

# TEST REPORT

FCC/ISED UNII Test for 1080i  
Certification

**APPLICANT**

Ericsson-LG Enterprise Co., Ltd.

**REPORT NO.**

HCT-RF-2104-FI005

**DATE OF ISSUE**

April 1, 2021

Tested by  
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<b>TEST REPORT</b> FCC/ISED UNII Test for 1080i	<b>REPORT NO.</b> HCT-RF-2104-FI005
	<b>DATE OF ISSUE</b> April 01, 2021
	<b>Additional Model</b> VIP-1080i-00

Applicant	<b>Ericsson-LG Enterprise Co., Ltd.</b> LG Gasan digital Center 11F, Gasan digital 1-ro 189, Geumchun-gu, Seoul 08503, Korea
Eut Type Model Name	IP Phone 1080i
FCC ID IC	2ABGA1080I 11597A-1080I
Modulation type	OFDM
FCC Classification	Unlicensed National Information Infrastructure(NII)
FCC Rule Part(s)	Part 15.407
ISED Rule Part(s)	RSS-247 Issue 2 (February 2017) RSS-Gen Issue 5_Amendment 2 (February 2021)

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	April 01, 2021	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 / ISED Rules under normal use and maintenance.

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**1. GENERAL INFORMATION****EUT DESCRIPTION**

Model	1080i	
Additional Model	VIP-1080i-00	
EUT Type	IP Phone	
Power Supply	DC 48.0 [V]	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20MHz BW : 5180 - 5240 40MHz BW : 5190 - 5230 80MHz BW : 5210
	U-NII-2A	20MHz BW : 5260 - 5320 40MHz BW : 5270 - 5310 80MHz BW : 5290
	U-NII-2C	20MHz BW : 5500 - 5720 40MHz BW : 5510 - 5710 80MHz BW : 5530 - 5690
	U-NII-3	20MHz BW : 5745 - 5825 40MHz BW : 5755 - 5795 80MHz BW : 5775
Antenna Specification	Antenna type: Pattern Antenna Peak Gain : UNII-1: 2.38 dBi, UNII-2A: 2.04 dBi UNII-2C: 1.93 dBi, UNII-3: 1.93 dBi	
Straddle channel	Supported	
TDWR Band	Not Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	March 15, 2021 ~ March 26, 2021	
PMN (Product Marketing Number)	iPECS Videophone	
HVIN (Hardware Version Identification Number)	1080i	
FVIN (Firmware Version Identification Number)	Android 10.0	
HMN (Host Marketing Name)	N/A	
EUT serial numbers	Radiated : 1080i Conducted : 1080i	

## 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)
UNII-1	802.11a	15.06	0.032
	802.11n (HT20)	14.69	0.029
	802.11n (HT40)	11.55	0.014
	802.11ac (VHT20)	14.78	0.030
	802.11ac (VHT40)	11.64	0.015
	802.11ac (VHT80)	7.93	0.006
UNII-2A	802.11a	15.51	0.036
	802.11n (HT20)	15.13	0.033
	802.11n (HT40)	11.97	0.016
	802.11ac (VHT20)	15.12	0.033
	802.11ac (VHT40)	11.50	0.014
	802.11ac (VHT80)	8.63	0.007
UNII-2C	802.11a	15.04	0.032
	802.11n (HT20)	14.62	0.029
	802.11n (HT40)	11.70	0.015
	802.11ac (VHT20)	14.62	0.029
	802.11ac (VHT40)	11.61	0.015
	802.11ac (VHT80)	8.38	0.007
UNII-3	802.11a	14.84	0.030
	802.11n (HT20)	14.49	0.028
	802.11n (HT40)	11.36	0.014
	802.11ac (VHT20)	14.47	0.028
	802.11ac (VHT40)	11.43	0.014
	802.11ac (VHT80)	7.03	0.005

### **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.

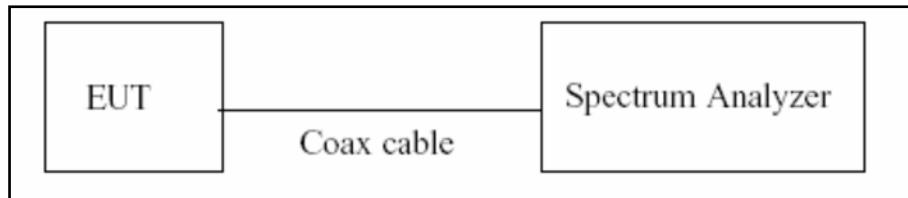
The measurement data shown herein meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance

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.

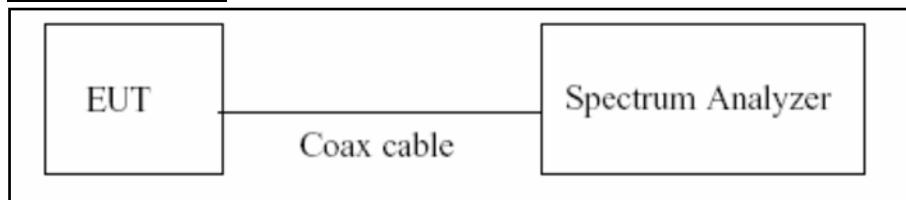
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ( $\geq$  RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep  $> 100$
6. Trace mode = Clear write
7. Measure  $T_{\text{total}}$  and  $T_{\text{on}}$
8. Calculate Duty Cycle =  $T_{\text{on}} / T_{\text{total}}$  and Duty Cycle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

## 8.2. 6dB Bandwidth & 26dB Bandwidth & 99 % 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 lever measured in the fundamental emission.

**Note:**

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

**Test Procedure (99 % Bandwidth for ISED)**

The transmitter output is connected to the spectrum analyzer.

RBW = 1% ~ 5% of the occupied bandwidth

VBW  $\approx$  3 x RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

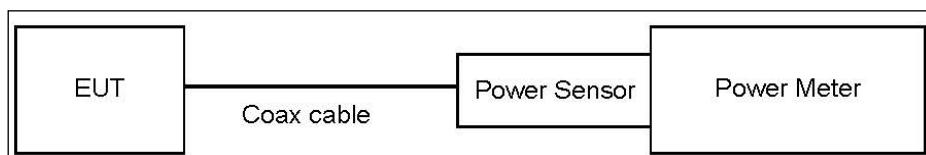
### 8.3. Output Power Measurement

#### Limit

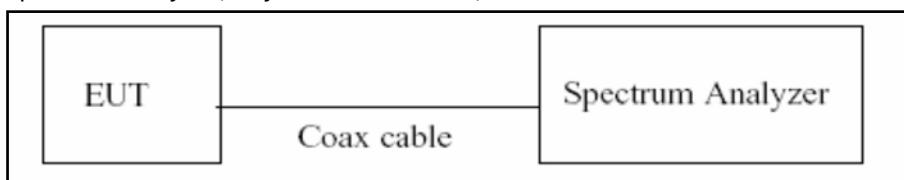
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

#### 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  $\geq$  3 MHz.
5. Number of points in sweep  $\geq$  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

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

Band	Loss(dB)
UNII 1	12.02
UNII 2A	12.02
UNII 2C	12.02
UNII 3	12.02

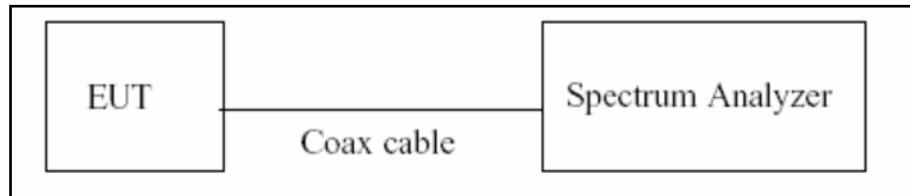
(Actual value of loss for the attenuator and cable combination)

#### 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

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

Band	Loss(dB)
UNII 1	12.02
UNII 2A	12.02
UNII 2C	12.02
UNII 3	12.02

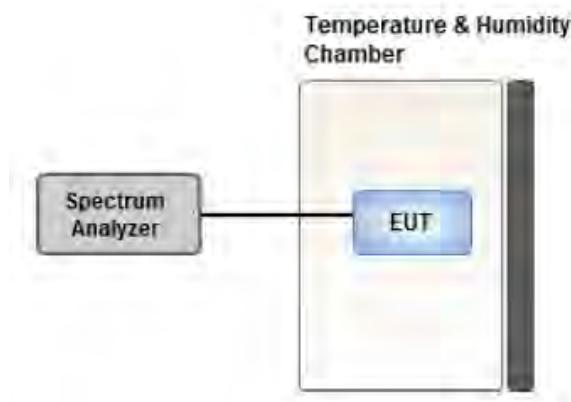
(Actual value of loss for the attenuator and cable combination)

## 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  $-27 \text{ dBm/MHz}$ .
2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of  $-27 \text{ dBm/MHz}$ .
3. UNII 3: All emissions shall be limited to a level of  $-27 \text{ dBm/MHz}$  at 75 MHz or more above or below the band edge increasing linearly to  $10 \text{ dBm/MHz}$  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  $15.6 \text{ dBm/MHz}$  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  $27 \text{ dBm/MHz}$  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.

### FCC

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

### ISED

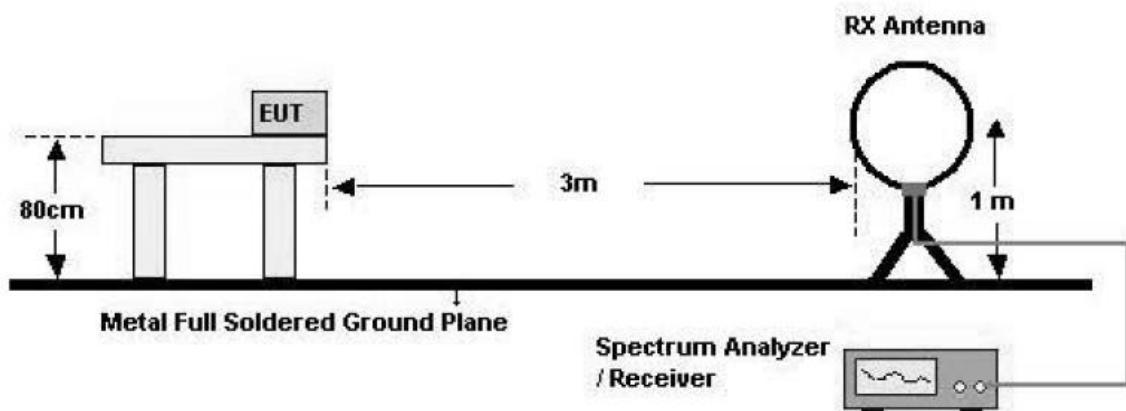
Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	$6.37/F(\text{kHz})$	300
0.490 – 1.705	$63.7/F(\text{kHz})$	30
1.705 – 30	0.08	30

**FCC&ISED**

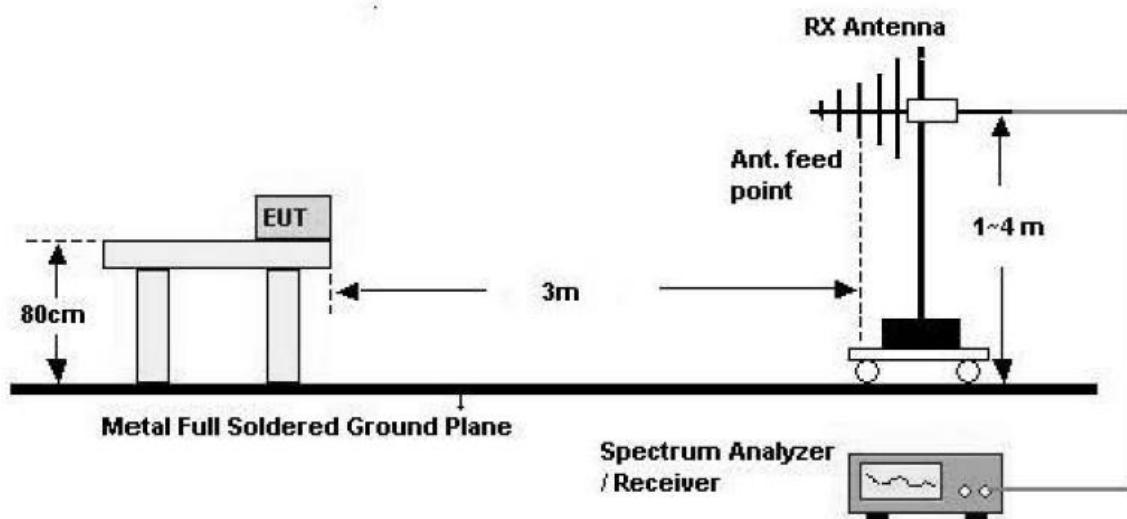
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

**Test Configuration**

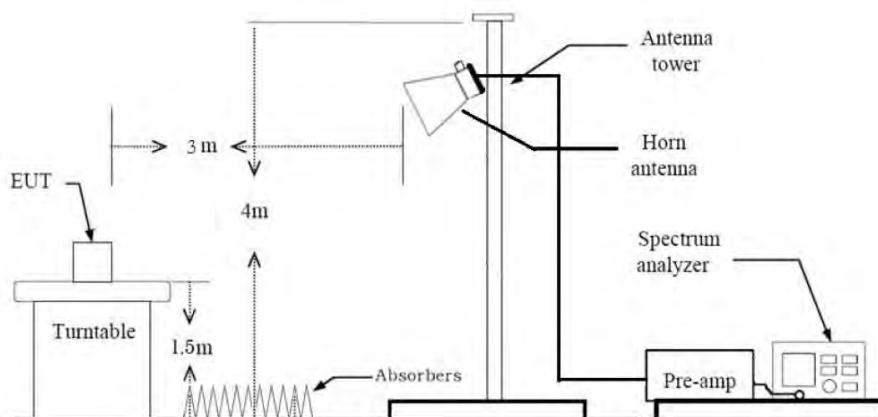
Below 30 MHz



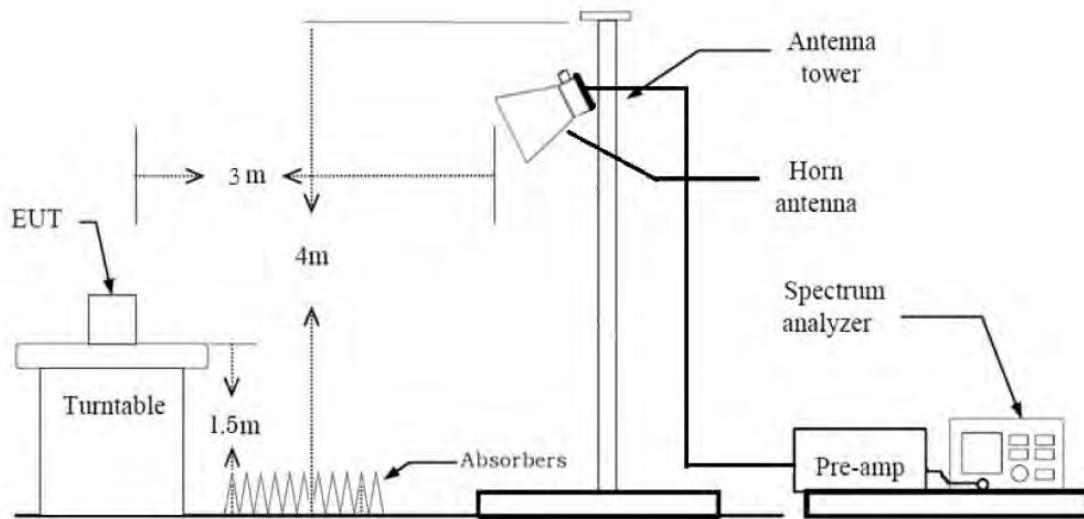
30 MHz - 1 GHz



Above 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( $0.009 \text{ MHz} - 0.490 \text{ MHz}$ ) =  $40\log(3 \text{ m}/300 \text{ m}) = -80 \text{ dB}$   
Measurement Distance : 3 m
7. Distance Correction Factor( $0.490 \text{ MHz} - 30 \text{ MHz}$ ) =  $40\log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$   
Measurement Distance : 3 m
8. Spectrum Setting
  - Frequency Range = 9 kHz ~ 30 MHz
  - Detector = Peak
  - Trace = Maxhold
  - RBW = 9 kHz
  - VBW  $\geq 3 \times \text{RBW}$
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
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.d in KDB 789033 v02r01):

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

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor
10. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
11. Distance extrapolation factor =  $20\log(\text{test distance} / \text{specific distance})$  (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.d in KDB 789033 v02r01):
    - RBW = 1 MHz
    - VBW(Duty cycle  $\geq$  98 percent) =  $\text{VBW} \leq \text{RBW}/100$ (i.e., 10 kHz) but not less than 10 Hz.
    - VBW(Duty cycle is < 98 percent) =  $\text{VBW} \geq 1/T$ , where  $T$  is the minimum transmission duration.
    - The analyzer is set to linear detector mode.
    - Detector = Peak.
    - Sweep time = auto.
    - Trace mode = max hold.
    - Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimym number of traces by a factor of  $1/x$ , where  $x$  is the duty cycle.

## 9. Measured Frequency Range :

- 4 500 MHz ~ 5 150 MHz
- 5 350 MHz ~ 5 460 MHz
- 5 460 MHz ~ 5 470 MHz
- (75 MHz or more below the 5 725 MHz) ~ 5 725 MHz
- 5 850 MHz ~ (75 MHz or more above the 5 850 MHz)

10. Distance extrapolation factor =  $20\log(\text{test distance} / \text{specific distance})$  (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	0.970	0.132	1000
802.11n(HT20)	MCS 0(6.5)	0.970	0.134	1000
802.11n(HT40)	MCS 0(13.5)	0.939	0.272	3000
802.11ac(VHT20)	MCS 0(6.5)	0.970	0.133	1000
802.11ac(VHT40)	MCS 0(13.5)	0.939	0.273	3000
802.11ac(VHT80)	MCS 0(29.3)	0.888	0.518	5000

## 8.8. Receiver Spurious Emissions

### Limit

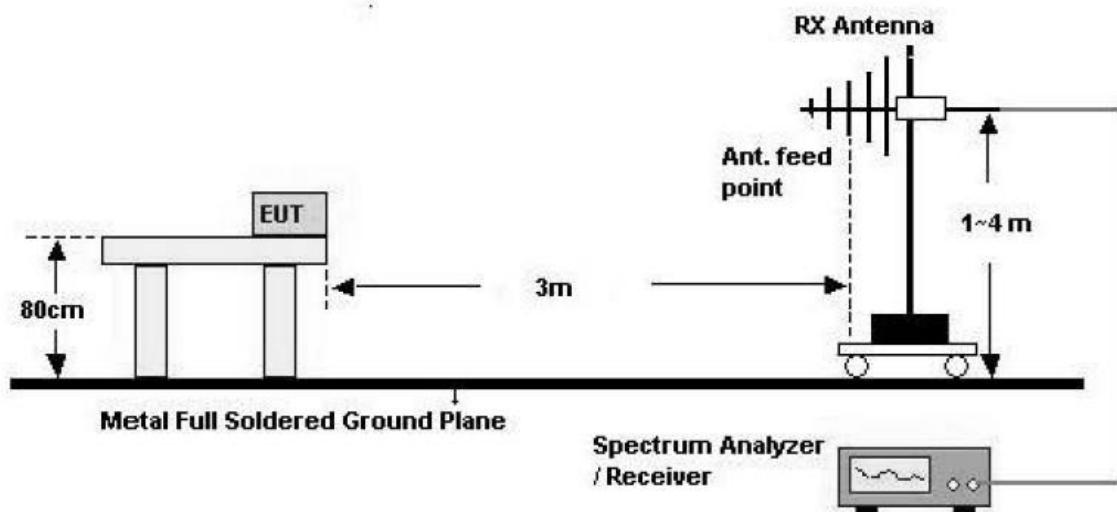
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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):

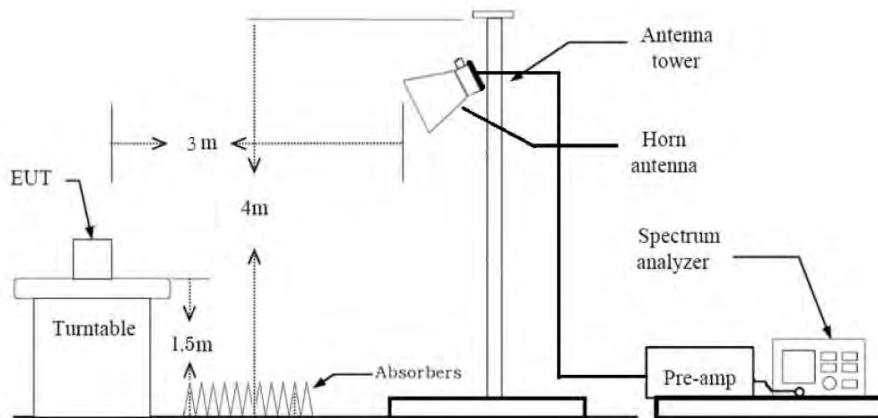
- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW  $\geq 3 \times$  RBW

### (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 x 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 +Switching Power Supply
- Worstcase : Stand alone +Switching Power Supply

2. All configurations of antenna were investigated and the worst case configuration results are reported.

- UNII 1, 2A, 2C, 3 : 802.11a
- In order to simplify the report, We only have attached RSE result of worst case.  
(= Highest power of Each bands)

3. EUT Axis

- Radiated Spurious Emissions : X-V
- Radiated Restricted Band Edge : X-H

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

- 802.11a : 6Mbps
- 802.11n : MCS0
- 802.11ac : MCS0
- R.S.E Worstcase : 802.11a(UNII 1, 2A, 2C, 3)

5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.

- Position : Horizontal, Vertical, Parallel to the ground plane

### AC Power line Conducted Emissions

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

- Mode : Stand alone + Switching Power Supply + External accessories (Notebook)

### Conducted test

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

**9. SUMMARY OF TEST RESULTS**

FCC

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§ 15.407 (for Power Measurement)	N/A		PASS
6 dB Bandwidth	§ 15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§ 15.407(a)(1),(2),(3)	< 250 mW(5150-5250 MHz)  < 250 mW or $11+10\log_{10}(\text{BW})$ dBm (5250-5350 MHz)  < 250 mW or $11+10\log_{10}(\text{BW})$ dBm (5470-5725 MHz)  <1 W(5725-5850 MHz)	Conducted	PASS
Peak Power Spectral Density	§ 15.407(a)(1),(2),(3)	<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 15.407(b)(8)	<FCC 15.207 limits		PASS
Undesirable Emissions	§ 15.407(b)(1~4)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.7 (UNII 3)		PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(9), (10)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	PASS

**ISED**

Test Description	ISED Part Section(s)	Test Limit	Test Condition	Test Result
99% Bandwidth	RSS-GEN, 6.7	N/A		PASS
6 dB Bandwidth	RSS-247, 6.2.4.1	> 500 kHz (5725~5850 MHz)		PASS
Maximum Conducted Output Power,	RSS-247, 6.2	< 250 mW or $11+10 \log_{10} (\text{BW})$ dBm (5470-5600, 5650-5725 MHz) Whichever power is less		PASS
	RSS-247, 6.2.4.1	<1 W (5725-5850 MHz)		
Maximum e.i.r.p	RSS-247, 6.2	< 200 mW or $10+10 \log_{10} (\text{BW})$ dBm (5150-5250 MHz) < 1 W or $17+10 \log_{10} (\text{BW})$ dBm (5250-5350 MHz) < 1 W or $17+10 \log_{10} (\text{BW})$ dBm (5470-5725 MHz) Whichever power is less	CONDUCTED	PASS
Power Spectral Density	RSS-247 6.2	<10 dBm/ MHz(e.i.r.p.) (5150-5250 MHz) <11 dBm/ MHz(Conducted) (5250-5350 MHz, 5470-5600 MHz, 5650-5725 MHz)		PASS
	RSS-247, 6.2.4.1	<30 dBm/500 kHz(Conducted) (5725-5850 MHz)		
Frequency Stability	RSS-GEN 8.11	should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation.		PASS
AC Conducted Emissions 150 kHz-30 MHz	RSS-GEN, 8.8	RSS-GEN section 8.8 table 4		PASS
	RSS-247, 6.2.1.2	26 dBc at 5250~5350 MHz (5150~5350 MHz)		PASS
Undesirable Emissions	RSS-247, 6.2	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)		PASS
	RSS-247, 6.2.4.2	cf. Section 9.8.1 (UNII 3)		
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	RSS-Gen, 8.9 RSS-Gen, 8.10	RSS-Gen section 8.9 table 5, 6 section 8.10 table 7	RADIATED	PASS
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3		PASS

## 10. TEST RESULT

### 10.1 DUTY CYCLE

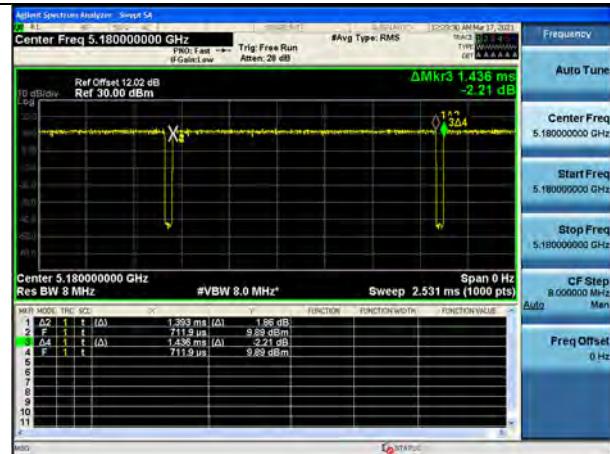
Mode	Data Rate (Mbps)	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	1.393	1.436	0.970	0.132
	9	0.940	0.980	0.959	0.183
	12	0.709	0.751	0.945	0.248
	18	0.479	0.521	0.920	0.364
	24	0.364	0.406	0.897	0.470
	36	0.253	0.294	0.859	0.661
	48	0.192	0.234	0.820	0.860
	54	0.176	0.218	0.809	0.920
Mode	MCS Index	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.309	1.350	0.970	0.134
	1	0.672	0.714	0.941	0.263
	2	0.459	0.501	0.916	0.380
	3	0.357	0.398	0.896	0.475
	4	0.248	0.290	0.856	0.677
	5	0.196	0.237	0.825	0.838
	6	0.180	0.222	0.811	0.912
	7	0.164	0.206	0.798	0.982
802.11n (HT40)	0	0.647	0.689	0.939	0.272
	1	0.344	0.386	0.892	0.496
	2	0.240	0.282	0.852	0.694
	3	0.192	0.234	0.822	0.851
	4	0.140	0.182	0.771	1.129
	5	0.116	0.158	0.736	1.329
	6	0.104	0.146	0.715	1.455
	7	0.100	0.142	0.707	1.504

Mode	MCS Index	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.317	1.358	0.970	0.133
	1	0.679	0.721	0.943	0.257
	2	0.467	0.509	0.918	0.370
	3	0.359	0.402	0.894	0.487
	4	0.256	0.297	0.860	0.656
	5	0.200	0.242	0.827	0.823
	6	0.184	0.226	0.815	0.887
	7	0.168	0.209	0.801	0.964
	8	0.148	0.190	0.780	1.078
802.11ac (VHT40)	0	0.656	0.698	0.939	0.273
	1	0.348	0.389	0.895	0.484
	2	0.248	0.290	0.856	0.677
	3	0.196	0.238	0.824	0.842
	4	0.144	0.186	0.777	1.098
	5	0.120	0.162	0.743	1.288
	6	0.112	0.154	0.730	1.366
	7	0.104	0.146	0.713	1.467
	8	0.092	0.133	0.689	1.615
	9	0.088	0.129	0.680	1.677
802.11ac (VHT80)	0	0.324	0.365	0.888	0.518
	1	0.184	0.226	0.814	0.892
	2	0.136	0.178	0.764	1.170
	3	0.112	0.154	0.728	1.381
	4	0.088	0.129	0.679	1.680
	5	0.075	0.117	0.642	1.924
	6	0.072	0.114	0.633	1.984
	7	0.071	0.113	0.628	2.018
	8	0.064	0.106	0.605	2.182
	9	0.063	0.105	0.595	2.252

**Note:**

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

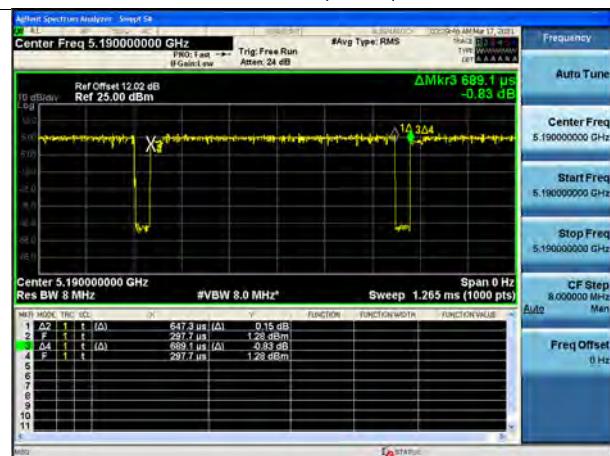
802.11a



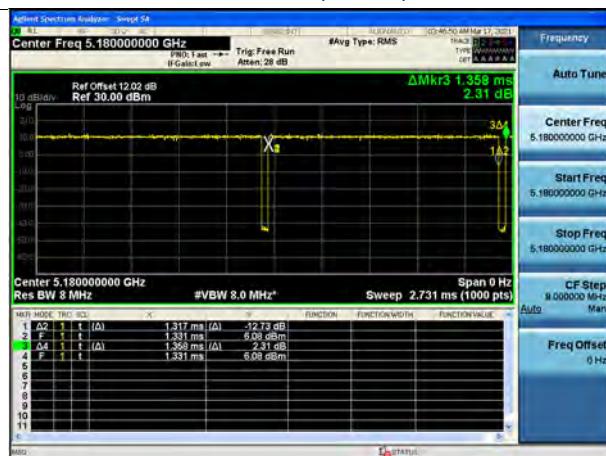
802.11n(HT20)



802.11n(HT40)



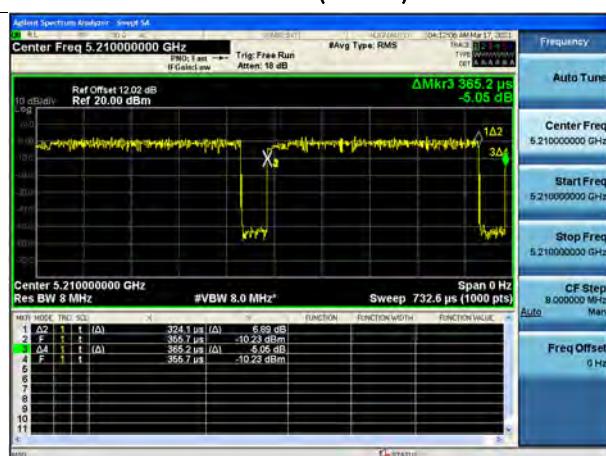
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



**10.2 26dB BANDWIDTH & 99 % BANDWIDTH****FCC(26dB) & ISED(99%BW)**

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	21.32	16.649
5200	40	20.97	16.632
5240	48	20.96	16.616
5260	52	21.00	16.646
5300	60	21.23	16.611
5320	64	21.08	16.637
5500	100	21.18	16.627
5580	116	21.36	16.652
5720	144	21.13	16.667
5745	149	21.37	16.721
5785	157	21.15	16.707
5825	165	21.29	16.718

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	21.31	17.807
5200	40	21.48	17.809
5240	48	21.17	17.801
5260	52	21.29	17.789
5300	60	21.57	17.780
5320	64	20.99	17.750
5500	100	21.38	17.793
5580	116	21.44	17.793
5720	144	21.44	17.795
5745	149	21.42	17.794
5785	157	21.63	17.822
5825	165	21.35	17.739

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.65	36.207
5230	46	39.70	36.254
5270	54	39.70	36.196
5310	62	39.79	36.211
5510	102	39.56	36.162
5550	110	39.66	36.181
5710	142	39.63	36.202
5755	151	39.48	36.202
5795	159	39.58	36.149

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	21.32	17.795
5200	40	21.28	17.770
5240	48	21.46	17.780
5260	52	21.29	17.754
5300	60	21.38	17.799
5320	64	21.49	17.820
5500	100	21.28	17.766
5580	116	21.08	17.780
5720	144	21.25	17.808
5745	149	22.30	17.808
5785	157	22.36	17.821
5825	165	22.25	17.795

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.66	36.154
5230	46	39.50	36.171
5270	54	39.52	36.214
5310	62	39.85	36.140
5510	102	39.66	36.192
5550	110	39.67	36.164
5710	142	39.67	36.235
5755	151	39.61	36.155
5795	159	39.75	36.190

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.05	75.430
5290	58	81.31	75.437
5530	106	81.20	75.567
5690	138	81.06	75.583
5775	155	81.40	75.509

Test Plots(802.11a)

Note:

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

802.11a UNII 1 BAND 26dB Bandwidth (CH 36)



802.11a UNII 2A BAND 26dB Bandwidth (CH 60)



802.11a UNII 2C BAND 26dB Bandwidth (CH116)



802.11a UNII 3 BAND 26dB Bandwidth (CH 165)



Test Plots(802.11n(HT20))

Note:

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



Test Plots(802.11n(HT40))

Note:

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

802.11n\_HT40 UNII 1 BAND 26dB Bandwidth(CH 46)



802.11n\_HT40 UNII 2A BAND 26dB Bandwidth (CH 62)



802.11n\_HT40 UNII 2C BAND 26dB Bandwidth(CH 110)



802.11n\_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)



Test Plots(802.11ac(VHT20))

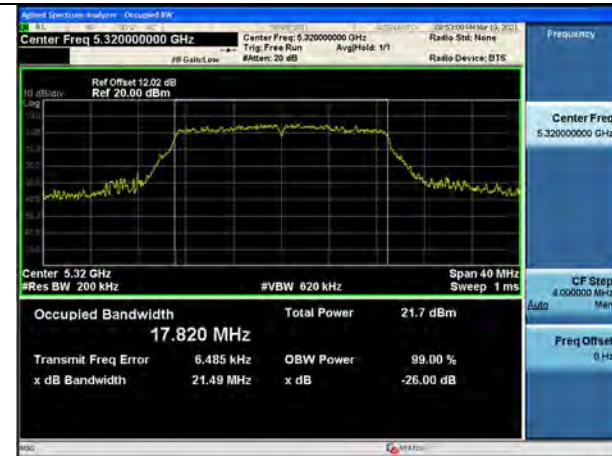
Note:

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

802.11ac\_VHT20 UNII 1 BAND 26dB Bandwidth(CH 48)



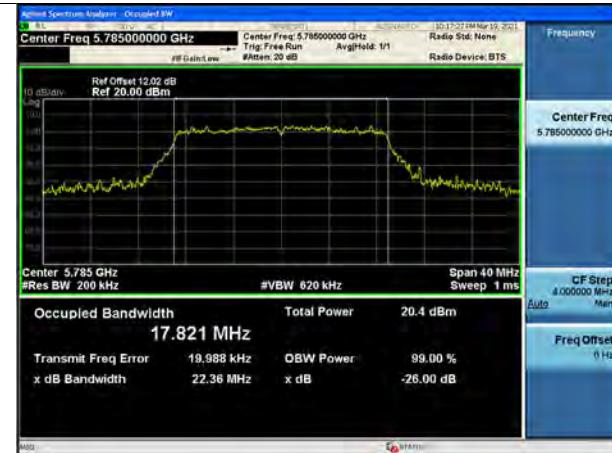
802.11ac\_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)



802.11ac\_VHT20 UNII 2C BAND 26dB Bandwidth(CH 100)



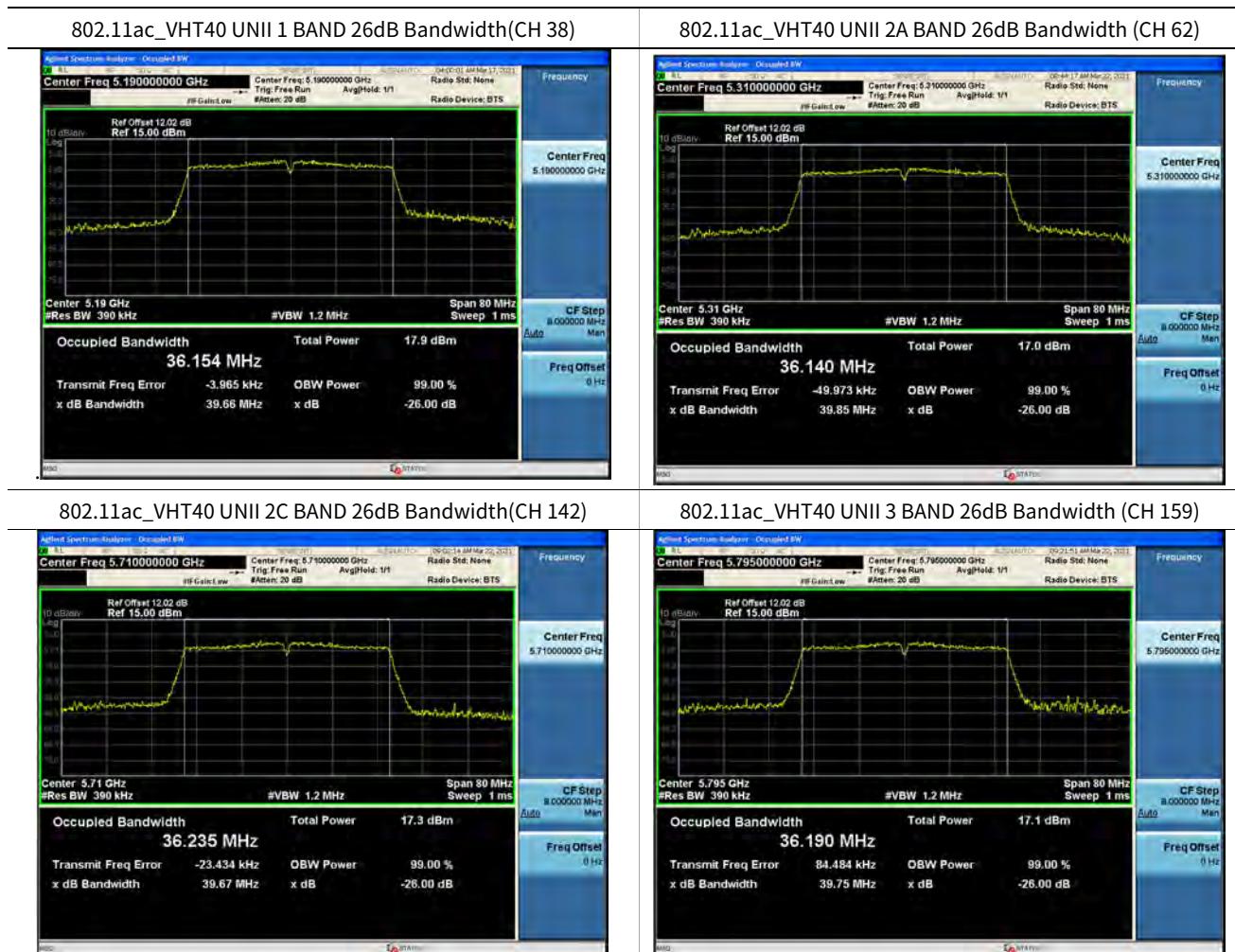
802.11ac\_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)



Test Plots(802.11ac(VHT40))

Note:

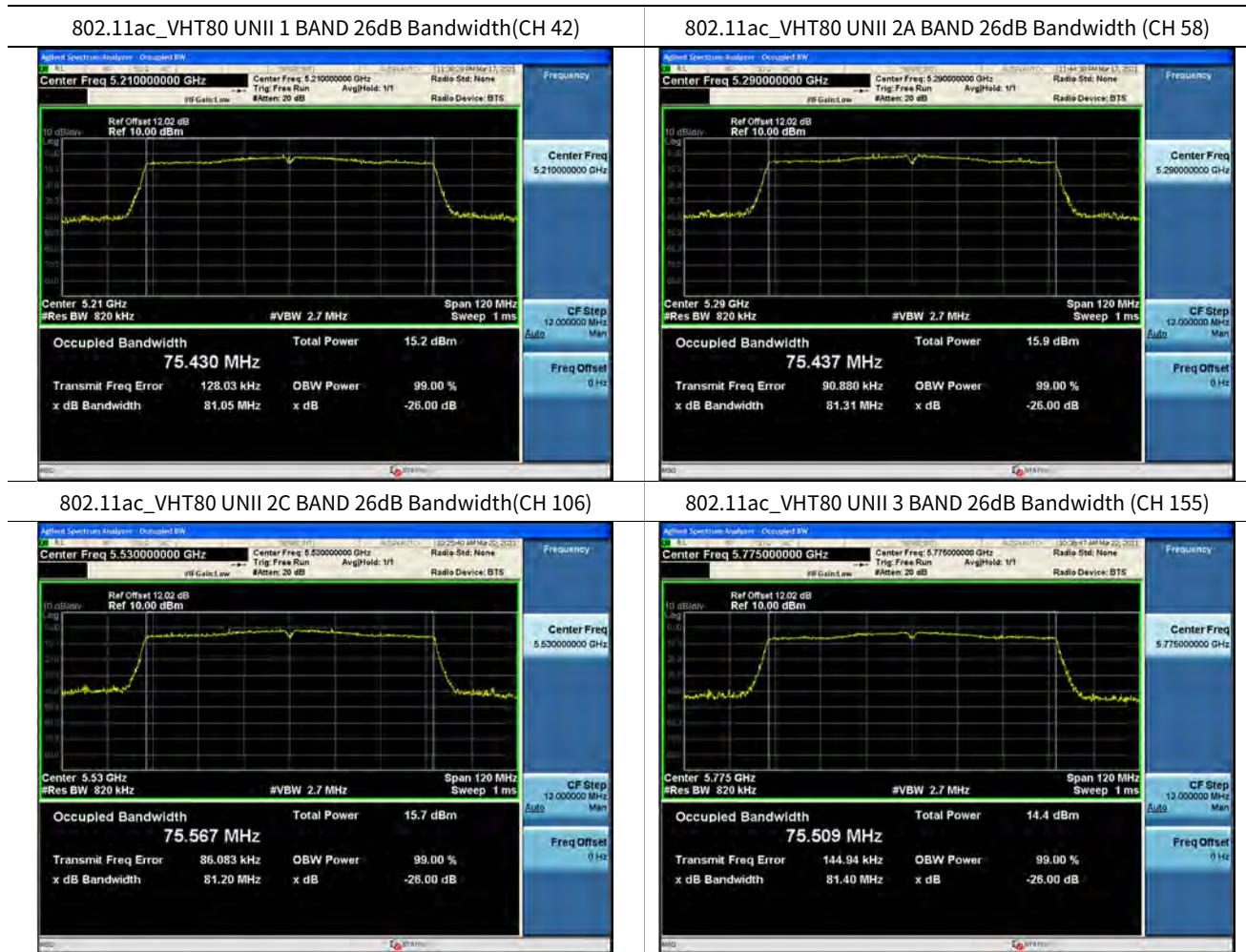
In order to simplify the report, attached plots were only the most wide channel.



□ Test Plots(802.11ac(VHT80))

Note:

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



**99% bandwidth UNII-3 (ISED)**

802.11a Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.333
5785	157	17.317
5825	165	17.306

802.11n(HT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	18.230
5785	157	18.198
5825	165	18.242

802.11n(HT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.399
5795	159	36.425

802.11ac(VHT20) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	18.230
5785	157	18.236
5825	165	18.258

802.11ac(VHT40) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.423
5795	159	36.518

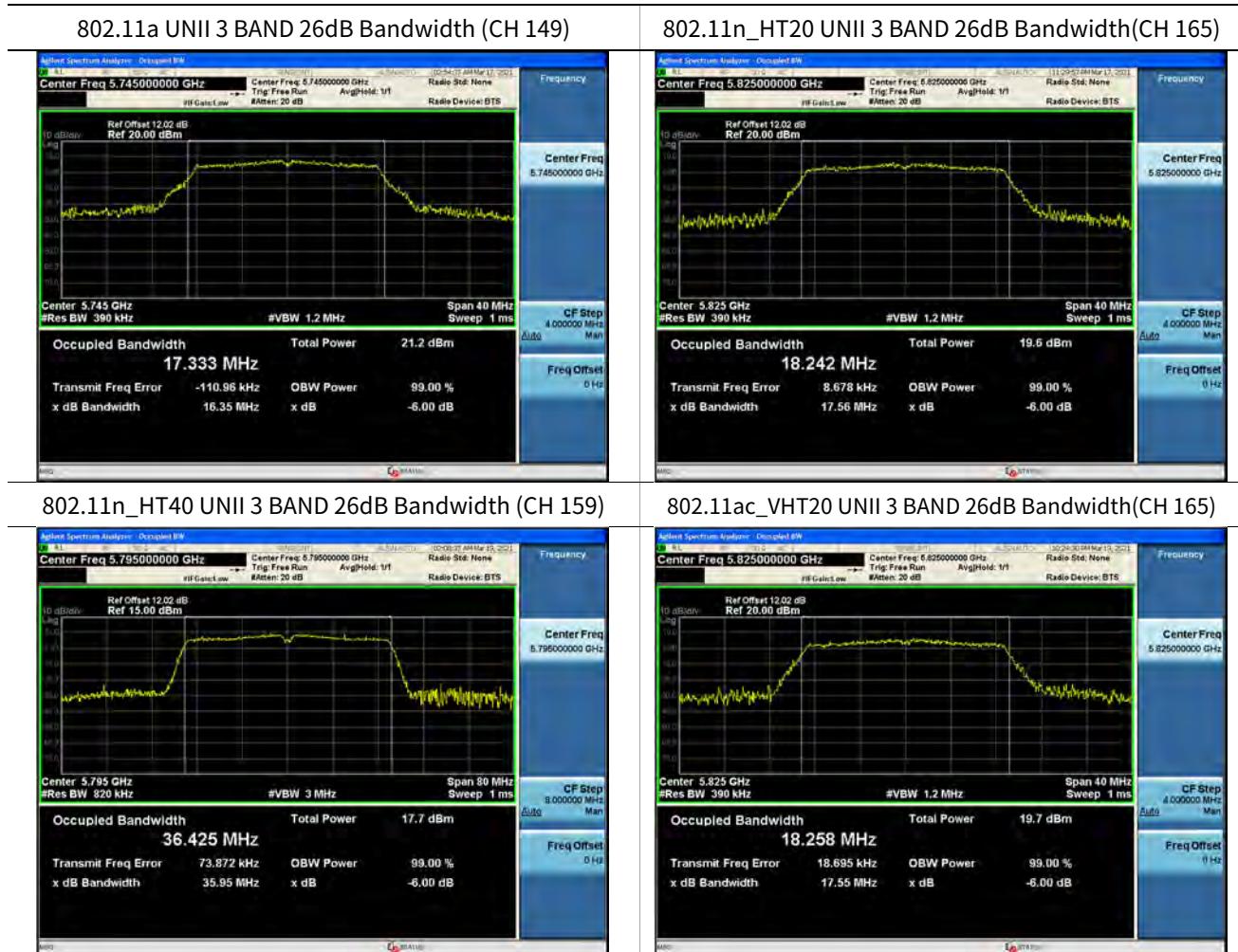
  

802.11ac(VHT80) Mode		99% bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	75.509

□ Test Plots

Note:

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



802.11ac\_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)



802.11ac\_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)



**10.3 6DB BANDWIDTH**

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.33	> 0.5	Pass
5785	157	16.34	> 0.5	Pass
5825	165	16.33	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.94	> 0.5	Pass
5785	157	16.98	> 0.5	Pass
5825	165	17.33	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.05	> 0.5	Pass
5795	159	35.90	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.08	> 0.5	Pass
5785	157	17.16	> 0.5	Pass
5825	165	16.61	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.94	> 0.5	Pass
5795	159	35.84	> 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.

802.11a (CH.149)



802.11n(HT20) (CH.149)



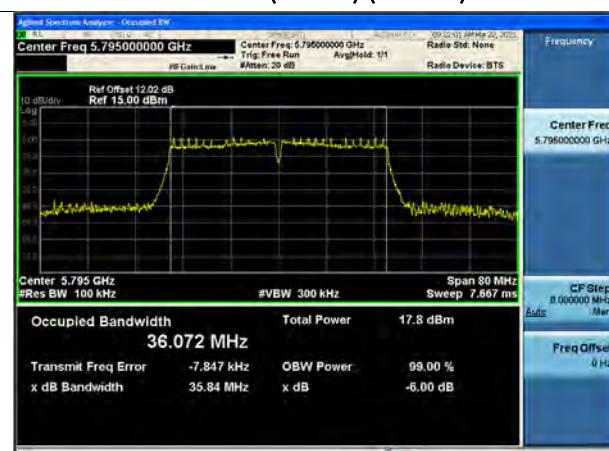
802.11n(HT40) (CH.159)



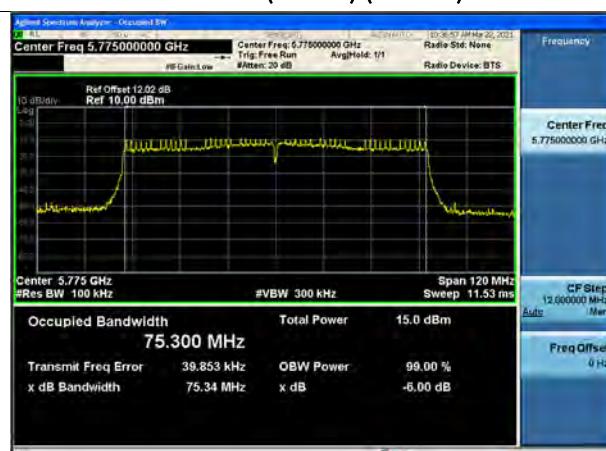
802.11ac(VHT20) (CH.165)



802.11ac(VHT40) (CH.159)



802.11ac(VHT80) (CH.155)



#### 10.4 OUTPUT POWER MEASUREMENT

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

Straddle channel data were added in section 10.7.3.

802.11a Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	14.35	0.13	14.48	2.38	16.86	23.98	22.21
5200	40	14.38	0.13	14.51	2.38	16.89		
5240	48	14.93	0.13	15.06	2.38	17.44		
5260	52	14.77	0.36	15.14	-	-	23.20	23.20
5300	60	15.33	0.13	15.46	-	-		
5320	64	15.26	0.25	15.51	-	-		
5500	100	11.87	0.25	12.12	-	-	23.21	23.21
5580	116	14.90	0.13	15.04	-	-		
5720	144	13.74	0.36	14.10	-	-		
5745	149	14.48	0.36	14.84	-	-	30.00	30.00
5785	157	13.63	0.36	13.99	-	-		
5825	165	13.05	0.36	13.41	-	-		

802.11n(HT20) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	13.45	0.48	13.93	2.38	16.31	23.98	22.21
5200	40	13.98	0.13	14.11	2.38	16.49		
5240	48	14.43	0.26	14.69	2.38	17.07		
5260	52	14.38	0.38	14.76	-	-	23.49	23.49
5300	60	14.43	0.48	14.90	-	-		
5320	64	14.75	0.38	15.13	-	-		
5500	100	11.55	0.26	11.81	-	-	23.49	23.50
5580	116	14.24	0.38	14.62	-	-		
5720	144	13.33	0.38	13.71	-	-		
5745	149	14.11	0.38	14.49	-	-	30.00	30.00
5785	157	13.22	0.48	13.70	-	-		
5825	165	12.65	0.38	13.03	-	-		

802.11ac(VHT20) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5180	36	13.48	0.49	13.96	2.38	16.34		
5200	40	13.72	0.49	14.21	2.38	16.59	23.98	22.50
5240	48	14.65	0.13	14.78	2.38	17.16		
5260	52	14.34	0.49	14.83	-	-		
5300	60	14.78	0.13	14.91	-	-	23.49	23.49
5320	64	14.99	0.13	15.12	-	-		
5500	100	11.15	0.49	11.63	-	-		
5580	116	14.13	0.49	14.62	-	-	23.50	23.50
5720	144	13.37	0.37	13.74	-	-		
5745	149	14.34	0.13	14.47	-	-		
5785	157	13.18	0.49	13.67	-	-	30.00	30.00
5825	165	12.70	0.49	13.18	-	-		

802.11n(HT40) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	10.96	0.27	11.23	2.38	13.61	23.98	22.21
5230	46	10.86	0.69	11.55	2.38	13.93		
5270	54	11.28	0.69	11.97	-	-	23.98	23.98
5310	62	10.07	0.27	10.34	-	-		
5510	102	9.12	0.85	9.97	-	-		
5550	110	10.85	0.85	11.70	-	-	23.98	23.98
5710	142	10.32	0.50	10.81	-	-		
5755	151	10.51	0.85	11.36	-	-		
5795	159	10.32	0.27	10.59	-	-	30.00	30.00

802.11ac(VHT40) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5190	38	10.93	0.27	11.20	2.38	13.58	23.98	23.01
5230	46	11.36	0.27	11.64	2.38	14.02		
5270	54	11.23	0.27	11.50	2.53	14.03	23.98	23.98
5310	62	9.67	0.68	10.34	2.29	12.63		
5510	102	8.96	0.84	9.80	-	-		
5550	110	10.77	0.84	11.61	-	-	23.98	23.98
5710	142	9.85	0.84	10.69	-	-		
5755	151	10.76	0.68	11.43	-	-		
5795	159	9.95	0.68	10.63	-	-	30.00	30.00

802.11ac(VHT80) Mode		Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Ant Gain [dBi]	EIRP [dBm]	ISED Limit [dBm]	FCC Limit [dBm]
Frequency [MHz]	Channel No.							
5210	42	6.54	1.38	7.93	2.38	10.31	23.98	23.01
5290	58	7.25	1.38	8.63	2.53	11.16	23.98	23.98
5530	106	7.86	0.52	8.38	-	-	23.98	23.98
5690	138	6.48	0.89	7.37	-	-	23.98	23.98
5775	155	5.86	1.17	7.03	-	-	30.00	30.00

Note :

# FCC&ISED Worst Limit applied

U-NII-1	► ISED Maximum E.I.R.P Worst Limit <200 mW (23.01 dBm) or 10 dBm + 10 log B, (where B is the 99% bandwidth in megahertz.)
U-NII-2A & 2C	► FCC&ISED Conducted Power Limit < 250 mW (23.98 dBm) or 11 dBm + 10 log B, (where B is the 99% bandwidth in megahertz.)

**10.5 POWER SPECTRAL DENSITY****FCC & ISED**

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	4.032	0.132	4.164	11 dBm/MHz
5200	40	4.452	0.132	4.584	
5240	48	4.709	0.132	4.841	
5260	52	4.765	0.364	5.129	
5300	60	5.114	0.132	5.246	
5320	64	5.095	0.248	5.343	
5500	100	1.809	0.248	2.057	
5580	116	4.786	0.132	4.918	
5720	144	3.994	0.364	4.358	
5745	149	1.655	0.364	2.019	
5785	157	0.880	0.364	1.244	30 dBm/500kHz
5825	165	0.216	0.364	0.580	

802.11n(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	3.175	0.475	3.650	11 dBm/MHz
5200	40	3.829	0.134	3.963	
5240	48	3.999	0.263	4.262	
5260	52	4.046	0.380	4.426	
5300	60	4.177	0.475	4.652	
5320	64	4.563	0.380	4.943	
5500	100	1.256	0.263	1.519	
5580	116	4.174	0.380	4.554	
5720	144	3.208	0.380	3.588	
5745	149	0.812	0.380	1.192	30 dBm/500kHz
5785	157	0.098	0.475	0.573	
5825	165	-0.408	0.380	-0.028	

802.11n(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-2.723	0.272	-2.451	
5230	46	-2.644	0.694	-1.950	
5270	54	-1.998	0.694	-1.304	
5310	62	-3.394	0.272	-3.122	11 dBm/MHz
5510	102	-4.302	0.851	-3.451	
5500	110	-2.288	0.851	-1.437	
5710	142	-3.058	0.496	-2.562	
5755	151	-5.434	0.851	-4.583	
5795	159	-5.889	0.272	-5.617	30 dBm /500kHz

802.11ac(20MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5180	36	3.341	0.487	3.828	
5200	40	3.455	0.487	3.942	
5240	48	4.216	0.133	4.349	
5260	52	4.244	0.487	4.731	
5300	60	4.504	0.133	4.637	11 dBm/MHz
5320	64	4.844	0.133	4.977	
5500	100	0.795	0.487	1.282	
5580	116	3.978	0.487	4.465	
5720	144	3.040	0.370	3.410	
5745	149	1.578	0.133	1.711	
5785	157	0.166	0.487	0.653	30 dBm/500kHz
5825	165	-0.505	0.487	-0.018	

802.11ac(40MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5190	38	-2.542	0.273	-2.269	11 dBm/MHz
5230	46	-1.945	0.273	-1.672	
5270	54	-1.620	0.273	-1.347	
5310	62	-3.638	0.677	-2.961	
5510	102	-4.193	0.842	-3.351	
5500	110	-2.365	0.842	-1.523	
5710	142	-3.456	0.842	-2.614	
5755	151	-5.321	0.677	-4.644	
5795	159	-6.167	0.677	-5.490	

802.11ac(80MHz) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Limit
Frequency [MHz]	Channel No.				
5210	42	-9.250	1.381	-7.869	11 dBm/MHz
5290	58	-8.850	1.381	-7.469	
5530	106	-8.263	0.518	-7.745	
5690	138	-9.794	0.892	-8.902	
5775	155	-12.722	1.170	-11.552	
					30 dBm/500kHz

**ISED Only**
**EIRP(UNII-1)** # NOTE : Only UNII1 bands were calculated as EIRP.

802.11a Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	4.032	0.132	4.164	2.38	6.544	10 dBm/MHz
5200	40	4.452	0.132	4.584	2.38	6.964	
5240	48	4.709	0.132	4.841	2.38	7.221	

802.11n(HT20) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	3.175	0.475	3.650	2.38	6.030	10 dBm/MHz
5200	40	3.829	0.134	3.963	2.38	6.343	
5240	48	3.999	0.263	4.262	2.38	6.642	

802.11n(HT40) Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	-2.723	0.272	-2.451	2.38	-0.071	10 dBm/MHz
5230	46	-2.644	0.694	-1.950	2.38	0.430	

802.11ac(VHT20)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5180	36	3.341	0.487	3.828	2.38	6.208	10 dBm/MHz
5200	40	3.455	0.487	3.942	2.38	6.322	
5240	48	4.216	0.133	4.349	2.38	6.729	

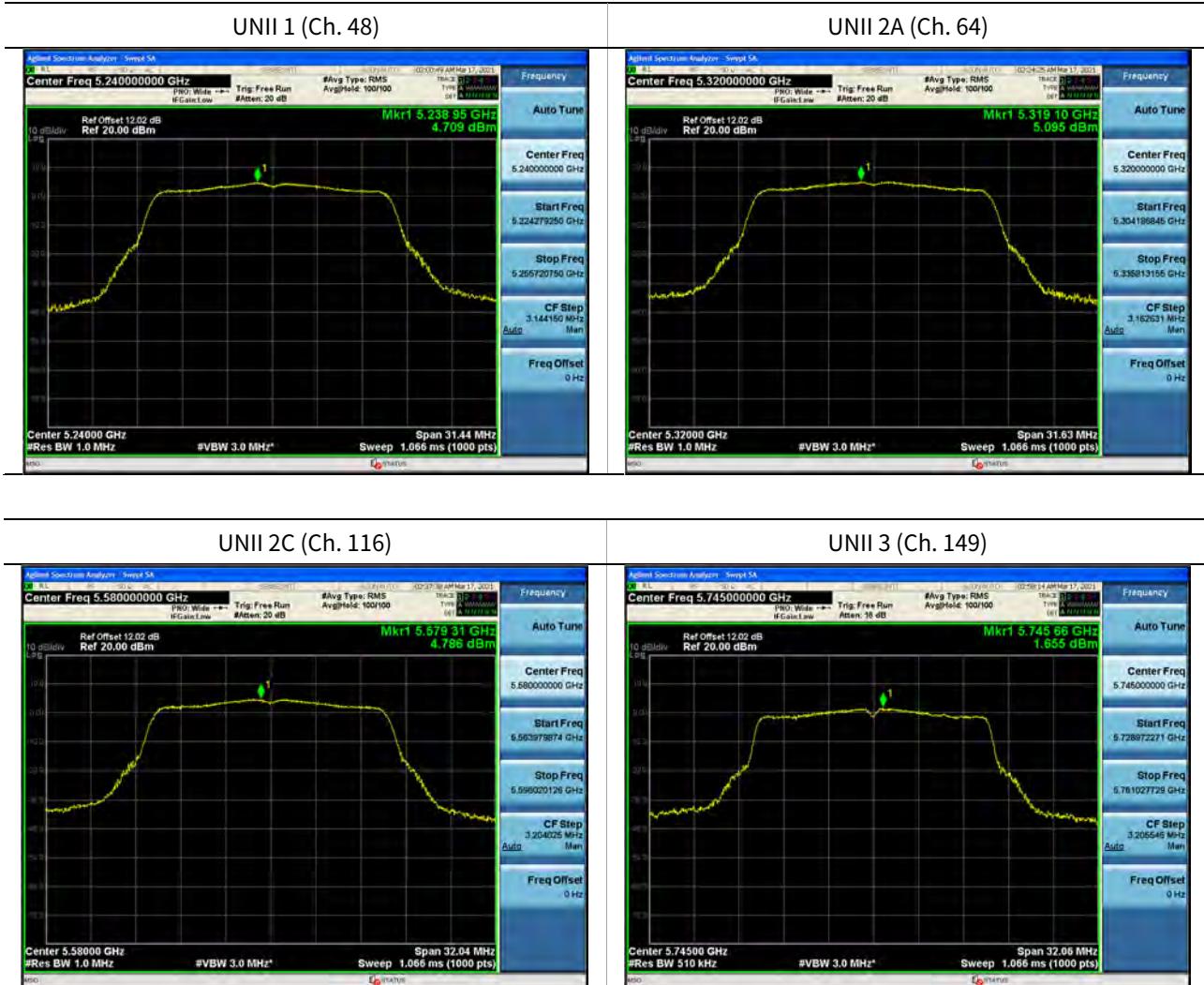
802.11ac(VHT40)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5190	38	-2.542	0.273	-2.269	2.38	0.111	10 dBm/MHz
5230	46	-1.945	0.273	-1.672	2.38	0.708	

802.11ac(VHT80)Mode		Measured PSD [dBm]	Duty Cycle Factor (dB)	Total PSD [dBm]	Ant. Gain (dBi)	EIRP PSD (dBm)	EIRP PSD Limit
Frequency [MHz]	Channel No.						
5210	42	-9.250	1.381	-7.869	2.38	-5.489	10 dBm/MHz

█ Test Plots(802.11a)

Note:

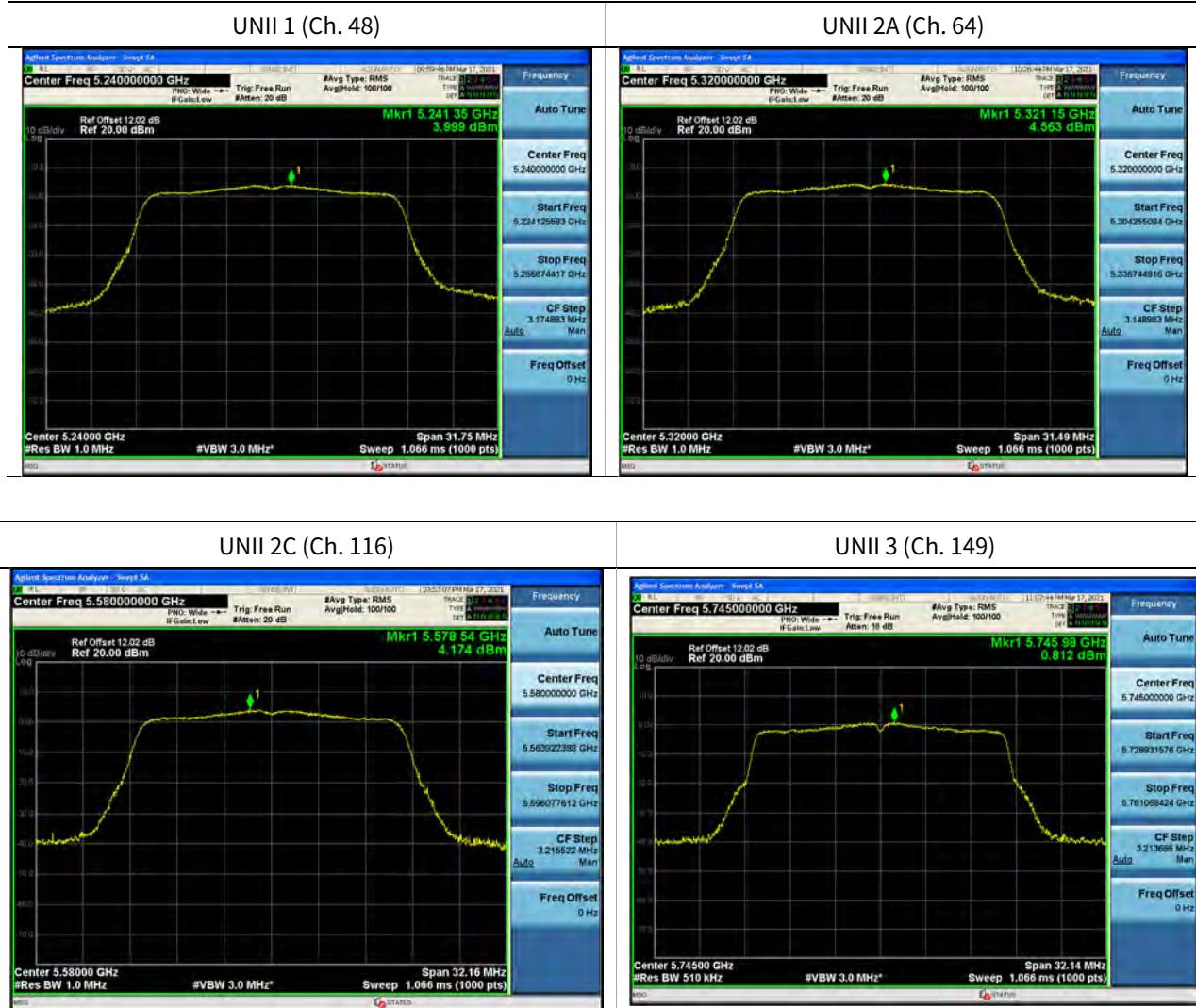
In order to simplify the report, attached plots were only channel of highest power.



□ 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:

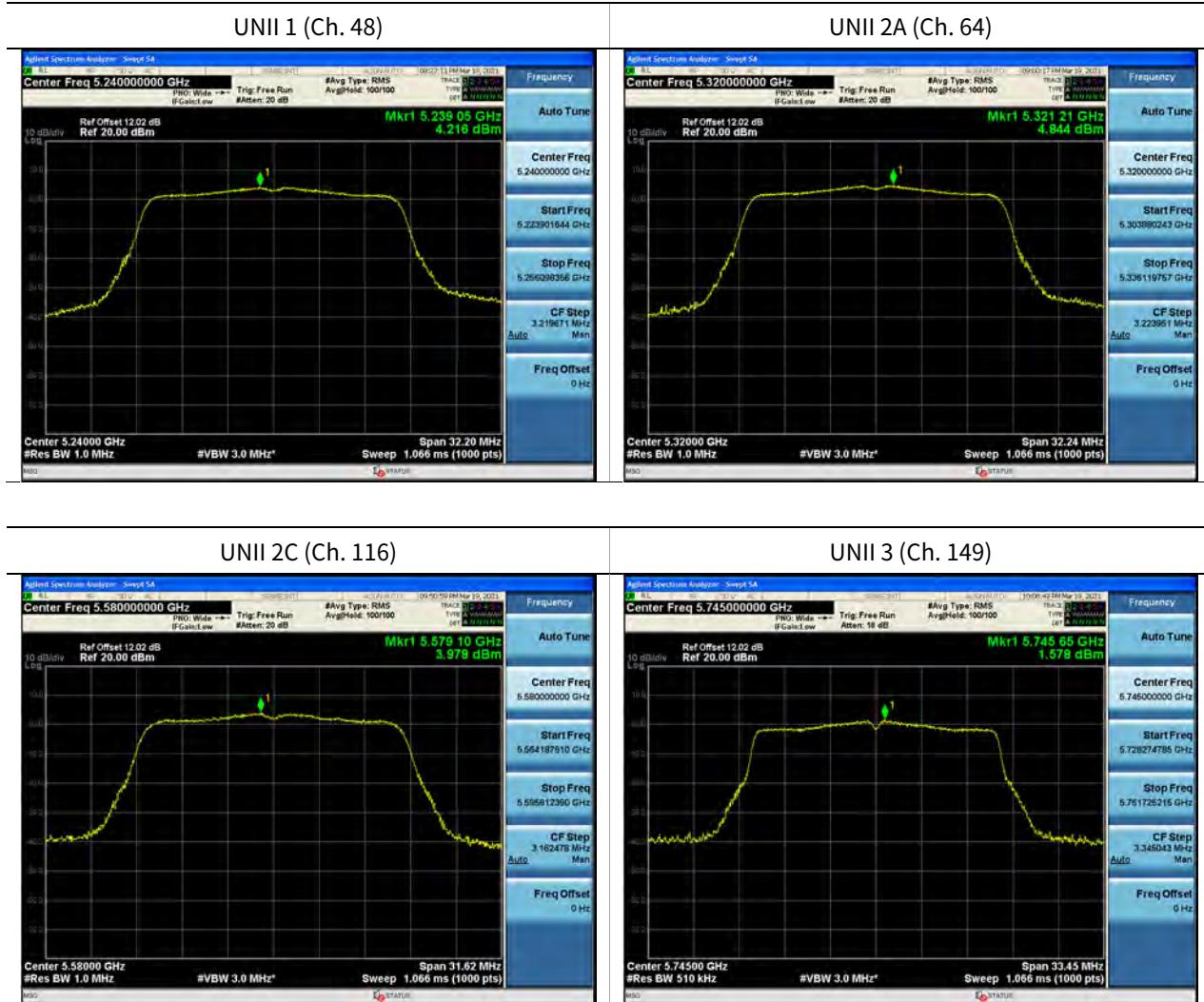
In order to simplify the report, attached plots were only channel of highest power.



□ Test Plots(802.11ac(VHT20))

Note:

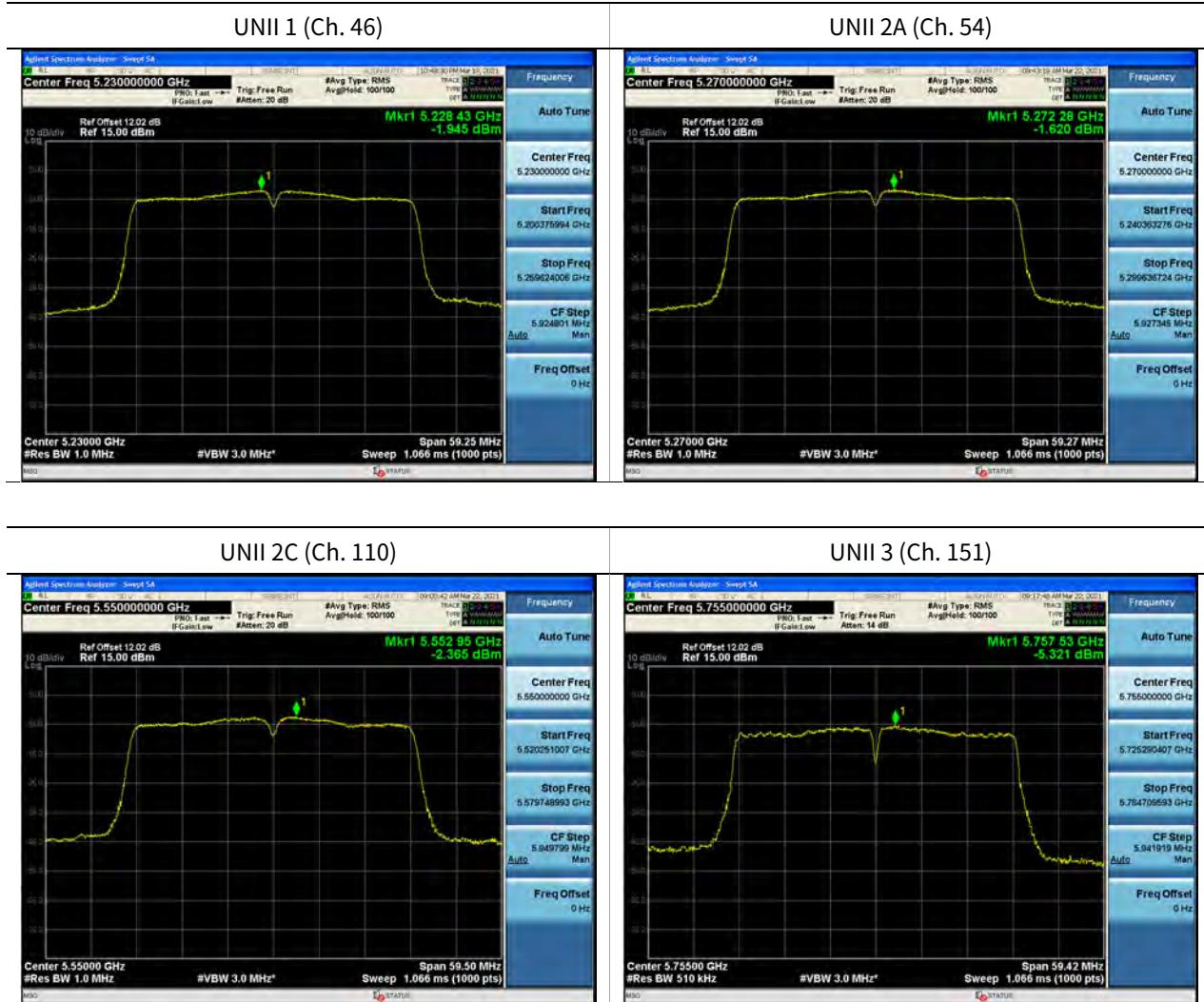
In order to simplify the report, attached plots were only channel of highest power.



□ Test Plots(802.11ac(VHT40))

Note:

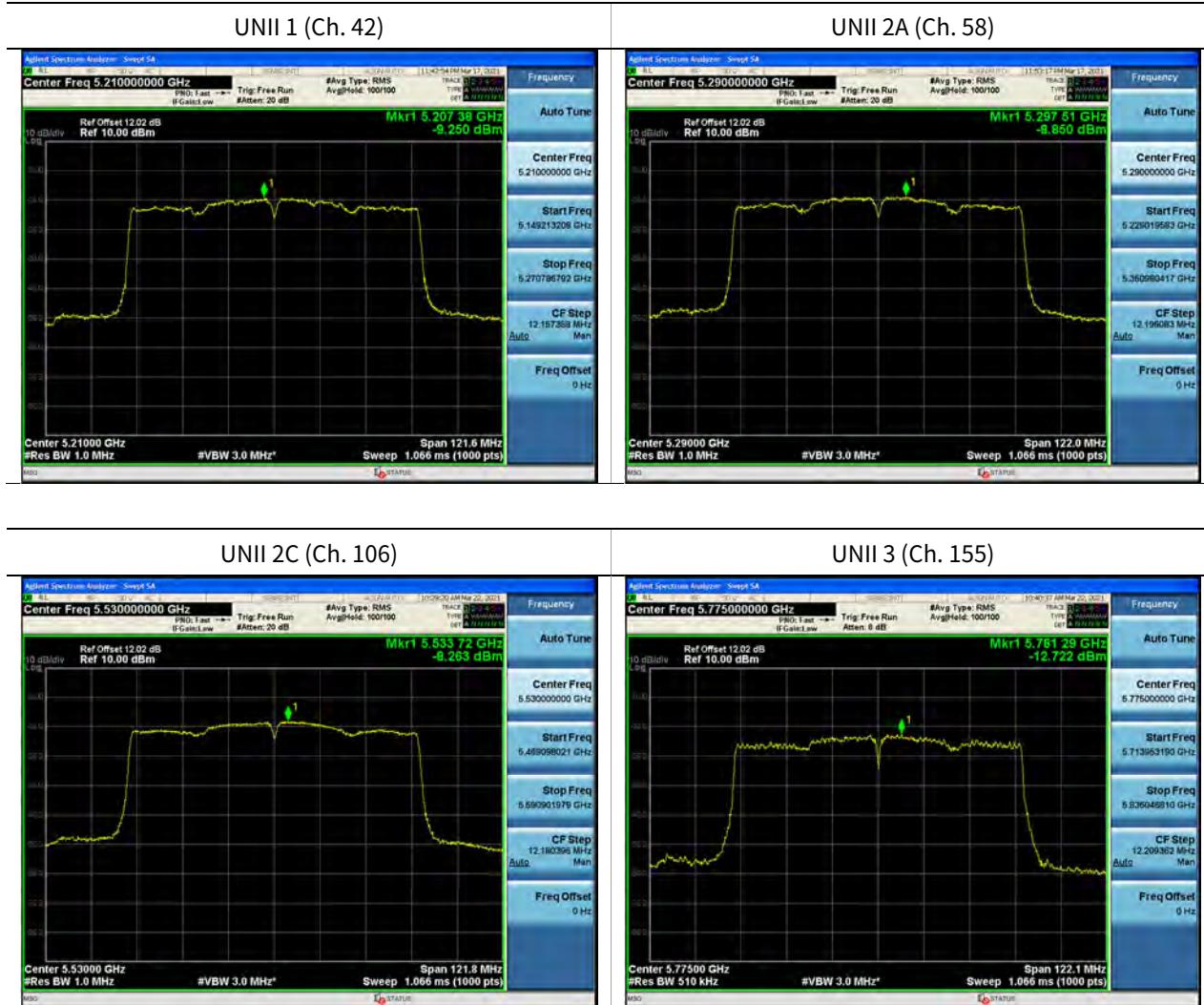
In order to simplify the report, attached plots were only channel of highest power.



□ Test Plots(802.11ac(VHT80))

Note:

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



**10.6 FREQUENCY STABILITY.****10.6.1 80MHz BW****Startup after the EUT is energized**

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5210023.73	23.73
100%		-30	5210047.11	47.11
100%		-20	5210039.16	39.16
100%		-10	5210032.36	32.36
100%		0	5210027.45	27.45
100%		+10	5210024.07	24.07
100%		+30	5210026.48	26.48
100%		+40	5210035.55	35.55
100%		+50	5210040.71	40.71
LOW	43.20	+20	5210041.57	41.57
HIGH	52.80	+20	5210038.70	38.70

**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: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5290026.41	26.41
100%		-30	5290049.97	49.97
100%		-20	5290043.15	43.15
100%		-10	5290036.96	36.96
100%		0	5290032.45	32.45
100%		+10	5290029.11	29.11
100%		+30	5290029.52	29.52
100%		+40	5290040.21	40.21
100%		+50	5290046.07	46.07
LOW	43.20	+20	5290043.55	43.55
HIGH	52.80	+20	5290041.35	41.35

**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: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5530032.26	32.26
100%		-30	5530056.85	56.85
100%		-20	5530050.31	50.31
100%		-10	5530044.24	44.24
100%		0	5530039.76	39.76
100%		+10	5530037.46	37.46
100%		+30	5530035.60	35.60
100%		+40	5530043.84	43.84
100%		+50	5530049.90	49.90
LOW	43.20	+20	5530049.20	49.20
HIGH	52.80	+20	5530047.98	47.98

**Note:**

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

OPERATING BAND: UNII Band 3  
OPERATING FREQUENCY: 5,775,000,000 Hz  
CHANNEL: 155  
REFERENCE VOLTAGE: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5775015.33	15.33
100%		-30	5775039.21	39.21
100%		-20	5775032.35	32.35
100%		-10	5775026.66	26.66
100%		0	5775022.74	22.74
100%		+10	5775019.79	19.79
100%		+30	5775017.84	17.84
100%		+40	5775026.10	26.10
100%		+50	5775031.61	31.61
LOW		+20	5775032.82	32.82
HIGH	52.80	+20	5775029.66	29.66

**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.

**2 minutes after the EUT is energized**

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5210011.49	11.49
100%		-30	5210035.06	35.06
100%		-20	5210027.84	27.84
100%		-10	5210020.74	20.74
100%		0	5210016.24	16.24
100%		+10	5210012.87	12.87
100%		+30	5210015.56	15.56
100%		+40	5210023.83	23.83
100%		+50	5210027.11	27.11
LOW	43.20	+20	5210031.21	31.21
HIGH	52.80	+20	5210025.20	25.20

**Note:**

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

OPERATING BAND: UNII Band 2A  
OPERATING FREQUENCY: 5,290,000,000 Hz  
CHANNEL: 58  
REFERENCE VOLTAGE: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5290032.16	32.16
100%		-30	5290056.77	56.77
100%		-20	5290049.24	49.24
100%		-10	5290043.37	43.37
100%		0	5290039.17	39.17
100%		+10	5290035.89	35.89
100%		+30	5290034.38	34.38
100%		+40	5290044.79	44.79
100%		+50	5290048.81	48.81
LOW		+20	5290051.14	51.14
HIGH	52.80	+20	5290047.37	47.37

**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: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5530027.48	27.48
100%		-30	5530050.63	50.63
100%		-20	5530042.66	42.66
100%		-10	5530036.37	36.37
100%		0	5530032.67	32.67
100%		+10	5530029.92	29.92
100%		+30	5530029.88	29.88
100%		+40	5530039.02	39.02
100%		+50	5530044.56	44.56
LOW	43.20	+20	5530044.94	44.94
HIGH	52.80	+20	5530041.67	41.67

**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: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5775033.55	33.55
100%		-30	5775058.18	58.18
100%		-20	5775050.08	50.08
100%		-10	5775043.56	43.56
100%		0	5775039.21	39.21
100%		+10	5775036.81	36.81
100%		+30	5775036.70	36.7
100%		+40	5775045.97	45.97
100%		+50	5775050.61	50.61
LOW		+20	5775051.91	51.91
HIGH	52.80	+20	5775049.17	49.17

**Note:**

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

**5 minutes after the EUT is energized**

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5210011.77	11.77
100%		-30	5210035.14	35.14
100%		-20	5210027.20	27.20
100%		-10	5210021.70	21.70
100%		0	5210017.31	17.31
100%		+10	5210015.04	15.04
100%		+30	5210014.94	14.94
100%		+40	5210024.47	24.47
100%		+50	5210029.72	29.72
LOW	43.20	+20	5210029.52	29.52
HIGH	52.80	+20	5210026.16	26.16

**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: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5290030.19	30.19
100%		-30	5290053.42	53.42
100%		-20	5290045.63	45.63
100%		-10	5290040.52	40.52
100%		0	5290037.16	37.16
100%		+10	5290034.25	34.25
100%		+30	5290033.21	33.21
100%		+40	5290042.62	42.62
100%		+50	5290045.75	45.75
LOW	43.20	+20	5290050.06	50.06
HIGH	52.80	+20	5290043.68	43.68

**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: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5530026.49	26.49
100%		-30	5530051.12	51.12
100%		-20	5530044.40	44.40
100%		-10	5530038.30	38.30
100%		0	5530034.80	34.80
100%		+10	5530032.42	32.42
100%		+30	5530029.19	29.19
100%		+40	5530038.67	38.67
100%		+50	5530042.89	42.89
LOW	43.20	+20	5530045.27	45.27
HIGH	52.80	+20	5530041.43	41.43

**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: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5775041.36	41.36
100%		-30	5775065.23	65.23
100%		-20	5775058.01	58.01
100%		-10	5775052.79	52.79
100%		0	5775049.66	49.66
100%		+10	5775047.25	47.25
100%		+30	5775043.50	43.5
100%		+40	5775051.23	51.23
100%		+50	5775056.51	56.51
LOW		+20	5775059.08	59.08
HIGH	52.80	+20	5775056.25	56.25

**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: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5210015.39	15.39
100%		-30	5210039.99	39.99
100%		-20	5210032.01	32.01
100%		-10	5210026.16	26.16
100%		0	5210022.75	22.75
100%		+10	5210020.08	20.08
100%		+30	5210018.11	18.11
100%		+40	5210027.18	27.18
100%		+50	5210030.66	30.66
LOW	43.20	+20	5210034.91	34.91
HIGH	52.80	+20	5210029.56	29.56

**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: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5290027.61	27.61
100%		-30	5290051.15	51.15
100%		-20	5290044.74	44.74
100%		-10	5290039.42	39.42
100%		0	5290034.70	34.70
100%		+10	5290031.38	31.38
100%		+30	5290031.19	31.19
100%		+40	5290041.80	41.80
100%		+50	5290044.93	44.93
LOW	43.20	+20	5290047.48	47.48
HIGH	52.80	+20	5290043.54	43.54

**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: 48 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(AC)	(°C)	(kHz)	Error (kHz)
100%	48.00	+20(Ref)	5530031.98	31.98
100%		-30	5530056.12	56.12
100%		-20	5530049.82	49.82
100%		-10	5530043.49	43.49
100%		0	5530039.69	39.69
100%		+10	5530035.67	35.67
100%		+30	5530035.94	35.94
100%		+40	5530044.67	44.67
100%		+50	5530049.15	49.15
LOW	43.20	+20	5530050.50	50.50
HIGH	52.80	+20	5530047.58	47.58

**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: 48 VDC

Voltage (%)	Power (AC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	48.00	+20(Ref)	5775042.55	42.55
100%		-30	5775066.99	66.99
100%		-20	5775060.83	60.83
100%		-10	5775053.97	53.97
100%		0	5775050.39	50.39
100%		+10	5775047.66	47.66
100%		+30	5775045.15	45.15
100%		+40	5775053.92	53.92
100%		+50	5775058.50	58.50
LOW	43.20	+20	5775060.97	60.97
HIGH	52.80	+20	5775057.74	57.74

**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.

## 10.7 STRADDLE CHANNEL

### 10.7.1 26dB Bandwidth

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5709.48	15.52
802.11n(HT20)				5709.28	15.72
802.11ac(VHT20)				5709.20	15.80
802.11a	UNII 3	5720	144	5730.64	5.64
802.11n(HT20)				5730.64	5.64
802.11ac(VHT20)				5730.68	5.68

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	5729.76	4.76
802.11ac(VHT40)				5729.84	4.84

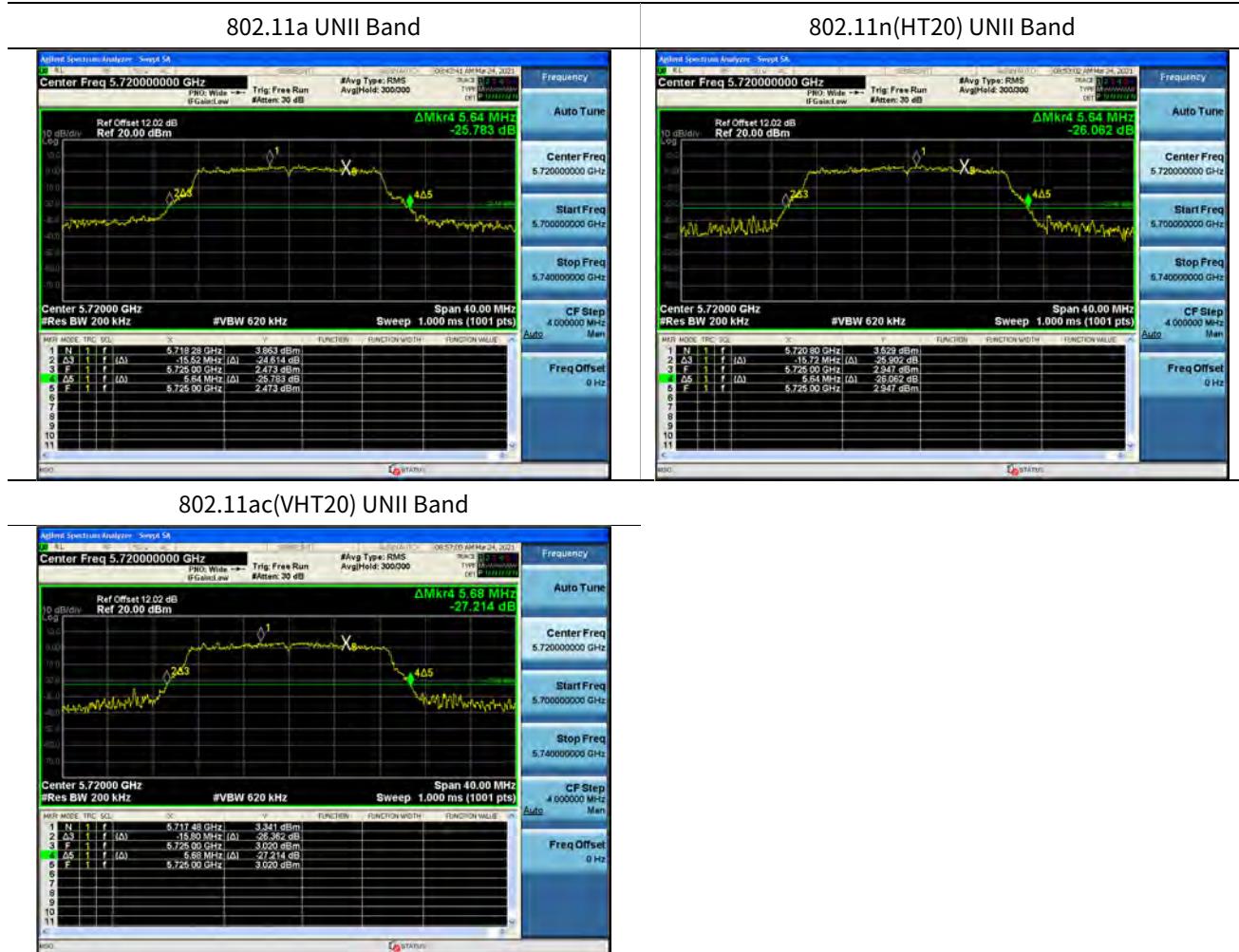
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.32	75.68
	UNII 3	5690	138	5730.80	5.80

**Note:**

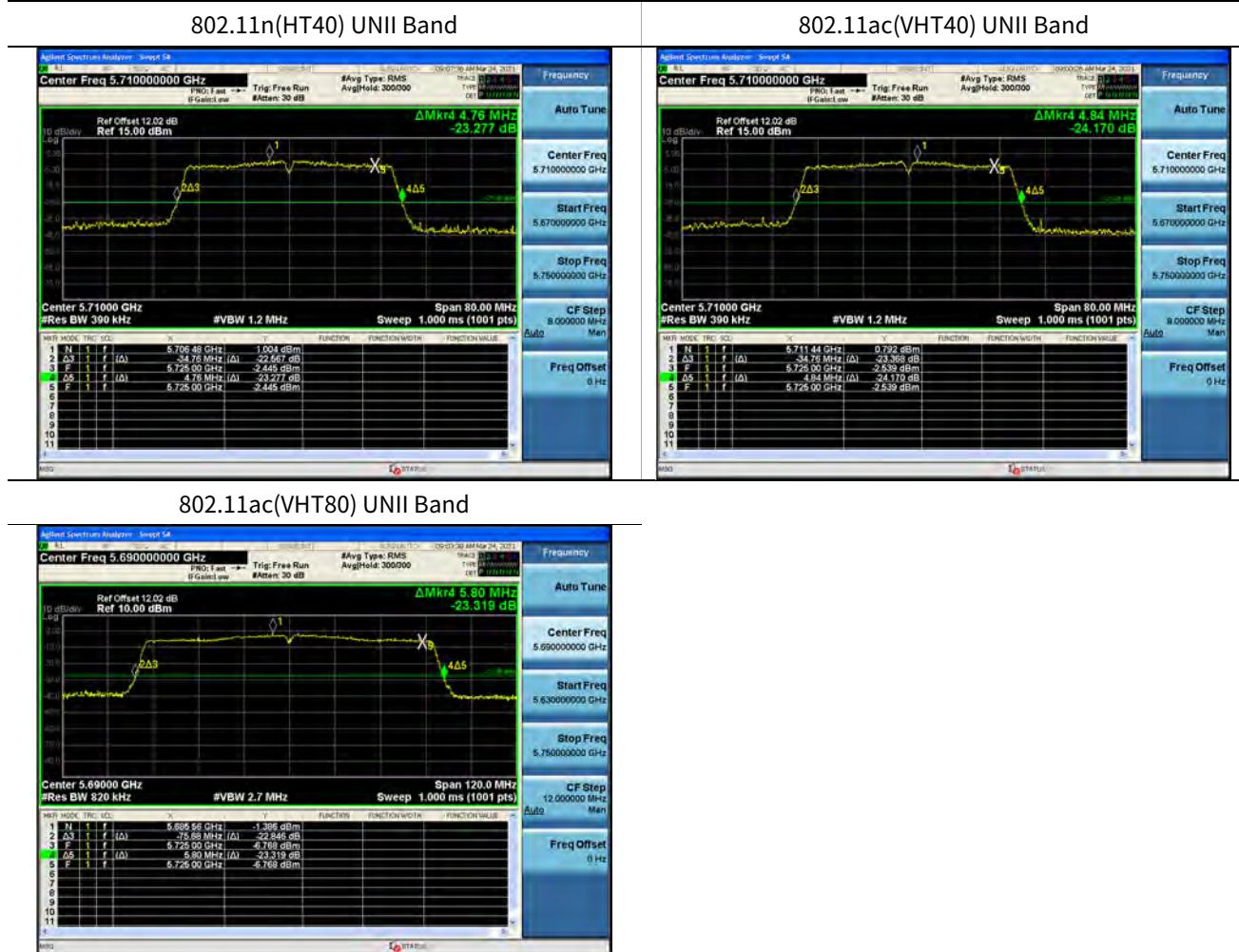
[UNII 2C] 26dB Bandwidth = 5725MHz - Measured Frequency[MHz]

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

## □ Test Plots (26dB Bandwidth)



## □ Test Plots (26dB Bandwidth)



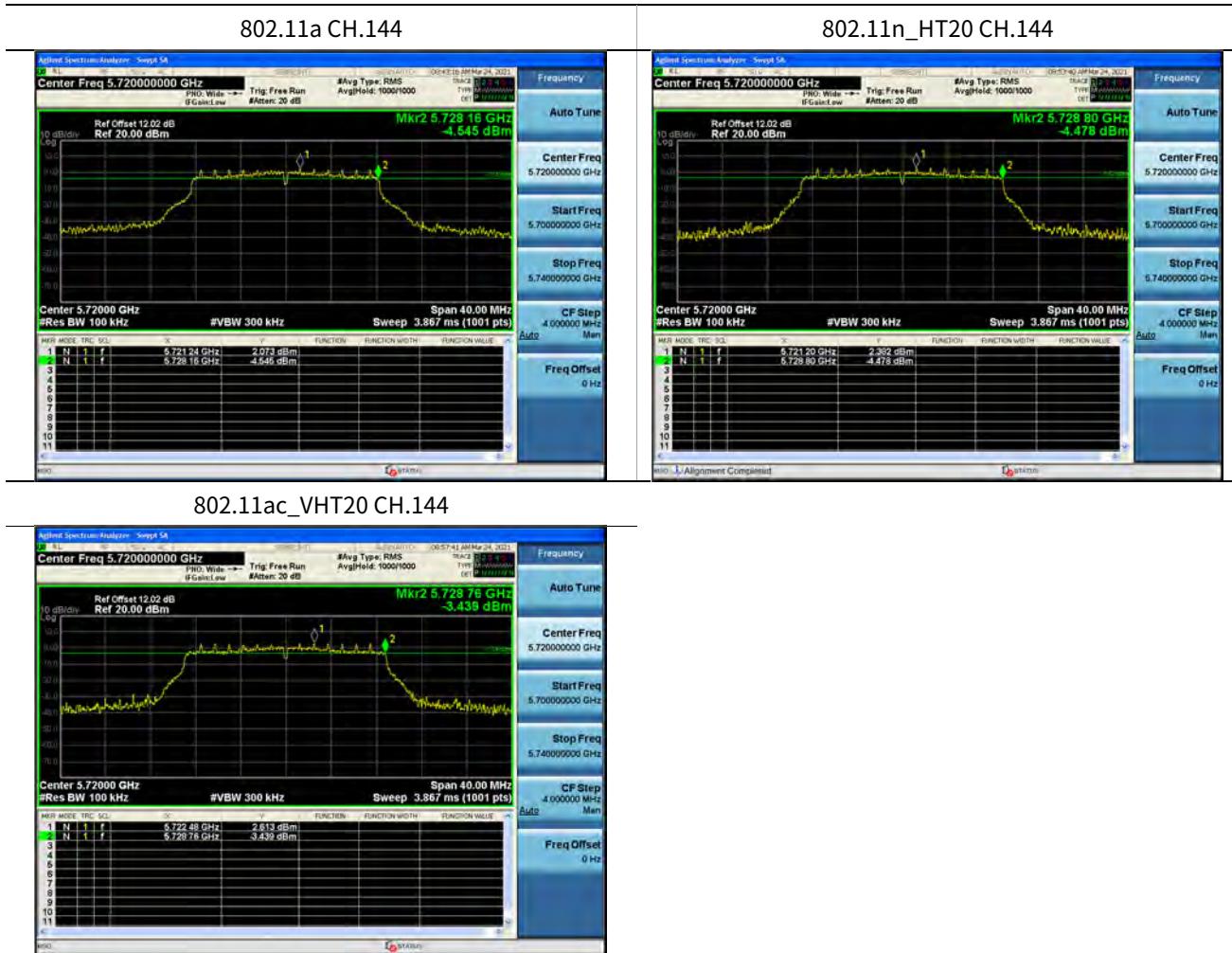
**10.7.2 6dB Bandwidth**

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII 3	5720	144	5728.16	3.16	> 0.5
802.11n(HT20)				5728.80	3.80	> 0.5
802.11ac(VHT20)				5728.76	3.76	> 0.5
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5728.16	3.16	> 0.5
802.11ac(VHT40)				5727.92	2.92	> 0.5
Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5727.68	2.68	> 0.5

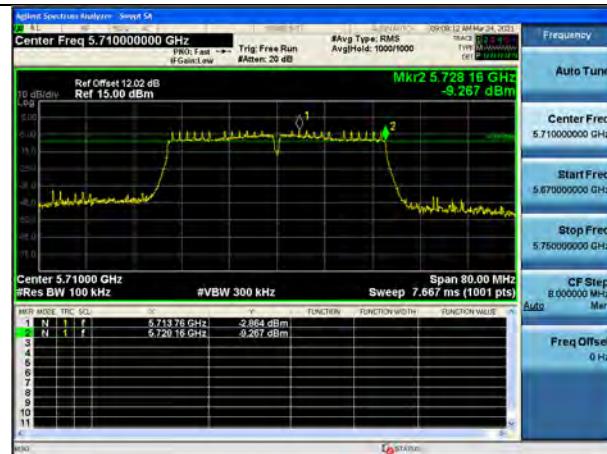
**Note:**

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

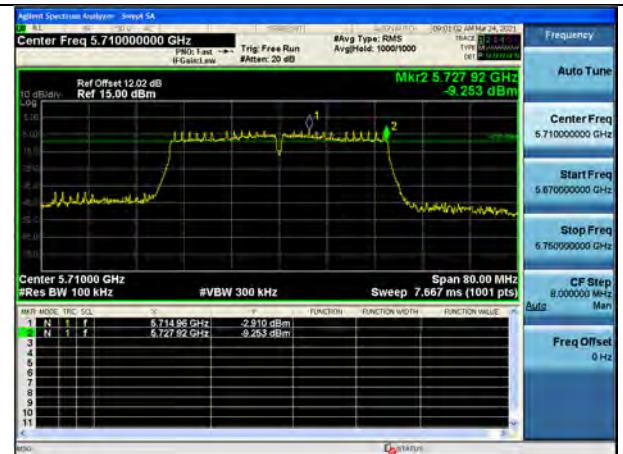
## □ Test Plots (UNII 3 Band 6dB Bandwidth)



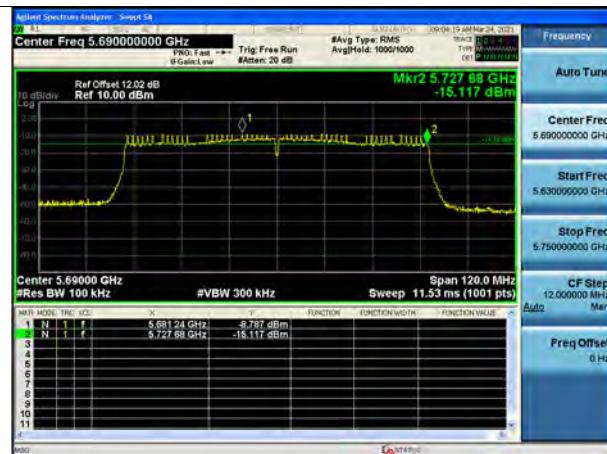
802.11n\_HT40 CH.142



802.11ac\_VHT40 CH.142



802.11ac\_VHT80 CH.138



### 10.7.3 Output Power

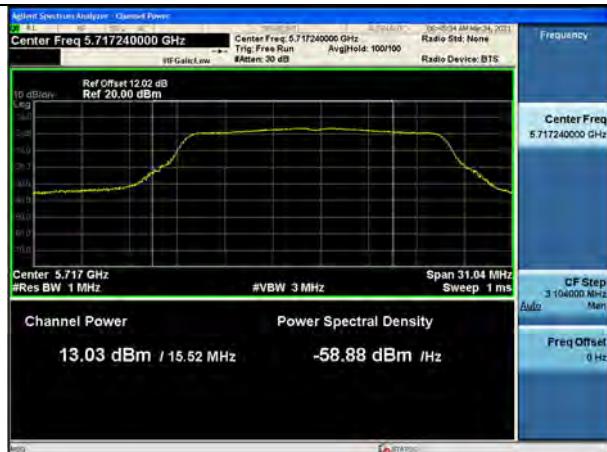
Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	13.03	0.364	13.39	22.91
802.11n(HT20)			12.44	0.380	12.82	22.96
802.11ac(VHT20)			12.39	0.370	12.76	22.99
802.11a	5720 (UNII 3 Band)	144	5.70	0.364	6.06	30.00
802.11n(HT20)			5.63	0.380	6.01	30.00
802.11ac(VHT20)			5.64	0.370	6.01	30.00

Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	10.07	0.496	10.56	23.98
802.11ac(VHT40)			9.45	0.842	10.29	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	-1.01	0.496	-0.51	30.00
802.11ac(VHT40)			-1.50	0.842	-0.66	30.00

Mode	Frequency [MHz]	Channel	Measured Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	6.35	0.892	7.25	23.98
	5690 (UNII 3 Band)	138	-8.12	0.892	-7.22	30.00

## □ Test Plots\_

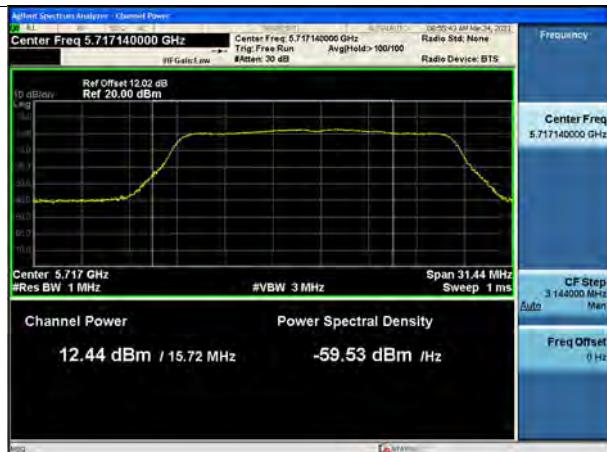
802.11a UNII 2C Band



802.11a UNII 3 Band



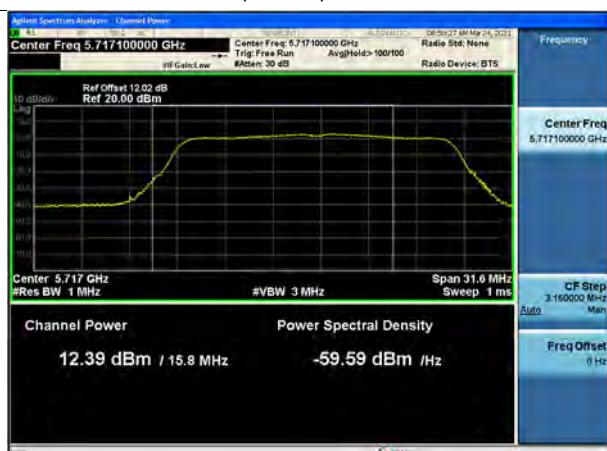
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



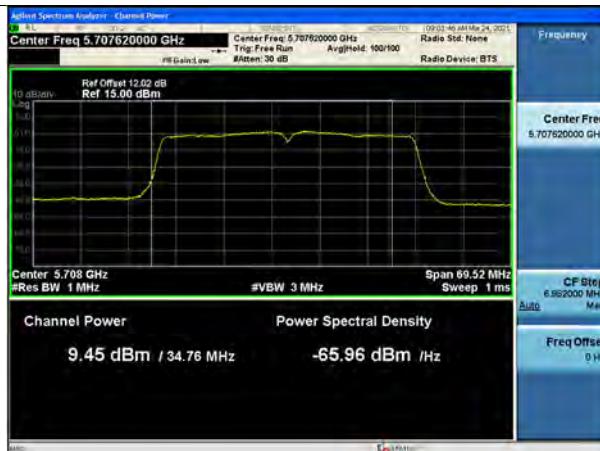
## 802.11n(HT40) UNII 2C Band



## 802.11n(HT40) UNII 3 Band



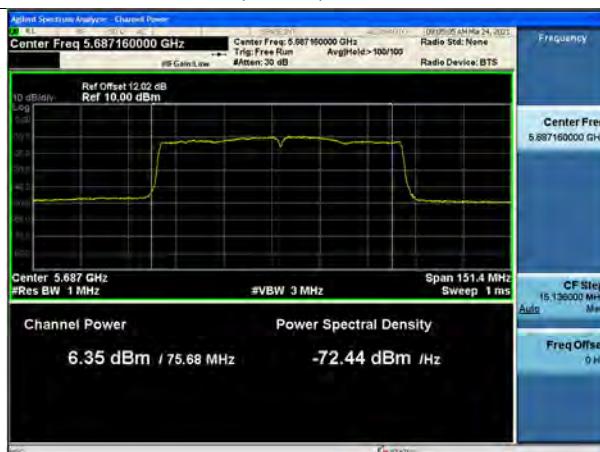
## 802.11ac(VHT40) UNII 2C Band



## 802.11ac(VHT40) UNII 3 Band



## 802.11ac(VHT80) UNII 2C Band



## 802.11ac(VHT80) UNII 3 Band



**10.7.4 Power Spectral Density**

Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	3.691	0.364	4.055	11dBm/ MHz
802.11n(HT20)			3.107	0.380	3.487	
802.11ac(VHT20)			2.811	0.370	3.181	
802.11a	5720 (UNII 3 Band)	144	-1.452	0.364	-1.088	30 dBm /500kHz
802.11n(HT20)			-2.113	0.380	-1.733	
802.11ac(VHT20)			-2.083	0.370	-1.713	
Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	-2.959	0.496	-2.463	11dBm/ MHz
802.11ac(VHT40)			-3.596	0.842	-2.754	
802.11n(HT40)	5710 (UNII 3 Band)	142	-8.176	0.496	-7.680	30 dBm/ 500kHz
802.11ac(VHT40)			-8.240	0.842	-7.398	
Mode	Frequency [MHz]	Channel	Measured Density (dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-9.657	0.892	-8.765	11dBm/ MHz
	5690 (UNII 3 Band)	138	-15.192	0.892	-14.300	30 dBm/ 500kHz

## □ Test Plots\_

802.11a UNII 2C Band



802.11a UNII 3 Band



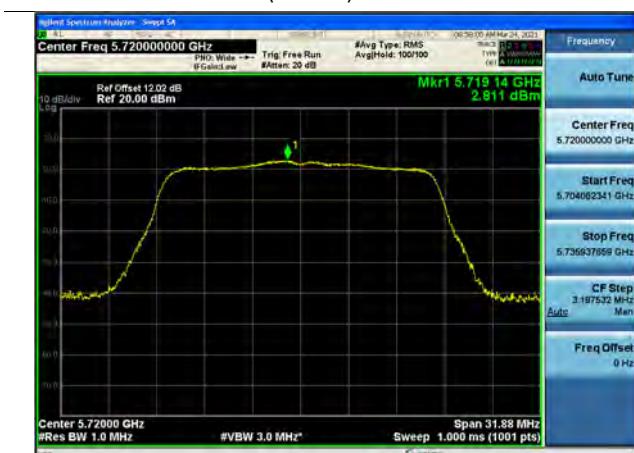
802.11n(HT20) UNII 2C Band



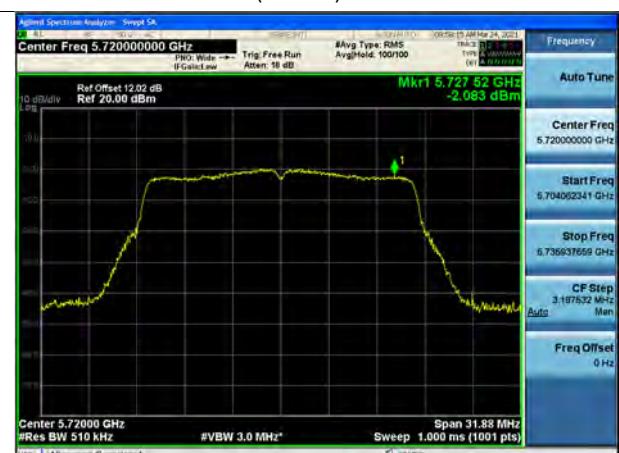
802.11n(HT20) UNII 3 Band



802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



## 802.11n(HT40) UNII 2C Band



## 802.11n(HT40) UNII 3 Band



## 802.11ac(VHT40) UNII 2C Band



## 802.11ac(VHT40) UNII 3 Band



## 802.11ac(VHT80) UNII 2C Band



## 802.11ac(VHT80) UNII 3 Band



## 10.8 RADIATED SPURIOUS EMISSIONS

### Frequency Range : 9 kHz – 30MHz

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

**Note:**

1. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor =  $40\log(\text{specific distance} / \text{test distance})$  (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	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
10360	44.75	8.90	V	53.65	68.20	14.55	PK
15540	40.71	13.15	V	53.86	73.98	20.12	PK
15540	26.86	13.15	V	40.01	53.98	13.97	AV
10360	43.63	8.90	H	52.53	68.20	15.67	PK
15540	40.25	13.15	H	53.40	73.98	20.58	PK
15540	26.74	13.15	H	39.89	53.98	14.09	AV

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
10400	44.45	9.11	V	53.56	68.20	14.64	PK
15600	40.09	13.41	V	53.50	73.98	20.48	PK
15600	26.57	13.41	V	39.98	53.98	14.00	AV
10400	43.72	9.11	H	52.83	68.20	15.37	PK
15600	39.60	13.41	H	53.01	73.98	20.97	PK
15600	26.46	13.41	H	39.87	53.98	14.11	AV

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
10480	44.02	9.54	V	53.56	68.20	14.64	PK
15720	39.63	13.05	V	52.68	73.98	21.30	PK
15720	26.24	13.05	V	39.29	53.98	14.69	AV
10480	43.42	9.54	H	52.96	68.20	15.24	PK
15720	39.17	13.05	H	52.22	73.98	21.76	PK
15720	26.15	13.05	H	39.20	53.98	14.78	AV

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
10520	43.72	9.80	V	53.52	68.20	14.68	PK
15780	39.79	13.51	V	53.30	73.98	20.68	PK
15780	26.89	13.51	V	40.40	53.98	13.58	AV
10520	43.49	9.80	H	53.29	68.20	14.91	PK
15780	39.17	13.51	H	52.68	73.98	21.30	PK
15780	26.70	13.51	H	40.21	53.98	13.77	AV

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
10600	42.99	10.27	V	53.26	73.98	20.72	PK
10600	29.41	10.27	V	39.68	53.98	14.30	AV
15900	40.77	13.01	V	53.78	73.98	20.20	PK
15900	27.60	13.01	V	40.61	53.98	13.37	AV
10600	42.73	10.27	H	53.00	73.98	20.98	PK
10600	29.34	10.27	H	39.61	53.98	14.37	AV
15900	40.54	13.01	H	53.55	73.98	20.43	PK
15900	27.56	13.01	H	40.57	53.98	13.41	AV

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
10640	42.65	10.41	V	53.06	73.98	20.92	PK
10640	29.23	10.41	V	39.64	53.98	14.34	AV
15960	40.84	13.53	V	54.37	73.98	19.61	PK
15960	27.51	13.53	V	41.04	53.98	12.94	AV
10640	42.29	10.41	H	52.70	73.98	21.28	PK
10640	29.06	10.41	H	39.47	53.98	14.51	AV
15960	40.38	13.53	H	53.91	73.98	20.07	PK
15960	27.41	13.53	H	40.94	53.98	13.04	AV

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
11000	42.55	10.99	V	53.54	73.98	20.44	PK
11000	28.97	10.99	V	39.96	53.98	14.02	AV
16500	41.65	12.68	V	54.33	68.20	13.87	PK
11000	41.69	10.99	H	52.68	73.98	21.30	PK
11000	28.82	10.99	H	39.81	53.98	14.17	AV
16500	41.28	12.68	H	53.96	68.20	14.24	PK

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
11160	42.71	10.82	V	53.53	73.98	20.45	PK
11160	28.97	10.82	V	39.79	53.98	14.19	AV
16740	40.74	13.47	V	54.21	68.20	13.99	PK
11160	41.51	10.82	H	52.33	73.98	21.65	PK
11160	28.81	10.82	H	39.63	53.98	14.35	AV
16740	40.41	13.47	H	53.88	68.20	14.32	PK

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
11440	41.83	11.37	V	53.20	73.98	20.78	PK
11440	28.19	11.37	V	39.56	53.98	14.42	AV
17160	40.21	15.11	V	55.32	68.20	12.88	PK
11440	40.26	11.37	H	51.63	73.98	22.35	PK
11440	27.79	11.37	H	39.16	53.98	14.82	AV
17160	39.88	15.11	H	54.99	68.20	13.21	PK

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
11490	41.33	11.29	V	52.62	73.98	21.36	PK
11490	28.31	11.29	V	39.60	53.98	14.38	AV
17235	40.22	15.41	V	55.63	68.20	12.57	PK
11490	41.08	11.29	H	52.37	73.98	21.61	PK
11490	27.16	11.29	H	38.45	53.98	15.53	AV
17235	39.92	15.41	H	55.33	68.20	12.87	PK

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
							Type
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11570	42.13	10.65	V	52.78	73.98	21.20	PK
11570	28.72	10.65	V	39.37	53.98	14.61	AV
17355	41.20	16.11	V	57.31	68.20	10.89	PK
11570	41.50	10.65	H	52.15	73.98	21.83	PK
11570	28.50	10.65	H	39.15	53.98	14.83	AV
17355	40.90	16.11	H	57.01	68.20	11.19	PK

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

Frequency	Reading	A.F+C.L-A.G+D.F	ANT. POL	Total	Limit	Margin	Measurement
							Type
[MHz]	[dBuV]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11650	42.20	10.20	V	52.40	73.98	21.58	PK
11650	28.76	10.20	V	38.96	53.98	15.02	AV
17475	40.99	17.45	V	58.44	68.20	9.76	PK
11650	41.75	10.20	H	51.95	73.98	22.03	PK
11650	28.60	10.20	H	38.80	53.98	15.18	AV
17475	39.55	17.45	H	57.00	68.20	11.20	PK

**Note:**

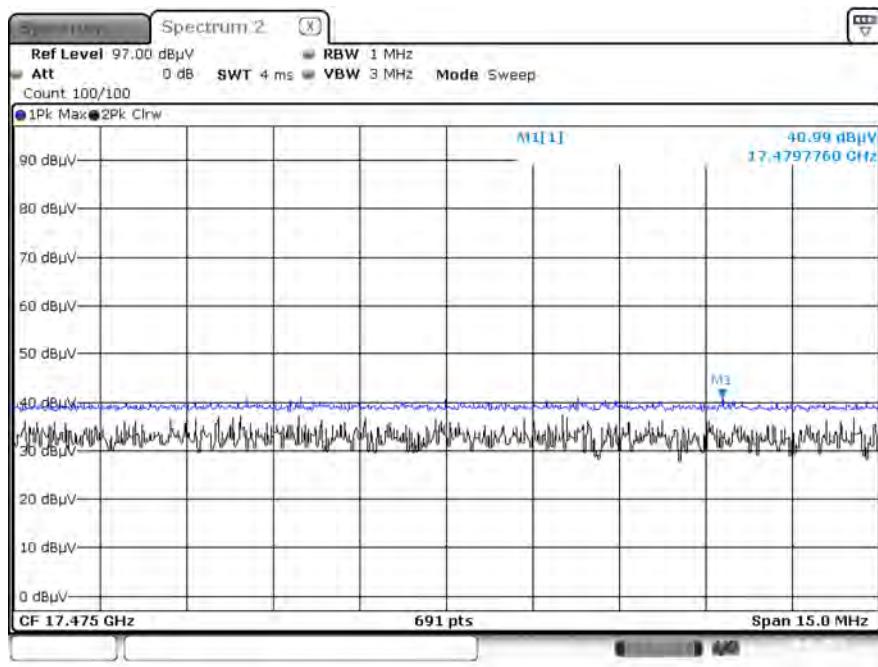
All Modes of operation were investigated and the worst case configuration results are reported.

[Worst case]

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

**■ Test Plots**

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

**Note:**

Only the worst case plots for Radiated Spurious Emissions.

**10.9 RADIATED RESTRICTED BAND EDGE**

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

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5150	58.86	7.81	H	66.67	73.98	7.31	PK
5150	40.34	7.81	H	48.15	53.98	5.83	AV
5150	58.21	7.81	V	66.02	73.98	7.96	PK
5150	39.84	7.81	V	47.65	53.98	6.33	AV

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

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	55.62	7.51	H	63.13	73.98	10.85	PK
5350	40.17	7.51	H	47.68	53.98	6.30	AV
5350	54.50	7.51	V	62.01	73.98	11.97	PK
5350	40.05	7.51	V	47.56	53.98	6.42	AV

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

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5460	47.53	8.15	H	55.68	73.98	18.30	PK
5460	34.76	8.15	H	42.91	53.98	11.07	AV
5470	54.84	8.21	H	63.05	68.20	5.15	PK
5460	46.29	8.15	V	54.44	73.98	19.54	PK
5460	33.68	8.15	V	41.83	53.98	12.15	AV
5470	53.46	8.21	V	61.67	68.20	6.53	PK

Band : UNII 2C  
Operation Mode: 802.11 a  
Transfer Rate: 6 Mbps  
Operating Frequency 5520 MHz  
Channel No. 104 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5460	48.03	8.15	H	56.18	73.98	17.80	PK
5460	33.96	8.15	H	42.11	53.98	11.87	AV
5470	49.91	8.21	H	58.12	68.20	10.08	PK
5460	47.69	8.15	V	55.84	73.98	18.14	PK
5460	32.64	8.15	V	40.79	53.98	13.19	AV
5470	48.66	8.21	V	56.87	68.20	11.33	PK

Band : UNII 1  
Operation Mode: 802.11 n\_HT20  
Transfer MCS Index: 0  
Operating Frequency 5180 MHz  
Channel No. 36 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5150	57.73	7.81	H	65.54	73.98	8.44	PK
5150	41.37	7.81	H	49.18	53.98	4.80	AV
5150	56.90	7.81	V	64.71	73.98	9.27	PK
5150	40.55	7.81	V	48.36	53.98	5.62	AV

Band : UNII 2A  
Operation Mode: 802.11 n\_HT20  
Transfer MCS Index: 0  
Operating Frequency 5320 MHz  
Channel No. 64 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	57.44	7.51	H	64.95	73.98	9.03	PK
5350	40.16	7.51	H	47.67	53.98	6.31	AV
5350	56.83	7.51	V	64.34	73.98	9.64	PK
5350	38.97	7.51	V	46.48	53.98	7.50	AV

Band : UNII 2C  
Operation Mode: 802.11 n\_HT20  
Transfer MCS Index: 0  
Operating Frequency 5500 MHz  
Channel No. 100 Ch

Frequency [MHz]	Reading dBuV	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	47.16	8.15	H	55.31	73.98	18.67	PK
5460	34.59	8.15	H	42.74	53.98	11.24	AV
5470	50.62	8.21	H	58.83	68.20	9.37	PK
5460	45.20	8.15	V	53.35	73.98	20.63	PK
5460	33.32	8.15	V	41.47	53.98	12.51	AV
5470	50.03	8.21	V	58.24	68.20	9.96	PK

Band : UNII 2C  
Operation Mode: 802.11 n\_HT20  
Transfer MCS Index: 0  
Operating Frequency 5520 MHz  
Channel No. 104 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	45.09	8.15	H	53.24	73.98	20.74	PK
5460	33.70	8.15	H	41.85	53.98	12.13	AV
5470	50.43	8.21	H	58.64	68.20	9.56	PK
5460	44.89	8.15	V	53.04	73.98	20.94	PK
5460	33.64	8.15	V	41.79	53.98	12.19	AV
5470	48.95	8.21	V	57.16	68.20	11.04	PK

Band : UNII 1  
Operation Mode: 802.11 ac\_VHT20  
Transfer MCS Index: 0  
Operating Frequency 5180 MHz  
Channel No. 36 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5150	57.66	7.81	H	65.47	73.98	8.51	PK
5150	39.66	7.81	H	47.47	53.98	6.51	AV
5150	56.40	7.81	V	64.21	73.98	9.77	PK
5150	38.86	7.81	V	46.67	53.98	7.31	AV

Band : UNII 2A  
Operation Mode: 802.11 ac\_VHT20  
Transfer MCS Index: 0  
Operating Frequency 5320 MHz  
Channel No. 64 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	60.31	7.51	H	67.82	73.98	6.16	PK
5350	40.15	7.51	H	47.66	53.98	6.32	AV
5350	57.86	7.51	V	65.37	73.98	8.61	PK
5350	39.93	7.51	V	47.44	53.98	6.54	AV

Band : UNII 2C  
Operation Mode: 802.11 ac\_VHT20  
Transfer MCS Index: 0  
Operating Frequency 5500 MHz  
Channel No. 100 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5460	47.57	8.15	H	55.72	73.98	18.26	PK
5460	34.44	8.15	H	42.59	53.98	11.39	AV
5470	52.14	8.21	H	60.35	68.20	7.85	PK
5460	47.16	8.15	V	55.31	73.98	18.67	PK
5460	33.52	8.15	V	41.67	53.98	12.31	AV
5470	49.18	8.21	V	57.39	68.20	10.81	PK

Band : UNII 2C  
Operation Mode: 802.11 ac\_VHT20  
Transfer MCS Index: 0  
Operating Frequency 5520 MHz  
Channel No. 104 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5460	45.81	8.15	H	53.96	73.98	20.02	PK
5460	33.66	8.15	H	41.81	53.98	12.17	AV
5470	49.45	8.21	H	57.66	68.20	10.54	PK
5460	44.66	8.15	V	52.81	73.98	21.17	PK
5460	33.17	8.15	V	41.32	53.98	12.66	AV
5470	48.09	8.21	V	56.30	68.20	11.90	PK

Band : UNII 1  
Operation Mode: 802.11 n\_HT40  
Transfer MCS Index: 0  
Operating Frequency 5190 MHz  
Channel No. 38 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5150	54.87	7.81	H	62.68	73.98	11.30	PK
5150	41.16	7.81	H	48.97	53.98	5.01	AV
5150	53.81	7.81	V	61.62	73.98	12.36	PK
5150	40.58	7.81	V	48.39	53.98	5.59	AV

Band : UNII 2A  
Operation Mode: 802.11 n\_HT40  
Transfer MCS Index: 0  
Operating Frequency 5270 MHz  
Channel No. 54 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	46.40	7.51	H	53.91	73.98	20.07	PK
5350	34.41	7.51	H	41.92	53.98	12.06	AV
5350	45.95	7.51	V	53.46	73.98	20.52	PK
5350	34.11	7.51	V	41.62	53.98	12.36	AV

Band : UNII 2A  
Operation Mode: 802.11 n\_HT40  
Transfer MCS Index: 0  
Operating Frequency 5310 MHz  
Channel No. 62 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	60.42	7.51	H	67.93	73.98	6.05	PK
5350	41.55	7.51	H	49.06	53.98	4.92	AV
5350	54.99	7.51	V	62.50	73.98	11.48	PK
5350	40.50	7.51	V	48.01	53.98	5.97	AV

Band : UNII 2C  
Operation Mode: 802.11 n\_HT40  
Transfer MCS Index: 0  
Operating Frequency 5510 MHz  
Channel No. 102 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5460	46.21	8.15	H	54.36	73.98	19.62	PK
5460	34.35	8.15	H	42.50	53.98	11.48	AV
5470	53.02	8.21	H	61.23	68.20	6.97	PK
5460	45.96	8.15	V	54.11	73.98	19.87	PK
5460	33.84	8.15	V	41.99	53.98	11.99	AV
5470	52.04	8.21	V	60.25	68.20	7.95	PK

Band : UNII 2C  
Operation Mode: 802.11 n\_HT40  
Transfer MCS Index: 0  
Operating Frequency 5550 MHz  
Channel No. 110 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	45.10	8.15	H	53.25	73.98	20.73	PK
5460	33.20	8.15	H	41.35	53.98	12.63	AV
5470	45.71	8.21	H	53.92	68.20	14.28	PK
5460	42.74	8.15	V	50.89	73.98	23.09	PK
5460	33.08	8.15	V	41.23	53.98	12.75	AV
5470	44.51	8.21	V	52.72	68.20	15.48	PK

Band : UNII 1  
Operation Mode: 802.11 ac\_VHT40  
Transfer MCS Index: 0  
Operating Frequency 5190 MHz  
Channel No. 38 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5150	54.60	7.81	H	62.41	73.98	11.57	PK
5150	42.10	7.81	H	49.91	53.98	4.07	AV
5150	53.50	7.81	V	61.31	73.98	12.67	PK
5150	41.52	7.81	V	49.33	53.98	4.65	AV

Band : UNII 2A  
Operation Mode: 802.11 ac\_VHT40  
Transfer MCS Index: 0  
Operating Frequency 5270 MHz  
Channel No. 54 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	47.83	7.51	H	55.34	73.98	18.64	PK
5350	34.87	7.51	H	42.38	53.98	11.60	AV
5350	46.51	7.51	V	54.02	73.98	19.96	PK
5350	34.20	7.51	V	41.71	53.98	12.27	AV

Band : UNII 2A  
Operation Mode: 802.11 ac\_VHT40  
Transfer MCS Index: 0  
Operating Frequency 5310 MHz  
Channel No. 62 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	59.67	7.51	H	67.18	73.98	6.80	PK
5350	41.26	7.51	H	48.77	53.98	5.21	AV
5350	57.43	7.51	V	64.94	73.98	9.04	PK
5350	41.01	7.51	V	48.52	53.98	5.46	AV

Band : UNII 2C  
Operation Mode: 802.11 ac\_VHT40  
Transfer MCS Index: 0  
Operating Frequency 5510 MHz  
Channel No. 102 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5460	47.89	8.15	H	56.04	73.98	17.94	PK
5460	34.78	8.15	H	42.93	53.98	11.05	AV
5470	52.55	8.21	H	60.76	68.20	7.44	PK
5460	46.44	8.15	V	54.59	73.98	19.39	PK
5460	34.13	8.15	V	42.28	53.98	11.70	AV
5470	50.11	8.21	V	58.32	68.20	9.88	PK

Band : UNII 2C  
Operation Mode: 802.11 ac\_VHT40  
Transfer MCS Index: 0  
Operating Frequency 5550 MHz  
Channel No. 110 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	44.20	8.15	H	52.35	73.98	21.63	PK
5460	33.65	8.15	H	41.80	53.98	12.18	AV
5470	46.23	8.21	H	54.44	68.20	13.76	PK
5460	43.64	8.15	V	51.79	73.98	22.19	PK
5460	33.32	8.15	V	41.47	53.98	12.51	AV
5470	45.82	8.21	V	54.03	68.20	14.17	PK

Band : UNII 1  
Operation Mode: 802.11 ac\_VHT80  
Transfer MCS Index: 0  
Operating Frequency 5210 MHz  
Channel No. 42 Ch

Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5150	51.58	7.81	H	59.39	73.98	14.59	PK
5150	41.37	7.81	H	49.18	53.98	4.80	AV
5150	50.29	7.81	V	58.10	73.98	15.88	PK
5150	40.65	7.81	V	48.46	53.98	5.52	AV

Band : UNII 2A  
Operation Mode: 802.11 ac\_VHT80  
Transfer MCS Index: 0  
Operating Frequency 5290 MHz  
Channel No. 58 Ch

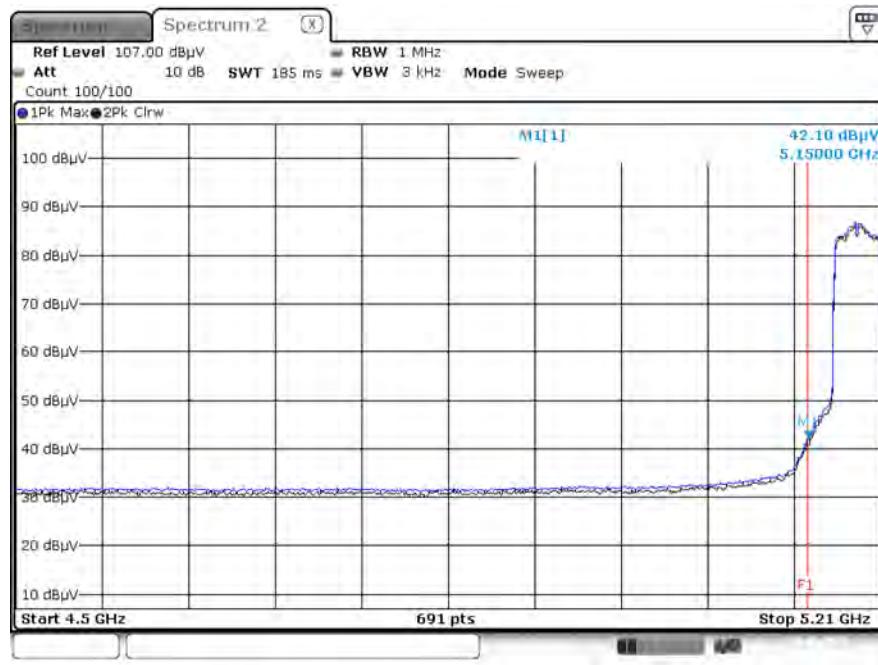
Frequency	Reading	A.F+C.L-A.G+ATT+D.F	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Type
5350	57.27	7.51	H	64.78	73.98	9.20	PK
5350	42.25	7.51	H	49.76	53.98	4.22	AV
5350	54.69	7.51	V	62.20	73.98	11.78	PK
5350	41.11	7.51	V	48.62	53.98	5.36	AV

Band : UNII 2C  
Operation Mode: 802.11 ac\_VHT80  
Transfer MCS Index: 0  
Operating Frequency 5530 MHz  
Channel No. 106 Ch

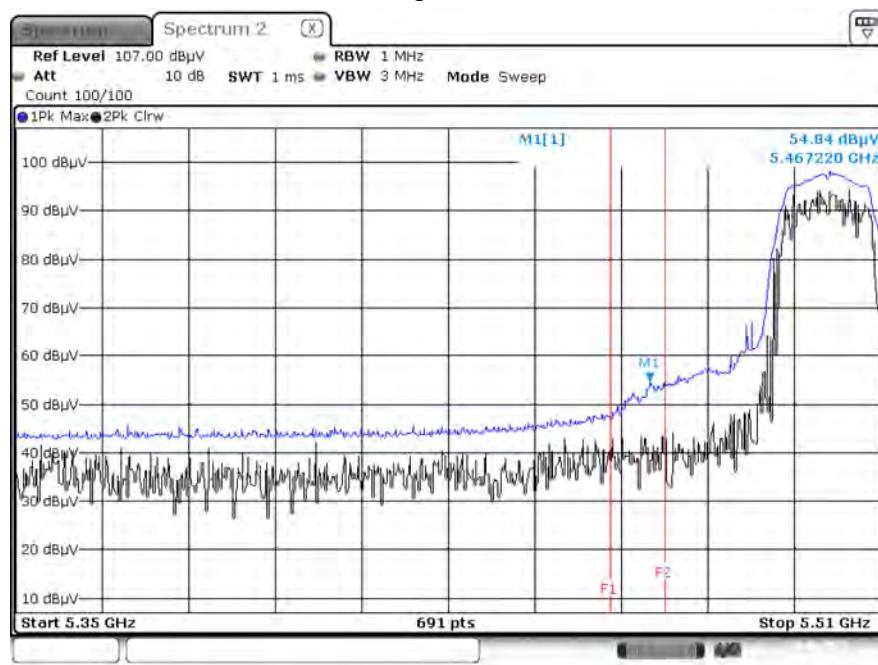
Frequency [MHz]	Reading dBuV	A.F+C.L-A.G+ATT+D.F [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement
							Type
5460	51.16	8.15	H	59.31	73.98	14.67	PK
5460	38.40	8.15	H	46.55	53.98	7.43	AV
5470	52.26	8.21	H	60.47	68.20	7.73	PK
5460	50.46	8.15	V	58.61	73.98	15.37	PK
5460	37.23	8.15	V	45.38	53.98	8.60	AV
5470	51.24	8.21	V	59.45	68.20	8.75	PK

**■ Test Plots (UNII 1, 2A, 2C) (X-H)**

Average Reading (802.11ac(VHT40), Ch.38)



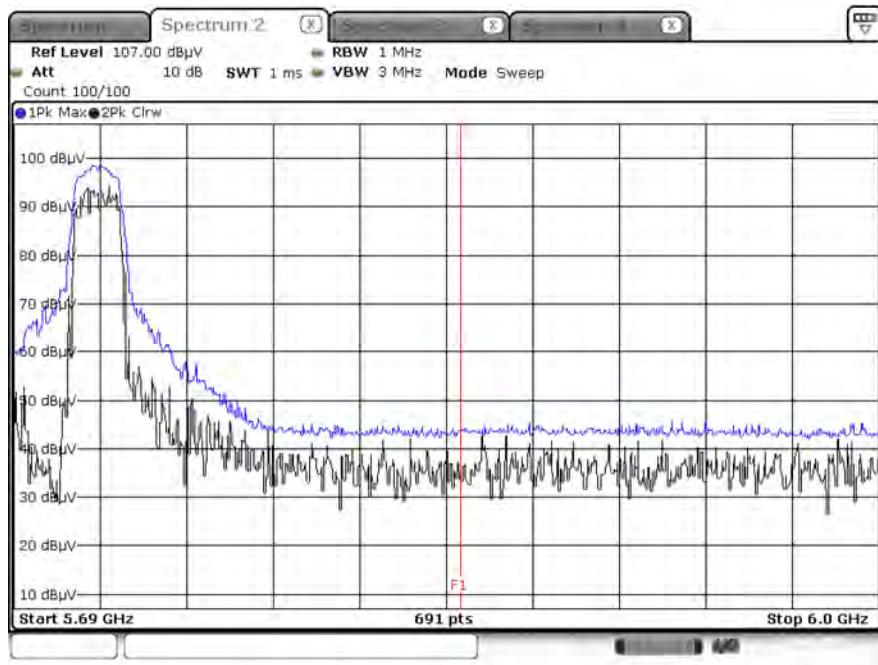
Peak Reading (802.11a, Ch.100)

**Note:**

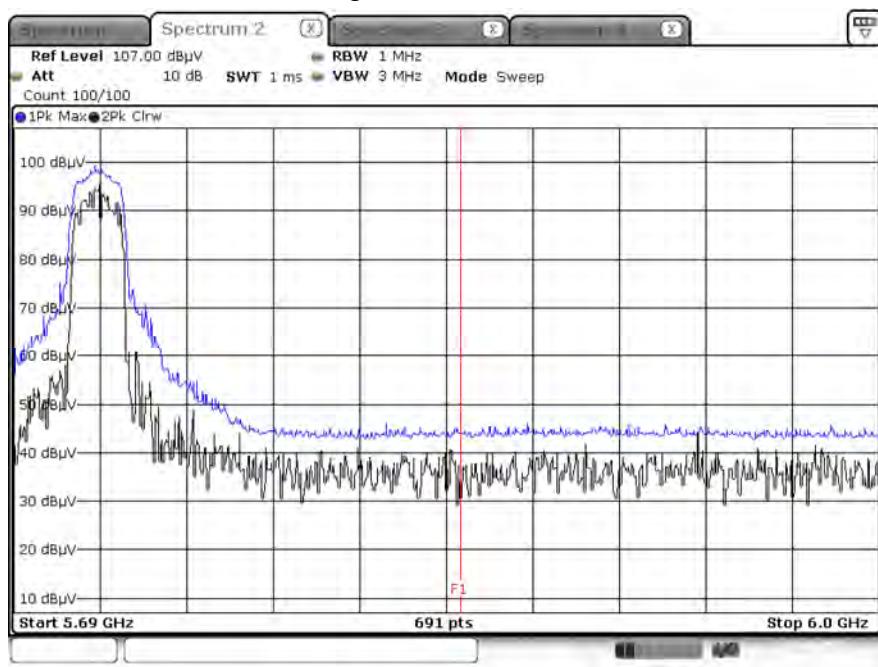
Only the worst case plots for Radiated Restricted Band Edge.

**█ Test Plots(Straddle Channel)**

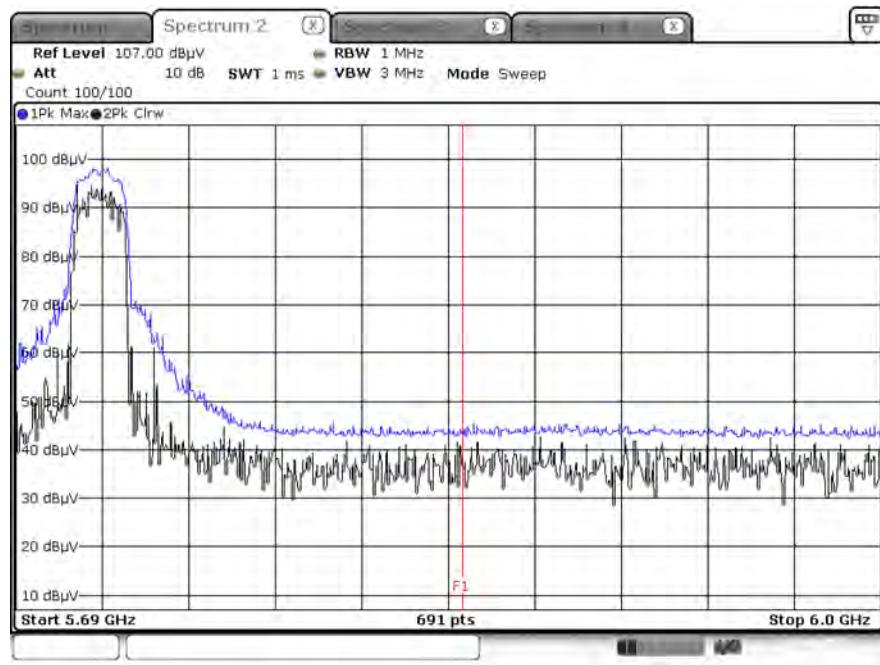
Peak Reading (802.11a, Ch.144, X-H)



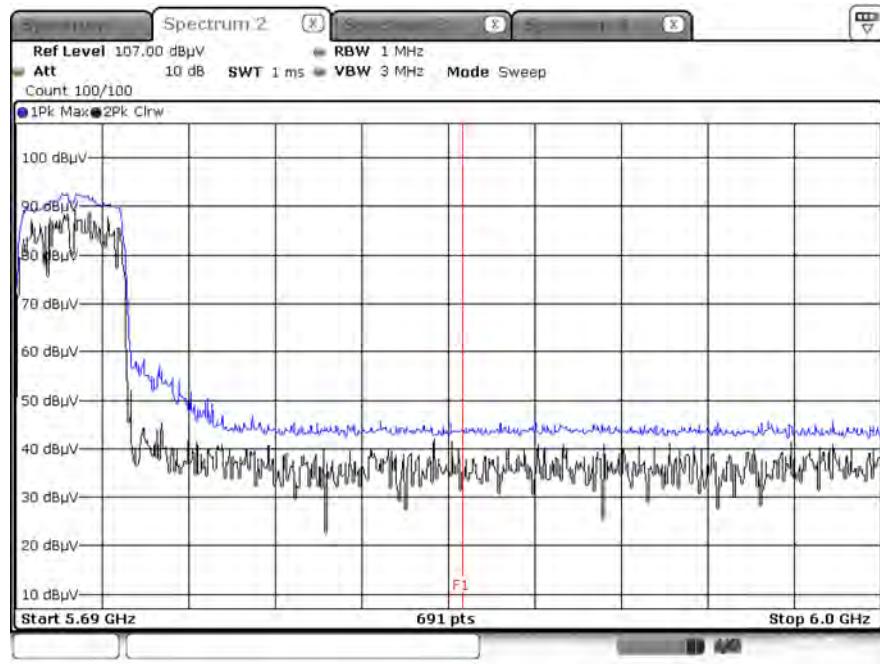
Peak Reading (802.11n\_HT20, Ch.144, X-H)



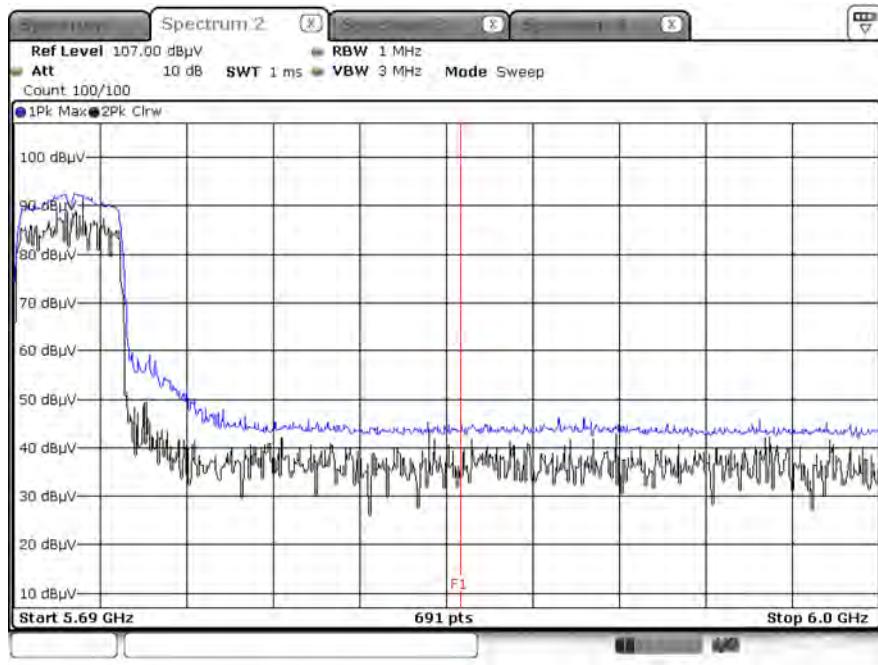
## Peak Reading (802.11ac\_VHT20, Ch.144, X-H)



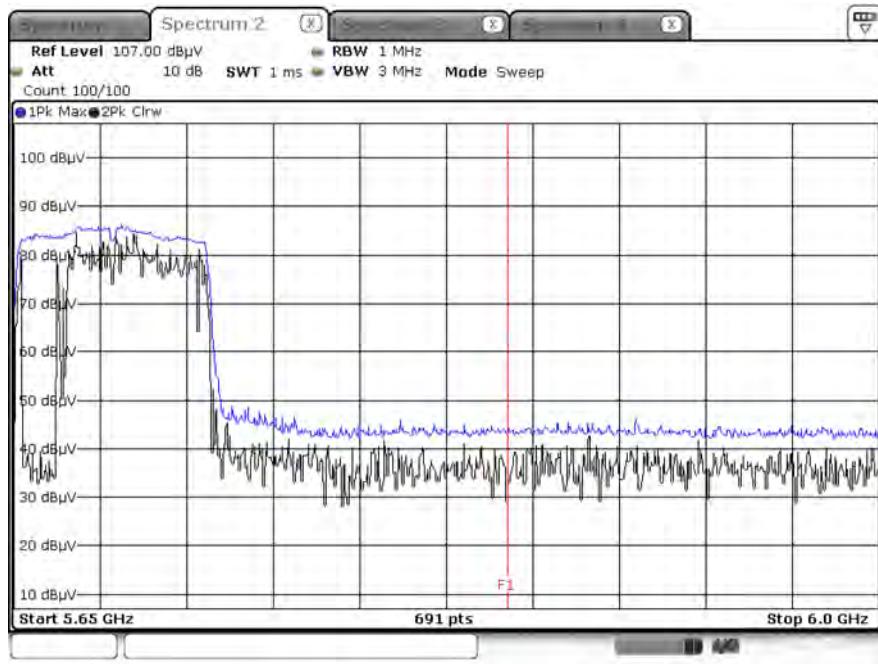
## Peak Reading (802.11n-HT40, Ch.142, X-H)



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



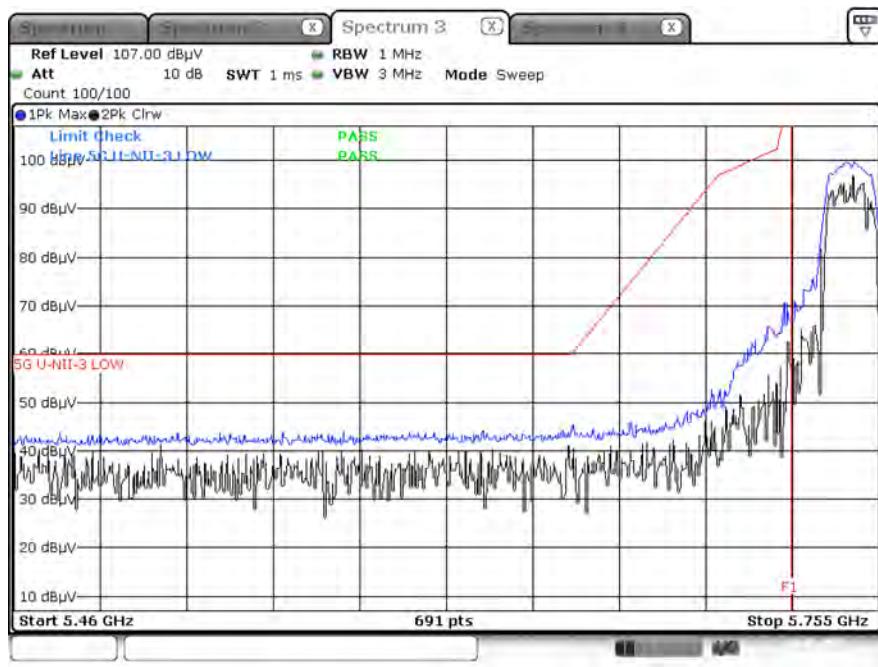
Peak Reading (802.11ac\_VHT80, Ch.138, X-H)


**Note :**

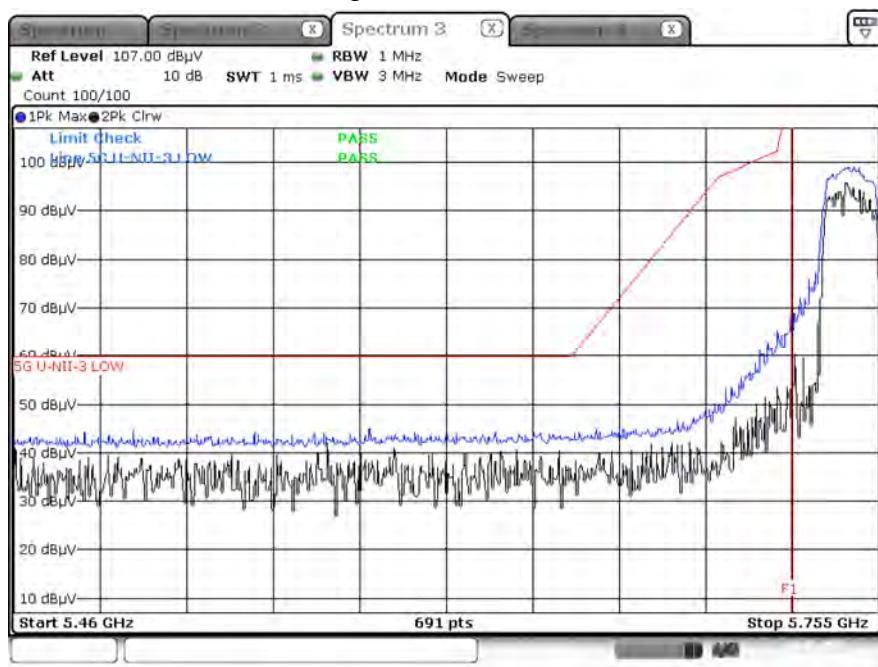
1. Only the worst case plots for Radiated Restricted Band Edge.
2. Red line : 5.850 MHz
3. Ambient Noise (Because of ambient noise, We attached only the worst plot without a data table)

**■ Test Plots (UNII 3)**

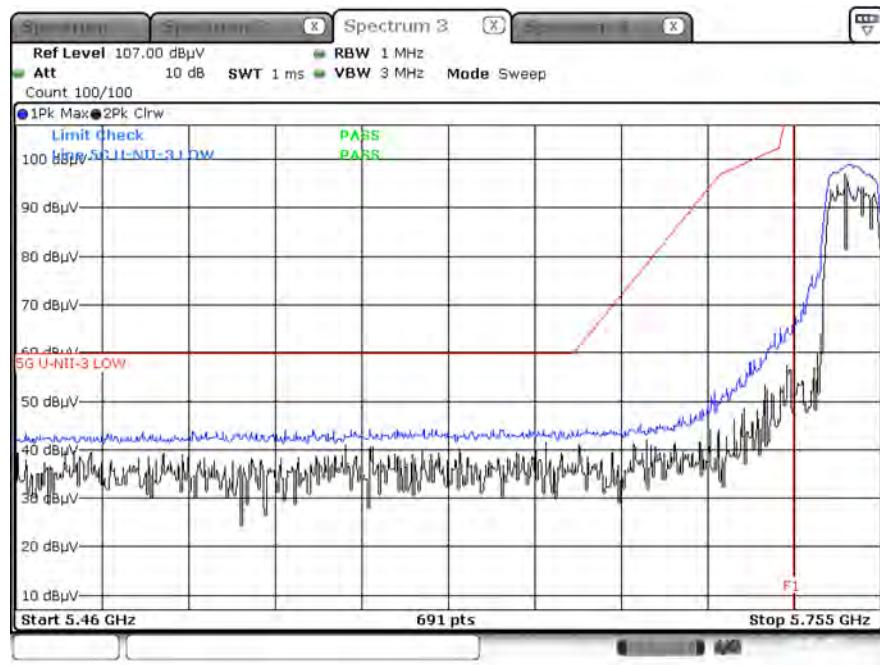
Peak Reading (802.11a, Ch.149, X-H)



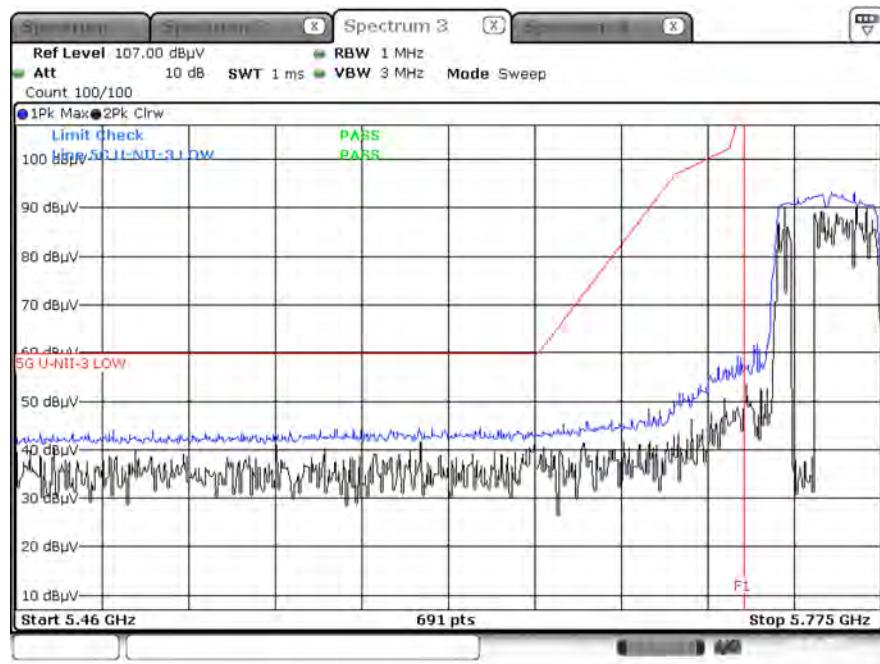
Peak Reading (802.11n\_HT20, Ch.149, X-H)



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



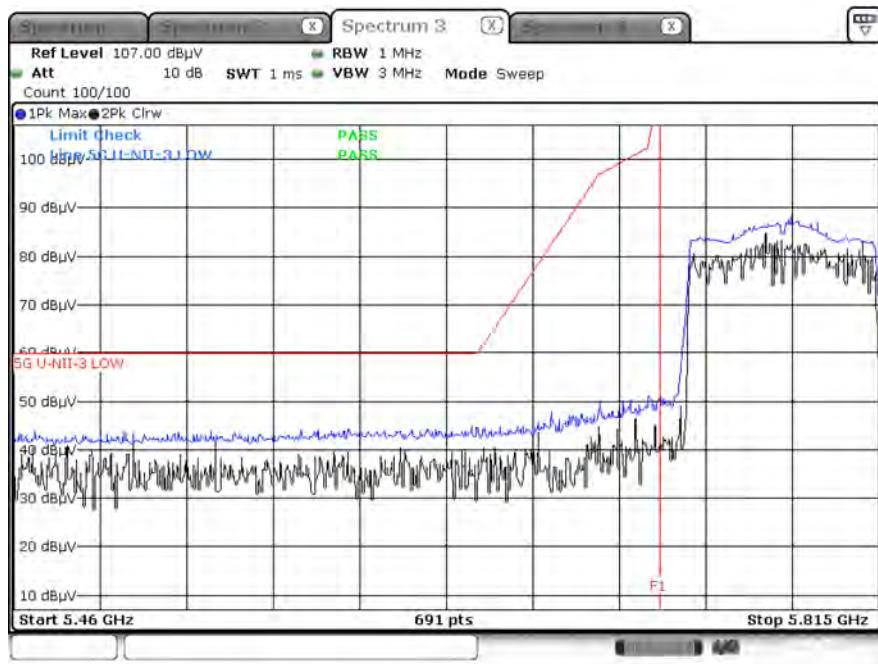
## Peak Reading (802.11n\_HT40, Ch.151, X-H)



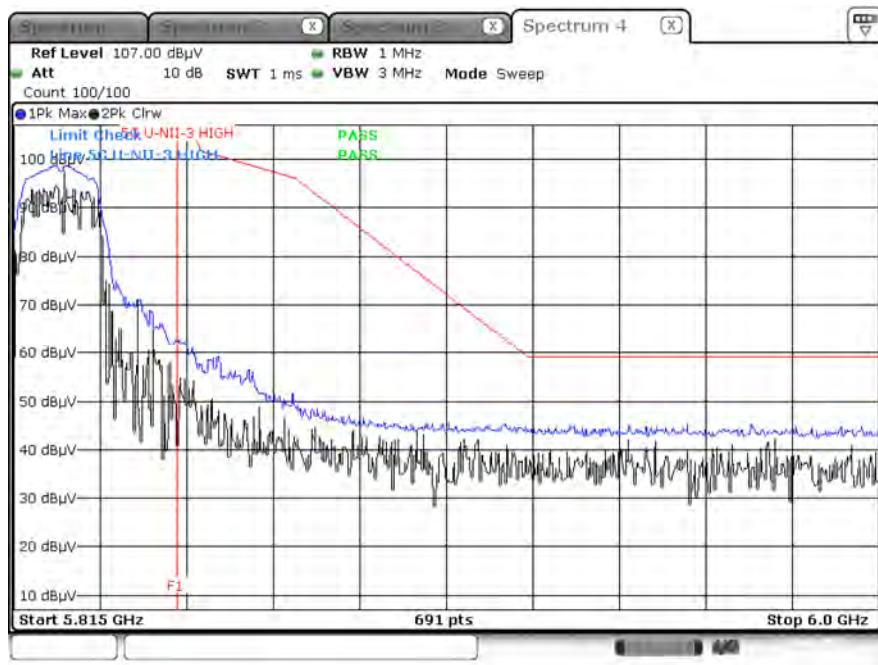
## Peak Reading (802.11ac\_VHT40, Ch.151, X-H)



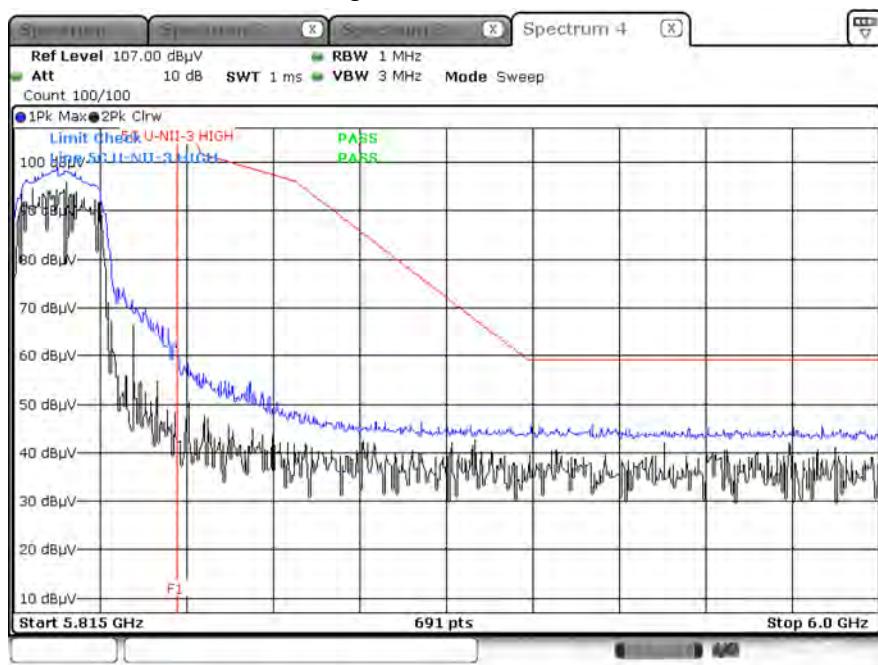
## Peak Reading (802.11ac\_VHT80, Ch.155, X-H)



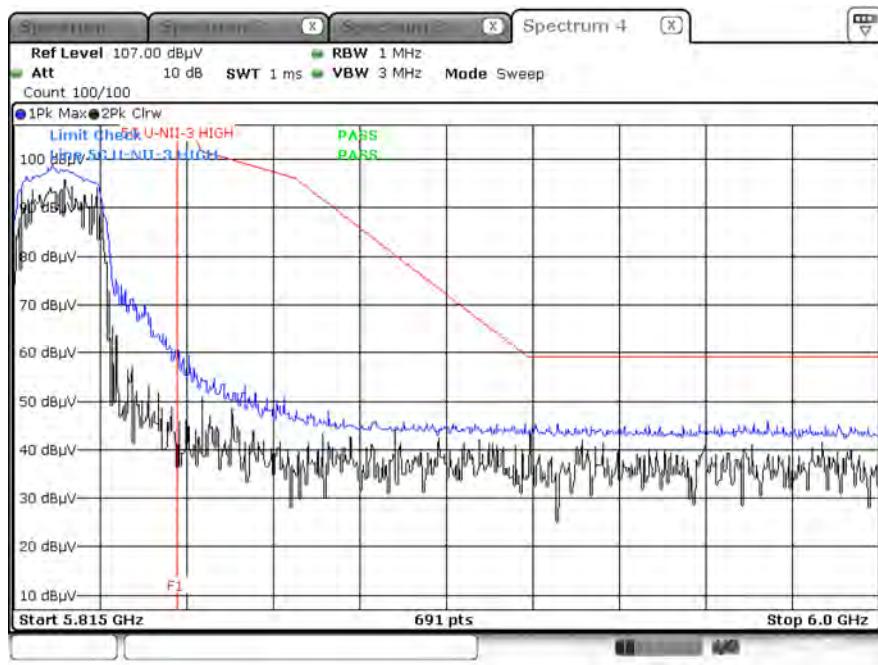
## Peak Reading (802.11a, Ch.165, X-H)



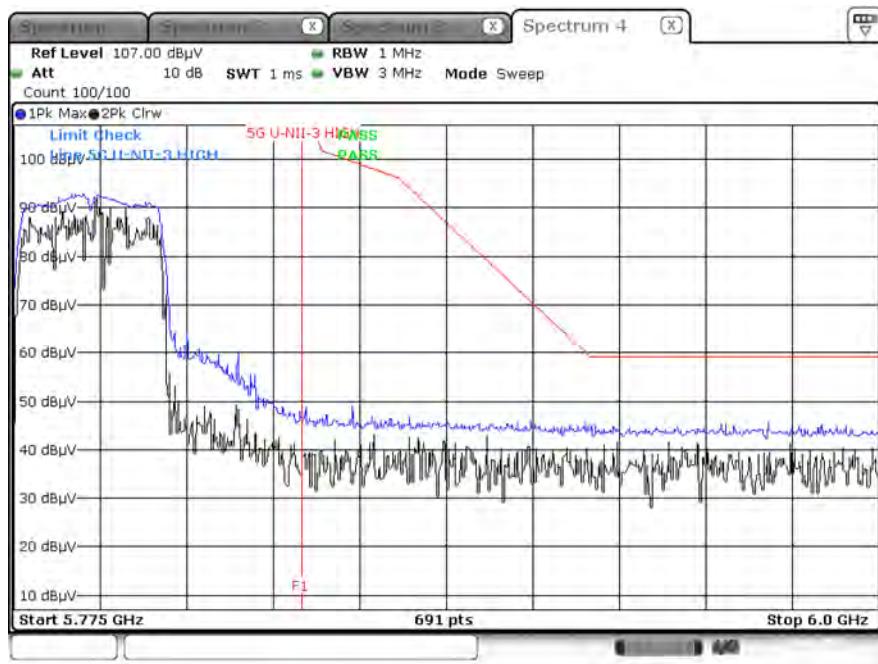
## Peak Reading (802.11n\_HT20, Ch.165, X-H)



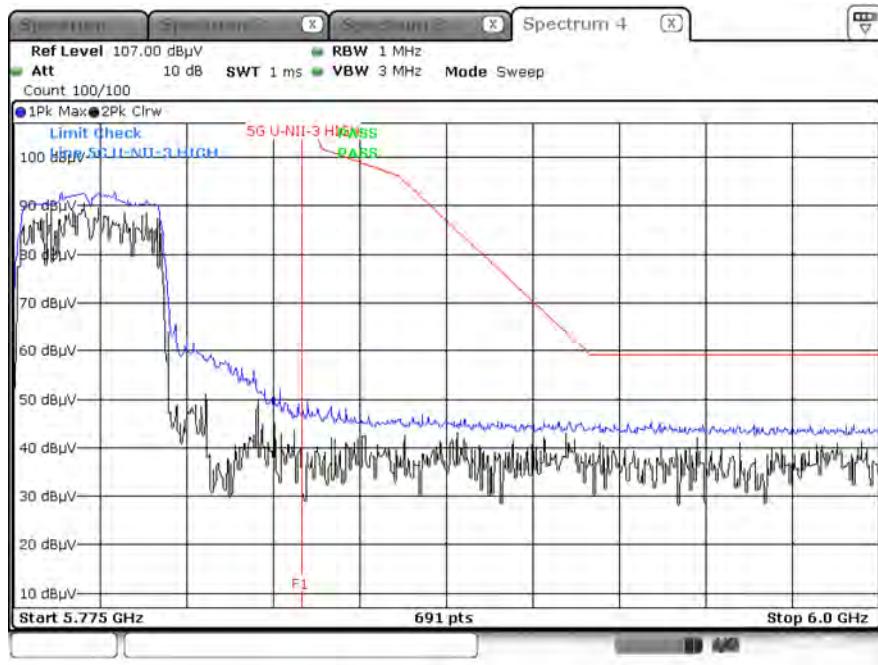
## Peak Reading (802.11ac\_VHT20, Ch.165, X-H)



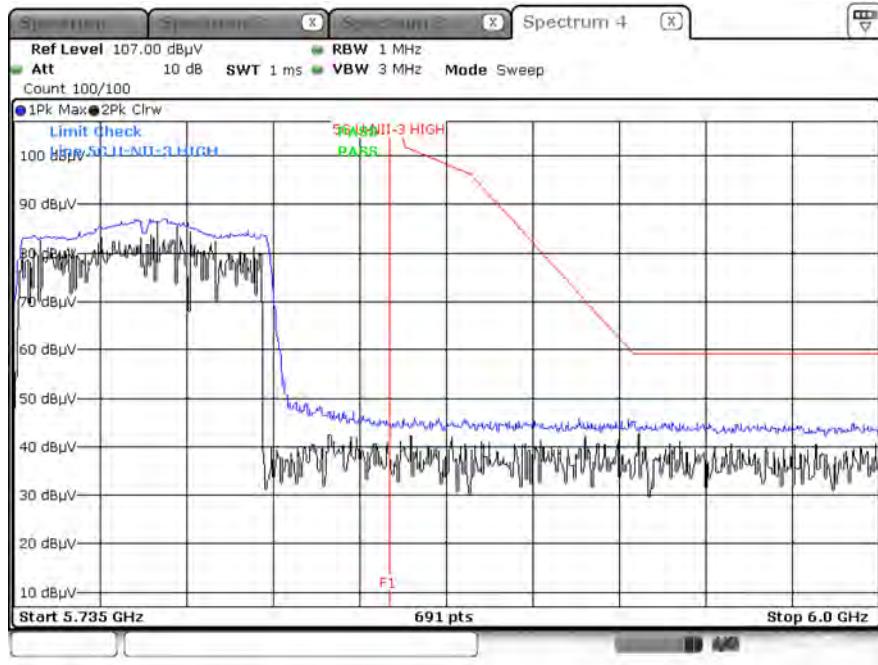
## Peak Reading (802.11n\_HT40, Ch.159, X-H)



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



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



**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.

**10.10 RECEIVER SPURIOUS EMISSIONS****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**

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							

## 10.11 POWERLINE CONDUCTED EMISSIONS

### Conducted Emissions (Line 1)

Test

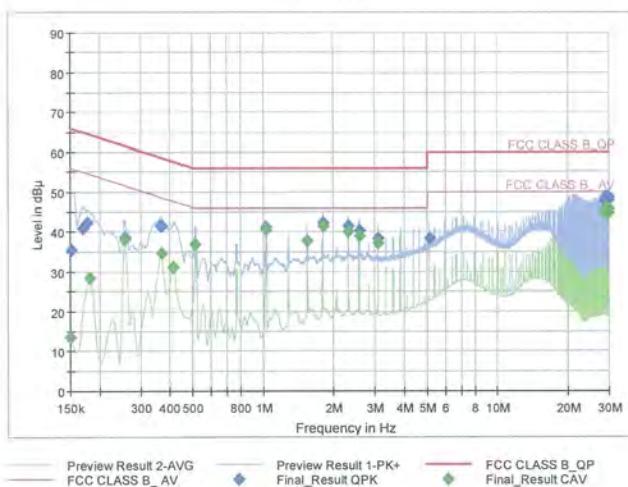
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## Test Report

### Common Information

EUT : 1080i  
Manufacturer : ERICSSON-LG  
Test Site: SHIELD ROOM  
Operating Conditions : 5G WLAN L1 Mode

Full Spectrum



### Final\_Result\_QPK

Frequency (MHz)	QuasiPeak	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	35.53	65.88	30.34	9.000	L1	OFF	9.6
0.1703	40.96	64.95	23.99	9.000	L1	OFF	9.6
0.1770	42.32	64.63	22.30	9.000	L1	OFF	9.6
0.2580	38.55	61.50	22.95	9.000	L1	OFF	9.6
0.3660	41.53	58.59	17.06	9.000	L1	OFF	9.6
0.3705	41.59	58.49	16.90	9.000	L1	OFF	9.6
1.0288	41.17	56.00	14.83	9.000	L1	OFF	9.6
1.7983	42.53	56.00	13.47	9.000	L1	OFF	9.6
2.3135	41.40	56.00	14.60	9.000	L1	OFF	9.7
2.5700	40.39	56.00	15.62	9.000	L1	OFF	9.7
3.0853	38.47	56.00	17.53	9.000	L1	OFF	9.7
5.1395	38.32	60.00	21.68	9.000	L1	OFF	9.8
28.5283	47.81	60.00	12.19	9.000	L1	OFF	10.0
28.7848	47.73	60.00	12.27	9.000	L1	OFF	10.0
29.0413	48.76	60.00	11.24	9.000	L1	OFF	10.0
29.2978	48.49	60.00	11.51	9.000	L1	OFF	10.0
29.5565	47.99	60.00	12.01	9.000	L1	OFF	10.0
29.8130	48.88	60.00	11.12	9.000	L1	OFF	10.0

### Final\_Result\_CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	13.59	56.00	42.41	9.000	L1	OFF	9.6

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Test

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0.1815	28.67	54.42	25.74	9.000	L1	OFF	9.6
0.2580	38.08	51.50	13.42	9.000	L1	OFF	9.6
0.3683	34.55	48.54	13.99	9.000	L1	OFF	9.6
0.4133	31.21	47.58	16.38	9.000	L1	OFF	9.6
0.5135	36.95	46.00	9.05	9.000	L1	OFF	9.6
1.0288	40.61	46.00	5.39	9.000	L1	OFF	9.6
1.5418	37.89	46.00	8.11	9.000	L1	OFF	9.6
1.7983	41.63	46.00	4.37	9.000	L1	OFF	9.6
2.3135	40.11	46.00	5.89	9.000	L1	OFF	9.7
2.5700	38.85	46.00	7.15	9.000	L1	OFF	9.7
3.0830	37.18	46.00	8.82	9.000	L1	OFF	9.7
28.5283	44.85	50.00	5.15	9.000	L1	OFF	10.0
28.7848	44.97	50.00	5.03	9.000	L1	OFF	10.0
29.0413	45.96	50.00	4.04	9.000	L1	OFF	10.0
29.2978	45.79	50.00	4.21	9.000	L1	OFF	10.0
29.5565	44.84	50.00	5.16	9.000	L1	OFF	10.0
29.8130	45.95	50.00	4.05	9.000	L1	OFF	10.0

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Conducted Emissions (Line 2)

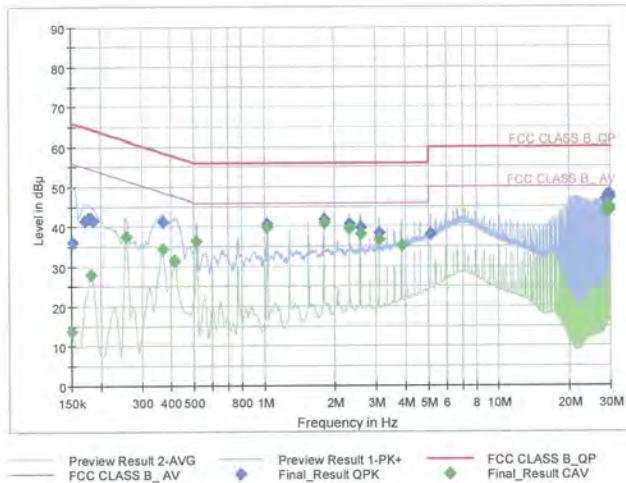
Test

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**Test Report****Common Information**

EUT : 1080i  
Manufacturer : ERICSSON-LG  
Test Site: SHIELD ROOM  
Operating Conditions : 5G WLAN N Mode

Full Spectrum

**Final\_Result\_QPK**

Frequency (MHz)	QuasiPeak	Limit (dBuV)	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.1523	35.94	65.88	29.94	9.000	N	OFF	9.6
0.1725	41.51	64.84	23.33	9.000	N	OFF	9.6
0.1770	41.99	64.63	22.63	9.000	N	OFF	9.6
0.1815	42.00	64.42	22.41	9.000	N	OFF	9.6
0.1860	41.43	64.21	22.78	9.000	N	OFF	9.6
0.3705	41.27	58.49	17.22	9.000	N	OFF	9.6
1.0288	40.63	56.00	15.37	9.000	N	OFF	9.6
1.7983	41.97	56.00	14.03	9.000	N	OFF	9.6
2.3135	40.73	56.00	15.27	9.000	N	OFF	9.6
2.5700	39.84	56.00	16.16	9.000	N	OFF	9.6
3.0830	38.48	56.00	17.52	9.000	N	OFF	9.7
5.1395	38.09	60.00	21.91	9.000	N	OFF	9.7
28.5260	46.82	60.00	13.18	9.000	N	OFF	10.1
28.7825	46.65	60.00	13.35	9.000	N	OFF	10.1
29.0390	47.61	60.00	12.39	9.000	N	OFF	10.1
29.2978	46.76	60.00	13.24	9.000	N	OFF	10.1
29.5543	47.13	60.00	12.87	9.000	N	OFF	10.1
29.8108	47.89	60.00	12.11	9.000	N	OFF	10.1

**Final\_Result\_CAV**

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	13.96	56.00	42.04	9.000	N	OFF	9.6

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Test

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0.1815	27.94	54.42	26.47	9.000	N	OFF	9.6
0.2580	37.38	51.50	14.12	9.000	N	OFF	9.6
0.3683	34.38	48.54	14.16	9.000	N	OFF	9.6
0.4133	31.31	47.58	16.27	9.000	N	OFF	9.6
0.5135	36.34	46.00	9.66	9.000	N	OFF	9.6
1.0288	39.94	46.00	6.06	9.000	N	OFF	9.6
1.7983	41.06	46.00	4.94	9.000	N	OFF	9.6
2.3135	39.38	46.00	6.62	9.000	N	OFF	9.6
2.5700	38.20	46.00	7.80	9.000	N	OFF	9.6
3.0830	36.74	46.00	9.26	9.000	N	OFF	9.7
3.8548	35.27	46.00	10.73	9.000	N	OFF	9.7
28.5260	43.92	50.00	6.08	9.000	N	OFF	10.1
28.7825	43.95	50.00	6.05	9.000	N	OFF	10.1
29.0390	44.95	50.00	5.05	9.000	N	OFF	10.1
29.2955	44.69	50.00	5.31	9.000	N	OFF	10.1
29.5543	44.15	50.00	5.85	9.000	N	OFF	10.1
29.8108	45.09	50.00	4.91	9.000	N	OFF	10.1

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**11. LIST OF TEST EQUIPMENT****Conducted Test**

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	09/04/2020	Annual	102245
Rohde & Schwarz	ESR / EMI Test Receiver	09/16/2020	Annual	101910
ESPEC	SU-642 /Temperature Chamber	07/30/2020	Annual	0093000718
Agilent	N9020A / Signal Analyzer	05/11/2020	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	03/09/2021	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	02/09/2021	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)	03/08/2021	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
Rohde & Schwarz	CBT / Bluetooth Tester	02/23/2021	Annual	100808

**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	03/19/2020	Biennial	1513-333
Schwarzbeck	VULB 9168 / Hybrid Antenna	08/02/2019	Biennial	01039
Schwarzbeck	BBHA 9120D / Horn Antenna	08/01/2019	Biennial	912D-1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	02/11/2020	Biennial	BBHA9170124
Rohde & Schwarz	FSP(10 Hz ~ 40 GHz) / Spectrum Analyzer	05/13/2020	Annual	101055
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/06/2021	Annual	2
Wainwright Instruments	WRCJV12-4900-5100-5900-6100-50SS	06/24/2021	Annual	5
Wainwright Instruments	WRCJV12-4900-5100-5900-6100-50SS	06/24/2021	Annual	6
CERNEX	CBL18265035 / Power Amplifier	12/04/2020	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2021	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	04/28/2020	Annual	3000C000175
TNM system	FBSM-05B / HPF(3~18GHz) + LNA1(1~18GHz)	01/20/2021	Annual	F6
TNM system	FBSM-05B / ATT(10dB) + LNA1(1~18GHz)	01/20/2021	Annual	None
TNM system	FBSM-05B / ATT(3dB) + LNA1(1~18GHz)	01/20/2021	Annual	None
TNM system	FBSM-05B / LNA1(1~18GHz)	01/20/2021	Annual	25540
TNM system	FBSM-05B / HPF(7~18GHz) + LNA2(6~18GHz)	01/20/2021	Annual	28550
TNM system	FBSM-05B / Thru(30MHz ~ 18GHz)	01/20/2021	Annual	None

**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-2104-FI005-P