# TEST REPORT

FCC UNII Test for LGSWAAC63
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2508-FC004-R2

DATE OF ISSUE
August 22, 2025

Tested by
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Accredited by KOLAS, Republic of KOREA

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| | |
|---|---|
| Applicant | **LG Electronics Inc.**<br>222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Republic of Korea |
| Product Name<br>Model Name | RF Module<br>LGSWAAC63 |
| FCC ID | 2BO3LLGSWAAC63 |
| Date of Test | June 18, 2025 ~ August 04, 2025 |
| FCC Classification | Unlicensed National Information Infrastructure(NII) |
| Test Standard Used | FCC Rule Part(s): Part 15.407 |
| Test Results | PASS |
| Location of Test | ■ Permanent Testing Lab ☐ On Site Testing Lab<br>(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea) |
| Brand | LG |

## REVISION HISTORY

The revision history for this test report is shown in table.

| Revision No. | Date of Issue | Description |
|---|---|---|
| 0 | August 06, 2025 | Initial Release |
| 1 | August 19, 2025 | We removed the Note in section 10.9. |
| 2 | August 22, 2025 | Corrected the antenna type. |

## Notice

| Content |
|---|
| Engineering Statement:<br>The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.<br><br>The laboratory is not accredited for the test results marked *.<br>Information provided by the applicant is marked **.<br>Test results provided by external providers are marked ***.<br><br>The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.<br>The test results have only been applied with the test methods required by the standard(s).<br><br>When confirmation of authenticity of this test report is required, please contact www.hct.co.kr<br><br>This test report provides test result(s) under the scope accredited by the Korea Laboratory Accreditation Scheme (KOLAS), which signed the ILAC-MRA.<br>(KOLAS (KS Q ISO/IEC 17025) Accreditation No. KT197) |

## CONTENTS

# 1. GENERAL INFORMATION

## EUT DESCRIPTION

| | | |
|---|---|---|
| **Model** | LGSWAAC63 | |
| **Additional Model** | - | |
| **EUT Type** | RF Module | |
| **Power Supply** | DC 3.30 V | |
| **Modulation Type** | OFDM : 802.11a, 802.11n, 802.11ac | |
| **Frequency Range (MHz)** | U-NII-1 | 20 MHz BW : 5180 - 5240<br>40 MHz BW : 5190 - 5230<br>80 MHz BW : 5210 |
| | U-NII-2A | 20 MHz BW : 5260 - 5320<br>40 MHz BW : 5270 - 5310<br>80 MHz BW : 5290 |
| | U-NII-2C | 20 MHz BW : 5500 - 5720<br>40 MHz BW : 5510 - 5710<br>80 MHz BW : 5530 – 5690 |
| | U-NII-3 | 20 MHz BW : 5745 - 5825<br>40 MHz BW : 5755 - 5795<br>80 MHz BW : 5775 |
| **Straddle channel** | Supported | |
| **TDWR Band** | Supported | |
| **Dynamic Frequency Selection** | Slave without radar detection | |
| **Antenna Specification** | Type: Metal press | |
| **Serial number** | Radiated : 9C:12:21:00:00:D2<br>Conducted : 9C:12:21:00:00:A0 | |

## ANTENNA CONFIGURATIONS

1. Antenna configuration

| Configurations | SISO | | MIMO | |
|---|---|---|---|---|
| | Ant.1 | Ant.2 | CDD | SDM |
| 802.11a | O | O | O | X |
| 802.11n | O | O | O | O |
| 802.11ac | O | O | O | O |

**Note:**

(1) O = Support, X = Not Support

(2) SISO = Single Input Single Output

(3) SDM = Spatial Diversity Multiplexing

(4) CDD = Cyclic Delay Diversity

2. This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 2.4 GHz and 5 GHz Bands simultaneously on each antenna.

| Simultaneous transmission Scenario | 2.4 GHz WiFi | 5 GHz WiFi | Bluetooth | Test Case |
|---|---|---|---|---|
| Bluetooth + 2.4 GHz WiFi | on | - | on | Scenario1 |
| Bluetooth + 5 GHz WiFi | - | on | on | Scenario2 |

### 3. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) e) (iii), f) ii)

$$\text{Directional Gain(CDD)} = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\{\sum_{k=1}^{N_{ANT}} g_{j,k}\}^2}{N_{ANT}}\right]$$

Directional gain(SDM) = Gmax + 10·LOG($N_{ANT}$/ $N_{ss}$)

| Band | Ant Gain (dBi) | | $N_{ANT}$/ $N_{ss}$ | Directional Gain (dBi) | |
|---|---|---|---|---|---|
| | ANT1 | ANT2 | | CDD | SDM |
| UNII 1 | -1.60 | 2.09 | 2 / 2 | 3.45 | 2.09 |
| UNII 2A | -0.39 | 2.09 | | 3.95 | 2.09 |
| UNII 2C | 1.80 | 2.02 | | 4.92 | 2.02 |
| UNII 3 | 2.19 | 2.23 | | 5.22 | 2.23 |

**Note**

According to Ansi C63.10-2013 section 14.4.3, the directional gain is calculated using the formula, where GN is the gain of the nth antenna and NANT is the total number of antennas used.

Directional gain(CDD) = 10·log(((10$^{(ANT1\ Gain/20)}$+10$^{(ANT2\ Gain/20)}$)$^2$)/2) dBi

Directional gain(SDM) = Gmax + 10·LOG($N_{ANT}$/ $N_{ss}$)

**Sample Calculation (Conducted Power, MIMO):**

Ex) Ant 1 : 11.58 dBm  Ant 2 : 12.08 dBm

Ant1 + Ant 2 = MIMO

(11.58 dBm + 12.08 dBm) = (14.387 mW + 16.143 mW) = 30.53 mW = 14.88 dBm

**Sample Calculation (E.I.R.P & E.I.R.P Spectral Density, MIMO):**

Ex) ANT1 : 15.35 dBm , ANT2 : 15.12 dBm, Directional Gain : 3 dBi

Conducted Power = (15.35 dBm + 15.12 dBm) = (34.276 mW + 32.508 mW) = 66.784 mW = 18.25 dBm

E.I.R.P = 18.25 dBm + 3 dBi = 21.25 dBm

## 2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

| Band | Mode | MIMO_CDD(Ant.1+ Ant.2) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Ant.1 Power | | Ant.2 Power | | Ant.1 + Ant.2 Power | |
| | | (dBm) | (W) | (dBm) | (W) | (dBm) | (W) |
| UNII1 | 802.11a | 13.68 | 0.023 | 13.15 | 0.021 | 16.43 | 0.044 |
| | 802.11n (HT20) | 13.61 | 0.023 | 12.72 | 0.019 | 16.20 | 0.042 |
| | 802.11n (HT40) | 13.51 | 0.022 | 12.59 | 0.018 | 16.09 | 0.041 |
| | 802.11ac (VHT20) | 13.48 | 0.022 | 12.80 | 0.019 | 16.16 | 0.041 |
| | 802.11ac (VHT40) | 13.31 | 0.021 | 12.72 | 0.019 | 16.04 | 0.040 |
| | 802.11ac (VHT80) | 13.16 | 0.021 | 12.39 | 0.017 | 15.81 | 0.038 |
| UNII2A | 802.11a | 13.60 | 0.023 | 12.77 | 0.019 | 16.22 | 0.042 |
| | 802.11n (HT20) | 13.47 | 0.022 | 12.69 | 0.019 | 16.11 | 0.041 |
| | 802.11n (HT40) | 13.26 | 0.021 | 12.79 | 0.019 | 16.04 | 0.040 |
| | 802.11ac (VHT20) | 13.52 | 0.023 | 12.63 | 0.018 | 16.11 | 0.041 |
| | 802.11ac (VHT40) | 13.15 | 0.021 | 12.87 | 0.019 | 16.02 | 0.040 |
| | 802.11ac (VHT80) | 12.66 | 0.018 | 12.07 | 0.016 | 15.38 | 0.035 |
| UNII2C | 802.11a | 13.76 | 0.024 | 13.11 | 0.020 | 16.46 | 0.044 |
| | 802.11n (HT20) | 13.54 | 0.023 | 13.02 | 0.020 | 16.30 | 0.043 |
| | 802.11n (HT40) | 13.45 | 0.022 | 12.79 | 0.019 | 16.14 | 0.041 |
| | 802.11ac (VHT20) | 13.44 | 0.022 | 13.06 | 0.020 | 16.26 | 0.042 |
| | 802.11ac (VHT40) | 13.58 | 0.023 | 12.80 | 0.019 | 16.22 | 0.042 |
| | 802.11ac (VHT80) | 12.69 | 0.019 | 12.32 | 0.017 | 15.52 | 0.036 |
| UNII3 | 802.11a | 13.54 | 0.023 | 12.87 | 0.019 | 16.23 | 0.042 |
| | 802.11n (HT20) | 13.49 | 0.022 | 12.65 | 0.018 | 16.10 | 0.041 |
| | 802.11n (HT40) | 13.30 | 0.021 | 12.81 | 0.019 | 16.07 | 0.040 |
| | 802.11ac (VHT20) | 13.54 | 0.023 | 13.06 | 0.020 | 16.32 | 0.043 |
| | 802.11ac (VHT40) | 13.37 | 0.022 | 12.82 | 0.019 | 16.11 | 0.041 |
| | 802.11ac (VHT80) | 12.84 | 0.019 | 13.27 | 0.021 | 16.07 | 0.040 |

## 3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’ were used in the measurement.

### EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

### GENERAL TEST PROCEDURES

**Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average Measurement Typeor modes.

**Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

### DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

## 4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.
Detailed description of test facility was submitted to the Commission and accepted dated March 11, 2024 (Registration Number: KR0032).

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak Measurement Typeors are used to perform radiated measurements.
Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

## 6. ANTENNA REQUIREMENTS

**According to FCC 47 CFR § 15.203, § 15.407:**

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of § 15.203, § 15.407

## 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the $U_{CISPR}$ measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

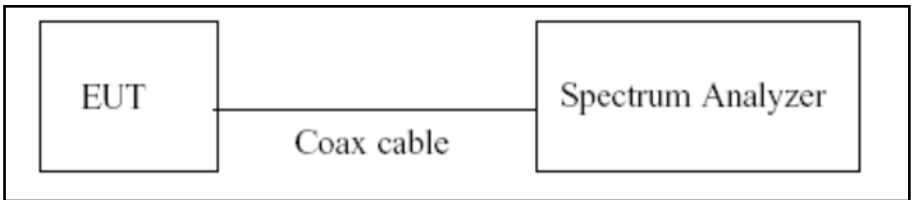
| Parameter | Expanded Uncertainty (±kHz) |
|---|---|
| X dB, 99% Bandwidth | 95 (Confidence level about 95 %, *k=2*) |
| Frequency stability | 28 (Confidence level about 95 %, *k=2*) |

| Parameter | Expanded Uncertainty (±dB) |
|---|---|
| Conducted Disturbance (150 kHz ~ 30 MHz) | 1.54 ( Confidence level about 95 %, *k=2*) |
| Conducted Output Power(Power Meter) | 0.54 (Confidence level about 95 %, k=2) |
| Conducted Output Power(Signal Analyzer) | 0.68 (Confidence level about 95 %, k=2) |
| Power Spectral Density | 1.03 (Confidence level about 95 %, k=2) |
| Radiated Disturbance (9 kHz ~ 30 MHz) | 4.36 (Confidence level about 95 %, *k*=2) |
| Radiated Disturbance (30 MHz ~ 1 GHz) | 5.68 (Confidence level about 95 %, *k*=2) |
| Radiated Disturbance (1 GHz ~ 18 GHz) | 5.75 (Confidence level about 95 %, *k*=2) |
| Radiated Disturbance (18 GHz ~ 40 GHz) | 5.82 (Confidence level about 95 %, *k*=2) |

# 8. DESCRIPTION OF TESTS

## 8.1. Duty Cycle

**Test Configuration**




**Test Procedure**

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure B.2 in KDB 789033 D02 v02r01.

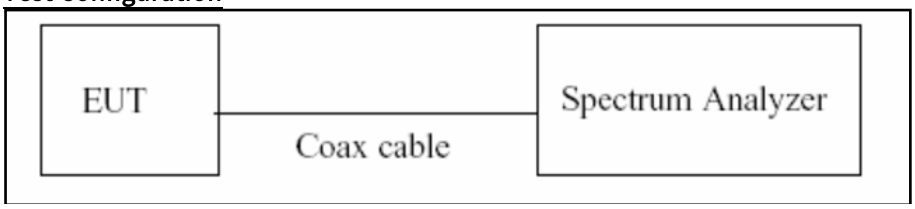
1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Measurement Typeor = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure $T_{total}$ and $T_{on}$
8. Calculate Duty Cycle = $T_{on}$/ $T_{total}$ and Duty Cycle Factor = 10log(1/Duty Cycle)

## 8.2. 6 dB Bandwidth & 26 dB Bandwidth

**Limit**

Within the 5.725-5.85 GHz(NII-3) band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

**Test Configuration**




**Test Procedure (26 dB Bandwidth)**

The transmitter output is connected to the Spectrum Analyzer.
We tested according to Procedure C.1 in KDB 789033 D02 v02r01.

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

**Test Procedure (6 dB Bandwidth)**

The transmitter output is connected to the Spectrum Analyzer.
We tested according to Procedure C.2 in KDB 789033 D02 v02r01.

1. RBW = 100 kHz
2. VBW ≥ 3 x RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum lever measured in the fundamental emission.

**Note:**

1. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.
2. DFS test channels should be defined. So, we performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.
3. The 26 dB bandwidth is used to determine the conducted power limits.

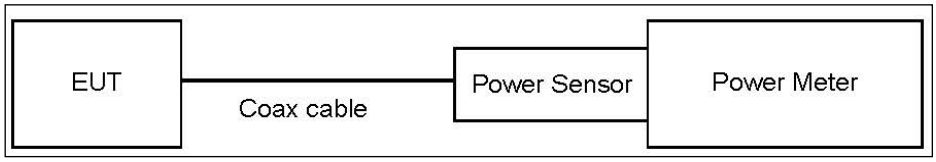
## 8.3. Output Power Measurement

**Limit**

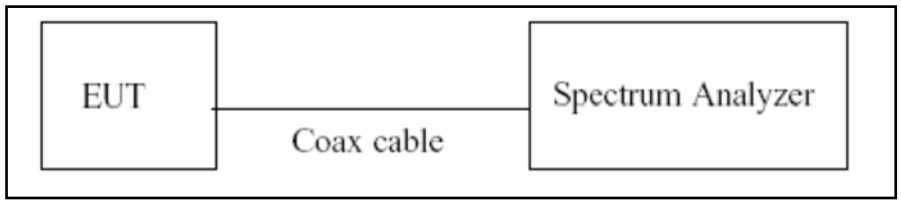
| Band | Limit |
|---|---|
| UNII 1 | - Master : Not exceed 1 W(=30 dBm)<br>- Slave : Not exceed 250 mW(=23.98 dBm) |
| UNII 2A, 2C | Not exceed the lesser of 250 mW or 11 dBm + 10 log B,<br>(where B is the 26 dB emission bandwidth in megahertz.) |
| UNII 3 | Not exceed 1 W(=30 dBm) |

**Test Configuration**

Power Meter




Spectrum Analyzer(Only Straddle Channel)




**Test Procedure(Power Meter)**

We tested according to Procedure E.3.a in KDB 789033 D02 v02r01.

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

**Test Procedure (Spectrum Analyzer)**

The transmitter output is connected to the Spectrum Analyzer.

We use the spectrum analyzer's integrated band power measurement function.

We tested according to Procedure E.2.d) in KDB 789033 D02 v02r01.

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW ≥ 3 MHz.
5. Number of points in sweep ≥ 2 x span/RBW.
6. Sweep time = auto.
7. Measurement Typeor = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. Add 10log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

**Sample Calculation**

Total Power(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

**Note**

1. Spectrum Measured Levels are not plot data.

   The power results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Actual value of loss for the attenuator and cable combination is below table.

| Band | Loss(dB) |
|---|---|
| UNII 1 | 11.98 |
| UNII 2A | 11.98 |
| UNII 2C | 11.98 |
| UNII 3 | 11.98 |

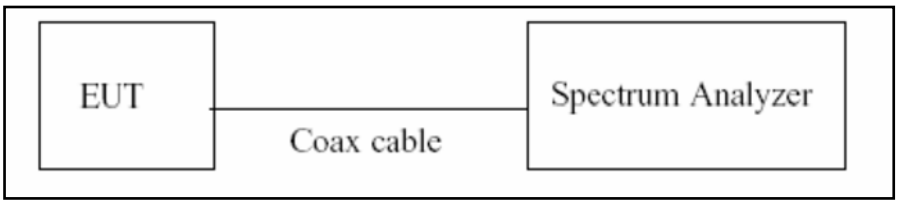
(Actual value of loss for the attenuator and cable combination)

## 8.4. Power Spectral Density

**Limit**

| Band | Limit |
|---|---|
| UNII 1 | 11 dBm/MHz |
| UNII 2A, 2C | 11 dBm/MHz |
| UNII 3 | 30 dBm/500 kHz |

**Test Configuration**




**Test Procedure**

We tested according to Procedure F in KDB 789033 D02 v02r01.

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
   ➔For portion within the NII-3 be used RBW 510kHz
3. VBW ≥ 3 MHz
4. Number of points in sweep ≥ 2 x span/RBW.
5. Sweep time = auto.
6. Measurement Typeor = RMS(i.e., power averaging), if available. Otherwise, use sample Measurement Typeor mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.

**Sample Calculation**

Total PSD(dBm) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

**Note**

1. Spectrum Measured Levels are not plot data.
   The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Actual value of loss for the attenuator and cable combination is below table.

| Band | Loss(dB) |
|---|---|
| UNII 1 | 11.98 |
| UNII 2A | 11.98 |
| UNII 2C | 11.98 |
| UNII 3 | 11.98 |

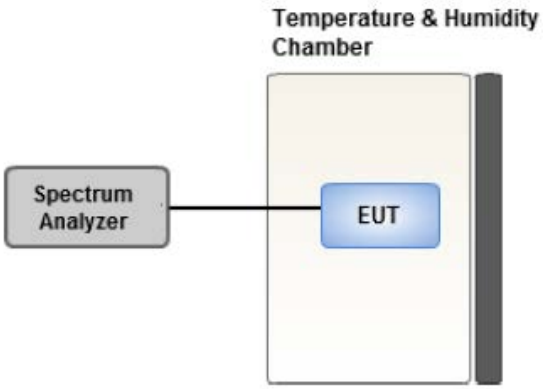
(Actual value of loss for the attenuator and cable combination)

## 8.5. Frequency Stability

**Limit**

Maintained within the band

**Test Configuration**




**Test Procedure**

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 °C and 50 °C.
2. The temperature was incremented by 10 °C intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.
3. The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battety operating end point which shall be specified by the manufacturer.
4. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON
   and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after
   the EUT is energized. Four measurements in total are made.

## 8.6. AC Power line Conducted Emissions

### Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

| Frequency Range (MHz) | Limits (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56[a] | 56 to 46[a] |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

[a]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

### Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Measurement Typeors : Quasi Peak and Average Measurement Typeor.

### Sample Calculation

Quasi-peak(Final Result) = Measured Value + Correction Factor

## 8.7. Radiated Test

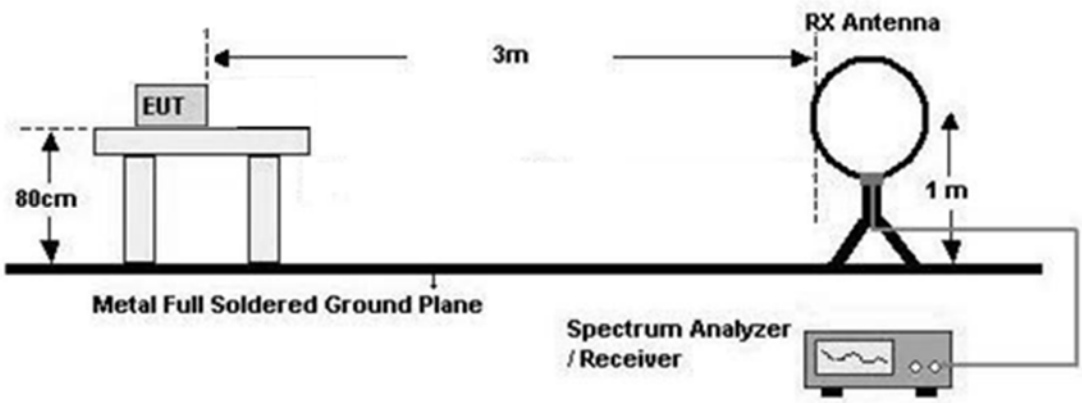
**Limit**

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz.
2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.
3. UNII 3: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

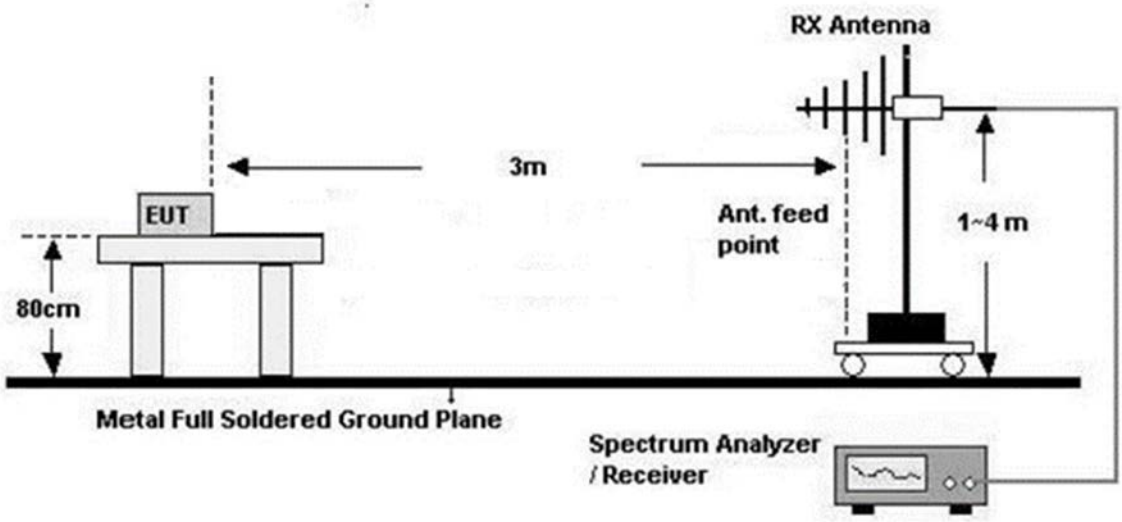
| Frequency (MHz) | Field Strength (μV/m) | Measurement Distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

## Test Configuration

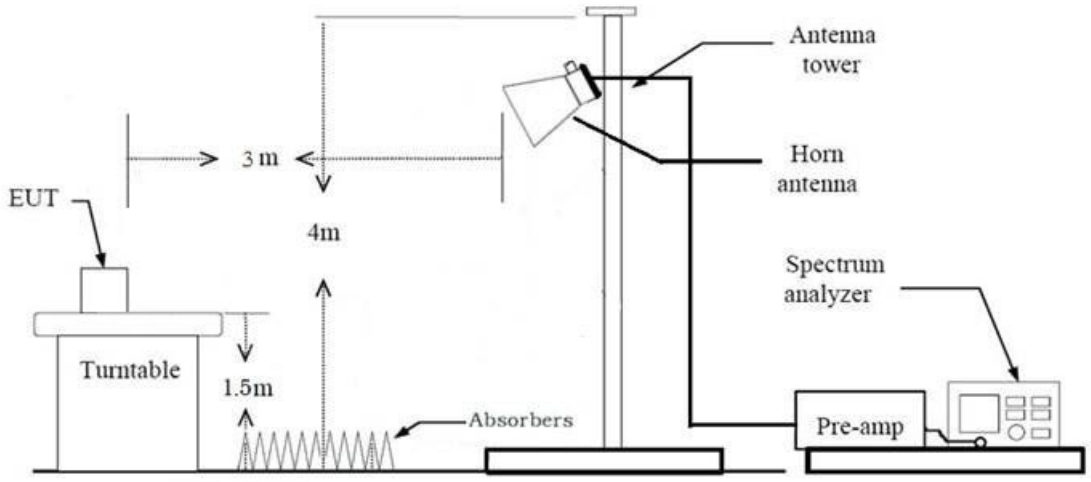
Below 30 MHz




30 MHz - 1 GHz



Above 1 GHz




**Test Procedure of Radiated spurious emissions (Below 30 MHz)**

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. .We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) =40log(3 m/300 m)= - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) =40log(3 m/30 m)= - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Max Hold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
9. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions (Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Max Hold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz

   ※In general, (1) is used mainly
7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

**Test Procedure of Radiated spurious emissions (Above 1 GHz)**

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Spectrum Setting

(1) Measurement Type (Peak, G.5 in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

(2) Measurement Type (Average, G.6.c in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = power averaging (rms), if span/(# of points in sweep) ≤ RBW/2. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, the detector mode shall be set to peak.
- Averaging type = power averaging (rms)

As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

- Sweep time = auto.
- Trace mode = Max Hold.
- Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, the number of traces shall be increased by a factor of 1/x, where x is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—rather than turning on and off with the transmit cycle, at least 100 traces shall be averaged.)
- If tests are performed with the EUT transmitting at a duty cycle less than 98%, a correction

factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

- If power averaging (rms) mode was used in II.G.6.c)(iv), the correction factor is 10 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB must be added to the measured emission levels.
- If linear voltage averaging mode was used in II.G.6.c)(iv), the correction factor is 20 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB must be added to the measured emission levels.
- If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor
9. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Distance Factor(D.F)

**Test Procedure of Radiated Restricted Band Edge**

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Spectrum Setting
   (1) Measurement Type(Peak, G.5 in KDB 789033 v02r01):
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep Time = auto
   - Trace mode = Max Hold
   - Allow sweeps to continue until the trace stabilizes.

   Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

   (2) Measurement Type(Average, G.6.d in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW(Duty cycle ≥ 98 percent) = VBW ≤ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW ≥ 1/T, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.

8. Measured Frequency Range :
   - 4 500 MHz ~ 5 150 MHz
   - 5 350 MHz ~ 5 460 MHz
   - 5 460 MHz ~ 5 470 MHz
   - (75 MHz or more below the 5 725 MHz) ~ 5 725 MHz
   - 5 850 MHz ~ (75 MHz or more above the 5 850 MHz)
9. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
10. Total

(1)Measurement(Peak)

= Measured Value(Peak)

(2)Measurement(Avg)

= Measured Value (Avg)

- We apply to the offset in the range 1 GHz - 18 GHz.
- The offset = Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F) – Amp. Gain(A.G) + Attenuator (ATT)

The actual setting value of VBW

[Ant.1]

| Mode | Worst Data rate | Duty Cycle | Duty Cycle Factor (dB) | The actual setting value of VBW (Hz) |
|---|---|---|---|---|
| 802.11a | 6 Mbps | 0.843 | 0.744 | 1 000 |
| 802.11n(HT20) | MCS 0 | 0.835 | 0.785 | 1 000 |
| 802.11n(HT40) | MCS 0 | 0.715 | 1.455 | 3 000 |
| 802.11ac(VHT20) | MCS 0 | 0.835 | 0.782 | 1 000 |
| 802.11ac(VHT40) | MCS 0 | 0.715 | 1.457 | 3 000 |
| 802.11ac(VHT80) | MCS 0 | 0.556 | 2.548 | 5 000 |

[Ant.2]

| Mode | Worst Data rate | Duty Cycle | Duty Cycle Factor (dB) | The actual setting value of VBW (Hz) |
|---|---|---|---|---|
| 802.11a | 6 Mbps | 0.843 | 0.744 | 1 000 |
| 802.11n(HT20) | MCS 0 | 0.835 | 0.785 | 1 000 |
| 802.11n(HT40) | MCS 0 | 0.715 | 1.455 | 3 000 |
| 802.11ac(VHT20) | MCS 0 | 0.835 | 0.783 | 1 000 |
| 802.11ac(VHT40) | MCS 0 | 0.717 | 1.446 | 3 000 |
| 802.11ac(VHT80) | MCS 0 | 0.556 | 2.548 | 5 000 |

## 8.8. Worst case configuration and mode

**Radiated test**

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone
   - Worstcase : Stand alone
2. All configurations of antenna were investigated and the worst case configuration results are reported.
   - Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(CDD,SDM)
   - Worstcase : Ant1+Ant2(CDD)
3. EUT Axis
   - Radiated Spurious Emissions : X
   - Radiated Restricted Band Edge : Z
4. All datarate of operation were investigated and the worst case datarate results are reported
   - 802.11a : 6 Mbps
   - 802.11n_HT20 : MCS0
   - 802.11n_HT40 : MCS0
   - 802.11ac_VHT20 : MCS0
   - 802.11ac_VHT40 : MCS0
   - 802.11ac_VHT80 : MCS0
5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
   - Position : Horizontal, Vertical, Parallel to the ground plane
6. Radiated Spurious Emission
   - All modulation of operation were investigated and the worst case modulation results are reported.

   Worst-case : 802.11a_6 Mbps

**AC Power line Conducted Emissions**

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone
   - Worstcase : Stand alone

**Conducted test**

1. All datarate of operation were investigated and the worst case datarate results are reported.

**Radiated test(Simultaneous transmission Scenario)**

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone
   - Worstcase : Stand alone
2. EUT Axis
   - Radiated Spurious Emissions : X
3. All of Simultaneous transmission Scenario were investigated and the worst case configuration results are reported.

| Simultaneous transmission Scenario | 2.4 GHz WiFi | 5 GHz WiFi | Bluetooth | Test Case |
|---|---|---|---|---|
| Bluetooth + 2.4 GHz WiFi | on | - | on | Scenario1 |
| Bluetooth + 5 GHz WiFi | - | on | on | Scenario2 |

4. The Simultaneous transmission Scenario mode test investigated both intermodulation and radiated spurious emissions.And the worst results were reported.
   - Worst result: Radiated spurious emissions
   - Intermodulation: No signals are generated.
   - Radiated spurious emissions: cf. Section 10.6.2.
5. The following tables show the worst cases configurations determined during testing.
   (Worst case: The lowest margin condition the channels and modes were selected for test.)

| Scenario | Description | Bluetooth Emission | 2.4 GHz Emission |
|---|---|---|---|
| 1 | Antenna | BT/BTLE ANT | WLAN ANT |
| | Channel | 0 | 11 |
| | Data Rate | 1 Mbps | 1 Mbps |
| | Mode | 8DPSK | 802.11b |

Note : DTS Simultaneous transmission Scenario Data refer to [DTS] Test Report

| Scenario | Description | Bluetooth Emission | 5 GHz Emission |
|---|---|---|---|
| 2 | Antenna | BT/BTLE ANT | WLAN ANT |
| | Channel | 0 | 116 |
| | Data Rate | 1 Mbps | 6 Mbps |
| | Mode | 8DPSK | 802.11a |

## 9. SUMMARY OF TEST RESULTS

| Test Description | FCC Part Section(s) | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| 26 dB Bandwidth | § 15.407 (for Power Measurement) | N/A | Conducted | PASS |
| 6 dB Bandwidth | § 15.407(e) | >500 kHz (5725-5850 MHz)(UNII-3) | | PASS |
| Maximum Conducted Output Power | § 15.407(a)(1),(2),(3) | < 250 mW(5150-5250 MHz)<br><br>< 250 mW or 11+10log$_{10}$ (BW) dBm (5250-5350 MHz)<br><br>< 250 mW or 11+10log$_{10}$ (BW) dBm (5470-5725 MHz)<br><br><1 W (5725-5850 MHz) | | PASS |
| Maximum Power Spectral Density | § 15.407(a)(1),(2),(3) | <11 dBm/ MHz (5150-5250 MHz)<br><11 dBm/ MHz (5250-5350 MHz)<br><11 dBm/ MHz (5470-5725 MHz)<br><30 dBm/500 kHz(5725-5850 MHz) | | PASS |
| Frequency Stability | § 15.407(g)<br>§ 2.1055 | Maintained within the band | | PASS |
| AC Conducted Emissions 150 kHz-30 MHz | 15.207<br>15.407(b)(8) | <FCC 15.207 limits | | PASS |
| Undesirable Emissions | § 15.407(b) (1),(2),(3),(4)<br><br>§ 15.407(b)(5)(ii),(iii)<br>§ 15.35(b) | <-27 dBm/MHz EIRP (UNII1, 2A, 2C)<br>cf. Section 8.6 (UNII 3) | Radiated | PASS |
| General Field Strength Limits(Restricted Bands and Radiated Emission Limits) | 15.205,<br>15.407(b)(9),(10) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | | PASS |

**Note**

1. The decision rule applies 'simple acceptance'

2. UNII 2A, 2C: TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

# 10. TEST RESULT

## 10.1 DUTY CYCLE

[Ant.1]

| Mode | Data Rate (Mbps) | $T_{on}$ (ms) | $T_{total}$ (ms) | Duty Cycle | Duty Cycle Factor(dB) |
|---|---|---|---|---|---|
| 802.11a | 6M | 1.359 | 1.613 | 0.843 | 0.744 |
| 802.11n(HT20) | MCS0 | 1.271 | 1.523 | 0.835 | 0.785 |
| 802.11n(HT40) | MCS0 | 0.633 | 0.884 | 0.715 | 1.455 |
| 802.11ac(VHT20) | MCS0 | 1.277 | 1.529 | 0.835 | 0.782 |
| 802.11ac(VHT40) | MCS0 | 0.632 | 0.884 | 0.715 | 1.457 |
| 802.11ac(VHT80) | MCS0 | 0.316 | 0.568 | 0.556 | 2.548 |

[Ant.2]

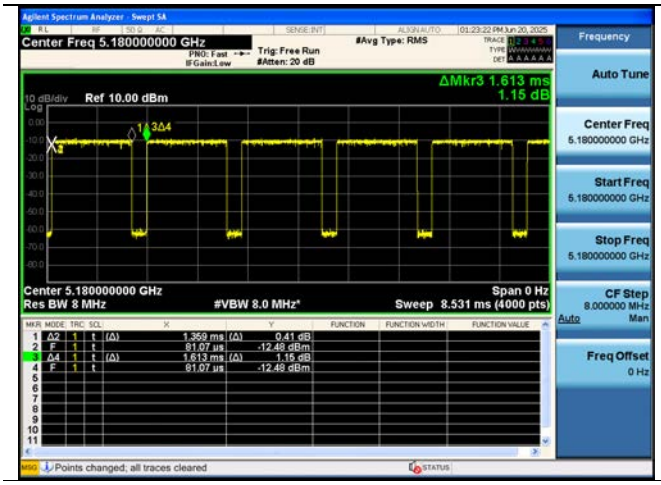
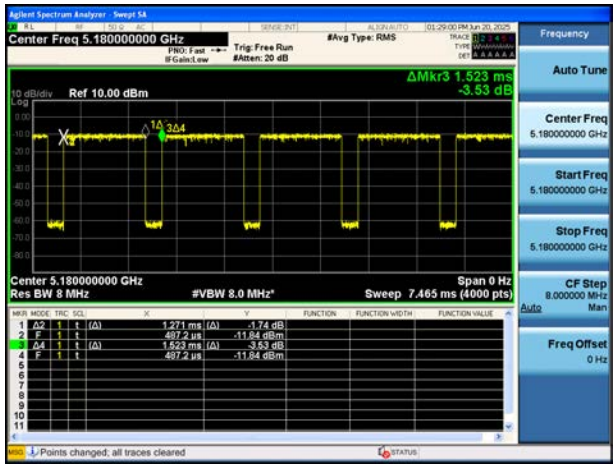
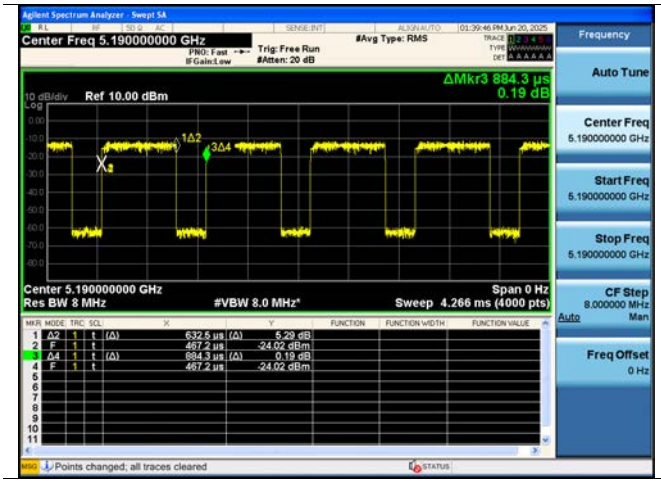
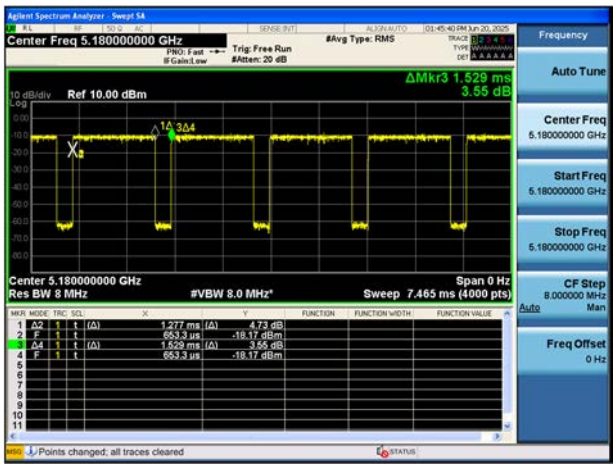
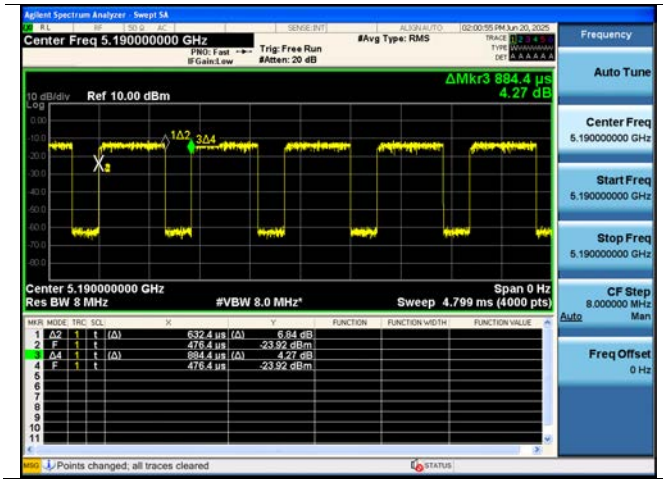
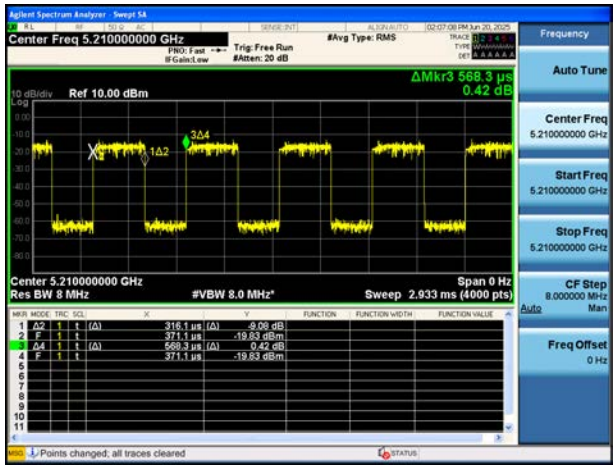
| Mode | Data Rate (Mbps) | $T_{on}$ (ms) | $T_{total}$ (ms) | Duty Cycle | Duty Cycle Factor(dB) |
|---|---|---|---|---|---|
| 802.11a | 6M | 1.359 | 1.613 | 0.843 | 0.744 |
| 802.11n(HT20) | MCS0 | 1.272 | 1.524 | 0.835 | 0.785 |
| 802.11n(HT40) | MCS0 | 0.633 | 0.884 | 0.715 | 1.455 |
| 802.11ac(VHT20) | MCS0 | 1.275 | 1.527 | 0.835 | 0.783 |
| 802.11ac(VHT40) | MCS0 | 0.637 | 0.888 | 0.717 | 1.446 |
| 802.11ac(VHT80) | MCS0 | 0.316 | 0.568 | 0.556 | 2.548 |

**Note:**

In order to simplify the report, attached plots were only the lowest data rate.

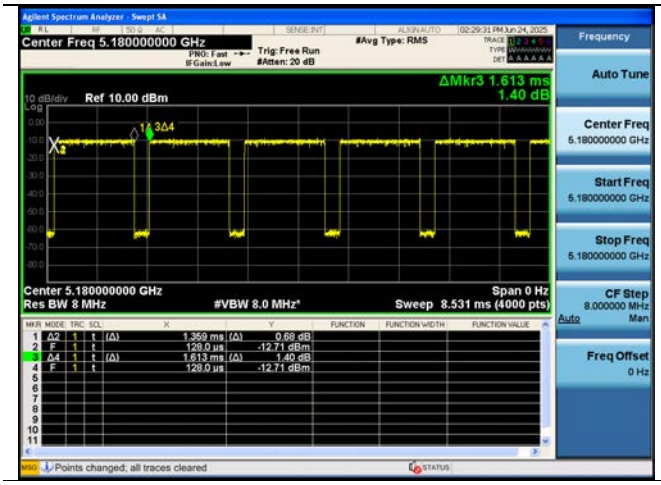
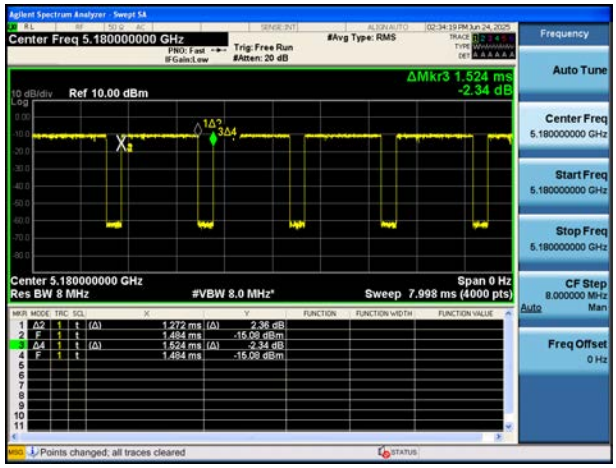
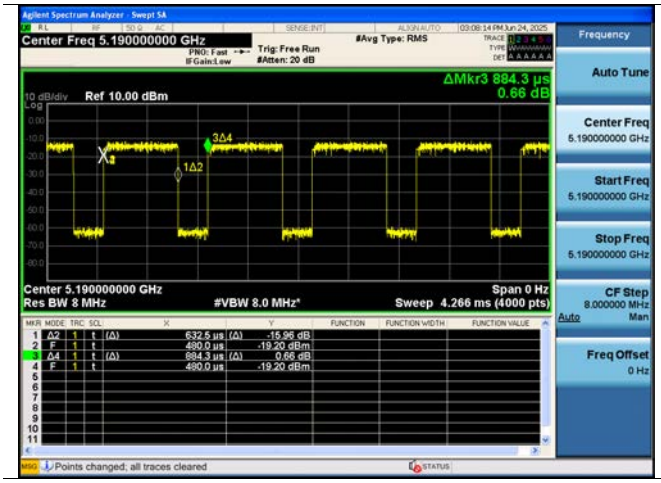
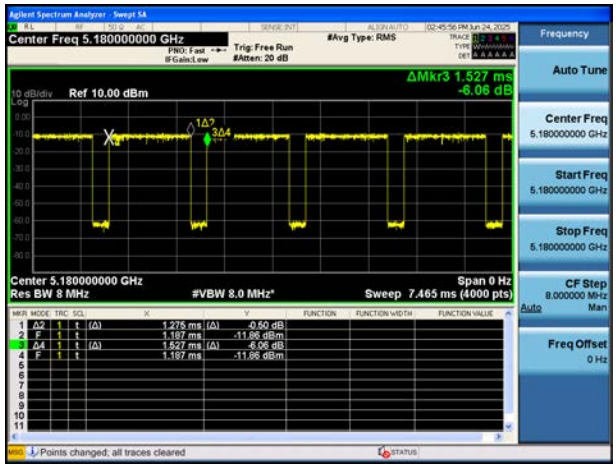
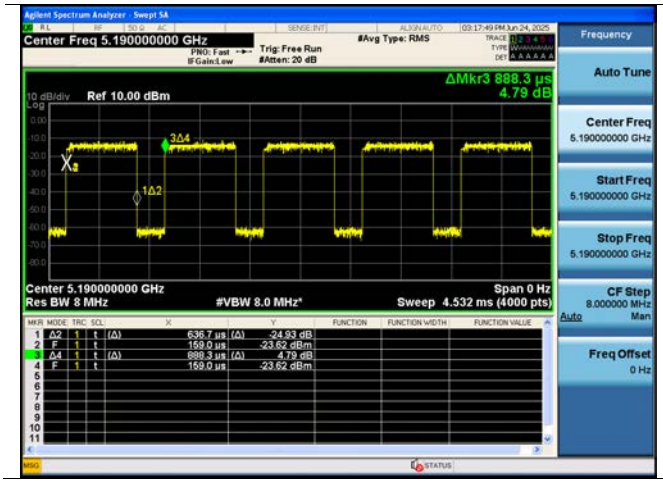
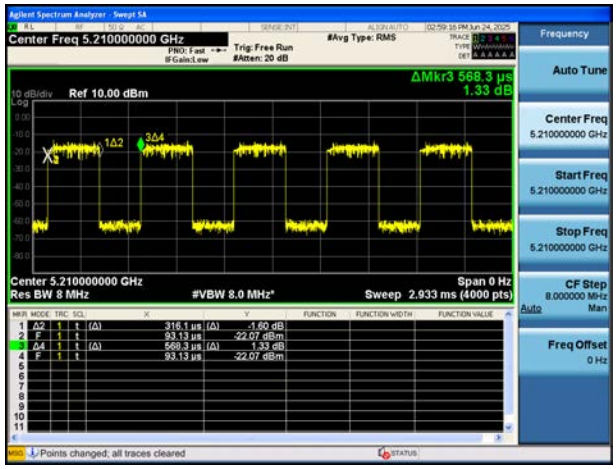
[ANT. 1]

▣ Test Plots

| 802.11a | 802.11n(HT20) |
|---|---|
|  |  |
| **802.11n(HT40)** | **802.11ac(VHT20)** |
|  |  |
| **802.11ac(VHT40)** | **802.11ac(VHT80)** |
|  |  |

[ANT. 2]

▣ Test Plots

| 802.11a | 802.11n(HT20) |
|---|---|
|  |  |
| **802.11n(HT40)** | **802.11ac(VHT20)** |
|  |  |
| **802.11ac(VHT40)** | **802.11ac(VHT80)** |
|  |  |

## 10.2 26 dB Bandwidth

**Note:**

Straddle channel data in the table below are for reporting purposes only. Straddle channel data were added in section 10.7.1.

**[Ant.1]**

| Mode : 802.11a | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5180 | 36 | 18.34 | 16.265 |
| | 5200 | 40 | 18.37 | 16.265 |
| | 5240 | 48 | 18.30 | 16.269 |
| UNII2A | 5260 | 52 | 18.41 | 16.277 |
| | 5300 | 60 | 18.30 | 16.266 |
| | 5320 | 64 | 18.19 | 16.260 |
| UNII2C | 5500 | 100 | 18.18 | 16.270 |
| | 5580 | 116 | 18.23 | 16.278 |
| | 5720 | 144 | 18.23 | 16.272 |
| UNII3 | 5745 | 149 | 18.41 | 16.271 |
| | 5785 | 157 | 18.33 | 16.274 |
| | 5825 | 165 | 18.29 | 16.269 |

| Mode : 802.11n(HT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5180 | 36 | 19.20 | 17.457 |
| | 5200 | 40 | 19.16 | 17.460 |
| | 5240 | 48 | 19.18 | 17.443 |
| UNII2A | 5260 | 52 | 19.33 | 17.450 |
| | 5300 | 60 | 19.18 | 17.457 |
| | 5320 | 64 | 19.26 | 17.454 |
| UNII2C | 5500 | 100 | 19.22 | 17.461 |
| | 5580 | 116 | 19.20 | 17.457 |
| | 5720 | 144 | 19.16 | 17.450 |
| UNII3 | 5745 | 149 | 19.18 | 17.460 |
| | 5785 | 157 | 19.08 | 17.457 |
| | 5825 | 165 | 19.14 | 17.439 |

| Mode : 802.11ac(VHT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5180 | 36 | 19.32 | 17.453 |
| | 5200 | 40 | 19.22 | 17.459 |
| | 5240 | 48 | 19.23 | 17.461 |
| UNII2A | 5260 | 52 | 19.23 | 17.455 |
| | 5300 | 60 | 19.13 | 17.448 |
| | 5320 | 64 | 19.25 | 17.457 |
| UNII2C | 5500 | 100 | 19.21 | 17.463 |
| | 5580 | 116 | 19.38 | 17.458 |
| | 5720 | 144 | 19.13 | 17.443 |
| UNII3 | 5745 | 149 | 19.21 | 17.457 |
| | 5785 | 157 | 19.12 | 17.455 |
| | 5825 | 165 | 19.21 | 17.452 |

| Mode : 802.11n(HT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5190 | 38 | 39.02 | 35.956 |
| | 5230 | 46 | 38.99 | 35.907 |
| UNII2A | 5270 | 54 | 38.86 | 35.928 |
| | 5310 | 62 | 38.91 | 35.971 |
| UNII2C | 5510 | 102 | 38.94 | 35.956 |
| | 5550 | 110 | 39.07 | 35.948 |
| | 5710 | 142 | 38.87 | 35.897 |
| UNII3 | 5755 | 151 | 38.95 | 35.961 |
| | 5795 | 159 | 39.01 | 35.960 |

| Mode : 802.11ac(VHT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5190 | 38 | 38.79 | 35.950 |
| | 5230 | 46 | 38.86 | 35.886 |
| UNII2A | 5270 | 54 | 39.10 | 35.960 |
| | 5310 | 62 | 38.94 | 35.928 |
| UNII2C | 5510 | 102 | 39.00 | 35.957 |
| | 5550 | 110 | 39.07 | 35.939 |
| | 5710 | 142 | 38.92 | 35.925 |
| UNII3 | 5755 | 151 | 39.03 | 35.909 |
| | 5795 | 159 | 38.95 | 35.925 |

| Mode : 802.11ac(VHT80) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5210 | 42 | 80.61 | 74.710 |
| UNII2A | 5290 | 58 | 81.09 | 74.828 |
| UNII2C | 5530 | 106 | 80.57 | 74.742 |
| | 5610 | 122 | 81.18 | 74.658 |
| | 5690 | 138 | 81.00 | 74.970 |
| UNII3 | 5775 | 155 | 80.80 | 74.836 |

[Ant.2]

| Mode : 802.11a | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5180 | 36 | 18.09 | 16.270 |
| | 5200 | 40 | 18.36 | 16.271 |
| | 5240 | 48 | 18.20 | 16.266 |
| UNII2A | 5260 | 52 | 18.26 | 16.260 |
| | 5300 | 60 | 18.22 | 16.266 |
| | 5320 | 64 | 18.25 | 16.266 |
| UNII2C | 5500 | 100 | 18.15 | 16.264 |
| | 5580 | 116 | 18.28 | 16.282 |
| | 5720 | 144 | 18.20 | 16.263 |
| UNII3 | 5745 | 149 | 18.31 | 16.270 |
| | 5785 | 157 | 18.17 | 16.268 |
| | 5825 | 165 | 18.37 | 16.278 |

| Mode : 802.11n(HT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5180 | 36 | 19.21 | 17.446 |
| | 5200 | 40 | 19.26 | 17.464 |
| | 5240 | 48 | 19.27 | 17.462 |
| UNII2A | 5260 | 52 | 19.24 | 17.453 |
| | 5300 | 60 | 19.16 | 17.449 |
| | 5320 | 64 | 19.18 | 17.444 |
| UNII2C | 5500 | 100 | 19.17 | 17.445 |
| | 5580 | 116 | 19.13 | 17.446 |
| | 5720 | 144 | 19.20 | 17.448 |
| UNII3 | 5745 | 149 | 19.26 | 17.450 |
| | 5785 | 157 | 19.18 | 17.443 |
| | 5825 | 165 | 19.24 | 17.450 |

| Mode : 802.11ac(VHT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5180 | 36 | 19.24 | 17.463 |
| | 5200 | 40 | 19.22 | 17.457 |
| | 5240 | 48 | 19.15 | 17.456 |
| UNII2A | 5260 | 52 | 19.26 | 17.458 |
| | 5300 | 60 | 19.06 | 17.465 |
| | 5320 | 64 | 19.18 | 17.447 |
| UNII2C | 5500 | 100 | 19.16 | 17.445 |
| | 5580 | 116 | 19.20 | 17.467 |
| | 5720 | 144 | 19.17 | 17.451 |
| UNII3 | 5745 | 149 | 19.13 | 17.454 |
| | 5785 | 157 | 19.20 | 17.448 |
| | 5825 | 165 | 19.25 | 17.466 |

| Mode : 802.11n(HT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5190 | 38 | 38.96 | 35.901 |
| | 5230 | 46 | 38.82 | 35.873 |
| UNII2A | 5270 | 54 | 38.88 | 35.894 |
| | 5310 | 62 | 39.02 | 35.846 |
| UNII2C | 5510 | 102 | 38.97 | 35.911 |
| | 5550 | 110 | 38.89 | 35.835 |
| | 5710 | 142 | 39.17 | 35.920 |
| UNII3 | 5755 | 151 | 39.00 | 35.889 |
| | 5795 | 159 | 38.99 | 35.972 |

| Mode : 802.11ac(VHT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5190 | 38 | 38.93 | 35.918 |
| | 5230 | 46 | 38.81 | 35.898 |
| UNII2A | 5270 | 54 | 39.07 | 35.914 |
| | 5310 | 62 | 38.88 | 35.900 |
| UNII2C | 5510 | 102 | 38.87 | 35.881 |
| | 5550 | 110 | 38.82 | 35.904 |
| | 5710 | 142 | 38.80 | 35.891 |
| UNII3 | 5755 | 151 | 38.95 | 35.921 |
| | 5795 | 159 | 38.73 | 35.909 |

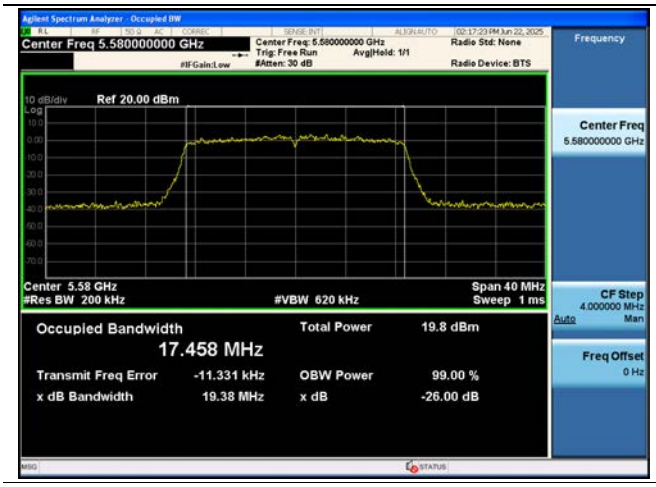
| Mode : 802.11ac(VHT80) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 26 dB Bandwidth [MHz] | 99% Occupied Bandwidth [MHz] |
| UNII1 | 5210 | 42 | 80.89 | 74.979 |
| UNII2A | 5290 | 58 | 80.95 | 74.779 |
| UNII2C | 5530 | 106 | 81.31 | 74.691 |
| | 5610 | 122 | 81.11 | 74.804 |
| | 5690 | 138 | 81.00 | 74.783 |
| UNII3 | 5775 | 155 | 81.58 | 75.084 |

[ANT. 1]

▣ Test Plots

**Note:** In order to simplify the report, attached plots were only the widest channel per channel bandwidth.

Bandwidth 20M, 802.11ac(VHT20) Ch.116




Bandwidth 40M, 802.11ac(VHT40) Ch.54


Bandwidth 80M, 802.11ac(VHT80) Ch.122

[ANT. 2]

▣ Test Plots

**Note:** In order to simplify the report, attached plots were only the widest channel per channel bandwidth.

Bandwidth 20M, 802.11n(HT20) Ch.48


Bandwidth 40M, 802.11n(HT40) Ch.142


Bandwidth 80M, 802.11ac(VHT80) Ch.155

## 10.3 6 dB BANDWIDTH

**[Ant.1]**

| Mode : 802.11a | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5745 | 149 | **15.75** | > 0.5 |
| | 5785 | 157 | **15.68** | > 0.5 |
| | 5825 | 165 | **16.35** | > 0.5 |

| Mode : 802.11n(HT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5745 | 149 | **16.99** | > 0.5 |
| | 5785 | 157 | **15.70** | > 0.5 |
| | 5825 | 165 | **15.74** | > 0.5 |

| Mode : 802.11ac(VHT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5745 | 149 | **16.33** | > 0.5 |
| | 5785 | 157 | **16.32** | > 0.5 |
| | 5825 | 165 | **15.16** | > 0.5 |

| Mode : 802.11n(HT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5755 | 151 | **35.23** | > 0.5 |
| | 5795 | 159 | **35.07** | > 0.5 |

| Mode : 802.11ac(VHT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5755 | 151 | **35.20** | > 0.5 |
| | 5795 | 159 | **35.15** | > 0.5 |

| Mode : 802.11ac(VHT80) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5775 | 155 | **75.17** | > 0.5 |

[Ant.2]

| Mode : 802.11a | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5745 | 149 | 15.36 | > 0.5 |
| | 5785 | 157 | 15.54 | > 0.5 |
| | 5825 | 165 | 15.35 | > 0.5 |

| Mode : 802.11n(HT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5745 | 149 | 15.13 | > 0.5 |
| | 5785 | 157 | 16.28 | > 0.5 |
| | 5825 | 165 | 17.07 | > 0.5 |

| Mode : 802.11ac(VHT20) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5745 | 149 | 15.09 | > 0.5 |
| | 5785 | 157 | 15.94 | > 0.5 |
| | 5825 | 165 | 16.58 | > 0.5 |

| Mode : 802.11n(HT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5755 | 151 | 35.20 | > 0.5 |
| | 5795 | 159 | 35.20 | > 0.5 |

| Mode : 802.11ac(VHT40) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5755 | 151 | 35.21 | > 0.5 |
| | 5795 | 159 | 35.23 | > 0.5 |

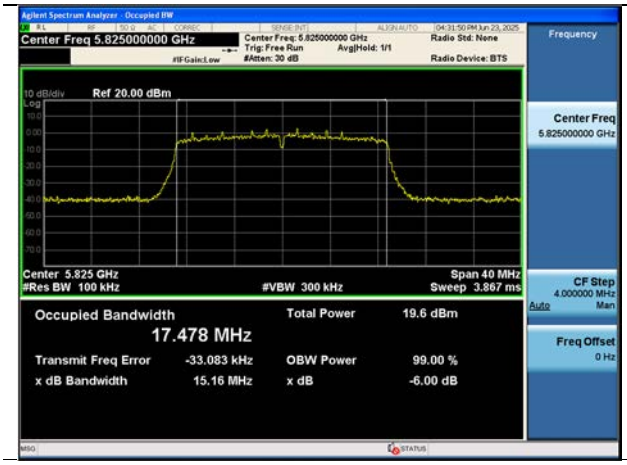
| Mode : 802.11ac(VHT80) | | | | |
|---|---|---|---|---|
| BAND | Freq. [MHz] | CH. | 6 dB Bandwidth [MHz] | Limit [MHz] |
| UNII3 | 5775 | 155 | 75.14 | > 0.5 |

[ANT. 1]

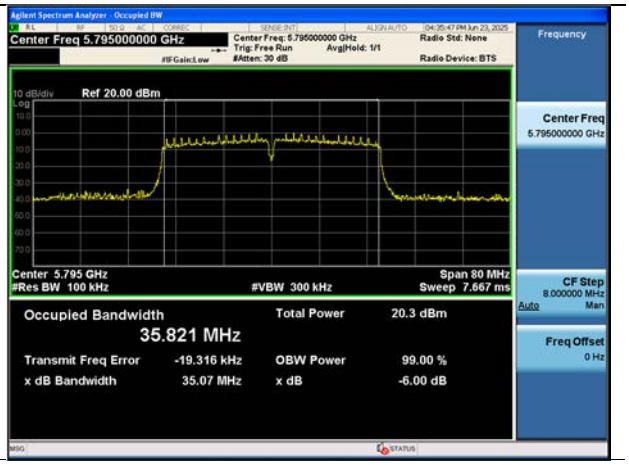
▣ Test Plots

**Note:** In order to simplify the report, attached plots were only the narrowest channel.

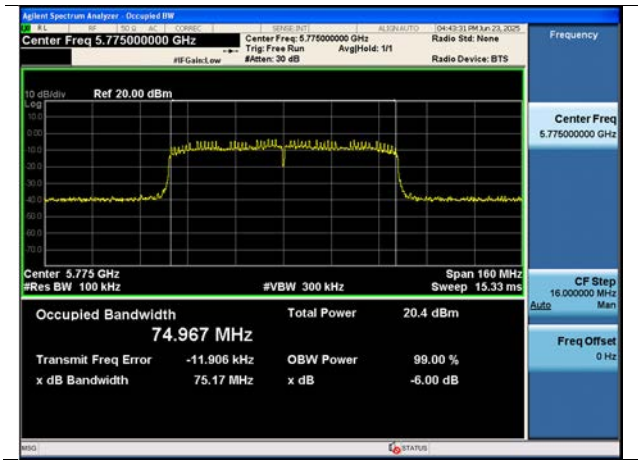
Bandwidth 20M, 802.11ac(VHT20) Ch.165




Bandwidth 40M, 802.11n(HT40) Ch.159



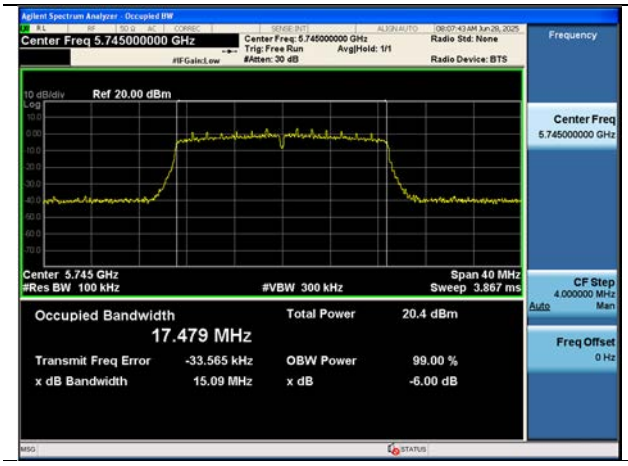

Bandwidth 80M, 802.11ac(VHT80) Ch.155



[ANT. 2]

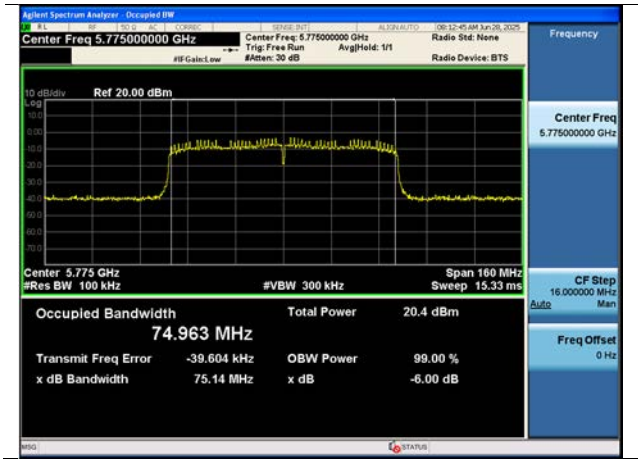
**Note:** In order to simplify the report, attached plots were only the narrowest channel.

Bandwidth 20M, 802.11ac(VHT20) Ch.149




Bandwidth 40M, 802.11n(HT40) Ch.151


Bandwidth 80M, 802.11ac(VHT80) Ch.155



## 10.4 OUTPUT POWER MEASUREMENT

Straddle channel data in the table below are for reporting purposes only.
Straddle channel data were added in section 10.7.3.

**# Limit**

(UNII 1) : 23.98 dBm
(UNII 2A, 2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
(UNII 3) : 30.00 dBm

**[MIMO_CDD(Ant.1+ Ant.2)]**

# Ant Total Power [dBm] = Measured Power [dBm] + Duty Cycle Factor [dB]

# MIMO_CDD(Ant.1+ Ant.2) Total Power [dBm] = Ant.1 Total Power [dBm] + Ant.2 Total Power [dBm]

# Max EIRP = MIMO Total Power [dBm] + Directional Gain [dBi]

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Average Power [dBm] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm] |
| 5180 | 36 | 6M | a | 13.18 | 13.54 | 16.38 | 23.98 |
| 5200 | 40 | 6M | a | 13.68 | 13.15 | 16.43 | 23.98 |
| 5240 | 48 | 6M | a | 13.69 | 12.26 | 16.05 | 23.98 |
| 5260 | 52 | 6M | a | 12.98 | 12.46 | 15.74 | 23.62 |
| 5300 | 60 | 6M | a | 13.27 | 12.33 | 15.83 | 23.61 |
| 5320 | 64 | 6M | a | 13.60 | 12.77 | 16.22 | 23.60 |
| 5500 | 100 | 6M | a | 13.76 | 13.11 | 16.46 | 23.59 |
| 5580 | 116 | 6M | a | 13.42 | 13.13 | 16.29 | 23.61 |
| 5720 | 144 | 6M | a | 13.46 | 12.32 | 15.94 | 23.60 |
| 5745 | 149 | 6M | a | 13.54 | 12.87 | 16.23 | 30.00 |
| 5785 | 157 | 6M | a | 13.44 | 12.88 | 16.18 | 30.00 |
| 5825 | 165 | 6M | a | 12.92 | 12.77 | 15.86 | 30.00 |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Average Power [dBm] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm] |
| 5180 | 36 | MCS0 | n20 | 13.06 | 12.65 | 15.87 | 23.98 |
| 5200 | 40 | MCS0 | n20 | 13.61 | 12.72 | 16.20 | 23.98 |
| 5240 | 48 | MCS0 | n20 | 13.76 | 12.12 | 16.03 | 23.98 |
| 5260 | 52 | MCS0 | n20 | 12.88 | 12.58 | 15.74 | 23.84 |
| 5300 | 60 | MCS0 | n20 | 13.07 | 12.72 | 15.91 | 23.82 |
| 5320 | 64 | MCS0 | n20 | 13.47 | 12.69 | 16.11 | 23.83 |
| 5500 | 100 | MCS0 | n20 | 13.54 | 13.02 | 16.30 | 23.83 |
| 5580 | 116 | MCS0 | n20 | 13.39 | 13.01 | 16.22 | 23.82 |
| 5720 | 144 | MCS0 | n20 | 13.34 | 12.23 | 15.83 | 23.82 |
| 5745 | 149 | MCS0 | n20 | 13.49 | 12.65 | 16.10 | 30.00 |
| 5785 | 157 | MCS0 | n20 | 13.42 | 12.62 | 16.05 | 30.00 |
| 5825 | 165 | MCS0 | n20 | 13.06 | 12.54 | 15.82 | 30.00 |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Average Power [dBm] | | | Limit [dBm] |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | |
| 5180 | 36 | MCS0 | ac20 | 12.95 | 12.50 | 15.74 | 23.98 |
| 5200 | 40 | MCS0 | ac20 | 13.48 | 12.80 | 16.16 | 23.98 |
| 5240 | 48 | MCS0 | ac20 | 13.58 | 12.15 | 15.93 | 23.98 |
| 5260 | 52 | MCS0 | ac20 | 12.98 | 12.38 | 15.70 | 23.84 |
| 5300 | 60 | MCS0 | ac20 | 12.96 | 12.74 | 15.87 | 23.80 |
| 5320 | 64 | MCS0 | ac20 | 13.52 | 12.63 | 16.11 | 23.83 |
| 5500 | 100 | MCS0 | ac20 | 13.44 | 12.83 | 16.15 | 23.82 |
| 5580 | 116 | MCS0 | ac20 | 13.44 | 13.06 | 16.26 | 23.83 |
| 5720 | 144 | MCS0 | ac20 | 13.28 | 12.13 | 15.75 | 23.82 |
| 5745 | 149 | MCS0 | ac20 | 13.54 | 13.06 | 16.32 | 30.00 |
| 5785 | 157 | MCS0 | ac20 | 13.22 | 12.63 | 15.94 | 30.00 |
| 5825 | 165 | MCS0 | ac20 | 12.74 | 12.59 | 15.68 | 30.00 |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Average Power [dBm] | | | Limit [dBm] |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | |
| 5190 | 38 | MCS0 | n40 | 13.36 | 12.66 | 16.03 | 23.98 |
| 5230 | 46 | MCS0 | n40 | 13.51 | 12.59 | 16.09 | 23.98 |
| 5270 | 54 | MCS0 | n40 | 13.26 | 12.79 | 16.04 | 23.98 |
| 5310 | 62 | MCS0 | n40 | 13.20 | 12.44 | 15.85 | 23.98 |
| 5510 | 102 | MCS0 | n40 | 13.45 | 12.79 | 16.14 | 23.98 |
| 5550 | 110 | MCS0 | n40 | 13.37 | 12.46 | 15.95 | 23.98 |
| 5710 | 142 | MCS0 | n40 | 13.44 | 12.25 | 15.90 | 23.98 |
| 5755 | 151 | MCS0 | n40 | 13.30 | 12.81 | 16.07 | 30.00 |
| 5795 | 159 | MCS0 | n40 | 13.14 | 12.72 | 15.94 | 30.00 |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Average Power [dBm] | | | Limit [dBm] |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | |
| 5190 | 38 | MCS0 | ac40 | 13.22 | 12.75 | 16.00 | 23.98 |
| 5230 | 46 | MCS0 | ac40 | 13.31 | 12.72 | 16.04 | 23.98 |
| 5270 | 54 | MCS0 | ac40 | 13.15 | 12.87 | 16.02 | 23.98 |
| 5310 | 62 | MCS0 | ac40 | 13.21 | 12.43 | 15.84 | 23.98 |
| 5510 | 102 | MCS0 | ac40 | 13.58 | 12.80 | 16.22 | 23.98 |
| 5550 | 110 | MCS0 | ac40 | 13.34 | 12.31 | 15.87 | 23.98 |
| 5710 | 142 | MCS0 | ac40 | 13.42 | 12.37 | 15.94 | 23.98 |
| 5755 | 151 | MCS0 | ac40 | 13.37 | 12.82 | 16.11 | 30.00 |
| 5795 | 159 | MCS0 | ac40 | 13.12 | 12.66 | 15.91 | 30.00 |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Average Power [dBm] | | | Limit [dBm] |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | |
| 5210 | 42 | MCS0 | ac80 | 13.16 | 12.39 | 15.81 | 23.98 |
| 5290 | 58 | MCS0 | ac80 | 12.66 | 12.07 | 15.38 | 23.98 |
| 5530 | 106 | MCS0 | ac80 | 12.93 | 12.02 | 15.51 | 23.98 |
| 5610 | 122 | MCS0 | ac80 | 12.69 | 12.32 | 15.52 | 23.98 |
| 5690 | 138 | MCS0 | ac80 | 12.69 | 12.19 | 15.45 | 23.98 |
| 5775 | 155 | MCS0 | ac80 | 12.84 | 13.27 | 16.07 | 30.00 |

## 10.5 POWER SPECTRAL DENSITY

**[MIMO_CDD(Ant.1+ Ant.2)]**

# Ant Total PSD [dBm] = Measured PSD [dBm/MHz] + Duty Cycle Factor [dB]

# MIMO_CDD(Ant.1+ Ant.2)Total PSD [dBm/MHz] = Ant.1 Total PSD [dBm/MHz] + Ant.2 Total PSD [dB]

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Power Spectral Density [dBm/MHz] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm/MHz] |
| 5180 | 36 | 6M | a | 3.008 | 2.048 | 5.565 | 11.00 |
| 5200 | 40 | 6M | a | 3.187 | 3.035 | 6.122 | 11.00 |
| 5240 | 48 | 6M | a | 2.939 | 2.429 | 5.702 | 11.00 |
| 5260 | 52 | 6M | a | 2.597 | 2.669 | 5.643 | 11.00 |
| 5300 | 60 | 6M | a | 2.487 | 3.039 | 5.782 | 11.00 |
| 5320 | 64 | 6M | a | 2.826 | 2.826 | 5.836 | 11.00 |
| 5500 | 100 | 6M | a | 3.033 | 2.915 | 5.985 | 11.00 |
| 5580 | 116 | 6M | a | 2.677 | 2.760 | 5.729 | 11.00 |
| 5720 | 144 | 6M | a | 2.845 | 2.585 | 5.727 | 11.00 |
| 5745 | 149 | 6M | a | 0.421 | 0.206 | 3.325 | 30 dBm/500kHz |
| 5785 | 157 | 6M | a | 0.325 | 0.312 | 3.329 | 30 dBm/500kHz |
| 5825 | 165 | 6M | a | -0.545 | 0.380 | 2.952 | 30 dBm/500kHz |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Power Spectral Density [dBm/MHz] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm/MHz] |
| 5180 | 36 | MCS0 | n20 | 2.721 | 2.614 | 5.679 | 11.00 |
| 5200 | 40 | MCS0 | n20 | 2.985 | 2.863 | 5.935 | 11.00 |
| 5240 | 48 | MCS0 | n20 | 2.842 | 1.988 | 5.447 | 11.00 |
| 5260 | 52 | MCS0 | n20 | 2.014 | 2.165 | 5.101 | 11.00 |
| 5300 | 60 | MCS0 | n20 | 2.242 | 2.275 | 5.269 | 11.00 |
| 5320 | 64 | MCS0 | n20 | 2.618 | 2.309 | 5.477 | 11.00 |
| 5500 | 100 | MCS0 | n20 | 2.363 | 3.268 | 5.850 | 11.00 |
| 5580 | 116 | MCS0 | n20 | 2.535 | 2.877 | 5.720 | 11.00 |
| 5720 | 144 | MCS0 | n20 | 1.969 | 2.208 | 5.101 | 11.00 |
| 5745 | 149 | MCS0 | n20 | 0.076 | -0.123 | 2.988 | 30 dBm/500kHz |
| 5785 | 157 | MCS0 | n20 | -0.102 | -0.256 | 2.832 | 30 dBm/500kHz |
| 5825 | 165 | MCS0 | n20 | -0.694 | -0.269 | 2.534 | 30 dBm/500kHz |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Power Spectral Density [dBm/MHz] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm/MHz] |
| 5180 | 36 | MCS0 | ac20 | 2.260 | 2.685 | 5.488 | 11.00 |
| 5200 | 40 | MCS0 | ac20 | 2.816 | 2.728 | 5.783 | 11.00 |
| 5240 | 48 | MCS0 | ac20 | 3.196 | 2.117 | 5.701 | 11.00 |
| 5260 | 52 | MCS0 | ac20 | 2.186 | 2.029 | 5.119 | 11.00 |
| 5300 | 60 | MCS0 | ac20 | 2.355 | 2.408 | 5.392 | 11.00 |
| 5320 | 64 | MCS0 | ac20 | 2.705 | 2.621 | 5.674 | 11.00 |
| 5500 | 100 | MCS0 | ac20 | 2.555 | 3.513 | 6.071 | 11.00 |
| 5580 | 116 | MCS0 | ac20 | 2.204 | 2.972 | 5.616 | 11.00 |
| 5720 | 144 | MCS0 | ac20 | 2.412 | 2.288 | 5.361 | 11.00 |
| 5745 | 149 | MCS0 | ac20 | -0.052 | 0.089 | 3.030 | 30 dBm/500kHz |
| 5785 | 157 | MCS0 | ac20 | -0.042 | -0.224 | 2.879 | 30 dBm/500kHz |
| 5825 | 165 | MCS0 | ac20 | -0.431 | -0.232 | 2.680 | 30 dBm/500kHz |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Power Spectral Density [dBm/MHz] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm/MHz] |
| 5190 | 38 | MCS0 | n40 | -0.652 | -0.139 | 2.622 | 11.00 |
| 5230 | 46 | MCS0 | n40 | -0.530 | -0.415 | 2.538 | 11.00 |
| 5270 | 54 | MCS0 | n40 | -0.396 | -0.226 | 2.700 | 11.00 |
| 5310 | 62 | MCS0 | n40 | -0.789 | -0.934 | 2.149 | 11.00 |
| 5510 | 102 | MCS0 | n40 | -0.475 | 0.047 | 2.804 | 11.00 |
| 5550 | 110 | MCS0 | n40 | -0.861 | -0.705 | 2.228 | 11.00 |
| 5710 | 142 | MCS0 | n40 | -0.132 | -1.054 | 2.442 | 11.00 |
| 5755 | 151 | MCS0 | n40 | -2.687 | -3.328 | 0.015 | 30 dBm/500kHz |
| 5795 | 159 | MCS0 | n40 | -3.266 | -2.912 | -0.075 | 30 dBm/500kHz |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Power Spectral Density [dBm/MHz] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm/MHz] |
| 5190 | 38 | MCS0 | ac40 | -0.766 | -0.170 | 2.552 | 11.00 |
| 5230 | 46 | MCS0 | ac40 | -0.354 | -0.512 | 2.578 | 11.00 |
| 5270 | 54 | MCS0 | ac40 | -0.593 | -0.194 | 2.621 | 11.00 |
| 5310 | 62 | MCS0 | ac40 | -0.737 | -0.246 | 2.525 | 11.00 |
| 5510 | 102 | MCS0 | ac40 | -0.845 | 0.386 | 2.828 | 11.00 |
| 5550 | 110 | MCS0 | ac40 | -0.472 | -0.467 | 2.540 | 11.00 |
| 5710 | 142 | MCS0 | ac40 | -0.422 | -0.399 | 2.599 | 11.00 |
| 5755 | 151 | MCS0 | ac40 | -3.147 | -2.750 | 0.066 | 30 dBm/500kHz |
| 5795 | 159 | MCS0 | ac40 | -3.324 | -3.563 | -0.432 | 30 dBm/500kHz |

| Freq. [MHz] | CH. | Datarate | Mode (802.11) | Total Power Spectral Density [dBm/MHz] | | | Limit |
|---|---|---|---|---|---|---|---|
| | | | | ANT1 | ANT2 | MIMO | [dBm/MHz] |
| 5210 | 42 | MCS0 | ac80 | -3.254 | -3.682 | -0.452 | 11.00 |
| 5290 | 58 | MCS0 | ac80 | -3.723 | -4.391 | -1.034 | 11.00 |
| 5530 | 106 | MCS0 | ac80 | -3.612 | -4.098 | -0.838 | 11.00 |
| 5610 | 122 | MCS0 | ac80 | -3.699 | -3.443 | -0.559 | 11.00 |
| 5690 | 138 | MCS0 | ac80 | -3.620 | -3.894 | -0.744 | 11.00 |
| 5775 | 155 | MCS0 | ac80 | -7.059 | -6.330 | -3.669 | 30 dBm/500kHz |

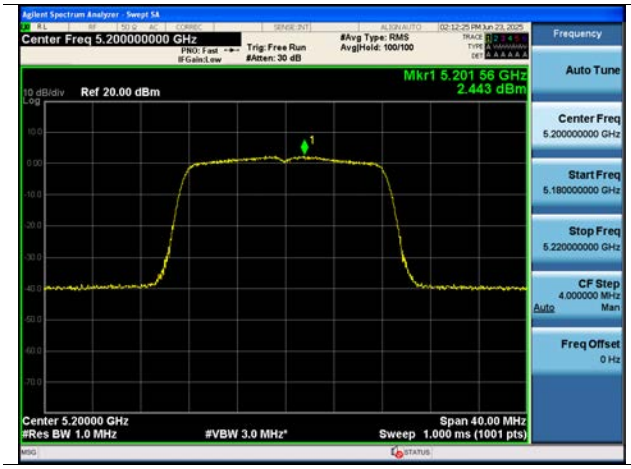
[MIMO_CDD(Ant.1+ Ant.2)]

☑ Test Plots

Note: In order to simplify the report, attached plots were only channel of the highest PSD.

| ANT. 1 | ANT. 2 |
|---|---|

Bandwidth 20M, 802.11a(Ch. 40)





Bandwidth 40M, 802.11ac(VHT40) (Ch. 102)



Bandwidth 80M, 802.11ac(VHT80) (Ch. 42)


## 10.6 FREQUENCY STABILITY

**Note:**

1. All modes of operation were investigated and the worst case configuration results are reported.
2. Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

### 10.6.1 80 MHz BW

REFERENCE VOLTAGE: 3.300 VDC

**Startup after the EUT is energized**

| OPERATING BAND: | | | UNII Band 1 | | UNII Band 2A | | UNII Band 2C | |
|---|---|---|---|---|---|---|---|---|
| OPERATING FREQUENCY: | | | 5,210,000,000 Hz | | 5,290,000,000 Hz | | 5, 530,000,000 Hz | |
| CHANNEL: | | | 42 | | 58 | | 106 | |
| Voltage | Power | Temp. | Frequency | Frequency Error | Frequency | Frequency Error | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 210 068.19 | 68.19 | 5 290 016.55 | 16.55 | 5 530 043.90 | 43.90 |
| 100 % | | -30 | 5 210 064.03 | 64.03 | 5 290 008.65 | 8.65 | 5 530 001.36 | 1.36 |
| 100 % | | -20 | 5 210 023.36 | 23.36 | 5 290 008.27 | 8.27 | 5 530 019.65 | 19.65 |
| 100 % | | -10 | 5 210 009.41 | 9.41 | 5 290 008.34 | 8.34 | 5 530 072.32 | 72.32 |
| 100 % | | 0 | 5 210 011.82 | 11.82 | 5 290 091.60 | 91.60 | 5 530 013.13 | 13.13 |
| 100 % | | +10 | 5 210 091.81 | 91.81 | 5 290 068.56 | 68.56 | 5 530 095.71 | 95.71 |
| 100 % | | +30 | 5 210 066.30 | 66.30 | 5 290 012.94 | 12.94 | 5 530 086.58 | 86.58 |
| 100 % | | +40 | 5 210 012.08 | 12.08 | 5 290 082.48 | 82.48 | 5 530 059.88 | 59.88 |
| 100 % | | +50 | 5 210 048.43 | 48.43 | 5 290 045.25 | 45.25 | 5 530 046.33 | 46.33 |
| High | 3.600 | +20 | 5 210 011.93 | 11.93 | 5 290 062.39 | 62.39 | 5 530 072.28 | 72.28 |
| Low | 3.135 | +20 | 5 210 039.95 | 39.95 | 5 290 077.16 | 77.16 | 5 530 070.50 | 70.50 |

| OPERATING BAND: | | UNII Band 3 | |
|---|---|---|---|
| OPERATING FREQUENCY: | | 5,775,000,000 Hz | |
| CHANNEL: | | 155 | |
| Voltage | Power | Temp. | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 775 017.50 | 17.50 |
| 100 % | | -30 | 5 775 078.06 | 78.06 |
| 100 % | | -20 | 5 775 062.24 | 62.24 |
| 100 % | | -10 | 5 775 086.19 | 86.19 |
| 100 % | | 0 | 5 775 095.02 | 95.02 |
| 100 % | | +10 | 5 775 090.65 | 90.65 |
| 100 % | | +30 | 5 775 070.19 | 70.19 |
| 100 % | | +40 | 5 775 063.17 | 63.17 |
| 100 % | | +50 | 5 775 022.36 | 22.36 |
| High | 3.600 | +20 | 5 775 048.27 | 48.27 |
| Low | 3.135 | +20 | 5 775 063.14 | 63.14 |

2 minutes after the EUT is energized

| OPERATING BAND: | | | UNII Band 1 | | UNII Band 2A | | UNII Band 2C | |
|---|---|---|---|---|---|---|---|---|
| OPERATING FREQUENCY: | | | 5,210,000,000 Hz | | 5,290,000,000 Hz | | 5, 530,000,000 Hz | |
| CHANNEL: | | | 42 | | 58 | | 106 | |
| Voltage | Power | Temp. | Frequency | Frequency Error | Frequency | Frequency Error | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 210 067.23 | 67.23 | 5 290 085.57 | 85.57 | 5 530 014.01 | 14.01 |
| 100 % | | -30 | 5 210 024.09 | 24.09 | 5 290 011.40 | 11.40 | 5 530 015.15 | 15.15 |
| 100 % | | -20 | 5 210 097.86 | 97.86 | 5 290 075.14 | 75.14 | 5 530 024.98 | 24.98 |
| 100 % | | -10 | 5 210 060.17 | 60.17 | 5 290 061.23 | 61.23 | 5 530 055.05 | 55.05 |
| 100 % | | 0 | 5 210 040.84 | 40.84 | 5 290 082.84 | 82.84 | 5 530 065.75 | 65.75 |
| 100 % | | +10 | 5 210 001.41 | 1.41 | 5 290 009.94 | 9.94 | 5 530 003.37 | 3.37 |
| 100 % | | +30 | 5 210 086.07 | 86.07 | 5 290 096.75 | 96.75 | 5 530 057.61 | 57.61 |
| 100 % | | +40 | 5 210 046.69 | 46.69 | 5 290 072.49 | 72.49 | 5 530 076.80 | 76.80 |
| 100 % | | +50 | 5 210 087.53 | 87.53 | 5 290 095.05 | 95.05 | 5 530 072.29 | 72.29 |
| High | 3.600 | +20 | 5 210 076.34 | 76.34 | 5 290 079.12 | 79.12 | 5 530 057.87 | 57.87 |
| Low | 3.135 | +20 | 5 210 034.60 | 34.60 | 5 290 060.81 | 60.81 | 5 530 041.30 | 41.30 |

| OPERATING BAND: | | | UNII Band 3 | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | | | 5,775,000,000 Hz | |
| CHANNEL: | | | 155 | |
| Voltage | Power | Temp. | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 775 018.31 | 18.31 |
| 100 % | | -30 | 5 775 036.33 | 36.33 |
| 100 % | | -20 | 5 775 068.73 | 68.73 |
| 100 % | | -10 | 5 775 081.25 | 81.25 |
| 100 % | | 0 | 5 775 062.15 | 62.15 |
| 100 % | | +10 | 5 775 074.81 | 74.81 |
| 100 % | | +30 | 5 775 019.38 | 19.38 |
| 100 % | | +40 | 5 775 025.23 | 25.23 |
| 100 % | | +50 | 5 775 022.40 | 22.40 |
| High | 3.600 | +20 | 5 775 016.31 | 16.31 |
| Low | 3.135 | +20 | 5 775 075.19 | 75.19 |

5 minutes after the EUT is energized

| OPERATING BAND: | | | UNII Band 1 | | UNII Band 2A | | UNII Band 2C | |
|---|---|---|---|---|---|---|---|---|
| OPERATING FREQUENCY: | | | 5,210,000,000 Hz | | 5,290,000,000 Hz | | 5, 530,000,000 Hz | |
| CHANNEL: | | | 42 | | 58 | | 106 | |
| Voltage | Power | Temp. | Frequency | Frequency Error | Frequency | Frequency Error | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 210 044.86 | 44.86 | 5 290 008.29 | 8.29 | 5 530 078.94 | 78.94 |
| 100 % | | -30 | 5 210 031.66 | 31.66 | 5 290 064.80 | 64.80 | 5 530 087.27 | 87.27 |
| 100 % | | -20 | 5 210 055.36 | 55.36 | 5 290 059.35 | 59.35 | 5 530 050.73 | 50.73 |
| 100 % | | -10 | 5 210 099.76 | 99.76 | 5 290 015.33 | 15.33 | 5 530 044.58 | 44.58 |
| 100 % | | 0 | 5 210 070.95 | 70.95 | 5 290 003.35 | 3.35 | 5 530 073.03 | 73.03 |
| 100 % | | +10 | 5 210 041.88 | 41.88 | 5 290 027.75 | 27.75 | 5 530 051.43 | 51.43 |
| 100 % | | +30 | 5 210 028.98 | 28.98 | 5 290 053.65 | 53.65 | 5 530 034.69 | 34.69 |
| 100 % | | +40 | 5 210 004.43 | 4.43 | 5 290 067.96 | 67.96 | 5 530 026.05 | 26.05 |
| 100 % | | +50 | 5 210 069.90 | 69.90 | 5 290 005.87 | 5.87 | 5 530 025.02 | 25.02 |
| High | 3.600 | +20 | 5 210 058.75 | 58.75 | 5 290 091.61 | 91.61 | 5 530 033.46 | 33.46 |
| Low | 3.135 | +20 | 5 210 053.33 | 53.33 | 5 290 072.46 | 72.46 | 5 530 092.94 | 92.94 |

| OPERATING BAND: | | UNII Band 3 | |
|---|---|---|---|
| OPERATING FREQUENCY: | | 5,775,000,000 Hz | |
| CHANNEL: | | 155 | |
| Voltage | Power | Temp. | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 775 057.55 | 57.55 |
| 100 % | | -30 | 5 775 065.06 | 65.06 |
| 100 % | | -20 | 5 775 074.16 | 74.16 |
| 100 % | | -10 | 5 775 023.23 | 23.23 |
| 100 % | | 0 | 5 775 047.51 | 47.51 |
| 100 % | | +10 | 5 775 048.79 | 48.79 |
| 100 % | | +30 | 5 775 072.86 | 72.86 |
| 100 % | | +40 | 5 775 005.89 | 5.89 |
| 100 % | | +50 | 5 775 091.85 | 91.85 |
| High | 3.600 | +20 | 5 775 052.02 | 52.02 |
| Low | 3.135 | +20 | 5 775 047.31 | 47.31 |

10 minutes after the EUT is energized

| OPERATING BAND: | | | UNII Band 1 | | UNII Band 2A | | UNII Band 2C | |
|---|---|---|---|---|---|---|---|---|
| OPERATING FREQUENCY: | | | 5,210,000,000 Hz | | 5,290,000,000 Hz | | 5, 530,000,000 Hz | |
| CHANNEL: | | | 42 | | 58 | | 106 | |
| Voltage | Power | Temp. | Frequency | Frequency Error | Frequency | Frequency Error | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 210 043.92 | 43.92 | 5 290 012.83 | 12.83 | 5 530 074.51 | 74.51 |
| 100 % | | -30 | 5 210 051.63 | 51.63 | 5 290 071.60 | 71.60 | 5 530 003.28 | 3.28 |
| 100 % | | -20 | 5 210 089.03 | 89.03 | 5 290 034.16 | 34.16 | 5 530 037.27 | 37.27 |
| 100 % | | -10 | 5 210 025.16 | 25.16 | 5 290 024.08 | 24.08 | 5 530 044.44 | 44.44 |
| 100 % | | 0 | 5 210 068.03 | 68.03 | 5 290 052.53 | 52.53 | 5 530 038.69 | 38.69 |
| 100 % | | +10 | 5 210 055.49 | 55.49 | 5 290 027.83 | 27.83 | 5 530 012.45 | 12.45 |
| 100 % | | +30 | 5 210 094.53 | 94.53 | 5 290 045.89 | 45.89 | 5 530 019.38 | 19.38 |
| 100 % | | +40 | 5 210 048.57 | 48.57 | 5 290 089.10 | 89.10 | 5 530 007.63 | 7.63 |
| 100 % | | +50 | 5 210 044.75 | 44.75 | 5 290 083.09 | 83.09 | 5 530 061.15 | 61.15 |
| High | 3.600 | +20 | 5 210 097.28 | 97.28 | 5 290 010.58 | 10.58 | 5 530 087.95 | 87.95 |
| Low | 3.135 | +20 | 5 210 013.49 | 13.49 | 5 290 099.82 | 99.82 | 5 530 075.02 | 75.02 |

| OPERATING BAND: | | | UNII Band 3 | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | | | 5,775,000,000 Hz | |
| CHANNEL: | | | 155 | |
| Voltage | Power | Temp. | Frequency | Frequency Error |
| (%) | (VDC) | (°C) | (kHz) | (kHz) |
| 100 % | 3.300 | +20(Ref) | 5 775 009.72 | 9.72 |
| 100 % | | -30 | 5 775 054.59 | 54.59 |
| 100 % | | -20 | 5 775 014.37 | 14.37 |
| 100 % | | -10 | 5 775 087.48 | 87.48 |
| 100 % | | 0 | 5 775 072.73 | 72.73 |
| 100 % | | +10 | 5 775 070.30 | 70.30 |
| 100 % | | +30 | 5 775 081.82 | 81.82 |
| 100 % | | +40 | 5 775 078.75 | 78.75 |
| 100 % | | +50 | 5 775 076.08 | 76.08 |
| High | 3.600 | +20 | 5 775 004.11 | 4.11 |
| Low | 3.135 | +20 | 5 775 073.50 | 73.50 |

## 10.7 STRADDLE CHANNEL

| Test Description | Note |
|---|---|
| 26 dB Bandwidth | 1. [UNII 2C] 26 dB Bandwidth = 5725 MHz - Measured Frequency[MHz]<br>2. [UNII 3] 26 dB Bandwidth = Measured Frequency[MHz] -5725 MHz |
| 6 dB Bandwidth | 1. 6 dB Bandwidth = Measured Frequency[MHz] – 5725 MHz<br>2. Limit : > 0.5 MHz |
| Output Power | 1. Limit(UNII2C) : 23.98 dBm or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)<br>2. Limit(UNII 3) : 30.00 dBm<br>3. Total Power (dBm) = Measured Value (dBm) + Duty Cycle Factor (dB) |
| Power Spectral Density | 1. Limit(UNII 2C) : 11.0 dBm/MHz<br>2. Limit(UNII 3) : 30.0 dBm/500kHz<br>3. Total PSD (dBm/MHz) = Measured Value (dBm/MHz) + Duty Cycle Factor (dB) |

[ANT. 1]

| Mode | Band | Freq. [MHz] | CH. | 26dB BW [MHz] | 6dB BW [MHz] | Total Power [dBm] | Limit [dBm] | Total PSD [dBm] | Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|---|---|
| 802.11a | UNII2C | 5720 | 144 | 14.16 | - | 12.4 | 22.51 | 2.542 | 11 |
| 802.11n(HT20) | | | | 14.68 | - | 12.2 | 22.67 | 2.170 | 11 |
| 802.11ac(VHT20) | | | | 14.68 | - | 12.1 | 22.67 | 2.312 | 11 |
| 802.11a | UNII3 | 5720 | 144 | 4.20 | 2.76 | 5.2 | 30.00 | -1.934 | 30 dBm/500kHz |
| 802.11n(HT20) | | | | 4.60 | 2.76 | 5.5 | 30.00 | -2.255 | 30 dBm/500kHz |
| 802.11ac(VHT20) | | | | 4.60 | 2.56 | 5.5 | 30.00 | -2.133 | 30 dBm/500kHz |

| Mode | Band | Freq. [MHz] | Channel | 26dB BW [MHz] | 6dB BW [MHz] | Total Power [dBm] | Limit [dBm] | Total PSD [dBm] | Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|---|---|
| 802.11n(HT40) | UNII2C | 5710 | 142 | 34.60 | - | 12.8 | 23.98 | -0.563 | 11 |
| 802.11ac(VHT40) | | | | 34.44 | - | 13.0 | 23.98 | -0.217 | 11 |
| 802.11n(HT40) | UNII3 | 5710 | 142 | 4.44 | 2.60 | 1.3 | 30.00 | -5.801 | 30 dBm/500kHz |
| 802.11ac(VHT40) | | | | 4.60 | 2.60 | 1.3 | 30.00 | -5.712 | 30 dBm/500kHz |

| Mode | Band | Freq. [MHz] | Channel | 26dB BW [MHz] | 6dB BW [MHz] | Total Power [dBm] | Limit [dBm] | Total PSD [dBm] | Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|---|---|
| 802.11ac(VHT80) | UNII2C | 5690 | 138 | 75.32 | - | 12.6 | 23.98 | -3.521 | 11 |
| 802.11ac(VHT80) | UNII3 | 5690 | 138 | 5.80 | 2.60 | -4.1 | 30.00 | -10.884 | 30 dBm/500kHz |

**[ANT. 2]**

| Mode | Band | Freq. [MHz] | CH. | 26dB BW [MHz] | 6dB BW [MHz] | Total Power [dBm] | Limit [dBm] | Total PSD [dBm] | Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|---|---|
| 802.11a | UNII2C | 5720 | 144 | 14.16 | - | 12.1 | 22.51 | 2.422 | 11 |
| 802.11n(HT20) | | | | 14.64 | - | 12.0 | 22.66 | 2.079 | 11 |
| 802.11ac(VHT20) | | | | 14.64 | - | 11.9 | 22.66 | 1.949 | 11 |
| 802.11a | UNII3 | 5720 | 144 | 4.20 | 2.80 | 5.0 | 30.00 | -2.075 | 30 dBm/500kHz |
| 802.11n(HT20) | | | | 4.60 | 2.92 | 5.3 | 30.00 | -2.428 | 30 dBm/500kHz |
| 802.11ac(VHT20) | | | | 4.60 | 2.56 | 5.3 | 30.00 | -2.362 | 30 dBm/500kHz |

| Mode | Band | Freq. [MHz] | Channel | 26dB BW [MHz] | 6dB BW [MHz] | Total Power [dBm] | Limit [dBm] | Total PSD [dBm] | Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|---|---|
| 802.11n(HT40) | UNII2C | 5710 | 142 | 34.60 | - | 12.4 | 23.98 | -0.742 | 11 |
| 802.11ac(VHT40) | | | | 34.44 | - | 12.4 | 23.98 | -0.813 | 11 |
| 802.11n(HT40) | UNII3 | 5710 | 142 | 4.44 | 2.60 | 0.7 | 30.00 | -6.878 | 30 dBm/500kHz |
| 802.11ac(VHT40) | | | | 4.60 | 2.60 | 0.7 | 30.00 | -6.385 | 30 dBm/500kHz |

| Mode | Band | Freq. [MHz] | Channel | 26dB BW [MHz] | 6dB BW [MHz] | Total Power [dBm] | Limit [dBm] | Total PSD [dBm] | Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|---|---|
| 802.11ac(VHT80) | UNII2C | 5690 | 138 | 75.80 | - | 12.4 | 23.98 | -4.577 | 11 |
| 802.11ac(VHT80) | UNII3 | 5690 | 138 | 6.12 | 2.60 | -3.9 | 30.00 | -10.966 | 30 dBm/500kHz |

▣ Test Plots (26 dB Bandwidth)

[ANT. 1]

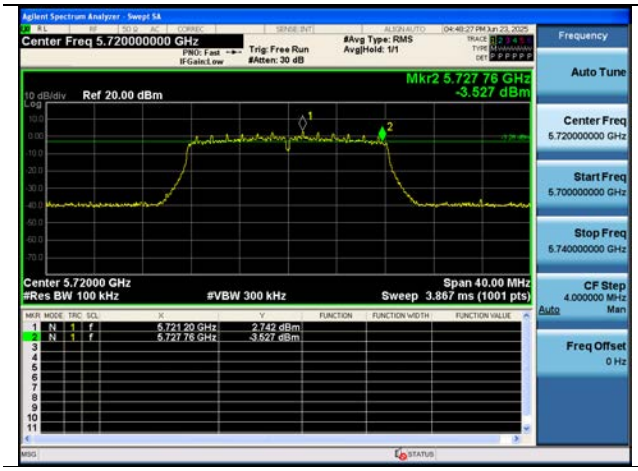
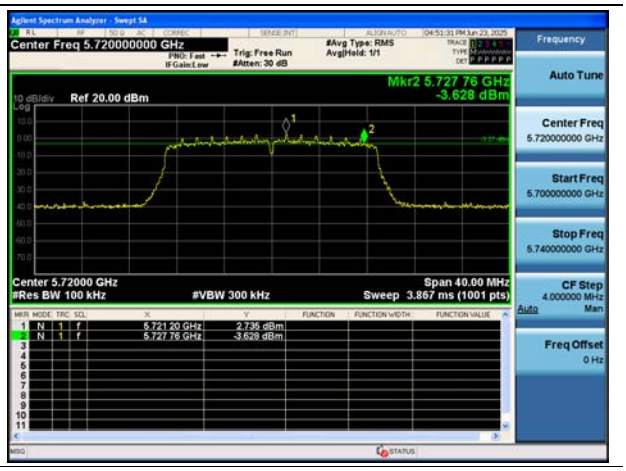
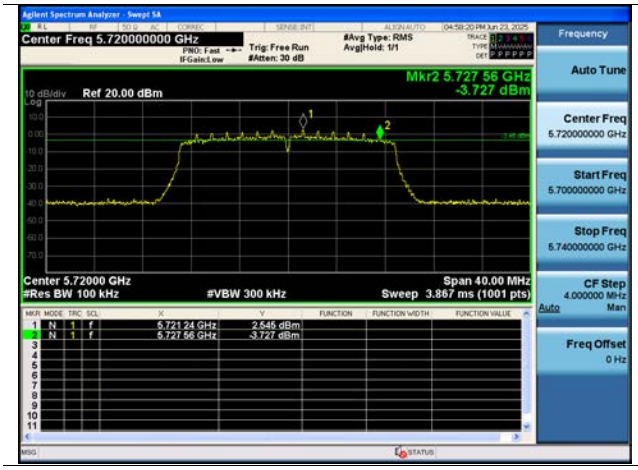
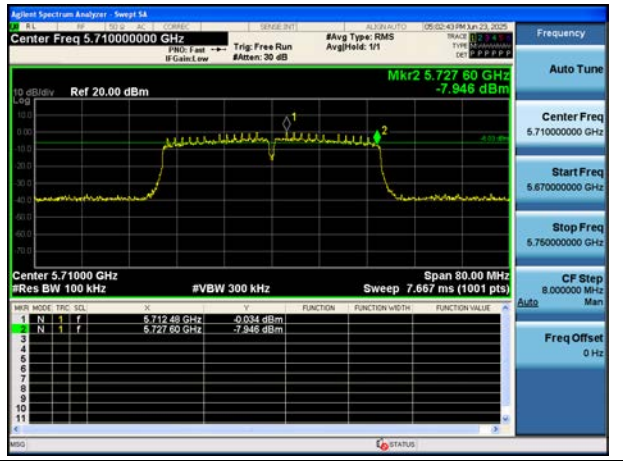
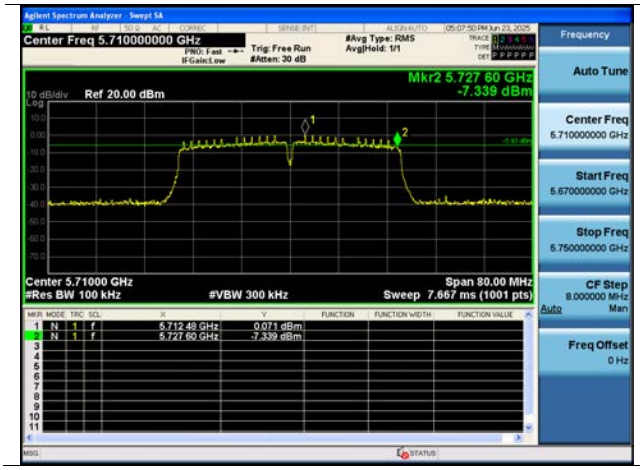
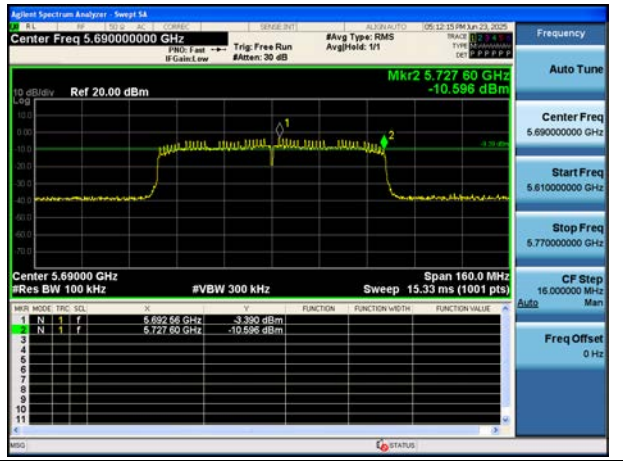
| 802.11a UNII Band | 802.11n(HT20) UNII Band |
|---|---|
|  |  |
| **802.11ac(VHT20) UNII Band** | **802.11n(HT40) UNII Band** |
|  |  |
| **802.11ac(VHT40) UNII Band** | **802.11ac(VHT80) UNII Band** |
|  |  |

[ANT. 2]

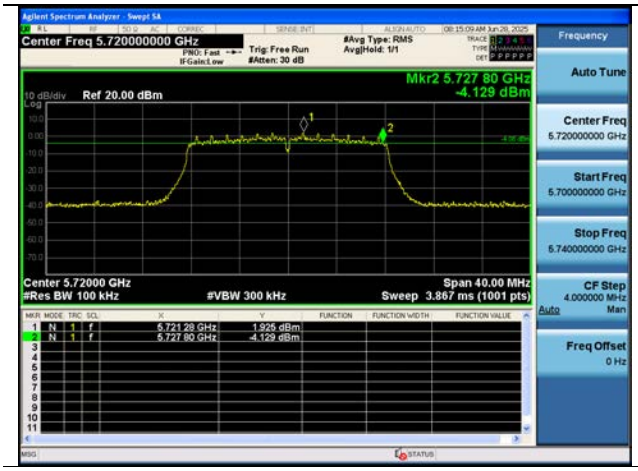
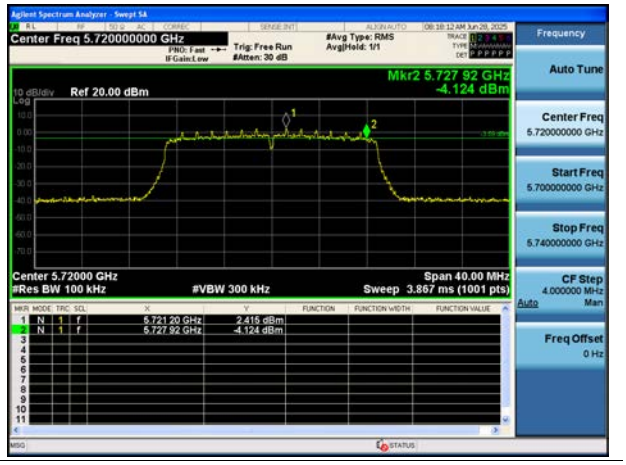
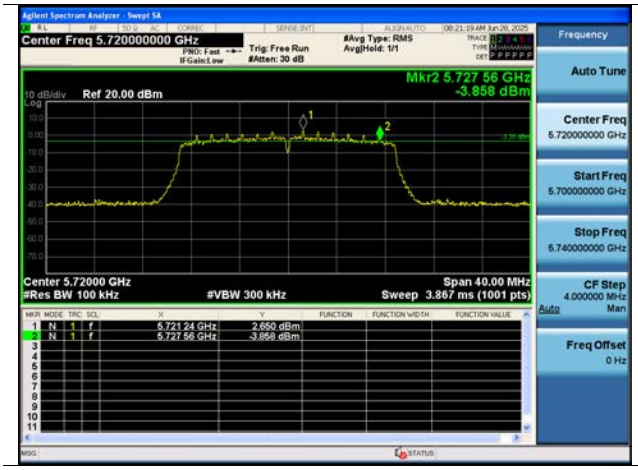
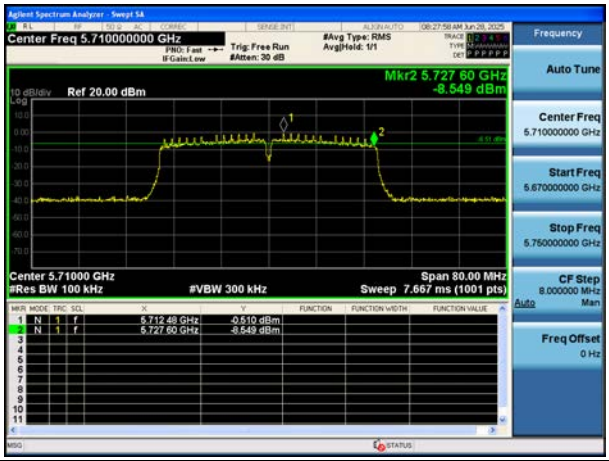
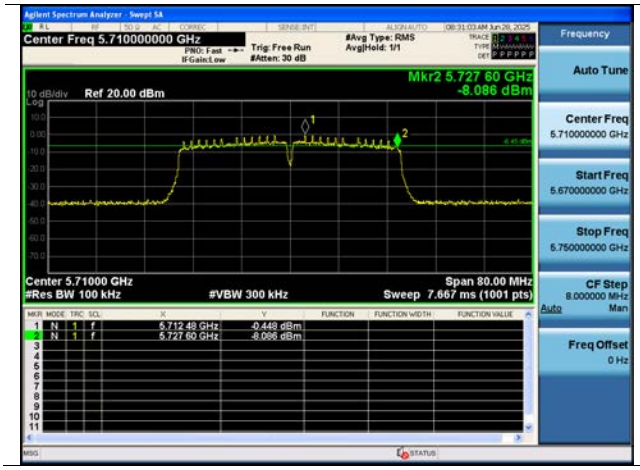
| 802.11a UNII Band | 802.11n(HT20) UNII Band |
|---|---|
|  |  |
| **802.11ac(VHT20) UNII Band** | **802.11n(HT40) UNII Band** |
|  |  |
| **802.11ac(VHT40) UNII Band** | **802.11ac(VHT80) UNII Band** |
|  |  |

▣ Test Plots(UNII 3 Band 6 dB Bandwidth)

[ANT. 1]

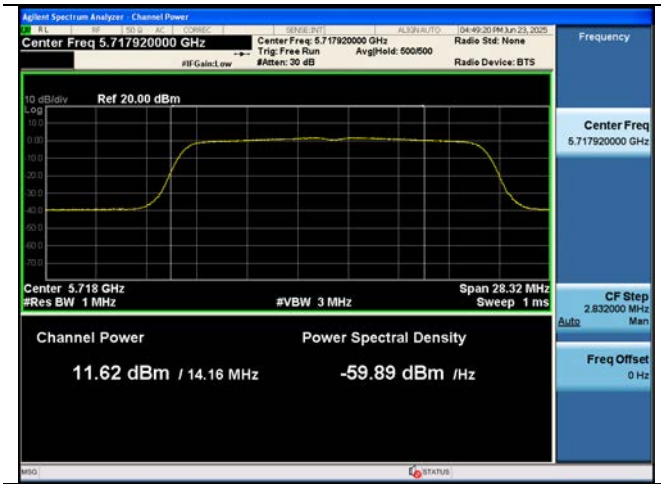
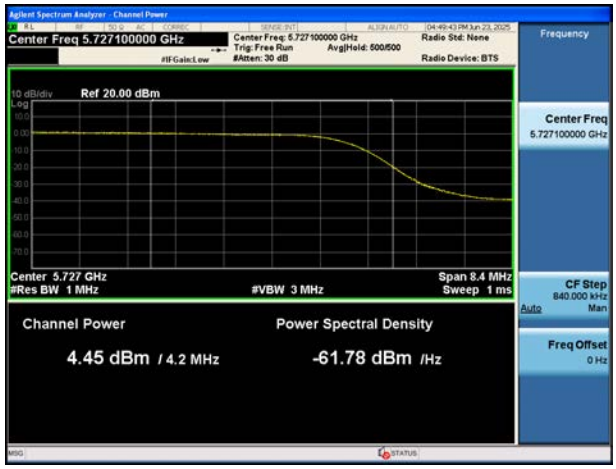
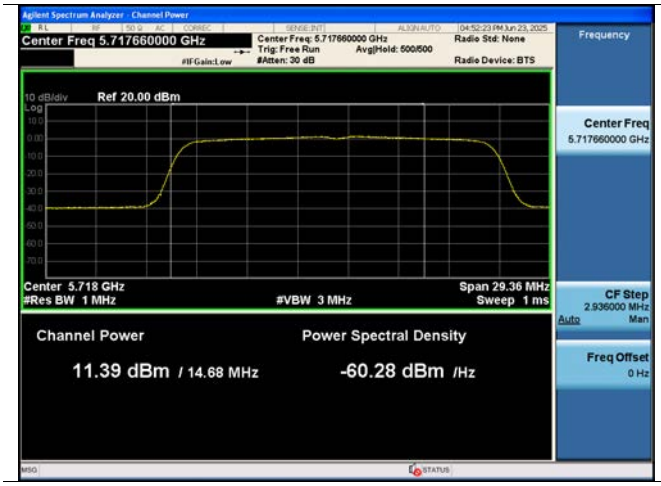
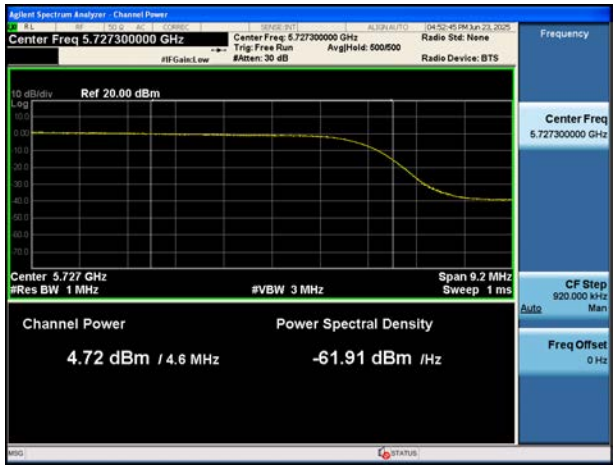
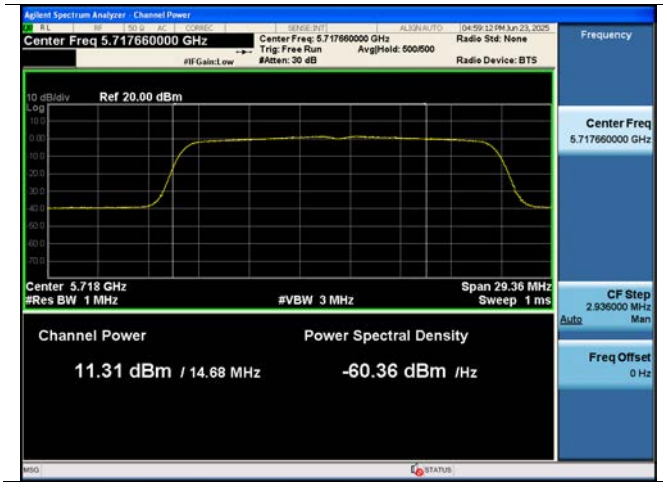
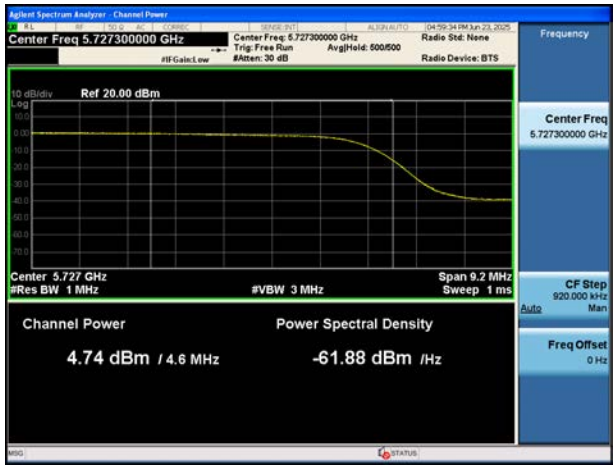
| 802.11a UNII Band | 802.11n(HT20) UNII Band |
|---|---|
|  |  |
| **802.11ac(VHT20) UNII Band** | **802.11n(HT40) UNII Band** |
|  |  |
| **802.11ac(VHT40) UNII Band** | **802.11ac(VHT80) UNII Band** |
|  |  |

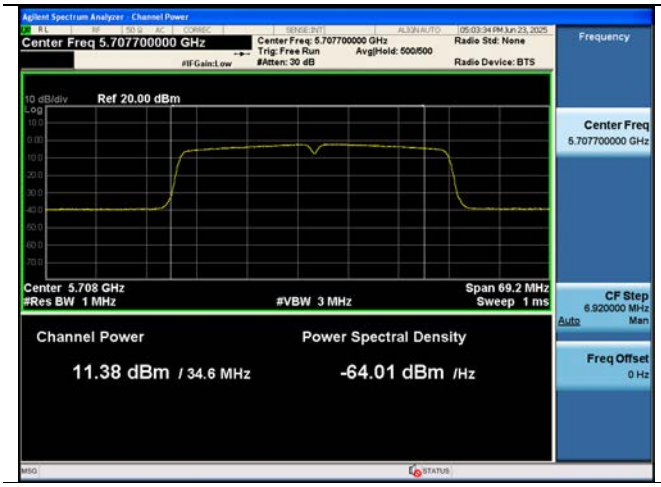
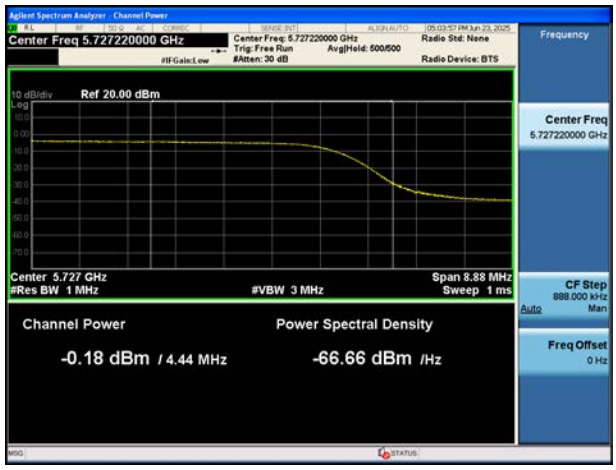
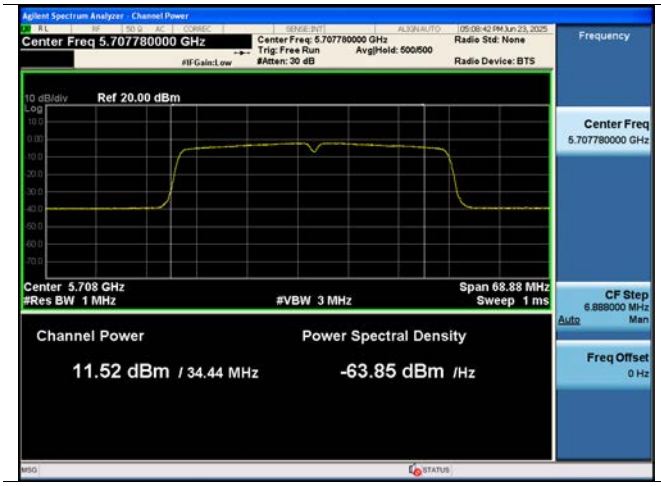
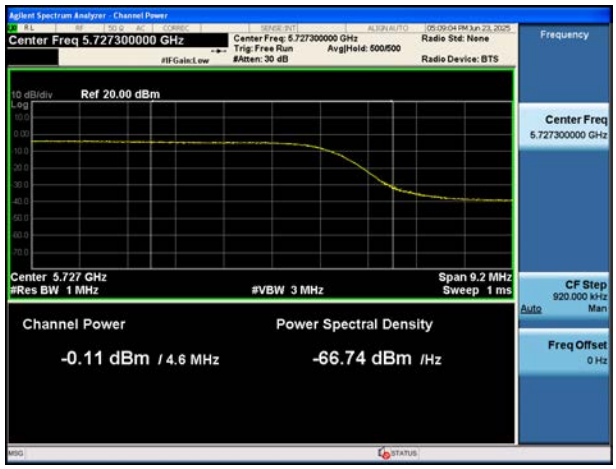
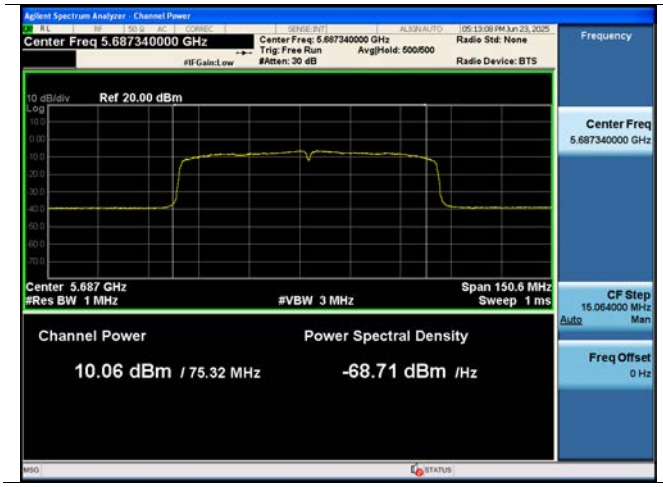
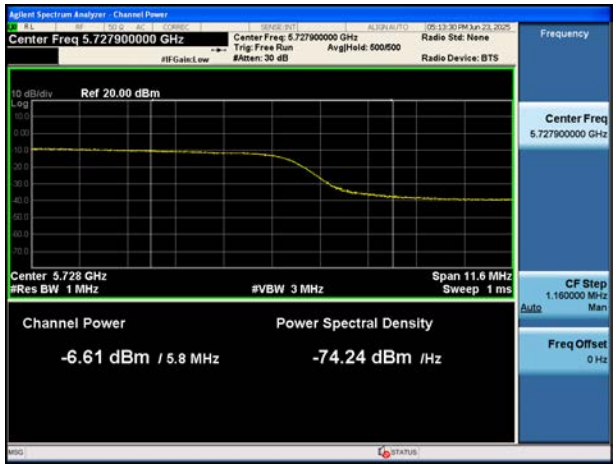
[ANT. 2]

| 802.11a UNII Band | 802.11n(HT20) UNII Band |
|---|---|
|  |  |
| **802.11ac(VHT20) UNII Band** | **802.11n(HT40) UNII Band** |
|  |  |
| **802.11ac(VHT40) UNII Band** | **802.11ac(VHT80) UNII Band** |
|  |  |

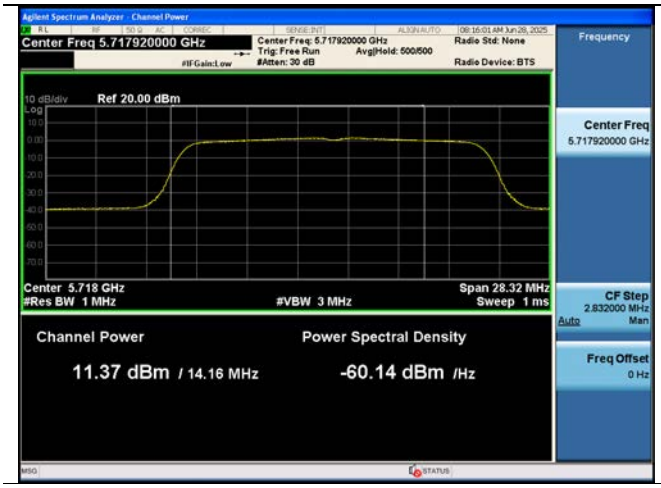
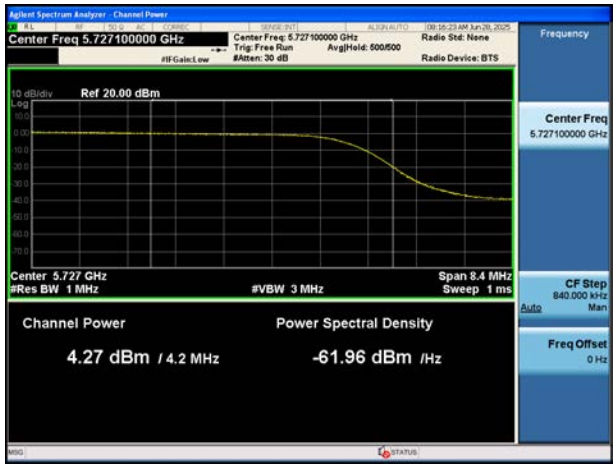
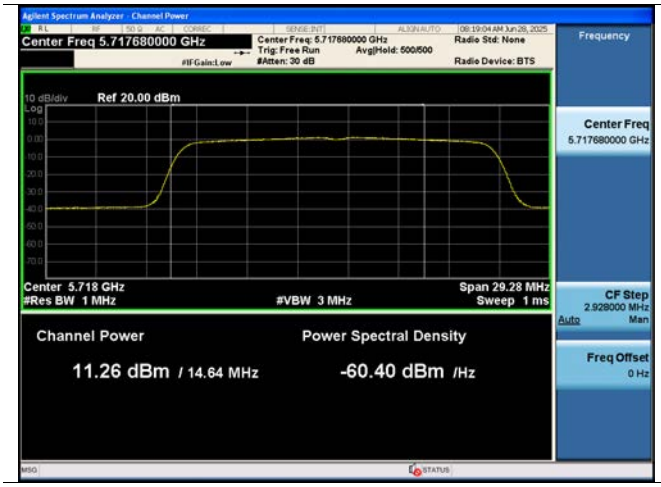
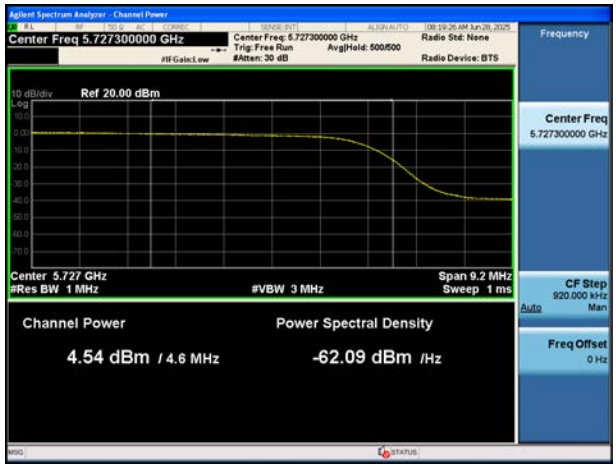
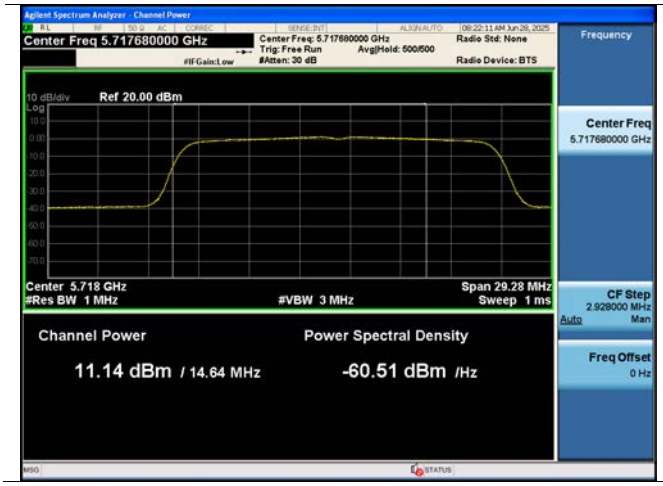
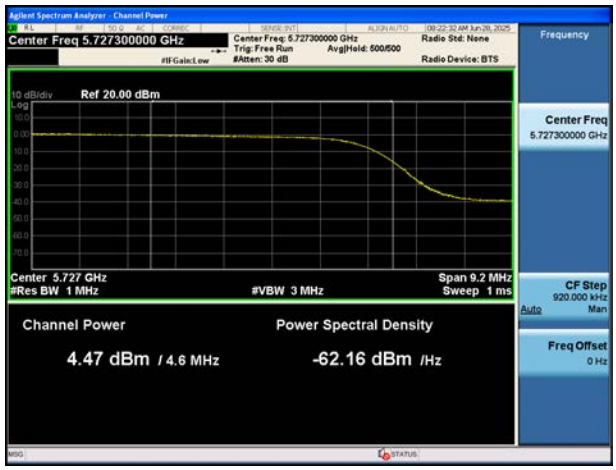
▣ Test Plots(Output Power)

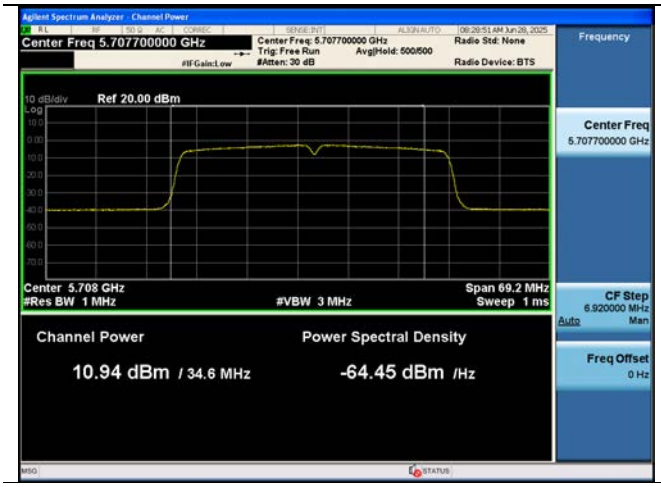
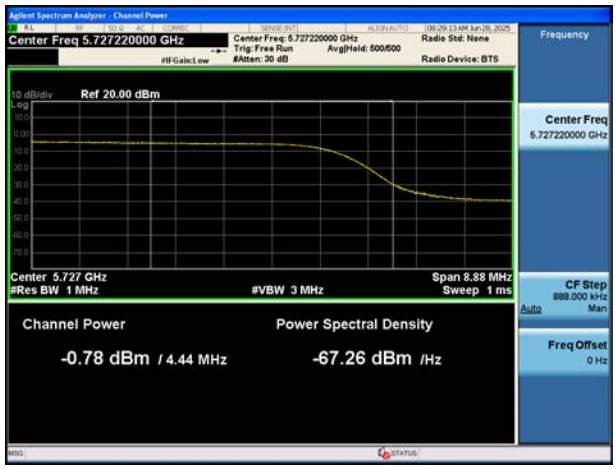
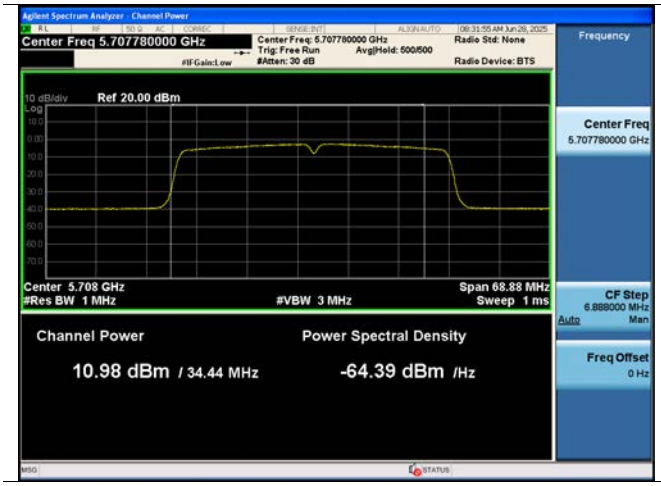
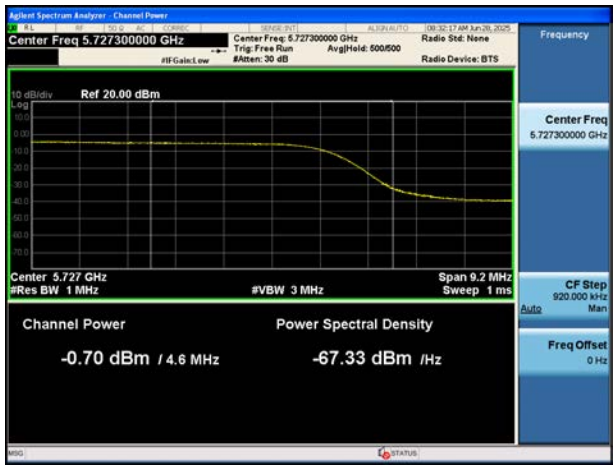
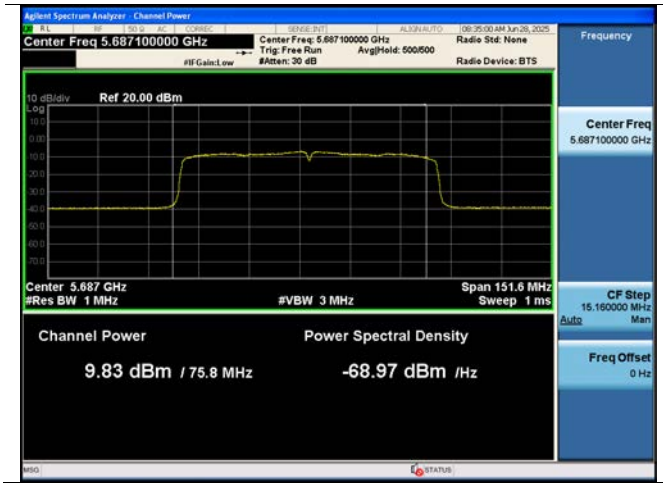
[ANT. 1]

| 802.11a UNII 2C Band | 802.11a UNII 3 Band |
|---|---|
|  |  |
| **802.11n(HT20) UNII 2C Band** | **802.11n(HT20) UNII 3 Band** |
|  |  |
| **802.11ac(VHT20) UNII 2C Band** | **802.11ac(VHT20) UNII 3 Band** |
|  |  |

| 802.11n(HT40) UNII 2C Band | 802.11n(HT40) UNII 3 Band |
|---|---|
|  |  |
| **802.11ac(VHT40) UNII 2C Band** | **802.11ac(VHT40) UNII 3 Band** |
|  |  |
| **802.11ac(VHT80) UNII 2C Band** | **802.11ac(VHT80) UNII 3 Band** |
|  |  |

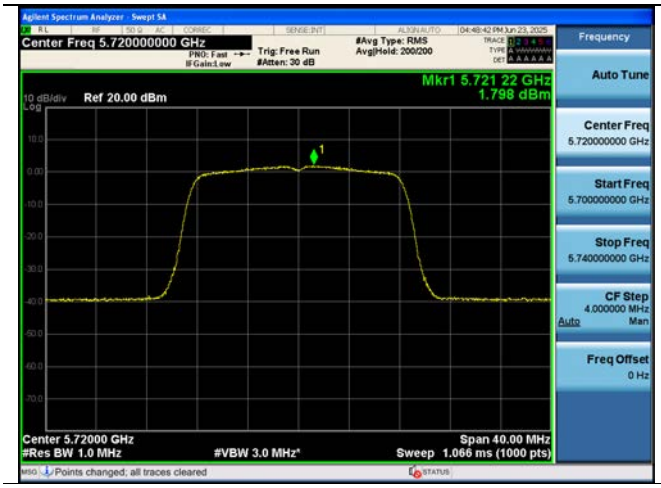
[ANT. 2]

| 802.11a UNII 2C Band | 802.11a UNII 3 Band |
|---|---|
|  |  |
| **802.11n(HT20) UNII 2C Band** | **802.11n(HT20) UNII 3 Band** |
|  |  |
| **802.11ac(VHT20) UNII 2C Band** | **802.11ac(VHT20) UNII 3 Band** |
|  |  |

| 802.11n(HT40) UNII 2C Band | 802.11n(HT40) UNII 3 Band |
|---|---|
|  |  |
| **802.11ac(VHT40) UNII 2C Band** | **802.11ac(VHT40) UNII 3 Band** |
|  |  |
| **802.11ac(VHT80) UNII 2C Band** | **802.11ac(VHT80) UNII 3 Band** |
|  |  |

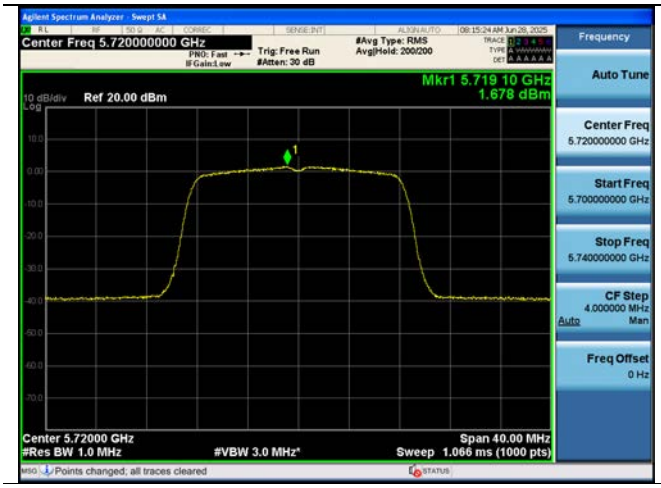
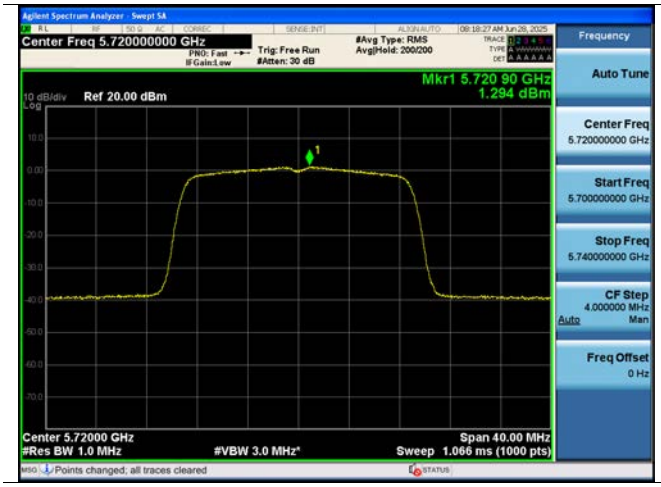
▣ Test Plots(Power Spectral Density)

[ANT. 1]

| 802.11a UNII 2C Band | 802.11a UNII 3 Band |
|---|---|
|  |  |
| **802.11n(HT20) UNII 2C Band** | **802.11n(HT20) UNII 3 Band** |
|  |  |
| **802.11ac(VHT20) UNII 2C Band** | **802.11ac(VHT20) UNII 3 Band** |
|  |  |

| 802.11n(HT40) UNII 2C Band | 802.11n(HT40) UNII 3 Band |
|---|---|
|  |  |
| **802.11ac(VHT40) UNII 2C Band** | **802.11ac(VHT40) UNII 3 Band** |
|  |  |
| **802.11ac(VHT80) UNII 2C Band** | **802.11ac(VHT80) UNII 3 Band** |
|  |  |

[ANT. 2]

| 802.11a UNII 2C Band | 802.11a UNII 3 Band |
|---|---|
|  |  |
| **802.11n(HT20) UNII 2C Band** | **802.11n(HT20) UNII 3 Band** |
|  |  |
| **802.11ac(VHT20) UNII 2C Band** | **802.11ac(VHT20) UNII 3 Band** |
|  |  |

| 802.11n(HT40) UNII 2C Band | 802.11n(HT40) UNII 3 Band |
|---|---|
|  |  |
| **802.11ac(VHT40) UNII 2C Band** | **802.11ac(VHT40) UNII 3 Band** |
|  |  |
| **802.11ac(VHT80) UNII 2C Band** | **802.11ac(VHT80) UNII 3 Band** |
|  |  |

## 10.8 RADIATED SPURIOUS EMISSIONS

**Frequency Range : 9 kHz – 30 MHz**

| Frequency | Measured Value | A.F+D.F+C.L | POL | Total | Limit | Margin |
|---|---|---|---|---|---|---|
| [MHz] | [dBμV] | [dB/m] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] |
| No Critical peaks found | | | | | | |

**Note:**

1. The Measured Value of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
3. Limit line = specific Limits (dBμV) + Distance extrapolation factor

**Frequency Range : Below 1 GHz**

| Frequency | Measured Value | A.F+C.L | POL | Total | Limit | Margin |
|---|---|---|---|---|---|---|
| [MHz] | [dBμV] | [dB/m] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] |
| No Critical peaks found | | | | | | |

**Note:**

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode

**Frequency Range : Above 1 GHz**

**[MIMO_CDD(Ant1+Ant2)]**

| Band : | UNII 1 | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.36 | 5180MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 10360 | 53.04 | -0.54 | V | - | 52.50 | 68.20 | 15.70 | PK |
| 15540 | 52.27 | -0.44 | V | - | 51.83 | 73.98 | 22.15 | PK |
| 15540 | 39.75 | -0.44 | V | 0.74 | 40.05 | 53.98 | 13.93 | AV |
| 10360 | 53.85 | -0.54 | H | - | 53.31 | 68.20 | 14.89 | PK |
| 15540 | 51.62 | -0.44 | H | - | 51.18 | 73.98 | 22.80 | PK |
| 15540 | 39.67 | -0.44 | H | 0.74 | 39.97 | 53.98 | 14.01 | AV |

| Band : | UNII 1 | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.40 | 5200MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 10400 | 53.43 | 0.01 | V | - | 53.44 | 68.20 | 14.76 | PK |
| 15600 | 53.36 | -1.16 | V | - | 52.20 | 73.98 | 21.78 | PK |
| 15600 | 40.53 | -1.16 | V | 0.74 | 40.11 | 53.98 | 13.87 | AV |
| 10400 | 54.96 | 0.01 | H | - | 54.97 | 68.20 | 13.23 | PK |
| 15600 | 52.44 | -1.16 | H | - | 51.28 | 73.98 | 22.70 | PK |
| 15600 | 40.09 | -1.16 | H | 0.74 | 39.67 | 53.98 | 14.31 | AV |

| Band : | UNII 1 | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.48 | 5240MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 10480 | 53.00 | 0.34 | V | - | 53.34 | 68.20 | 14.86 | PK |
| 15720 | 54.83 | -1.23 | V | - | 53.60 | 73.98 | 20.38 | PK |
| 15720 | 39.83 | -1.23 | V | 0.74 | 39.34 | 53.98 | 14.64 | AV |
| 10480 | 54.46 | 0.34 | H | - | 54.80 | 68.20 | 13.40 | PK |
| 15720 | 52.55 | -1.23 | H | - | 51.32 | 73.98 | 22.66 | PK |
| 15720 | 39.83 | -1.23 | H | 0.74 | 39.34 | 53.98 | 14.64 | AV |

| Band : | UNII 2A | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.52 | 5260MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 10520 | 53.82 | -0.06 | V | - | 53.76 | 68.20 | 14.44 | PK |
| 15780 | 51.64 | -1.43 | V | - | 50.21 | 73.98 | 23.77 | PK |
| 15780 | 39.57 | -1.43 | V | 0.74 | 38.88 | 53.98 | 15.10 | AV |
| 10520 | 54.31 | -0.06 | H | - | 54.25 | 68.20 | 13.95 | PK |
| 15780 | 51.79 | -1.43 | H | - | 50.36 | 73.98 | 23.62 | PK |
| 15780 | 39.56 | -1.43 | H | 0.74 | 38.87 | 53.98 | 15.11 | AV |

| Band : | UNII 2A | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.60 | 5300MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 10600 | 53.78 | -0.16 | V | - | 53.62 | 73.98 | 20.36 | PK |
| 10600 | 41.04 | -0.16 | V | 0.74 | 41.62 | 53.98 | 12.36 | AV |
| 15900 | 52.71 | -1.91 | V | - | 50.80 | 73.98 | 23.18 | PK |
| 15900 | 39.90 | -1.91 | V | 0.74 | 38.73 | 53.98 | 15.25 | AV |
| 10600 | 55.10 | -0.16 | H | - | 54.94 | 73.98 | 19.04 | PK |
| 10600 | 42.28 | -0.16 | H | 0.74 | 42.86 | 53.98 | 11.12 | AV |
| 15900 | 52.11 | -1.91 | H | - | 50.20 | 73.98 | 23.78 | PK |
| 15900 | 39.81 | -1.91 | H | 0.74 | 38.64 | 53.98 | 15.34 | AV |

| Band : | UNII 2A | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.64 | 5320MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 10640 | 52.87 | 0.06 | V | - | 52.93 | 73.98 | 21.05 | PK |
| 10640 | 40.91 | 0.06 | V | 0.74 | 41.71 | 53.98 | 12.27 | AV |
| 15960 | 51.54 | -1.56 | V | - | 49.98 | 73.98 | 24.00 | PK |
| 15960 | 39.53 | -1.56 | V | 0.74 | 38.71 | 53.98 | 15.27 | AV |
| 10640 | 54.87 | 0.06 | H | - | 54.93 | 73.98 | 19.05 | PK |
| 10640 | 42.24 | 0.06 | H | 0.74 | 43.04 | 53.98 | 10.94 | AV |
| 15960 | 51.61 | -1.56 | H | - | 50.05 | 73.98 | 23.93 | PK |
| 15960 | 39.47 | -1.56 | H | 0.74 | 38.65 | 53.98 | 15.33 | AV |

| Band : | UNII 2C | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.100 | 5500MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 11000 | 53.84 | 0.19 | V | - | 54.03 | 73.98 | 19.95 | PK |
| 11000 | 40.45 | 0.19 | V | 0.74 | 41.38 | 53.98 | 12.60 | AV |
| 16500 | 51.66 | 0.67 | V | - | 52.33 | 68.20 | 15.87 | PK |
| 11000 | 52.51 | 0.19 | H | - | 52.70 | 73.98 | 21.28 | PK |
| 11000 | 40.25 | 0.19 | H | 0.74 | 41.18 | 53.98 | 12.80 | AV |
| 16500 | 51.50 | 0.67 | H | - | 52.17 | 68.20 | 16.03 | PK |

| Band : | UNII 2C | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.116 | 5580MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 11160 | 53.49 | -0.12 | V | - | 53.37 | 73.98 | 20.61 | PK |
| 11160 | 41.21 | -0.12 | V | 0.74 | 41.83 | 53.98 | 12.15 | AV |
| 16740 | 53.03 | 0.30 | V | - | 53.33 | 68.20 | 14.87 | PK |
| 11160 | 52.81 | -0.12 | H | - | 52.69 | 73.98 | 21.29 | PK |
| 11160 | 40.99 | -0.12 | H | 0.74 | 41.61 | 53.98 | 12.37 | AV |
| 16740 | 52.75 | 0.30 | H | - | 53.05 | 68.20 | 15.15 | PK |

| Band : | UNII 2C | | Operation Mode : | | | 802.11a | | |
|---|---|---|---|---|---|---|---|---|
| CH.144 | 5720MHz | | Transfer Rate : | | | 6 Mbps | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 11440 | 49.32 | 0.40 | V | - | 49.72 | 73.98 | 24.26 | PK |
| 11440 | 37.48 | 0.40 | V | 0.74 | 38.62 | 53.98 | 15.36 | AV |
| 17160 | 52.58 | 1.42 | V | - | 54.00 | 68.20 | 14.20 | PK |
| 11440 | 48.69 | 0.40 | H | - | 49.09 | 73.98 | 24.89 | PK |
| 11440 | 36.94 | 0.40 | H | 0.74 | 38.08 | 53.98 | 15.90 | AV |
| 17160 | 52.24 | 1.42 | H | - | 53.66 | 68.20 | 14.54 | PK |

| Band : | UNII 3 | | Operation Mode : | | 802.11a | | | |
|---|---|---|---|---|---|---|---|---|
| CH.149 | 5745MHz | | Transfer Rate : | | 6 Mbps | | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 11490 | 53.14 | 0.06 | V | - | 53.20 | 73.98 | 20.78 | PK |
| 11490 | 40.42 | 0.06 | V | 0.74 | 41.22 | 53.98 | 12.76 | AV |
| 17235 | 52.97 | 1.51 | V | - | 54.48 | 68.20 | 13.72 | PK |
| 11490 | 52.05 | 0.06 | H | - | 52.11 | 73.98 | 21.87 | PK |
| 11490 | 39.95 | 0.06 | H | 0.74 | 40.75 | 53.98 | 13.23 | AV |
| 17235 | 52.95 | 1.51 | H | - | 54.46 | 68.20 | 13.74 | PK |

| Band : | UNII 3 | | Operation Mode : | | 802.11a | | | |
|---|---|---|---|---|---|---|---|---|
| CH.157 | 5785MHz | | Transfer Rate : | | 6 Mbps | | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 11570 | 55.46 | -0.03 | V | - | 55.43 | 73.98 | 18.55 | PK |
| 11570 | 41.96 | -0.03 | V | 0.74 | 42.67 | 53.98 | 11.31 | AV |
| 17355 | 52.05 | 3.59 | V | - | 55.64 | 68.20 | 12.56 | PK |
| 11570 | 53.62 | -0.03 | H | - | 53.59 | 73.98 | 20.39 | PK |
| 11570 | 41.40 | -0.03 | H | 0.74 | 42.11 | 53.98 | 11.87 | AV |
| 17355 | 51.84 | 3.59 | H | - | 55.43 | 68.20 | 12.77 | PK |

| Band : | UNII 3 | | Operation Mode : | | 802.11a | | | |
|---|---|---|---|---|---|---|---|---|
| CH.165 | 5825MHz | | Transfer Rate : | | 6 Mbps | | | |
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
| 11650 | 54.25 | -0.29 | V | - | 53.96 | 73.98 | 20.02 | PK |
| 11650 | 41.81 | -0.29 | V | 0.74 | 42.26 | 53.98 | 11.72 | AV |
| 17475 | 52.44 | 3.63 | V | - | 56.07 | 68.20 | 12.13 | PK |
| 11650 | 52.68 | -0.29 | H | - | 52.39 | 73.98 | 21.59 | PK |
| 11650 | 41.23 | -0.29 | H | 0.74 | 41.68 | 53.98 | 12.30 | AV |
| 17475 | 52.49 | 3.63 | H | - | 56.12 | 68.20 | 12.08 | PK |

**[Simultaneous transmission Scenario)**

Scenario 2

WLAN 5 GHz 802.11a_Ch. 116 + Bluetooth 3-DH5_Ch.0

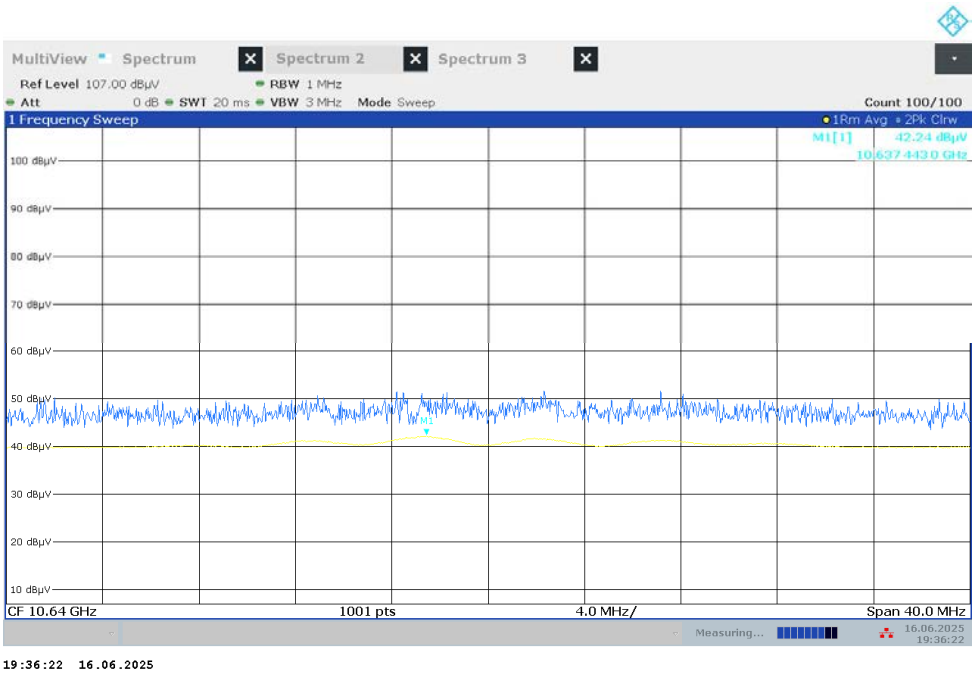
| Frequency [MHz] | Measured value [dBμV] | CL+AF+DF-AG [dB/m] | ANT. POL [H/V] | Duty Cycle Factor [dB] | Total [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Measurement Type |
|---|---|---|---|---|---|---|---|---|
| 11160 | 54.46 | -0.12 | V | - | 54.34 | 73.98 | 19.64 | PK |
| 11160 | 41.49 | -0.12 | V | 0.74 | 42.11 | 53.98 | 11.87 | AV |
| 16740 | 52.36 | 0.30 | V | - | 52.66 | 68.20 | 15.54 | PK |

## ▣ Test Plots

**Note:** Only the worst case plot for Radiated Spurious Emissions.

### [MIMO_CDD(Ant1+Ant2)]

Radiated Spurious Emissions plot – Average Result (802.11a, Ch.64 Spurious Emissions, Z-H)

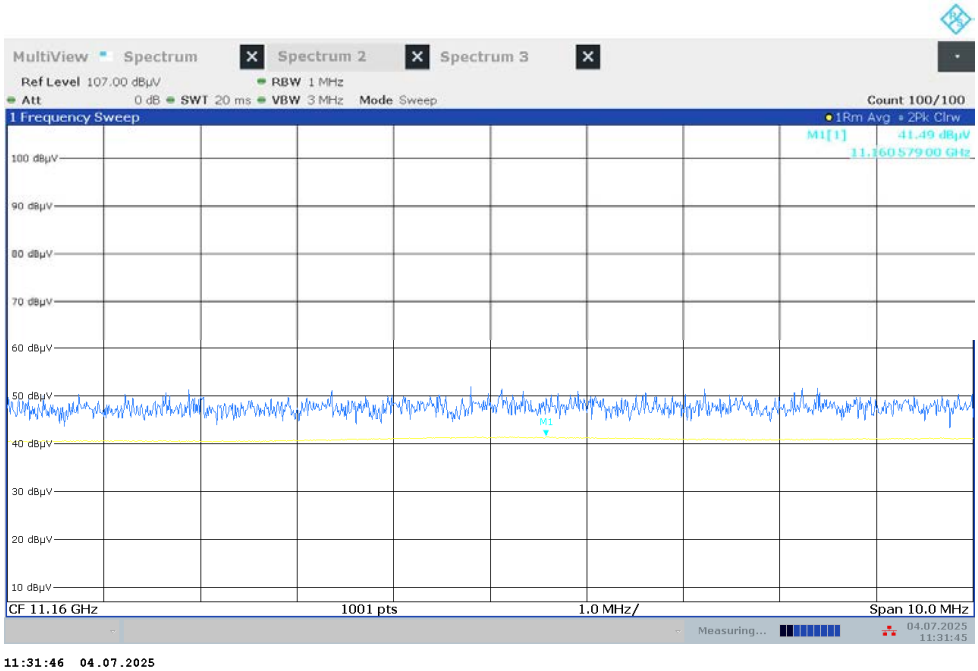


**[Simultaneous transmission Scenario)**

Scenario 2

WLAN 5 GHz 802.11a_Ch. 116 + Bluetooth 3-DH5_Ch.0

Radiated Spurious Emissions plot – Average Result (Spurious Emissions, X-V)



## 10.9 RADIATED RESTRICTED BAND EDGE

**[MIMO_CDD(Ant1+Ant2)]**

| 802.11 a | | 6 Mbps | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch.36 | 5180 MHz | UNII 1 | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBµV] | [dB] | [H/V] | [dBµV/m] | [dBµV/m] | [dB] | Type |
| 5150 | 53.11 | 1.86 | H | 54.97 | 73.98 | 19.01 | PK |
| 5150 | 42.32 | 1.86 | H | 44.18 | 53.98 | 9.80 | AV |

| 802.11 a | | 6 Mbps | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 64 | 5320 MHz | UNII 2A | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBµV] | [dB] | [H/V] | [dBµV/m] | [dBµV/m] | [dB] | Type |
| 5350 | 57.93 | 1.23 | H | 59.16 | 73.98 | 14.82 | PK |
| 5350 | 44.96 | 1.23 | H | 46.19 | 53.98 | 7.79 | AV |

| 802.11 a | | 6 Mbps | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 100 | 5500 MHz | UNII 2C | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBµV] | [dB] | [H/V] | [dBµV/m] | [dBµV/m] | [dB] | Type |
| 5460 | 56.87 | 1.91 | H | 58.78 | 73.98 | 15.20 | PK |
| 5460 | 43.82 | 1.91 | H | 45.73 | 53.98 | 8.25 | AV |
| 5470 | 56.06 | 1.99 | H | 58.05 | 68.20 | 10.15 | PK |

| 802.11 n_HT20 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 36 | 5180 MHz | UNII 1 | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBµV] | [dB] | [H/V] | [dBµV/m] | [dBµV/m] | [dB] | Type |
| 5150 | 54.38 | 1.86 | H | 56.24 | 73.98 | 17.74 | PK |
| 5150 | 42.13 | 1.86 | H | 43.99 | 53.98 | 9.99 | AV |

| 802.11 n_HT20 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 64 | 5320 MHz | UNII 2A | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBµV] | [dB] | [H/V] | [dBµV/m] | [dBµV/m] | [dB] | Type |
| 5350 | 57.29 | 1.23 | H | 58.52 | 73.98 | 15.46 | PK |
| 5350 | 45.23 | 1.23 | H | 46.46 | 53.98 | 7.52 | AV |

| 802.11 n_HT20 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 100 | 5500 MHz | UNII 2C | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5460 | 56.73 | 1.91 | H | 58.64 | 73.98 | 15.34 | PK |
| 5460 | 43.83 | 1.91 | H | 45.74 | 53.98 | 8.24 | AV |
| 5470 | 56.59 | 1.99 | H | 58.58 | 68.20 | 9.62 | PK |

| 802.11 ac_VHT20 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 36 | 5180 MHz | UNII 1 | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5150 | 54.83 | 1.86 | H | 56.69 | 73.98 | 17.29 | PK |
| 5150 | 42.16 | 1.86 | H | 44.02 | 53.98 | 9.96 | AV |

| 802.11 ac_VHT20 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 64 | 5320 MHz | UNII 2A | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5350 | 57.47 | 1.23 | H | 58.70 | 73.98 | 15.28 | PK |
| 5350 | 45.11 | 1.23 | H | 46.34 | 53.98 | 7.64 | AV |

| 802.11 ac_VHT20 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 100 | 5500 MHz | UNII 2C | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5460 | 57.03 | 1.91 | H | 58.94 | 73.98 | 15.04 | PK |
| 5460 | 43.84 | 1.91 | H | 45.75 | 53.98 | 8.23 | AV |
| 5470 | 56.30 | 1.99 | H | 58.29 | 68.20 | 9.91 | PK |

| 802.11 n_HT40 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 38 | 5190 MHz | UNII 1 | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5150 | 56.32 | 1.86 | H | 58.18 | 73.98 | 15.80 | PK |
| 5150 | 43.17 | 1.86 | H | 45.03 | 53.98 | 8.95 | AV |

| 802.11 n_HT40 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 62 | 5310 MHz | UNII 2A | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5350 | 61.61 | 1.23 | H | 62.84 | 73.98 | 11.14 | PK |
| 5350 | 47.61 | 1.23 | H | 48.84 | 53.98 | 5.14 | AV |

| 802.11 n_HT40 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 102 | 5510 MHz | UNII 2C | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5460 | 56.82 | 1.91 | H | 58.73 | 73.98 | 15.25 | PK |
| 5460 | 44.61 | 1.91 | H | 46.52 | 53.98 | 7.46 | AV |
| 5470 | 62.55 | 1.99 | H | 64.54 | 68.20 | 3.66 | PK |

| 802.11 ac_VHT40 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 38 | 5190 MHz | UNII 1 | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5150 | 57.74 | 1.86 | H | 59.60 | 73.98 | 14.38 | PK |
| 5150 | 43.10 | 1.86 | H | 44.96 | 53.98 | 9.02 | AV |

| 802.11 ac_VHT40 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 62 | 5310 MHz | UNII 2A | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5350 | 63.35 | 1.23 | H | 64.58 | 73.98 | 9.40 | PK |
| 5350 | 46.91 | 1.23 | H | 48.14 | 53.98 | 5.84 | AV |

| 802.11 ac_VHT40 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 102 | 5510 MHz | UNII 2C | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5460 | 57.85 | 1.91 | H | 59.76 | 73.98 | 14.22 | PK |
| 5460 | 41.31 | 1.91 | H | 43.22 | 53.98 | 10.76 | AV |
| 5470 | 59.45 | 1.99 | H | 61.44 | 68.20 | 6.76 | PK |

| 802.11 ac_VHT80 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 42 | 5210 MHz | UNII 1 | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5150 | 58.14 | 1.86 | H | 60.00 | 73.98 | 13.98 | PK |
| 5150 | 46.19 | 1.86 | H | 48.05 | 53.98 | 5.93 | AV |

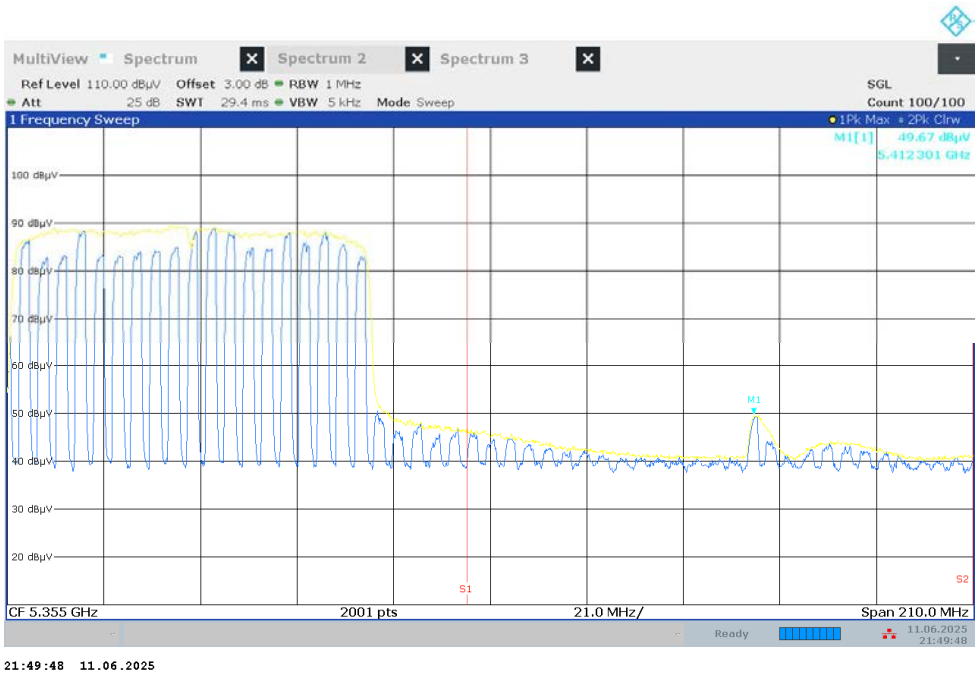
| 802.11 ac_VHT80 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 58 | 5290 MHz | UNII 2A | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5350 | 59.89 | 1.23 | H | 61.12 | 73.98 | 12.86 | PK |
| 5350 | 49.67 | 1.23 | H | 50.90 | 53.98 | 3.08 | AV |

| 802.11 ac_VHT80 | | MCS 0 | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Ch. 106 | 5530 MHz | UNII 2C | | | | |
| Frequency | Measured Value | C.L+A.F+D.F-A.G+ATT | ANT. POL | Total | Limit | Margin | Measurement |
| [MHz] | [dBμV] | [dB] | [H/V] | [dBμV/m] | [dBμV/m] | [dB] | Type |
| 5460 | 57.89 | 1.91 | H | 59.80 | 73.98 | 14.18 | PK |
| 5460 | 46.40 | 1.91 | H | 48.31 | 53.98 | 5.67 | AV |
| 5470 | 56.75 | 1.99 | H | 58.74 | 68.20 | 9.46 | PK |

**[MIMO_CDD(Ant1+Ant2)]**

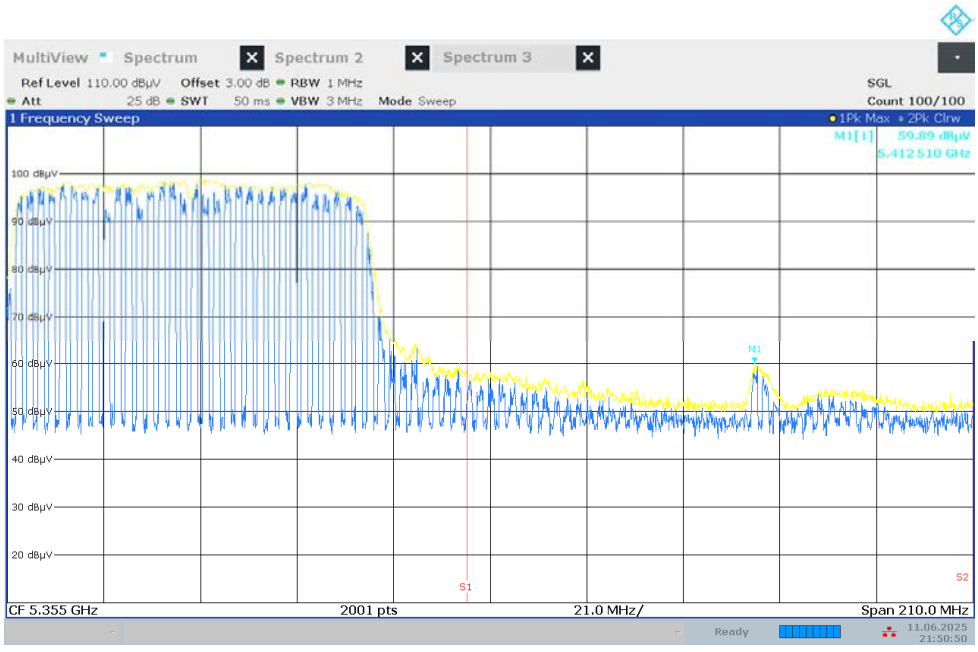
**▣ Test Plots(UNII 1, 2A, 2C)**

Average Result (802.11ac80_ MCS0, Ch. 58, Z-H)




21:49:48 11.06.2025

Peak Result (802.11ac80_ MCS0, Ch. 58, Z-H)

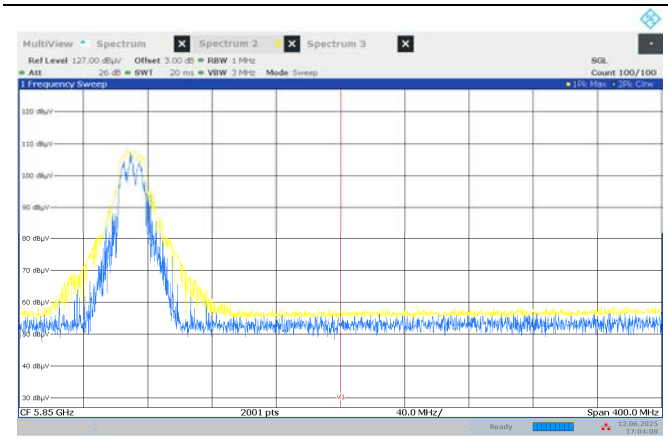



21:50:50 11.06.2025

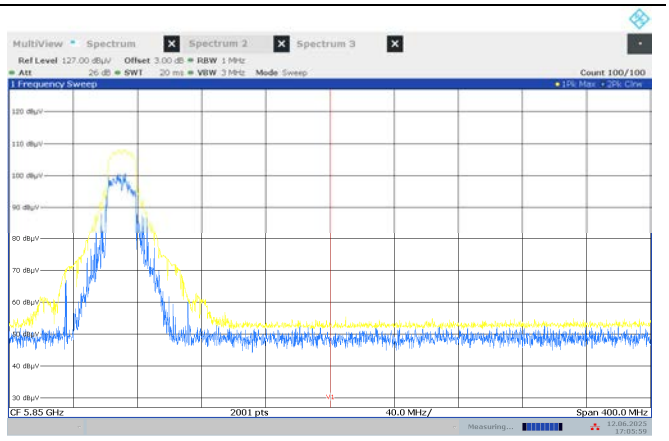
**Note:** Only the worst case plots for Radiated Restricted Band Edge.

## ▣ Test Plots(Straddle Channel)

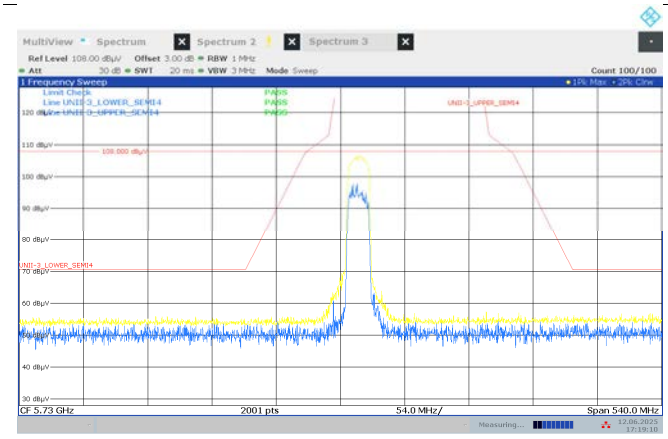
Peak Result (802.11a, Ch.144, Z-H)



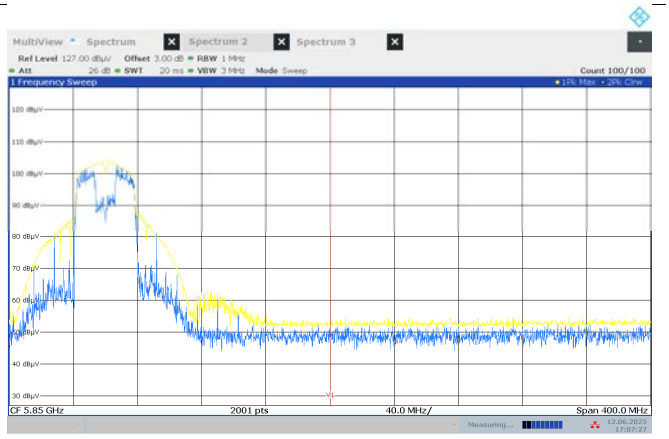

Peak Result (802.11n_HT20, Ch.144, Z-H)



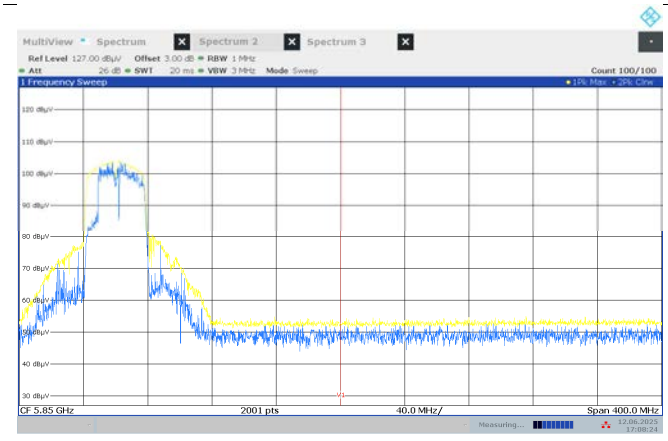

Peak Result (802.11ac_VHT20, Ch.144, Z-H)



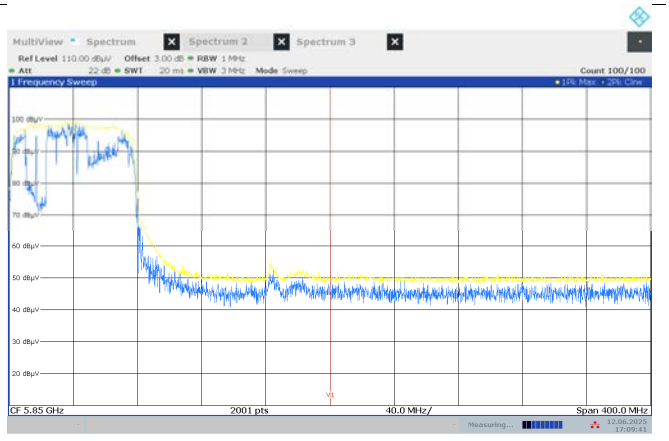

Peak Result (802.11n_HT40, Ch.142, Z-H)




Peak Result (802.11ac_VHT40, Ch.142, Z-H)



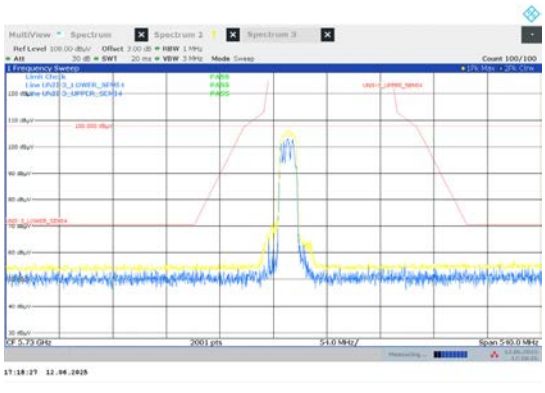
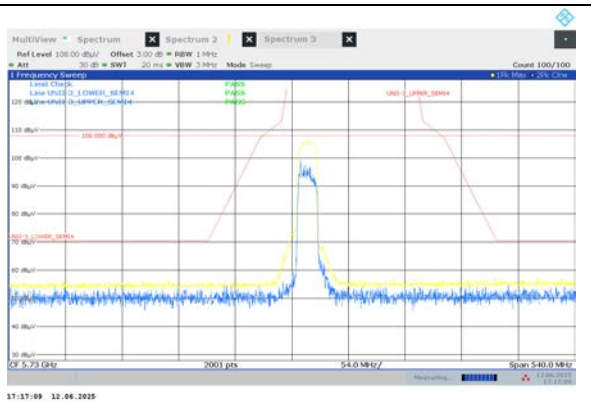
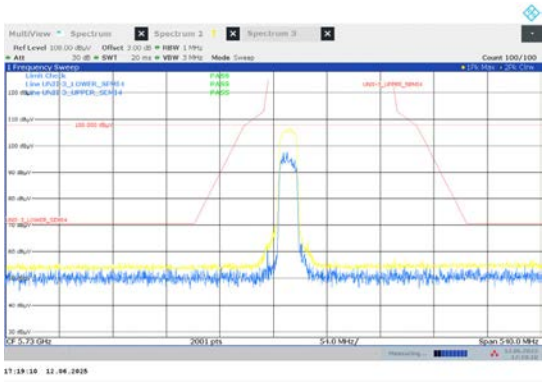
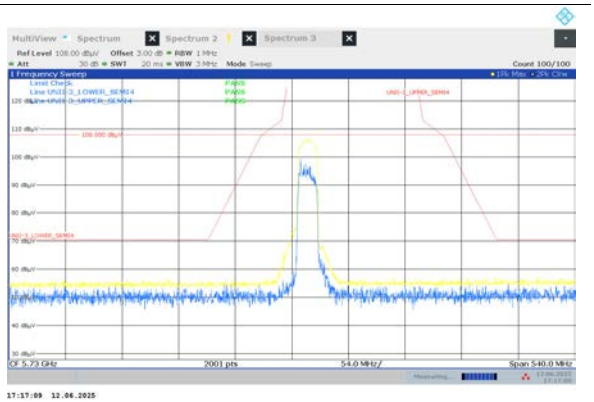
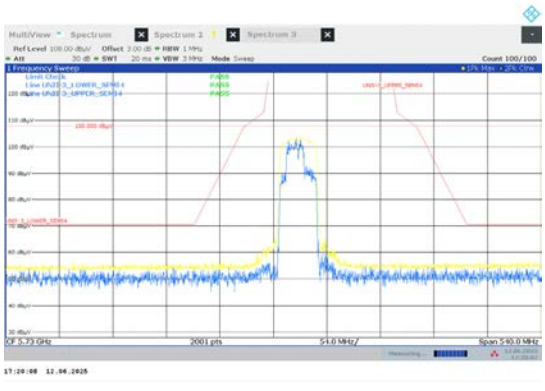
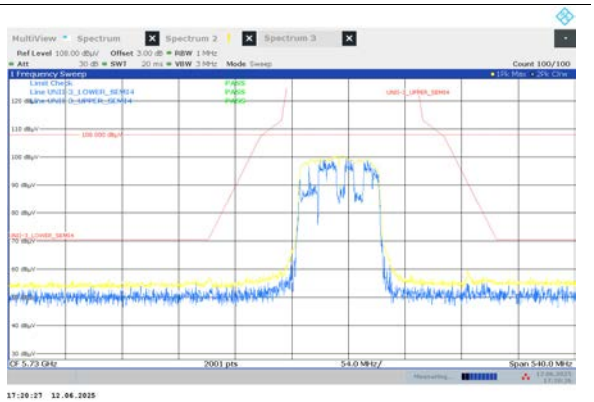

Peak Result (802.11ac_VHT80, Ch.138, Z-H)

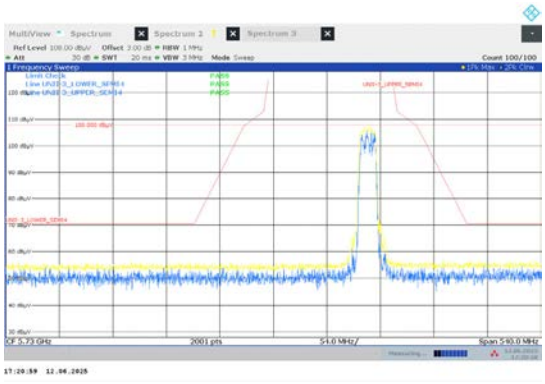
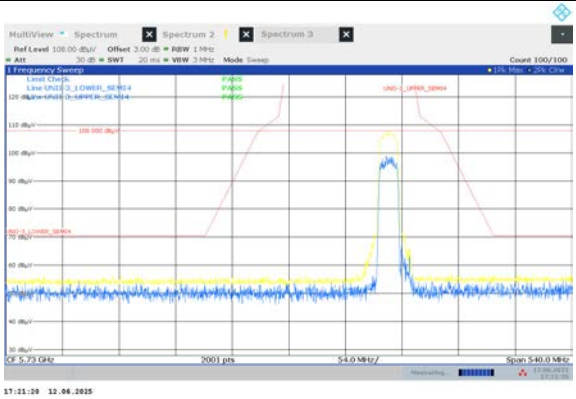
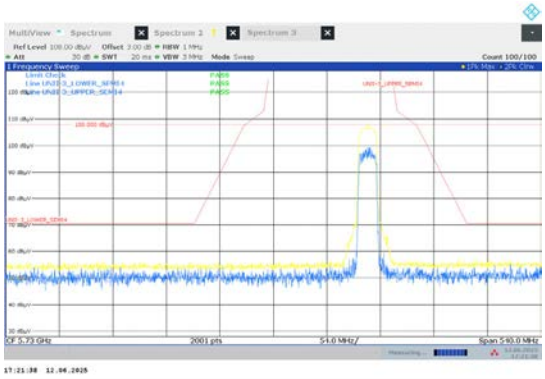
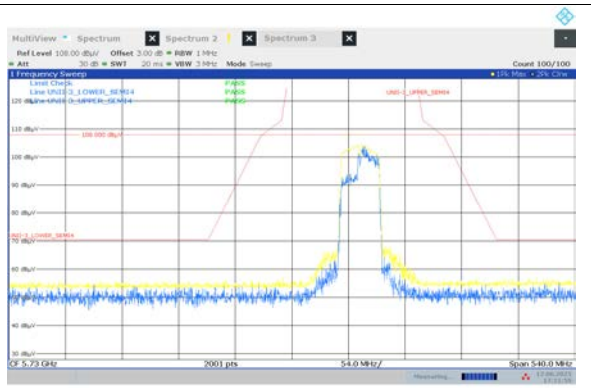
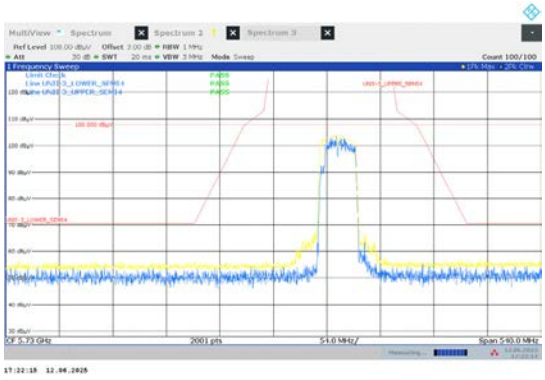
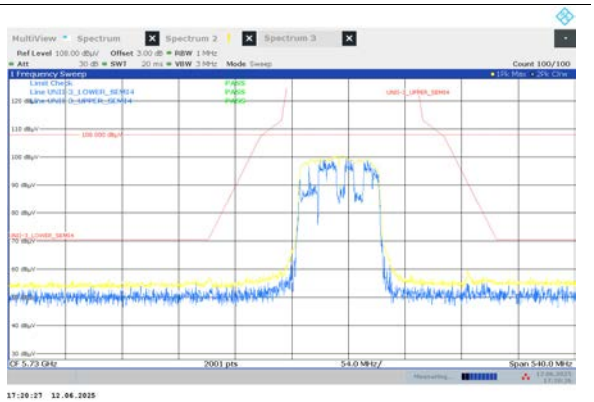



**Note :**

1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5 850 MHz

## ▣ Test Plots(UNII 3)

| Peak Result (802.11a, Ch.149, Z-H) | Peak Result (802.11n_HT20, Ch.149, Z-H) |
|---|---|
|  |  |
| **Peak Result (802.11ac_VHT20, Ch.149, Z-H)** | **Peak Result (802.11n_HT40, Ch.151, Z-H)** |
|  |  |
| **Peak Result (802.11ac_VHT40, Ch.151, Z-H)** | **Peak Result (802.11ac_VHT80, Ch.155, Z-H)** |
|  |  |

| Peak Result (802.11a, Ch.165, Z-H) | Peak Result (802.11n_HT20, Ch.165, Z-H) |
|---|---|
|  |  |
| Peak Result (802.11ac_VHT20, Ch.165, Z-H) | Peak Result (802.11n_HT40, Ch.159, Z-H) |
|  |  |
| Peak Result (802.11ac_VHT40, Ch.159, Z-H) | Peak Result (802.11ac_VHT80, Ch.155, Z-H) |
|  |  |

**Note :**

1. Only the worst case plots for U-NII-3 Out of Band e.i.r.p Emission.

## 10.10 POWERLINE CONDUCTED EMISSIONS

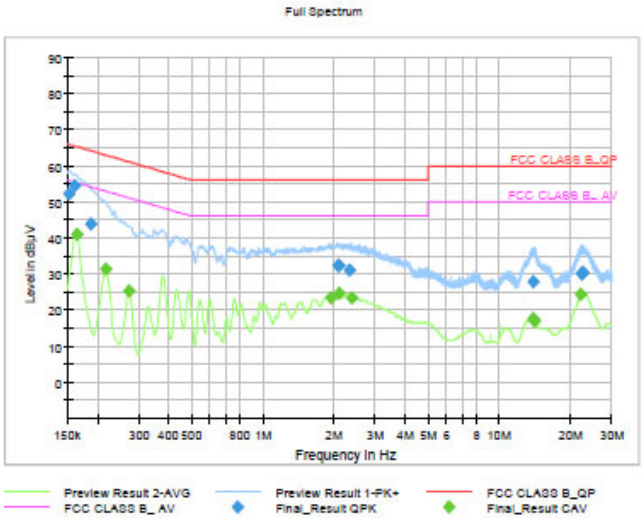
### Conducted Emissions

WLAN 5GHz 1 / 1

# Test Report

## Common Information

EUT : LGSWAAC83
Operating Conditions : 5G WLAN Mode
Comment :




## Final_Result_QPK

| Frequency (MHz) | QuasiPeak (dBµV) | Limit (dBµV) | Margin (dB) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.1523 | 52.04 | 65.88 | 13.83 | 9.000 | L1 | 9.6 |
| 0.1613 | 54.53 | 65.40 | 10.87 | 9.000 | L1 | 9.6 |
| 0.1883 | 43.88 | 64.11 | 20.23 | 9.000 | L1 | 9.6 |
| 2.0953 | 32.29 | 56.00 | 23.71 | 9.000 | N | 9.6 |
| 2.1020 | 32.21 | 56.00 | 23.79 | 9.000 | N | 9.6 |
| 2.3405 | 31.13 | 56.00 | 24.87 | 9.000 | N | 9.7 |
| 14.0293 | 27.71 | 60.00 | 32.29 | 9.000 | N | 9.9 |
| 22.3813 | 30.21 | 60.00 | 29.79 | 9.000 | N | 10.0 |
| 22.4443 | 30.22 | 60.00 | 29.78 | 9.000 | N | 10.0 |
| 22.6243 | 30.30 | 60.00 | 29.70 | 9.000 | N | 10.0 |

## Final_Result_CAV

| Frequency (MHz) | CAverage (dBµV) | Limit (dBµV) | Margin (dB) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.1635 | 41.02 | 55.28 | 14.27 | 9.000 | L1 | 9.6 |
| 0.2175 | 31.22 | 52.91 | 21.69 | 9.000 | L1 | 9.7 |
| 0.2715 | 25.26 | 51.07 | 25.82 | 9.000 | L1 | 9.7 |
| 1.9603 | 23.19 | 46.00 | 22.81 | 9.000 | N | 9.6 |
| 2.1020 | 24.57 | 46.00 | 21.43 | 9.000 | N | 9.6 |
| 2.3878 | 23.45 | 46.00 | 22.55 | 9.000 | N | 9.7 |
| 13.9145 | 17.67 | 50.00 | 32.33 | 9.000 | N | 9.9 |
| 14.1598 | 16.93 | 50.00 | 33.07 | 9.000 | N | 9.9 |
| 22.2598 | 24.26 | 50.00 | 25.74 | 9.000 | N | 10.0 |

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## 11. LIST OF TEST EQUIPMENT

Conducted Test

| Equipment | Model | Manufacturer | Serial No. | Due to Calibration | Calibration Interval |
|---|---|---|---|---|---|
| LISN | ENV216 | Rohde & Schwarz | 102245 | 07/15/2026 | Annual |
| EMI Test Receiver | ESR | Rohde & Schwarz | 101910 | 08/27/2025 | Annual |
| Signal Analyzer | N9020A | Keysight | MY46471250 | 08/04/2026 | Annual |
| Power Measurement Set | OSP 120 | Rohde & Schwarz | 100935 | 07/24/2026 | Annual |
| Power Meter | N1911A | Agilent | MY45100523 | 02/21/2026 | Annual |
| Power Sensor | N1921A | Agilent | MY57820067 | 02/04/2026 | Annual |
| DC Power Supply | E3632A | Agilent | KR75305528 | 12/24/2025 | Annual |
| Attenuator(10 dB)(DC-26.5 GHz) | 8493C-010 | Agilent | 08285 | 05/19/2026 | Annual |
| Attenuator(20 dB) | 18N-20dB | Rohde & Schwarz | 8 | 02/18/2026 | Annual |
| Software | EMC32 | Rohde & Schwarz | N/A | N/A | N/A |
| FCC WLAN&BT&BLE Conducted Test Software v3.0 | N/A | HCT CO., LTD. | N/A | N/A | N/A |

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

**Radiated Test**

| Equipment | Model | Manufacturer | Serial No. | Due to Calibration | Calibration Interval |
|---|---|---|---|---|---|
| Controller | CO3000 | Innco system | CO3000-4p | N/A | N/A |
| Antenna Position Tower | MA4640/800-XP-EP | Innco system | S4AM | 08/01/2026 | Annual |
| Turn Table | 1060 | Innco system | N/A | N/A | N/A |
| Turn Table | N/A | Ets. | N/A | N/A | N/A |
| Loop Antenna | FMZB 1513 | Rohde & Schwarz | 1513-333 | 06/23/2027 | Biennial |
| BILOG Antenna | VULB 9168 | Schwarzbeck | 9168-0895 | 08/28/2026 | Biennial |
| Horn Antenna | BBHA 9120D | Schwarzbeck | 9120D-1191 | 11/07/2025 | Biennial |
| Horn Antenna | BBHA9170 | Schwarzbeck | BBHA9170342 | 09/20/2026 | Biennial |
| Amp & Filter Bank Switch Controller | FBSM-01B | TNM system | TM20090002 | N/A | N/A |
| RF Switching System | FBSR-04C (3 GHz HPF + LNA) | TNM system | S4L1 | 03/12/2026 | Annual |
| RF Switching System | FBSR-04C (10 dB ATT + LNA) | TNM system | S4L2 | 03/12/2026 | Annual |
| RF Switching System | FBSR-04C (3 dB ATT + LNA) | TNM system | S4L3 | 03/12/2026 | Annual |
| RF Switching System | FBSR-04C (LNA) | TNM system | S4L4 | 03/12/2026 | Annual |
| RF Switching System | FBSR-04C (Thru) | TNM system | S4L6 | 03/12/2026 | Annual |
| Spectrum Analyzer | FSV30 (10 Hz ~ 30 GHz) | Rohde & Schwarz | 100900 | 08/27/2025 | Annual |
| Spectrum Analyzer | FSW (2 Hz ~ 67 GHz) | Rohde & Schwarz | 101736 | 05/27/2026 | Annual |

**Note:**

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

## 12. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

| No. | Description |
|---|---|
| 1 | HCT-RF-2508-FC004-P |