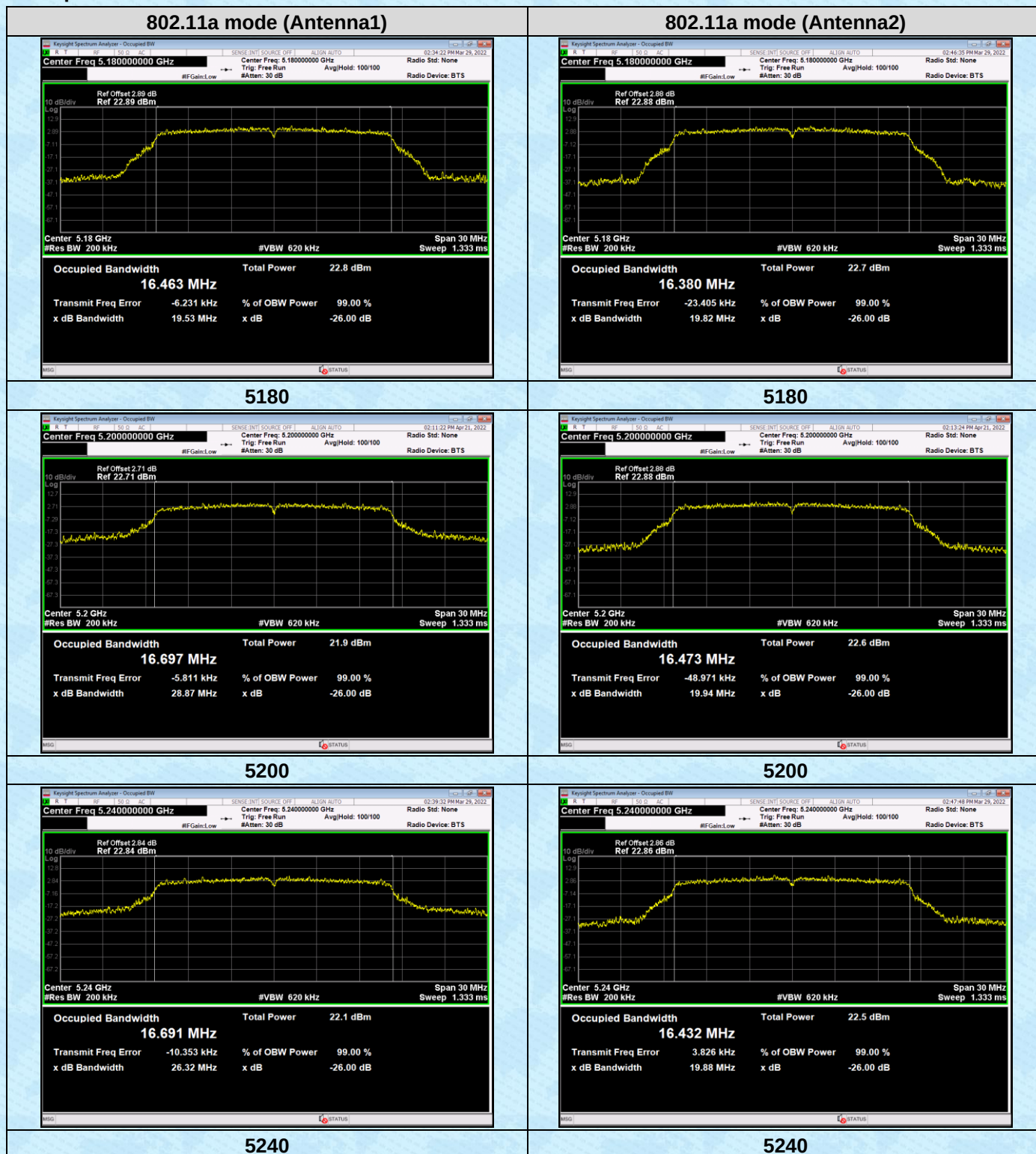
| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | 26dB Occupied Bandwidth (MHz) |       |
|---------|-----------------|------------------------------|-------|-------------------------------|-------|
|         |                 | 802.11n(HT40)                |       | 802.11n(HT40)                 |       |
|         |                 | ANT1                         | ANT2  | ANT1                          | ANT2  |
| 38      | 5190            | 36.07                        | 36.03 | 40.02                         | 39.91 |
| 46      | 5230            | 36.07                        | 35.98 | 43.97                         | 39.96 |

| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |        | 26dB Occupied Bandwidth (MHz) |       |
|---------|-----------------|------------------------------|--------|-------------------------------|-------|
|         |                 | 802.11ac(VHT20)              |        | 802.11ac(VHT20)               |       |
|         |                 | ANT1                         | ANT2   | ANT1                          | ANT2  |
| 36      | 5180            | 17.56                        | 17.56  | 19.80                         | 19.79 |
| 40      | 5200            | 17.628                       | 17.562 | 20.67                         | 19.91 |
| 48      | 5240            | 17.58                        | 17.57  | 20.63                         | 19.99 |

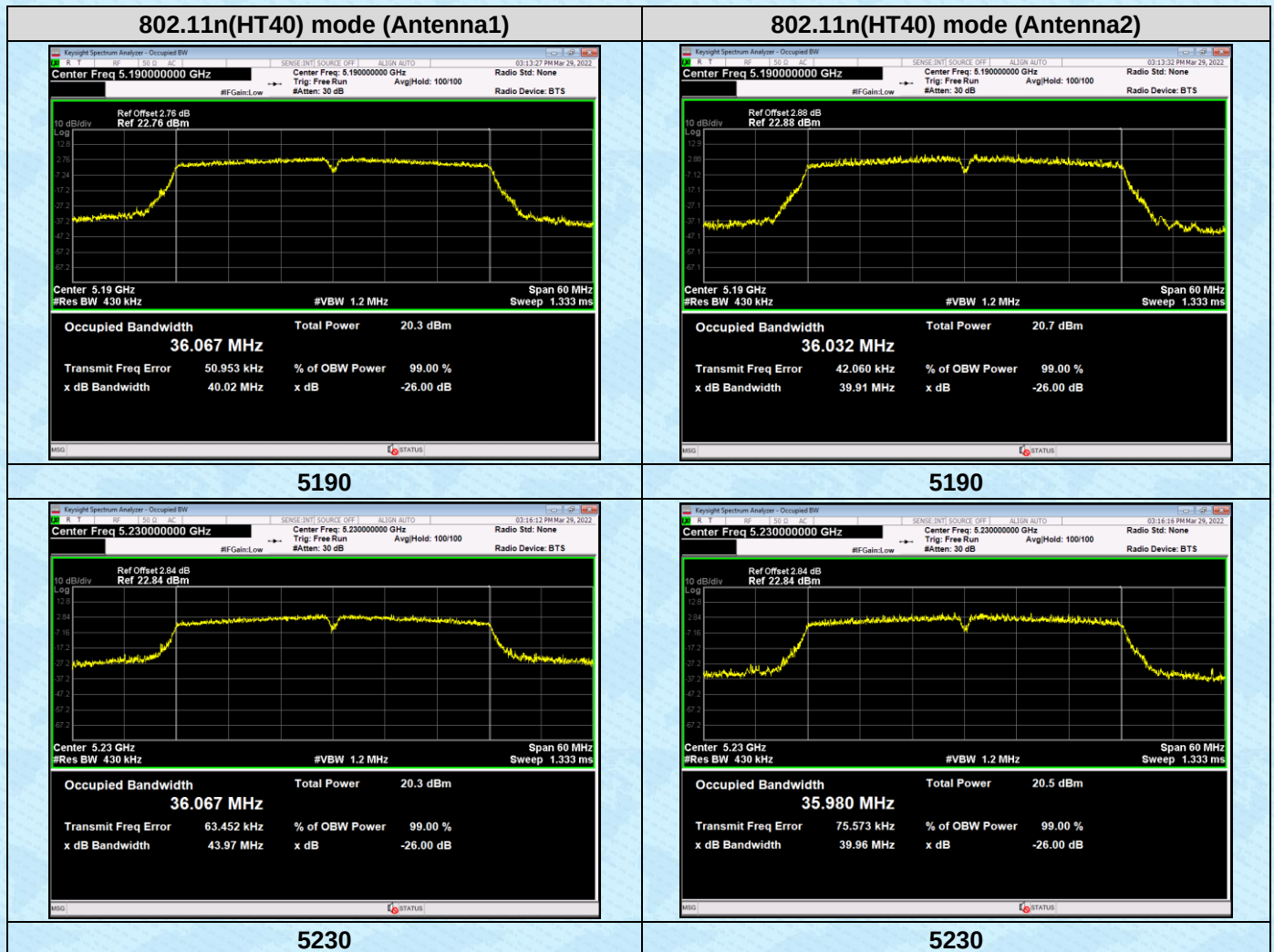
| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | 26dB Occupied Bandwidth (MHz) |       |
|---------|-----------------|------------------------------|-------|-------------------------------|-------|
|         |                 | 802.11ac(VHT40)              |       | 802.11ac(VHT40)               |       |
|         |                 | ANT1                         | ANT2  | ANT1                          | ANT2  |
| 38      | 5190            | 35.99                        | 36.00 | 40.42                         | 39.81 |
| 46      | 5230            | 36.04                        | 36.01 | 47.88                         | 39.73 |

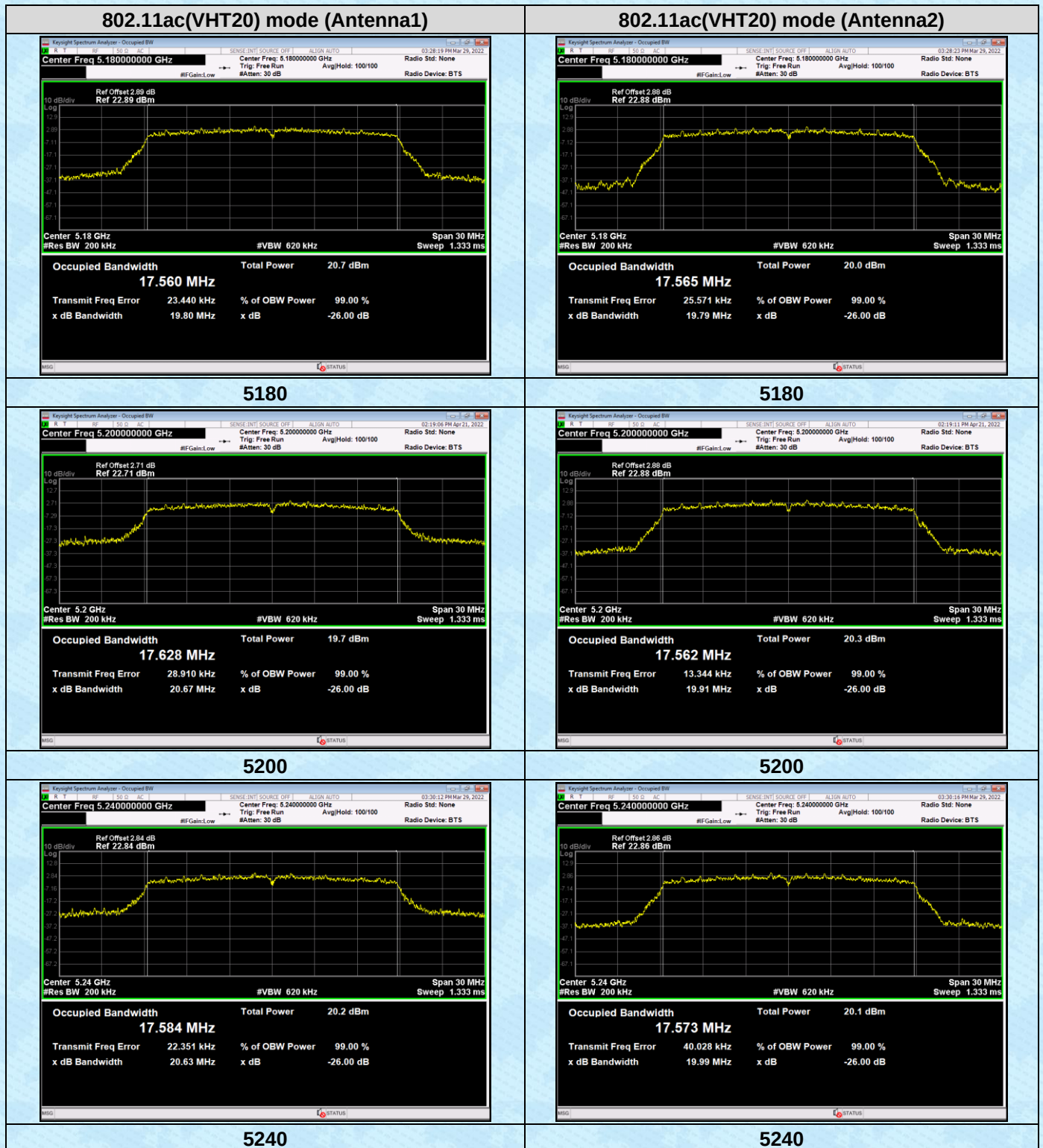
| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) |       | 26dB Occupied Bandwidth (MHz) |       |
|---------|-----------------|------------------------------|-------|-------------------------------|-------|
|         |                 | 802.11ac(VHT80)              |       | 802.11ac(VHT80)               |       |
|         |                 | ANT1                         | ANT2  | ANT1                          | ANT2  |
| 42      | 5210            | 75.43                        | 75.30 | 80.53                         | 80.15 |

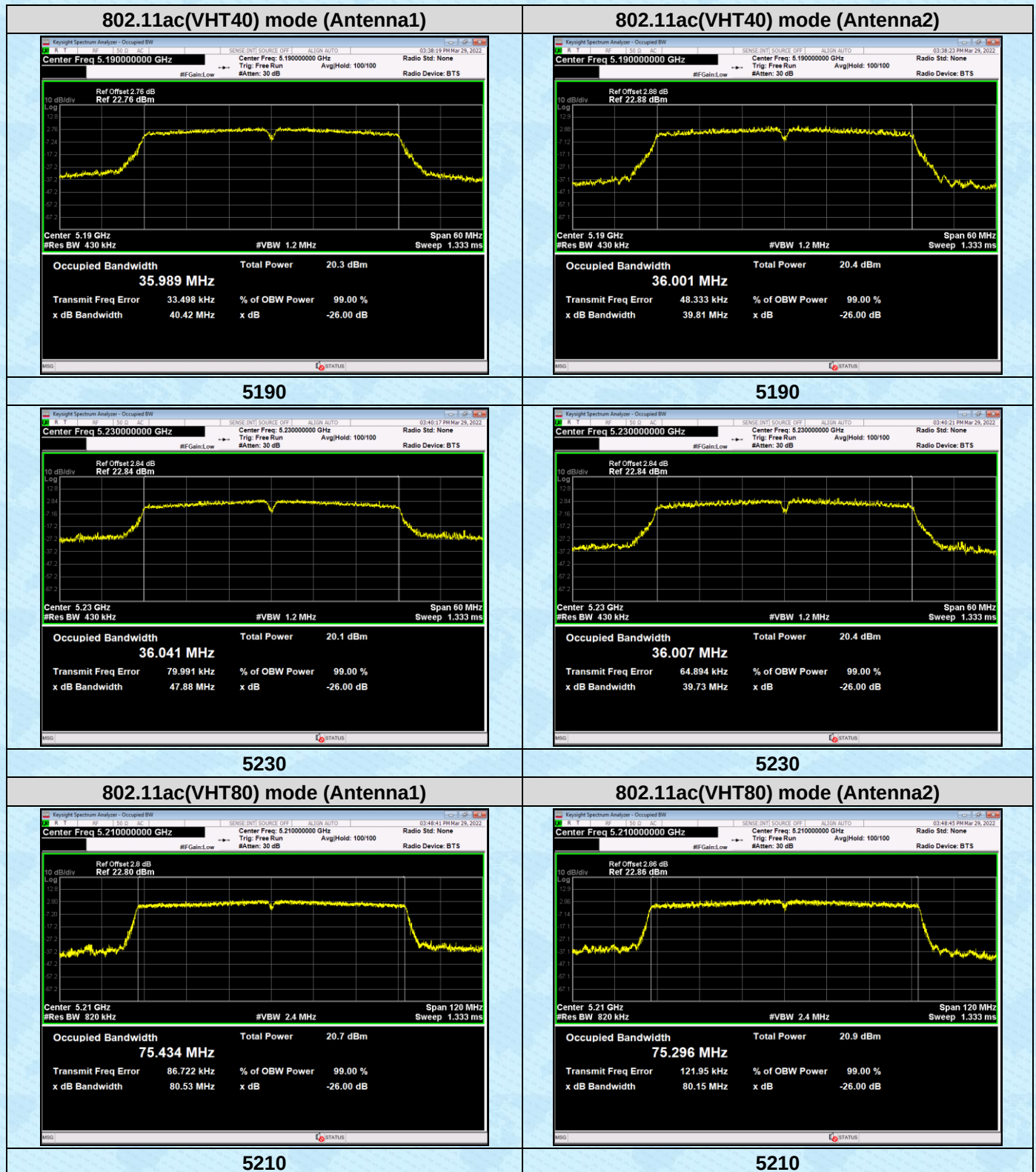
Test plots as followed:



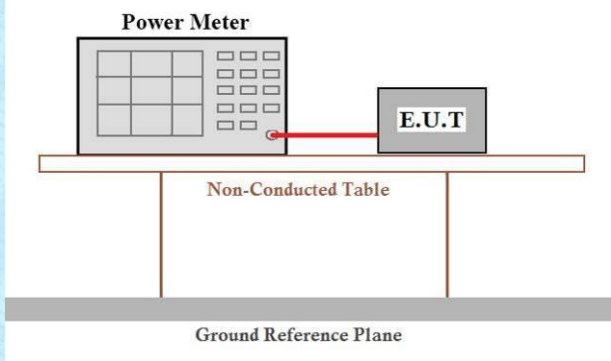








## 7.3 Peak Transmit Power

|                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Test Requirement:                                                                                                                                                                                                                   | FCC Part15 E Section 15.407                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                     |
| Test Method:                                                                                                                                                                                                                        | KDB 789033 D02 General U-NII Test Procedures New Rules v02r01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                     |
| Limit:                                                                                                                                                                                                                              | Frequency band (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Limit                                                                               |
|                                                                                                                                                                                                                                     | 5150-5250                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $\leq 1\text{W}(30\text{dBm})$ for master device                                    |
|                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | $\leq 250\text{mW}(23.98\text{dBm})$ for client device                              |
|                                                                                                                                                                                                                                     | 5250-5350                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $\leq 250\text{mW}(23.98\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$ |
|                                                                                                                                                                                                                                     | 5470-5725                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $\leq 250\text{mW}(23.98\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$ |
| Remark: *Where B is the 26dB emission bandwidth in MHz.<br>The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                     |
| Test setup:                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                     |
| Test procedure:                                                                                                                                                                                                                     | <b>Measurement using an RF average power meter</b> <ul style="list-style-type: none"> <li>(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied <ul style="list-style-type: none"> <li>a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle.</li> <li>b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.</li> <li>c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.</li> </ul> </li> <li>(ii) If the transmitter does not transmit continuously, measure the duty cycle, <math>x</math>, of the transmitter output signal as described in section B).</li> <li>(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.</li> <li>(iv) Adjust the measurement in dBm by adding <math>10 \log(1/x)</math> where <math>x</math> is the duty cycle (e.g., <math>10\log(1/0.25)</math> if the duty cycle is 25 percent).</li> </ul> |                                                                                     |
| Test Instruments:                                                                                                                                                                                                                   | Refer to section 6 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |
| Test mode:                                                                                                                                                                                                                          | Refer to section 5.2 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                     |
| Test results:                                                                                                                                                                                                                       | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                     |

## Measurement Data

| Modulation      | Frequency (MHz) | Duty cycle |          | Duty Factor |          |
|-----------------|-----------------|------------|----------|-------------|----------|
|                 |                 | Antenna1   | Antenna2 | Antenna1    | Antenna2 |
| 802.11a         | 5180            | 97.83      | 97.83    | 0.1         | 0.1      |
|                 | 5200            | 97.82      | 97.81    | 0.1         | 0.1      |
|                 | 5240            | 97.82      | 97.82    | 0.1         | 0.1      |
| 802.11n(HT20)   | 5180            | 97.71      | 97.71    | 0.1         | 0.1      |
|                 | 5200            | 97.7       | 97.7     | 0.1         | 0.1      |
|                 | 5240            | 97.68      | 97.68    | 0.1         | 0.1      |
| 802.11n(HT40)   | 5190            | 95.65      | 95.65    | 0.19        | 0.19     |
|                 | 5230            | 95.36      | 95.36    | 0.21        | 0.21     |
| 802.11ac(VHT20) | 5180            | 95.69      | 95.69    | 0.19        | 0.19     |
|                 | 5200            | 95.71      | 95.71    | 0.19        | 0.19     |
|                 | 5240            | 95.7       | 95.7     | 0.19        | 0.19     |
| 802.11ac(VHT40) | 5190            | 92.43      | 92.43    | 0.34        | 0.34     |
|                 | 5230            | 91.91      | 91.91    | 0.37        | 0.37     |
| 802.11ac(VHT80) | 5210            | 86.59      | 86.59    | 0.63        | 0.63     |

| 802.11a mode |                 |                      |        |         |             |                    |        |         |             |        |
|--------------|-----------------|----------------------|--------|---------|-------------|--------------------|--------|---------|-------------|--------|
| CH No.       | Frequency (MHz) | Measured Power (dBm) |        |         | Duty Factor | Output Power (dBm) |        |         | Limit (dBm) | Result |
|              |                 | ANT1                 | ANT2   | ANT 1+2 |             | ANT1               | ANT2   | ANT 1+2 |             |        |
| 36           | 5180            | 17.208               | 16.949 | --      | 0.1         | 17.308             | 17.049 | --      | 24          | Pass   |
| 40           | 5200            | 16.193               | 17.007 |         | 0.1         | 16.293             | 17.107 |         |             |        |
| 48           | 5240            | 16.41                | 16.771 | --      | 0.1         | 16.51              | 16.871 | --      |             |        |

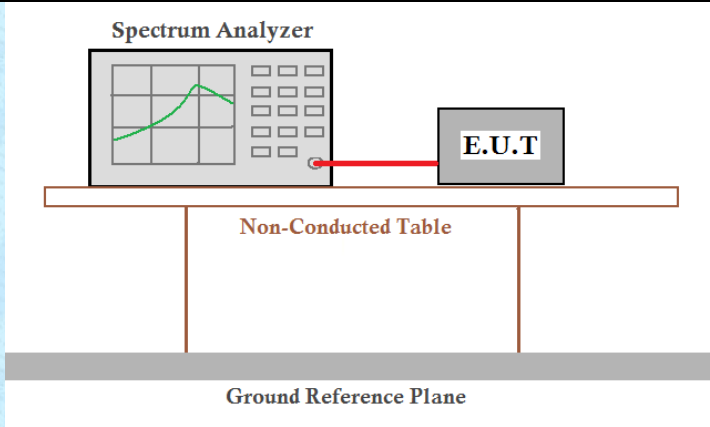
| 802.11n(HT20) mode   |                 |                      |        |         |             |                    |        |         |             |        |
|----------------------|-----------------|----------------------|--------|---------|-------------|--------------------|--------|---------|-------------|--------|
| CH No.               | Frequency (MHz) | Measured Power (dBm) |        |         | Duty Factor | Output Power (dBm) |        |         | Limit (dBm) | Result |
|                      |                 | ANT1                 | ANT2   | ANT 1+2 |             | ANT1               | ANT2   | ANT 1+2 |             |        |
| 36                   | 5180            | 14.896               | 14.376 | 17.654  | 0.1         | 14.996             | 14.476 | 17.754  | 24          | Pass   |
| 40                   | 5200            | 13.922               | 14.792 | 17.389  | 0.1         | 14.022             | 14.892 | 17.489  |             |        |
| 48                   | 5240            | 14.371               | 14.481 | 17.437  | 0.1         | 14.471             | 14.581 | 17.537  |             |        |
| 802.11n(HT40) mode   |                 |                      |        |         |             |                    |        |         |             |        |
| CH No.               | Frequency (MHz) | Measured Power (dBm) |        |         | Duty Factor | Output Power (dBm) |        |         | Limit (dBm) | Result |
|                      |                 | ANT1                 | ANT2   | ANT 1+2 |             | ANT1               | ANT2   | ANT 1+2 |             |        |
| 38                   | 5190            | 14.555               | 14.472 | 17.524  | 0.19        | 14.745             | 14.662 | 17.714  | 24          | Pass   |
| 46                   | 5230            | 14.271               | 14.417 | 17.355  | 0.21        | 14.481             | 14.627 | 17.565  |             |        |
| 802.11ac(VHT20) mode |                 |                      |        |         |             |                    |        |         |             |        |
| CH No.               | Frequency (MHz) | Measured Power (dBm) |        |         | Duty Factor | Output Power (dBm) |        |         | Limit (dBm) | Result |
|                      |                 | ANT1                 | ANT2   | ANT 1+2 |             | ANT1               | ANT2   | ANT 1+2 |             |        |
| 36                   | 5180            | 14.872               | 14.206 | 17.562  | 0.19        | 15.062             | 14.396 | 17.752  | 24          | Pass   |
| 40                   | 5200            | 13.842               | 14.602 | 17.249  | 0.19        | 14.032             | 14.792 | 17.439  |             |        |
| 48                   | 5240            | 14.176               | 14.315 | 17.256  | 0.19        | 14.366             | 14.505 | 17.446  |             |        |

| 802.11ac(VHT40) mode |                 |                      |        |         |             |                    |        |         |             |        |
|----------------------|-----------------|----------------------|--------|---------|-------------|--------------------|--------|---------|-------------|--------|
| CH No.               | Frequency (MHz) | Measured Power (dBm) |        |         | Duty Factor | Output Power (dBm) |        |         | Limit (dBm) | Result |
|                      |                 | ANT1                 | ANT2   | ANT 1+2 |             | ANT1               | ANT2   | ANT 1+2 |             |        |
| 38                   | 5190            | 14.352               | 14.149 | 17.262  | 0.34        | 14.692             | 14.489 | 17.602  | 24          | Pass   |
| 46                   | 5230            | 14.046               | 14.031 | 17.049  | 0.37        | 14.416             | 14.401 | 17.419  |             |        |
| 802.11ac(VHT80) mode |                 |                      |        |         |             |                    |        |         |             |        |
| CH No.               | Frequency (MHz) | Measured Power (dBm) |        |         | Duty Factor | Output Power (dBm) |        |         | Limit (dBm) | Result |
|                      |                 | ANT1                 | ANT2   | ANT 1+2 |             | ANT1               | ANT2   | ANT 1+2 |             |        |
| 42                   | 5210            | 13.659               | 13.536 | 16.608  | 0.63        | 14.289             | 14.166 | 17.238  | 24          | Pass   |

Note: Output Power = Measured Power + Duty Factor

Duty Factor = 10 log (1/Duty Cycle)

## 7.4 Power Spectral Density

|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Test Requirement:                                                                                                                                                | FCC Part15 E Section 15.407                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                  |
| Test Method:                                                                                                                                                     | KDB 789033 D02 General U-NII Test Procedures New Rules v02r01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |
| Limit:                                                                                                                                                           | Frequency band (MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Limit                            |
|                                                                                                                                                                  | 5150-5250                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ≤17dBm in 1MHz for master device |
|                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ≤11dBm in 1MHz for client device |
|                                                                                                                                                                  | 5250-5350                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ≤11dBm in 1MHz for client device |
|                                                                                                                                                                  | 5470-5725                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ≤11dBm in 1MHz for client device |
| Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |
| Test setup:                                                                                                                                                      |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                  |
| Test procedure:                                                                                                                                                  | <ol style="list-style-type: none"> <li>1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...".</li> <li>2) Use the peak search function on the instrument to find the peak of the spectrum.</li> <li>3) Make the following adjustments to the peak value of the spectrum, if applicable: <ol style="list-style-type: none"> <li>a) If Method SA-2 or SA-2 Alternative was used, add <math>10 \log(1/x)</math>, where <math>x</math> is the duty cycle, to the peak of the spectrum.</li> <li>b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.</li> </ol> </li> <li>4) The result is the PSD.</li> </ol> |                                  |
| Test Instruments:                                                                                                                                                | Refer to section 6 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                  |
| Test mode:                                                                                                                                                       | Refer to section 5.2 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |
| Test results:                                                                                                                                                    | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |

## Measurement Data Measurement Data

| Modulation      | Frequency (MHz) | Duty cycle |          | Duty Factor |          |
|-----------------|-----------------|------------|----------|-------------|----------|
|                 |                 | Antenna1   | Antenna2 | Antenna1    | Antenna2 |
| 802.11a         | 5180            | 97.83      | 97.83    | 0.1         | 0.1      |
|                 | 5200            | 97.82      | 97.81    | 0.1         | 0.1      |
|                 | 5240            | 97.82      | 97.82    | 0.1         | 0.1      |
| 802.11n(HT20)   | 5180            | 97.71      | 97.71    | 0.1         | 0.1      |
|                 | 5200            | 97.7       | 97.7     | 0.1         | 0.1      |
|                 | 5240            | 97.68      | 97.68    | 0.1         | 0.1      |
| 802.11n(HT40)   | 5190            | 95.65      | 95.65    | 0.19        | 0.19     |
|                 | 5230            | 95.36      | 95.36    | 0.21        | 0.21     |
| 802.11ac(VHT20) | 5180            | 95.69      | 95.69    | 0.19        | 0.19     |
|                 | 5200            | 95.71      | 95.71    | 0.19        | 0.19     |
|                 | 5240            | 95.7       | 95.7     | 0.19        | 0.19     |
| 802.11ac(VHT40) | 5190            | 92.43      | 92.43    | 0.34        | 0.34     |
|                 | 5230            | 91.91      | 91.91    | 0.37        | 0.37     |
| 802.11ac(VHT80) | 5210            | 86.59      | 86.59    | 0.63        | 0.63     |

| 802.11a mode |                 |                        |       |         |             |                          |       |         |                 |        |
|--------------|-----------------|------------------------|-------|---------|-------------|--------------------------|-------|---------|-----------------|--------|
| CH No.       | Frequency (MHz) | Measured PSD (dBm/MHz) |       |         | Duty Factor | Total PSD Power(dBm/MHz) |       |         | Limit (dBm/MHz) | Result |
|              |                 | ANT1                   | ANT2  | ANT 1+2 |             | ANT1                     | ANT2  | ANT 1+2 |                 |        |
| 36           | 5180            | 7.34                   | 7.099 | --      | 0.1         | 7.44                     | 7.199 | --      | 11              | Pass   |
| 40           | 5200            | 6.34                   | 7.228 | --      | 0.1         | 6.44                     | 7.328 | --      | 11              | Pass   |
| 48           | 5240            | 7.221                  | 7.096 | --      | 0.1         | 7.321                    | 7.196 | --      | 11              | Pass   |

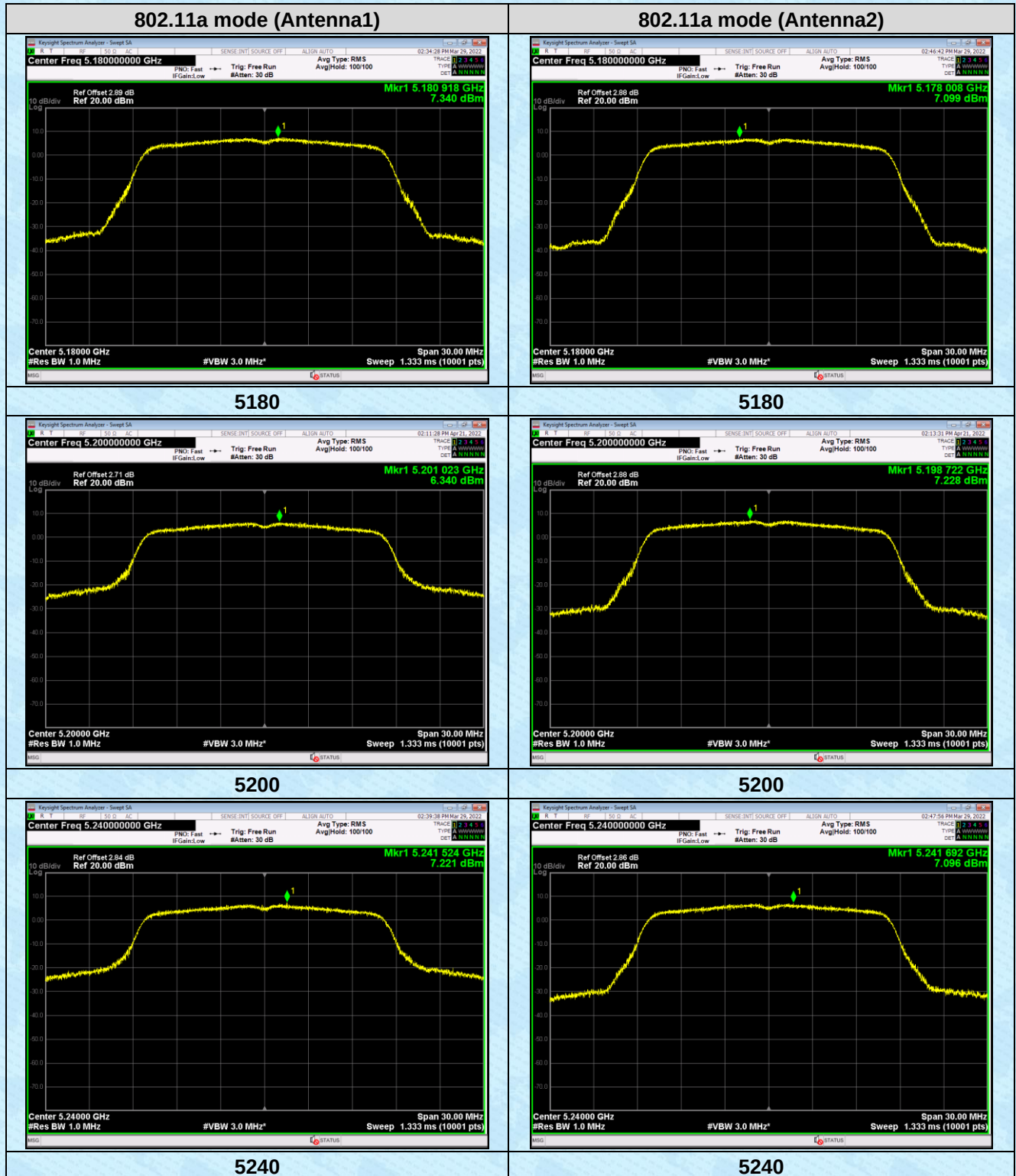
| 802.11n(HT20) mode   |                 |                        |       |         |             |                          |       |         |                 |        |
|----------------------|-----------------|------------------------|-------|---------|-------------|--------------------------|-------|---------|-----------------|--------|
| CH No.               | Frequency (MHz) | Measured PSD (dBm/MHz) |       |         | Duty Factor | Total PSD Power(dBm/MHz) |       |         | Limit (dBm/MHz) | Result |
|                      |                 | ANT1                   | ANT2  | ANT 1+2 |             | ANT1                     | ANT2  | ANT 1+2 |                 |        |
| 36                   | 5180            | 4.892                  | 4.353 | 7.641   | 0.1         | 4.992                    | 4.453 | 7.741   | 11              | Pass   |
| 40                   | 5200            | 4.319                  | 5.201 | 7.793   | 0.1         | 4.419                    | 5.301 | 7.893   | 11              | Pass   |
| 48                   | 5240            | 4.592                  | 4.383 | 7.499   | 0.1         | 4.692                    | 4.483 | 7.599   | 11              | Pass   |
| 802.11n(HT40) mode   |                 |                        |       |         |             |                          |       |         |                 |        |
| CH No.               | Frequency (MHz) | Measured PSD (dBm/MHz) |       |         | Duty Factor | Total PSD Power(dBm/MHz) |       |         | Limit (dBm/MHz) | Result |
|                      |                 | ANT1                   | ANT2  | ANT 1+2 |             | ANT1                     | ANT2  | ANT 1+2 |                 |        |
| 38                   | 5190            | 1.741                  | 2.019 | 4.893   | 0.19        | 1.931                    | 2.209 | 5.083   | 11              | Pass   |
| 46                   | 5230            | 2.193                  | 1.772 | 4.998   | 0.21        | 2.403                    | 1.982 | 5.208   | 11              | Pass   |
| 802.11ac(VHT20) mode |                 |                        |       |         |             |                          |       |         |                 |        |
| CH No.               | Frequency (MHz) | Measured PSD (dBm/MHz) |       |         | Duty Factor | Total PSD Power(dBm/MHz) |       |         | Limit (dBm/MHz) | Result |
|                      |                 | ANT1                   | ANT2  | ANT 1+2 |             | ANT1                     | ANT2  | ANT 1+2 |                 |        |
| 36                   | 5180            | 4.9                    | 4.53  | 7.729   | 0.19        | 5.09                     | 4.72  | 7.919   | 11              | Pass   |
| 40                   | 5200            | 4.184                  | 4.981 | 7.611   | 0.19        | 4.374                    | 5.171 | 7.801   | 11              | Pass   |
| 48                   | 5240            | 4.425                  | 4.86  | 7.658   | 0.19        | 4.615                    | 5.05  | 7.848   | 11              | Pass   |
| 802.11ac(VHT40) mode |                 |                        |       |         |             |                          |       |         |                 |        |
| CH No.               | Frequency (MHz) | Measured PSD (dBm/MHz) |       |         | Duty Factor | Total PSD Power(dBm/MHz) |       |         | Limit (dBm/MHz) | Result |
|                      |                 | ANT1                   | ANT2  | ANT 1+2 |             | ANT1                     | ANT2  | ANT 1+2 |                 |        |
| 38                   | 5190            | 1.468                  | 1.506 | 4.497   | 0.34        | 1.808                    | 1.846 | 4.837   | 11              | Pass   |
| 46                   | 5230            | 1.56                   | 1.268 | 4.427   | 0.37        | 1.93                     | 1.638 | 4.797   | 11              | Pass   |

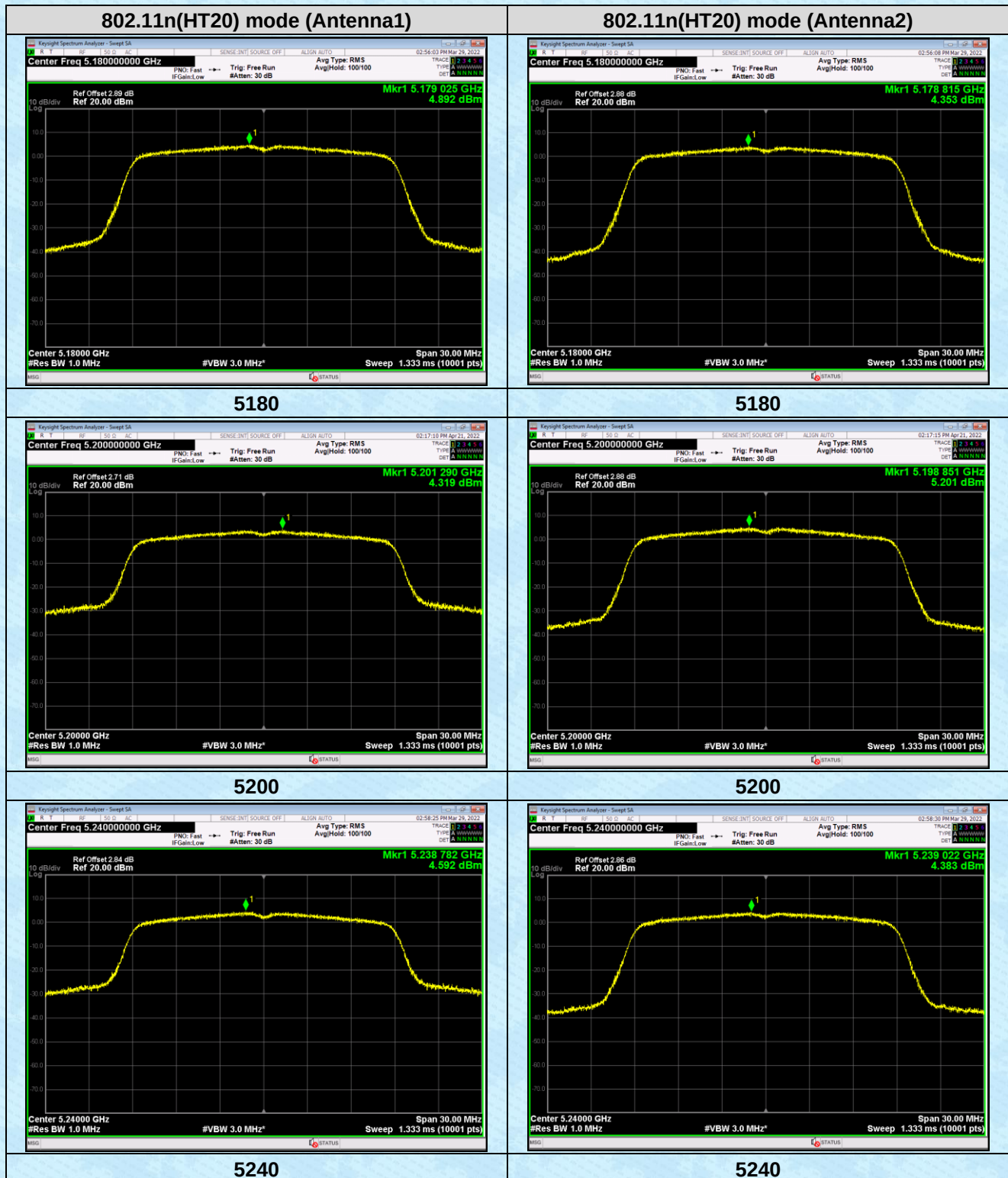
| 802.11ac(VHT80) mode |                 |                        |        |         |             |                          |        |         |                 |        |
|----------------------|-----------------|------------------------|--------|---------|-------------|--------------------------|--------|---------|-----------------|--------|
| CH No.               | Frequency (MHz) | Measured PSD (dBm/MHz) |        |         | Duty Factor | Total PSD Power(dBm/MHz) |        |         | Limit (dBm/MHz) | Result |
|                      |                 | ANT1                   | ANT2   | ANT 1+2 |             | ANT1                     | ANT2   | ANT 1+2 |                 |        |
| 42                   | 5210            | -2.066                 | -2.163 | 0.896   | 0.63        | -1.436                   | -1.533 | 1.526   | 11              | Pass   |

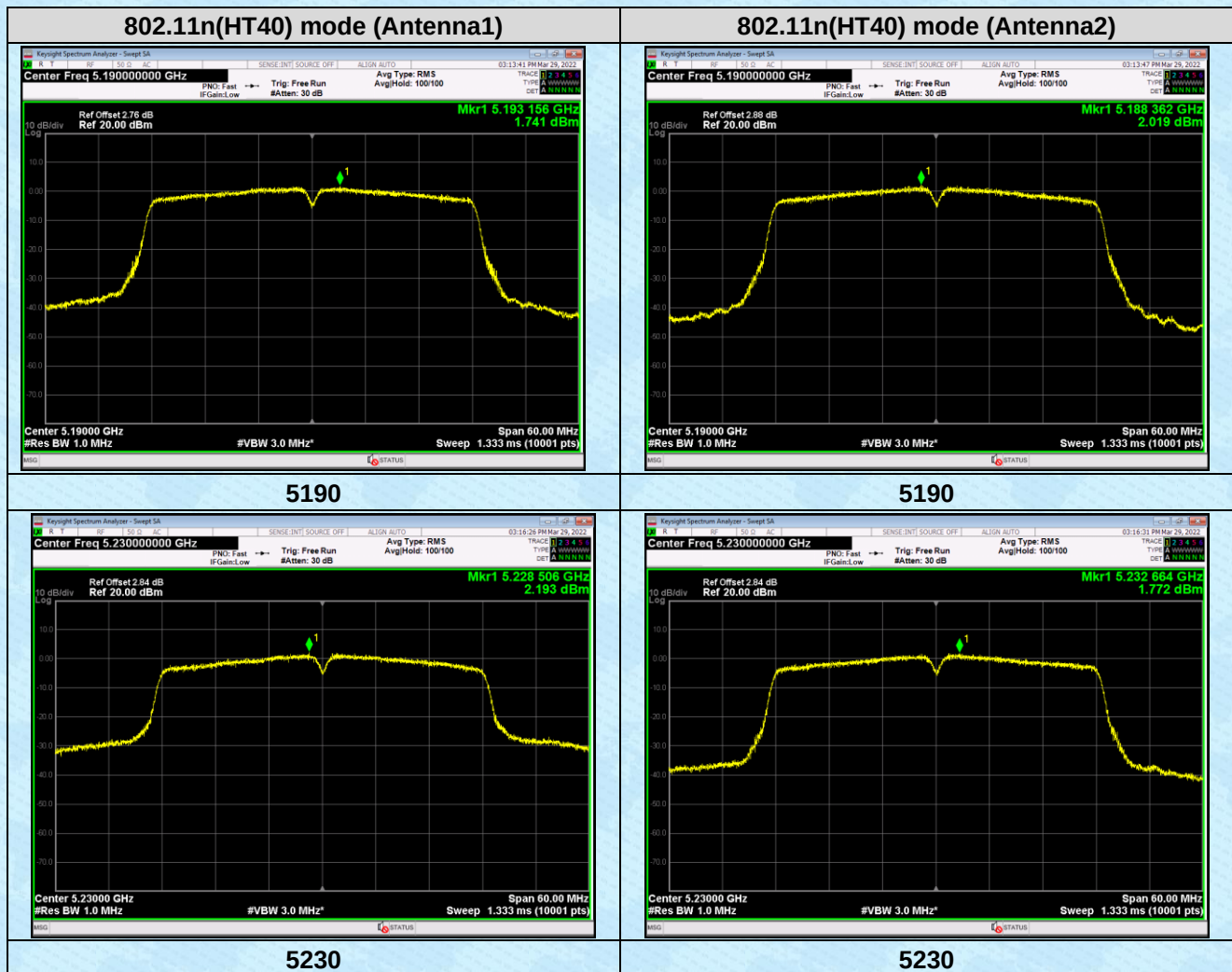
Note: Output Power = Measured Power + Duty Factor

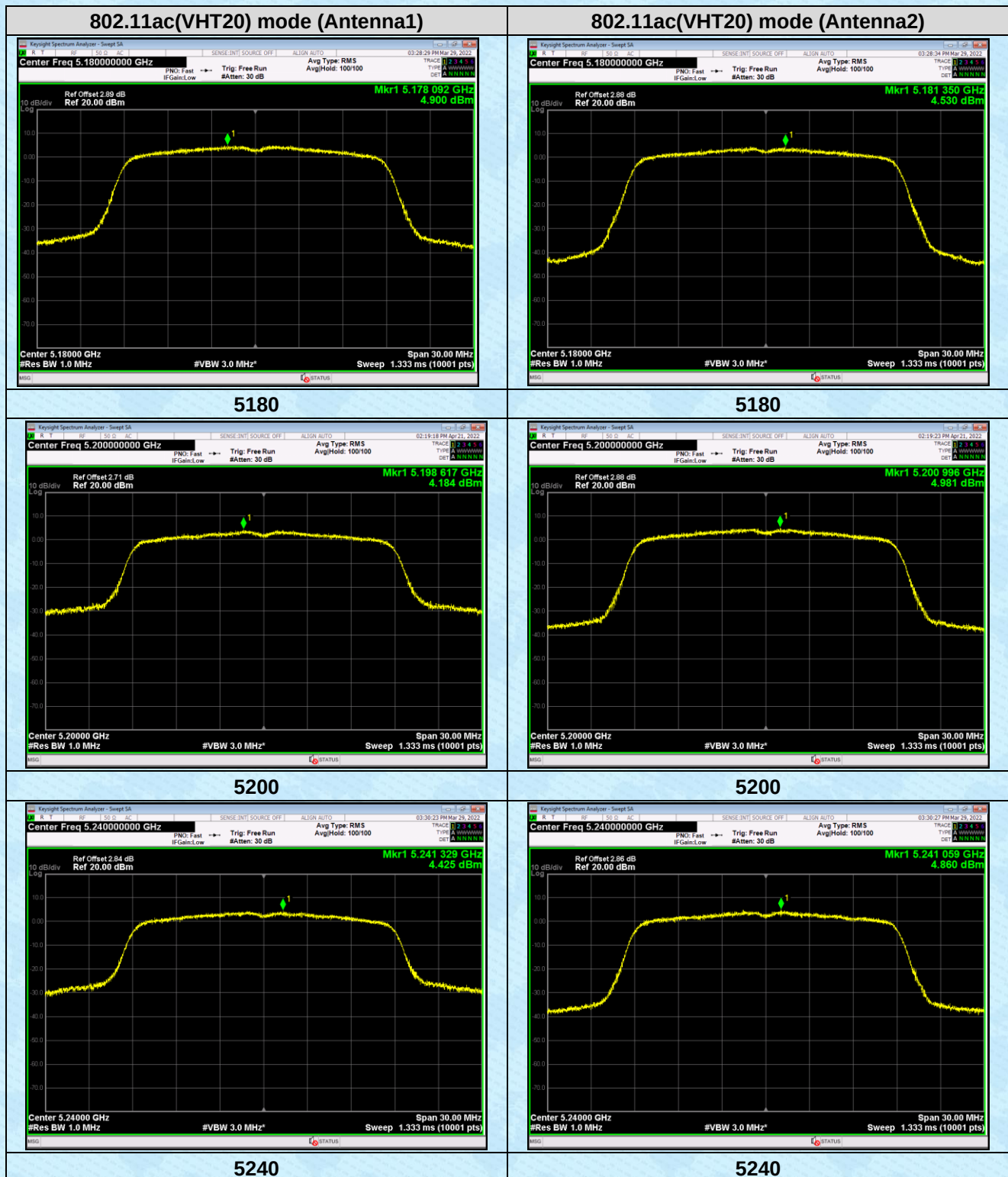
Duty Factor = 10 log (1/Duty Cycle)

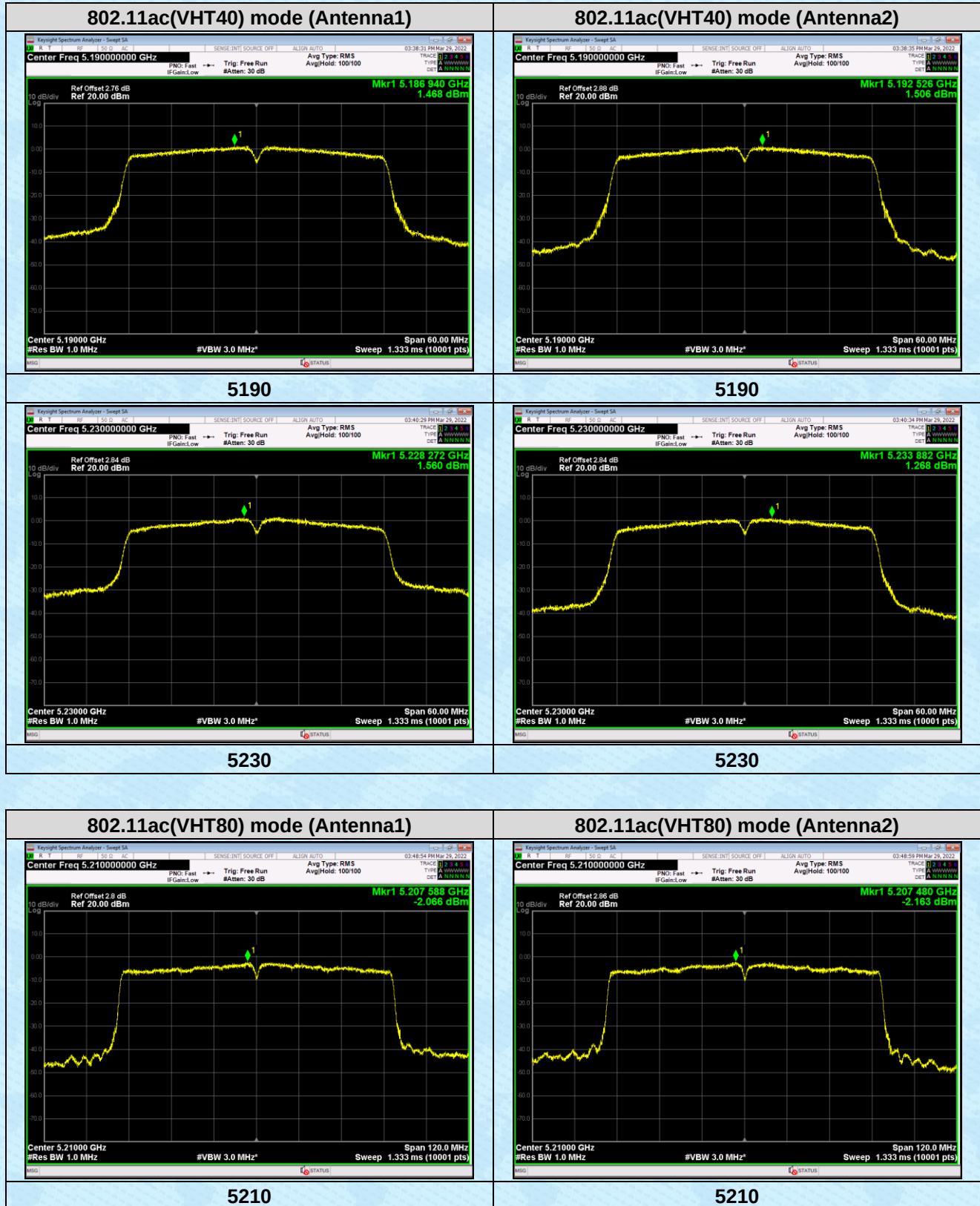
Test plots as followed:





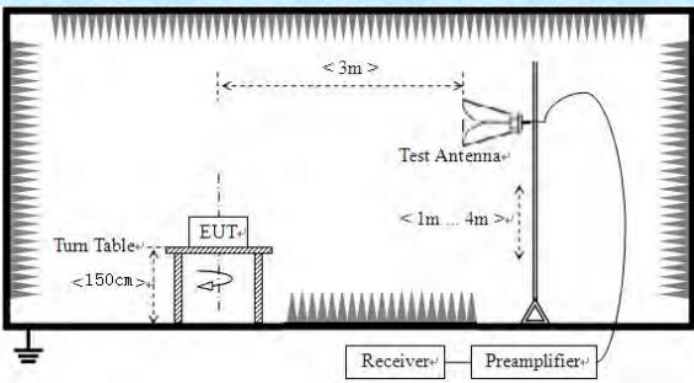






## 7.5 Band Edge

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                    |               |                  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|---------------|------------------|
| Test Requirement: | FCC Part15 E Section 15.407 and 15.205                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                    |               |                  |
| Test Method:      | ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                    |               |                  |
| Test site:        | Measurement Distance: 3m (Semi-Anechoic Chamber)                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                    |               |                  |
| Receiver setup:   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                    |               |                  |
|                   | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Detector   | RBW                | VBW           | Remark           |
|                   | 30MHz-1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Quasi-peak | 100KHz             | 300KHz        | Quasi-peak Value |
|                   | Above 1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Peak       | 1MHz               | 3MHz          | Peak Value       |
| AV                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1MHz       | 3MHz               | Average Value |                  |
| Limit:            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                    |               |                  |
|                   | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            | Limit (dBuV/m @3m) |               | Remark           |
|                   | 30MHz-88MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | 40.0               |               | Quasi-peak Value |
|                   | 88MHz-216MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            | 43.5               |               | Quasi-peak Value |
|                   | 216MHz-960MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            | 46.0               |               | Quasi-peak Value |
|                   | 960MHz-1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | 54.0               |               | Quasi-peak Value |
|                   | Above 1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            | 54.0               |               | Average Value    |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            | 68.2               |               | Peak Value       |
|                   | Undesirable emission limits:                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                    |               |                  |
|                   | (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.                                                                                                                                                                                                                                                                                                                 |            |                    |               |                  |
|                   | (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band. |            |                    |               |                  |
|                   | (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.                                                                                                                                                                                                                                                                                                               |            |                    |               |                  |
| Test Procedure:   | a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.                                                                                                                                                                                                                                                                             |            |                    |               |                  |
|                   | b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.                                                                                                                                                                                                                                                                                                                         |            |                    |               |                  |
|                   | c. 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.                                                                                                                                                                                                                                    |            |                    |               |                  |
|                   | d. 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.                                                                                                                                                                                                                            |            |                    |               |                  |
|                   | e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.                                                                                                                                                                                                                                                                                                                                                        |            |                    |               |                  |
|                   | f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not                                                                                                                                                                                                                                                     |            |                    |               |                  |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                    |               |                  |

|                   |                                                                                                                                         |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|                   | have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. |
| Test setup:       | <p>For radiated emissions above 1GHz</p>              |
| Test Instruments: | Refer to section 6 for details                                                                                                          |
| Test mode:        | Refer to section 5.2 for details                                                                                                        |
| Test results:     | Pass                                                                                                                                    |

## Remarks:

- Only the worst case Main Antenna test data.
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
- According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:  
 $E[dBuV/m] = EIRP[dBm] + 95.2;$   
For example, if  $EIRP = -27dBm$   
 $E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.$

| Worse case mode:<br>ANT 1 |               | 802.11a |                | Test Frequency: |        | 5180MHz       |           |
|---------------------------|---------------|---------|----------------|-----------------|--------|---------------|-----------|
| Frequency                 | Meter Reading | Factor  | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                     | (dBμV)        | (dB)    | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5150                      | 52.97         | -3.63   | 49.34          | 68.2            | -18.86 | peak          | H         |
| 5150                      | 49.14         | -3.63   | 45.51          | 54              | -8.49  | AVG           | H         |
| 5150                      | 50.02         | -3.63   | 46.39          | 68.2            | -21.81 | peak          | V         |
| 5150                      | 43.69         | -3.63   | 40.06          | 54              | -13.94 | AVG           | V         |

| Worse case mode:<br>ANT 1 |               | 802.11a |                | Test Frequency: |        | 5240MHz       |           |
|---------------------------|---------------|---------|----------------|-----------------|--------|---------------|-----------|
| Frequency                 | Meter Reading | Factor  | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                     | (dBμV)        | (dB)    | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5350                      | 50.43         | -3.59   | 46.84          | 68.2            | -21.36 | peak          | H         |
| 5350                      | 48.52         | -3.59   | 44.93          | 54              | -9.07  | AVG           | H         |
| 5350                      | 50.13         | -3.59   | 46.54          | 68.2            | -21.66 | peak          | V         |
| 5350                      | 48.01         | -3.59   | 44.42          | 54              | -9.58  | AVG           | V         |

| Worse case mode:<br>SUM |               | 802.11n(HT20) |                | Test Frequency: |        | 5180MHz       |           |
|-------------------------|---------------|---------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor        | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)          | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5150                    | 54.12         | -3.63         | 50.49          | 68.2            | -17.71 | peak          | H         |
| 5150                    | 49.47         | -3.63         | 45.84          | 54              | -8.16  | AVG           | H         |
| 5150                    | 49.43         | -3.63         | 45.8           | 68.2            | -22.4  | peak          | V         |
| 5150                    | 43.82         | -3.63         | 40.19          | 54              | -13.81 | AVG           | V         |

| Worse case mode:<br>SUM |               | 802.11n(HT20) |                | Test Frequency: |        | 5240MHz       |           |
|-------------------------|---------------|---------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor        | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)          | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5350                    | 51.02         | -3.59         | 47.43          | 68.2            | -20.77 | peak          | H         |
| 5350                    | 50.16         | -3.59         | 46.57          | 54              | -7.43  | AVG           | H         |
| 5350                    | 49.8          | -3.59         | 46.21          | 68.2            | -21.99 | peak          | V         |
| 5350                    | 48.09         | -3.59         | 44.5           | 54              | -9.5   | AVG           | V         |

| Worse case mode:<br>SUM |               | 802.11n(HT40) |                | Test Frequency: |        | 5190MHz       |           |
|-------------------------|---------------|---------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor        | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)          | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5150                    | 53.12         | -3.63         | 49.49          | 68.2            | -18.71 | peak          | H         |
| 5150                    | 47.41         | -3.63         | 43.78          | 54              | -10.22 | AVG           | H         |
| 5150                    | 53.5          | -3.63         | 49.87          | 68.2            | -18.33 | peak          | V         |
| 5150                    | 46.52         | -3.63         | 42.89          | 54              | -11.11 | AVG           | V         |

| Worse case mode:<br>SUM |               | 802.11n(HT40) |                | Test Frequency: |        | 5230MHz       |           |
|-------------------------|---------------|---------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor        | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)          | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5350                    | 51.62         | -3.59         | 48.03          | 68.2            | -20.17 | peak          | H         |
| 5350                    | 46.23         | -3.59         | 42.64          | 54              | -11.36 | AVG           | H         |
| 5350                    | 53.49         | -3.59         | 49.9           | 68.2            | -18.3  | peak          | V         |
| 5350                    | 50.22         | -3.59         | 46.63          | 54              | -7.37  | AVG           | V         |

| Worse case mode:<br>SUM |               | 802.11ac(VHT20) |                | Test Frequency: |        | 5180MHz       |           |
|-------------------------|---------------|-----------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor          | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)            | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5150                    | 54.01         | -3.63           | 50.38          | 68.2            | -17.82 | peak          | H         |
| 5150                    | 50.19         | -3.63           | 46.56          | 54              | -7.44  | AVG           | H         |
| 5150                    | 50.8          | -3.63           | 47.17          | 68.2            | -21.03 | peak          | V         |
| 5150                    | 43.39         | -3.63           | 39.76          | 54              | -14.24 | AVG           | V         |

| Worse case mode:<br>SUM |               | 802.11ac(VHT20) |                | Test Frequency: |        | 5240MHz       |           |
|-------------------------|---------------|-----------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor          | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)            | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5350                    | 50.07         | -3.59           | 46.48          | 68.2            | -21.72 | peak          | H         |
| 5350                    | 49.79         | -3.59           | 46.2           | 54              | -7.8   | AVG           | H         |
| 5350                    | 49.35         | -3.59           | 45.76          | 68.2            | -22.44 | peak          | V         |
| 5350                    | 49.27         | -3.59           | 45.68          | 54              | -8.32  | AVG           | V         |

| Worse case mode:<br>SUM |               | 802.11ac(VHT40) |                | Test Frequency: |        | 5190MHz       |           |
|-------------------------|---------------|-----------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor          | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)            | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5150                    | 53.39         | -3.63           | 49.76          | 68.2            | -18.44 | peak          | H         |
| 5150                    | 46.65         | -3.63           | 43.02          | 54              | -10.98 | AVG           | H         |
| 5150                    | 51.95         | -3.63           | 48.32          | 68.2            | -19.88 | peak          | V         |
| 5150                    | 49.64         | -3.63           | 46.01          | 54              | -7.99  | AVG           | V         |

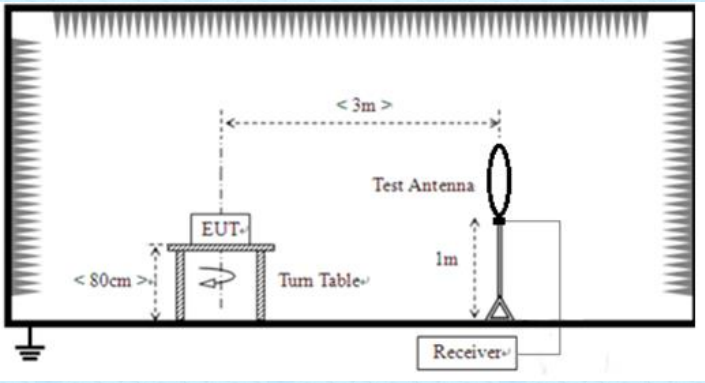
| Worse case mode:<br>SUM |               | 802.11ac(VHT40) |                | Test Frequency: |        | 5230MHz       |           |
|-------------------------|---------------|-----------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor          | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)            | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5350                    | 53.21         | -3.59           | 49.62          | 68.2            | -18.58 | peak          | H         |
| 5350                    | 49.67         | -3.59           | 46.08          | 54              | -7.92  | AVG           | H         |
| 5350                    | 53.37         | -3.59           | 49.78          | 68.2            | -18.42 | peak          | V         |
| 5350                    | 46.3          | -3.59           | 42.71          | 54              | -11.29 | AVG           | V         |

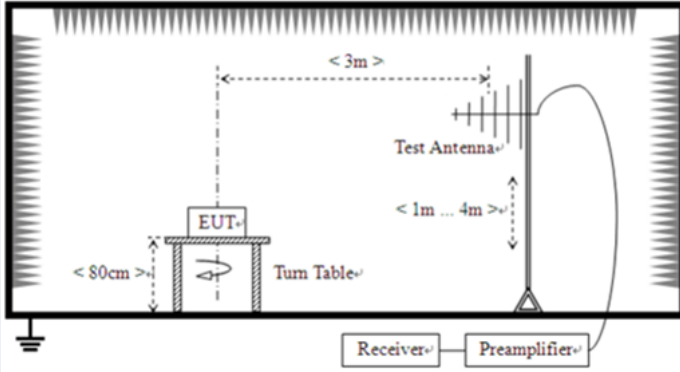
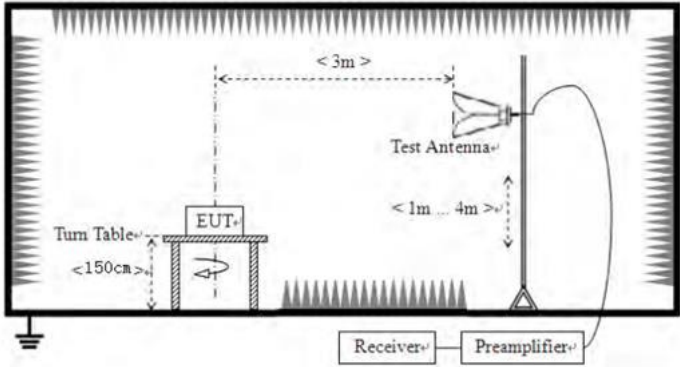
| Worse case mode:<br>SUM |               | 802.11ac(VHT80) |                | Test Frequency: |        | 5210MHz       |           |
|-------------------------|---------------|-----------------|----------------|-----------------|--------|---------------|-----------|
| Frequency               | Meter Reading | Factor          | Emission Level | Limits          | Over   | Detector Type | Ant. Pol. |
| (MHz)                   | (dBμV)        | (dB)            | (dBμV/m)       | (dBμV/m)        | (dB)   |               | H/V       |
| 5150                    | 52.47         | -3.63           | 48.84          | 68.2            | -19.36 | peak          | H         |
| 5150                    | 45.7          | -3.63           | 42.07          | 54              | -11.93 | AVG           | H         |
| 5150                    | 53.48         | -3.63           | 49.85          | 68.2            | -18.35 | peak          | V         |
| 5150                    | 46.68         | -3.63           | 43.05          | 54              | -10.95 | AVG           | V         |
| 5350                    | 51.92         | -3.59           | 48.33          | 68.2            | -19.87 | peak          | H         |
| 5350                    | 45.66         | -3.59           | 42.07          | 54              | -11.93 | AVG           | H         |
| 5350                    | 54.08         | -3.59           | 50.49          | 68.2            | -17.71 | peak          | V         |
| 5350                    | 47            | -3.59           | 43.41          | 54              | -10.59 | AVG           | V         |

## Measurement Data:

### 7.6 Radiated Emission

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                |               |                      |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|---------------|----------------------|
| Test Requirement:     | FCC Part15 C Section 15.209 and 15.205, Part 15E Section 15.407(b)(4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                |               |                      |
| Test Method:          | ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                |               |                      |
| Test Frequency Range: | 9kHz to 40GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                |               |                      |
| Test site:            | Measurement Distance: 3m (Semi-Anechoic Chamber)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                |               |                      |
| Receiver setup:       | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Detector   | RBW            | VBW           | Value                |
|                       | 9kHz-150KHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Quasi-peak | 200Hz          | 1kHz          | Quasi-peak Value     |
|                       | 150kHz-30MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Quasi-peak | 9kHz           | 30kHz         | Quasi-peak Value     |
|                       | 30MHz-1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Quasi-peak | 100KHz         | 300KHz        | Quasi-peak Value     |
|                       | Above 1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Peak       | 1MHz           | 3MHz          | Peak Value           |
| AV                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1MHz       | 3MHz           | Average Value |                      |
| Limit:                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                |               |                      |
|                       | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            | Limit (uV/m)   | Value         | Measurement Distance |
|                       | 0.009MHz-0.490MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | 2400/F(KHz)    | QP            | 300m                 |
|                       | 0.490MHz-1.705MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            | 24000/F(KHz)   | QP            | 300m                 |
|                       | 1.705MHz-30MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            | 30             | QP            | 30m                  |
|                       | 30MHz-88MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            | 100            | QP            | 3m                   |
|                       | 88MHz-216MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            | 150            | QP            |                      |
|                       | 216MHz-960MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            | 200            | QP            |                      |
|                       | 960MHz-1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            | 500            | QP            |                      |
|                       | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            | Limit (dBuV/m) | Remark        |                      |
|                       | Above 1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            | 68.20          | Peak          |                      |
| 54.00                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            | Average        |               |                      |
| Test Procedure:       | <p>Substitution method was performed to determine the actual ERP emission levels of the EUT.</p> <p>The following test procedure as below:</p> <p>1&gt;.Below 1GHz test procedure:</p> <ol style="list-style-type: none"><li>1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>3. 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.</li><li>4. 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.</li><li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported</li></ol> |            |                |               |                      |

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | <p>in a data sheet.</p> <p>2&gt;.Above 1GHz test procedure:</p> <ol style="list-style-type: none"> <li>1. On the test site as test setup graph above,the EUT shall be placed at the 0.8m support on the turntable and in the position closest to normal use as declared by the provider.</li> <li>2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver.</li> <li>3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.</li> <li>4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.</li> <li>5. Repeat step 4 for test frequency with the test antenna polarized horizontally.</li> <li>6. Remove the transmitter and replace it with a substitution antenna</li> <li>7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.</li> <li>8. Repeat step 7 with both antennas horizontally polarized for each test frequency.</li> <li>9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:<br/> <math display="block">EIRP(dBm) = P_g(dBm) - \text{cable loss (dB)} + \text{antenna gain (dBi)}</math>                     where:<br/> <math>P_g</math> is the generator output power into the substitution antenna.</li> </ol> |
| <p>Test setup:</p> | <p>For radiated emissions from 9kHz to 30MHz</p>  <p>For radiated emissions from 30MHz to 1GHz</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|                   |                                                                                                                                                                                                                 |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |  <p>For radiated emissions above 1GHz</p>  |
| Test Instruments: | Refer to section 6 for details                                                                                                                                                                                  |
| Test mode:        | Refer to section 5.2 for details                                                                                                                                                                                |
| Test environment: | Temp.: 25 °C    Humid.: 52%    Press.: 1012mbar                                                                                                                                                                 |
| Test voltage:     | DC 5V                                                                                                                                                                                                           |
| Test results:     | Pass                                                                                                                                                                                                            |

*Remarks:*

1. For 802.11a test, only the worse case (ANT A) test result recorded in the report, For 802.11n(HT20)/ 802.11n(HT40)/ 802.11ac(VHT20)/ 802.11ac(VHT40)/ 802.11ac(VHT80), only the worse case(MIMO) test result recorded in the report.
2. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

## Measurement Data:

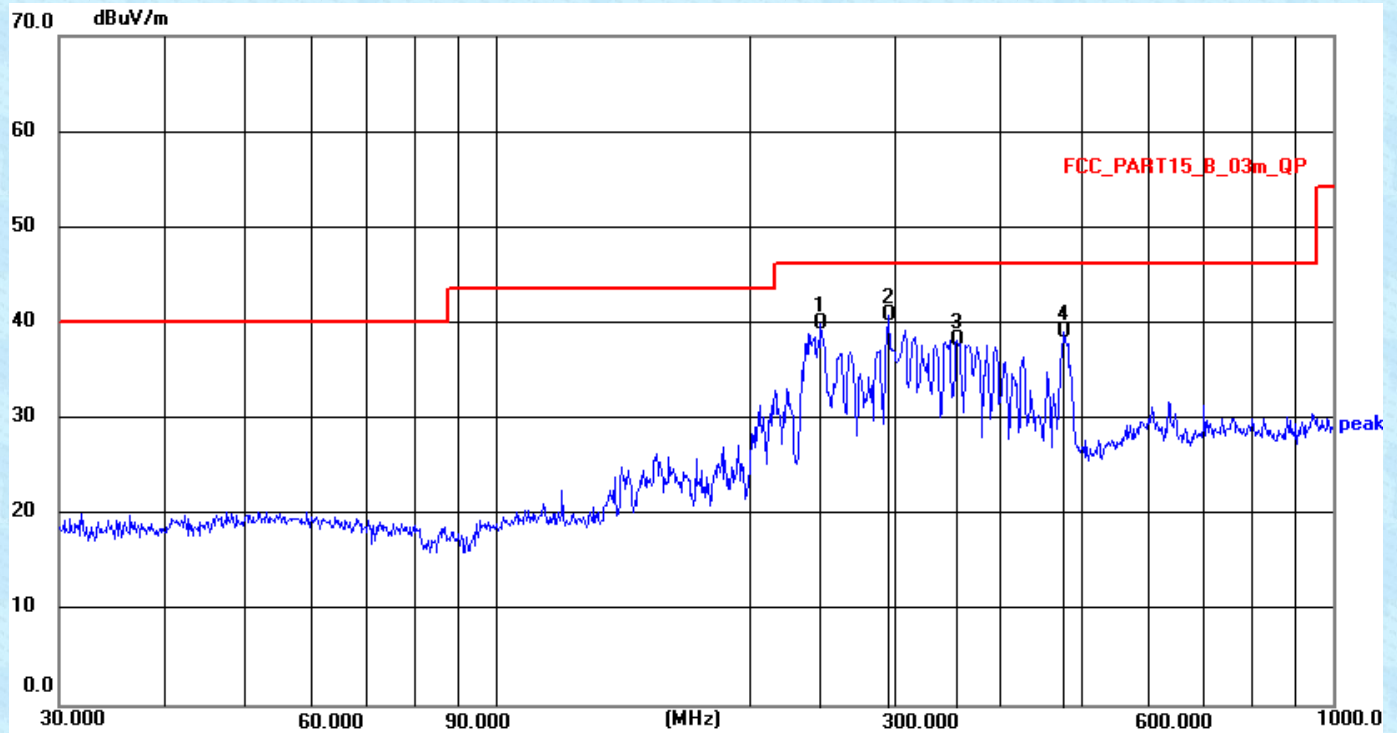
### 9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

### 30MHz~ 1GHz

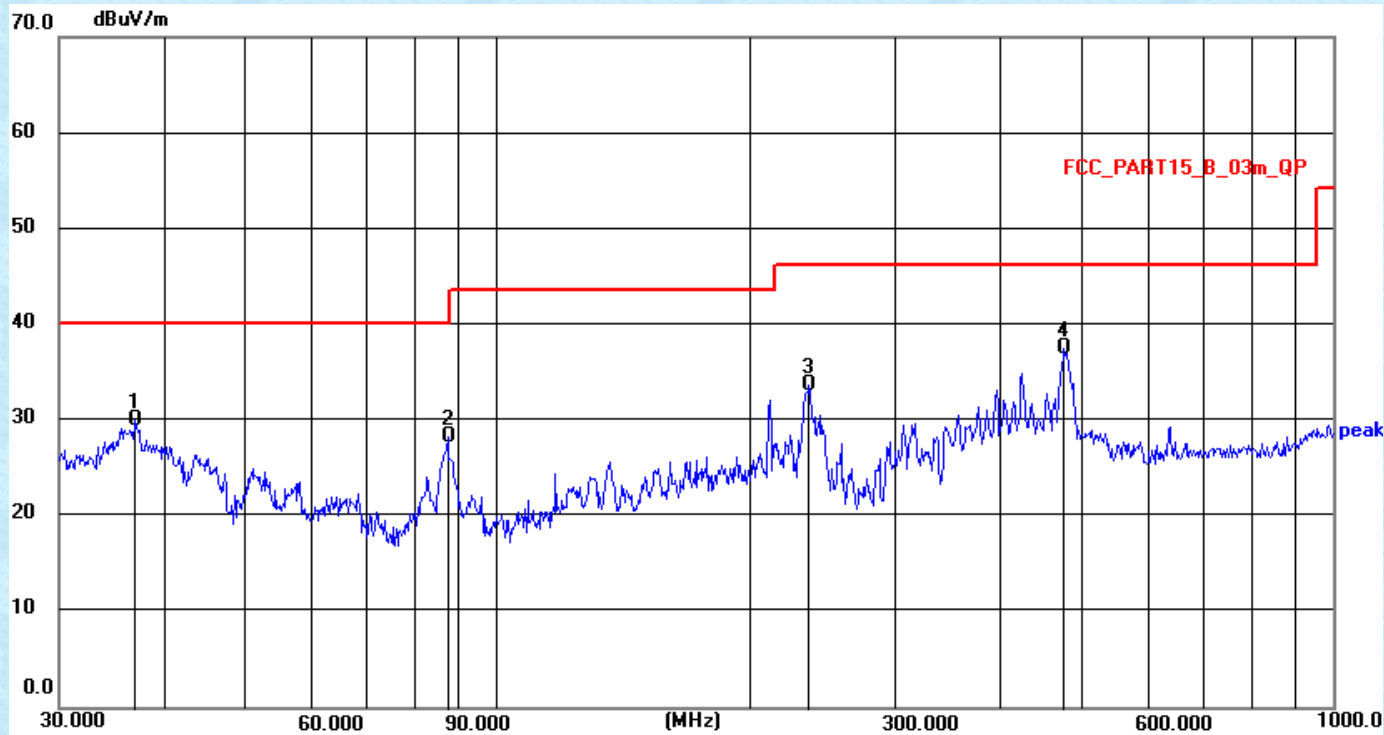
Pre-scan all test modes, found worst case at 802.11n(HT20) 5180MHz of MIMO, and so only show the test result of 802.11n(HT20) 5180MHz of MIMO.

### Horizont



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|--------|
| 1   | 244.2321        | 26.54          | 13.43         | 39.97          | 46.00          | 6.03        | QP     |
| 2   | 294.1136        | 26.16          | 14.62         | 40.78          | 46.00          | 5.22        | QP     |
| 3   | 355.4272        | 22.21          | 15.94         | 38.15          | 46.00          | 7.85        | QP     |
| 4   | 477.1693        | 20.78          | 18.32         | 39.10          | 46.00          | 6.90        | QP     |

Vertical:



| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|--------|
| 1   | 37.0248         | 16.54          | 13.44         | 29.98          | 40.00          | 10.02       | QP     |
| 2   | 87.4175         | 17.31          | 11.00         | 28.31          | 40.00          | 11.69       | QP     |
| 3   | 236.6447        | 20.39          | 13.22         | 33.61          | 46.00          | 12.39       | QP     |
| 4   | 477.1693        | 19.12          | 18.32         | 37.44          | 46.00          | 8.56        | QP     |

## Above 1GHz:

| 802.11a         |                   |                       |                 |                          | Test Frequency: 5180MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10360           | 37.76             | 38.96                 | 8.27            | 35.64                    | 49.35                   | 68.2                | -18.85          | Vertical     |
| 15540           | 36.06             | 38.4                  | 10.57           | 35.35                    | 49.68                   | 68.2                | -18.52          | Vertical     |
| 10360           | 36.24             | 38.96                 | 8.27            | 35.64                    | 47.83                   | 68.2                | -20.37          | Horizontal   |
| 15540           | 33.2              | 38.4                  | 10.57           | 35.35                    | 46.82                   | 68.2                | -21.38          | Horizontal   |
| 10360           | 31.09             | 38.96                 | 8.27            | 35.64                    | 42.68                   | 54                  | -11.32          | Vertical     |
| 15540           | 29.03             | 38.4                  | 10.57           | 35.35                    | 42.65                   | 54                  | -11.35          | Vertical     |
| 10360           | 27.06             | 38.96                 | 8.27            | 35.64                    | 38.65                   | 54                  | -15.35          | Horizontal   |
| 15540           | 28.07             | 38.4                  | 10.57           | 35.35                    | 41.69                   | 54                  | -12.31          | Horizontal   |

| 802.11a         |                   |                       |                 |                          | Test Frequency: 5200MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10400           | 35.46             | 39.01                 | 8.29            | 35.67                    | 47.09                   | 68.2                | -21.11          | Vertical     |
| 15600           | 31.61             | 38.3                  | 10.62           | 35.36                    | 45.17                   | 68.2                | -23.03          | Vertical     |
| 10400           | 33.49             | 39.01                 | 8.29            | 35.67                    | 45.12                   | 68.2                | -23.08          | Horizontal   |
| 15600           | 28.79             | 38.3                  | 10.62           | 35.36                    | 42.35                   | 68.2                | -25.85          | Horizontal   |
| 10400           | 28.5              | 39.01                 | 8.29            | 35.67                    | 40.13                   | 54                  | -13.87          | Vertical     |
| 15600           | 26.84             | 38.3                  | 10.62           | 35.36                    | 40.4                    | 54                  | -13.6           | Vertical     |
| 10400           | 23.61             | 39.01                 | 8.29            | 35.67                    | 35.24                   | 54                  | -18.76          | Horizontal   |
| 15600           | 23.6              | 38.3                  | 10.62           | 35.36                    | 37.16                   | 54                  | -16.84          | Horizontal   |

| 802.11a         |                   |                       |                 |                          | Test Frequency: 5240MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10480           | 38.57             | 39.15                 | 8.32            | 35.78                    | 50.26                   | 68.2                | -17.94          | Vertical     |
| 15720           | 34.76             | 38                    | 10.72           | 35.37                    | 48.11                   | 68.2                | -20.09          | Vertical     |
| 10480           | 34.32             | 39.15                 | 8.32            | 35.78                    | 46.01                   | 68.2                | -22.19          | Horizontal   |
| 15720           | 34.49             | 38                    | 10.72           | 35.37                    | 47.84                   | 68.2                | -20.36          | Horizontal   |
| 10480           | 28.28             | 39.15                 | 8.32            | 35.78                    | 39.97                   | 54                  | -14.03          | Vertical     |
| 15720           | 27.46             | 38                    | 10.72           | 35.37                    | 40.81                   | 54                  | -13.19          | Vertical     |
| 10480           | 28.33             | 39.15                 | 8.32            | 35.78                    | 40.02                   | 54                  | -13.98          | Horizontal   |
| 15720           | 23.49             | 38                    | 10.72           | 35.37                    | 36.84                   | 54                  | -17.16          | Horizontal   |

| 802.11n(HT20)   |                   |                       |                 |                          | Test Frequency: 5180MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10360           | 37.76             | 38.96                 | 8.27            | 35.64                    | 49.35                   | 68.2                | -18.85          | Vertical     |
| 15540           | 35.58             | 38.4                  | 10.57           | 35.35                    | 49.2                    | 68.2                | -19             | Vertical     |
| 10360           | 37.81             | 38.96                 | 8.27            | 35.64                    | 49.4                    | 68.2                | -18.8           | Horizontal   |
| 15540           | 34.09             | 38.4                  | 10.57           | 35.35                    | 47.71                   | 68.2                | -20.49          | Horizontal   |
| 10360           | 29.39             | 38.96                 | 8.27            | 35.64                    | 40.98                   | 54                  | -13.02          | Vertical     |
| 15540           | 27.83             | 38.4                  | 10.57           | 35.35                    | 41.45                   | 54                  | -12.55          | Vertical     |
| 10360           | 27.02             | 38.96                 | 8.27            | 35.64                    | 38.61                   | 54                  | -15.39          | Horizontal   |
| 15540           | 28.8              | 38.4                  | 10.57           | 35.35                    | 42.42                   | 54                  | -11.58          | Horizontal   |

| 802.11n(HT20)   |                   |                       |                 |                          | Test Frequency: 5200MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10400           | 35.37             | 39.01                 | 8.29            | 35.67                    | 47                      | 68.2                | -21.2           | Vertical     |
| 15600           | 31.06             | 38.3                  | 10.62           | 35.36                    | 44.62                   | 68.2                | -23.58          | Vertical     |
| 10400           | 33.35             | 39.01                 | 8.29            | 35.67                    | 44.98                   | 68.2                | -23.22          | Horizontal   |
| 15600           | 28.73             | 38.3                  | 10.62           | 35.36                    | 42.29                   | 68.2                | -25.91          | Horizontal   |
| 10400           | 28.45             | 39.01                 | 8.29            | 35.67                    | 40.08                   | 54                  | -13.92          | Vertical     |
| 15600           | 26.68             | 38.3                  | 10.62           | 35.36                    | 40.24                   | 54                  | -13.76          | Vertical     |
| 10400           | 23.26             | 39.01                 | 8.29            | 35.67                    | 34.89                   | 54                  | -19.11          | Horizontal   |
| 15600           | 23.27             | 38.3                  | 10.62           | 35.36                    | 36.83                   | 54                  | -17.17          | Horizontal   |

| 802.11n(HT20)   |                   |                       |                 |                          | Test Frequency: 5240MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10480           | 38.26             | 39.15                 | 8.32            | 35.78                    | 49.95                   | 68.2                | -18.25          | Vertical     |
| 15720           | 35.6              | 38                    | 10.72           | 35.37                    | 48.95                   | 68.2                | -19.25          | Vertical     |
| 10480           | 35.01             | 39.15                 | 8.32            | 35.78                    | 46.7                    | 68.2                | -21.5           | Horizontal   |
| 15720           | 34.28             | 38                    | 10.72           | 35.37                    | 47.63                   | 68.2                | -20.57          | Horizontal   |
| 10480           | 29.9              | 39.15                 | 8.32            | 35.78                    | 41.59                   | 54                  | -12.41          | Vertical     |
| 15720           | 25.77             | 38                    | 10.72           | 35.37                    | 39.12                   | 54                  | -14.88          | Vertical     |
| 10480           | 27.08             | 39.15                 | 8.32            | 35.78                    | 38.77                   | 54                  | -15.23          | Horizontal   |
| 15720           | 24.28             | 38                    | 10.72           | 35.37                    | 37.63                   | 54                  | -16.37          | Horizontal   |

| 802.11n(HT40)   |                   |                       |                 |                          | Test Frequency: 5190MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10380           | 38.13             | 39.01                 | 8.28            | 35.67                    | 49.75                   | 68.2                | -18.45          | Vertical     |
| 15570           | 34.53             | 38.3                  | 10.6            | 35.36                    | 48.07                   | 68.2                | -20.13          | Vertical     |
| 10380           | 35.83             | 39.01                 | 8.28            | 35.67                    | 47.45                   | 68.2                | -20.75          | Horizontal   |
| 15570           | 32.78             | 38.3                  | 10.6            | 35.36                    | 46.32                   | 68.2                | -21.88          | Horizontal   |
| 10380           | 28.71             | 39.01                 | 8.28            | 35.67                    | 40.33                   | 54                  | -13.67          | Vertical     |
| 15570           | 28.18             | 38.3                  | 10.6            | 35.36                    | 41.72                   | 54                  | -12.28          | Vertical     |
| 10380           | 29.74             | 39.01                 | 8.28            | 35.67                    | 41.36                   | 54                  | -12.64          | Horizontal   |
| 15570           | 24.74             | 38.3                  | 10.6            | 35.36                    | 38.28                   | 54                  | -15.72          | Horizontal   |

| 802.11n(HT40)   |                   |                       |                 |                          | Test Frequency: 5230MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10460           | 37.89             | 39.11                 | 8.31            | 35.75                    | 49.56                   | 68.2                | -18.64          | Vertical     |
| 15690           | 35.21             | 38.1                  | 10.7            | 35.37                    | 48.64                   | 68.2                | -19.56          | Vertical     |
| 10460           | 34.79             | 39.11                 | 8.31            | 35.75                    | 46.46                   | 68.2                | -21.74          | Horizontal   |
| 15690           | 33.39             | 38.1                  | 10.7            | 35.37                    | 46.82                   | 68.2                | -21.38          | Horizontal   |
| 10460           | 32.39             | 39.11                 | 8.31            | 35.75                    | 44.06                   | 54                  | -9.94           | Vertical     |
| 15690           | 29.75             | 38.1                  | 10.7            | 35.37                    | 43.18                   | 54                  | -10.82          | Vertical     |
| 10460           | 27.2              | 39.11                 | 8.31            | 35.75                    | 38.87                   | 54                  | -15.13          | Horizontal   |
| 15690           | 27.97             | 38.1                  | 10.7            | 35.37                    | 41.4                    | 54                  | -12.6           | Horizontal   |

| 802.11ac(VHT20) |                   |                       |                 |                          | Test Frequency: 5180MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10360           | 37.92             | 38.96                 | 8.27            | 35.64                    | 49.51                   | 68.2                | -18.69          | Vertical     |
| 15540           | 36.73             | 38.4                  | 10.57           | 35.35                    | 50.35                   | 68.2                | -17.85          | Vertical     |
| 10360           | 37.57             | 38.96                 | 8.27            | 35.64                    | 49.16                   | 68.2                | -19.04          | Horizontal   |
| 15540           | 33.57             | 38.4                  | 10.57           | 35.35                    | 47.19                   | 68.2                | -21.01          | Horizontal   |
| 10360           | 29.88             | 38.96                 | 8.27            | 35.64                    | 41.47                   | 54                  | -12.53          | Vertical     |
| 15540           | 28.8              | 38.4                  | 10.57           | 35.35                    | 42.42                   | 54                  | -11.58          | Vertical     |
| 10360           | 28.76             | 38.96                 | 8.27            | 35.64                    | 40.35                   | 54                  | -13.65          | Horizontal   |
| 15540           | 28.61             | 38.4                  | 10.57           | 35.35                    | 42.23                   | 54                  | -11.77          | Horizontal   |

| 802.11ac(VHT20) |                   |                       |                 |                          | Test Frequency: 5200MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10400           | 34.46             | 39.01                 | 8.29            | 35.67                    | 46.09                   | 68.2                | -22.11          | Vertical     |
| 15600           | 30.67             | 38.3                  | 10.62           | 35.36                    | 44.23                   | 68.2                | -23.97          | Vertical     |
| 10400           | 32.46             | 39.01                 | 8.29            | 35.67                    | 44.09                   | 68.2                | -24.11          | Horizontal   |
| 15600           | 28.01             | 38.3                  | 10.62           | 35.36                    | 41.57                   | 68.2                | -26.63          | Horizontal   |
| 10400           | 28.29             | 39.01                 | 8.29            | 35.67                    | 39.92                   | 54                  | -14.08          | Vertical     |
| 15600           | 26.18             | 38.3                  | 10.62           | 35.36                    | 39.74                   | 54                  | -14.26          | Vertical     |
| 10400           | 22.53             | 39.01                 | 8.29            | 35.67                    | 34.16                   | 54                  | -19.84          | Horizontal   |
| 15600           | 22.55             | 38.3                  | 10.62           | 35.36                    | 36.11                   | 54                  | -17.89          | Horizontal   |

| 802.11ac(VHT20) |                   |                       |                 |                          | Test Frequency: 5240MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10480           | 38.47             | 39.15                 | 8.32            | 35.78                    | 50.16                   | 68.2                | -18.04          | Vertical     |
| 15720           | 35.15             | 38                    | 10.72           | 35.37                    | 48.5                    | 68.2                | -19.7           | Vertical     |
| 10480           | 35.1              | 39.15                 | 8.32            | 35.78                    | 46.79                   | 68.2                | -21.41          | Horizontal   |
| 15720           | 35.91             | 38                    | 10.72           | 35.37                    | 49.26                   | 68.2                | -18.94          | Horizontal   |
| 10480           | 28.8              | 39.15                 | 8.32            | 35.78                    | 40.49                   | 54                  | -13.51          | Vertical     |
| 15720           | 26.45             | 38                    | 10.72           | 35.37                    | 39.8                    | 54                  | -14.2           | Vertical     |
| 10480           | 26.66             | 39.15                 | 8.32            | 35.78                    | 38.35                   | 54                  | -15.65          | Horizontal   |
| 15720           | 24.53             | 38                    | 10.72           | 35.37                    | 37.88                   | 54                  | -16.12          | Horizontal   |

| 802.11ac(VHT40) |                   |                       |                 |                          | Test Frequency: 5190MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10380           | 38.82             | 39.01                 | 8.28            | 35.67                    | 50.44                   | 68.2                | -17.76          | Vertical     |
| 15570           | 34.88             | 38.3                  | 10.6            | 35.36                    | 48.42                   | 68.2                | -19.78          | Vertical     |
| 10380           | 36.14             | 39.01                 | 8.28            | 35.67                    | 47.76                   | 68.2                | -20.44          | Horizontal   |
| 15570           | 31.02             | 38.3                  | 10.6            | 35.36                    | 44.56                   | 68.2                | -23.64          | Horizontal   |
| 10380           | 28.92             | 39.01                 | 8.28            | 35.67                    | 40.54                   | 54                  | -13.46          | Vertical     |
| 15570           | 28.37             | 38.3                  | 10.6            | 35.36                    | 41.91                   | 54                  | -12.09          | Vertical     |
| 10380           | 28.81             | 39.01                 | 8.28            | 35.67                    | 40.43                   | 54                  | -13.57          | Horizontal   |
| 15570           | 26.26             | 38.3                  | 10.6            | 35.36                    | 39.8                    | 54                  | -14.2           | Horizontal   |

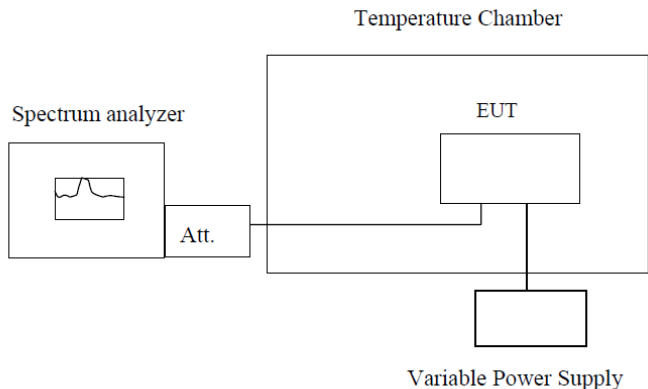
| 802.11ac(VHT40) |                   |                       |                 |                          | Test Frequency: 5230MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10460           | 37.17             | 39.11                 | 8.31            | 35.75                    | 48.84                   | 68.2                | -19.36          | Vertical     |
| 15690           | 34.16             | 38.1                  | 10.7            | 35.37                    | 47.59                   | 68.2                | -20.61          | Vertical     |
| 10460           | 35.34             | 39.11                 | 8.31            | 35.75                    | 47.01                   | 68.2                | -21.19          | Horizontal   |
| 15690           | 32.89             | 38.1                  | 10.7            | 35.37                    | 46.32                   | 68.2                | -21.88          | Horizontal   |
| 10460           | 32.11             | 39.11                 | 8.31            | 35.75                    | 43.78                   | 54                  | -10.22          | Vertical     |
| 15690           | 30.85             | 38.1                  | 10.7            | 35.37                    | 44.28                   | 54                  | -9.72           | Vertical     |
| 10460           | 25.78             | 39.11                 | 8.31            | 35.75                    | 37.45                   | 54                  | -16.55          | Horizontal   |
| 15690           | 28.29             | 38.1                  | 10.7            | 35.37                    | 41.72                   | 54                  | -12.28          | Horizontal   |

| 802.11ac(VHT80) |                   |                       |                 |                          | Test Frequency: 5210MHz |                     |                 |              |
|-----------------|-------------------|-----------------------|-----------------|--------------------------|-------------------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m)          | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 10420           | 38.48             | 39.06                 | 8.29            | 35.71                    | 50.12                   | 68.2                | -18.08          | Vertical     |
| 15630           | 35.96             | 38.2                  | 10.65           | 35.36                    | 49.45                   | 68.2                | -18.75          | Vertical     |
| 10420           | 37.68             | 39.06                 | 8.29            | 35.71                    | 49.32                   | 68.2                | -18.88          | Horizontal   |
| 15630           | 35.1              | 38.2                  | 10.65           | 35.36                    | 48.59                   | 68.2                | -19.61          | Horizontal   |
| 10420           | 31.73             | 39.06                 | 8.29            | 35.71                    | 43.37                   | 54                  | -10.63          | Vertical     |
| 15630           | 30.13             | 38.2                  | 10.65           | 35.36                    | 43.62                   | 54                  | -10.38          | Vertical     |
| 10420           | 26.56             | 39.06                 | 8.29            | 35.71                    | 38.2                    | 54                  | -15.8           | Horizontal   |
| 15630           | 29.01             | 38.2                  | 10.65           | 35.36                    | 42.5                    | 54                  | -11.5           | Horizontal   |

## Notes:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamplifier Factor.
2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

## 7.7 Frequency stability

|                   |                                                                                                                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Requirement: | FCC Part15 C Section 15.407(g)                                                                                                                                                                        |
| Test Method:      | ANSI C63.10:2013, FCC Part 2.1055                                                                                                                                                                     |
| Limit:            | Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified |
| Test Procedure:   | The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.                                                                                            |
| Test setup:       |  <p><b>Note :</b> Measurement setup for testing on Antenna connector</p>                                           |
| Test Instruments: | Refer to section 6 for details                                                                                                                                                                        |
| Test mode:        | Refer to section 5.2 for details                                                                                                                                                                      |
| Test results:     | Pass                                                                                                                                                                                                  |

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

**Measurement data:**

| Frequency stability versus Temp.        |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
|-----------------------------------------|----------------------|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|
| Worst Case Operating Frequency: 5180MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| -30                                     | 5                    | 5180.0339                      | 6.54                        | P   | 5180.0296                      | 5.71                        | P   | 5180.0323                      | 6.24                        | P   | 5180.0333                      | 6.43                        | P   |
| -20                                     | 5                    | 5179.9868                      | -2.55                       | P   | 5179.9915                      | -1.64                       | P   | 5179.9882                      | -2.28                       | P   | 5179.9874                      | -2.43                       | P   |
| -10                                     | 5                    | 5179.975                       | -4.83                       | P   | 5179.9825                      | -3.38                       | P   | 5179.9777                      | -4.31                       | P   | 5179.9751                      | -4.81                       | P   |
| 0                                       | 5                    | 5180.0181                      | 3.49                        | P   | 5180.0245                      | 4.73                        | P   | 5180.0157                      | 3.03                        | P   | 5180.0235                      | 4.54                        | P   |
| 10                                      | 5                    | 5179.9634                      | -7.07                       | P   | 5179.9599                      | -7.74                       | P   | 5179.9571                      | -8.28                       | P   | 5179.9634                      | -7.07                       | P   |
| 20                                      | 5                    | 5179.9497                      | -9.71                       | P   | 5179.952                       | -9.27                       | P   | 5179.9524                      | -9.19                       | P   | 5179.9532                      | -9.03                       | P   |
| 30                                      | 5                    | 5180.0221                      | 4.27                        | P   | 5180.0233                      | 4.5                         | P   | 5180.0248                      | 4.79                        | P   | 5180.0232                      | 4.48                        | P   |
| 40                                      | 5                    | 5180.0062                      | 1.2                         | P   | 5180.0006                      | 0.12                        | P   | 5180.0086                      | 1.66                        | P   | 5179.9951                      | -0.95                       | P   |
| 50                                      | 5                    | 5179.9807                      | -3.73                       | P   | 5179.9751                      | -4.81                       | P   | 5179.9747                      | -4.88                       | P   | 5179.9746                      | -4.9                        | P   |
| Frequency stability versus Voltage.     |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Worst Case Operating Frequency: 5180MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| 25                                      | 4.25                 | 5180.0271                      | 5.23                        | P   | 5179.9904                      | -1.85                       | P   | 5180                           | 0                           | P   | 5180.032                       | 6.18                        | P   |
| 25                                      | 5                    | 5179.993                       | -1.35                       | P   | 5179.9768                      | -4.48                       | P   | 5180.0314                      | 6.06                        | P   | 5179.986                       | -2.7                        | P   |
| 25                                      | 5.75                 | 5179.9753                      | -4.77                       | P   | 5180                           | 0                           | P   | 5179.9895                      | -2.03                       | P   | 5180                           | 0                           | P   |

| Frequency stability versus Temp.        |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
|-----------------------------------------|----------------------|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|
| Worst Case Operating Frequency: 5200MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| -30                                     | 5                    | 5200.01                        | 1.92                        | P   | 5200.0104                      | 2                           | P   | 5200.0075                      | 1.44                        | P   | 5200.0058                      | 1.12                        | P   |
| -20                                     | 5                    | 5199.9899                      | -1.94                       | P   | 5199.9882                      | -2.27                       | P   | 5199.9904                      | -1.85                       | P   | 5199.9946                      | -1.04                       | P   |
| -10                                     | 5                    | 5199.9821                      | -3.44                       | P   | 5199.983                       | -3.27                       | P   | 5199.9745                      | -4.9                        | P   | 5199.9781                      | -4.21                       | P   |
| 0                                       | 5                    | 5200.0175                      | 3.37                        | P   | 5200.0186                      | 3.58                        | P   | 5200.0216                      | 4.15                        | P   | 5200.0161                      | 3.1                         | P   |
| 10                                      | 5                    | 5199.962                       | -7.31                       | P   | 5199.9574                      | -8.19                       | P   | 5199.9568                      | -8.31                       | P   | 5199.9609                      | -7.52                       | P   |
| 20                                      | 5                    | 5199.9496                      | -9.69                       | P   | 5199.9488                      | -9.85                       | P   | 5199.9528                      | -9.08                       | P   | 5199.9497                      | -9.67                       | P   |
| 30                                      | 5                    | 5200.0178                      | 3.42                        | P   | 5200.018                       | 3.46                        | P   | 5200.0243                      | 4.67                        | P   | 5200.0246                      | 4.73                        | P   |
| 40                                      | 5                    | 5200.0027                      | 0.52                        | P   | 5200.0032                      | 0.62                        | P   | 5200.0016                      | 0.31                        | P   | 5200.0031                      | 0.6                         | P   |
| 50                                      | 5                    | 5199.977                       | -4.42                       | P   | 5199.9812                      | -3.62                       | P   | 5199.9841                      | -3.06                       | P   | 5199.9823                      | -3.4                        | P   |
| Frequency stability versus Voltage.     |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Worst Case Operating Frequency: 5200MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| 25                                      | 4.25                 | 5200.0184                      | 3.54                        | P   | 5200.0158                      | 3.04                        | P   | 5200.0146                      | 2.81                        | P   | 5200.0134                      | 2.58                        | P   |
| 25                                      | 5                    | 5199.9874                      | -2.42                       | P   | 5199.9871                      | -2.48                       | P   | 5199.9891                      | -2.1                        | P   | 5199.9905                      | -1.83                       | P   |
| 25                                      | 5.75                 | 5199.9799                      | -3.87                       | P   | 5199.9757                      | -4.67                       | P   | 5199.9791                      | -4.02                       | P   | 5199.9812                      | -3.62                       | P   |

| Frequency stability versus Temp.        |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
|-----------------------------------------|----------------------|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|
| Worst Case Operating Frequency: 5240MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| -30                                     | 5                    | 5240.0273                      | 5.21                        | P   | 5240.0356                      | 6.79                        | P   | 5240.0337                      | 6.43                        | P   | 5240.0312                      | 5.95                        | P   |
| -20                                     | 5                    | 5239.993                       | -1.34                       | P   | 5239.9884                      | -2.21                       | P   | 5239.9879                      | -2.31                       | P   | 5239.9896                      | -1.98                       | P   |
| -10                                     | 5                    | 5239.9791                      | -3.99                       | P   | 5239.979                       | -4.01                       | P   | 5239.9796                      | -3.89                       | P   | 5239.9813                      | -3.57                       | P   |
| 0                                       | 5                    | 5240.0214                      | 4.08                        | P   | 5240.0189                      | 3.61                        | P   | 5240.0238                      | 4.54                        | P   | 5240.0216                      | 4.12                        | P   |
| 10                                      | 5                    | 5239.9534                      | -8.89                       | P   | 5239.9534                      | -8.89                       | P   | 5239.9602                      | -7.6                        | P   | 5239.9584                      | -7.94                       | P   |
| 20                                      | 5                    | 5239.9511                      | -9.33                       | P   | 5239.9502                      | -9.5                        | P   | 5239.9499                      | -9.56                       | P   | 5239.9501                      | -9.52                       | P   |
| 30                                      | 5                    | 5240.0228                      | 4.35                        | P   | 5240.0257                      | 4.9                         | P   | 5240.0233                      | 4.45                        | P   | 5240.016                       | 3.05                        | P   |
| 40                                      | 5                    | 5240.0035                      | 0.67                        | P   | 5240.0102                      | 1.95                        | P   | 5239.9998                      | -0.04                       | P   | 5239.9971                      | -0.55                       | P   |
| 50                                      | 5                    | 5239.9797                      | -3.87                       | P   | 5239.9806                      | -3.7                        | P   | 5239.9822                      | -3.4                        | P   | 5239.9786                      | -4.08                       | P   |
| Frequency stability versus Voltage.     |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Worst Case Operating Frequency: 5240MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| 25                                      | 4.25                 | 5239.9768                      | -4.43                       | P   | 5239.9745                      | -4.87                       | P   | 5240                           | 0                           | P   | 5239.978                       | -4.2                        | P   |
| 25                                      | 5                    | 5240.0195                      | 3.72                        | P   | 5240.0204                      | 3.89                        | P   | 5240.0193                      | 3.68                        | P   | 5240.0259                      | 4.94                        | P   |
| 25                                      | 5.75                 | 5240.0068                      | 1.3                         | P   | 5240.007                       | 1.34                        | P   | 5240.0087                      | 1.66                        | P   | 5239.9981                      | -0.36                       | P   |

| Frequency stability versus Temp.        |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
|-----------------------------------------|----------------------|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|
| Worst Case Operating Frequency: 5190MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| -30                                     | 5                    | 5190.0248                      | 4.78                        | P   | 5190.0104                      | 2                           | P   | 5190.0233                      | 4.49                        | P   | 5190.0128                      | 2.47                        | P   |
| -20                                     | 5                    | 5189.9895                      | -2.02                       | P   | 5189.9914                      | -1.66                       | P   | 5189.9857                      | -2.76                       | P   | 5189.9897                      | -1.98                       | P   |
| -10                                     | 5                    | 5189.9808                      | -3.7                        | P   | 5189.9773                      | -4.37                       | P   | 5189.9834                      | -3.2                        | P   | 5189.9821                      | -3.45                       | P   |
| 0                                       | 5                    | 5190.0189                      | 3.64                        | P   | 5190.0157                      | 3.03                        | P   | 5190.0171                      | 3.29                        | P   | 5190.025                       | 4.82                        | P   |
| 10                                      | 5                    | 5189.9548                      | -8.71                       | P   | 5189.9605                      | -7.61                       | P   | 5189.9551                      | -8.65                       | P   | 5189.9626                      | -7.21                       | P   |
| 20                                      | 5                    | 5189.9496                      | -9.71                       | P   | 5189.9491                      | -9.81                       | P   | 5189.9528                      | -9.09                       | P   | 5189.95                        | -9.63                       | P   |
| 30                                      | 5                    | 5190.0203                      | 3.91                        | P   | 5190.018                       | 3.47                        | P   | 5190.0234                      | 4.51                        | P   | 5190.0205                      | 3.95                        | P   |
| 40                                      | 5                    | 5190.0095                      | 1.83                        | P   | 5190.0053                      | 1.02                        | P   | 5190.0043                      | 0.83                        | P   | 5190.003                       | 0.58                        | P   |
| 50                                      | 5                    | 5189.9797                      | -3.91                       | P   | 5189.9804                      | -3.78                       | P   | 5189.978                       | -4.24                       | P   | 5189.9765                      | -4.53                       | P   |
| Frequency stability versus Voltage.     |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Worst Case Operating Frequency: 5190MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| 25                                      | 4.25                 | 5189.9807                      | -3.72                       | P   | 5189.9881                      | -2.29                       | P   | 5189.9848                      | -2.93                       | P   | 5189.9797                      | -3.91                       | P   |
| 25                                      | 5                    | 5190.02                        | 3.85                        | P   | 5190.0174                      | 3.35                        | P   | 5190.0228                      | 4.39                        | P   | 5190.0226                      | 4.35                        | P   |
| 25                                      | 5.75                 | 5190                           | 0                           | P   | 5190.0049                      | 0.94                        | P   | 5190.0071                      | 1.37                        | P   | 5190.0059                      | 1.14                        | P   |

| Frequency stability versus Temp.        |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
|-----------------------------------------|----------------------|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|
| Worst Case Operating Frequency: 5230MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| -30                                     | 5                    | 5230.0112                      | 2.14                        | P   | 5230.0228                      | 4.36                        | P   | 5230.0186                      | 3.56                        | P   | 5230.0229                      | 4.38                        | P   |
| -20                                     | 5                    | 5229.9943                      | -1.09                       | P   | 5229.9936                      | -1.22                       | P   | 5229.988                       | -2.29                       | P   | 5229.9901                      | -1.89                       | P   |
| -10                                     | 5                    | 5229.9834                      | -3.17                       | P   | 5229.9763                      | -4.53                       | P   | 5229.9808                      | -3.67                       | P   | 5229.9768                      | -4.44                       | P   |
| 0                                       | 5                    | 5230.0208                      | 3.98                        | P   | 5230.0175                      | 3.35                        | P   | 5230.0198                      | 3.79                        | P   | 5230.0179                      | 3.42                        | P   |
| 10                                      | 5                    | 5229.9564                      | -8.34                       | P   | 5229.9605                      | -7.55                       | P   | 5229.9631                      | -7.06                       | P   | 5229.9596                      | -7.72                       | P   |
| 20                                      | 5                    | 5229.9507                      | -9.43                       | P   | 5229.9496                      | -9.64                       | P   | 5229.9491                      | -9.73                       | P   | 5229.9523                      | -9.12                       | P   |
| 30                                      | 5                    | 5230.0236                      | 4.51                        | P   | 5230.018                       | 3.44                        | P   | 5230.0235                      | 4.49                        | P   | 5230.0203                      | 3.88                        | P   |
| 40                                      | 5                    | 5230.0094                      | 1.8                         | P   | 5230.0087                      | 1.66                        | P   | 5230.0039                      | 0.75                        | P   | 5230.0039                      | 0.75                        | P   |
| 50                                      | 5                    | 5229.982                       | -3.44                       | P   | 5229.9824                      | -3.37                       | P   | 5229.9823                      | -3.38                       | P   | 5229.9819                      | -3.46                       | P   |
| Frequency stability versus Voltage.     |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Worst Case Operating Frequency: 5230MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| 25                                      | 4.25                 | 5229.9526                      | -9.06                       | P   | 5229.9872                      | -2.45                       | P   | 5230                           | 0                           | P   | 5229.9884                      | -2.22                       | P   |
| 25                                      | 5                    | 5230.0187                      | 3.58                        | P   | 5230.0186                      | 3.56                        | P   | 5230.0207                      | 3.96                        | P   | 5230.0163                      | 3.12                        | P   |
| 25                                      | 5.75                 | 5229.9951                      | -0.94                       | P   | 5230.0104                      | 1.99                        | P   | 5230.0092                      | 1.76                        | P   | 5230.0042                      | 0.8                         | P   |

| Frequency stability versus Temp.        |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
|-----------------------------------------|----------------------|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|--------------------------------|-----------------------------|-----|
| Worst Case Operating Frequency: 5210MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| -30                                     | 5                    | 5210.0181                      | 3.47                        | P   | 5210.0183                      | 3.51                        | P   | 5210.0116                      | 2.23                        | P   | 5210.0158                      | 3.03                        | P   |
| -20                                     | 5                    | 5209.9942                      | -1.11                       | P   | 5209.9861                      | -2.67                       | P   | 5209.9877                      | -2.36                       | P   | 5209.994                       | -1.15                       | P   |
| -10                                     | 5                    | 5209.9774                      | -4.34                       | P   | 5209.9748                      | -4.84                       | P   | 5209.9763                      | -4.55                       | P   | 5209.9781                      | -4.2                        | P   |
| 0                                       | 5                    | 5210.0196                      | 3.76                        | P   | 5210.0232                      | 4.45                        | P   | 5210.0196                      | 3.76                        | P   | 5210.0249                      | 4.78                        | P   |
| 10                                      | 5                    | 5209.9575                      | -8.16                       | P   | 5209.9561                      | -8.43                       | P   | 5209.9607                      | -7.54                       | P   | 5209.9586                      | -7.95                       | P   |
| 20                                      | 5                    | 5209.953                       | -9.02                       | P   | 5209.9496                      | -9.67                       | P   | 5209.9486                      | -9.87                       | P   | 5209.948                       | -9.98                       | P   |
| 30                                      | 5                    | 5210.0169                      | 3.24                        | P   | 5210.0213                      | 4.09                        | P   | 5210.0218                      | 4.18                        | P   | 5210.0179                      | 3.44                        | P   |
| 40                                      | 5                    | 5209.9963                      | -0.71                       | P   | 5210.0079                      | 1.52                        | P   | 5210.0039                      | 0.75                        | P   | 5209.9996                      | -0.08                       | P   |
| 50                                      | 5                    | 5209.9769                      | -4.43                       | P   | 5209.9825                      | -3.36                       | P   | 5209.9821                      | -3.44                       | P   | 5209.9844                      | -2.99                       | P   |
| Frequency stability versus Voltage.     |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Worst Case Operating Frequency: 5210MHz |                      |                                |                             |     |                                |                             |     |                                |                             |     |                                |                             |     |
| Temp.<br>(°C)                           | Power<br>Supply(VDC) | 0 minute                       |                             |     | 2 minute                       |                             |     | 5 minute                       |                             |     | 10 minute                      |                             |     |
|                                         |                      | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F | Measured<br>Frequency<br>(MHz) | Frequency<br>Error<br>(ppm) | P/F |
| 25                                      | 4.25                 | 5209.9838                      | -3.11                       | P   | 5209.9835                      | -3.17                       | P   | 5210                           | 0                           | P   | 5209.9745                      | -4.89                       | P   |
| 25                                      | 5                    | 5210.0204                      | 3.92                        | P   | 5210.0203                      | 3.9                         | P   | 5210.0199                      | 3.82                        | P   | 5210.0168                      | 3.22                        | P   |
| 25                                      | 5.75                 | 5209.9976                      | -0.46                       | P   | 5210.0058                      | 1.11                        | P   | 5210.003                       | 0.58                        | P   | 5210.0048                      | 0.92                        | P   |

Note: P for PASS and F for Fail.

## 8 Test Setup Photo

Reference to the **appendix I** for details.

## 9 EUT Constructional Details

Reference to the **appendix II** for details.

---END---