# FCC TEST REPORT

**Test report**
**On Behalf of**
**Sichuan Coolux Technology Co.,Ltd**
**For**
**Laser Theater Projector**
**Model No.: L4K1, L4K2, L4K3, L4K4, V501, V502, V503, V504, V508, L4K1, V510, V511**
**FCC ID: 2AXBDL4K1**

| | |
|---|---|
| **Prepared for :** | **Sichuan Coolux Technology Co.,Ltd**<br>Room 1, Floor 2, Building 1, No.355 Wuxing Road, Wuhou District (Wuhou New Town Management Committee), Chengdu, China |
| **Prepared By :** | **Shenzhen Tongzhou Testing Co.,Ltd**<br>**1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China** |

| | |
|---|---|
| **Date of Test:** | **2021/1/02 ~ 2021/03/08** |
| **Date of Report:** | **2021/03/08** |
| **Report Number:** | **TZ210101959-E3** |

The test report apply only to the specific sample(s) tested under stated test conditions
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

# TEST REPORT

| | |
|---|---|
| **Applicant's name** ..... : | Sichuan Coolux Technology Co.,Ltd |
| Address ..... : | Room 1, Floor 2, Building 1, No.355 Wuxing Road, Wuhou District (Wuhou New Town Management Committee), Chengdu, China |
| **Manufacture's Name**..... : | Sichuan Coolux Technology Co.,Ltd |
| Address ..... : | Room 1, Floor 2, Building 1, No.355 Wuxing Road, Wuhou District (Wuhou New Town Management Committee), Chengdu, China |
| **Product description** | |
| Trade Mark: | / |
| Product name ..... : | Laser Theater Projector |
| Model and/or type reference : | L4K1, L4K2, L4K3, L4K4, V501, V502, V503, V504, V508, L4K1, V510, V511 |
| **Standards** ..... : | FCC Rules and Regulations Part 15 Subpart E 15.407<br>ANSI C63.10: 2013 |



**Date of Test** .....

Date (s) of performance of tests ..... 2021/1/02 ~ 2021/03/08

Date of Issue..... 2021/03/08

Test Result..... **Pass**

Testing Engineer : Anna Hu

(Anna Hu)

Technical Manager : Hugo Chen

(Hugo Chen)

Authorized Signatory : Andy Zhang

(Andy Zhang)

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| Revision | Issue Date | Revisions | Revised By |
|---|---|---|---|
| 000 | 2021/03/08 | Initial Issue | Andy Zhang |
| | | | |
| | | | |

# 1. SUMMARY

## 1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15 Subpart E—Unlicensed National Information Infrastructure Devices

ANSI C63.10:2013 : American National Standard for Testing Unlicensed Wireless Devices

KDB789033 D02: General UNII Test Procedures New Rules v02r01

## 1.2. Test Description

| FCC Requirement | | |
|---|---|---|
| FCC Part 15.207 | AC Power Conducted Emission | PASS |
| FCC Part 15.407(a) | Emission Bandwidth(26dBm Bandwidth) | PASS$_{Note1}$ |
| FCC Part 15.407(e) | Minimum Emission Bandwidth(6dBm Bandwidth) | PASS$_{Note2}$ |
| FCC Part 15.407(a) | Maximum Conducted Output Power | PASS |
| FCC Part 15.407(a) | Peak Power Spectral Density | PASS |
| FCC Part 15.407(g) | Frequency Stability | PASS |
| FCC Part 15.407(b) | Undesirable emission | PASS |
| FCC Part 15.407(b)/15.205/15.209 | Radiated Emissions | PASS |
| FCC Part 15.407(h) | Dynamic Frequency Selection | PASS$_{Note\ 3}$ |
| FCC Part 15.203/15.247(b) | Antenna Requirement | PASS |

Note 1: Apply to U-NII 1, U-NII 2A, and U-NII 2C band.
Note 2: Apply to U-NII 3 band only.
Note 3: Test result see DFS report.

## 1.3. Test Facility

### 1.3.1 Address of the test laboratory

Shenzhen Tongzhou Testing Co.,Ltd
1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

## 1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

| Test Item | | Frequency Range | Uncertainty | Note |
|---|---|---|---|---|
| Radiation Uncertainty | : | 9KHz~30MHz | ±3.08dB | (1) |
| | | 30MHz~1000MHz | ±4.42dB | (1) |
| | | 1GHz~40GHz | ±4.06dB | (1) |
| Conduction Uncertainty | : | 150kHz~30MHz | ±2.23dB | (1) |

# 2. GENERAL INFORMATION

## 2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Normal Temperature: | 25°C |
| Relative Humidity: | 55 % |
| Air Pressure: | 101 kPa |

## 2.2. General Description of EUT

| | | | | |
|---|---|---|---|---|
| Product Name: | Laser Theater Projector | | | |
| Model/Type reference: | L4K1, L4K2, L4K3, L4K4, V501, V502, V503, V504, V508, L4K1, V510, V511 | | | |
| Power supply: | AC 100-240V 50/60Hz | | | |
| **WIFI** | | | | |
| Supported type: | 20MHz system | 40MHz system | 80MHz system | 160MHz system |
| | 802.11a<br>802.11n<br>802.11ac | 802.11n<br>802.11ac | 802.11ac | N/A |
| Operation frequency: | 5180MHz-5240MHz<br>5745MHz-5825MHz | 5190MHz-5230MHz<br>5755MHz-5795MHz | 5210MHz;<br>5775MHz | N/A |
| Modulation: | OFDM | OFDM | OFDM | N/A |
| Channel number: | 9 | 4 | 2 | N/A |
| Channel separation: | 20MHz | 40MHz | 80MHz | N/A |
| Antenna type： | Two Internal antennas | | | |
| Antenna Gain: | Max. 0.0dBi for each antenna | | | |

Note: For more details, please refer to the user's manual of the EUT.

## 2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

All test performed at the low, middle and high of operational frequency range of each mode.

Operation Frequency List WIFI on 5G Band：

| Operating band | 20MHz | | 40MHz | | 80MHz | |
|---|---|---|---|---|---|---|
| | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| U-NII 1 (5150MHz-5250MHz) | 36 | 5180 | 38 | 5190 | 42 | 5210 |
| | 40 | 5200 | | | | |
| | 44 | 5220 | 46 | 5230 | | |
| | 48 | 5240 | | | | |
| U-NII 3 (5725MHz-5850MHz) | 149 | 5745 | 151 | 5755 | 155 | 5775 |
| | 153 | 5765 | | | | |
| | 157 | 5785 | 159 | 5795 | | |
| | 161 | 5805 | | | | |
| | 165 | 5825 | -- | -- | -- | -- |

Note:

1. "--"Means no channel(s) available any more.
2. The line display in grey is those Channels/Frequencies select to test in this report for each operation mode.

**Antenna**

| Antenna | Antenna 0 | | | Antenna 1 | | | Simultaneously |
|---|---|---|---|---|---|---|---|
| Bandwidth Mode | 20MHz | 40MHz | 80MHz | 20MHz | 40MHz | 80MHz | / |
| IEEE 802.11a | ☑ | ☐ | ☐ | ☑ | ☐ | ☐ | ☐ |
| IEEE 802.11n20 | ☑ | ☐ | ☐ | ☑ | ☐ | ☐ | ☑ |
| IEEE 802.11ac20 | ☑ | ☐ | ☐ | ☑ | ☐ | ☐ | ☑ |
| IEEE 802.11n40 | ☐ | ☑ | ☐ | ☐ | ☑ | ☐ | ☑ |
| IEEE 802.11ac40 | ☐ | ☑ | ☐ | ☐ | ☑ | ☐ | ☑ |
| IEEE 802.11ac80 | ☐ | ☐ | ☑ | ☐ | ☐ | ☑ | ☑ |

**Data Rate Used:**

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Items | Mode | Data Rate |
|---|---|---|
| Maximum Conducted Output Power<br>Power Spectral Density<br>Emission Bandwidth(26dBm Bandwidth)<br>Minimum Emission Bandwidth(6dBm Bandwidth)<br>Undesirable emission<br>Frequency Stability | 11a/OFDM | 6 Mbps |
| | 11n(20MHz),11ac(20MHz)/OFDM | 7.2 Mbps |
| | 11n(40MHz),11ac(40MHz)/OFDM | 15.0Mbps |
| | 11ac(80MHz)/OFDM | 65.0Mbps |

## 2.4. Special Accessories

| Manufacturer | Description | Model | Serial Number | Certificate |
|---|---|---|---|---|
| / | / | / | / | / |
| / | / | / | / | / |

## 2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

## 2.6. Modifications

No modifications were implemented to meet testing criteria.

# 3. TEST CONDITIONS AND RESULTS

## 3.1. Conducted Emissions Test

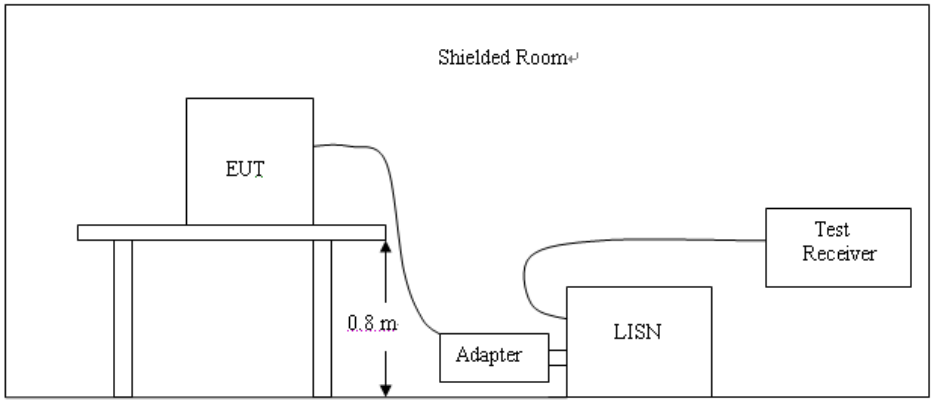
**LIMIT**

According to FCC CFR Title 47 Part 15 Subpart C Section 15.207, AC Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus as below:

| Frequency range (MHz) | Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

## TEST RESULTS

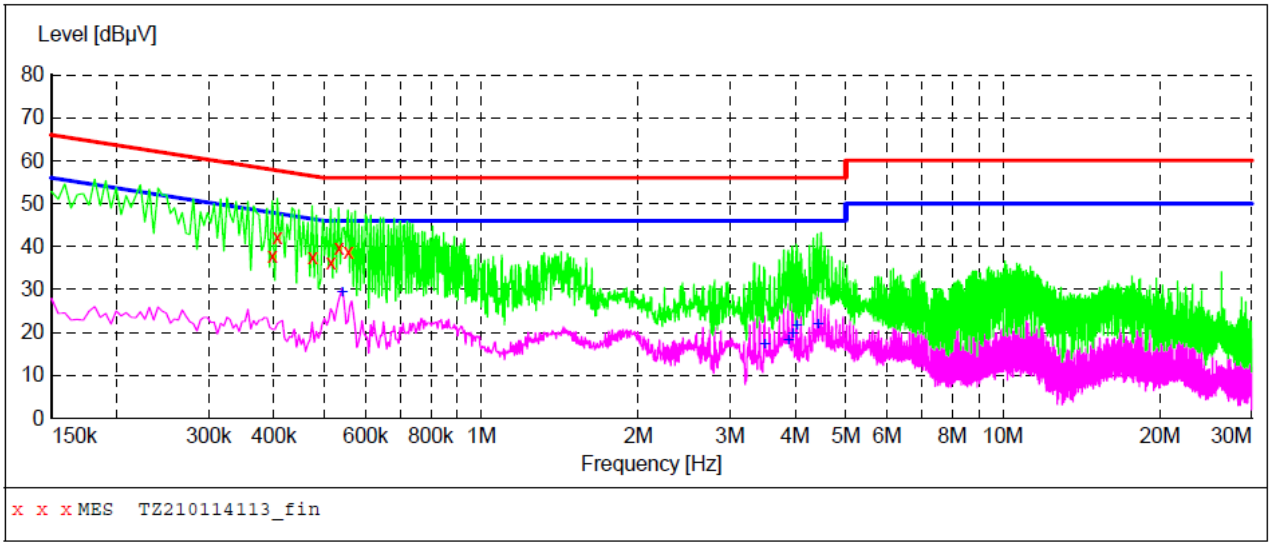
| Temperature | 22.5℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Anna Hu | Configurations | IEEE 802.11a/n/ac |

Remark:

1. All modes of 802.11a/ n/ac were tested at Low, Middle, and High channel; only the worst result of 802.11a CH36 was reported as below:
2. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:
3. Pre-test AC conducted emission at power from AC mains mode, recorded worst case.

| Power supply: | AC 120V/60Hz | Polarization | L |
|---|---|---|---|

***SCAN TABLE: "Voltage (9K-30M)FIN"***
Short Description: 150K-30M Voltage




***MEASUREMENT RESULT: "TZ210114113_fin"***

1/14/2021 10:36AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.397500 | 37.70 | 10.0 | 58 | 20.2 | QP | L1 | GND |
| 0.406500 | 42.10 | 10.0 | 58 | 15.6 | QP | L1 | GND |
| 0.474000 | 37.50 | 10.0 | 56 | 18.9 | QP | L1 | GND |
| 0.514500 | 36.10 | 9.9 | 56 | 19.9 | QP | L1 | GND |
| 0.532500 | 39.50 | 9.9 | 56 | 16.5 | QP | L1 | GND |
| 0.555000 | 38.90 | 9.9 | 56 | 17.1 | QP | L1 | GND |

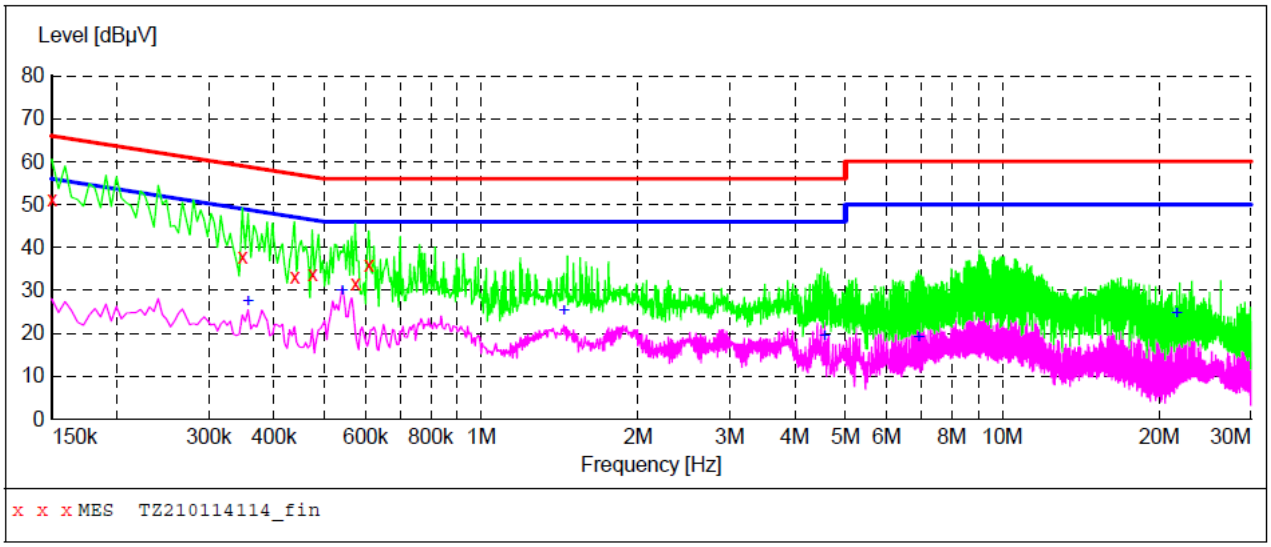
***MEASUREMENT RESULT: "TZ210114113_fin2"***

1/14/2021 10:36AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.541500 | 29.50 | 9.9 | 46 | 16.5 | AV | L1 | GND |
| 3.493500 | 17.30 | 9.7 | 46 | 28.7 | AV | L1 | GND |
| 3.880500 | 18.30 | 9.7 | 46 | 27.7 | AV | L1 | GND |
| 3.952500 | 19.90 | 9.7 | 46 | 26.1 | AV | L1 | GND |
| 4.024500 | 21.60 | 9.7 | 46 | 24.4 | AV | L1 | GND |
| 4.411500 | 22.10 | 9.8 | 46 | 23.9 | AV | L1 | GND |

| Power supply: | AC 120V/60Hz | Polarization | N |
|---|---|---|---|

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage




MEASUREMENT RESULT: "TZ210114114_fin"

1/14/2021 10:39AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.150000 | 51.30 | 9.8 | 66 | 14.7 | QP | N | GND |
| 0.348000 | 37.80 | 10.1 | 59 | 21.2 | QP | N | GND |
| 0.438000 | 33.20 | 10.0 | 57 | 23.9 | QP | N | GND |
| 0.474000 | 33.80 | 10.0 | 56 | 22.6 | QP | N | GND |
| 0.573000 | 31.60 | 9.9 | 56 | 24.4 | QP | N | GND |
| 0.609000 | 36.00 | 9.9 | 56 | 20.0 | QP | N | GND |

MEASUREMENT RESULT: "TZ210114114_fin2"

1/14/2021 10:39AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.357000 | 27.50 | 10.1 | 49 | 21.3 | AV | N | GND |
| 0.541500 | 29.90 | 9.9 | 46 | 16.1 | AV | N | GND |
| 1.441500 | 25.30 | 9.7 | 46 | 20.7 | AV | N | GND |
| 4.560000 | 19.60 | 9.8 | 46 | 26.4 | AV | N | GND |
| 6.918000 | 19.30 | 9.8 | 50 | 30.7 | AV | N | GND |
| 21.664500 | 24.90 | 10.3 | 50 | 25.1 | AV | N | GND |

*Note:*
*1). Pre-scan all modes and recorded the worst case results in this report*
*2). Emission level (dBuV) = 20 log Emission level (uV).*
*3). Margin=Limit-Level*

## 3.2. Radiated Emissions

**Limit**

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

**Undesirable emission limits**

| Requirement | Limit(EIRP) | Limit (Field strength at 3m) Note1 |
|---|---|---|
| 15.407(b)(1) | PK:-27(dBm/MHz) | PK:68.2(dBμV/m) |
| 15.407(b)(2) | | |
| 15.407(b)(3) | | |
| 15.407(b)(4) | | |

Note1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

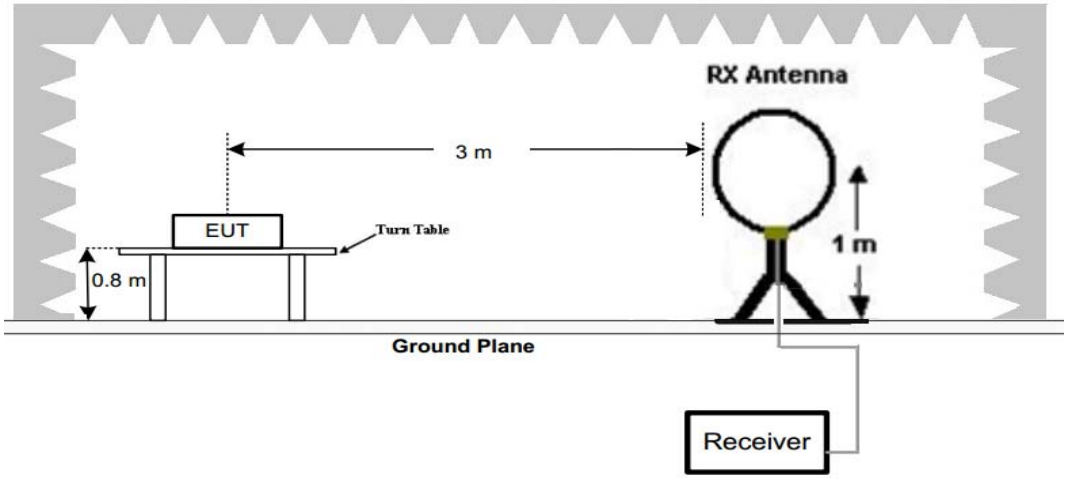
(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209
(6)In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

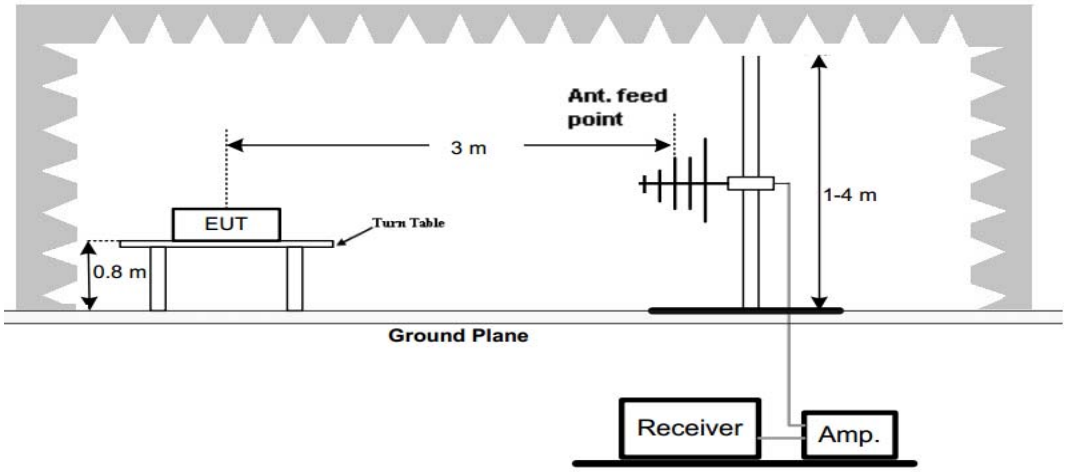
| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m) | Radiated (μV/m) |
|---|---|---|---|
| 0.009-0.49 | 3 | 20log(2400/F(KHz))+40log(300/3) | 2400/F(KHz) |
| 0.49-1.705 | 3 | 20log(24000/F(KHz))+ 40log(30/3) | 24000/F(KHz) |
| 1.705-30 | 3 | 20log(30)+ 40log(30/3) | 30 |
| 30-88 | 3 | 40.0 | 100 |
| 88-216 | 3 | 43.5 | 150 |
| 216-960 | 3 | 46.0 | 200 |
| Above 960 | 3 | 54.0 | 500 |

## TEST CONFIGURATION

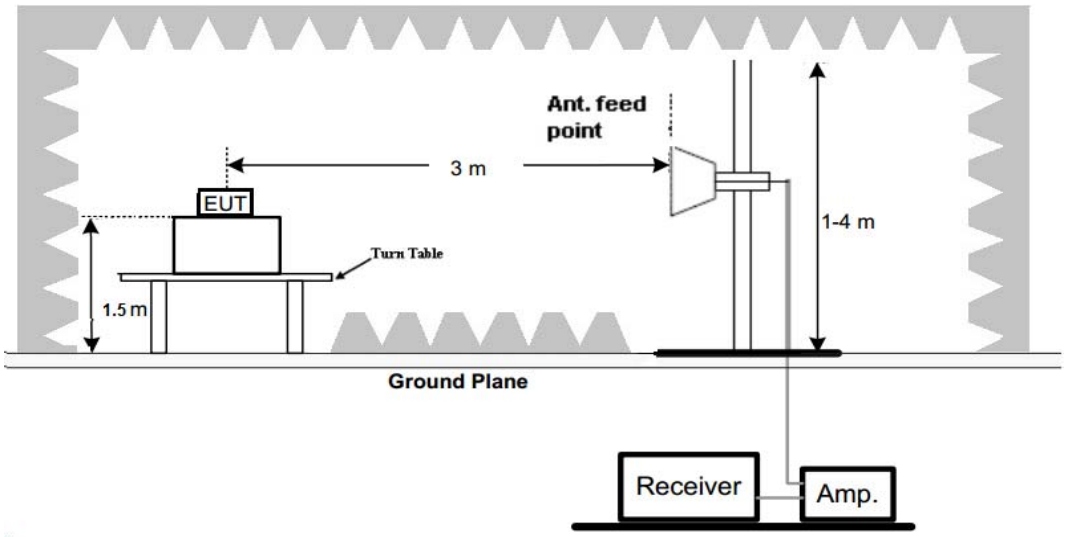
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz




(B) Radiated Emission Test Set-Up, Frequency below 1000MHz




(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



## Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 40GHz.
6. The distance between test antenna and EUT as following table states:

| Test Frequency range | Test Antenna Type | Test Distance |
|---|---|---|
| 9KHz-30MHz | Active Loop Antenna | 3 |
| 30MHz-1GHz | Bilog Antenna | 3 |
| 1GHz-18GHz | Horn Antenna | 3 |
| 18GHz-25GHz | Horn Anternna | 1 |

7. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting | Detector |
|---|---|---|
| 9KHz-150KHz | RBW=200Hz/VBW=3KHz,Sweep time=Auto | QP |
| 150KHz-30MHz | RBW=9KHz/VBW=100KHz,Sweep time=Auto | QP |
| 30MHz-1GHz | RBW=120KHz/VBW=1000KHz,Sweep time=Auto | QP |
| 1GHz-40GHz | Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto<br>Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto | Peak |

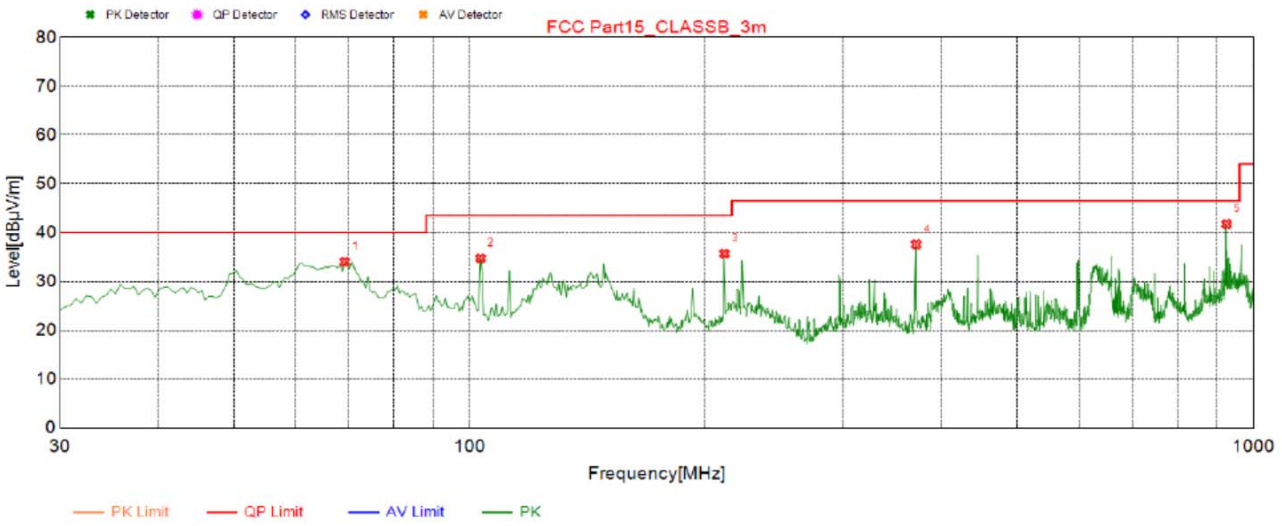
## TEST RESULTS

Remark:
1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2. All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80) /MIMO modes have been tested for below 1GHz test, only the worst case 802.11ac (HT20)MIMO low channel of U-NII 1 band was recorded.
3. All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80)/ MIMO modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) MIMO was recorded.
4. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

| Temperature | 22.5℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Anna Hu | Configurations | IEEE 802.11a/n/ac |

**For 30MHz-1GHz**

Horizontal

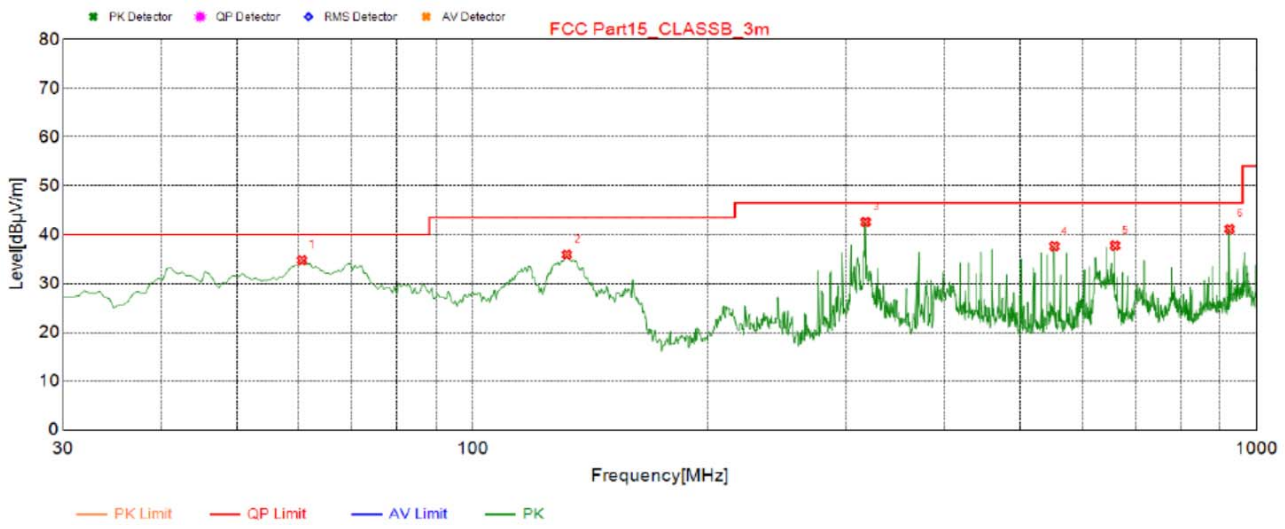



**Suspected List**

| NO. | Freq. [MHz] | Result Level [dBµV/m] | Factor [dB/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle[°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 69.285 | 34 | -18.02 | 40 | 6.00 | 100 | 162 | Vertical |
| 2 | 103.235 | 34.73 | -15.99 | 43.5 | 8.77 | 100 | 76 | Vertical |
| 3 | 211.390 | 35.7 | -15.08 | 43.5 | 7.80 | 100 | 342 | Vertical |
| 4 | 371.440 | 37.6 | -10.83 | 46.5 | 8.90 | 200 | 189 | Vertical |
| 5 | 924.340 | 41.77 | -0.75 | 46.5 | 4.73 | 100 | 339 | Vertical |

Note:
1). Pre-scan all modes and recorded the worst case results in this report (BT LE (Middle CH)). Emission level (dBuV/m) = 20 log Emission level (uV/m).
2). Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Vertical




**Suspected List**

| NO. | Freq. [MHz] | Result Level [dBµV/m] | Factor [dB/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle[°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 60.555 | 34.76 | -15.79 | 40 | 5.24 | 100 | 177 | Vertical |
| 2 | 131.850 | 35.93 | -19.15 | 43.5 | 7.57 | 100 | 354 | Vertical |
| 3 | 317.120 | 42.61 | -12.34 | 46.5 | 3.89 | 100 | 12 | Vertical |
| 4 | 552.345 | 37.63 | -6.77 | 46.5 | 8.87 | 100 | 299 | Vertical |
| 5 | 660.015 | 37.76 | -4.85 | 46.5 | 8.74 | 100 | 323 | Vertical |
| 6 | 924.340 | 41.16 | -0.75 | 46.5 | 5.34 | 100 | 2 | Vertical |

Note:
1). Pre-scan all modes and recorded the worst case results in this report (BT LE (Middle CH)). Emission level (dBuV/m) = 20 log Emission level (uV/m).
2). Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

***For 1GHz to 25GHz***

Note: All 802.11a / 802.11n (HT20) / 802.11ac (HT20) / 802.11n (HT40) / 802.11ac (HT40) / 802.11ac (HT80)/MIMO modes have been tested for above 1GHz test, only the worst case 802.11ac (HT20) MIMO was recorded.

***U-NII 1 & 802.11ac (HT20) MIMO Mode (above 1GHz)***

LOW CH 36 /5180

Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5150 | 59.21 | -2.49 | 56.72 | 68.2 | -11.48 | peak |
| 5150 | 46.87 | -2.49 | 44.38 | 54 | -9.62 | AVG |
| 10360 | 56.45 | 3.74 | 60.19 | 68.2 | -8.01 | peak |
| 10360 | 41.66 | 3.74 | 45.4 | 54 | -8.6 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5150 | 60.38 | -2.49 | 57.89 | 68.2 | -10.31 | peak |
| 5150 | 44.45 | -2.49 | 41.96 | 54 | -12.04 | AVG |
| 10360 | 57.87 | 3.74 | 61.61 | 68.2 | -6.59 | peak |
| 10360 | 42.51 | 3.74 | 46.25 | 54 | -7.75 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

MID CH 40 /5200

Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 10400 | 54.64 | 3.74 | 58.38 | 68.2 | -9.82 | peak |
| 10400 | 41.11 | 3.74 | 44.85 | 54 | -9.15 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 10400 | 55.63 | 3.74 | 59.37 | 68.2 | -8.83 | peak |
| 10400 | 42.18 | 3.74 | 45.92 | 54 | -8.08 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

HIGH CH 48 /5240

Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5350.5 | 60.21 | -2.11 | 58.1 | 68.2 | -10.1 | peak |
| 5350.5 | 49.79 | -4.63 | 45.16 | 54 | -8.84 | AVG |
| 10480 | 56.85 | 3.75 | 60.6 | 68.2 | -7.6 | peak |
| 10480 | 41.55 | 3.75 | 45.3 | 54 | -8.7 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5350.5 | 60.18 | -2.11 | 58.07 | 68.2 | -10.13 | peak |
| 5350.5 | 49.52 | -4.63 | 44.89 | 54 | -9.11 | AVG |
| 10480 | 55.75 | 3.75 | 59.5 | 68.2 | -8.7 | peak |
| 10480 | 40.28 | 3.75 | 44.03 | 54 | -9.97 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Remark：

(1) Measuring frequencies from 1 GHz to the 40 GHz。

(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

## *U-NII 3 & 802.11ac (HT20) MIMIO Mode (above 1GHz)*

LOW CH 149 /5745

Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5720 | 62.63 | -4.45 | 58.18 | 68.2 | -10.02 | peak |
| 5720 | 48.17 | -4.45 | 43.72 | 54 | -10.28 | AVG |
| 11490 | 56.24 | 4.21 | 60.45 | 68.2 | -7.75 | peak |
| 11490 | 41.86 | 4.21 | 46.07 | 54 | -7.93 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5720 | 61.98 | -4.45 | 57.53 | 68.2 | -10.67 | peak |
| 5720 | 48.75 | -4.45 | 44.3 | 54 | -9.7 | AVG |
| 11490 | 55.82 | 4.21 | 60.03 | 68.2 | -8.17 | peak |
| 11490 | 41.68 | 4.21 | 45.89 | 54 | -8.11 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

MID CH157 /5785

Horizontal:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 11570 | 54.29 | 4.26 | 58.55 | 68.2 | -9.65 | peak |
| 11570 | 40.43 | 4.26 | 44.69 | 54 | -9.31 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 11570 | 53.18 | 4.26 | 57.44 | 68.2 | -10.76 | peak |
| 11570 | 40.73 | 4.26 | 44.99 | 54 | -9.01 | AVG |
| | | | | | | |
| | | | | | | |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

HIGH CH 165 (802.11a Mode with 5.8G)/5825

Horizontal

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5855 | 62.74 | -4.63 | 58.11 | 68.2 | -10.09 | peak |
| 5855 | 48.45 | -4.63 | 43.82 | 54 | -10.18 | AVG |
| 11650 | 55.42 | 4.84 | 60.26 | 68.2 | -7.94 | peak |
| 11650 | 41.58 | 4.84 | 46.42 | 54 | -7.58 | AVG |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 5855 | 63.28 | -4.63 | 58.65 | 68.2 | -9.55 | peak |
| 5855 | 50.75 | -4.63 | 46.12 | 54 | -7.88 | AVG |
| 11650 | 55.83 | 4.84 | 60.67 | 68.2 | -7.53 | peak |
| 11650 | 40.59 | 4.84 | 45.43 | 54 | -8.57 | AVG |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark：

(1) Measuring frequencies from 1 GHz to the 40 GHz。

(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

## 3.3. Maximum Conducted Average Output Power

**Limit**

**FCC requirement:**
**For the band 5.15-5.25 GHz.**
(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

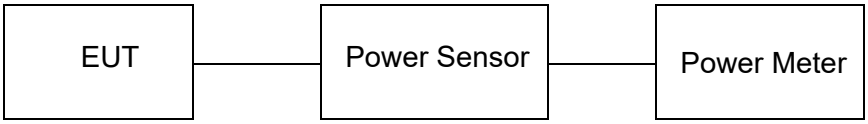
**For the 5.25-5.35 GHz and 5.47-5.725 GHz bands**, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.

**For the band 5.725-5.85 GHz**, the maximum conducted output power over the frequency band of operation shall not exceed 1 W

**Test Procedure**

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

**Test Configuration**




**Test Results**

| Temperature | 22.5℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Anna Hu | Configurations | IEEE 802.11a/n/ac |

***For ANT1:***

***U-NII 1***

| Type | Channel | Output power Average (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 802.11a | 36 | 12.73 | 24.00 | Pass |
| | 40 | 12.46 | | |
| | 48 | 11.98 | | |
| 802.11n(HT20) | 36 | 12.11 | | Pass |
| | 40 | 12.02 | | |
| | 48 | 11.90 | | |
| 802.11n(HT40) | 38 | 12.35 | | Pass |
| | 46 | 12.17 | | |
| 802.11ac(HT20) | 36 | 12.16 | | Pass |
| | 40 | 11.83 | | |
| | 48 | 11.88 | | |
| 802.11ac(HT40) | 38 | 12.31 | | Pass |
| | 46 | 12.17 | | |
| 802.11ac(HT80) | 42 | 12.71 | | Pass |

***U-NII 3***

| Type | Channel | Output power Average (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 802.11a | 149 | 12.08 | 30.00 | Pass |
| | 157 | 11.96 | | |
| | 165 | 11.93 | | |
| 802.11n(HT20) | 149 | 11.05 | | Pass |
| | 157 | 12.39 | | |
| | 165 | 12.83 | | |
| 802.11n(HT40) | 151 | 13.31 | | Pass |
| | 159 | 12.23 | | |
| 802.11ac(HT20) | 149 | 11.07 | | Pass |
| | 157 | 11.29 | | |
| | 165 | 11.42 | | |
| 802.11ac(HT40) | 151 | 12.11 | | Pass |
| | 159 | 12.17 | | |
| 802.11ac(HT80) | 155 | 12.85 | | Pass |

***For ANT2:***

***U-NII 1***

| Type | Channel | Output power Average (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 802.11a | 36 | 12.29 | 24.00 | Pass |
| | 40 | 11.65 | | |
| | 48 | 11.53 | | |
| 802.11n(HT20) | 36 | 11.67 | | |
| | 40 | 12.19 | | |
| | 48 | 11.96 | | |
| 802.11n(HT40) | 38 | 12.37 | | |
| | 46 | 12.24 | | |
| 802.11ac(HT20) | 36 | 12.35 | | |
| | 40 | 11.59 | | |
| | 48 | 11.48 | | |
| 802.11ac(HT40) | 38 | 11.95 | | |
| | 46 | 11.80 | | |
| 802.11ac(HT80) | 42 | 12.11 | | |

***U-NII 3***

| Type | Channel | Output power Average (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 802.11a | 149 | 12.35 | 30.00 | Pass |
| | 157 | 12.76 | | |
| | 165 | 13.17 | | |
| 802.11n(HT20) | 149 | 11.76 | | |
| | 157 | 11.66 | | |
| | 165 | 12.19 | | |
| 802.11n(HT40) | 151 | 12.82 | | |
| | 159 | 12.85 | | |
| 802.11ac(HT20) | 149 | 11.77 | | |
| | 157 | 11.73 | | |
| | 165 | 12.02 | | |
| 802.11ac(HT40) | 151 | 12.83 | | |
| | 159 | 12.76 | | |
| 802.11ac(HT80) | 155 | 12.85 | | |

*Note:*

1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20 ,IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*

For MIMO*2

***U-NII 1***

| Type | Channel | ANT 1 Output power Average (dBm) | ANT 2 Output power Average (dBm) | MIMO*2 Output power Average (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|---|---|
| 802.11n(HT20) | 36 | 12.11 | 11.67 | 14.91 | 24.00 | Pass |
| | 40 | 12.02 | 12.19 | 15.12 | | |
| | 48 | 11.9 | 11.96 | 14.94 | | |
| 802.11n(HT40) | 36 | 12.35 | 12.37 | 15.37 | | |
| | 40 | 12.17 | 12.24 | 15.22 | | |
| 802.11ac(HT20) | 48 | 12.16 | 12.35 | 15.27 | | |
| | 38 | 11.83 | 11.59 | 14.72 | | |
| | 46 | 11.88 | 11.48 | 14.69 | | |
| 802.11ac(HT40) | 36 | 12.31 | 11.95 | 15.14 | | |
| | 40 | 12.17 | 11.8 | 15.00 | | |
| 802.11ac(HT80) | 48 | 12.71 | 12.11 | 15.43 | | |

***U-NII 3***

| Type | Channel | ANT 1 Output power Average (dBm) | ANT 2 Output power Average (dBm) | MIMO*2 Output power Average (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|---|---|
| 802.11n(HT20) | 149 | 11.05 | 11.76 | 14.43 | 30.00 | Pass |
| | 157 | 12.39 | 11.66 | 15.05 | | |
| | 165 | 12.83 | 12.19 | 15.53 | | |
| 802.11n(HT40) | 149 | 13.31 | 12.82 | 16.08 | | |
| | 157 | 12.23 | 12.85 | 15.56 | | |
| 802.11ac(HT20) | 165 | 11.07 | 11.77 | 14.44 | | |
| | 151 | 11.29 | 11.73 | 14.53 | | |
| | 159 | 11.42 | 12.02 | 14.74 | | |
| 802.11ac(HT40) | 149 | 12.11 | 12.83 | 15.50 | | |
| | 157 | 12.17 | 12.76 | 15.49 | | |
| 802.11ac(HT80) | 165 | 12.85 | 12.85 | 15.86 | | |

## 3.4. Power Spectral Density

**Limit**

**FCC requirement:**
**For the band 5.15-5.25 GHz.**

(i) For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.note1

(ii) For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.note1

(iii) For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.

(iv) For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band. note1

**For the 5.25-5.35 GHz and 5.47-5.725 GHz bands**

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

**IC requirement:**

**For the band 5.15-5.25 GHz.**

The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

**Frequency band 5250-5350 MHz**

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band

**Frequency bands 5470-5600 MHz and 5650-5725 MHz**

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

**For the band 5.725 - 5.85 GHz**

The maximum power spectral density shall not exceed 30 dBm in any 500 kHz band. note1, note2

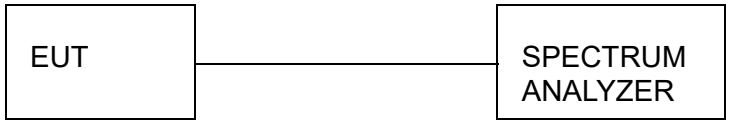
Note1: If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note2: Fixed point - to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

**Test Procedure**

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 1MHz for U-NII 1, U-NII 2A, U-NII C band and 510KHz for U-NII 3 band.
3. Set the VBW ≥ 3× RBW.
4. Set the span to encompass the entire EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.

**Test Configuration**




**Test Results**

| Temperature | 22.5℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Anna Hu | Configurations | IEEE 802.11a/n/ac |

***For ANT1:***

***U-NII 1***

| *Type* | *Channel* | *Power Spectral Density (dBm/MHz)* | *Limit (dBm/ MHz)* | *Result* |
|---|---|---|---|---|
| 802.11a | 36 | -1.050 | 11 | Pass |
| | 40 | -0.223 | | |
| | 48 | 2.209 | | |
| 802.11n(HT20) | 36 | -2.190 | | |
| | 40 | -0.485 | | |
| | 48 | 0.834 | | |
| 802.11n(HT40) | 38 | -2.780 | | |
| | 46 | -0.980 | | |
| 802.11ac(HT20) | 36 | -2.092 | | |
| | 40 | -1.422 | | |
| | 48 | 1.800 | | |
| 802.11ac(HT40) | 38 | -2.906 | | |
| | 46 | -0.587 | | |
| 802.11ac(HT80) | 42 | -4.282 | | |

***U-NII 3***

| *Type* | *Channel* | *Power Spectral Density (dBm/300KHz)* | *RBW Factor (dB)* | *Power Spectral Density (dBm/500KHz)* | *Limit (dBm/500KHz)* | *Result* |
|---|---|---|---|---|---|---|
| 802.11a | 149 | -4.198 | 2.218 | -1.98 | 30 | Pass |
| | 157 | -5.878 | 2.218 | -3.66 | | |
| | 165 | -6.283 | 2.218 | -4.065 | | |
| 802.11n(HT20) | 149 | -4.784 | 2.218 | -2.566 | | |
| | 157 | -6.203 | 2.218 | -3.985 | | |
| | 165 | -6.051 | 2.218 | -3.833 | | |
| 802.11n(HT40) | 151 | -6.712 | 2.218 | -4.494 | | |
| | 159 | -8.891 | 2.218 | -6.673 | | |
| 802.11ac(HT20) | 149 | -4.633 | 2.218 | -2.415 | | |
| | 157 | -6.583 | 2.218 | -4.365 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 165 | -6.154 | 2.218 | -3.936 | | |
| 802.11ac(HT40) | 151 | -7.024 | 2.218 | -4.806 | | |
| | 159 | -8.718 | 2.218 | -6.5 | | |
| 802.11ac(HT80) | 155 | -10.446 | 2.218 | -8.228 | | |

***For ANT2:***

***U-NII 1***

| *Type* | *Channel* | *Power Spectral Density (dBm/MHz)* | *Limit (dBm/ MHz)* | *Result* |
|---|---|---|---|---|
| 802.11a | 36 | 2.021 | 11 | Pass |
| | 40 | 2.555 | | |
| | 48 | 3.584 | | |
| 802.11n(HT20) | 36 | 1.782 | | |
| | 40 | 2.106 | | |
| | 48 | 3.227 | | |
| 802.11n(HT40) | 38 | -0.752 | | |
| | 46 | 0.171 | | |
| 802.11ac(HT20) | 36 | 1.817 | | |
| | 40 | 2.421 | | |
| | 48 | 3.272 | | |
| 802.11ac(HT40) | 38 | 0.171 | | |
| | 46 | -0.244 | | |
| 802.11ac(HT80) | 42 | -3.437 | | |

| *Type* | *Channel* | *Power Spectral Density (dBm/300KHz)* | *RBW Factor (dB)* | *Power Spectral Density (dBm/500KHz)* | *Limit (dBm/500KHz)* | *Result* |
|---|---|---|---|---|---|---|
| 802.11a | 149 | -3.391 | 2.218 | -1.173 | 30 | Pass |
| | 157 | -2.164 | 2.218 | 0.054 | | |
| | 165 | -2.183 | 2.218 | 0.035 | | |
| 802.11n(HT20) | 149 | -2.604 | 2.218 | -0.386 | | |
| | 157 | -2.243 | 2.218 | -0.025 | | |
| | 165 | -2.637 | 2.218 | -0.419 | | |
| 802.11n(HT40) | 151 | -5.732 | 2.218 | -3.514 | | |
| | 159 | -5.076 | 2.218 | -2.858 | | |
| 802.11ac(HT20) | 149 | -2.796 | 2.218 | -0.578 | | |
| | 157 | -2.223 | 2.218 | -0.005 | | |
| | 165 | -2.674 | 2.218 | -0.456 | | |
| 802.11ac(HT40) | 151 | -5.415 | 2.218 | -3.197 | | |
| | 159 | -5.375 | 2.218 | -3.157 | | |
| 802.11ac(HT80) | 155 | -8.482 | 2.218 | -6.264 | | |

*Note:*

1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20 ,IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*
4. *RBW factor = 10 log (500 KHz / 300 KHz) = 2.218 dB;*

*For MIMO:*

***U-NII 1***

| Type | Channel | ANT 1 *Power Spectral Density (dBm/MHz)* | ANT 2 *Power Spectral Density (dBm/MHz)* | MIMO*2 *Power Spectral Density (dBm/MHz)* | Limit (dBm) | Result |
|---|---|---|---|---|---|---|
| 802.11n(HT20) | 36 | -2.19 | 1.782 | 3.25 | 11 | Pass |
| | 40 | -0.485 | 2.106 | 4.01 | | |
| | 48 | 0.834 | 3.227 | 5.20 | | |
| 802.11n(HT40) | 36 | -2.78 | -0.752 | 1.36 | | |
| | 40 | -0.98 | 0.171 | 2.64 | | |
| 802.11ac(HT20) | 48 | -2.092 | 1.817 | 3.30 | | |
| | 38 | -1.422 | 2.421 | 3.92 | | |
| | 46 | 1.8 | 3.272 | 5.61 | | |
| 802.11ac(HT40) | 36 | -2.906 | 0.171 | 1.91 | | |
| | 40 | -0.587 | -0.244 | 2.60 | | |
| 802.11ac(HT80) | 48 | -4.282 | -3.437 | -0.83 | | |

***U-NII 3***

| Type | Channel | ANT 1 *Power Spectral Density (dBm/500KHz)* | ANT 2 *Power Spectral Density (dBm/500KHz)* | MIMO*2 *Power Spectral Density (dBm/500KHz)* | Limit (dBm) | Result |
|---|---|---|---|---|---|---|
| 802.11n(HT20) | 149 | -2.566 | -0.386 | 1.67 | 30 | Pass |
| | 157 | -3.985 | -0.025 | 1.44 | | |
| | 165 | -3.833 | -0.419 | 1.21 | | |
| 802.11n(HT40) | 149 | -4.494 | -3.514 | -0.97 | | |
| | 157 | -6.673 | -2.858 | -1.35 | | |
| 802.11ac(HT20) | 165 | -2.415 | -0.578 | 1.61 | | |
| | 151 | -4.365 | -0.005 | 1.35 | | |
| | 159 | -3.936 | -0.456 | 1.15 | | |
| 802.11ac(HT40) | 149 | -4.806 | -3.197 | -0.92 | | |
| | 157 | -6.5 | -3.157 | -1.50 | | |
| 802.11ac(HT80) | 165 | -8.228 | -6.264 | -4.13 | | |

*Please refer to following test plots;*

*For ANT 1:*

| 802.11a | |
|---|---|
| *U-NII 1* | *U-NII 3* |
|  |  |
| *CH36* | *CH149* |
|  |  |
| *CH40* | *CH157* |
|  |  |
| *CH48* | *CH165* |

802.11n20

U-NII 1


CH36

U-NII 3


CH149


CH40


CH157


CH48


CH165

| 802.11n(HT40) | |
|---|---|
| U-NII 1 | U-NII 3 |
|  |  |
| CH38 | CH151 |
|  |  |
| CH46 | CH159 |

802.11ac(HT20)

U-NII 1


CH36

U-NII 3


CH149


CH40


CH157


CH48


CH165

*802.11ac(HT40)*

*U-NII 1*


*CH38*

*U-NII 3*

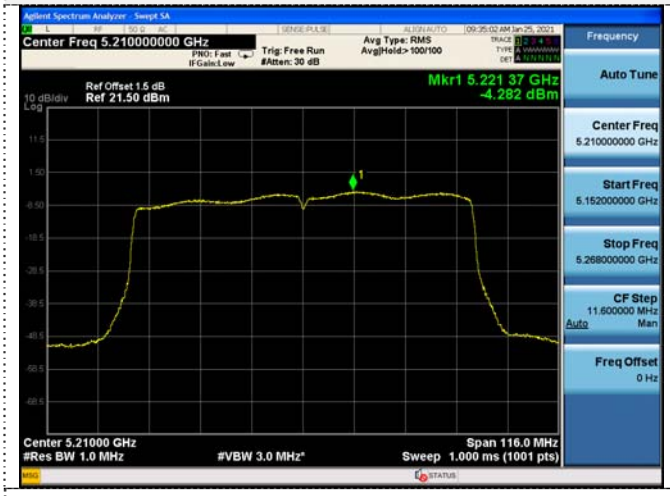

*CH151*


*CH46*


*CH159*

*802.11ac(HT80)*

*U-NII 1*




*CH42*

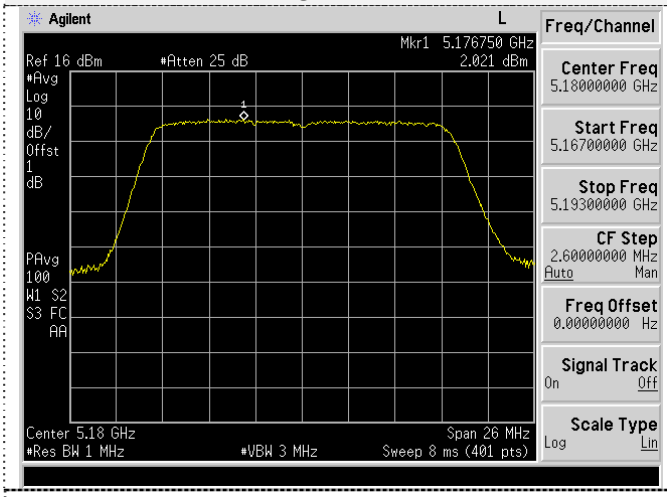
*U-NII 3*


*CH155*

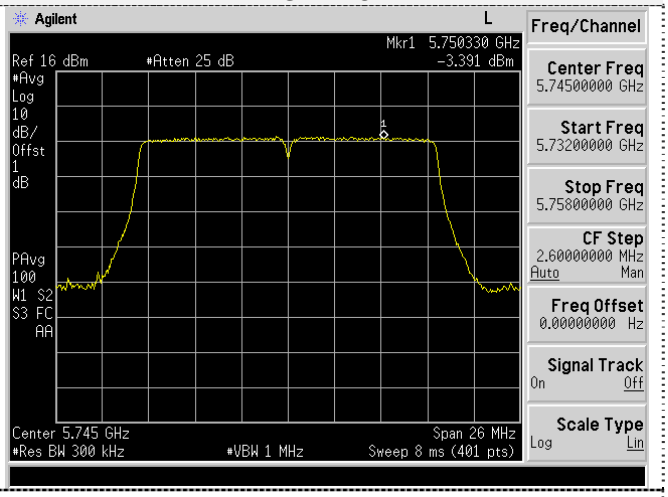
*For ANT 2:*

*802.11a*

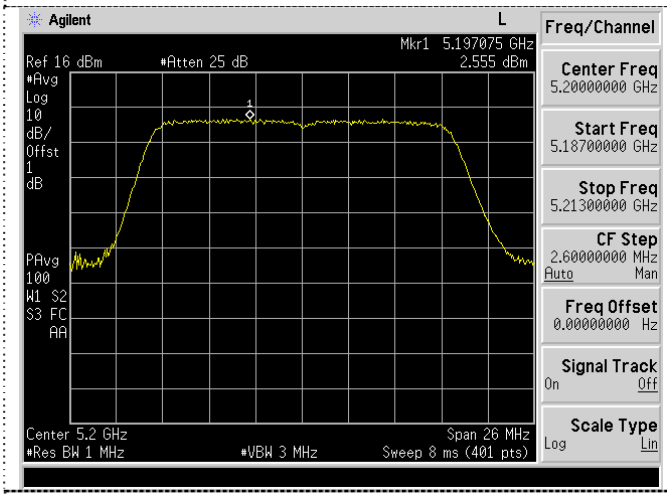
*U-NII 1*



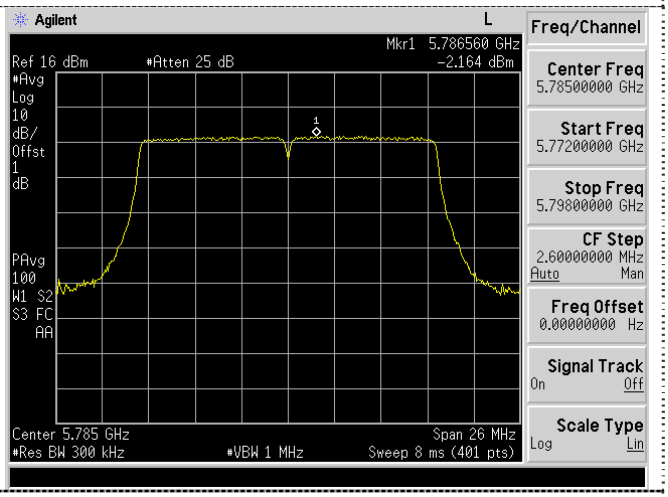

*U-NII 3*



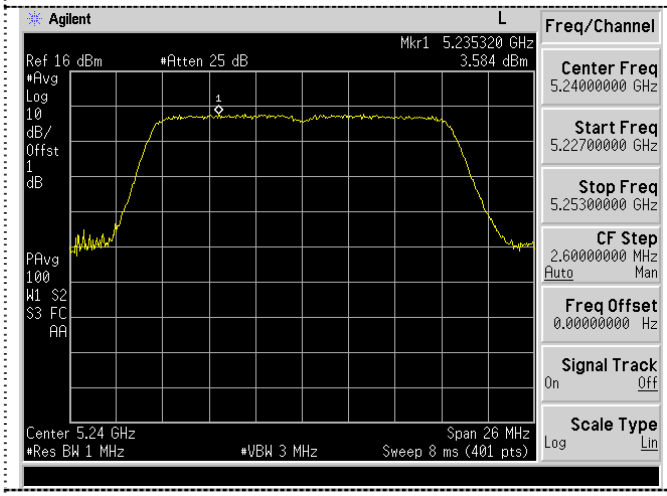

*CH36*



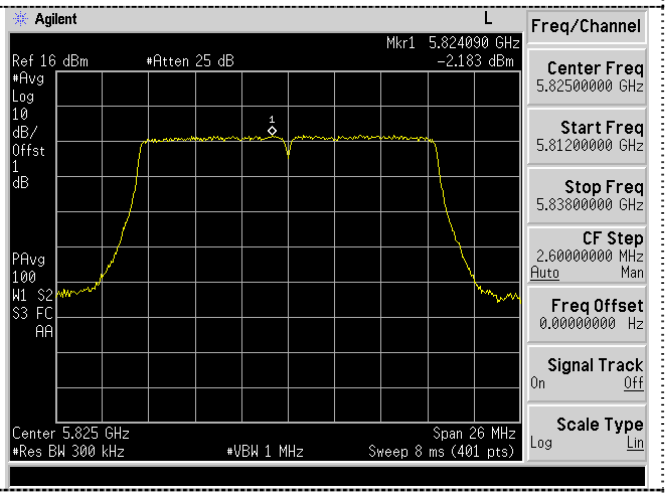

*CH149*




*CH40*




*CH157*

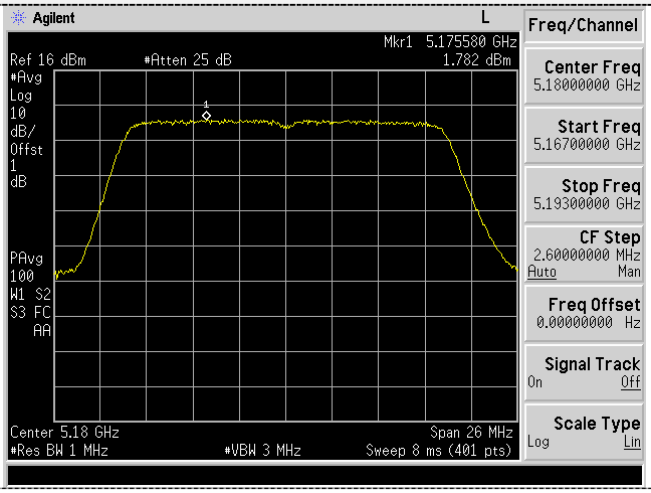



*CH48*

*CH165*

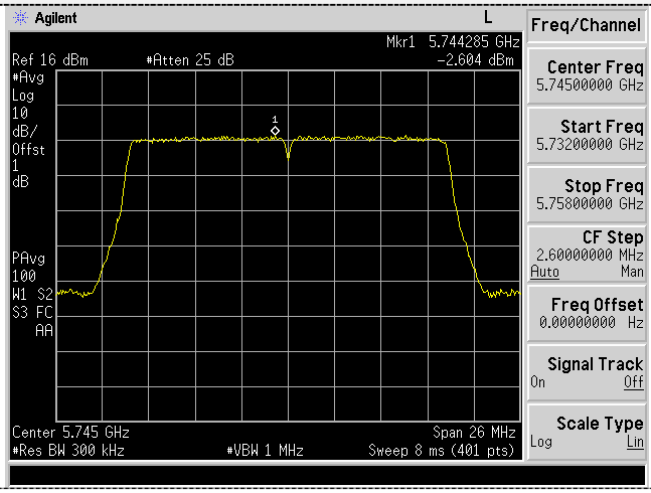
## 802.11n20

### U-NII 1

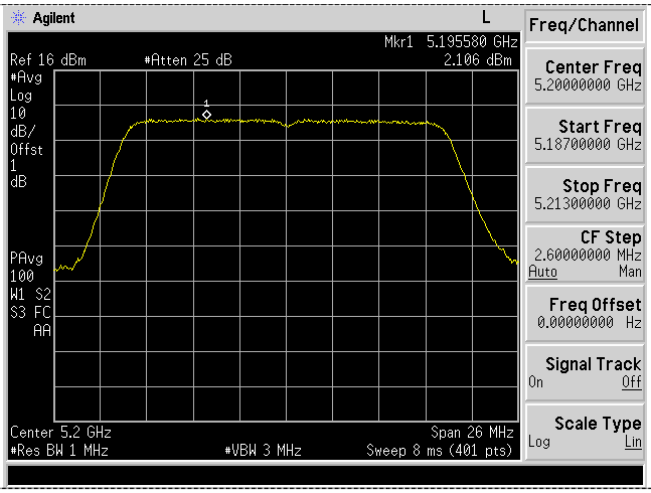



### CH36

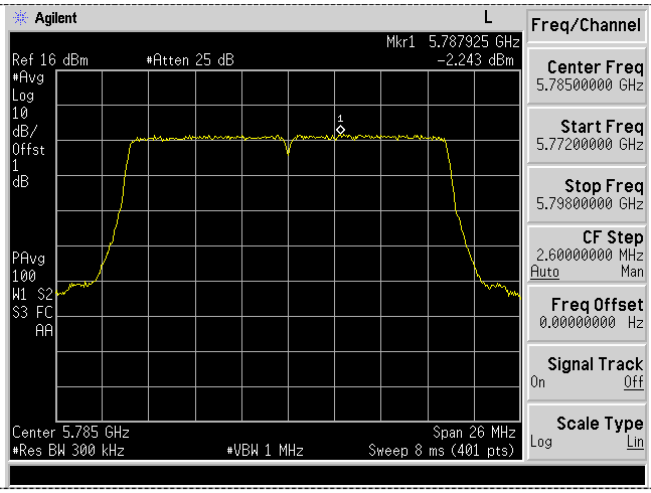
### U-NII 3



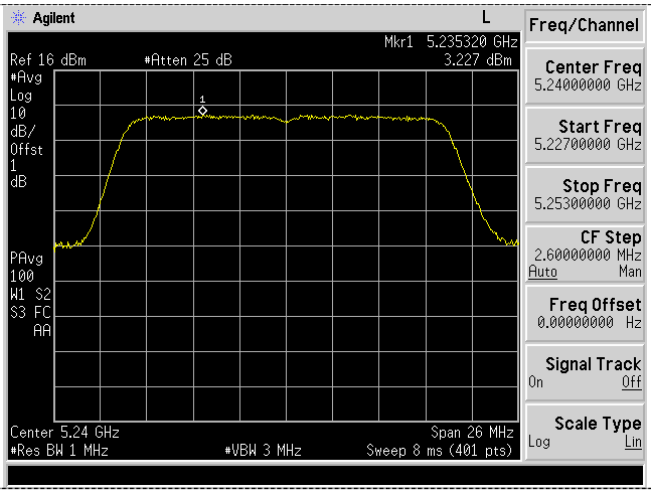

### CH149



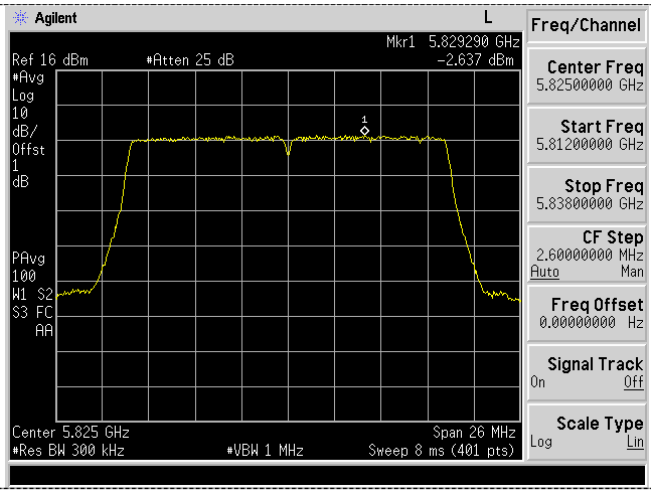

### CH40



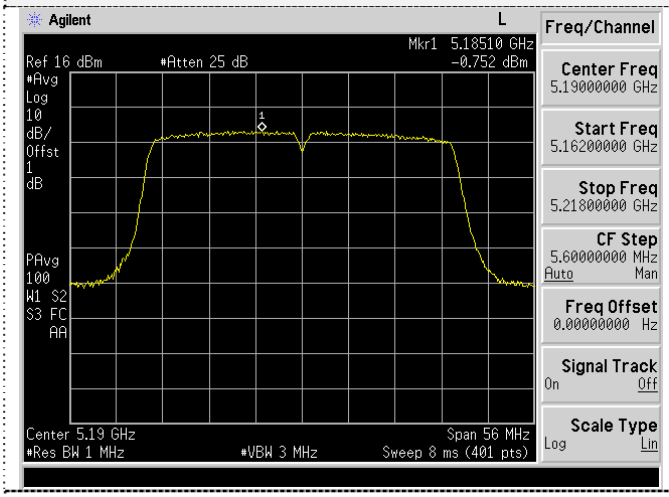
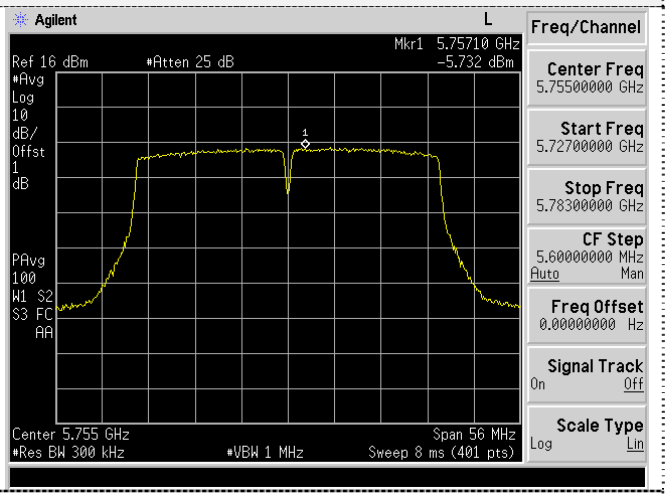
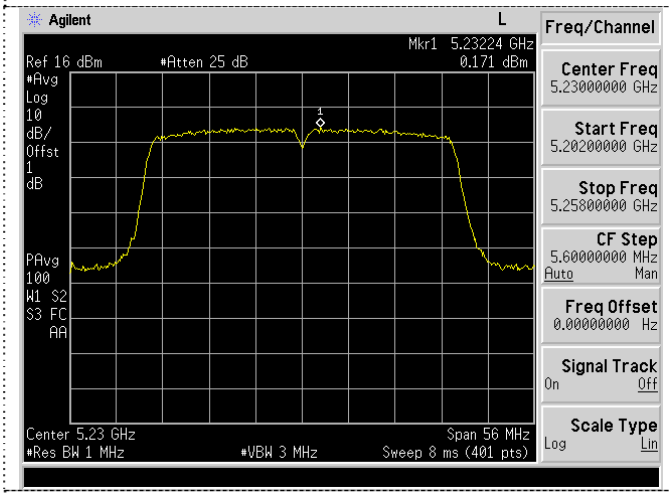
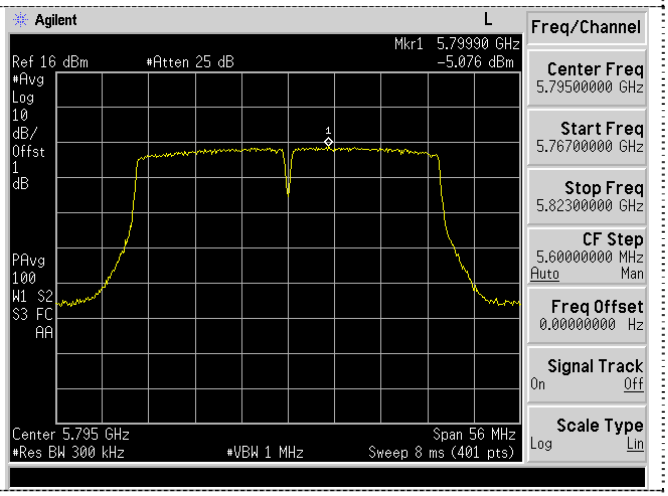

### CH157




### CH48

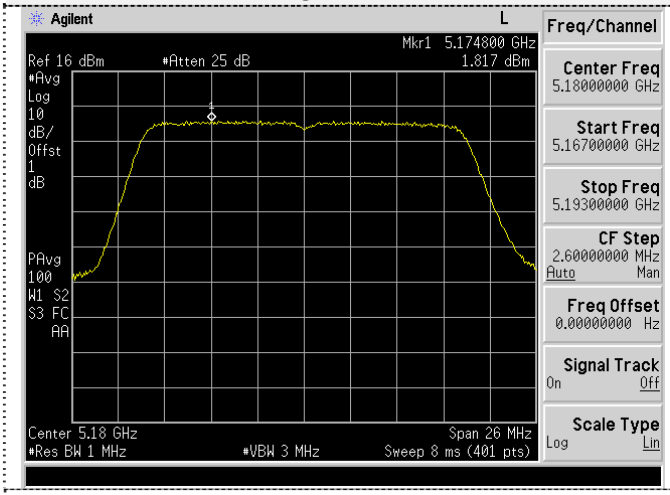



### CH165

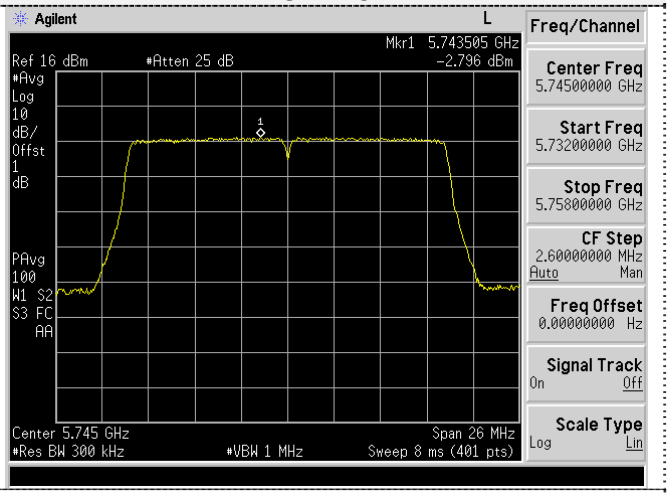
| 802.11n(HT40) | |
|---|---|
| U-NII 1 | U-NII 3 |
|  |  |
| CH3 | CH151 |
|  |  |
| CH46 | CH159 |

## 802.11ac(HT20)

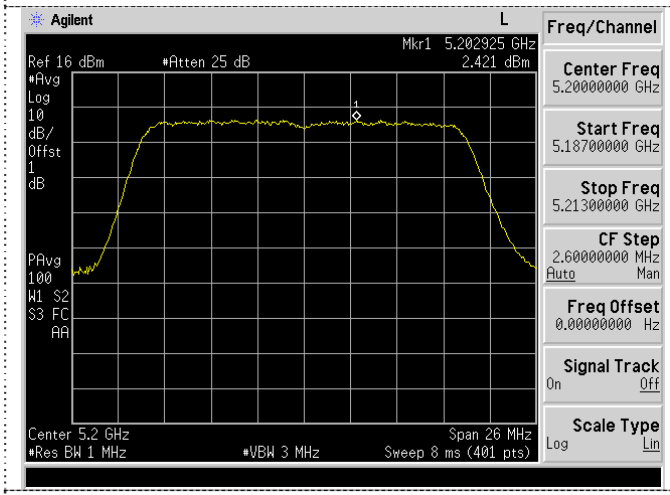
### U-NII 1



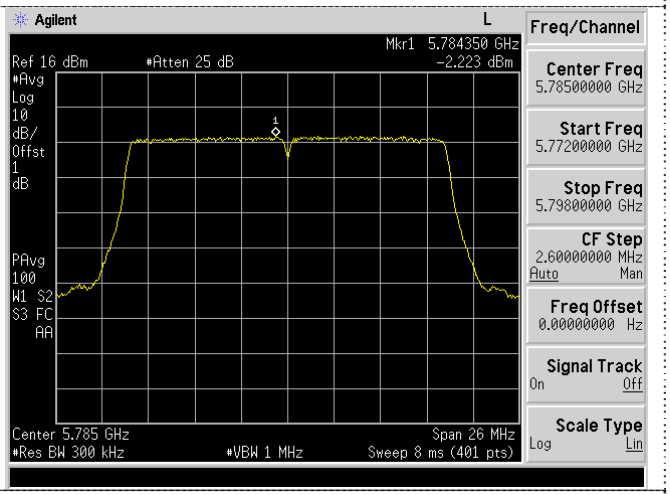

### U-NII 3



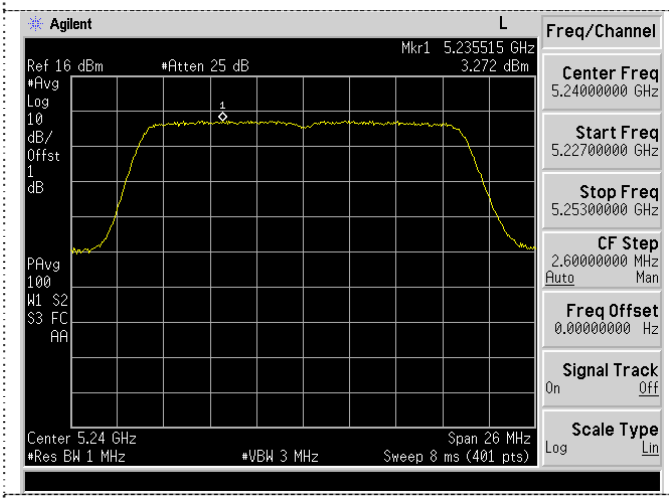

### CH36



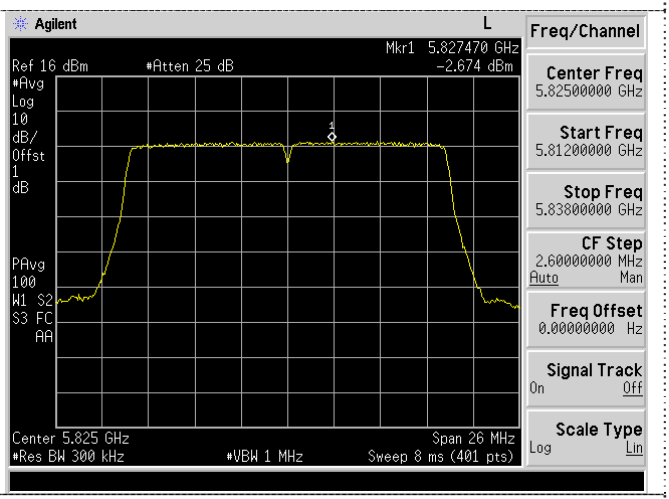

### CH149




### CH40




### CH157

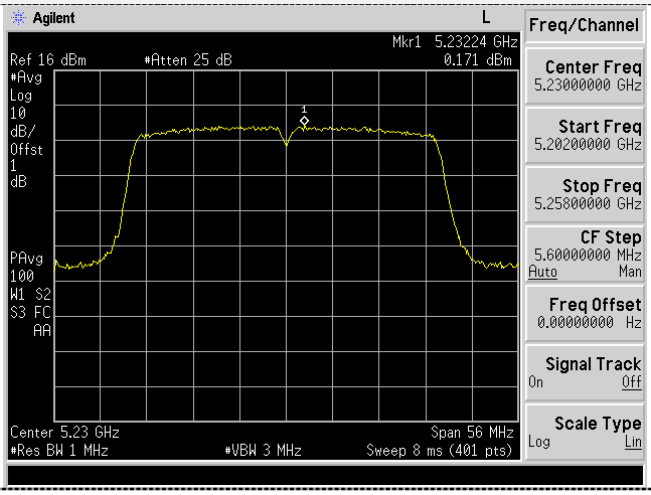



### CH48

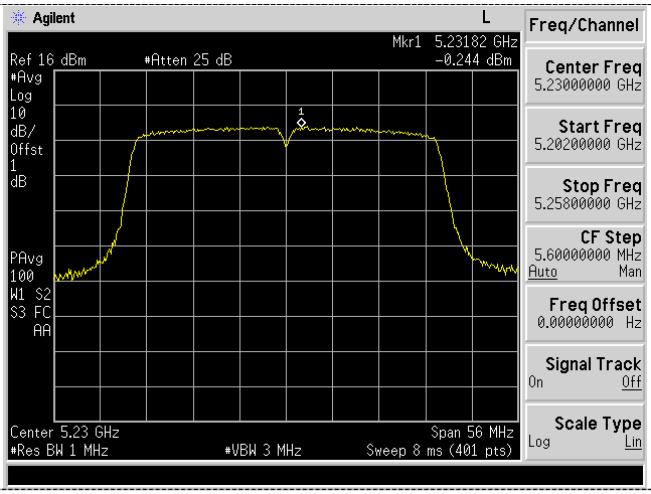
### CH165

## 802.11ac(HT40)

### U-NII 1

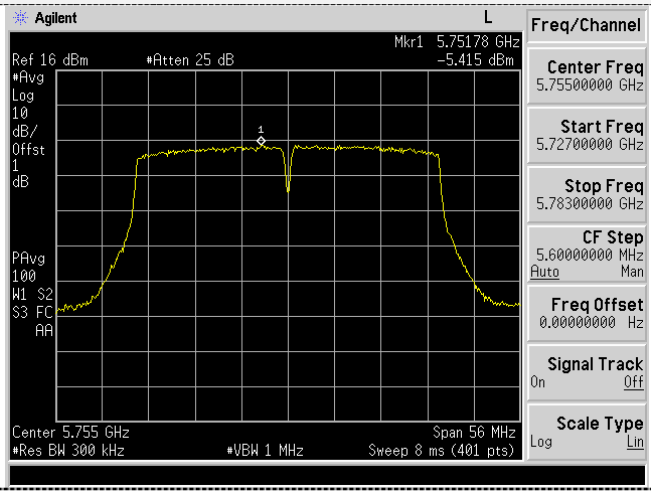



CH38

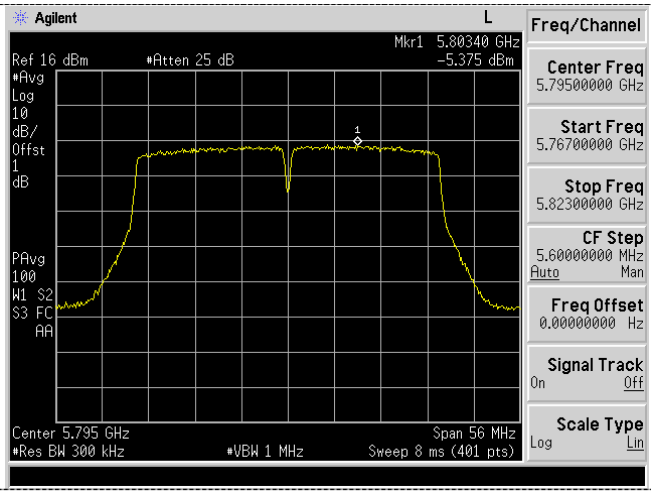



CH46

### U-NII 3



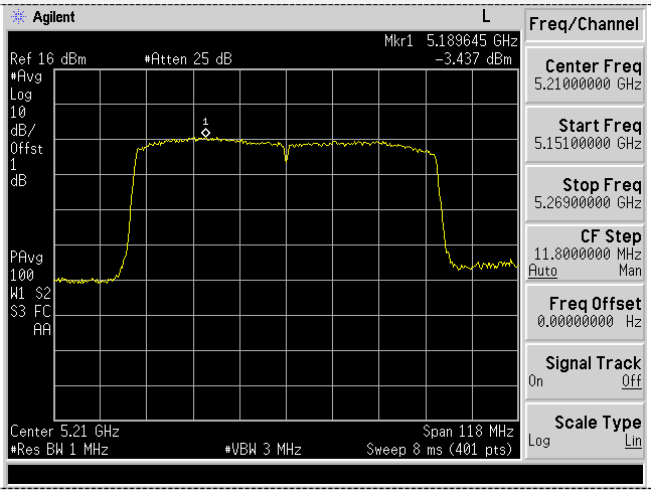

CH151




CH159

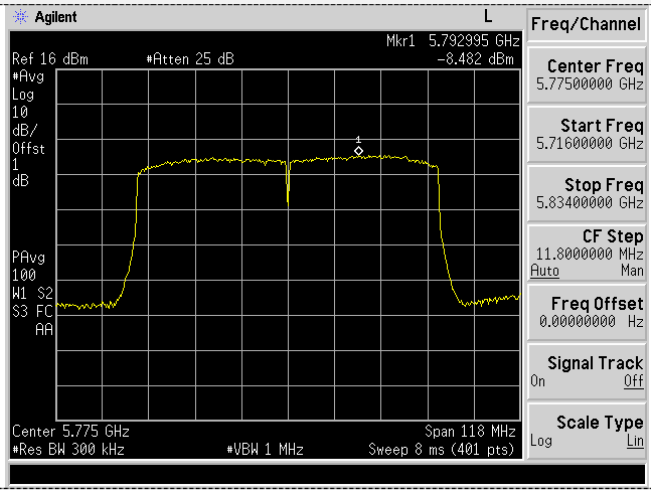
## 802.11ac(HT80)

### U-NII 1




CH42

### U-NII 3




CH155

## 3.5. Emission Bandwidth (26dBm Bandwidth)

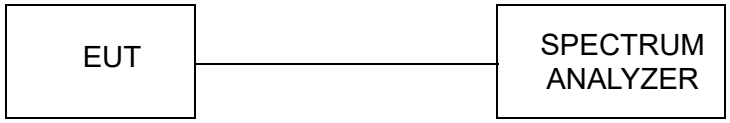
**Limit**

N/A

**Test Procedure**

1. Set resolution bandwidth (RBW) = approximately 1 % of the EBW.
2. Set the video bandwidth (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 peak 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 Configuration**




**Test Results**

| Temperature | 22.5℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Anna Hu | Configurations | IEEE 802.11a/n/ac |

**For ANT1:**

| Type | Bands | Channel | 26dB Bandwidth (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|---|
| 802.11a | U-NII 1 | 36 | 19.42 | N/A | Pass |
| | | 40 | 19.47 | | |
| | | 48 | 19.23 | | |
| 802.11n(HT20) | U-NII 1 | 36 | 20.59 | | |
| | | 40 | 19.95 | | |
| | | 48 | 20.50 | | |
| 802.11n(HT40) | U-NII 1 | 38 | 39.72 | | |
| | | 46 | 39.39 | | |
| 802.11ac(HT20) | U-NII 1 | 36 | 20.33 | N/A | Pass |
| | | 40 | 20.16 | | |
| | | 48 | 20.31 | | |
| 802.11ac(HT40) | U-NII 1 | 38 | 39.04 | | |
| | | 46 | 39.36 | | |
| 802.11ac(HT80) | U-NII 1 | 42 | 81.66 | | |

**For ANT2:**

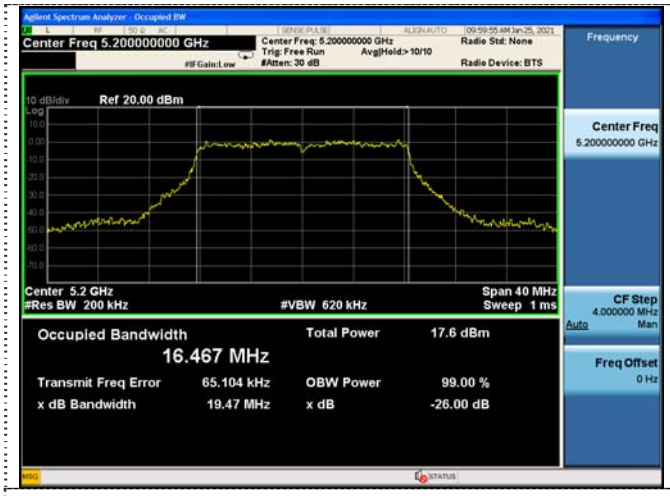
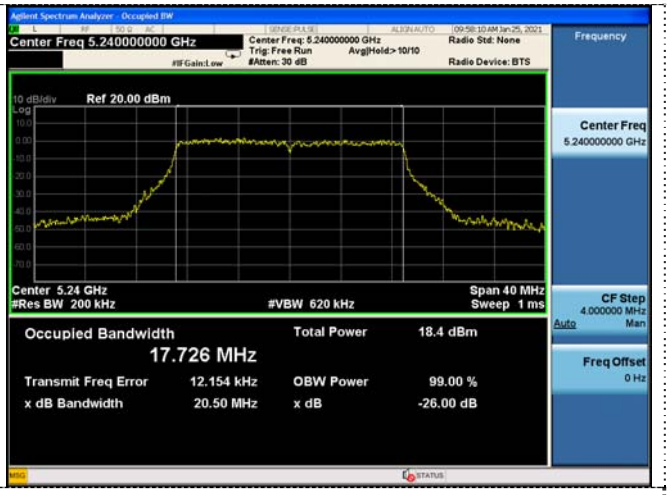
| Type | Bands | Channel | 26dB Bandwidth (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|---|
| 802.11a | U-NII 1 | 36 | 18.76 | N/A | Pass |
| | | 40 | 18.80 | | |
| | | 48 | 18.78 | | |
| 802.11n(HT20) | U-NII 1 | 36 | 19.72 | | |
| | | 40 | 19.80 | | |
| | | 48 | 19.81 | | |
| 802.11n(HT40) | U-NII 1 | 38 | 40.92 | | |
| | | 46 | 41.07 | | |
| 802.11ac(HT20) | U-NII 1 | 36 | 19.67 | N/A | Pass |
| | | 40 | 19.66 | | |
| | | 48 | 19.62 | | |
| 802.11ac(HT40) | U-NII 1 | 38 | 40.47 | | |
| | | 46 | 40.48 | | |
| 802.11ac(HT80) | U-NII 1 | 42 | 82.01 | | |

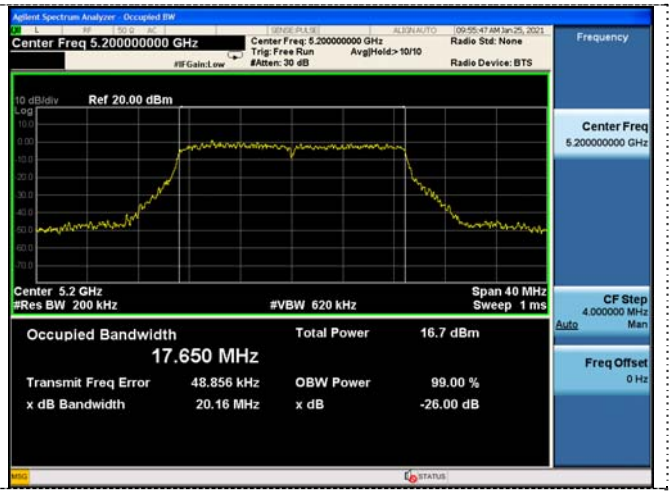
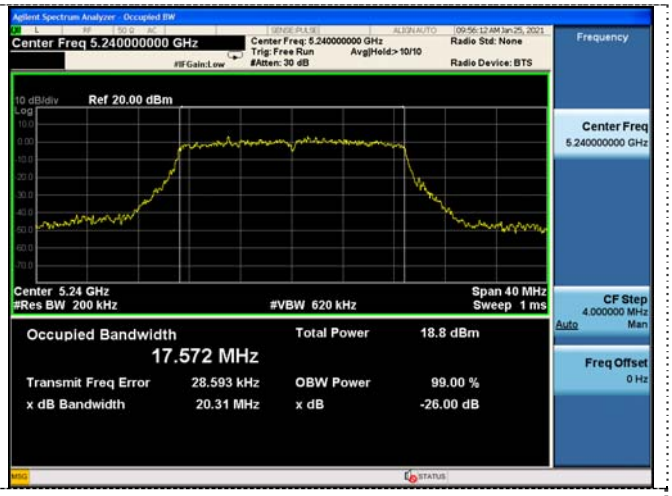
*Note:*

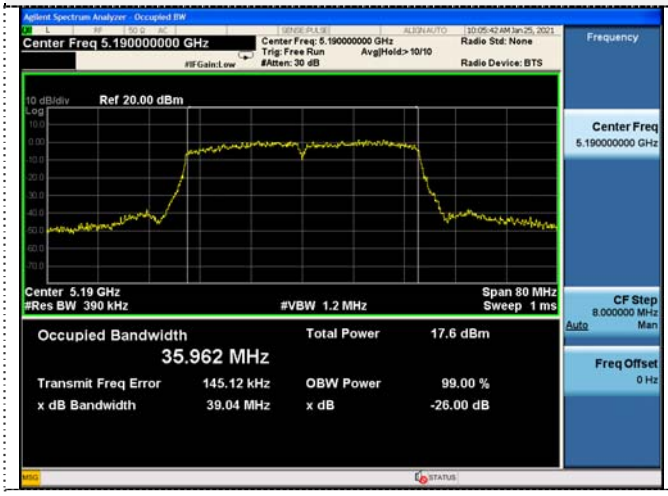
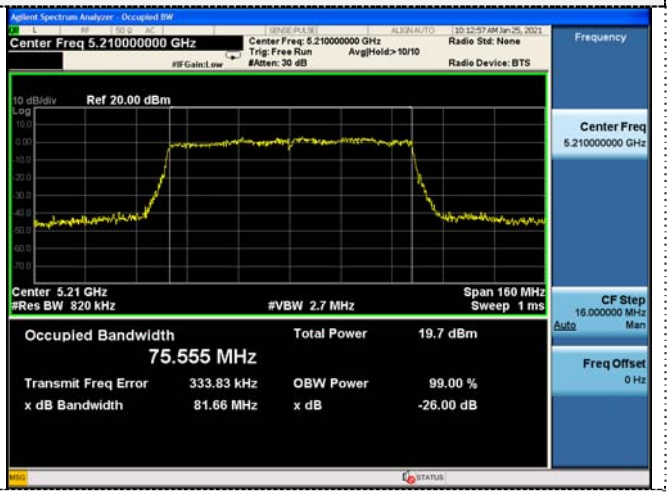
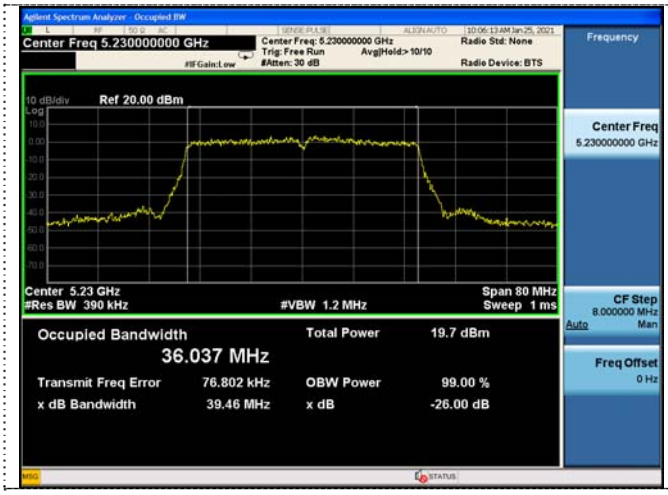
1. *Measured 26dB bandwidth at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20 ,IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*

*Please refer to following test plots;*

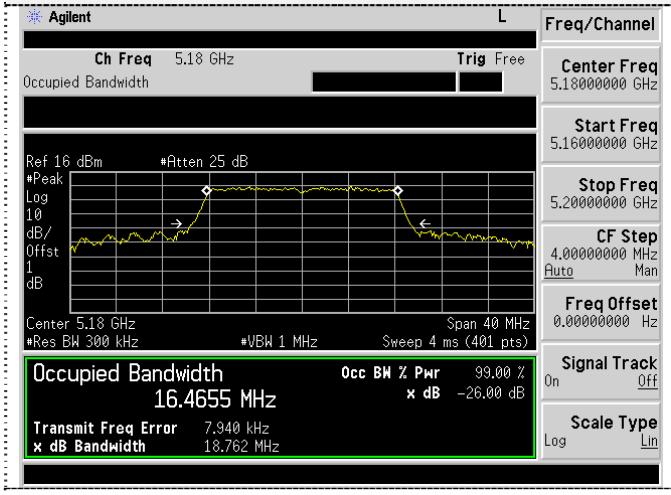
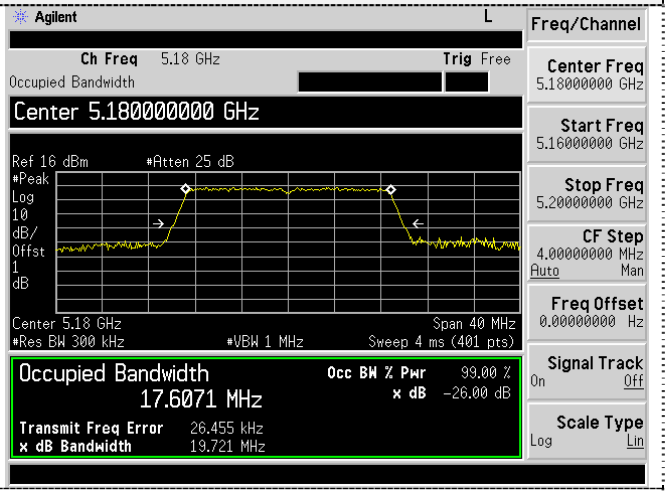
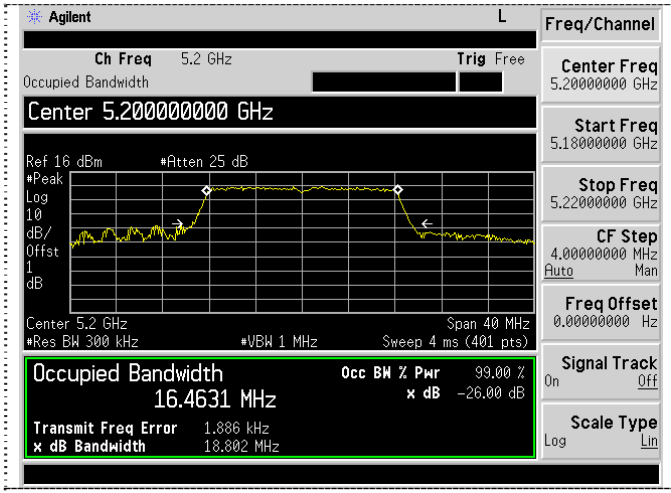
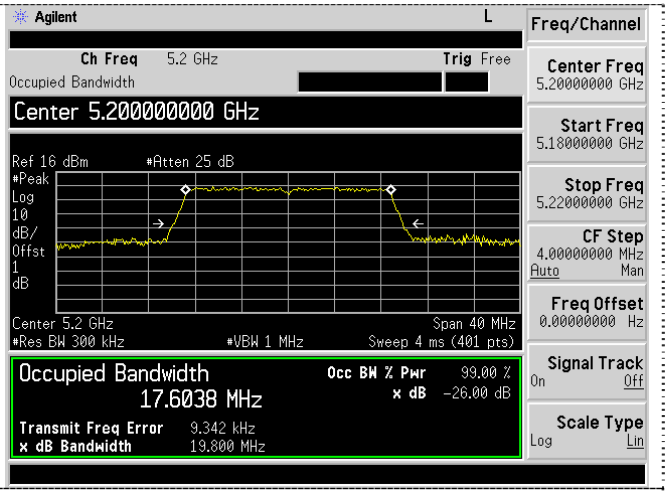
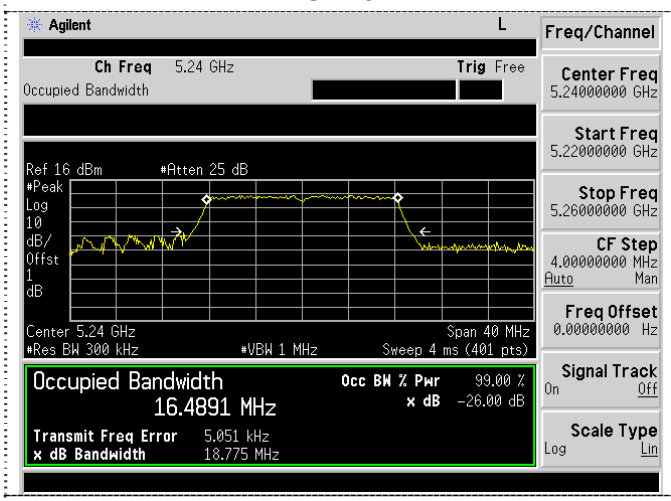
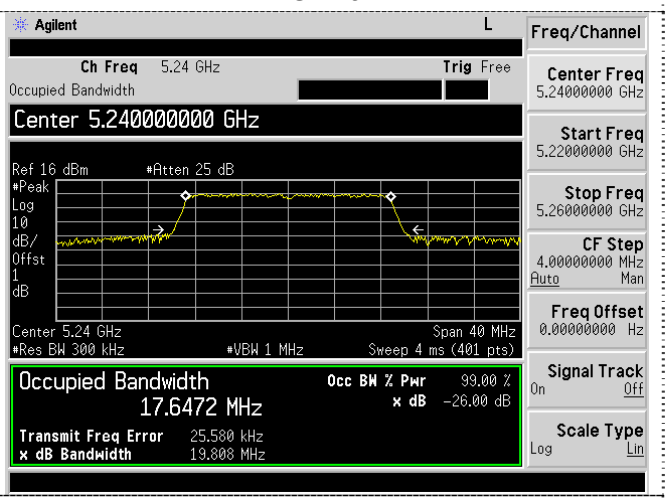
For ANT1:

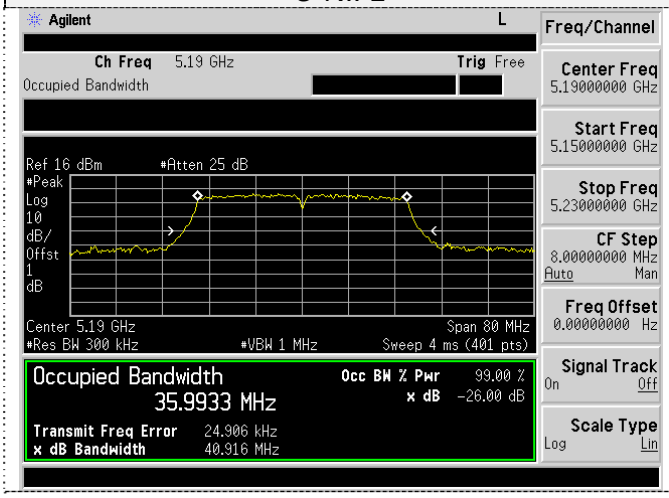
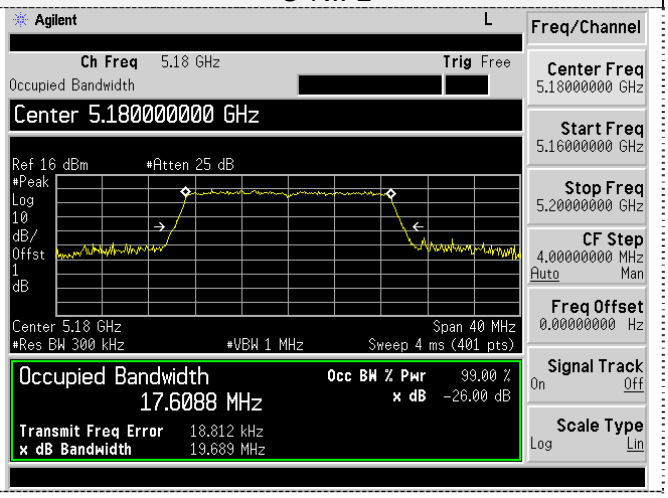
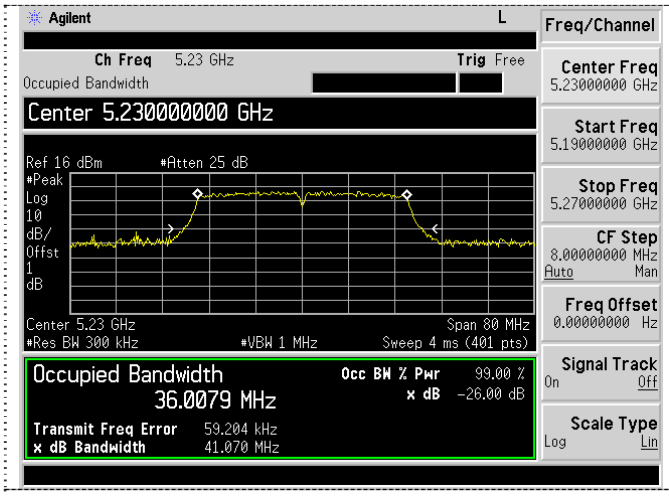
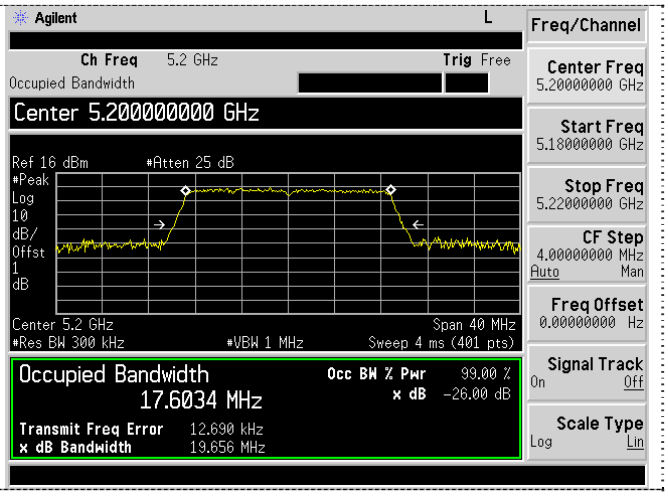
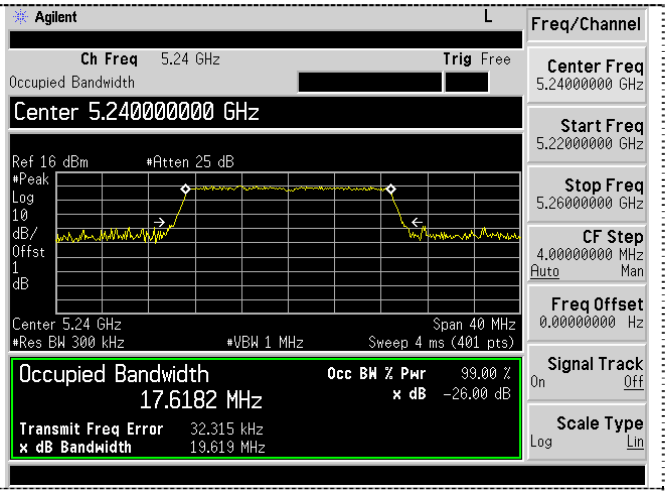
| *802.11a* | *802.11n(HT20)* |
|---|---|
| *U-NII 1* | *U-NII 1* |
|  |  |
| *CH36* | *CH36* |
|  |  |
| *CH40* | *CH40* |
|  |  |
| *CH48* | *CH48* |

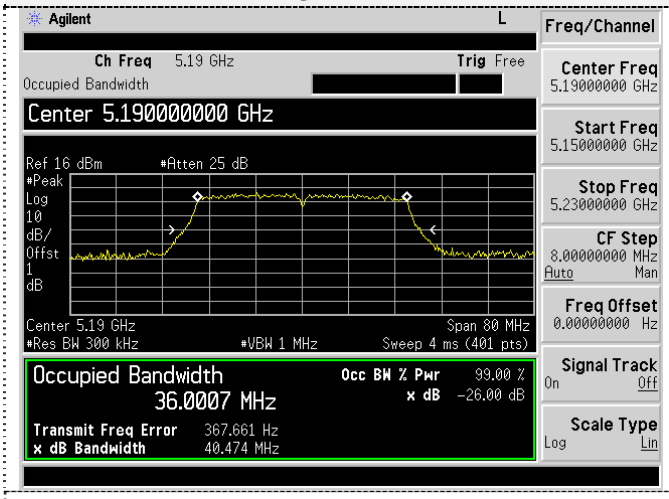
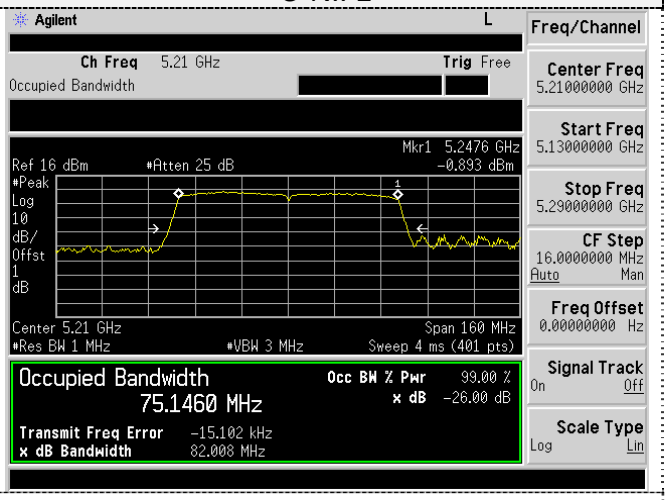
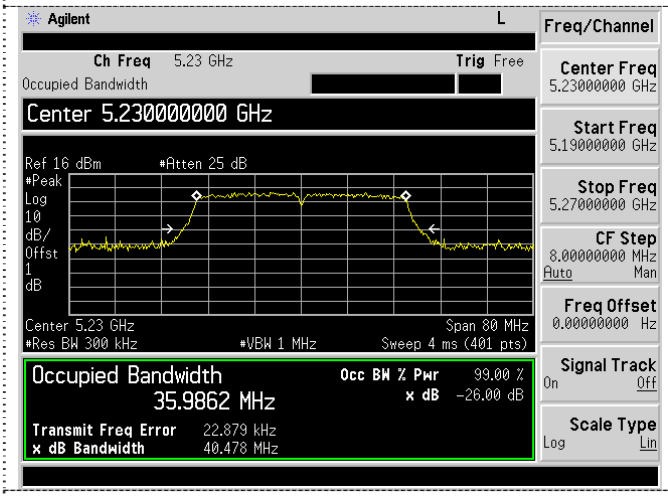
| 802.11n(HT40) | 802.11ac(HT20) |
|---|---|
| U-NII 1 | U-NII 1 |
|  |  |
| CH38 | CH36 |
|  |  |
| CH46 | CH40 |
| |  |
| | CH48 |

| 802.11ac(HT40) | 802.11ac(HT80) |
|---|---|
| U-NII 1 | U-NII 1 |
|  |  |
| CH38 | CH42 |
|  | |
| CH46 | |

For ANT2:

| 802.11a | 802.11n(HT20) |
|---|---|
| U-NII 1 | U-NII 1 |
|  |  |
| CH36 | CH36 |
|  |  |
| CH40 | CH40 |
|  |  |
| CH48 | CH48 |

| 802.11n(HT40) | 802.11ac(HT20) |
|---|---|
| U-NII 1 | U-NII 1 |
|  |  |
| CH38 | CH36 |
|  |  |
| CH46 | CH40 |
| |  |
| | CH48 |

| 802.11ac(HT40) | 802.11ac(HT80) |
|---|---|
| U-NII 1 | U-NII 1 |
|  |  |
| CH38 | CH42 |
|  | |
| CH46 | |

## 3.6. Minimum Emission Bandwidth (6dBm Bandwidth)

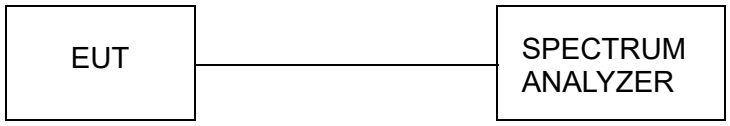
**Limit**

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

**Test Procedure**

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth 3 x RBW.
3. Detector = Peak.
4. Trace mode = Max hold.
5. 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 level measured in the fundamental emission.

**Test Configuration**




**Test Results**

| Temperature | 22.5℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Anna Hu | Configurations | IEEE 802.11a/n/ac |

**For ANT1:**

| Type | Bands | Channel | 6dB Bandwidth (MHz) | Limit (KHz) | Result |
|---|---|---|---|---|---|
| 802.11a | U-NII 3 | 149 | 16.36 | ≥500KHz | Pass |
| | | 157 | 16.38 | | |
| | | 165 | 15.72 | | |
| 802.11n(HT20) | U-NII 3 | 149 | 15.72 | | |
| | | 157 | 17.64 | | |
| | | 165 | 17.67 | | |
| 802.11n(HT40) | U-NII 3 | 151 | 35.74 | | |
| | | 159 | 33.96 | | |
| 802.11ac(HT20) | U-NII 3 | 149 | 14.16 | | |
| | | 157 | 17.20 | | |
| | | 165 | 17.67 | | |
| 802.11ac(HT40) | U-NII 3 | 151 | 33.17 | | |
| | | 159 | 36.38 | | |
| 802.11ac(HT80) | U-NII 3 | 155 | 75.49 | | |

**For ANT2:**

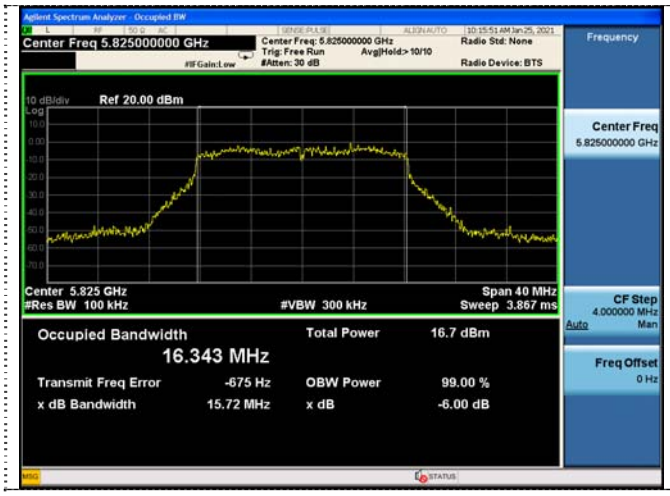
| Type | Bands | Channel | 6dB Bandwidth (MHz) | Limit (KHz) | Result |
|---|---|---|---|---|---|
| 802.11a | U-NII 3 | 149 | 16.53 | ≥500KHz | Pass |
| | | 157 | 15.56 | | |
| | | 165 | 16.54 | | |
| 802.11n(HT20) | U-NII 3 | 149 | 17.79 | | |
| | | 157 | 17.73 | | |
| | | 165 | 17.75 | | |
| 802.11n(HT40) | U-NII 3 | 151 | 36.59 | | |
| | | 159 | 36.54 | | |
| 802.11ac(HT20) | U-NII 3 | 149 | 17.77 | | |
| | | 157 | 17.77 | | |
| | | 165 | 17.72 | | |
| 802.11ac(HT40) | U-NII 3 | 151 | 36.59 | | |
| | | 159 | 36.51 | | |
| 802.11ac(HT80) | U-NII 3 | 155 | 76.42 | | |

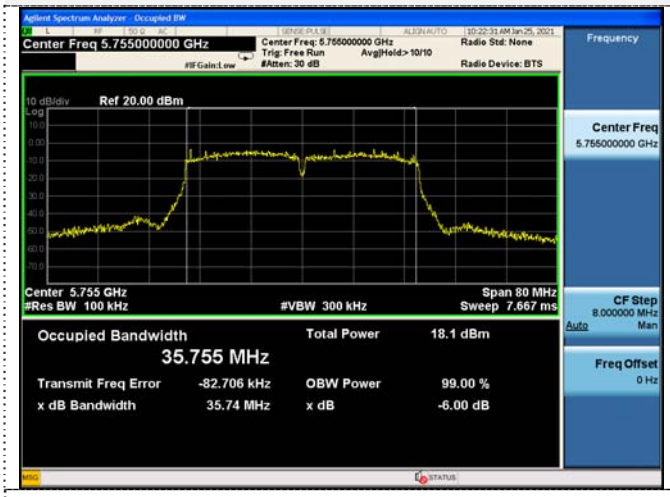
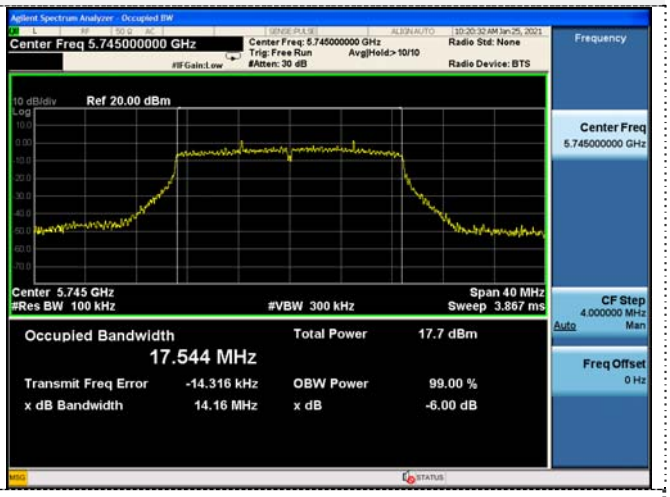
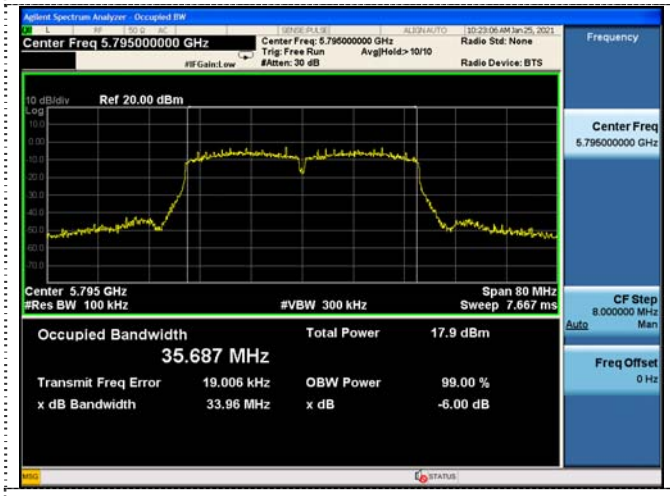
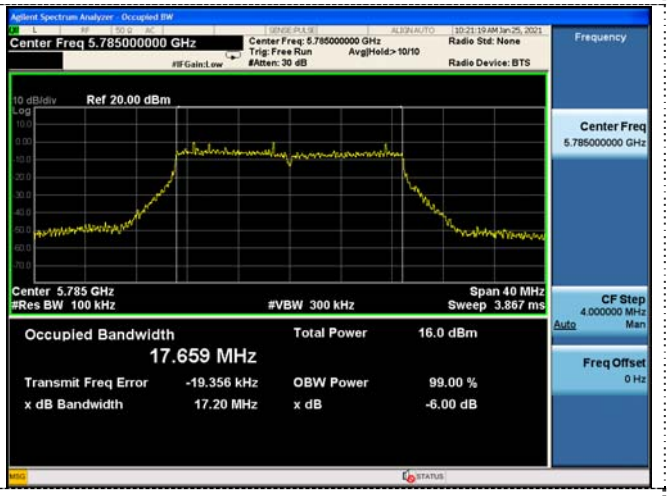
*Note:*

1. *Measured 26dB bandwidth at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20 ,IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*

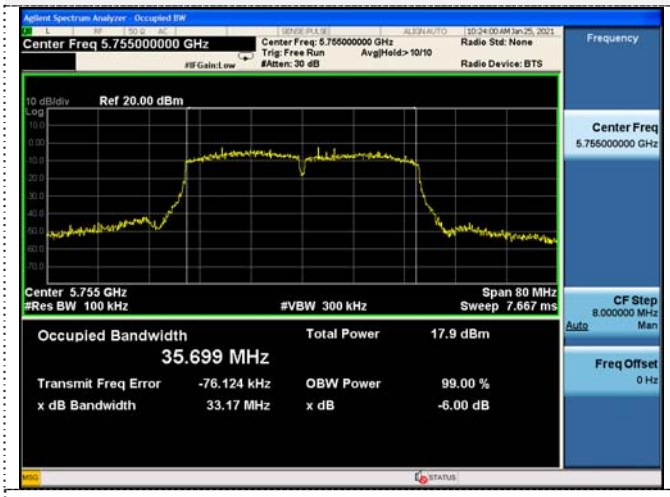
*Please refer to following test plots;*

*For ANT1:*

| *802.11a* | *802.11n(HT20)* |
|---|---|
|  |  |
| *CH149* | *CH149* |
|  |  |
| *CH157* | *CH157* |
|  |  |
| *CH165* | *CH165* |

| 802.11n(HT40) | 802.11ac(HT20) |
|---|---|
|  |  |
| CH151 | CH149 |
|  |  |
| CH159 | CH157 |
| |  |
| | CH165 |

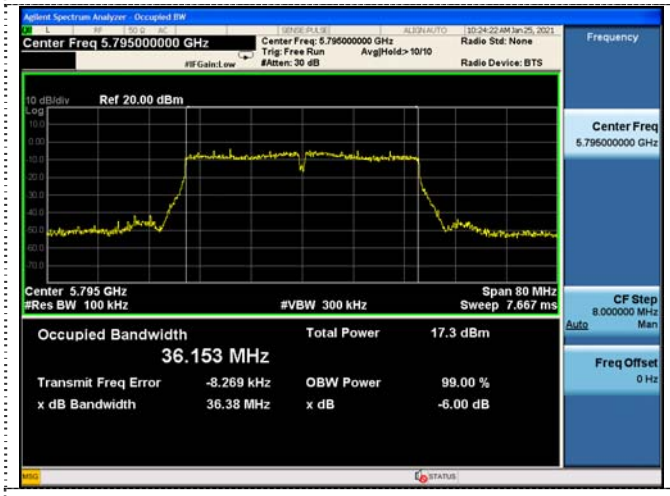
*802.11ac(HT40)*




*CH151*

*802.11ac(HT80)*

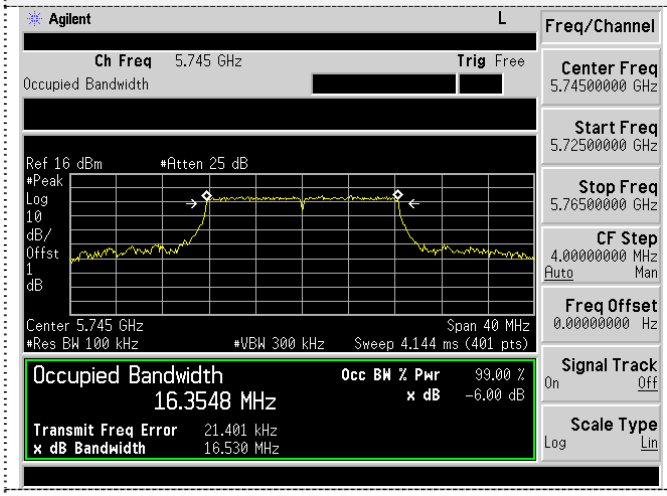

*CH155*



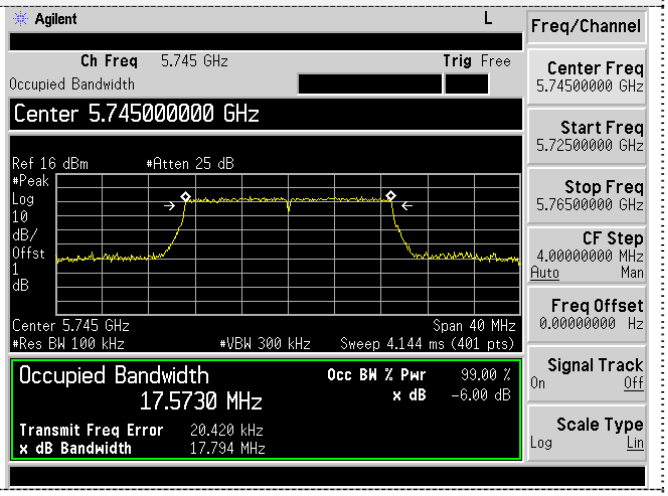

*CH159*

*For ANT2:*

*802.11a*

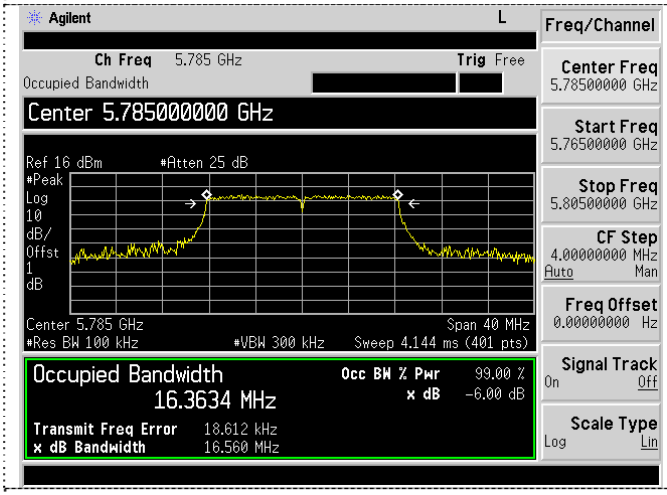


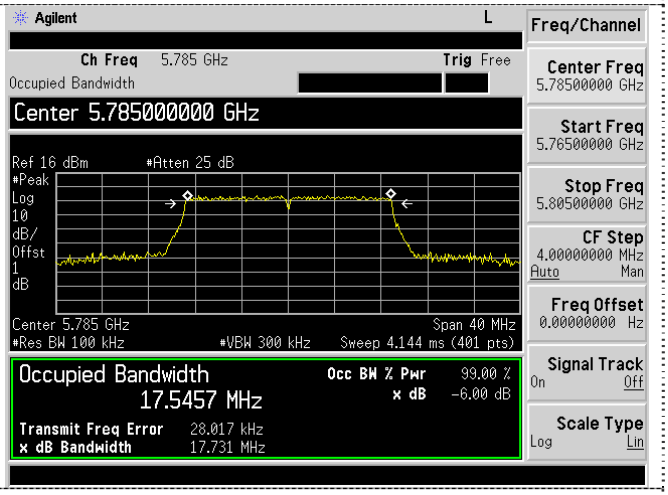

*802.11n(HT20)*




*CH149*

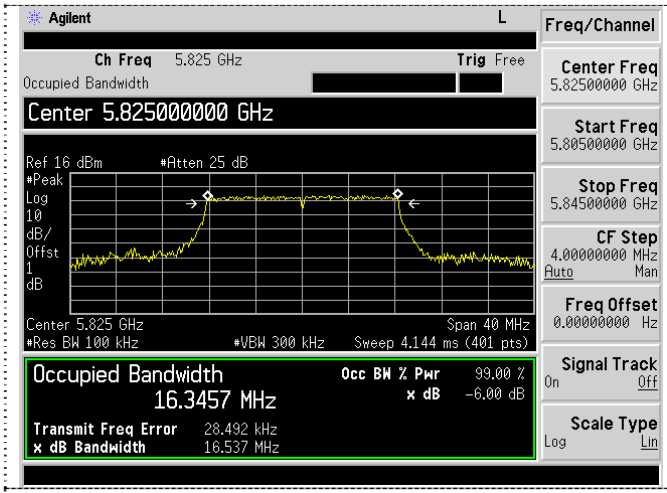
*CH149*

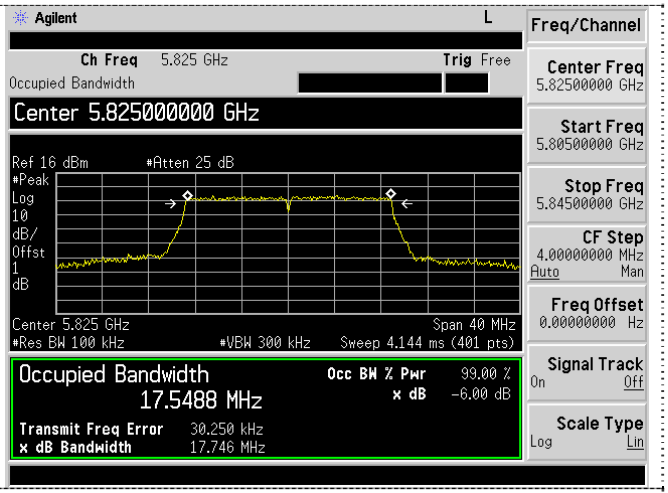



*CH157*

*CH157*

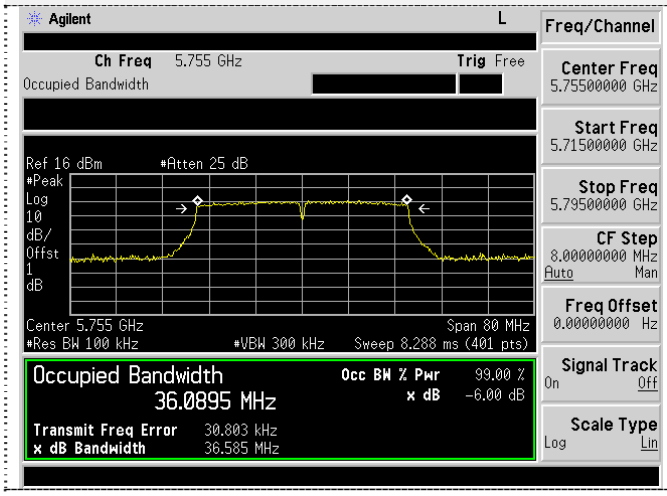



*CH165*

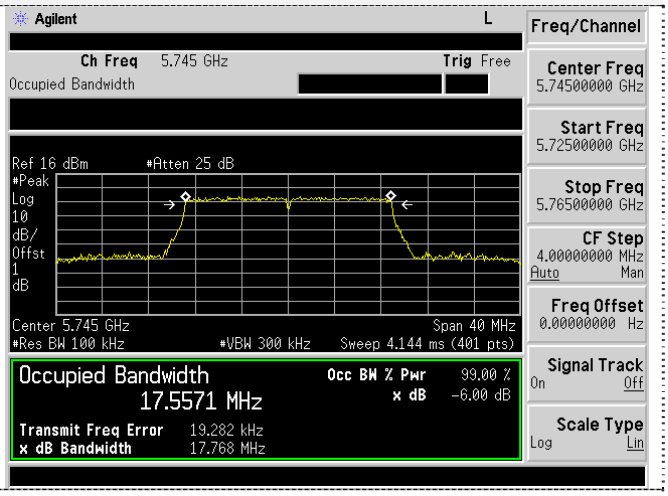
*CH165*

*802.11n(HT40)*

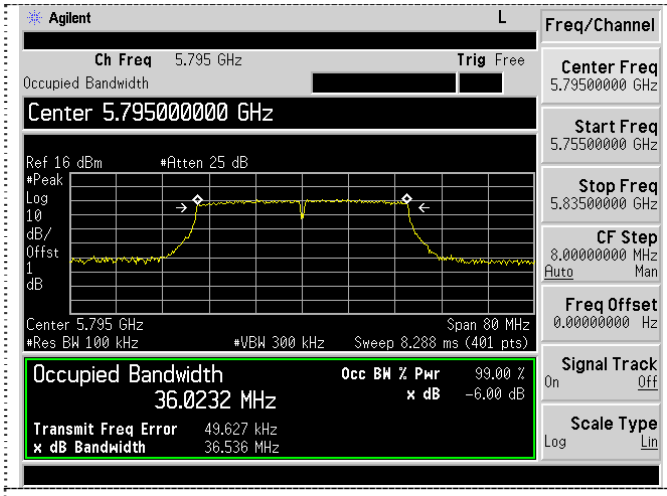



*CH151*

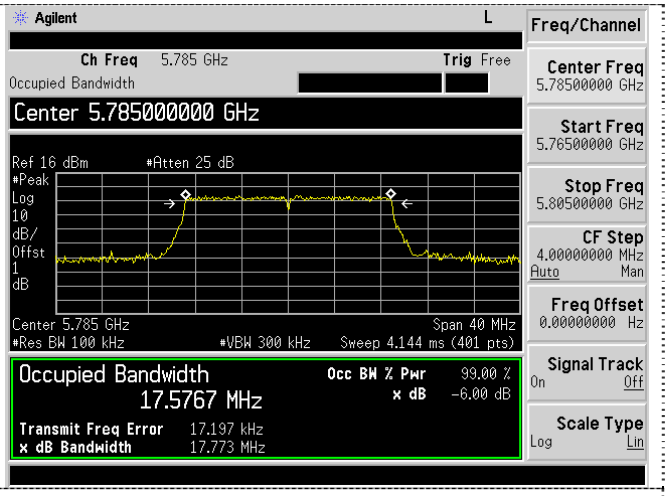
*802.11ac(HT20)*



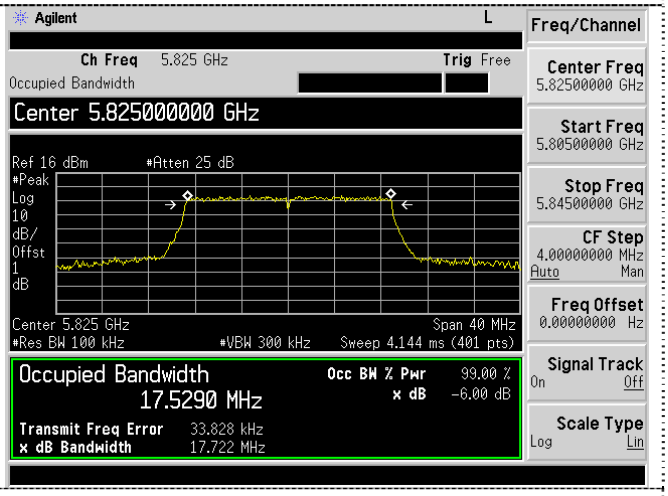

*CH149*




*CH159*

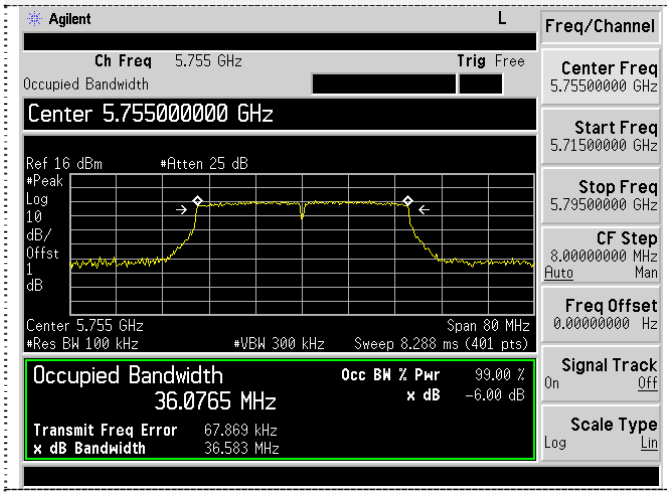



*CH157*



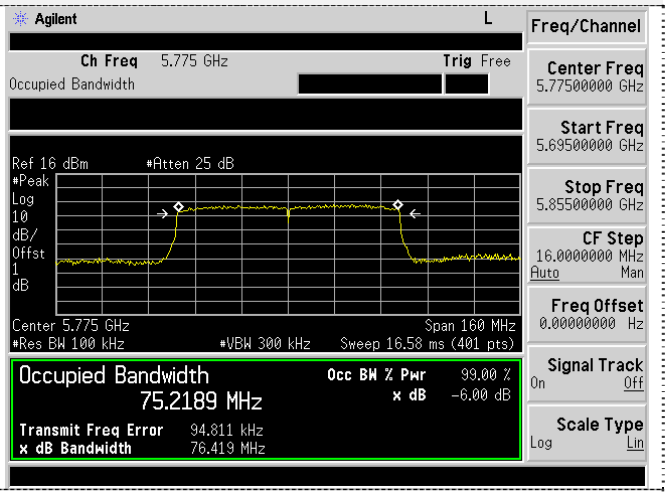

*CH165*

802.11ac(HT40)

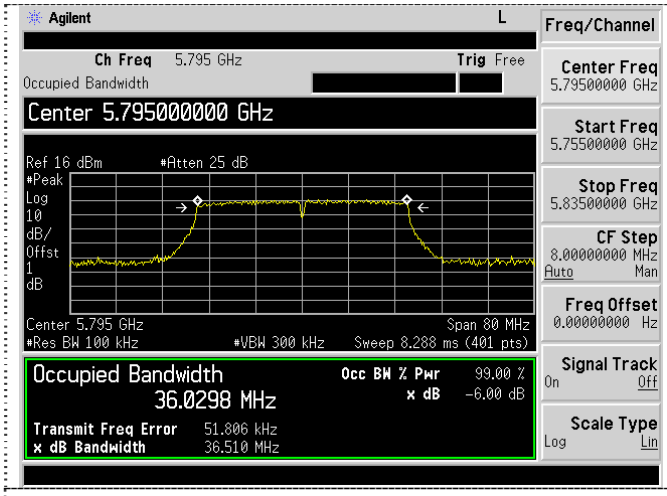



CH151

802.11ac(HT80)




CH155



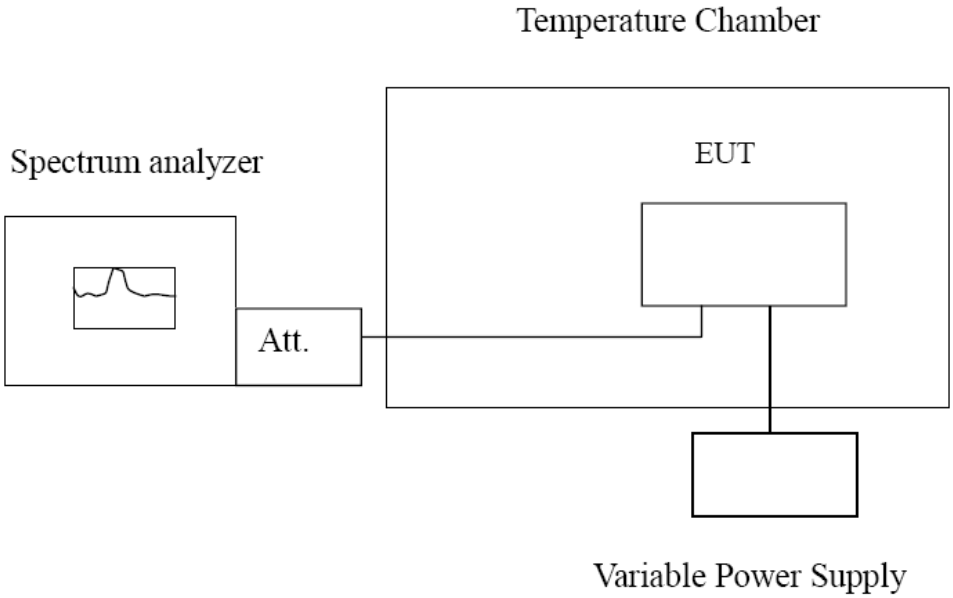

CH159

## 3.7. Frequency Stability

**LIMIT**

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

**TEST CONFIGURATION**




**TEST PROCEDURE**

**Frequency Stability under Temperature Variations:**
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

**Frequency Stability under Voltage Variations:**
Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

**TEST RESULTS**

| Temperature | 22.5℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Anna Hu | Configurations | IEEE 802.11a/n/ac |

Record worst case as below:

For ANT1:

| Reference Frequency: 802.11ac channel=36 frequency=5180MHz | | | | | |
|---|---|---|---|---|---|
| Voltage ( V ) | Temperature (℃) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| 120 | -30 | 757 | 0.146 | Within the band of operation | Pass |
| | -20 | 564 | 0.109 | | |
| | -10 | 417 | 0.081 | | |
| | 0 | 268 | 0.052 | | |
| | 10 | 381 | 0.074 | | |
| | 20 | 175 | 0.034 | | |
| | 30 | 200 | 0.039 | | |
| | 40 | 485 | 0.094 | | |
| | 50 | 777 | 0.150 | | |
| 132 | 25 | 960 | 0.185 | | |
| 110 | 25 | 802 | 0.155 | | |

| Reference Frequency: 802.11ac channel=149 frequency=5745MHz | | | | | |
|---|---|---|---|---|---|
| Voltage ( V ) | Temperature (℃) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| 120 | -30 | 712 | 0.124 | Within the band of operation | Pass |
| | -20 | 776 | 0.135 | | |
| | -10 | 579 | 0.101 | | |
| | 0 | 384 | 0.067 | | |
| | 10 | 292 | 0.051 | | |
| | 20 | 198 | 0.034 | | |
| | 30 | 219 | 0.038 | | |
| | 40 | 390 | 0.068 | | |
| | 50 | 804 | 0.140 | | |
| 132 | 25 | 773 | 0.135 | | |
| 110 | 25 | 794 | 0.138 | | |

For ANT2:

| Reference Frequency: 802.11ac channel=36 frequency=5180MHz | | | | | |
|---|---|---|---|---|---|
| Voltage ( V ) | Temperature (℃) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| 230 | -30 | 635 | 0.123 | Within the band of operation | Pass |
| | -20 | 615 | 0.119 | | |
| | -10 | 506 | 0.098 | | |
| | 0 | 442 | 0.085 | | |
| | 10 | 483 | 0.093 | | |
| | 20 | 660 | 0.127 | | |
| | 30 | 505 | 0.097 | | |
| | 40 | 589 | 0.114 | | |
| | 50 | 703 | 0.136 | | |
| 240 | 25 | 870 | 0.168 | | |
| 207 | 25 | 773 | 0.149 | | |

| Reference Frequency: 802.11ac channel=149 frequency=5745MHz | | | | | |
|---|---|---|---|---|---|
| Voltage ( V ) | Temperature (℃) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| 230 | -30 | 721 | 0.126 | Within the band of operation | Pass |
| | -20 | 826 | 0.144 | | |
| | -10 | 594 | 0.103 | | |
| | 0 | 568 | 0.099 | | |
| | 10 | 355 | 0.062 | | |
| | 20 | 234 | 0.041 | | |
| | 30 | 215 | 0.037 | | |
| | 40 | 469 | 0.082 | | |
| | 50 | 768 | 0.134 | | |
| 240 | 25 | 773 | 0.135 | | |
| 207 | 25 | 807 | 0.140 | | |

## 3.8. Antenna Requirement

**Standard Applicable**

**For intentional device, according to FCC 47 CFR Section 15.203:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may d

esign the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

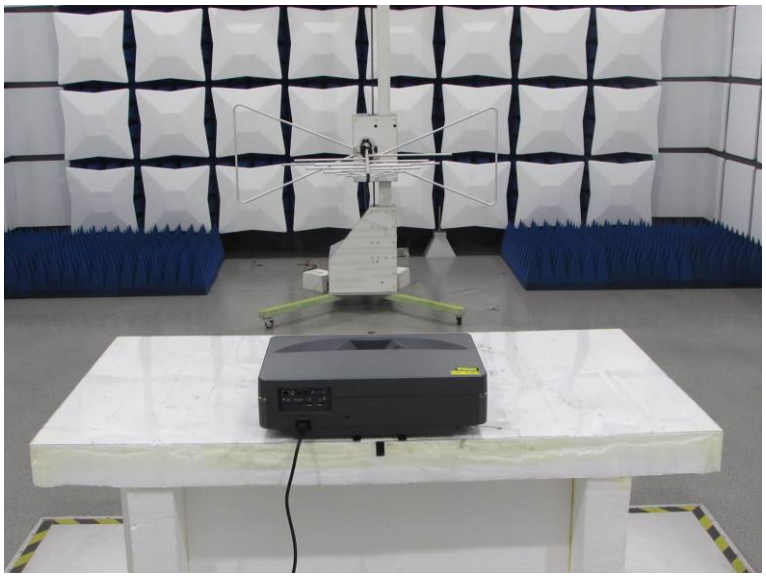
**Test Result:**

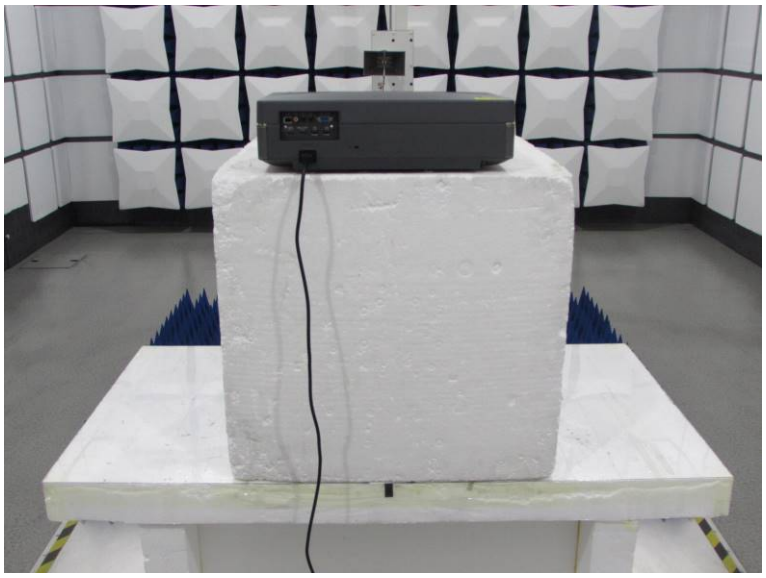
Use External antennas connect to PCB Boards, The maximum gain of each antenna was 0.00dBi for 5G WIFI,

# 4. LIST OF MEASURING EQUIPMENTS

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|---|
| 1 | MXA Signal Analyzer | Keysight | N9020A | MY52091623 | 2021/1/4 | 2022/1/3 |
| 2 | Power Sensor | Agilent | U2021XA | MY5365004 | 2021/1/4 | 2022/1/3 |
| 3 | Power Meter | Agilent | U2531A | TW53323507 | 2021/1/4 | 2022/1/3 |
| 4 | Wideband Antenna | schwarzbeck | VULB 9163 | 958 | 2019/11/16 | 2022/11/15 |
| 5 | Horn Antenna | schwarzbeck | 9120D-1141 | 1574 | 2019/11/16 | 2022/11/15 |
| 6 | EMI Test Receiver | R&S | ESCI | 100849/003 | 2021/1/4 | 2022/1/3 |
| 7 | Controller | MF | MF7802 | N/A | N/A | N/A |
| 8 | Amplifier | schwarzbeck | BBV 9743 | 209 | 2021/1/4 | 2022/1/3 |
| 9 | Amplifier | Tonscend | TSAMP-0518SE | -- | 2021/1/4 | 2022/1/3 |
| 10 | RF Cable(below 1GHz) | HUBER+SUHNER | RG214 | N/A | 2021/1/4 | 2022/1/3 |
| 11 | RF Cable(above 1GHz) | HUBER+SUHNER | RG214 | N/A | 2021/1/4 | 2022/1/3 |
| 12 | Artificial Mains | ROHDE & SCHWARZ | ENV 216 | 101333-IP | 2021/1/4 | 2022/1/3 |
| 12 | EMI Test Software | ROHDE & SCHWARZ | ESK1 | V1.71 | N/A | N/A |
| 14 | RE test software | Tonscend | JS32-RE | V2.0.2.0 | N/A | N/A |
| 15 | Test Software | Tonscend | JS1120-3 | V2.5.77.0418 | N/A | N/A |
| 16 | Horn Antenna | A-INFO | LB-180400-KF | J211020657 | 2019/11/16 | 2022/11/15 |
| 17 | Amplifier | CDSA | PAP-1840 | 17021 | 2020/03/24 | 2021/03/23 |

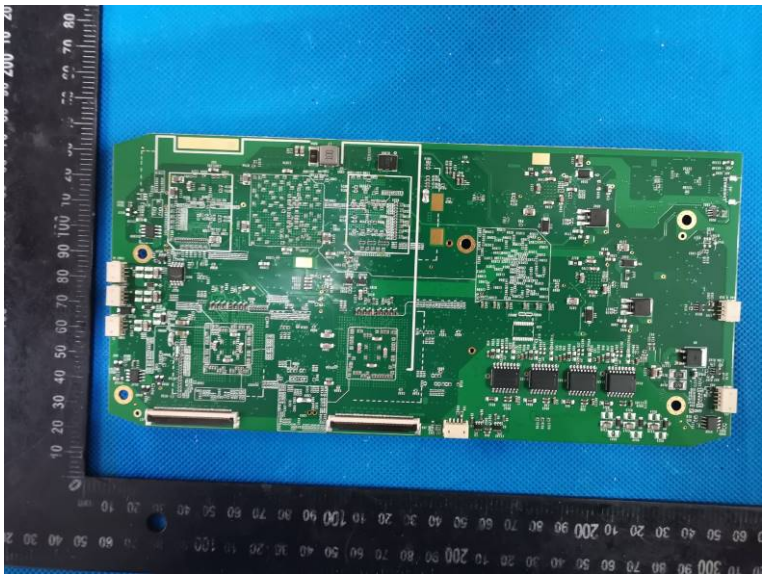
# 5. Test Setup Photos of the EUT

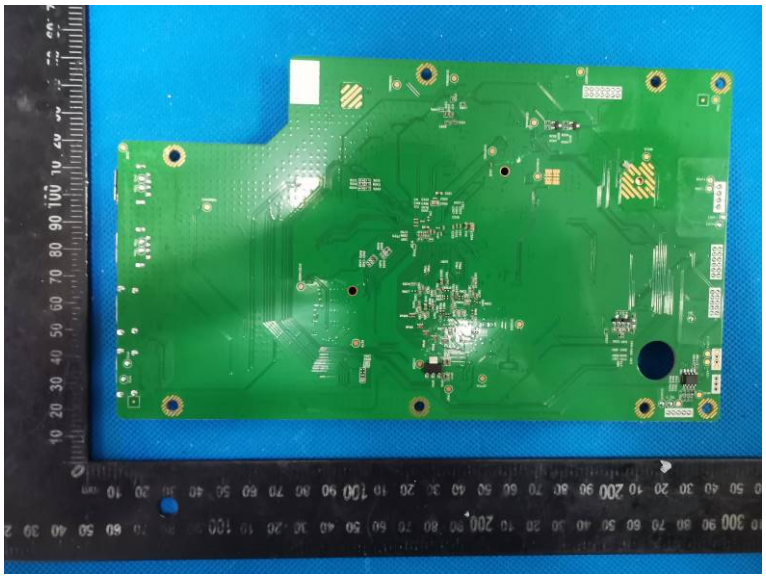


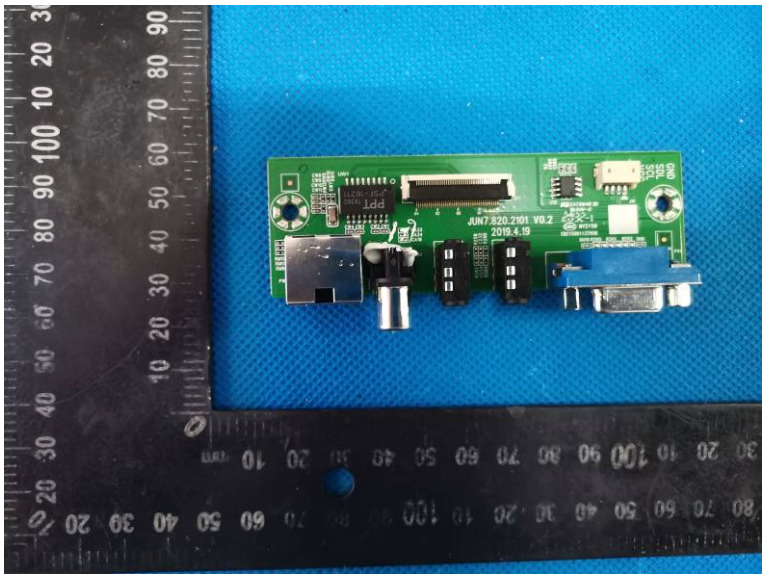


# 6. EXTERIOR PHOTOGRAPHS OF THE EUT


# 9. INTERIOR PHOTOGRAPHS OF THE EUT



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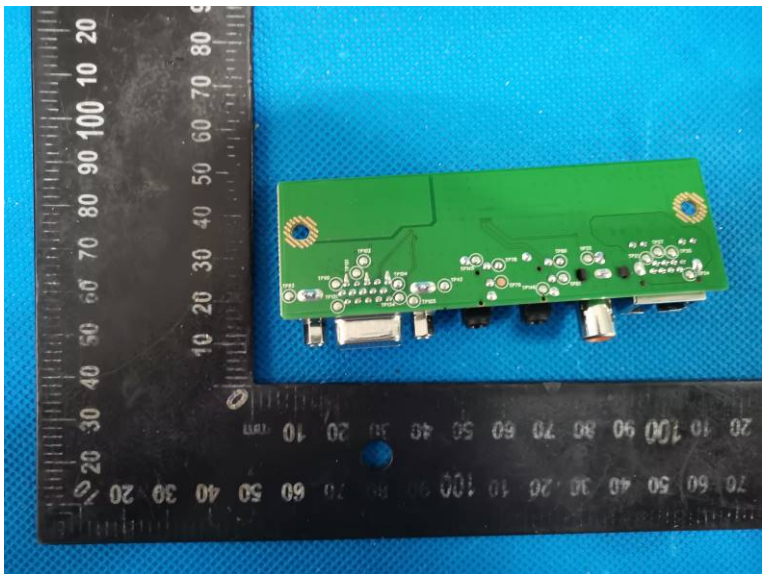
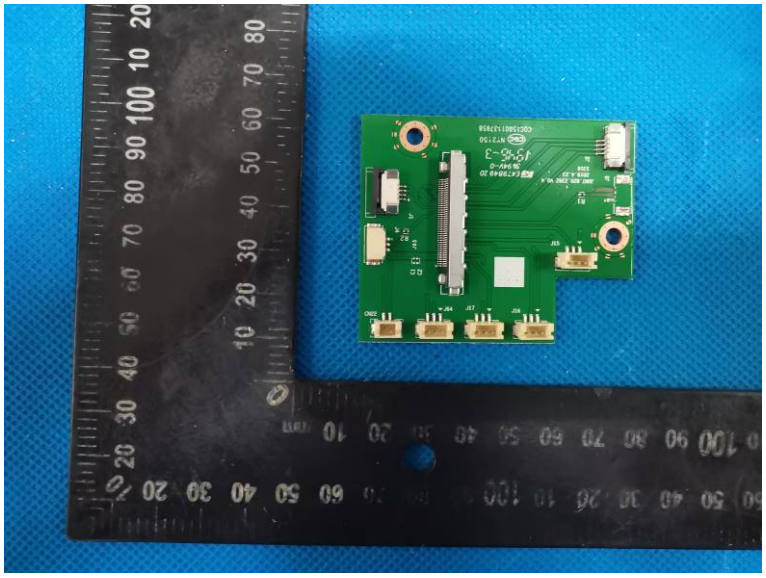
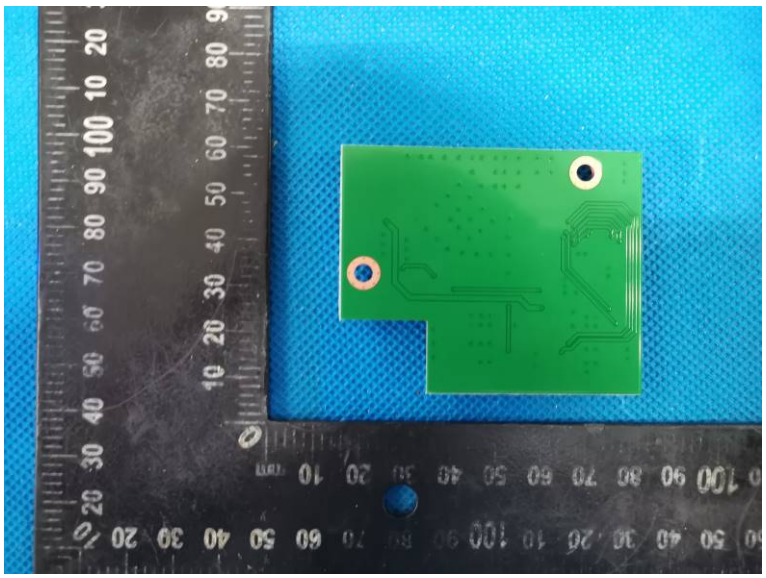
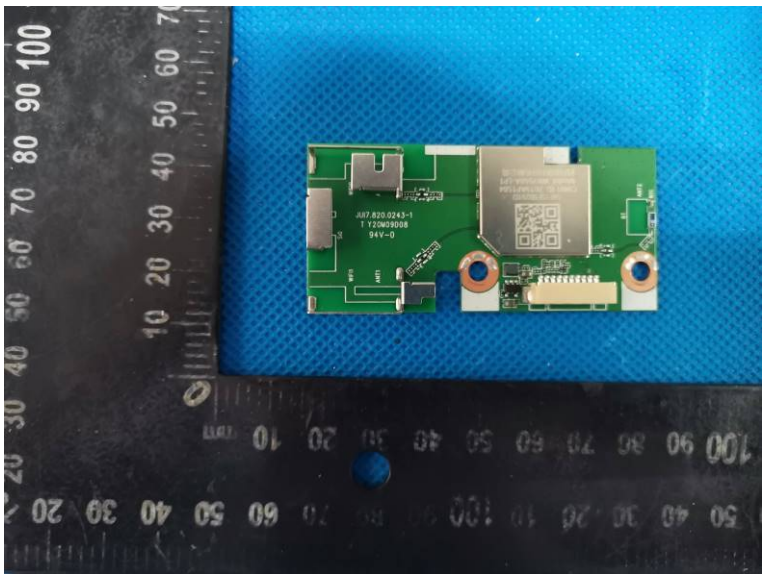
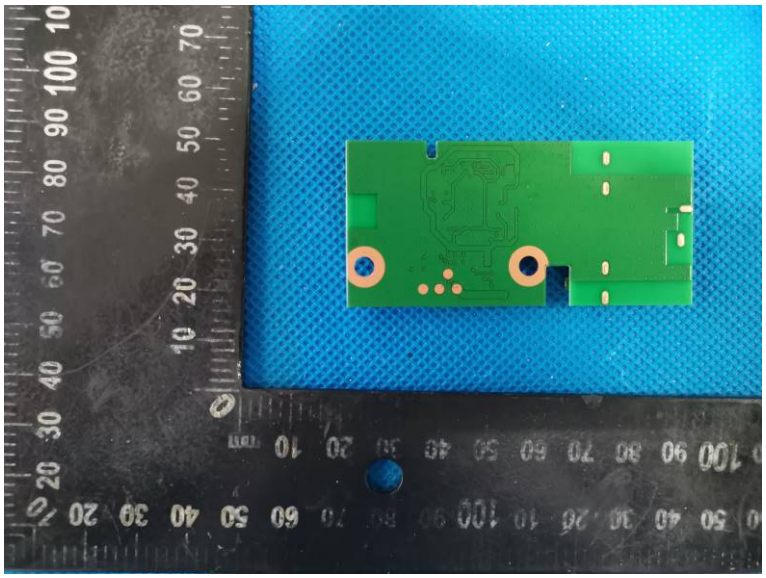
2019.4.19

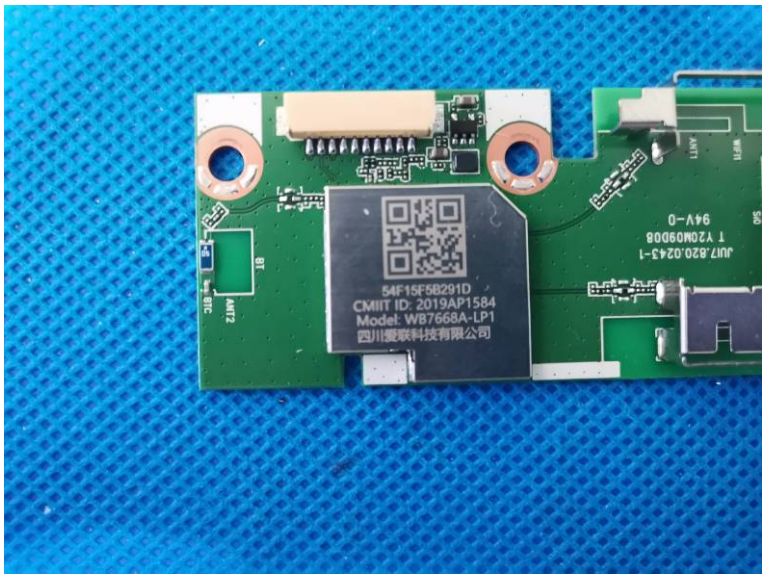








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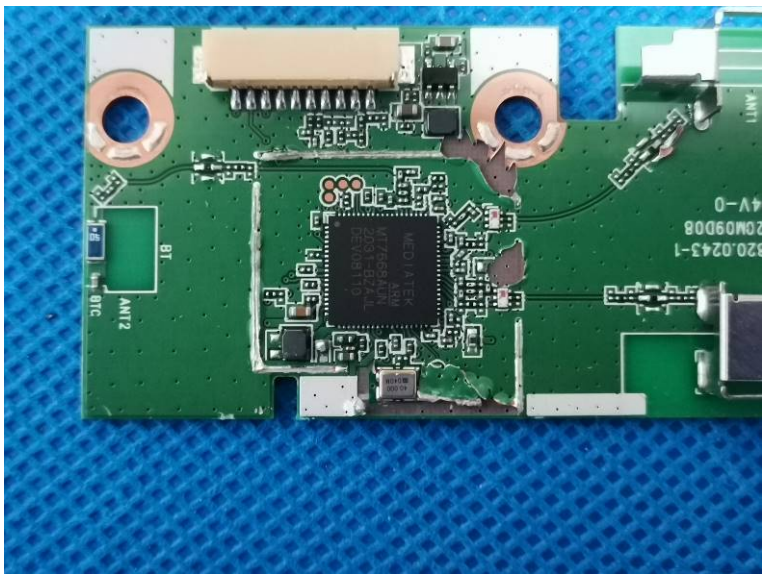
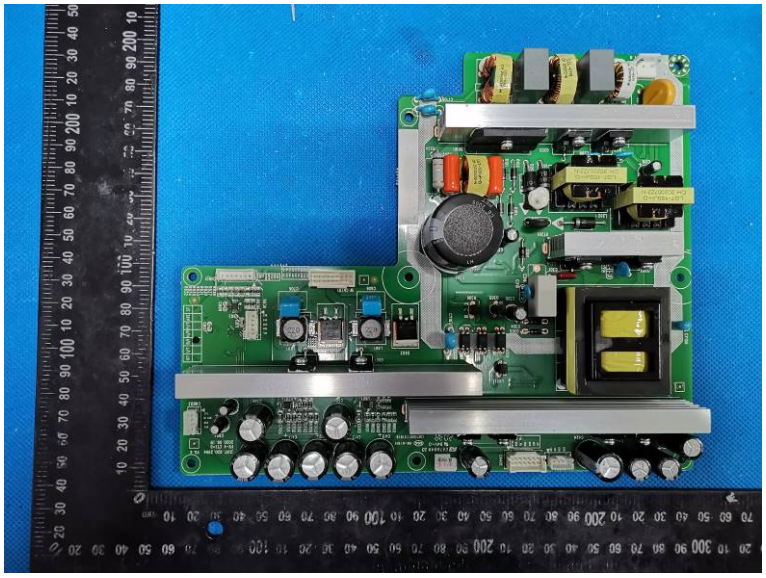
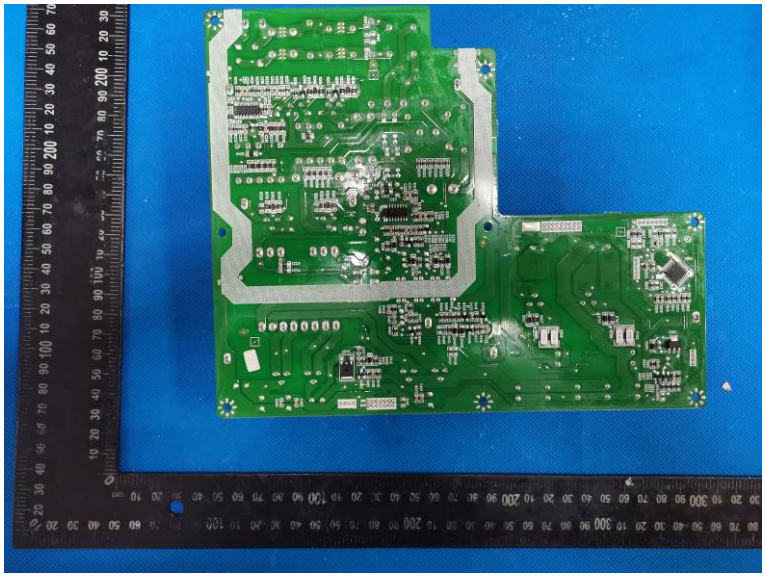
Model: WB7668A-LP1
四川爱联科技有限公司







----------THE END OF REPORT----------