

# TEST REPORT

FCC UNII Test for DA350GGN  
Certification

**APPLICANT**  
HYUNDAI MOBIS CO., LTD.

**REPORT NO.**  
HCT-RF-2012-FC039

**DATE OF ISSUE**  
December 22, 2020

**Tested by**  
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**TEST  
REPORT**

FCC UNII Test for  
DA350GGGN

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**Additional Model**

DA350GGGG, DA350GGGL, DA350GGGB, DA350GGGP,  
DA351GGGG, DA350GGMG

**Applicant**

**HYUNDAI MOBIS CO., LTD.**

203, Teheran-ro, Gangnam-gu, Seoul, 135-977, South Korea

**Eut Type  
Model Name**

Car Audio System  
DA350GGGN

**FCC ID**

TQA-DA350GGGN

**Modulation type**

GFSK

**FCC Classification**

Unlicensed National Information Infrastructure(NII)

**FCC Rule Part(s)**

Part 15.407

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

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

## REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	December 22, 2020	Initial Release

### 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.

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## 1. GENERAL INFORMATION

### EUT DESCRIPTION

Model	DA350GGGN	
Additional Model	DA350GGGG, DA350GGGL, DA350GGGB, DA350GGGP, DA351GGGG, DA350GGMG	
EUT Type	Car Audio System	
Power Supply	DC 14.4 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 type	Pattern Antenna	
Antenna Peak Gain	UNII 1: -0.61 dBi UNII 2A: -0.18 dBi UNII 2C: -0.77 dBi UNII 3: -0.18 dBi	
Straddle channel	Supported	
TDWR Band	Not Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	November 16, 2020 ~ December 17, 2020	

## 2. MAXIMUM OUTPUT POWER

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

Band	Mode	RF Output Power (dBm)	RF Output Power (W)
U-NII-1	802.11a	7.12	0.005
	802.11n (HT20)	6.82	0.005
	802.11n (HT40)	3.54	0.002
	802.11ac (VHT20)	7.43	0.006
	802.11ac (VHT40)	3.30	0.002
	802.11ac (VHT80)	3.91	0.002
U-NII-2A	802.11a	8.07	0.006
	802.11n (HT20)	7.51	0.006
	802.11n (HT40)	6.50	0.004
	802.11ac (VHT20)	7.59	0.006
	802.11ac (VHT40)	6.41	0.004
	802.11ac (VHT80)	6.93	0.005
U-NII-2C	802.11a	5.77	0.004
	802.11n (HT20)	5.77	0.004
	802.11n (HT40)	5.60	0.004
	802.11ac (VHT20)	5.73	0.004
	802.11ac (VHT40)	5.81	0.004
	802.11ac (VHT80)	5.60	0.004
U-NII-3	802.11a	3.05	0.002
	802.11n (HT20)	3.17	0.002
	802.11n (HT40)	2.65	0.002
	802.11ac (VHT20)	3.33	0.002
	802.11ac (VHT40)	2.74	0.002
	802.11ac (VHT80)	2.72	0.002

### 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. / RSS-Gen issue 5, RSS-247 issue 2.

#### 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 ).

For ISED, test facility was accepted dated February 14, 2019 (CAB identifier: 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 / RSS-Gen (Issue 5) Section 8:

“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.

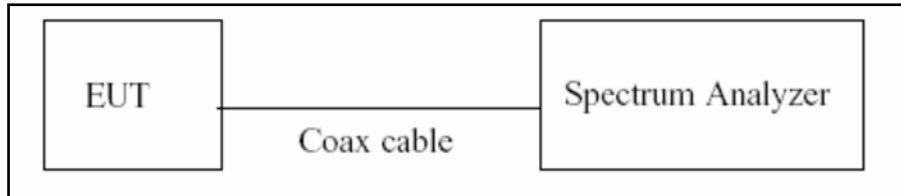
The measurement data shown herein meets or exceeds the  $U_{CISPR}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance

Parameter	Expanded Uncertainty ( $\pm$ 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.

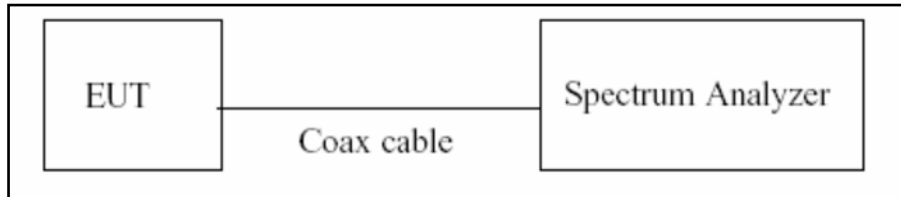
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ( $\geq$  RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure  $T_{total}$  and  $T_{on}$
8. Calculate Duty Cycle =  $T_{on} / T_{total}$  and Duty Cycle Factor =  $10\log(1/Duty\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

## 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  $\geq$  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 level 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.

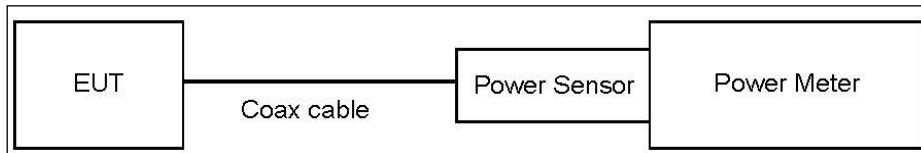
### 8.3. Output Power Measurement

#### Limit

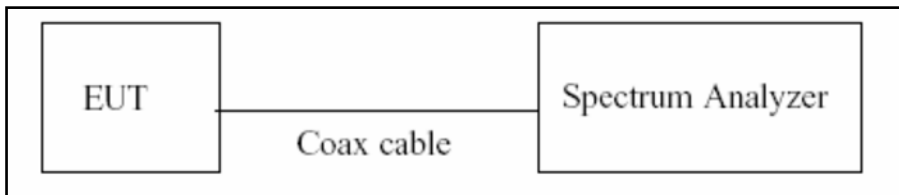
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

#### 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  $10\log(1/x)$ , where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

**Sample Calculation**

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

**Note**

1. Spectrum reading values are not plot data.

The power results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Spectrum offset = Attenuator loss(20 dB) + Cable loss + EUT Cable loss

3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	21.98
UNII 2A	21.98
UNII 2C	21.98
UNII 3	21.98

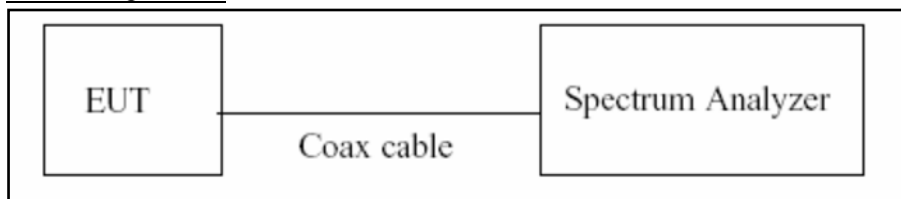
(Actual value of loss for the attenuator and cable combination)

### 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  $\geq$  3 MHz
4. Number of points in sweep  $\geq$  2 x span/RBW.
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to "free run".
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add  $10 \log(1/x)$ , where x is the duty cycle, to the peak of the spectrum.

**Sample Calculation**

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

**Note**

1. Spectrum reading values are not plot data.

The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Spectrum offset = Attenuator loss(20 dB) + Cable loss + EUT Cable loss

3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	21.98
UNII 2A	21.98
UNII 2C	21.98
UNII 3	21.98

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

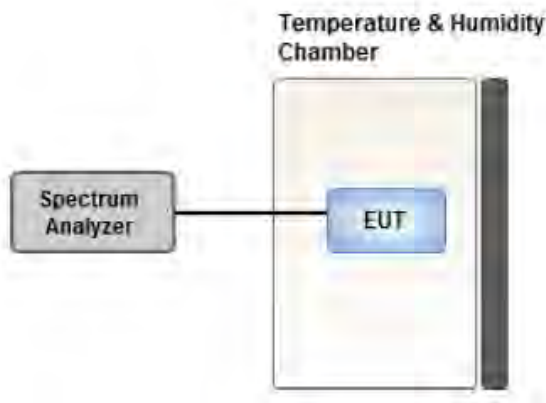


## 8.5. Frequency Stability

### 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 °C and 50 °C.
2. The temperature was incremented by 10 °C 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 battery 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  $\mu$ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56 <sup>(a)</sup>	56 to 46 <sup>(a)</sup>
0.50 to 5	56	46
5 to 30	60	50

<sup>(a)</sup>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

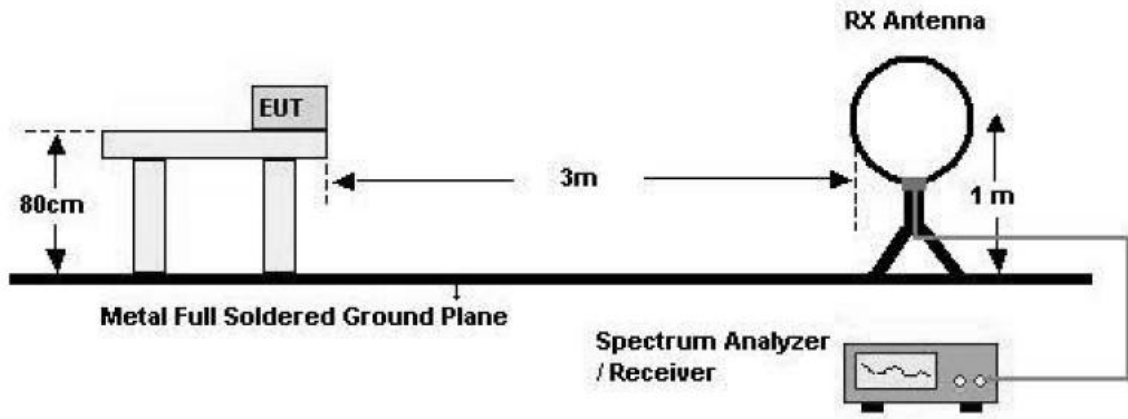
#### Limit

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.

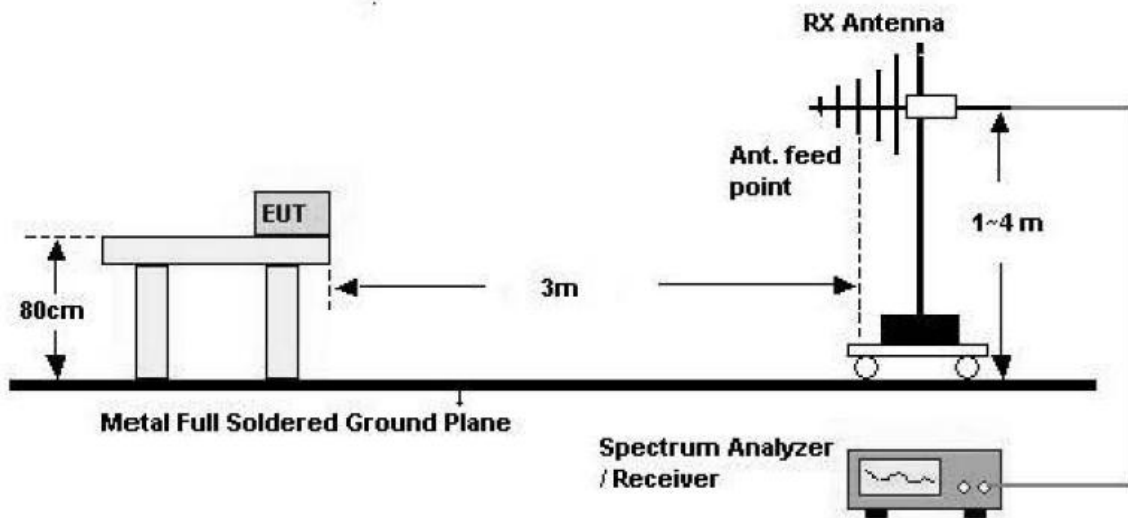
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

### Test Configuration

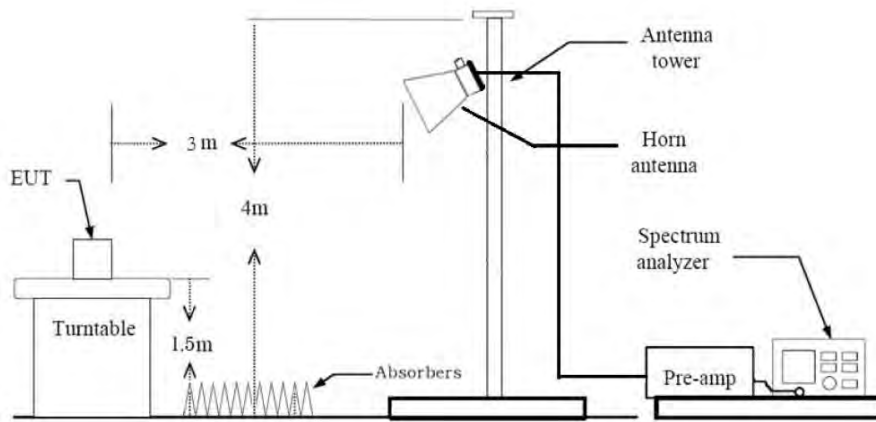
Below 30 MHz



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) =  $40\log(3\text{ m}/300\text{ m}) = - 80\text{ dB}$   
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) =  $40\log(3\text{ m}/30\text{ m}) = - 40\text{ dB}$   
Measurement Distance : 3 m
8. Spectrum Setting
  - Frequency Range = 9 kHz ~ 30 MHz
  - Detector = Peak
  - Trace = Maxhold
  - RBW = 9 kHz
  - VBW  $\geq 3 \times$  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  $\geq$  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  $\geq$  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.c in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW  $\geq$  3 MHz
- The analyzer is set to linear detector mode.
- Averaging type = power (*i.e.*, RMS)
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

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 =  $20\log(\text{test distance} / \text{specific distance})$  (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  $\geq$  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.c in KDB 789033 v02r01):
    - RBW = 1 MHz
    - VBW  $\geq$  3 MHz
    - The analyzer is set to linear detector mode.
    - Averaging type = power (*i.e.*, RMS)
    - Sweep time = auto.
    - Trace mode = average (at least 100 traces).
    - If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.



9. Measured Frequency Range :

- 4500MHz ~ 5150MHz
- 5350MHz ~ 5460MHz
- 5460MHz ~ 5470MHz
- (75 MHz or more below the 5725MHz) ~ 5725MHz
- 5850MHz ~ (75 MHz or more above the 5850MHz)

10. Distance extrapolation factor =  $20\log(\text{test distance} / \text{specific distance})$  (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	0.954	0.205	1000
802.11n(HT20)	MCS 0	0.950	0.223	1000
802.11n(HT40)	MCS 0	0.904	0.438	3000
802.11ac(VHT20)	MCS 0	0.950	0.223	1000
802.11ac(VHT40)	MCS 0	0.906	0.428	3000
802.11ac(VHT80)	MCS 0	0.817	0.876	10000

### 8.8. Receiver Spurious Emissions

Limit

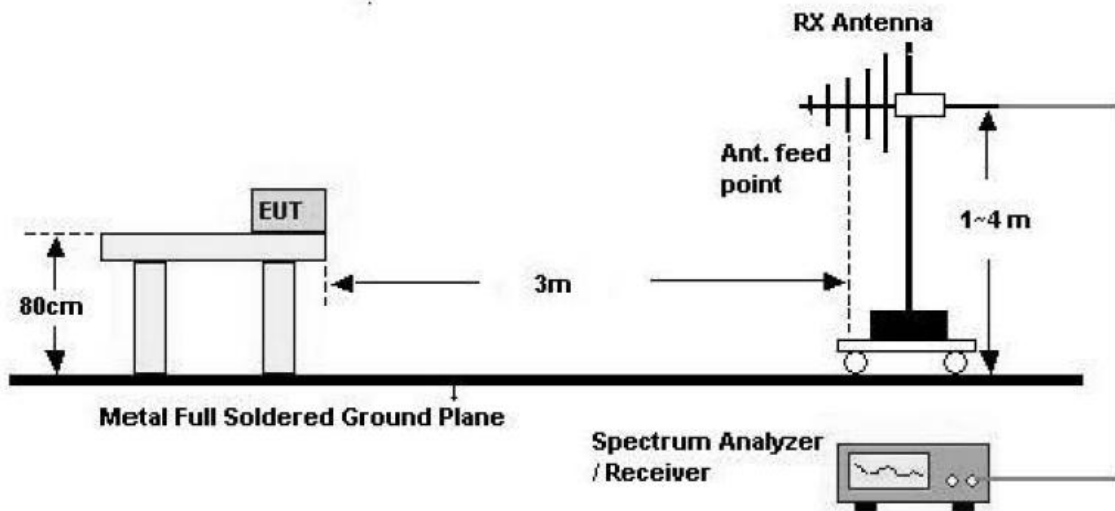
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

Measurements for compliance with the limits in table may be performed at distances other than 3 metres.

## Test Configuration

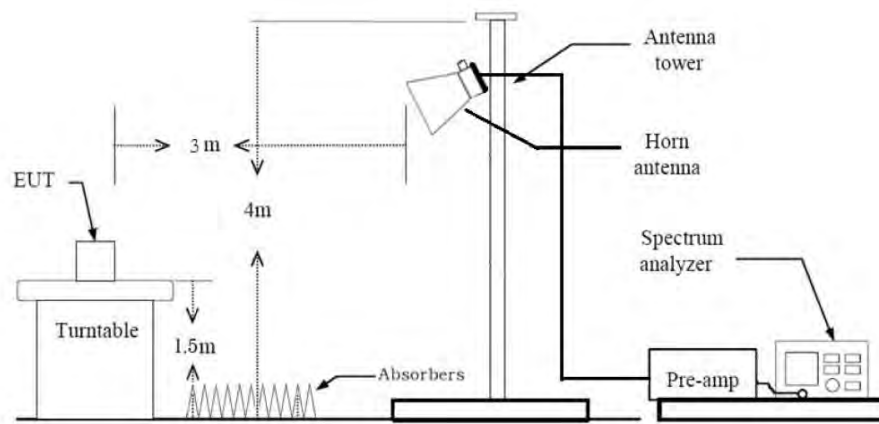
30 MHz - 1 GHz



## Test Procedure of Receiver 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  $\geq$  3 x RBW
  - (2) Measurement Type(Quasi-peak):
    - Measured Frequency Range : 30 MHz – 1 GHz
    - Detector = Quasi-Peak
    - RBW = 120 kHz
7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)

Above 1 GHz



### 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):
    - Measured Frequency Range : 1 GHz – 25 GHz
    - Detector = Peak
    - Trace = Maxhold
    - RBW = 1 MHz
    - VBW  $\geq 3 \times$  RBW
  - (2) Measurement Type(Average):
    - We performed using a reduced video BW method was done with the analyzer in linear mode
    - Measured Frequency Range : 1 GHz – 25 GHz
    - Detector = Peak
    - Trace = Maxhold
    - RBW = 1 MHz
    - VBW  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds

The actual setting value of VBW = 1 kHz

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. Distance extrapolation factor =  $20\log(\text{test distance} / \text{specific distance})$  (dB)

11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

## 8.9. 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 + Shark Antenna
2. EUT Axis
  - Radiated Spurious Emissions : X-H
  - Radiated Restricted Band Edge : X-H
3. All datarate of operation were investigated and the worst case datarate results are reported
  - 802.11a : 6Mbps
  - 802.11n : MCS0
  - 802.11ac : MCS0
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
  - All band of operation were investigated and the worst case band results are reported.
  - Worstcase band : UNII 3
6. DA350GGGN & Additional Models were tested and the worst case results are reported.  
(Worst case : DA350GGGN)

### AC Power line Conducted Emissions

1. We don't perform powerline conducted emission test. Because this EUT is used with vehicle.

### Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported
2. DA350GGGN & Additional Models were tested and the worst case results are reported.  
(Worst case : DA350GGGN)

## 9. SUMMARY OF TEST RESULTS

### FCC Part

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+10 log <sub>10</sub> (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log <sub>10</sub> (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
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 <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	2.063	2.162	0.954	0.205
	9	1.385	1.488	0.931	0.312
	12	1.043	1.147	0.910	0.410
	18	0.706	0.806	0.875	0.578
	24	0.533	0.633	0.842	0.746
	36	0.363	0.466	0.780	1.079
	48	0.275	0.378	0.729	1.374
	54	0.246	0.350	0.704	1.523

Mode	MCS Index	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.924	2.025	0.950	0.223
	1	0.982	1.083	0.906	0.426
	2	0.665	0.766	0.868	0.613
	3	0.508	0.609	0.834	0.786
	4	0.354	0.454	0.780	1.080
	5	0.272	0.374	0.729	1.375
	6	0.247	0.350	0.707	1.505
	7	0.226	0.329	0.688	1.622
802.11n (HT40)	0	0.945	1.045	0.904	0.438
	1	0.494	0.594	0.831	0.803
	2	0.339	0.441	0.769	1.142
	3	0.264	0.365	0.722	1.413
	4	0.188	0.290	0.650	1.873
	5	0.151	0.253	0.597	2.241
	6	0.140	0.241	0.581	2.355
	7	0.128	0.230	0.556	2.553

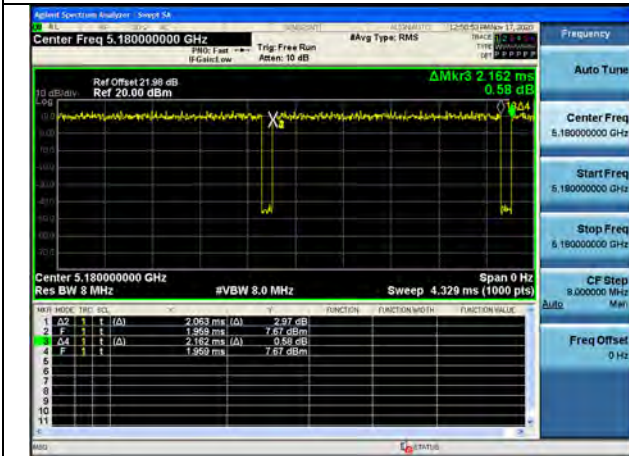


Mode	MCS Index	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.932	2.033	0.950	0.223
	1	0.989	1.090	0.908	0.420
	2	0.673	0.773	0.871	0.600
	3	0.517	0.616	0.838	0.766
	4	0.357	0.457	0.780	1.081
	5	0.282	0.382	0.738	1.317
	6	0.251	0.352	0.714	1.465
	7	0.232	0.334	0.695	1.583
	8	0.199	0.300	0.664	1.778
802.11ac (VHT40)	0	0.955	1.054	0.906	0.428
	1	0.498	0.597	0.833	0.793
	2	0.344	0.446	0.773	1.118
	3	0.268	0.370	0.725	1.396
	4	0.192	0.293	0.656	1.833
	5	0.156	0.257	0.607	2.165
	6	0.143	0.245	0.585	2.329
	7	0.130	0.234	0.558	2.532
	8	0.116	0.217	0.535	2.716
802.11ac (VHT80)	0	0.458	0.561	0.817	0.876
	1	0.251	0.353	0.712	1.475
	2	0.181	0.281	0.642	1.922
	3	0.148	0.250	0.593	2.269
	4	0.111	0.213	0.523	2.819
	5	0.096	0.197	0.487	3.122
	6	0.088	0.189	0.463	3.345
	7	0.084	0.185	0.454	3.429
	8	0.076	0.177	0.429	3.672
	9	0.074	0.174	0.426	3.702

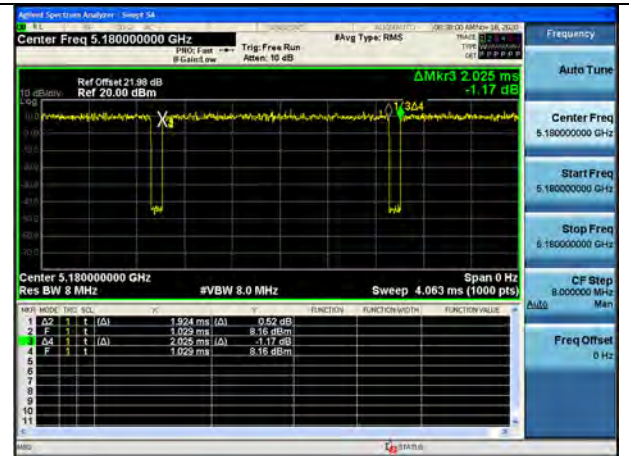
Note:

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

802.11a



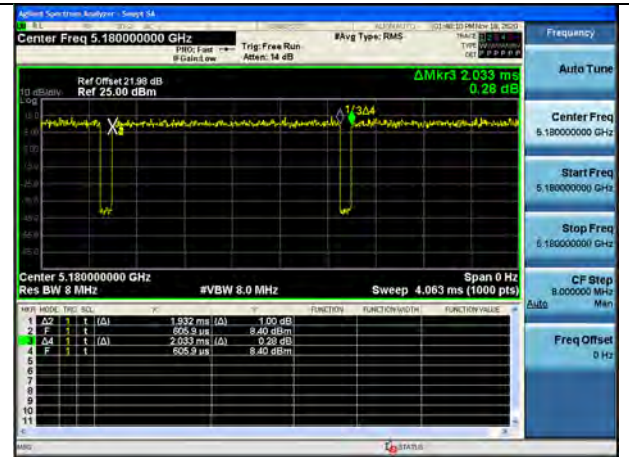
802.11n(HT20)



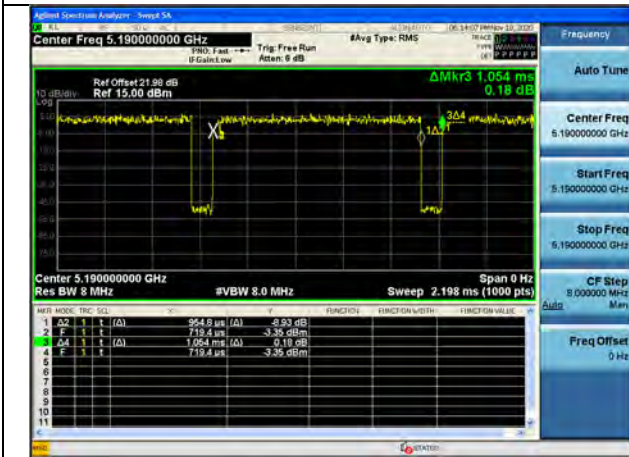
802.11n(HT40)



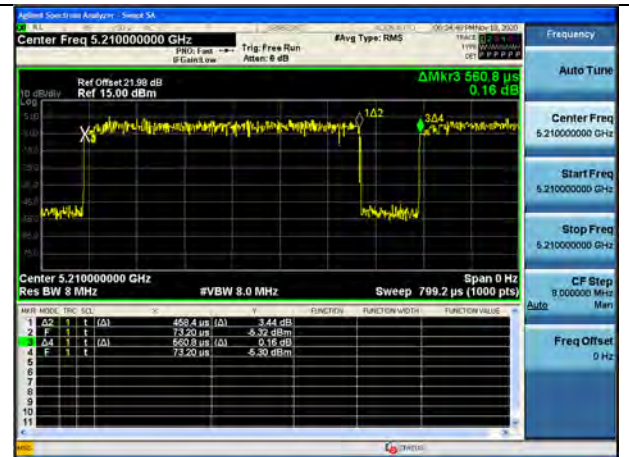
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



## 10.2 26DB 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]
Frequency [MHz]	Channel No.	
5180	36	21.04
5200	40	21.09
5240	48	21.07
5260	52	20.84
5300	60	20.63
5320	64	21.06
5500	100	21.17
5580	116	21.06
5720	144	21.13
5745	149	20.70
5785	157	20.78
5825	165	21.02

802.11n(HT20) Mode		26dB Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5180	36	21.10
5200	40	21.35
5240	48	21.38
5260	52	21.40
5300	60	21.34
5320	64	21.15
5500	100	21.27
5580	116	21.31
5720	144	21.12
5745	149	21.22
5785	157	21.47
5825	165	21.49

802.11n(HT40) Mode		26dB Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5190	38	39.62
5230	46	39.65
5270	54	39.21
5310	62	39.64
5510	102	39.47
5550	110	39.45
5710	142	39.59
5755	151	39.62
5795	159	39.72

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5180	36	21.10
5200	40	21.19
5240	48	21.20
5260	52	21.24
5300	60	21.53
5320	64	21.42
5500	100	21.32
5580	116	21.28
5720	144	21.34
5745	149	21.48
5785	157	21.16
5825	165	21.36

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5190	38	39.68
5230	46	39.56
5270	54	39.42
5310	62	39.64
5510	102	39.59
5550	110	39.71
5710	142	39.48
5755	151	39.50
5795	159	39.66

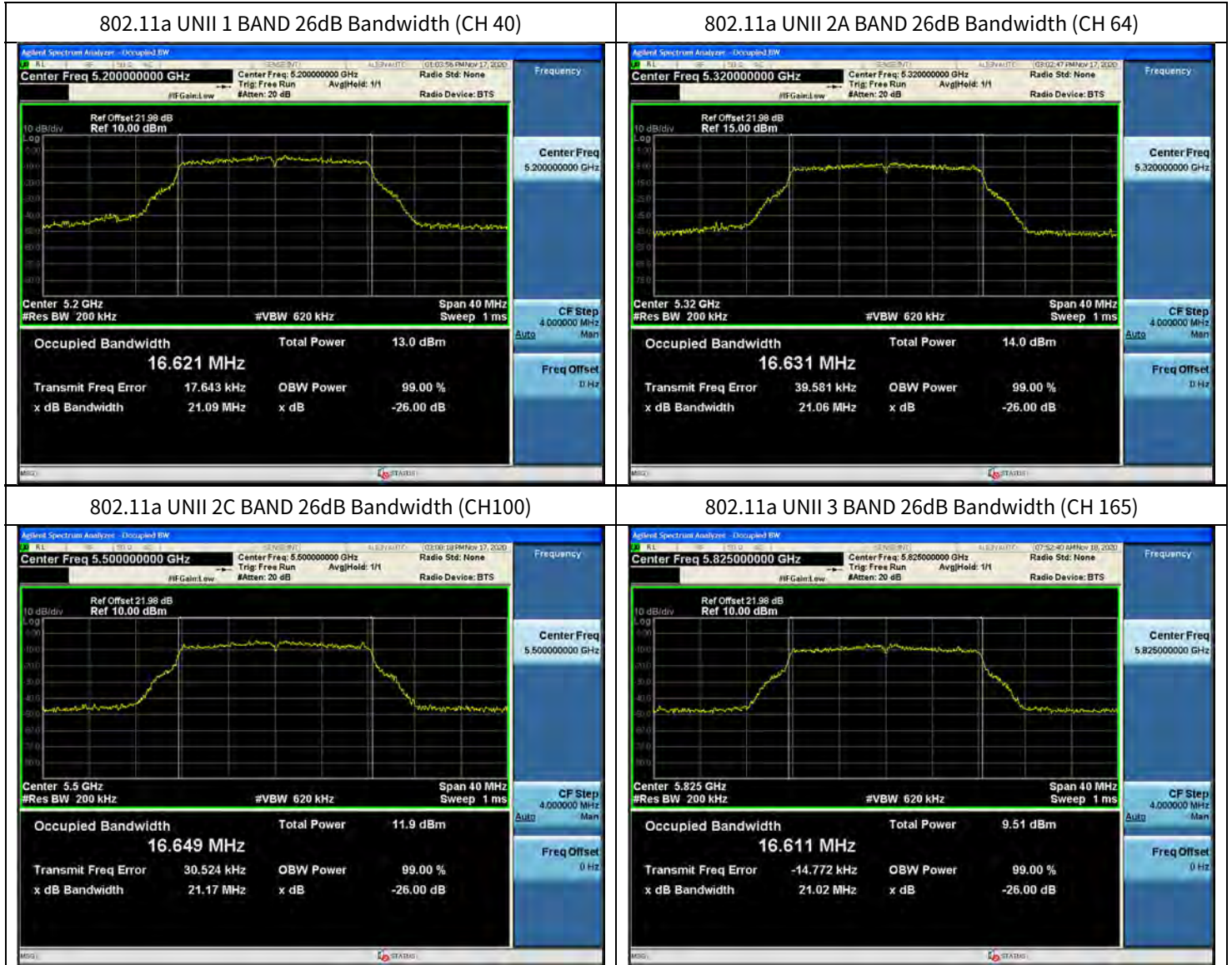
802.11ac(VHT80) Mode		26dB Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5210	42	81.24
5290	58	80.82
5530	106	80.78
5690	138	81.04
5775	155	80.58



▣ Test Plots(802.11a)

Note:

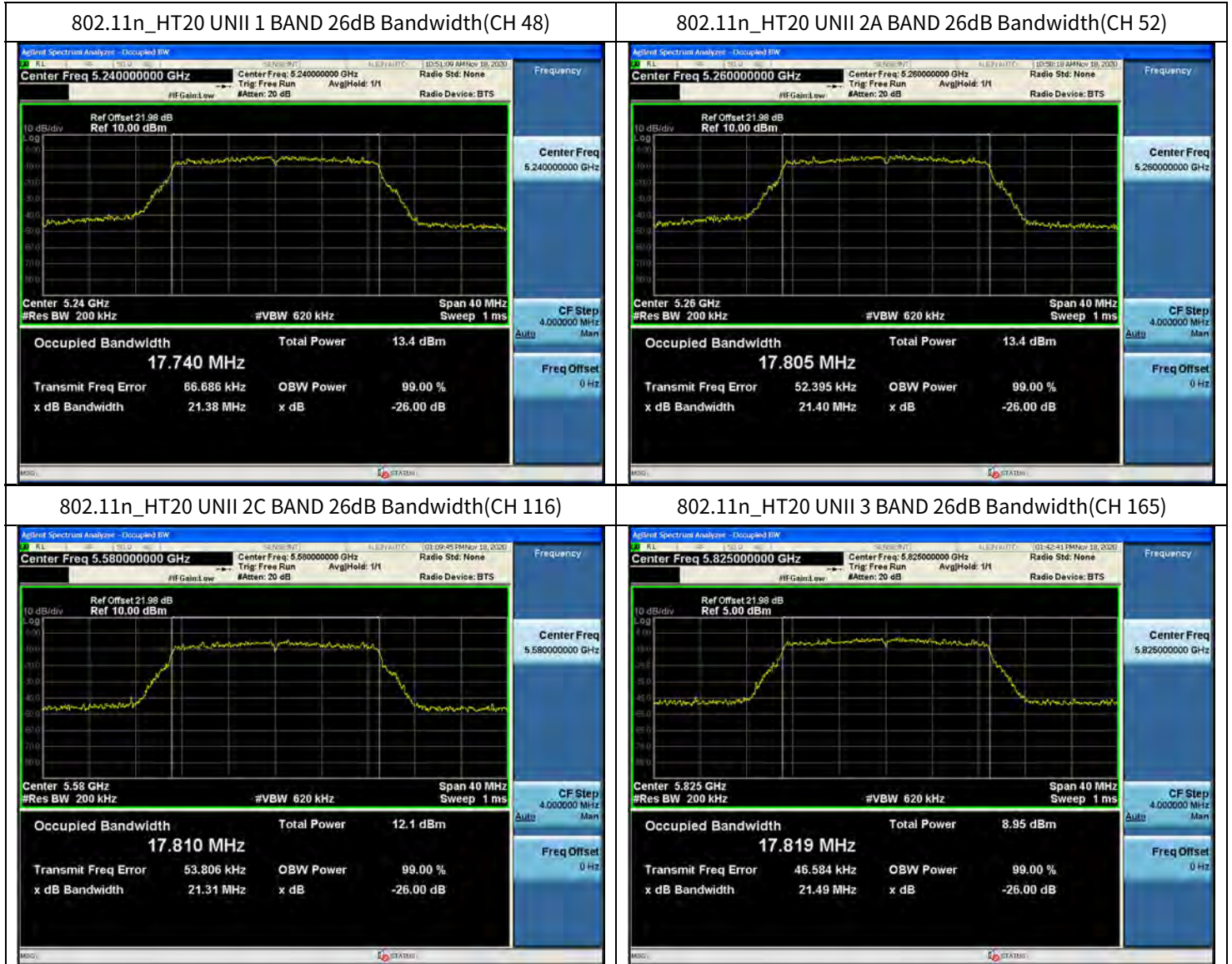
In order to simplify the report, attached plots were only the most wide channel.



▣ Test Plots(802.11n(HT20))

Note:

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

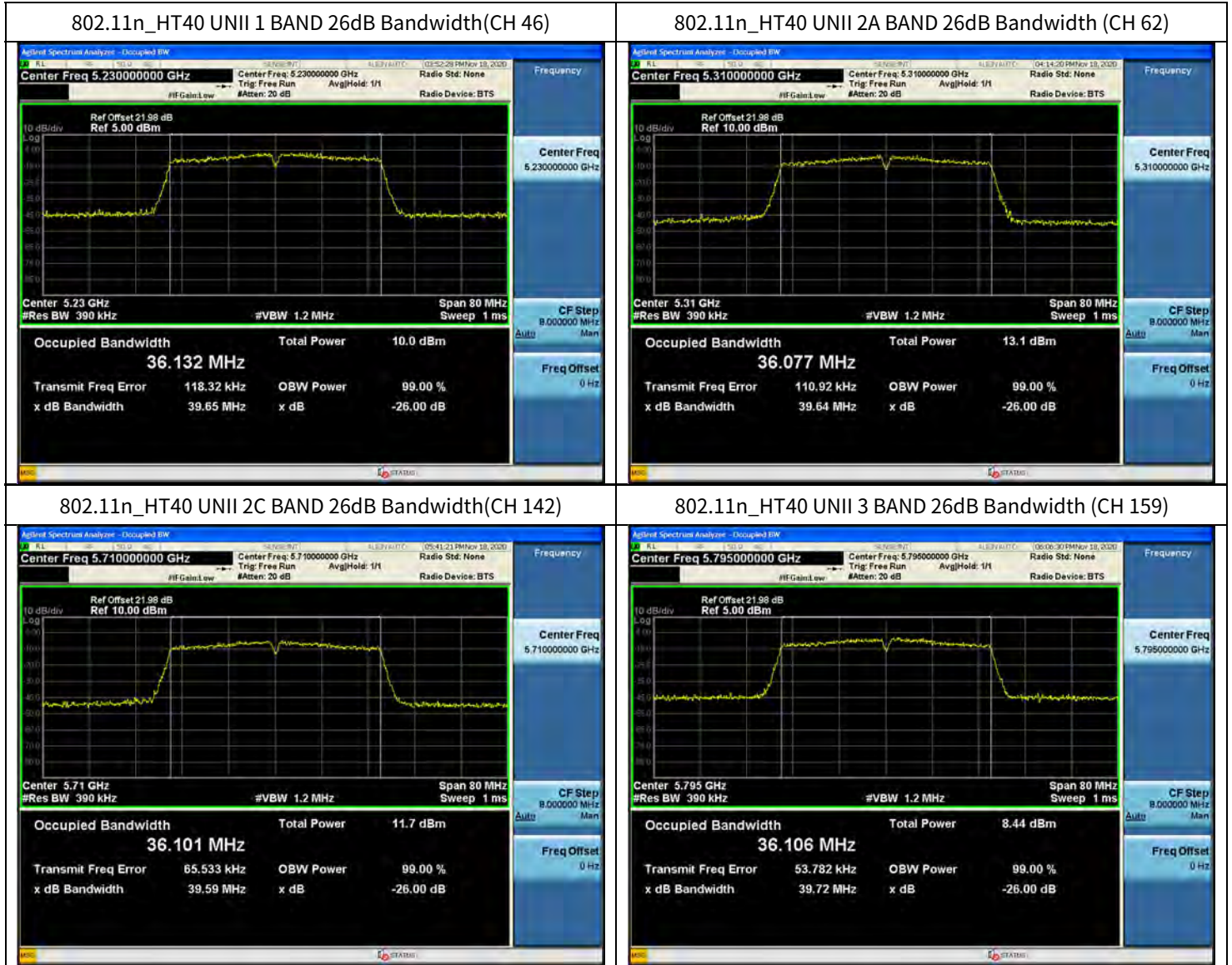




▣ Test Plots(802.11n(HT40))

Note:

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

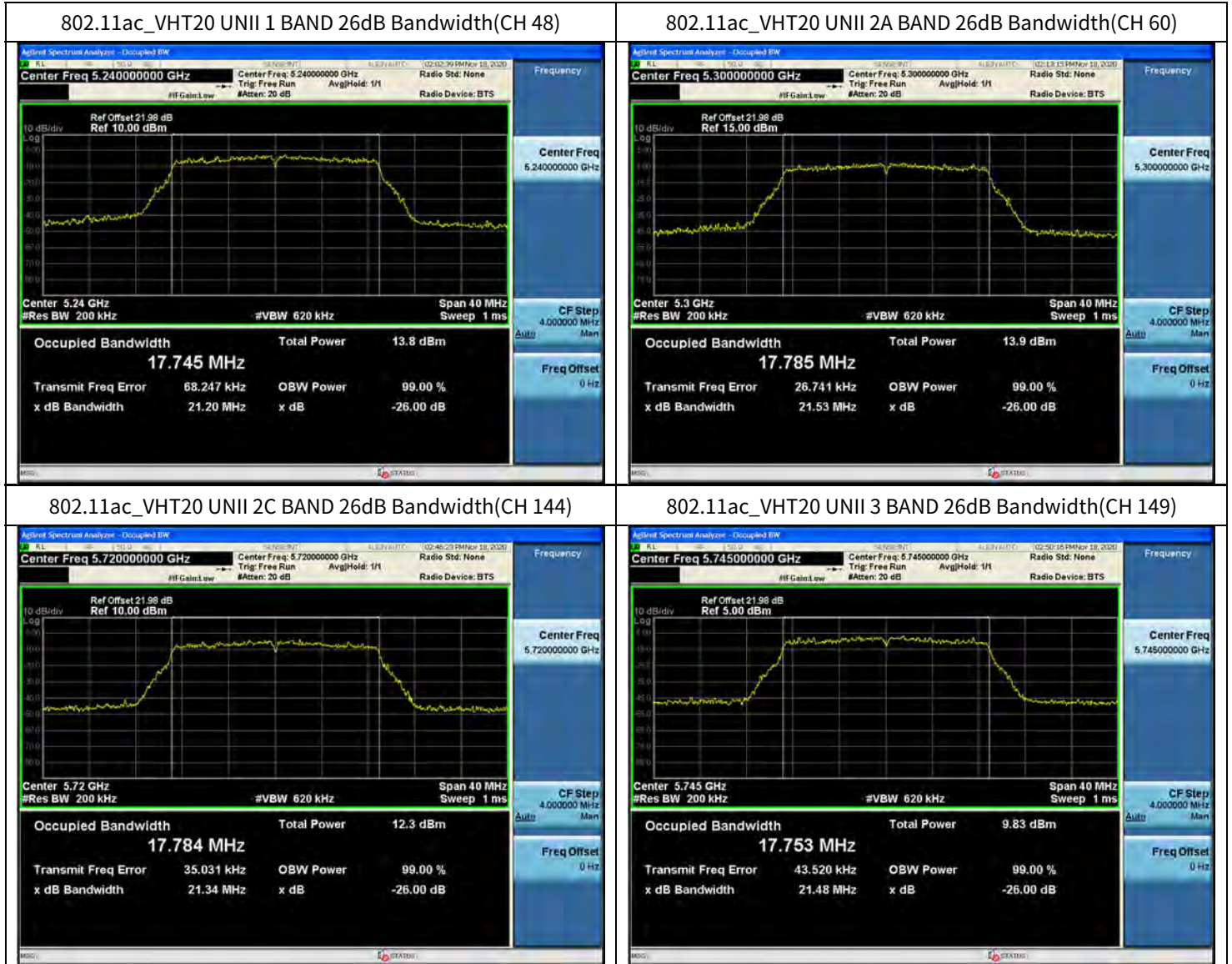




▣ Test Plots(802.11ac(VHT20))

Note:

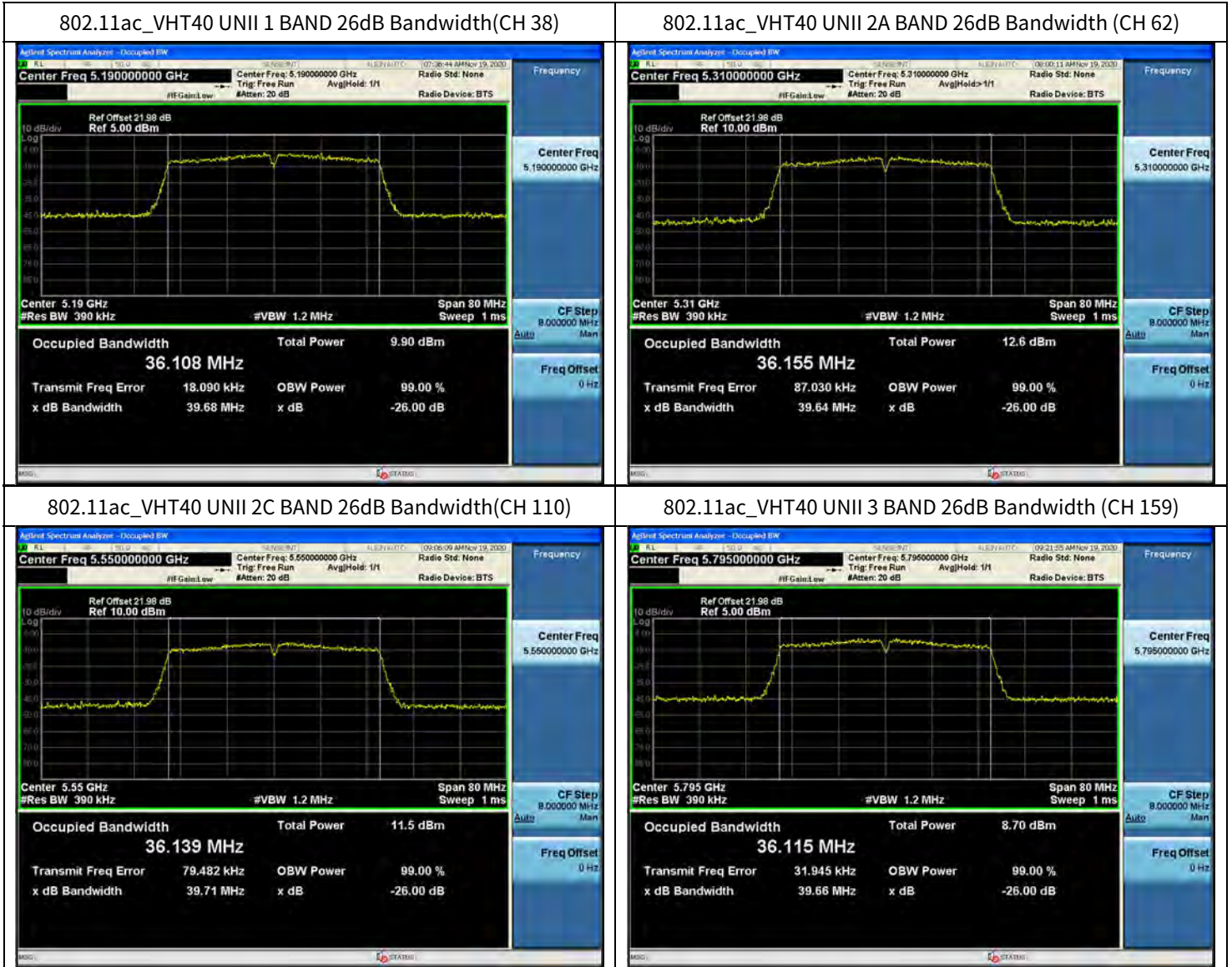
In order to simplify the report, attached plots were only the most wide channel.



▣ Test Plots(802.11ac(VHT40))

Note:

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

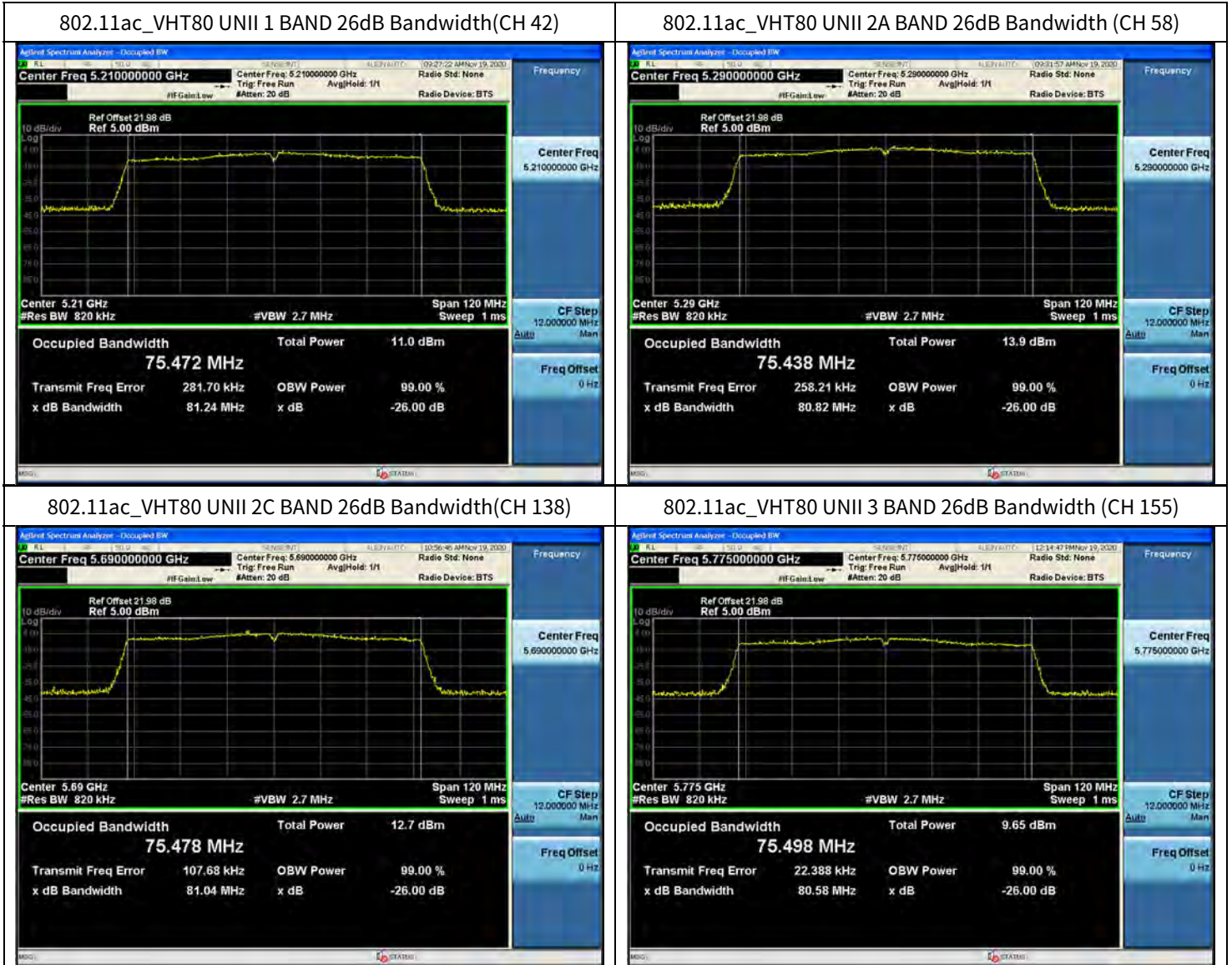




▣ Test Plots(802.11ac(VHT80))

Note:

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



### 10.2 6DB BANDWIDTH

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.37	> 0.5	Pass
5785	157	16.37	> 0.5	Pass
5825	165	16.36	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.44	> 0.5	Pass
5785	157	17.62	> 0.5	Pass
5825	165	17.61	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.61	> 0.5	Pass
5795	159	35.51	> 0.5	Pass

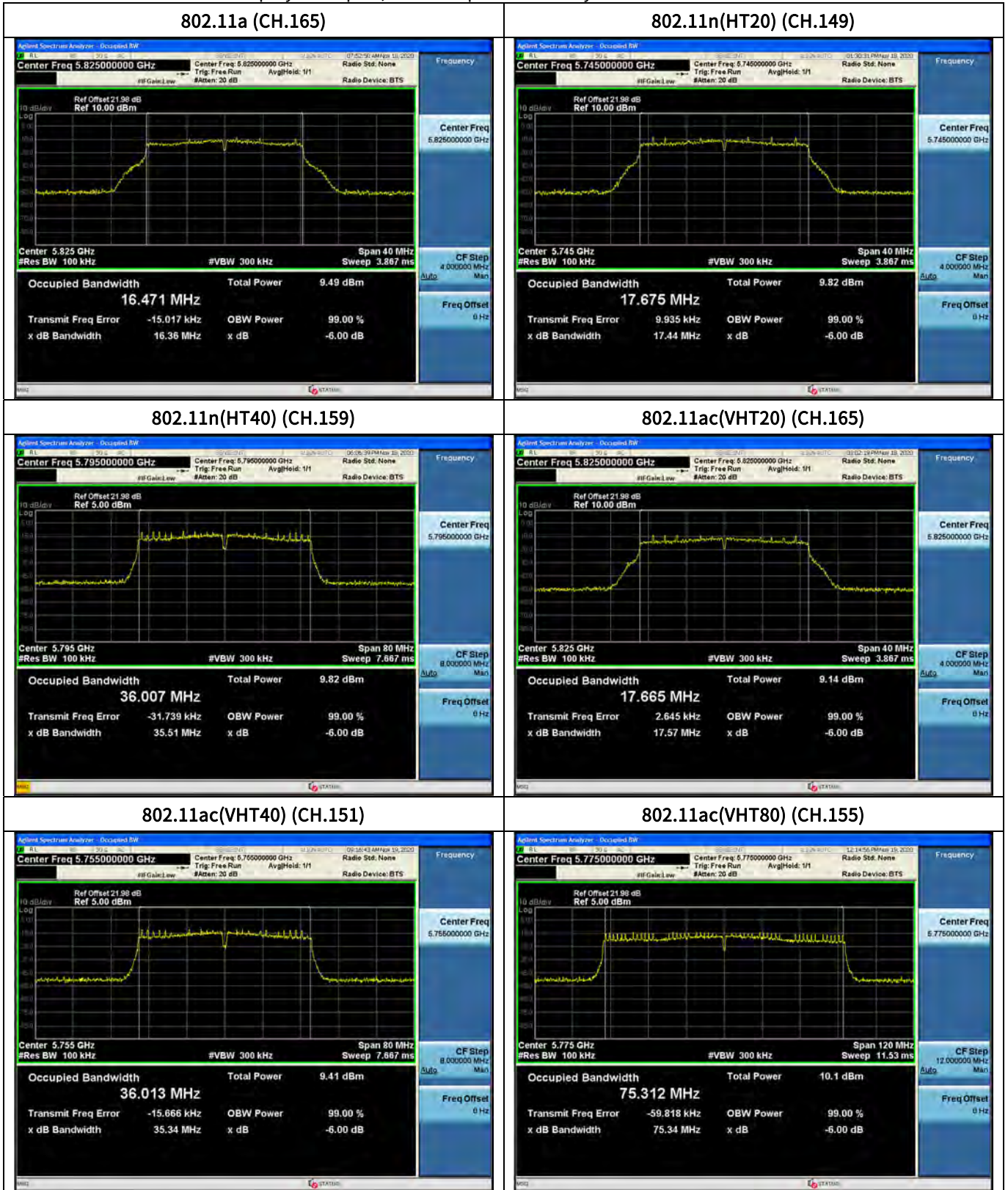
802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.59	> 0.5	Pass
5785	157	17.59	> 0.5	Pass
5825	165	17.57	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.34	> 0.5	Pass
5795	159	35.51	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.34	> 0.5	Pass

☐ Test Plots

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



### 10.3 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		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]
Frequency [MHz]	Channel No.				
5180	36	6.18	0.20	6.38	23.98
5200	40	6.27	0.31	6.58	
5240	48	6.91	0.20	7.12	
5260	52	6.82	0.20	7.02	23.98
5300	60	7.26	0.41	7.67	
5320	64	7.66	0.41	8.07	
5500	100	5.19	0.31	5.50	23.98
5580	116	4.14	1.37	5.52	
5720	144	4.39	1.37	5.77	
5745	149	2.63	0.31	2.94	30.00
5785	157	2.11	0.41	2.52	
5825	165	2.64	0.41	3.05	

802.11n(20MHz) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]
Frequency [MHz]	Channel No.				
5180	36	5.99	0.61	6.61	23.98
5200	40	5.90	0.61	6.52	
5240	48	6.20	0.61	6.82	
5260	52	6.40	0.61	7.01	23.98
5300	60	6.76	0.61	7.38	
5320	64	6.90	0.61	7.51	
5500	100	5.14	0.43	5.56	23.98
5580	116	4.94	0.61	5.55	
5720	144	5.35	0.43	5.77	
5745	149	2.74	0.43	3.17	30.00
5785	157	1.24	1.62	2.86	
5825	165	0.95	1.62	2.57	



802.11ac(20MHz) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]
Frequency [MHz]	Channel No.				
5180	36	7.01	0.42	7.43	23.98
5200	40	5.55	1.58	7.13	
5240	48	6.70	0.60	7.30	
5260	52	6.88	0.60	7.48	23.98
5300	60	6.89	0.60	7.49	
5320	64	6.01	1.58	7.59	
5500	100	3.94	1.58	5.52	23.98
5580	116	5.03	0.60	5.63	
5720	144	3.96	1.78	5.73	
5745	149	2.74	0.60	3.33	30.00
5785	157	1.05	1.78	2.82	
5825	165	1.98	0.60	2.57	

802.11n(40MHz) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]
Frequency [MHz]	Channel No.				
5190	38	2.03	1.41	3.44	23.98
5230	46	2.40	1.14	3.54	23.98
5270	54	3.82	2.55	6.37	23.98
5310	62	5.70	0.80	6.50	23.98
5510	102	3.14	2.24	5.38	23.98
5550	110	2.67	2.55	5.22	23.98
5710	142	4.46	1.14	5.60	23.98
5755	151	1.51	1.14	2.65	30.00
5795	159	1.81	0.80	2.61	30.00



802.11ac(40MHz) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]
Frequency [MHz]	Channel No.				
5190	38	0.97	2.33	3.30	23.98
5230	46	0.45	2.80	3.25	23.98
5270	54	4.46	1.83	6.29	23.98
5310	62	3.88	2.53	6.41	23.98
5510	102	4.26	1.12	5.38	23.98
5550	110	2.49	2.72	5.20	23.98
5710	142	4.69	1.12	5.81	23.98
5755	151	1.95	0.79	2.74	30.00
5795	159	-0.23	2.80	2.58	30.00

802.11ac(80MHz) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]
Frequency [MHz]	Channel No.				
5210	42	0.24	3.67	3.91	23.98
5290	58	4.66	2.27	6.93	23.98
5530	106	2.13	3.34	5.47	23.98
5690	138	4.13	1.48	5.60	23.98
5775	155	-0.40	3.12	2.72	30.00

### 10.4 POWER SPECTRAL DENSITY

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	-3.935	0.205	-3.730	11 dBm/MHz
5200	40	-3.940	0.312	-3.628	
5240	48	-3.215	0.205	-3.010	
5260	52	-3.229	0.205	-3.024	
5300	60	-2.829	0.410	-2.419	
5320	64	-2.428	0.410	-2.018	
5500	100	-4.745	0.312	-4.433	
5580	116	-6.842	1.374	-5.468	
5720	144	-6.682	1.374	-5.308	
5745	149	-10.175	0.312	-9.863	30 dBm/500kHz
5785	157	-10.728	0.410	-10.318	
5825	165	-10.467	0.410	-10.057	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	-4.002	0.613	-3.389	11 dBm/MHz
5200	40	-4.610	0.613	-3.997	
5240	48	-4.066	0.613	-3.453	
5260	52	-3.729	0.613	-3.116	
5300	60	-3.512	0.613	-2.899	
5320	64	-3.386	0.613	-2.773	
5500	100	-4.844	0.426	-4.418	
5580	116	-5.283	0.613	-4.670	
5720	144	-5.068	0.426	-4.642	
5745	149	-10.418	0.426	-9.992	30 dBm/500kHz z
5785	157	-12.689	1.622	-11.067	
5825	165	-12.732	1.622	-11.110	

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-11.541	1.413	-10.128	11 dBm/MHz
5230	46	-10.854	1.142	-9.712	
5270	54	-8.767	2.553	-6.214	
5310	62	-7.819	0.803	-7.016	
5510	102	-9.794	2.241	-7.553	
5500	110	-10.321	2.553	-7.768	
5710	142	-8.948	1.142	-7.806	
5755	151	-14.840	1.142	-13.698	30 dBm /500kHz
5795	159	-14.564	0.803	-13.761	

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	-3.770	0.420	-3.350	11 dBm/MHz
5200	40	-5.580	1.583	-3.997	
5240	48	-3.492	0.600	-2.892	
5260	52	-3.506	0.600	-2.906	
5300	60	-3.210	0.600	-2.610	
5320	64	-5.223	1.583	-3.640	
5500	100	-7.292	1.583	-5.709	
5580	116	-5.015	0.600	-4.415	
5720	144	-7.184	1.778	-5.406	
5745	149	-10.452	0.600	-9.852	30 dBm/500kHz
5785	157	-12.716	1.778	-10.938	
5825	165	-10.857	0.600	-10.257	

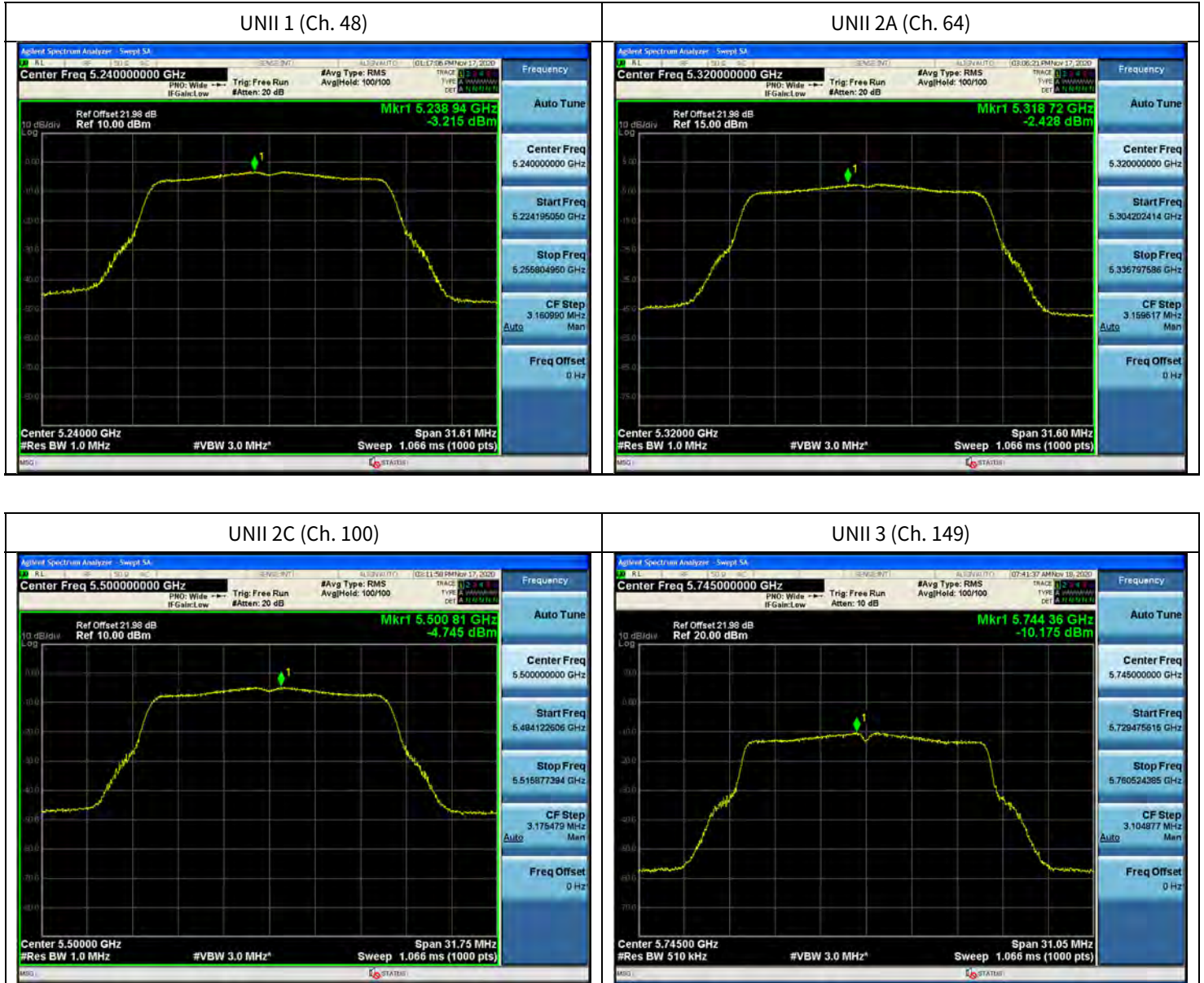
802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-11.565	2.329	-9.236	11 dBm/MHz
5230	46	-12.098	2.804	-9.294	
5270	54	-8.909	1.833	-7.076	
5310	62	-8.762	2.532	-6.230	
5510	102	-9.257	1.118	-8.139	
5500	110	-10.644	2.716	-7.928	
5710	142	-8.830	1.118	-7.712	30 dBm/500kHz
5755	151	-13.787	0.793	-12.994	
5795	159	-15.446	2.804	-12.642	

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-16.186	3.672	-12.514	11 dBm/MHz
5290	58	-12.084	2.269	-9.815	
5530	106	-14.738	3.345	-11.066	
5690	138	-11.452	1.475	-9.977	
5775	155	-19.878	3.122	-16.756	30 dBm/500kHz

▣ Test Plots(802.11a)

Note:

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



▣ Test Plots(802.11n(HT20))

Note:

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





▣ Test Plots(802.11n(HT40))

Note:

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



▣ Test Plots(802.11ac(VHT20))

Note:

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

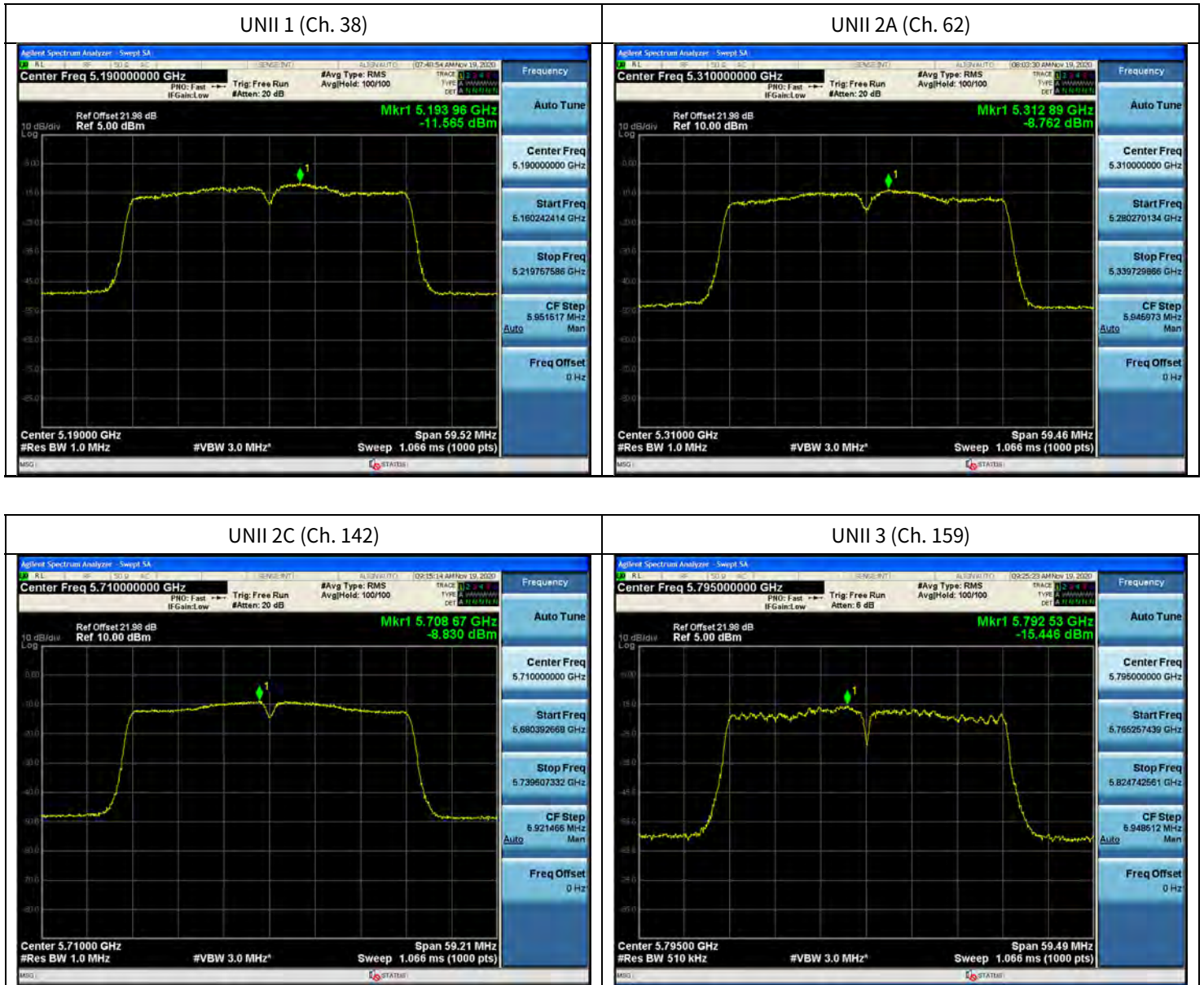




▣ Test Plots(802.11ac(VHT40))

Note:

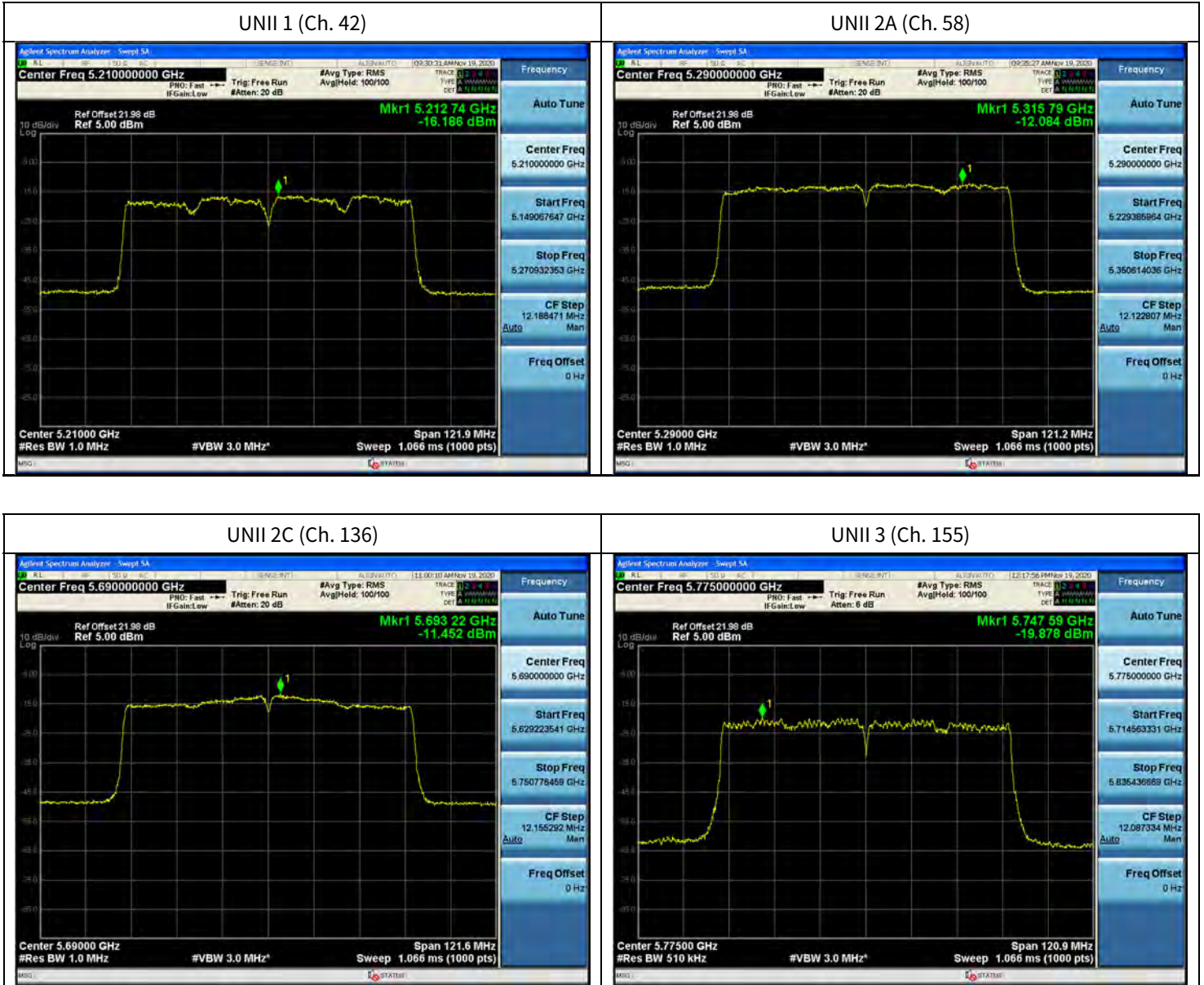
In order to simplify the report, attached plots were only channel of highest power.



▣ Test Plots(802.11ac(VHT80))

Note:

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



## 10.5 FREQUENCY STABILITY.

### 10.5.1 80MHz BW

#### Startup after the EUT is energized

OPERATING BAND: UNII Band 1  
 OPERATING FREQUENCY: 5,210,000,000 Hz  
 CHANNEL: 42  
 REFERENCE VOLTAGE: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5210022.51	22.51
100%		-30	5210053.36	53.36
100%		-20	5210045.53	45.53
100%		-10	5210040.05	40.05
100%		0	5210036.29	36.29
100%		+10	5210034.03	34.03
100%		+30	5210030.95	30.95
100%		+40	5210039.20	39.20
100%		+50	5210045.26	45.26
Batt. Endpoint		9	+20	5210045.61

#### 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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5290030.25	30.25
100%		-30	5290053.08	53.08
100%		-20	5290046.72	46.72
100%		-10	5290040.18	40.18
100%		0	5290036.64	36.64
100%		+10	5290034.02	34.02
100%		+30	5290031.18	31.18
100%		+40	5290041.25	41.25
100%		+50	5290044.64	44.64
Batt. Endpoint		9	+20	5290048.28

**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.

OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5530019.46	19.46
100%		-30	5530051.92	51.92
100%		-20	5530045.77	45.77
100%		-10	5530039.41	39.41
100%		0	5530034.51	34.51
100%		+10	5530030.60	30.60
100%		+30	5530031.02	31.02
100%		+40	5530040.31	40.31
100%		+50	5530044.62	44.62
Batt. Endpoint		9	+20	5530047.36

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5775024.33	24.33
100%		-30	5775052.22	52.22
100%		-20	5775045.22	45.22
100%		-10	5775038.49	38.49
100%		0	5775035.07	35.07
100%		+10	5775031.41	31.41
100%		+30	5775031.20	31.2
100%		+40	5775041.24	41.24
100%		+50	5775046.92	46.92
Batt. Endpoint		9	+20	5775045.99

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5210011.49	11.49
100%		-30	5210052.98	52.98
100%		-20	5210046.46	46.46
100%		-10	5210040.74	40.74
100%		0	5210037.54	37.54
100%		+10	5210034.24	34.24
100%		+30	5210031.87	31.87
100%		+40	5210040.98	40.98
100%		+50	5210044.78	44.78
Batt. Endpoint		9	+20	5210047.87

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5290034.06	34.06
100%		-30	5290051.95	51.95
100%		-20	5290044.03	44.03
100%		-10	5290038.42	38.42
100%		0	5290033.51	33.51
100%		+10	5290030.09	30.09
100%		+30	5290032.08	32.08
100%		+40	5290040.48	40.48
100%		+50	5290045.76	45.76
Batt. Endpoint		9	+20	5290046.39

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5530019.04	19.04
100%		-30	5530052.84	52.84
100%		-20	5530045.99	45.99
100%		-10	5530039.83	39.83
100%		0	5530035.68	35.68
100%		+10	5530033.37	33.37
100%		+30	5530032.12	32.12
100%		+40	5530041.77	41.77
100%		+50	5530046.45	46.45
Batt. Endpoint		9	+20	5530046.99

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5775045.22	45.22
100%		-30	5775051.71	51.71
100%		-20	5775044.99	44.99
100%		-10	5775039.74	39.74
100%		0	5775035.87	35.87
100%		+10	5775032.14	32.14
100%		+30	5775032.32	32.32
100%		+40	5775041.27	41.27
100%		+50	5775046.92	46.92
Batt. Endpoint		9	+20	5775046.02

**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.

**5 minutes after the EUT is energized**

OPERATING BAND: UNII Band 1  
 OPERATING FREQUENCY: 5,210,000,000 Hz  
 CHANNEL: 42  
 REFERENCE VOLTAGE: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5210027.56	27.56
100%		-30	5210051.74	51.74
100%		-20	5210045.28	45.28
100%		-10	5210039.09	39.09
100%		0	5210035.11	35.11
100%		+10	5210031.11	31.11
100%		+30	5210032.05	32.05
100%		+40	5210040.67	40.67
100%		+50	5210045.52	45.52
Batt. Endpoint		9	+20	5210046.82

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5290011.69	11.69
100%		-30	5290051.63	51.63
100%		-20	5290045.37	45.37
100%		-10	5290038.77	38.77
100%		0	5290035.10	35.10
100%		+10	5290031.91	31.91
100%		+30	5290031.70	31.70
100%		+40	5290040.02	40.02
100%		+50	5290044.15	44.15
Batt. Endpoint		9	+20	5290047.54

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5530035.69	35.69
100%		-30	5530053.12	53.12
100%		-20	5530045.18	45.18
100%		-10	5530040.04	40.04
100%		0	5530035.53	35.53
100%		+10	5530031.98	31.98
100%		+30	5530032.16	32.16
100%		+40	5530039.85	39.85
100%		+50	5530045.57	45.57
Batt. Endpoint		9	+20	5530045.95

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5775039.81	39.81
100%		-30	5775052.13	52.13
100%		-20	5775044.43	44.43
100%		-10	5775038.62	38.62
100%		0	5775034.07	34.07
100%		+10	5775031.81	31.81
100%		+30	5775031.67	31.67
100%		+40	5775039.33	39.33
100%		+50	5775043.26	43.26
Batt. Endpoint		9	+20	5775047.74

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5210040.18	40.18
100%		-30	5210053.29	53.29
100%		-20	5210045.36	45.36
100%		-10	5210040.25	40.25
100%		0	5210036.78	36.78
100%		+10	5210032.92	32.92
100%		+30	5210032.27	32.27
100%		+40	5210041.07	41.07
100%		+50	5210046.11	46.11
Batt. Endpoint		9	+20	5210046.63

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5290035.16	35.16
100%		-30	5290053.32	53.32
100%		-20	5290046.85	46.85
100%		-10	5290041.69	41.69
100%		0	5290037.81	37.81
100%		+10	5290033.92	33.92
100%		+30	5290031.00	31.00
100%		+40	5290040.61	40.61
100%		+50	5290045.62	45.62
Batt. Endpoint		9	+20	5290046.66

**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: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5530021.09	21.09
100%		-30	5530052.64	52.64
100%		-20	5530045.07	45.07
100%		-10	5530039.73	39.73
100%		0	5530036.39	36.39
100%		+10	5530034.04	34.04
100%		+30	5530031.35	31.35
100%		+40	5530040.60	40.60
100%		+50	5530045.18	45.18
Batt. Endpoint		9	+20	5530047.09

**Note:**

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

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 14.4 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	14.4	+20(Ref)	5775018.56	18.56
100%		-30	5775053.46	53.46
100%		-20	5775046.14	46.14
100%		-10	5775040.64	40.64
100%		0	5775035.81	35.81
100%		+10	5775032.38	32.38
100%		+30	5775031.12	31.12
100%		+40	5775040.43	40.43
100%		+50	5775046.39	46.39
Batt. Endpoint		9	+20	5775045.71

**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.

## 10.6 STRADDLE CHANNEL

### 10.6.1 26dB Bandwidth

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5709.48	15.52
802.11n(HT20)				5709.44	15.56
802.11ac(VHT20)				5709.36	15.64
802.11a	UNII 3	5720	144	5730.64	5.64
802.11n(HT20)				5730.76	5.76
802.11ac(VHT20)				5730.64	5.64

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5690.24	34.76
802.11ac(VHT40)				5690.24	34.76
802.11n(HT40)	UNII 3	5710	142	5730.24	5.24
802.11ac(VHT40)				5729.84	4.84

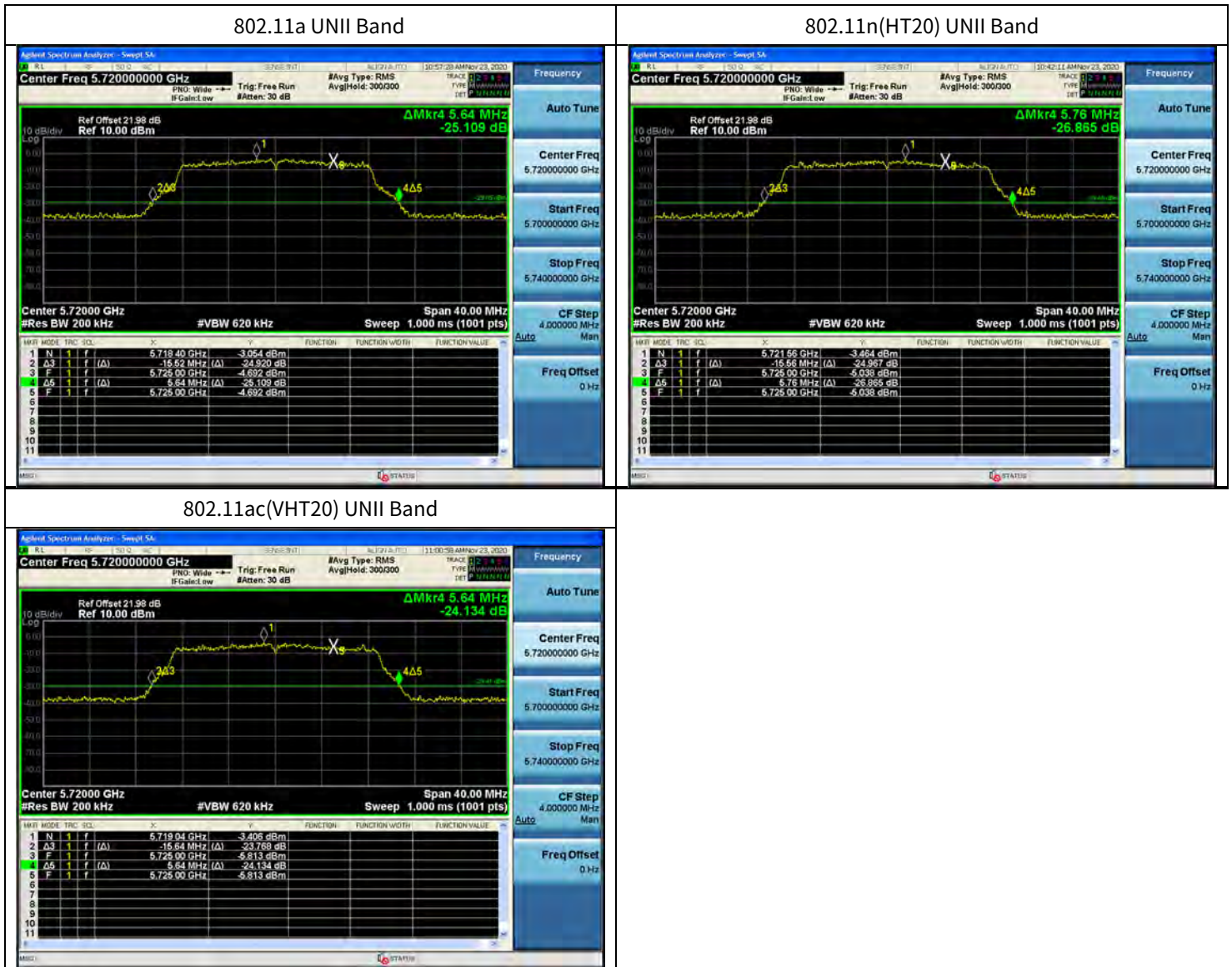
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.20	75.80
	UNII 3	5690	138	5731.04	6.04

**Note:**

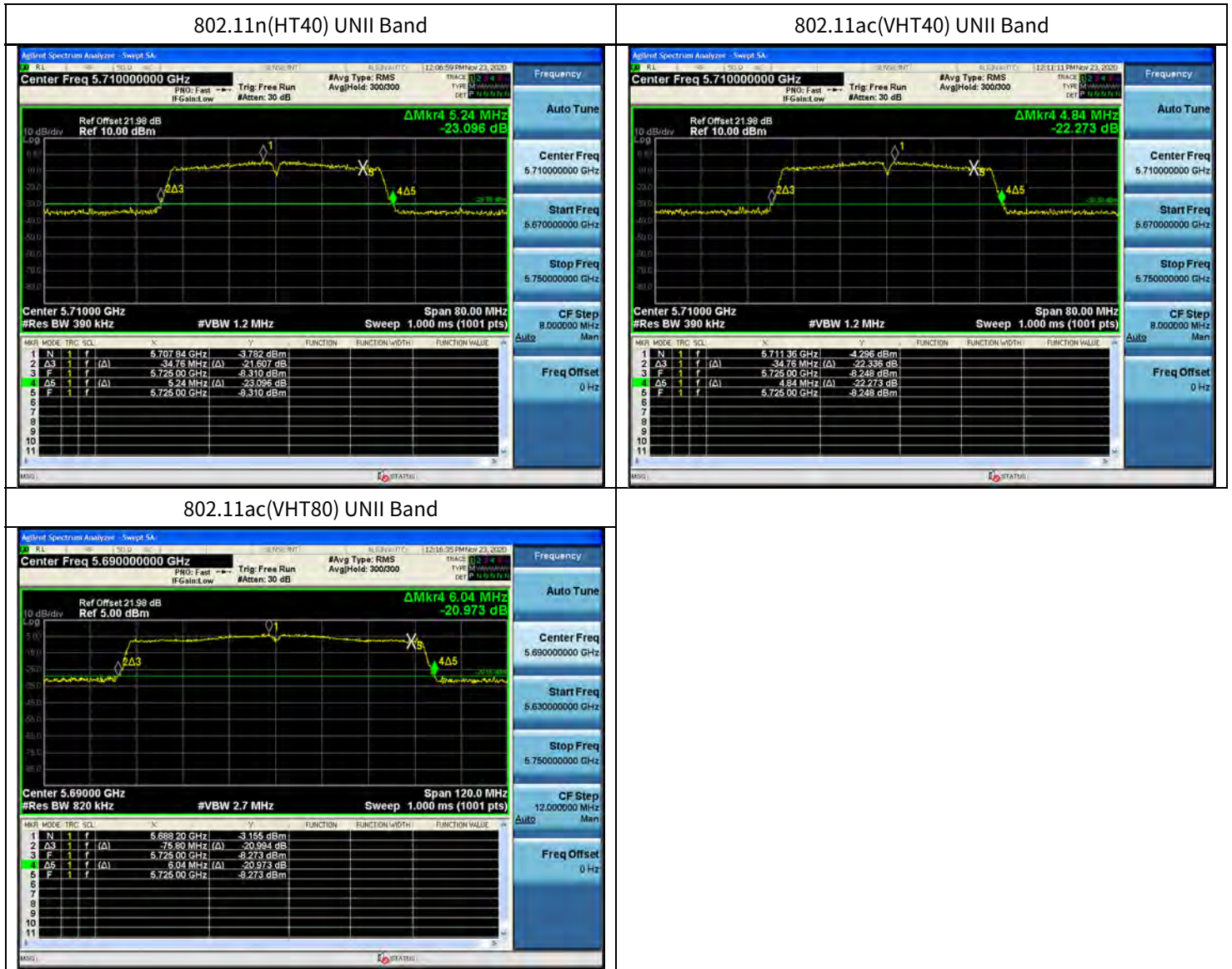
[UNII 2C] 26dB Bandwidth = 5725MHz - Measured Frequency[MHz]

[UNII 3C] 26dB Bandwidth = Measured Frequency[MHz] -5725MHz

▣ Test Plots (26dB Bandwidth)



▣ Test Plots (26dB Bandwidth)



### 10.6.2 6dB Bandwidth

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII 3	5720	144	5728.20	3.20	> 0.5
802.11n(HT20)				5728.84	3.84	> 0.5
802.11ac(VHT20)				5728.80	3.80	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5727.84	2.84	> 0.5
802.11ac(VHT40)				5728.00	3.00	> 0.5

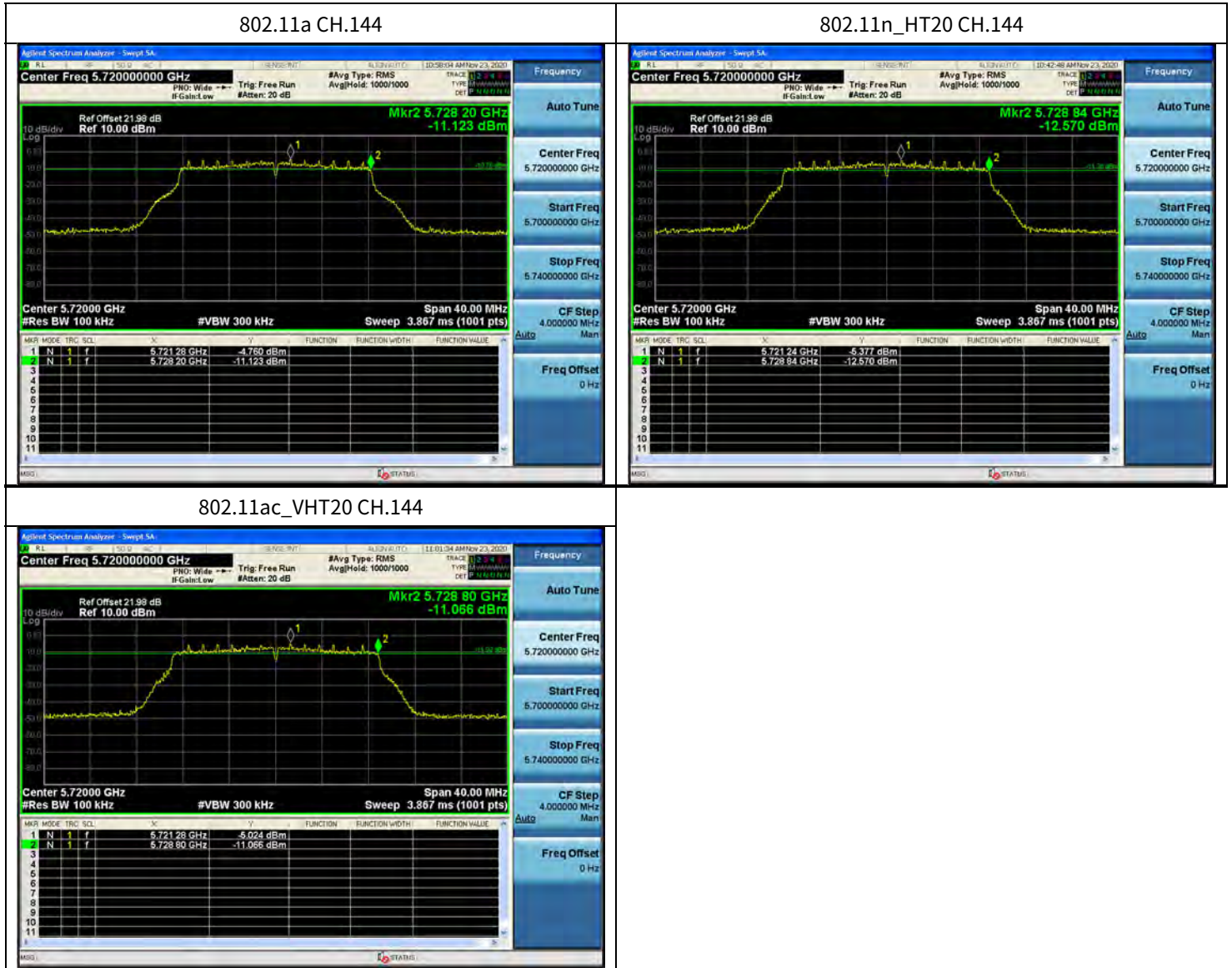
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5727.68	2.68	> 0.5

**Note:**

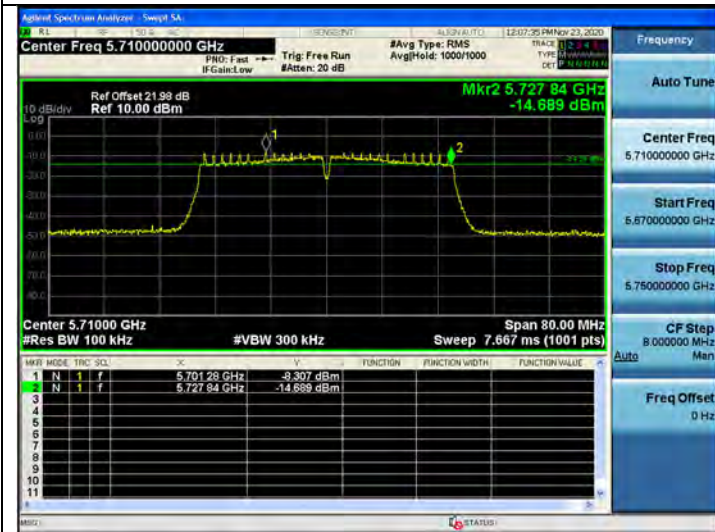
6dB Bandwidth = Measured Frequency[MHz] - 5725MHz



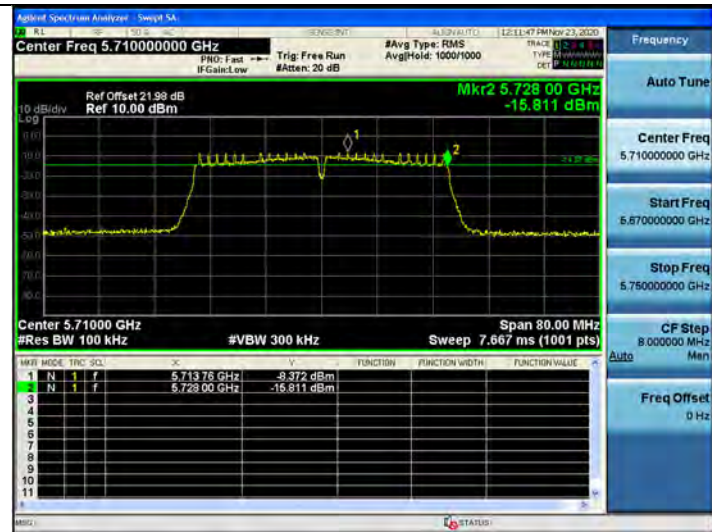
▣ Test Plots(UNII 3 Band 6dB Bandwidth)



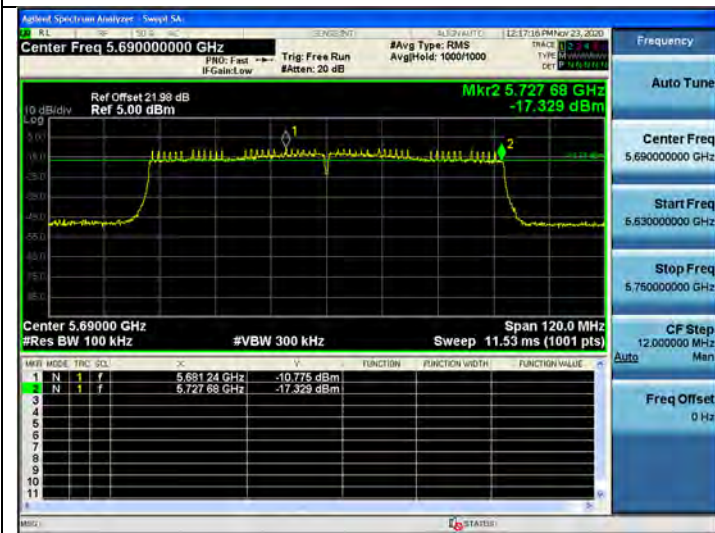
802.11n\_HT40 CH.142



802.11ac\_VHT40 CH.142



802.11ac\_VHT80 CH.138



### 10.6.3 Output Power

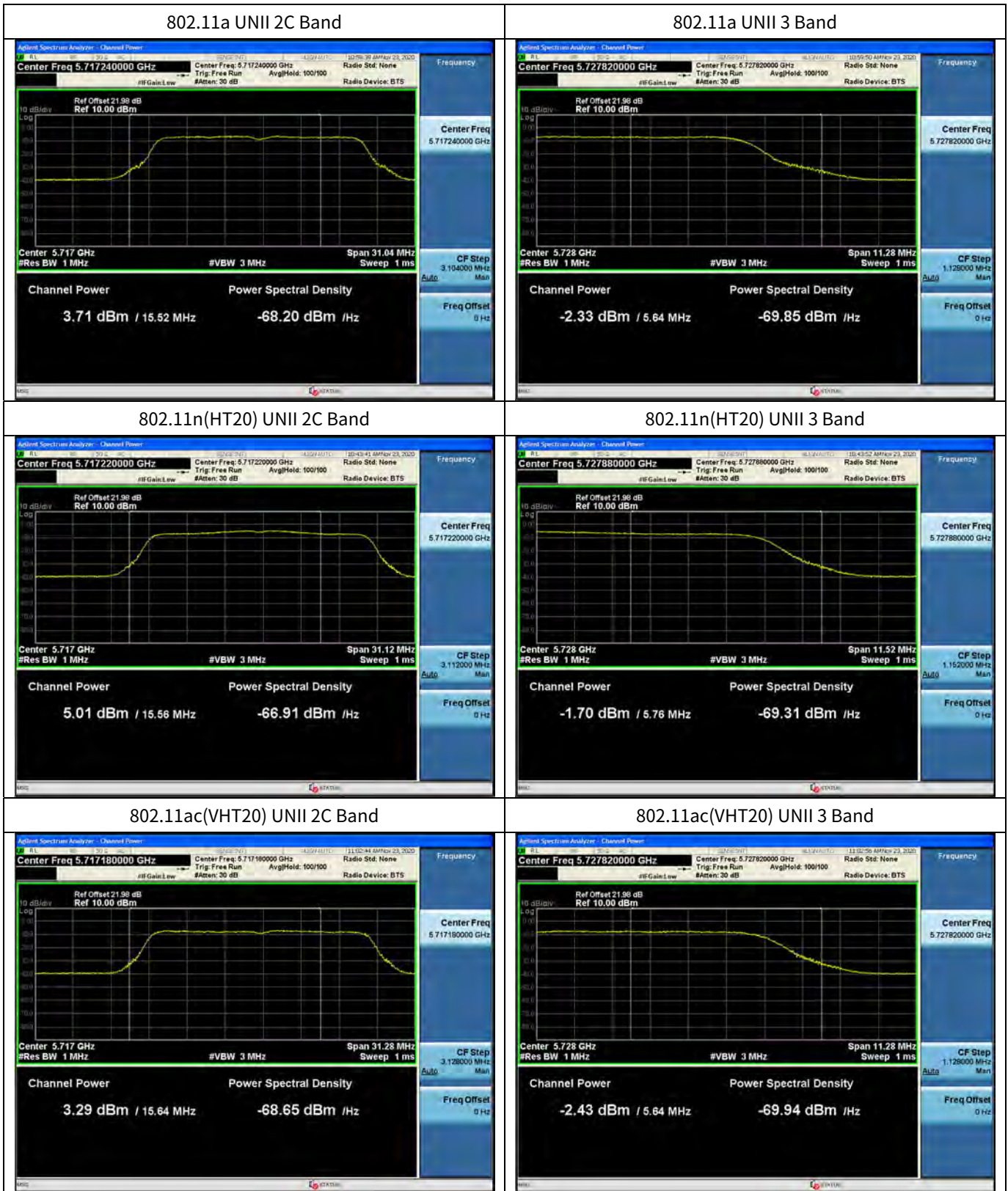
Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	3.71	1.374	5.08	22.91
802.11n(HT20)			5.01	0.426	5.43	22.92
802.11ac(VHT20)			3.29	1.778	5.07	22.94
802.11a	5720 (UNII 3 Band)	144	-2.33	1.374	-0.96	30.00
802.11n(HT20)			-1.70	0.426	-1.27	30.00
802.11ac(VHT20)			-2.43	1.778	-0.65	30.00

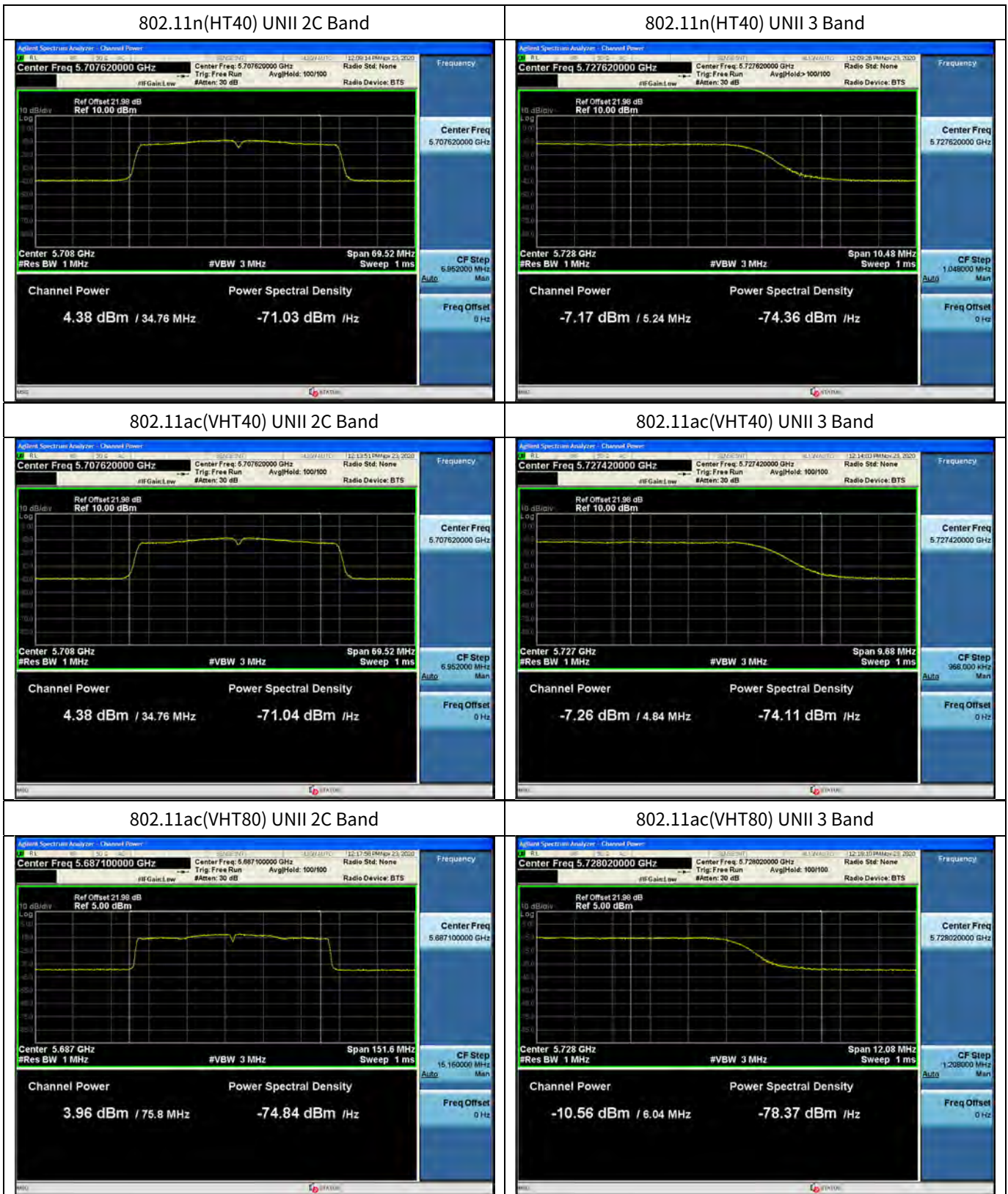
Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11n (HT40)	5710 (UNII 2C Band)	142	4.38	1.142	5.52	23.98
802.11ac (VHT40)			4.38	1.118	5.49	23.98
802.11n (HT40)	5710 (UNII 3 Band)	142	-7.17	1.142	-6.03	30.00
802.11ac (VHT40)			-7.26	1.118	-6.14	30.00

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11ac	5690 (UNII 2C Band)	138	3.96	1.475	5.43	23.98
802.11ac	5690 (UNII 3 Band)	138	-10.56	1.475	-9.09	30.00



Test Plots





### 10.6.4 Power Spectral Density

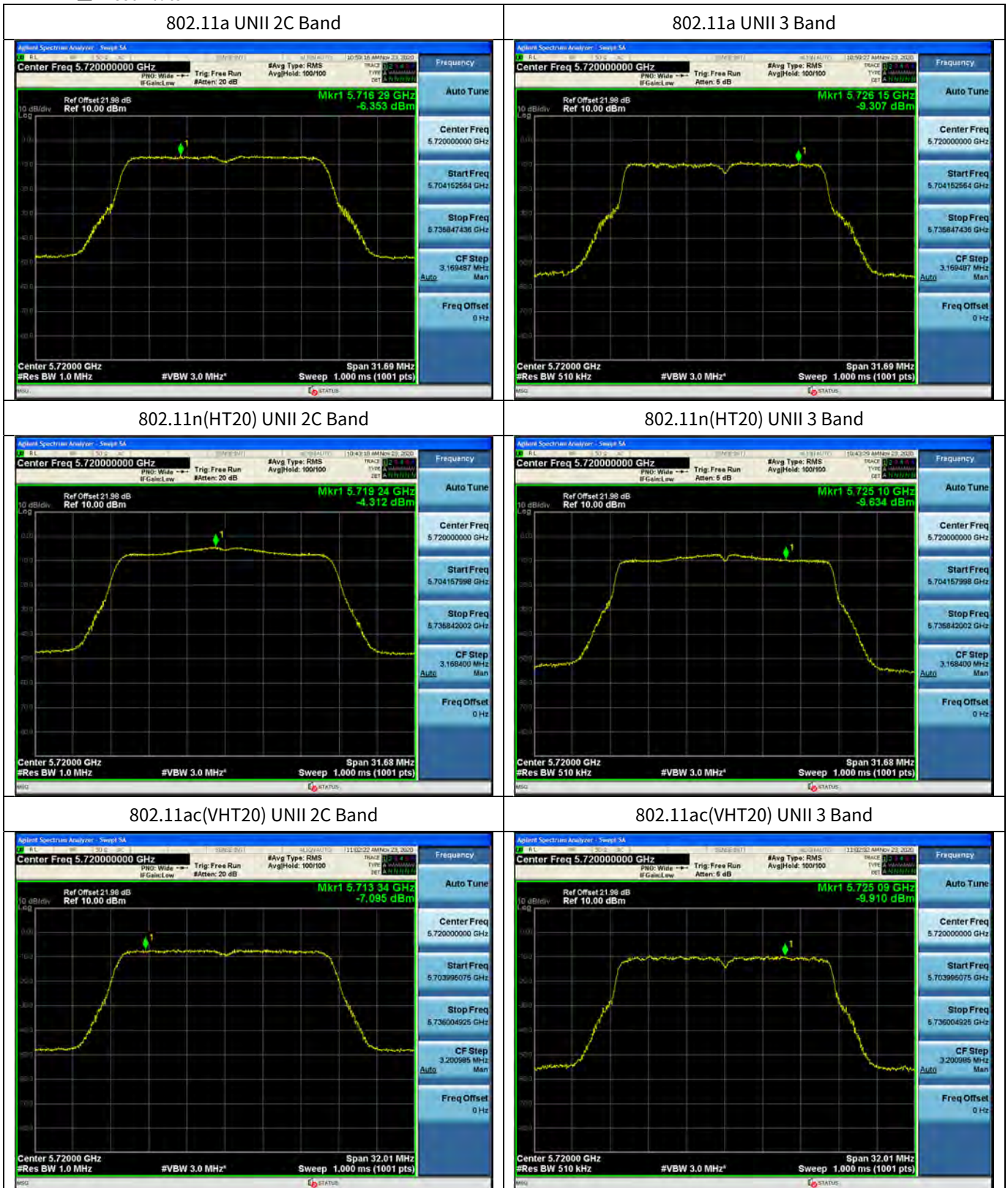
Mode	Frequency [MHz]	Channel	Total PSD (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	-4.979	11.00
802.11n(HT20)			-3.886	11.00
802.11ac(VHT20)			-5.317	11.00
802.11a	5720 (UNII 3 Band)	144	-7.933	30.00
802.11n(HT20)			-9.208	30.00
802.11ac(VHT20)			-8.132	30.00

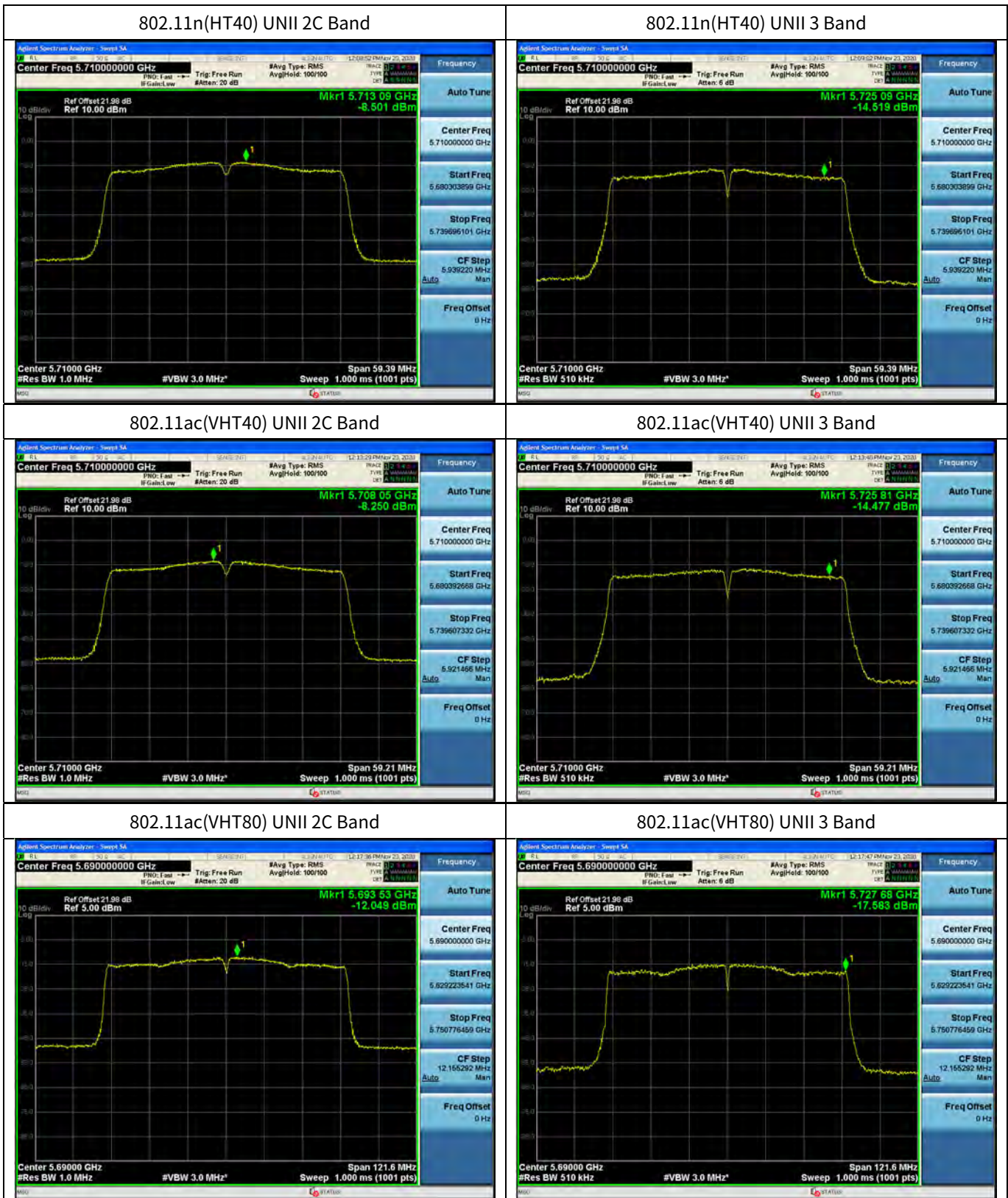
Mode	Frequency [MHz]	Channel	Total PSD (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	-7.359	11.00
802.11ac(VHT40)			-7.132	11.00
802.11n(HT40)	5710 (UNII 3 Band)	142	-13.377	30.00
802.11ac(VHT40)			-13.359	30.00

Mode	Frequency [MHz]	Channel	Total PSD (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-10.574	11.00
	5690 (UNII 3 Band)	138	-16.108	30.00



Test Plots







### 10.7 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 =  $40 \log(\text{specific distance} / \text{test distance})$  (dB)
3. Limit line = specific Limits (dBuV) + Distance extrapolation factor

#### Frequency Range : Below 1 GHz

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

**Note:**

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

**Frequency Range : Above 1 GHz**

Band : UNII 1

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5180 MHz

Channel No. 36 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	44.36	9.17	V	53.53	68.20	14.67	PK
15540	49.40	13.42	V	62.82	73.98	11.16	PK
15540	29.41	13.42	V	42.83	53.98	11.15	AV
10360	44.16	9.17	H	53.33	68.20	14.87	PK
15540	47.52	13.42	H	60.94	73.98	13.04	PK
15540	29.20	13.42	H	42.62	53.98	11.36	AV

Band : UNII 1

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5200 MHz

Channel No. 40 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	44.06	9.57	V	53.63	68.20	14.57	PK
15600	47.09	13.16	V	60.25	73.98	13.73	PK
15600	28.24	13.16	V	41.40	53.98	12.58	AV
10400	43.79	9.57	H	53.36	68.20	14.84	PK
15600	46.95	13.16	H	60.11	73.98	13.87	PK
15600	28.06	13.16	H	41.22	53.98	12.76	AV

Band : UNII 1

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5240 MHz

Channel No. 48 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	43.88	9.94	V	53.82	68.20	14.38	PK
15720	47.27	13.28	V	60.55	73.98	13.43	PK
15720	28.83	13.28	V	42.11	53.98	11.87	AV
10480	43.14	9.94	H	53.08	68.20	15.12	PK
15720	45.57	13.28	H	58.85	73.98	15.13	PK
15720	28.59	13.28	H	41.87	53.98	12.11	AV

Band : UNII 1

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5180 MHz

Channel No. 36 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	44.40	9.17	V	53.57	68.20	14.63	PK
15540	48.71	13.42	V	62.13	73.98	11.85	PK
15540	29.10	13.42	V	42.52	53.98	11.46	AV
10360	43.82	9.17	H	52.99	68.20	15.21	PK
15540	47.19	13.42	H	60.61	73.98	13.37	PK
15540	29.05	13.42	H	42.47	53.98	11.51	AV

Band : UNII 1

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5200 MHz

Channel No. 40 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	44.36	9.57	V	53.93	68.20	14.27	PK
15600	47.24	13.16	V	60.40	73.98	13.58	PK
15600	28.18	13.16	V	41.34	53.98	12.64	AV
10400	44.22	9.57	H	53.79	68.20	14.41	PK
15600	46.59	13.16	H	59.75	73.98	14.23	PK
15600	28.08	13.16	H	41.24	53.98	12.74	AV

Band : UNII 1

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5240 MHz

Channel No. 48 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	43.74	9.94	V	53.68	68.20	14.52	PK
15720	47.35	13.28	V	60.63	73.98	13.35	PK
15720	28.61	13.28	V	41.89	53.98	12.09	AV
10480	42.64	9.94	H	52.58	68.20	15.62	PK
15720	45.85	13.28	H	59.13	73.98	14.85	PK
15720	27.48	13.28	H	40.76	53.98	13.22	AV

Band : UNII 1

Operation Mode: 802.11 ac(VHT20)

Transfer MCS Index: MCS0

Operating Frequency 5180 MHz

Channel No. 36 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	44.72	9.17	V	53.89	68.20	14.31	PK
15540	48.94	13.42	V	62.36	73.98	11.62	PK
15540	29.09	13.42	V	42.51	53.98	11.47	AV
10360	43.04	9.17	H	52.21	68.20	15.99	PK
15540	46.72	13.42	H	60.14	73.98	13.84	PK
15540	28.93	13.42	H	42.35	53.98	11.63	AV

Band : UNII 1

Operation Mode: 802.11 ac(VHT20)

Transfer MCS Index: MCS0

Operating Frequency 5200 MHz

Channel No. 40 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	43.87	9.57	V	53.44	68.20	14.76	PK
15600	47.64	13.16	V	60.80	73.98	13.18	PK
15600	28.14	13.16	V	41.30	53.98	12.68	AV
10400	43.20	9.57	H	52.77	68.20	15.43	PK
15600	46.70	13.16	H	59.86	73.98	14.12	PK
15600	27.94	13.16	H	41.10	53.98	12.88	AV

Band : UNII 1

Operation Mode: 802.11 ac(VHT20)

Transfer MCS Index: MCS0

Operating Frequency 5240 MHz

Channel No. 48 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	44.22	9.94	V	54.16	68.20	14.04	PK
15720	47.92	13.28	V	61.20	73.98	12.78	PK
15720	28.71	13.28	V	41.99	53.98	11.99	AV
10480	43.41	9.94	H	53.35	68.20	14.85	PK
15720	46.46	13.28	H	59.74	73.98	14.24	PK
15720	27.41	13.28	H	40.69	53.98	13.29	AV

Band : UNII 1

Operation Mode: 802.11 n(HT40)

Transfer MCS Index: MCS0

Operating Frequency 5190 MHz

Channel No. 38 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10380	44.96	9.23	V	54.19	68.20	14.01	PK
15570	40.72	13.21	V	53.93	73.98	20.05	PK
15570	28.03	13.21	V	41.24	53.98	12.74	AV
10380	43.77	9.23	H	53.00	68.20	15.20	PK
15570	40.02	13.21	H	53.23	73.98	20.75	PK
15570	28.01	13.21	H	41.22	53.98	12.76	AV

Band : UNII 1

Operation Mode: 802.11 n(HT40)

Transfer MCS Index: MCS0

Operating Frequency 5230 MHz

Channel No. 46 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10460	43.92	9.83	V	53.75	68.20	14.45	PK
15690	39.83	13.19	V	53.02	73.98	20.96	PK
15690	27.34	13.19	V	40.53	53.98	13.45	AV
10460	43.05	9.83	H	52.88	68.20	15.32	PK
15690	39.45	13.19	H	52.64	73.98	21.34	PK
15690	27.05	13.19	H	40.24	53.98	13.74	AV

Band : UNII 1

Operation Mode: 802.11 ac(VHT40)

Transfer MCS Index: MCS0

Operating Frequency 5190 MHz

Channel No. 38 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10380	44.28	9.23	V	53.51	68.20	14.69	PK
15570	41.58	13.21	V	54.79	73.98	19.19	PK
15570	27.94	13.21	V	41.15	53.98	12.83	AV
10380	42.65	9.23	H	51.88	68.20	16.32	PK
15570	38.91	13.21	H	52.12	73.98	21.86	PK
15570	27.64	13.21	H	40.85	53.98	13.13	AV

Band : UNII 1  
 Operation Mode: 802.11 ac(VHT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5230 MHz  
 Channel No. 46 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10460	44.22	9.83	V	54.05	68.20	14.15	PK
15690	40.35	13.19	V	53.54	73.98	20.44	PK
15690	26.61	13.19	V	39.80	53.98	14.18	AV
10460	43.33	9.83	H	53.16	68.20	15.04	PK
15690	39.14	13.19	H	52.33	73.98	21.65	PK
15690	26.53	13.19	H	39.72	53.98	14.26	AV

Band : UNII 1  
 Operation Mode: 802.11 ac(VHT80)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5210 MHz  
 Channel No. 42 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10420	43.87	9.19	V	53.06	68.20	15.14	PK
15630	39.84	13.57	V	53.41	73.98	20.57	PK
15630	28.79	13.57	V	42.36	53.98	11.62	AV
10420	42.30	9.19	H	51.49	68.20	16.71	PK
15630	39.14	13.57	H	52.71	73.98	21.27	PK
15630	28.12	13.57	H	41.69	53.98	12.29	AV



Band : UNII 2A

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5260 MHz

Channel No. 52 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	44.13	9.96	V	54.09	68.20	14.11	PK
15780	45.52	13.29	V	58.81	73.98	15.17	PK
15780	28.14	13.29	V	41.43	53.98	12.55	AV
10520	42.72	9.96	H	52.68	68.20	15.52	PK
15780	43.73	13.29	H	57.02	73.98	16.96	PK
15780	27.93	13.29	H	41.22	53.98	12.76	AV

Band : UNII 2A

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5300 MHz

Channel No. 60 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	42.34	10.34	V	52.68	73.98	21.30	PK
10600	29.66	10.34	V	40.00	53.98	13.98	AV
15900	46.06	13.19	V	59.25	73.98	14.73	PK
15900	28.91	13.19	V	42.10	53.98	11.88	AV
10600	42.02	10.34	H	52.36	73.98	21.62	PK
10600	29.45	10.34	H	39.79	53.98	14.19	AV
15900	43.59	13.19	H	56.78	73.98	17.20	PK
15900	27.75	13.19	H	40.94	53.98	13.04	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]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	43.53	10.30	V	53.83	73.98	20.15	PK
10640	30.24	10.30	V	40.54	53.98	13.44	AV
15960	45.24	12.29	V	57.53	73.98	16.45	PK
15960	28.90	12.29	V	41.19	53.98	12.79	AV
10640	42.49	10.30	H	52.79	73.98	21.19	PK
10640	30.02	10.30	H	40.32	53.98	13.66	AV
15960	44.10	12.29	H	56.39	73.98	17.59	PK
15960	27.77	12.29	H	40.06	53.98	13.92	AV

Band : UNII 2A  
 Operation Mode: 802.11 n(HT20)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5260 MHz  
 Channel No. 52 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	43.25	9.96	V	53.21	68.20	14.99	PK
15780	46.30	13.29	V	59.59	73.98	14.39	PK
15780	28.09	13.29	V	41.38	53.98	12.60	AV
10520	42.70	9.96	H	52.66	68.20	15.54	PK
15780	45.51	13.29	H	58.80	73.98	15.18	PK
15780	27.75	13.29	H	41.04	53.98	12.94	AV

Band : UNII 2A

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5300 MHz

Channel No. 60 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	42.29	10.34	V	52.63	73.98	21.35	PK
10600	29.50	10.34	V	39.84	53.98	14.14	AV
15900	47.53	13.19	V	60.72	73.98	13.26	PK
15900	28.90	13.19	V	42.09	53.98	11.89	AV
10600	41.16	10.34	H	51.50	73.98	22.48	PK
10600	29.15	10.34	H	39.49	53.98	14.49	AV
15900	46.19	13.19	H	59.38	73.98	14.60	PK
15900	27.97	13.19	H	41.16	53.98	12.82	AV

Band : UNII 2A

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5320 MHz

Channel No. 64 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	42.68	10.30	V	52.98	73.98	21.00	PK
10640	29.57	10.30	V	39.87	53.98	14.11	AV
15960	46.12	12.29	V	58.41	73.98	15.57	PK
15960	28.36	12.29	V	40.65	53.98	13.33	AV
10640	41.78	10.30	H	52.08	73.98	21.90	PK
10640	28.60	10.30	H	38.90	53.98	15.08	AV
15960	45.54	12.29	H	57.83	73.98	16.15	PK
15960	27.88	12.29	H	40.17	53.98	13.81	AV

Band : UNII 2A  
 Operation Mode: 802.11 ac(VHT20)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5260MHz  
 Channel No. 52 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	43.49	9.96	V	53.45	68.20	14.75	PK
15780	48.27	13.29	V	61.56	73.98	12.42	PK
15780	28.95	13.29	V	42.24	53.98	11.74	AV
10520	42.71	9.96	H	52.67	68.20	15.53	PK
15780	47.55	13.29	H	60.84	73.98	13.14	PK
15780	28.16	13.29	H	41.45	53.98	12.53	AV

Band : UNII 2A  
 Operation Mode: 802.11 ac(VHT20)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5300 MHz  
 Channel No. 60 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	42.75	10.34	V	53.09	73.98	20.89	PK
10600	29.67	10.34	V	40.01	53.98	13.97	AV
15900	47.81	13.19	V	61.00	73.98	12.98	PK
15900	29.02	13.19	V	42.21	53.98	11.77	AV
10600	41.07	10.34	H	51.41	73.98	22.57	PK
10600	29.60	10.34	H	39.94	53.98	14.04	AV
15900	44.58	13.19	H	57.77	73.98	16.21	PK
15900	28.81	13.19	H	42.00	53.98	11.98	AV

Band : UNII 2A  
 Operation Mode: 802.11 ac(VHT20)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5320 MHz  
 Channel No. 64 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	42.97	10.30	V	53.27	73.98	20.71	PK
10640	29.51	10.30	V	39.81	53.98	14.17	AV
15960	46.05	12.29	V	58.34	73.98	15.64	PK
15960	28.65	12.29	V	40.94	53.98	13.04	AV
10640	41.82	10.30	H	52.12	73.98	21.86	PK
10640	28.11	10.30	H	38.41	53.98	15.57	AV
15960	45.88	12.29	H	58.17	73.98	15.81	PK
15960	27.42	12.29	H	39.71	53.98	14.27	AV

Band : UNII 2A  
 Operation Mode: 802.11 n(HT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5270 MHz  
 Channel No. 54 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10540	42.88	9.84	V	52.72	68.20	15.48	PK
15810	40.93	13.30	V	54.23	73.98	19.75	PK
15810	28.22	13.30	V	41.52	53.98	12.46	AV
10540	42.48	9.84	H	52.32	68.20	15.88	PK
15810	39.92	13.30	H	53.22	73.98	20.76	PK
15810	28.09	13.30	H	41.39	53.98	12.59	AV

Band : UNII 2A  
 Operation Mode: 802.11 n(HT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5310 MHz  
 Channel No. 62 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10620	43.28	10.22	V	53.50	73.98	20.48	PK
10620	30.08	10.22	V	40.30	53.98	13.68	AV
15930	42.36	12.71	V	55.07	73.98	18.91	PK
15930	28.96	12.71	V	41.67	53.98	12.31	AV
10620	41.46	10.22	H	51.68	73.98	22.30	PK
10620	28.98	10.22	H	39.20	53.98	14.78	AV
15930	41.98	12.71	H	54.69	73.98	19.29	PK
15930	28.75	12.71	H	41.46	53.98	12.52	AV

Band : UNII 2A  
 Operation Mode: 802.11 ac(VHT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5270 MHz  
 Channel No. 54 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10540	43.50	9.84	V	53.34	68.20	14.86	PK
15810	41.25	13.30	V	54.55	73.98	19.43	PK
15810	28.37	13.30	V	41.67	53.98	12.31	AV
10540	41.67	9.84	H	51.51	68.20	16.69	PK
15810	40.08	13.30	H	53.38	73.98	20.60	PK
15810	28.14	13.30	H	41.44	53.98	12.54	AV

Band : UNII 2A  
 Operation Mode: 802.11 ac(VHT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5310 MHz  
 Channel No. 62 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10620	42.34	10.22	V	52.56	73.98	21.42	PK
10620	30.09	10.22	V	40.31	53.98	13.67	AV
15930	42.63	12.71	V	55.34	73.98	18.64	PK
15930	28.77	12.71	V	41.48	53.98	12.50	AV
10620	41.91	10.22	H	52.13	73.98	21.85	PK
10620	29.99	10.22	H	40.21	53.98	13.77	AV
15930	40.45	12.71	H	53.16	73.98	20.82	PK
15930	28.68	12.71	H	41.39	53.98	12.59	AV

Band : UNII 2A  
 Operation Mode: 802.11 ac(VHT80)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5290 MHz  
 Channel No. 58 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10580	42.99	10.35	V	53.34	68.20	14.86	PK
15870	40.57	13.05	V	53.62	73.98	20.36	PK
15870	29.45	13.05	V	42.50	53.98	11.48	AV
10580	41.49	10.35	H	51.84	68.20	16.36	PK
15870	40.28	13.05	H	53.33	73.98	20.65	PK
15870	29.11	13.05	H	42.16	53.98	11.82	AV

Band : UNII 2C

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5500 MHz

Channel No. 100 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	42.43	11.12	V	53.55	73.98	20.43	PK
11000	30.26	11.12	V	41.38	53.98	12.60	AV
16500	42.30	12.50	V	54.80	68.20	13.40	PK
11000	42.11	11.12	H	53.23	73.98	20.75	PK
11000	29.11	11.12	H	40.23	53.98	13.75	AV
16500	41.03	12.50	H	53.53	68.20	14.67	PK

Band : UNII 2C

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5580 MHz

Channel No. 116 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	42.12	11.13	V	53.25	73.98	20.73	PK
11160	29.16	11.13	V	40.29	53.98	13.69	AV
16740	41.29	13.55	V	54.84	68.20	13.36	PK
11160	41.56	11.13	H	52.69	73.98	21.29	PK
11160	28.97	11.13	H	40.10	53.98	13.88	AV
16740	40.65	13.55	H	54.20	68.20	14.00	PK



Band : UNII 2C

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5720 MHz

Channel No. 144 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11440	41.51	11.26	V	52.77	73.98	21.21	PK
11440	29.79	11.26	V	41.05	53.98	12.93	AV
17160	47.99	14.70	V	62.69	68.20	5.51	PK
11440	40.46	11.26	H	51.72	73.98	22.26	PK
11440	28.63	11.26	H	39.89	53.98	14.09	AV
17160	49.77	14.70	H	64.47	68.20	3.73	PK

Band : UNII 2C

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5500 MHz

Channel No. 100 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	42.78	11.12	V	53.90	73.98	20.08	PK
11000	29.25	11.12	V	40.37	53.98	13.61	AV
16500	41.82	12.50	V	54.32	68.20	13.88	PK
11000	41.43	11.12	H	52.55	73.98	21.43	PK
11000	28.18	11.12	H	39.30	53.98	14.68	AV
16500	40.26	12.50	H	52.76	68.20	15.44	PK

Band : UNII 2C

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5580 MHz

Channel No. 116 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	42.21	11.13	V	53.34	73.98	20.64	PK
11160	29.11	11.13	V	40.24	53.98	13.74	AV
16740	41.67	13.55	V	55.22	68.20	12.98	PK
11160	41.91	11.13	H	53.04	73.98	20.94	PK
11160	29.01	11.13	H	40.14	53.98	13.84	AV
16740	40.47	13.55	H	54.02	68.20	14.18	PK

Band : UNII 2C

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5720 MHz

Channel No. 144 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11440	42.10	11.26	V	53.36	73.98	20.62	PK
11440	29.81	11.26	V	41.07	53.98	12.91	AV
17160	47.72	14.70	V	62.42	68.20	5.78	PK
11440	41.06	11.26	H	52.32	73.98	21.66	PK
11440	28.44	11.26	H	39.70	53.98	14.28	AV
17160	49.29	14.70	H	63.99	68.20	4.21	PK

Band : UNII 2C  
 Operation Mode: 802.11 ac(VHT20)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	42.96	11.12	V	54.08	73.98	19.90	PK
11000	29.41	11.12	V	40.53	53.98	13.45	AV
16500	42.06	12.50	V	54.56	68.20	13.64	PK
11000	41.66	11.12	H	52.78	73.98	21.20	PK
11000	28.11	11.12	H	39.23	53.98	14.75	AV
16500	41.42	12.50	H	53.92	68.20	14.28	PK

Band : UNII 2C  
 Operation Mode: 802.11 ac(VHT20)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5580 MHz  
 Channel No. 116 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	43.12	11.13	V	54.25	73.98	19.73	PK
11160	29.11	11.13	V	40.24	53.98	13.74	AV
16740	41.23	13.55	V	54.78	68.20	13.42	PK
11160	42.97	11.13	H	54.10	73.98	19.88	PK
11160	29.02	11.13	H	40.15	53.98	13.83	AV
16740	40.79	13.55	H	54.34	68.20	13.86	PK

Band : UNII 2C

Operation Mode: 802.11 ac(VHT20)

Transfer MCS Index: MCS0

Operating Frequency 5720 MHz

Channel No. 144 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11440	41.77	11.26	V	53.03	73.98	20.95	PK
11440	29.86	11.26	V	41.12	53.98	12.86	AV
17160	46.85	14.70	V	61.55	68.20	6.65	PK
11440	40.63	11.26	H	51.89	73.98	22.09	PK
11440	28.61	11.26	H	39.87	53.98	14.11	AV
17160	49.65	14.70	H	64.35	68.20	3.85	PK

Band : UNII 2C

Operation Mode: 802.11 n(HT40)

Transfer MCS Index: MCS0

Operating Frequency 5510 MHz

Channel No. 102 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11020	42.16	11.18	V	53.34	73.98	20.64	PK
11020	29.09	11.18	V	40.27	53.98	13.71	AV
16530	42.11	12.80	V	54.91	68.20	13.29	PK
11020	41.75	11.18	H	52.93	73.98	21.05	PK
11020	28.26	11.18	H	39.44	53.98	14.54	AV
16530	40.21	12.80	H	53.01	68.20	15.19	PK

Band : UNII 2C  
 Operation Mode: 802.11 n(HT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5550 MHz  
 Channel No. 110 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11100	42.34	10.89	V	53.23	73.98	20.75	PK
11100	29.83	10.89	V	40.72	53.98	13.26	AV
16650	41.01	13.76	V	54.77	68.20	13.43	PK
11100	41.16	10.89	H	52.05	73.98	21.93	PK
11100	29.36	10.89	H	40.25	53.98	13.73	AV
16650	40.68	13.76	H	54.44	68.20	13.76	PK

Band : UNII 2C  
 Operation Mode: 802.11 n(HT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5710 MHz  
 Channel No. 142 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11420	41.92	11.29	V	53.21	73.98	20.77	PK
11420	29.50	11.29	V	40.79	53.98	13.19	AV
17130	41.09	14.54	V	55.63	68.20	12.57	PK
11420	40.30	11.29	H	51.59	73.98	22.39	PK
11420	29.05	11.29	H	40.34	53.98	13.64	AV
17130	40.48	14.54	H	55.02	68.20	13.18	PK

Band : UNII 2C

Operation Mode: 802.11 ac(VHT40)

Transfer MCS Index: MCS0

Operating Frequency 5500 MHz

Channel No. 102 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11020	42.42	11.18	V	53.60	73.98	20.38	PK
11020	29.26	11.18	V	40.44	53.98	13.54	AV
16530	41.11	12.80	V	53.91	68.20	14.29	PK
11020	41.47	11.18	H	52.65	73.98	21.33	PK
11020	29.06	11.18	H	40.24	53.98	13.74	AV
16530	40.51	12.80	H	53.31	68.20	14.89	PK

Band : UNII 2C

Operation Mode: 802.11 ac(VHT40)

Transfer MCS Index: MCS0

Operating Frequency 5550 MHz

Channel No. 110 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11100	42.24	10.89	V	53.13	73.98	20.85	PK
11100	29.72	10.89	V	40.61	53.98	13.37	AV
16650	41.78	13.76	V	55.54	68.20	12.66	PK
11100	41.56	10.89	H	52.45	73.98	21.53	PK
11100	29.16	10.89	H	40.05	53.98	13.93	AV
16650	41.54	13.76	H	55.30	68.20	12.90	PK

Band : UNII 2C

Operation Mode: 802.11 ac(VHT40)

Transfer MCS Index: MCS0

Operating Frequency 5710 MHz

Channel No. 142 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11420	41.93	11.29	V	53.22	73.98	20.76	PK
11420	29.39	11.29	V	40.68	53.98	13.30	AV
17130	41.39	14.54	V	55.93	68.20	12.27	PK
11420	40.66	11.29	H	51.95	73.98	22.03	PK
11420	29.26	11.29	H	40.55	53.98	13.43	AV
17130	40.77	14.54	H	55.31	68.20	12.89	PK

Band : UNII 2C

Operation Mode: 802.11 ac(VHT80)

Transfer MCS Index: MCS0

Operating Frequency 5530 MHz

Channel No. 106 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11060	43.03	10.95	V	53.98	73.98	20.00	PK
11060	31.03	10.95	V	41.98	53.98	12.00	AV
16590	41.12	12.73	V	53.85	68.20	14.35	PK
11060	42.52	10.95	H	53.47	73.98	20.51	PK
11060	30.63	10.95	H	41.58	53.98	12.40	AV
16590	40.38	12.73	H	53.11	68.20	15.09	PK

Band : UNII 2C  
 Operation Mode: 802.11 ac(VHT80)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5690 MHz  
 Channel No. 138 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11380	41.98	11.38	V	53.36	73.98	20.62	PK
11380	30.72	11.38	V	42.10	53.98	11.88	AV
17070	41.32	14.66	V	55.98	68.20	12.22	PK
11380	41.32	11.38	H	52.70	73.98	21.28	PK
11380	30.59	11.38	H	41.97	53.98	12.01	AV
17070	39.80	14.66	H	54.46	68.20	13.74	PK



Band : UNII 3

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5745MHz

Channel No. 149 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11490	41.30	11.54	V	52.84	73.98	21.14	PK
11490	29.02	11.54	V	40.56	53.98	13.42	AV
17235	42.67	15.28	V	57.95	68.20	10.25	PK
11490	42.16	11.54	H	53.70	73.98	20.28	PK
11490	30.36	11.54	H	41.90	53.98	12.08	AV
17235	43.72	15.28	H	59.00	68.20	9.20	PK

Band : UNII 3

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5785 MHz

Channel No. 157 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11570	41.38	10.94	V	52.32	73.98	21.66	PK
11570	29.01	10.94	V	39.95	53.98	14.03	AV
17355	41.93	15.94	V	57.87	68.20	10.33	PK
11570	42.52	10.94	H	53.46	73.98	20.52	PK
11570	29.11	10.94	H	40.05	53.98	13.93	AV
17355	42.90	15.94	H	58.84	68.20	9.36	PK

Band : UNII 3

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5825 MHz

Channel No. 165 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	43.59	10.39	V	53.98	73.98	20.00	PK
11650	31.06	10.39	V	41.45	53.98	12.53	AV
17475	40.81	17.24	V	58.05	68.20	10.15	PK
11650	42.54	10.39	H	52.93	73.98	21.05	PK
11650	30.69	10.39	H	41.08	53.98	12.90	AV
17475	42.33	17.24	H	59.57	68.20	8.63	PK

Band : UNII 3

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5745MHz

Channel No. 149 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11490	41.81	11.54	V	53.35	73.98	20.63	PK
11490	29.05	11.54	V	40.59	53.98	13.39	AV
17235	41.76	15.28	V	57.04	68.20	11.16	PK
11490	42.46	11.54	H	54.00	73.98	19.98	PK
11490	29.12	11.54	H	40.66	53.98	13.32	AV
17235	42.66	15.28	H	57.94	68.20	10.26	PK

Band : UNII 3

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5785 MHz

Channel No. 157 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11570	41.42	10.94	V	52.36	73.98	21.62	PK
11570	29.03	10.94	V	39.97	53.98	14.01	AV
17355	39.67	15.94	V	55.61	68.20	12.59	PK
11570	42.30	10.94	H	53.24	73.98	20.74	PK
11570	29.11	10.94	H	40.05	53.98	13.93	AV
17355	40.06	15.94	H	56.00	68.20	12.20	PK

Band : UNII 3

Operation Mode: 802.11 n(HT20)

Transfer MCS Index: MCS0

Operating Frequency 5825 MHz

Channel No. 165 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	41.39	10.39	V	51.78	73.98	22.20	PK
11650	28.92	10.39	V	39.31	53.98	14.67	AV
17475	40.38	17.24	V	57.62	68.20	10.58	PK
11650	42.84	10.39	H	53.23	73.98	20.75	PK
11650	29.01	10.39	H	39.40	53.98	14.58	AV
17475	43.25	17.24	H	60.49	68.20	7.71	PK

Band : UNII 3

Operation Mode: 802.11 ac(VHT20)

Transfer MCS Index: MCS0

Operating Frequency 5745MHz

Channel No. 149 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11490	42.81	11.54	V	54.35	73.98	19.63	PK
11490	28.69	11.54	V	40.23	53.98	13.75	AV
17235	42.81	15.28	V	58.09	68.20	10.11	PK
11490	43.33	11.54	H	54.87	73.98	19.11	PK
11490	28.91	11.54	H	40.45	53.98	13.53	AV
17235	43.69	15.28	H	58.97	68.20	9.23	PK

Band : UNII 3

Operation Mode: 802.11 ac(VHT20)

Transfer MCS Index: MCS0

Operating Frequency 5785 MHz

Channel No. 157 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11570	40.93	10.94	V	51.87	73.98	22.11	PK
11570	28.91	10.94	V	39.85	53.98	14.13	AV
17355	39.79	15.94	V	55.73	68.20	12.47	PK
11570	41.95	10.94	H	52.89	73.98	21.09	PK
11570	29.02	10.94	H	39.96	53.98	14.02	AV
17355	40.83	15.94	H	56.77	68.20	11.43	PK

Band : UNII 3  
 Operation Mode: 802.11 ac(VHT20)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5825 MHz  
 Channel No. 165 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11650	40.74	10.39	V	51.13	73.98	22.85	PK
11650	28.85	10.39	V	39.24	53.98	14.74	AV
17475	40.75	17.24	V	57.99	68.20	10.21	PK
11650	42.50	10.39	H	52.89	73.98	21.09	PK
11650	29.01	10.39	H	39.40	53.98	14.58	AV
17475	41.20	17.24	H	58.44	68.20	9.76	PK

Band : UNII 3  
 Operation Mode: 802.11 n(HT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5755 MHz  
 Channel No. 151 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11510	41.63	11.45	V	53.08	73.98	20.90	PK
11510	29.33	11.45	V	40.78	53.98	13.20	AV
17265	40.77	15.19	V	55.96	68.20	12.24	PK
11510	41.85	11.45	H	53.30	73.98	20.68	PK
11510	30.94	11.45	H	42.39	53.98	11.59	AV
17265	41.08	15.19	H	56.27	68.20	11.93	PK

Band : UNII 3  
 Operation Mode: 802.11 n(HT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5795 MHz  
 Channel No. 159 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11590	41.68	10.48	V	52.16	73.98	21.82	PK
11590	29.41	10.48	V	39.89	53.98	14.09	AV
17385	40.04	16.15	V	56.19	68.20	12.01	PK
11590	42.73	10.48	H	53.21	73.98	20.77	PK
11590	31.17	10.48	H	41.65	53.98	12.33	AV
17385	40.86	16.15	H	57.01	68.20	11.19	PK

Band : UNII 3  
 Operation Mode: 802.11 ac(VHT40)  
 Transfer MCS Index: MCS0  
 Operating Frequency 5755 MHz  
 Channel No. 151 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11510	41.54	11.45	V	52.99	73.98	20.99	PK
11510	29.30	11.45	V	40.75	53.98	13.23	AV
17265	40.59	15.19	V	55.78	68.20	12.42	PK
11510	42.04	11.45	H	53.49	73.98	20.49	PK
11510	30.69	11.45	H	42.14	53.98	11.84	AV
17265	41.50	15.19	H	56.69	68.20	11.51	PK

Band : UNII 3

Operation Mode: 802.11 ac(VHT40)

Transfer MCS Index: MCS0

Operating Frequency 5795 MHz

Channel No. 159 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11590	41.28	10.48	V	51.76	73.98	22.22	PK
11590	28.67	10.48	V	39.15	53.98	14.83	AV
17385	40.05	16.15	V	56.20	68.20	12.00	PK
11590	42.04	10.48	H	52.52	73.98	21.46	PK
11590	30.83	10.48	H	41.31	53.98	12.67	AV
17385	40.46	16.15	H	56.61	68.20	11.59	PK

Band : UNII 3

Operation Mode: 802.11 ac(VHT80)

Transfer MCS Index: MCS0

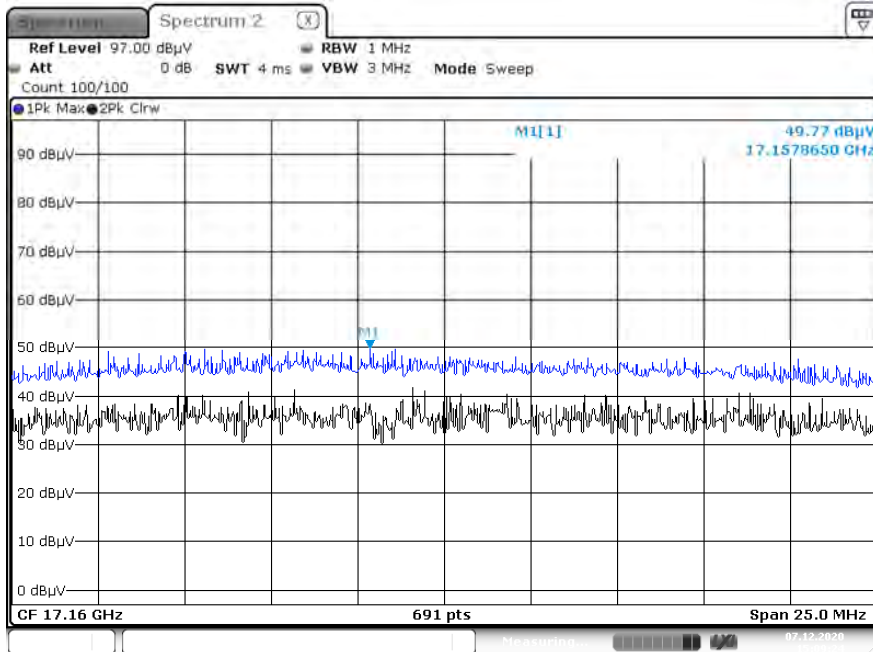
Operating Frequency 5775 MHz

Channel No. 155 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L-A.G+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11550	41.66	11.00	V	52.66	73.98	21.32	PK
11550	30.05	11.00	V	41.05	53.98	12.93	AV
17325	39.94	15.71	V	55.65	68.20	12.55	PK
11550	42.50	11.00	H	53.50	73.98	20.48	PK
11550	30.82	11.00	H	41.82	53.98	12.16	AV
17325	41.10	15.71	H	56.81	68.20	11.39	PK

▣ Test Plots

Peak Reading (802.11a, Ch.144 3rd Harmonic, X-H)



**Note:**

Only the worst case plots for Radiated Spurious Emissions.



### 10.8 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	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	44.58	8.02	H	52.60	73.98	21.38	PK
5150	31.87	8.02	H	39.89	53.98	14.09	AV
5150	44.92	8.02	V	52.94	73.98	21.04	PK
5150	32.18	8.02	V	40.20	53.98	13.78	AV

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	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	43.14	8.02	H	51.16	73.98	22.82	PK
5150	31.98	8.02	H	40.00	53.98	13.98	AV
5150	43.87	8.02	V	51.89	73.98	22.09	PK
5150	32.36	8.02	V	40.38	53.98	13.60	AV

Band : UNII 1

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Operation Mode: 802.11 ac\_VHT20

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Transfer MCS Index: 0

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Operating Frequency 5180 MHz

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Channel No. 36 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	43.51	8.02	H	51.53	73.98	22.45	PK
5150	31.95	8.02	H	39.97	53.98	14.01	AV
5150	44.57	8.02	V	52.59	73.98	21.39	PK
5150	32.19	8.02	V	40.21	53.98	13.77	AV

Band : UNII 1

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Operation Mode: 802.11 n\_HT40

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Transfer MCS Index: 0

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Operating Frequency 5190 MHz

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Channel No. 38 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	43.57	8.02	H	51.59	73.98	22.39	PK
5150	32.73	8.02	H	40.75	53.98	13.23	AV
5150	44.42	8.02	V	52.44	73.98	21.54	PK
5150	33.16	8.02	V	41.18	53.98	12.80	AV

Band : UNII 1

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Operation Mode: 802.11 ac\_VHT40

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Transfer MCS Index: 0

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Operating Frequency 5190 MHz

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Channel No. 38 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	42.64	8.02	H	50.66	73.98	23.32	PK
5150	31.26	8.02	H	39.28	53.98	14.70	AV
5150	44.89	8.02	V	52.91	73.98	21.07	PK
5150	32.65	8.02	V	40.67	53.98	13.31	AV

Band : UNII 1

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Operation Mode: 802.11 ac\_VHT80

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Transfer MCS Index: 0

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Operating Frequency 5210 MHz

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Channel No. 42 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	44.10	8.02	H	52.12	73.98	21.86	PK
5150	34.37	8.02	H	42.39	53.98	11.59	AV
5150	44.57	8.02	V	52.59	73.98	21.39	PK
5150	35.49	8.02	V	43.51	53.98	10.47	AV

Band : UNII 2A

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Operation Mode: 802.11 a

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Transfer Rate: 6 Mbps

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Operating Frequency 5320 MHz

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Channel No. 64 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	46.32	7.87	H	54.19	73.98	19.79	PK
5350	34.11	7.87	H	41.98	53.98	12.00	AV
5350	45.72	7.87	V	53.59	73.98	20.39	PK
5350	33.37	7.87	V	41.24	53.98	12.74	AV

Band : UNII 2A

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Operation Mode: 802.11 n\_HT20

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Transfer MCS Index: 0

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Operating Frequency 5320 MHz

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Channel No. 64 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	46.05	7.87	H	53.92	73.98	20.06	PK
5350	33.80	7.87	H	41.67	53.98	12.31	AV
5350	45.13	7.87	V	53	73.98	20.98	PK
5350	33.41	7.87	V	41.28	53.98	12.70	AV

Band : UNII 2A

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Operation Mode: 802.11 ac\_VHT20

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Transfer MCS Index: 0

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Operating Frequency 5320 MHz

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Channel No. 64 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	46.45	7.87	H	54.32	73.98	19.66	PK
5350	34.17	7.87	H	42.04	53.98	11.94	AV
5350	45.85	7.87	V	53.72	73.98	20.26	PK
5350	33.86	7.87	V	41.73	53.98	12.25	AV

Band : UNII 2A

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Operation Mode: 802.11 n\_HT40

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Transfer MCS Index: 0

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Operating Frequency 5310 MHz

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Channel No. 62 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	47.09	7.87	H	54.96	73.98	19.02	PK
5350	34.41	7.87	H	42.28	53.98	11.70	AV
5350	44.85	7.87	V	52.72	73.98	21.26	PK
5350	33.05	7.87	V	40.92	53.98	13.06	AV

Band : UNII 2A

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Operation Mode: 802.11 ac\_VHT40

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Transfer MCS Index: 0

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Operating Frequency 5310 MHz

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Channel No. 62 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	46.07	7.87	H	53.94	73.98	20.04	PK
5350	33.94	7.87	H	41.81	53.98	12.17	AV
5350	45.67	7.87	V	53.54	73.98	20.44	PK
5350	33.53	7.87	V	41.4	53.98	12.58	AV

Band : UNII 2A

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Operation Mode: 802.11 ac\_VHT80

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Transfer MCS Index: 0

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Operating Frequency 5290 MHz

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Channel No. 58 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	50.37	7.87	H	58.24	73.98	15.74	PK
5350	37.75	7.87	H	45.62	53.98	8.36	AV
5350	49.62	7.87	V	57.49	73.98	16.49	PK
5350	36.17	7.87	V	44.04	53.98	9.94	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+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	44.93	8.35	H	53.28	73.98	20.70	PK
5460	32.05	8.35	H	40.4	53.98	13.58	AV
5470	44.47	8.31	H	52.78	68.20	15.42	PK
5460	45.16	8.35	V	53.51	73.98	20.47	PK
5460	32.47	8.31	V	40.78	53.98	13.20	AV
5470	45.23	8.31	V	53.54	68.20	14.66	PK

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	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	43.94	8.35	H	52.29	73.98	21.69	PK
5460	31.72	8.35	H	40.07	53.98	13.91	AV
5470	44.62	8.31	H	52.93	68.20	15.27	PK
5460	44.64	8.35	V	52.99	73.98	20.99	PK
5460	32.23	8.31	V	40.54	53.98	13.44	AV
5470	45.06	8.31	V	53.37	68.20	14.83	PK

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	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	44.34	8.35	H	52.69	73.98	21.29	PK
5460	32.02	8.35	H	40.37	53.98	13.61	AV
5470	45.38	8.31	H	53.69	68.20	14.51	PK
5460	44.35	8.35	V	52.7	73.98	21.28	PK
5460	32.21	8.31	V	40.52	53.98	13.46	AV
5470	45.44	8.31	V	53.75	68.20	14.45	PK

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	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	43.89	8.35	H	52.24	73.98	21.74	PK
5460	31.71	8.35	H	40.06	53.98	13.92	AV
5470	44.91	8.31	H	53.22	68.20	14.98	PK
5460	43.96	8.35	V	52.31	73.98	21.67	PK
5460	32.99	8.31	V	41.3	53.98	12.68	AV
5470	45.25	8.31	V	53.56	68.20	14.64	PK



Band : UNII 2C

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Operation Mode: 802.11 ac\_VHT40

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Transfer MCS Index: 0

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Operating Frequency 5510 MHz

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Channel No. 102 Ch

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Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	43.63	8.35	H	51.98	73.98	22.00	PK
5460	33.70	8.35	H	42.05	53.98	11.93	AV
5470	43.93	8.31	H	52.24	68.20	15.96	PK
5460	43.95	8.35	V	52.3	73.98	21.68	PK
5460	34.18	8.31	V	42.49	53.98	11.49	AV
5470	44.58	8.31	V	52.89	68.20	15.31	PK

Band : UNII 2C

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Operation Mode: 802.11 ac\_VHT80

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Transfer MCS Index: 0

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Operating Frequency 5530 MHz

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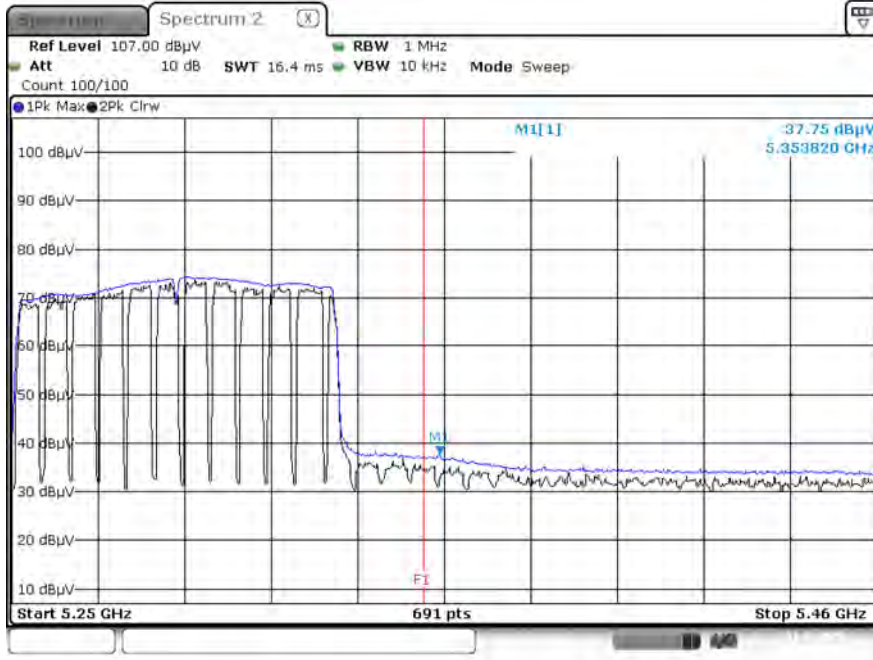
Channel No. 106 Ch

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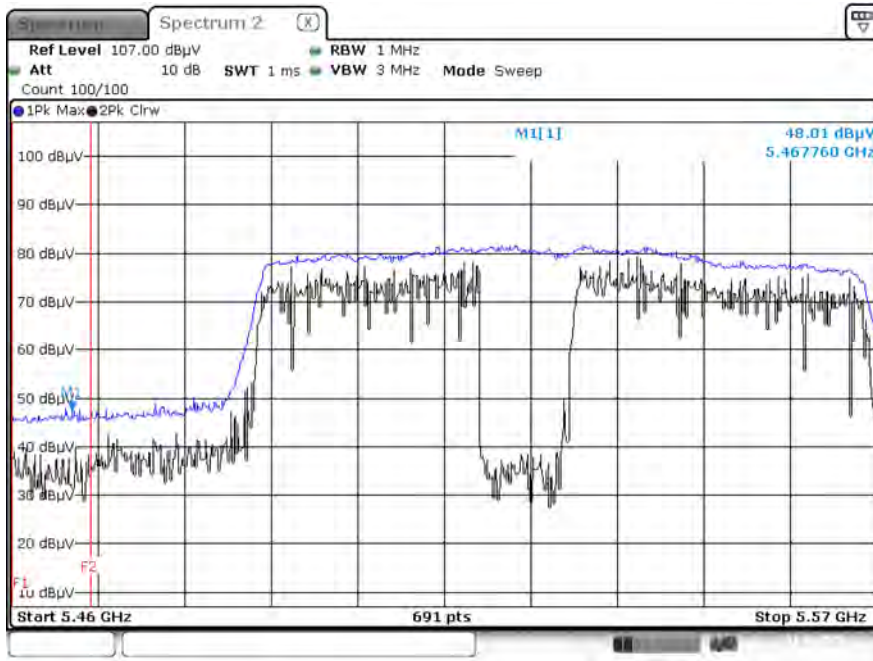
Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	45.59	8.35	H	53.94	73.98	20.04	PK
5460	34.93	8.35	H	43.28	53.98	10.70	AV
5470	46.25	8.31	H	54.56	68.20	13.64	PK
5460	46.88	8.35	V	55.23	73.98	18.75	PK
5460	35.04	8.31	V	43.35	53.98	10.63	AV
5470	48.01	8.31	V	56.32	68.20	11.88	PK

▣ Test Plots(UNII 1, 2A, 2C)\_ (X-H)

Average Reading (802.11 ac\_VHT80, Ch.58)



Peak Reading (802.11 ac\_VHT80, Ch.106)

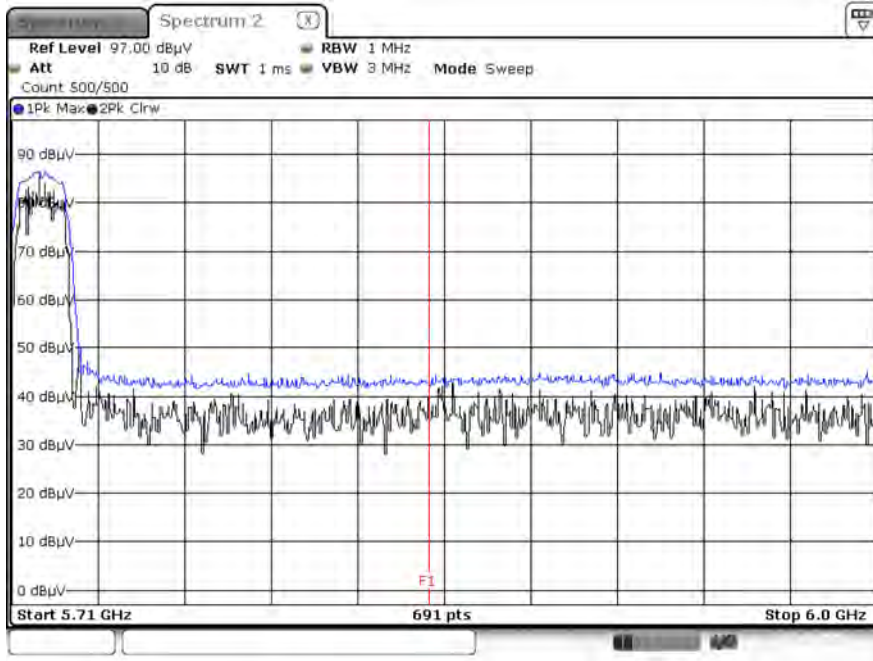


**Note:**

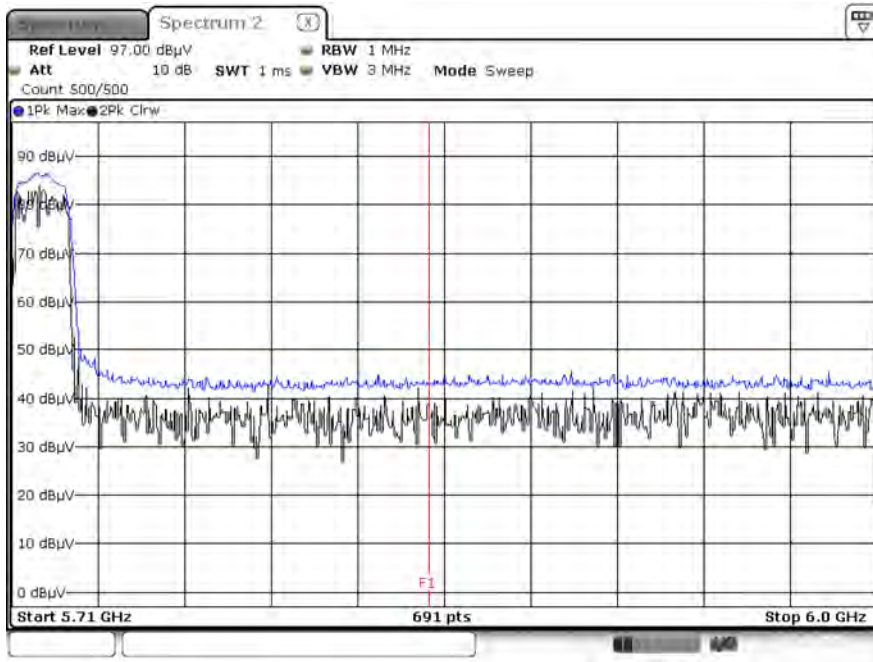
Only the worst case plots for Radiated Restricted Band Edge.

Test Plots(Staraddle Channel)

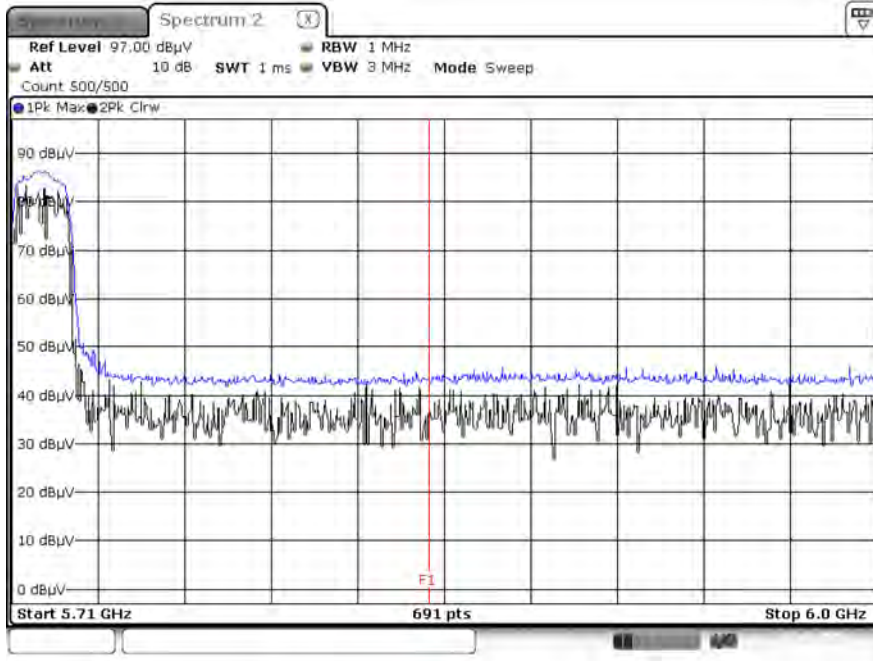
Peak Reading (802.11a, Ch.144, X-H)



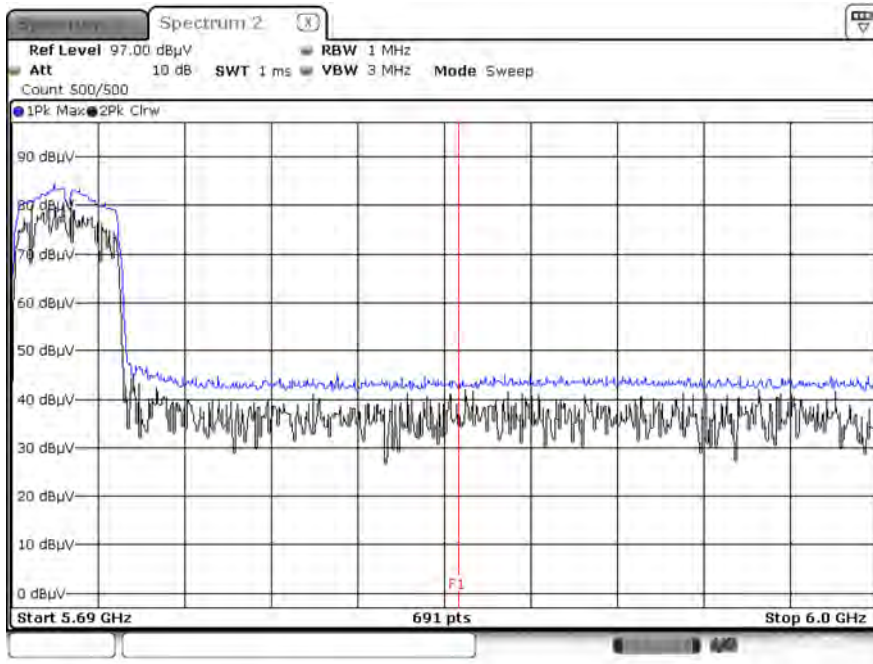
Peak Reading (802.11n\_HT20, Ch.144, X-H)



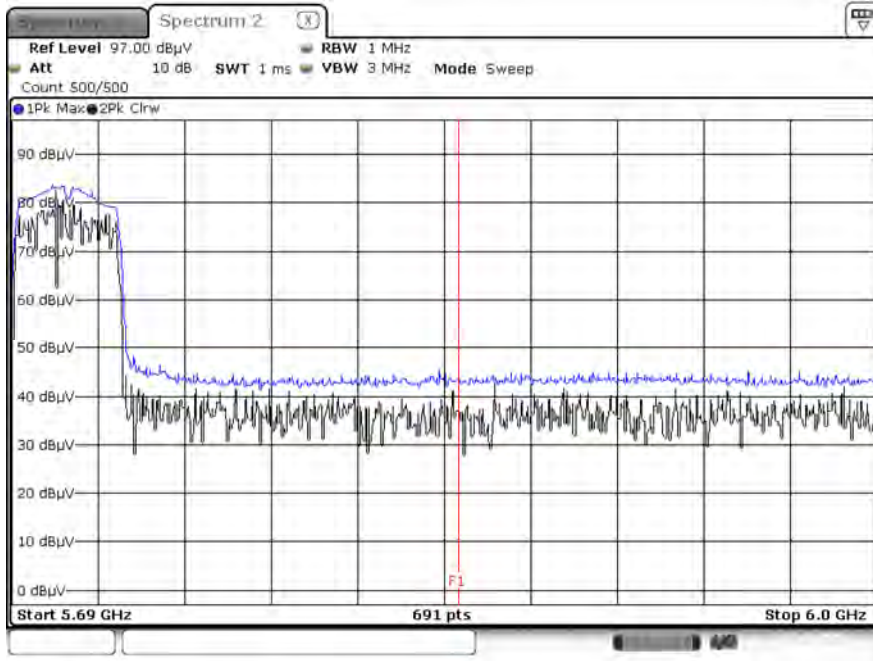
### Peak Reading (802.11ac\_VHT20, Ch.144, X-H)



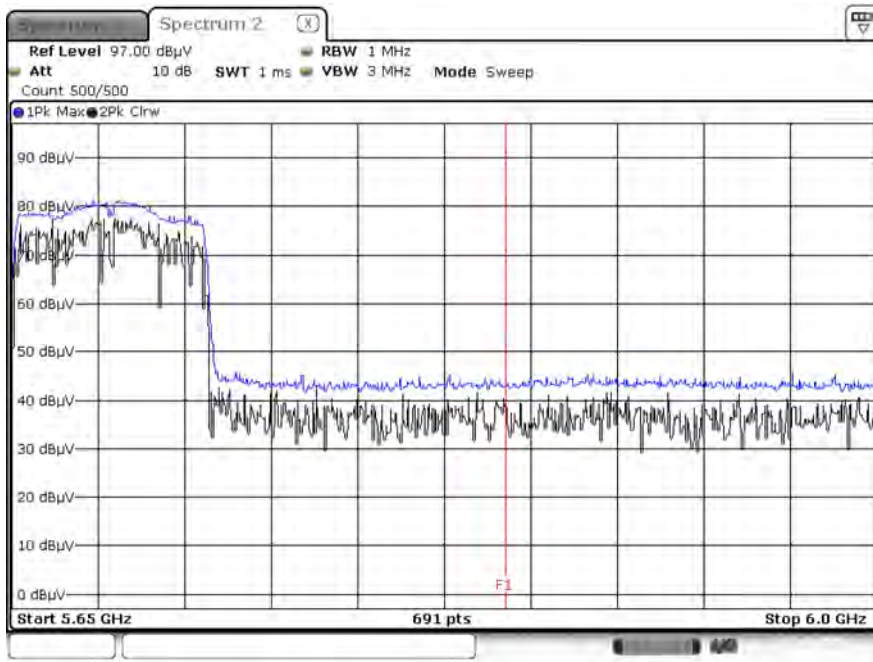
### Peak Reading (802.11n\_HT40, Ch.142, X-H)



Peak Reading (802.11ac\_VHT40, Ch.142, X-H)



Peak Reading (802.11ac\_VHT80, Ch.138, X-H)



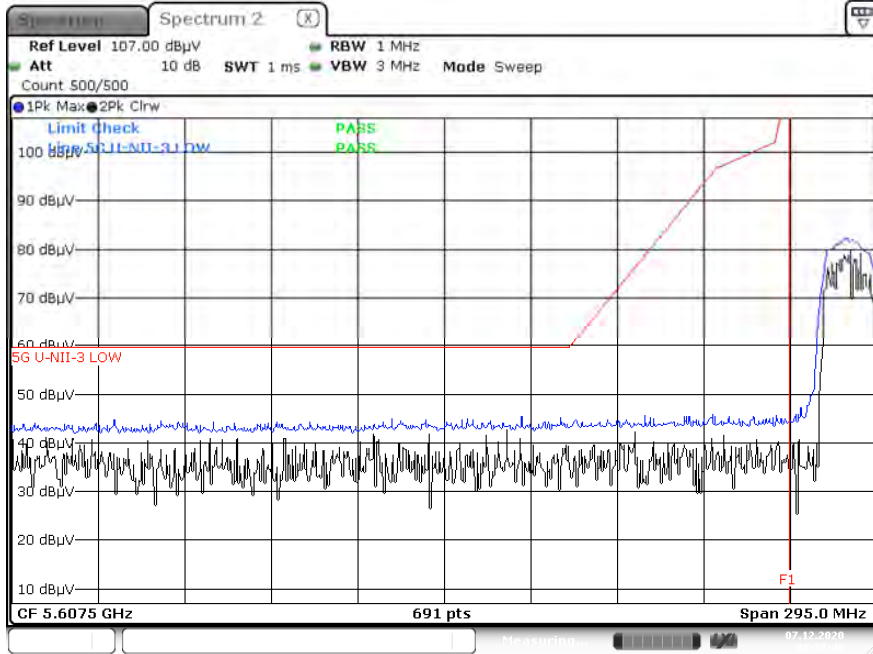
**Note :**

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)

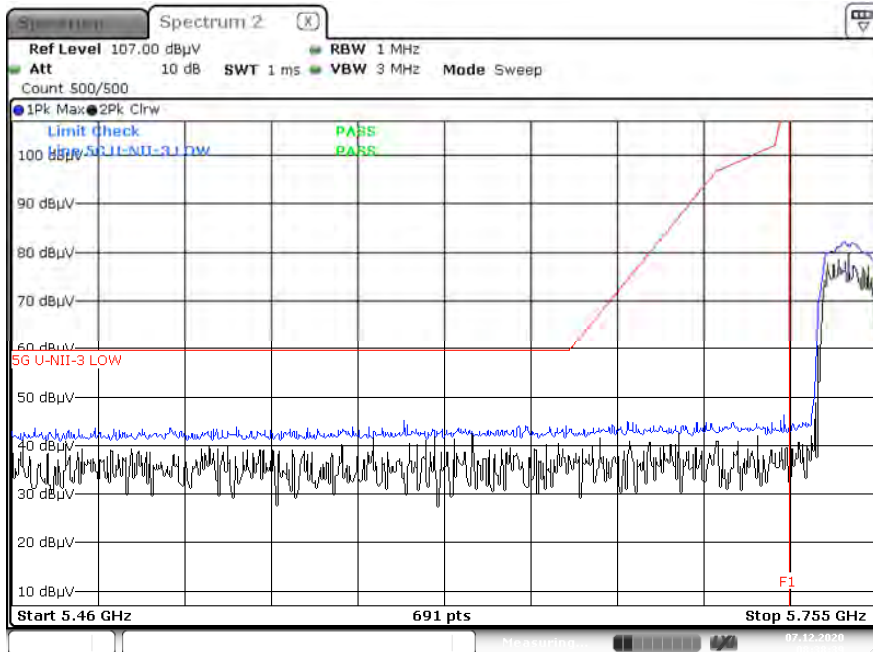


▣ Test Plots(UNII 3)

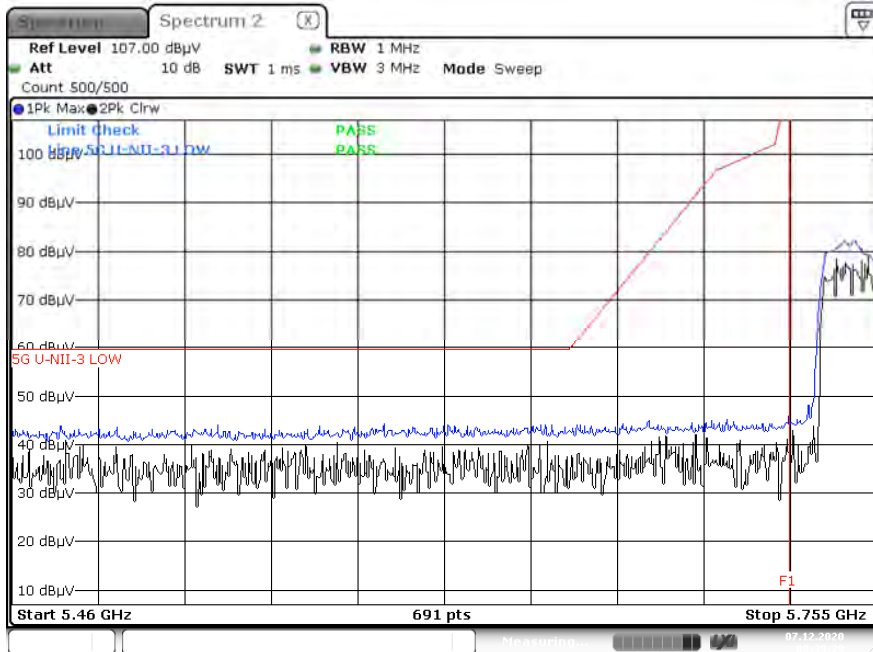
Peak Reading (802.11a, Ch.149, X-H)



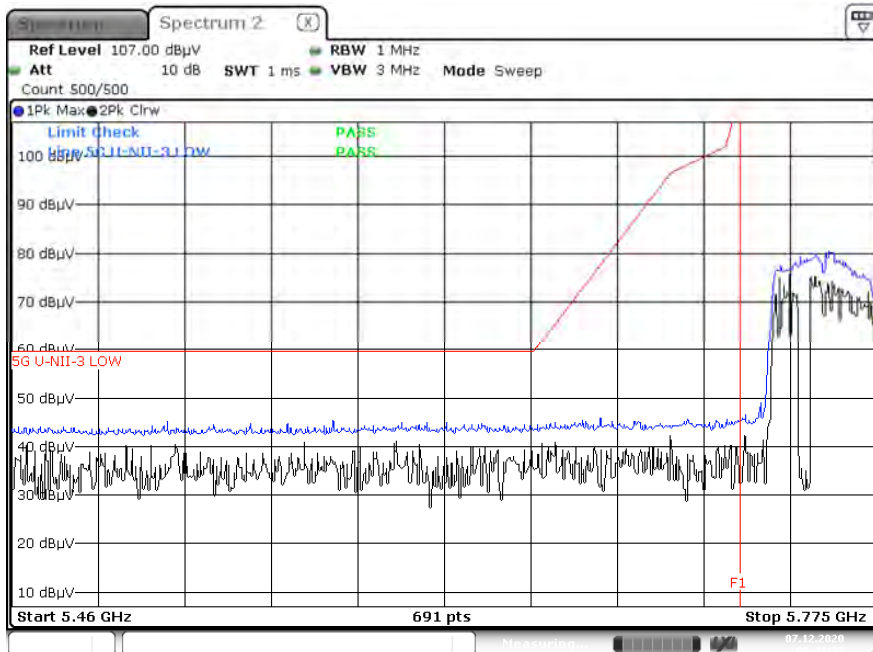
Peak Reading (802.11n\_HT20, Ch.149, X-H)



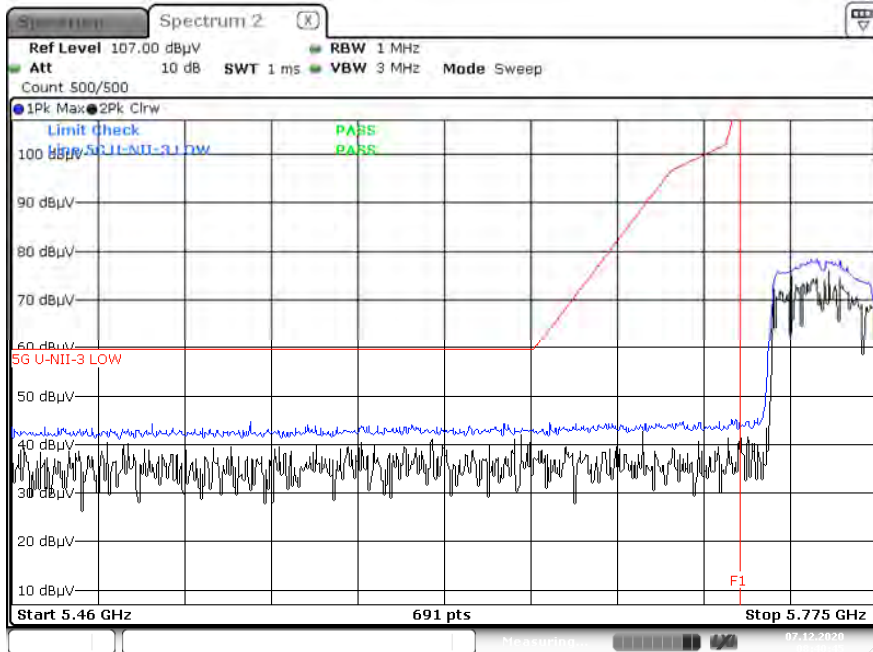
### Peak Reading (802.11ac\_VHT20, Ch.149, X-H)



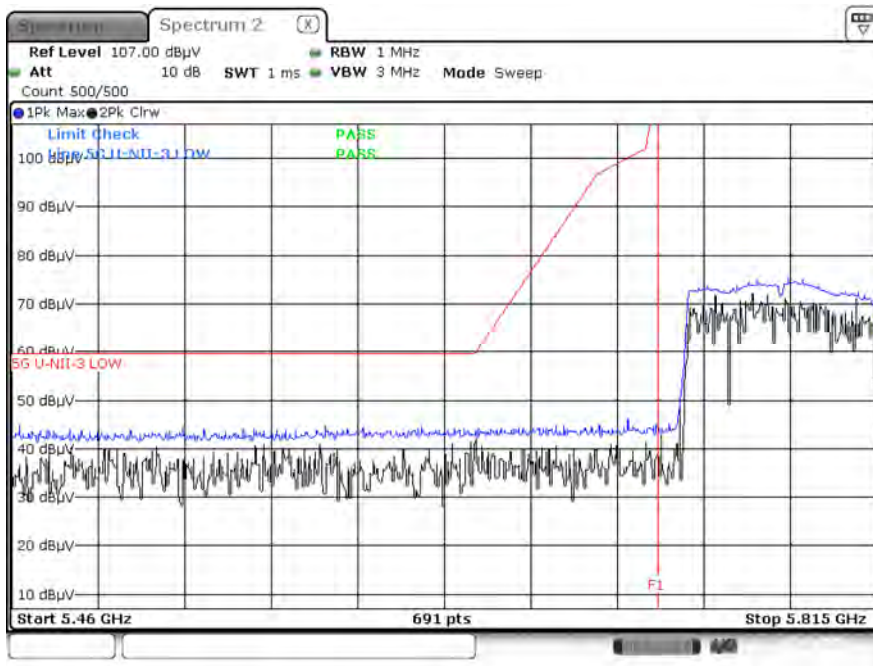
### Peak Reading (802.11n\_HT40, Ch.151, X-H)



Peak Reading (802.11ac\_VHT40, Ch.151, X-H)

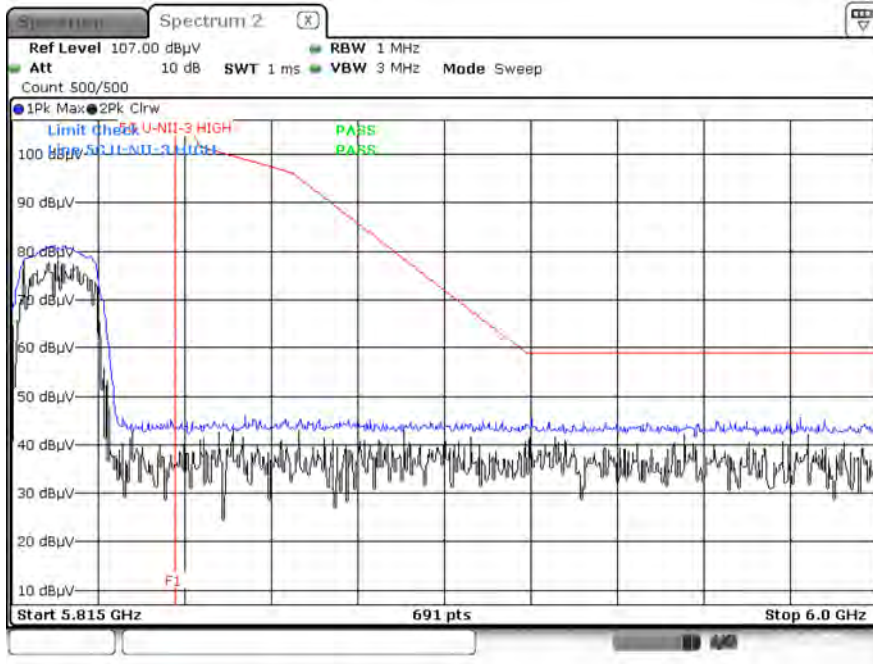


Peak Reading (802.11ac\_VHT80, Ch.155, X-H)

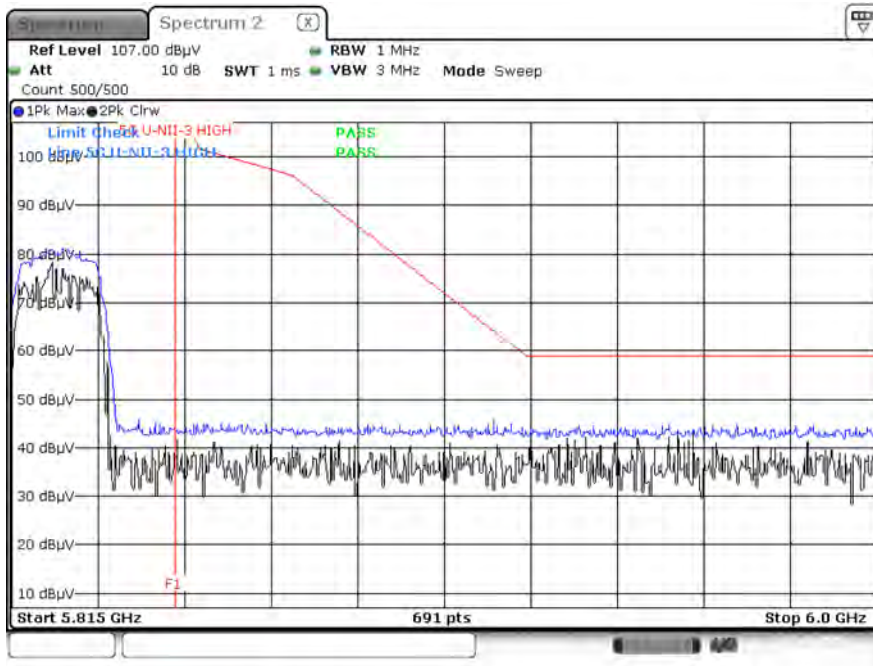




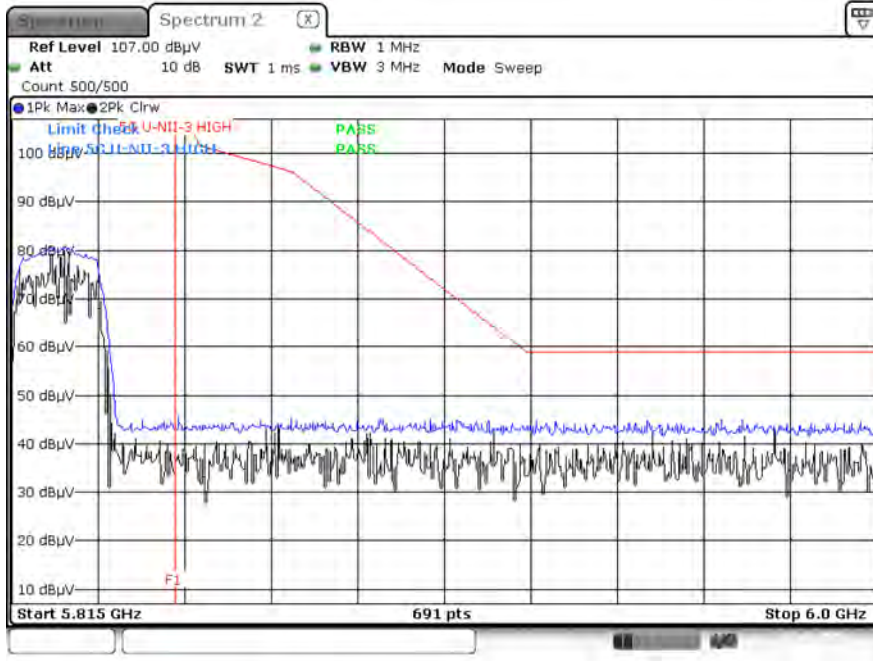
Peak Reading (802.11a, Ch.165, X-H)



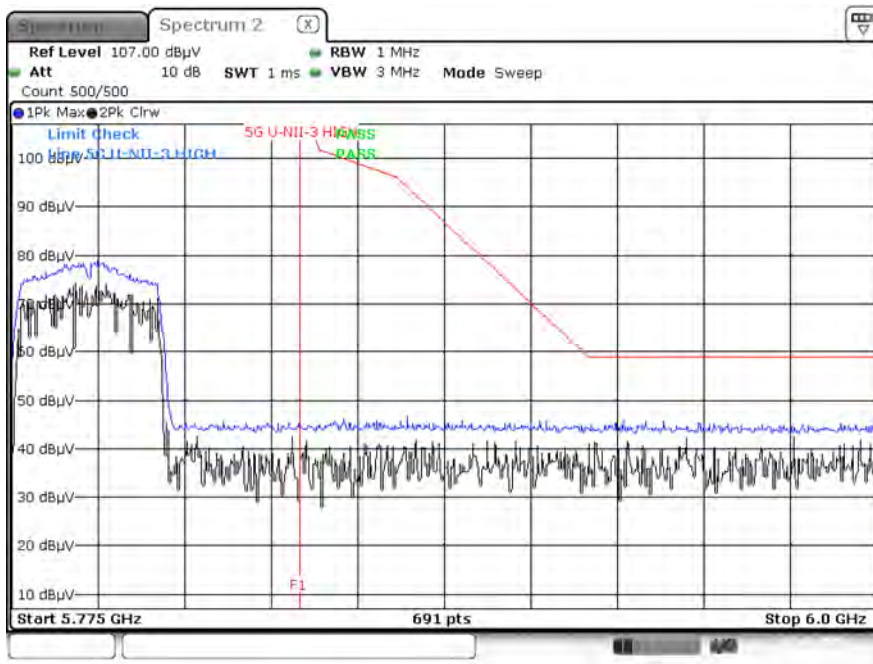
Peak Reading (802.11n\_HT20, Ch.165, X-H)



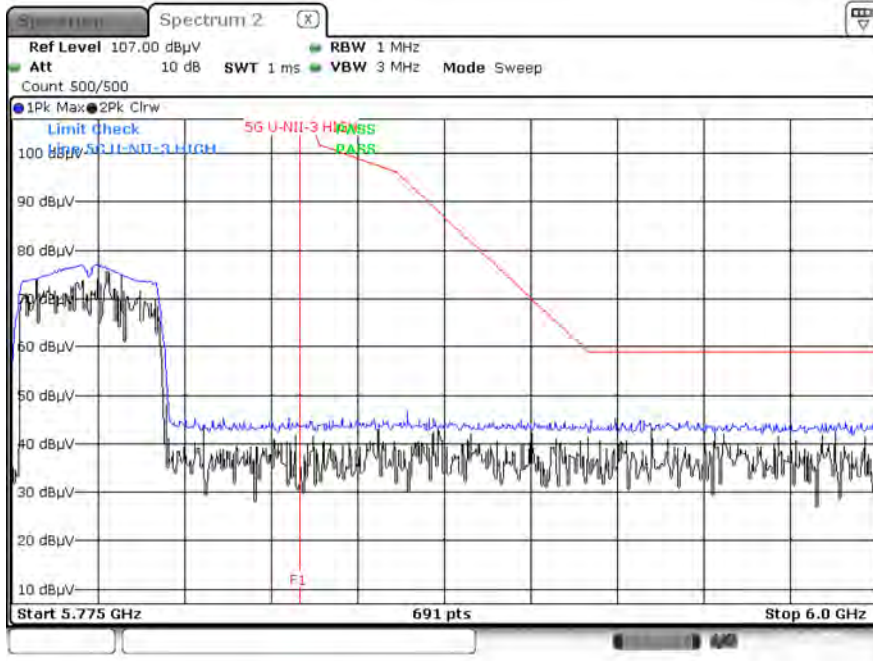
**Peak Reading (802.11ac\_VHT20, Ch.165, X-H)**



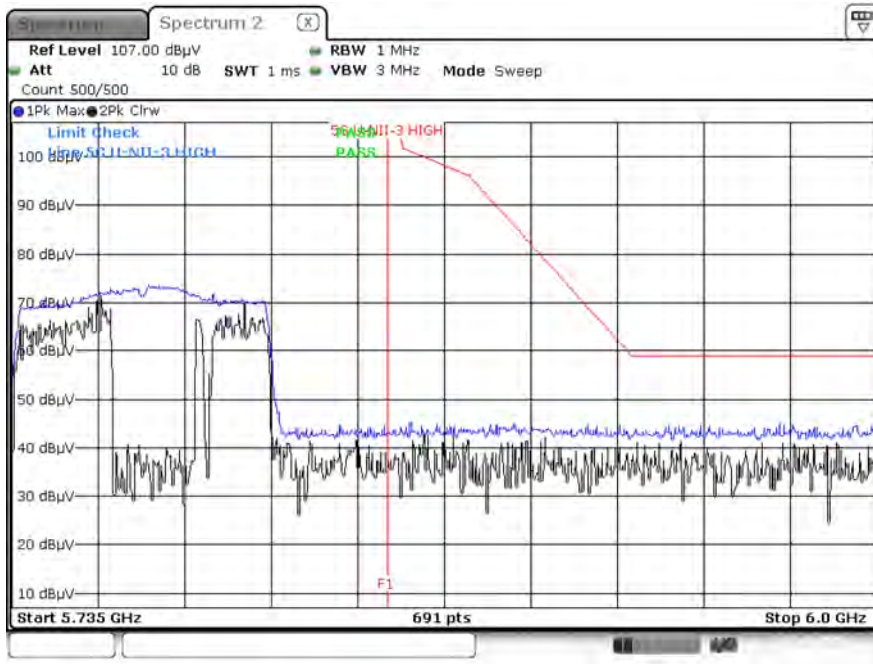
**Peak Reading (802.11n\_HT40, Ch.159, X-H)**



Peak Reading (802.11ac\_VHT40, Ch.159, X-H)



Peak Reading (802.11ac\_VHT80, Ch.155, X-H)



**Note :**

1. Only the worst case plots for U-NII-3 Out of Band e.i.r.p Emission.
2. U-NII-3 Low & High Band Edge RedLine is Final Test Limit about factor value compensation.

## 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	ESCI / Test Receiver	06/10/2020	Annual	100584
ESPEC	SU-642 / Temperature Chamber	07/30/2020	Annual	0093000718
Agilent	N9020A / Signal Analyzer	05/11/2020	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	03/23/2020	Annual	MY49432108
Agilent	N1911A / Power Meter	04/07/2020	Annual	MY45100523
Agilent	N1921A / Power Sensor	06/08/2020	Annual	MY57820067
Agilent	87300B / Directional Coupler	11/10/2020	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	02/14/2020	Annual	10545
HP	E3632A / DC Power Supply	09/16/2020	Annual	MY40004427
HP	8493C / Attenuator(10 dB)(DC-26.5 GHz)	06/26/2020	Annual	07560
HP	8493C / Attenuator(10 dB)(DC-26.5 GHz)	07/03/2020	Annual	08285
Rohde & Schwarz	18N-20dB / Attenuator(20 dB)	03/23/2020	Annual	8
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A

**Note:**

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

**Radiated Test**

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
TNM system	FBSM-01B / Amp & Filter Bank Switch Controller	N/A	N/A	N/A
Schwarzbeck	Loop Antenna	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	08/02/2019	Biennial	01039
Schwarzbeck	BBHA 9120D / Horn Antenna	06/28/2019	Biennial	1300
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	04/29/2019	Biennial	BBHA9170342
Rohde & Schwarz	FSP(10 Hz ~ 40 GHz) / Spectrum Analyzer	05/13/2020	Annual	101055
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/21/2020	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/10/2020	Annual	1
CERNEX	CBL18265035 / Power Amplifier	12/26/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956
TNM system	FBSM-05B / HPF(3~18GHz) + LNA1(1~18GHz)	01/21/2020	Annual	F6
TNM system	FBSM-05B / ATT(10dB) + LNA1(1~18GHz)	01/21/2020	Annual	None
TNM system	FBSM-05B / ATT(3dB) + LNA1(1~18GHz)	01/21/2020	Annual	None
TNM system	FBSM-05B / LNA1(1~18GHz)	01/21/2020	Annual	25540
TNM system	FBSM-05B / HPF(7~18GHz) + LNA2(6~18GHz)	01/21/2020	Annual	28550
TNM system	FBSM-05B / Thru(30MHz ~ 18GHz)	01/21/2020	Annual	None
Weinschel	2-3 / Attenuator (3 dB)	10/07/2020	Annual	BR0617
H+S	5910-N-50-010 / Attenuator(10 dB)	10/28/2020	Annual	None

**Note:**

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

## 12. ANNEX A\_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2012-FC039-P