HCT CO.,LTD.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

FCC UNII REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
February 25, 2021

Test Site/Location:
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2102-FC037

FCC ID:	**A3LSMA526U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model:	SM-A526U
Additional Model:	SM-A526U1
EUT Type:	Mobile Phone
Modulation type	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(NII)
FCC Rule Part(s):	Part 15.407

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

REVIEWED BY

Report prepared by : Jeong Ho Kim Engineer of Telecommunication Testing Center	Report approved by : Jong Seok Lee Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2102-FC037	February 25, 2021	- First Approval Report

Table of Contents

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	SM-A526U	
Additional Model	SM-A526U1	
EUT Type	Mobile Phone	
Power Supply	DC 3.86 V	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20MHz BW : 5180 - 5240 40MHz BW : 5190 - 5230 80MHz BW : 5210
	U-NII-2A	20MHz BW : 5260 - 5320 40MHz BW : 5270 - 5310 80MHz BW : 5290
	U-NII-2C	20MHz BW : 5500 - 5720 40MHz BW : 5510 - 5710 80MHz BW : 5530 – 5690
	U-NII-3	20MHz BW : 5745 - 5825 40MHz BW : 5755 - 5795 80MHz BW : 5775
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	January 20, 2021 ~ February 19, 2021	
Serial number	Radiated: R3CR10D8NKP Conducted: R3CR10BBHNB	

2. MAXIMUM OUTPUT POWER

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

Band	Mode	Output Power	
		(dBm)	(W)
UNII1	802.11a	18.58	0.072
	802.11n (HT20)	18.48	0.071
	802.11n (HT40)	15.06	0.032
	802.11ac (VHT20)	16.93	0.049
	802.11ac (VHT40)	15.30	0.034
	802.11ac (VHT80)	10.47	0.011
UNII2A	802.11a	18.64	0.073
	802.11n (HT20)	18.71	0.074
	802.11n (HT40)	14.52	0.028
	802.11ac (VHT20)	16.99	0.050
	802.11ac (VHT40)	14.64	0.029
	802.11ac (VHT80)	8.42	0.007
UNII2C	802.11a	18.44	0.070
	802.11n (HT20)	18.16	0.066
	802.11n (HT40)	14.50	0.028
	802.11ac (VHT20)	16.30	0.043
	802.11ac (VHT40)	14.46	0.028
	802.11ac (VHT80)	11.84	0.015
UNII3	802.11a	18.56	0.072
	802.11n (HT20)	18.35	0.068
	802.11n (HT40)	14.58	0.029
	802.11ac (VHT20)	16.47	0.044
	802.11ac (VHT40)	14.56	0.029
	802.11ac (VHT80)	12.03	0.016

3. TEST METHODOLOGY

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

EUT CONFIGURATION

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

EUT EXERCISE

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

GENERAL TEST PROCEDURES

Conducted Emissions

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

Radiated Emissions

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

DESCRIPTION OF TEST MODES

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

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203, §15.407:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

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

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

7. MEASUREMENT UNCERTAINTY

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

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

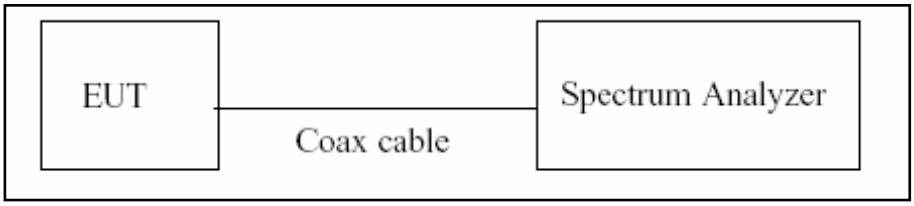
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

8. DESCRIPTION OF TESTS

8.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

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

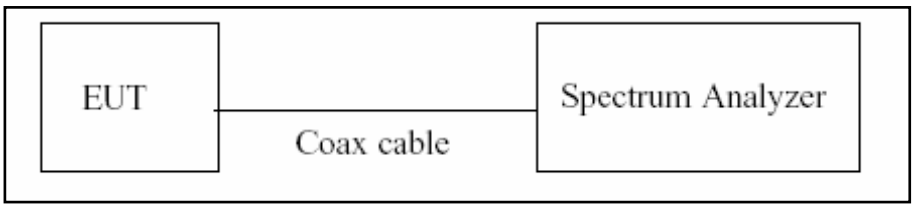
1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

8.2. 6dB Bandwidth & 26dB Bandwidth

Limit

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

Test Configuration



Test Procedure(26dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure C.1 in KDB 789033 D02 v02r01.

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

Test Procedure (6dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

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

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

Note:

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

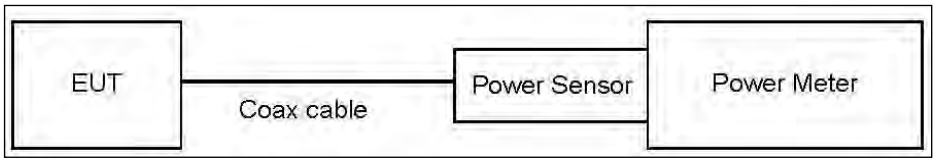
8.3. Output Power Measurement

Limit

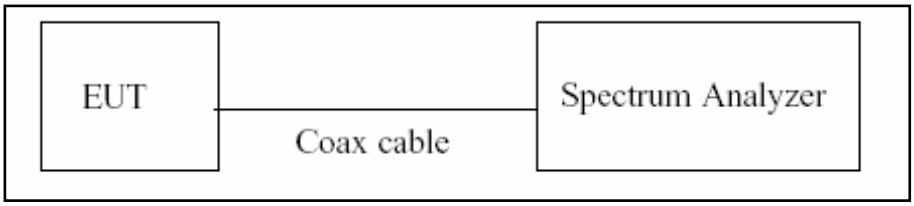
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

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

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

Test Procedure(Spectrum Analyzer)

The transmitter output is connected to the Spectrum Analyzer.

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

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

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

Sample Calculation

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

Note

1. Spectrum reading values are not plot data.
   The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(20 dB) + Cable loss + EUT Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	21.60
UNII 2A	21.60
UNII 2C	21.60
UNII 3	21.60

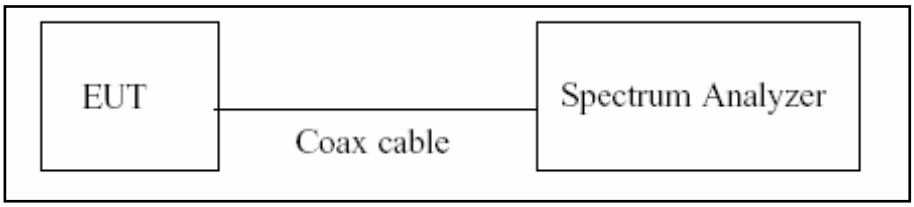
(Actual value of loss for the attenuator and cable combination)

8.4. Power Spectral Density

Limit

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

Test Configuration



Test Procedure

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

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

Sample Calculation

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

Note

1. Spectrum reading values are not plot data.
   The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(20 dB) + Cable loss + EUT Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	21.60
UNII 2A	21.60
UNII 2C	21.60
UNII 3	21.60

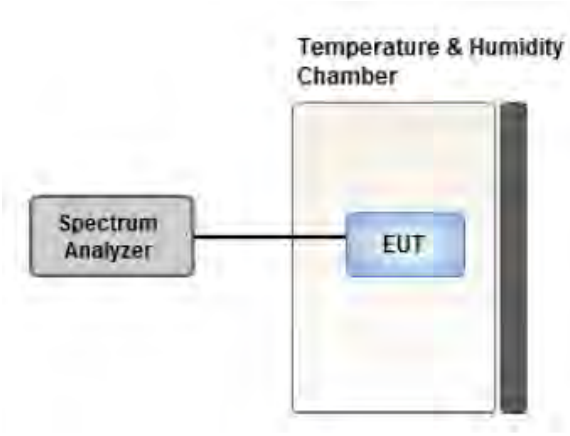
(Actual value of loss for the attenuator and cable combination)

8.5. Frequency Stability

Limit

Maintained within the band

Test Configuration



Test Procedure

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

8.6. AC Power line Conducted Emissions

Limit

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

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

[(a)]Decreases with the logarithm of the frequency.

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

Test Configuration

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

Test Procedure

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

Sample Calculation

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

8.7. Radiated Test

Limit

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz.

2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

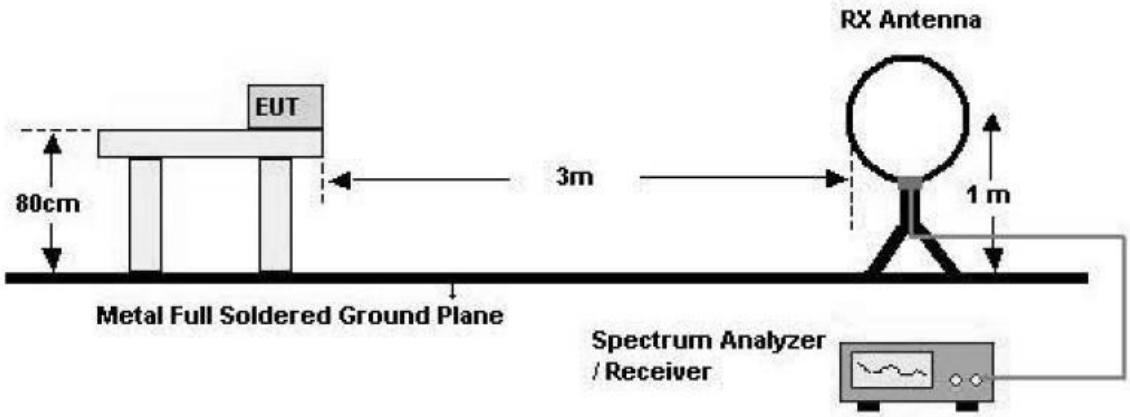
3. UNII 3: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

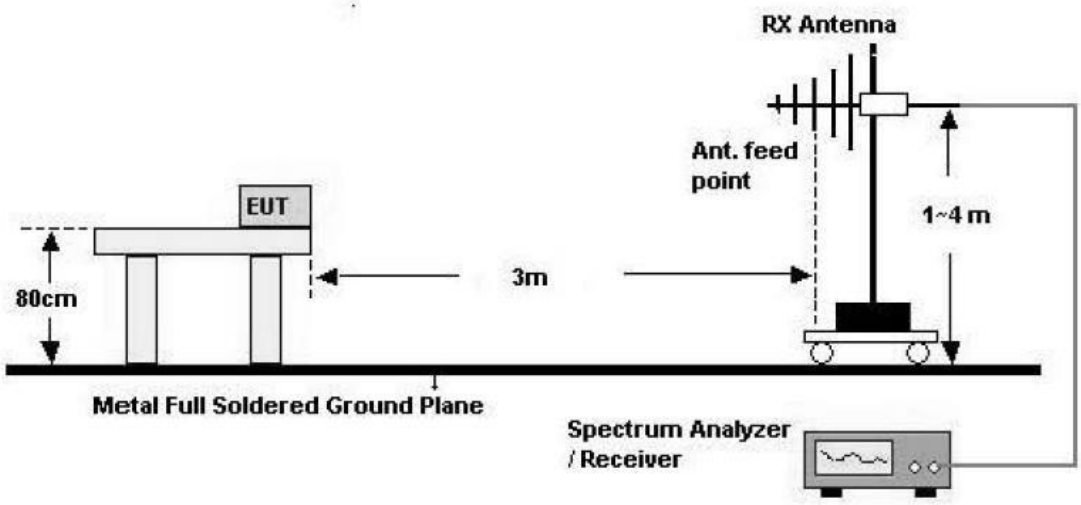
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

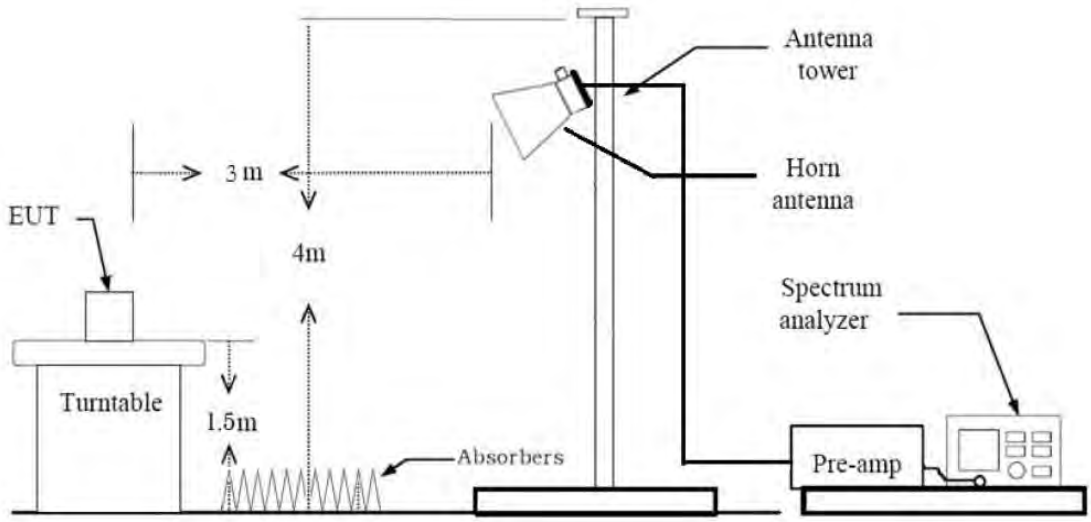
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

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

KDB 414788 OFS and Chamber Correlation Justification

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

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

Test Procedure of Radiated spurious emissions(Below 1GHz)

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

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

Test Procedure of Radiated spurious emissions (Above 1 GHz)

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

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

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

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

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

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

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

Test Procedure of Radiated Restricted Band Edge

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

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

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

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

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

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

9. Measured Frequency Range :
   - 4 500 MHz ~ 5 150 MHz
   - 5 350 MHz ~ 5 460 MHz
   - 5 460 MHz ~ 5 470 MHz
   - (75 MHz or more below the 5 725 MHz) ~ 5 725 MHz
   - 5 850 MHz ~ (75 MHz or more above the 5 850 MHz)
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Attenuator + Distance Factor(D.F)

The actual setting value of VBW

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	18	0.930	0.317	3000
802.11n(HT20)	MCS 3	0.906	0.427	3000
802.11n(HT40)	MCS 3	0.843	0.740	10000
802.11ac(VHT20)	MCS 3	0.909	0.416	3000
802.11ac(VHT40)	MCS 4	0.805	0.943	10000
802.11ac(VHT80)	MCS 4	0.717	1.447	20000

8.8. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
   - Worstcase : Stand alone
2. EUT Axis
   - Radiated Spurious Emissions : Z
   - Radiated Restricted Band Edge : Y
3. All datarate of operation were investigated and the worst case datarate results are reported
   - 802.11a : 18 Mbps
   - 802.11n_HT20 : MCS3
   - 802.11n_HT40 : MCS3
   - 802.11ac_VHT20 : MCS3
   - 802.11ac_VHT40 : MCS4
   - 802.11ac_VHT80 : MCS4
4. Radiated Spurious Emission
   - All modulation of operation were investigated and the worst case modulation results are reported.
     (Worstcase : 802.11a_6 Mbps)
5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
   - Position : Horizontal, Vertical, Parallel to the ground plane
6. SM-A526U, SM-A526U1 were tested and the worst case results are reported.
   - Worst case : SM-A526U
7. We were performed the RSE test in condition of co-location. There has no significant emission raised.
   - WWAN+WLAN 5GHz+BT

Radiated test(DBS)

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
   - Worstcase : Stand alone
2. EUT Axis
   - Radiated Spurious Emissions : Y
3. The following tables show the worst case configurations determined during testing.

Description	Bluetooth Emission	5 GHz Emission
Antenna	WIFI/BT	WIFI/BT
Channel	78	165
Data Rate	339 Bytes	6 Mbps
Mode	GFSK : DH5	802.11a

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone + External accessories(Earphone, etc) + Travel Adapter, Stand alone + Travel Adapter
   - Worstcase : Stand alone + Travel Adapter
2. SM-A526U, SM-A526U1 were tested and the worst case results are reported.
   - Worst case : SM-A526U

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.
2. SM-A526U, SM-A526U1 were tested and the worst case results are reported.
   - Worst case : SM-A526U

9. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	N/A	Conducted	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§15.407(a)(1)	< 250 mW(5150-5250 MHz) < 250 mW or 11+10log$_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10log$_{10}$ (BW) dBm (5470-5725 MHz) <1 W(5725-5850 MHz)		PASS
Peak Power Spectral Density	§15.407(a)(1),(5)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS
Frequency Stability	§15.407(g) §2.1055	Maintained within the band		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207	<FCC 15.207 limits		PASS
Undesirable Emissions	§15.407(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.7 (UNII 3)	Radiated	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(5), (6)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

10. TEST RESULT

10.1 DUTY CYCLE

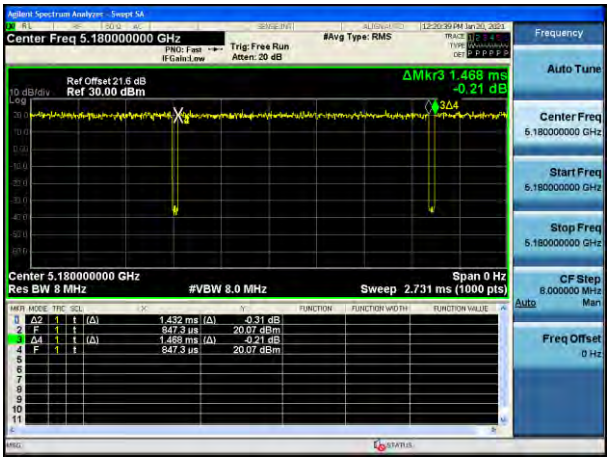
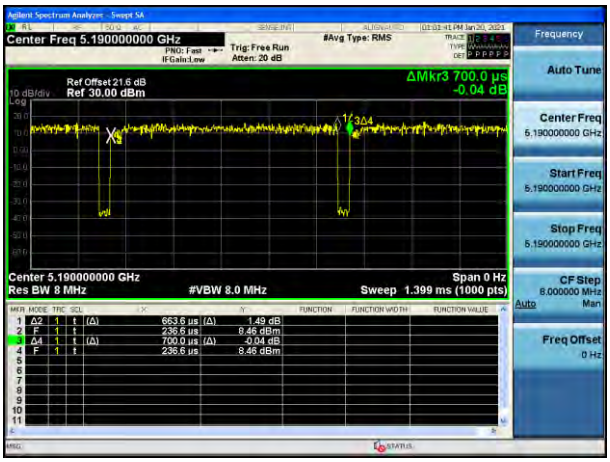
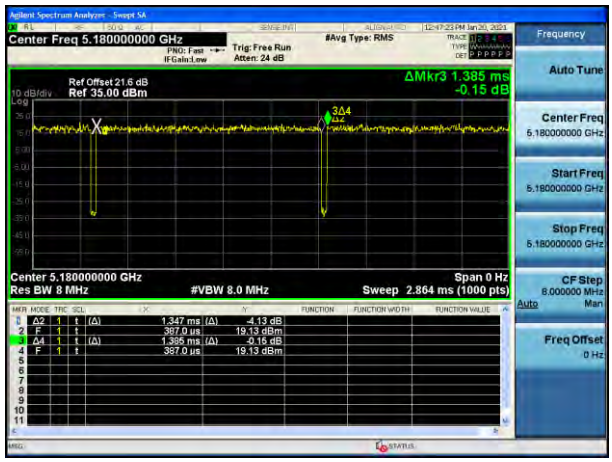
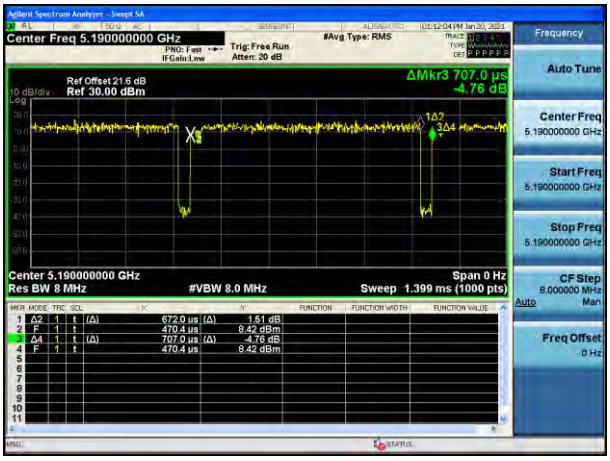
Mode	Data Rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	1.432	1.468	0.976	0.106
	9	0.961	0.997	0.964	0.160
	12	0.727	0.764	0.951	0.217
	18	0.492	0.529	0.930	0.317
	24	0.376	0.413	0.911	0.406
	36	0.256	0.292	0.875	0.578
	48	0.200	0.236	0.846	0.726
	54	0.180	0.216	0.832	0.800

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.340	1.376	0.974	0.113
	1	0.688	0.724	0.950	0.223
	2	0.471	0.509	0.927	0.332
	3	0.364	0.402	0.906	0.427
	4	0.256	0.292	0.877	0.571
	5	0.200	0.237	0.846	0.724
	6	0.184	0.220	0.837	0.774
	7	0.168	0.204	0.822	0.851
802.11n (HT40)	0	0.664	0.700	0.948	0.232
	1	0.352	0.388	0.907	0.423
	2	0.248	0.284	0.874	0.587
	3	0.196	0.232	0.843	0.740
	4	0.144	0.180	0.801	0.966
	5	0.116	0.152	0.764	1.171
	6	0.108	0.144	0.751	1.246
	7	0.100	0.136	0.734	1.342

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.347	1.385	0.973	0.119
	1	0.695	0.732	0.950	0.223
	2	0.476	0.513	0.928	0.325
	3	0.368	0.405	0.909	0.416
	4	0.260	0.296	0.878	0.567
	5	0.204	0.240	0.850	0.705
	6	0.188	0.225	0.838	0.769
	7	0.172	0.208	0.827	0.826
	8	0.152	0.188	0.808	0.925
802.11ac (VHT40)	0	0.672	0.707	0.950	0.221
	1	0.357	0.392	0.909	0.413
	2	0.252	0.288	0.874	0.582
	3	0.200	0.236	0.847	0.723
	4	0.148	0.184	0.805	0.943
	5	0.120	0.156	0.770	1.135
	6	0.112	0.148	0.757	1.207
	7	0.104	0.140	0.743	1.288
	8	0.096	0.132	0.728	1.377
	9	0.088	0.124	0.708	1.502
802.11ac (VHT80)	0	0.333	0.368	0.904	0.437
	1	0.188	0.224	0.841	0.751
	2	0.140	0.176	0.796	0.991
	3	0.116	0.152	0.761	1.183
	4	0.092	0.128	0.717	1.447
	5	0.080	0.116	0.685	1.640
	6	0.076	0.112	0.674	1.712
	7	0.072	0.108	0.667	1.761
	8	0.068	0.104	0.654	1.845
	9	0.064	0.101	0.637	1.960

Note:

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

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

10.2 26 dB BANDWIDTH

Straddle channel data in the table below are for reporting purposes only.

Straddle channel data were added in section 10.7.1.

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.82	16.479
5200	40	20.55	16.569
5240	48	20.05	16.578
5260	52	23.29	16.646
5300	60	20.11	16.670
5320	64	23.02	16.766
5500	100	22.30	16.616
5580	116	21.59	16.568
5720	144	21.39	16.579
5745	149	21.46	16.523
5785	157	22.74	16.619
5825	165	22.27	16.588

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.64	17.661
5200	40	20.26	17.677
5240	48	20.62	17.689
5260	52	20.74	17.660
5300	60	20.68	17.676
5320	64	22.57	17.659
5500	100	20.40	17.648
5580	116	20.74	17.656
5720	144	20.80	17.663
5745	149	20.89	17.688
5785	157	20.83	17.694
5825	165	20.53	17.641

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.18	36.212
5230	46	41.78	36.216
5270	54	40.95	36.214
5310	62	41.18	36.252
5510	102	40.62	36.201
5550	110	40.95	36.222
5710	142	41.06	36.246
5755	151	40.96	36.228
5795	159	41.01	36.202

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.34	17.652
5200	40	20.82	17.639
5240	48	20.31	17.647
5260	52	20.47	17.684
5300	60	20.64	17.641
5320	64	22.02	17.639
5500	100	20.73	17.649
5580	116	20.39	17.689
5720	144	20.51	17.661
5745	149	20.67	17.669
5785	157	20.62	17.650
5825	165	21.22	17.669

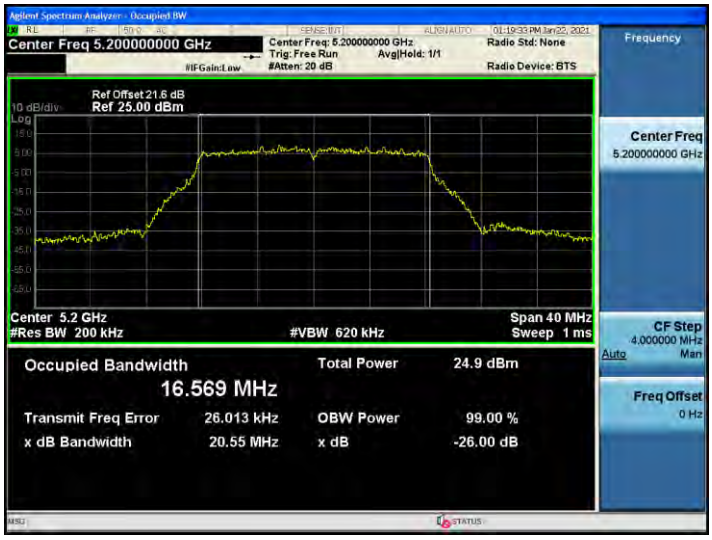
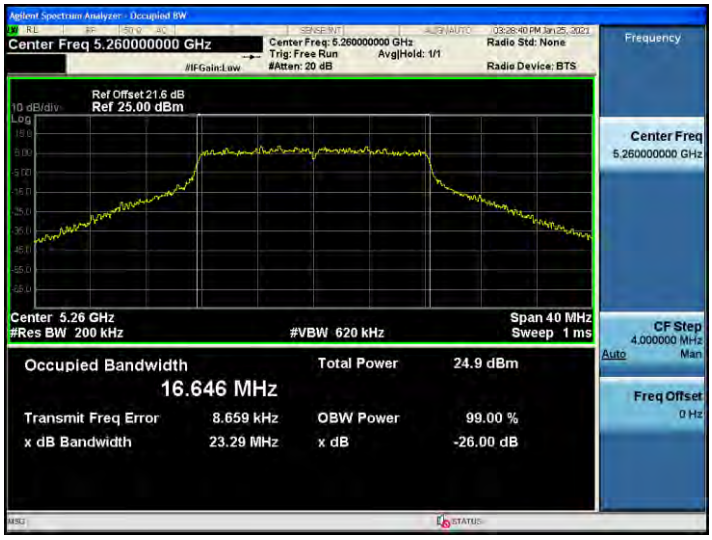
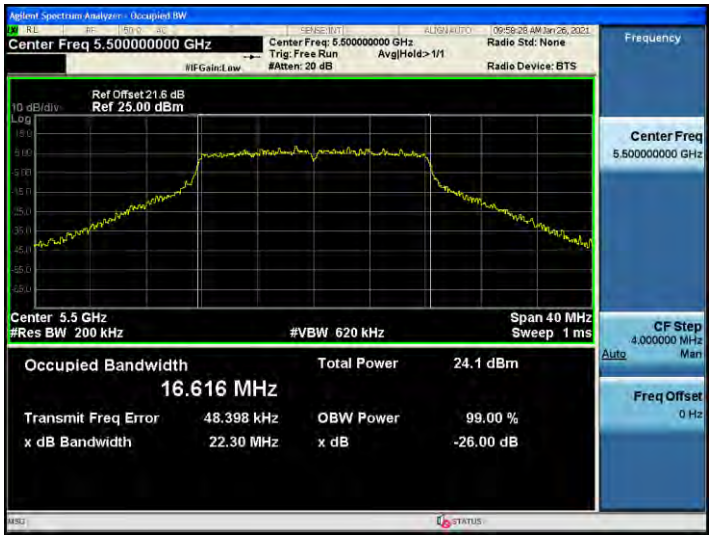
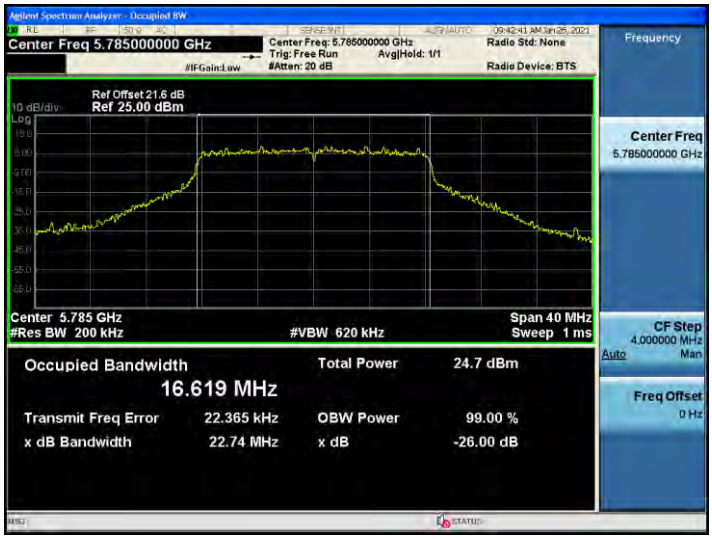
802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.55	36.210
5230	46	41.05	36.294
5270	54	40.83	36.256
5310	62	41.11	36.249
5510	102	41.21	36.242
5550	110	41.12	36.233
5710	142	40.78	36.266
5755	151	41.14	36.220
5795	159	40.63	36.212

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	84.00	75.625
5290	58	84.24	75.619
5530	106	82.99	75.604
5610	122	83.00	75.551
5690	138	83.42	75.624
5775	155	84.66	75.619

▣ Test Plots(802.11a)

Note:

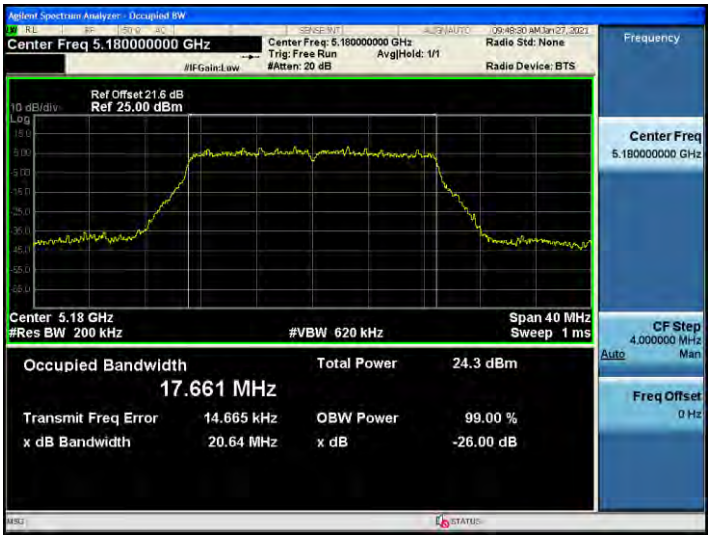
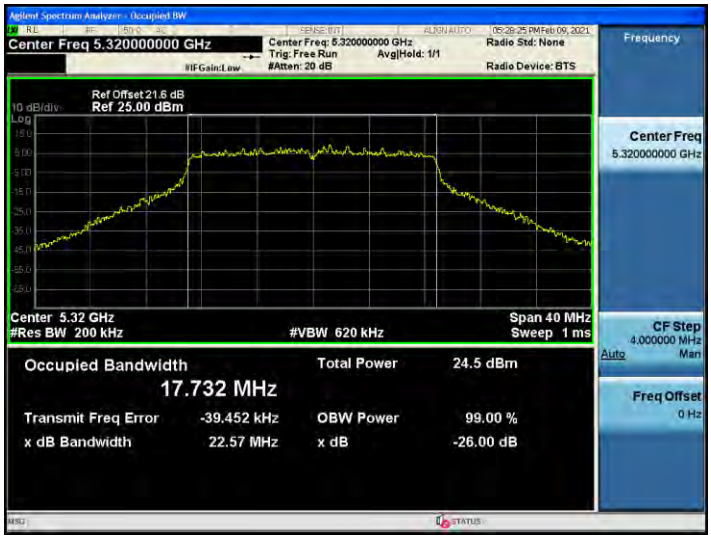
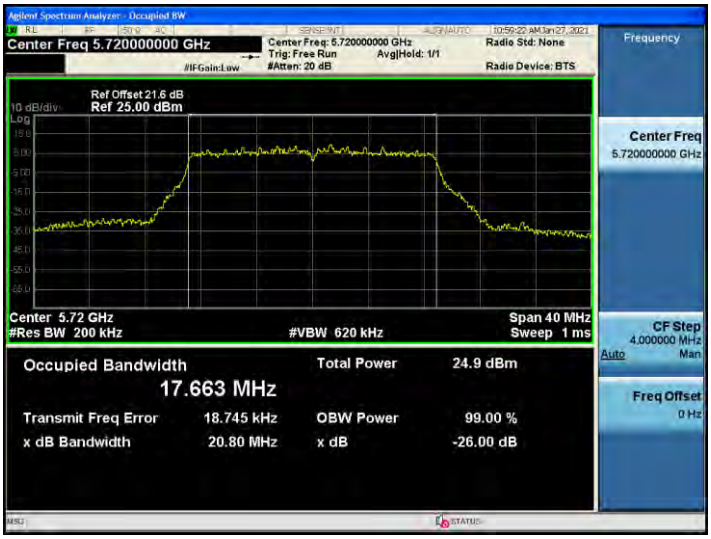
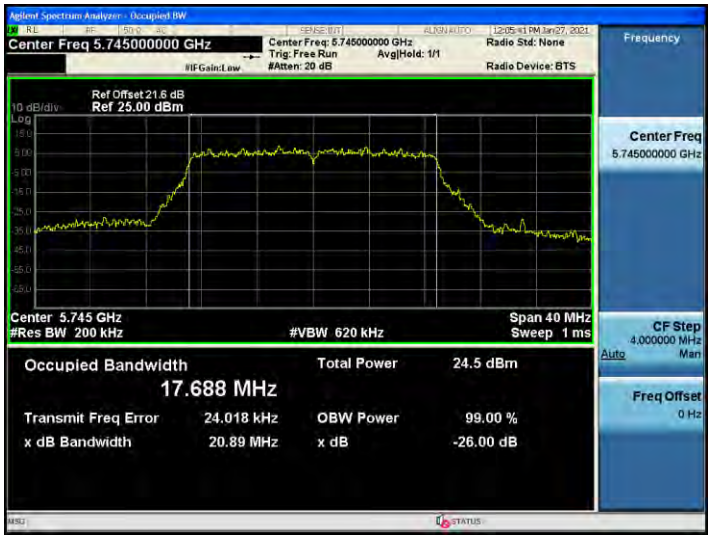
In order to simplify the report, attached plots were only the most wide channel.

802.11a UNII 1 BAND 26dB Bandwidth (CH 40)	802.11a UNII 2A BAND 26dB Bandwidth (CH 52)
	
802.11a UNII 2C BAND 26dB Bandwidth (CH 100)	**802.11a UNII 3 BAND 26dB Bandwidth (CH 157)**
	

▣ Test Plots(802.11n(HT20))

Note:

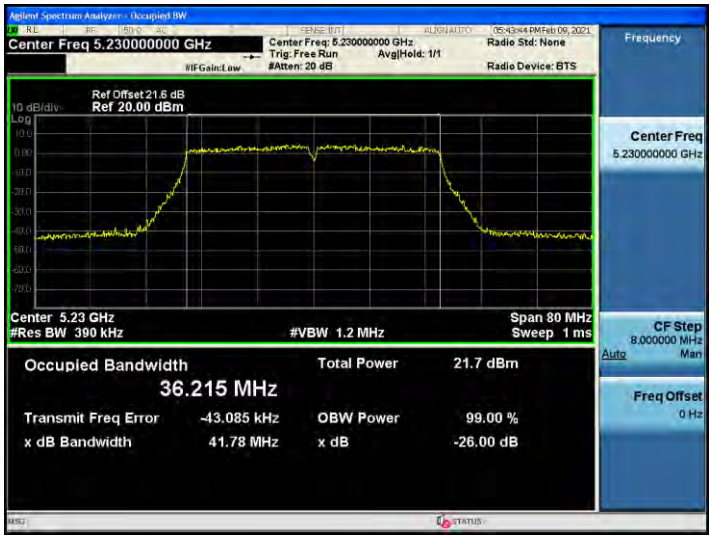
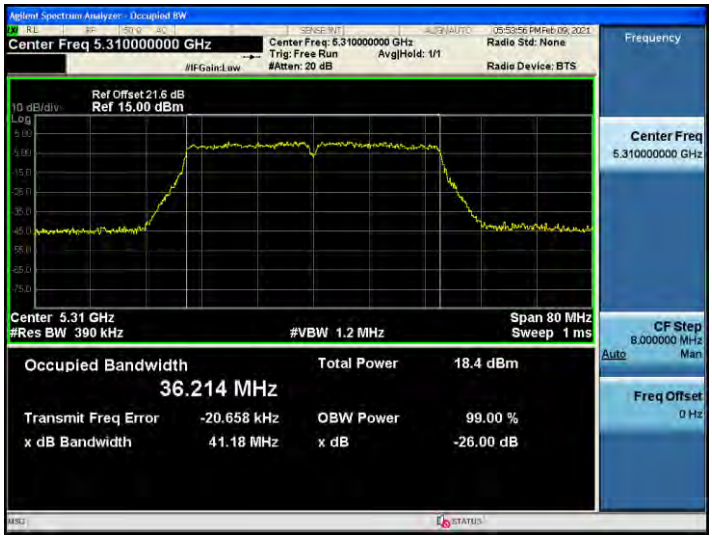
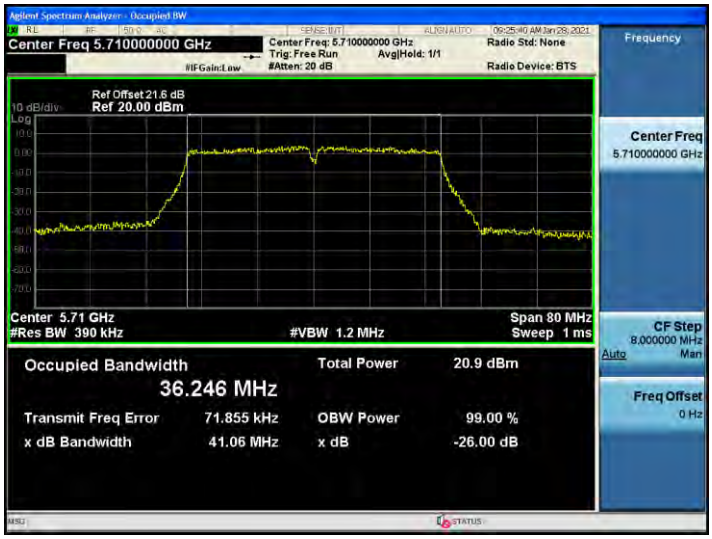
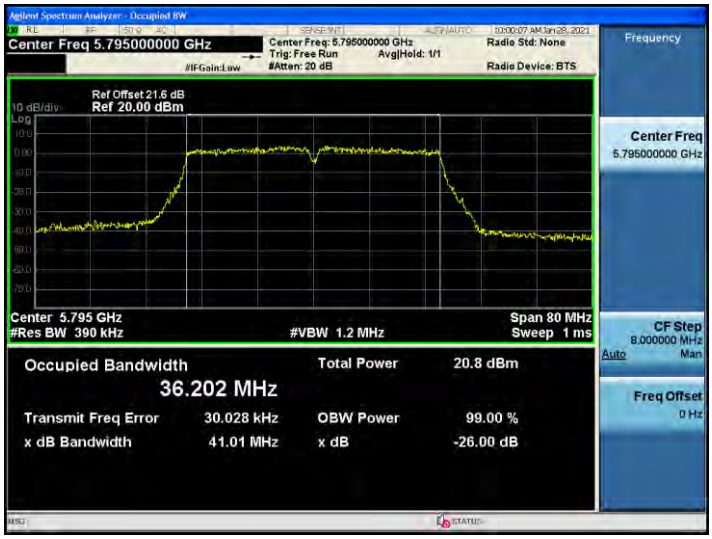
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)	802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 64)
	
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 144)	**802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 149)**
	

▣ Test Plots(802.11n(HT40))

Note:

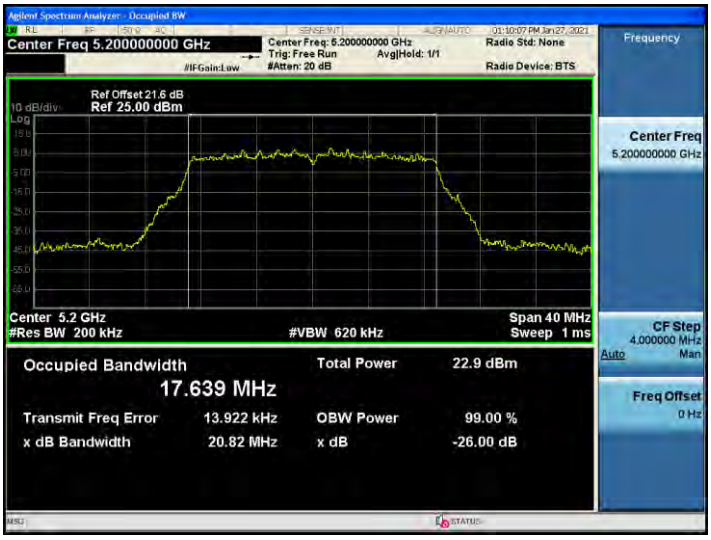
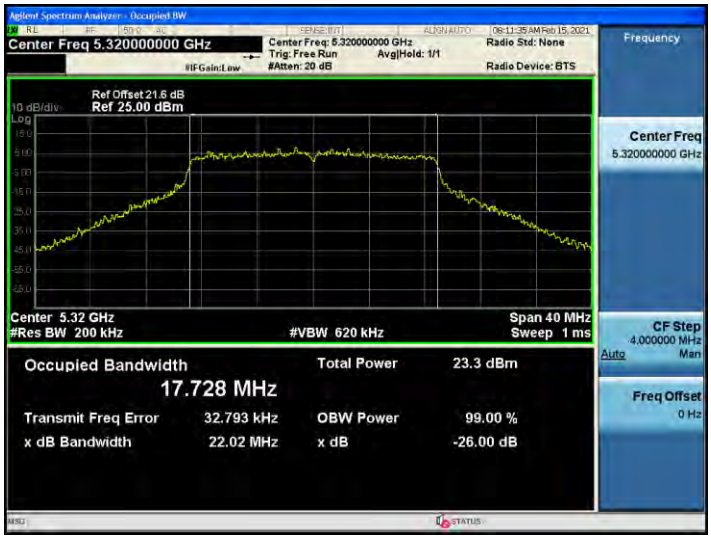
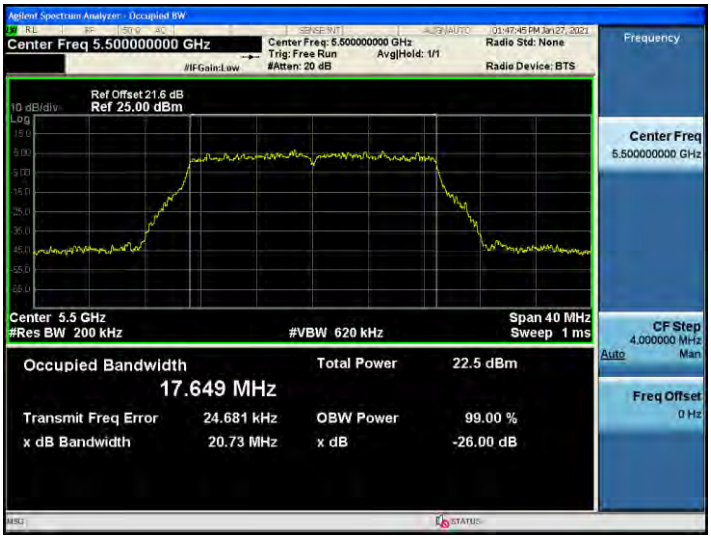
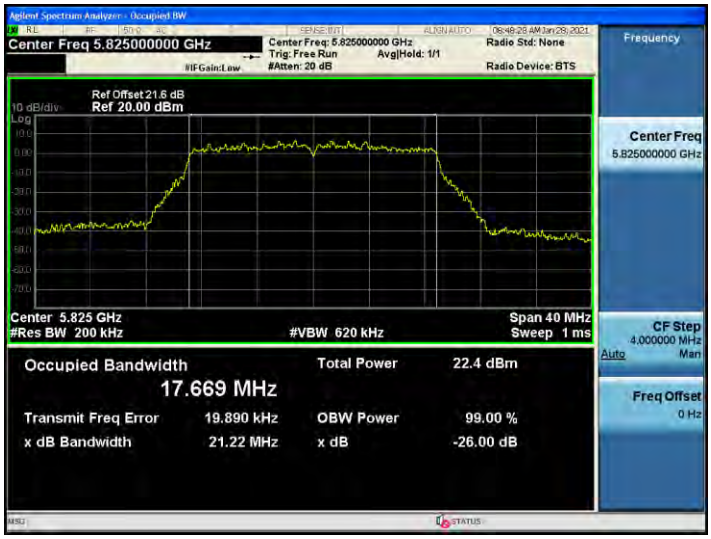
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 46)	802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 142)	**802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)**
	

▣ Test Plots(802.11ac(VHT20))

Note:

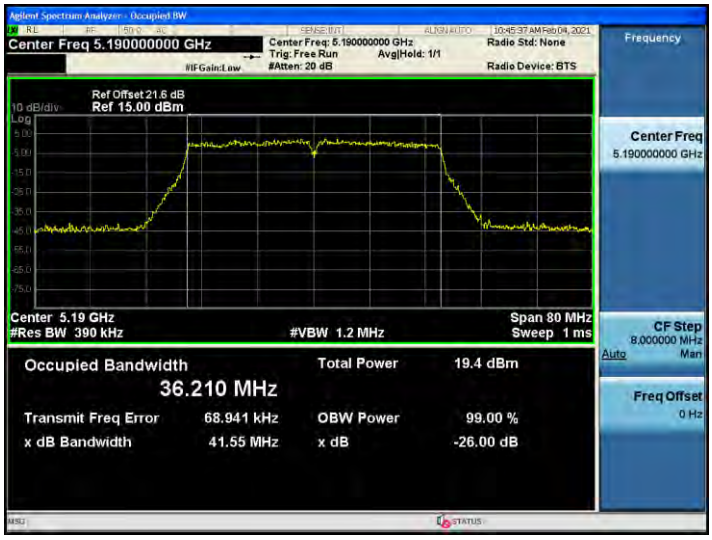
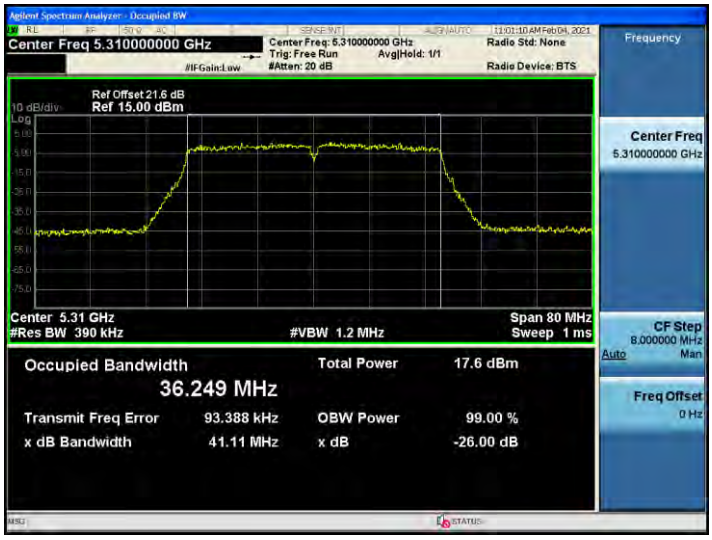
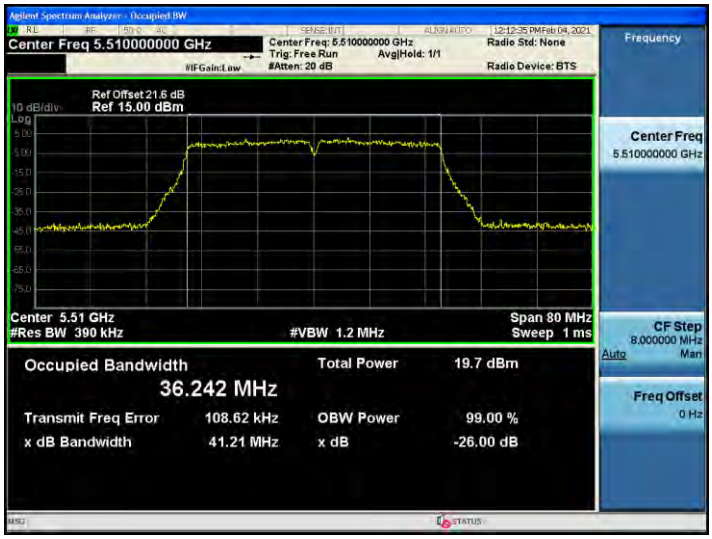
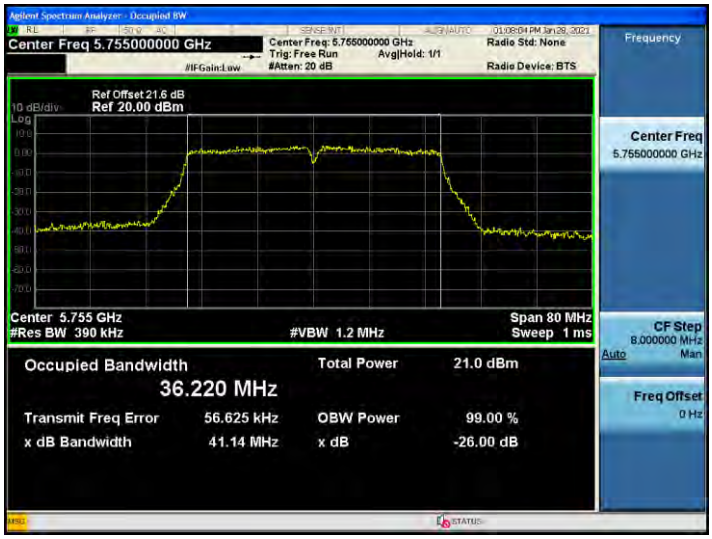
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 40)	802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)
	
802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 100)	**802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 165)**
	

▣ Test Plots(802.11ac(VHT40))

Note:

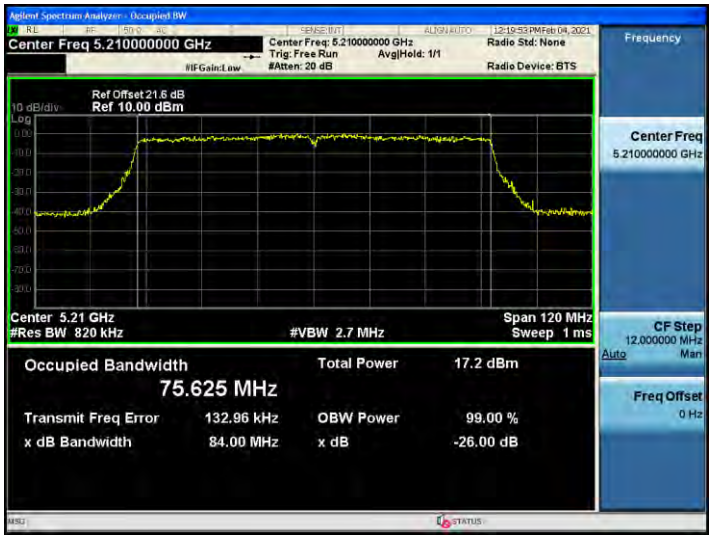
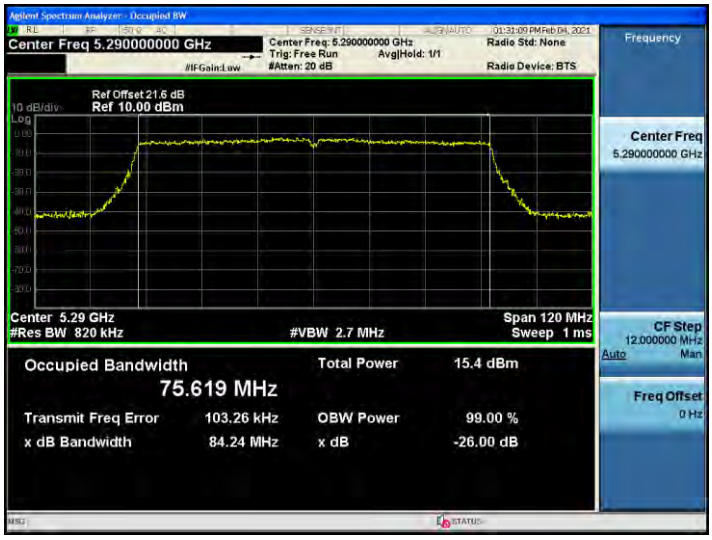
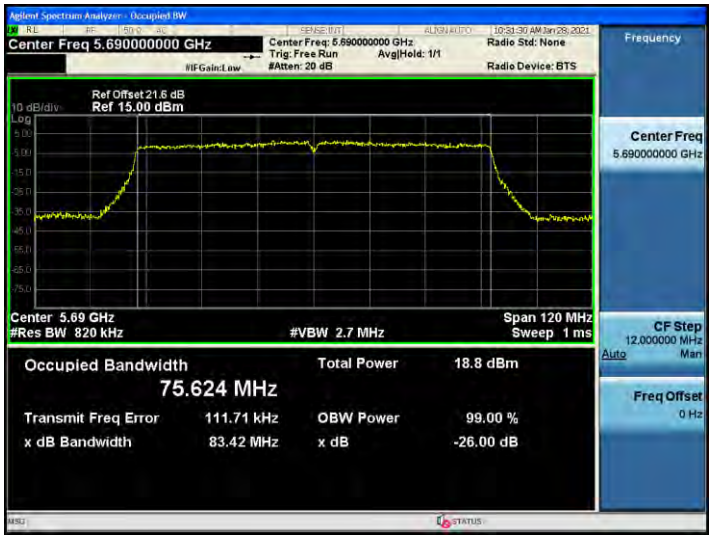
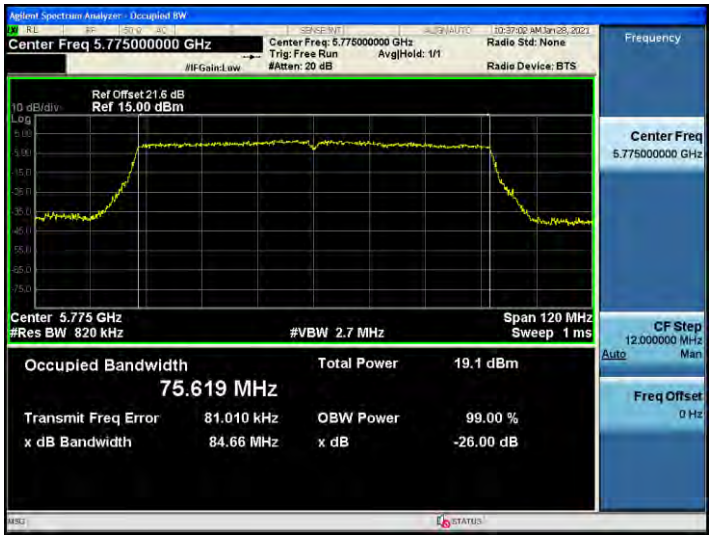
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)	**802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)**
	

▣ Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)	802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)
	
802.11ac_VHT80 UNII 2C BAND 26dB Bandwidth(CH 138)	**802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)**
	

10.3 6dB BANDWIDTH

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.27	> 0.5	Pass
5785	157	15.85	> 0.5	Pass
5825	165	15.65	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.34	> 0.5	Pass
5785	157	16.09	> 0.5	Pass
5825	165	16.66	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.75	> 0.5	Pass
5795	159	35.36	> 0.5	Pass

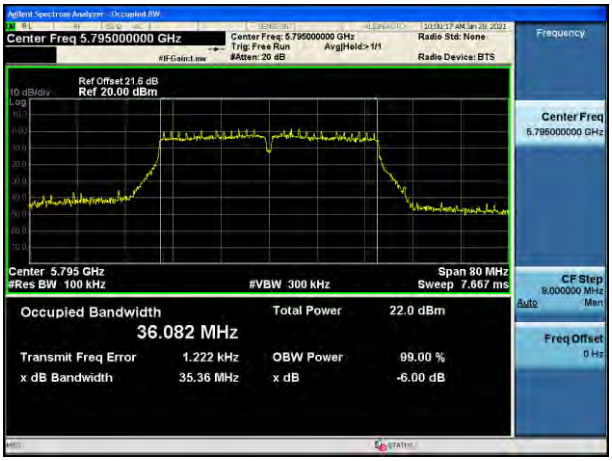
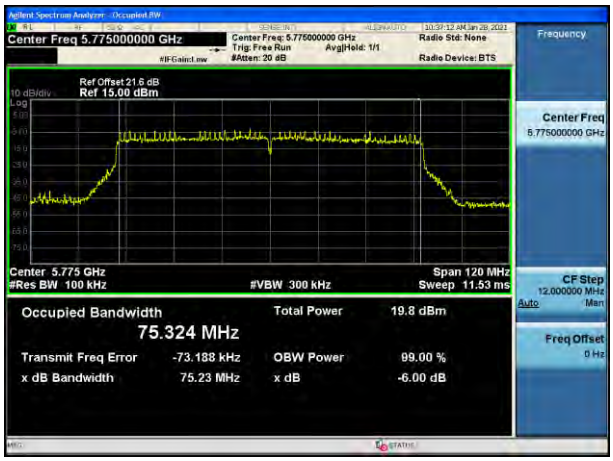
802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.10	> 0.5	Pass
5785	157	16.04	> 0.5	Pass
5825	165	15.14	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.19	> 0.5	Pass
5795	159	35.24	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.23	> 0.5	Pass

▣ Test Plots

Note: In order to simplify the report, attached plots were only the most narrow channel.

802.11a (CH.149)	802.11n(HT20) (CH.157)
	
802.11n(HT40) (CH.159)	**802.11ac(VHT20) (CH.149)**
	
802.11ac(VHT40) (CH.151)	**802.11ac(VHT80) (CH.155)**
	

10.4 OUTPUT POWER MEASUREMENT

Straddle channel data in the table below are for reporting purposes only.

Straddle channel data were added in section 10.7.3.

802.11a Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase Datarate (Mbps)
Frequency [MHz]	Channel No.						
5180	36	18	17.82	0.317	18.14	23.98	18
5200	40	18	18.20	0.317	18.52	23.98	18
5240	48	18	18.26	0.317	18.58	23.98	18
5260	52	18	18.20	0.317	18.51	23.21	18
5300	60	18	18.32	0.317	18.64	23.21	18
5320	64	17	17.93	0.317	18.25	23.21	18
5500	100	18	17.32	0.317	17.64	23.19	18
5580	116	18	17.58	0.317	17.89	23.19	18
5720	144	18	18.12	0.317	18.44	23.19	18
5745	149	18	18.24	0.317	18.56	30.00	18
5785	157	18	18.14	0.317	18.45	30.00	18
5825	165	18	18.00	0.317	18.31	30.00	18

802.11n(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.						
5180	36	18	17.48	0.427	17.91	23.98	MCS3
5200	40	18	17.74	0.427	18.17	23.98	MCS3
5240	48	18	18.06	0.427	18.48	23.98	MCS3
5260	52	18	17.96	0.427	18.39	23.47	MCS3
5300	60	18	18.28	0.427	18.71	23.47	MCS3
5320	64	17	17.71	0.427	18.14	23.47	MCS3
5500	100	18	17.12	0.427	17.55	23.47	MCS3
5580	116	18	17.35	0.427	17.78	23.47	MCS3
5720	144	18	17.74	0.427	18.16	23.47	MCS3
5745	149	18	17.92	0.427	18.35	30.00	MCS3
5785	157	18	17.88	0.427	18.31	30.00	MCS3
5825	165	18	17.83	0.427	18.25	30.00	MCS3

802.11n(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.						
5190	38	13	12.68	0.740	13.42	23.98	MCS3
5230	46	14	14.47	0.587	15.06	23.98	MCS2
5270	54	14	13.78	0.740	14.52	23.98	MCS3
5310	62	11	11.52	0.232	11.75	23.98	MCS0
5510	102	14	13.47	0.740	14.20	23.98	MCS3
5550	110	14	13.69	0.587	14.27	23.98	MCS2
5710	142	14	13.91	0.587	14.50	23.98	MCS2
5755	151	14	13.73	0.740	14.47	30.00	MCS3
5795	159	14	13.84	0.740	14.58	30.00	MCS3

802.11ac(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.						
5180	36	16	15.87	0.416	16.29	23.98	MCS3
5200	40	16	16.08	0.416	16.50	23.98	MCS3
5240	48	16	16.52	0.416	16.93	23.98	MCS3
5260	52	16	16.33	0.416	16.74	23.46	MCS3
5300	60	16	16.57	0.416	16.98	23.46	MCS3
5320	64	16	16.66	0.325	16.99	23.46	MCS2
5500	100	16	15.77	0.416	16.19	23.47	MCS3
5580	116	16	15.86	0.416	16.27	23.47	MCS3
5720	144	16	15.89	0.416	16.30	23.47	MCS3
5745	149	16	16.05	0.416	16.47	30.00	MCS3
5785	157	16	15.91	0.416	16.33	30.00	MCS3
5825	165	16	15.87	0.416	16.29	30.00	MCS3

802.11ac(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.						
5190	38	12	11.38	1.502	12.88	23.98	MCS9
5230	46	14	14.35	0.943	15.30	23.98	MCS4
5270	54	14	13.70	0.943	14.64	23.98	MCS4
5310	62	10	9.67	1.502	11.17	23.98	MCS9
5510	102	13	12.24	0.943	13.18	23.98	MCS4
5550	110	14	13.37	0.943	14.31	23.98	MCS4
5710	142	14	13.52	0.943	14.46	23.98	MCS4
5755	151	14	13.48	0.943	14.42	30.00	MCS4
5795	159	14	13.62	0.943	14.56	30.00	MCS4

802.11ac(80MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)	Worstcase MCS Index
Frequency [MHz]	Channel No.						
5210	42	10	8.62	1.845	10.47	23.98	MCS8
5290	58	7	6.97	1.447	8.42	23.98	MCS4
5530	106	12	10.39	1.447	11.84	23.98	MCS4
5610	122	12	10.28	1.447	11.72	23.98	MCS4
5690	138	12	10.09	1.447	11.54	23.98	MCS4
5775	155	12	10.58	1.447	12.03	30.00	MCS4

10.5 POWER SPECTRAL DENSITY

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Worstcase Datarate (Mbps)	Limit
Frequency [MHz]	Channel No.					
5180	36	7.671	0.317	7.988	18	11 dBm/MHz
5200	40	7.927	0.317	8.244	18	
5240	48	7.994	0.317	8.311	18	
5260	52	7.925	0.317	8.242	18	
5300	60	7.866	0.317	8.183	18	
5320	64	7.501	0.317	7.818	18	
5500	100	6.944	0.317	7.261	18	
5580	116	7.173	0.317	7.490	18	
5720	144	7.759	0.317	8.076	18	
5745	149	5.293	0.317	5.610	18	30 dBm/500kHz
5785	157	4.820	0.317	5.137	18	
5825	165	4.795	0.317	5.112	18	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	6.862	0.427	7.289	MCS3	11 dBm/MHz
5200	40	7.118	0.427	7.545	MCS3	
5240	48	7.732	0.427	8.159	MCS3	
5260	52	7.513	0.427	7.940	MCS3	
5300	60	7.542	0.427	7.969	MCS3	
5320	64	7.273	0.427	7.700	MCS3	
5500	100	6.730	0.427	7.157	MCS3	
5580	116	6.900	0.427	7.327	MCS3	
5720	144	7.475	0.427	7.902	MCS3	
5745	149	4.480	0.427	4.907	MCS3	30 dBm/500 kHz
5785	157	4.891	0.427	5.318	MCS3	
5825	165	4.516	0.427	4.943	MCS3	

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-0.912	0.740	-0.172	MCS3	11 dBm/MHz
5230	46	0.694	0.587	1.281	MCS2	
5270	54	0.160	0.740	0.900	MCS3	
5310	62	-2.414	0.232	-2.182	MCS0	
5510	102	0.002	0.740	0.742	MCS3	
5550	110	0.107	0.587	0.694	MCS2	
5710	142	0.401	0.587	0.988	MCS2	
5755	151	-2.484	0.740	-1.744	MCS3	30 dBm /500kHz
5795	159	-2.484	0.740	-1.744	MCS3	

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5180	36	5.495	0.416	5.911	MCS3	11 dBm/MHz
5200	40	5.666	0.416	6.082	MCS3	
5240	48	5.982	0.416	6.398	MCS3	
5260	52	5.802	0.416	6.218	MCS3	
5300	60	6.258	0.416	6.674	MCS3	
5320	64	6.294	0.325	6.619	MCS2	
5500	100	4.986	0.416	5.402	MCS3	
5580	116	5.332	0.416	5.748	MCS3	
5720	144	5.168	0.416	5.584	MCS3	
5745	149	2.883	0.416	3.299	MCS3	30 dBm/500kHz
5785	157	2.642	0.416	3.058	MCS3	
5825	165	2.417	0.416	2.833	MCS3	

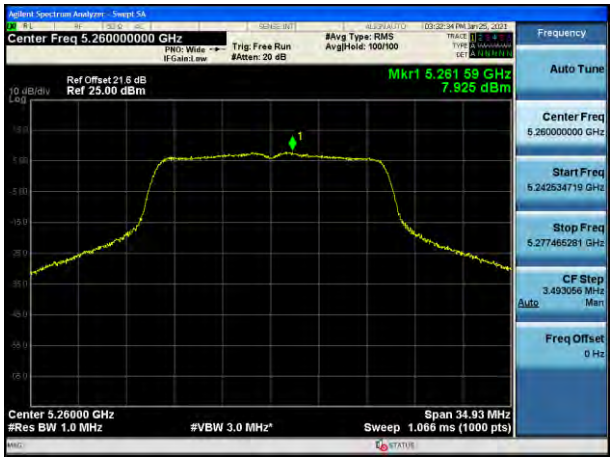
802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5190	38	-2.545	1.502	-1.043	MCS9	11 dBm/MHz
5230	46	0.050	0.943	0.993	MCS4	
5270	54	-0.424	0.943	0.519	MCS4	
5310	62	-4.655	1.502	-3.153	MCS9	
5510	102	-1.847	0.943	-0.904	MCS4	
5550	110	-0.878	0.943	0.065	MCS4	
5710	142	-0.603	0.943	0.340	MCS4	
5755	151	-2.716	0.943	-1.773	MCS4	30 dBm/500kHz
5795	159	-3.077	0.943	-2.134	MCS4	

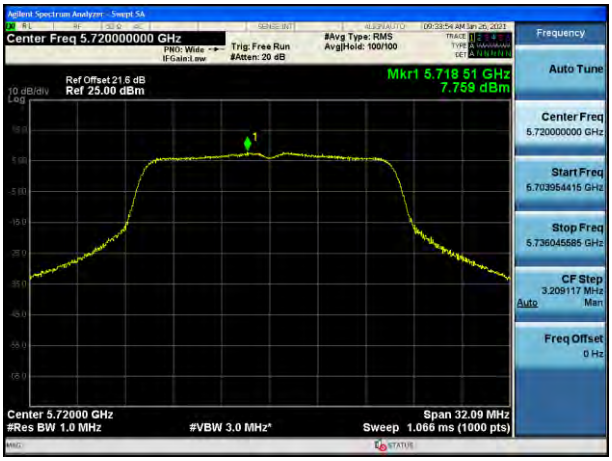
802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Worstcase MCS Index	Limit
Frequency [MHz]	Channel No.					
5210	42	-8.601	1.845	-6.756	MCS8	11 dBm/MHz
5290	58	-10.086	1.447	-8.639	MCS4	
5530	106	-6.164	1.447	-4.717	MCS4	
5610	122	-6.519	1.447	-5.072	MCS4	
5690	138	-6.744	1.447	-5.297	MCS4	
5775	155	-8.940	1.447	-7.493	MCS4	30 dBm/500kHz

▣ Test Plots(802.11a)

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 48)	UNII 2A (Ch. 52)
	

UNII 2C (Ch. 144)	UNII 3 (Ch. 149)
	

▣ Test Plots(802.11n(HT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 48)	UNII 2A (Ch. 60)
	

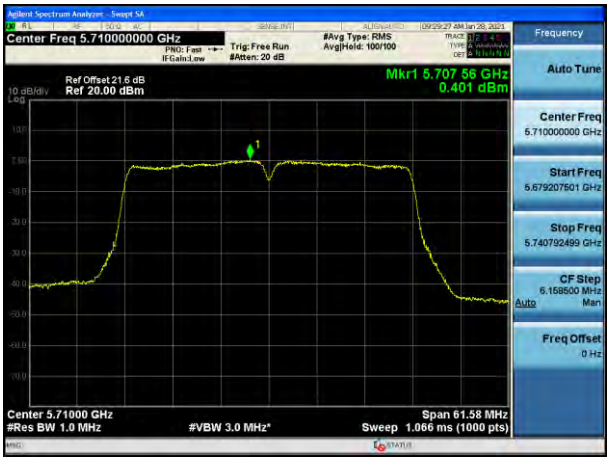
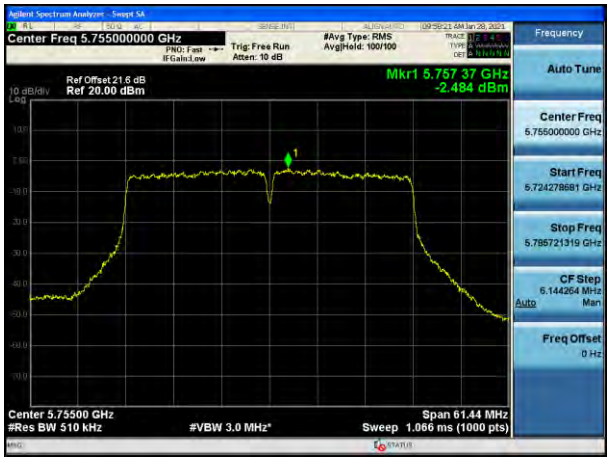
UNII 2C (Ch. 144)	UNII 3 (Ch. 157)
	

▣ Test Plots(802.11n(HT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 46)	UNII 2A (Ch. 54)
	

UNII 2C (Ch. 142)	UNII 3 (Ch. 151)
	

▣ Test Plots(802.11ac(VHT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 48)	UNII 2A (Ch. 60)
	

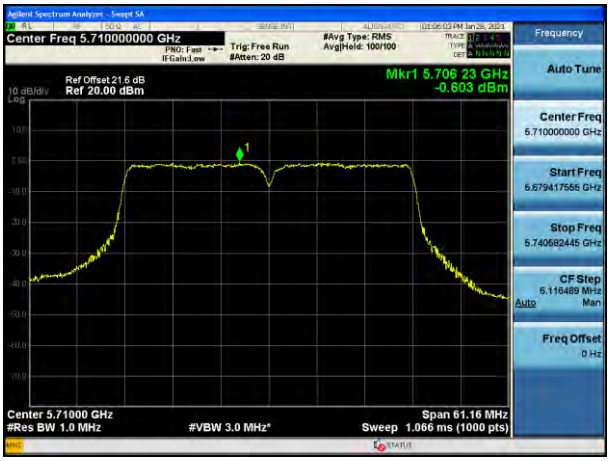
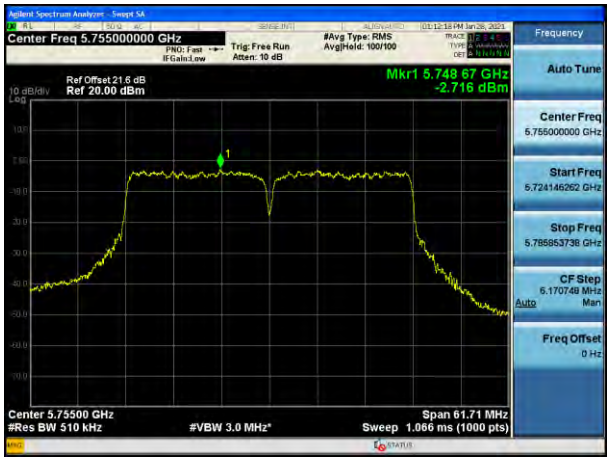
UNII 2C (Ch. 116)	UNII 3 (Ch. 149)
	

▣ Test Plots(802.11ac(VHT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 46)	UNII 2A (Ch. 54)
	

UNII 2C (Ch. 142)	UNII 3 (Ch. 151)
	

▣ Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 42)	UNII 2A (Ch. 58)
	

UNII 2C (Ch. 106)	UNII 3 (Ch. 155)
	

10.6 FREQUENCY STABILITY.

10.6.1 80MHz BW

Startup after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5210019.15	19.15
100%		-30	5210042.84	42.84
100%		-20	5210035.99	35.99
100%		-10	5210030.66	30.66
100%		0	5210026.29	26.29
100%		+10	5210022.92	22.92
100%		+30	5210021.83	21.83
100%		+40	5210032.53	32.53
100%		+50	5210036.68	36.68
LOW	3.65	+20	5210038.00	38.00
HIGH	4.40	+20	5210034.40	34.40

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5290039.84	39.84
100%		-30	5290042.60	42.60
100%		-20	5290036.19	36.19
100%		-10	5290029.23	29.23
100%		0	5290024.50	24.50
100%		+10	5290021.14	21.14
100%		+30	5290021.59	21.59
100%		+40	5290030.12	30.12
100%		+50	5290034.82	34.82
LOW	3.65	+20	5290035.35	35.35
HIGH	4.40	+20	5290036.17	36.17

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5530024.09	24.09
100%		-30	5530048.00	48.00
100%		-20	5530040.83	40.83
100%		-10	5530034.30	34.30
100%		0	5530029.24	29.24
100%		+10	5530025.88	25.88
100%		+30	5530026.25	26.25
100%		+40	5530036.18	36.18
100%		+50	5530041.69	41.69
LOW	3.65	+20	5530041.58	41.58
HIGH	4.40	+20	5530039.50	39.50

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5775011.05	11.05
100%		-30	5775047.82	47.82
100%		-20	5775039.82	39.82
100%		-10	5775034.38	34.38
100%		0	5775030.26	30.26
100%		+10	5775026.56	26.56
100%		+30	5775026.81	26.81
100%		+40	5775036.75	36.75
100%		+50	5775040.56	40.56
LOW	3.65	+20	5775039.40	39.40
HIGH	4.40	+20	5775042.94	42.94

Note:

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

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5210040.00	40.00
100%		-30	5210064.02	64.02
100%		-20	5210056.99	56.99
100%		-10	5210050.24	50.24
100%		0	5210046.88	46.88
100%		+10	5210043.51	43.51
100%		+30	5210042.76	42.76
100%		+40	5210051.32	51.32
100%		+50	5210056.76	56.76
LOW	3.65	+20	5210057.56	57.56
HIGH	4.40	+20	5210054.72	54.72

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5290019.07	19.07
100%		-30	5290063.68	63.68
100%		-20	5290057.25	57.25
100%		-10	5290050.50	50.50
100%		0	5290047.21	47.21
100%		+10	5290043.89	43.89
100%		+30	5290043.40	43.40
100%		+40	5290052.64	52.64
100%		+50	5290057.48	57.48
LOW	3.65	+20	5290056.34	56.34
HIGH	4.40	+20	5290056.98	56.98

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5530021.04	21.04
100%		-30	5530045.51	45.51
100%		-20	5530038.23	38.23
100%		-10	5530032.03	32.03
100%		0	5530027.04	27.04
100%		+10	5530024.15	24.15
100%		+30	5530024.07	24.07
100%		+40	5530032.98	32.98
100%		+50	5530038.59	38.59
LOW	3.65	+20	5530038.43	38.43
HIGH	4.40	+20	5530034.20	34.20

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5775039.77	39.77
100%		-30	5775044.94	44.94
100%		-20	5775037.07	37.07
100%		-10	5775031.33	31.33
100%		0	5775026.54	26.54
100%		+10	5775022.82	22.82
100%		+30	5775024.45	24.45
100%		+40	5775033.78	33.78
100%		+50	5775038.88	38.88
LOW	3.65	+20	5775037.64	37.64
HIGH	4.40	+20	5775038.69	38.69

Note:

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

5 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5210021.75	21.75
100%		-30	5210044.70	44.70
100%		-20	5210036.61	36.61
100%		-10	5210030.57	30.57
100%		0	5210027.04	27.04
100%		+10	5210024.53	24.53
100%		+30	5210024.18	24.18
100%		+40	5210033.32	33.32
100%		+50	5210037.69	37.69
LOW	3.65	+20	5210040.38	40.38
HIGH	4.40	+20	5210037.33	37.33

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5290045.12	45.12
100%		-30	5290046.42	46.42
100%		-20	5290039.36	39.36
100%		-10	5290033.61	33.61
100%		0	5290029.27	29.27
100%		+10	5290025.25	25.25
100%		+30	5290024.84	24.84
100%		+40	5290033.49	33.49
100%		+50	5290039.45	39.45
LOW	3.65	+20	5290039.21	39.21
HIGH	4.40	+20	5290041.59	41.59

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5530039.44	39.44
100%		-30	5530062.67	62.67
100%		-20	5530055.32	55.32
100%		-10	5530049.56	49.56
100%		0	5530046.39	46.39
100%		+10	5530042.96	42.96
100%		+30	5530042.04	42.04
100%		+40	5530050.98	50.98
100%		+50	5530055.51	55.51
LOW	3.65	+20	5530057.91	57.91
HIGH	4.40	+20	5530055.05	55.05

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5775033.26	33.26
100%		-30	5775063.46	63.46
100%		-20	5775056.96	56.96
100%		-10	5775051.41	51.41
100%		0	5775046.93	46.93
100%		+10	5775044.12	44.12
100%		+30	5775043.33	43.33
100%		+40	5775052.91	52.91
100%		+50	5775057.55	57.55
LOW	3.65	+20	5775055.58	55.58
HIGH	4.40	+20	5775059.13	59.13

Note:

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

10 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5210042.83	42.83
100%		-30	5210066.68	66.68
100%		-20	5210060.54	60.54
100%		-10	5210054.79	54.79
100%		0	5210051.20	51.20
100%		+10	5210047.58	47.58
100%		+30	5210045.04	45.04
100%		+40	5210055.71	55.71
100%		+50	5210061.30	61.30
LOW	3.65	+20	5210060.24	60.24
HIGH	4.40	+20	5210057.10	57.10

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5290015.93	15.93
100%		-30	5290066.24	66.24
100%		-20	5290059.91	59.91
100%		-10	5290053.24	53.24
100%		0	5290050.07	50.07
100%		+10	5290047.48	47.48
100%		+30	5290046.13	46.13
100%		+40	5290056.09	56.09
100%		+50	5290061.24	61.24
LOW	3.65	+20	5290059.48	59.48
HIGH	4.40	+20	5290061.34	61.34

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5530027.77	27.77
100%		-30	5530050.77	50.77
100%		-20	5530043.87	43.87
100%		-10	5530036.89	36.89
100%		0	5530032.78	32.78
100%		+10	5530029.19	29.19
100%		+30	5530030.38	30.38
100%		+40	5530040.40	40.40
100%		+50	5530043.69	43.69
LOW	3.65	+20	5530047.48	47.48
HIGH	4.40	+20	5530042.09	42.09

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.86 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.86	+20(Ref)	5775035.86	35.86
100%		-30	5775051.15	51.15
100%		-20	5775043.53	43.53
100%		-10	5775038.03	38.03
100%		0	5775034.13	34.13
100%		+10	5775030.77	30.77
100%		+30	5775030.46	30.46
100%		+40	5775040.89	40.89
100%		+50	5775046.33	46.33
LOW	3.65	+20	5775044.71	44.71
HIGH	4.40	+20	5775045.30	45.30

Note:

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

10.7 STRADDLE CHANNEL

10.7.1 26dB Bandwidth

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5709.88	15.12
802.11n(HT20)				5709.32	15.68
802.11ac(VHT20)				5709.08	15.92
802.11a	UNII 3	5720	144	5730.32	5.32
802.11n(HT20)				5730.68	5.68
802.11ac(VHT20)				5730.52	5.52

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.52	35.48
802.11ac(VHT40)				5689.60	35.40
802.11n(HT40)	UNII 3	5710	142	5730.16	5.16
802.11ac(VHT40)				5730.56	5.56

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5648.36	76.64
	UNII 3	5690	138	5732.00	7.00

Note:

[UNII 2C] 26dB Bandwidth = 5 725 MHz **-** Measured Frequency[MHz]

[UNII 3C] 26dB Bandwidth = Measured Frequency[MHz] – 5 725 MHz

▣ Test Plots (26dB Bandwidth)

802.11a UNII Band	802.11n(HT20) UNII Band
	

802.11ac(VHT20) UNII Band


▣ Test Plots (26dB Bandwidth)

802.11n(HT40) UNII Band	802.11ac(VHT40) UNII Band
	

802.11ac(VHT80) UNII Band


10.7.2 6dB Bandwidth

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII 3	5720	144	5727.60	2.60	> 0.5
802.11n(HT20)				5727.76	2.76	> 0.5
802.11ac(VHT20)				5727.60	2.60	> 0.5

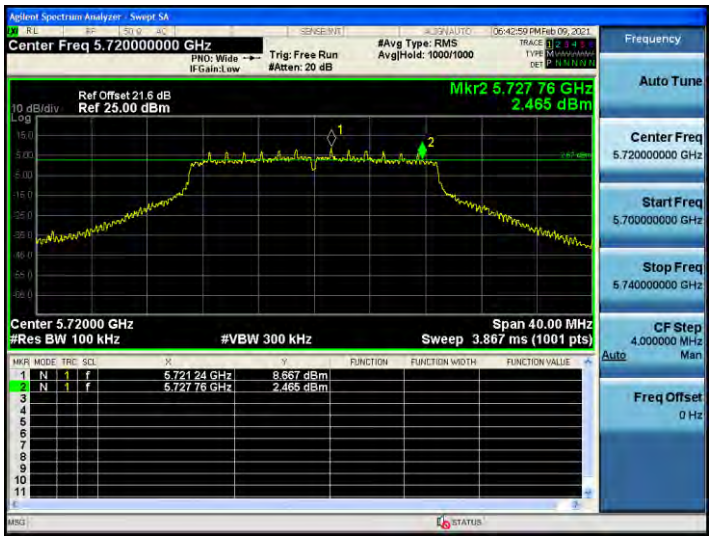
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5728.16	3.16	> 0.5
802.11ac(VHT40)				5727.92	2.92	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5727.68	2.68	> 0.5

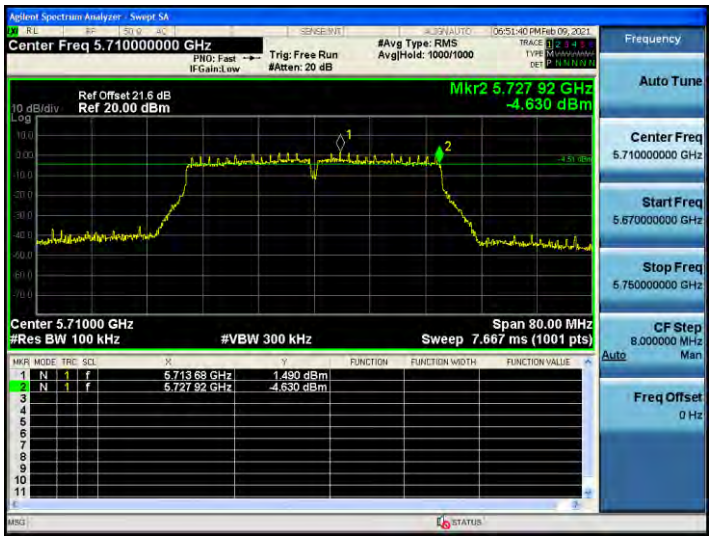
Note:

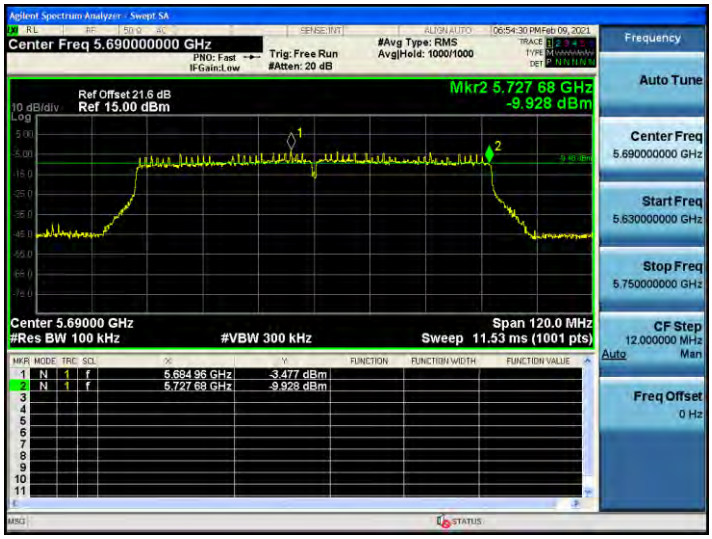
6dB Bandwidth = Measured Frequency[MHz] – 5725MHz

▣ Test Plots(UNII 3 Band 6dB Bandwidth)

802.11a CH.144	802.11n_HT20 CH.144
	

802.11ac_VHT20 CH.144


802.11n_HT40 CH.142	802.11ac_VHT40 CH.142
	

802.11ac_VHT80 CH.138


10.7.3 Output Power

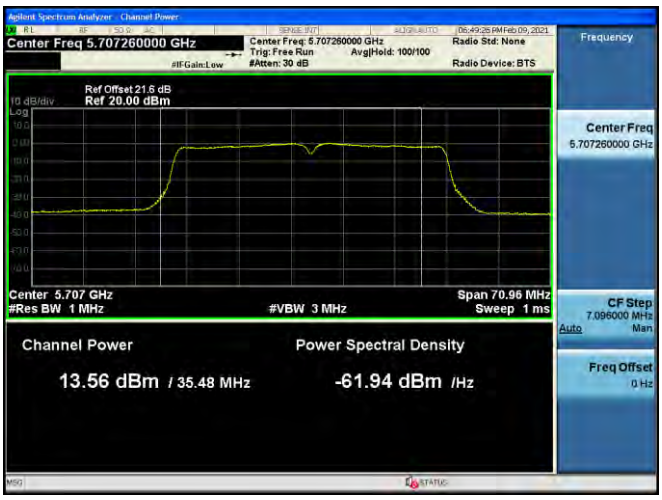
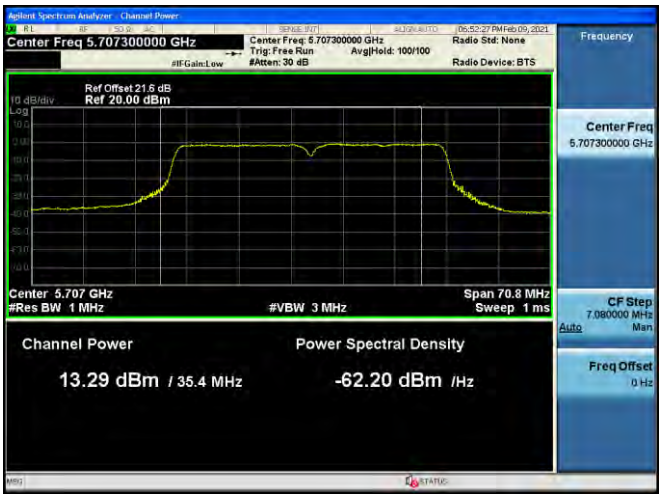
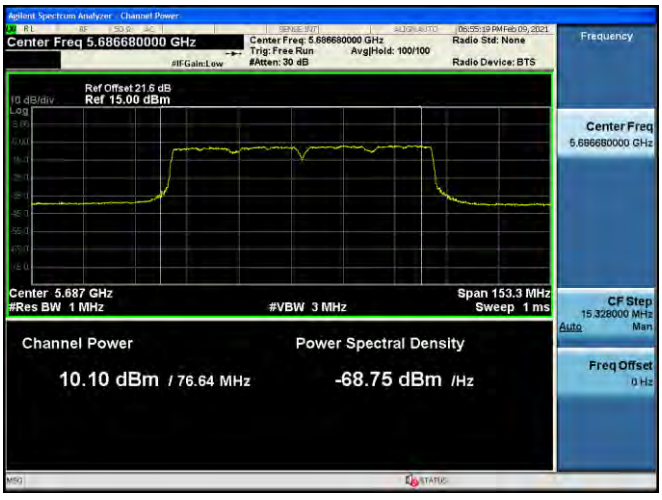
Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)	Worstcase Datarate
802.11a	5720 (UNII 2C Band)	144	17.22	0.317	17.53	22.80	18 Mbps
802.11n(HT20)			16.95	0.427	17.38	22.95	MCS3
802.11ac(VHT20)			14.95	0.416	15.37	23.02	MCS3
802.11a	5720 (UNII 3 Band)	144	10.36	0.317	10.68	30.00	18 Mbps
802.11n(HT20)			10.58	0.427	11.00	30.00	MCS3
802.11ac(VHT20)			8.64	0.416	9.06	30.00	MCS3

Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)	Worstcase Datarate
802.11n(HT40)	5710 (UNII 2C Band)	142	13.56	0.587	14.15	23.98	MCS2
802.11ac(VHT40)			13.29	0.943	14.23	23.98	MCS4
802.11n(HT40)	5710 (UNII 3 Band)	142	3.03	0.587	3.61	30.00	MCS2
802.11ac(VHT40)			3.48	0.943	4.43	30.00	MCS4

Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)	Worstcase Datarate
802.11ac(VHT80)	5690 (UNII 2C Band)	138	10.10	1.447	11.54	23.98	MCS4
	5690 (UNII 3 Band)	138	-2.23	1.447	-0.79	30.00	MCS4

▣ Test Plots_

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

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

10.7.4 Power Spectral Density

Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)	Worstcase Datarate
802.11a	5720 (UNII 2C Band)	144	7.547	0.317	7.864	11dBm/ MHz	18 Mbps
802.11n(HT20)			7.519	0.427	7.946		MCS3
802.11ac(VHT20)			5.147	0.416	5.563		MCS3
802.11a	5720 (UNII 3 Band)	144	3.132	0.317	3.449	30 dB/ 500kHz	18 Mbps
802.11n(HT20)			2.649	0.427	3.076		MCS3
802.11ac(VHT20)			1.174	0.416	1.590		MCS3

Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)	Worstcase Datarate
802.11n(HT40)	5710 (UNII 2C Band)	142	0.380	0.587	0.967	11dBm/ MHz	MCS2
802.11ac(VHT40)			-0.452	0.943	0.491		MCS4
802.11n(HT40)	5710 (UNII 3 Band)	142	-4.054	0.587	-3.467	30 dB/ 500kHz	MCS2
802.11ac(VHT40)			-3.575	0.943	-2.632		MCS4

Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)	Worstcase Datarate
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-6.506	1.447	-5.059	11dBm/ MHz	MCS4
	5690 (UNII 3 Band)	138	-9.699	1.447	-8.252	30 dBm/ 500kHz	MCS4

▣ Test Plots

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

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

10.8 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30MHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Note:

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

Frequency Range : Below 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Note:

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

Frequency Range : Above 1 GHz

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	43.83	8.90	V	52.73	68.20	15.47	PK
15540	39.91	13.15	V	53.06	73.98	20.92	PK
15540	26.90	13.15	V	40.05	53.98	13.93	AV
10360	44.17	8.90	H	53.07	68.20	15.13	PK
15540	40.26	13.15	H	53.41	73.98	20.57	PK
15540	26.85	13.15	H	40.00	53.98	13.98	AV

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5200 MHz
Channel No.	40 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	43.82	9.11	V	52.93	68.20	15.27	PK
15600	39.99	13.41	V	53.40	73.98	20.58	PK
15600	26.67	13.41	V	40.08	53.98	13.90	AV
10400	44.09	9.11	H	53.20	68.20	15.00	PK
15600	40.31	13.41	H	53.72	73.98	20.26	PK
15600	26.71	13.41	H	40.12	53.98	13.86	AV

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	43.97	9.54	V	53.51	68.20	14.69	PK
15720	39.94	13.05	V	52.99	73.98	20.99	PK
15720	26.40	13.05	V	39.45	53.98	14.53	AV
10480	43.54	9.54	H	53.08	68.20	15.12	PK
15720	39.87	13.05	H	52.92	73.98	21.06	PK
15720	26.38	13.05	H	39.43	53.98	14.55	AV

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5260 MHz
Channel No.	52 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	43.07	9.80	V	52.87	68.20	15.33	PK
15780	39.88	13.51	V	53.39	73.98	20.59	PK
15780	26.63	13.51	V	40.14	53.98	13.84	AV
10520	43.19	9.80	H	52.99	68.20	15.21	PK
15780	40.50	13.51	H	54.01	73.98	19.97	PK
15780	26.73	13.51	H	40.24	53.98	13.74	AV

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5300 MHz
Channel No.	60 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	42.68	10.27	V	52.95	73.98	21.03	PK
10600	29.15	10.27	V	39.42	53.98	14.56	AV
15900	41.09	13.01	V	54.10	73.98	19.88	PK
15900	27.45	13.01	V	40.46	53.98	13.52	AV
10600	42.53	10.27	H	52.80	73.98	21.18	PK
10600	29.03	10.27	H	39.30	53.98	14.68	AV
15900	40.89	13.01	H	53.90	73.98	20.08	PK
15900	27.37	13.01	H	40.38	53.98	13.60	AV

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	42.77	10.41	V	53.18	73.98	20.80	PK
10640	28.89	10.41	V	39.30	53.98	14.68	AV
15960	40.66	13.53	V	54.19	73.98	19.79	PK
15960	27.33	13.53	V	40.86	53.98	13.12	AV
10640	42.23	10.41	H	52.64	73.98	21.34	PK
10640	28.77	10.41	H	39.18	53.98	14.80	AV
15960	40.17	13.53	H	53.70	73.98	20.28	PK
15960	27.32	13.53	H	40.85	53.98	13.13	AV

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	42.31	10.99	V	53.30	73.98	20.68	PK
11000	29.00	10.99	V	39.99	53.98	13.99	AV
16500	42.46	12.68	V	55.14	68.20	13.06	PK
11000	42.24	10.99	H	53.23	73.98	20.75	PK
11000	28.87	10.99	H	39.86	53.98	14.12	AV
16500	42.31	12.68	H	54.99	68.20	13.21	PK

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5580 MHz
Channel No.	116 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	42.11	10.82	V	52.93	73.98	21.05	PK
11160	29.02	10.82	V	39.84	53.98	14.14	AV
16740	41.31	13.47	V	54.78	68.20	13.42	PK
11160	41.98	10.82	H	52.80	73.98	21.18	PK
11160	28.83	10.82	H	39.65	53.98	14.33	AV
16740	41.06	13.47	H	54.53	68.20	13.67	PK

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5720 MHz
Channel No.	144 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11440	42.31	11.37	V	53.68	73.98	20.30	PK
11440	27.92	11.37	V	39.29	53.98	14.69	AV
17160	41.37	15.11	V	56.48	68.20	11.72	PK
11440	41.96	11.37	H	53.33	73.98	20.65	PK
11440	27.86	11.37	H	39.23	53.98	14.75	AV
17160	40.71	15.11	H	55.82	68.20	12.38	PK

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5745MHz
Channel No.	149 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11490	41.82	11.29	V	53.11	73.98	20.87	PK
11490	28.42	11.29	V	39.71	53.98	14.27	AV
17235	40.61	15.41	V	56.02	68.20	12.18	PK
11490	41.91	11.29	H	53.20	73.98	20.78	PK
11490	28.48	11.29	H	39.77	53.98	14.21	AV
17235	40.86	15.41	H	56.27	68.20	11.93	PK

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11570	41.92	10.65	V	52.57	73.98	21.41	PK
11570	28.74	10.65	V	39.39	53.98	14.59	AV
17355	40.51	16.11	V	56.62	68.20	11.58	PK
11570	42.10	10.65	H	52.75	73.98	21.23	PK
11570	28.84	10.65	H	39.49	53.98	14.49	AV
17355	40.88	16.11	H	56.99	68.20	11.21	PK

Band :	UNII 3
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	42.76	10.20	V	52.96	73.98	21.02	PK
11650	28.93	10.20	V	39.13	53.98	14.85	AV
17475	40.77	17.45	V	58.22	68.20	9.98	PK
11650	42.54	10.20	H	52.74	73.98	21.24	PK
11650	28.85	10.20	H	39.05	53.98	14.93	AV
17475	40.75	17.45	H	58.20	68.20	10.00	PK

Note:

All Modes of operation were investigated and the worst case configuration results are reported.

[Worst case]

UNII 1, UNII 2A, UNII 2C, UNII 3 : 802.11a_6Mbps

[DBS Mode]

WLAN/BT Ant : 802.11a ch.165 & Bluetooth Ch. 78 (GFSK)

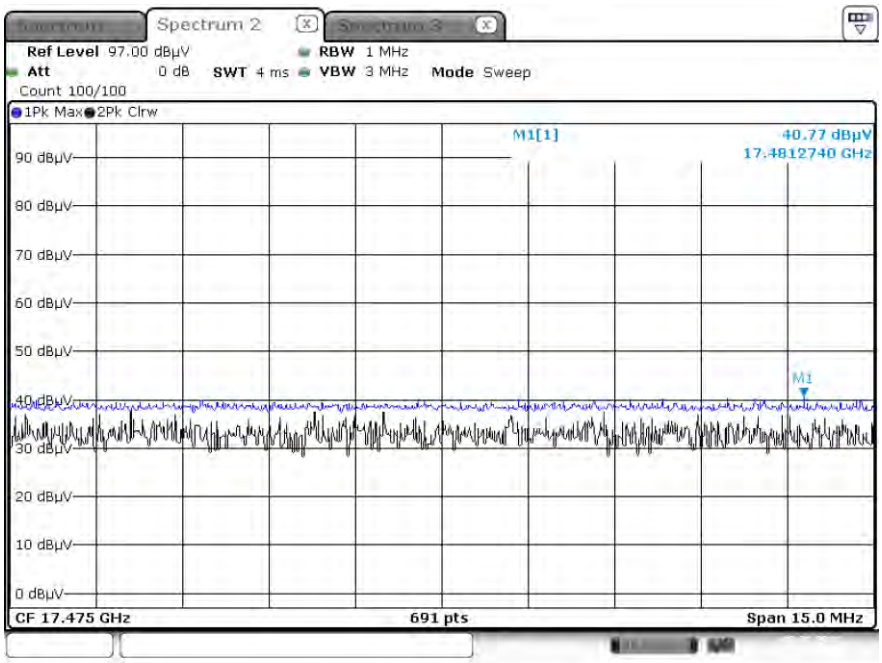
Operation Mode:	802.11a & GFSK
Transfer Rate:	6 Mbps & 339bytes
Operating Frequency	5825 & 2480 MHz
Channel No.	165 Ch & 78 Ch

Frequency [MHz]	Reading [dBuV]	A.F+C.L -A.G+D.F [dB]	Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	42.55	10.20	V	52.75	73.98	21.23	PK
11650	28.53	10.20	V	38.73	53.98	15.25	AV
17475	40.53	17.45	V	57.98	68.20	10.22	PK
11650	42.33	10.20	H	52.53	73.98	21.45	PK
11650	28.50	10.20	H	38.70	53.98	15.28	AV
17475	41.12	17.45	H	58.57	68.20	9.63	PK

Note : Bluetooth DBS Data refer to BT Test Report.

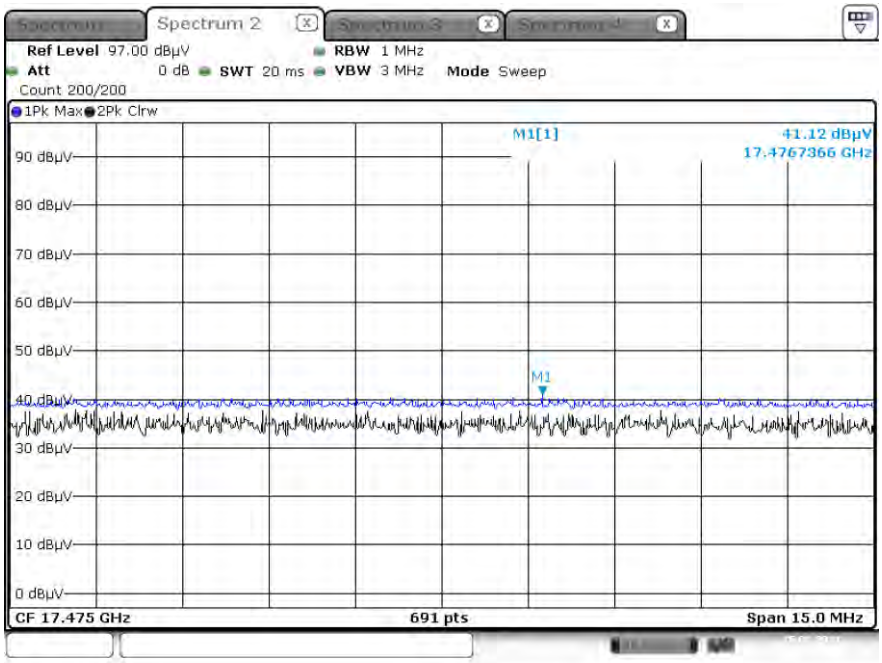
▣ Test Plots

Peak Reading (802.11a, Ch.165 3rd Harmonic, Z-V)



[DBS Mode]

Peak Reading (3rd,802.11a ch.165 & Bluetooth Ch.78 (GFSK), Y-H)



Note:

Only the worst case plots for Radiated Spurious Emissions.

10.9 RADIATED RESTRICTED BAND EDGE

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	18 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	53.15	7.81	H	60.96	73.98	13.02	PK
5150	38.58	7.81	H	46.39	53.98	7.59	AV
5150	52.72	7.81	V	60.53	73.98	13.45	PK
5150	38.13	7.81	V	45.94	53.98	8.04	AV

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	18 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	55.68	7.51	H	63.19	73.98	10.79	PK
5350	41.56	7.51	H	49.07	53.98	4.91	AV
5350	55.24	7.51	V	62.75	73.98	11.23	PK
5350	41.10	7.51	V	48.61	53.98	5.37	AV

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	18 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	50.30	8.15	H	58.45	73.98	15.53	PK
5460	35.83	8.15	H	43.98	53.98	10.00	AV
5470	53.77	8.21	H	61.98	68.20	6.22	PK
5460	49.97	8.15	V	58.12	73.98	15.86	PK
5460	35.56	8.15	V	43.71	53.98	10.27	AV
5470	53.35	8.21	V	61.56	68.20	6.64	PK

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	3
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	52.25	7.81	H	60.06	73.98	13.92	PK
5150	38.99	7.81	H	46.80	53.98	7.18	AV
5150	51.72	7.81	V	59.53	73.98	14.45	PK
5150	38.56	7.81	V	46.37	53.98	7.61	AV

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	3
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	55.75	7.51	H	63.26	73.98	10.72	PK
5350	41.68	7.51	H	49.19	53.98	4.79	AV
5350	55.36	7.51	V	62.87	73.98	11.11	PK
5350	41.27	7.51	V	48.78	53.98	5.20	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	3
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	51.73	8.15	H	59.88	73.98	14.10	PK
5460	36.77	8.15	H	44.92	53.98	9.06	AV
5470	53.38	8.21	H	61.59	68.20	6.61	PK
5460	51.24	8.15	V	59.39	73.98	14.59	PK
5460	36.23	8.15	V	44.38	53.98	9.60	AV
5470	52.99	8.21	V	61.20	68.20	7.00	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	3
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	51.44	7.81	H	59.25	73.98	14.73	PK
5150	35.76	7.81	H	43.57	53.98	10.41	AV
5150	51.09	7.81	V	58.90	73.98	15.08	PK
5150	35.24	7.81	V	43.05	53.98	10.93	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	3
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	53.17	7.51	H	60.68	73.98	13.30	PK
5350	39.55	7.51	H	47.06	53.98	6.92	AV
5350	52.85	7.51	V	60.36	73.98	13.62	PK
5350	39.21	7.51	V	46.72	53.98	7.26	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	3
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	48.43	8.15	H	56.58	73.98	17.40	PK
5460	35.24	8.15	H	43.39	53.98	10.59	AV
5470	53.09	8.21	H	61.30	68.20	6.90	PK
5460	47.96	8.15	V	56.11	73.98	17.87	PK
5460	35.01	8.15	V	43.16	53.98	10.82	AV
5470	52.83	8.21	V	61.04	68.20	7.16	PK

Band :	UNII 1
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	3
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	52.92	7.81	H	60.73	73.98	13.25	PK
5150	42.29	7.81	H	50.10	53.98	3.88	AV
5150	42.65	7.81	V	50.46	73.98	23.52	PK
5150	41.77	7.81	V	49.58	53.98	4.40	AV

Band :	UNII 2A
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	3
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	53.75	7.51	H	61.26	73.98	12.72	PK
5350	41.47	7.51	H	48.98	53.98	5.00	AV
5350	53.33	7.51	V	60.84	73.98	13.14	PK
5350	41.02	7.51	V	48.53	53.98	5.45	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	3
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency [MHz]	Reading DBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	47.98	8.15	H	56.13	73.98	17.85	PK
5460	36.00	8.15	H	44.15	53.98	9.83	AV
5470	52.31	8.21	H	60.52	68.20	7.68	PK
5460	46.24	8.15	V	54.39	73.98	19.59	PK
5460	35.66	8.15	V	43.81	53.98	10.17	AV
5470	52.03	8.21	V	60.24	68.20	7.96	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	4
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	57.72	7.81	H	65.53	73.98	8.45	PK
5150	41.77	7.81	H	49.58	53.98	4.40	AV
5150	57.24	7.81	V	65.05	73.98	8.93	PK
5150	41.46	7.81	V	49.27	53.98	4.71	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	4
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	58.40	7.51	H	65.91	73.98	8.07	PK
5350	42.45	7.51	H	49.96	53.98	4.02	AV
5350	58.12	7.51	V	65.63	73.98	8.35	PK
5350	42.13	7.51	V	49.64	53.98	4.34	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	4
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency [MHz]	Reading DBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	48.25	8.15	H	56.40	73.98	17.58	PK
5460	36.49	8.15	H	44.64	53.98	9.34	AV
5470	54.14	8.21	H	62.35	68.20	5.85	PK
5460	48.12	8.15	V	56.27	73.98	17.71	PK
5460	36.17	8.15	V	44.32	53.98	9.66	AV
5470	54.08	8.21	V	62.29	68.20	5.91	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	4
Operating Frequency	5210 MHz
Channel No.	42 Ch

Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	52.23	7.81	H	60.04	73.98	13.94	PK
5150	39.37	7.81	H	47.18	53.98	6.80	AV
5150	51.86	7.81	V	59.67	73.98	14.31	PK
5150	39.01	7.81	V	46.82	53.98	7.16	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	4
Operating Frequency	5290 MHz
Channel No.	58 Ch

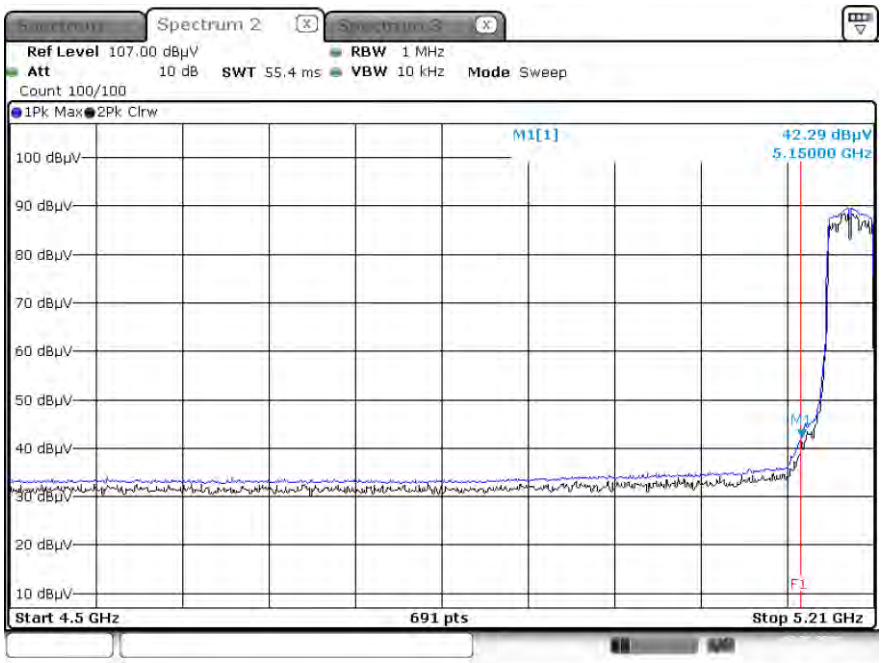
Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	53.82	7.51	H	61.33	73.98	12.65	PK
5350	41.05	7.51	H	48.56	53.98	5.42	AV
5350	53.35	7.51	V	60.86	73.98	13.12	PK
5350	40.76	7.51	V	48.27	53.98	5.71	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	4
Operating Frequency	5530 MHz
Channel No.	106 Ch

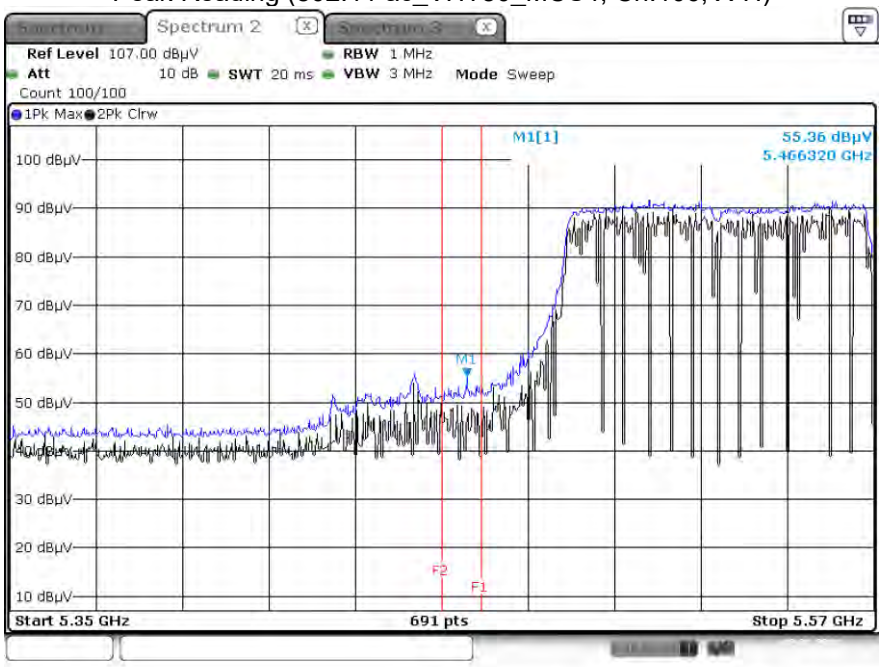
Frequency [MHz]	Reading DBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	55.47	8.15	H	63.62	73.98	10.36	PK
5460	41.94	8.15	H	50.09	53.98	3.89	AV
5470	55.36	8.21	H	63.57	68.20	4.63	PK
5460	55.02	8.15	V	63.17	73.98	10.81	PK
5460	41.45	8.15	V	49.60	53.98	4.38	AV
5470	54.36	8.21	V	62.57	68.20	5.63	PK

▣ Test Plots(UNII 1, 2A, 2C)

Average Reading (802.11 n(HT40)_MCS3, Ch.38, X-H)



Peak Reading (802.11 ac_VHT80_MCS4, Ch.106, X-H)

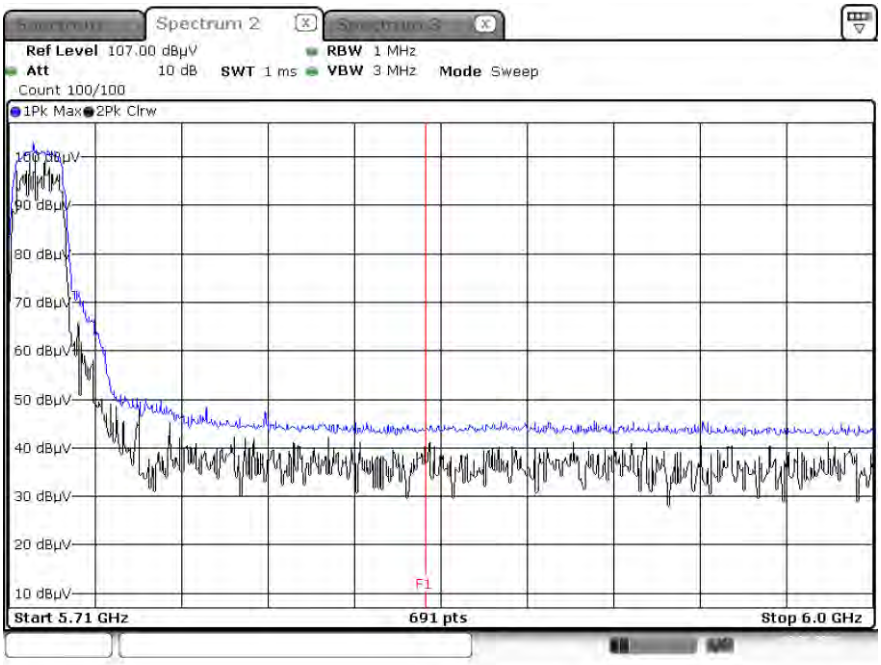


Note:

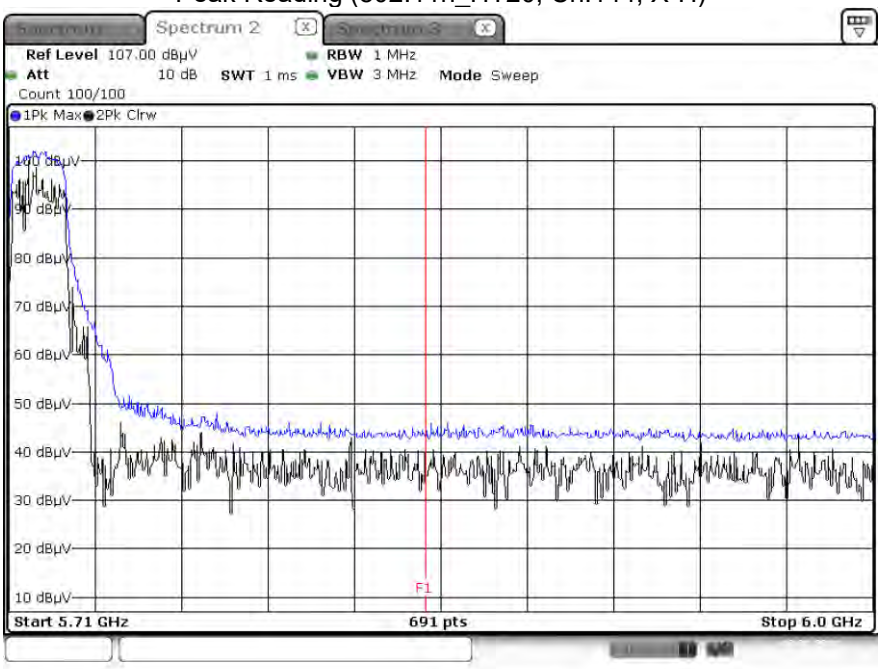
Only the worst case plots for Radiated Restricted Band Edge.

▣ Test Plots(Straddle Channel)

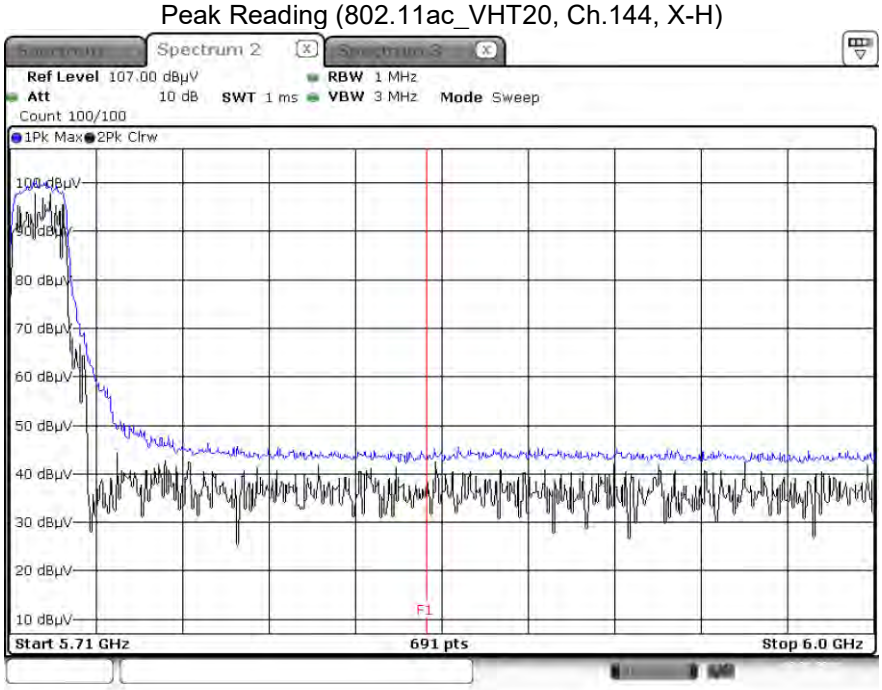
Peak Reading (802.11a, Ch.144, X-H)



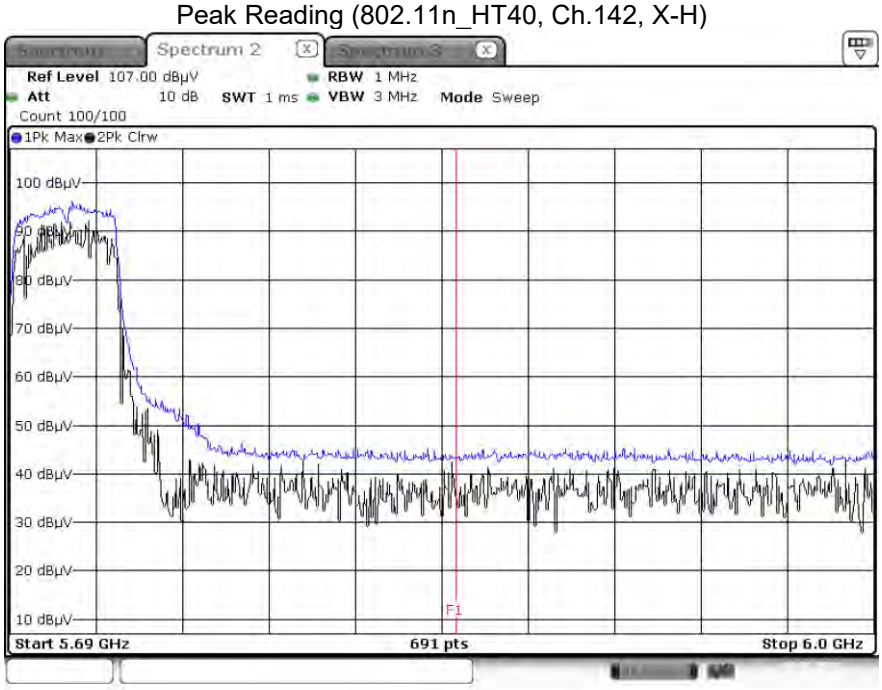
Peak Reading (802.11n_HT20, Ch.144, X-H)



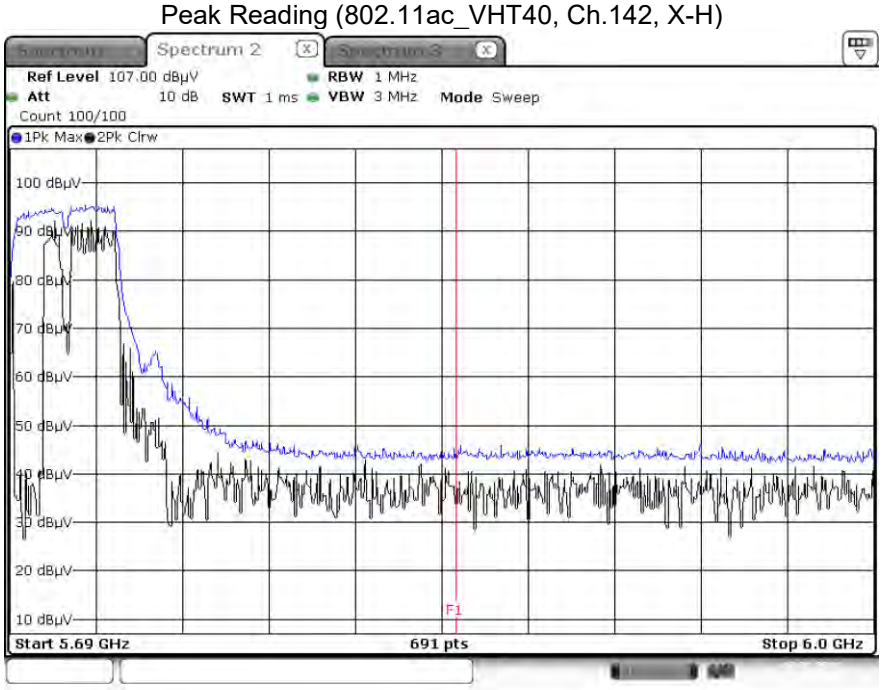
Peak Reading (802.11ac_VHT20, Ch.144, X-H)



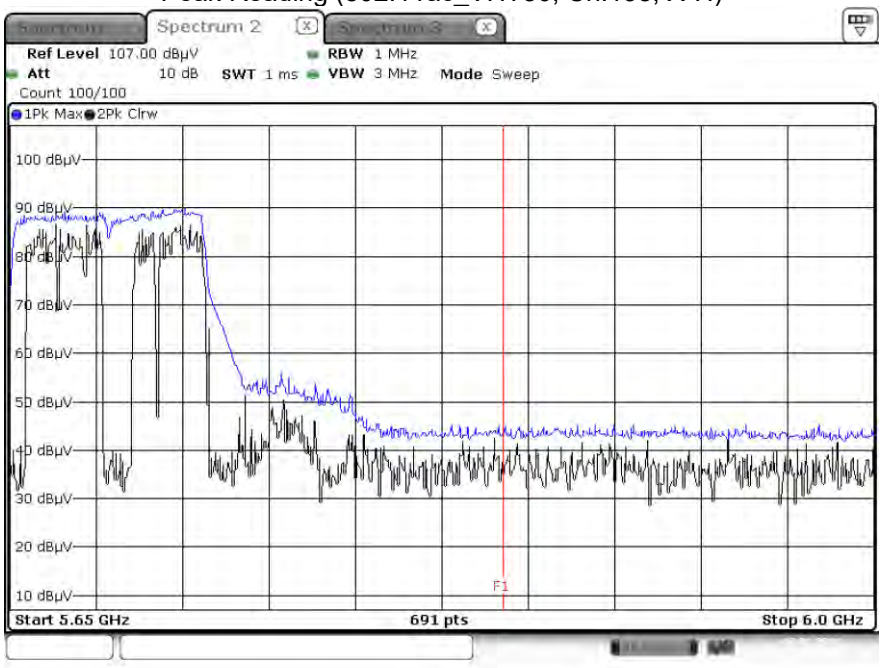
Peak Reading (802.11n_HT40, Ch.142, X-H)



Peak Reading (802.11ac_VHT40, Ch.142, X-H)



Peak Reading (802.11ac_VHT80, Ch.138, X-H)

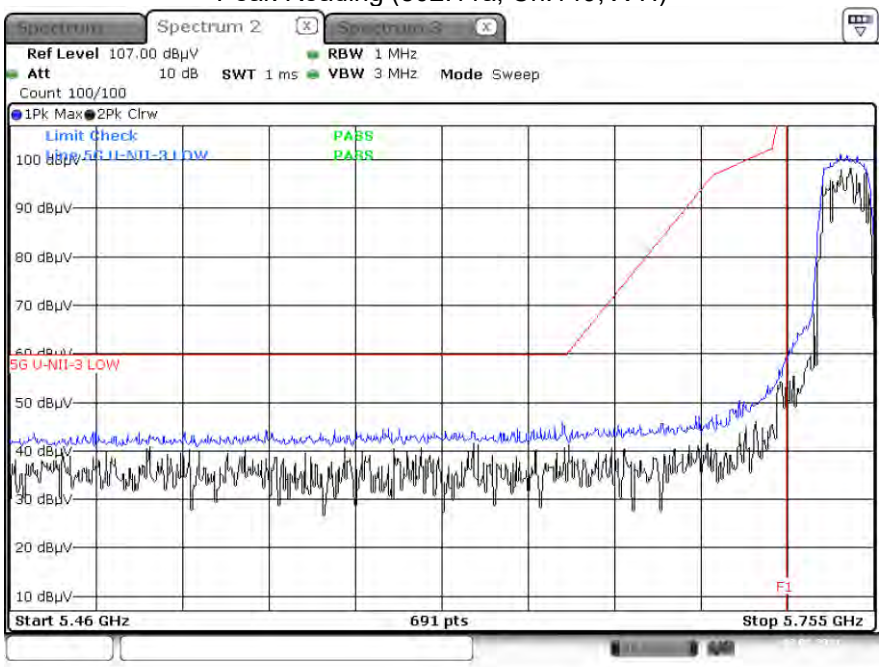


Note :

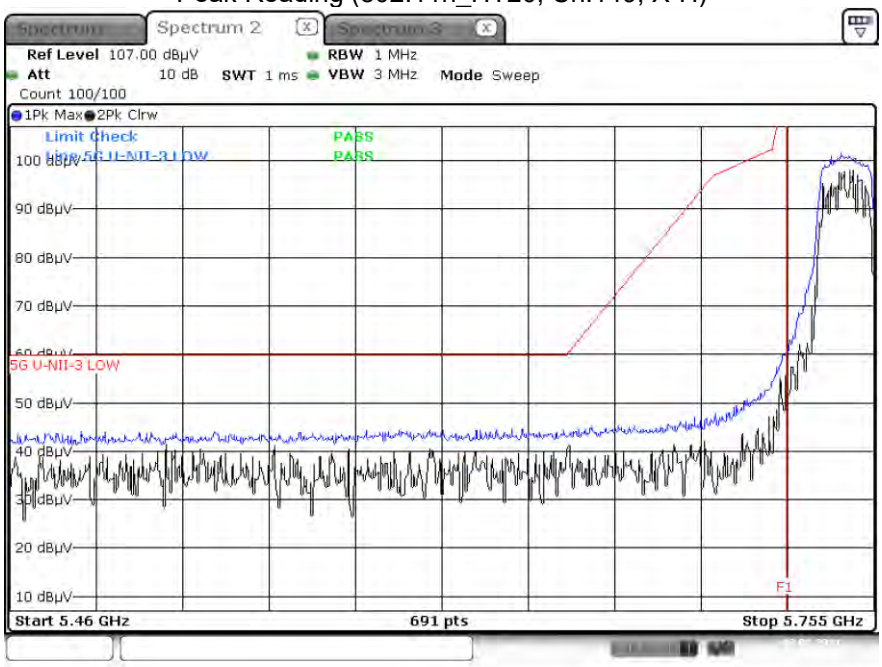
1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5 850 MHz
3. Ambient Noise (Because of ambient noise, We attached only the worst plot without a data table)

▣ Test Plots(UNII 3)

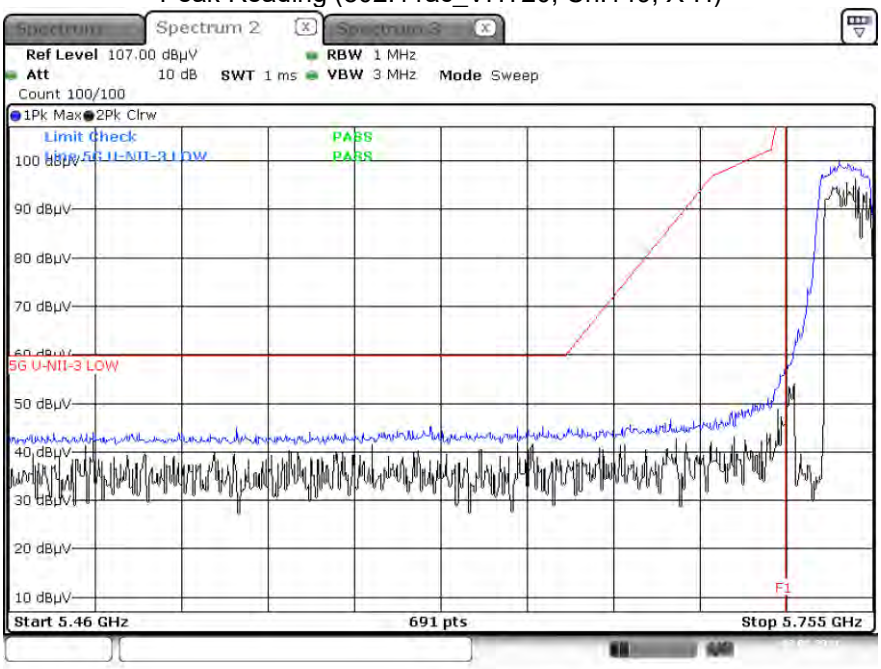
Peak Reading (802.11a, Ch.149, X-H)



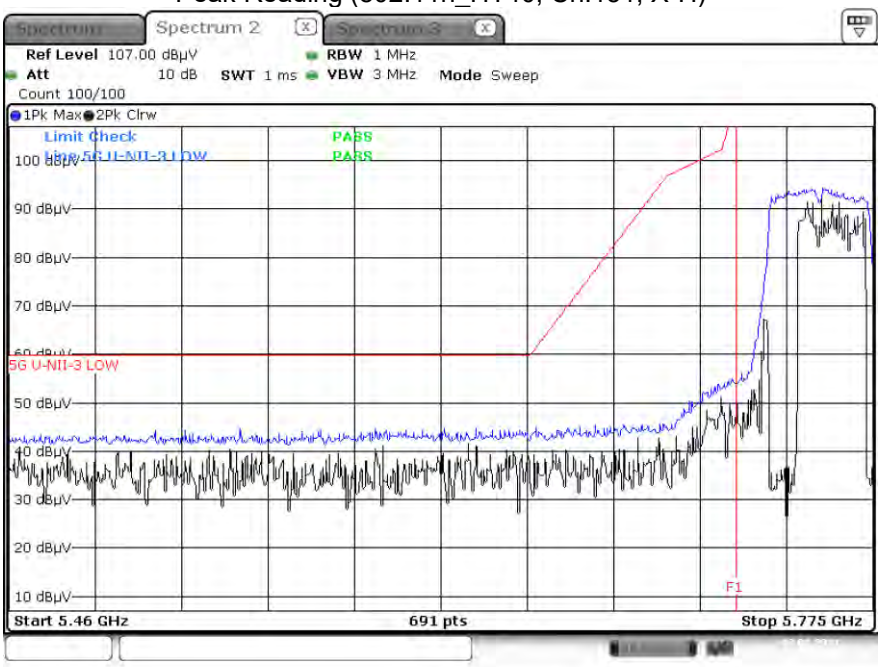
Peak Reading (802.11n_HT20, Ch.149, X-H)



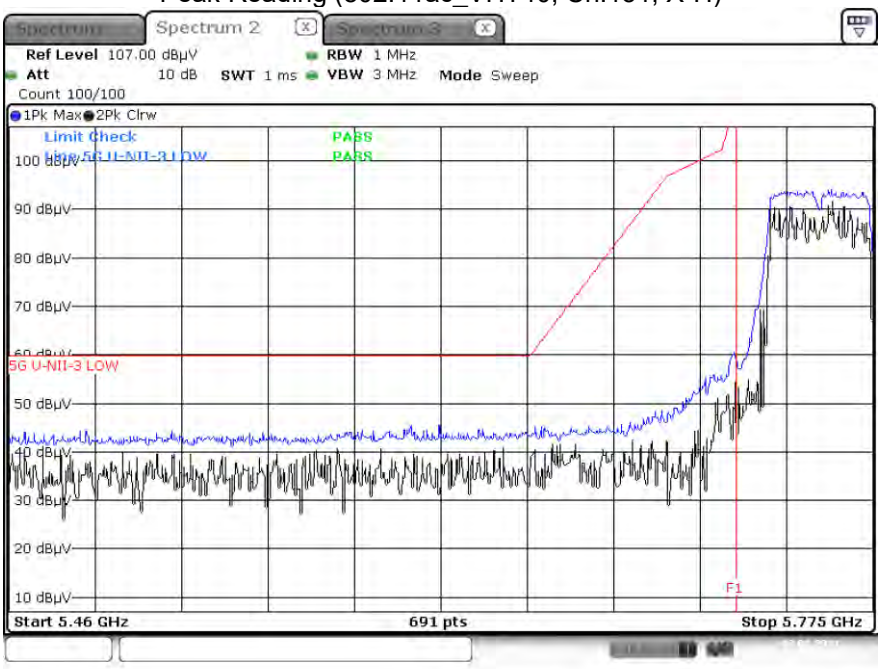
Peak Reading (802.11ac_VHT20, Ch.149, X-H)



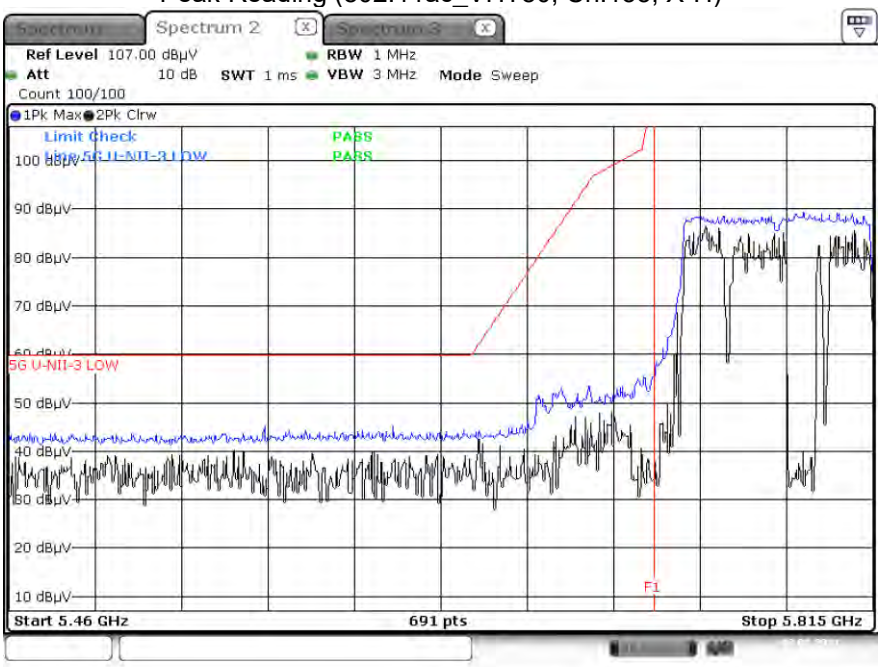
Peak Reading (802.11n_HT40, Ch.151, X-H)



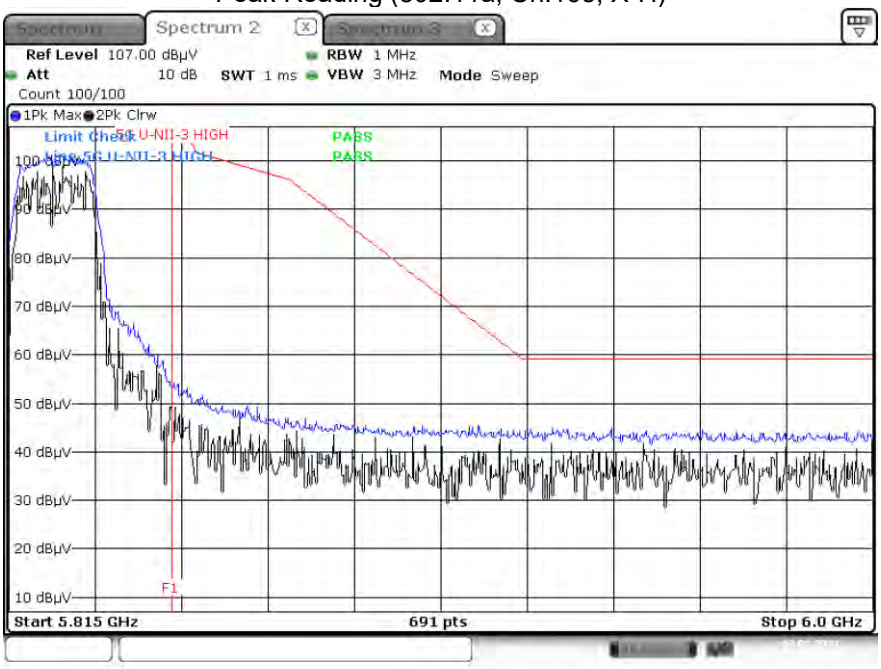
Peak Reading (802.11ac_VHT40, Ch.151, X-H)



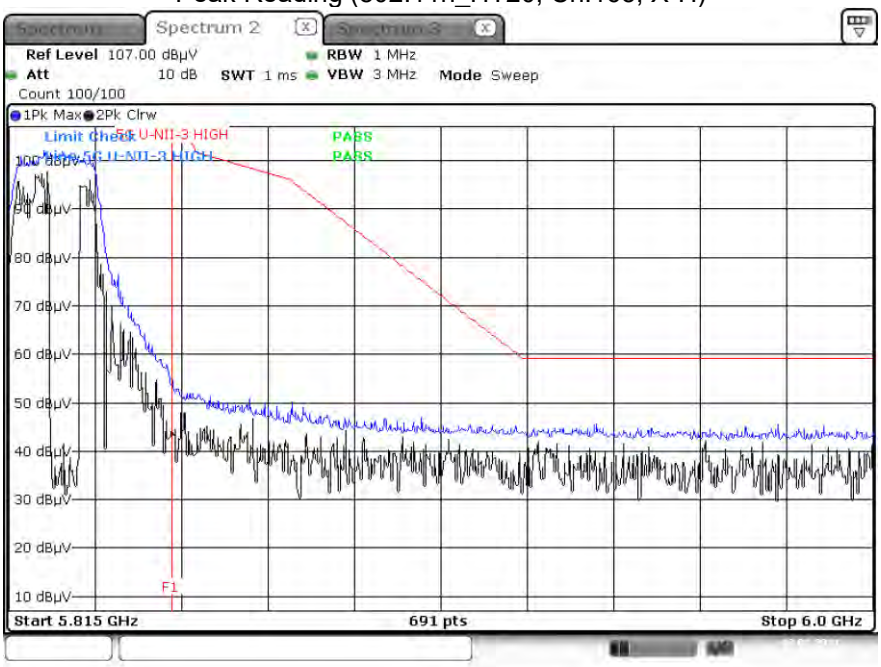
Peak Reading (802.11ac_VHT80, Ch.155, X-H)



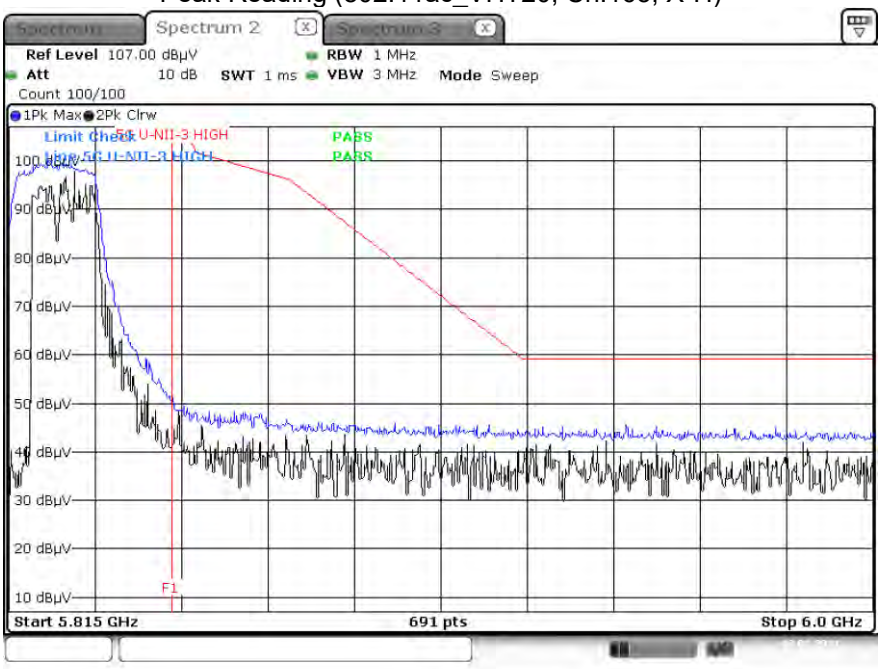
Peak Reading (802.11a, Ch.165, X-H)



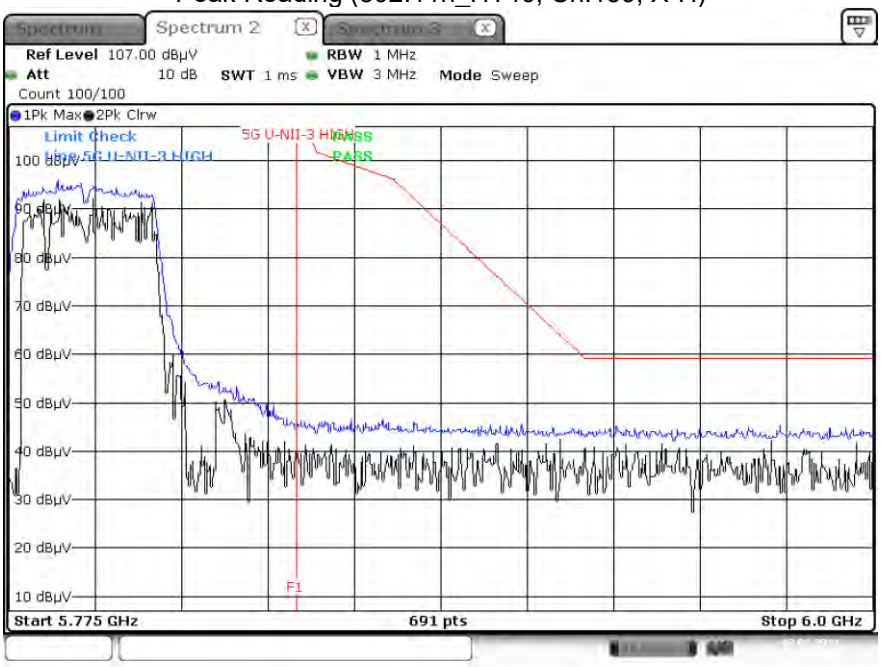
Peak Reading (802.11n_HT20, Ch.165, X-H)



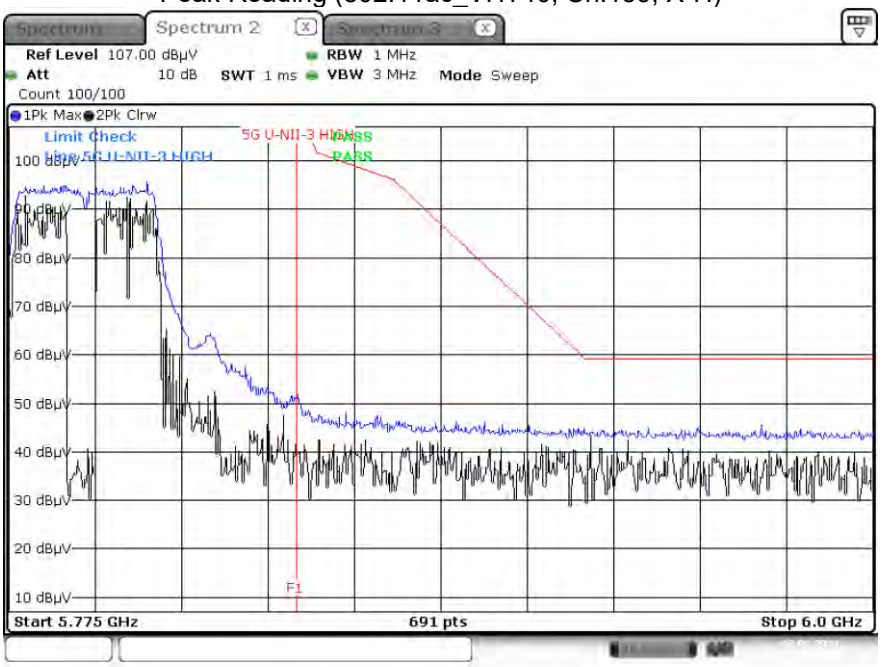
Peak Reading (802.11ac_VHT20, Ch.165, X-H)



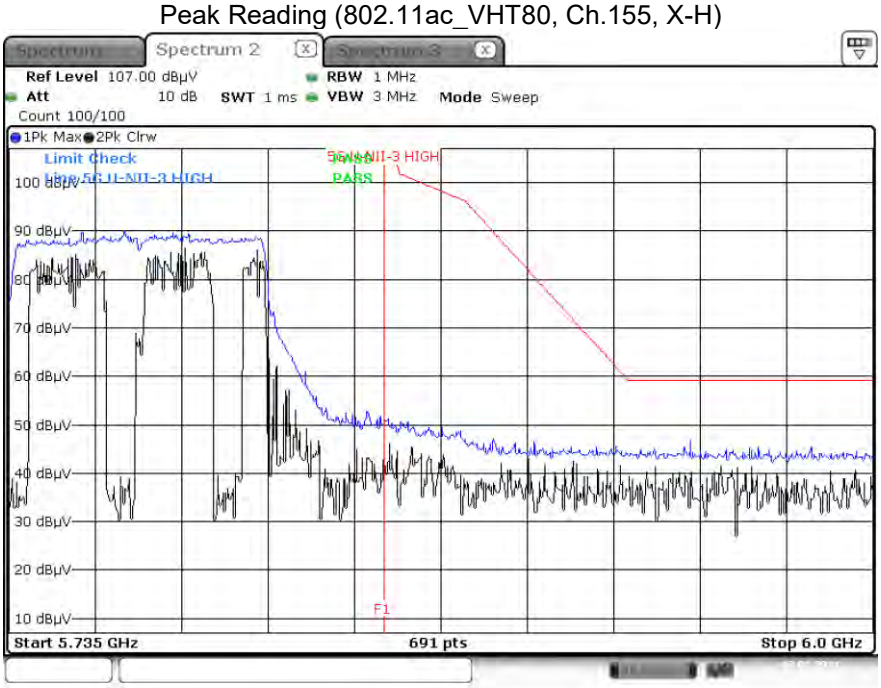
Peak Reading (802.11n_HT40, Ch.159, X-H)



Peak Reading (802.11ac_VHT40, Ch.159, X-H)



Peak Reading (802.11ac_VHT80, Ch.155, X-H)



10.10 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

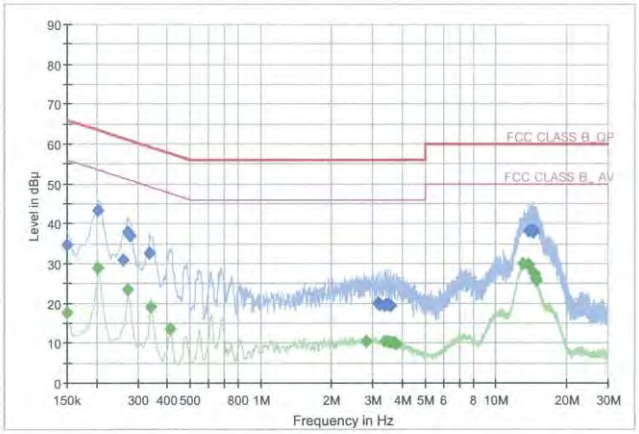
Test 1 / 2

Test Report

Common Information

EUT :	SM-A526U
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	5G WLAN_L1 MODE

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak	Limit (dBµV	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.150000	34.61	66.00	31.39	9.000	L1	OFF	9.7
0.204000	43.33	63.45	20.12	9.000	L1	OFF	9.6
0.260250	30.92	61.42	30.50	9.000	L1	OFF	9.6
0.271500	37.79	61.07	23.28	9.000	L1	OFF	9.6
0.278250	37.06	60.87	23.81	9.000	L1	OFF	9.6
0.339000	32.52	59.23	26.71	9.000	L1	OFF	9.6
3.168500	19.93	56.00	36.07	9.000	L1	OFF	9.8
3.236000	19.65	56.00	36.35	9.000	L1	OFF	9.8
3.371000	19.38	56.00	36.62	9.000	L1	OFF	9.8
3.438500	19.54	56.00	36.46	9.000	L1	OFF	9.8
3.506000	19.71	56.00	36.29	9.000	L1	OFF	9.8
3.573500	19.29	56.00	36.71	9.000	L1	OFF	9.8
13.840250	37.95	60.00	22.05	9.000	L1	OFF	10.2
14.094500	38.35	60.00	21.65	9.000	L1	OFF	10.2
14.369000	38.40	60.00	21.60	9.000	L1	OFF	10.2
14.436500	37.86	60.00	22.14	9.000	L1	OFF	10.2
14.479250	37.72	60.00	22.28	9.000	L1	OFF	10.2
14.504000	38.01	60.00	21.99	9.000	L1	OFF	10.2

2021-01-26 오후 2:24:52

Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.150000	17.55	56.00	38.45	9.000	L1	OFF	9.7
0.204000	28.75	53.45	24.70	9.000	L1	OFF	9.6
0.273750	23.41	51.00	27.60	9.000	L1	OFF	9.6
0.341250	18.97	49.17	30.20	9.000	L1	OFF	9.6
0.411000	13.62	47.63	34.01	9.000	L1	OFF	9.6
2.833250	10.41	46.00	35.59	9.000	L1	OFF	9.8
3.373250	10.41	46.00	35.59	9.000	L1	OFF	9.8
3.508250	10.47	46.00	35.53	9.000	L1	OFF	9.8
3.575750	10.16	46.00	35.84	9.000	L1	OFF	9.8
3.715250	10.02	46.00	35.98	9.000	L1	OFF	9.8
3.782750	9.82	46.00	36.18	9.000	L1	OFF	9.8
13.093250	29.93	50.00	20.07	9.000	L1	OFF	10.2
13.775000	29.63	50.00	20.37	9.000	L1	OFF	10.2
14.434250	27.82	50.00	22.18	9.000	L1	OFF	10.2
14.569250	27.26	50.00	22.74	9.000	L1	OFF	10.2
14.767250	26.35	50.00	23.65	9.000	L1	OFF	10.2
14.832500	26.12	50.00	23.88	9.000	L1	OFF	10.2
14.915750	25.69	50.00	24.31	9.000	L1	OFF	10.2

2021-01-26 오후 2:24:52

Conducted Emissions (Line 2)

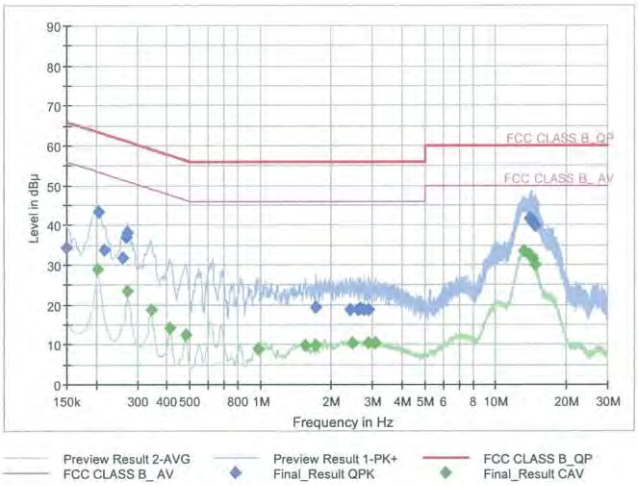
Test 1 / 2

Test Report

Common Information

EUT :	SM-A526U
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	5G WLAN_N MODE

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak	Limit (dBuV	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.150000	34.22	66.00	31.78	9.000	N	OFF	9.6
0.206250	43.36	63.36	19.99	9.000	N	OFF	9.6
0.217500	33.82	62.91	29.09	9.000	N	OFF	9.6
0.260250	31.59	61.42	29.84	9.000	N	OFF	9.6
0.269250	36.84	61.14	24.30	9.000	N	OFF	9.6
0.273750	37.96	61.00	23.05	9.000	N	OFF	9.6
1.726250	19.28	56.00	36.72	9.000	N	OFF	9.7
2.403500	18.79	56.00	37.21	9.000	N	OFF	9.8
2.615000	18.83	56.00	37.17	9.000	N	OFF	9.8
2.684750	19.05	56.00	36.95	9.000	N	OFF	9.8
2.754500	18.62	56.00	37.38	9.000	N	OFF	9.8
2.889500	18.77	56.00	37.23	9.000	N	OFF	9.8
14.038250	41.49	60.00	18.51	9.000	N	OFF	10.3
14.103500	41.33	60.00	18.67	9.000	N	OFF	10.3
14.168750	41.29	60.00	18.71	9.000	N	OFF	10.3
14.236250	41.06	60.00	18.94	9.000	N	OFF	10.3
14.301500	41.12	60.00	18.88	9.000	N	OFF	10.3
14.850500	39.94	60.00	20.06	9.000	N	OFF	10.3

2021-01-26 오후 2:31:38

Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.204000	28.76	53.45	24.69	9.000	N	OFF	9.6
0.273750	23.46	51.00	27.54	9.000	N	OFF	9.6
0.343500	18.87	49.12	30.25	9.000	N	OFF	9.6
0.413250	14.17	47.58	33.41	9.000	N	OFF	9.6
0.483000	12.37	46.29	33.92	9.000	N	OFF	9.6
0.977000	8.81	46.00	37.19	9.000	N	OFF	9.7
1.555250	9.76	46.00	36.24	9.000	N	OFF	9.7
1.726250	9.80	46.00	36.20	9.000	N	OFF	9.7
2.473250	10.34	46.00	35.66	9.000	N	OFF	9.8
2.882750	10.35	46.00	35.66	9.000	N	OFF	9.8
3.096500	10.38	46.00	35.62	9.000	N	OFF	9.8
13.239500	33.58	50.00	16.42	9.000	N	OFF	10.3
14.038250	32.54	50.00	17.46	9.000	N	OFF	10.3
14.236250	31.91	50.00	18.09	9.000	N	OFF	10.3
14.303750	31.69	50.00	18.31	9.000	N	OFF	10.3
14.366750	31.56	50.00	18.44	9.000	N	OFF	10.3
14.373500	31.53	50.00	18.47	9.000	N	OFF	10.3
14.780750	29.86	50.00	20.14	9.000	N	OFF	10.3

2021-01-26 오후 2:31:38

11. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	09/04/2020	Annual	102245
Rohde & Schwarz	ESR / EMI Test Receiver	09/16/2020	Annual	101910
ESPEC	SU-642 /Temperature Chamber	07/30/2020	Annual	0093000718
Agilent	N9020A / Signal Analyzer	05/11/2020	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	03/23/2020	Annual	MY49432108
Agilent	N1911A / Power Meter	04/07/2020	Annual	MY45100523
Agilent	N1921A / Power Sensor	06/08/2020	Annual	MY57820067
Agilent	87300B / Directional Coupler	11/10/2020	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	04/27/2020	Annual	11275
HP	E3632A / DC Power Supply	09/16/2020	Annual	MY40004427
HP	8493C / Attenuator(10 dB)(DC-26.5 GHz)	06/26/2020	Annual	07560
HP	8493C / Attenuator(10 dB)(DC-26.5 GHz)	07/03/2020	Annual	08285
Rohde & Schwarz	18N-20dB / Attenuator(20 dB)	03/23/2020	Annual	8
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A

Note:

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

Radiated Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
TNM system	FBSM-01B / Amp & Filter Bank Switch Controller	N/A	N/A	N/A
Schwarzbeck	Loop Antenna	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	08/02/2019	Biennial	01039
Schwarzbeck	BBHA 9120D / Horn Antenna	08/01/2019	Biennial	912D-1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	04/29/2019	Biennial	BBHA9170342
Rohde & Schwarz	FSP(10 Hz ~ 40 GHz) / Spectrum Analyzer	05/13/2020	Annual	101055
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/06/2021	Annual	2
Wainwright Instruments	WRCJV12-4900-5100-5900-6100-50SS	06/24/2021	Annual	5
Wainwright Instruments	WRCJV12-4900-5100-5900-6100-50SS	06/24/2021	Annual	6
CERNEX	CBL18265035 / Power Amplifier	12/04/2020	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956
TNM system	FBSM-05B / HPF(3~18GHz) + LNA1(1~18GHz)	01/20/2021	Annual	F6
TNM system	FBSM-05B / ATT(10dB) + LNA1(1~18GHz)	01/20/2021	Annual	None
TNM system	FBSM-05B / ATT(3dB) + LNA1(1~18GHz)	01/20/2021	Annual	None
TNM system	FBSM-05B / LNA1(1~18GHz)	01/20/2021	Annual	25540
TNM system	FBSM-05B / HPF(7~18GHz) + LNA2(6~18GHz)	01/20/2021	Annual	28550
TNM system	FBSM-05B / Thru(30MHz ~ 18GHz)	01/20/2021	Annual	None
Weinschel	2-3 / Attenuator (3 dB)	10/07/2020	Annual	BR0617
H+S	5910-N-50-010 / Attenuator(10 dB)	10/28/2020	Annual	None
Rohde & Schwarz	ESCI / Test Receiver	06/10/2020	Annual	100584

Note:

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

12. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2102-FC037-P