Certificate Number: 5055.02

# TEST REPORT FOR WLAN TESTING

Report No: SRTC2019-9004(F)-19101501(G)

Product Name: Mobile Phone

Product Model: HLTE220E

Applicant: Hisense International Co., Ltd.

Manufacturer: Hisense Communications Co., Ltd.

Specification: FCC Part 15, Subpart C (2019)

FCC ID: 2ADOBHLTE220E

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30, Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

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# 1. GENERAL INFORMATION

## 1.1 Notes of the test report

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## 1.2 Information about the testing laboratory

| | |
|---|---|
| Company: | The State Radio_monitoring_center Testing Center (SRTC) |
| Address: | 15th Building, No.30 Shixing Street, Shijingshan District, P.R.China |
| City: | Beijing |
| Country or Region: | P.R.China |
| Contacted person: | Liu Jia |
| Tel: | +86 10 57996183 |
| Fax: | +86 10 57996388 |
| Email: | liujiaf@srtc.org.cn |

## 1.3 Applicant's details

| | |
|---|---|
| Company: | Hisense International Co., Ltd. |
| Address: | Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China |
| City: | Qingdao |
| Country or Region: | China |
| Contacted person: | Geng Ruifeng |
| Tel: | +86-532-80877742 |
| Fax: | --- |
| Email: | gengruifeng@hisense.com |

## 1.4 Manufacturer's details

| | |
|---|---|
| Company: | Hisense Communications Co., Ltd. |
| Address: | No.218 Qianwangang Road, Economic & Technological Development Zone, Qingdao, China |
| City: | Qingdao |
| Country or Region: | China |
| Contacted person: | Song Haibin |
| Tel: | +86-532-55753700 |
| Fax: | --- |
| Email: | songhaibin@hisense.com |

## 1.5 Test Environment

| | |
|---|---|
| Date of Receipt of test sample at SRTC: | 2019-10-15 |
| Testing Start Date: | 2019-10-15 |
| Testing End Date: | 2019-11-11 |

| Environmental Data: | Temperature (°C) | Humidity (%) |
|---|---|---|
| Ambient | 25 | 30 |
| Maximum Extreme | 50 | --- |
| Minimum Extreme | 0 | --- |

| | |
|---|---|
| Normal Supply Voltage (V d.c.): | 3.80 |
| Maximum Extreme Supply Voltage (V d.c.): | 4.35 |
| Minimum Extreme Supply Voltage (V d.c.): | 3.50 |

# 2. DESCRIPTION OF THE DEVICE UNDER TEST

## 2.1Final Equipment Build Status

| | |
|---|---|
| Frequency Band(s) | U-NII-1:5150MHz-5250MHz<br>U-NII-2A:5250MHz-5350MHz<br>U-NII-3:5725MHz-5850MHz |
| DFS | Client Without Radar Detection |
| Modulation Type | 802.11a<br>802.11n (HT20/HT40) |
| Antenna Type | Fixed Internal Antenna |
| Antenna Gain | -1.3 dBi |
| Power Supply | Battery/AC adapter |
| Hardware Version | YK680--MB-V0.1 |
| Software Version | Hisense_HLTE220E_MX02_L201.01_20190926 |
| IMEI | 863501040484886 |

Note: The equipments have two supplies, is different on the supplier of CTP/Earphone/Camera/Data cable.

Main Supply

| Part Name | Model | Supplier(Brand) | Description |
|---|---|---|---|
| Camera | ST-CFKS816-5MFF-V2.0/<br>ST-CFKS816-30WFF-V2.0/ | Union Image | Front CAM |
| Camera | ST-CFKS816BF-V2.0 | Union Image | Rear CAM |
| CTP | CCF11700-6.0 | Jiangxi Holitech Technology Co.,Ltd | CTP |
| Data cable | KLKS816AUSB | Dongguan Keling Electronic Technology Co., Ltd. | |
| Earphone | KLKS816A | Shenzhen Jinchuangju Electronic Technology Co.,Ltd. | |

Secondary Supply

| Part Name | Model Name | supplier | Remark |
|---|---|---|---|
| Camera | HTP1157/HTV1155 | JIXIHOLITECH TECHNOLGY CO.LTD | Front CAM |
| Camera | HTV1156 | JIXIHOLITECH TECHNOLGY CO.LTD | Rear CAM |
| CTP | Y152073B2-D-X | Dongguan Yuye Commumication Technology CO.,ted | CTP |
| Data cable | A106-0022-S | SHENZHEN KOAR ELECTIC CO.,LTD | |
| Earphone | W1G513A06S | Shenzhen Jinchuangju Electronic Technology Co.,Ltd. | |

## 2.2Wireless Technology and Frequency Range

| Wireless Technology | | Bandwidth | Channel | Frequency(MHz) |
|---|---|---|---|---|
| Wi-Fi | U-NII-1 | 20MHz | 36 | 5180 |
| | | | 40 | 5200 |
| | | | 44 | 5220 |
| | | | 48 | 5240 |
| | | 40MHz | 38 | 5190 |
| | | | 46 | 5230 |
| | U-NII-2A | 20MHz | 52 | 5260 |
| | | | 56 | 5280 |
| | | | 60 | 5300 |
| | | | 64 | 5320 |
| | | 40MHz | 54 | 5270 |
| | | | 62 | 5310 |
| | U-NII-3 | 20MHz | 149 | 5745 |
| | | | 153 | 5765 |
| | | | 157 | 5785 |
| | | | 161 | 5805 |
| | | | 165 | 5825 |
| | | 40MHz | 151 | 5755 |
| | | | 159 | 5795 |

## 2.3 Support Equipment

The following support equipment was used to exercise the DUT during testing:

| Equipment | Battery |
|---|---|
| Manufacturer | Shenzhen Tianjin New Energy Technology Co.,Ltd； |
| Model Number | KS816 |
| Serial Number | --- |

| Equipment | Charger |
|---|---|
| Manufacturer | Shenzhen Tianyin Electronics Co., Ltd |
| Model Number | TPA-97050100VU |
| Serial Number | --- |

| Equipment | USB Cable1 |
|---|---|
| Manufacturer | SHENZHEN KOAR　ELECTIC CO.,LTD |
| Model Number | A106-0022-S |
| Serial Number | --- |

| Equipment | USB Cable2 |
|---|---|
| Manufacturer | Dongguan Keling Electronic Technology Co., Ltd. |
| Model Number | KLKS816AUSB |
| Serial Number | --- |

## 2.4 Note

| Automatically Discontinue Transmission | |
|---|---|
| **Description** | The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met. |
| **Result** | While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission. |

The antenna provide to the EUT, please refer to the following table:

| Brand | Model | Antenna gain | Frequency Bands(GHz) | Antenna type | Connecter Type |
|---|---|---|---|---|---|
| N/A | N/A | -1.3dBi | 5150MHz-5350MHz<br>5725MHz-5850MHz | Fixed Internal Antenna | N/A |
| Manufacturers ensure that their designs will not be modified by the user or third parties arbitrary antenna parameters and performance. | | | | | |

# 3 REFERENCE SPECIFICATION

| Specification | Version | Title |
|---|---|---|
| 15.35 | 2019 | Measurement detector functions and bandwidths. |
| 15.209 | 2019 | Radiated emission limits; general requirements. |
| 15.205 | 2019 | Restricted bands of operation. |
| 15.207 | 2019 | Conducted limits. |
| 15.407 | 2019 | General technical requirements |
| ANSI C63.10 | 2013 | Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| KDB 644545 D03 | August 14, 2014 | GUIDANCE FOR IEEE Std 802.11ac™ DEVICES EMISSION TESTING |
| KDB 905462 D03 | August 22, 2016 | U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY |
| KDB 905462 D02 | April 8, 2016 | COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION |
| KDB 662911 D01 | October 31, 2013 | Emissions Testing of Transmitters with Multiple Outputs in the Same Band |
| KDB 789033 D02 | December 14, 2017 | GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E |

# 4 KEY TO NOTES AND RESULT CODES

The following are the definition of the test result.

| Code | Meaning |
|---|---|
| PASS | Test result shows that the requirements of the relevant specification have been met. |
| FAIL | Test result shows that the requirements of the relevant specification have not been met. |

# 5. RESULT SUMMARY

| No. | Test case | FCC reference | Verdict |
|---|---|---|---|
| 1. | Average Conducted Output Power | 15.407(a) | Pass |
| 2. | Occupied Bandwidth | 15.407(e) | Pass |
| 3. | Transmitter Power Spectral Density | 15.407(a) | Pass |
| 4. | Unwanted Conducted Emission Measurement | 15.407(b) | Pass |
| 5. | Frequency Stability | 15.407(g) | Pass |
| 6. | Unwanted Radiated Emission Measurement | 15.205<br>15.209<br>15.35(b) | Pass |
| 7. | AC Power line Conducted Emission | 15.207 | Pass |
| 8. | DFS | 15.407(h) | Pass |
| 9. | Automatically Discontinue Transmission | 15.407(c) | Pass(See 2.4Note) |
| 10. | Antenna Requirements | 15.407(a) &15.203 | Pass(See 2.4Note) |

| | |
|---|---|
| This Test Report Is Issued by:<br>Mr. Peng Zhen | Checked by:<br>Mr. Li Bin |
| Tested by:<br>Mr. He Dengshun | Issued date:<br>20191111 |

# 6 TEST RESULT

## 6.1 Average Conducted Output Power

### 6.1.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 25°C | 30% | 101.5kPa |

### 6.1.2 Test Description

A transmitter antenna terminal of EUT is connected to the power meter. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies.

### 6.1.3 Test limit

FCC Part15.407 (a)(1) ,

(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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

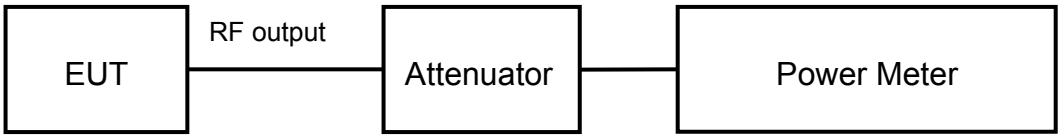
(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
FCC Part15.407 (a)(2) ,
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 11.0 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11.0 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
FCC Part15.407 (a)(3) ,
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30.0 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 6.1.4 Test Procedure Used
KDB 789033 D02 v02r01,Section E.3.b (Method PM-G).

### 6.1.5 Test Settings
Measurements perform using a wideband gated RF power meter.

### 6.1.6 Test Setup
The EUT and measurement equipment were set up as shown in the diagram below.




### 6.1.7 Test result
The test results are shown in Appendix A.

## 6.2 Occupied Bandwidth

### 6.2.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 25°C | 30% | 101.5kPa |

### 6.2.2 Test Description

A transmitter antenna terminal of EUT is connected to the Spectrum Analyzer. This connected to the transmitter antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies.

### 6.2.3 Test limit

Rule FCC Part §15.407(e)

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

### 6.2.4 Test Procedure Used

KDB 789033 D02 v02r01,Section D.

### 6.2.5 Test Settings

For U-NII-1, set RBW ≈1% OCB kHz, VBW≥3×RBW, 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 26 dB relative to the maximum level measured in the fundamental emission.

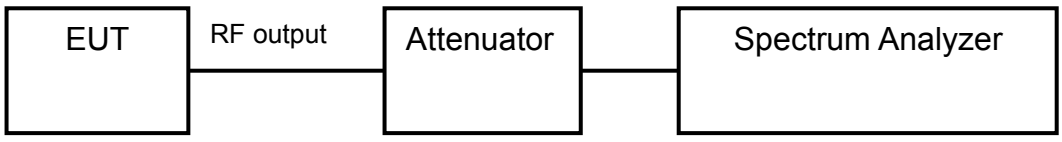
For U-NII-3, Set RBW =100 kHz, VBW≥3×RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

Use the 99 % power bandwidth function of the instrument.

### 6.2.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.




### 6.2.7 Test result

The test results are shown in Appendix A .

## 6.3 Transmitter Power Spectral Density

### 6.3.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 25°C | 30% | 101.5kPa |

### 6.3.2 Test Description

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies. All data rates were investigated and the worst case configuration results are reported in this section.

### 6.3.3 Test limit

FCC Part15.407 (a)(1) ,

(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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
FCC Part15.407 (a)(2) ,
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 11.0 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11.0 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
FCC Part15.407 (a)(3) ,
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30.0 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 6.3.4 Test Procedure Used

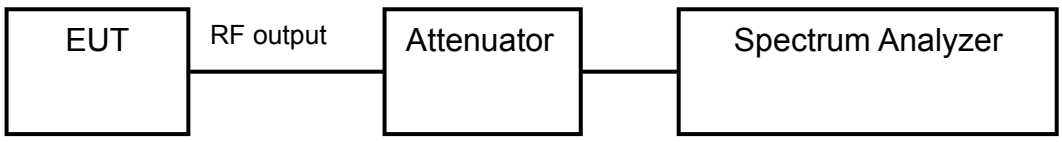
KDB 789033 D02 v02r01,Section F.

### 6.3.5 Test Settings

Set RBW = 500 kHz, VBW =1.5MHz for the band 5.725-5.85 GHz
Set RBW = 1 MHz, VBW =3MHz for the band 5.150-5.250 GHz，5.250-5.350 GHz and 5.470-5.725 GHz.
The conducted PSD is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

### 6.3.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.




### 6.3.7 Test result

The test results are shown in Appendix A.

## 6.4 Unwanted Conducted Emission Measurement

### 6.4.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 25°C | 40% | 101.5kPa |

### 6.4.2 Test Description

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration.

### 6.4.3 Test limit

FCC Part 15.407(b) ,
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, 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 within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

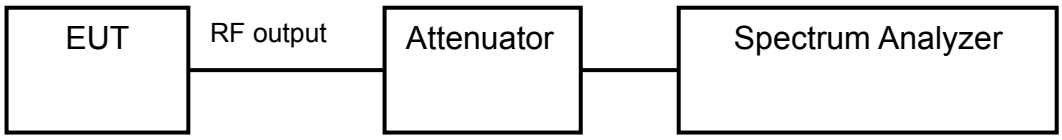
### 6.4.4 Test Procedure Used

KDB 789033 D02 v02r01,Section G.

### 6.4.5 Test Settings

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 1 MHz.
c) Set the VBW ≥ 3 MHz.
d) Detector = peak.
e) Set span to encompass the spectrum to be examined
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level.

### 6.4.6 Test Setup




### 6.4.7 Test result

The test results are shown in Appendix A.

## 6.5 Frequency Stability

### 6.5.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 20.8°C | 36.5% | 100.9kPa |

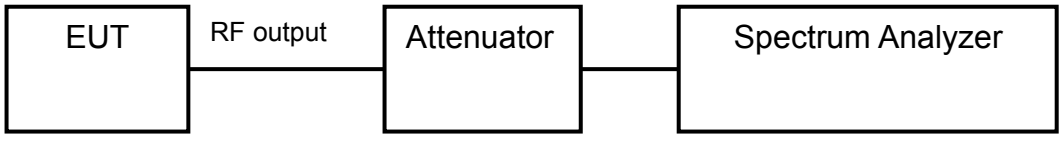
### 6.5.2 Test limit

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 user's manual.

### 6.5.3 Test Procedure Used

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

### 6.5.4 Test Setup




### 6.5.5 Test result

The test results are shown in Appendix A.

## 6.6 Unwanted Radiated Emission Measurement

### 6.6.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 20.8°C | 36.5% | 100.9kPa |

### 6.6.2 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

### 6.6.3 Test limit

FCC Part15.205, 15.209,;

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).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 below Table per Section 15.209.

| Frequency [MHz] | Field strength [ μV/m ] | Measured Distance [meters] |
|---|---|---|
| 30～88 | 100 | 3 |
| 88～216 | 150 | 3 |
| 216～960 | 200 | 3 |
| Above 960 | 500 | 3 |

**Radiated Limits**

FCC Part15.35(b):

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

**Used conversion factor: Limit (dBμV/m) = 20 log (Limit (μV/m)/1μV/m)**

| Frequency [MHz] | Detector | Unit (dBμV/m) |
|---|---|---|
| 30～88 | Quasi-peak | 40.0 |
| 88～216 | Quasi-peak | 43.5 |
| 216～960 | Quasi-peak | 46.0 |
| 960～1000 | Quasi-peak | 54.0 |
| 1000～5th harmonic of the highest frequency or 40GHz, whichever is lower | Average | 54.0 |
| | Peak | 74.0 |

**Conversion Radiated limits**

### 6.6.4 Test Procedure Used

KDB 789033 D02 v02r01,Sections G.3, G.4, G.5, and G.6.

### 6.6.5 Test Settings

Average Field Strength Measurements

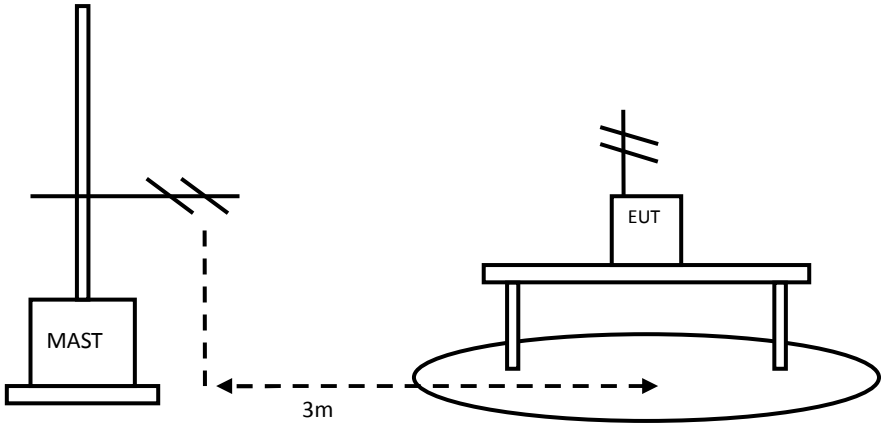
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be > 2 x span/RBW)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 6.6.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below




The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Then start the test software ES-K1. Sweep the whole frequency band through the range from 30MHz to 1GHz or above, using receive log period antenna HL562 or Ridge horn antenna HF906.

During the test, the antenna height and EUT azimuth were varied in order to identify the

maximum level of emission from the EUT. The height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees. The measurements shall be repeated with orthogonal polarization of the test antenna. The results shall be showed the worst case of the three orthogonal axes.
The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

### 6.6.7 Test result

The test results are shown in Appendix B.

## 6.7 AC Power line Conducted Emission

### 6.7.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 24°C | 36% | 100.9kPa |

### 6.7.2 Test limit

FCC Part 15.207(a) ,

| Frequency of Emission (MHz) | Conducted 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.

The measurement is made according to ANSI C63.10-2013

### 6.7.3 Test result

The test results are shown in Appendix B.

## 6.8 Dynamic Frequency Selection

### 6.8.1 Ambient condition

| Temperature | Relative humidity | Pressure |
|---|---|---|
| 25°C | 30% | 101.5kPa |

### 6.8.2 Test limit

FCC Part 15.407(h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

### 6.8.3 DFS Overview

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

| Requirement | Operational Mode | | |
|---|---|---|---|
| | Master | Client Without Radar Detection | Client With Radar Detection |
| *Non-Occupancy Period* | Yes | Not required | Yes |
| *DFS Detection Threshold* | Yes | Not required | Yes |
| *Channel Availability Check Time* | Yes | Not required | Not required |
| *U-NII Detection Bandwidth* | Yes | Not required | Yes |

Table 2: Applicability of DFS requirements during normal operation

| Requirement | Operational Mode | |
|---|---|---|
| | Master Device or Client with Radar Detection | Client Without Radar Detection |
| *DFS Detection Threshold* | Yes | Not required |
| *Channel Closing Transmission Time* | Yes | Yes |
| *Channel Move Time* | Yes | Yes |
| *U-NII Detection Bandwidth* | Yes | Not required |

| Additional requirements for devices with multiple bandwidth modes | Master Device or Client with Radar Detection | Client Without Radar Detection |
|---|---|---|
| *U-NII Detection Bandwidth and Statistical Performance Check* | All BW modes must be tested | Not required |
| *Channel Move Time and Channel Closing Transmission Time* | Test using widest BW mode available | Test using the widest BW mode available for the link |
| *All other tests* | Any single BW mode | Not required |

**Note:** Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

| **Maximum Transmit Power** | **Value (See Notes 1, 2, and 3)** |
|---|---|
| EIRP ≥ 200 milliwatt | -64 dBm |
| EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz | -62 dBm |
| EIRP < 200 milliwatt that do not meet the power spectral density requirement | -64 dBm |
| **Note 1:** This is the level at the input of the receiver assuming a 0 dBi receive antenna. **Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01. | |

Table 4: DFS Response Requirement Values

| **Parameter** | **Value** |
|---|---|
| *Non-occupancy period* | Minimum 30 minutes |
| *Channel Availability Check Time* | 60 seconds |
| *Channel Move Time* | 10 seconds See Note 1. |
| *Channel Closing Transmission Time* | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2. |
| *U-NII Detection Bandwidth* | Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3. |
| **Note 1:** *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. **Note 3:** During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic. | |

Table 5 – Short Pulse Radar Test Waveforms

| Radar Type | Pulse Width (µsec) | PRI (µsec) | Number of Pulses | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|---|---|---|---|---|---|
| 0 | 1 | 1428 | 18 | See Note 1 | See Note 1 |
| 1 | 1 | Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a | Roundup $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\mathrm{PRI}_{\mu\mathrm{sec}}}\right)\right\}$ | 60% | 30 |
| | | Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, excluding PRI values selected in Test A | | | |
| 2 | 1-5 | 150-230 | 23-29 | 60% | 30 |
| 3 | 6-10 | 200-500 | 16-18 | 60% | 30 |
| 4 | 11-20 | 200-500 | 12-16 | 60% | 30 |
| Aggregate (Radar Types 1-4) | | | | 80% | 120 |
| **Note 1:** Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests. | | | | | |

Table 6 – Long Pulse Radar Test Waveform

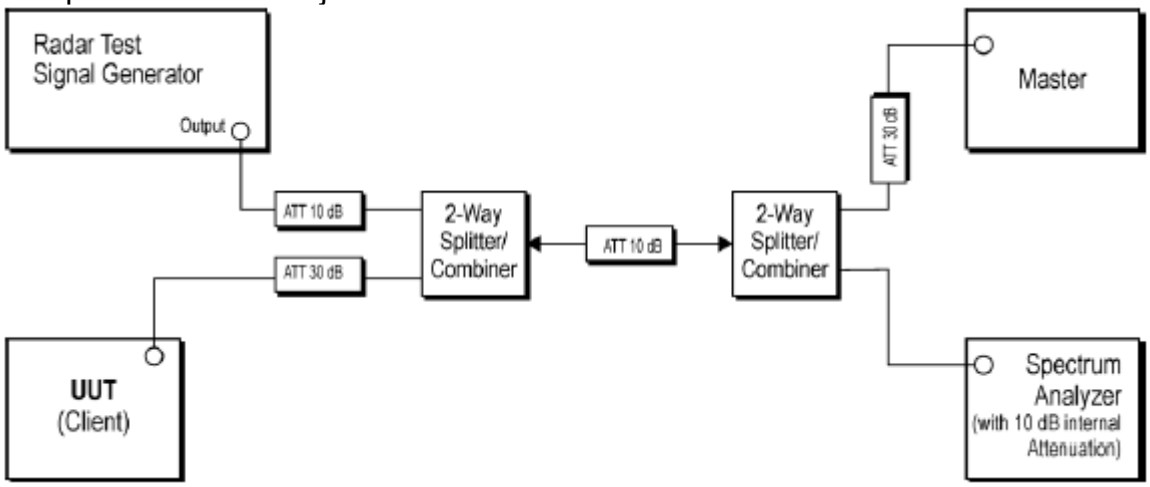
| Radar Type | Pulse Width (µsec) | Chirp Width (MHz) | PRI (µsec) | Number of Pulses per *Burst* | Number of *Bursts* | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|---|---|---|---|---|---|---|---|
| 5 | 50-100 | 5-20 | 1000-2000 | 1-3 | 8-20 | 80% | 30 |

Table 7 – Frequency Hopping Radar Test Waveform

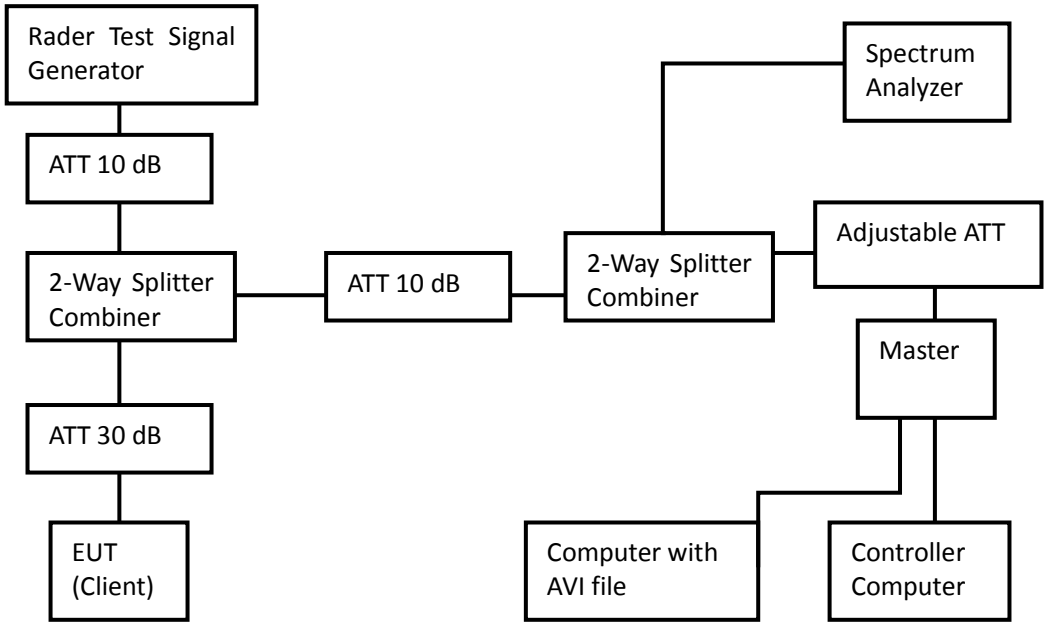
| Radar Type | Pulse Width (µsec) | PRI (µsec) | Pulses per Hop | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|---|---|---|---|---|---|---|---|
| 6 | 1 | 333 | 9 | 0.333 | 300 | 70% | 30 |

## 6.8.4 TEST AND MEASUREMENT SYSTEM

Setup for Client with injection at the Master




Setup of EUT
CLIENT MODE:



Test Setup Operation

System testing was performed with the designated MPEG-4 (1080P,WEBRip,DD5.1.x264-btbta) test file that streams full motion video from the Access Point to the Client in full motion video mode using the media player with the V2.61 Codec package.
This file is used by IP and Frame based systems for loading the test channel during the In-service compliance testing of the device.

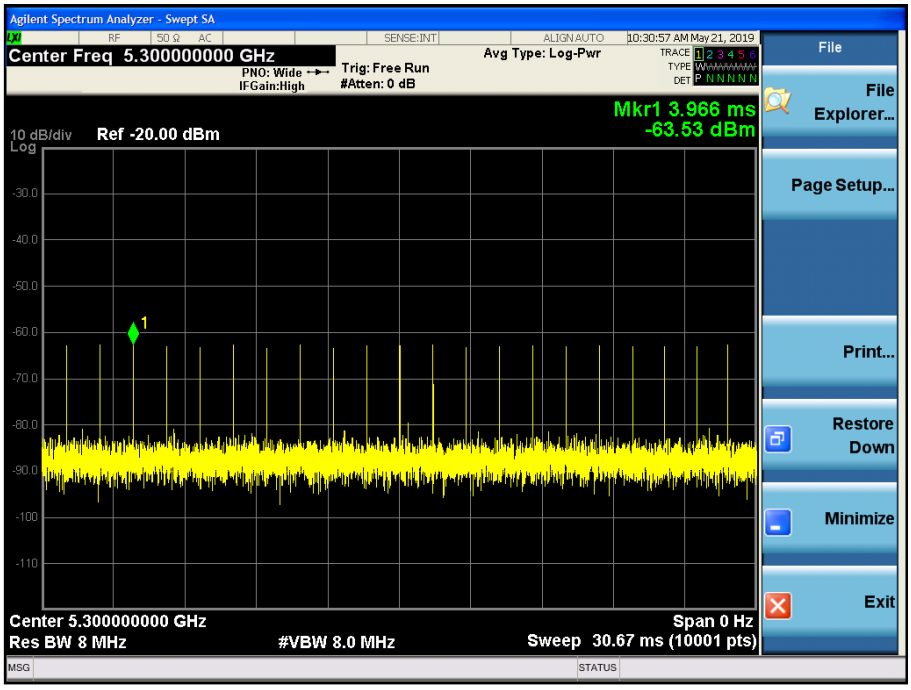
The waveform parameters from within the bounds of the signal type are selected randomly using uniform distribution.

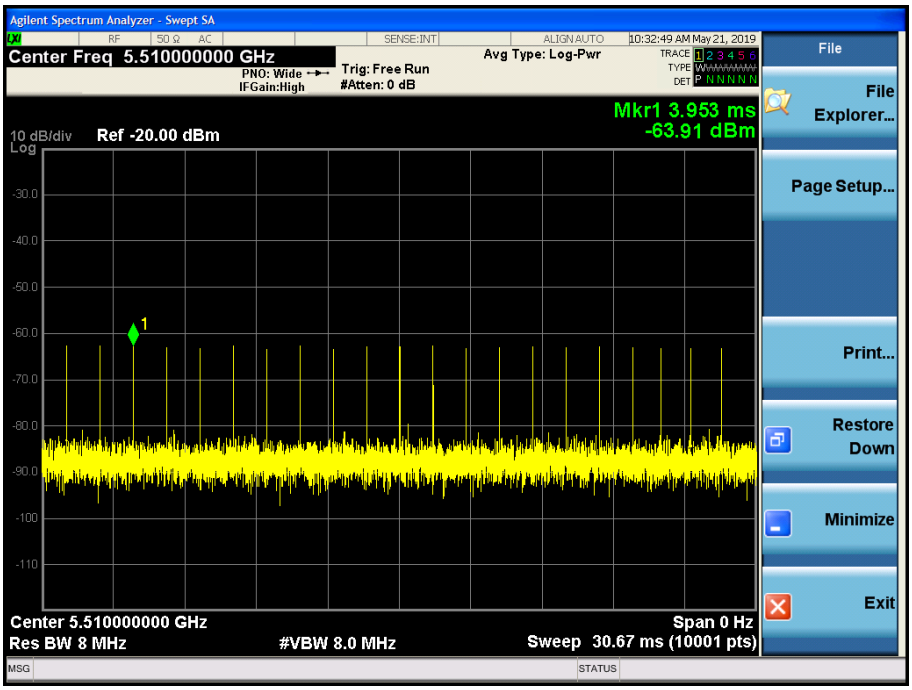
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move. It is also used to monitor EUT transmissions during the Channel Availability Check Time.

**6.8.5 Test Procedure Used**

(i) Operational Modes. The DFS requirement applies to the following operational modes:
(A) The requirement for channel availability check time applies in the master operational mode.
(B) The requirement for channel move time applies in both the master and slave operational modes.
(ii) Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.
(iii) Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.
(iv) Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

## 6.8.6 RADAR WAVEFORM




## 6.8.7 Test result

The test results are shown in Appendix A.

# 7 MEASUREMENT UNCERTAINTIES

| Items | Uncertainty | |
|---|---|---|
| Occupied Bandwidth | 3kHz | |
| Output Power | 0.67dB | |
| Transmitter Power Spectral Density | 0.75dB | |
| Spurious emissions | 30MHz～1GHz | 2.83dB |
| | 1GHz～12.75GHz | 2.50dB |
| | 12.75GHz～40GHz | 2.75dB |

# 8 TEST EQUIPMENTS

| No. | Name/ Model | Manufacturer | S/N | Cal date | Cal Due date |
|---|---|---|---|---|---|
| 1. | Spectrum Analyzer FSV | ROHDE&SCHWARZ | 101065 | 2019.08.20 | 2020.08.19 |
| 2. | Signal Analyzer N9020A | Agilent | MY48010771 | 2019.08.20 | 2020.08.19 |
| 3. | Chamber SH-241 | ESPEC | 92013758 | 2019.08.20 | 2020.08.19 |
| 4. | DC Power Apply E3645A | Agilent | MY40000741 | 2019.03.01 | 2020.02.29 |
| 5. | Power Meter E4416A | Agilent | MY52370013 | 2019.03.01 | 2020.02.29 |
| 6. | Power Sensor E9327A | Agilent | MY52420006 | 2019.03.01 | 2020.02.29 |
| 7. | 12.65m×8.03m×7.50m Fully-Anechoic Chamber | FRANKONIA | ----- | ----- | ----- |
| 8. | 23.18m×16.88m×9.60m Semi-Anechoic Chamber | FRANKONIA | --- | ----- | ----- |
| 9. | Turn table Diameter:1m | HD | ----- | ----- | ----- |
| 10. | Turn table Diameter:5m | HD | ----- | ----- | ----- |
| 11. | Antenna master FAC(MA4.0) | MATURO | ----- | ----- | ----- |
| 12. | Antenna master SAC(MA4.0) | MATURO | ----- | ----- | ----- |
| 13. | 9.080m×5.255m×3.525 m Shielding room | FRANKONIA | ----- | ----- | ----- |
| 14. | HF 906 Double-Ridged Waveguide Horn Antenna | R&S | 100030 | 2019.08.20 | 2020.08.19 |
| 15. | HF 906 Double-Ridged Waveguide Horn Antenna | R&S | 100029 | 2019.08.20 | 2020.08.19 |
| 16. | HL562 Ultra log antenna | R&S | 100016 | 2019.08.20 | 2020.08.19 |
| 17. | 3160-09 Receive antenna | SCHWARZ-BECK | 002058-002 | 2019.08.20 | 2020.08.19 |
| 18. | ESI 40 EMI test receiver | R&S | 100015 | 2019.08.20 | 2020.08.19 |
| 19. | Radio tester | CMU 200 | 114667 | 2019.08.20 | 2020.08.19 |
| 20. | ESCS30 EMI test receiver | R&S | 100029 | 2019.08.20 | 2020.08.19 |
| 21. | HL562 Receive antenna | R&S | 100167 | 2019.08.20 | 2020.08.19 |
| 22. | ESH3-Z5 LISN | R&S | 100020 | 2019.08.20 | 2020.08.19 |

| | | | | | |
|---|---|---|---|---|---|
| 23. | Spectrum Analyzer N9020A | Agilent | MY48010771 | 2019.08.20 | 2020.08.19 |
| 24. | Signal Generator SMBV100A | R&S | 260910 | 2019.08.20 | 2020.08.19 |
| 25. | Bluetooth Test Set MT8852B | Anritsu | 1142010 | 2019.03.01 | 2020.02.29 |
| 26. | Cable 104EA | SUCOFLEX | 9272/4EA | 2019.03.01 | 2020.02.29 |
| 27. | Cable 104EA | SUCOFLEX | 9266/4EA | 2019.03.01 | 2020.02.29 |
| 28. | WLAN AP WIA3300-20 | SKSpruce | 81520170607003 39 | --- | --- |
| 29. | Notebook E470c | Lenovo | PF10UZW7 | --- | --- |

# APPENDIX A – TEST DATA OF CONDUCTED EMISSION

**Output Power Result**

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Data rate below means worst-case rate of each test item.
Worst-case data rates are shown as following table.

| Test Mode | Data Rate |
|---|---|
| 802.11a | 6Mbps |
| 802.11n HT20 | MCS0(6.5 Mbps) |
| 802.11n HT40 | MCS0(13.5 Mbps) |

Duty Cycle Result

| Mode | Duty Cycle (%) | Correction Factor(dB) |
|---|---|---|
| 802.11a | 97.6 | 0.106 |
| 802.11n HT20 | 97.4 | 0.114 |
| 802.11n HT40 | 95.1 | 0.218 |

Correction factor = 10* log (1/duty cycle)

**Output Power**

| Band | Test Mode | Frequency (MHz) | Average Power (dBm) | Limit(dBm) |
|---|---|---|---|---|
| U-NII-1 | 802.11a | 5180 | 14.96 | 24.0 |
| | 802.11a | 5200 | 14.87 | 24.0 |
| | 802.11a | 5240 | 14.89 | 24.0 |
| | 802.11n HT20 | 5180 | 14.76 | 24.0 |
| | 802.11n HT20 | 5200 | 14.93 | 24.0 |
| | 802.11n HT20 | 5240 | 14.96 | 24.0 |
| | 802.11n HT40 | 5190 | 14.92 | 24.0 |
| | 802.11n HT40 | 5230 | 14.94 | 24.0 |
| U-NII-2A | 802.11a | 5260 | 14.54 | 24.0 |
| | 802.11a | 5300 | 14.69 | 24.0 |
| | 802.11a | 5320 | 13.96 | 24.0 |
| | 802.11n HT20 | 5260 | 14.45 | 24.0 |
| | 802.11n HT20 | 5300 | 13.92 | 24.0 |
| | 802.11n HT20 | 5320 | 14.52 | 24.0 |
| | 802.11n HT40 | 5270 | 14.64 | 24.0 |
| | 802.11n HT40 | 5310 | 14.15 | 24.0 |
| U-NII-3 | 802.11a | 5745 | 12.76 | 30.0 |
| | 802.11a | 5785 | 13.42 | 30.0 |
| | 802.11a | 5825 | 14.32 | 30.0 |
| | 802.11n HT20 | 5745 | 13.31 | 30.0 |
| | 802.11n HT20 | 5785 | 13.48 | 30.0 |
| | 802.11n HT20 | 5825 | 14.22 | 30.0 |
| | 802.11n HT40 | 5755 | 13.27 | 30.0 |
| | 802.11n HT40 | 5795 | 13.15 | 30.0 |

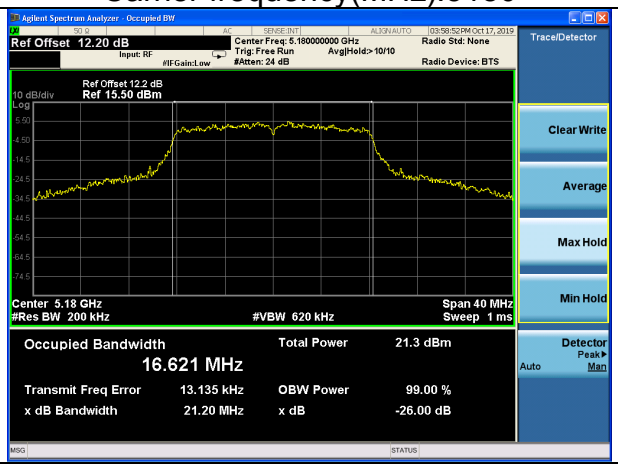
## Occupied Bandwidth

Offset 12.2dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 2dB

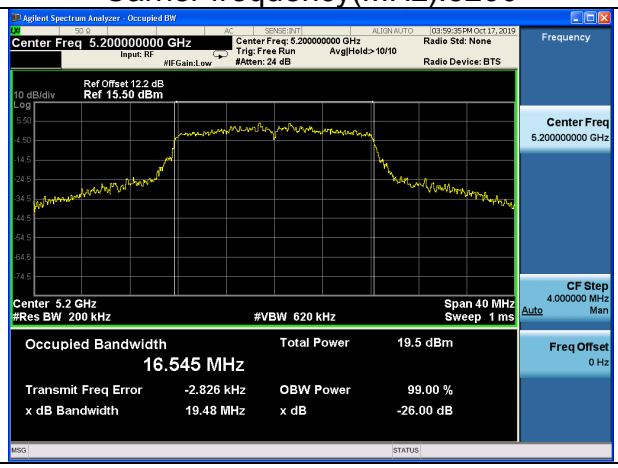
Test Mode: 802.11a

| Carrier frequency (MHz) | 99% Bandwidth(MHz) | Minimum 26dB Bandwidth(MHz) | Conclusion |
|---|---|---|---|
| 5180 | 16.621 | 21.20 | pass |
| 5200 | 16.545 | 19.48 | pass |
| 5240 | 16.550 | 19.32 | pass |
| 5260 | 16.560 | 19.83 | pass |
| 5300 | 16.513 | 19.32 | pass |
| 5320 | 16.519 | 19.41 | pass |
| 5745 | 16.473 | 19.27 | pass |
| 5785 | 16.516 | 19.59 | pass |
| 5825 | 16.519 | 19.42 | pass |

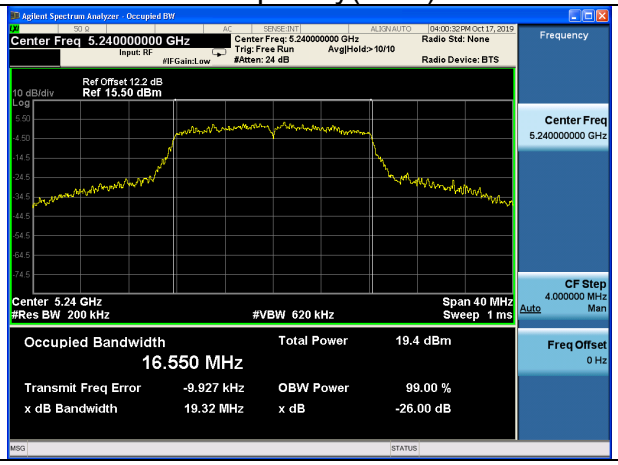
802.11a
Carrier frequency(MHz):5180



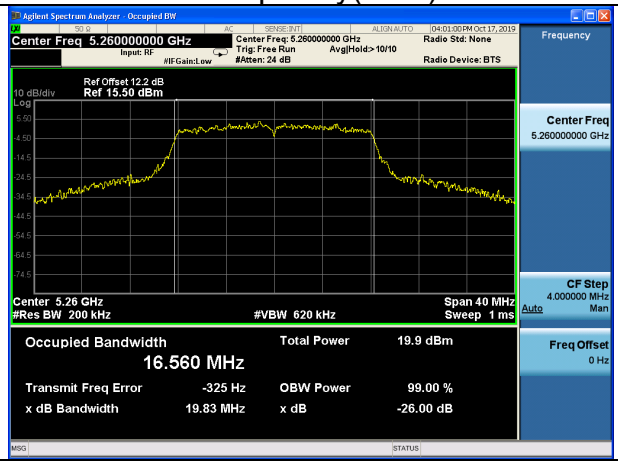

802.11a
Carrier frequency(MHz):5200



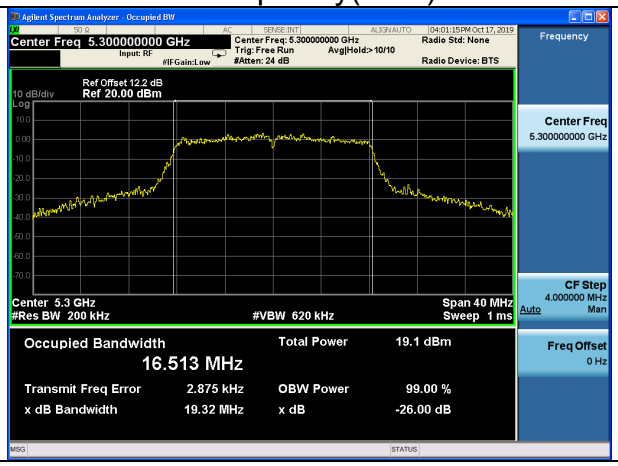

802.11a
Carrier frequency(MHz):5240



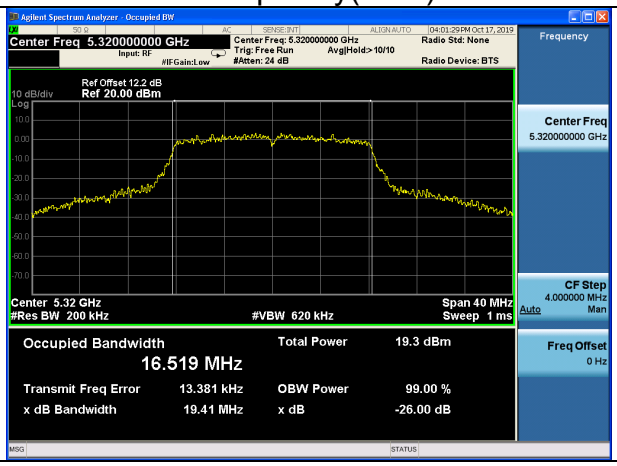

802.11a
Carrier frequency(MHz):5260



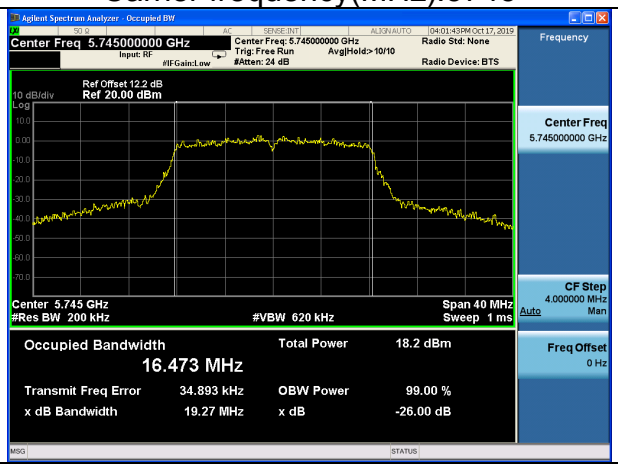
802.11a
Carrier frequency(MHz):5300



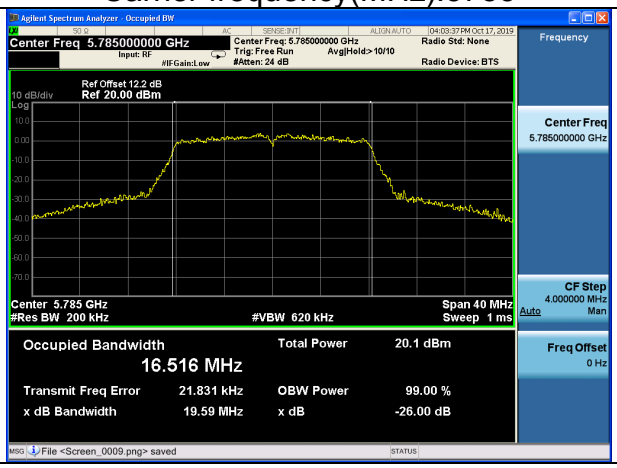

802.11a
Carrier frequency(MHz):5320



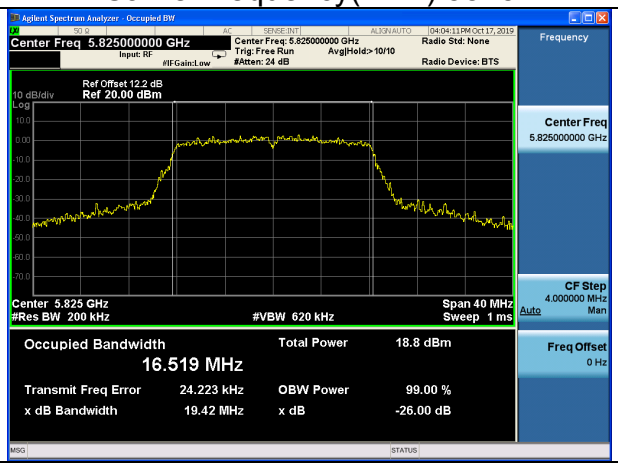

802.11a
Carrier frequency(MHz):5745




802.11a
Carrier frequency(MHz):5785



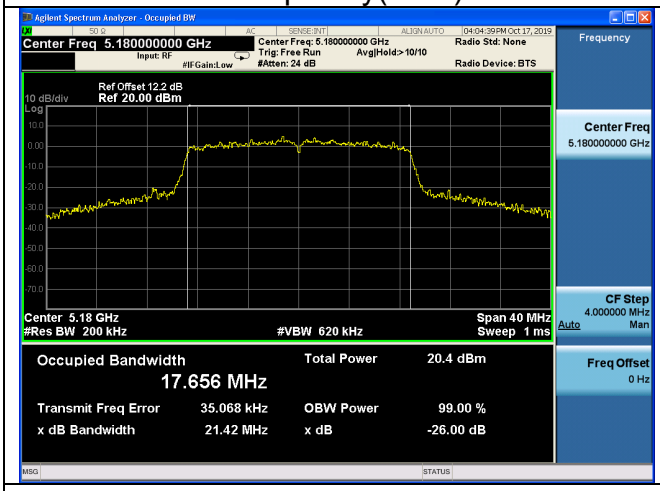

802.11a
Carrier frequency(MHz):5825



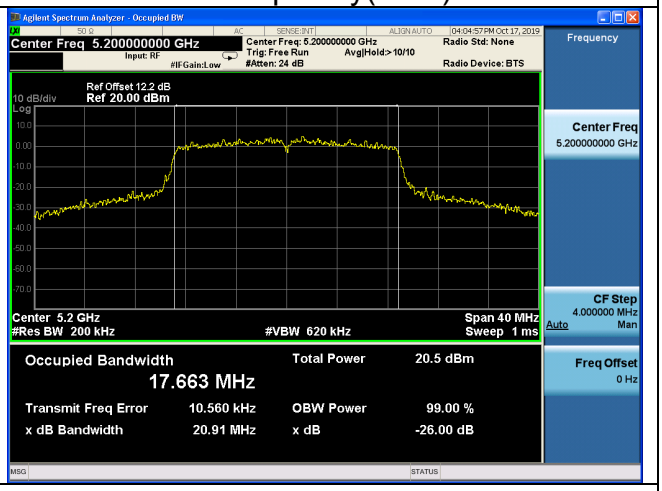
Test Mode: 802.11n HT20

| Carrier frequency (MHz) | 99% Bandwidth(MHz) | Minimum 26dB Bandwidth(MHz) | Conclusion |
|---|---|---|---|
| 5180 | 17.656 | 21.42 | pass |
| 5200 | 17.663 | 20.91 | pass |
| 5240 | 17.642 | 19.72 | pass |
| 5260 | 17.656 | 19.77 | pass |
| 5300 | 17.658 | 19.67 | pass |
| 5320 | 17.637 | 19.74 | pass |
| 5745 | 17.628 | 19.74 | pass |
| 5785 | 17.576 | 19.79 | pass |
| 5825 | 17.586 | 19.67 | pass |

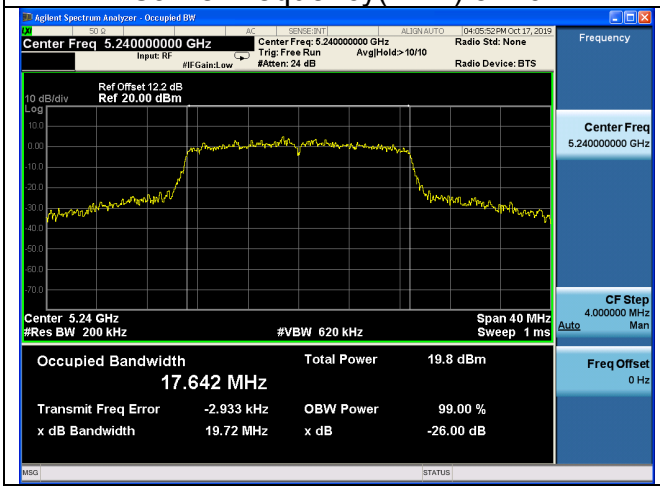
802.11n HT20
Carrier frequency(MHz):5180



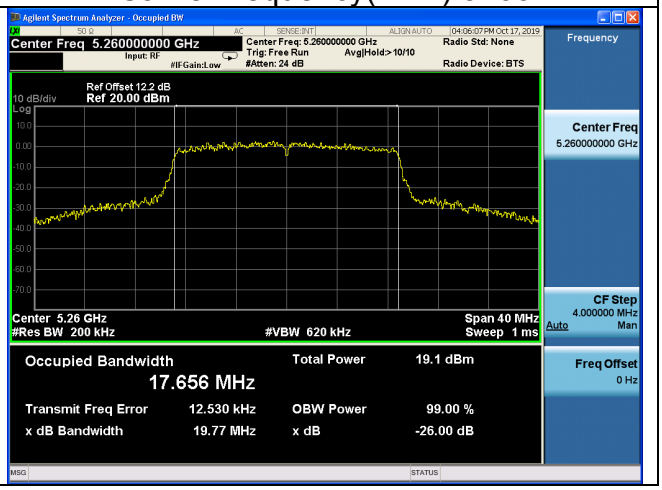

802.11n HT20
Carrier frequency(MHz):5200



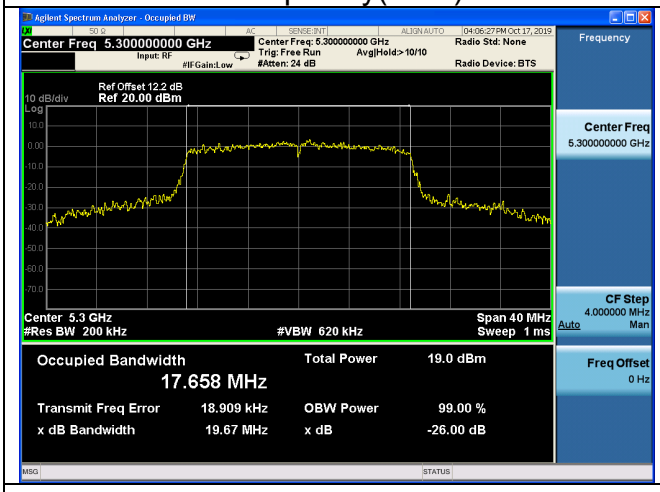

802.11n HT20
Carrier frequency(MHz):5240



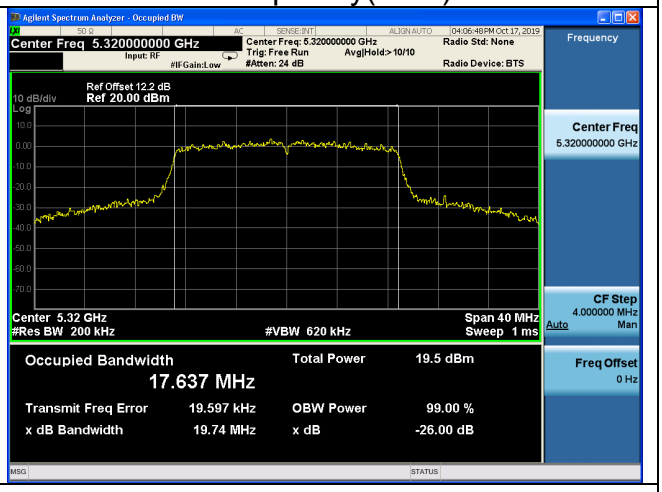

802.11n HT20
Carrier frequency(MHz):5260



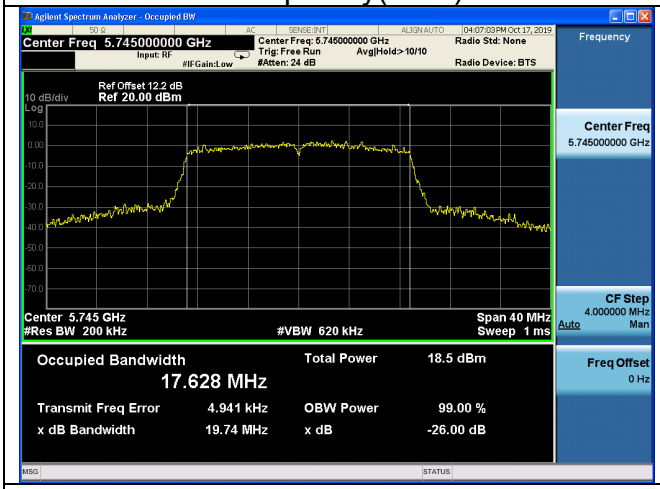
802.11n HT20
Carrier frequency(MHz):5300



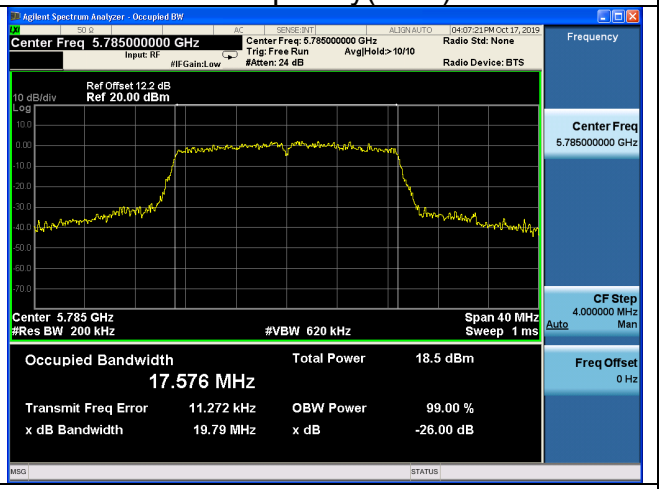

802.11n HT20
Carrier frequency(MHz):5320



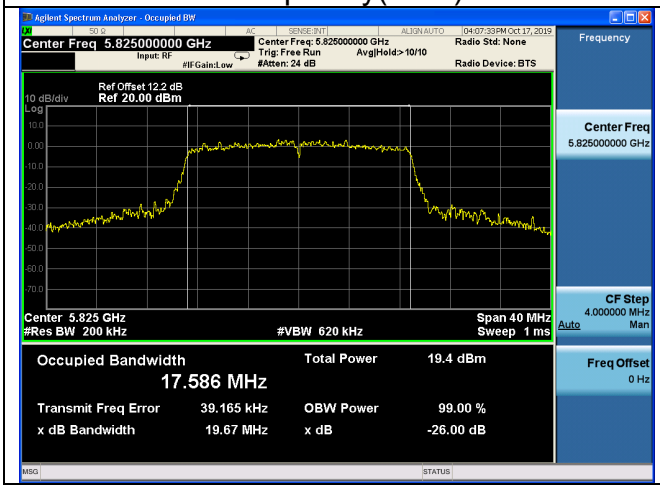

802.11n HT20
Carrier frequency(MHz):5745




802.11n HT20
Carrier frequency(MHz):5785



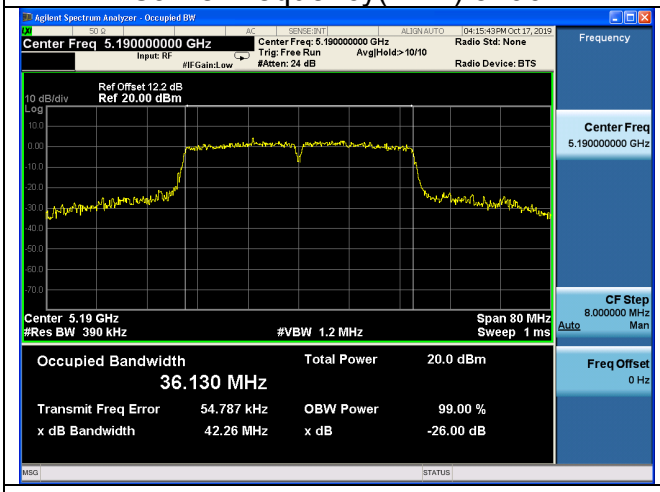

802.11n HT20
Carrier frequency(MHz):5825



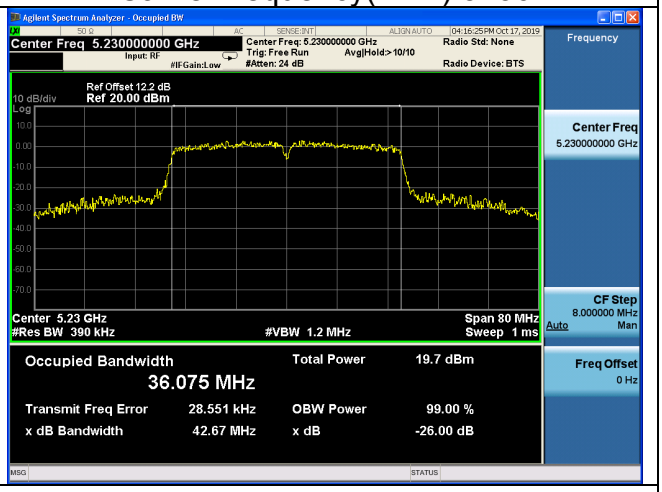
Test Mode: 802.11n HT40

| Carrier frequency (MHz) | 99% Bandwidth(MHz) | Minimum 26dB Bandwidth(MHz) | Conclusion |
|---|---|---|---|
| 5190 | 36.130 | 42.26 | pass |
| 5230 | 36.075 | 42.67 | pass |
| 5270 | 35.984 | 41.94 | pass |
| 5310 | 36.038 | 41.71 | pass |
| 5755 | 35.981 | 40.52 | pass |
| 5795 | 35.990 | 39.40 | pass |

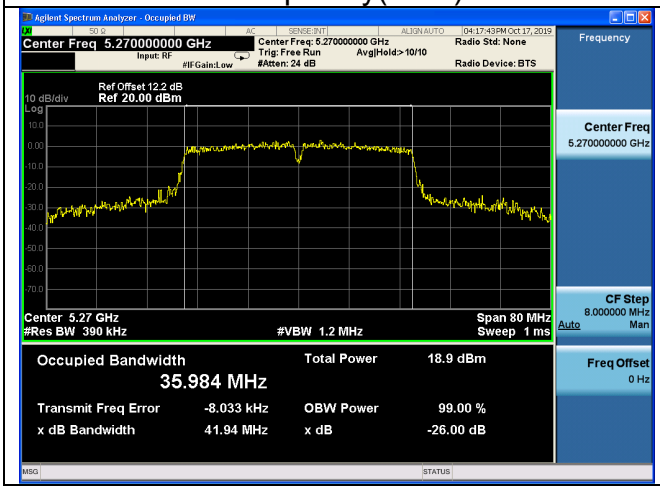
802.11n HT40
Carrier frequency(MHz):5190



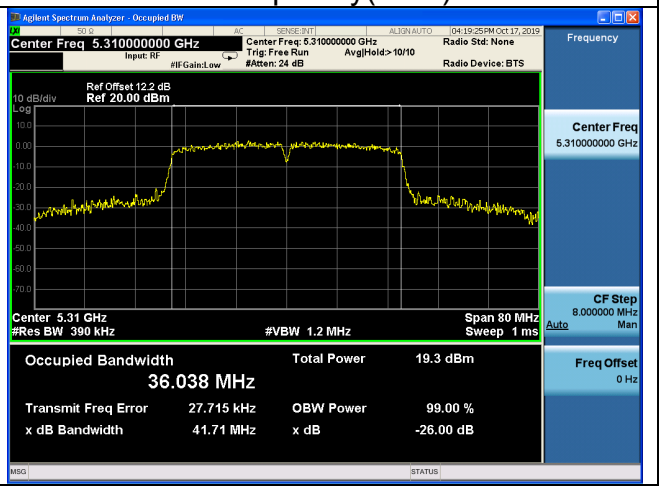

802.11n HT40
Carrier frequency(MHz):5230

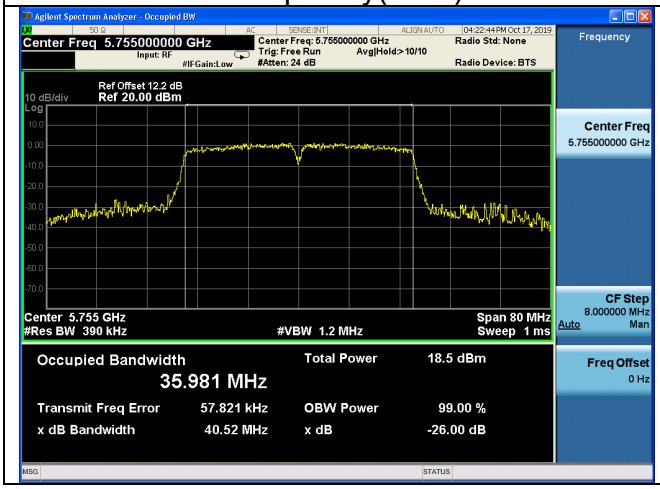
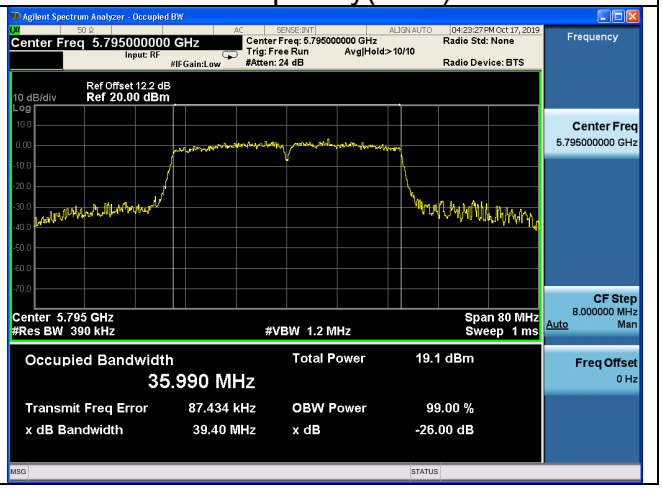



802.11n HT40
Carrier frequency(MHz):5270




802.11n HT40
Carrier frequency(MHz):5310



| 802.11n HT40<br>Carrier frequency(MHz):5755 | 802.11n HT40<br>Carrier frequency(MHz):5795 |
|---|---|
|  |  |

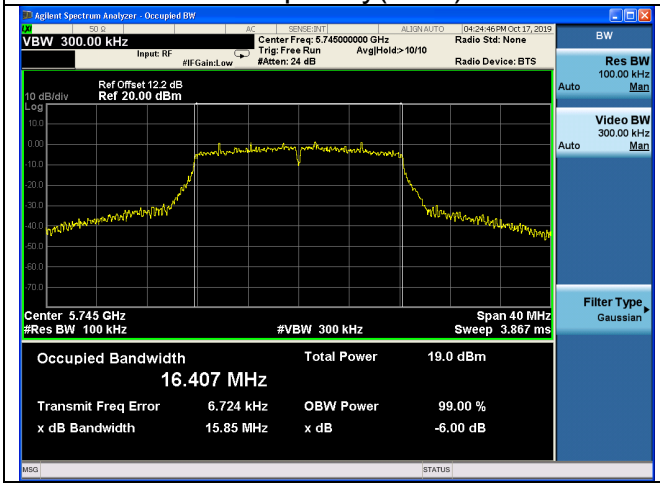
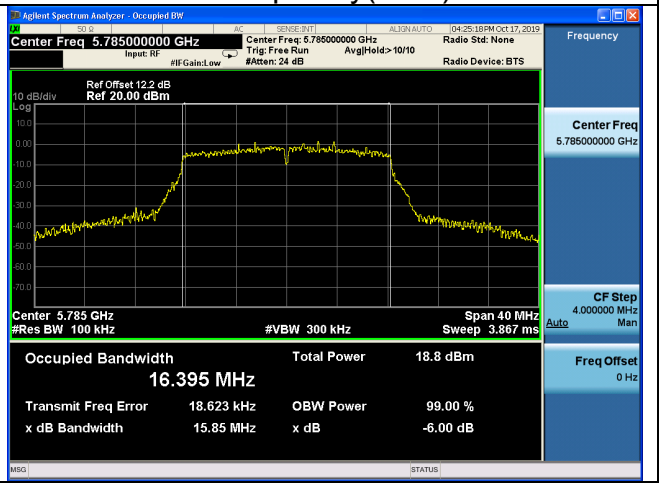


## 6dB Bandwidth

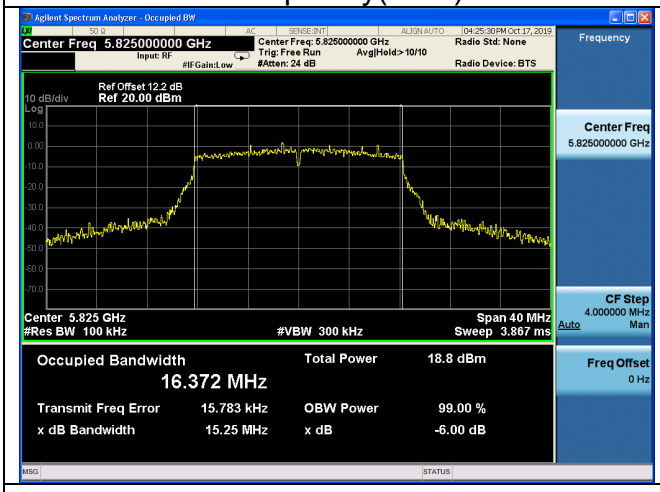
Offset 12.2dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 2dB

Test Mode:

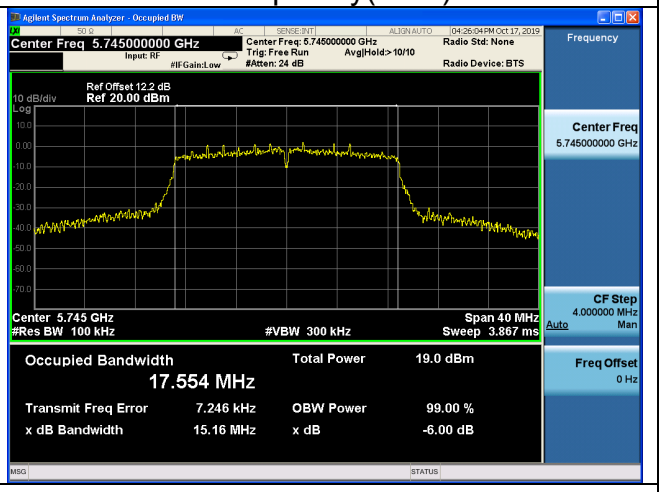
| Test Mode | Carrier frequency (MHz) | 6dB Bandwidth(MHz) | Minimum Limit (MHz) | Conclusion |
|---|---|---|---|---|
| 802.11a | 5745 | 15.85 | 0.5 | pass |
| 802.11a | 5785 | 15.85 | 0.5 | pass |
| 802.11a | 5825 | 15.25 | 0.5 | pass |
| 802.11n HT20 | 5745 | 15.16 | 0.5 | pass |
| 802.11n HT20 | 5785 | 15.84 | 0.5 | pass |
| 802.11n HT20 | 5825 | 15.16 | 0.5 | pass |
| 802.11n HT40 | 5755 | 35.16 | 0.5 | pass |
| 802.11n HT40 | 5795 | 35.24 | 0.5 | pass |

| 802.11a<br>Carrier frequency(MHz):5745 | 802.11a<br>Carrier frequency(MHz):5785 |
|---|---|
|  |  |

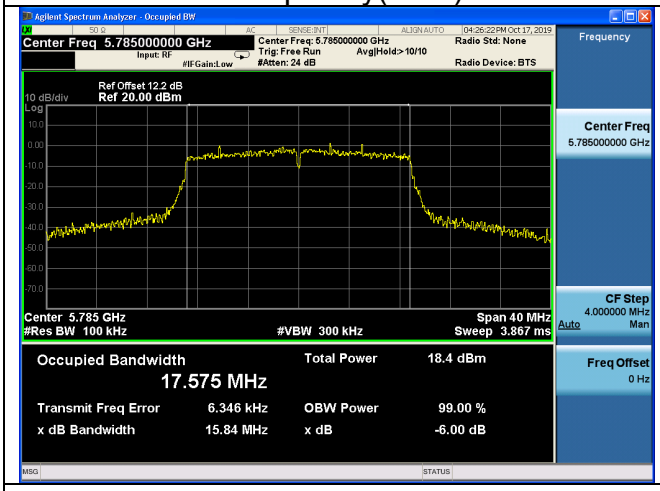
802.11a
Carrier frequency(MHz):5825



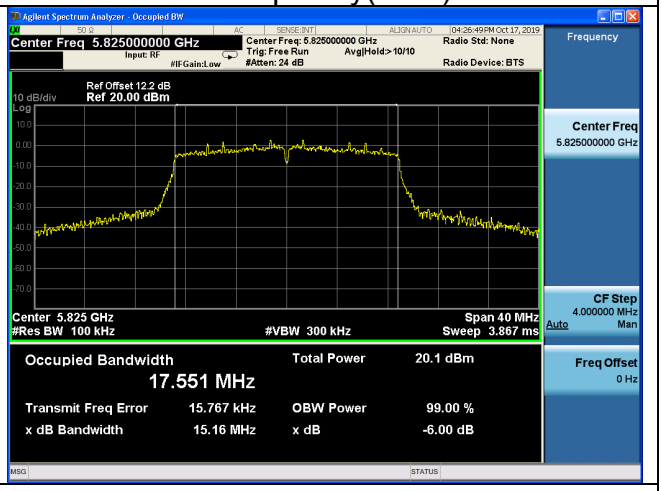

802.11n HT20
Carrier frequency(MHz):5745



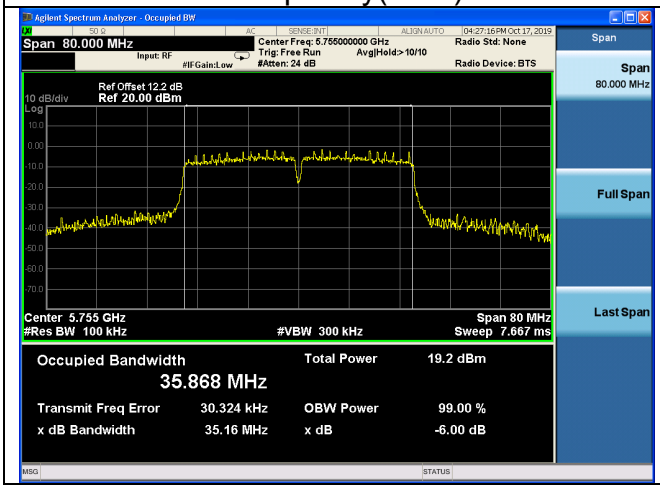

802.11n HT20
Carrier frequency(MHz):5785



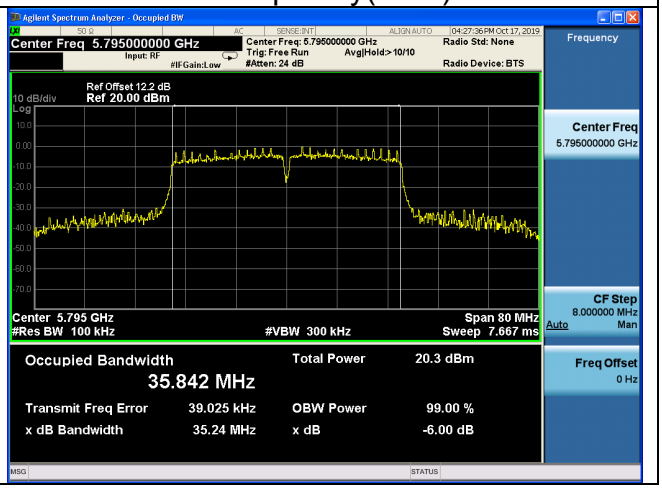

802.11n HT20
Carrier frequency(MHz):5825




802.11n HT40
Carrier frequency(MHz):5755




802.11n HT40
Carrier frequency(MHz):5795



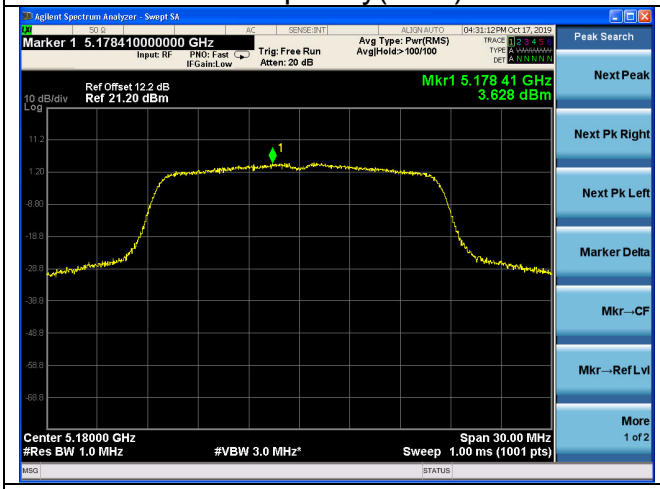
## Transmitter Power Spectral Density

Offset 12.2dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 2dB

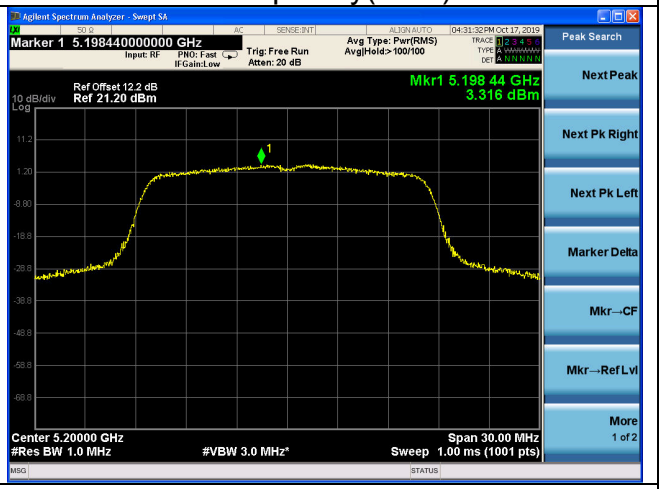
Test Mode: 802.11a

| Carrier frequency (MHz) | Duty Cycle Correction Factor(dB) | Power Spectral Density (dBm/MHz) | Limit | Conclusion |
|---|---|---|---|---|
| 5180 | 0.106 | 3.734 | 11.0 dBm/MHz | pass |
| 5200 | 0.106 | 3.422 | 11.0 dBm/MHz | pass |
| 5240 | 0.106 | 3.760 | 11.0 dBm/MHz | pass |
| 5260 | 0.106 | 3.734 | 11.0 dBm/MHz | pass |
| 5300 | 0.106 | 2.976 | 11.0 dBm/MHz | pass |
| 5320 | 0.106 | 3.680 | 11.0 dBm/MHz | pass |
| 5745 | 0.106 | 0.082 | 30.0 dBm/500kHz | pass |
| 5785 | 0.106 | 0.090 | 30.0 dBm/500kHz | pass |
| 5825 | 0.106 | 0.795 | 30.0 dBm/500kHz | pass |

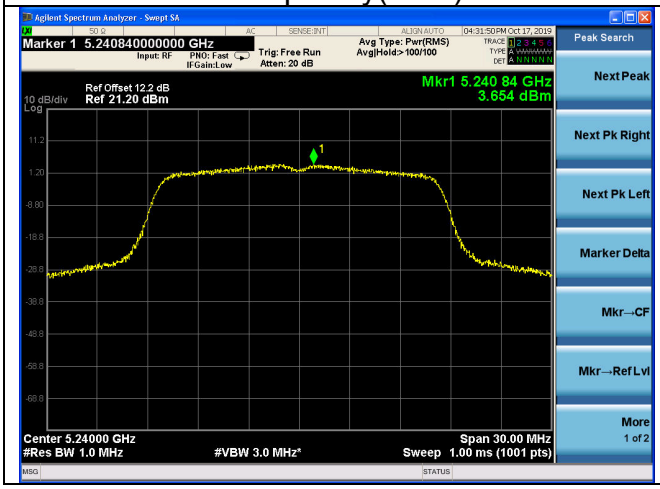
802.11a
Carrier frequency(MHz):5180



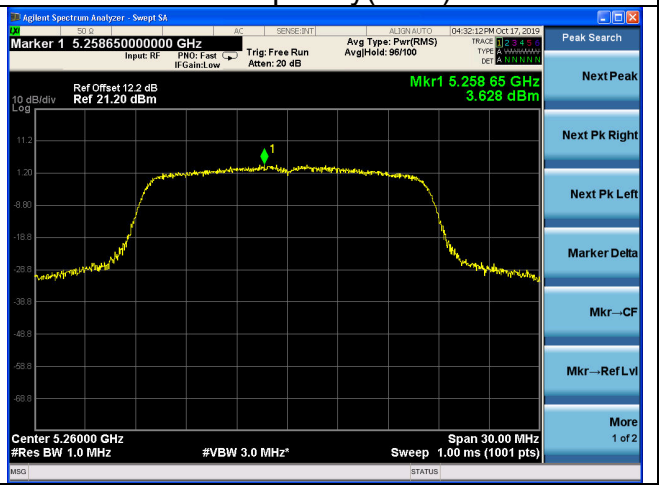

802.11a
Carrier frequency(MHz):5200



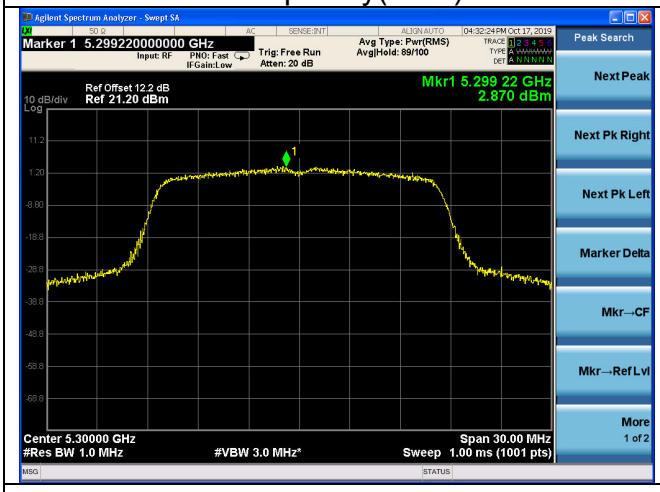

802.11a
Carrier frequency(MHz):5240



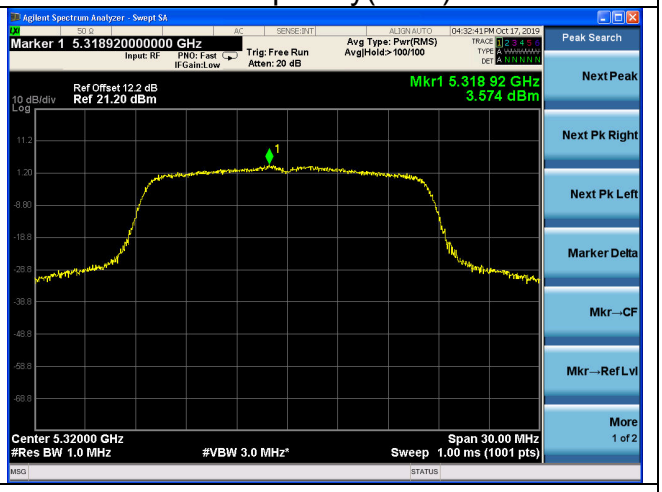

802.11a
Carrier frequency(MHz):5260



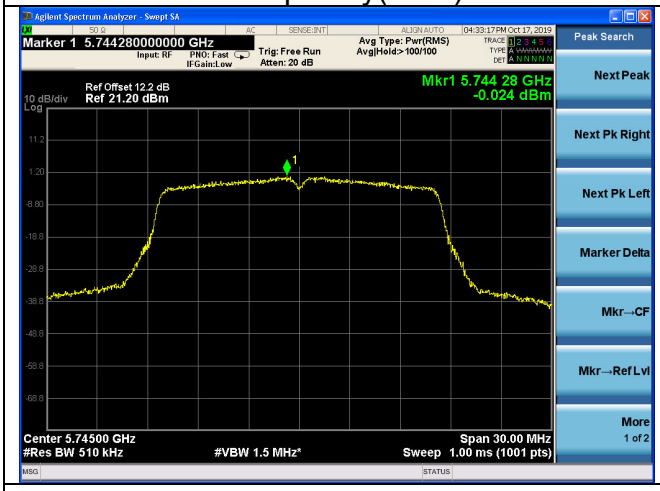
802.11a
Carrier frequency(MHz):5300




802.11a
Carrier frequency(MHz):5320

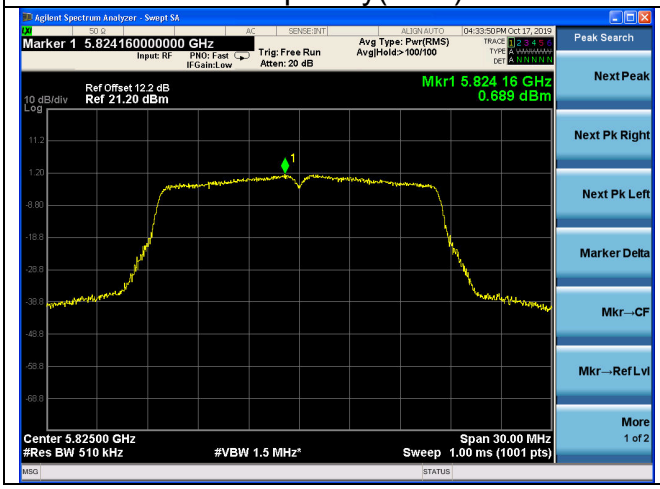



802.11a
Carrier frequency(MHz):5745




802.11a
Carrier frequency(MHz):5785

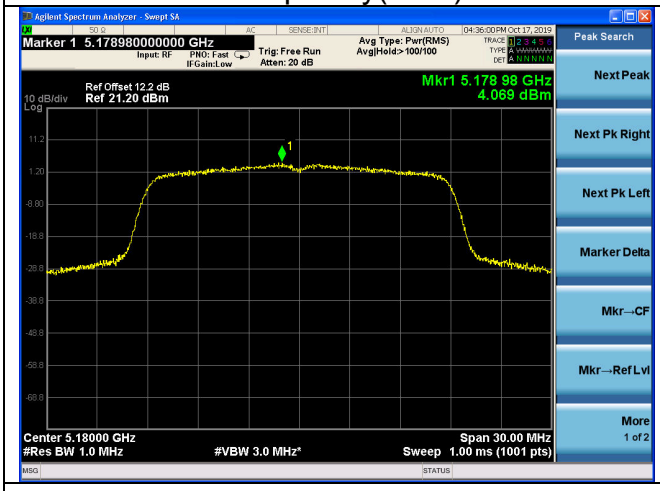

802.11a
Carrier frequency(MHz):5825



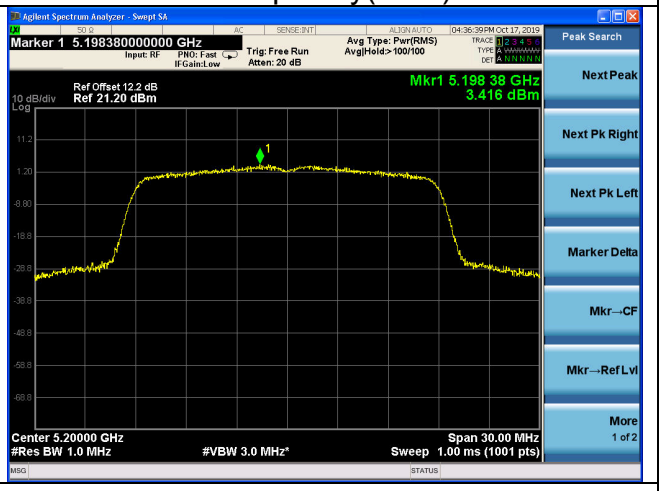
Test Mode: 802.11n HT20

| Carrier frequency (MHz) | Duty Cycle Correction Factor(dB) | Power Spectral Density (dBm/MHz) | Limit | Conclusion |
|---|---|---|---|---|
| 5180 | 0.114 | 4.183 | 11.0 dBm/MHz | pass |
| 5200 | 0.114 | 3.530 | 11.0 dBm/MHz | pass |
| 5240 | 0.114 | 3.740 | 11.0 dBm/MHz | pass |
| 5260 | 0.114 | 2.797 | 11.0 dBm/MHz | pass |
| 5300 | 0.114 | 3.038 | 11.0 dBm/MHz | pass |
| 5320 | 0.114 | 2.681 | 11.0 dBm/MHz | pass |
| 5745 | 0.114 | -0.410 | 30.0 dBm/500kHz | pass |
| 5785 | 0.114 | -0.532 | 30.0 dBm/500kHz | pass |
| 5825 | 0.114 | 0.617 | 30.0 dBm/500kHz | pass |

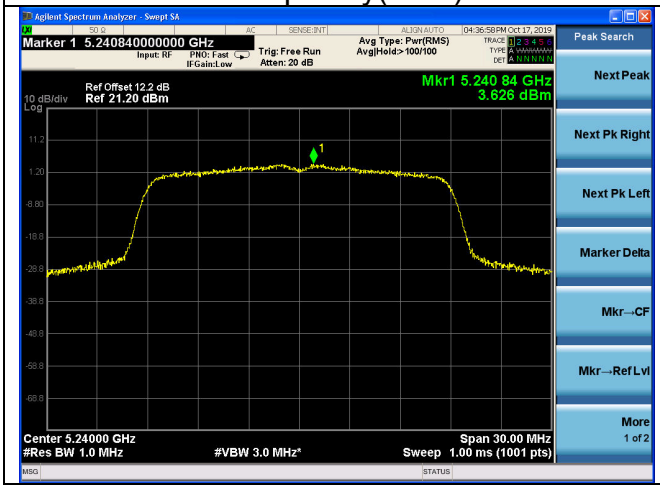
802.11n HT20
Carrier frequency(MHz):5180



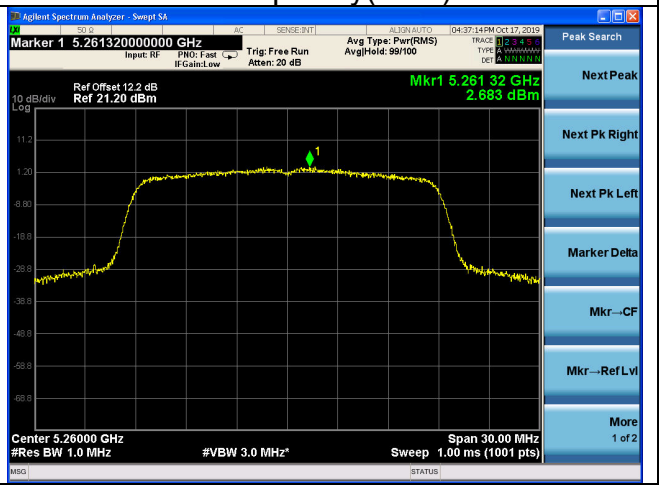

802.11n HT20
Carrier frequency(MHz):5200



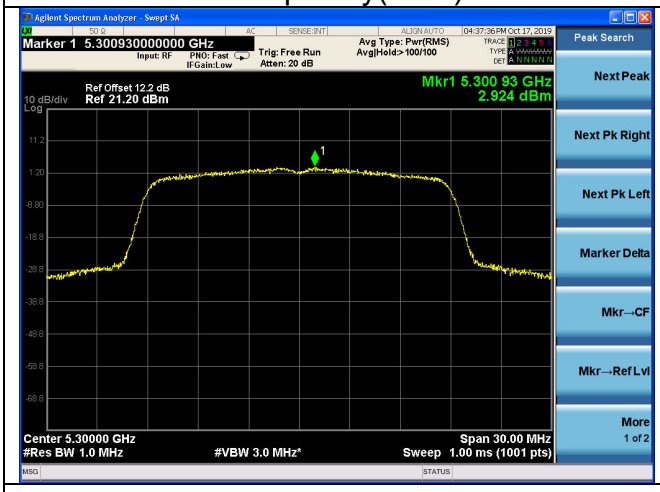

802.11n HT20
Carrier frequency(MHz):5240



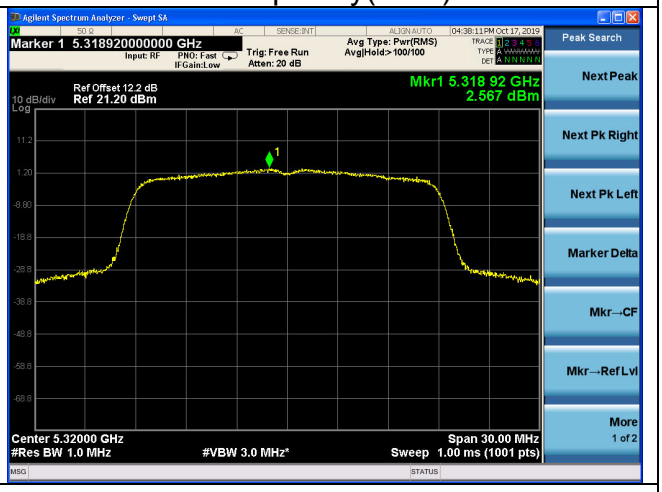

802.11n HT20
Carrier frequency(MHz):5260



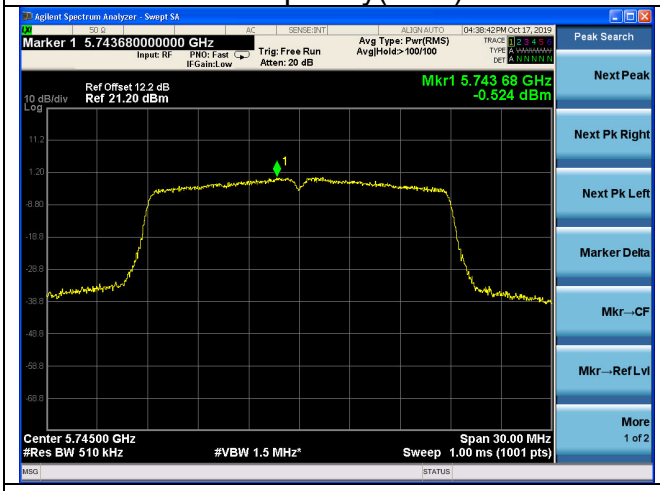
802.11n HT20
Carrier frequency(MHz):5300



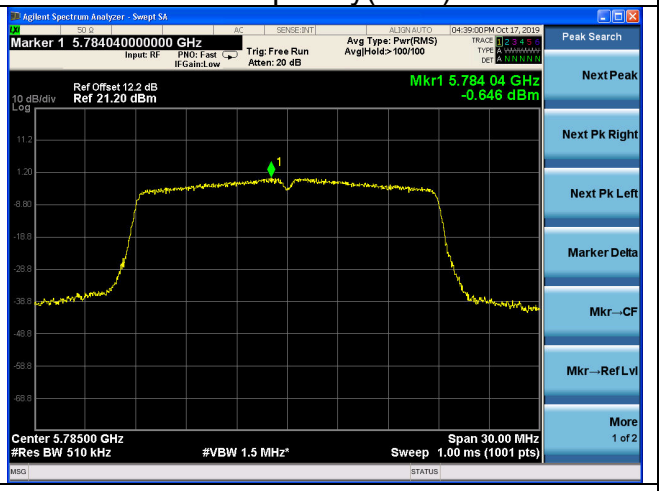

802.11n HT20
Carrier frequency(MHz):5320




802.11n HT20
Carrier frequency(MHz):5745




802.11n HT20
Carrier frequency(MHz):5785




802.11n HT20
Carrier frequency(MHz):5825