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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:
December 11, 2020

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

Report No.: HCT-RF-2012-FC017

FCC ID:	**A3LSMA326J**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**
Model:	SCG08
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 : Jung Ki Lim
Engineer of Telecommunication Testing Center

Report approved by : Kwon Jeong
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-2012-FC017	December 11, 2020	- First Approval Report

Table of Contents

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	SCG08	
Additional Model	-	
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
Antenna Specification	Antenna type: Metal + LDS Peak Gain: UNII 1: -7.57 dBi, UNII 2A: -7.30 dBi, UNII 2C: -7.32 dBi UNII 3: -7.08 dBi	
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	November 16, 2020 ~ December 11, 2020	

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	16.86	0.049
	802.11n (HT20)	15.92	0.039
	802.11n (HT40)	14.83	0.030
	802.11ac (VHT20)	14.75	0.030
	802.11ac (VHT40)	13.70	0.023
	802.11ac (VHT80)	12.87	0.019
UNII2A	802.11a	16.98	0.050
	802.11n (HT20)	16.06	0.040
	802.11n (HT40)	14.93	0.031
	802.11ac (VHT20)	14.92	0.031
	802.11ac (VHT40)	13.87	0.024
	802.11ac (VHT80)	12.96	0.020
UNII2C	802.11a	17.32	0.054
	802.11n (HT20)	16.07	0.040
	802.11n (HT40)	15.37	0.034
	802.11ac (VHT20)	15.19	0.033
	802.11ac (VHT40)	14.22	0.026
	802.11ac (VHT80)	13.26	0.021
UNII3	802.11a	17.40	0.055
	802.11n (HT20)	16.42	0.044
	802.11n (HT40)	15.43	0.035
	802.11ac (VHT20)	15.55	0.036
	802.11ac (VHT40)	14.35	0.027
	802.11ac (VHT80)	13.11	0.020

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.

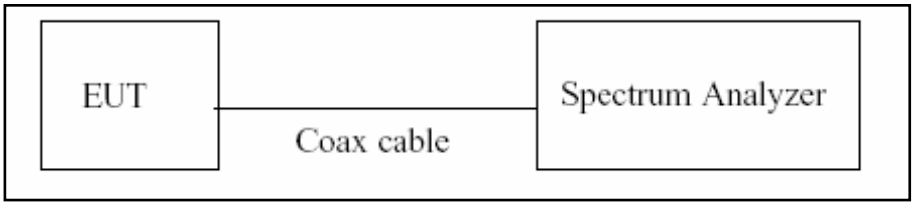
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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.

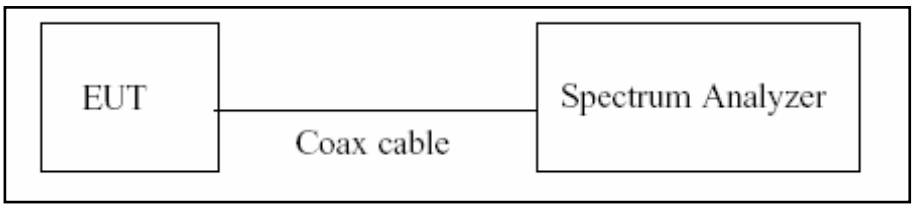
1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

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.

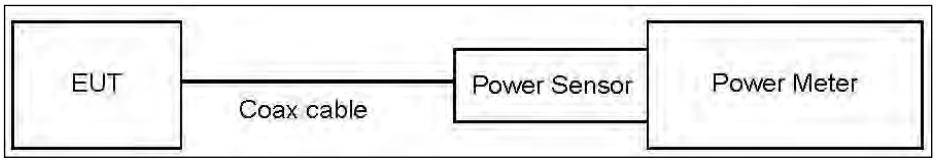
8.3. Output Power Measurement

Limit

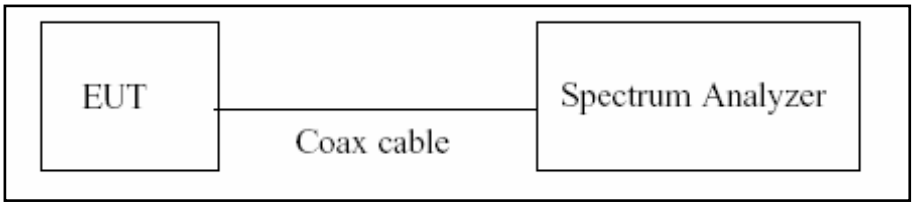
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

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(10 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	11.23
UNII 2A	11.23
UNII 2C	11.23
UNII 3	11.23

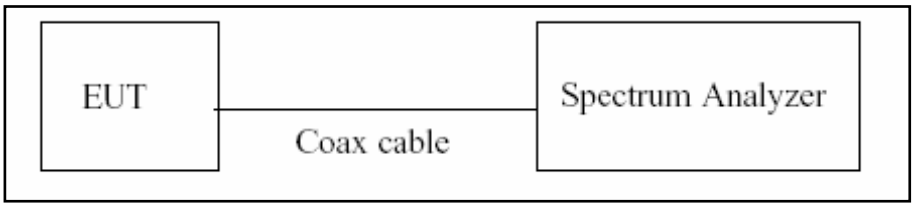
(Actual value of loss for the attenuator and cable combination)

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(10 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	11.23
UNII 2A	11.23
UNII 2C	11.23
UNII 3	11.23

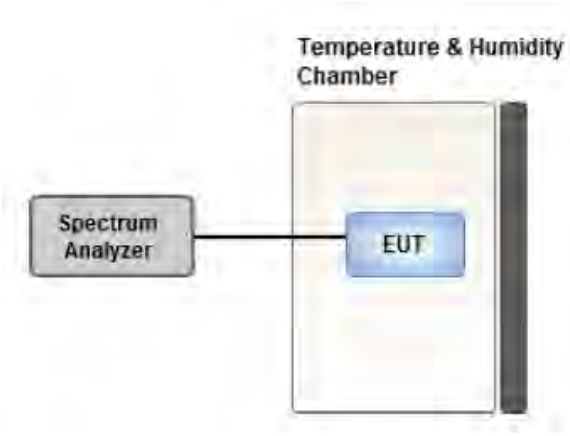
(Actual value of loss for the attenuator and cable combination)

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.

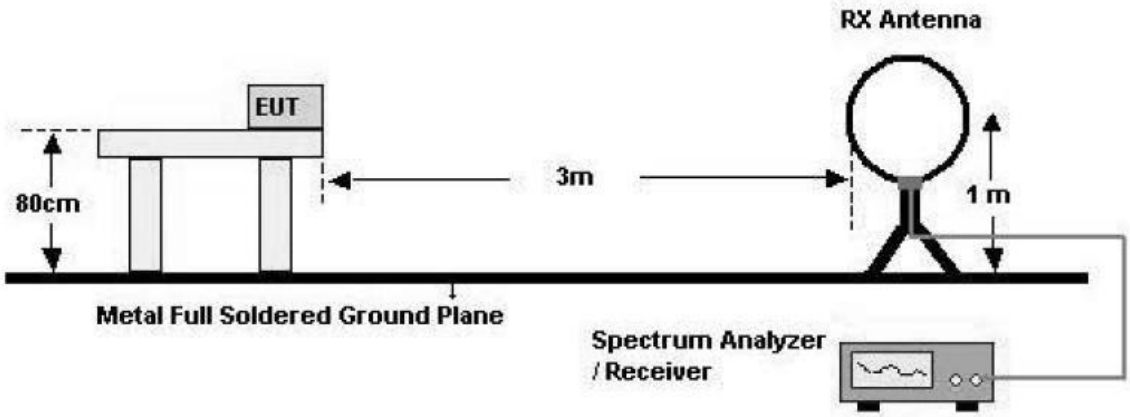
3. UNII 3: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below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

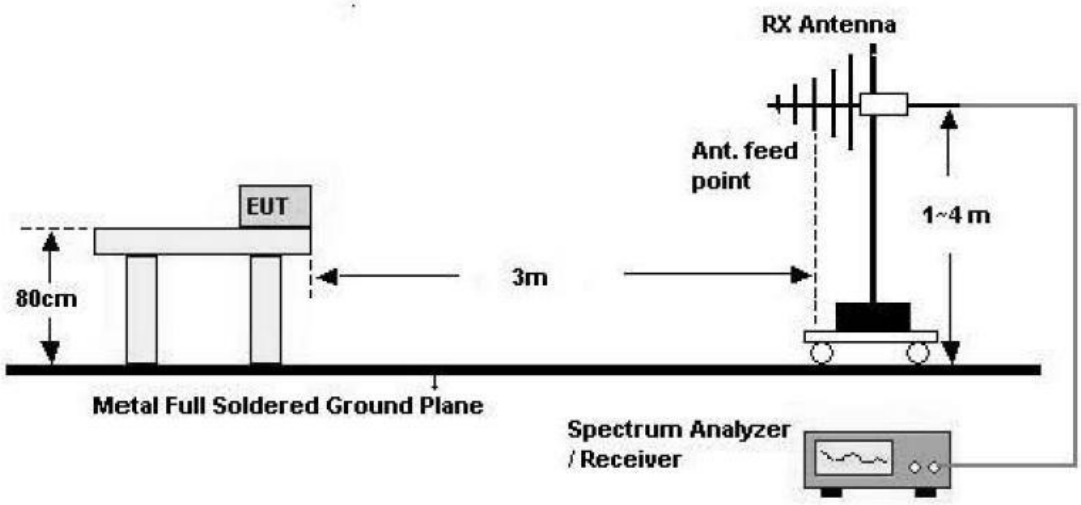
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

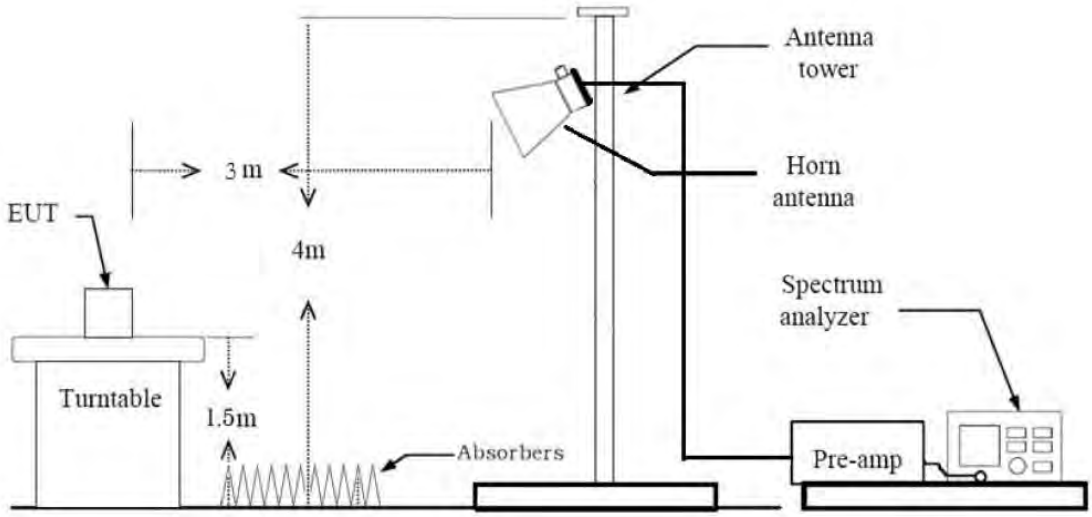
Below 30 MHz



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(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(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	6	0.969	0.138	1000
802.11n(HT20)	MCS 0	0.967	0.148	1000
802.11n(HT40)	MCS 0	0.936	0.285	2000
802.11ac(VHT20)	MCS 0	0.967	0.147	1000
802.11ac(VHT40)	MCS 0	0.939	0.274	2000
802.11ac(VHT80)	MCS 0	0.880	0.554	5000

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 : X
   - Radiated Restricted Band Edge : X
3. All datarate of operation were investigated and the worst case datarate results are reported
4. 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
5. Radiated Spurious Emission
   -UNII 1, 2A, 2C, 3 : 802.11a
   - In order to simplify the report, We only have attached RSE result of worst case.
   (= Highest power of Each bands)

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

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.

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

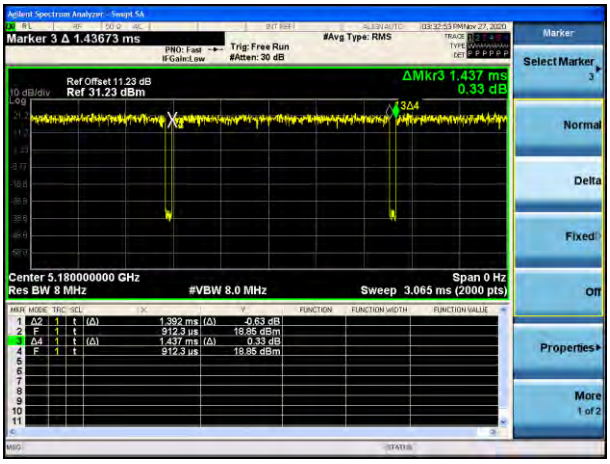
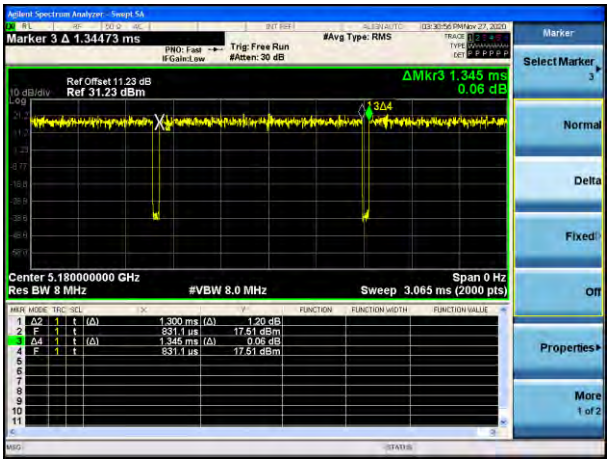
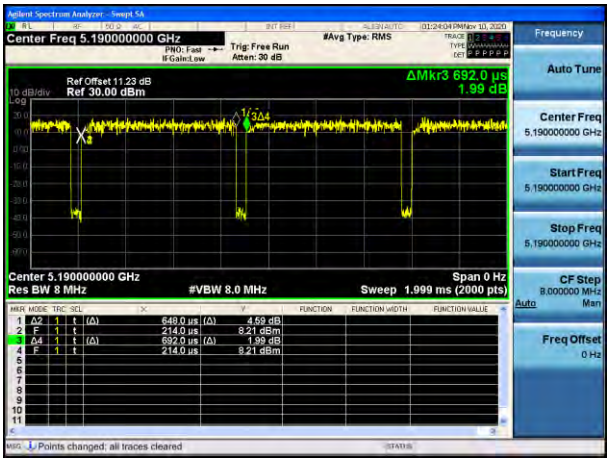
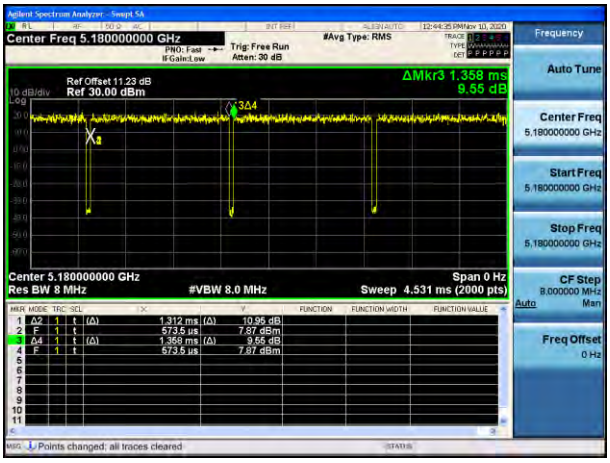
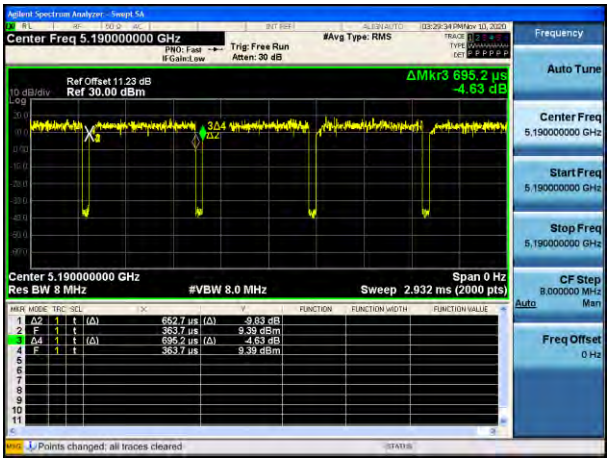
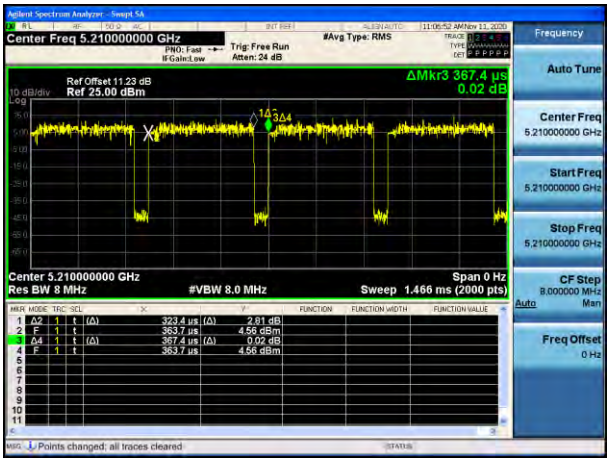
Mode	Data Rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	1.392	1.437	0.969	0.138
	9	0.936	0.980	0.955	0.202
	12	0.708	0.752	0.941	0.265
	18	0.480	0.524	0.916	0.381
	24	0.364	0.409	0.889	0.512
	36	0.252	0.297	0.849	0.713
	48	0.192	0.237	0.810	0.914
	54	0.176	0.221	0.796	0.988

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.300	1.345	0.967	0.148
	1	0.668	0.713	0.937	0.282
	2	0.461	0.505	0.911	0.403
	3	0.352	0.398	0.885	0.531
	4	0.248	0.293	0.846	0.724
	5	0.196	0.241	0.813	0.898
	6	0.180	0.225	0.801	0.961
	7	0.164	0.209	0.786	1.046
802.11n (HT40)	0	0.648	0.692	0.936	0.285
	1	0.344	0.388	0.887	0.523
	2	0.240	0.284	0.845	0.732
	3	0.192	0.236	0.813	0.897
	4	0.140	0.184	0.761	1.184
	5	0.116	0.160	0.723	1.406
	6	0.104	0.148	0.703	1.528
	7	0.100	0.144	0.695	1.579

Mode	MCS Index	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.312	1.358	0.967	0.147
	1	0.676	0.721	0.938	0.277
	2	0.464	0.509	0.912	0.402
	3	0.360	0.405	0.889	0.512
	4	0.252	0.297	0.848	0.717
	5	0.200	0.245	0.818	0.873
	6	0.184	0.229	0.805	0.942
	7	0.168	0.213	0.790	1.025
	8	0.148	0.193	0.768	1.146
802.11ac (VHT40)	0	0.653	0.695	0.939	0.274
	1	0.348	0.392	0.888	0.518
	2	0.244	0.288	0.847	0.719
	3	0.196	0.240	0.817	0.875
	4	0.144	0.188	0.767	1.153
	5	0.120	0.164	0.731	1.360
	6	0.108	0.152	0.711	1.479
	7	0.104	0.148	0.704	1.525
	8	0.092	0.136	0.676	1.701
	9	0.088	0.132	0.666	1.766
802.11ac (VHT80)	0	0.323	0.367	0.880	0.554
	1	0.184	0.228	0.808	0.928
	2	0.136	0.180	0.759	1.200
	3	0.112	0.156	0.720	1.428
	4	0.088	0.132	0.669	1.747
	5	0.076	0.120	0.637	1.960
	6	0.072	0.115	0.627	2.028
	7	0.072	0.115	0.626	2.037
	8	0.064	0.117	0.551	2.586
	9	0.064	0.108	0.596	2.247

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	24.18	16.564
5200	40	23.81	16.531
5240	48	28.75	16.597
5260	52	24.32	16.537
5300	60	23.31	16.604
5320	64	23.76	16.568
5500	100	19.64	16.458
5600	120	22.58	16.625
5720	144	23.47	16.615
5745	149	25.38	16.552
5785	157	24.84	16.620
5825	165	30.48	16.697

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.74	17.612
5200	40	20.25	17.615
5240	48	20.84	17.598
5260	52	21.84	17.654
5300	60	21.72	17.642
5320	64	23.08	17.624
5500	100	20.24	17.596
5600	120	23.78	17.642
5720	144	21.70	17.612
5745	149	22.94	17.689
5785	157	22.88	17.643
5825	165	24.00	17.679

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	42.01	36.087
5230	46	40.77	36.099
5270	54	40.88	36.034
5310	62	40.79	36.062
5510	102	40.50	35.957
5590	118	42.04	36.089
5710	142	50.42	36.044
5755	151	41.88	36.096
5795	159	42.12	36.150

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.98	17.567
5200	40	20.12	17.595
5240	48	20.16	17.578
5260	52	20.21	17.555
5300	60	19.94	17.546
5320	64	19.82	17.589
5500	100	20.13	17.577
5600	120	20.06	17.578
5720	144	20.14	17.595
5745	149	20.05	17.618
5785	157	20.16	17.596
5825	165	20.98	17.573

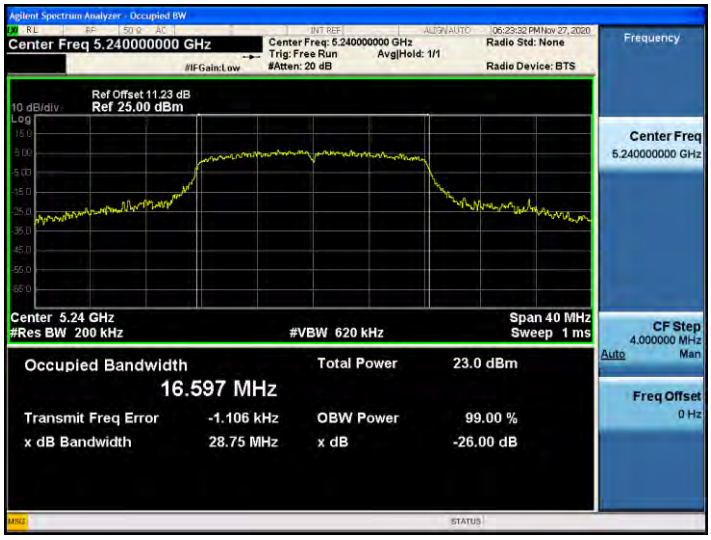
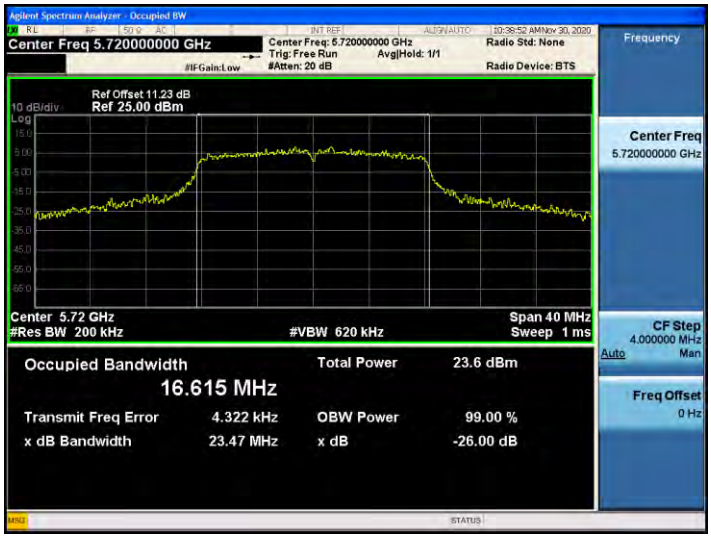
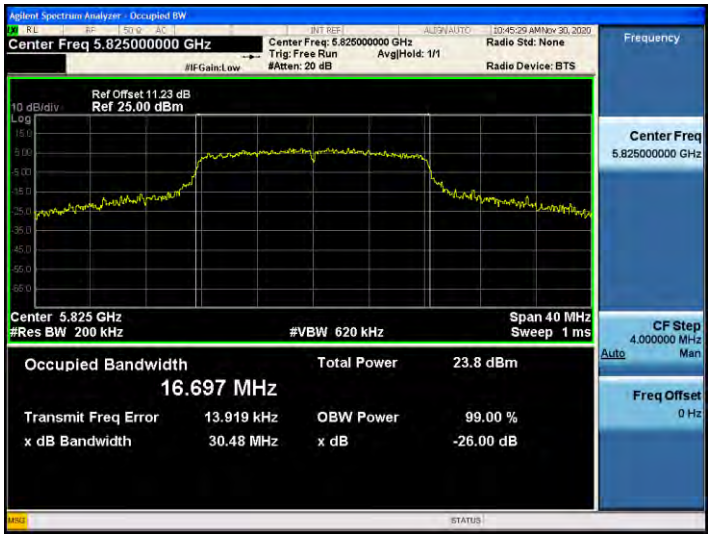
802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.08	35.926
5230	46	40.33	35.912
5270	54	39.95	35.956
5310	62	40.24	35.966
5510	102	39.90	35.956
5590	118	39.79	35.993
5710	142	40.66	35.981
5755	151	40.15	35.980
5795	159	40.01	35.986

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	80.65	75.221
5290	58	80.60	75.141
5530	106	80.58	75.181
5610	122	80.46	75.203
5690	138	80.64	75.169
5775	155	80.36	75.123

▣ Test Plots(802.11a)

Note:

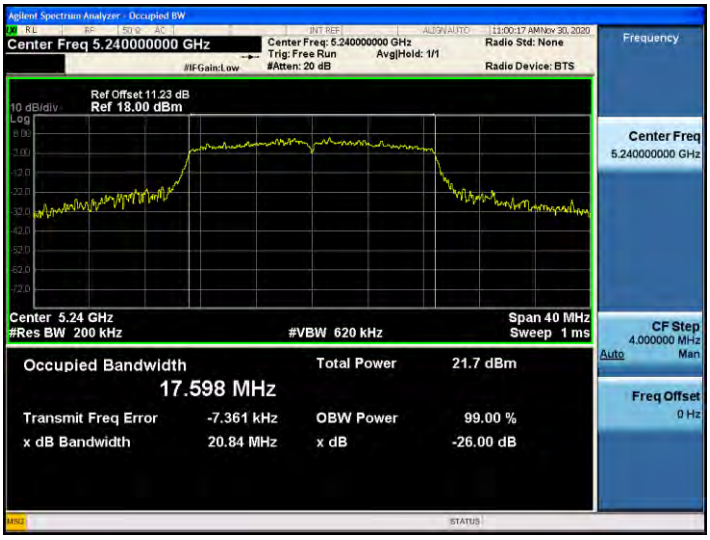
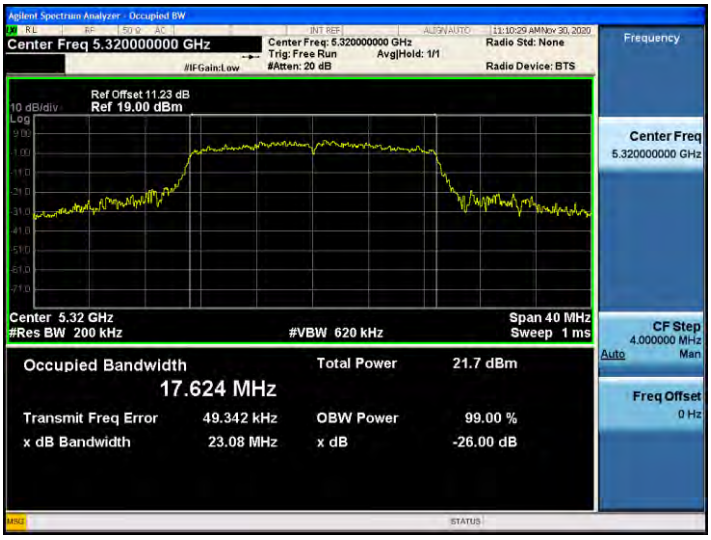
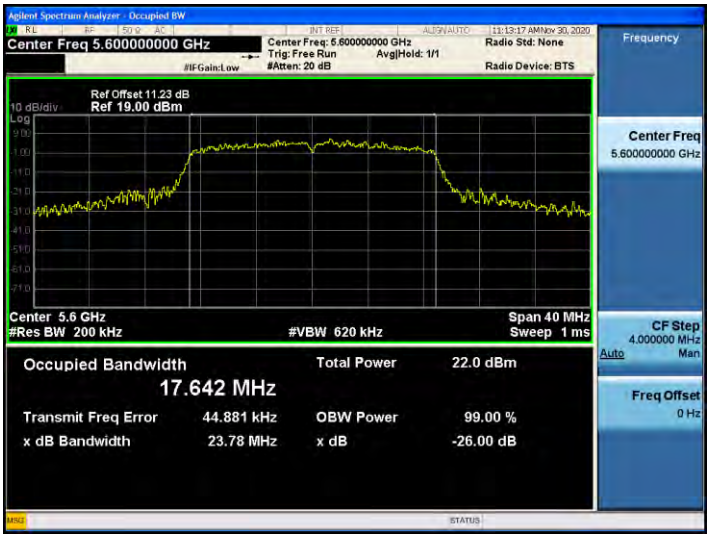
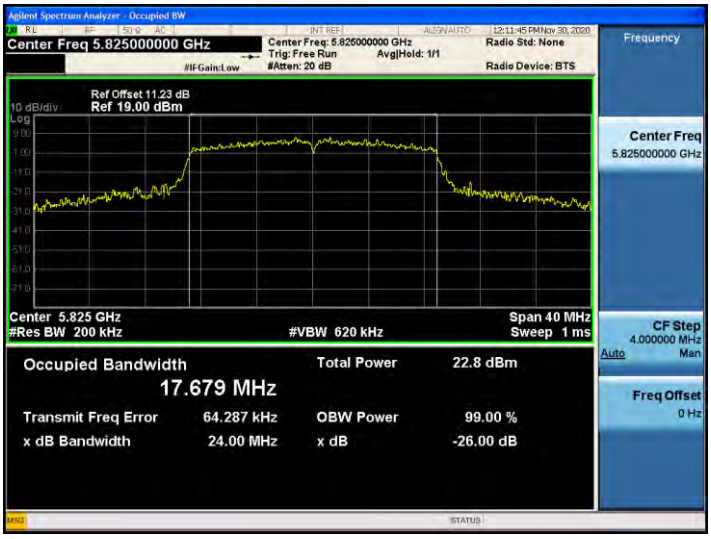
In order to simplify the report, attached plots were only the most wide channel.

802.11a UNII 1 BAND 26dB Bandwidth (CH 48)	802.11a UNII 2A BAND 26dB Bandwidth (CH 52)
	
802.11a UNII 2C BAND 26dB Bandwidth (CH 144)	**802.11a UNII 3 BAND 26dB Bandwidth (CH 165)**
	

▣ Test Plots(802.11n(HT20))

Note:

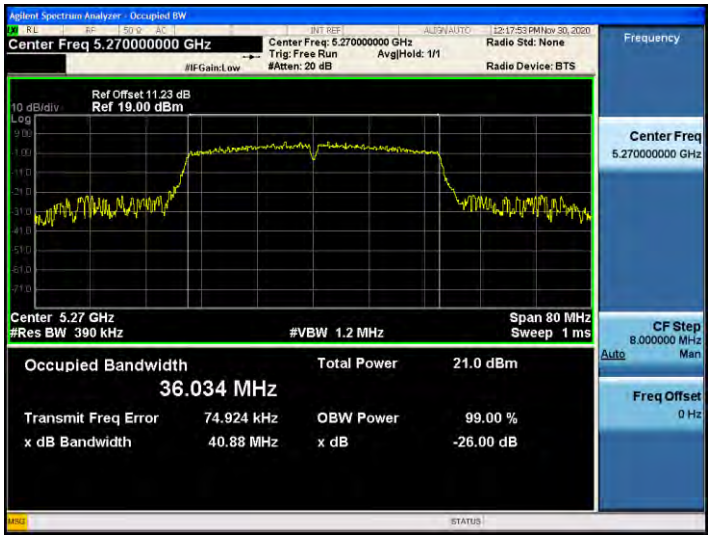
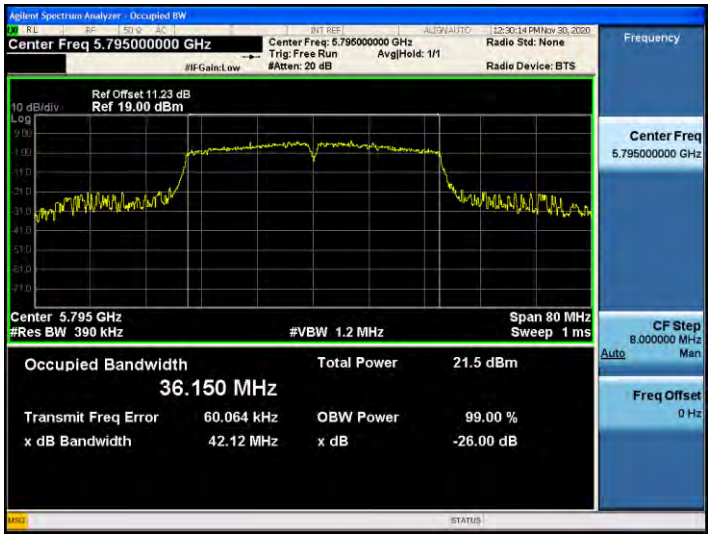
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 48)	802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 64)
	
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 120)	**802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 165)**
	

▣ Test Plots(802.11n(HT40))

Note:

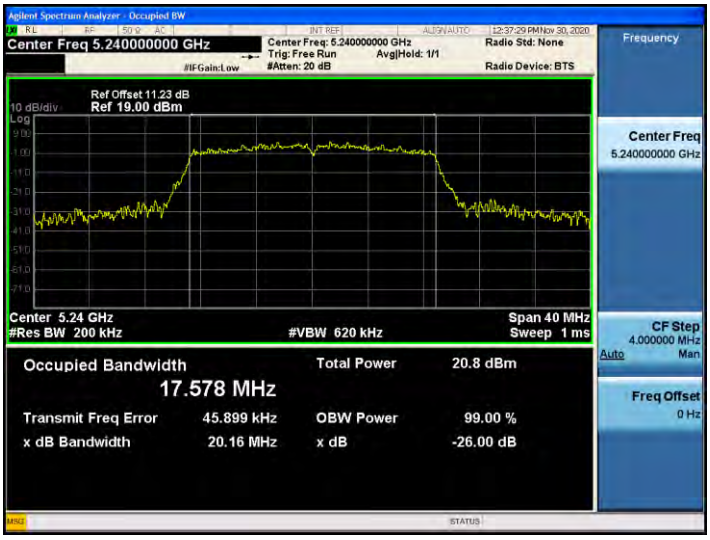
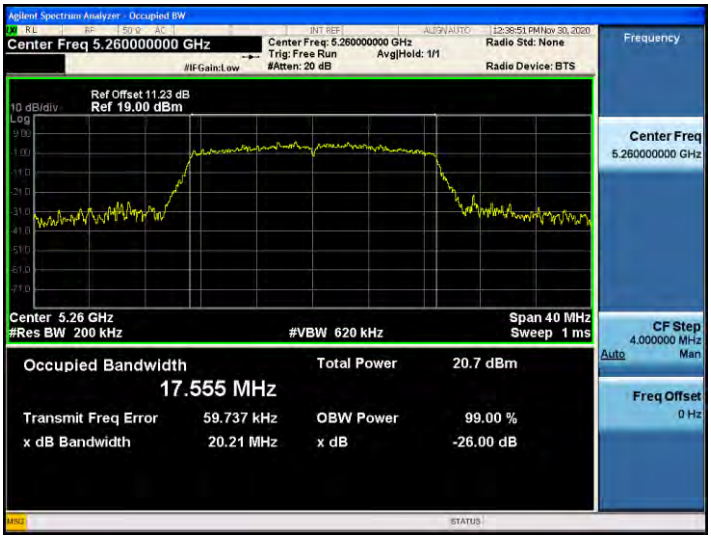
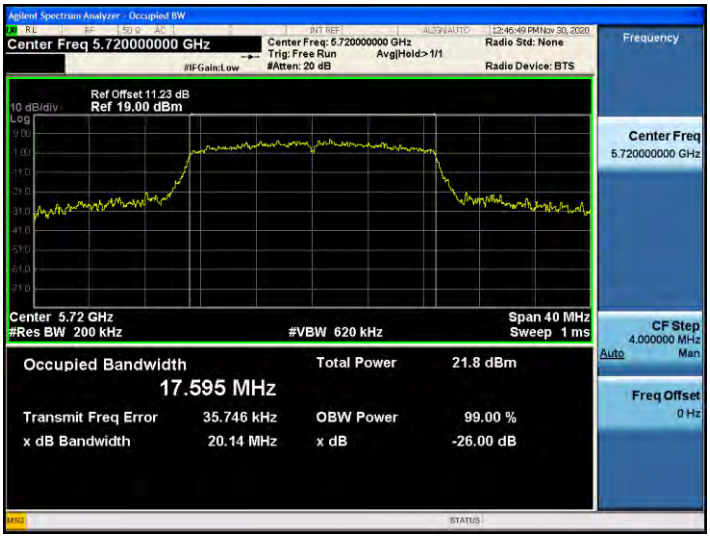
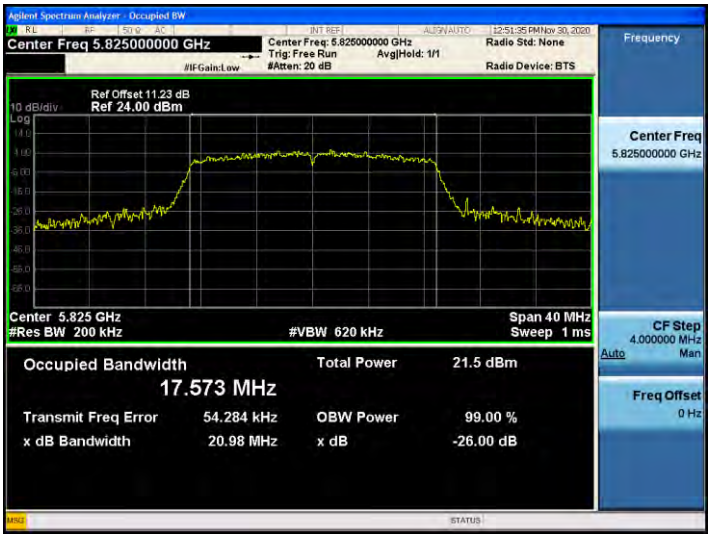
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 54)
	
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:

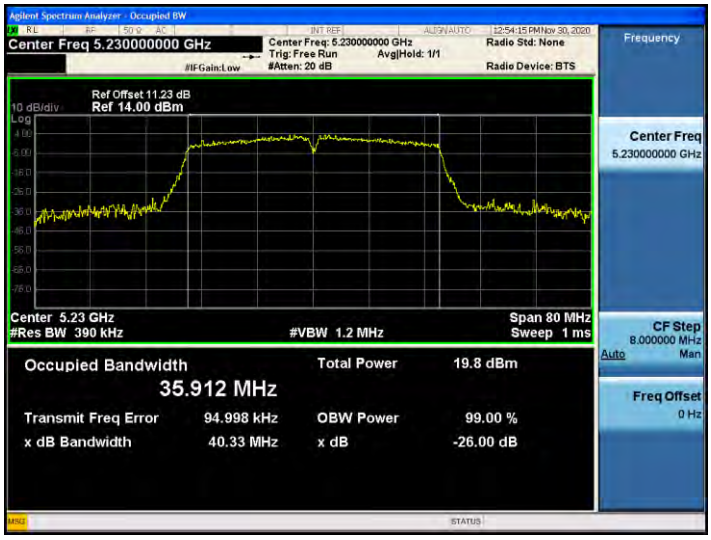
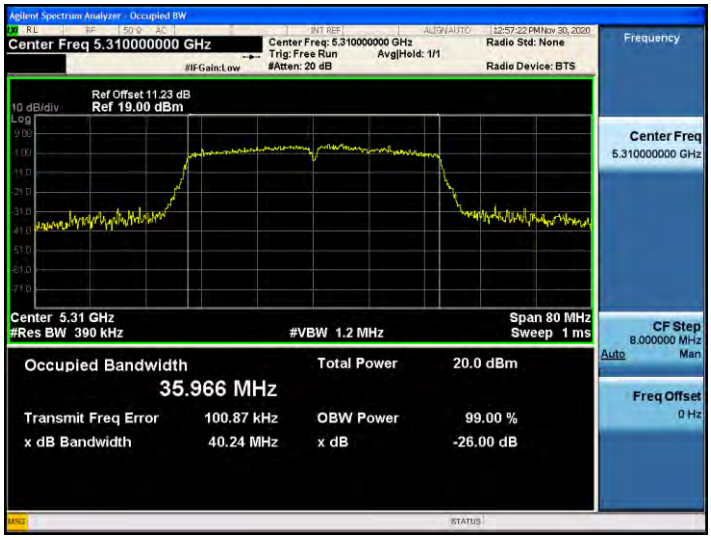
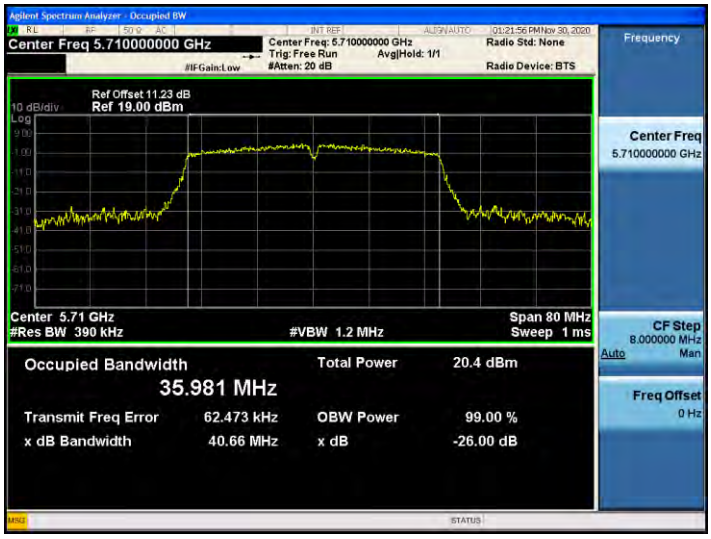
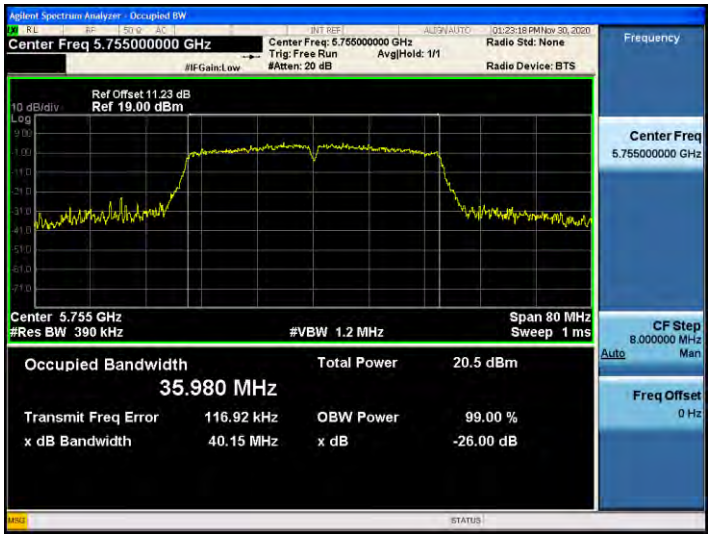
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 48)	802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 52)
	
802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)	**802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 165)**
	

▣ Test Plots(802.11ac(VHT40))

Note:

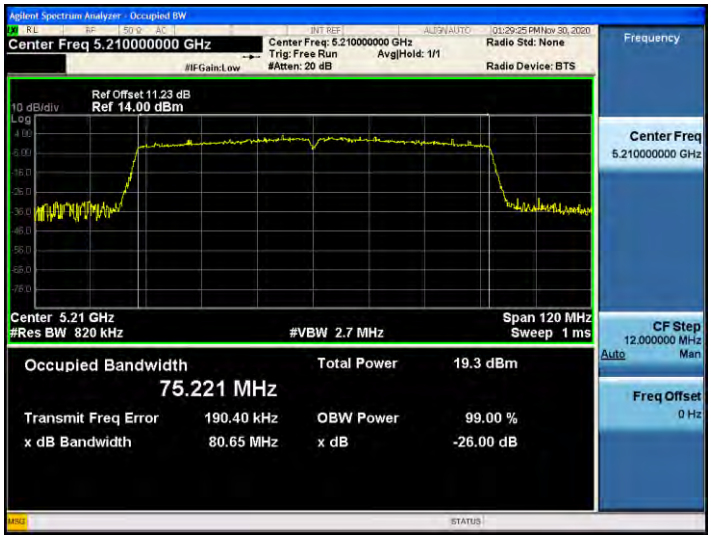
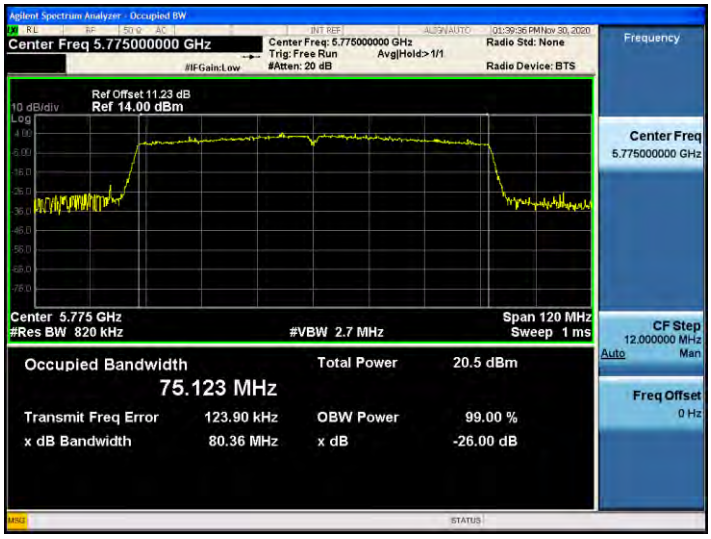
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 46)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 142)	**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	13.86	> 0.5	Pass
5785	157	13.91	> 0.5	Pass
5825	165	15.37	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.07	> 0.5	Pass
5785	157	13.86	> 0.5	Pass
5825	165	14.65	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.17	> 0.5	Pass
5795	159	35.15	> 0.5	Pass

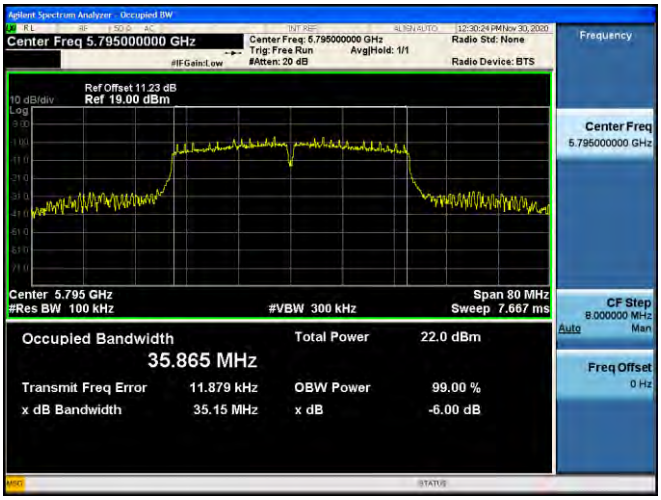
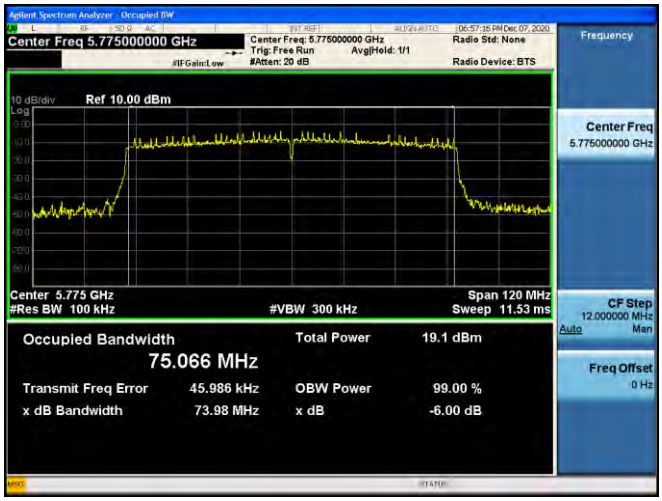
802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.08	> 0.5	Pass
5785	157	15.41	> 0.5	Pass
5825	165	15.11	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.13	> 0.5	Pass
5795	159	35.14	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	73.98	> 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)
Frequency [MHz]	Channel No.					
5180	36	17	16.30	0.138	16.44	23.98
5200	40	17	16.38	0.265	16.64	23.98
5240	48	17	16.48	0.381	16.86	23.98
5260	52	17	16.69	0.202	16.89	23.98
5300	60	17	16.75	0.138	16.89	23.98
5320	64	17	16.78	0.202	16.98	23.98
5500	100	15	14.65	0.381	15.03	23.93
5600	120	17	16.81	0.512	17.32	23.98
5720	144	17	16.39	0.713	17.10	23.98
5745	149	17	16.40	0.914	17.31	30.00
5785	157	17	16.45	0.914	17.36	30.00
5825	165	17	16.69	0.713	17.40	30.00

802.11n(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	16	15.60	0.148	15.75	23.98
5200	40	16	15.11	0.531	15.64	23.98
5240	48	16	15.77	0.148	15.92	23.98
5260	52	16	15.21	0.724	15.93	23.98
5300	60	16	15.78	0.282	16.06	23.98
5320	64	16	15.76	0.282	16.04	23.98
5500	100	15	14.33	0.531	14.86	23.98
5600	120	16	15.51	0.531	16.04	23.98
5720	144	16	15.35	0.724	16.07	23.98
5745	149	16	16.05	0.282	16.33	30.00
5785	157	16	15.70	0.724	16.42	30.00
5825	165	16	16.27	0.148	16.42	30.00

802.11n(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	15	14.22	0.285	14.51	23.98
5230	46	15	14.54	0.285	14.83	23.98
5270	54	15	14.40	0.523	14.92	23.98
5310	62	15	14.64	0.285	14.93	23.98
5510	102	12	11.67	0.285	11.96	23.98
5590	118	15	15.08	0.285	15.37	23.98
5710	142	15	14.97	0.285	15.26	23.98
5755	151	15	14.87	0.523	15.39	30.00
5795	159	15	15.14	0.285	15.43	30.00

802.11ac(20MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	15	14.45	0.147	14.60	23.98
5200	40	15	14.41	0.147	14.56	23.98
5240	48	15	14.35	0.402	14.75	23.98
5260	52	15	13.87	0.942	14.81	23.98
5300	60	15	14.75	0.147	14.90	23.98
5320	64	15	14.52	0.402	14.92	23.97
5500	100	15	14.92	0.147	15.07	23.98
5600	120	15	15.04	0.147	15.19	23.98
5720	144	15	14.83	0.277	15.11	23.98
5745	149	15	14.51	0.873	15.38	30.00
5785	157	15	15.32	0.147	15.47	30.00
5825	165	15	15.40	0.147	15.55	30.00

802.11ac(40MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	14	13.25	0.274	13.52	23.98
5230	46	14	13.43	0.274	13.70	23.98
5270	54	14	13.51	0.274	13.78	23.98
5310	62	14	12.99	0.875	13.87	23.98
5510	102	12	11.23	0.719	11.95	23.98
5590	118	14	13.95	0.274	14.22	23.98
5710	142	14	13.92	0.274	14.19	23.98
5755	151	14	14.05	0.274	14.32	30.00
5795	159	14	14.08	0.274	14.35	30.00

802.11ac(80MHz) Mode		Power Level Setting	Measured Power [dBm]	Duty Cycle Factor (dB)	Total Power [dBm]	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	13	12.32	0.554	12.87	23.98
5290	58	13	12.41	0.554	12.96	23.98
5530	106	12	11.20	0.928	12.13	23.98
5610	122	13	12.67	0.554	13.22	23.98
5690	138	13	12.71	0.554	13.26	23.98
5775	155	13	12.56	0.554	13.11	30.00

10.5 POWER SPECTRAL DENSITY

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	5.910	0.138	6.048	11 dBm/MHz
5200	40	6.380	0.265	6.645	
5240	48	6.551	0.381	6.932	
5260	52	6.693	0.202	6.895	
5300	60	7.009	0.138	7.147	
5320	64	6.739	0.202	6.941	
5500	100	4.792	0.381	5.173	
5600	120	6.553	0.512	7.065	
5720	144	6.245	0.713	6.958	
5745	149	3.556	0.914	4.470	30 dBm/500kHz
5785	157	3.533	0.914	4.447	
5825	165	4.067	0.713	4.780	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	4.283	0.148	4.431	11 dBm/MHz
5200	40	4.746	0.531	5.277	
5240	48	5.353	0.148	5.501	
5260	52	4.705	0.724	5.429	
5300	60	5.303	0.282	5.585	
5320	64	5.263	0.282	5.545	
5500	100	4.143	0.531	4.674	
5600	120	5.268	0.531	5.799	
5720	144	5.158	0.724	5.882	
5745	149	2.595	0.282	2.877	30 dBm/500kHz
5785	157	2.608	0.724	3.332	
5825	165	3.229	0.148	3.377	

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	0.897	0.285	1.182	11 dBm/MHz
5230	46	1.241	0.285	1.526	
5270	54	1.270	0.523	1.793	
5310	62	1.600	0.285	1.885	
5510	102	-1.537	0.285	-1.252	
5590	118	1.700	0.285	1.985	
5710	142	1.775	0.285	2.060	
5755	151	-1.366	0.523	-0.843	30 dBm /500kHz
5795	159	-0.702	0.285	-0.417	

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	3.817	0.147	3.964	11 dBm/MHz
5200	40	3.965	0.147	4.112	
5240	48	4.100	0.402	4.502	
5260	52	3.655	0.942	4.597	
5300	60	4.665	0.147	4.812	
5320	64	4.431	0.402	4.833	
5500	100	4.522	0.147	4.669	
5600	120	4.670	0.147	4.817	
5720	144	4.548	0.277	4.825	
5745	149	1.266	0.873	2.139	30 dBm/500kHz
5785	157	2.297	0.147	2.444	
5825	165	2.328	0.147	2.475	

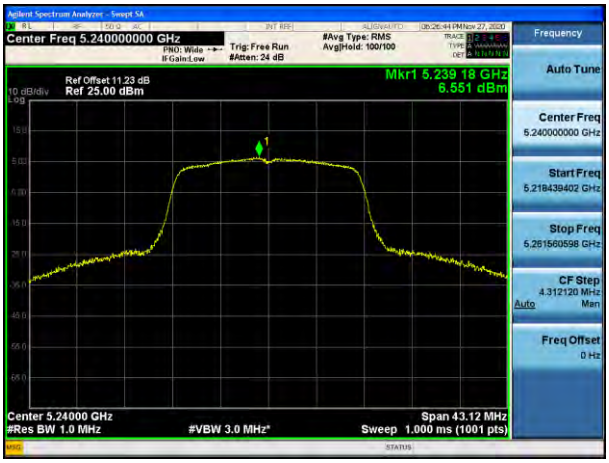
802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-0.001	0.274	0.273	11 dBm/MHz
5230	46	0.033	0.274	0.307	
5270	54	0.459	0.274	0.733	
5310	62	-0.019	0.875	0.856	
5510	102	-2.097	0.719	-1.378	
5590	118	0.667	0.274	0.941	
5710	142	0.754	0.274	1.028	
5755	151	-1.847	0.274	-1.573	30 dBm/500kHz
5795	159	-1.847	0.274	-1.573	

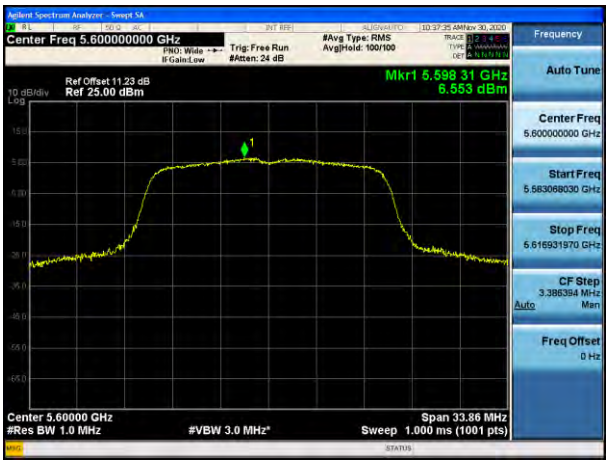
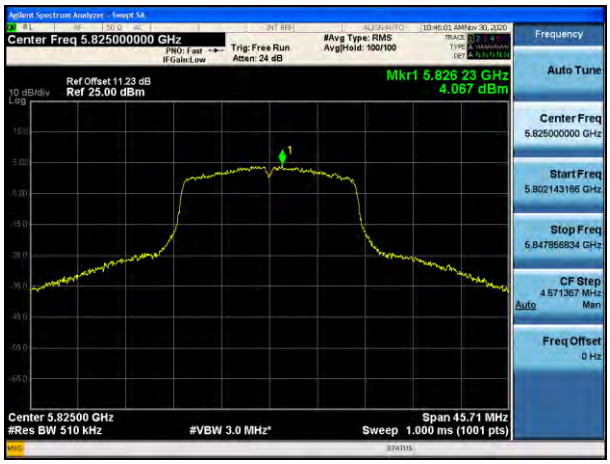
802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-4.178	0.554	-3.624	11 dBm/MHz
5290	58	-3.889	0.554	-3.335	
5530	106	-5.115	0.928	-4.187	
5610	122	-3.493	0.554	-2.939	
5690	138	-3.254	0.554	-2.700	
5775	155	-6.536	0.554	-5.982	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. 60)
	

UNII 2C (Ch. 120)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11n(HT20))

Note:

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

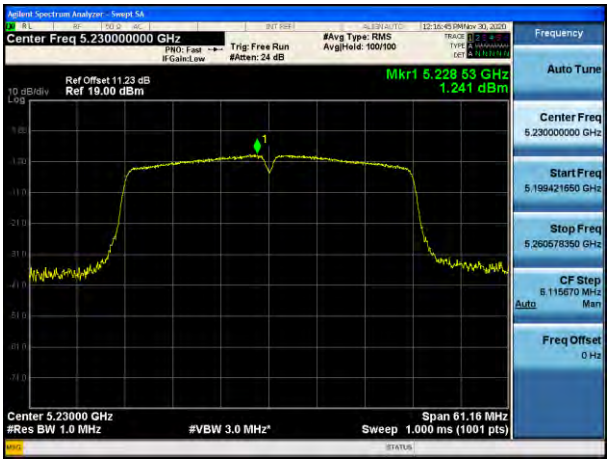
UNII 1 (Ch. 48)	UNII 2A (Ch. 60)
	

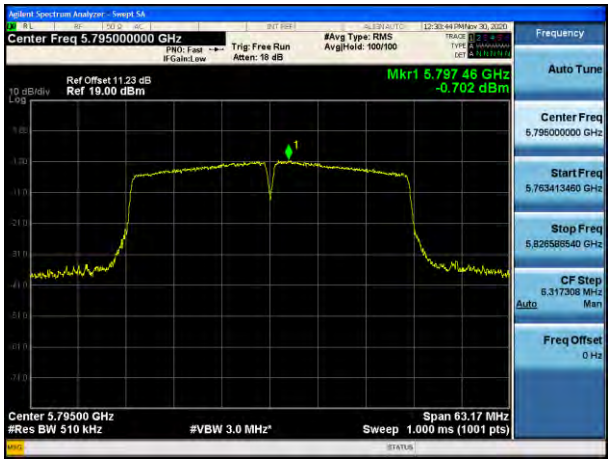
UNII 2C (Ch. 144)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11n(HT40))

Note:

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

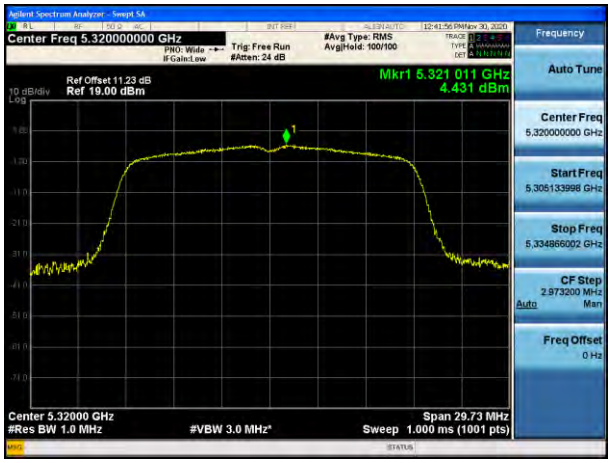
UNII 1 (Ch. 46)	UNII 2A (Ch. 62)
	

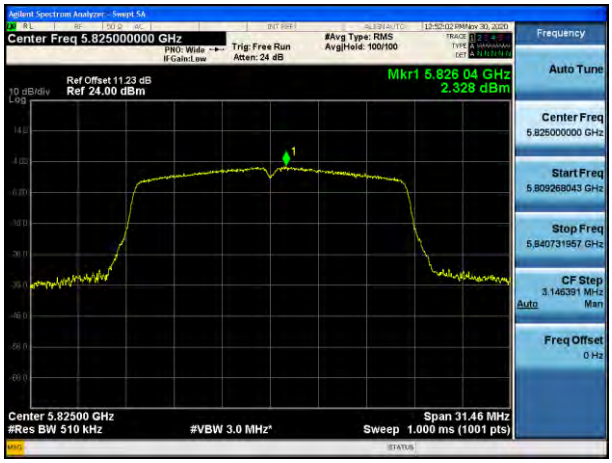
UNII 2C (Ch. 142)	UNII 3 (Ch. 159)
	

▣ 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. 64)
	

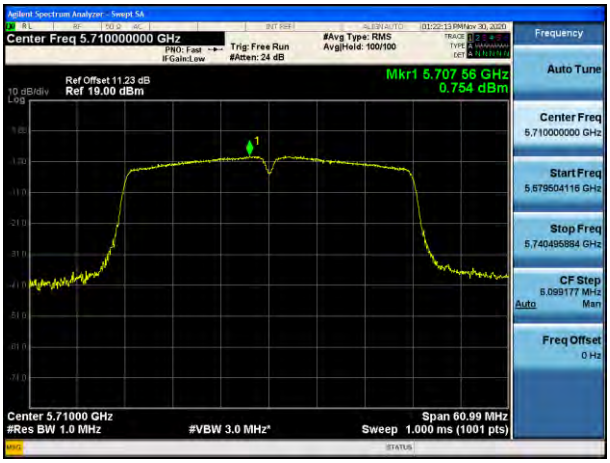
UNII 2C (Ch. 144)	UNII 3 (Ch. 165)
	

▣ 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. 62)
	

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. 138)	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)	5210079.70	79.70
100%		-30	5210090.99	90.99
100%		-20	5210001.67	1.67
100%		-10	5210024.50	24.50
100%		0	5210067.22	67.22
100%		+10	5210056.89	56.89
100%		+30	5210079.25	79.25
100%		+40	5210068.19	68.19
100%		+50	5210023.67	23.67
Batt. Endpoint	3.40	+20	5210024.47	24.47

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)	5290094.24	94.24
100%		-30	5290013.97	13.97
100%		-20	5290095.07	95.07
100%		-10	5290075.15	75.15
100%		0	5290058.98	58.98
100%		+10	5290037.27	37.27
100%		+30	5290036.57	36.57
100%		+40	5290022.54	22.54
100%		+50	5290050.30	50.30
Batt. Endpoint	3.40	+20	5290093.41	93.41

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)	5530032.90	32.90
100%		-30	5530006.83	6.83
100%		-20	5530059.67	59.67
100%		-10	5530057.21	57.21
100%		0	5530057.70	57.70
100%		+10	5530040.33	40.33
100%		+30	5530005.15	5.15
100%		+40	5530067.21	67.21
100%		+50	5530071.95	71.95
Batt. Endpoint	3.40	+20	5530074.18	74.18

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)	5775016.49	16.49
100%		-30	5775034.85	34.85
100%		-20	5775047.50	47.5
100%		-10	5775065.64	65.64
100%		0	5775057.99	57.99
100%		+10	5775081.48	81.48
100%		+30	5775036.89	36.89
100%		+40	5775065.35	65.35
100%		+50	5775033.19	33.19
Batt. Endpoint	3.40	+20	5775023.97	23.97

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)	5210047.27	47.27
100%		-30	5210021.92	21.92
100%		-20	5210098.93	98.93
100%		-10	5210067.97	67.97
100%		0	5210078.75	78.75
100%		+10	5210090.20	90.20
100%		+30	5210065.65	65.65
100%		+40	5210097.19	97.19
100%		+50	5210033.44	33.44
Batt. Endpoint	3.40	+20	5210085.11	85.11

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)	5290004.87	4.87
100%		-30	5290078.88	78.88
100%		-20	5290066.39	66.39
100%		-10	5290047.11	47.11
100%		0	5290073.90	73.9
100%		+10	5290018.07	18.07
100%		+30	5290066.33	66.33
100%		+40	5290022.42	22.42
100%		+50	5290020.12	20.12
Batt. Endpoint	3.40	+20	5290093.40	93.4

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)	5530081.48	81.48
100%		-30	5530068.91	68.91
100%		-20	5530005.52	5.52
100%		-10	5530071.86	71.86
100%		0	5530045.27	45.27
100%		+10	5530054.50	54.5
100%		+30	5530096.52	96.52
100%		+40	5530026.22	26.22
100%		+50	5530096.65	96.65
Batt. Endpoint	3.40	+20	5530044.34	44.34

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 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)	5775042.48	42.48
100%		-30	5775090.26	90.26
100%		-20	5775022.51	22.51
100%		-10	5775012.49	12.49
100%		0	5775023.25	23.25
100%		+10	5775021.16	21.16
100%		+30	5775043.84	43.84
100%		+40	5775040.09	40.09
100%		+50	5775053.55	53.55
Batt. Endpoint	3.40	+20	5775086.23	86.23

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)	5210093.28	93.28
100%		-30	5210067.36	67.36
100%		-20	5210062.64	62.64
100%		-10	5210014.69	14.69
100%		0	5210083.68	83.68
100%		+10	5210029.26	29.26
100%		+30	5210064.85	64.85
100%		+40	5210088.58	88.58
100%		+50	5210042.05	42.05
Batt. Endpoint	3.40	+20	5210077.02	77.02

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)	5290035.96	35.96
100%		-30	5290012.42	12.42
100%		-20	5290007.59	7.59
100%		-10	5290029.69	29.69
100%		0	5290011.89	11.89
100%		+10	5290086.98	86.98
100%		+30	5290062.54	62.54
100%		+40	5290093.64	93.64
100%		+50	5290086.19	86.19
Batt. Endpoint	3.40	+20	5290032.79	32.79

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)	5530054.93	54.93
100%		-30	5530030.33	30.33
100%		-20	5530034.57	34.57
100%		-10	5530013.33	13.33
100%		0	5530030.29	30.29
100%		+10	5530064.24	64.24
100%		+30	5530036.66	36.66
100%		+40	5530022.73	22.73
100%		+50	5530061.08	61.08
Batt. Endpoint	3.40	+20	5530030.05	30.05

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)	5775093.06	93.06
100%		-30	5775006.18	6.18
100%		-20	5775050.42	50.42
100%		-10	5775082.21	82.21
100%		0	5775086.44	86.44
100%		+10	5775035.57	35.57
100%		+30	5775082.26	82.26
100%		+40	5775043.76	43.76
100%		+50	5775046.74	46.74
Batt. Endpoint	3.40	+20	5775066.05	66.05

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.

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)	5210061.97	61.97
100%		-30	5210033.26	33.26
100%		-20	5210059.96	59.96
100%		-10	5210081.69	81.69
100%		0	5210027.77	27.77
100%		+10	5210087.21	87.21
100%		+30	5210025.09	25.09
100%		+40	5210030.61	30.61
100%		+50	5210008.25	8.25
Batt. Endpoint	3.40	+20	5210048.93	48.93

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)	5290093.42	93.42
100%		-30	5290012.72	12.72
100%		-20	5290007.31	7.31
100%		-10	5290027.50	27.5
100%		0	5290096.44	96.44
100%		+10	5290078.66	78.66
100%		+30	5290072.66	72.66
100%		+40	5290065.91	65.91
100%		+50	5290049.18	49.18
Batt. Endpoint	3.40	+20	5290057.41	57.41

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)	5530044.88	44.88
100%		-30	5530042.14	42.14
100%		-20	5530066.90	66.9
100%		-10	5530050.67	50.67
100%		0	5530095.20	95.2
100%		+10	5530020.85	20.85
100%		+30	5530062.40	62.4
100%		+40	5530004.69	4.69
100%		+50	5530026.44	26.44
Batt. Endpoint	3.40	+20	5530099.48	99.48

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)	5775099.68	99.68
100%		-30	5775094.20	94.20
100%		-20	5775037.46	37.46
100%		-10	5775088.44	88.44
100%		0	5775081.24	81.24
100%		+10	5775006.16	6.16
100%		+30	5775053.41	53.41
100%		+40	5775098.54	98.54
100%		+50	5775031.56	31.56
Batt. Endpoint	3.40	+20	5775038.28	38.28

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	5710.12	14.88
802.11n(HT20)				5709.96	15.04
802.11ac(VHT20)				5710.08	14.92
802.11a	UNII 3	5720	144	5730.16	5.16
802.11n(HT20)				5730.24	5.24
802.11ac(VHT20)				5730.12	5.12

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.92	35.08
802.11ac(VHT40)				5689.68	35.32
802.11n(HT40)	UNII 3	5710	142	5730.24	5.24
802.11ac(VHT40)				5730.08	5.08

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.44	75.56
	UNII 3	5690	138	5730.44	5.44

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)				5727.60	2.60	> 0.5
802.11ac(VHT20)				5727.60	2.60	> 0.5

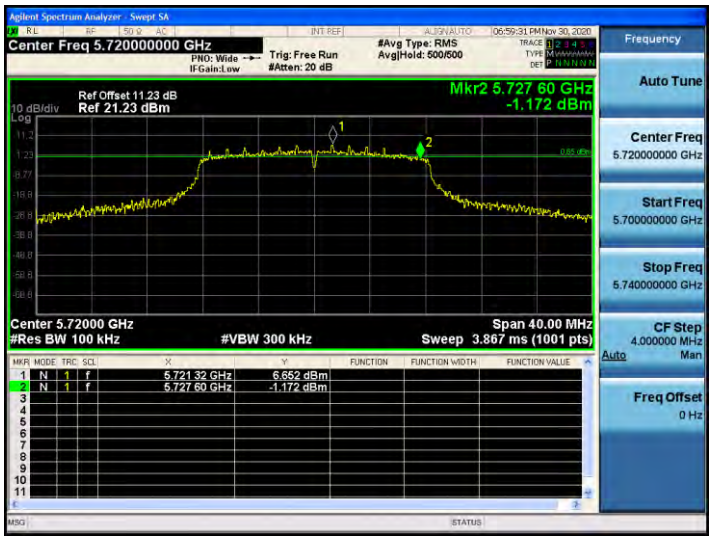
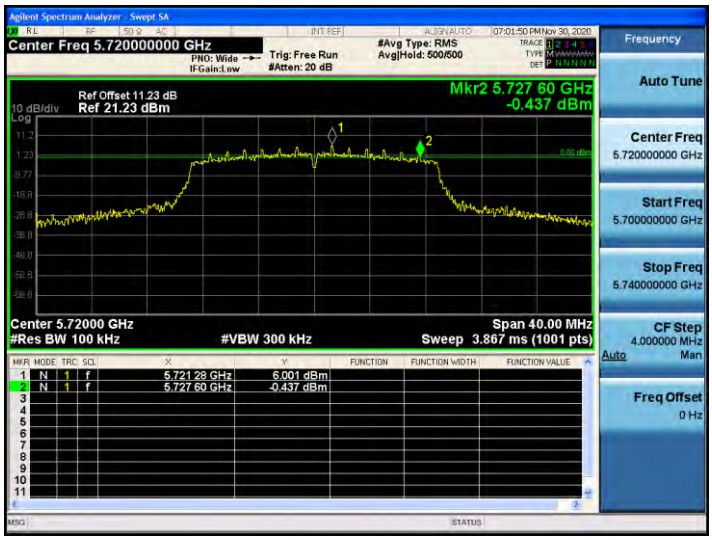
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5727.60	2.60	> 0.5
802.11ac(VHT40)				5727.60	2.60	> 0.5

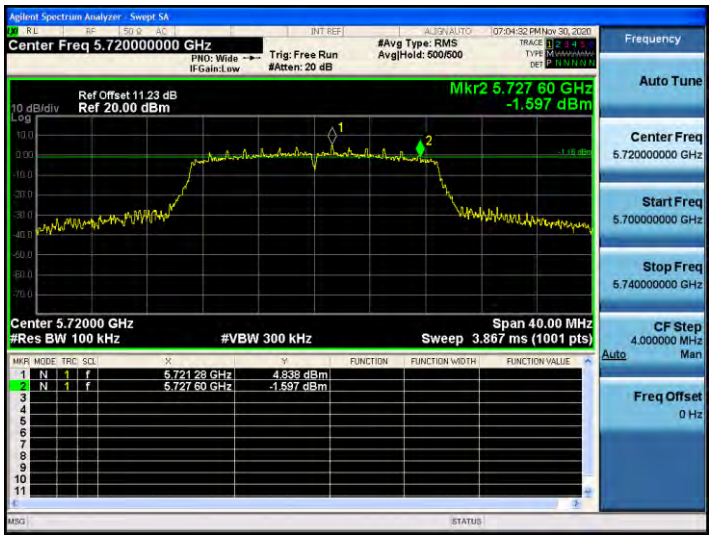
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5727.68	2.68	> 0.5

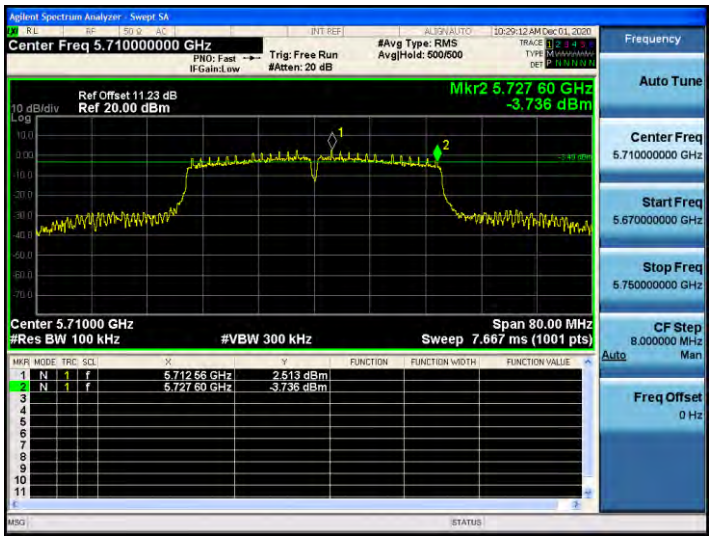
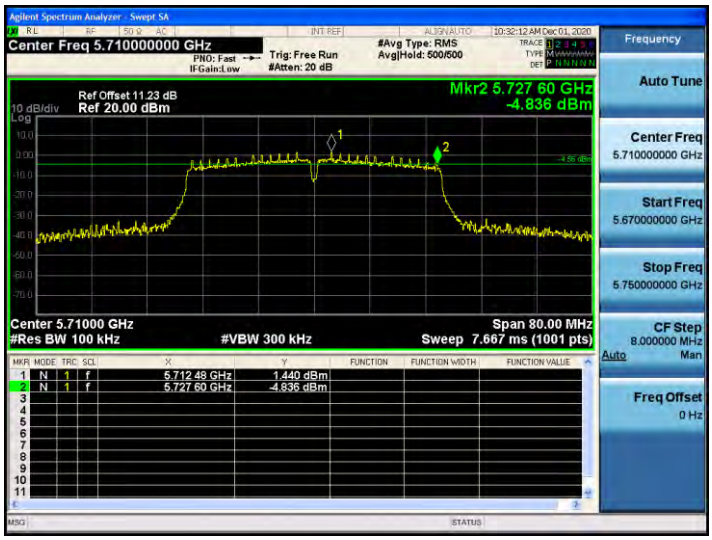
Note:

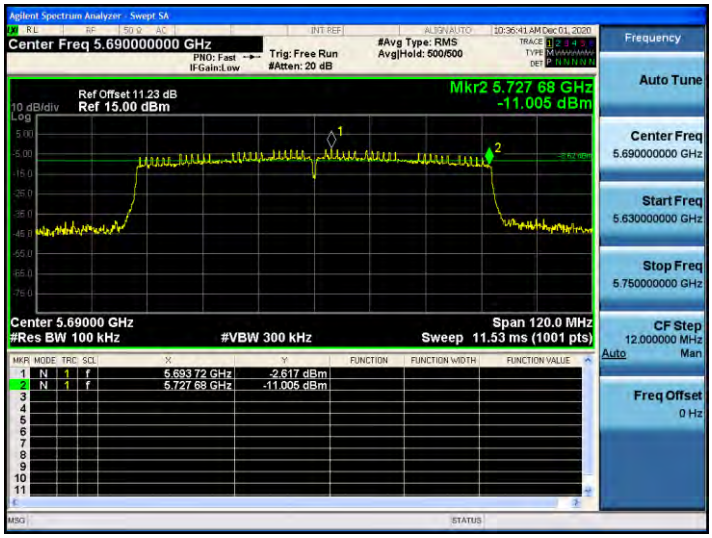
6dB Bandwidth = Measured Frequency[MHz] – 5725MHz

▣ 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


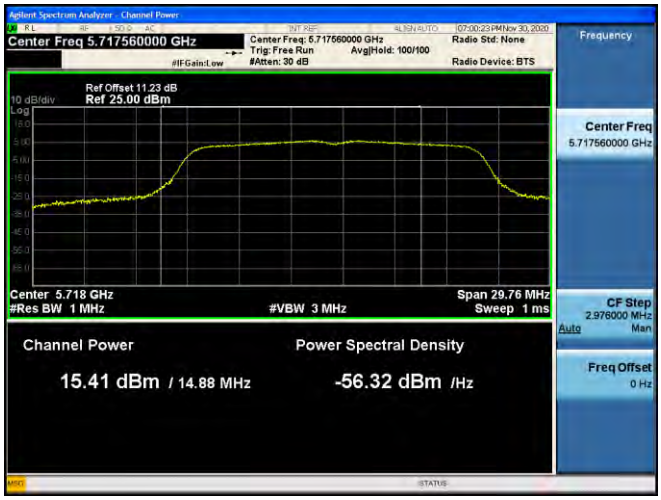
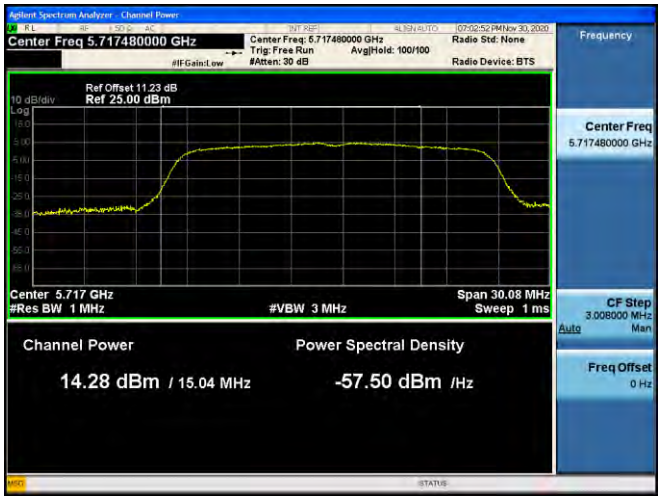
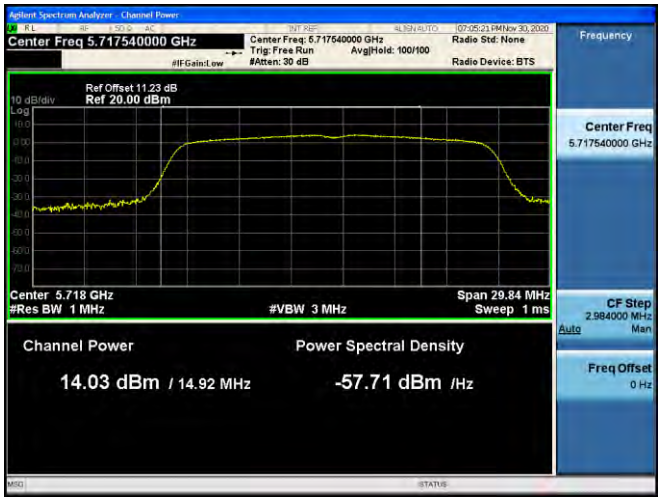
10.7.3 Output Power

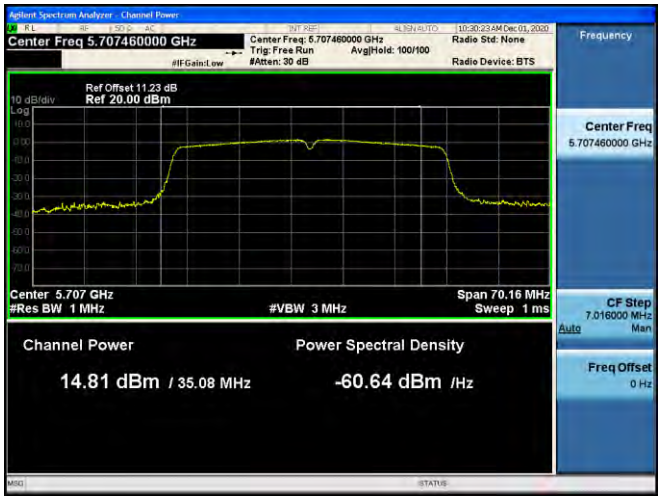
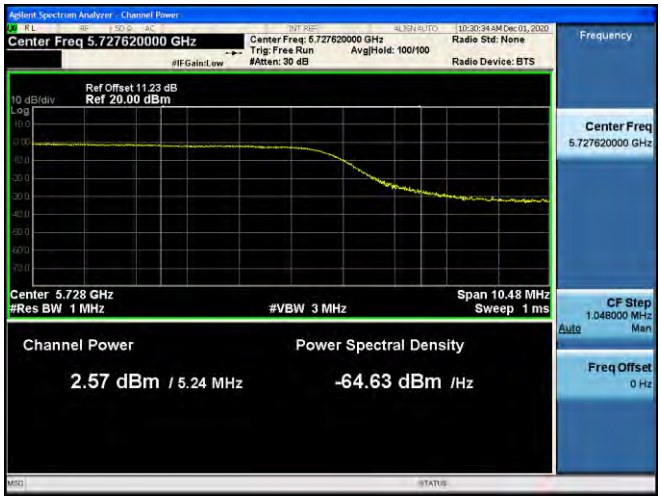
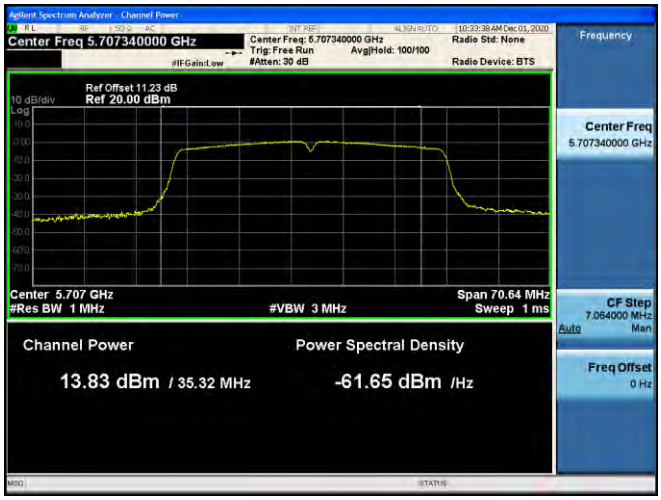
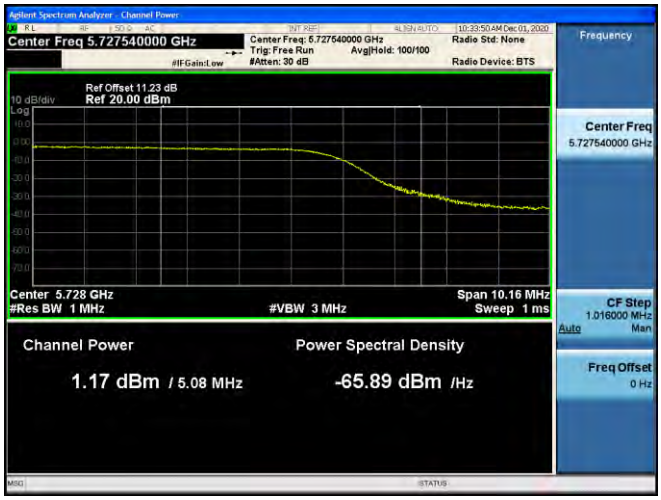
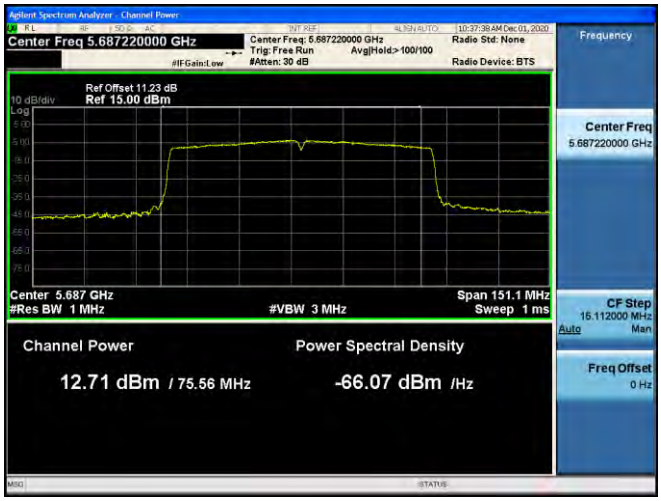
Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	15.41	0.713	16.12	22.73
802.11n(HT20)			14.28	0.724	15.00	22.77
802.11ac(VHT20)			14.03	0.277	14.31	22.74
802.11a	5720 (UNII 3 Band)	144	7.95	0.713	8.66	30.00
802.11n(HT20)			7.22	0.724	7.94	30.00
802.11ac(VHT20)			6.67	0.277	6.95	30.00

Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	14.81	0.285	15.09	23.98
802.11ac(VHT40)			13.83	0.274	14.10	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	2.57	0.285	2.85	30.00
802.11ac(VHT40)			1.17	0.274	1.44	30.00

Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	12.71	0.554	13.27	23.98
	5690 (UNII 3 Band)	138	-3.15	0.554	-2.59	30.00

▣ 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)
802.11a	5720 (UNII 2C Band)	144	6.549	0.713	7.262	11dBm/ MHz
802.11n(HT20)			5.499	0.724	6.223	
802.11ac(VHT20)			4.950	0.277	5.227	
802.11a	5720 (UNII 3 Band)	144	2.001	0.713	2.714	30 dBm/ 500kHz
802.11n(HT20)			1.027	0.724	1.751	
802.11ac(VHT20)			0.284	0.277	0.561	

Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	1.787	0.285	2.072	11dBm/ MHz
802.11ac(VHT40)			0.801	0.274	1.075	
802.11n(HT40)	5710 (UNII 3 Band)	142	-4.424	0.285	-4.139	30 dBm/ 500kHz
802.11ac(VHT40)			-5.374	0.274	-5.100	

Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-3.592	0.554	-3.038	11dBm/ MHz
	5690 (UNII 3 Band)	138	-10.083	0.554	-9.529	30 dBm/ 500kHz

▣ 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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	51.55	0.49	V	52.04	68.20	16.16	PK
15540	49.34	2.62	V	51.96	73.98	22.02	PK
15540	36.56	2.62	V	39.18	53.98	14.80	AV
10360	52.01	0.49	H	52.50	68.20	15.70	PK
15540	49.82	2.62	H	52.44	73.98	21.54	PK
15540	36.78	2.62	H	39.40	53.98	14.58	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	51.23	1.38	V	52.61	68.20	15.59	PK
15600	49.98	1.50	V	51.48	73.98	22.50	PK
15600	36.11	1.50	V	37.61	53.98	16.37	AV
10400	51.98	1.38	H	53.36	68.20	14.84	PK
15600	50.02	1.50	H	51.52	73.98	22.46	PK
15600	36.28	1.50	H	37.78	53.98	16.20	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	50.89	-0.33	V	50.56	68.20	17.64	PK
15720	49.99	0.56	V	50.55	73.98	23.43	PK
15720	36.74	0.56	V	37.30	53.98	16.68	AV
10480	51.78	-0.33	H	51.45	68.20	16.75	PK
15720	50.04	0.56	H	50.60	73.98	23.38	PK
15720	36.85	0.56	H	37.41	53.98	16.57	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	52.37	-0.06	V	52.31	68.20	15.89	PK
15780	50.21	0.96	V	51.17	73.98	22.81	PK
15780	36.75	0.96	V	37.71	53.98	16.27	AV
10520	52.11	-0.06	H	52.05	68.20	16.15	PK
15780	50.02	0.96	H	50.98	73.98	23.00	PK
15780	36.65	0.96	H	37.61	53.98	16.37	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	52.42	-0.18	V	52.24	73.98	21.74	PK
10600	39.29	-0.18	V	39.11	53.98	14.87	AV
15900	50.62	-0.13	V	50.49	73.98	23.49	PK
15900	37.21	-0.13	V	37.08	53.98	16.90	AV
10600	52.23	-0.18	H	52.05	73.98	21.93	PK
10600	39.13	-0.18	H	38.95	53.98	15.03	AV
15900	50.55	-0.13	H	50.42	73.98	23.56	PK
15900	37.18	-0.13	H	37.05	53.98	16.93	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	52.32	-0.04	V	52.28	73.98	21.70	PK
10640	39.11	-0.04	V	39.07	53.98	14.91	AV
15960	50.52	-0.36	V	50.16	73.98	23.82	PK
15960	37.45	-0.36	V	37.09	53.98	16.89	AV
10640	51.96	-0.04	H	51.92	73.98	22.06	PK
10640	39.01	-0.04	H	38.97	53.98	15.01	AV
15960	50.48	-0.36	H	50.12	73.98	23.86	PK
15960	37.41	-0.36	H	37.05	53.98	16.93	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	51.85	1.75	V	53.60	73.98	20.38	PK
11000	38.72	1.75	V	40.47	53.98	13.51	AV
16500	50.02	1.06	V	51.08	68.20	17.12	PK
11000	51.98	1.75	H	53.73	73.98	20.25	PK
11000	38.81	1.75	H	40.56	53.98	13.42	AV
16500	50.16	1.06	H	51.22	68.20	16.98	PK

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5600 MHz
Channel No.	120 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L. -A.G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11200	52.22	0.26	V	52.48	73.98	21.50	PK
11200	38.45	0.26	V	38.71	53.98	15.27	AV
16800	50.22	3.41	V	53.63	68.20	14.57	PK
11200	52.46	0.26	H	52.72	73.98	21.26	PK
11200	38.72	0.26	H	38.98	53.98	15.00	AV
16800	50.46	3.41	H	53.87	68.20	14.33	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11440	51.95	0.74	V	52.69	73.98	21.29	PK
11440	39.29	0.74	V	40.03	53.98	13.95	AV
17160	50.27	5.47	V	55.74	68.20	12.46	PK
11440	51.85	0.74	H	52.59	73.98	21.39	PK
11440	39.27	0.74	H	40.01	53.98	13.97	AV
17160	50.01	5.47	H	55.48	68.20	12.72	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11490	51.95	0.57	V	52.52	73.98	21.46	PK
11490	39.03	0.57	V	39.60	53.98	14.38	AV
17235	51.18	5.22	V	56.40	68.20	11.80	PK
11490	51.23	0.57	H	51.80	73.98	22.18	PK
11490	38.86	0.57	H	39.43	53.98	14.55	AV
17235	50.98	5.22	H	56.20	68.20	12.00	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11570	51.91	0.73	V	52.64	73.98	21.34	PK
11570	39.01	0.73	V	39.74	53.98	14.24	AV
17355	50.72	6.04	V	56.76	68.20	11.44	PK
11570	51.45	0.73	H	52.18	73.98	21.80	PK
11570	38.85	0.73	H	39.58	53.98	14.40	AV
17355	50.68	6.04	H	56.72	68.20	11.48	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 [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	52.93	-0.65	V	52.28	73.98	21.70	PK
11650	39.99	-0.65	V	39.34	53.98	14.64	AV
17475	50.15	7.62	V	57.77	68.20	10.43	PK
11650	52.68	-0.65	H	52.03	73.98	21.95	PK
11650	39.75	-0.65	H	39.10	53.98	14.88	AV
17475	50.02	7.62	H	57.64	68.20	10.56	PK

Note:

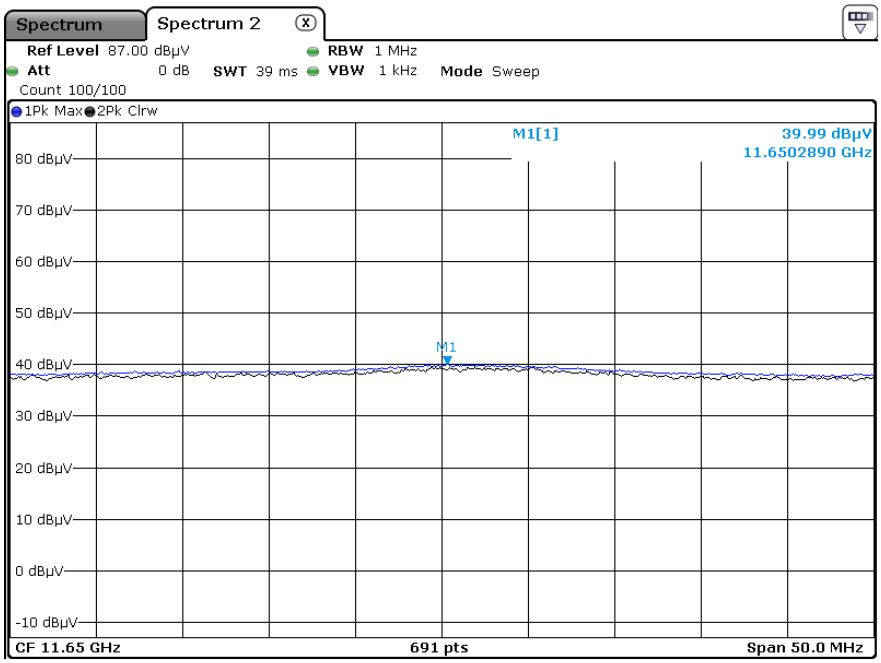
All Modes of operation were investigated and the worst case configuration results are reported.

[Worst case]

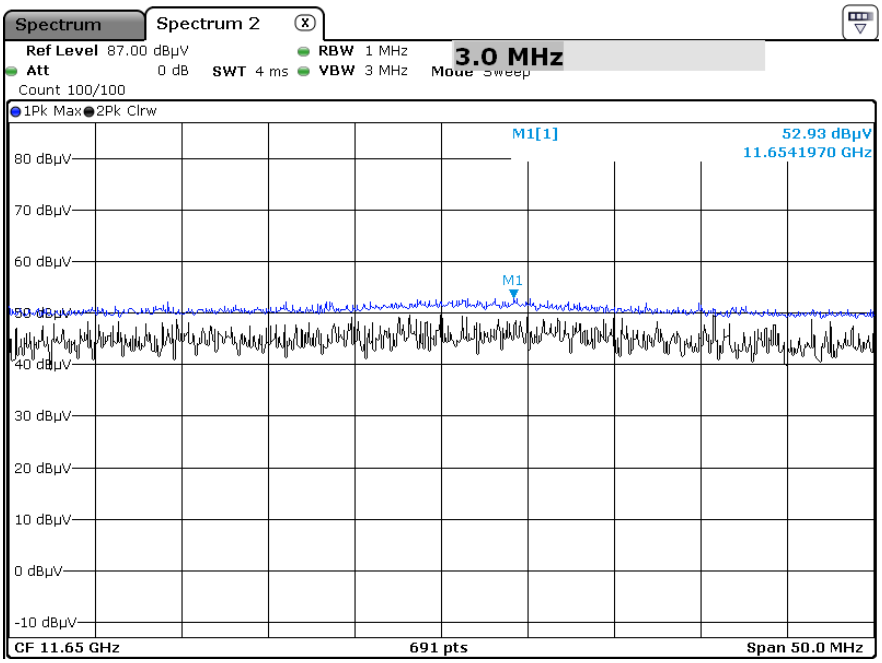
UNII 1, 2A, 2C, 3 : 802.11a

▣ Test Plots

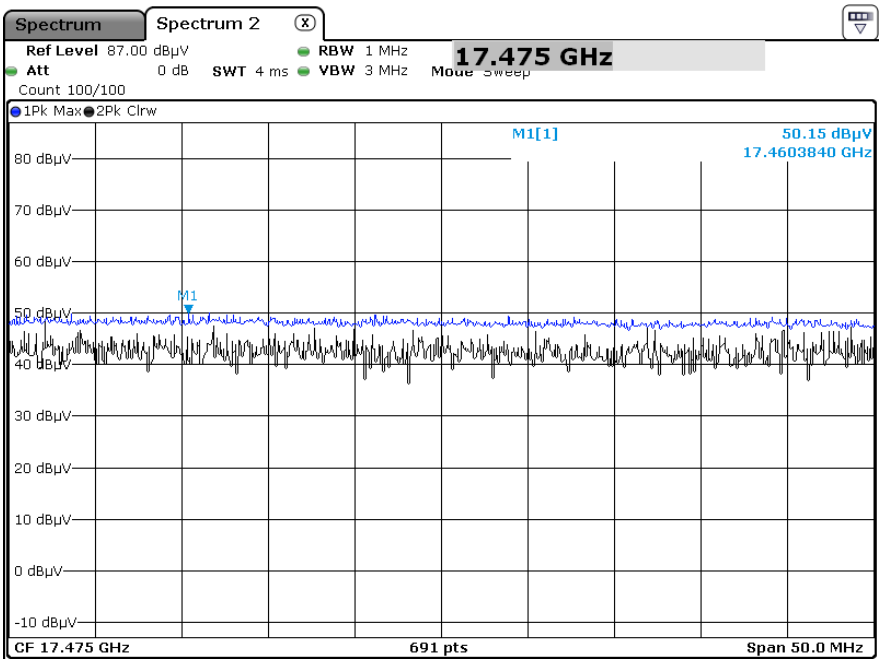
Average Reading (802.11a, Ch.165 2nd Harmonic, X-V)



Peak Reading (802.11a, Ch.165 2nd Harmonic, X-V)



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



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:	6 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	56.34	5.75	H	62.09	73.98	11.89	PK
5150	40.19	5.75	H	45.94	53.98	8.04	AV
5150	54.36	5.75	V	60.11	73.98	13.87	PK
5150	38.19	5.75	V	43.94	53.98	10.04	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	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	59.59	5.52	H	65.11	73.98	8.87	PK
5350	39.09	5.52	H	44.61	53.98	9.37	AV
5350	57.42	5.52	V	62.94	73.98	11.04	PK
5350	37.15	5.52	V	42.67	53.98	11.31	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	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	52.46	7.05	H	59.51	73.98	14.47	PK
5460	33.09	7.05	H	40.14	53.98	13.84	AV
5470	57.38	6.59	H	63.97	68.20	4.23	PK
5460	51.25	7.05	V	58.3	73.98	15.68	PK
5460	31.25	7.05	V	38.3	53.98	15.68	AV
5470	56.78	6.59	V	63.37	68.20	4.83	PK

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
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	56.52	5.75	H	62.27	73.98	11.71	PK
5150	37.11	5.75	H	42.86	53.98	11.12	AV
5150	54.42	5.75	V	60.17	73.98	13.81	PK
5150	35.53	5.75	V	41.28	53.98	12.70	AV

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
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	58.34	5.52	H	63.86	73.98	10.12	PK
5350	37.40	5.52	H	42.92	53.98	11.06	AV
5350	56.35	5.52	V	61.87	73.98	12.11	PK
5350	36.52	5.52	V	42.04	53.98	11.94	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
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	51.02	7.05	H	58.07	73.98	15.91	PK
5460	33.00	7.05	H	40.05	53.98	13.93	AV
5470	58.19	6.59	H	64.78	68.20	3.42	PK
5460	49.52	7.05	V	56.57	73.98	17.41	PK
5460	31.56	7.05	V	38.61	53.98	15.37	AV
5470	57.52	6.59	V	64.11	68.20	4.09	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
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	51.15	5.75	H	56.90	73.98	17.08	PK
5150	36.60	5.75	H	42.35	53.98	11.63	AV
5150	50.25	5.75	V	56	73.98	17.98	PK
5150	35.25	5.75	V	41	53.98	12.98	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
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	54.71	5.52	H	60.23	73.98	13.75	PK
5350	35.87	5.52	H	41.39	53.98	12.59	AV
5350	52.56	5.52	V	58.08	73.98	15.90	PK
5350	34.85	5.52	V	40.37	53.98	13.61	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
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	49.76	7.05	H	56.81	73.98	17.17	PK
5460	32.91	7.05	H	39.96	53.98	14.02	AV
5470	57.65	6.59	H	64.24	68.20	3.96	PK
5460	47.56	7.05	V	54.61	73.98	19.37	PK
5460	31.52	7.05	V	38.57	53.98	15.41	AV
5470	56.52	6.59	V	63.11	68.20	5.09	PK

Band :	UNII 1
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	0
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	55.96	12.72	H	68.68	73.98	5.30	PK
5150	38.33	12.72	H	51.05	53.98	2.93	AV
5150	53.52	12.72	V	66.24	73.98	7.74	PK
5150	37.52	12.72	V	50.24	53.98	3.74	AV

Band :	UNII 2A
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	0
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	55.15	12.38	H	67.53	73.98	6.45	PK
5350	36.89	12.38	H	49.27	53.98	4.71	AV
5350	54.36	12.38	V	66.74	73.98	7.24	PK
5350	35.25	12.38	V	47.63	53.98	6.35	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	0
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	45.05	13.91	H	58.96	73.98	15.02	PK
5460	31.96	13.91	H	45.87	53.98	8.11	AV
5470	49.99	13.46	H	63.45	68.20	4.75	PK
5460	44.23	13.91	V	58.14	73.98	15.84	PK
5460	30.56	13.91	V	44.47	53.98	9.51	AV
5470	48.53	13.46	V	61.99	68.20	6.21	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
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	55.70	12.72	H	68.42	73.98	5.56	PK
5150	35.71	12.72	H	48.43	53.98	5.55	AV
5150	53.42	12.72	V	66.14	73.98	7.84	PK
5150	34.23	12.72	V	46.95	53.98	7.03	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
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	54.19	12.38	H	66.57	73.98	7.41	PK
5350	35.21	12.38	H	47.59	53.98	6.39	AV
5350	53.15	12.38	V	65.53	73.98	8.45	PK
5350	34.52	12.38	V	46.9	53.98	7.08	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
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	44.56	13.91	H	58.47	73.98	15.51	PK
5460	31.93	13.91	H	45.84	53.98	8.14	AV
5470	49.66	13.46	H	63.12	68.20	5.08	PK
5460	43.53	13.91	V	57.44	73.98	16.54	PK
5460	30.56	13.91	V	44.47	53.98	9.51	AV
5470	48.95	13.46	V	62.41	68.20	5.79	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
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	50.41	12.72	H	63.13	73.98	10.85	PK
5150	36.35	12.72	H	49.07	53.98	4.91	AV
5150	49.21	12.72	V	61.93	73.98	12.05	PK
5150	35.42	12.72	V	48.14	53.98	5.84	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5290 MHz
Channel No.	58 Ch

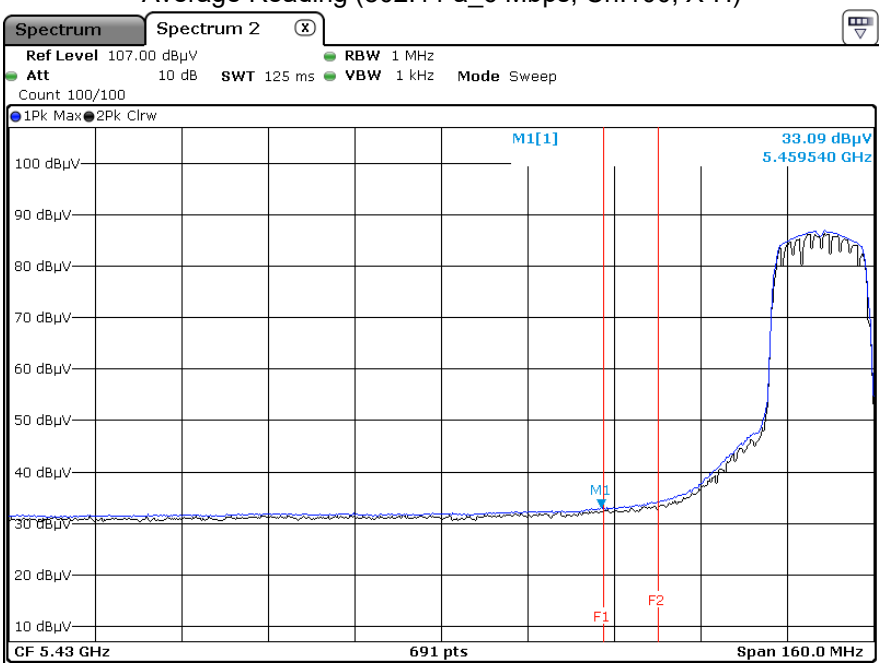
Frequency [MHz]	Reading dBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	52.51	12.38	H	64.89	73.98	9.09	PK
5350	37.08	12.38	H	49.46	53.98	4.52	AV
5350	51.21	12.38	V	63.59	73.98	10.39	PK
5350	36.54	12.38	V	48.92	53.98	5.06	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5530 MHz
Channel No.	106 Ch

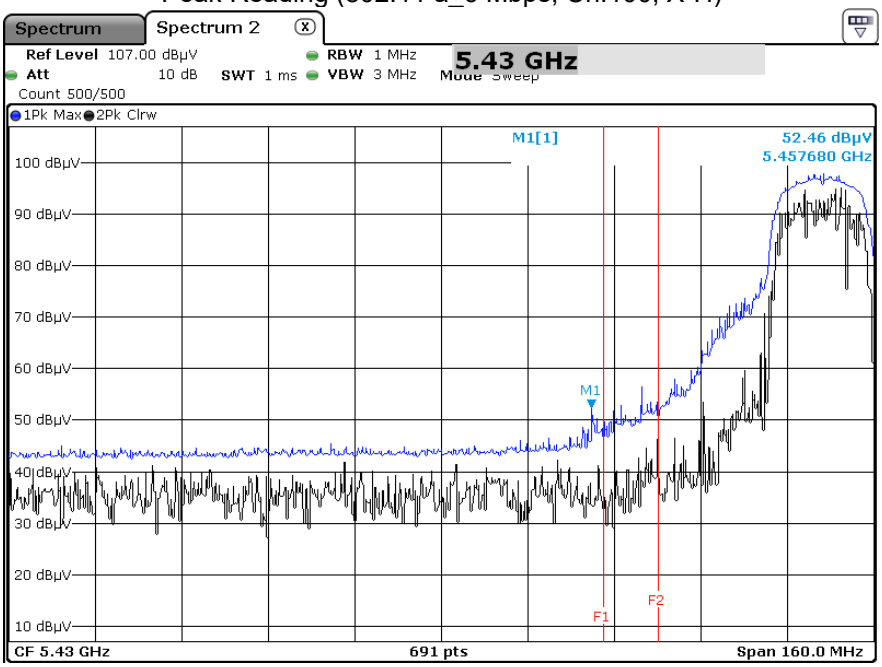
Frequency [MHz]	Reading DBuV	C.L+A.F+ D.F-A.G + ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	45.97	13.91	H	59.88	73.98	14.10	PK
5460	33.27	13.91	H	47.18	53.98	6.80	AV
5470	50.38	13.46	H	63.84	68.20	4.36	PK
5460	43.28	13.91	V	57.19	73.98	16.79	PK
5460	31.52	13.91	V	45.43	53.98	8.55	AV
5470	48.69	13.46	V	62.15	68.20	6.05	PK

▣ Test Plots(UNII 1, 2A, 2C)

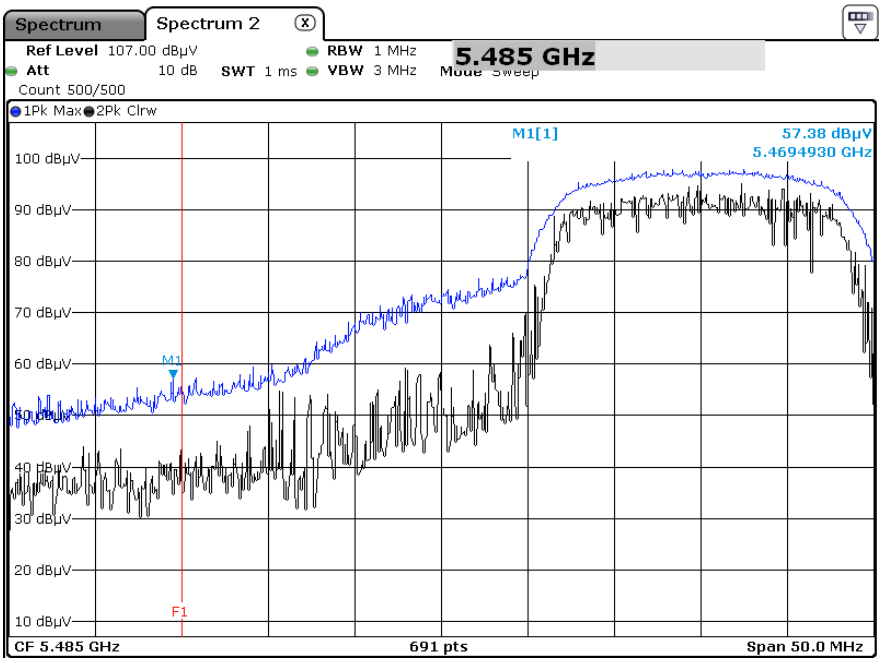
Average Reading (802.11 a_6 Mbps, Ch.100, X-H)



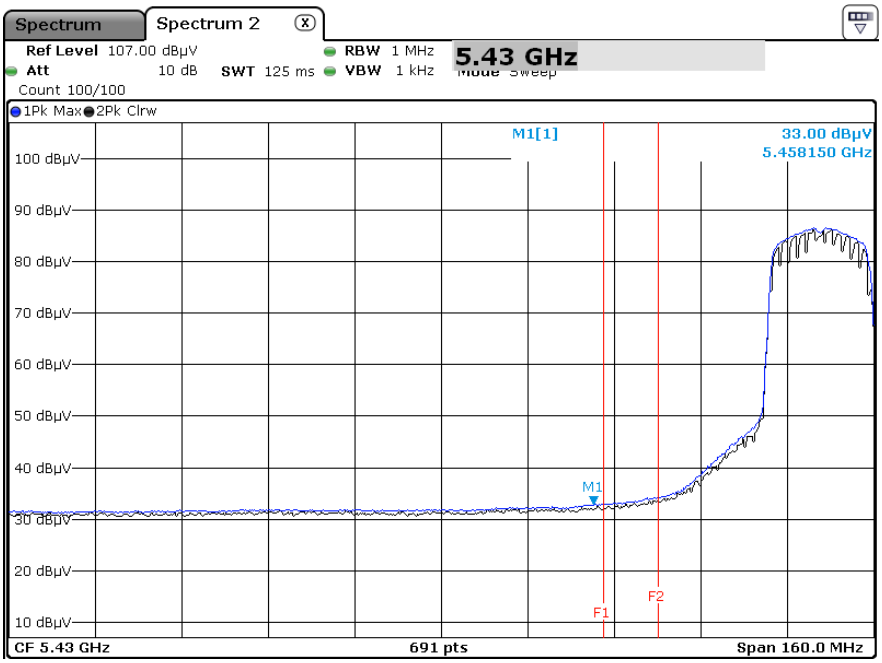
Peak Reading (802.11 a_6 Mbps, Ch.100, X-H)



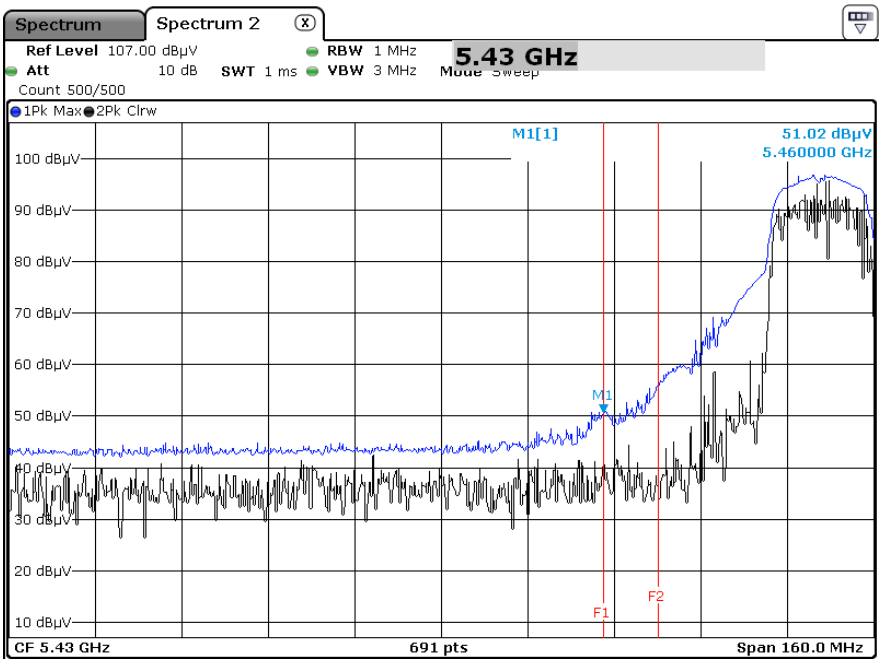
Peak Reading (802.11 a_6 Mbps, Ch.100, X-H)



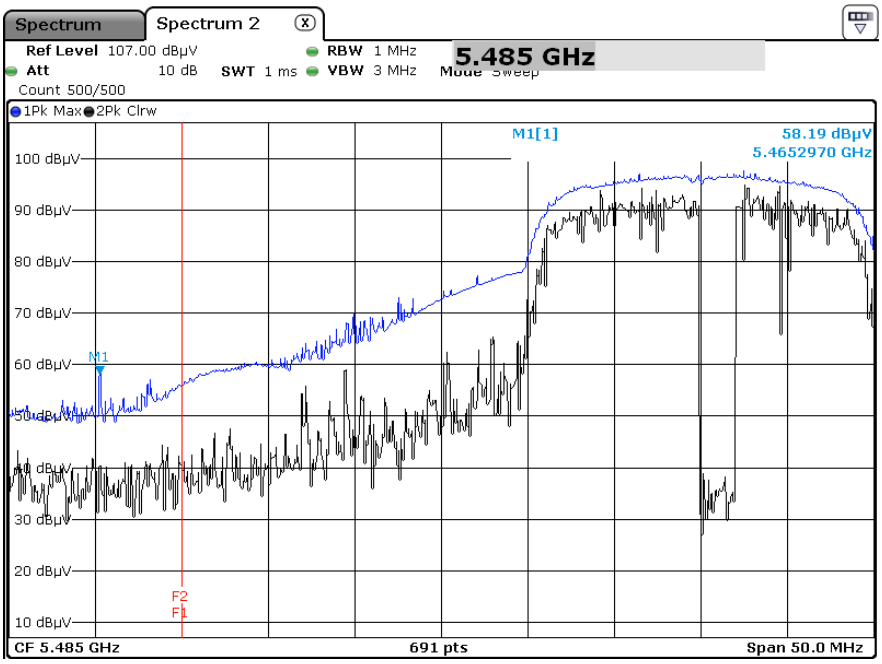
Average Reading (802.11 n(HT20)_MCS0, Ch.100, X-H)



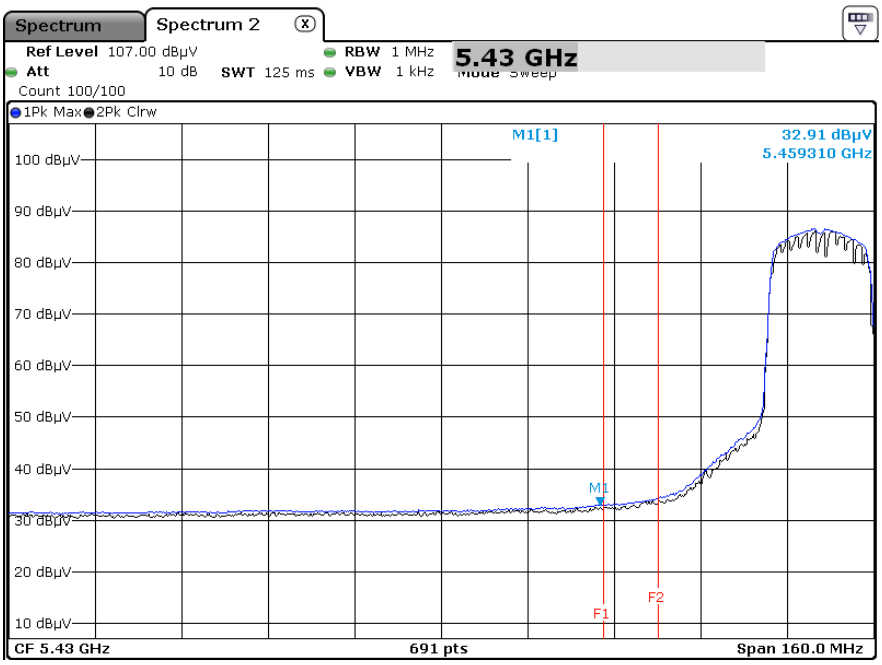
Peak Reading (802.11 n(HT20)_MCS0, Ch.100, X-H)



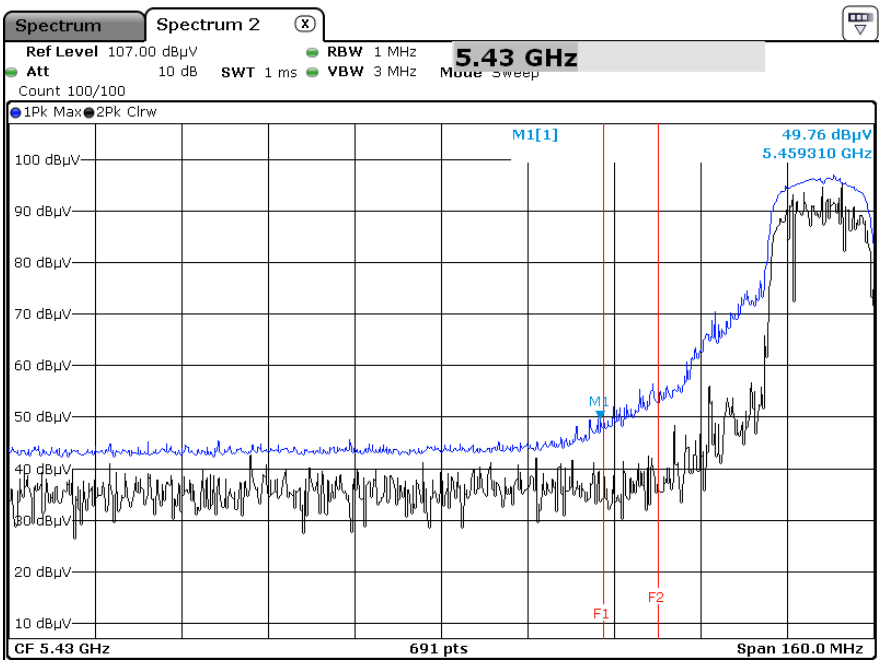
Peak Reading (802.11 n(HT20)_MCS0, Ch.100, X-H)



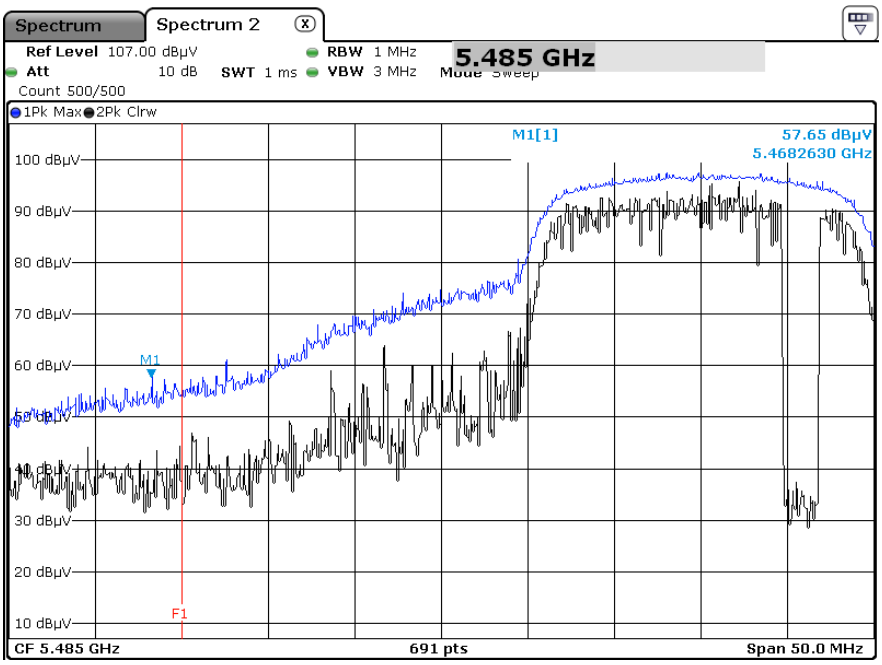
Average Reading (802.11 ac(VHT20)_MCS0, Ch.100, X-H)



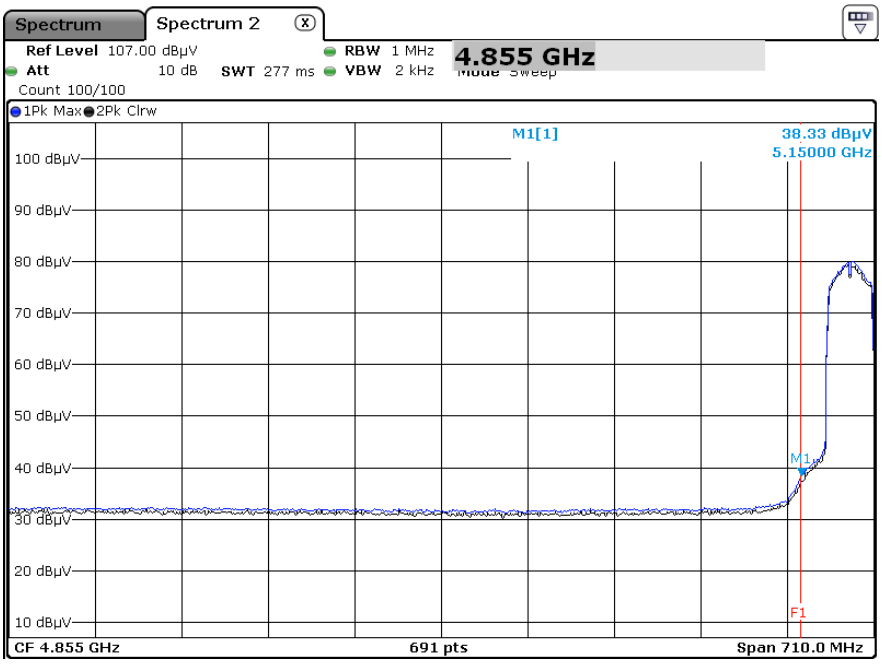
Peak Reading (802.11 ac(VHT20)_MCS0, Ch.100, X-H)



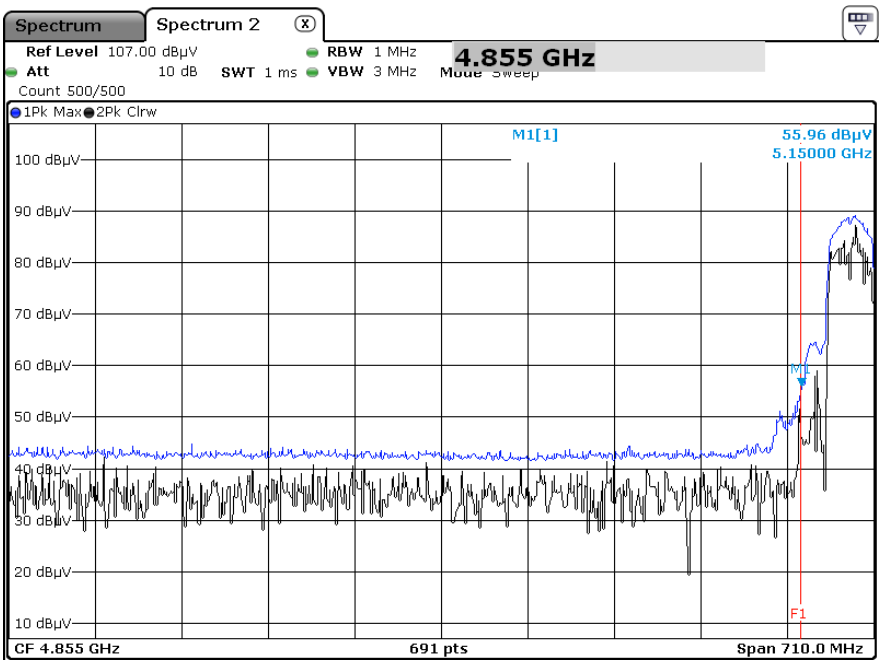
Peak Reading (802.11 ac(VHT20)_MCS0, Ch.100, X-H)



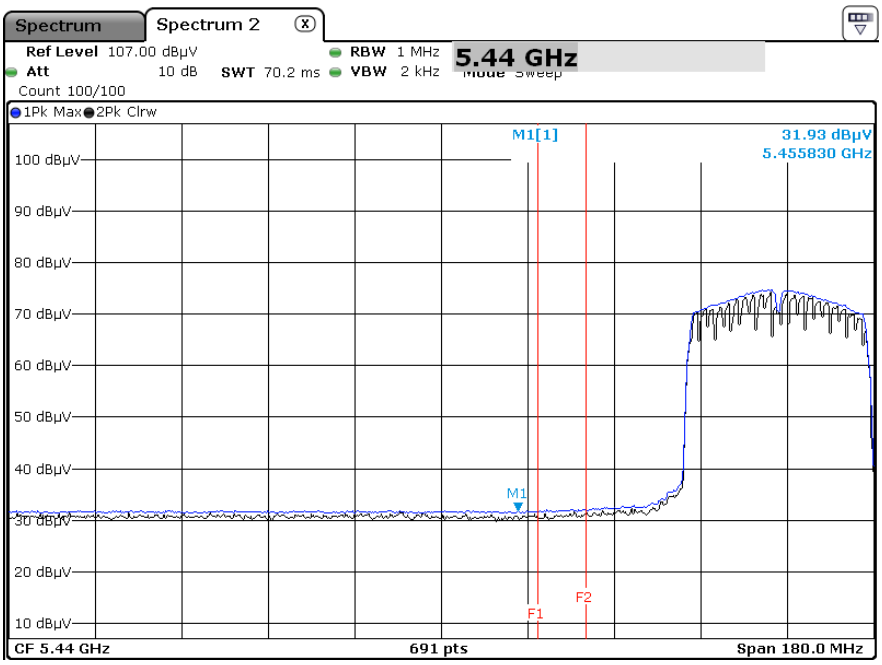
Average Reading (802.11 n(HT40)_MCS0, Ch.38, X-H)



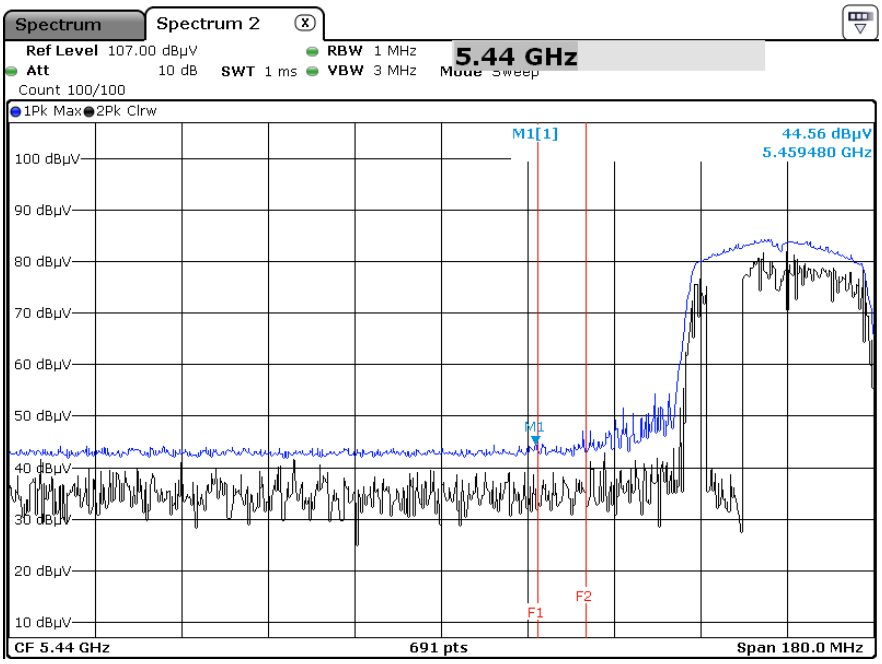
Peak Reading (802.11 n(HT40)_MCS0, Ch.38, X-H)



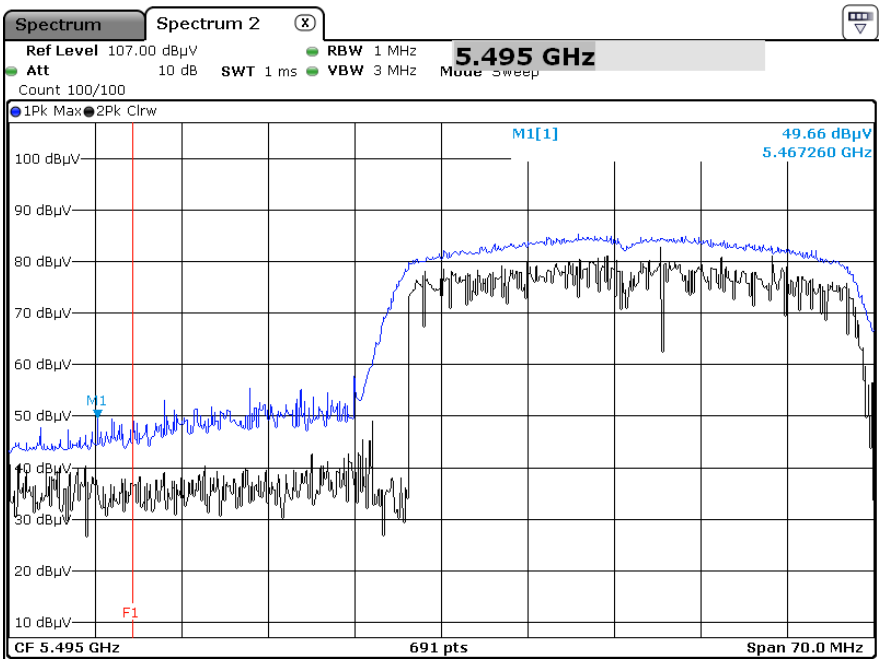
Average Reading (802.11 ac(VHT40)_MCS0, Ch.102, X-H)



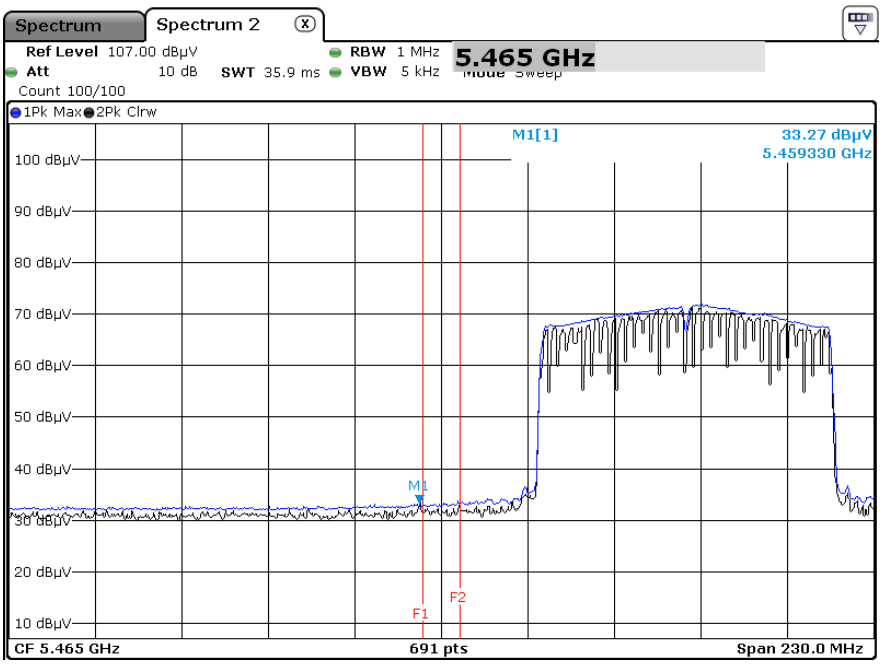
Peak Reading (802.11 ac(VHT40)_MCS0, Ch.102, X-H)



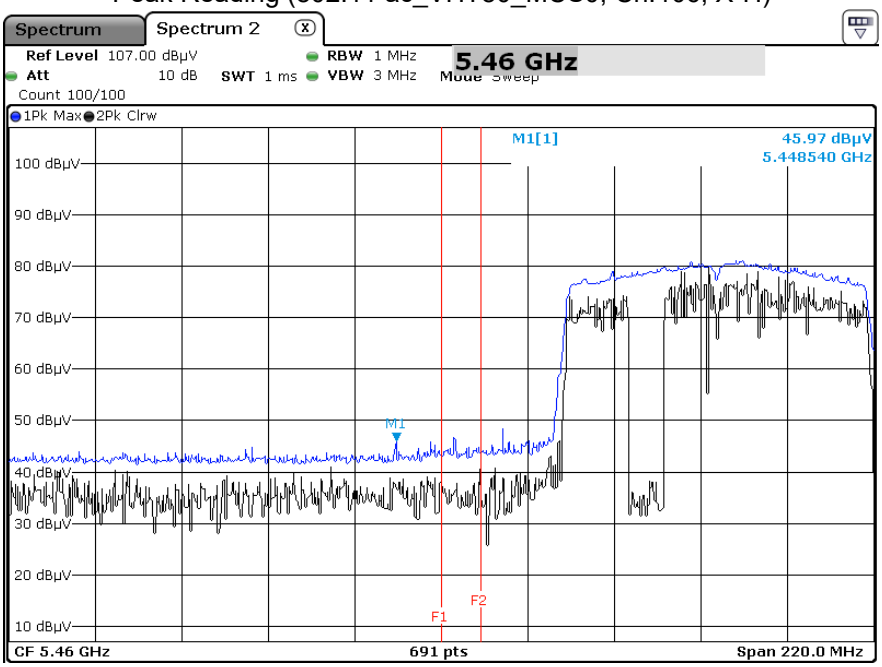
Peak Reading (802.11 ac(VHT40)_MCS0, Ch.102, X-H)



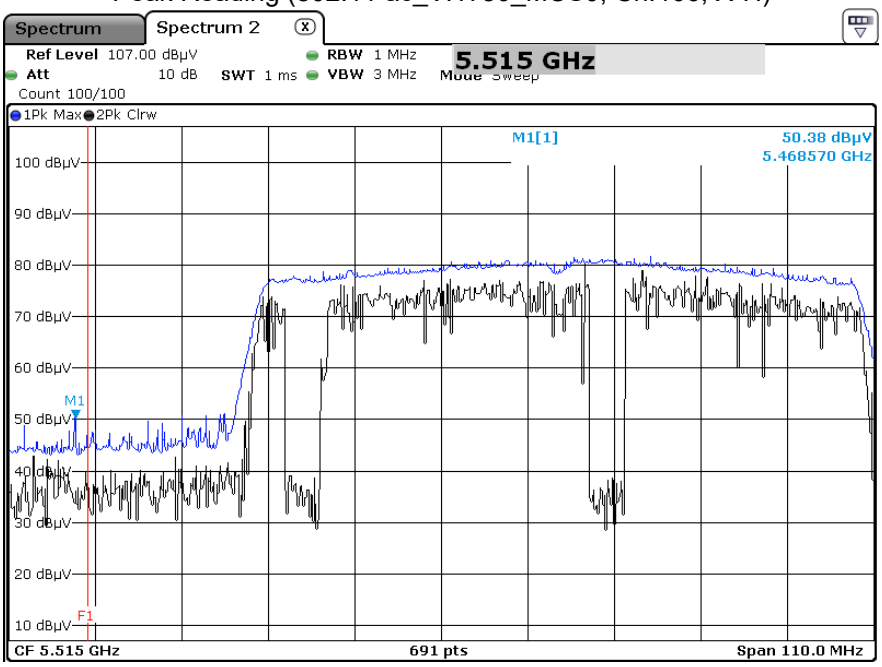
Average Reading (802.11 ac_VHT80_MCS0, Ch.106, X-H)



Peak Reading (802.11 ac_VHT80_MCS0, Ch.106, X-H)



Peak Reading (802.11 ac_VHT80_MCS0, Ch.106, X-H)

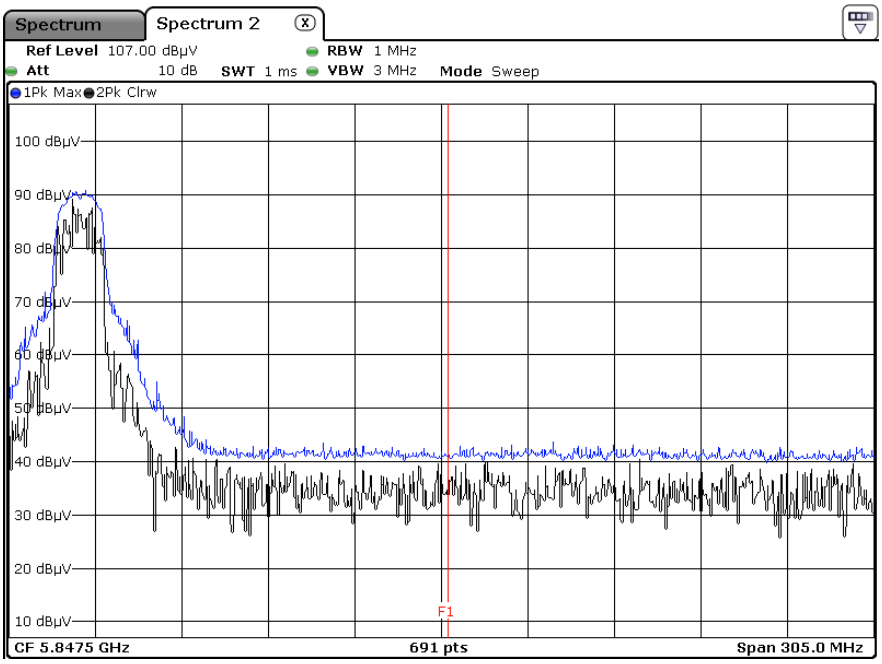


Note:

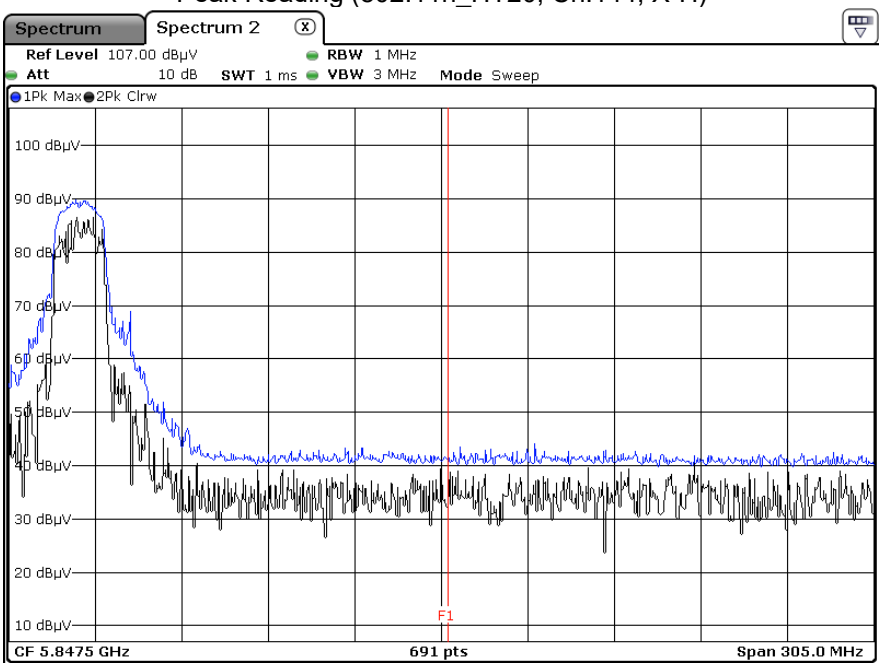
Only the worst case plots for Radiated Restricted Band Edge.

▣ Test Plots(Straddle Channel)

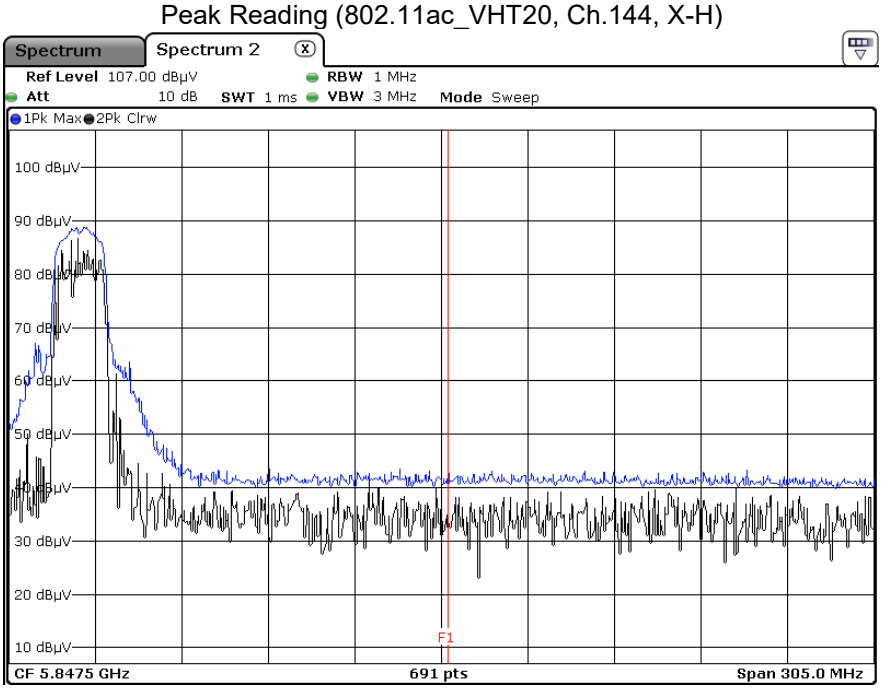
Peak Reading (802.11a, Ch.144, X-H)



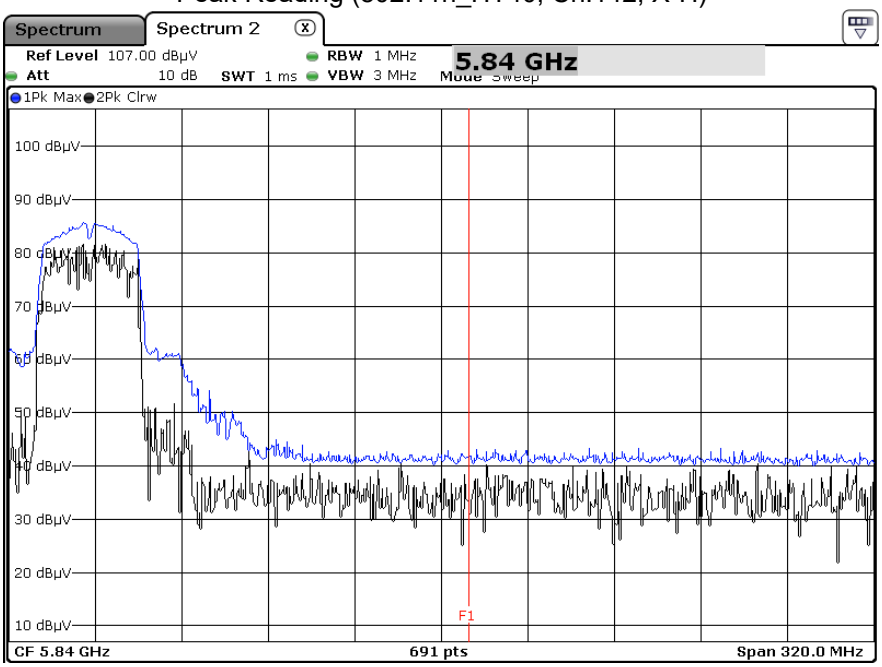
Peak Reading (802.11n_HT20, Ch.144, X-H)



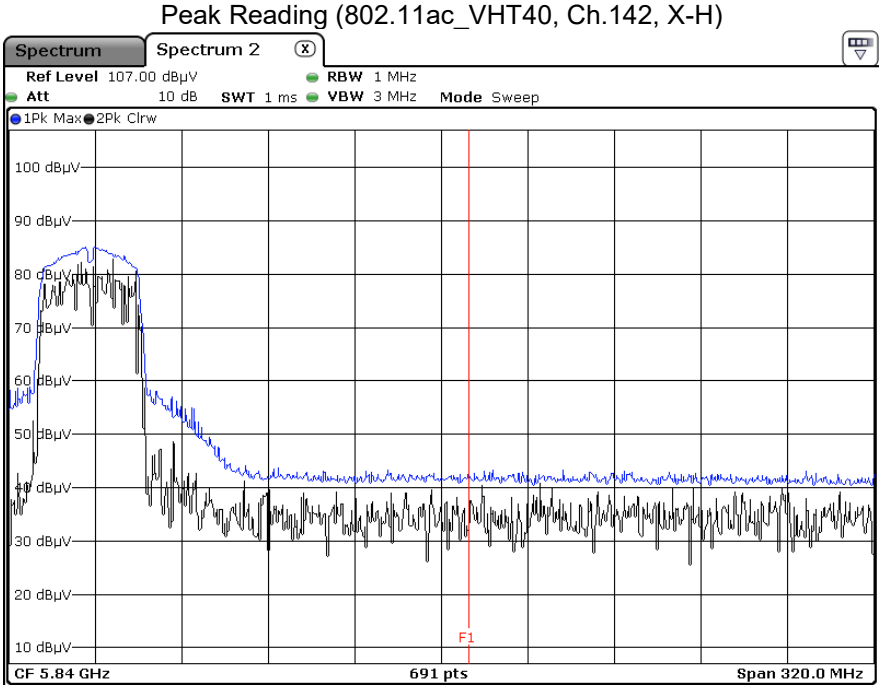
Peak Reading (802.11ac_VHT20, Ch.144, X-H)



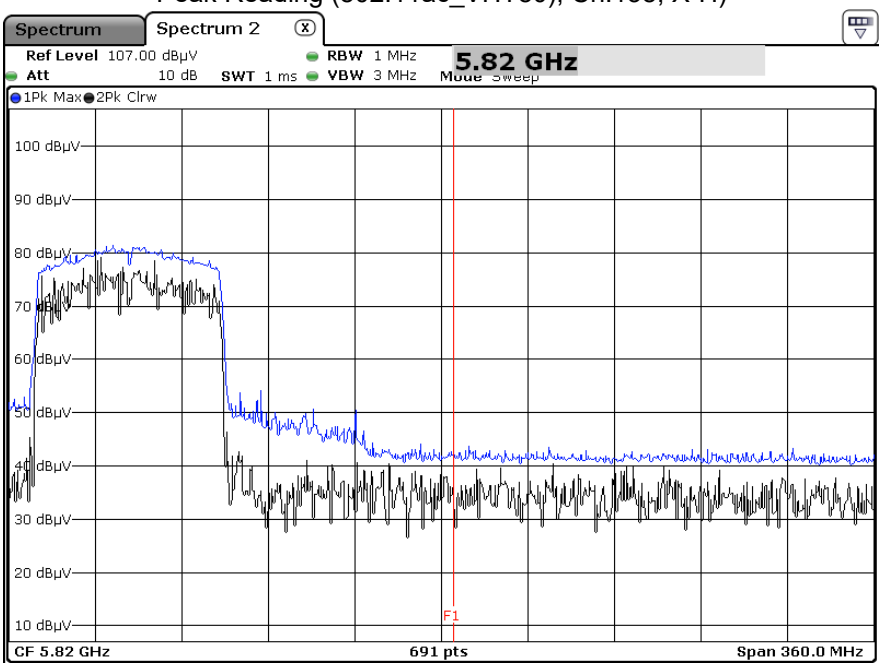
Peak Reading (802.11n_HT40, Ch.142, X-H)



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



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

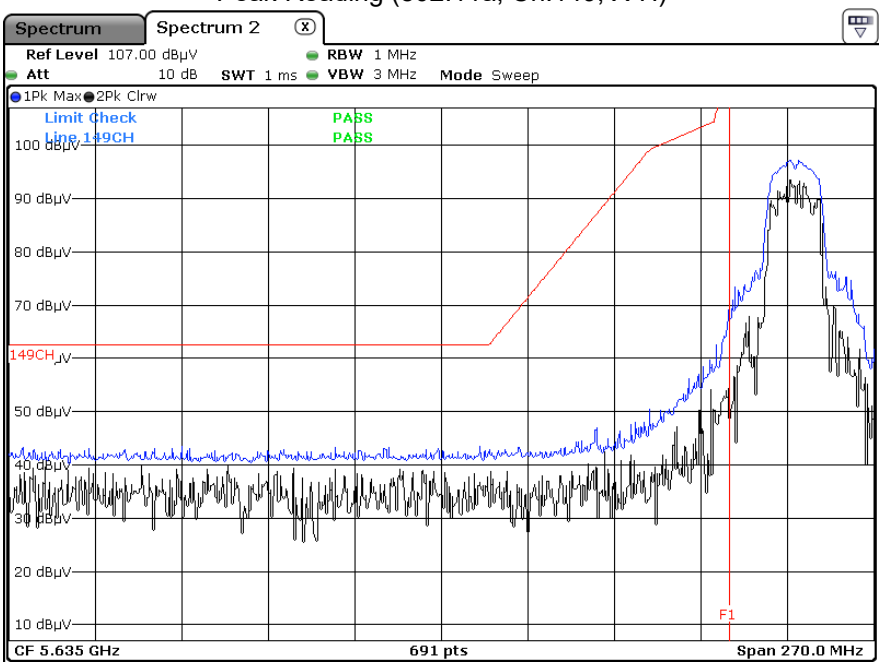


Note :

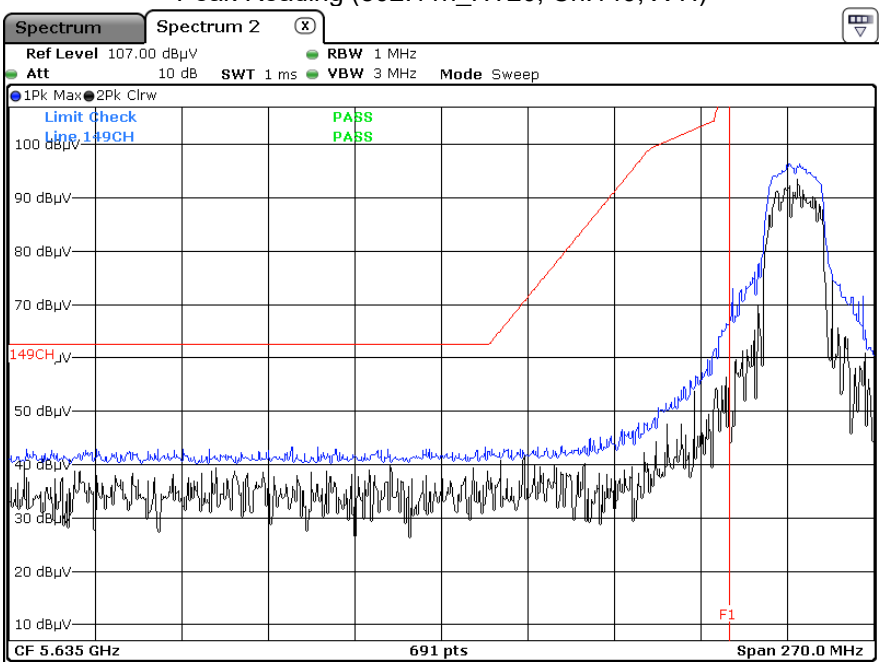
1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5 850 MHz
3. Ambient Noise (Because of ambient noise, We attached only the worst plot without a data table)

▣ Test Plots(UNII 3)

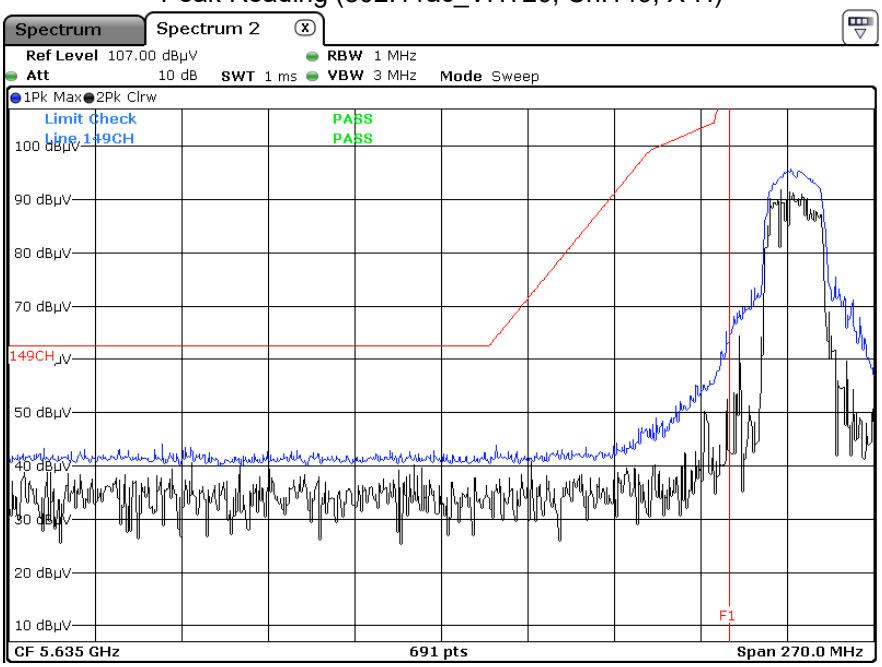
Peak Reading (802.11a, Ch.149, X-H)



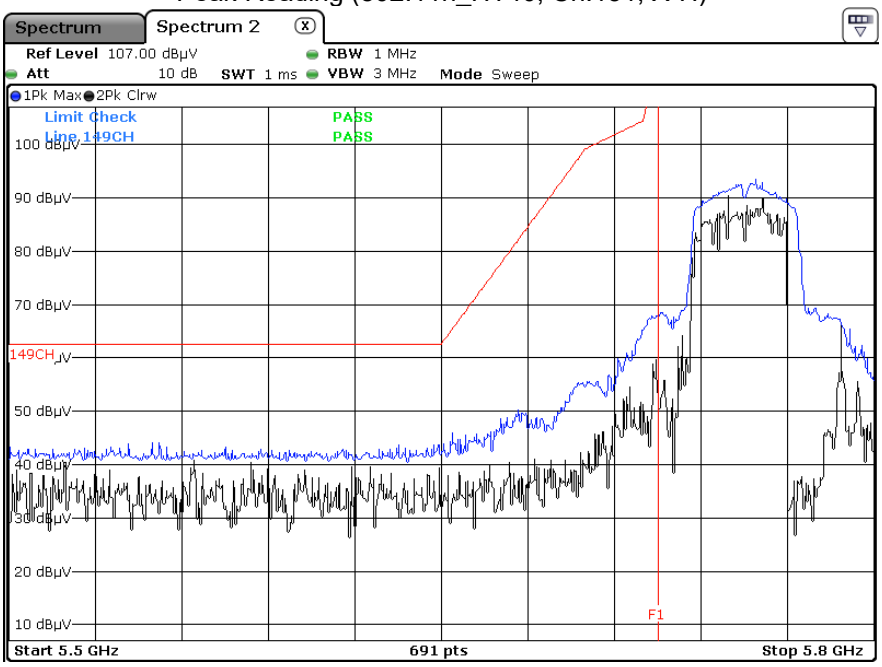
Peak Reading (802.11n_HT20, Ch.149, X-H)



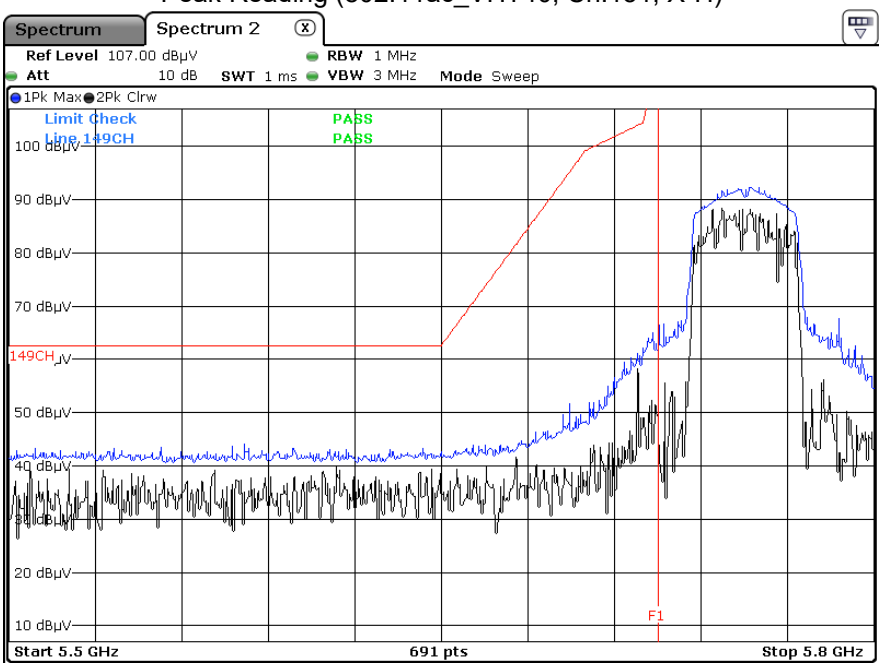
Peak Reading (802.11ac_VHT20, Ch.149, X-H)



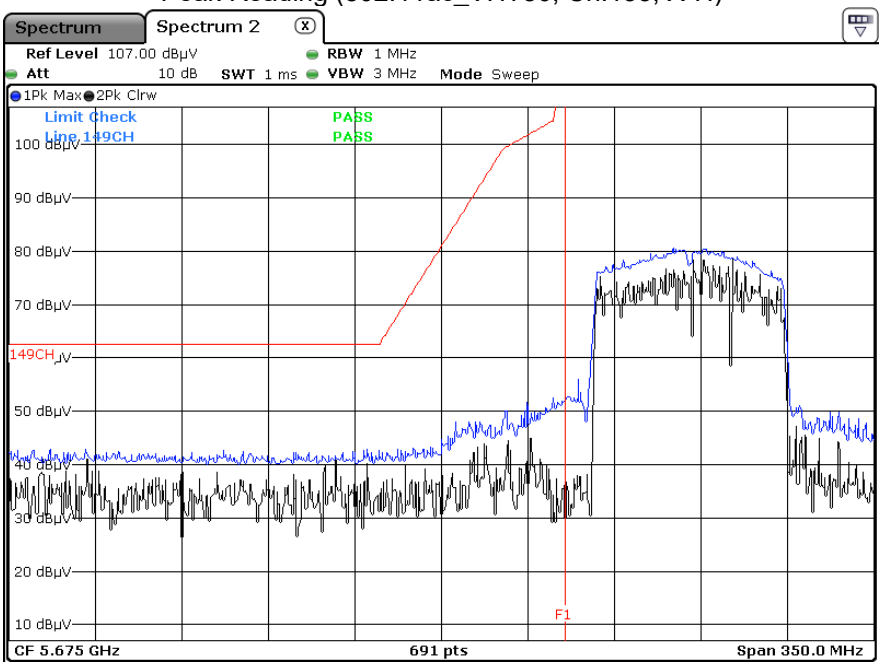
Peak Reading (802.11n_HT40, Ch.151, X-H)



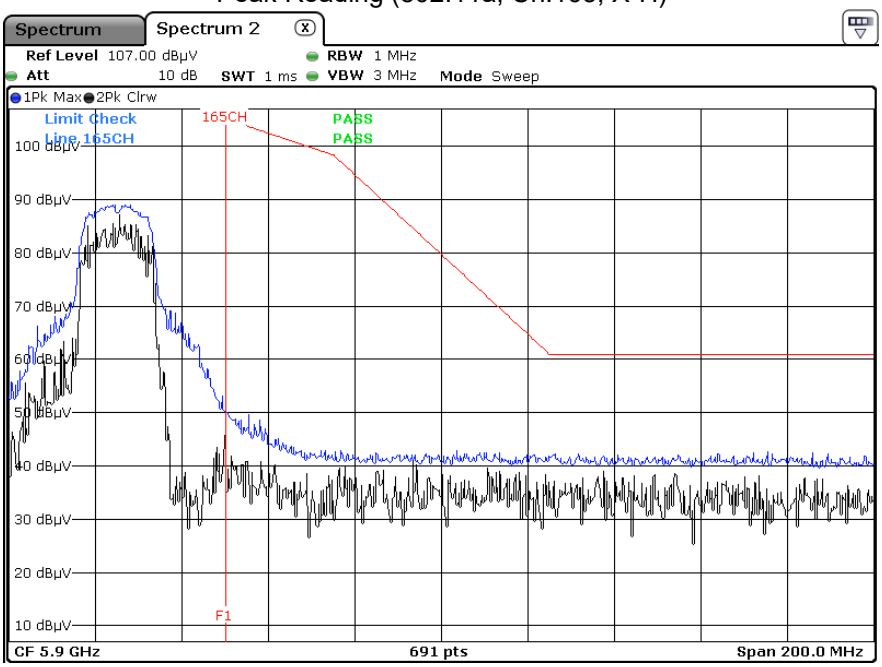
Peak Reading (802.11ac_VHT40, Ch.151, X-H)



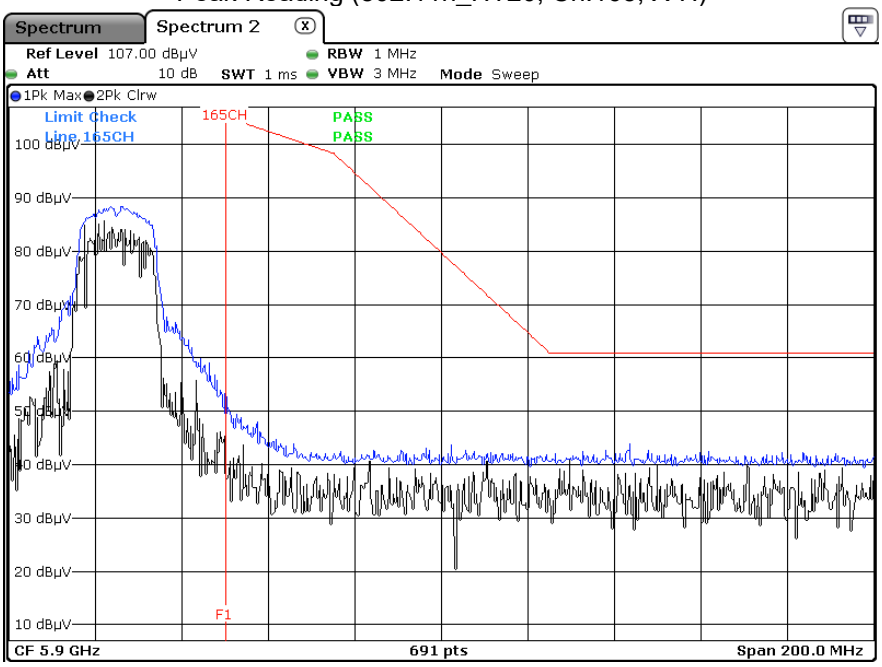
Peak Reading (802.11ac_VHT80, Ch.155, X-H)



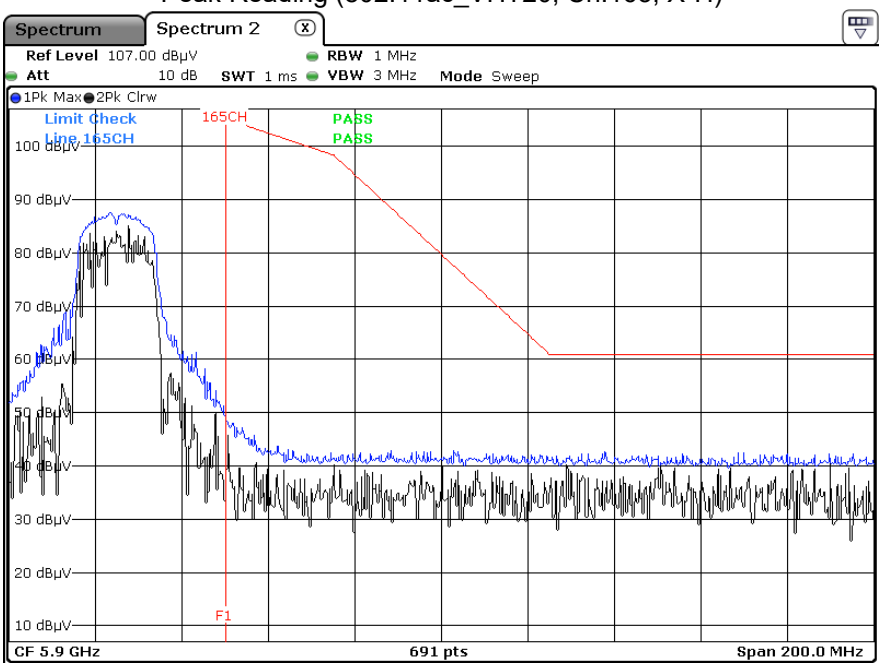
Peak Reading (802.11a, Ch.165, X-H)



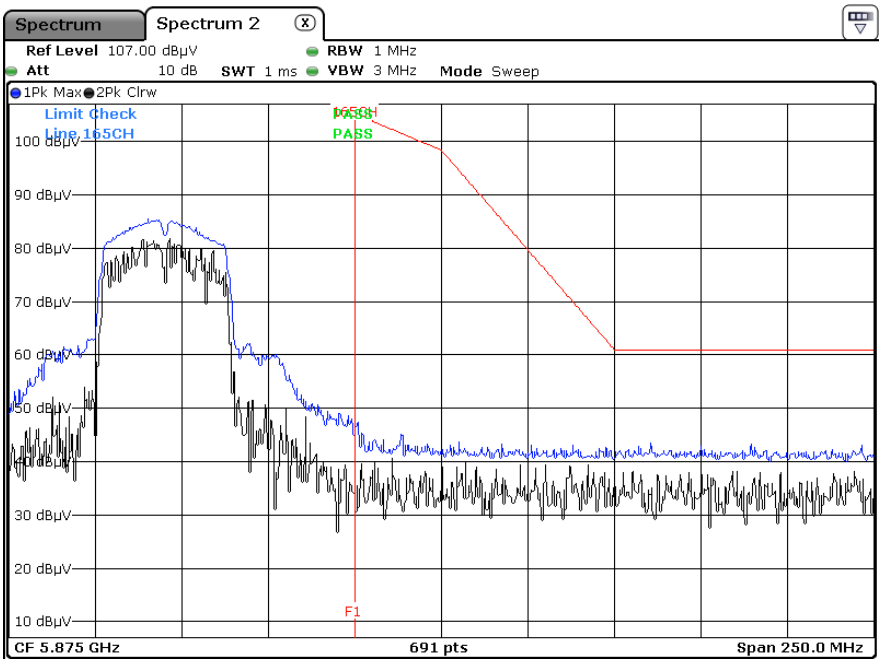
Peak Reading (802.11n_HT20, Ch.165, X-H)



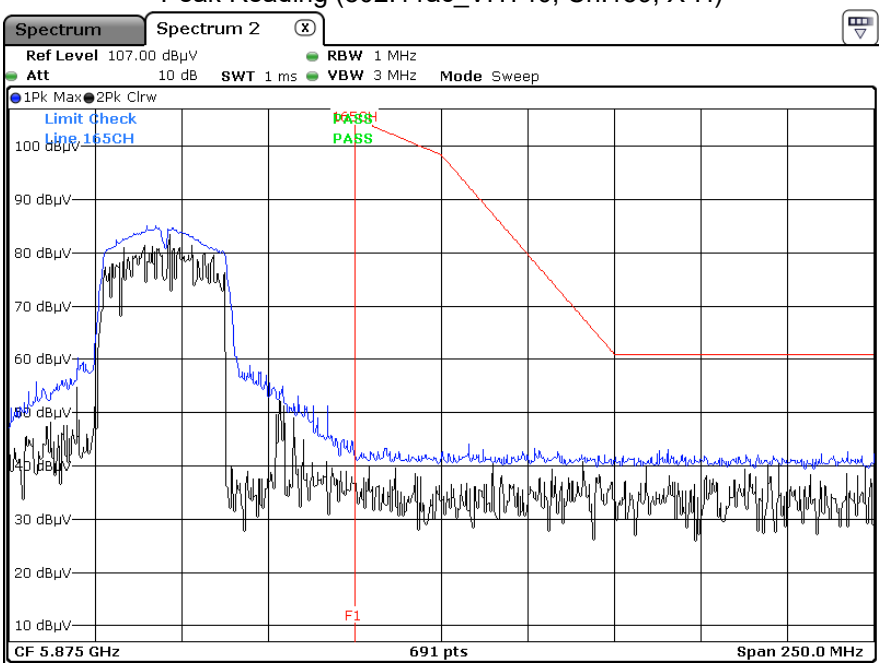
Peak Reading (802.11ac_VHT20, Ch.165, X-H)



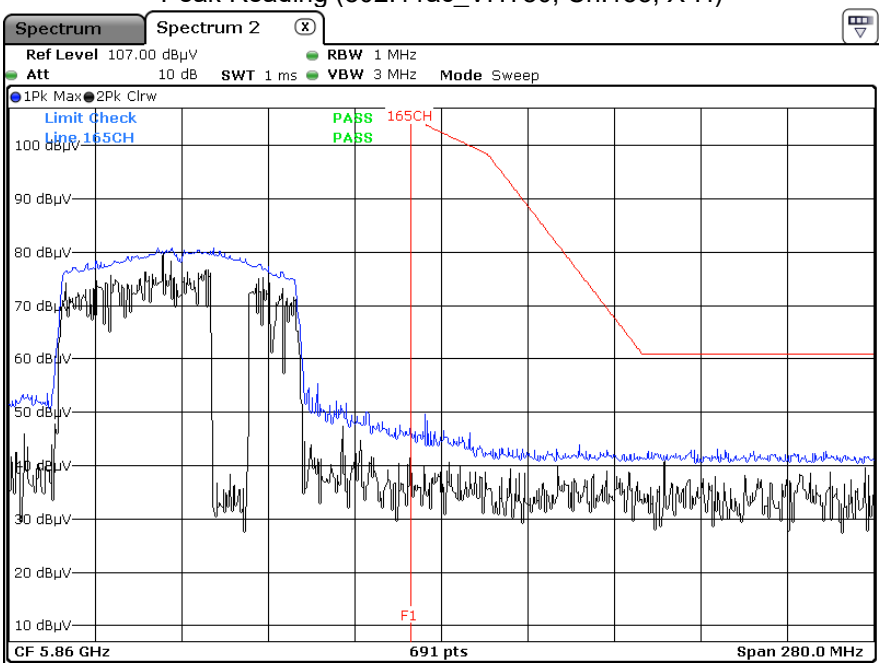
Peak Reading (802.11n_HT40, Ch.159, X-H)



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)

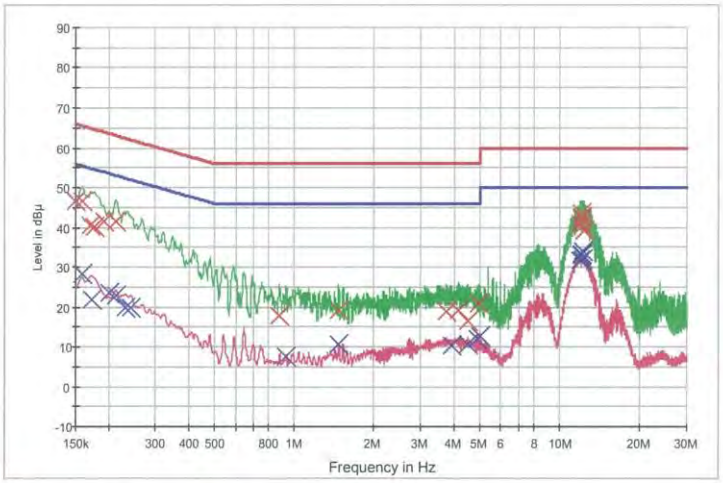
Test 1 / 2

HCT TEST Report

Common Information

EUT:	SCG08
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN 5G_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	46.5	9.000	Off	L1	9.8	19.5	66.0
0.159000	46.7	9.000	Off	L1	9.8	18.9	65.5
0.170250	40.4	9.000	Off	L1	9.8	24.6	64.9
0.177000	40.2	9.000	Off	L1	9.8	24.4	64.6
0.192750	41.7	9.000	Off	L1	9.8	22.3	63.9
0.213000	41.4	9.000	Off	L1	9.8	21.7	63.1
0.878000	17.7	9.000	Off	L1	9.8	38.3	56.0
1.472000	19.3	9.000	Off	L1	9.8	36.7	56.0
3.762500	19.0	9.000	Off	L1	9.9	37.0	56.0
4.149500	19.0	9.000	Off	L1	10.0	37.0	56.0
4.496000	16.5	9.000	Off	L1	10.0	39.5	56.0
4.948250	20.8	9.000	Off	L1	10.0	35.2	56.0
11.927750	40.8	9.000	Off	L1	10.3	19.2	60.0
12.013250	42.5	9.000	Off	L1	10.3	17.5	60.0
12.017750	42.4	9.000	Off	L1	10.3	17.6	60.0
12.069500	43.5	9.000	Off	L1	10.3	16.5	60.0
12.220250	40.4	9.000	Off	L1	10.3	19.6	60.0
12.272000	39.2	9.000	Off	L1	10.3	20.8	60.0

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Test 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.159000	28.4	9.000	Off	L1	9.8	27.1	55.5
0.172500	21.9	9.000	Off	L1	9.8	33.0	54.8
0.201750	23.7	9.000	Off	L1	9.8	29.9	53.5
0.213000	22.9	9.000	Off	L1	9.8	30.2	53.1
0.231000	19.7	9.000	Off	L1	9.8	32.7	52.4
0.242250	19.9	9.000	Off	L1	9.8	32.2	52.0
0.934250	7.7	9.000	Off	L1	9.8	38.3	46.0
1.472000	10.7	9.000	Off	L1	9.8	35.3	46.0
3.913250	10.4	9.000	Off	L1	9.9	35.6	46.0
4.496000	10.6	9.000	Off	L1	10.0	35.4	46.0
4.898750	12.1	9.000	Off	L1	10.0	33.9	46.0
5.004500	12.7	9.000	Off	L1	10.0	37.3	50.0
11.930000	31.7	9.000	Off	L1	10.3	18.3	50.0
11.979500	31.6	9.000	Off	L1	10.3	18.4	50.0
12.015500	32.9	9.000	Off	L1	10.3	17.1	50.0
12.069500	33.3	9.000	Off	L1	10.3	16.7	50.0
12.123500	34.1	9.000	Off	L1	10.3	15.9	50.0
12.222500	31.9	9.000	Off	L1	10.3	18.1	50.0

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Conducted Emissions (Line 2)

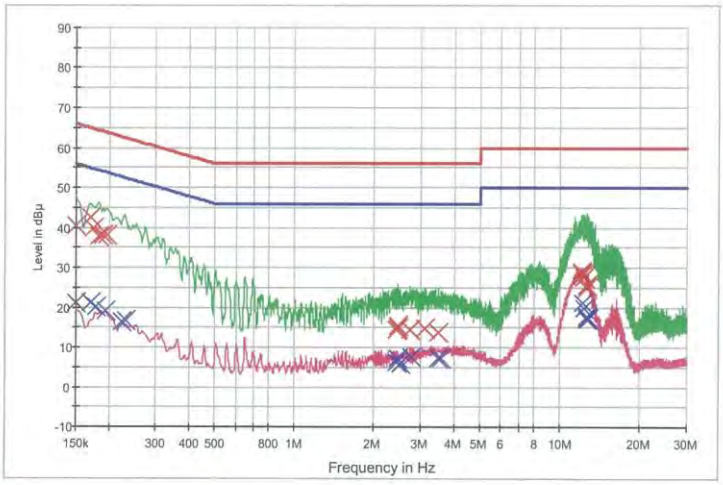
Test 1 / 2

HCT TEST Report

Common Information

EUT:	SCG08
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN 5G_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	40.4	9.000	Off	N	9.8	25.6	66.0
0.170250	42.4	9.000	Off	N	9.8	22.5	64.9
0.174750	39.7	9.000	Off	N	9.8	25.1	64.7
0.183750	37.9	9.000	Off	N	9.8	26.4	64.3
0.190500	38.1	9.000	Off	N	9.8	25.9	64.0
0.197250	38.0	9.000	Off	N	9.8	25.7	63.7
2.417000	14.4	9.000	Off	N	9.9	41.6	56.0
2.464250	14.7	9.000	Off	N	9.9	41.3	56.0
2.468750	15.5	9.000	Off	N	9.9	40.5	56.0
2.718500	14.4	9.000	Off	N	9.9	41.6	56.0
3.116750	14.7	9.000	Off	N	9.9	41.3	56.0
3.479000	13.7	9.000	Off	N	9.9	42.3	56.0
12.044750	28.9	9.000	Off	N	10.3	31.1	60.0
12.092000	28.5	9.000	Off	N	10.3	31.5	60.0
12.251750	28.3	9.000	Off	N	10.3	31.7	60.0
12.301250	27.6	9.000	Off	N	10.3	32.4	60.0
12.575750	24.9	9.000	Off	N	10.4	35.1	60.0
12.625250	25.7	9.000	Off	N	10.4	34.3	60.0

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Test 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	21.0	9.000	Off	N	9.8	35.0	56.0
0.170250	21.3	9.000	Off	N	9.8	33.6	54.9
0.179250	20.3	9.000	Off	N	9.8	34.2	54.5
0.195000	19.2	9.000	Off	N	9.8	34.6	53.8
0.224250	16.5	9.000	Off	N	9.8	36.2	52.7
0.231000	16.8	9.000	Off	N	9.8	35.6	52.4
2.417000	6.4	9.000	Off	N	9.9	39.6	46.0
2.466500	7.4	9.000	Off	N	9.9	38.6	46.0
2.513750	6.1	9.000	Off	N	9.9	39.9	46.0
2.772500	7.5	9.000	Off	N	9.9	38.5	46.0
3.476750	7.4	9.000	Off	N	9.9	38.6	46.0
3.580250	7.4	9.000	Off	N	9.9	38.6	46.0
12.141500	21.1	9.000	Off	N	10.3	28.9	50.0
12.301250	19.8	9.000	Off	N	10.3	30.2	50.0
12.573500	17.6	9.000	Off	N	10.4	32.4	50.0
12.623000	17.8	9.000	Off	N	10.4	32.2	50.0
12.674750	17.2	9.000	Off	N	10.4	32.8	50.0
12.796250	17.2	9.000	Off	N	10.4	32.8	50.0

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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
ESPAC	SU-642 /Temperature Chamber	03/18/2020	Annual	0093008124
Agilent	N9030A / Signal Analyzer	01/13/2020	Annual	MY49431210
Rohde & Schwarz	OSP 120 / Power Measurement Set	07/02/2020	Annual	101231
Agilent	N1911A / Power Meter	04/07/2020	Annual	MY45100523
Keysight	N1921A / Power Sensor	06/08/2020	Annual	MY57820067
Agilent	87300B / Directional Coupler	11/10/2020	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	05/25/2020	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/12/2020	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	06/26/2020	Annual	07560
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
Rohde & Schwarz	Loop Antenna	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	04/29/2019	Biennial	9120D-937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	11/29/2019	Biennial	BBHA9170541
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	07/28/2020	Annual	102168
Agilent	N9030A / Signal Analyzer	01/13/2020	Annual	MY49431210
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/21/2020	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/10/2020	Annual	1
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	03/02/2020	Annual	8
Wainwright Instruments	WHKX8-6090-7000-18000-40SS/ High Pass Filter	03/02/2020	Annual	25
Api tech.	18B-03 / Attenuator (3 dB)	03/02/2020	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	03/02/2020	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	03/02/2020	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	03/02/2020	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	12/26/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956

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. Espectially, 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-2012-FC017-P