

FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

For

VoIP Wireless Router

MODEL No.: FWR9600B

FCC ID: 2AL9D-FWR9600B

Trade Mark: Flyingvoice

REPORT NO.: ES181229009W02

ISSUE DATE: March 01, 2019

Prepared for

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Prepared by

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1 TEST RESULT CERTIFICATION

| | |
|----------------------|--|
| Applicant: | Flyingvoice Network Technology Co., Ltd. Rm 207-209, Unit B52, Zhong Chuang Industrial Park Nanshan District, Shenzhen, China |
| Manufacturer: | Flyingvoice Network Technology Co., Ltd. Rm 207-209, Unit B52, Zhong Chuang Industrial Park Nanshan District, Shenzhen, China |
| Product Description: | VoIP Wireless Router |
| Model Number: | FWR9600B |
| Trade Mark: | Flyingvoice |

Measurement Procedure Used:

| APPLICABLE STANDARDS | |
|---|-------------|
| STANDARD | TEST RESULT |
| FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart E | PASS |

The above equipment was tested by EMTEK(SHENZHEN) CO., LTD.. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.407

The test results of this report relate only to the tested sample identified in this report.

Date of Test : _____ December 12, 2018 to March 01, 2019

Prepared by : _____ 
Sevin Li/Editor

Reviewer : _____ 
Joe Xia/Supervisor

Approve & Authorized Signer : _____ 
Lisa Wang/Manager



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2 EUT TECHNICAL DESCRIPTION

| Characteristics | Description | | | |
|---|---|--------------------------------------|----------------------|--------------------|
| IEEE 802.11 WLAN Mode Supported Band | <input checked="" type="checkbox"/> 2.4G WIFI Band <input checked="" type="checkbox"/> 5G WIFI Band | | | |
| IEEE 802.11 WLAN Mode Supported | <input checked="" type="checkbox"/> 802.11b <input checked="" type="checkbox"/> 802.11g <input checked="" type="checkbox"/> 802.11a(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n(40MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11ac(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11ac(40MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11ac(80MHz channel bandwidth) | | | |
| Data Rate | 802.11 b:1,2,5.5,11Mbps; 802.11 g/a:6,9,12,18,24,36,48,54Mbps; 802.11n(HT20)/ac(HT20): MCS0-MCS15; 802.11n(HT40): MCS0-MCS15; 802.11ac(HT40):MCS0-MCS15; 802.11ac(VHT80):MCS0-MCS15; | | | |
| Operating Frequency Range | Band | Mode | Frequency Range(MHz) | Number of channels |
| | 2.4G Band | 802.11b/g/n(HT20) | 2412-2462 | 11 |
| | | 802.11n(HT40) | 2422-2452 | 7 |
| | 5G Band/ UNII Band I | 802.11a/n(HT20)/ac(VHT20) | 5180-5240 | 4 |
| | | 802.11n(HT40)/ac(VHT40) | 5190-5230 | 2 |
| | | 802.11 ac(VHT80) | 5210 | 1 |
| | 5G Band/ UNII Band III | 802.11a/n(HT20)/ac(VHT20) | 5745-5825 | 5 |
| | | 802.11n(HT40)/ac(VHT40) | 5755-5795 | 2 |
| | | 802.11 ac(VHT80) | 5775 | 1 |
| Modulation | DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/ac/g/n | | | |
| Antenna Type | External PCB Antenna | | | |
| Smart system | <input checked="" type="checkbox"/> SISO <input checked="" type="checkbox"/> MIMO | | | |
| Number of Antenna: | Four | Two for 2.4G Band Two for 5G Band | | |
| Antenna Gain | 2.4G Band Antenna 0: 5dBi; Antenna 1: 5dBi 5G Band Antenna 0: 5dBi; Antenna 1: 5dB | | | |

| | |
|--|--|
| Direction Gain | 2.4G Band 8.01 dBi 5G Band 8.01 dBi |
| Power supply | <input checked="" type="checkbox"/> DC 12V from Adapter <input checked="" type="checkbox"/> Adapter: Model: S12B23-120A100-04 Input: 100-240V~, 50-60Hz, Max 0.5A Output: DC 12V, 1A |
| This test report is only applicable to 5G WIFI Band | |

Note: for more details, please refer to the User's manual of the EUT.

3 SUMMARY OF TEST RESULT

| FCC Part Clause | Test Parameter | Verdict | Remark |
|--|--------------------------------|---------|--------|
| 15.407 (a) | 99% , 6dB and 26dB Bandwidth | PASS | |
| 15.407 (e) | | | |
| 15.407 (a) | Maximum Conducted Output Power | PASS | |
| 15.407 (a) | Peak Power Spectral Density | PASS | |
| 15.407 (b) | Radiated Spurious Emission | PASS | |
| 15.407(g) | Frequency Stability | PASS | |
| 15.407 (b)(6) 15.207 | Power Line Conducted Emission | PASS | |
| 15.407(a) 15.203 | Antenna Application | PASS | |
| NOTE1: N/A (Not Applicable) | | | |
| NOTE2: According to FCC OET KDB 789033 D02 General UNII Test Procedures New Rules v02r01, In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits. | | | |

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2AL9D-FWR9600B filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart E

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 662911 D02 MIMO With Cross Polarized Antenna V01

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LASTCAL. | DUE CAL. |
|--------------------|-----------------|--------------|----------------|--------------|--------------|
| Test Receiver | Rohde & Schwarz | ESCI | 26115-010-0027 | May 19, 2018 | May 18, 2019 |
| L.I.S.N. | Rohde & Schwarz | ENV216 | 101161 | May 19, 2018 | May 18, 2019 |
| 50Ω Coaxial Switch | Anritsu | MP59B | 6100175589 | May 20, 2018 | May 19, 2019 |
| Voltage Probe | Rohde & Schwarz | ESH2-Z3 | 100122 | May 20, 2018 | May 19, 2019 |
| Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100006 | May 19, 2018 | May 18, 2019 |
| I.S.N | Teseq GmbH | ISN T800 | 30327 | May 20, 2018 | May 19, 2019 |

4.2.2 Radiated Emission Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | DUE CAL. |
|-------------------|-----------------|--------------|---------------|--------------|--------------|
| EMI Test Receiver | Rohde & Schwarz | ESU | 1302.6005.26 | May 20, 2018 | May 19, 2019 |
| Pre-Amplifier | HP | 8447F | 2944A07999 | May 19, 2018 | May 18, 2019 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 142 | May 19, 2018 | May 18, 2019 |
| Loop Antenna | ARA | PLA-1030/B | 1029 | May 19, 2018 | May 18, 2019 |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170399 | May 20, 2018 | May 19, 2019 |
| Horn Antenna | Schwarzbeck | BBHA 9120 | D143 | May 19, 2018 | May 18, 2019 |
| Cable | Schwarzbeck | AK9513 | ACRX1 | May 20, 2018 | May 19, 2019 |
| Cable | Rosenberger | N/A | FP2RX2 | May 20, 2018 | May 19, 2019 |
| Cable | Schwarzbeck | AK9513 | CRPX1 | May 20, 2018 | May 19, 2019 |
| Cable | Schwarzbeck | AK9513 | CRRX2 | May 20, 2018 | May 19, 2019 |

4.2.3 Radio Frequency Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LASTCAL. | DUE CAL. |
|-------------------|---------|--------------|---------------|--------------|--------------|
| Spectrum Analyzer | Agilent | E4407B | 88156318 | May 20, 2018 | May 19, 2019 |
| Signal Analyzer | Agilent | N9010A | My53470879 | May 20, 2018 | May 19, 2019 |
| Power meter | Anritsu | ML2495A | 0824006 | May 20, 2018 | May 19, 2019 |
| Power sensor | Anritsu | MA2411B | 0738172 | May 20, 2018 | May 19, 2019 |

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

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

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11a: 6 Mbps; 802.11n (HT20): MCS0; 802.11n (HT20): MCS15; 802.11n (HT40): MCS0; 802.11n (HT40): MCS15; 802.11ac (HT20): MCS0; 802.11ac (HT20): MCS15; 802.11ac (HT40): MCS0; 802.11ac (HT40): MCS15; 802.11ac (HT80): MCS0; 802.11ac (HT80): MCS15;) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Wifi 5G with UNII Band I

Frequency and Channel list for 802.11a/n(HT20)/ac(VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 36 | 5180 | 44 | 5220 | | |
| 40 | 5200 | 48 | 5240 | | |

Frequency and Channel list for 802.11n(HT40)/ac(VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 38 | 5190 | | | | |
| 46 | 5230 | | | | |

Frequency and Channel list for 802.11ac(VHT80):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 42 | 5210 | | | | |
| | | | | | |

Test Frequency and Channel for 802.11a/n(HT20)/ac(VHT20):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36 | 5180 | 40 | 5200 | 48 | 5240 |

Test Frequency and channel for 802.11n (VHT40)/ac(VHT40):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 38 | 5190 | N/A | N/A | 46 | 5230 |

Test Frequency and channel for 802.11ac (HT80):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 42 | 5210 | N/A | N/A | N/A | N/A |

Wifi 5G with UNII Band III

Frequency and Channel list for 802.11a/n(HT20)/ac(VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 149 | 5745 | 157 | 5785 | 165 | 5825 |
| 153 | 5765 | 161 | 5805 | | |

Frequency and Channel list for 802.11n(HT40)/ac(VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 151 | 5755 | | | | |
| 159 | 5795 | | | | |

Frequency and Channel list for 802.11ac(VHT80):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 155 | 5775 | | | | |

Test Frequency and Channel for 802.11a/n(HT20)/ac(VHT20):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 149 | 5745 | 157 | 5785 | 165 | 5825 |

Test Frequency and channel for 802.11n(HT40)/ac(VHT40):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 151 | 5755 | N/A | N/A | 159 | 5795 |

Test Frequency and channel for 802.11ac(VHT80):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 155 | 5775 | | | | |

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS, 2016.10.24

The certificate is valid until 2022.10.28

The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)

The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2016.5.19

The Laboratory has been assessed according to the requirements
ISO/IEC 17025.

Accredited by FCC, August 06, 2018

The certificate is valid until August 07, 2020

Designation Number: CN1204

Test Firm Registration Number: 882943

Accredited by Industry Canada, November 09, 2018

The Conformity Assessment Body Identifier is CN0008.

Name of Firm

Site Location

: EMTEK(SHENZHEN) CO., LTD.

: Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

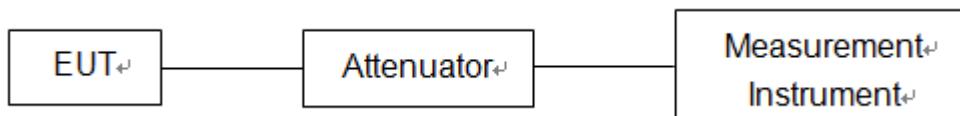
| Parameter | Uncertainty |
|--------------------------------|-------------------------|
| Radio Frequency | $\pm 1 \times 10^{-5}$ |
| Maximum Peak Output Power Test | $\pm 1.0 \text{dB}$ |
| Conducted Emissions Test | $\pm 2.0 \text{dB}$ |
| Radiated Emission Test | $\pm 2.0 \text{dB}$ |
| Power Density | $\pm 2.0 \text{dB}$ |
| Occupied Bandwidth Test | $\pm 1.0 \text{dB}$ |
| Band Edge Test | $\pm 3 \text{dB}$ |
| All emission, radiated | $\pm 3 \text{dB}$ |
| Antenna Port Emission | $\pm 3 \text{dB}$ |
| Temperature | $\pm 0.5^\circ\text{C}$ |
| Humidity | $\pm 3\%$ |

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna port(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

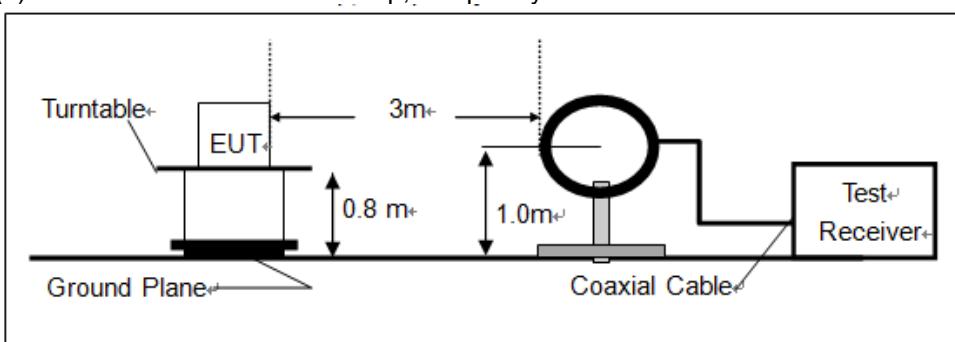
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

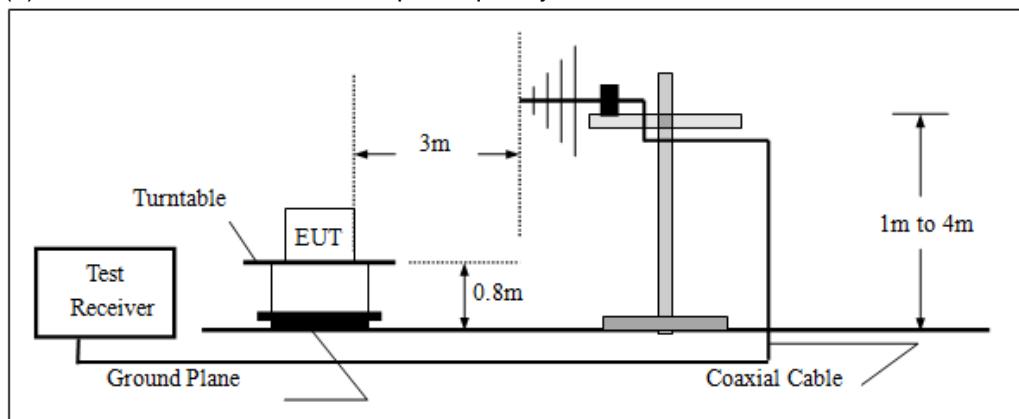
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

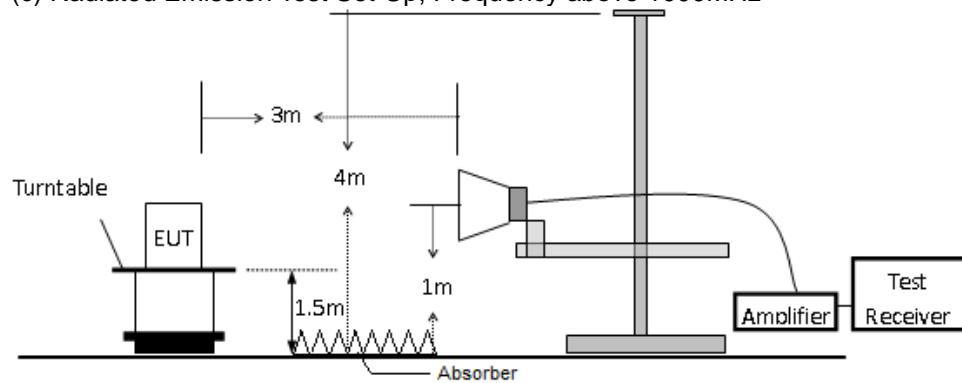
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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

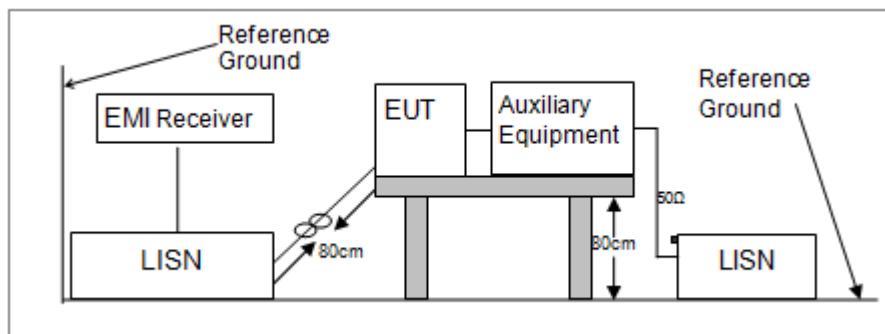


7.3 CONDUCTED EMISSION TEST SETUP

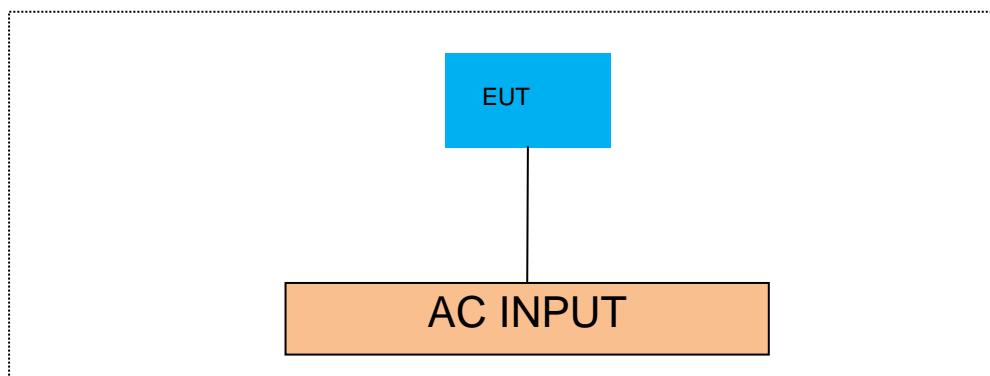
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|-----------|-----------|----------------|--------|------------|------|
| N/A | N/A | N/A | N/A | N/A | N/A | N/A |

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 TEST REQUIREMENTS

8.1 BANDWIDTH MEASUREMENT

8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I

According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C

According to FCC Part 15.407(a)(3) for UNII Band III

According to FCC Part 15.407(e) for UNII Band III

According to 789033 D02 Section II(C)

According to 789033 D02 Section II(D)

8.1.2 Conformance Limit

No limit requirement.

The minimum 6 dB emission bandwidth of at least 500 KHz for the UNII Band III.

8.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.1.4 Test Procedure

Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below

- The following procedure shall be used for measuring (26 dB) power bandwidth:

Center Frequency: test Frequency

Set RBW = approximately 1% of the emission bandwidth.

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

X dB Bandwidth: 26 dB

Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.

Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

- Minimum Emission Bandwidth for the UNII Band III

Center Frequency: test Frequency

Set RBW = 100 kHz

Set VBW \geq 3 · RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

X dB Bandwidth: 6 dB

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

- The following procedure shall be used for measuring (99 %) power bandwidth:

Set center frequency to the nominal EUT channel center frequency.

Set span = 1.5 times to 5.0 times the OBW.

Set RBW = 1 % to 5 % of the OBW

Set VBW \geq 3 · RBW

Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used.

Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

Use the 99 % power bandwidth function of the instrument (if available).

If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

8.1.5 Test Results

| | | | | | |
|---------------|------|--|----------|-----------|--|
| Temperature : | 28°C | <input checked="" type="checkbox"/> 802.11a mode | Test By: | King Kong | |
| Humidity : | 65 % | | | | |

| Band | Channel Number | Channel Freq. (MHz) | 26dB EBW | | 99% OBW | | Limit (MHz) | Verdict |
|---------------|----------------|---------------------|----------|-------|---------|--------|-------------|---------|
| | | | Ant0 | Ant1 | Ant0 | Ant1 | | |
| UNII Band I | CH36 | 5180 | 19.80 | 19.95 | 16.787 | 16.835 | N/A | N/A |
| | CH40 | 5200 | 19.78 | 19.84 | 16.716 | 16.725 | N/A | N/A |
| | CH48 | 5240 | 19.83 | 19.85 | 16.750 | 16.789 | N/A | N/A |
| UNII Band III | CH149 | 5745 | 19.60 | 19.84 | 16.719 | 16.797 | N/A | N/A |
| | CH157 | 5785 | 19.96 | 19.74 | 16.754 | 16.769 | N/A | N/A |
| | CH165 | 5825 | 19.88 | 19.64 | 16.781 | 16.739 | N/A | N/A |

Note:
N/A (Not Applicable)

| | | | | | |
|---------------|------|---|----------|-----------|--|
| Temperature : | 28°C | <input checked="" type="checkbox"/> 802.11n(VHT20) mode | Test By: | King Kong | |
| Humidity : | 65 % | | | | |

| Band | Channel Number | Channel Freq. (MHz) | 26dB EBW | | 99% OBW | | Limit (MHz) | Verdict |
|---------------|----------------|---------------------|----------|--------|---------|--------|-------------|---------|
| | | | Ant0 | Ant1 | Ant0 | Ant1 | | |
| UNII Band I | CH36 | 5180 | 20.28 | 20.380 | 17.678 | 17.672 | N/A | N/A |
| | CH40 | 5200 | 20.37 | 20.500 | 17.685 | 17.664 | N/A | N/A |
| | CH48 | 5240 | 20.29 | 20.28 | 17.656 | 17.697 | N/A | N/A |
| UNII Band III | CH149 | 5745 | 20.41 | 20.26 | 17.678 | 17.666 | N/A | N/A |
| | CH157 | 5785 | 20.32 | 20.24 | 17.669 | 17.688 | N/A | N/A |
| | CH165 | 5825 | 20.36 | 20.3 | 17.704 | 17.675 | N/A | N/A |

Note:
N/A (Not Applicable)

| | | | | | |
|---------------|------|--|----------|-----------|--|
| Temperature : | 28°C | <input checked="" type="checkbox"/> 802.11ac(VHT20) mode | Test By: | King Kong | |
| Humidity : | 65 % | | | | |

| Band | Channel Number | Channel Freq. (MHz) | 26dB EBW | | 99% OBW | | Limit (MHz) | Verdict |
|---------------|----------------|---------------------|----------|-------|---------|--------|-------------|---------|
| | | | Ant0 | Ant1 | Ant0 | Ant1 | | |
| UNII Band I | CH36 | 5180 | 20.19 | 20.27 | 17.684 | 17.641 | N/A | N/A |
| | CH40 | 5200 | 20.40 | 20.37 | 17.688 | 17.661 | N/A | N/A |
| | CH48 | 5240 | 20.46 | 20.36 | 17.671 | 17.67 | N/A | N/A |
| UNII Band III | CH149 | 5745 | 20.39 | 20.45 | 17.7 | 17.657 | N/A | N/A |
| | CH157 | 5785 | 20.19 | 20.28 | 17.697 | 17.698 | N/A | N/A |
| | CH165 | 5825 | 20.35 | 20.23 | 17.659 | 17.669 | N/A | N/A |

Note: N/A (Not Applicable)

| <input checked="" type="checkbox"/> 802.11n(VHT40) mode | | | | | | | | |
|---|----------------|---------------------|----------|-----------|---------|--------|-------------|---------|
| Temperature : 28°C | | Test By: | | King Kong | | | | |
| Band | Channel Number | Channel Freq. (MHz) | 26dB EBW | | 99% OBW | | Limit (MHz) | Verdict |
| | | | Ant0 | Ant1 | Ant0 | Ant1 | | |
| UNII Band I | CH38 | 5190 | 40.22 | 40.15 | 36.058 | 36.095 | N/A | N/A |
| | CH46 | 5230 | 40.32 | 40.67 | 36.108 | 36.156 | N/A | N/A |
| UNII Band III | CH151 | 5755 | 40.63 | 40.29 | 36.130 | 36.160 | N/A | N/A |
| | CH159 | 5795 | 40.39 | 40.23 | 36.080 | 36.096 | N/A | N/A |

Note:
N/A (Not Applicable)

| <input checked="" type="checkbox"/> 802.11ac(VHT40) mode | | | | | | | | |
|--|----------------|---------------------|----------|-----------|---------|--------|-------------|---------|
| Temperature : 28°C | | Test By: | | King Kong | | | | |
| Band | Channel Number | Channel Freq. (MHz) | 26dB EBW | | 99% OBW | | Limit (MHz) | Verdict |
| | | | Ant0 | Ant1 | Ant0 | Ant1 | | |
| UNII Band I | CH38 | 5190 | 40.06 | 40.13 | 36.025 | 36.03 | N/A | N/A |
| | CH46 | 5230 | 40.36 | 40.39 | 36.147 | 36.138 | N/A | N/A |
| UNII Band III | CH151 | 5755 | 40.22 | 40.34 | 36.136 | 36.102 | N/A | N/A |
| | CH159 | 5795 | 40.26 | 40.32 | 36.088 | 36.095 | N/A | N/A |

Note:
N/A (Not Applicable)

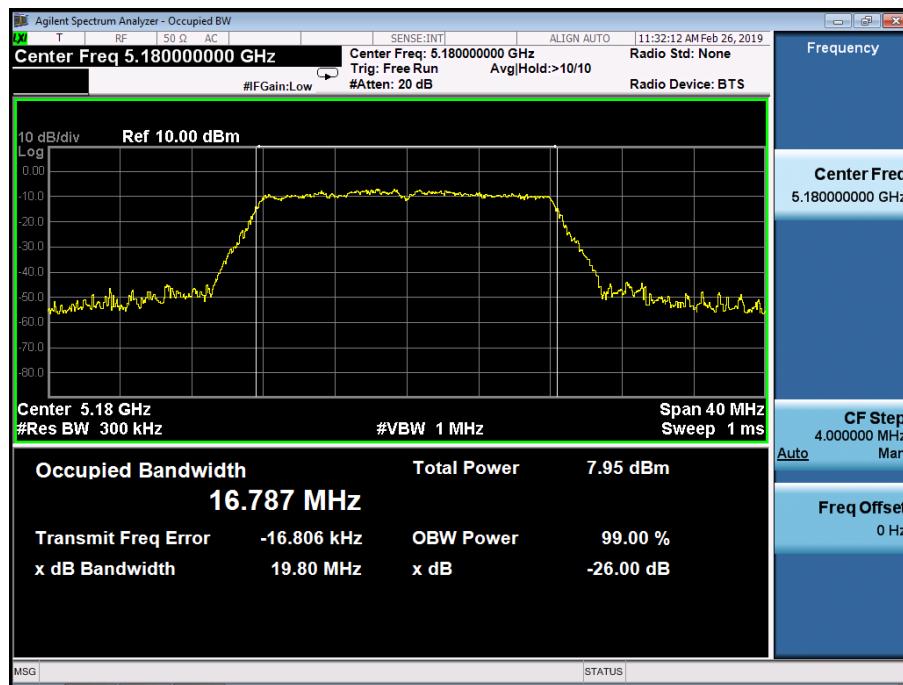
| <input checked="" type="checkbox"/> 802.11ac(VHT80) mode | | | | | | | | |
|--|------------------|---------------------|----------|-----------|---------|--------|-------------|---------|
| Temperature : 28°C | | Test By: | | King Kong | | | | |
| Band | Channel Number | Channel Freq. (MHz) | 26dB EBW | | 99% OBW | | Limit (MHz) | Verdict |
| | | | Ant0 | Ant1 | Ant0 | Ant1 | | |
| UNII Band I | CH42 | 5210 | 81.32 | 80.9 | 75.114 | 75.044 | N/A | N/A |
| | UNII Band III | CH155 | 5775 | 81.42 | 81.91 | 75.284 | 75.315 | N/A |

Note:
N/A (Not Applicable)

| | | | <input checked="" type="checkbox"/> UNII Band III | | | |
|-------------------------------|----------------|---------------------|---|-------|-------------|---------|
| Temperature : 28°C | | Test By: King Kong | | | | |
| Operation Mode | Channel Number | Channel Freq. (MHz) | 6dB EBW | | Limit (MHz) | Verdict |
| | | | Ant0 | Ant1 | | |
| 802.11a | CH149 | 5745 | 16.08 | 16.07 | 500 | PASS |
| | CH157 | 5785 | 16.38 | 15.93 | 500 | PASS |
| | CH165 | 5825 | 16.31 | 16.34 | 500 | PASS |
| 802.11n (VHT20) | CH149 | 5745 | 16.04 | 16.07 | 500 | PASS |
| | CH157 | 5785 | 15.99 | 15.93 | 500 | PASS |
| | CH165 | 5825 | 17.03 | 17.01 | 500 | PASS |
| 802.11ac (VHT20) | CH149 | 5745 | 16.13 | 16.81 | 500 | PASS |
| | CH157 | 5785 | 17.01 | 13.90 | 500 | PASS |
| | CH165 | 5825 | 17.06 | 16.36 | 500 | PASS |
| 802.11n (VHT40) | CH151 | 5755 | 35.30 | 35.51 | 500 | PASS |
| | CH159 | 5795 | 35.30 | 35.18 | 500 | PASS |
| 802.11ac (VHT40) | CH151 | 5755 | 35.08 | 35.36 | 500 | PASS |
| | CH159 | 5795 | 35.28 | 35.37 | 500 | PASS |
| 802.11ac (VHT80) | CH155 | 5775 | 75.40 | 75.36 | 500 | PASS |
| Note: N/A (Not Applicable) | | | | | | |

A. Antenna 0

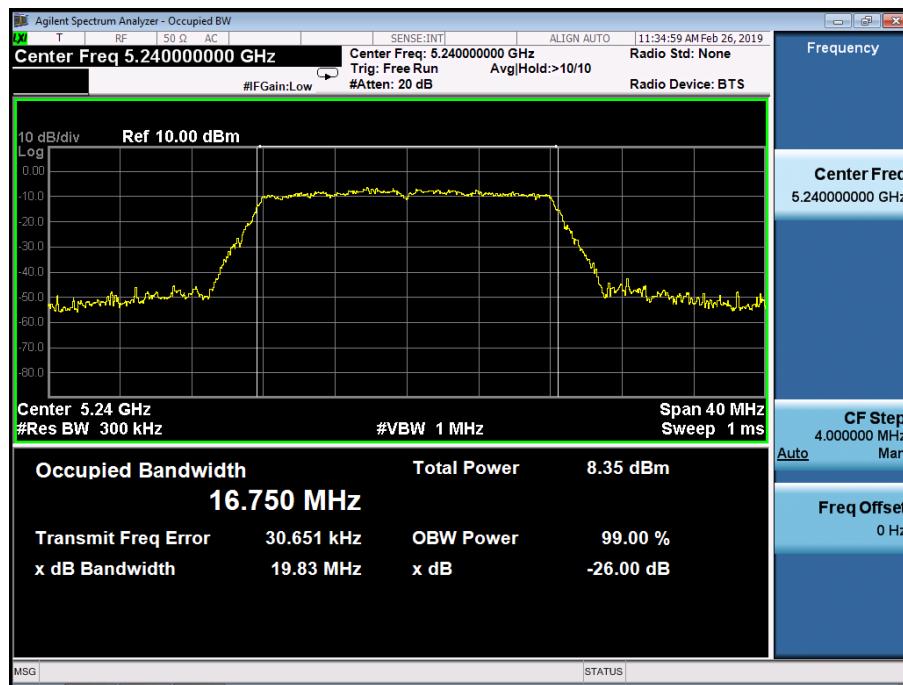
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|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11a | 5180 |



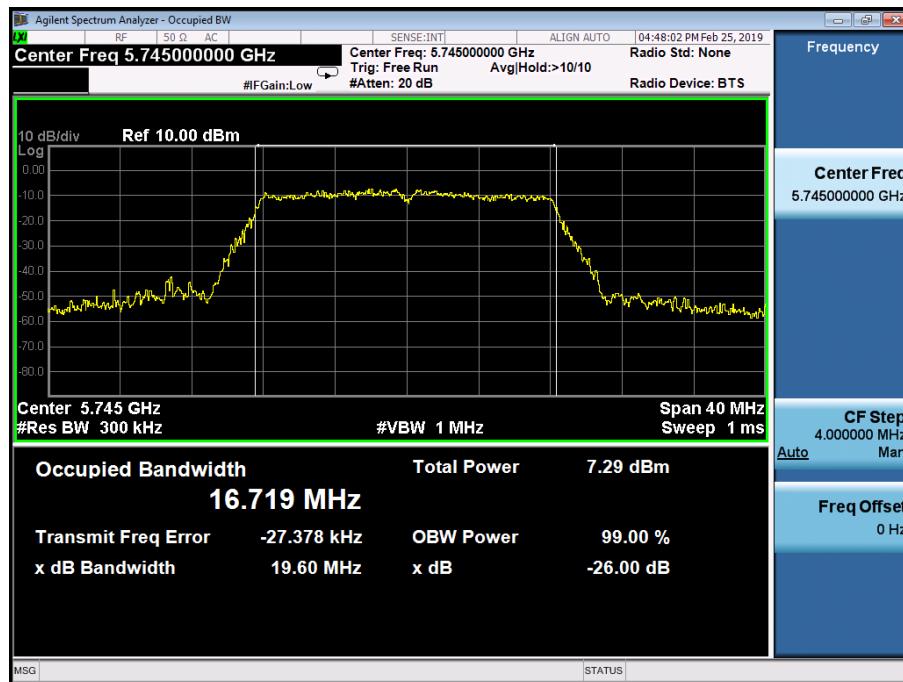
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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11a | 5200 |



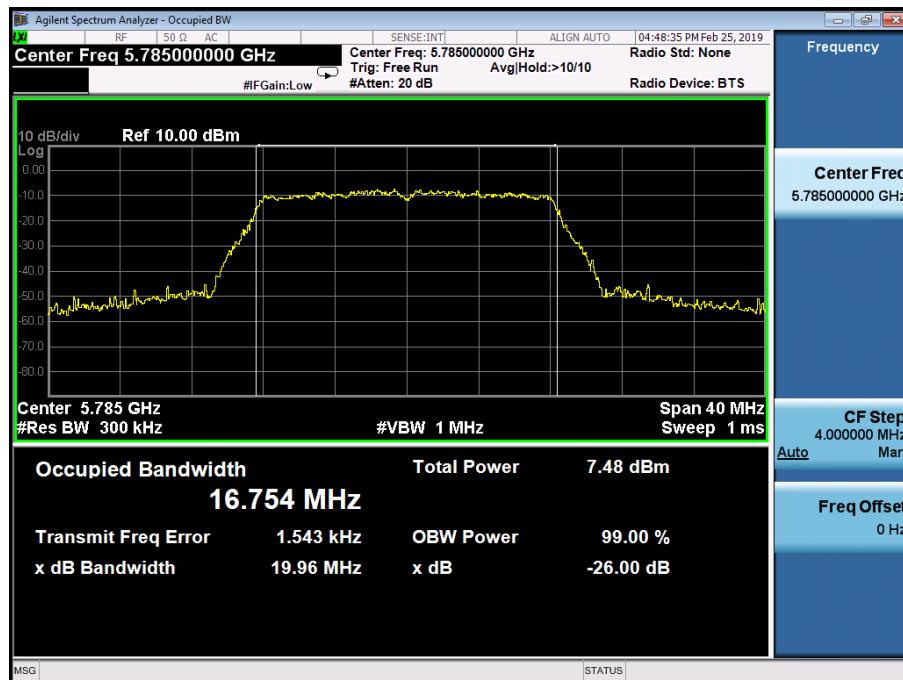
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|---|---------------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model 802.11a | Frequency(MHz) 5240 |



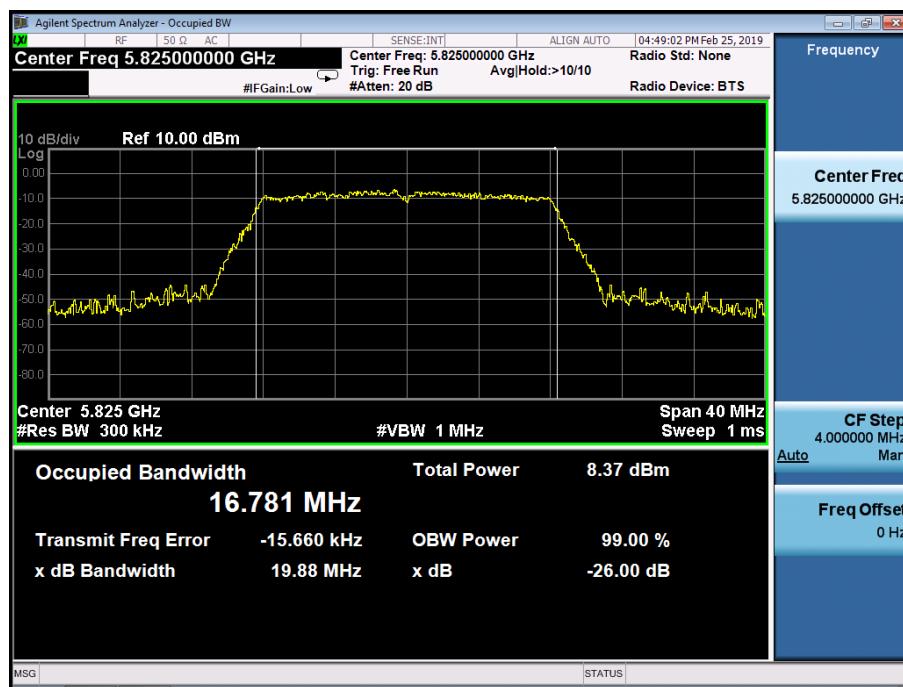
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|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model 802.11a | Frequency(MHz) |



| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model 802.11a | Frequency(MHz) |

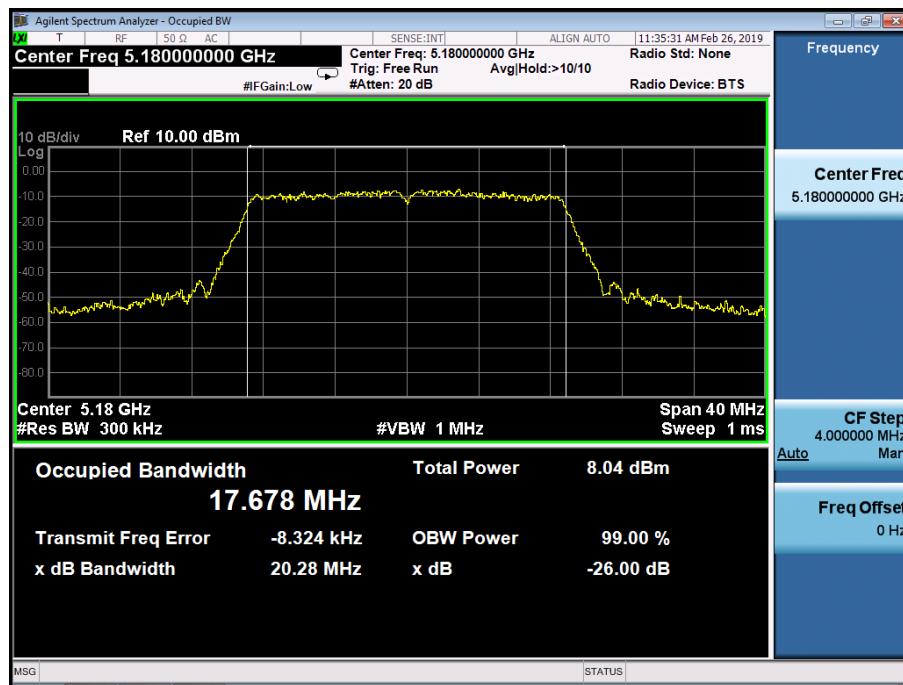


| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11a | 5825 |



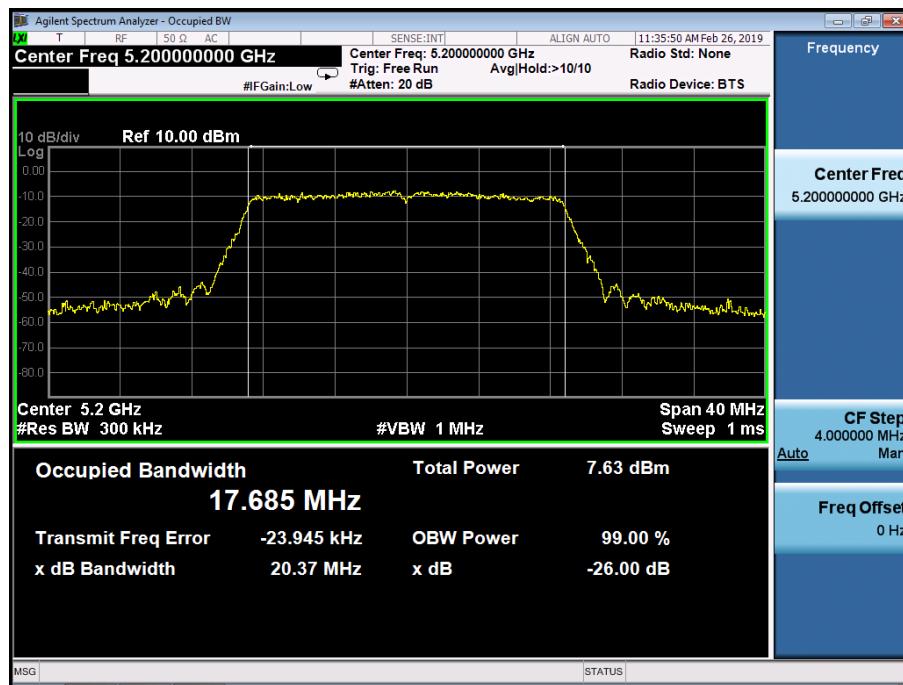
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 Test Model 802.11n(HT20) mode Frequency(MHz)

5180

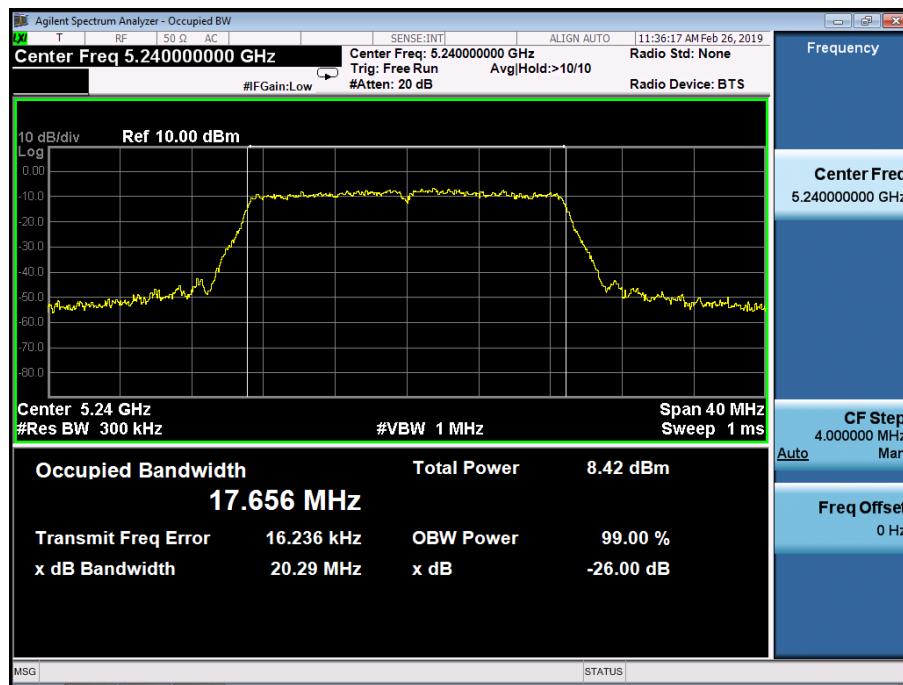


Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11n(HT20) mode Frequency(MHz)

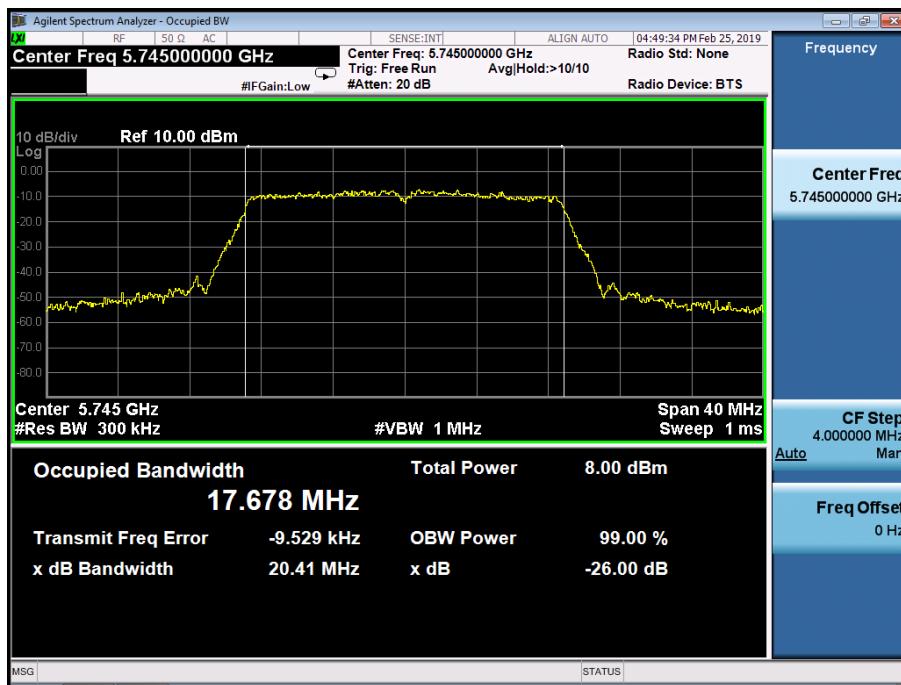
5200



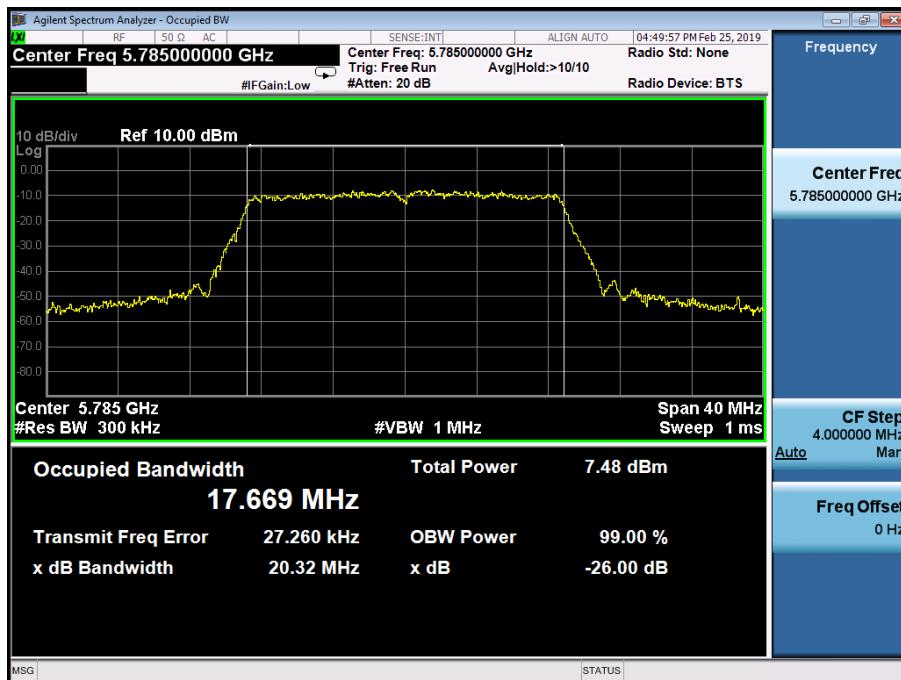
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| Test Model | Frequency(MHz) |
| 802.11n(HT20) mode | 5240 |



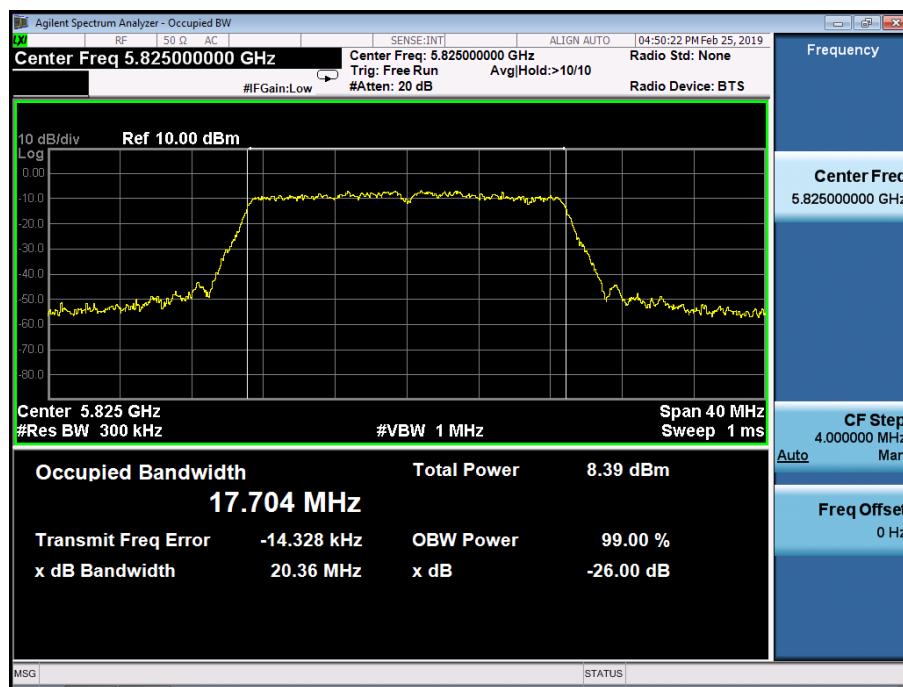
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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11n(HT20) mode | 5745 |



| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11n(HT20) mode | 5785 |

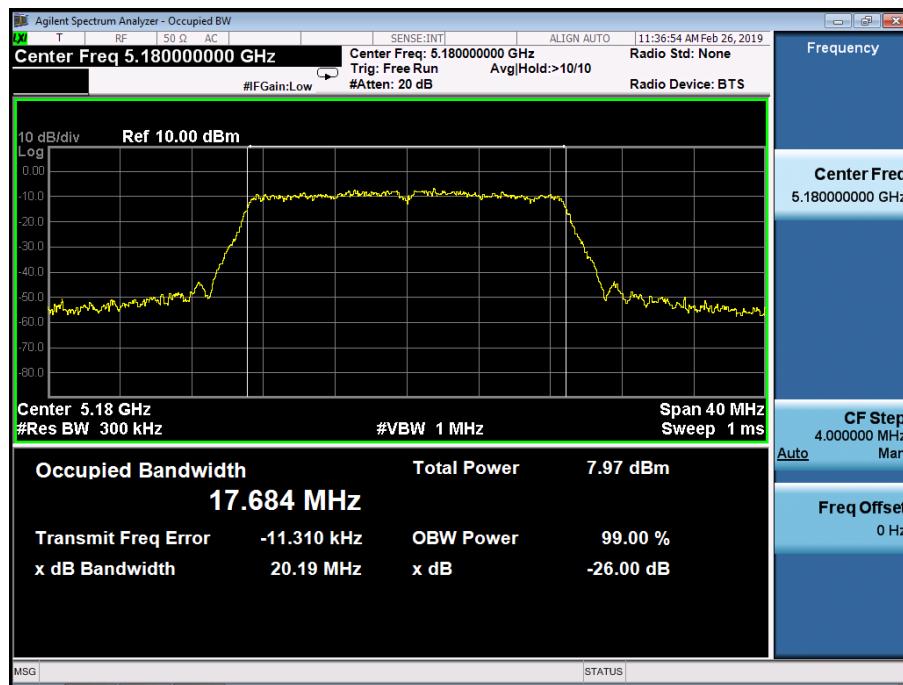


| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11n(HT20) mode | 5825 |



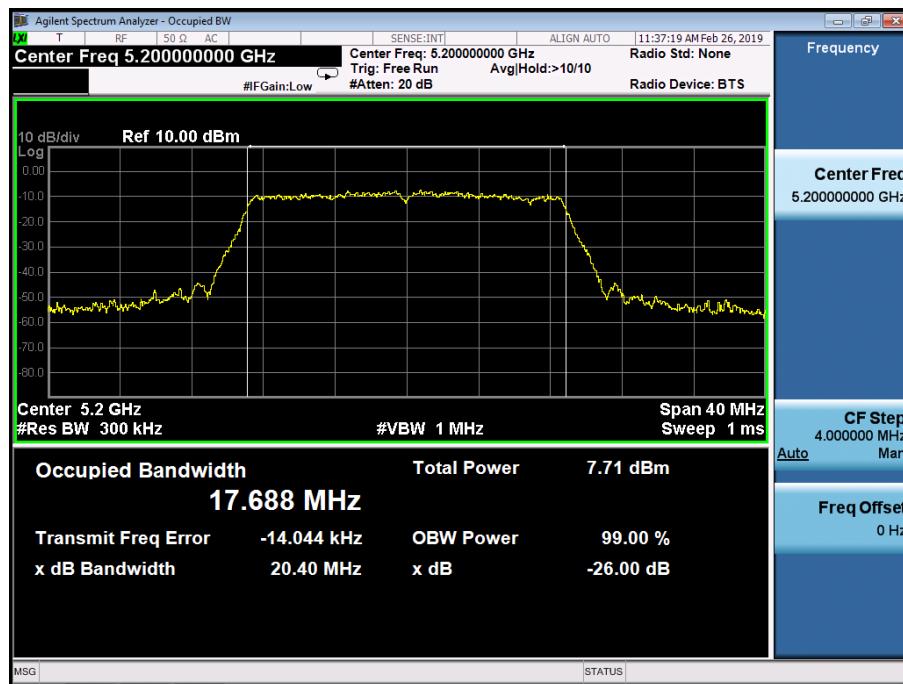
Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11ac(VHT20) mode Frequency(MHz)

5180

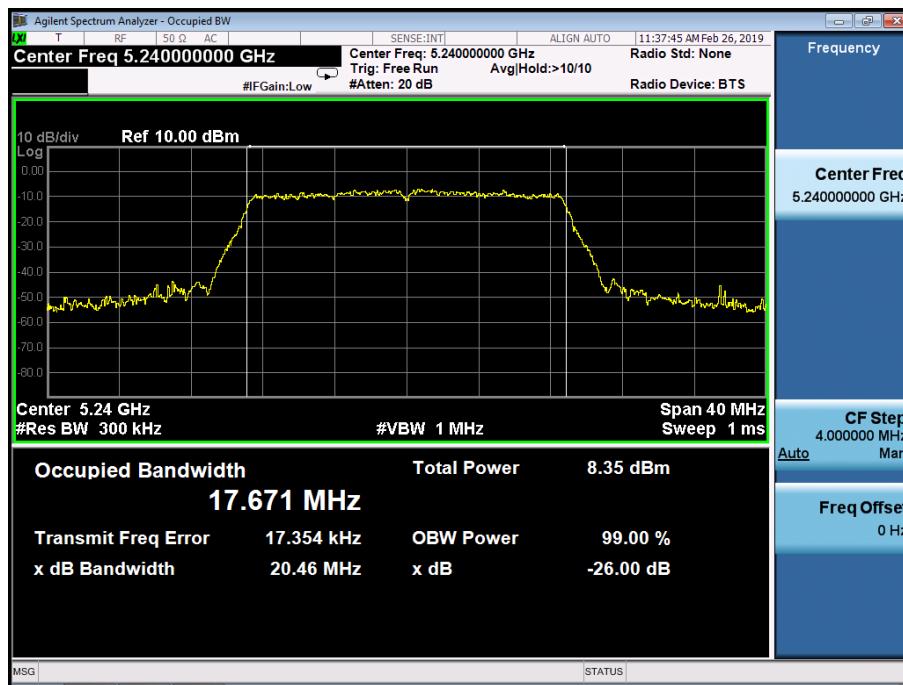


Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11ac(VHT20) mode Frequency(MHz)

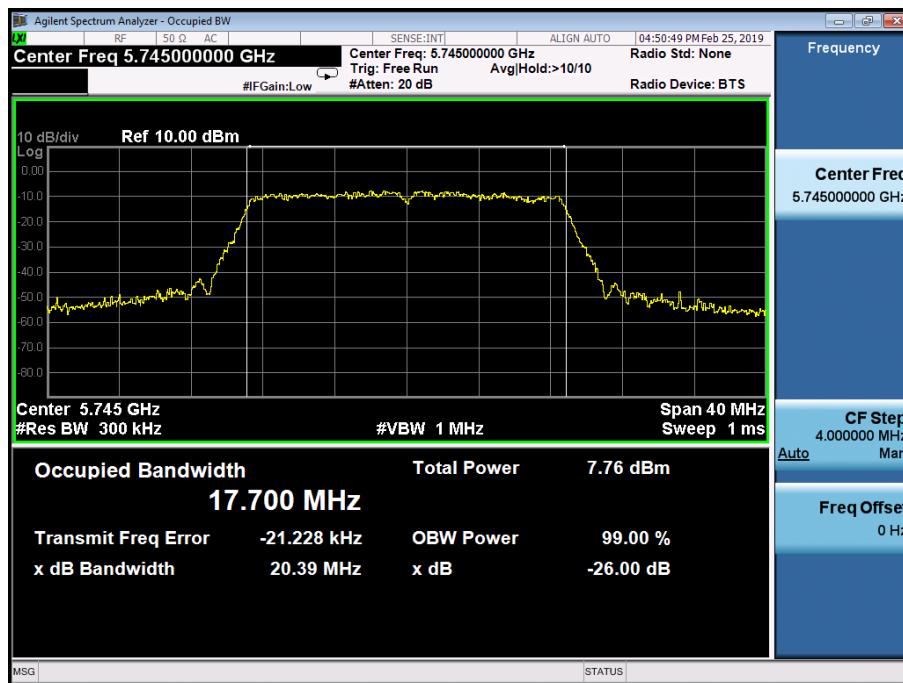
5200



| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT20) mode | 5240 |



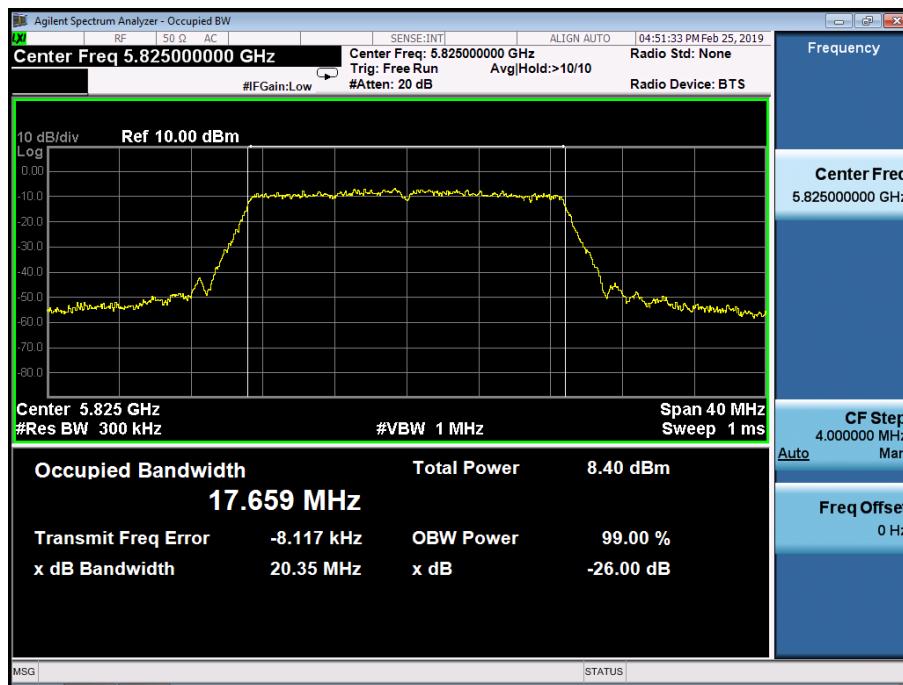
Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11ac(VHT20) mode Frequency(MHz) 5745



Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11ac(VHT20) mode Frequency(MHz) 5785

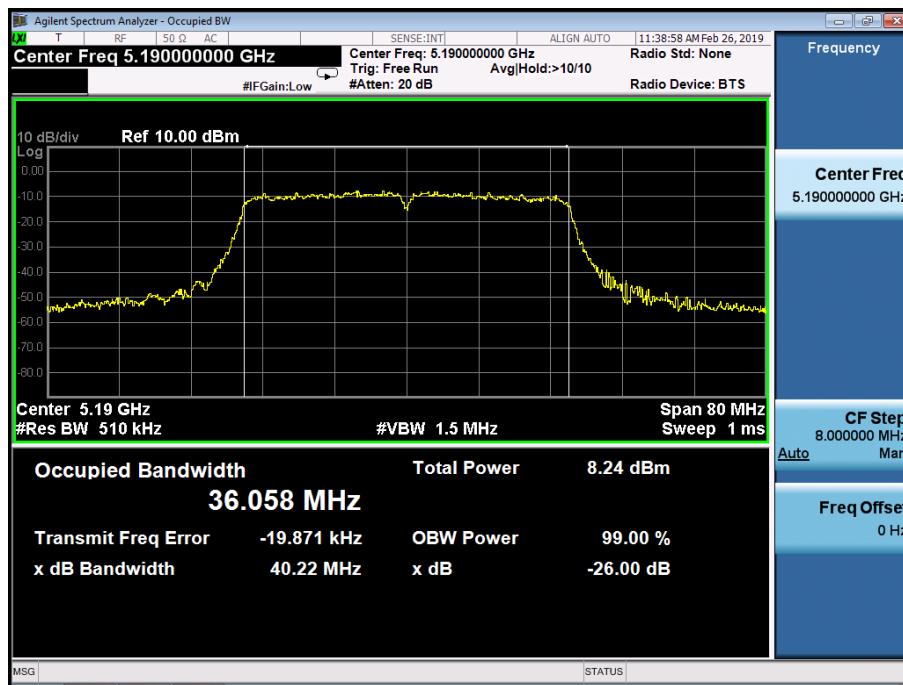


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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT20) mode | 5825 |



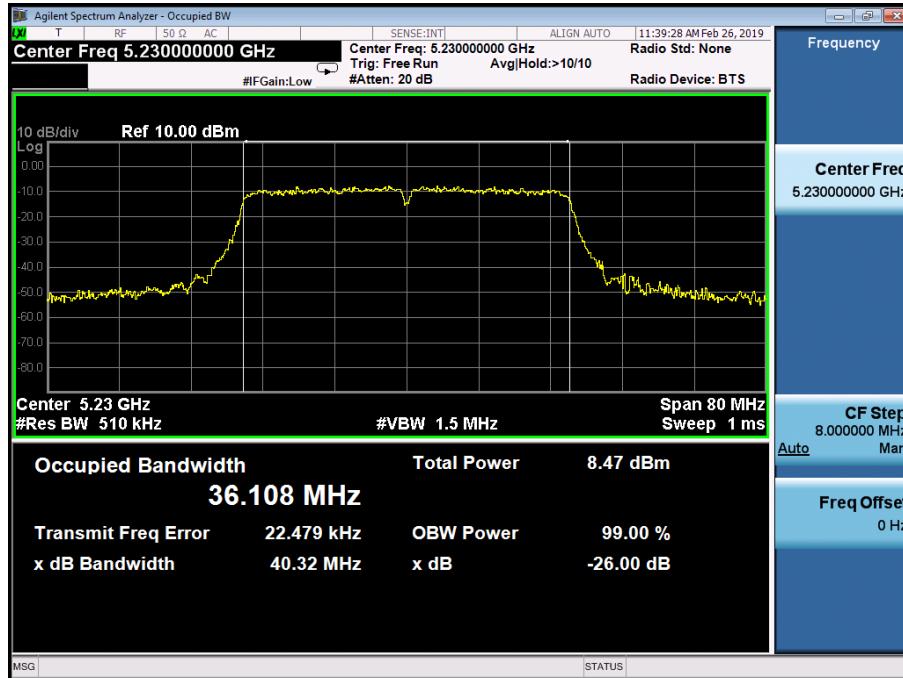
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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model 802.11n(HT40) mode | Frequency(MHz) |

5190

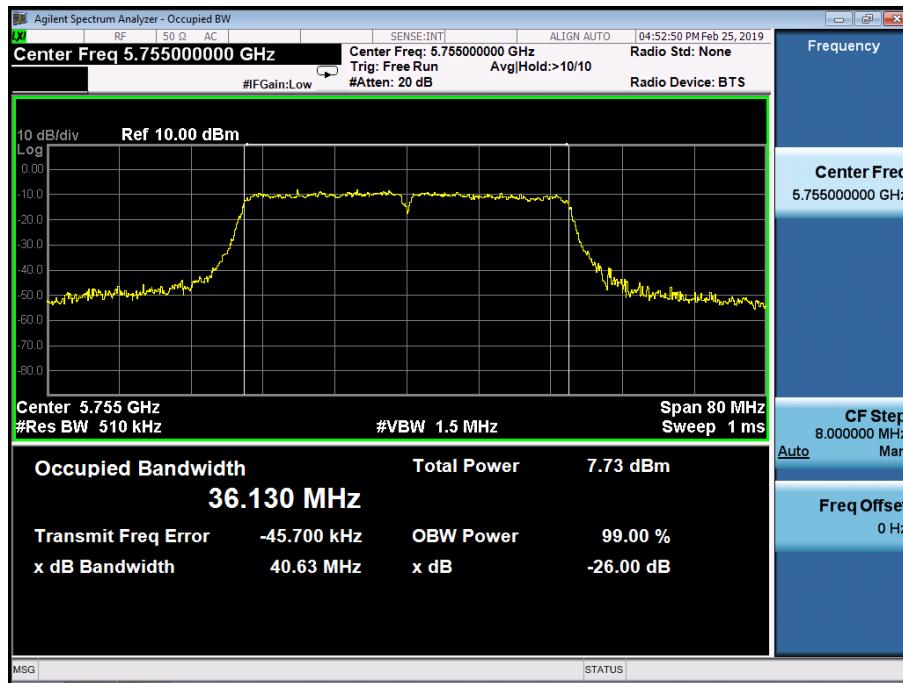


| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model 802.11n(HT40) mode | Frequency(MHz) |

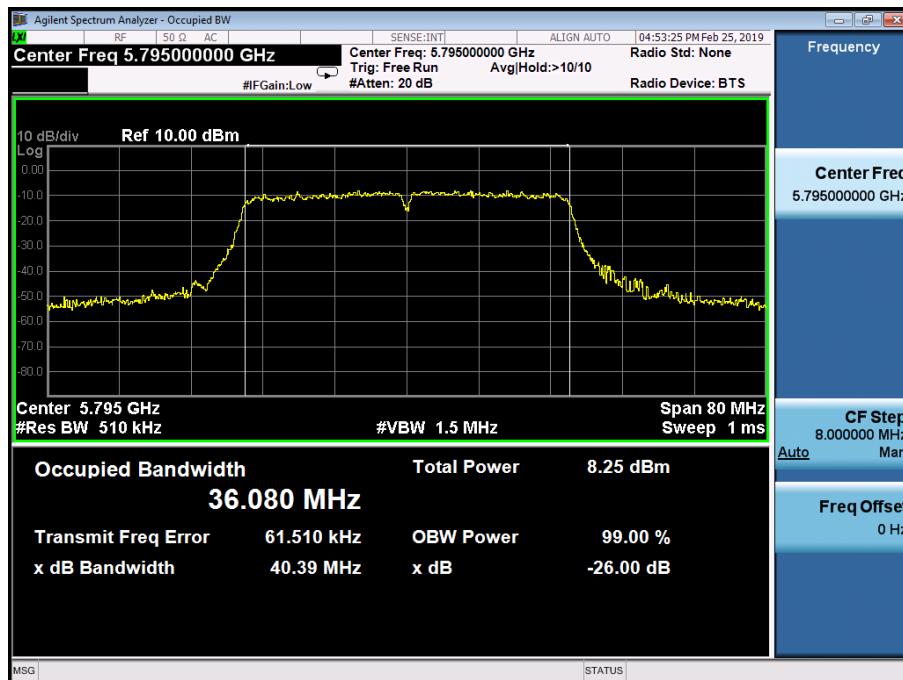
5230



Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11n(HT40) mode Frequency(MHz) 5755

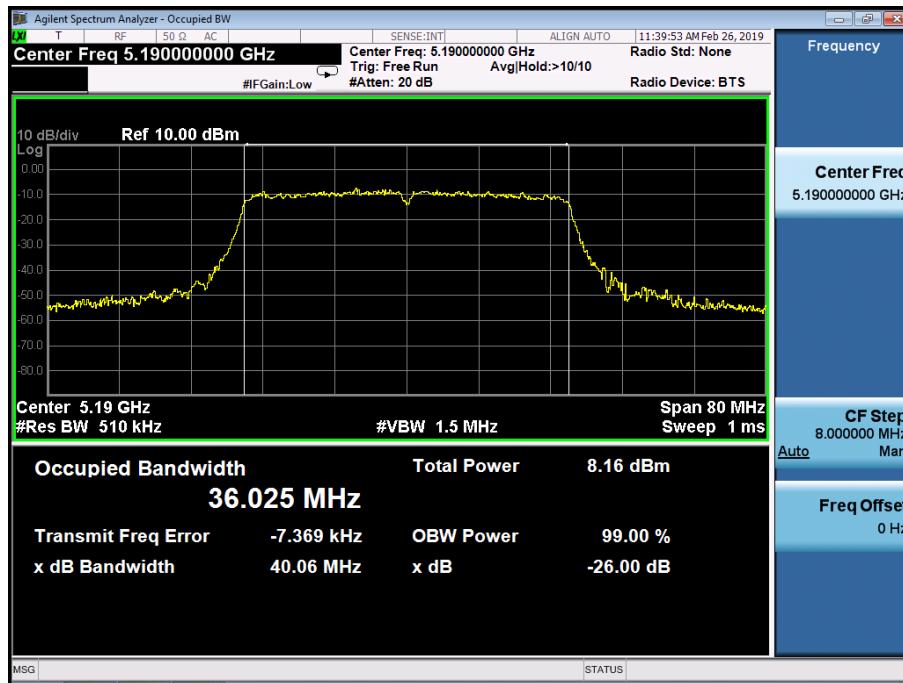


Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11n(HT40) mode Frequency(MHz) 5795



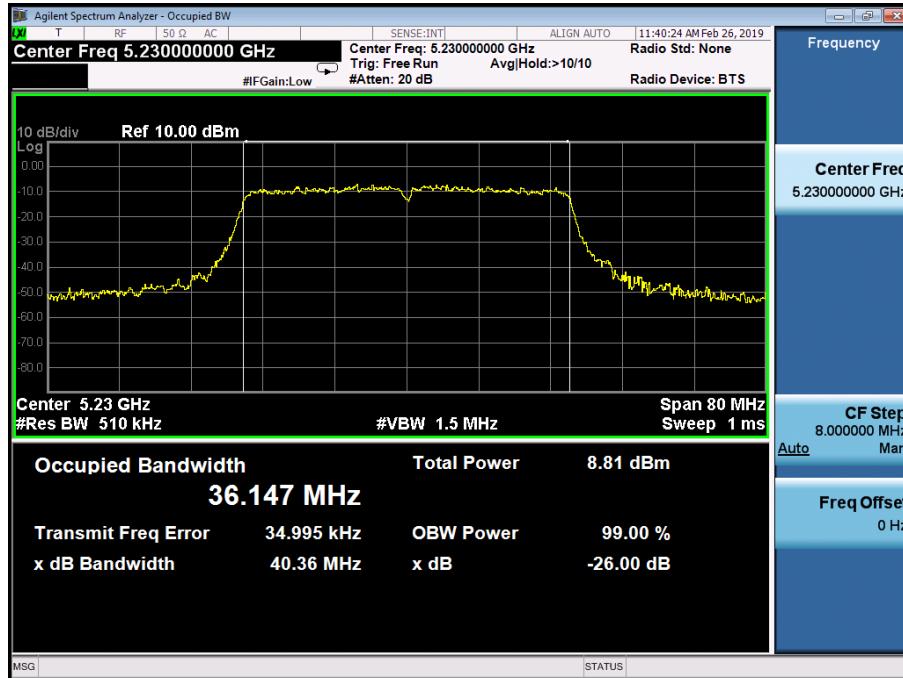
Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11ac(VHT40) mode Frequency(MHz)

5190

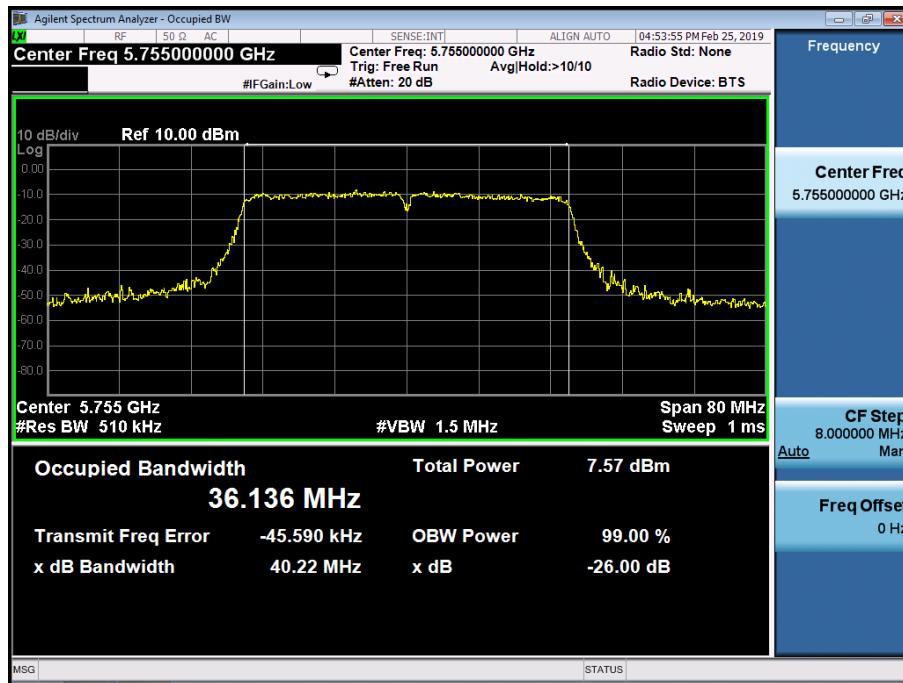


Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11ac(VHT40) mode Frequency(MHz)

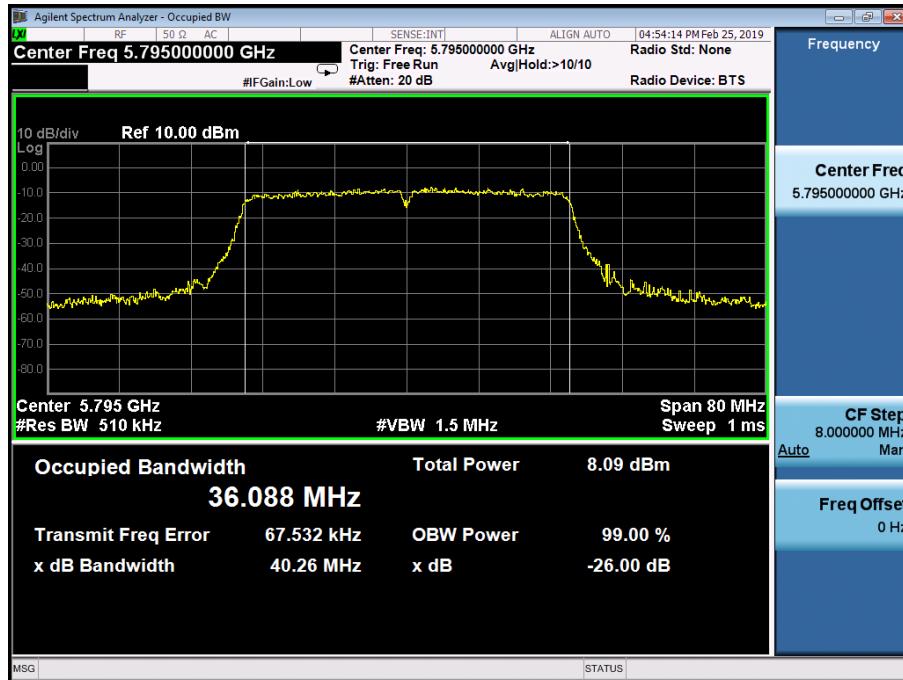
5230



Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11ac(VHT40) mode Frequency(MHz) 5755

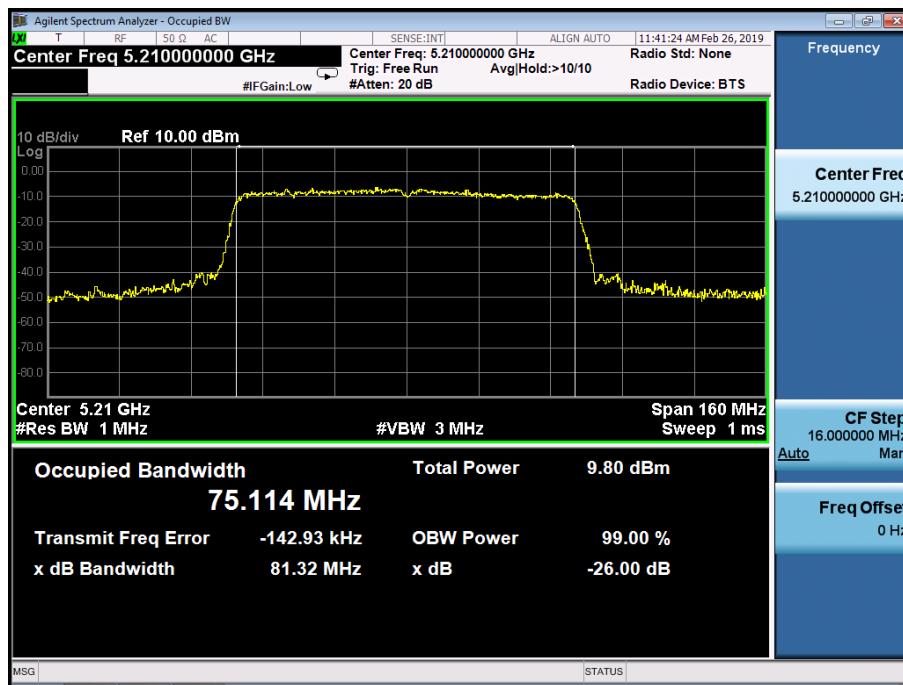


Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11ac(VHT40) mode Frequency(MHz) 5795



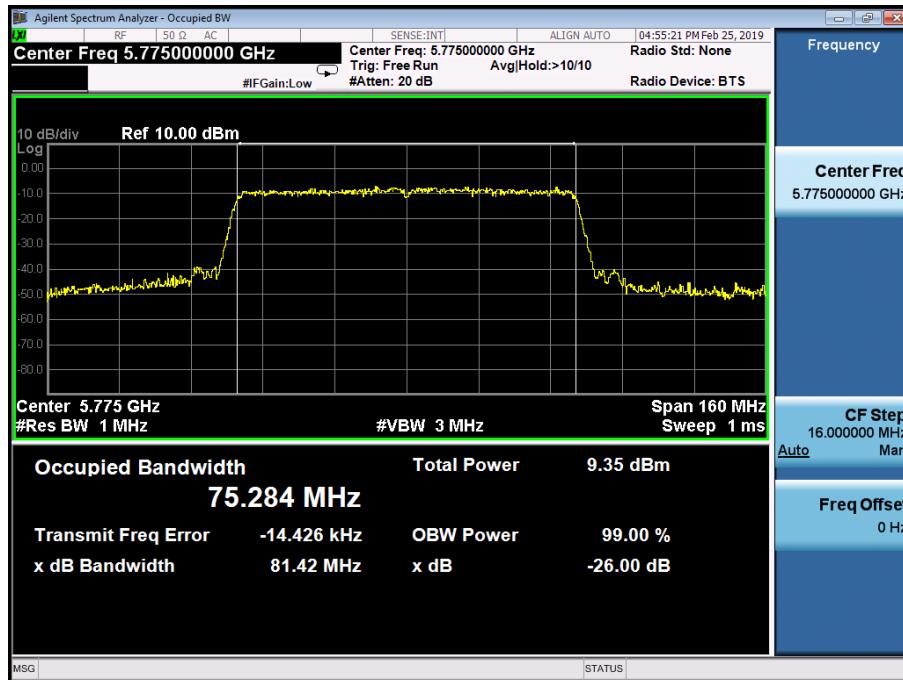
| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model 802.11ac(VHT80) mode | Frequency(MHz) |

5210



| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT80) mode | Frequency(MHz) |

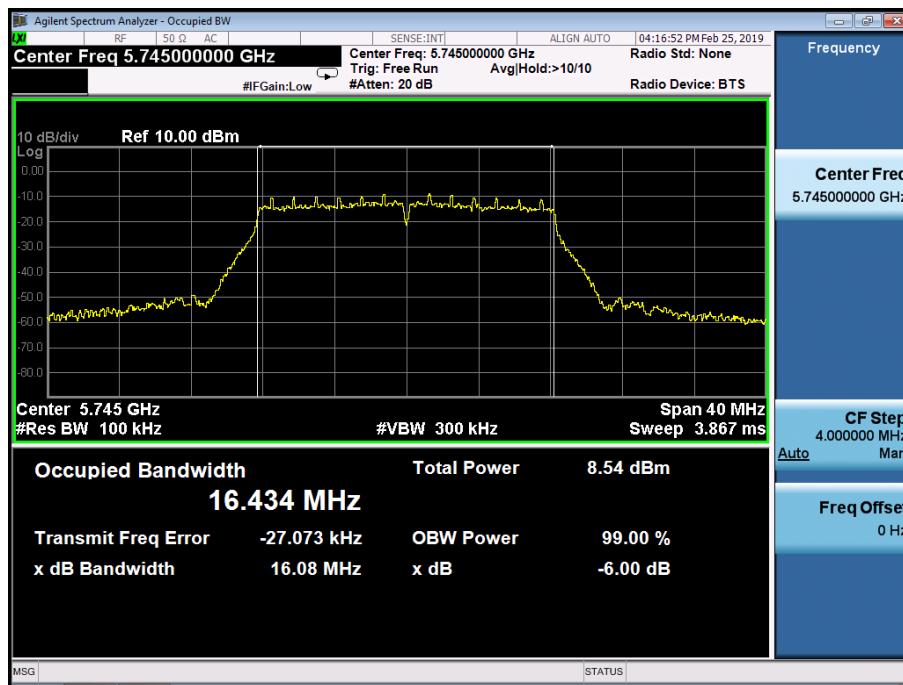
5775



Minimum Emission Bandwidth
Test Model 802.11a mode

UNII Band III
Frequency(MHz)

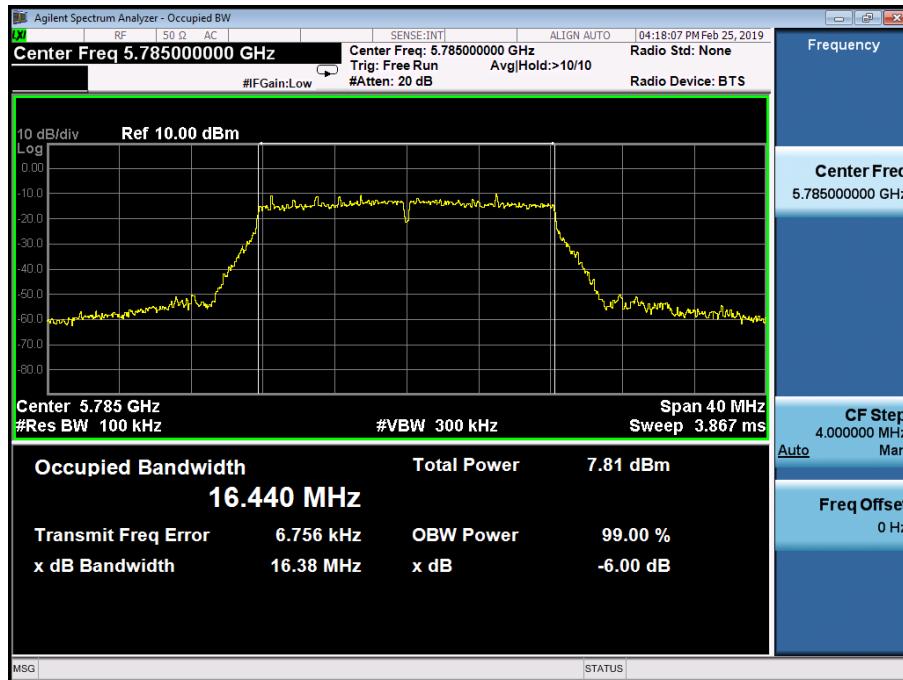
5745



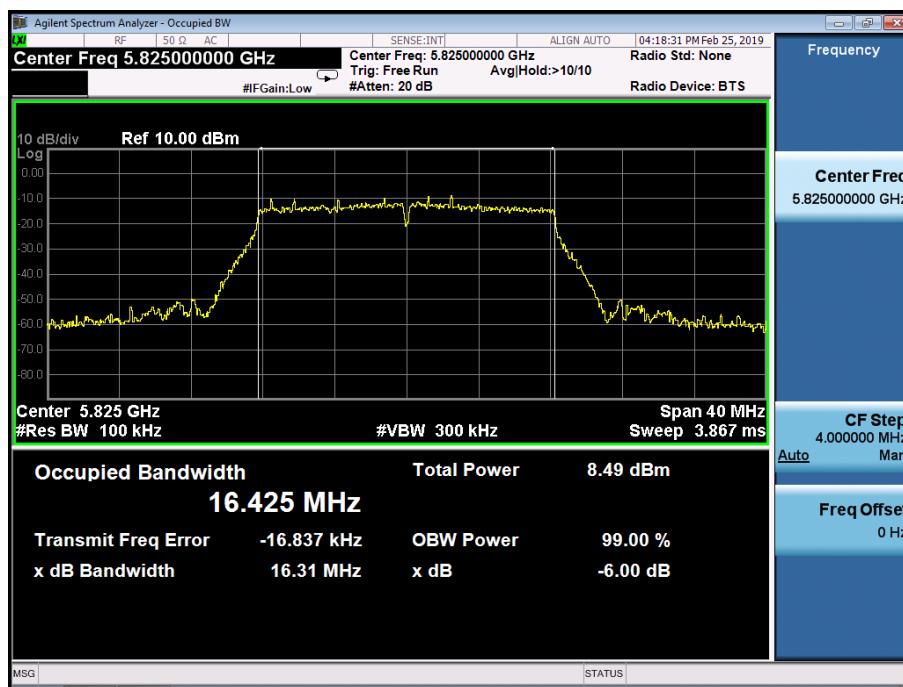
Minimum Emission Bandwidth
Test Model 802.11a mode

UNII Band III
Frequency(MHz)

5785



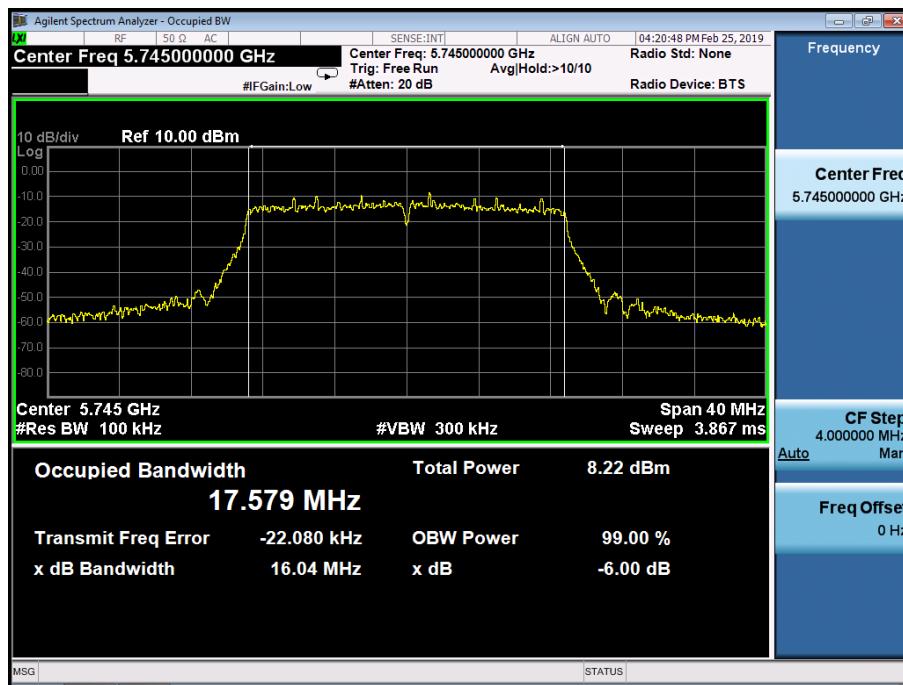
| | |
|----------------------------|------------------------|
| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11a mode | Frequency(MHz) 5825 |



Minimum Emission Bandwidth
Test Model 802.11n(HT20) mode

UNII Band III
Frequency(MHz)

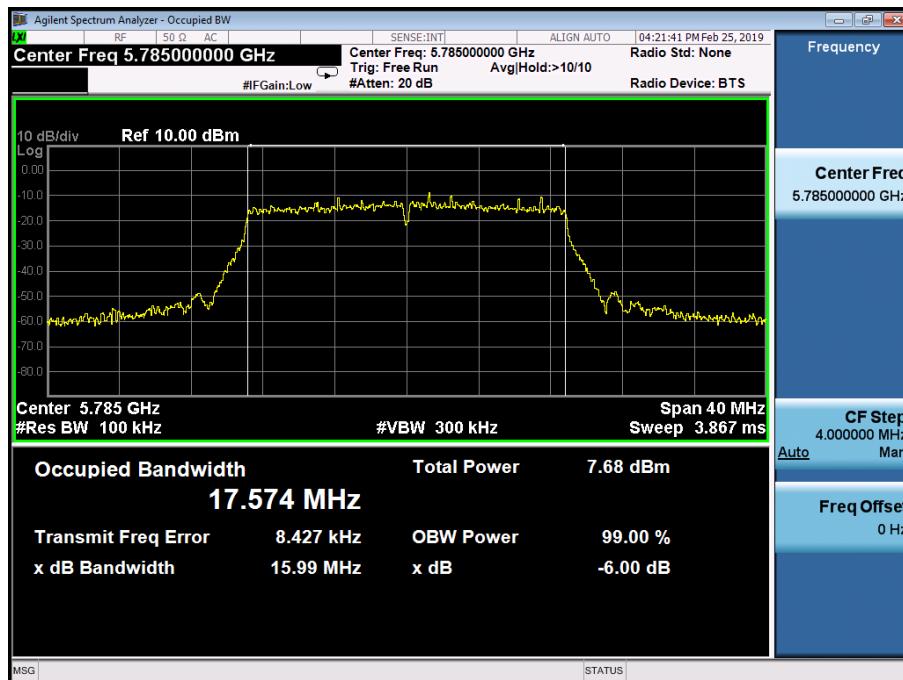
5745



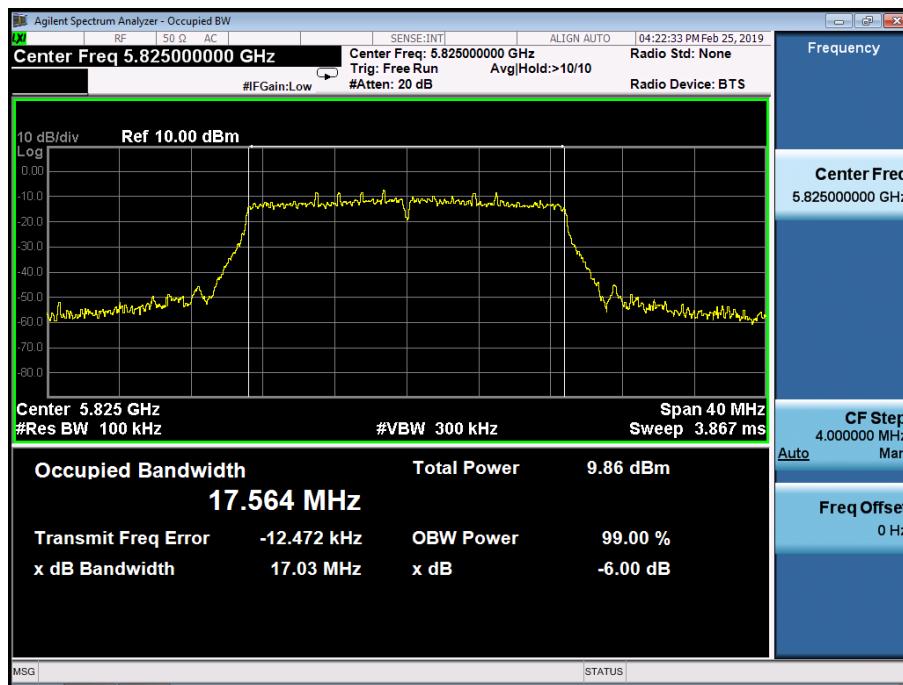
Minimum Emission Bandwidth
Test Model 802.11n(HT20) mode

UNII Band III
Frequency(MHz)

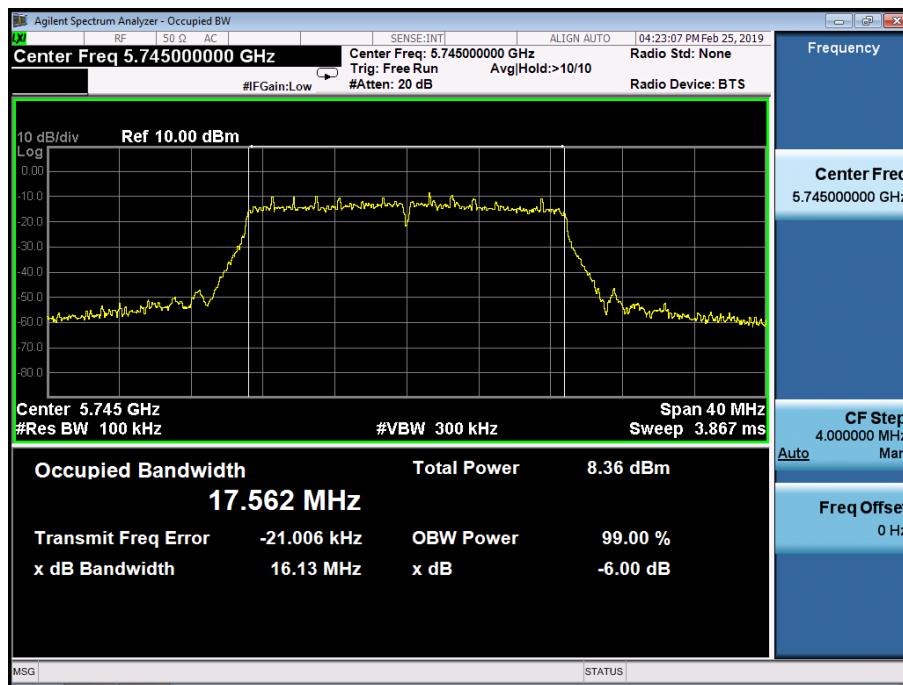
5785



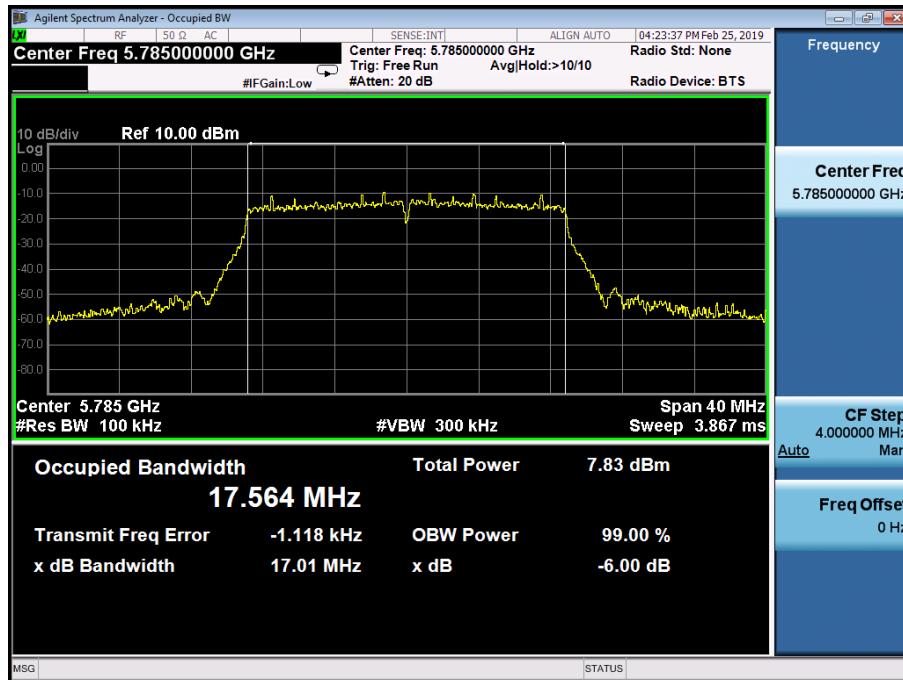
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| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11n(VHT20) mode | Frequency(MHz) 5825 |



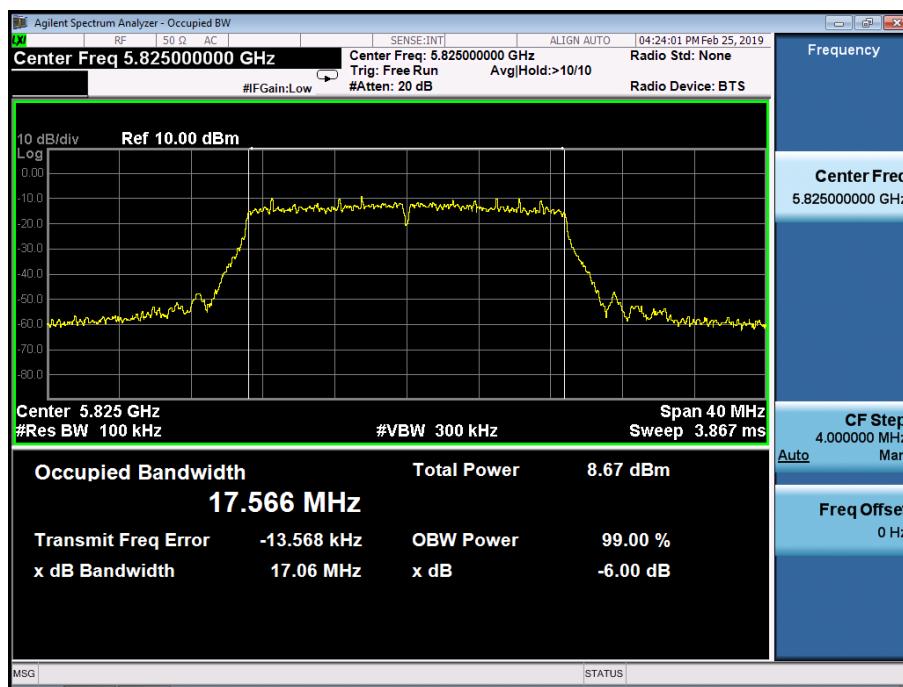
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| Test Model 802.11ac(VHT20) mode | Frequency(MHz) 5745 |



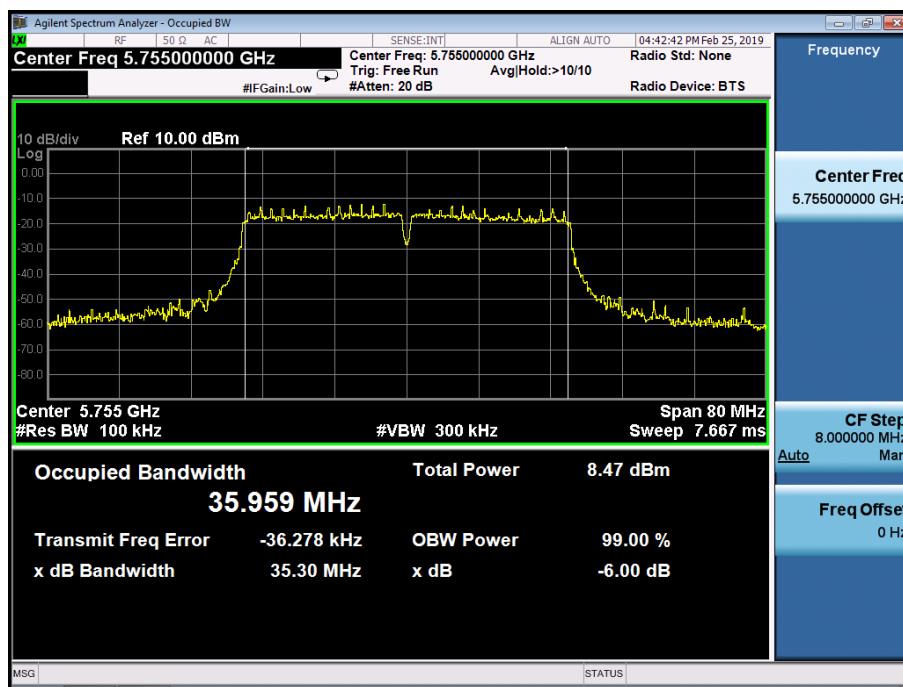
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| Test Model 802.11ac(VHT20) mode | Frequency(MHz) 5785 |



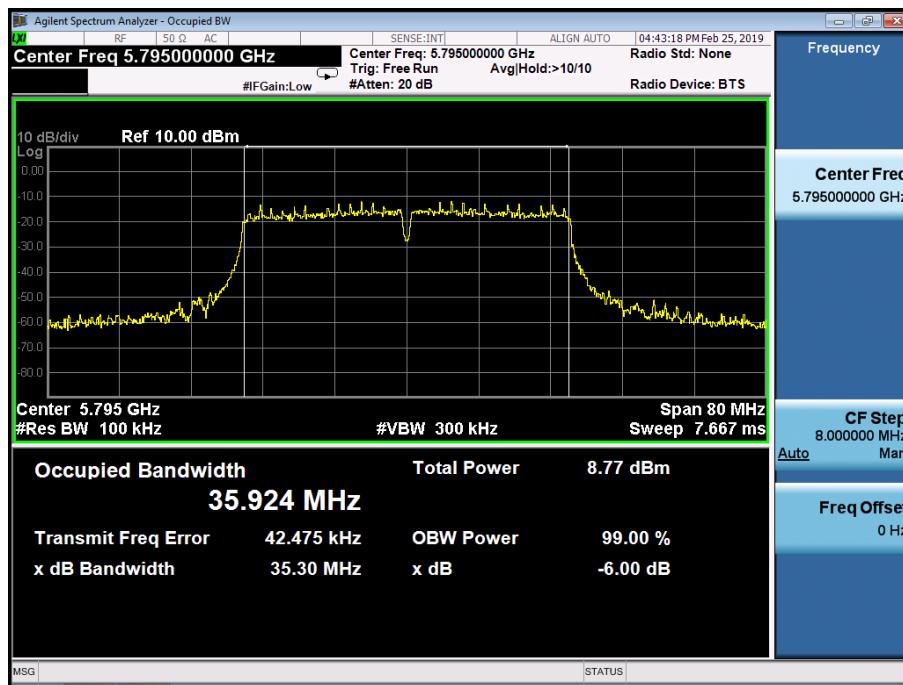
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| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT20) mode | Frequency(MHz) 5825 |



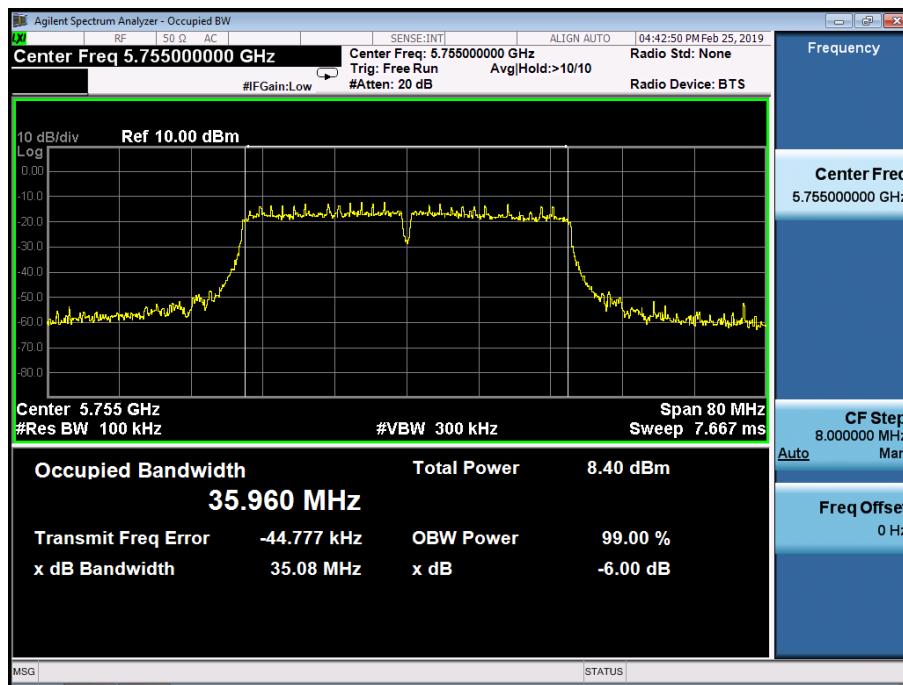
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|-------------------------------|---------------------|
| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11n(HT40) mode | Frequency(MHz) 5755 |



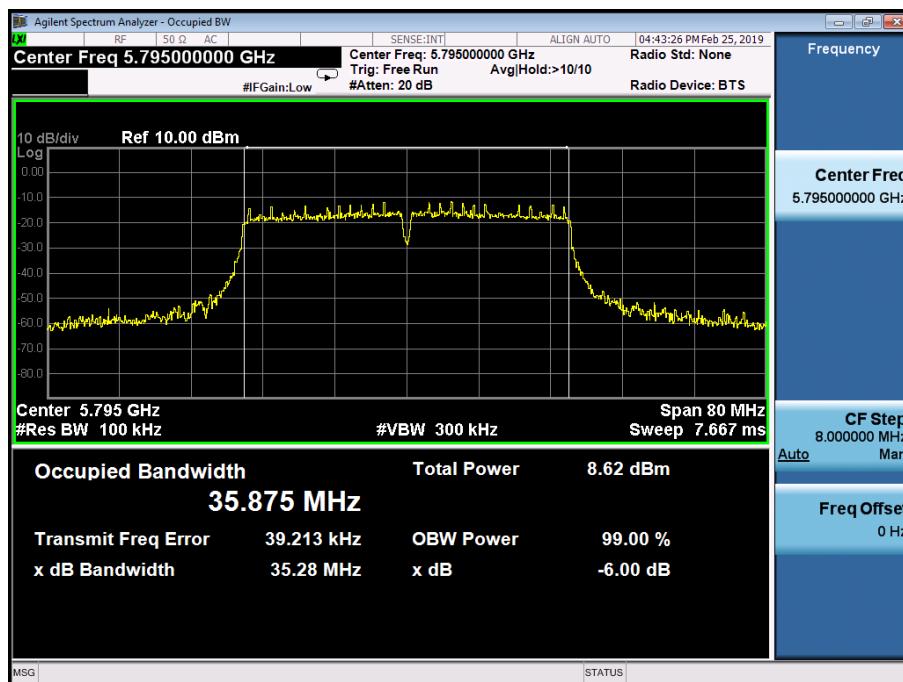
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| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11n(HT40) mode | Frequency(MHz) 5795 |



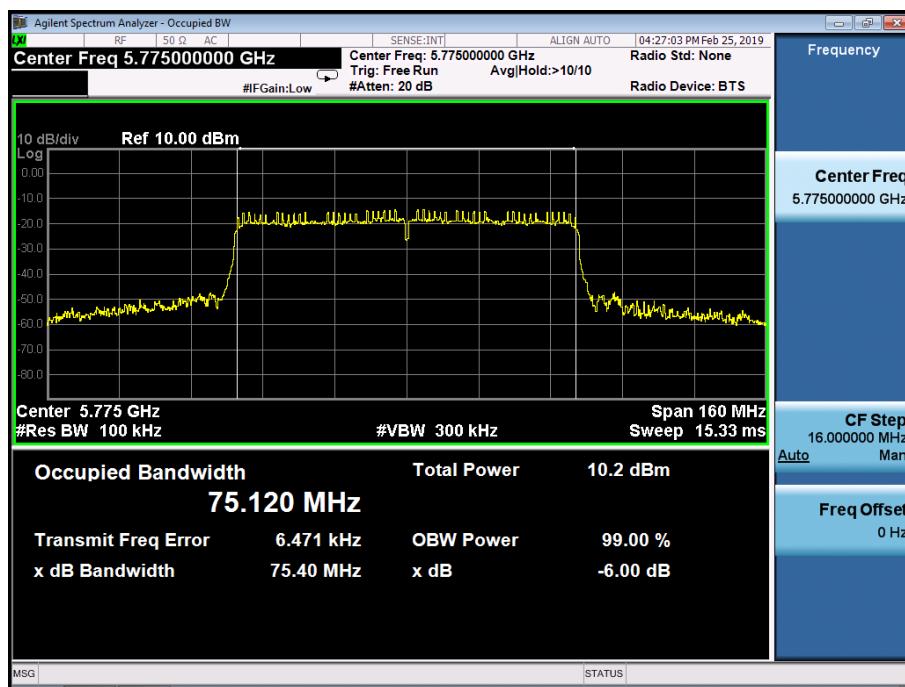
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| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT40) mode | Frequency(MHz) 5755 |



| | |
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| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT40) mode | Frequency(MHz) 5795 |

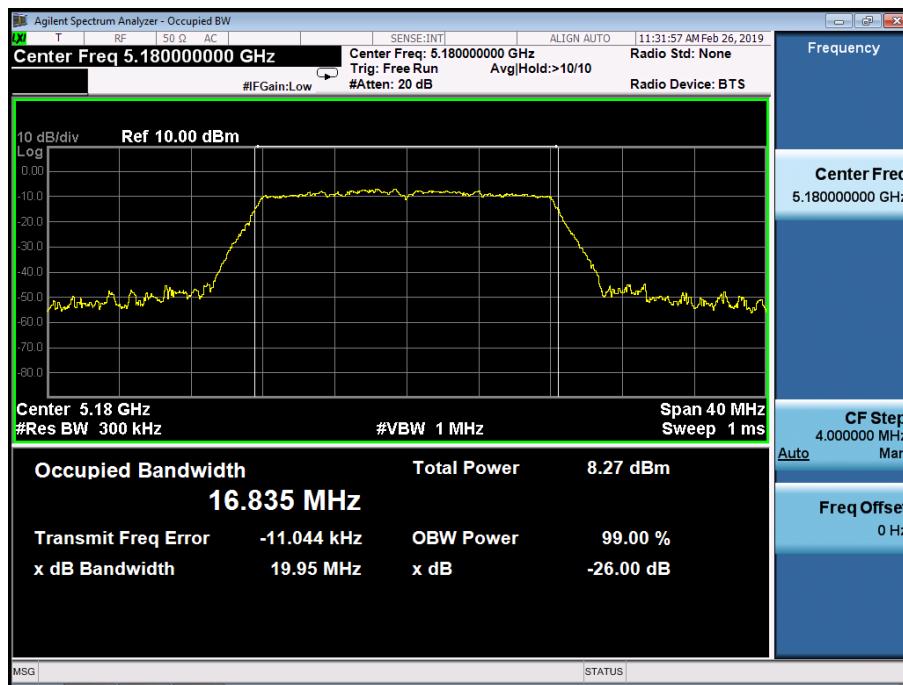


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| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT80) mode | Frequency(MHz) 5775 |

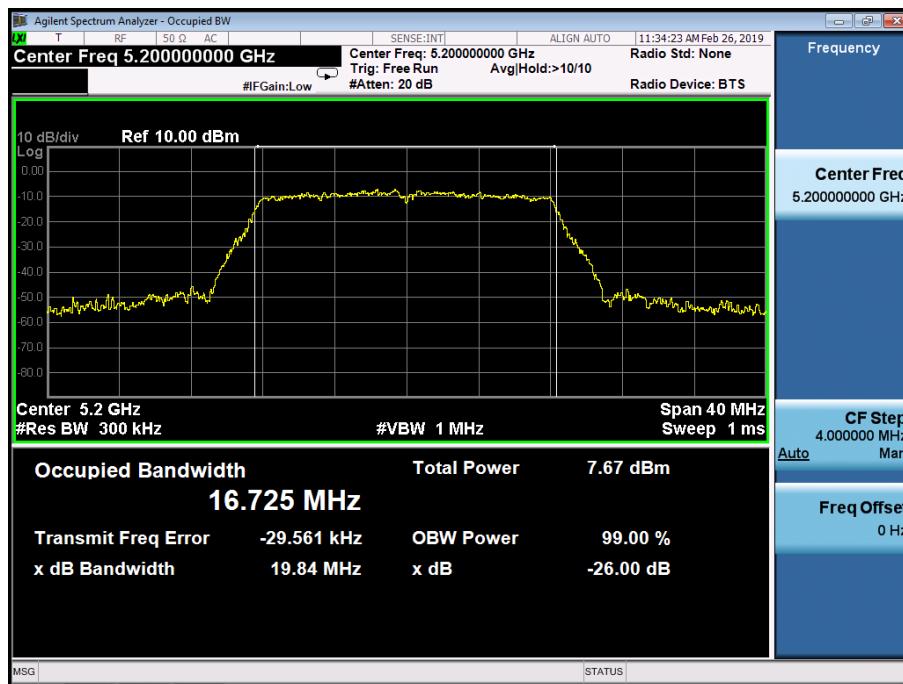


B. Antenna 1

| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11a | 5180 |

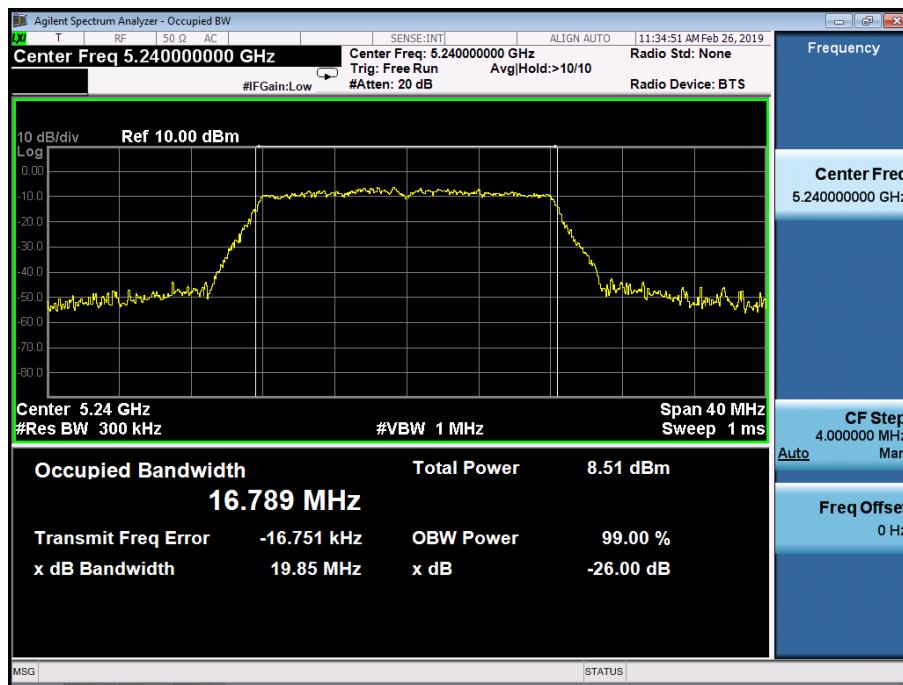


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|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11a | 5200 |

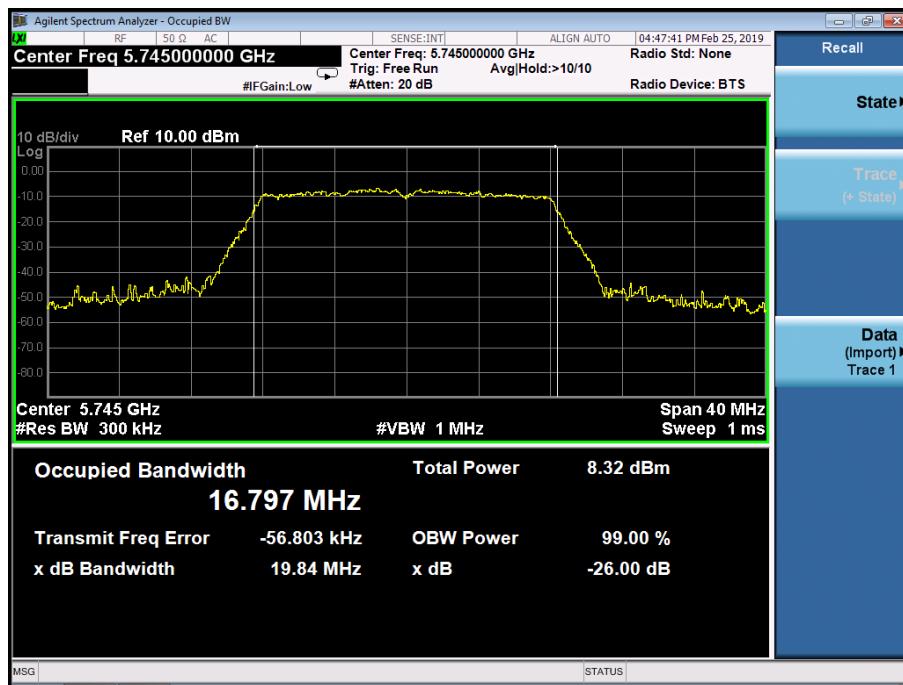


Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11a Frequency(MHz)

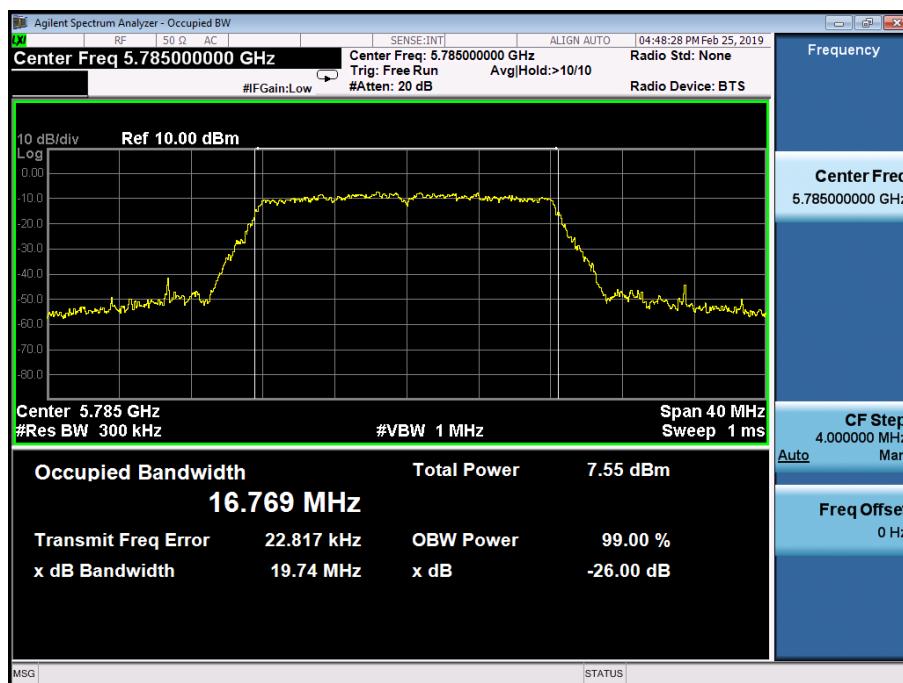
5240



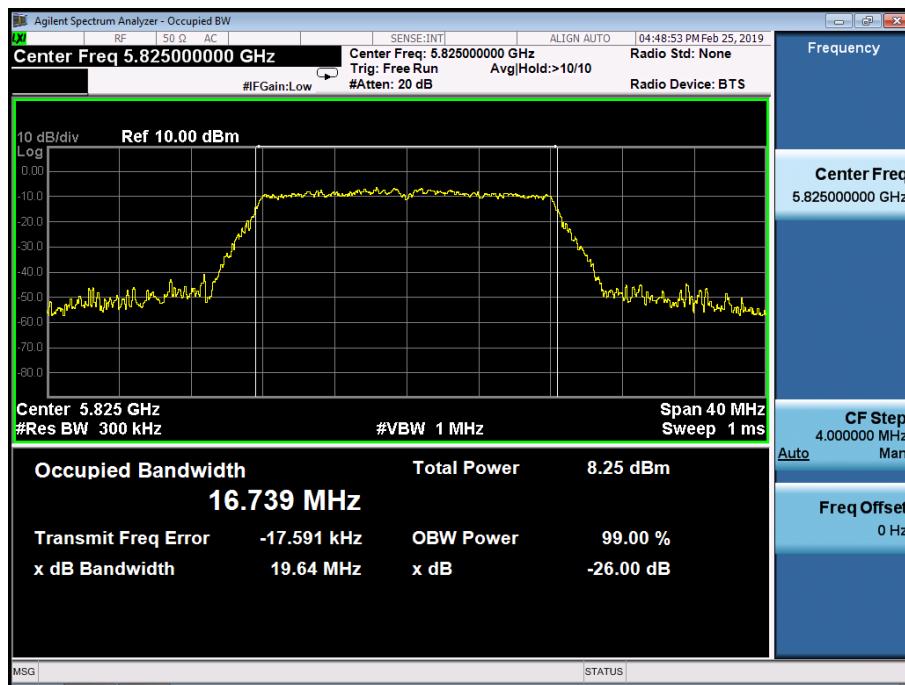
| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11a | 5745 |



| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11a | 5785 |

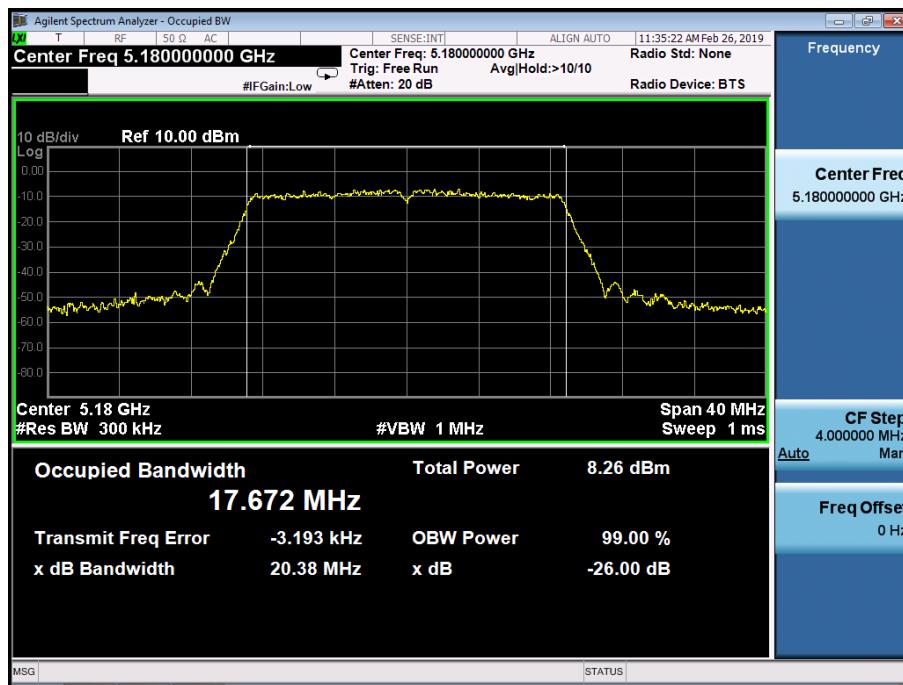


| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11a | 5825 |



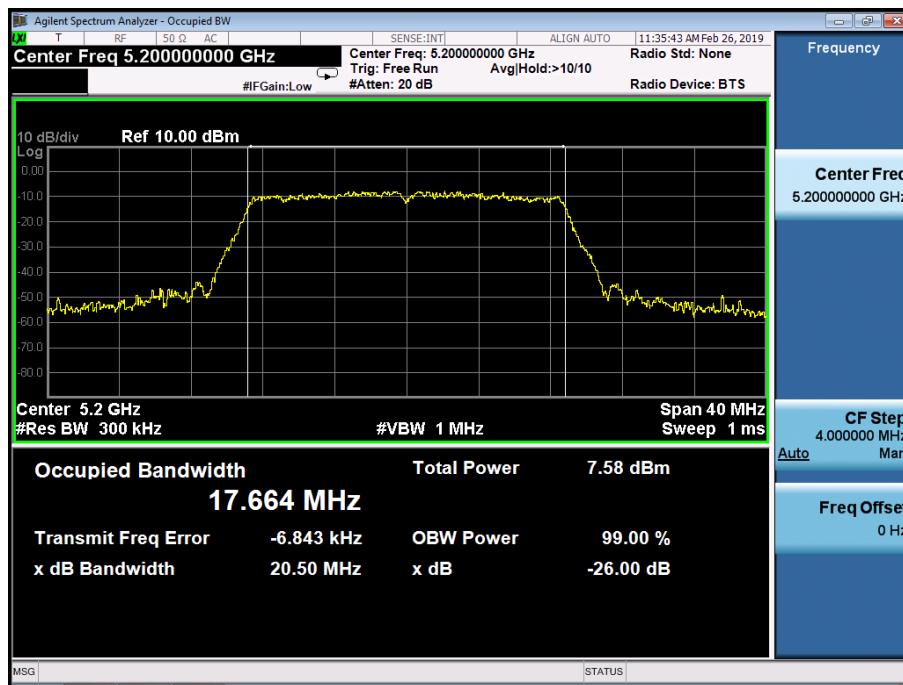
Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11n(HT20) mode Frequency(MHz)

5180

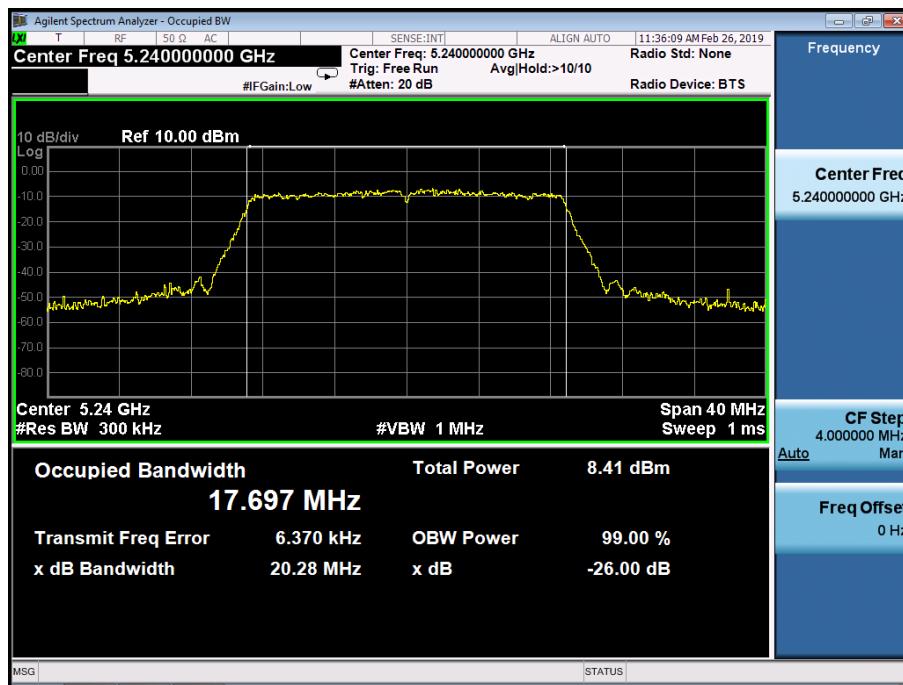


Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11n(HT20) mode Frequency(MHz)

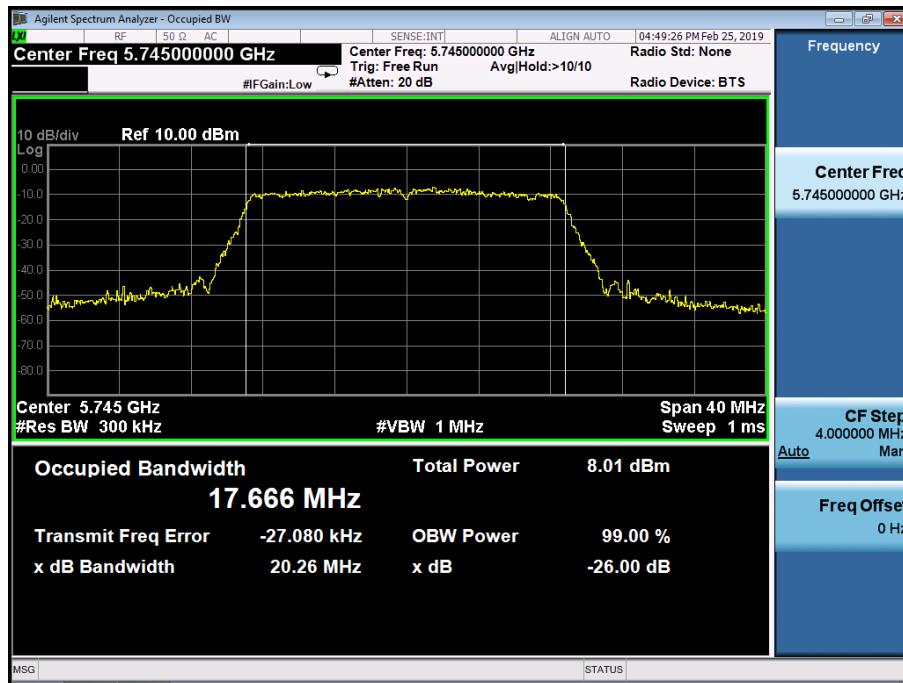
5200



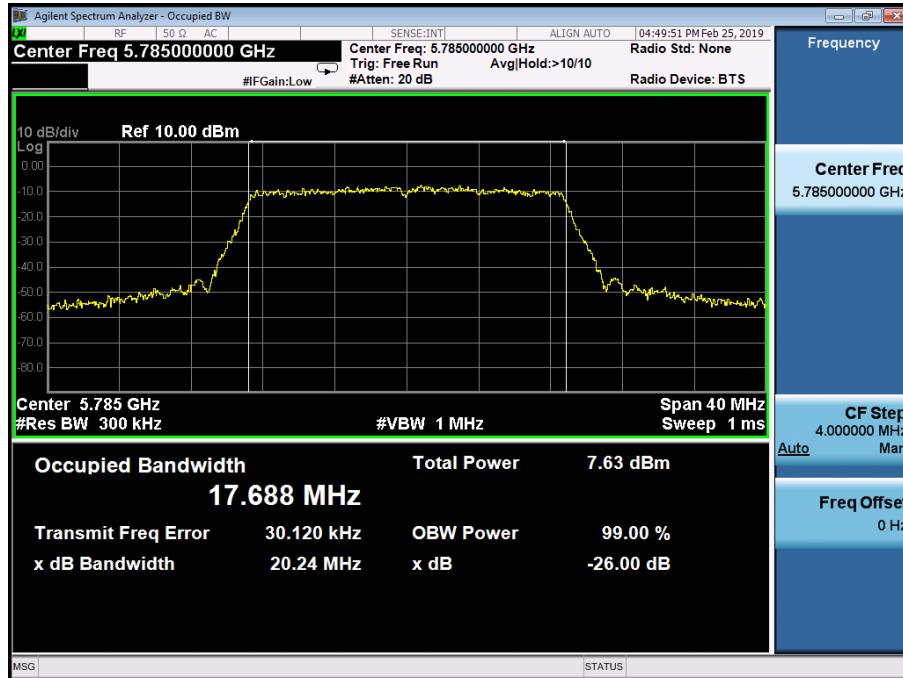
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|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11n(HT20) mode | 5240 |



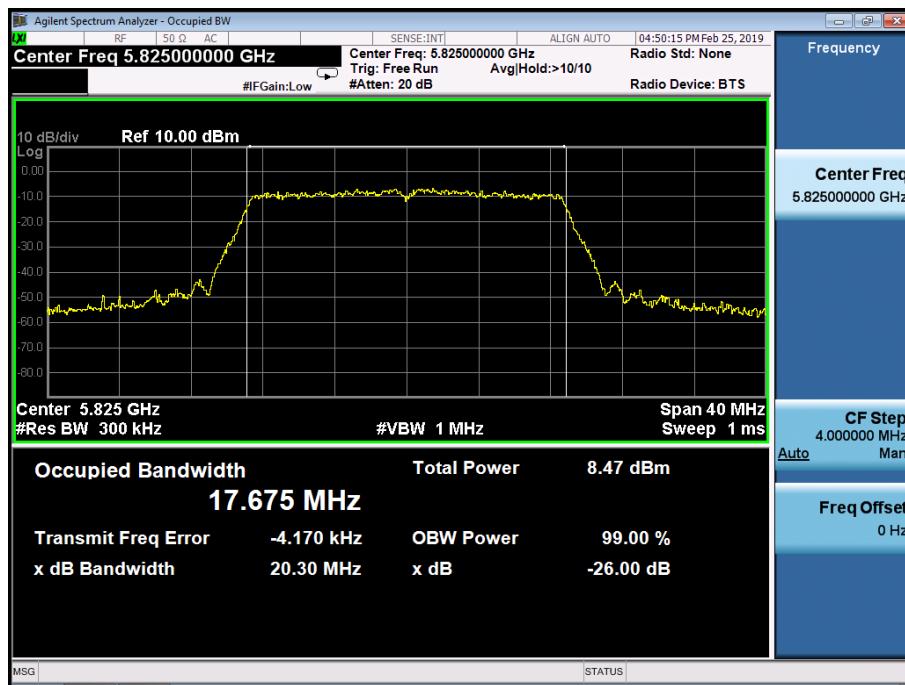
Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11n(HT20) mode Frequency(MHz) 5745



Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11n(HT20) mode Frequency(MHz) 5785

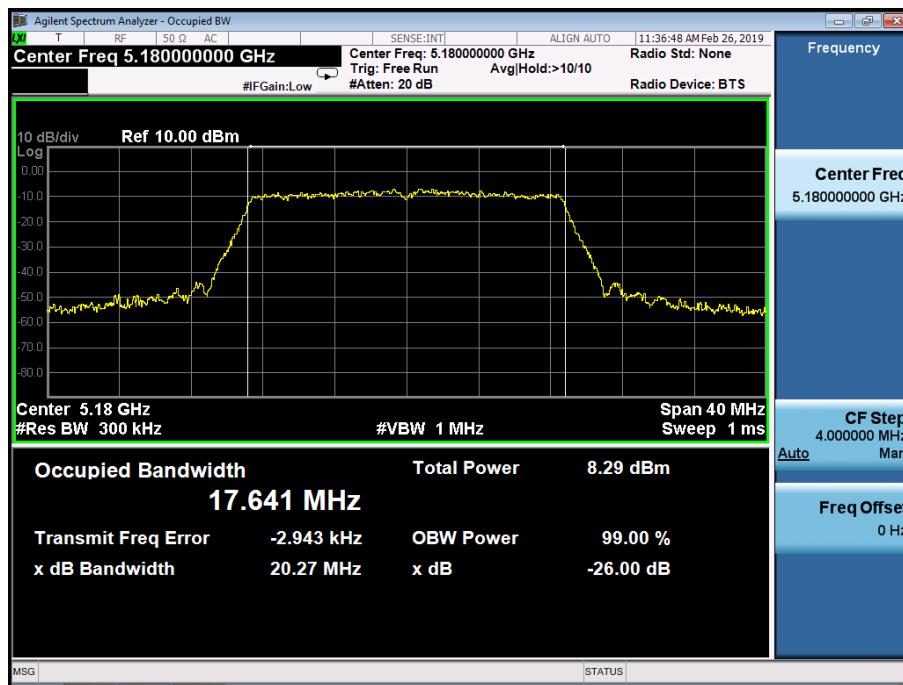


| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11n(HT20) mode | 5825 |



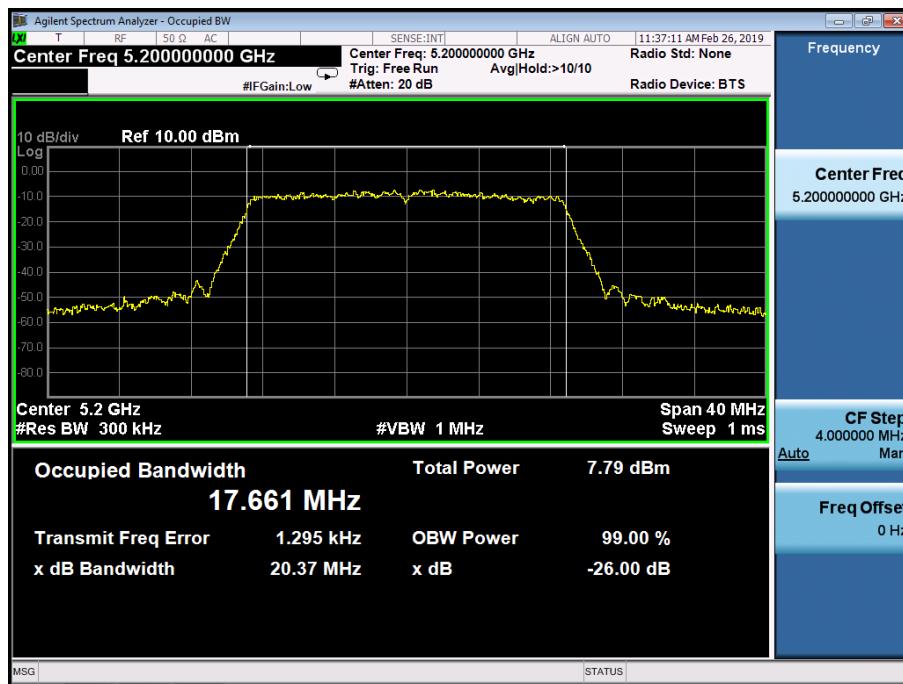
Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11ac(VHT20) mode Frequency(MHz)

5180

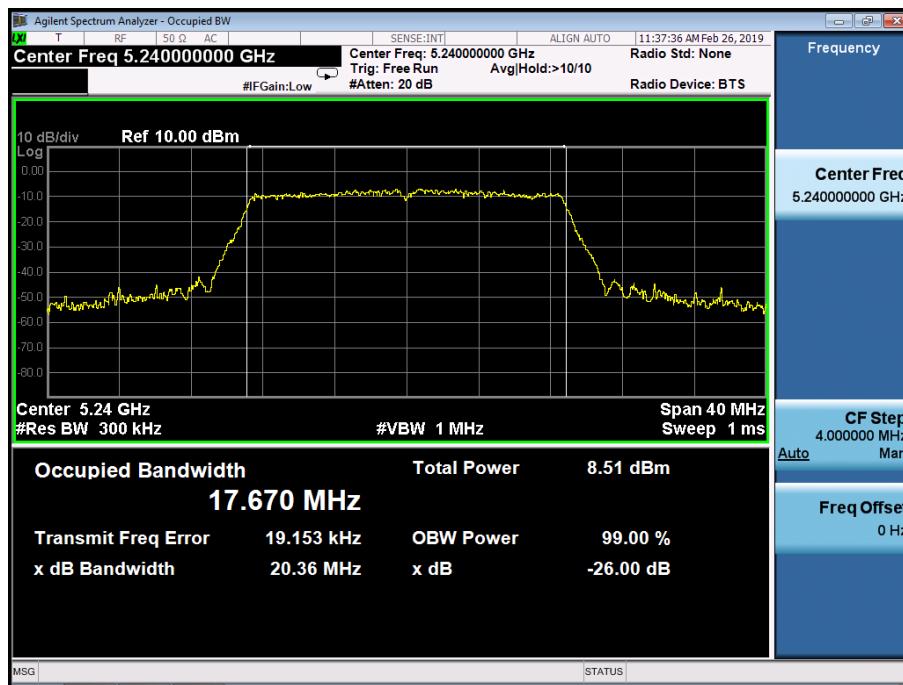


Emission Bandwidth&99% Occupied Bandwidth UNII Band I
 Test Model 802.11ac(VHT20) mode Frequency(MHz)

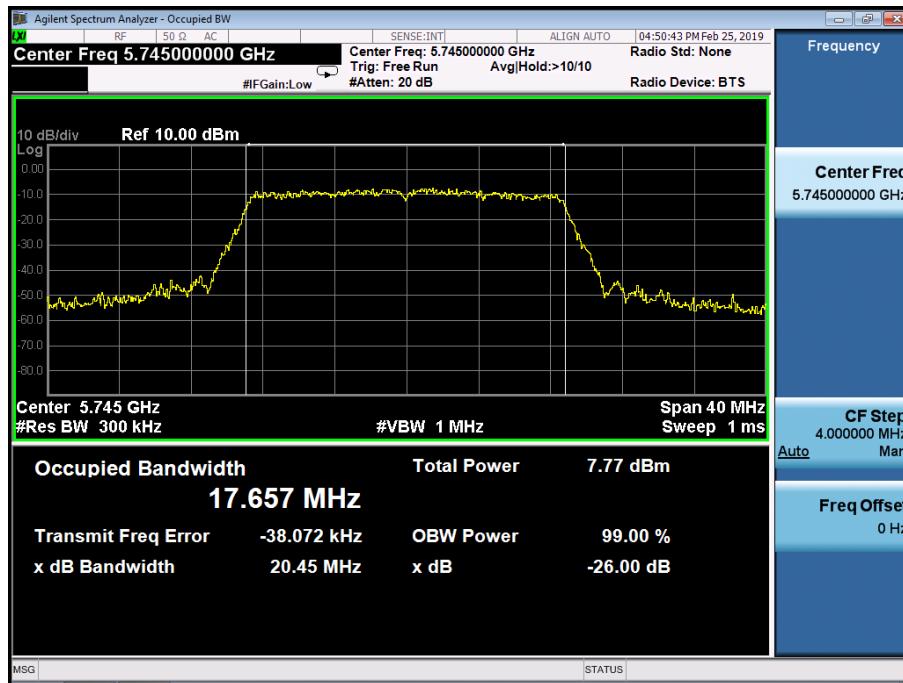
5200



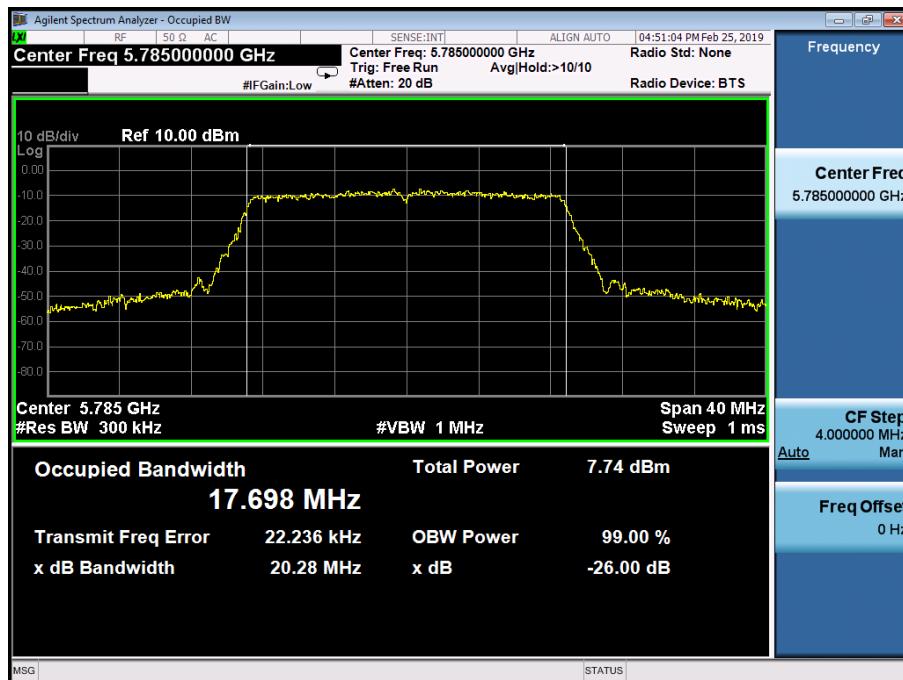
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|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT20) mode | 5240 |



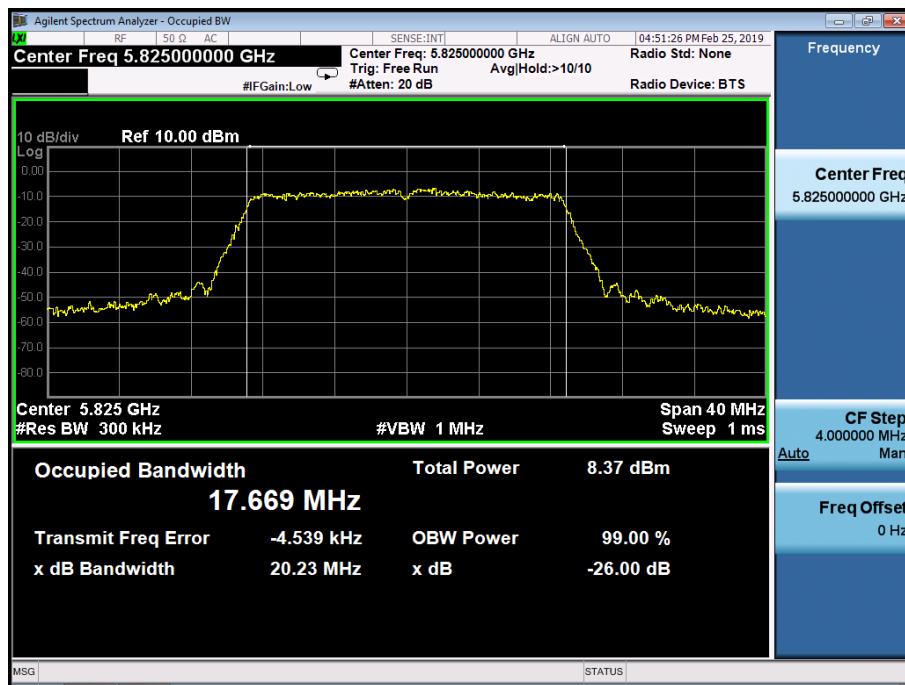
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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT20) mode | 5745 |



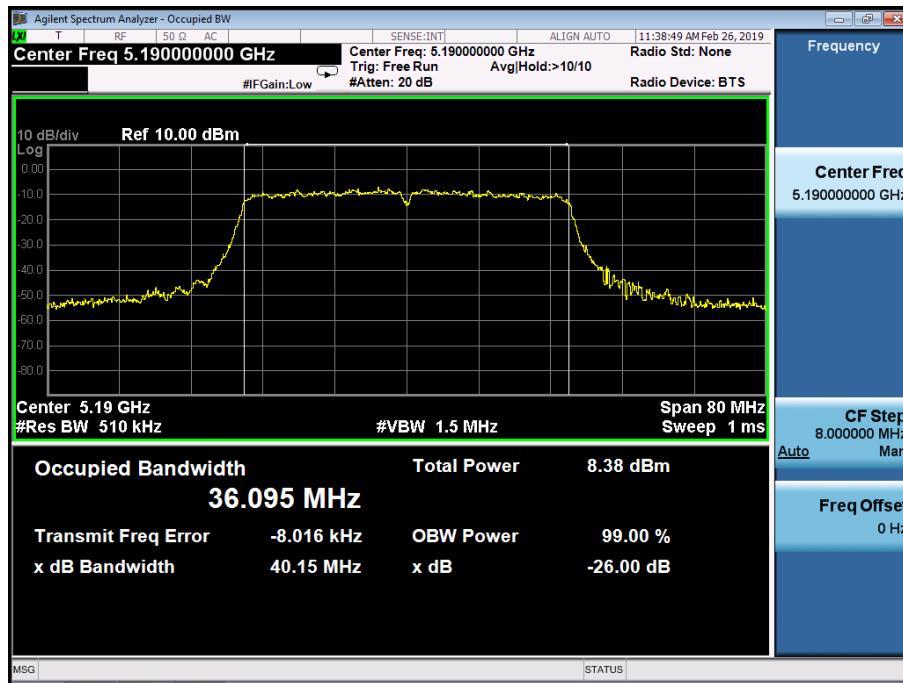
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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT20) mode | 5785 |



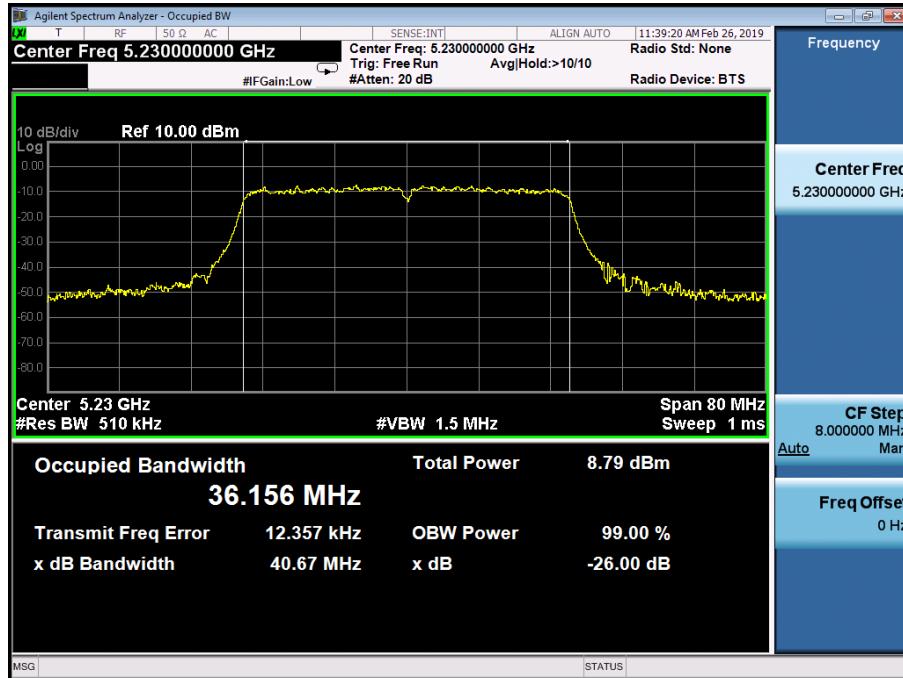
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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT20) mode | 5825 |



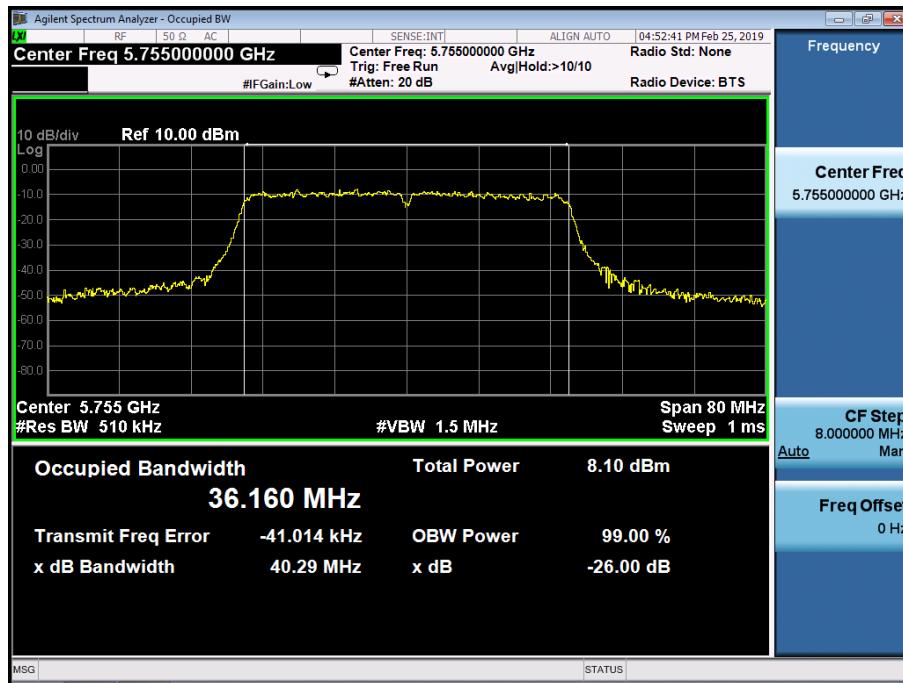
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| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11n(HT40) mode | 5190 |



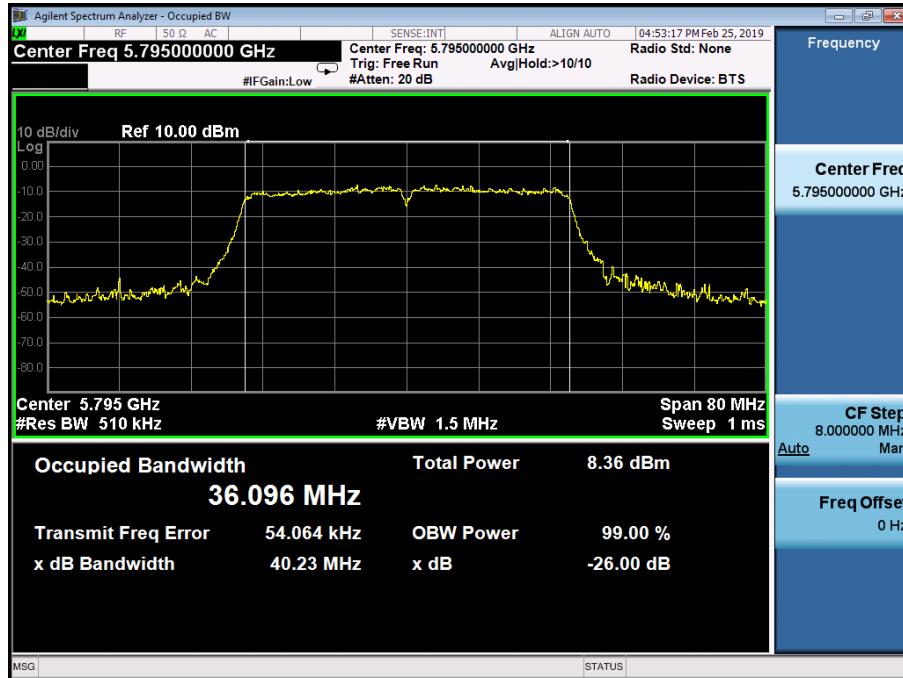
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|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11n(HT40) mode | 5230 |



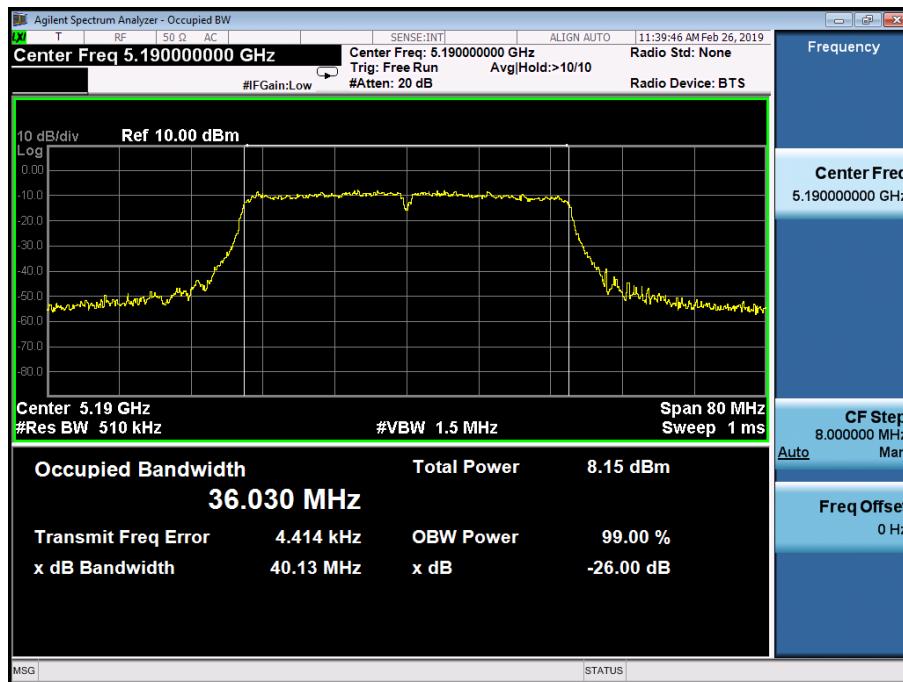
Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11n(HT40) mode Frequency(MHz) 5755



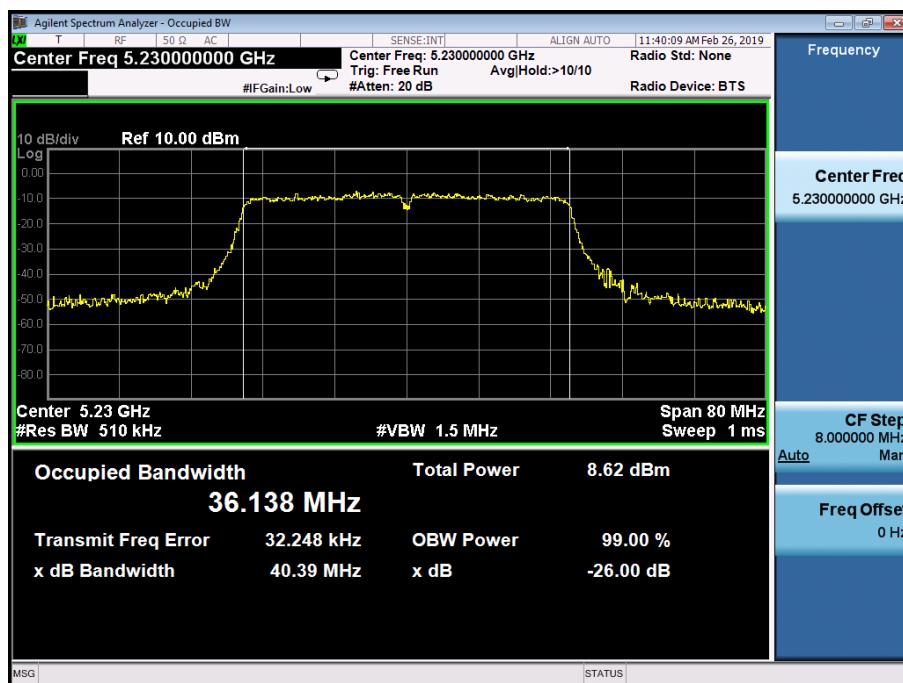
Emission Bandwidth&99% Occupied Bandwidth UNII Band III
 Test Model 802.11n(HT40) mode Frequency(MHz) 5795



| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT40) mode | 5190 |

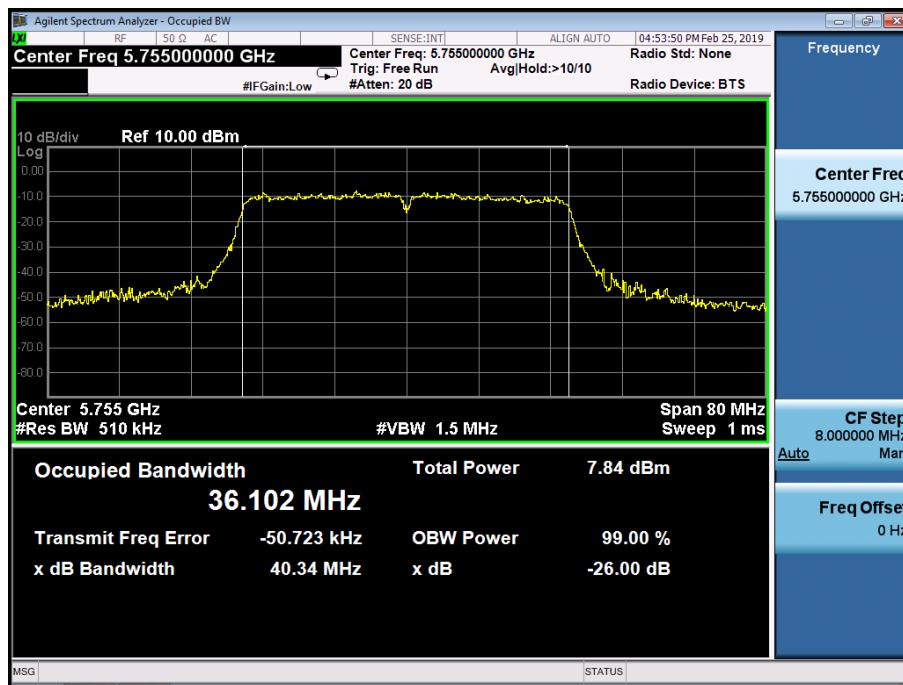


| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model | Frequency(MHz) |
| 802.11ac(VHT40) mode | 5230 |



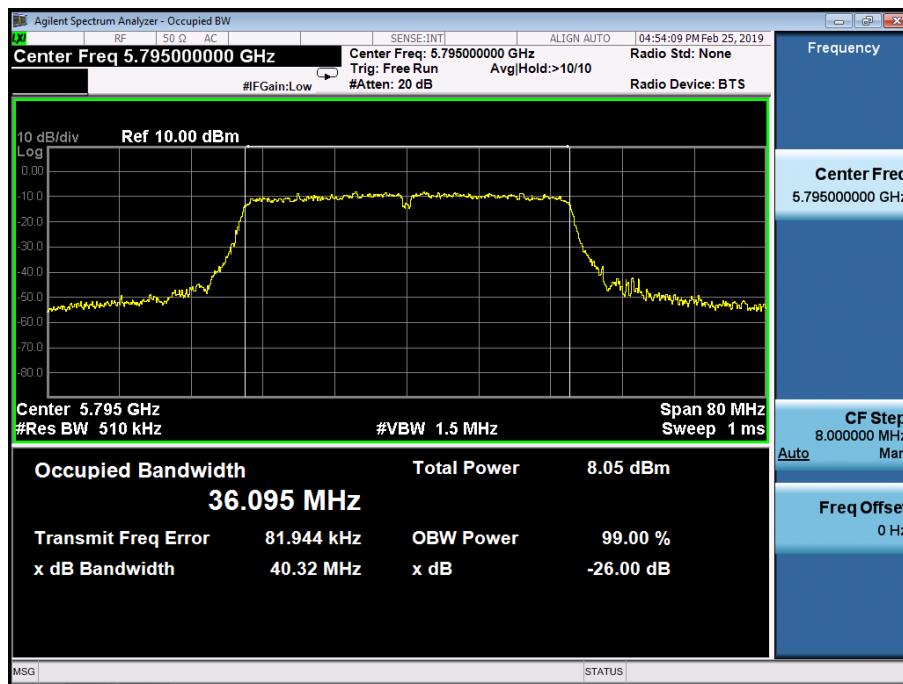
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|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT40) mode | Frequency(MHz) |

5755



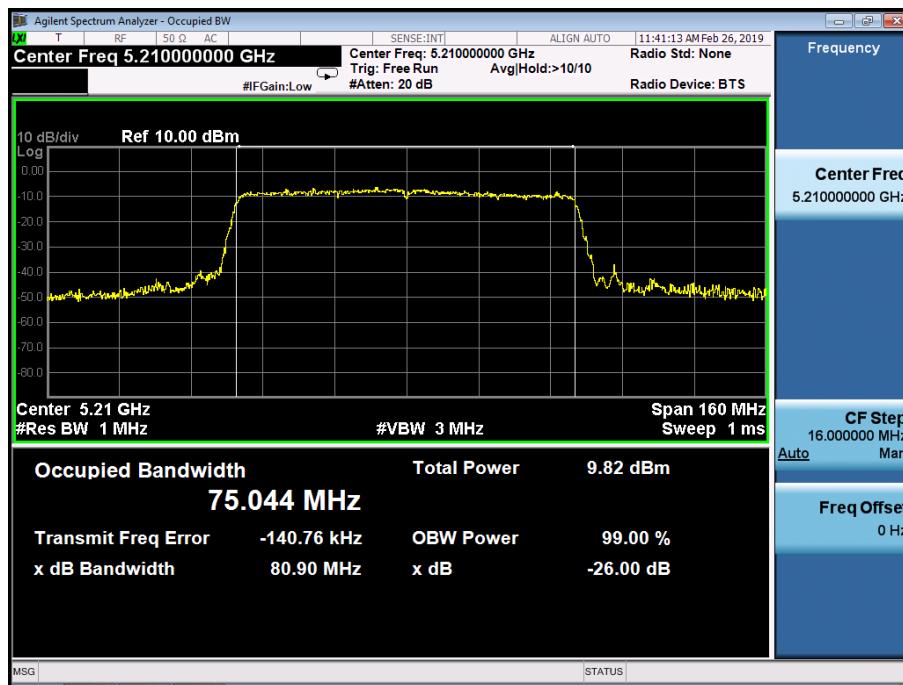
| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT40) mode | Frequency(MHz) |

5795



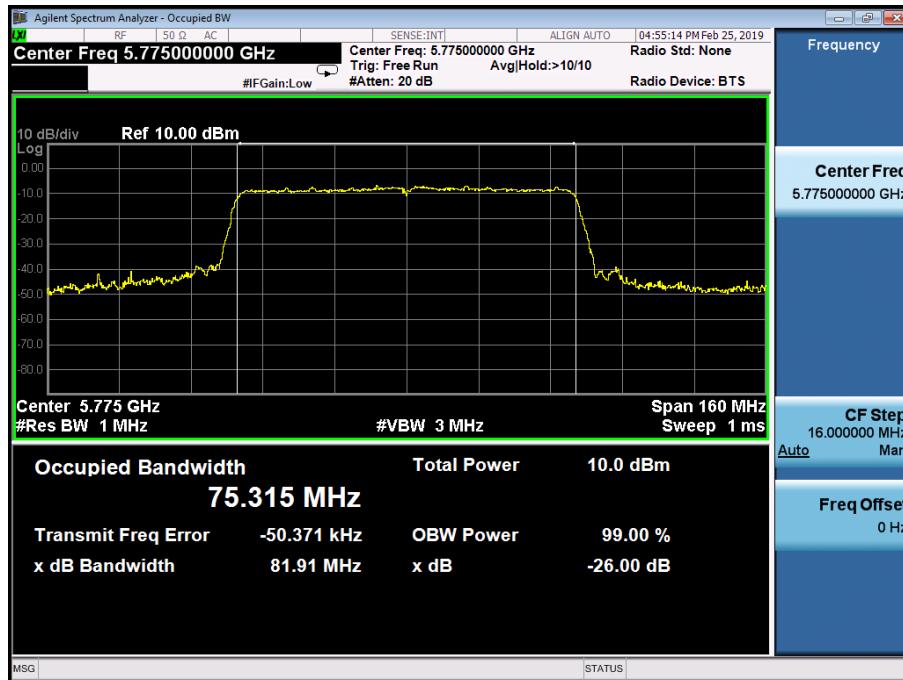
| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band I |
| Test Model 802.11ac(VHT80) mode | Frequency(MHz) |

5210



| | |
|---|----------------|
| Emission Bandwidth&99% Occupied Bandwidth | UNII Band III |
| Test Model 802.11ac(VHT80) mode | Frequency(MHz) |

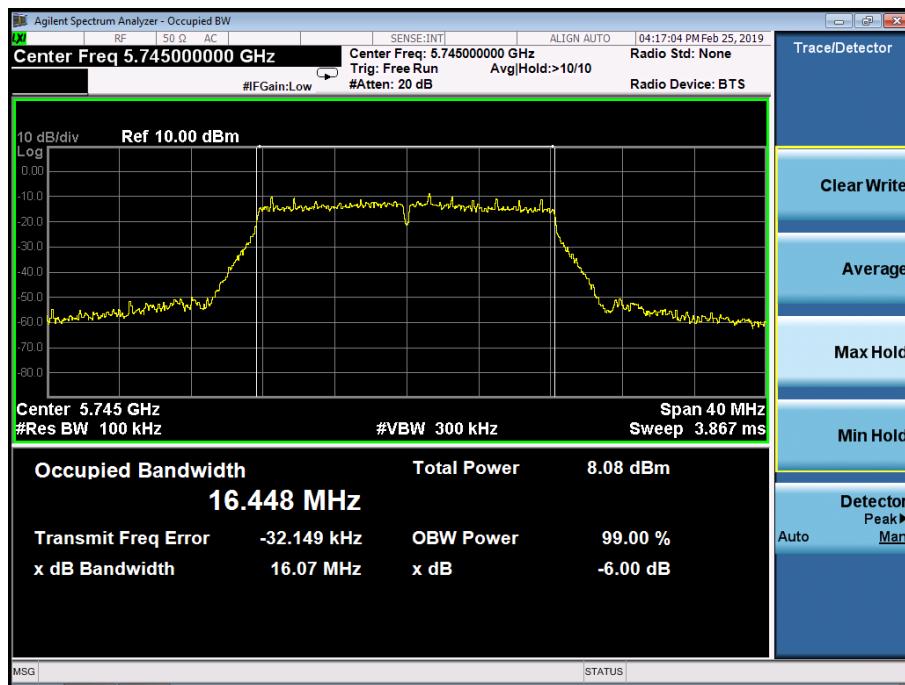
5775



Minimum Emission Bandwidth
Test Model 802.11a mode

UNII Band III
Frequency(MHz)

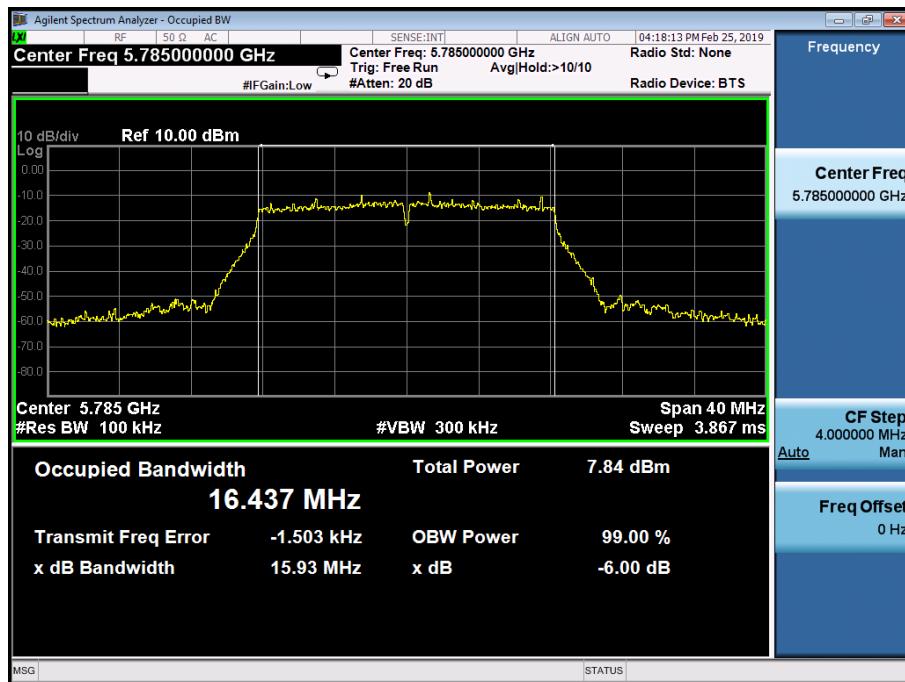
5745



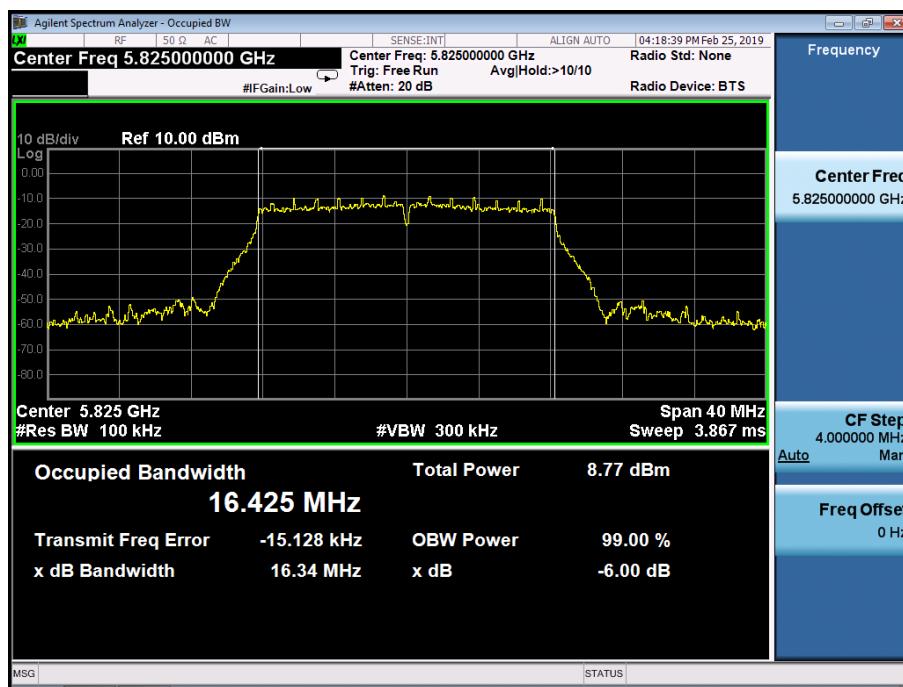
Minimum Emission Bandwidth
Test Model 802.11a mode

UNII Band III
Frequency(MHz)

5785



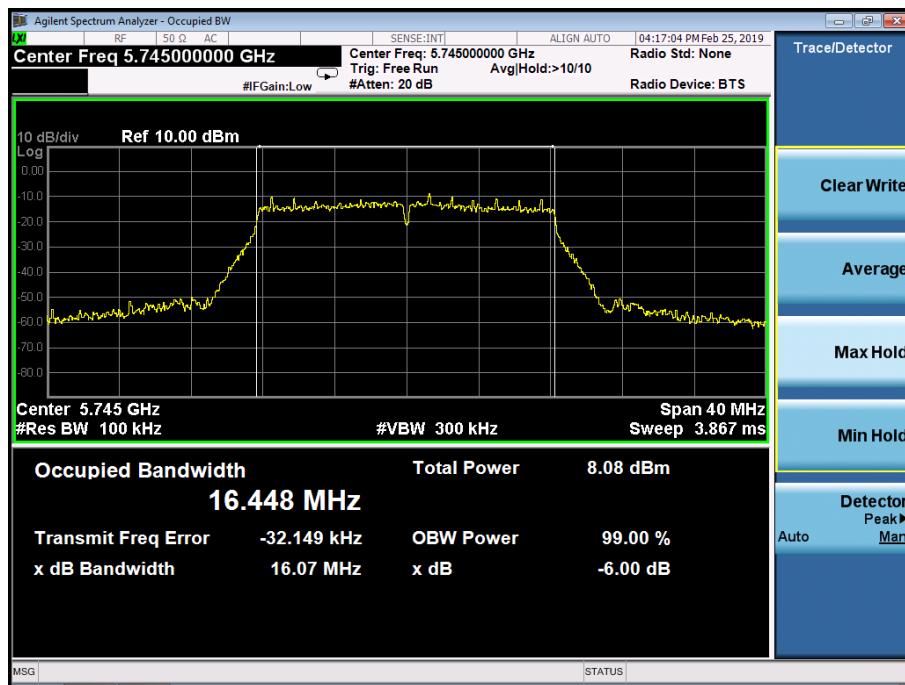
| | |
|----------------------------|------------------------|
| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11a mode | Frequency(MHz) 5825 |



Minimum Emission Bandwidth
Test Model 802.11n(HT20) mode

UNII Band III
Frequency(MHz)

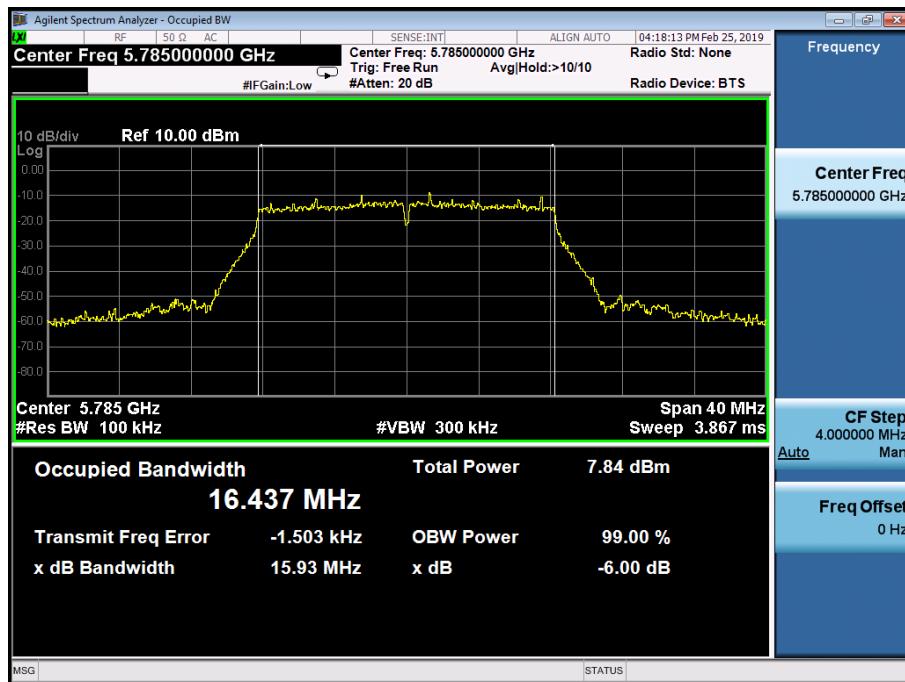
5745



Minimum Emission Bandwidth
Test Model 802.11n(HT20) mode

UNII Band III
Frequency(MHz)

5785



| | |
|--------------------------------|---------------------|
| Minimum Emission Bandwidth | UNII Band III |
| Test Model 802.11n(VHT20) mode | Frequency(MHz) 5825 |

