

TEST REPORT

of

FCC PART 15 SUBPART E

☒ New Application; ☐ Class I PC; ☐ Class II PC

Product : Compact 5GHz Wireless Surveillance Transmission System

Brand: Cleervu

Model: CV880

Model Difference: N/A

FCC ID: UYJ-CV880

FCC Rule Part: §15.407, Cat:NII

Applicant: Cleervu Surveillance Systems Inc.

Address: 6F., No.3, Lane 15, Bo-ai Road, Guanxi Township,
Hsinchu County 306, Taiwan (R.O.C.)

Test Performed by:

International Standards Laboratory

<Lung-Tan LAB>

*Site Registration No.

BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;

*Address:

No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan

*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-17LR056FE**

Issue Date : **2017/03/16**

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report MUST not be used to claim product endorsement by TAF, NVLAP or any agency of the Government.

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VERIFICATION OF COMPLIANCE

Applicant: CLEERVU
Product Description: Compact 5GHz Wireless Surveillance Transmission System
Brand Name: Cleervu
Model No.: CV880
Model Difference: N/A
FCC ID: UYJ-CV880
Date of test: 2017/02/23 ~ 2017/03/09
Date of EUT Received: 2017/02/23

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:



Date:

2017/03/16

Dino Chen / Engineer

Prepared By:



Date:

2017/03/16

Eva Kao / Technical Supervisor

Approved By:



Date:

2017/03/16

Vincent Su / Technical Manager

Version

| Version No. | Date | Description |
|-------------|------------|------------------------------|
| 00 | 2017/03/16 | Initial creation of document |
| | | |

Uncertainty of Measurement

| Description Of Test | Uncertainty |
|---------------------------------------|--|
| Conducted Emission (AC power line) | 2.586 dB |
| Field Strength of Spurious Radiation | <=30MHz: 2.96dB 30-1GHz: 4.22 dB 1-40 GHz: 4.08 dB |
| Conducted Power | 2.412 GHz: 1.30 dB 5.805 GHz: 1.55 dB |
| Power Density | 2.412 GHz: 1.30 dB 5.805 GHz: 1.67 dB |
| Frequency | 0.0032% |
| Time | 0.01% |
| DC Voltage | 1% |

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1. GENERAL INFORMATION

1.1. Product Description

General:

| | |
|-----------------------|---|
| Product Name: | Compact 5GHz Wireless Surveillance Transmission System |
| Brand Name: | Cleervu |
| Model Name: | CV880 |
| Model Difference: | N/A |
| Operation Environment | According to §15.407(a) (iii) For fixed point-to-point access points |
| PoE Port: | One provided |
| LAN Port: | One provided |
| TPC | No |
| DFS | No |
| Power Supply: | 48Vdc from POE adapter |

| | |
|--------------------------------------|---|
| RF power setting in TEST SoftWare | <p>B1 a mode : 7.5 n20 mode: 4.5 n40 mode : 7 ac mode : 7</p> <p>B4 a mode : 15 n20 mode: 12 n40 mode : 13 ac mode : 13</p> |
|--------------------------------------|---|

Power Tolerance: +/- 1 dB

WLAN: 2TX/2RX SM-MIMO

| Wi-Fi | Frequency Range (MHz) | Channels | Peak / Average Rated Power | Modulation Technology |
|---------------------|------------------------|--|----------------------------|-----------------------|
| 802.11a | 5180 – 5240(NII) | 4 | 6.57dBm (AV) | OFDM |
| | 5745 – 5825(NII) | 5 | 13.01dBm (AV) | |
| 802.11n(5G) | HT20, 5180 – 5240(NII) | 4 | 7.11dBm (AV) | |
| | HT20, 5745 – 5825(NII) | 5 | 12.77 dBm (AV) | |
| | HT40, 5190 – 5230(NII) | 3 | 8.73dBm (AV) | |
| | HT40, 5755 – 5815(NII) | 4 | 13.06dBm (AV) | |
| 802.11ac | HT80, 5210(NII) | 1 | 8.07dBm (AV) | |
| | HT80, 5775(NII) | 1 | 12.34dBm (AV) | |
| Modulation type | | CCK, DQPSK, DBPSK for DSSS 256QAM.64QAM. 16QAM, QPSK, BPSK for OFDM | | |
| Antenna Designation | | Patch array antenna WiFi 5G Antenna : 16.5 dBi | | |

The EUT is compliance with IEEE 802.11 a/n/ac Standard.

This report applies for Wifi frequency band 5150 MHz– 5250 MHz, 5725 MHz– 5850 MHz

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: UYJ-CV880** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

KDB Document: 789033 D02 General UNII Test Procedures New Rules v01r03

FCC 14-30 Revision UNII

594280 D02 U-NII Device Security v01r03

1.4. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of International Standards Laboratory <Lung-Tan LAB> No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10: 2013. FCC Registration Number is: 872200; Designation Number is: TW1036, Canada Registration Number: 4067B-3.

1.5. Special Accessories

Not available for this EUT intended for grant.

1.6. Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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.

2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 6 of ANSI C63.10: 2013. Con-ducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR 16-1-1 Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m/1.5m(Frequency above 1GHz) above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 6 and 11 of ANSI C63.10: 2013

2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

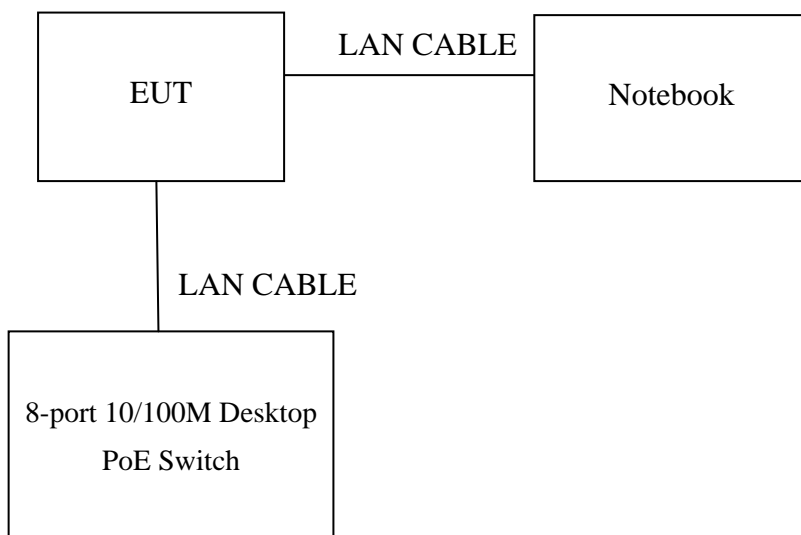


Table 1-1 Equipment Used in Tested System

| Item | Equipment | Mfr/Brand | Model/ Type No. | Series No. | Data Cable | Power Cord |
|------|---|-----------|--------------------|-------------|--------------|--------------|
| 1 | Notebook | HP | ProBook 440 G2 | 1588-3003 | NA | Non-shielded |
| 2 | 8-port 10/100M Desktop PoE Switch | TP-LINK | TL-SF1008P | 12370100056 | Non-shielded | Non-shielded |

3. SUMMARY OF TEST RESULT

| FCC Rules | Description Of Test | Result |
|---------------|--|-----------|
| §15.207 | AC Power Line Conducted Emission | Compliant |
| §15.407(a)(2) | Output Power/ EIRP/ Spectral Density Measurement | Compliant |
| §15.407(a) | 26dB Emission Bandwidth | Compliant |
| §15.407(e) | 6dB Emission Bandwidth | Compliant |
| §15.407(b) | Undesirable Emission – Radiated Measurement | Compliant |
| §15.407(c) | Transmission in case of Absence of Information | Compliant |
| §15.407(g) | Frequency Stability | Compliant |
| §15.407(a) | Antenna Requirement | Compliant |
| §15.407(d) | TPC and DFS Measurement | N/A |
| §15.407(i) | Device Security | Compliant |

4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode is programmed.

5150MHz-5250MHz:

802.11 a mode: Channel lowest (5180MHz), Mid (5200MHz) and Highest (5240MHz) with 6Mbps data rate are chosen for full testing.

802.11 n HT 20 mode: Channel lowest (5180MHz), Mid (5200MHz) and Highest (5240MHz) with 6.5Mbps data rate are chosen for full testing

802.11 n HT 40 mode: Channel lowest (5190MHz), Mid (5210MHz) and Highest (5230MHz) with 13.5Mbps data rate are chosen for full testing

802.11 AC HT80: Channel (5210MHz) with lowest data rate is chosen for full testing

The worst case Band 1, 802.11n HT40 was reported for Radiated Emission.

5725MHz-5850MHz:

802.11a mode: Channel low (5745MHz), mid (5785MHz) and high (5825MHz) with 6Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT20: Channel low (5745MHz), mid (5785MHz) and high (5825MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT40: Channel low (5755MHz), mid (5775MHz) and high (5815MHz) with 13.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 AC HT80: Channel (5775MHz) with lowest data rate is chosen for full testing

The worst case Band 4, 802.11n HT40 was reported for Radiated Emission.

5. AC POWER LINE CONDUCTED EMISSION TEST

5.1. Standard Applicable

According to §15.207, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

| Frequency range MHz | Limits dB(uV) | |
|--|------------------|----------|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |
| Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. | | |

5.2. Measurement Equipment Used:

| Conducted Emission Test Site | | | | | |
|------------------------------|--------------------|-----------------------|------------------|--------------|------------|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
| Conduction 04-3 Cable | WOKEN | CFD 300-NL | Conduction 04 -3 | 09/12/2016 | 09/11/2017 |
| EMI Receiver 16 | Rohde & Schwarz | ESCI | 101221 | 10/24/2016 | 10/23/2017 |
| LISN 18 | ROHDE & SCHWARZ | ENV216 | 101424 | 02/05/2017 | 02/04/2018 |
| LISN 19 | ROHDE & SCHWARZ | ENV216 | 101425 | 03/07/2017 | 03/06/2018 |
| Test Software | Farad | EZEMC Ver:ISL-03A2 | N/A | N/A | N/A |

5.3. EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10: 2013
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

5.4. Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.5. Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.

AC POWER LINE CONDUCTED EMISSION TEST DATA

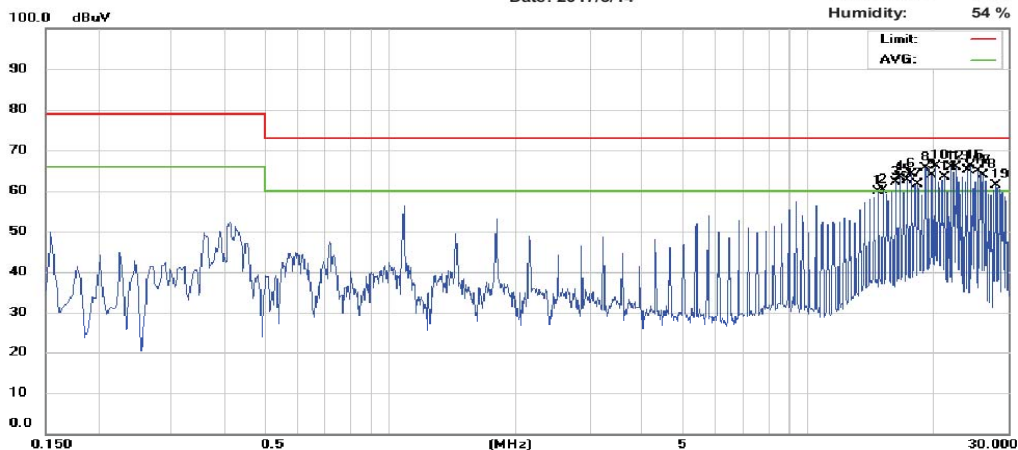
| | | | |
|-----------------|----------------|------------|------------|
| Operation Mode: | Operation Mode | Test Date: | 2017/03/14 |
| Test By: | Lake | | |



Address: No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel: 03-4071718

Conducted Emission Measurement

operator: jason
Temperature: 26 °C
Humidity: 54 %



Site: Conduction 04

Phase: L1

Limit: CISPR22 Class A Conduction(QP)

| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|-----|--------------------|----------------|-----------------|---------------------------|--------------------------|-----------------------|----------------------|---------------------------|------------------------|-----------------------|
| 1 | 14.734 | 36.01 | 18.65 | 10.00 | 46.01 | 73.00 | -26.99 | 28.65 | 60.00 | -31.35 |
| 2 | 15.094 | 29.55 | 18.19 | 10.01 | 39.56 | 73.00 | -33.44 | 28.20 | 60.00 | -31.80 |
| 3 | 16.166 | 26.59 | 22.54 | 10.02 | 36.61 | 73.00 | -36.39 | 32.56 | 60.00 | -27.44 |
| 4 | 16.522 | 23.35 | 17.36 | 10.02 | 33.37 | 73.00 | -39.63 | 27.38 | 60.00 | -32.62 |
| 5 | 17.250 | 39.91 | 18.86 | 10.03 | 49.94 | 73.00 | -23.06 | 28.89 | 60.00 | -31.11 |
| 6 | 17.606 | 32.54 | 20.48 | 10.03 | 42.57 | 73.00 | -30.43 | 30.51 | 60.00 | -29.49 |
| 7 | 18.326 | 26.55 | 20.63 | 10.04 | 36.59 | 73.00 | -36.41 | 30.67 | 60.00 | -29.33 |
| 8 | 19.038 | 27.76 | 22.04 | 10.05 | 37.81 | 73.00 | -35.19 | 32.09 | 60.00 | -27.91 |
| 9 | 19.766 | 27.75 | 22.05 | 10.06 | 37.81 | 73.00 | -35.19 | 32.11 | 60.00 | -27.89 |
| 10 | 20.122 | 27.27 | 21.33 | 10.06 | 37.33 | 73.00 | -35.67 | 31.39 | 60.00 | -28.61 |
| 11 | 21.206 | 24.11 | 18.29 | 10.07 | 34.18 | 73.00 | -38.82 | 28.36 | 60.00 | -31.64 |
| 12 | 21.910 | 30.32 | 28.04 | 10.08 | 40.40 | 73.00 | -32.60 | 38.12 | 60.00 | -21.88 |
| 13 | 22.638 | 21.66 | 15.85 | 10.08 | 31.74 | 73.00 | -41.26 | 25.93 | 60.00 | -34.07 |
| 14 | 24.074 | 21.60 | 15.91 | 10.09 | 31.69 | 73.00 | -41.31 | 26.00 | 60.00 | -34.00 |
| 15 | 24.426 | 21.32 | 15.20 | 10.10 | 31.42 | 73.00 | -41.58 | 25.30 | 60.00 | -34.70 |
| 16 | 25.498 | 19.54 | 13.90 | 10.11 | 29.65 | 73.00 | -43.35 | 24.01 | 60.00 | -35.99 |
| 17 | 25.854 | 19.28 | 13.88 | 10.12 | 29.40 | 73.00 | -43.60 | 24.00 | 60.00 | -36.00 |

Site: Conduction 04

Phase: **L1**

Limit: CISPR22 Class A Conduction(QP)

| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|-----|--------------------|----------------|-----------------|---------------------------|--------------------------|-----------------------|----------------------|---------------------------|------------------------|-----------------------|
| 18 | 26.230 | 20.16 | 13.77 | 10.12 | 30.28 | 73.00 | -42.72 | 23.89 | 60.00 | -36.11 |
| 19 | 28.014 | 20.08 | 15.80 | 10.13 | 30.21 | 73.00 | -42.79 | 25.93 | 60.00 | -34.07 |

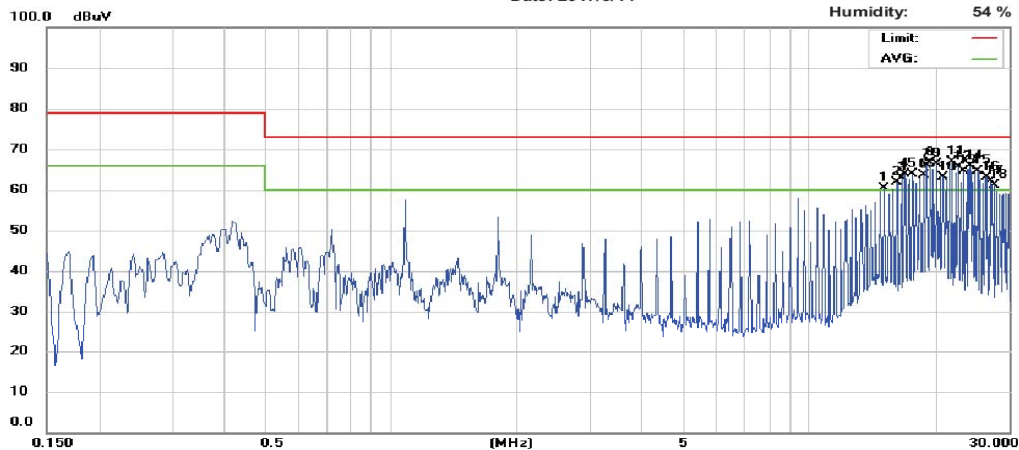


Address: No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel: 03-4071718

Conducted Emission Measurement

Date: 2017/3/14

operator: jason
Temperature: 26 °C
Humidity: 54 %



Site: Conduction 04

Phase: N

Limit: CISPR22 Class A Conduction(QP)

| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|-----|--------------------|----------------|-----------------|---------------------------|--------------------------|-----------------------|----------------------|---------------------------|------------------------|-----------------------|
| 1 | 15.130 | 49.82 | 33.59 | 10.07 | 59.89 | 73.00 | -13.11 | 43.66 | 60.00 | -16.34 |
| 2 | 16.214 | 49.81 | 37.34 | 10.09 | 59.90 | 73.00 | -13.10 | 47.43 | 60.00 | -12.57 |
| 3 | 16.578 | 50.65 | 42.68 | 10.10 | 60.75 | 73.00 | -12.25 | 52.78 | 60.00 | -7.22 |
| 4 | 16.926 | 45.99 | 25.64 | 10.11 | 56.10 | 73.00 | -16.90 | 35.75 | 60.00 | -24.25 |
| 5 | 17.658 | 52.10 | 42.50 | 10.12 | 62.22 | 73.00 | -10.78 | 52.62 | 60.00 | -7.38 |
| 6 | 18.746 | 54.17 | 41.20 | 10.14 | 64.31 | 73.00 | -8.69 | 51.34 | 60.00 | -8.66 |
| 7 | 19.098 | 53.63 | 38.97 | 10.15 | 63.78 | 73.00 | -9.22 | 49.12 | 60.00 | -10.88 |
| 8 | 19.446 | 43.17 | 23.71 | 10.16 | 53.33 | 73.00 | -19.67 | 33.87 | 60.00 | -26.13 |
| 9 | 20.178 | 52.68 | 36.47 | 10.17 | 62.85 | 73.00 | -10.15 | 46.64 | 60.00 | -13.36 |
| 10 | 20.898 | 53.60 | 35.32 | 10.19 | 63.79 | 73.00 | -9.21 | 45.51 | 60.00 | -14.49 |
| 11 | 21.970 | 45.84 | 21.32 | 10.20 | 56.04 | 73.00 | -16.96 | 31.52 | 60.00 | -28.48 |
| 12 | 22.702 | 51.19 | 34.15 | 10.21 | 61.40 | 73.00 | -11.60 | 44.36 | 60.00 | -15.64 |
| 13 | 23.442 | 52.44 | 42.89 | 10.22 | 62.66 | 73.00 | -10.34 | 53.11 | 60.00 | -6.89 |
| 14 | 24.150 | 52.93 | 37.86 | 10.22 | 63.15 | 73.00 | -9.85 | 48.08 | 60.00 | -11.92 |
| 15 | 25.218 | 44.17 | 23.17 | 10.24 | 54.41 | 73.00 | -18.59 | 33.41 | 60.00 | -26.59 |
| 16 | 26.670 | 50.08 | 32.84 | 10.26 | 60.34 | 73.00 | -12.66 | 43.10 | 60.00 | -16.90 |
| 17 | 27.022 | 47.31 | 25.02 | 10.26 | 57.57 | 73.00 | -15.43 | 35.28 | 60.00 | -24.72 |

Site: Conduction 04

Phase:

N

Limit: CISPR22 Class A Conduction(QP)

| No. | Frequency (MHz) | QP_R (dBuV) | AVG_R (dBuV) | Correct Factor (dB) | QP Emission (dBuV) | QP Limit (dBuV) | QP Margin (dB) | AVG Emission (dBuV) | AVG Limit (dBuV) | AVG Margin (dB) |
|-----|--------------------|----------------|-----------------|---------------------------|--------------------------|-----------------------|----------------------|---------------------------|------------------------|-----------------------|
| 18 | 27.742 | 43.95 | 22.44 | 10.28 | 54.23 | 73.00 | -18.77 | 32.72 | 60.00 | -27.28 |

6. OUTPUT POWER / EIRP /SPECTRAL DENSITY MEASUREMENT

6.1. Standard Applicable

According to §15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.

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

(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 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 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.

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

6.2. Measurement Procedure

For Output Power

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

For Power Spectral Density

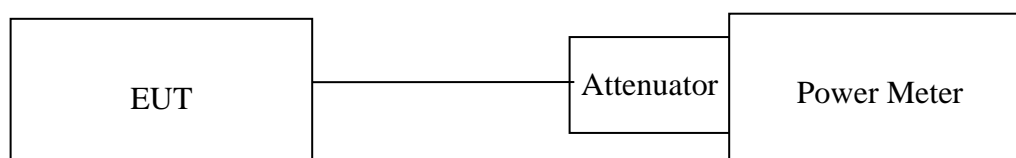
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
3. Set RBW=1MHz,VBW=3MHz, Span=50MHz (Base Mode), Sweep time = Auto, traces 100 sweeps of video averaging for 5150-5725MHz;
4. Set RBW=500KHz,VBW=1.5MHz, Span=60MHz (Base Mode), Sweep time = Auto, traces 100 sweeps of video averaging for 5725-5850MHz;
5. Record the max. reading.
6. Repeat above procedures until all frequency measured were complete.

Refer to section E3 of KDB Document: KDB 789033 D02 General UNII Test Procedures New Rules v01r03

6.3. Measurement Equipment Used:

| Conducted Emission Test Site | | | | | |
|------------------------------|----------|-----------------------------|-------------------|------------|------------|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
| Power Meter 05 | Anritsu | ML2495A | 1116010 | 07/28/2016 | 07/27/2017 |
| Power Sensor 05 | Anritsu | MA2411B | 34NKF50 | 07/28/2016 | 07/27/2017 |
| Power Sensor 06 | DARE | RPR3006W | 13I00030SNO3 3 | 11/03/2016 | 11/02/2017 |
| Power Sensor 07 | DARE | RPR3006W | 13I00030SNO3 4 | 11/03/2016 | 11/02/2017 |
| Temperature Chamber | KSON | THS-B4H100 | 2287 | 06/28/2016 | 06/27/2017 |
| DC Power supply | ABM | 8185D | N/A | 10/06/2016 | 10/05/2017 |
| AC Power supply | EXTECH | CFC105W | NA | 12/25/2016 | 12/24/2017 |
| Attenuator | Woken | Watt-65m3502 | 11051601 | NA | NA |
| Splitter | MCLI | PS4-199 | 12465 | 12/26/2015 | 12/25/2017 |
| Spectrum analyzer | keysight | N9010A | MY56070257 | 05/31/2016 | 05/30/2017 |
| Spectrum analyzer | R&S | FSP40 | 100143 | 08/07/2016 | 08/06/2017 |
| Test Software | DARE | Radimation Ver:2013.1.23 | NA | NA | NA |

6.4. Measurement Equipment Used:



6.5. Measurement Result

According to §15.407(a)

(iii) For fixed point-to-point access points, Power limit is 1W.

Average Power Measurement:

802.11a

| Channel | power (dBm) | limit(dBm) | result |
|---------|-------------|------------|--------|
| 5180 | 6.18 | 30 | pass |
| 5200 | 6.57 | 30 | pass |
| 5240 | 6.13 | 30 | pass |
| 5745 | 12.59 | 30 | pass |
| 5785 | 13.01 | 30 | pass |
| 5825 | 12.91 | 30 | pass |

| Mode | Freq(MHz) | Output Chain (dBm) | | Combine Output Power (dBm) | Limit (dBm) | Result |
|--------|-----------|--------------------|---------|----------------------------|-------------|--------|
| | | Chain A | chain B | | | |
| N HT20 | 5180 | 3.28 | 4.16 | 6.75 | 30 | Pass |
| | 5200 | 3.88 | 4.31 | 7.11 | 30 | Pass |
| | 5240 | 3.45 | 3.36 | 6.42 | 30 | Pass |
| | 5745 | 9.77 | 9.27 | 12.54 | 30 | Pass |
| | 5785 | 9.64 | 9.45 | 12.56 | 30 | Pass |
| | 5825 | 9.73 | 9.78 | 12.77 | 30 | Pass |

| Mode | Freq(MHz) | Output Chain (dBm) | | Combine Output Power (dBm) | Limit(dBm) | Result |
|--------|-----------|--------------------|---------|----------------------------|------------|--------|
| | | Chain A | chain B | | | |
| N HT40 | 5190 | 5.28 | 6.11 | 8.73 | 30 | Pass |
| | 5210 | 5.57 | 5.45 | 8.52 | 30 | Pass |
| | 5230 | 5.43 | 5.32 | 8.39 | 30 | Pass |
| | 5755 | 9.94 | 9.83 | 12.90 | 30 | Pass |
| | 5775 | 9.91 | 9.87 | 12.90 | 30 | Pass |
| | 5815 | 9.98 | 10.12 | 13.06 | 30 | Pass |

| Mode | Freq(MHz) | Output Chain (dBm) | | Combine Output Power (dBm) | Limit(dBm) | Result |
|---------|-----------|--------------------|---------|----------------------------|------------|--------|
| | | Chain A | chain B | | | |
| AC HT80 | 5210 | 4.87 | 5.24 | 8.07 | 30 | Pass |
| | 5775 | 9.42 | 9.23 | 12.34 | 30 | Pass |

Power Spectral Density Measurement:

BAND 1

802.11a Mode

| Frequency MHz | RF Power Density Reading (dBm/MHz) | Cable loss (dB) | Maximum Limit (dBm/MHz) |
|------------------|---------------------------------------|--------------------|----------------------------|
| 5180 | 5.973 | 0.00 | 17 |
| 5220 | 6.199 | 0.00 | 17 |
| 5240 | 5.199 | 0.00 | 17 |

802.11n HT20

| Frequency MHz | Chain 1 RF Power Density Reading (dBm/MHz) | Chain 2 RF Power Density Reading (dBm/MHz) | Cable loss (dB) | RF Power Density Reading (dBm/MHz) | Maximum Limit (dBm/MHz) |
|------------------|---|---|-----------------------|---|-------------------------------|
| 5180 | 2.35 | 2.85 | 0.00 | 5.62 | 17 |
| 5200 | 2.88 | 2.81 | 0.00 | 5.85 | 17 |
| 5240 | 2.32 | 2.81 | 0.00 | 5.58 | 17 |

802.11n HT40 Mode

| Frequency MHz | Chain 1 RF Power Density Reading (dBm/MHz) | Chain 2 RF Power Density Reading (dBm/MHz) | Cable loss (dB) | RF Power Density Reading (dBm/MHz) | Maximum Limit (dBm/MHz) |
|------------------|---|---|-----------------------|---|-------------------------------|
| 5190 | 2.85 | 2.64 | 0.00 | 5.76 | 17 |
| 5210 | 2.34 | 2.13 | 0.00 | 5.24 | 17 |
| 5230 | 1.94 | 2.08 | 0.00 | 5.02 | 17 |

802.11AC HT80 Mode

| Frequency MHz | Chain 1 RF Power Density Reading (dBm/MHz) | Chain 2 RF Power Density Reading (dBm/MHz) | Cable loss (dB) | RF Power Density Reading (dBm/MHz) | Maximum Limit (dBm/MHz) |
|------------------|---|---|-----------------------|---|-------------------------------|
| 5210 | 0.73 | 0.92 | 0.00 | 3.84 | 17 |

BAND 4

802.11a Mode

| Frequency MHz | RF Power Density Reading (dBm/500KHz) | Cable loss (dB) | Maximum Limit (dBm/500KHz) |
|------------------|---|--------------------|-------------------------------|
| 5745 | 8.327 | 0.00 | 19.5 |
| 5785 | 7.719 | 0.00 | 19.5 |
| 5825 | 8.130 | 0.00 | 19.5 |

802.11n HT20

| Frequency MHz | Chain 1 RF Power Density Reading (dBm/500KHz) | Chain 2 RF Power Density Reading (dBm/500KHz) | Cable loss (dB) | RF Power Density Reading (dBm/500KHz) | Maximum Limit (dBm/500KHz) |
|------------------|--|--|-----------------------|--|----------------------------------|
| 5745 | 4.56 | 4.52 | 0.00 | 7.55 | 19.5 |
| 5785 | 4.63 | 4.68 | 0.00 | 7.67 | 19.5 |
| 5825 | 4.68 | 5.07 | 0.00 | 7.89 | 19.5 |

802.11n HT40 Mode

| Frequency MHz | Chain 1 RF Power Density Reading (dBm/500KHz) | Chain 2 RF Power Density Reading (dBm/500KHz) | Cable loss (dB) | RF Power Density Reading (dBm/500KHz) | Maximum Limit (dBm/500KHz) |
|------------------|--|--|-----------------------|--|----------------------------------|
| 5755 | 2.24 | 2.72 | 0.00 | 5.50 | 19.5 |
| 5775 | 2.11 | 2.14 | 0.00 | 5.13 | 19.5 |
| 5815 | 1.93 | 2.73 | 0.00 | 5.36 | 19.5 |

802.11AC HT80 Mode

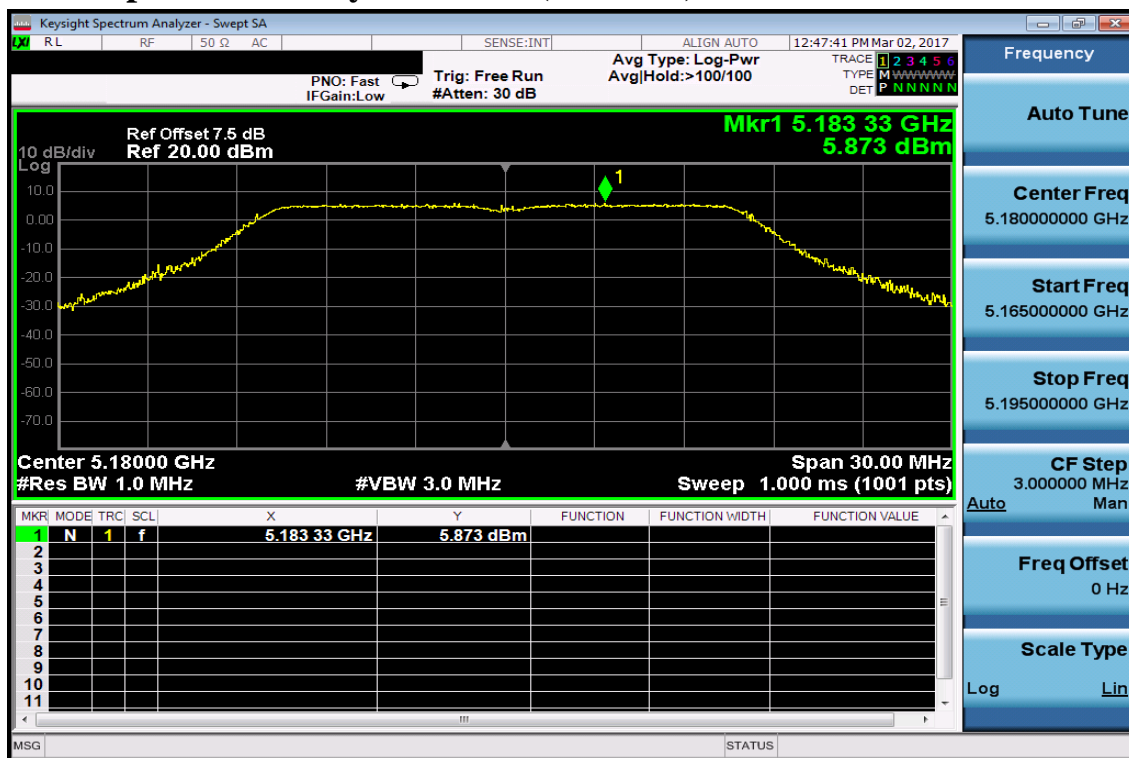
| Frequency MHz | Chain 1 RF Power Density Reading (dBm/500KHz) | Chain 2 RF Power Density Reading (dBm/500KHz) | Cable loss (dB) | RF Power Density Reading (dBm/500KHz) | Maximum Limit (dBm/500KHz) |
|------------------|--|--|-----------------------|--|----------------------------------|
| 5775 | 4.87 | 5.12 | 0.00 | 8.01 | 19.5 |

Limit = 30 – (16.5-6) = 19.5 dBm

BAND 1

802.11a

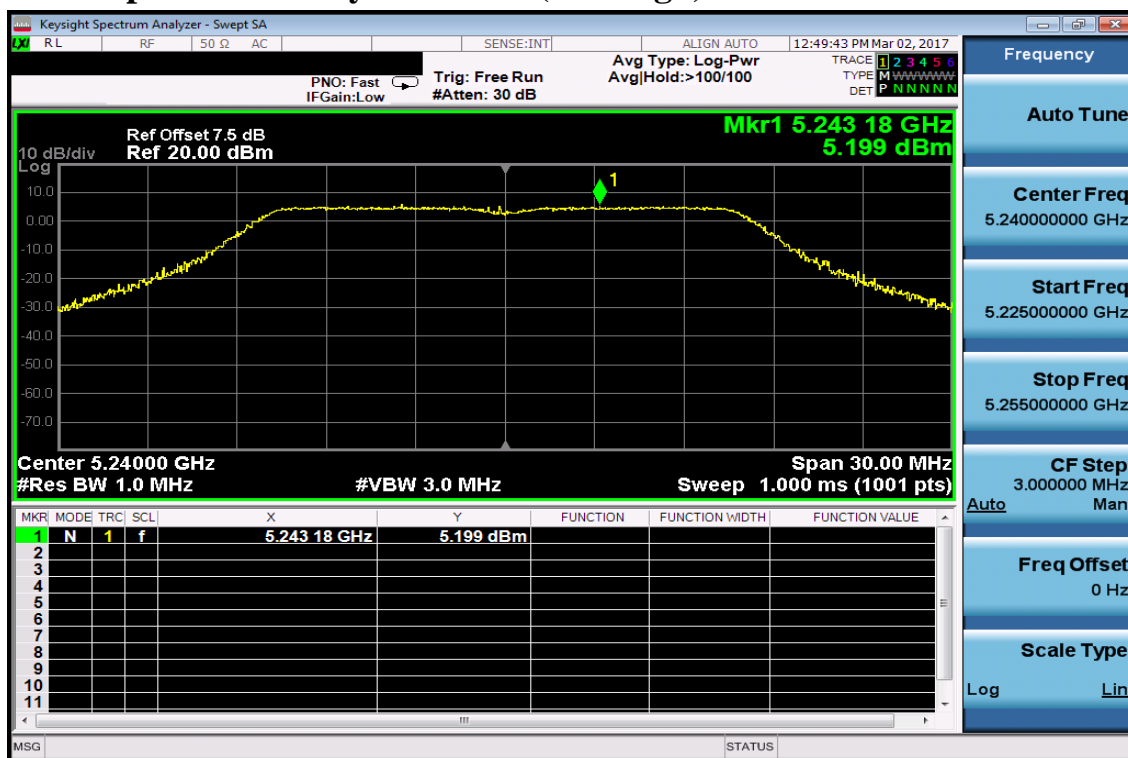
Power Spectral Density Data Plot (CH Low)



Power Spectral Density Data Plot (CH Mid)



Power Spectral Density Data Plot (CH High)

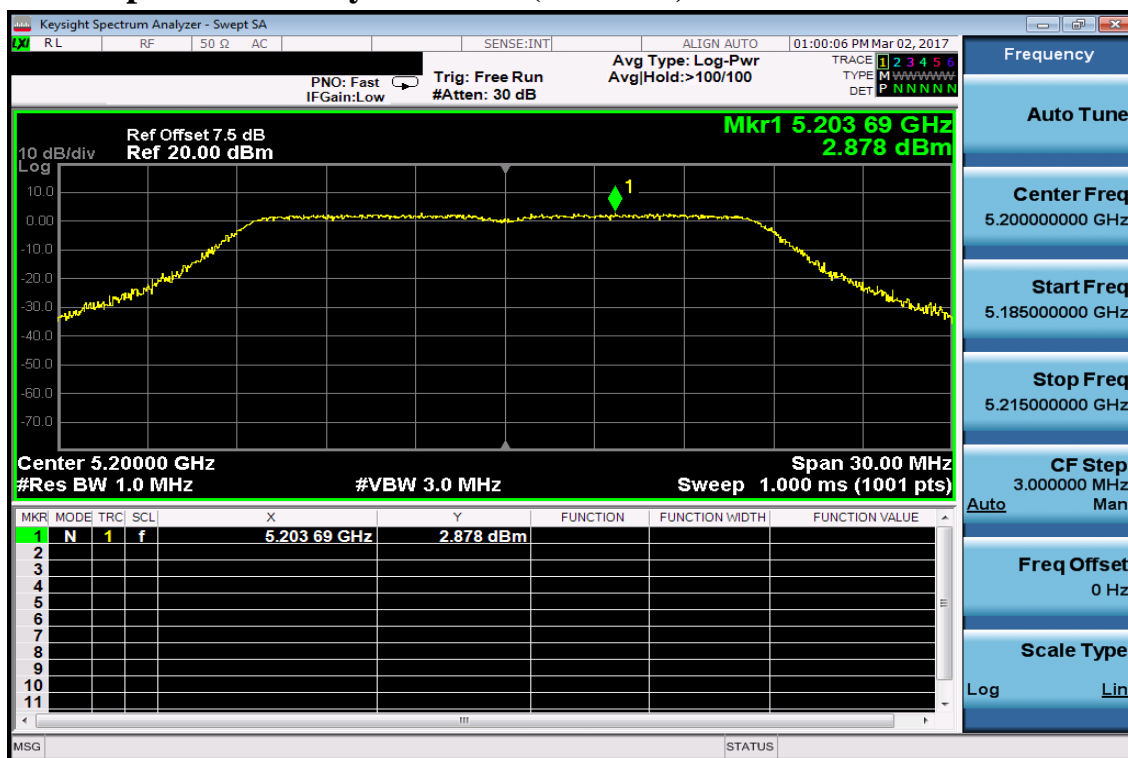


802.11n HT20, Chain 1

Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

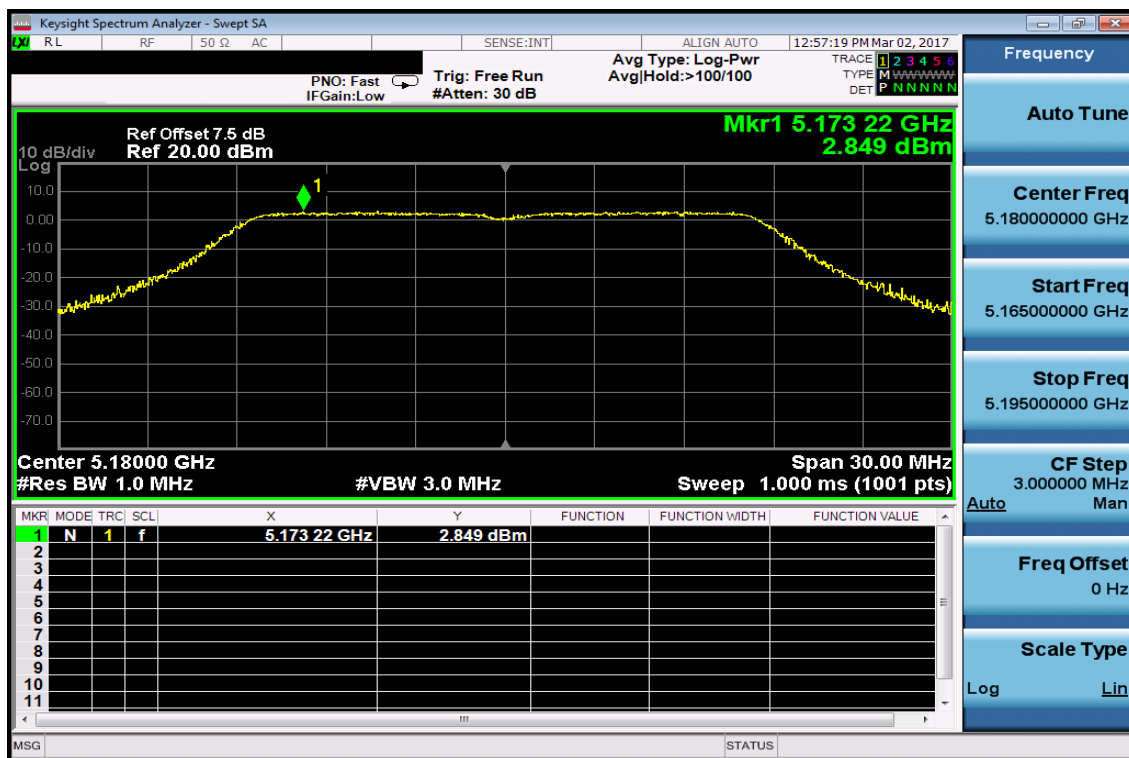


Power Spectral Density Test Plot (CH-High)



802.11n HT20, Chain 2

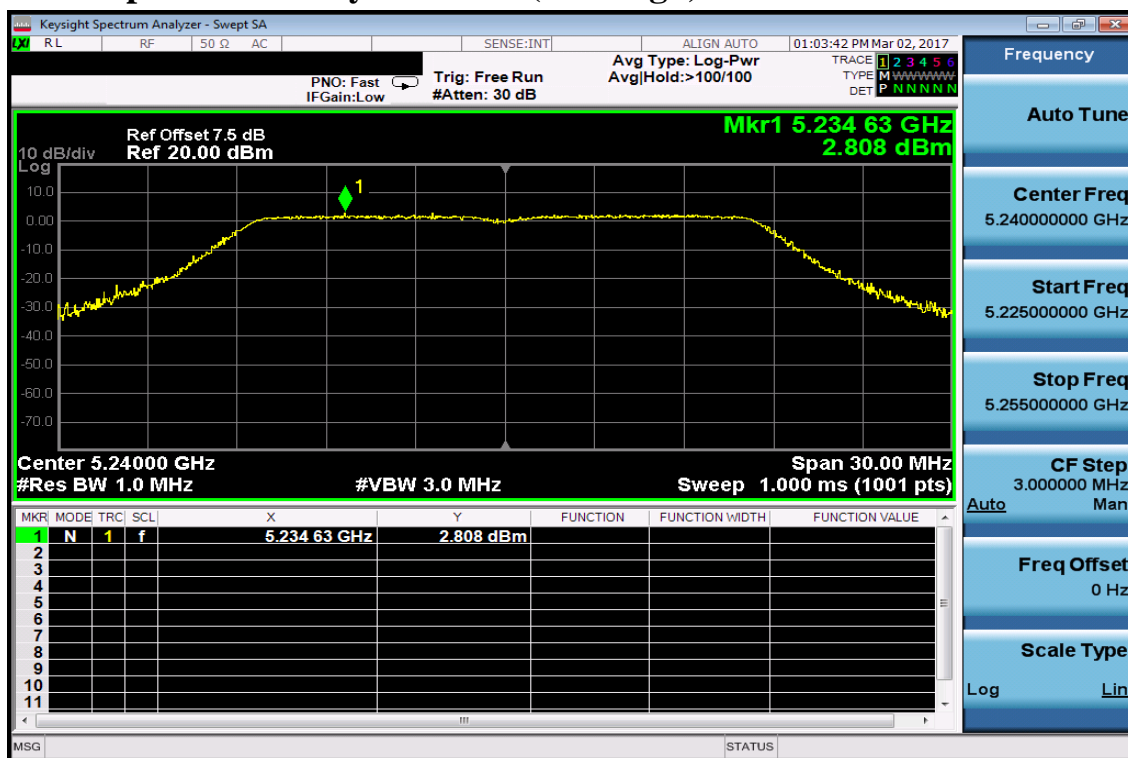
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

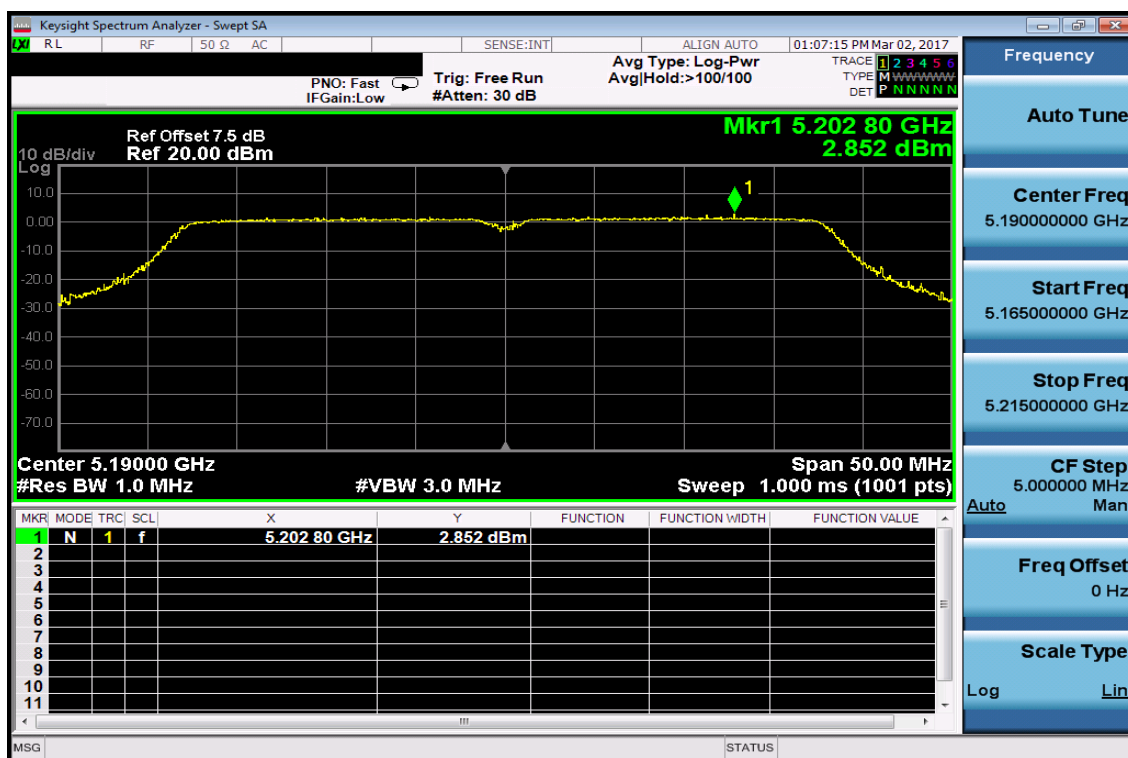


Power Spectral Density Test Plot (CH-High)



802.11n HT40, Chain 1

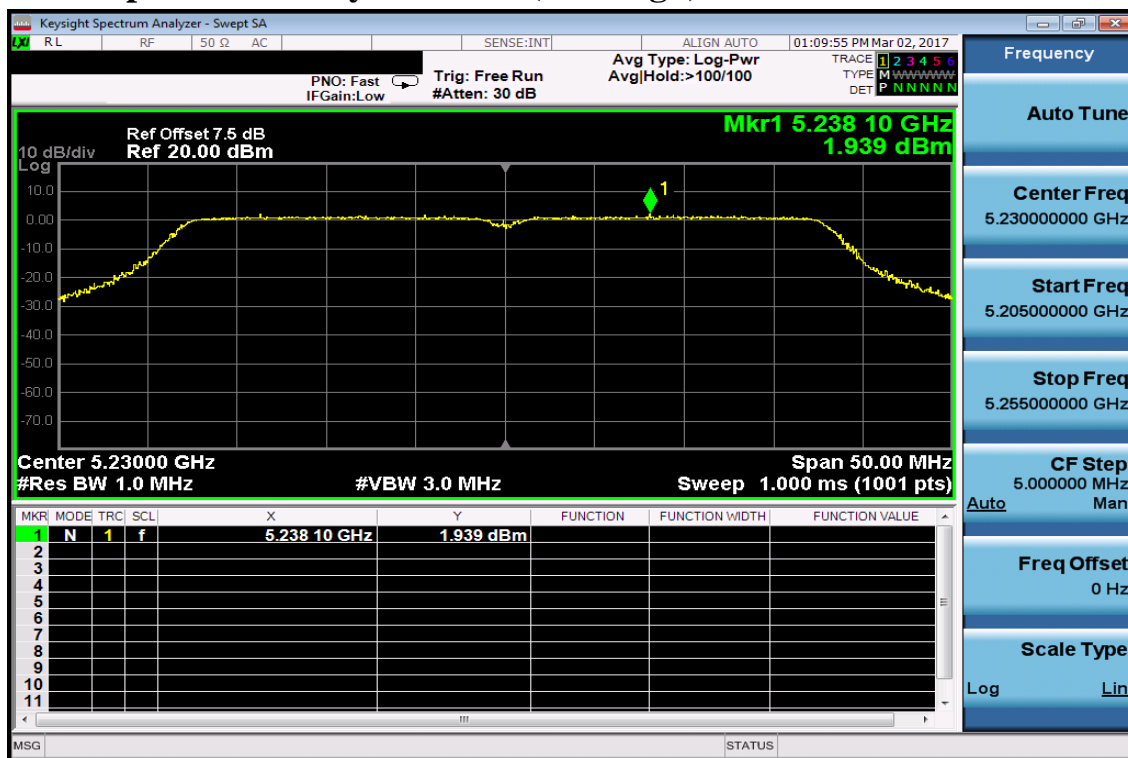
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

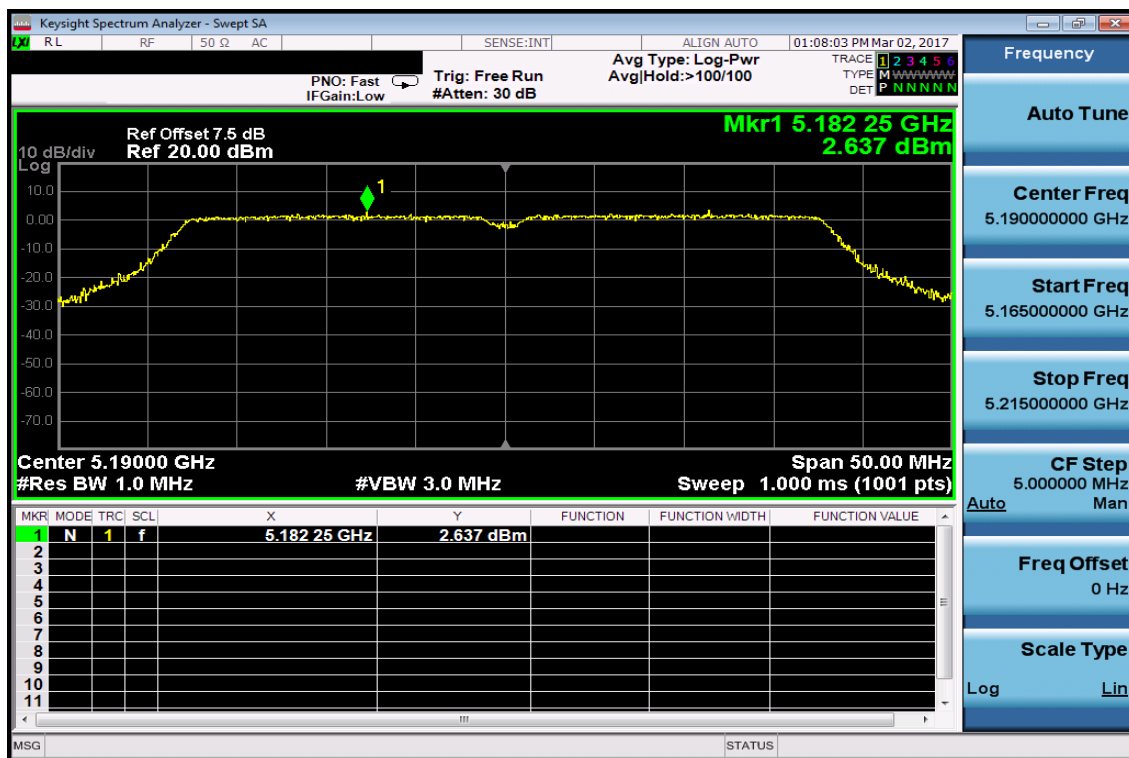


Power Spectral Density Test Plot (CH-High)

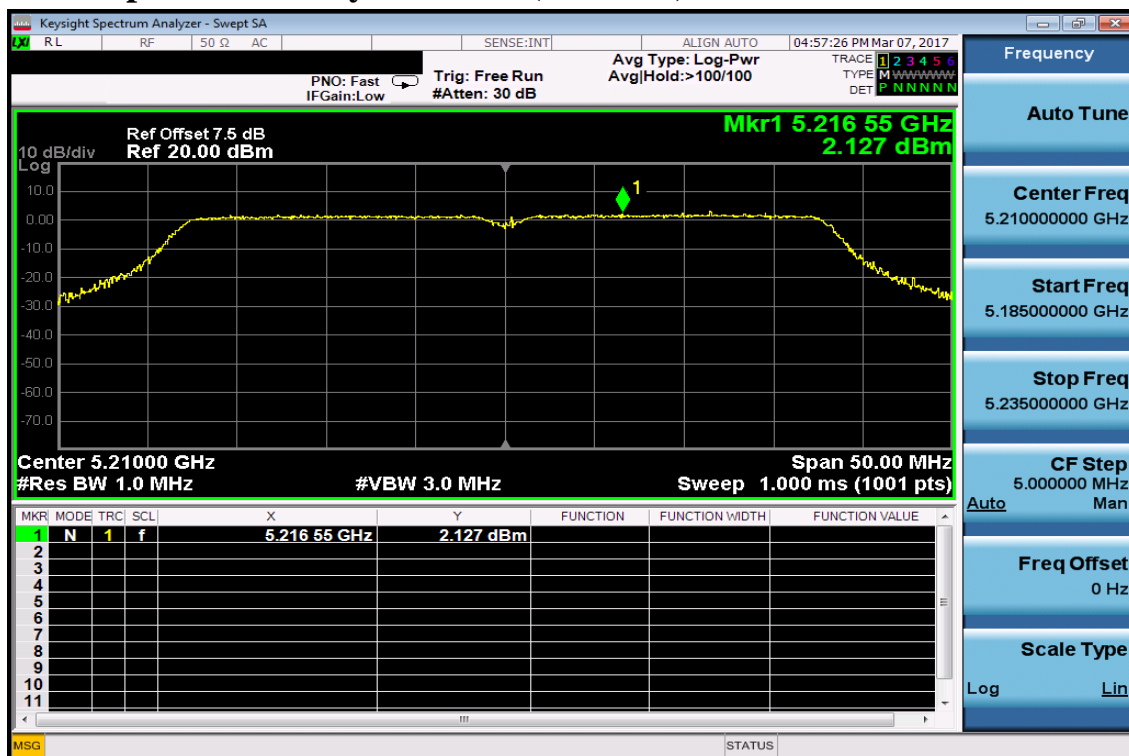


802.11n HT40, Chain 2

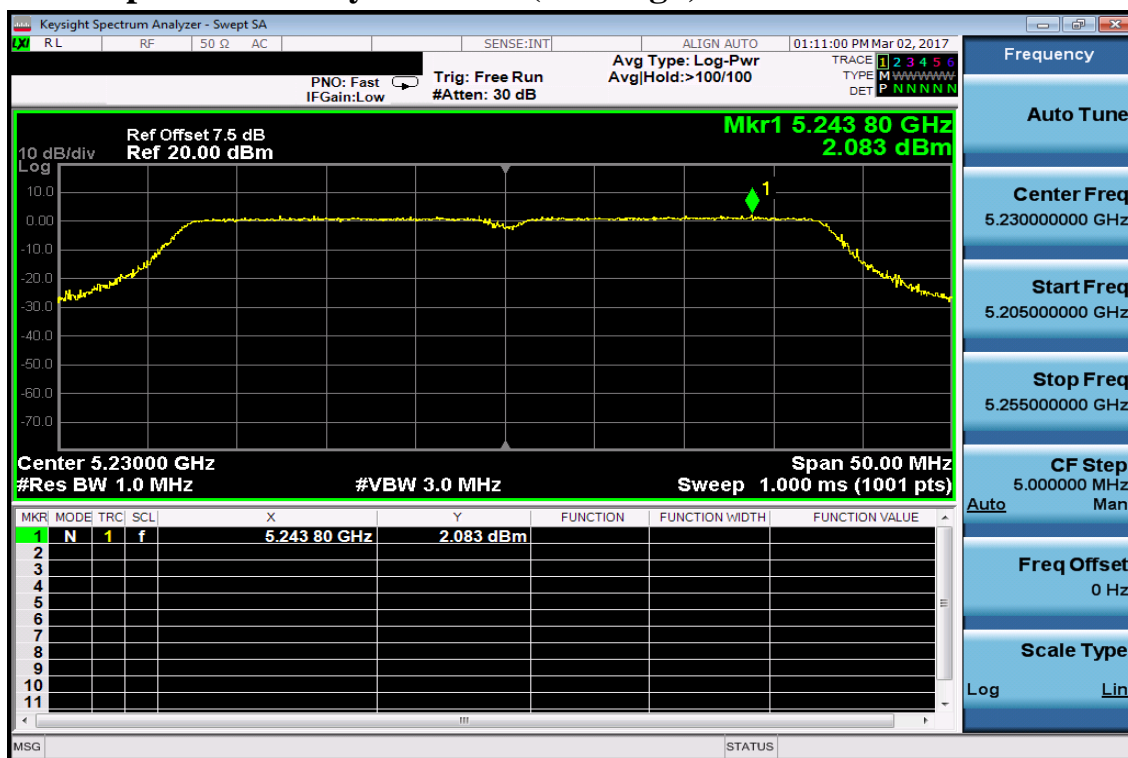
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

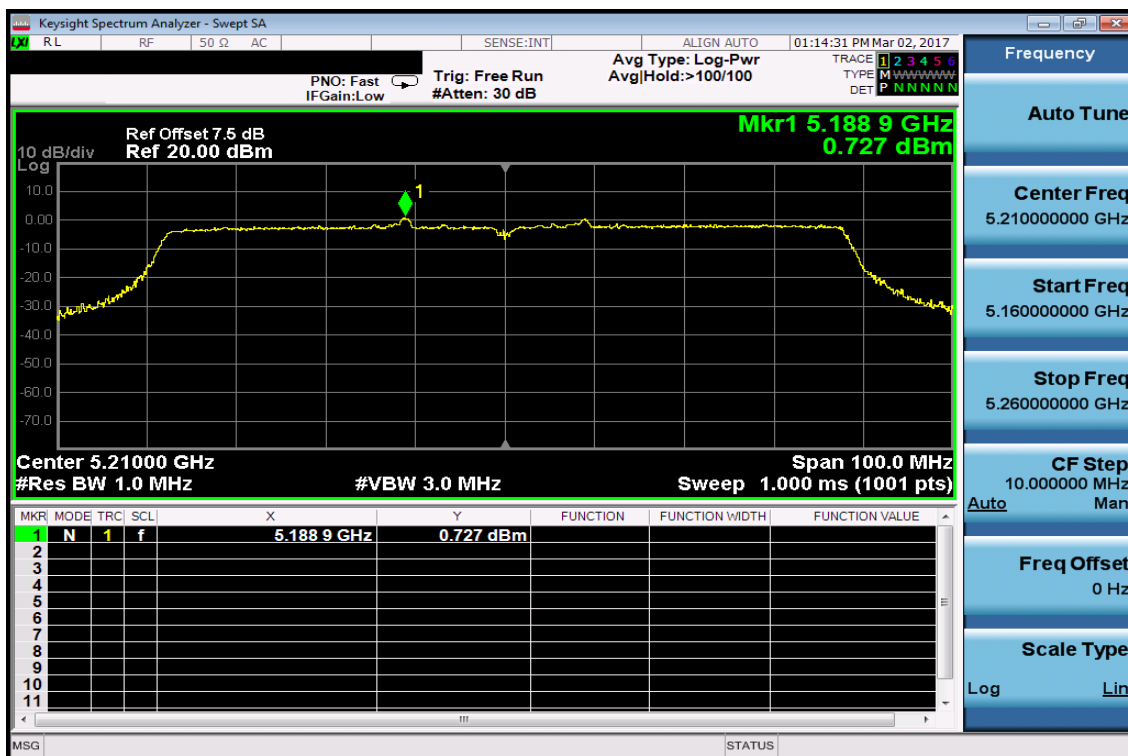


Power Spectral Density Test Plot (CH-High)

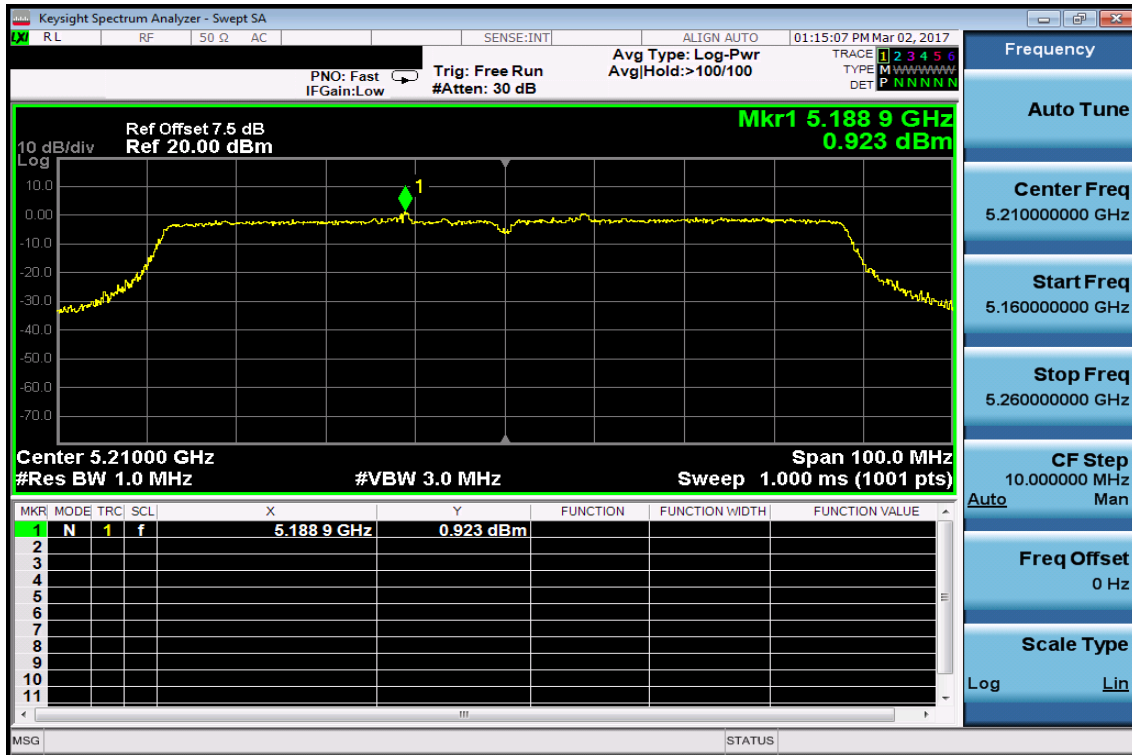


802.11AC HT80, Chain 1

Power Spectral Density Test Plot



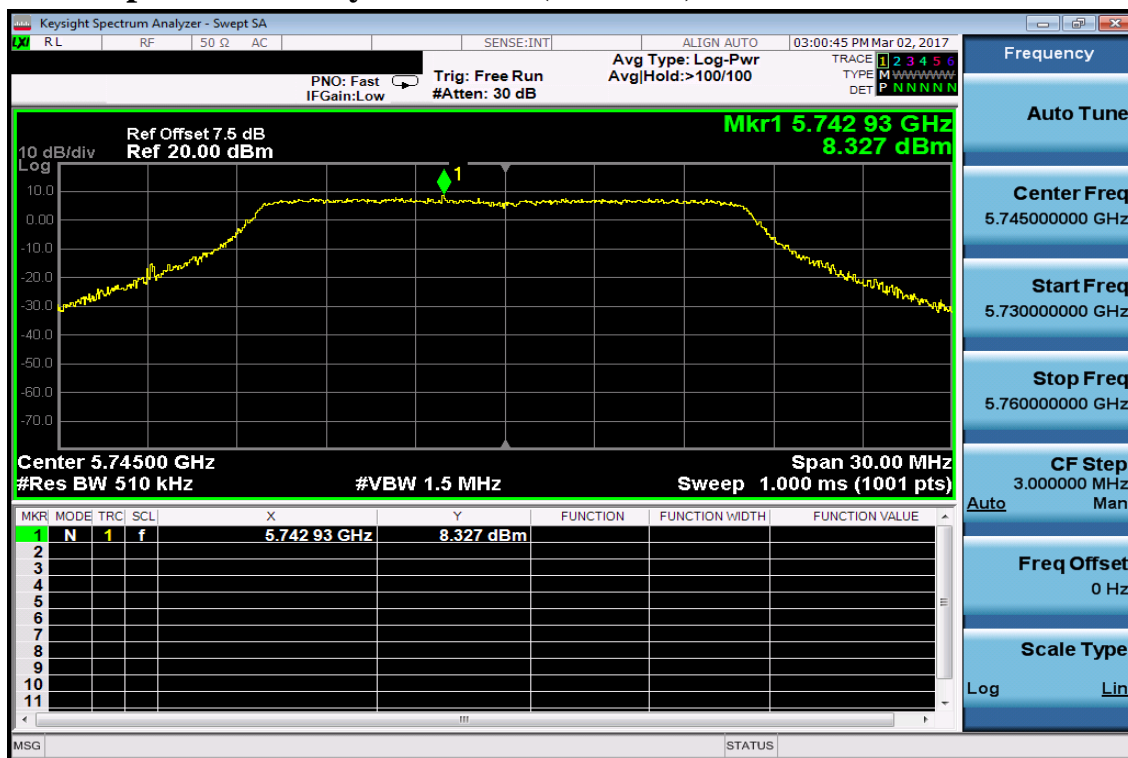
802.11AC HT80, Chain 2 Power Spectral Density Test Plot



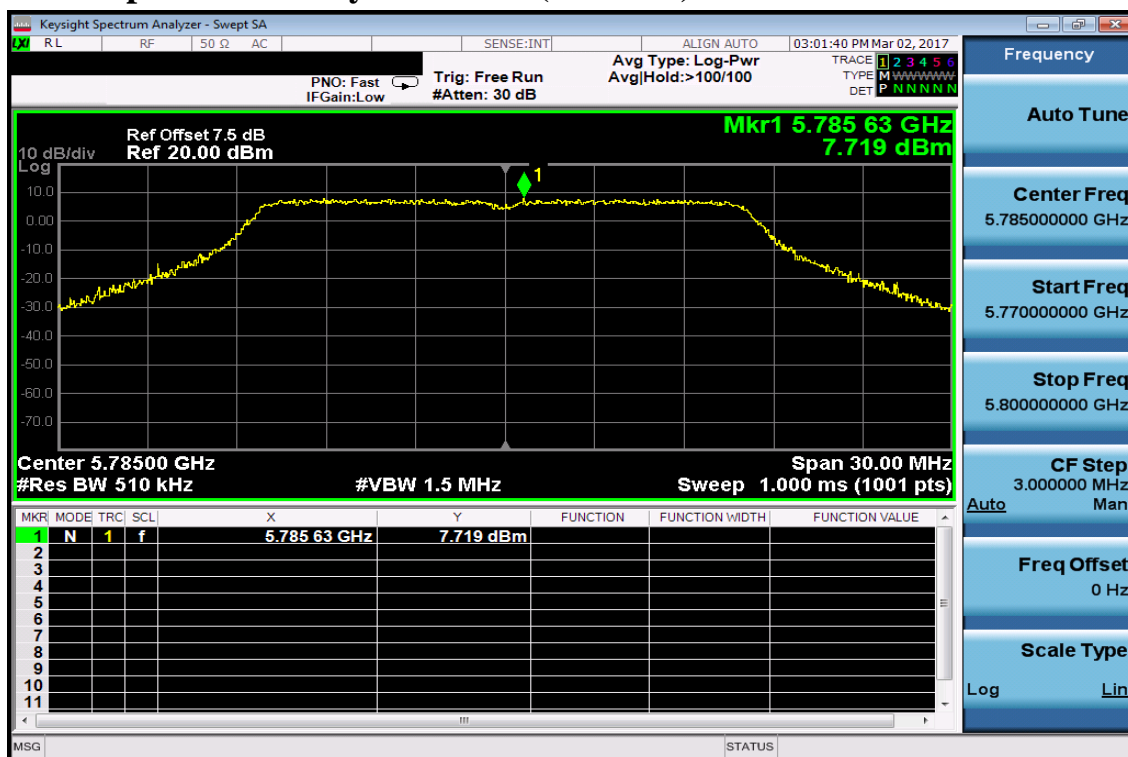
BAND 4

802.11a

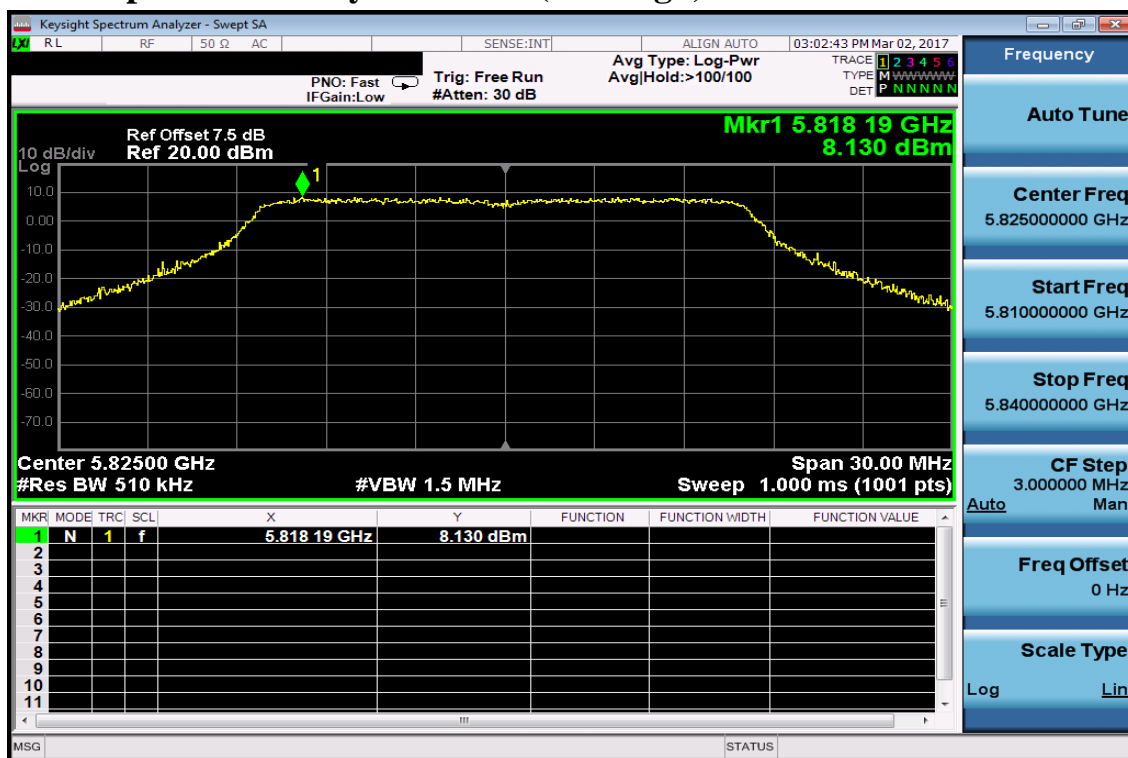
Power Spectral Density Data Plot (CH Low)



Power Spectral Density Data Plot (CH Mid)

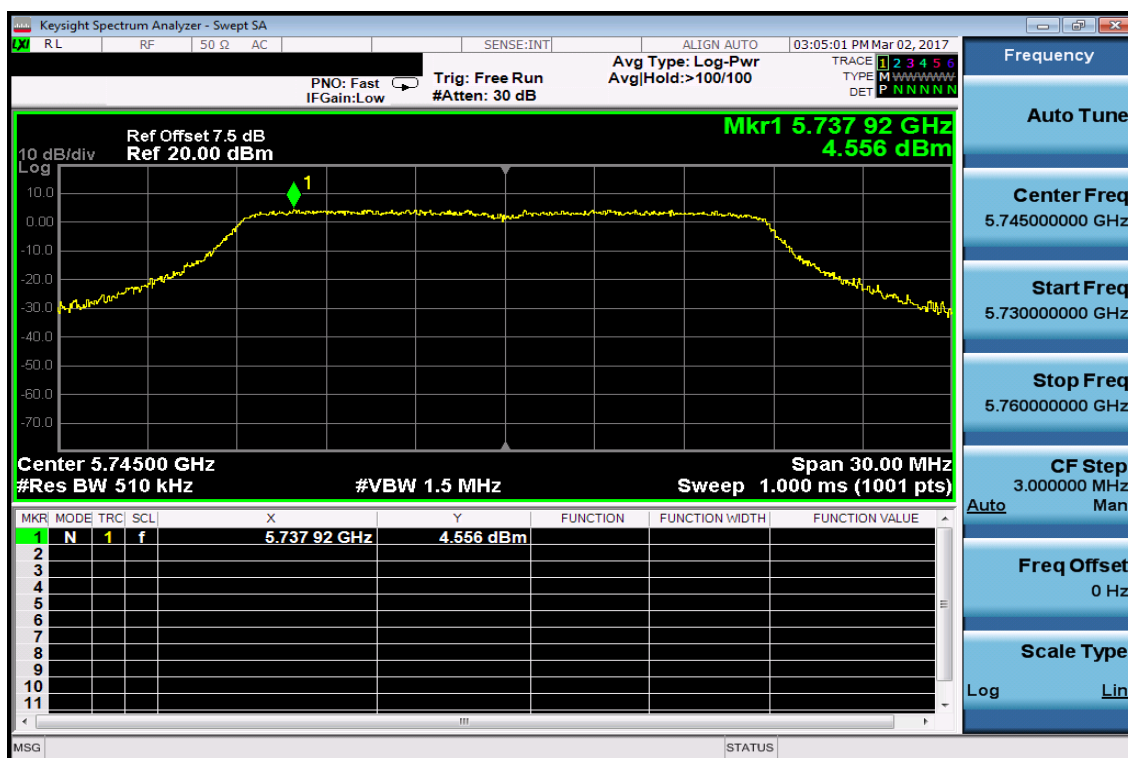


Power Spectral Density Data Plot (CH High)

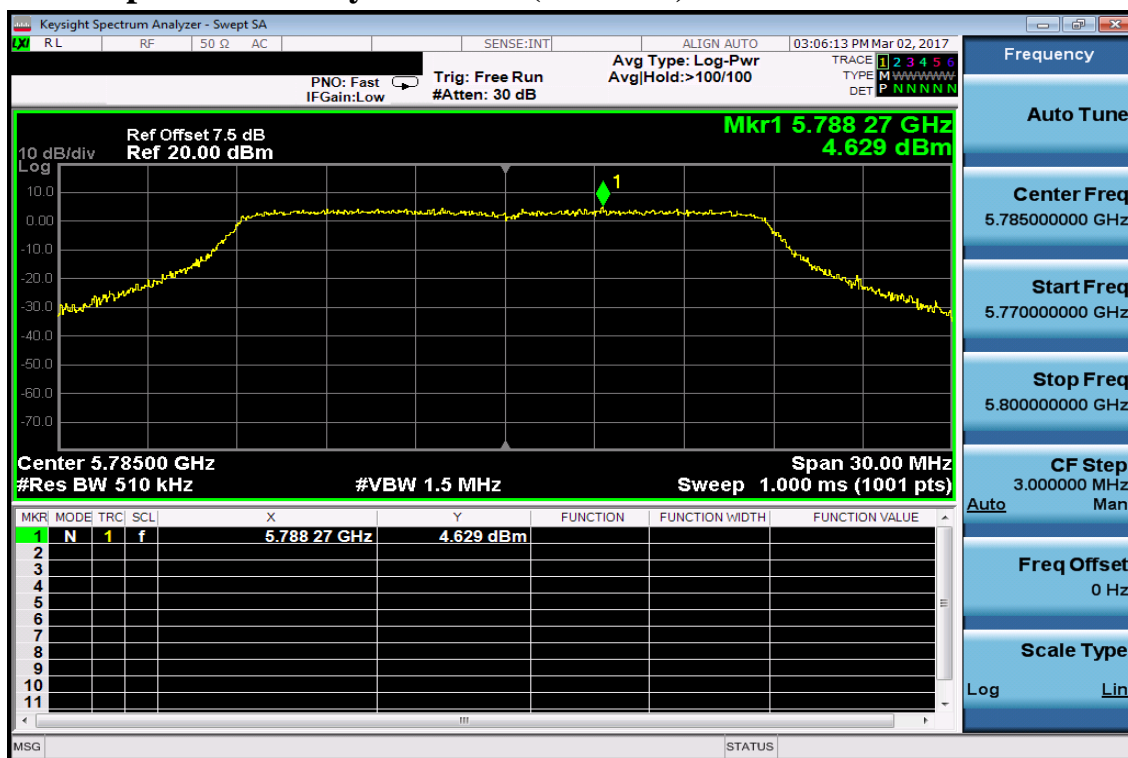


802.11n HT20, Chain 1

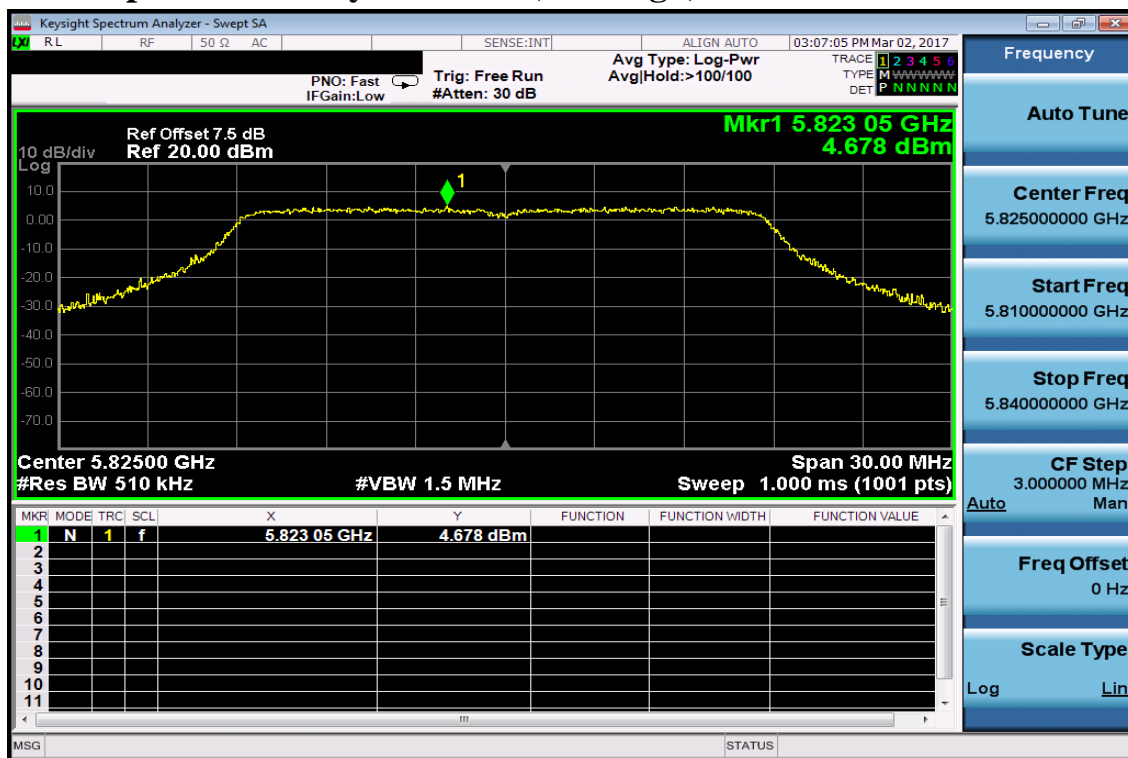
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

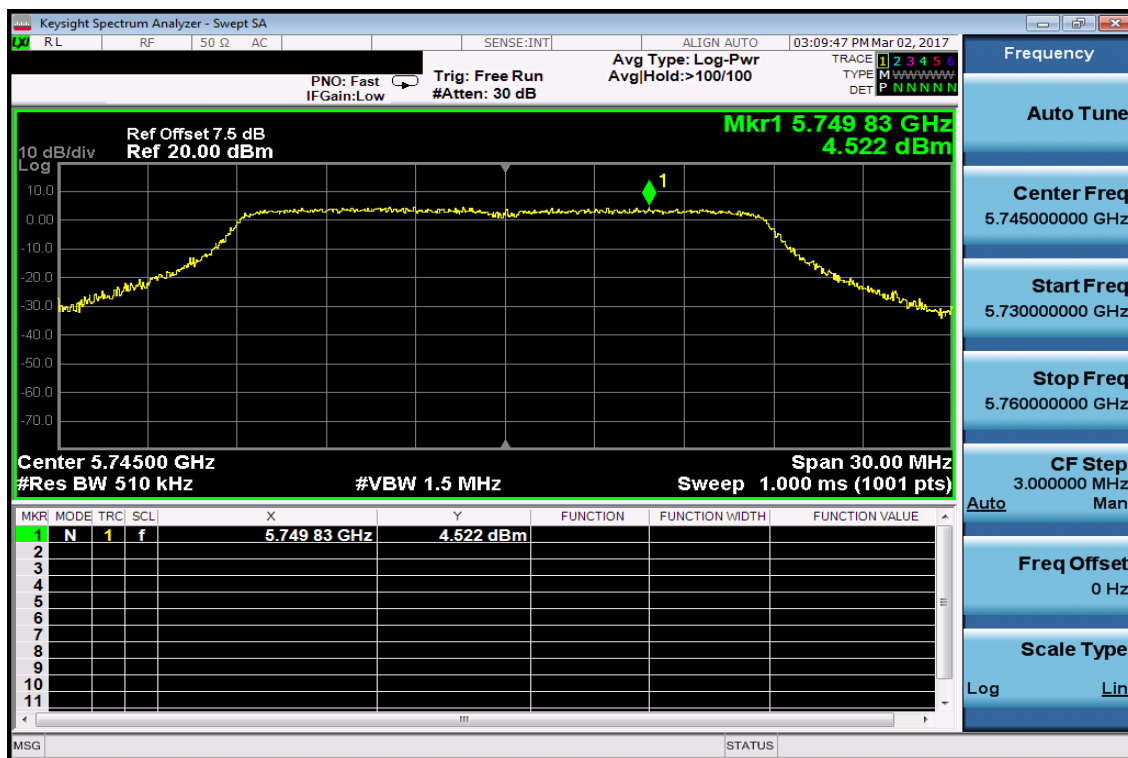


Power Spectral Density Test Plot (CH-High)

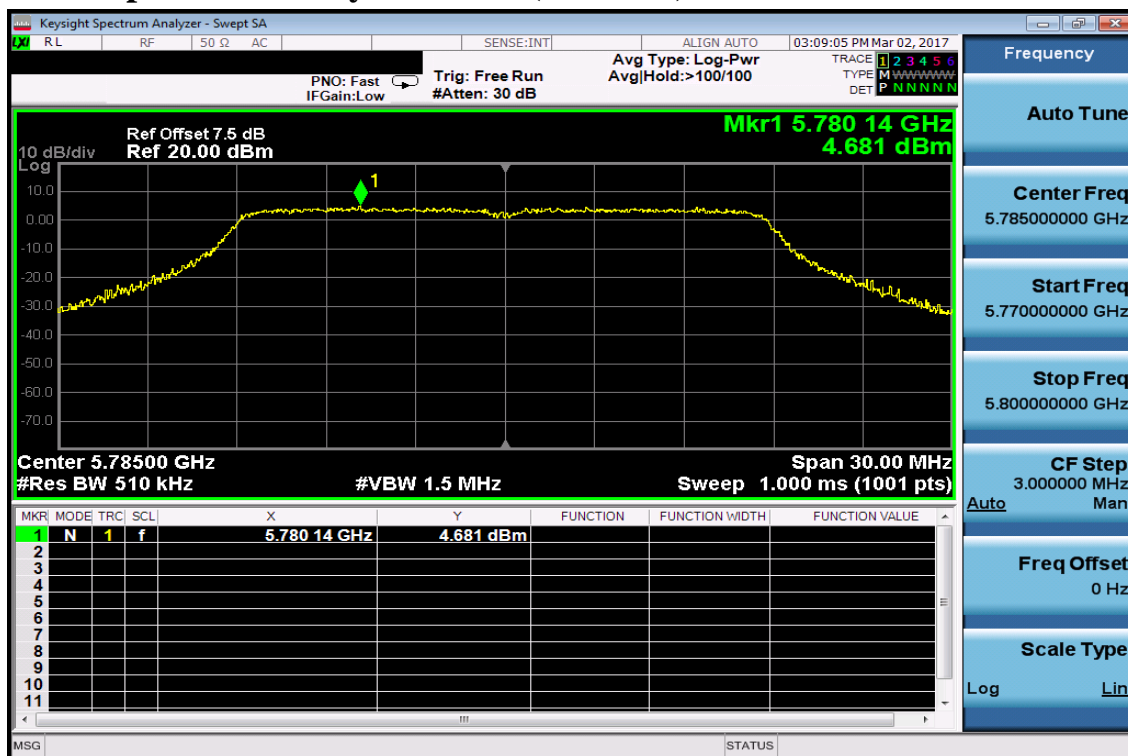


802.11n HT20, Chain 2

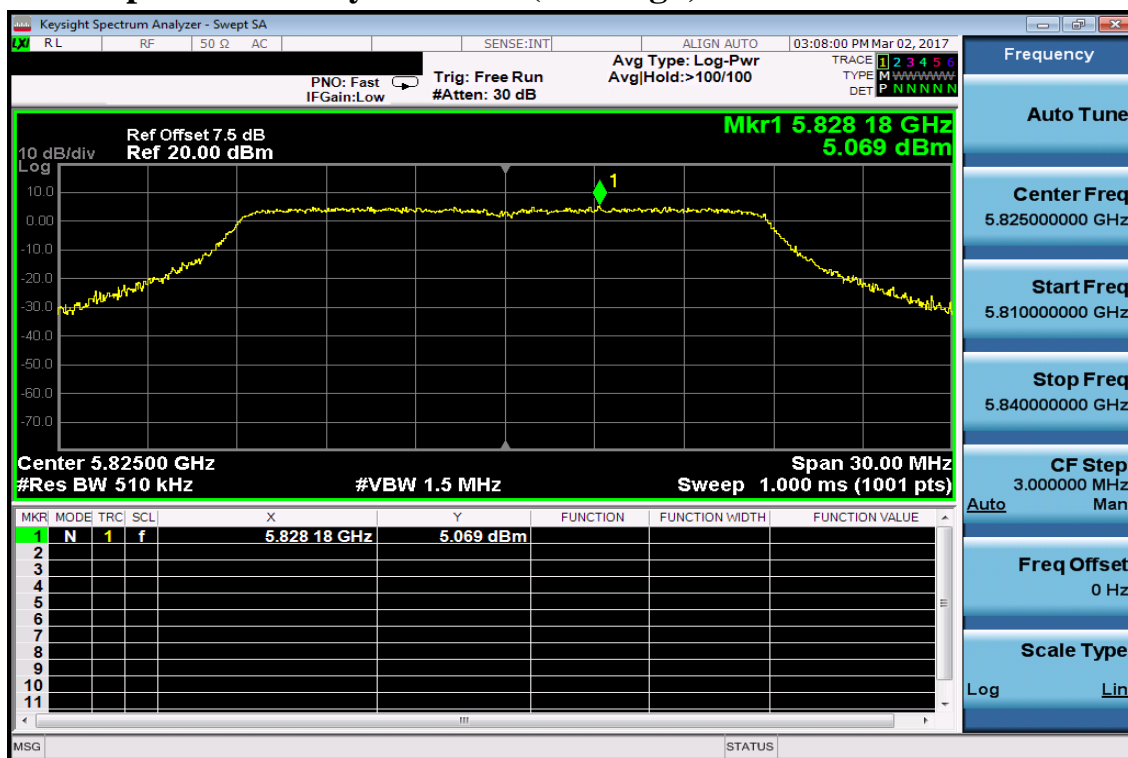
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



802.11n HT40, Chain 1

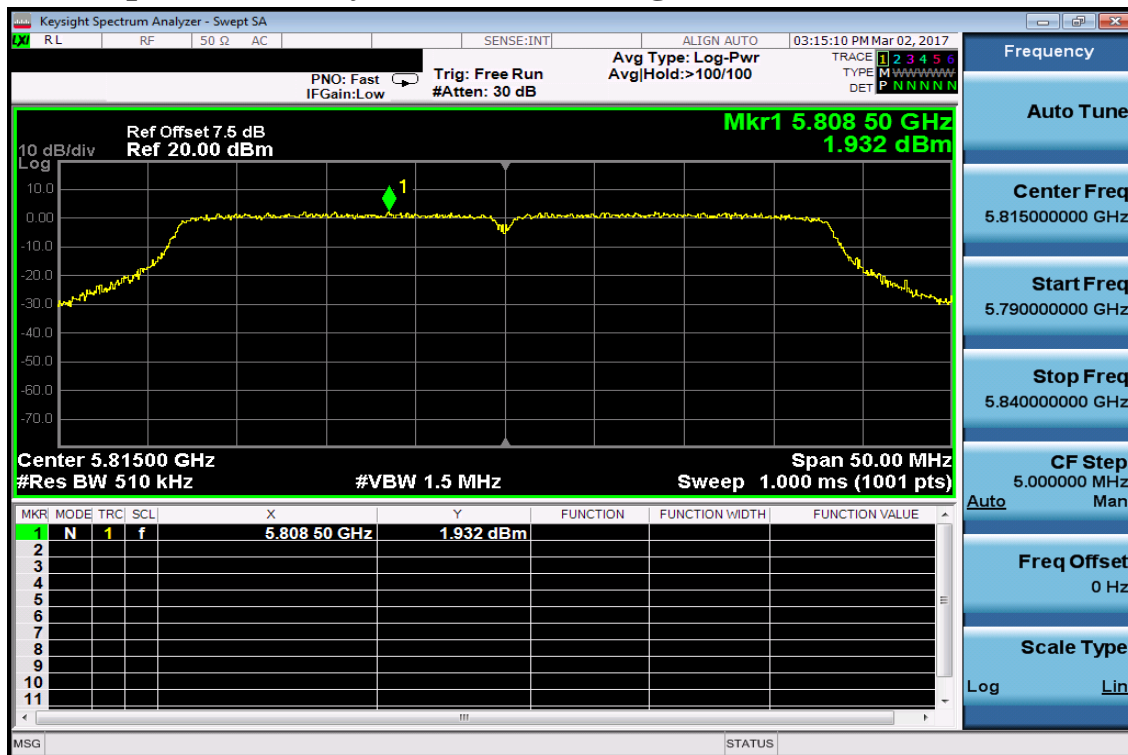
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

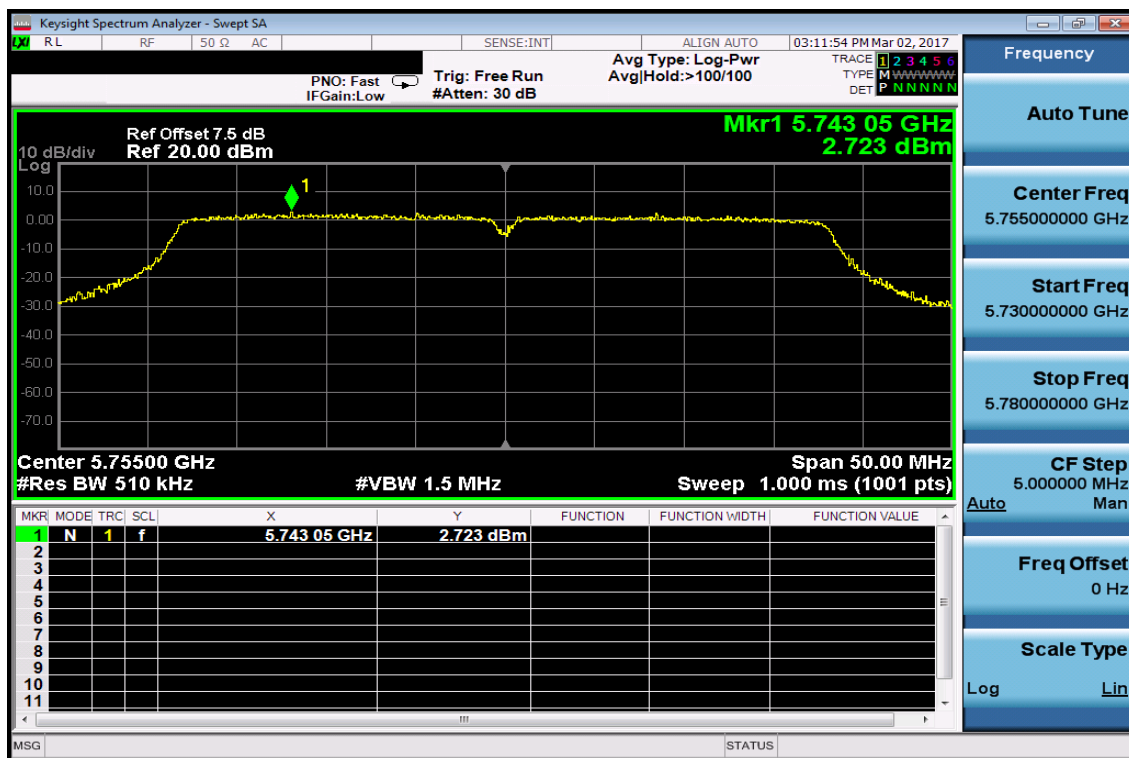


Power Spectral Density Test Plot (CH-High)

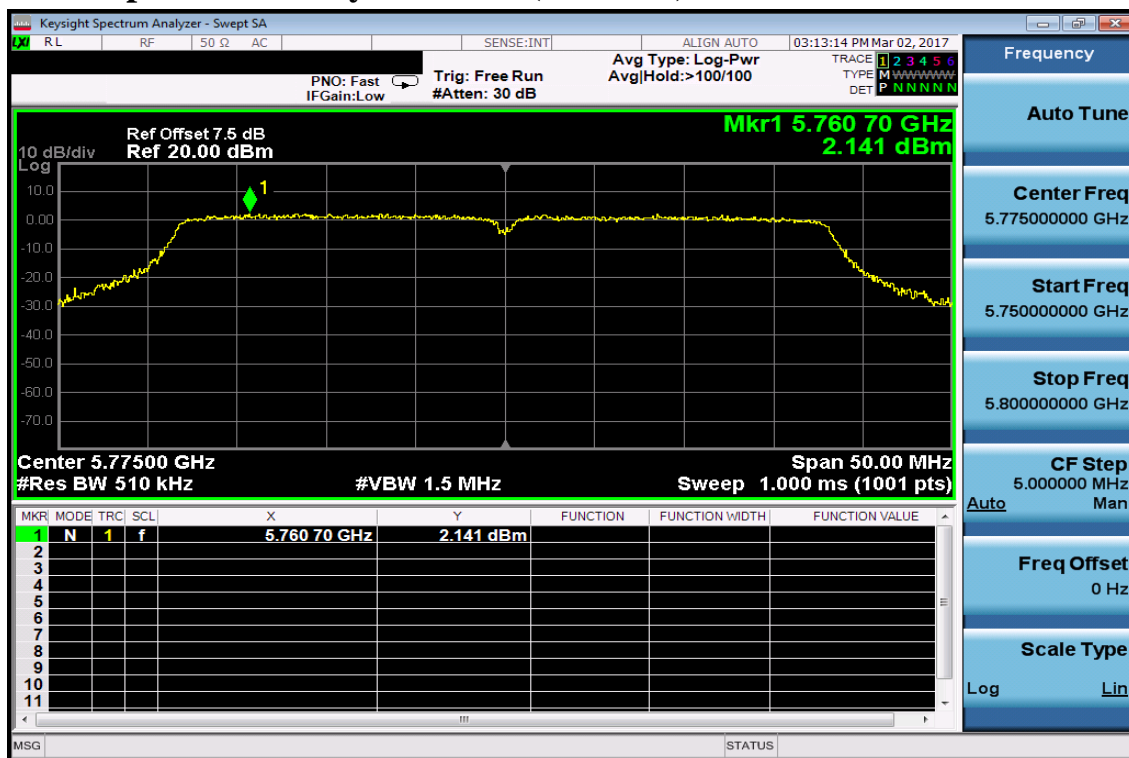


802.11n HT40, Chain 2

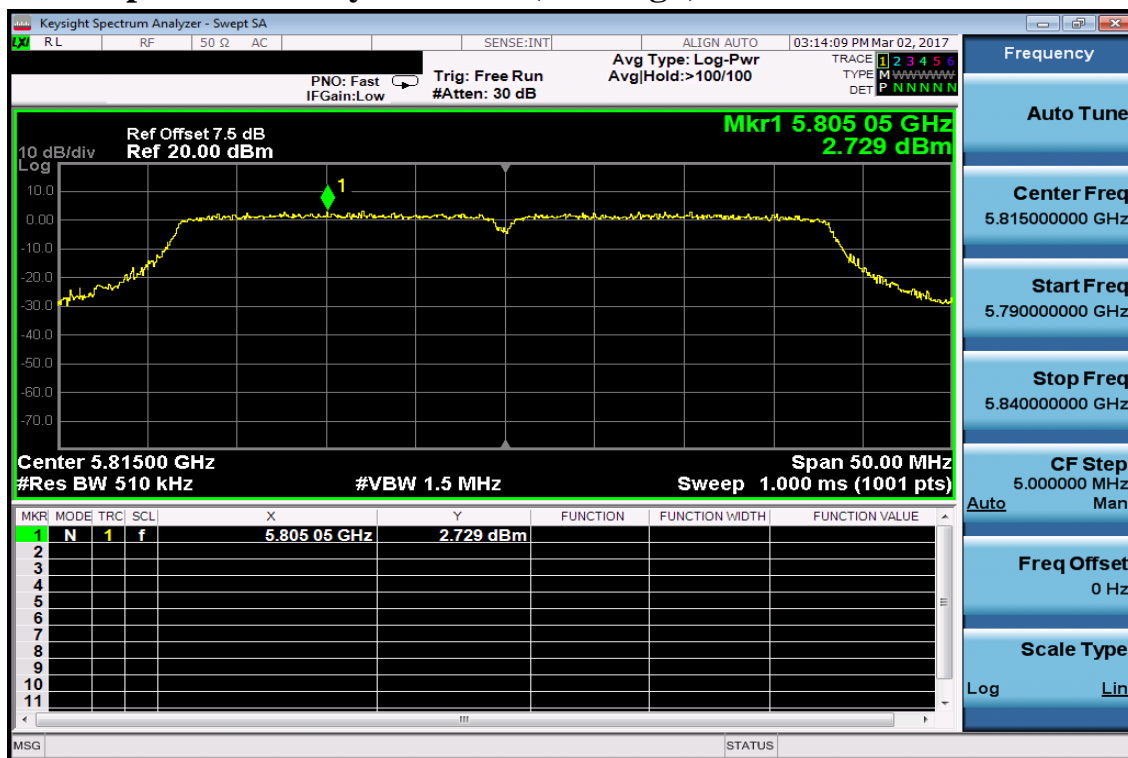
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

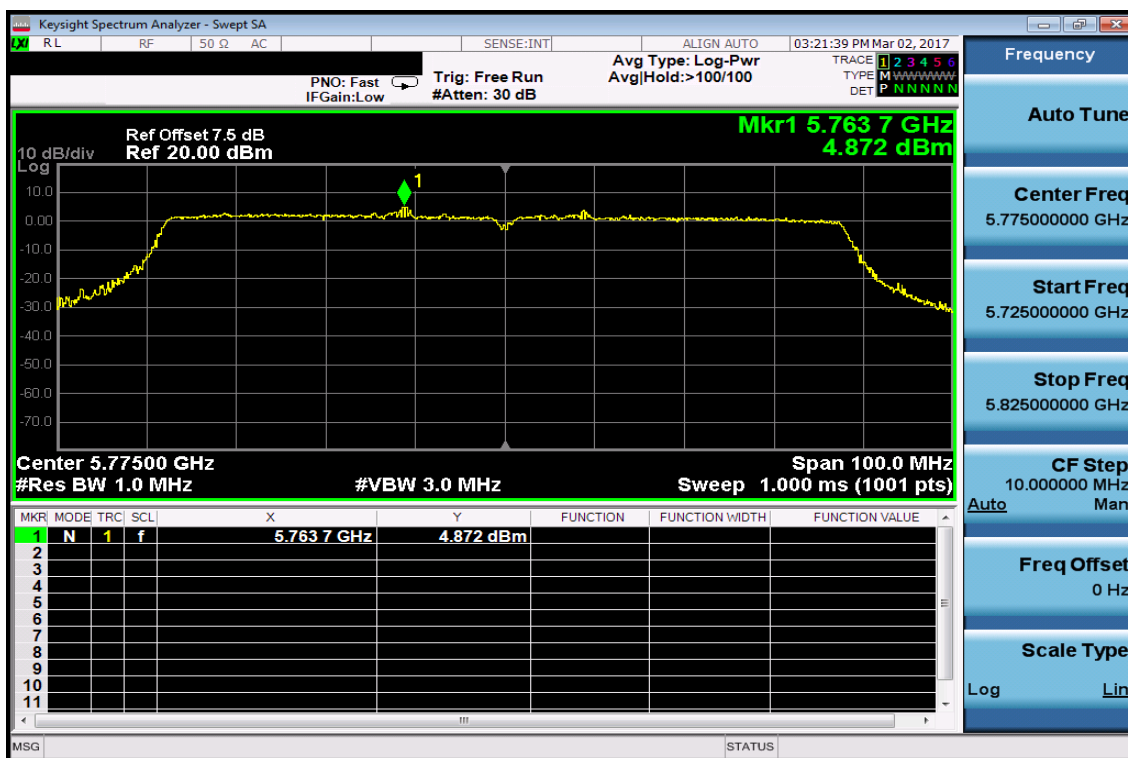


Power Spectral Density Test Plot (CH-High)

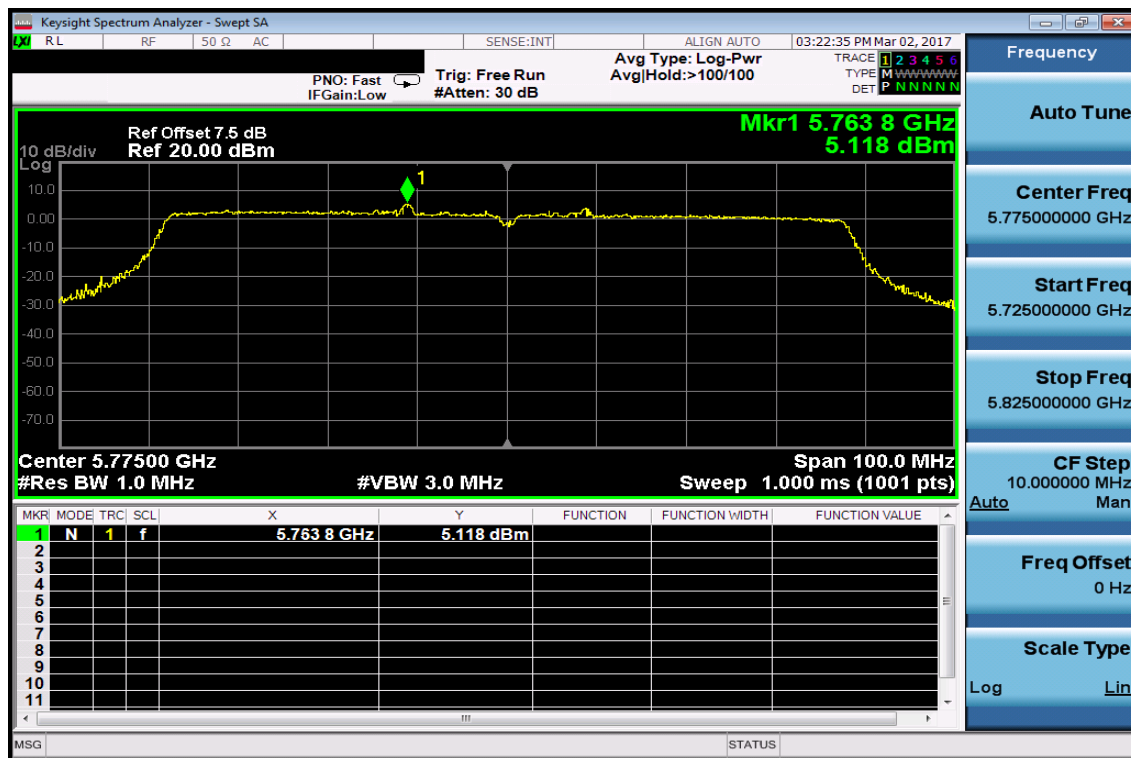


802.11AC HT80, Chain 1

Power Spectral Density Test Plot



802.11AC HT80, Chain 2 Power Spectral Density Test Plot



7. 26dB /99% EMISSION BANDWIDTH MEASUREMENT

7.1. Standard Applicable

According to §15.407(a) for band 1,2,3. No Limit required.

7.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=300KHz, VBW =1MHz, Span= 50MHz, Sweep=auto
4. Mark the peak frequency and -26dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

Refer to section D of KDB Document: KDB 789033 D02 General UNII Test Procedures New Rules v01r03

7.3. Measurement Equipment Used:

Refer to section 6.3 for details.

7.4. Test Set-up:

Refer to section 6.4 for details.

7.5. Measurement Result

5150-5250 MHz

802.11a Mode

| Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|--------------------|-------------------------|------------------------|
| 5180 | 22.010 | 16.786 |
| 5200 | 23.020 | 16.791 |
| 5240 | 21.950 | 16.827 |

802.11n HT20 Mode

| Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|--------------------|-------------------------|------------------------|
| 5180 | 22.630 | 17.894 |
| 5200 | 22.440 | 17.868 |
| 5240 | 23.420 | 17.919 |

802.11n HT40 Mode

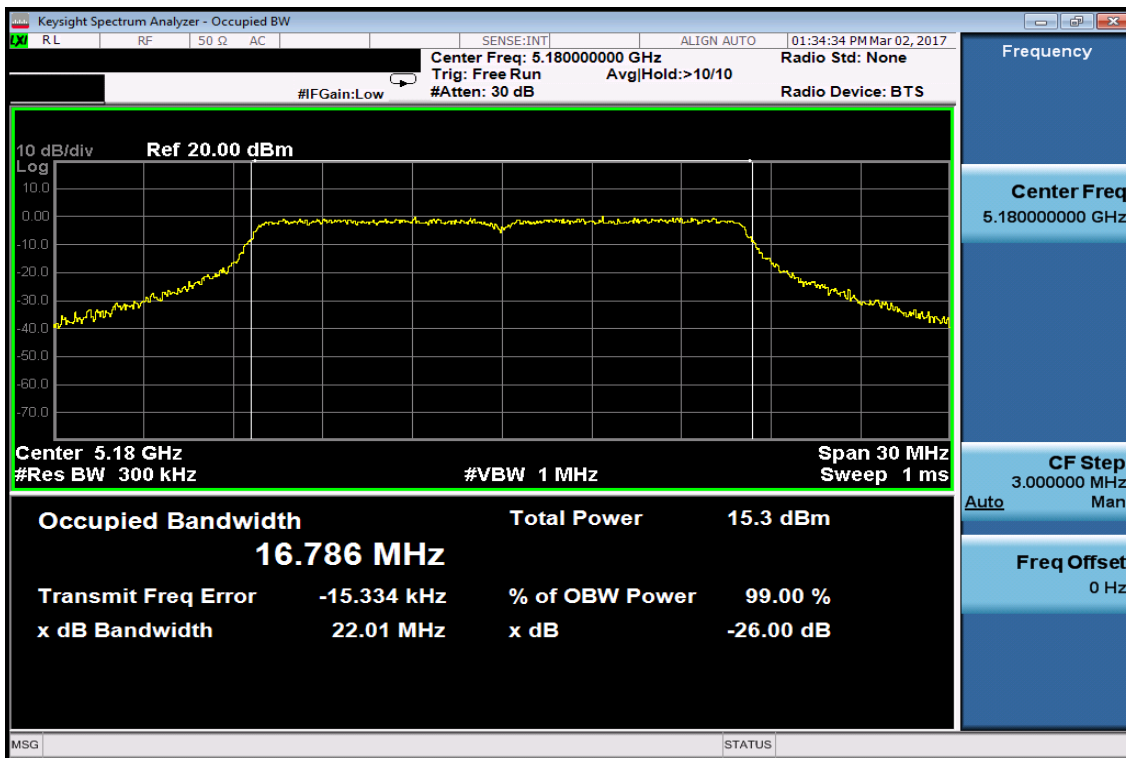
| Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|--------------------|-------------------------|------------------------|
| 5190 | 46.060 | 36.518 |
| 5210 | 46.250 | 36.577 |
| 5230 | 45.680 | 36.499 |

802.11a HT80 Mode

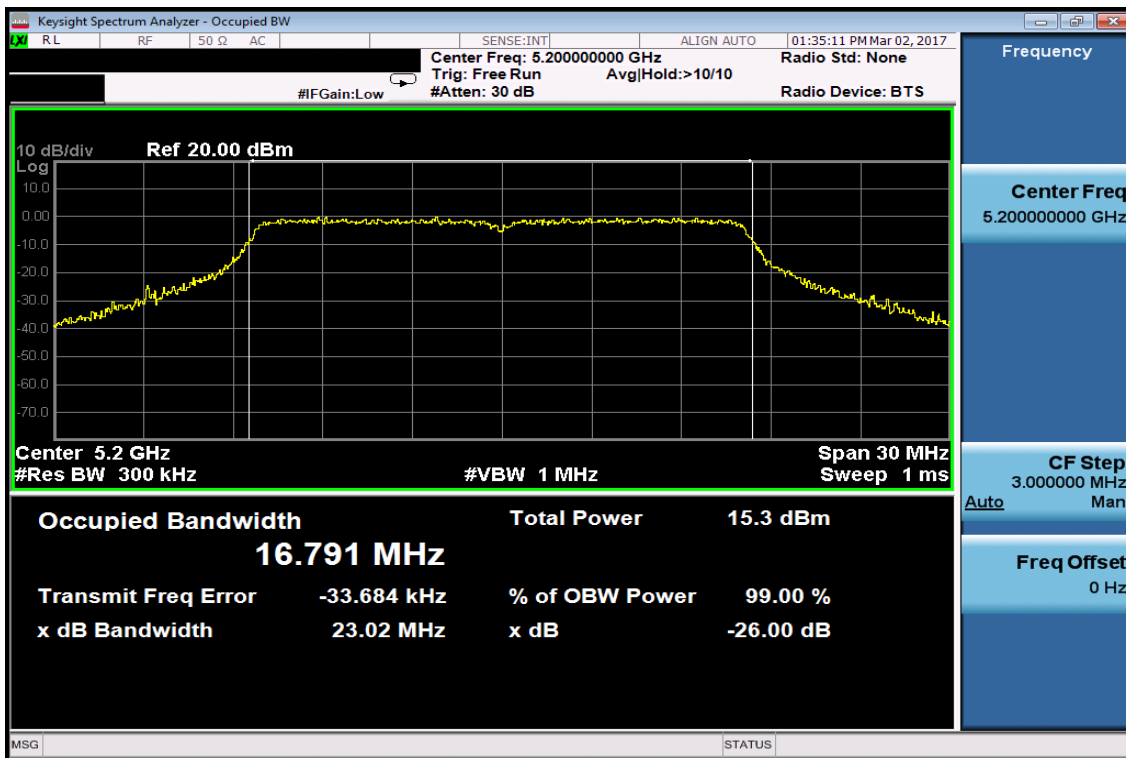
| Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|--------------------|-------------------------|------------------------|
| 5210 | 87.360 | 76.021 |

802.11a

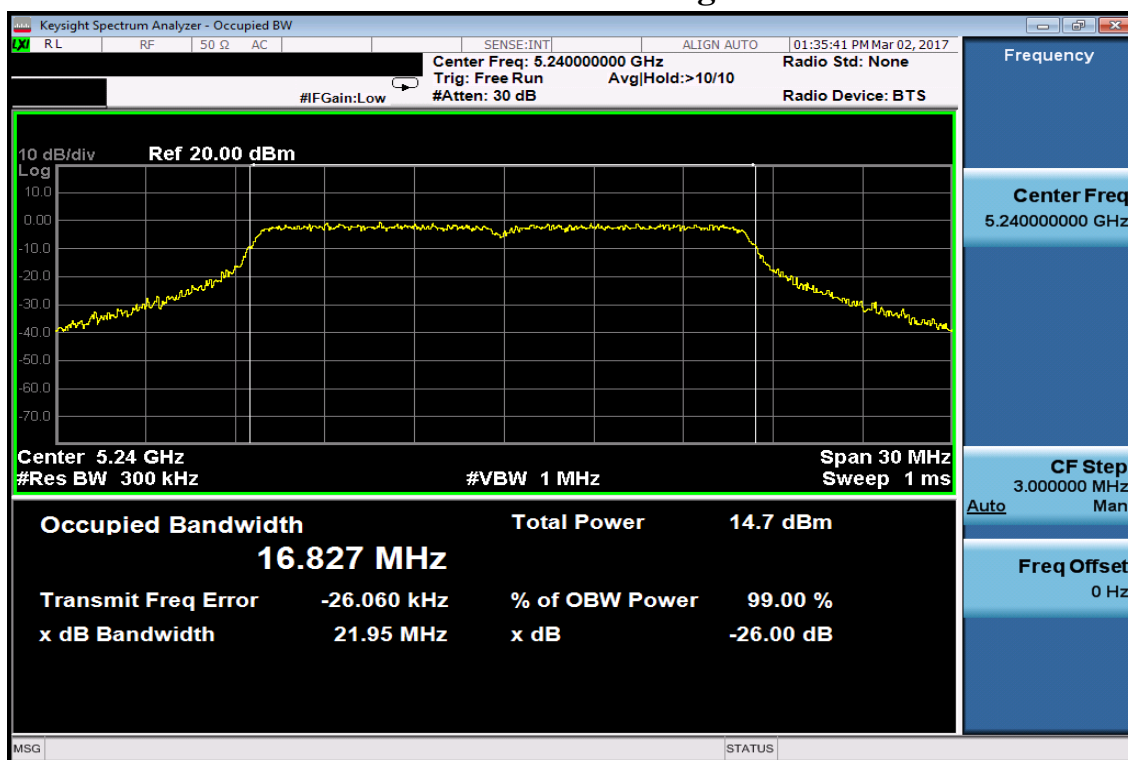
26dB / 99% Band Width Test Data CH-Low



26dB / 99% Band Width Test Data CH-Mid

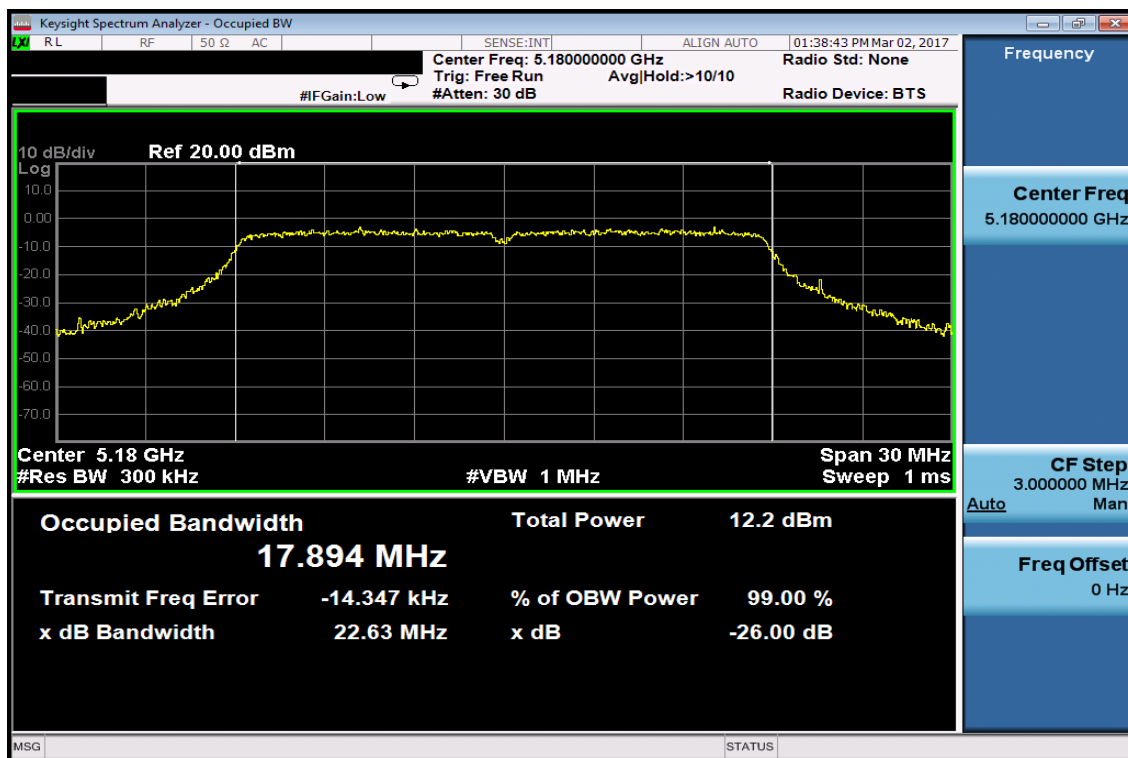


26dB / 99% Band Width Test Data CH-High

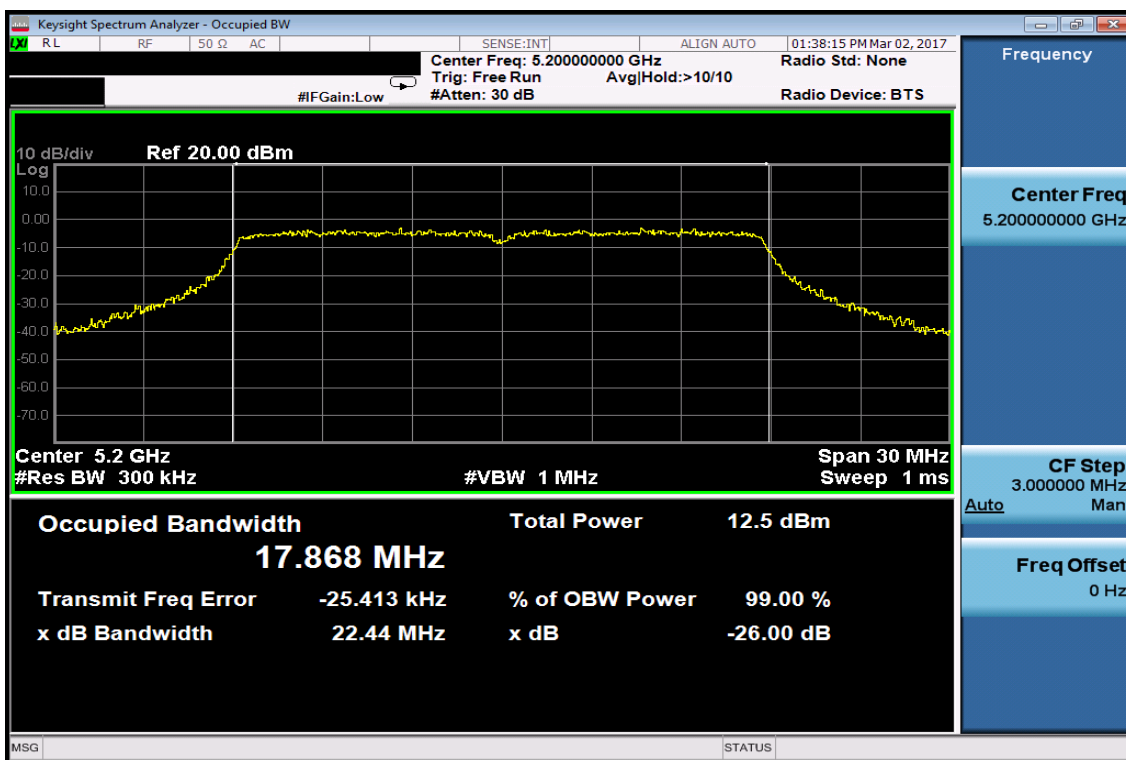


802.11n HT20

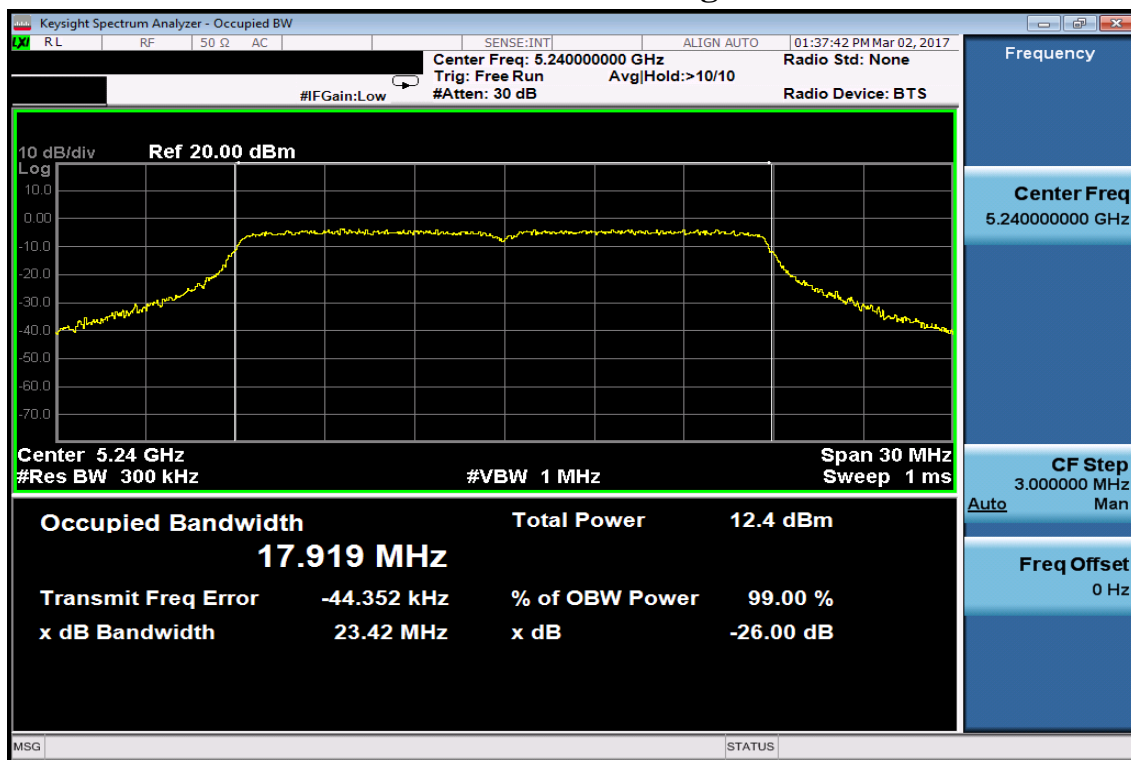
26dB / 99% Band Width Test Data CH-Low



26dB / 99% Band Width Test Data CH-Mid

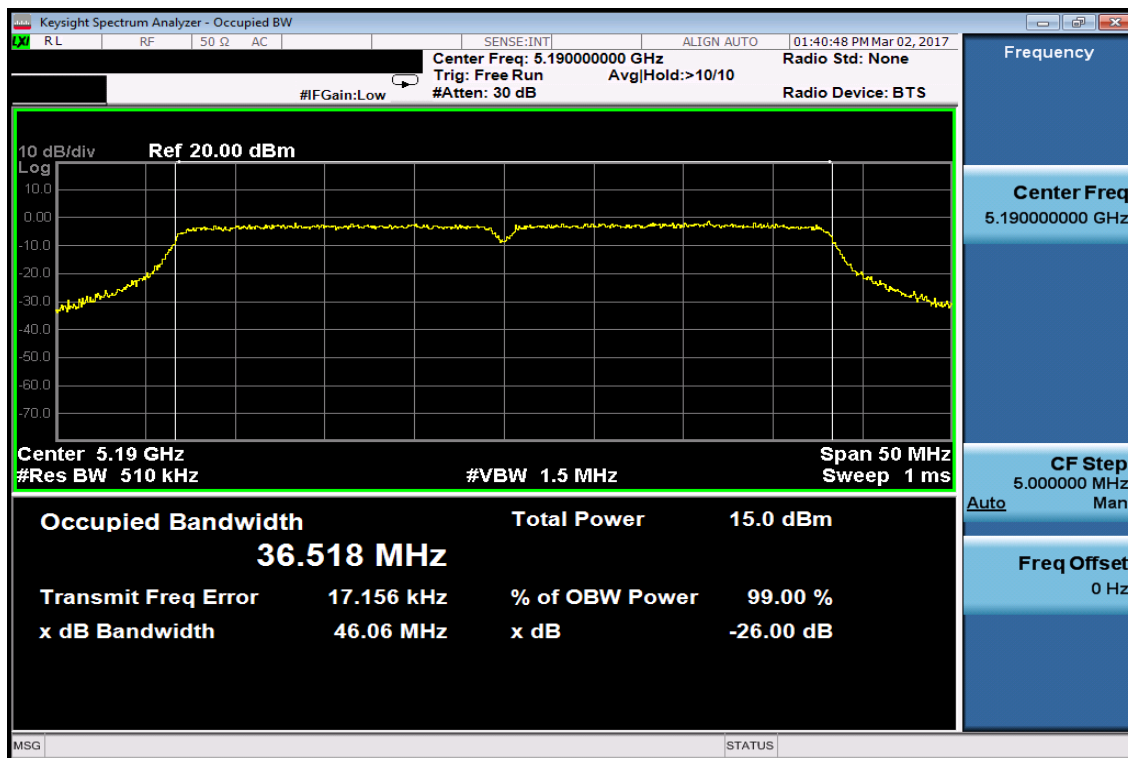


26dB / 99% Band Width Test Data CH-High

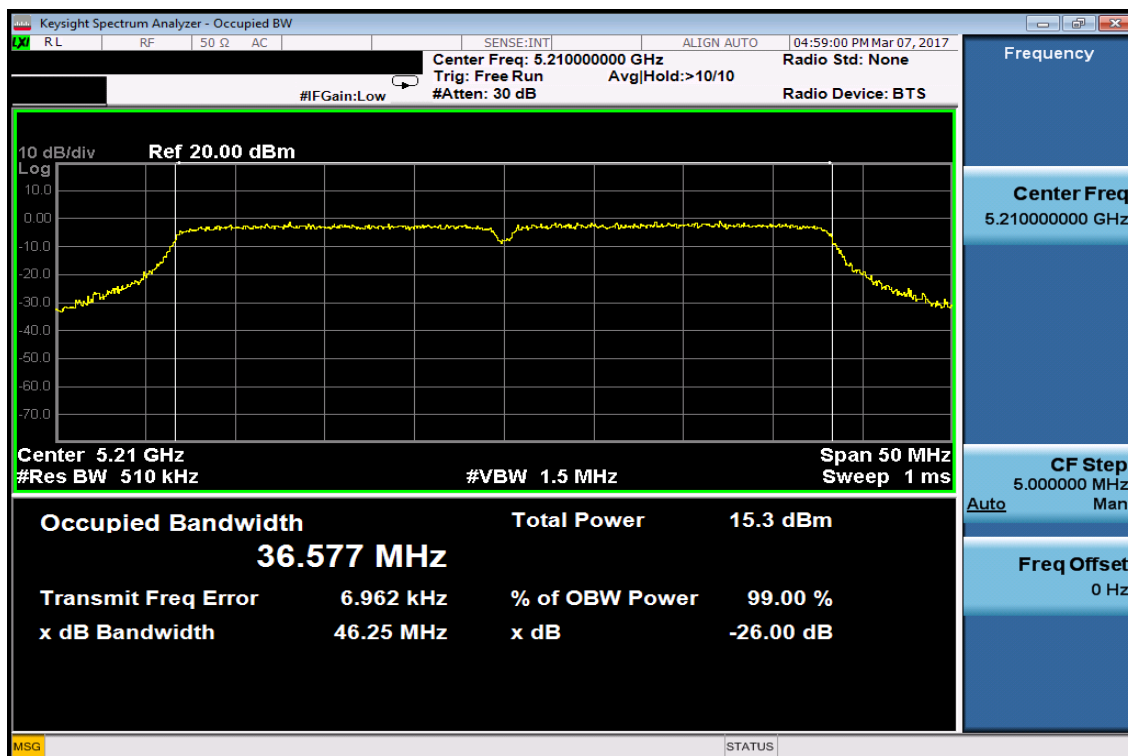


802.11n HT40

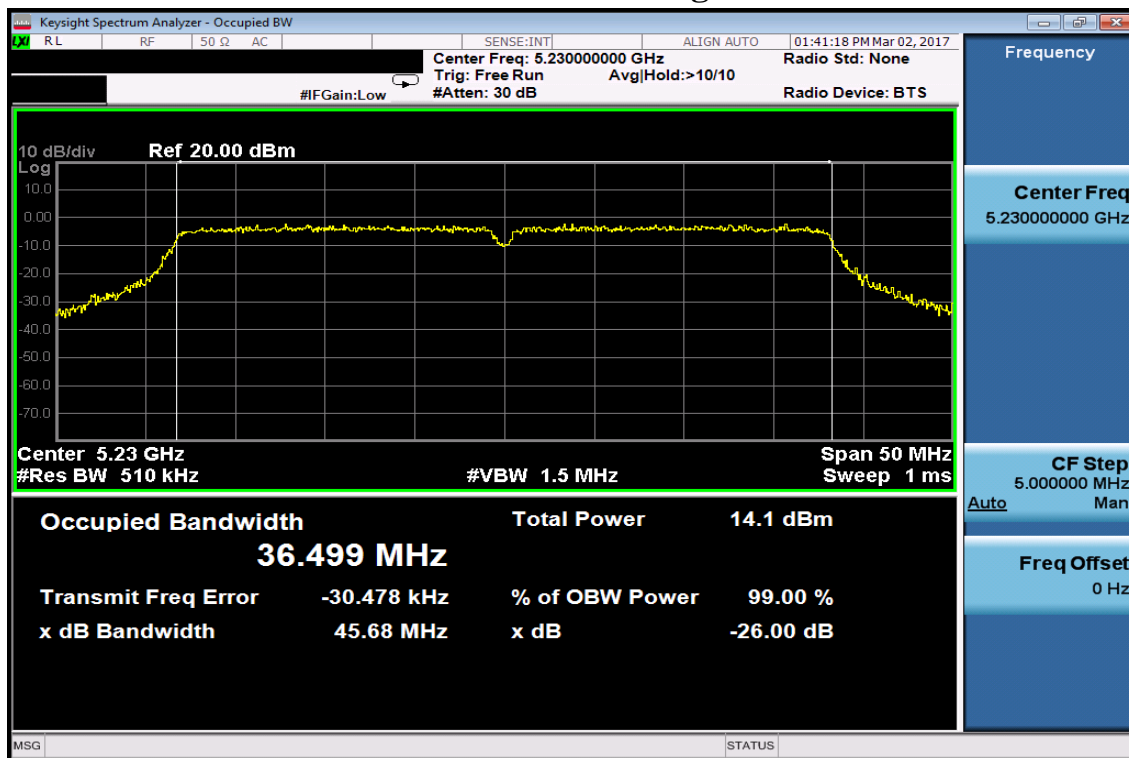
26dB / 99% Band Width Test Data CH-Low



26dB / 99% Band Width Test Data CH-Mid

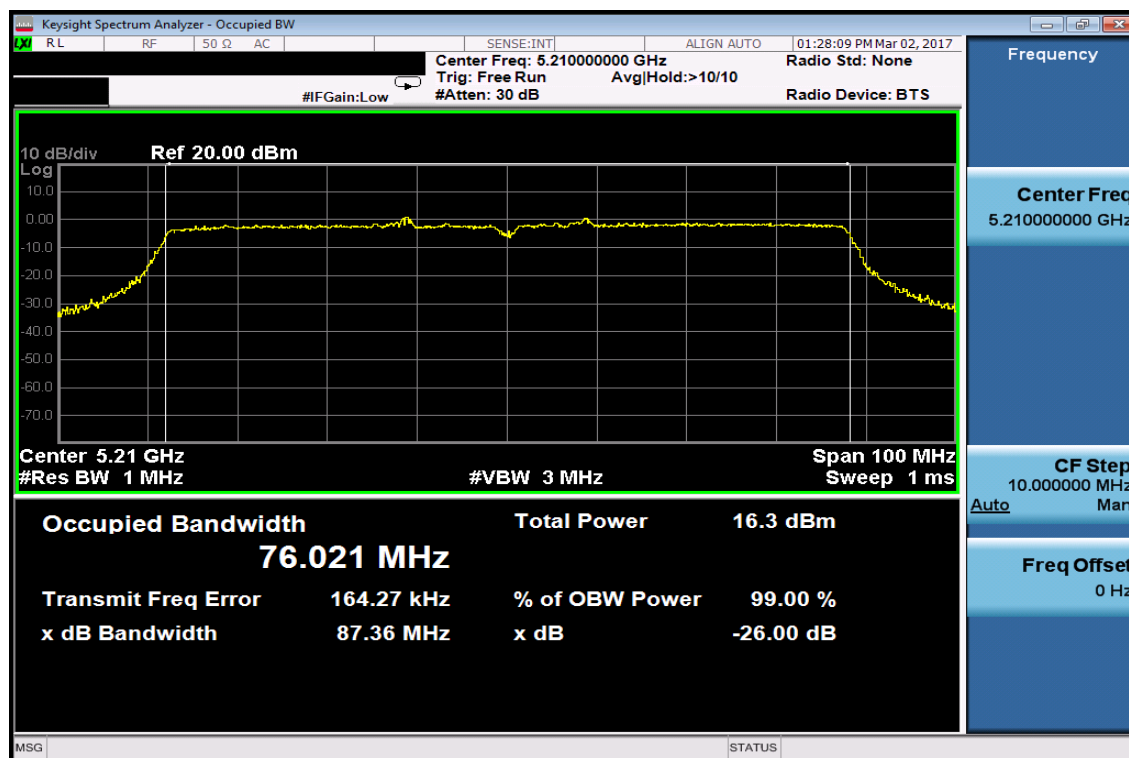


26dB / 99% Band Width Test Data CH-High



802.11AC HT80

26dB / 99% Band Width Test Data



8. 6dB EMISSION BANDWIDTH MEASUREMENT

8.1. Standard Applicable

According to §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.

8.2. Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW =300MHz, Span= 50MHz, Sweep=auto
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

Refer to section D of KDB Document: KDB 789033 D02 General UNII Test Procedures New Rules v01r03

8.3. Measurement Equipment Used:

Refer to section 6.3 for details.

8.4. Test Set-up:

Refer to section 6.4 for details.

8.5. Measurement Result

802.11a Mode

| Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (KHz) |
|--------------------|------------------------|----------------|
| 5745 | 16.370 | >500 |
| 5785 | 16.380 | >500 |
| 5825 | 16.400 | >500 |

802.11n HT20 Mode

| Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (KHz) |
|--------------------|------------------------|----------------|
| 5745 | 17.590 | >500 |
| 5785 | 17.600 | >500 |
| 5825 | 17.600 | >500 |

802.11n HT40 Mode

| Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (KHz) |
|--------------------|------------------------|----------------|
| 5755 | 35.950 | >500 |
| 5795 | 36.090 | >500 |
| 5815 | 36.340 | >500 |

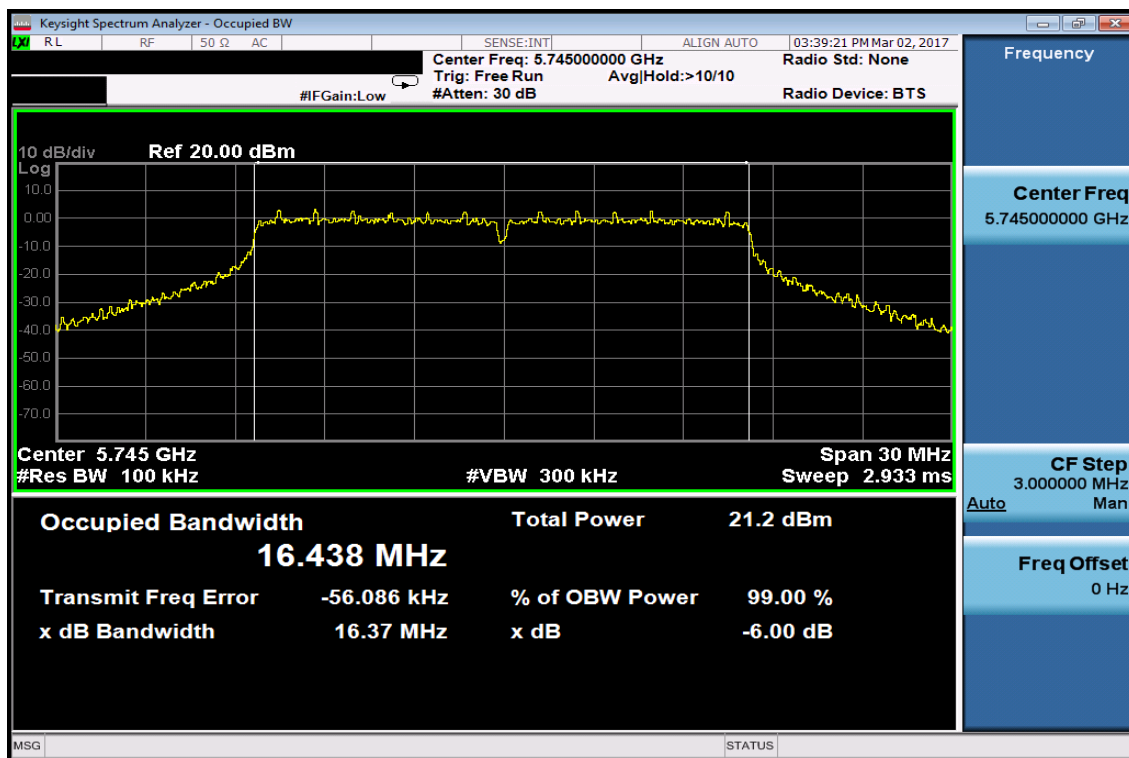
802.11a HT80 Mode

| Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (KHz) |
|--------------------|------------------------|----------------|
| 5755 | 76.620 | >500 |

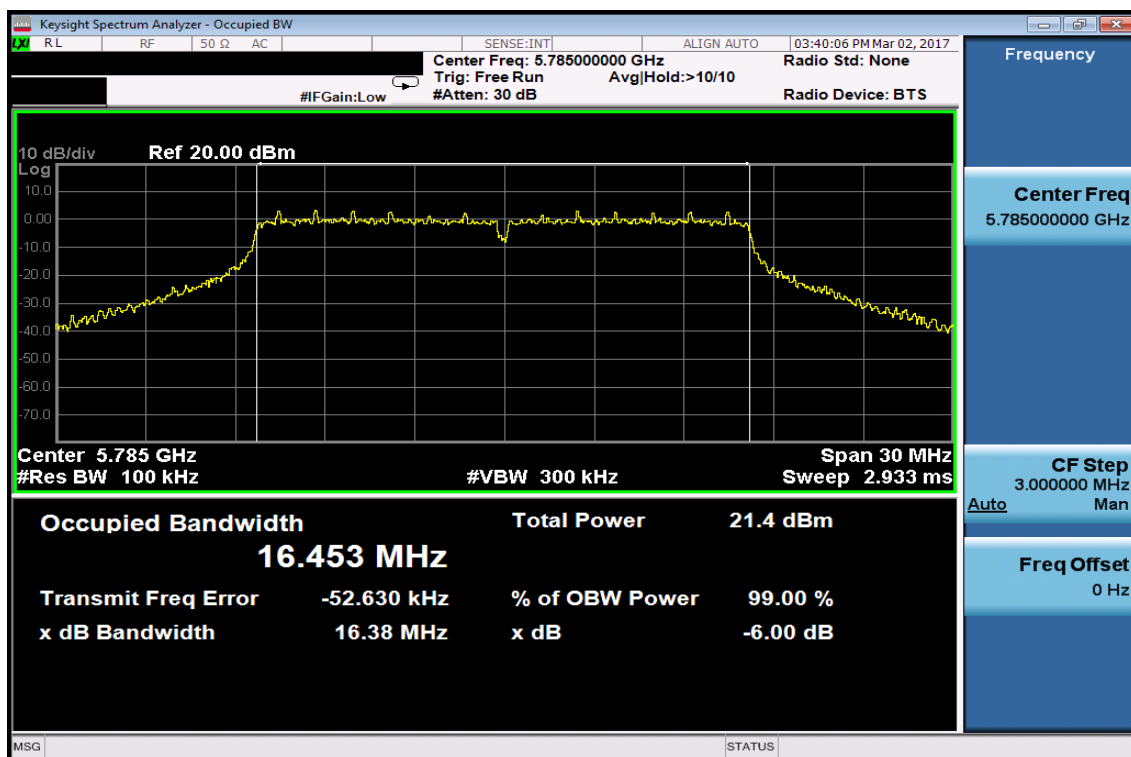
5725-5850 MHz

802.11a

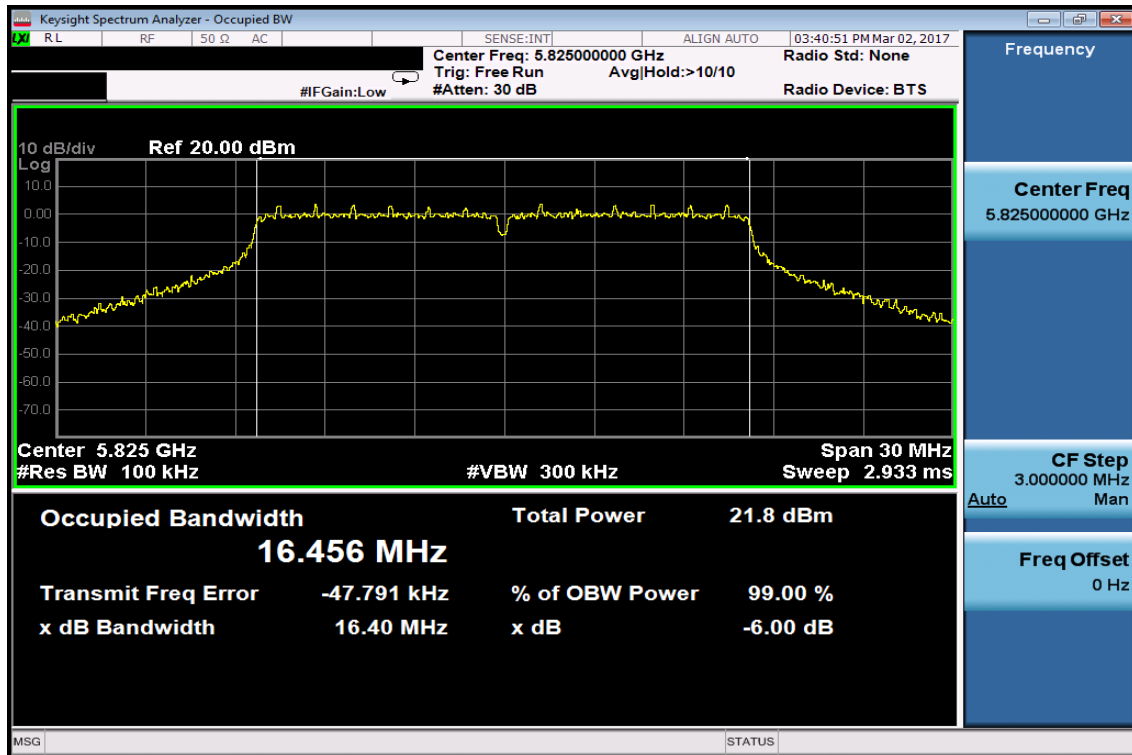
6dB Band Width Test Data CH-Low



6dB Band Width Data CH-Mid

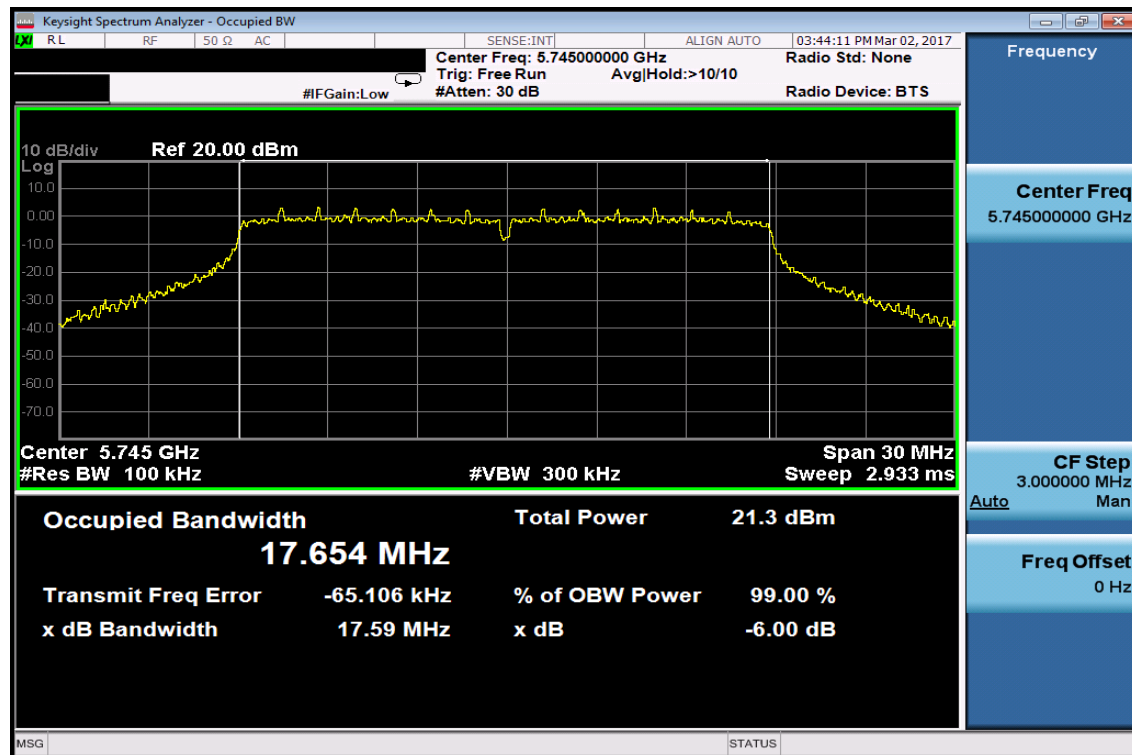


6dB Band Width Data CH-High

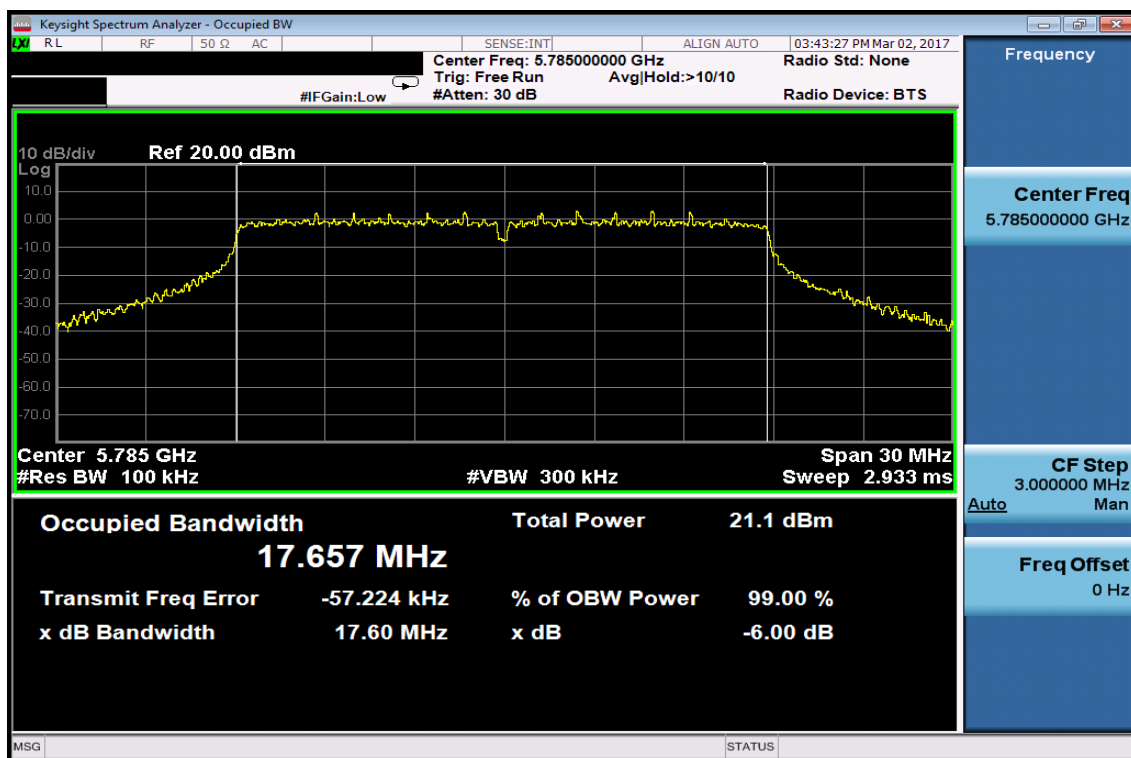


802.11n HT20

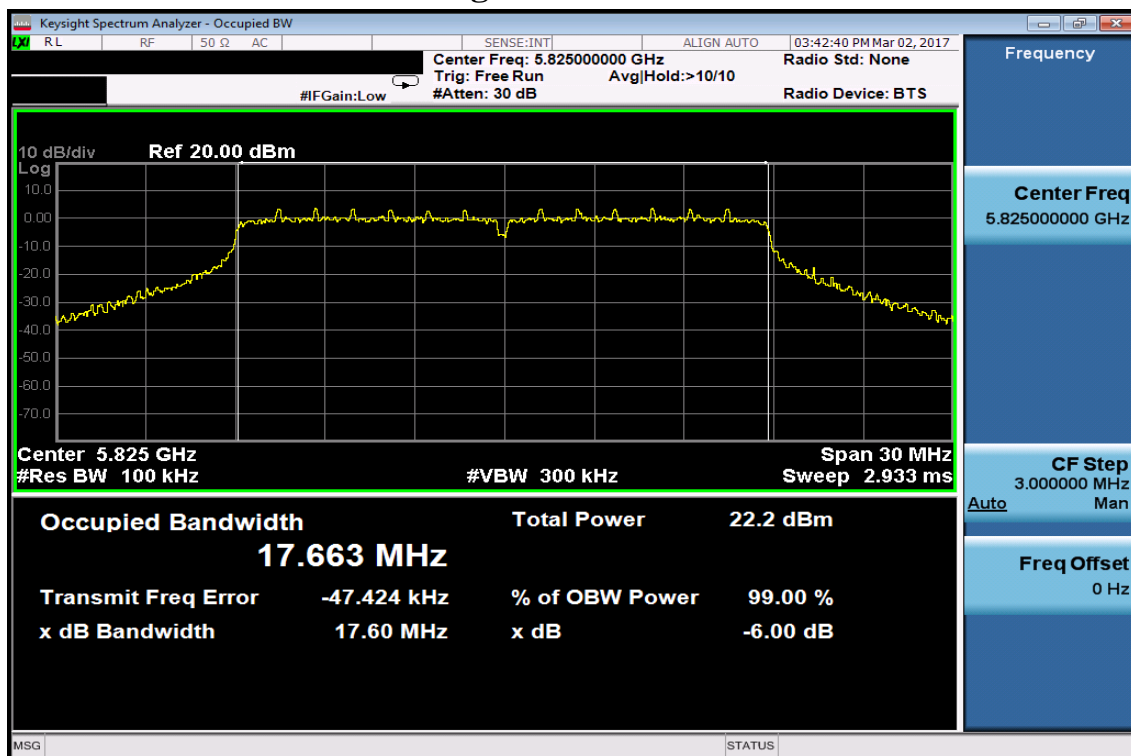
6dB Band Width Data CH-Low



6dB Band Width Data CH-Mid

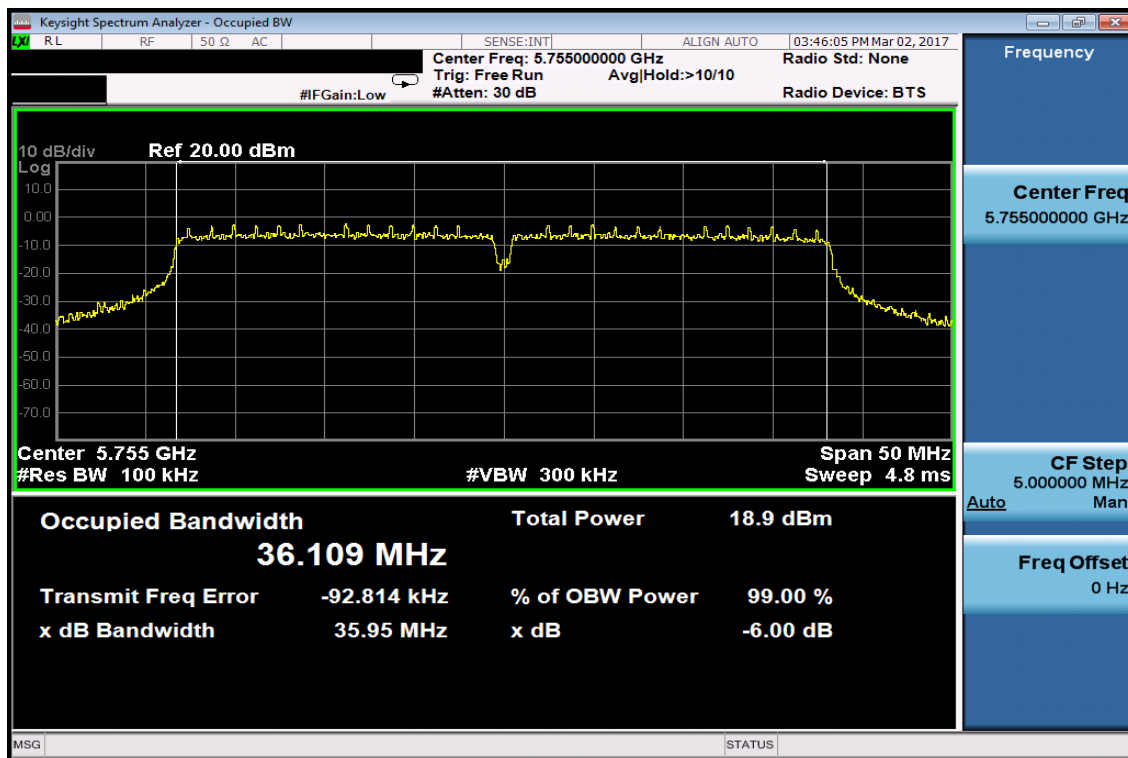


6dB Band Width Data CH-High

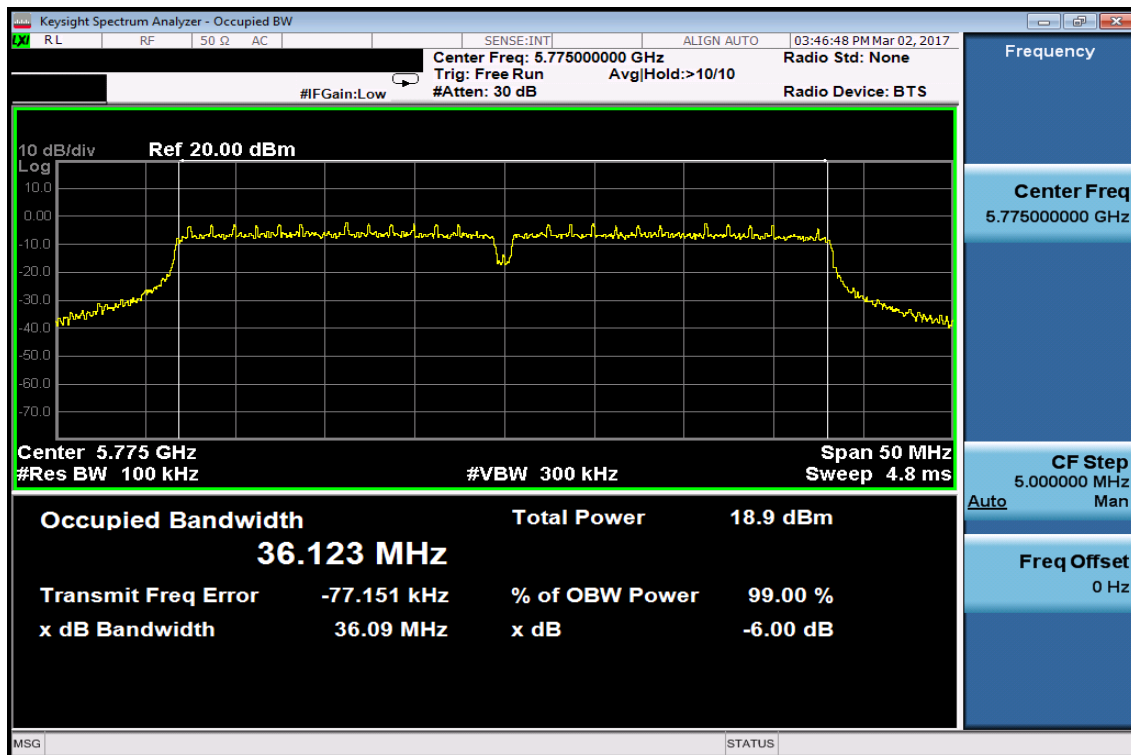


802.11n HT40

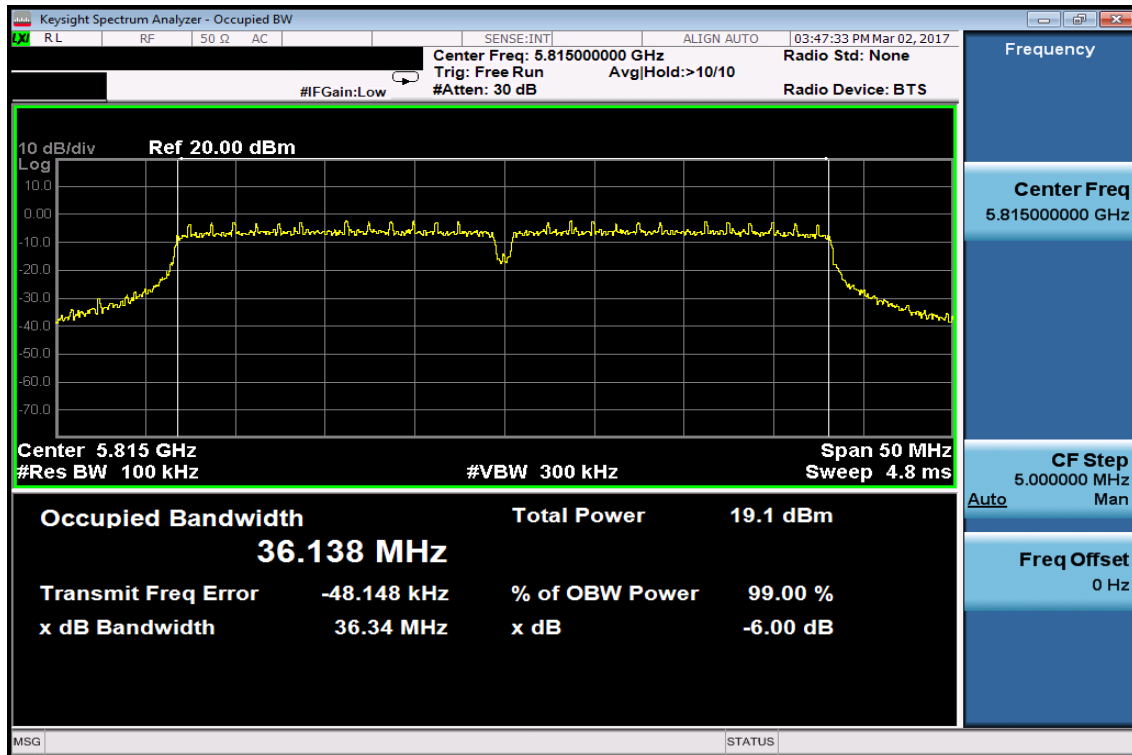
6dB Band Width Data CH-Low



6dB Band Width Data CH-Mid

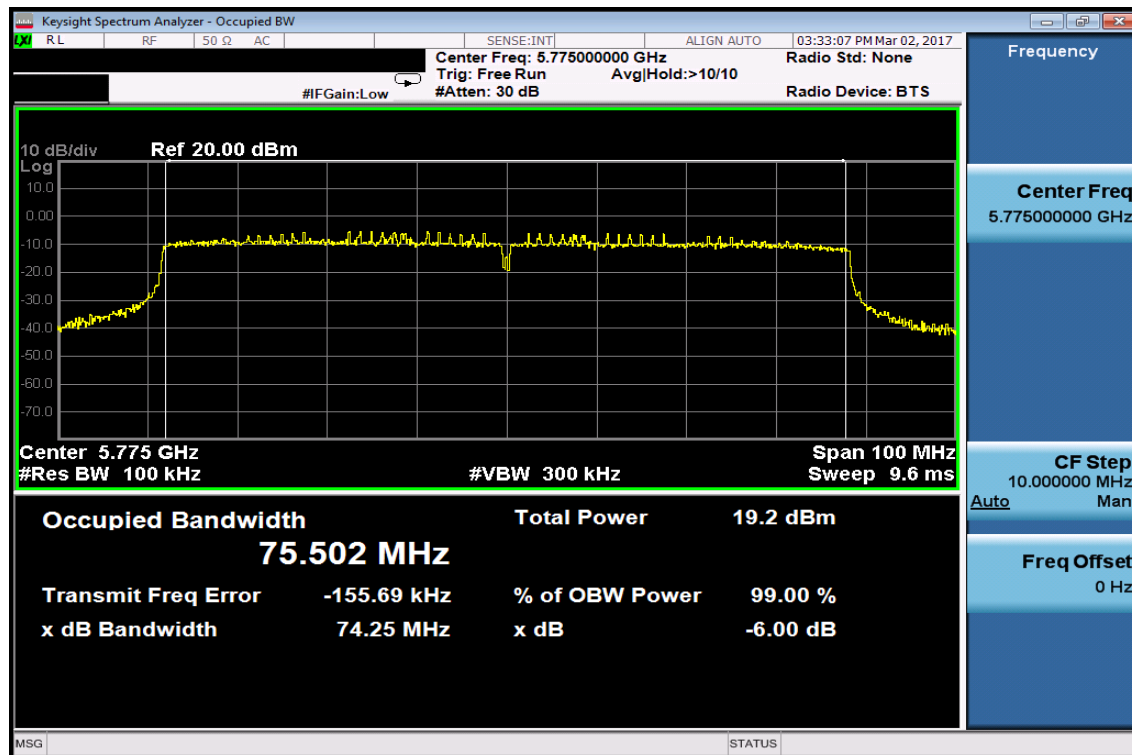


6dB Band Width Data CH-High



802.11AC HT80

6dB Band Width Data CH-Low



9. UNDESIRABLE EMISSION - RADIATED MEASUREMENT

9.1. Standard Applicable

According to §15.407(b), Undesirable Emission Limits: Except as shown in Paragraph (b)(7) of this section, the peak 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 -17dBm/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.
- (5) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
- (7) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

§15.205- RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|----------------------------|---------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.52525 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 156.7 - 156.9 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 162.0125 - 167.17 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 167.72 - 173.2 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 240 - 285 | 3600 - 4400 | (²) |
| 13.36 - 13.41 | 322 - 335.4 | | |

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

FCC PART 15.209

| MEASURING DISTANCE OF 3 METER | | |
|-------------------------------|----------------------------------|----------------------------|
| FREQUENCY RANGE (MHz) | FIELD STRENGTH (Microvolts/m) | FIELD STRENGTH (dBuV/m) |
| 30-88 | 100 | 40 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46 |
| Above 960 | 500 | 54 |

9.2. EUT Setup

1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.10: 2013
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 120Vac/60Hz power source.

9.3. Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

Refer to section F of KDB Document: KDB 789033 D02 General UNII Test Procedures New Rules v01r03

9.5. Measurement Equipment Used:

| Chamber 19(966) | | | | | |
|------------------------------------|---------------|------------------------|-----------------|------------|------------|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
| 966 Chamber | Chance Most | Chamber 19 | N/A | 08/15/2016 | 08/14/2017 |
| Spectrum Analyzer 21(3Hz-44GHz) | Agilent | N9030A | MY51360021 | 11/14/2016 | 11/13/2017 |
| EMI Receiver | SCHWARZBECK | FCVU1534 | 1534149 | 11/30/2016 | 11/29/2017 |
| Loop Antenna(9K-30M) | EM | EM-6879 | 271 | 11/01/2016 | 10/31/2018 |
| Loop Antenna (9K-30M) | A.H.SYSTEM | SAS-564 | 294 | 06/17/2015 | 06/16/2017 |
| Bilog Antenna (30M-1G) | SCHWARZBECK | VULB9168 w 5dB Att | 736 | 07/22/2016 | 07/21/2017 |
| Horn antenna (1G-18G) | SCHWARZBECK | 9120D | 9120D-1627 | 07/22/2016 | 07/21/2017 |
| Horn antenna (18G-26G) | Com-power | AH-826 | 081001 | 07/24/2015 | 07/23/2017 |
| Horn antenna (26G-40G) | Com-power | AH-640 | 100A | 02/22/2017 | 02/21/2019 |
| Preamplifier (9k-1000M) | HP | 8447F | 3113A06362 | 11/13/2016 | 11/12/2017 |
| Preamplifier(1G-26G) | Agilent | 8449B | 3008A02471 | 08/25/2016 | 08/24/2017 |
| Preamplifier (26G-40G) | MITEQ | JS4-26004000- 27-5A | 818471 | 07/23/2015 | 07/22/2017 |
| RF Cable (9k-18G) | HUBER SUHNER | SUCOFLEX 104A | MY1397/4A | 08/25/2016 | 08/24/2017 |
| RF cable (18G~40G) | HUBER SUHNER | Sucoflex 102 | 27963/2&37421/2 | 11/03/2015 | 11/02/2017 |
| Turn Table | MF | Turn Table-19 | Turn Table-19 | N/A | N/A |
| Mast Tower | MF | JSDS-15A | 1308283 | N/A | N/A |
| Controller | MF | MF-7802BS | MF780208460 | N/A | N/A |
| AC power source | T-Power | TFC-1005 | 40006471 | N/A | N/A |
| Signal Generator | R&S | SMU200A | 102330 | 03/28/2016 | 03/27/2017 |
| Signal Generator | Anritsu | MG3692A | 20311 | 11/04/2016 | 11/03/2017 |
| 2.4G Filter | Micro-Tronics | Brm50702 | 76 | 12/25/2016 | 12/24/2017 |
| 5G Filter | Micro-Tronics | Brm50716 | 005 | 12/25/2016 | 12/24/2017 |
| Test Software | Audix | E3 Ver:6.12023 | N/A | N/A | N/A |

9.6. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

| | | |
|-------|------------------------|--|
| Where | FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| | RA = Reading Amplitude | AG = Amplifier Gain |
| | AF = Antenna Factor | |

9.7. Measurement Result

Refer to attach tabular data sheets.

NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz. And RBW 1MHz for frequency above 1GHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

(Worst case: Band 4, 802.11n HT40)

| | | | |
|----------------|---------|-----------|------------|
| Operation Mode | TX MODE | Test Date | 2017/03/08 |
| Channel Number | CH Low | Test By | Dino |
| Temperature | 25 °C | Pol | Ver./Hor |
| Humidity | 65 % | | |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|--------|------------|
| 1 | 56.19 | 41.14 | -7.94 | 33.20 | 40.00 | -6.80 | Peak | VERTICAL |
| 2 | 96.93 | 43.43 | -12.79 | 30.64 | 43.50 | -12.86 | Peak | VERTICAL |
| 3 | 250.19 | 42.01 | -7.95 | 34.06 | 46.00 | -11.94 | Peak | VERTICAL |
| 4 | 375.32 | 46.09 | -4.63 | 41.46 | 46.00 | -4.54 | Peak | VERTICAL |
| 5 | 500.45 | 37.82 | -2.27 | 35.55 | 46.00 | -10.45 | Peak | VERTICAL |
| 6 | 649.83 | 34.44 | 0.19 | 34.63 | 46.00 | -11.37 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 60.07 | 42.04 | -8.33 | 33.71 | 40.00 | -6.29 | Peak | HORIZONTAL |
| 2 | 179.38 | 40.00 | -8.65 | 31.35 | 43.50 | -12.15 | Peak | HORIZONTAL |
| 3 | 250.19 | 43.20 | -7.95 | 35.25 | 46.00 | -10.75 | Peak | HORIZONTAL |
| 4 | 364.65 | 39.95 | -4.85 | 35.10 | 46.00 | -10.90 | Peak | HORIZONTAL |
| 5 | 649.83 | 32.90 | 0.19 | 33.09 | 46.00 | -12.91 | Peak | HORIZONTAL |
| 6 | 916.58 | 24.26 | 4.89 | 29.15 | 46.00 | -16.85 | Peak | HORIZONTAL |

Remark:

- 1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

| | | | |
|----------------|---------|-----------|------------|
| Operation Mode | TX MODE | Test Date | 2017/03/08 |
| Channel Number | CH Mid | Test By | Dino |
| Temperature | 25 °C | Pol | Ver./Hor |
| Humidity | 65 % | | |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|--------|------------|
| 1 | 52.31 | 40.32 | -7.55 | 32.77 | 40.00 | -7.23 | Peak | VERTICAL |
| 2 | 96.93 | 44.95 | -12.79 | 32.16 | 43.50 | -11.34 | Peak | VERTICAL |
| 3 | 250.19 | 42.03 | -7.95 | 34.08 | 46.00 | -11.92 | Peak | VERTICAL |
| 4 | 375.32 | 46.43 | -4.63 | 41.80 | 46.00 | -4.20 | Peak | VERTICAL |
| 5 | 500.45 | 37.10 | -2.27 | 34.83 | 46.00 | -11.17 | Peak | VERTICAL |
| 6 | 649.83 | 34.70 | 0.19 | 34.89 | 46.00 | -11.11 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 61.04 | 43.52 | -8.50 | 35.02 | 40.00 | -4.98 | Peak | HORIZONTAL |
| 2 | 250.19 | 43.57 | -7.95 | 35.62 | 46.00 | -10.38 | Peak | HORIZONTAL |
| 3 | 324.88 | 41.71 | -5.61 | 36.10 | 46.00 | -9.90 | Peak | HORIZONTAL |
| 4 | 375.32 | 40.82 | -4.63 | 36.19 | 46.00 | -9.81 | Peak | HORIZONTAL |
| 5 | 649.83 | 33.93 | 0.19 | 34.12 | 46.00 | -11.88 | Peak | HORIZONTAL |
| 6 | 745.86 | 32.98 | 2.18 | 35.16 | 46.00 | -10.84 | Peak | HORIZONTAL |

Remark:

- 1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

| | | | |
|----------------|---------|-----------|------------|
| Operation Mode | TX MODE | Test Date | 2017/03/08 |
| Channel Number | CH High | Test By | Dino |
| Temperature | 25 °C | Pol | Ver./Hor |
| Humidity | 65 % | | |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|--------|------------|
| 1 | 58.13 | 42.04 | -8.12 | 33.92 | 40.00 | -6.08 | Peak | VERTICAL |
| 2 | 96.93 | 45.84 | -12.79 | 33.05 | 43.50 | -10.45 | Peak | VERTICAL |
| 3 | 250.19 | 42.10 | -7.95 | 34.15 | 46.00 | -11.85 | Peak | VERTICAL |
| 4 | 375.32 | 45.89 | -4.63 | 41.26 | 46.00 | -4.74 | Peak | VERTICAL |
| 5 | 500.45 | 37.42 | -2.27 | 35.15 | 46.00 | -10.85 | Peak | VERTICAL |
| 6 | 649.83 | 34.22 | 0.19 | 34.41 | 46.00 | -11.59 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 58.13 | 42.47 | -8.12 | 34.35 | 40.00 | -5.65 | Peak | HORIZONTAL |
| 2 | 176.47 | 39.70 | -8.32 | 31.38 | 43.50 | -12.12 | Peak | HORIZONTAL |
| 3 | 250.19 | 43.29 | -7.95 | 35.34 | 46.00 | -10.66 | Peak | HORIZONTAL |
| 4 | 367.56 | 40.17 | -4.79 | 35.38 | 46.00 | -10.62 | Peak | HORIZONTAL |
| 5 | 649.83 | 33.07 | 0.19 | 33.26 | 46.00 | -12.74 | Peak | HORIZONTAL |
| 6 | 930.16 | 24.97 | 5.12 | 30.09 | 46.00 | -15.91 | Peak | HORIZONTAL |

Remark:

- 1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

(Worst case: Band 4, 802.11n HT40)

| | | | |
|----------------|---------|-----------|------------|
| Operation Mode | TX MODE | Test Date | 2017/03/08 |
| Channel Number | CH Low | Test By | Dino |
| Temperature | 25 °C | Humidity | 60 % |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|--------|------------|
| 1 | 2603.00 | 43.46 | -5.17 | 38.29 | 74.00 | -35.71 | Peak | VERTICAL |
| 2 | 7027.00 | 28.76 | 7.39 | 36.15 | 68.20 | -32.05 | Peak | VERTICAL |
| 3 | 11510.00 | 26.06 | 12.50 | 38.56 | 74.00 | -35.44 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 1952.00 | 42.82 | -7.12 | 35.70 | 74.00 | -38.30 | Peak | HORIZONTAL |
| 2 | 7188.00 | 29.57 | 7.61 | 37.18 | 68.20 | -31.02 | Peak | HORIZONTAL |
| 3 | 11510.00 | 32.45 | 12.50 | 44.95 | 74.00 | -29.05 | Peak | HORIZONTAL |

Remark:

- 1 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 2 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 4 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

| | | | |
|----------------|---------|-----------|------------|
| Operation Mode | TX MODE | Test Date | 2017/03/08 |
| Channel Number | CH Mid | Test By | Dino |
| Temperature | 25 °C | Humidity | 60 % |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|---------|------------|
| 1 | 5150.00 | 49.87 | 1.61 | 51.48 | 54.00 | -2.52 | Average | VERTICAL |
| 2 | 5150.00 | 58.19 | 1.61 | 59.80 | 74.00 | -14.20 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 5150.00 | 44.12 | 1.61 | 45.73 | 54.00 | -8.27 | Average | HORIZONTAL |
| 2 | 5150.00 | 53.99 | 1.61 | 55.60 | 74.00 | -18.40 | Peak | HORIZONTAL |

Remark:

- 1 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 2 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 4 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (worst case)

| | | | |
|----------------|---------|-----------|------------|
| Operation Mode | TX MODE | Test Date | 2017/03/08 |
| Channel Number | CH High | Test By | Dino |
| Temperature | 25 °C | Humidity | 60 % |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|--------|------------|
| 1 | 5350.00 | 42.74 | 1.98 | 44.72 | 74.00 | -29.28 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 5350.00 | 43.38 | 1.98 | 45.36 | 74.00 | -28.64 | Peak | HORIZONTAL |

Remark:

- 1 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 2 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 4 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Band Edges test (worst case: Band 1, 802.11n HT40) -Radiated

| | | | |
|----------------|-----------|-----------|------------|
| Operation Mode | TX CH Low | Test Date | 2016/08/15 |
| Channel Number | 5170 MHz | Test By | Dino |
| Temperature | 25 °C | Humidity | 65 % |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|---------|------------|
| 1 | 5150.30 | 41.12 | -2.50 | 38.62 | 54.00 | -15.38 | Average | VERTICAL |
| 2 | 5150.30 | 66.35 | -2.50 | 63.85 | 74.00 | -10.15 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 5150.30 | 43.02 | -2.50 | 40.52 | 54.00 | -13.48 | Average | HORIZONTAL |
| 2 | 5150.30 | 70.26 | -2.50 | 67.76 | 74.00 | -6.24 | Peak | HORIZONTAL |

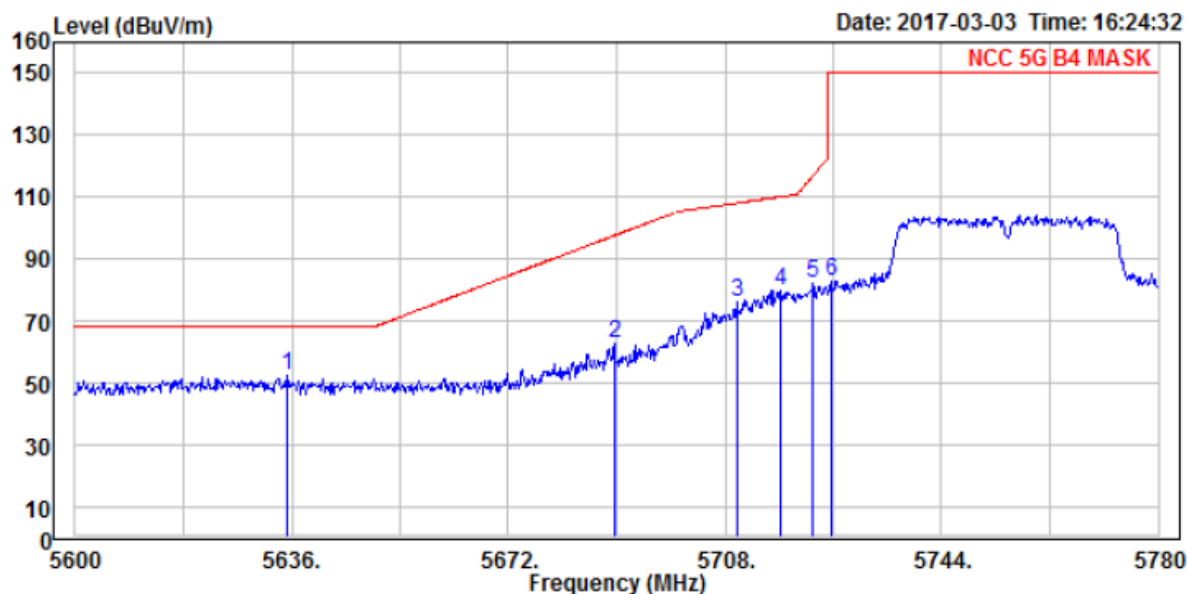
| | | | |
|----------------|------------|-----------|------------|
| Operation Mode | TX CH High | Test Date | 2016/08/15 |
| Channel Number | 5240MHz | Test By | Dino |
| Temperature | 25 °C | Humidity | 65 % |

| No | Freq MHz | Reading dBuV | Factor dB | Level dBuV/m | Limit dBuV/m | Over Limit dB | Remark | Pol V/H |
|----|-------------|-----------------|--------------|-----------------|-----------------|---------------------|--------|------------|
| 1 | 5350.08 | 42.93 | -2.05 | 40.88 | 74.00 | -33.12 | Peak | VERTICAL |
| | | | | | | | | |
| 1 | 5350.08 | 43.59 | -2.05 | 41.54 | 74.00 | -32.46 | Peak | HORIZONTAL |

Remark:

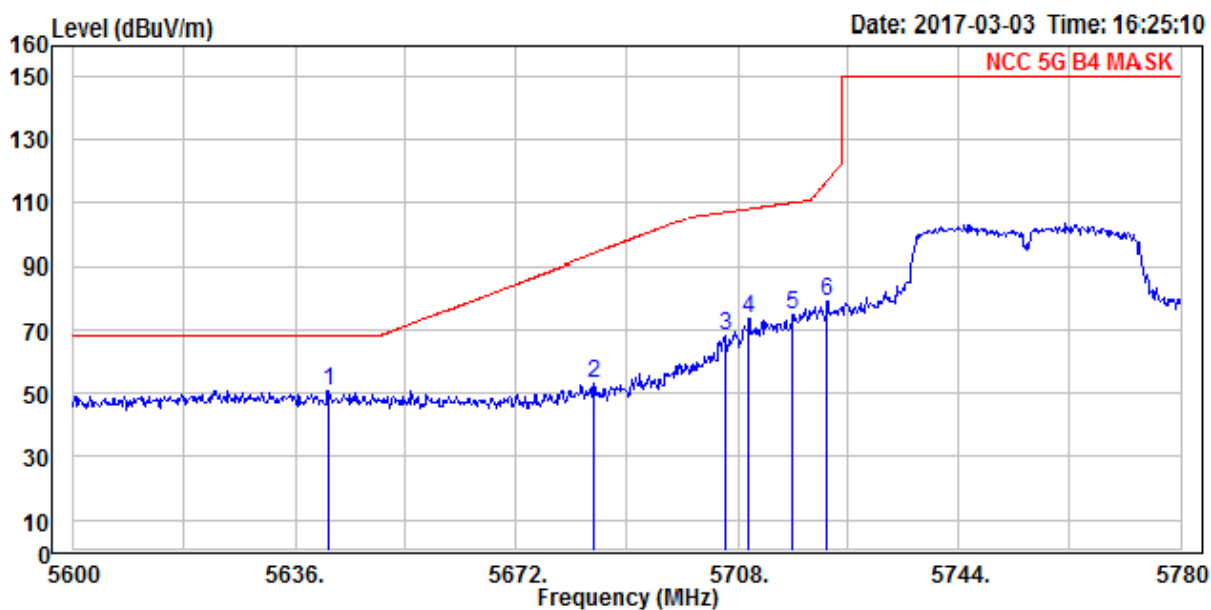
- Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Mask Band Edges test (worst case: Band 4, 802.11n HT40) –Radiated



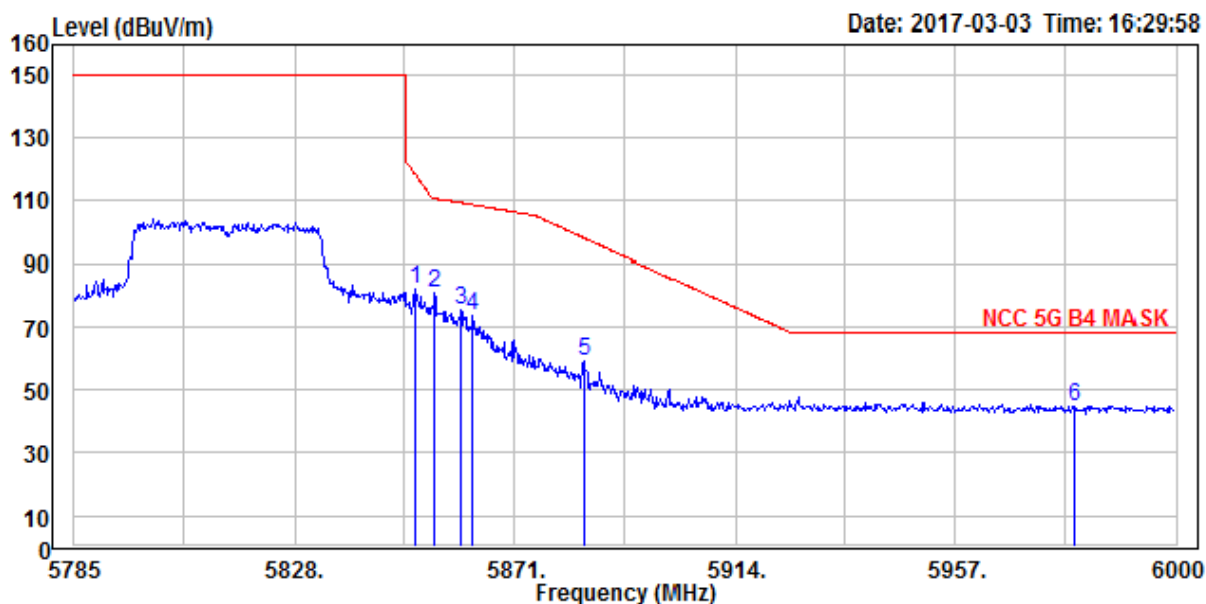
Condition: NCC 5G B4 MASK 3m 1166 EMAH10180 V 1-18G Vertical
 : RBW:1000kHz VBW:1000kHz SWT:Auto DET:Positive
 EUT : Outdoor AP
 Mode : 5GHz Band 4 n-VHT40 mode ch low mask bandedge
 Note :

| | | Read | | Limit | Over | |
|---|-------------|-------|--------|--------|--------|-----------------|
| | Freq | Level | Factor | Level | Line | Limit Pol/Phase |
| | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB |
| 1 | PP 5635.100 | 49.57 | 2.61 | 52.18 | 68.20 | -16.02 Vertical |
| 2 | 5689.640 | 59.65 | 2.76 | 62.41 | 97.56 | -35.15 Vertical |
| 3 | 5709.980 | 73.14 | 2.81 | 75.95 | 108.00 | -32.05 Vertical |
| 4 | 5717.360 | 77.04 | 2.82 | 79.86 | 110.06 | -30.20 Vertical |
| 5 | 5722.580 | 79.44 | 2.85 | 82.29 | 116.68 | -34.39 Vertical |
| 6 | 5725.640 | 79.97 | 2.85 | 82.82 | 150.00 | -67.18 Vertical |



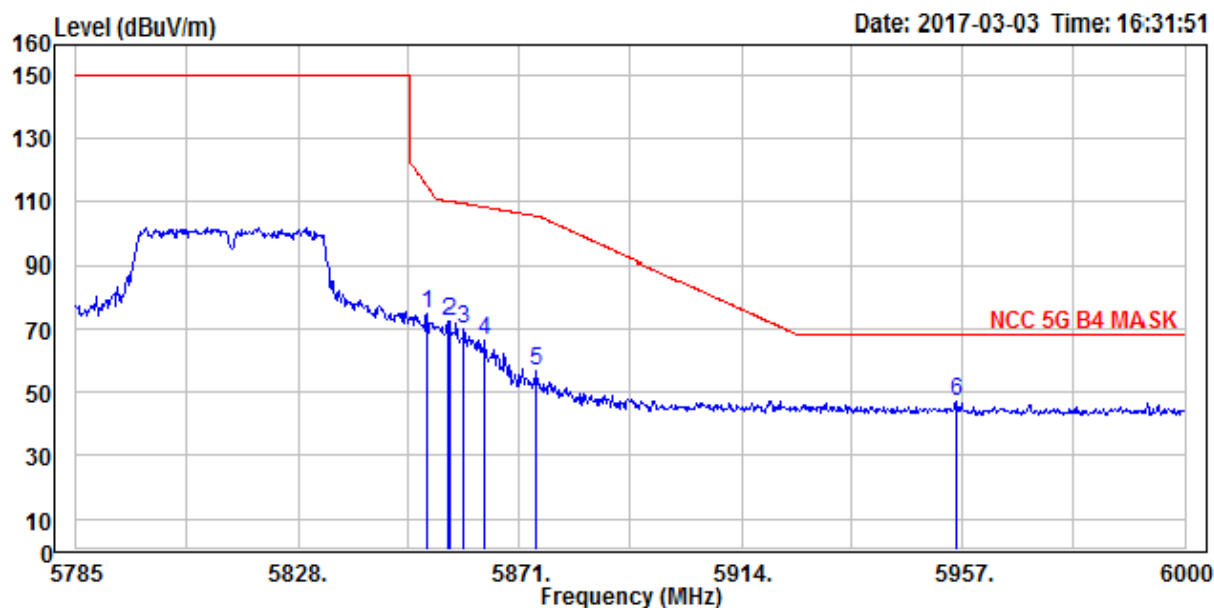
Condition: NCC 5G B4 MASK 3m 1166 EMAH10180 H 1-18G Horizontal
 : RBW:1000kHz VBW:1000kHz SWT:Auto DET:Positive
 EUT : Outdoor AP
 Mode : 5GHz Band 4 n-VHT40 mode ch low mask bandedge
 Note :

| | | Read | | Limit | Over | |
|---|-------------|-------|--------|--------|--------|-------------------|
| | Freq | Level | Factor | Level | Line | Limit Pol/Phase |
| | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB |
| 1 | PP 5641.400 | 47.86 | 2.63 | 50.49 | 68.20 | -17.71 Horizontal |
| 2 | 5684.780 | 50.07 | 2.74 | 52.81 | 93.97 | -41.16 Horizontal |
| 3 | 5705.840 | 65.20 | 2.80 | 68.00 | 106.84 | -38.84 Horizontal |
| 4 | 5709.800 | 70.83 | 2.81 | 73.64 | 107.95 | -34.31 Horizontal |
| 5 | 5717.000 | 72.14 | 2.82 | 74.96 | 109.96 | -35.00 Horizontal |
| 6 | 5722.580 | 76.37 | 2.85 | 79.22 | 116.68 | -37.46 Horizontal |



Condition: NCC 5G B4 MASK 3m 1166 EMAH10180 V 1-18G Vertical
 : RBW:1000kHz VBW:1000kHz SWT:Auto DET:Positive
 EUT : Outdoor AP
 Mode : 5GHz Band 4 n-VHT40 mode ch high mask bandedge
 Note :

| | | Read | | Limit | Over | |
|------|----------|-------|--------|--------|--------|-----------------|
| | Freq | Level | Factor | Level | Line | Limit Pol/Phase |
| | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB |
| 1 | 5851.880 | 78.85 | 3.18 | 82.03 | 117.91 | -35.88 Vertical |
| 2 | 5855.560 | 77.52 | 3.19 | 80.71 | 110.64 | -29.93 Vertical |
| 3 | 5860.390 | 72.00 | 3.20 | 75.20 | 109.29 | -34.09 Vertical |
| 4 | 5862.690 | 70.50 | 3.21 | 73.71 | 108.64 | -34.93 Vertical |
| 5 | 5884.540 | 56.02 | 3.27 | 59.29 | 98.12 | -38.83 Vertical |
| 6 PP | 5980.220 | 41.19 | 3.52 | 44.71 | 68.20 | -23.49 Vertical |



Condition: NCC 5G B4 MASK 3m 1166 EMAH10180 H 1-18G Horizontal
 : RBW:1000kHz VBW:1000kHz SWT:Auto DET:Positive
 EUT : Outdoor AP
 Mode : 5GHz Band 4 n-VHT40 mode ch high mask bandedge
 Note :

| | | Read | | Limit | Over | |
|------|----------|-------|--------|--------|--------|-------------------|
| | Freq | Level | Factor | Level | Line | Limit Pol/Phase |
| | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB |
| 1 | 5853.155 | 71.56 | 3.19 | 74.75 | 115.01 | -40.26 Horizontal |
| 2 | 5857.240 | 69.21 | 3.19 | 72.40 | 110.17 | -37.77 Horizontal |
| 3 | 5860.035 | 66.56 | 3.20 | 69.76 | 109.39 | -39.63 Horizontal |
| 4 | 5864.120 | 63.03 | 3.22 | 66.25 | 108.24 | -41.99 Horizontal |
| 5 | 5874.225 | 53.09 | 3.24 | 56.33 | 105.42 | -49.09 Horizontal |
| 6 PP | 5955.710 | 43.57 | 3.45 | 47.02 | 68.20 | -21.18 Horizontal |

10. TRANSMISSION IN THE ABSENCE OF DATA

10.1. Standard Applicable

According to §15.407(c)

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 a description of how this requirement is met.

10.2. Result:

Pass, the device is compliance with 802.11 a/ b/g/n ac standard, the short control signal is appear during no transmission period.

11. FREQUENCY STABILITY

11.1. Standard Applicable

According to §15.407 (g) 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.

11.2. Result

Test frequency : 5180 MHz

| Temperature test | | | | |
|------------------|------------------|-------------|-------------|-----------------------|
| Power Supply | Environment | Frequency | Delta (MHz) | frequency drift (PPM) |
| Vdc | Temperature (°C) | (MHz) | | |
| 48 | -20 | 5180.013700 | 0.013700 | 2.64 |
| | -10 | 5180.022100 | 0.022100 | 4.27 |
| | 0 | 5180.028900 | 0.028900 | 5.58 |
| | 10 | 5179.991300 | -0.008700 | -1.68 |
| | 20 | 5179.975600 | -0.024400 | -4.71 |
| | 30 | 5180.031200 | 0.031200 | 6.02 |
| | 40 | 5180.027400 | 0.027400 | 5.29 |
| | 50 | 5179.983300 | -0.016700 | -3.22 |

| Voltage test | | | | |
|--------------|------------------|-------------|-------------|-----------------------|
| Power Supply | Environment | Frequency | Delta (KHz) | frequency drift (PPM) |
| Vdc | Temperature (°C) | (MHz) | | |
| 48 | 20 | 5179.975600 | -0.02440 | -4.71 |
| 52.8 | 20 | 5180.019500 | 0.01950 | 3.76 |
| 43.2 | 20 | 5179.993200 | -0.00680 | -1.31 |

Test frequency : 5745 MHz

| Temperature test | | | | |
|------------------|------------------|-------------|-------------|-----------------------|
| Power Supply | Environment | Frequency | Delta (MHz) | frequency drift (PPM) |
| Vdc | Temperature (°C) | (MHz) | | |
| 48 | -20 | 5745.018500 | 0.018500 | 3.22 |
| | -10 | 5745.032500 | 0.032500 | 5.66 |
| | 0 | 5745.013500 | 0.013500 | 2.35 |
| | 10 | 5744.995000 | -0.005000 | -0.87 |
| | 20 | 5744.984000 | -0.016000 | -2.79 |
| | 30 | 5745.029500 | 0.029500 | 5.13 |
| | 40 | 5745.018000 | 0.018000 | 3.13 |
| | 50 | 5744.988000 | -0.012000 | -2.09 |

| voltage test | | | | |
|--------------|------------------|-------------|-------------|-----------------------|
| Power Supply | Environment | Frequency | Delta (KHz) | frequency drift (PPM) |
| Vdc | Temperature (°C) | (MHz) | | |
| 48 | 20 | 5744.984000 | -0.01600 | -2.79 |
| 52.8 | 20 | 5745.025000 | 0.02500 | 4.35 |
| 43.2 | 20 | 5744.998500 | -0.00150 | -0.26 |

12. ANTENNA REQUIREMENT

12.1. Standard Applicable

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

According to RSS-GEN 7.1.2, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-247 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-247 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5745-5850 MHz Bands) or RSS-247 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-247 Annex 8 or Annex 9, the antenna gain shall not be added.

12.2. Antenna Connected Construction

The directional gins of antenna used for transmitting is below table, and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

Antenna Designation:

| | P/N | Type | Gain (5GHz) |
|-----|-----------------------------|---------------------|-------------|
| Ant | C1380-510012-A(SRF20151482) | Patch array antenna | 16.5dBi |