고 객 비 밀
CUSTOMER SECRET

TEST REPORT

FCC/ISED UNII Test for LGSBWAC97

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2207-FI012

DATE OF ISSUE
July 20, 2022

Tested by
Jin Gwan Lee

Technical Manager
Se Wook Park

Accredited by KOLAS, Republic of KOREA

HCT CO., LTD.
BongJai Huh / CEO

HCT CO., LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si,
Gyeonggi-do, 17383 KOREA
Tel. +82 31 634 6300 Fax. +82 31 645 6401

고 객 비 밀
CUSTOMER SECRET

HCT Co., Ltd.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Tel. +82 31 634 6300 Fax. +82 31 645 6401

TEST REPORT

FCC/ISED UNII Test for LGSBWAC97

REPORT NO.
HCT-RF-2207-FI012

DATE OF ISSUE
July 20, 2022

Additional Model
-

Applicant	**LG Electronics Inc.** 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Republic of Korea
Eut Type Model Name	RF Module LGSBWAC97
FCC ID IC	BEJLGSBWAC97 2703H-LGSBWAC97
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	July 20, 2022	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.

KOLAS Statement:
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (KOLAS Accreditation No. KT197)

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr

CONTENTS

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	LGSBWAC97	
Additional Model	-	
EUT Type	RF Module	
Power Supply	DC 3.30 V	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20MHz BW : 5180 - 5240 40MHz BW : 5190 - 5230 80MHz BW : 5210
	U-NII-2A	20MHz BW : 5260 - 5320 40MHz BW : 5270 - 5310 80MHz BW : 5290
	U-NII-2C	20MHz BW : 5500 - 5720 40MHz BW : 5510 - 5710 80MHz BW : 5530 – 5690
	U-NII-3	20MHz BW : 5745 - 5825 40MHz BW : 5755 - 5795 80MHz BW : 5775
Antenna type	Metal press Antenna	
Antenna Peak Gain	Ant1 Peak Gain : 1.50 dBi(UNII 1)/ 1.50 dBi(UNII 2A)/ 1.48 dBi(UNII 2C)/ 1.50 dBi(UNII 3) Ant2 Peak Gain : 1.50 dBi(UNII 1)/ 1.50 dBi(UNII 2A)/ 1.46 dBi(UNII 2C)/ 1.49 dBi(UNII 3)	
Straddle channel	Supported	
TDWR Band	Not Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	June 08, 2022 ~ July 19, 2022	
PMN (Product Marketing Number)	RF Module	
HVIN (Hardware Version Identification Number)	LGSBWAC97	
FVIN (Firmware Version Identification Number)	MT7668_V1.0	
HMN (Host Marketing Name)	N/A	
EUT serial numbers	Radiated: ETWCFMBC03-01 Conducted : ETWCFMBC03-02	
Factory	1) PT. LG INNOTEK INDONESIA Bekasi International Industrial Estate, Blok C8 NO. 12 & 12 A, Desa Cibatu, Cikarang Selatan, Bekasi 17750 Indonesia 2) COMPAL NETWORKING(KUNSHAN)CO.,LTD No. 520, Nanbang Rd, Economic & Technical Development Zone, Kunshan, Jiangsu Province, China	
EUT Connetor Type	Top connector_FFC Cable Type Bottom Connector_FFC Cable Type	

ANTENNA CONFIGURATIONS

1. The device employs MIMO technology. Below are the possible configurations

Configurations	SISO		SDM	CDD
	Ant1	Ant2	Ant1 + Ant2	Ant1 + Ant2
802.11a	O	O	X	O
802.11n(HT20)	O	O	O	O
802.11n(HT40)	O	O	O	O
802.11ac(VHT20)	O	O	O	O
802.11ac(VHT40)	O	O	O	O
802.11ac(VHT80)	O	O	O	O

Note:

1. O = Support, X = Not Support
2. SISO = Single Input Single Output
3. SDM = Spatial Diversity Multiplexing
4. CDD = Cyclic Delay Diversity

2. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01

Directional gain = G_{ANT}+10*log(N_{ANT}/N_{SS}) dBi

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

Band	Ant Gain (dBi)		N_{ANT}/N_{SS}	Directional Gain = G_{ANT}+10*log(N_{ANT}/N_{SS})dBi
UNII 1	Ant1	1.50	2/2	CDD : 4.51
	Ant2	1.50	2/2	SDM : 1.50
UNII 2A	Ant1	1.50	2/2	CDD : 4.51
	Ant2	1.50	2/2	SDM : 1.50
UNII 2C	Ant1	1.48	2/2	CDD : 4.48
	Ant2	1.46	2/2	SDM : 1.48
UNII 3	Ant1	1.50	2/2	CDD : 4.51
	Ant2	1.49	2/2	SDM : 1.50

Note

According to ANSI C63.10-2013 section 14.4.3, the directional gain is calculated using the formula, where GN is the gain of the nth antenna and NANT is the total number of antennas used.

$$\text{Directional Gain} = 10 \cdot \log(((10^{(\text{ANT1 Gain}/20)} + 10^{(\text{ANT2 Gain}/20)})^2)/2) \text{ dBi}$$

Sample Calculation(Conducted Power, MIMO):

Ex) Ant 1 : 11.58 dBm Ant 2 : 12.08 dBm

Ant1 + Ant 2 = MIMO

(11.58 dBm + 12.08 dBm) = (14.387 mW + 16.143 mW) = 30.53 mW = 14.88 dBm

Sample Calculation(E.I.R.P & E.I.R.P Spectral Density, MIMO):

Ex) ANT1 : 15.35 dBm , ANT2 : 15.12 dBm, Directional Gain : 3 dBi

Conducted Power = (15.35 dBm + 15.12 dBm) = (34.276 mW + 32.508 mW) = 66.784 mW = 18.25 dBm

E.I.R.P = 18.25 dBm + 3 dBi = 21.25 dBm

2. MAXIMUM OUTPUT POWER

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

Band	Mode	SISO				MIMO	
		Ant1 Power		Ant2 Power		Ant 1 + Ant 2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	14.03	0.025	13.67	0.023	16.86	0.049
	802.11n (HT20)	13.82	0.024	13.53	0.023	16.69	0.047
	802.11n (HT40)	14.47	0.028	14.15	0.026	17.32	0.054
	802.11ac (VHT20)	13.71	0.023	13.43	0.022	16.58	0.046
	802.11ac (VHT40)	14.14	0.026	13.77	0.024	16.97	0.050
	802.11ac (VHT80)	9.98	0.010	9.80	0.010	12.90	0.020
UNII2A	802.11a	15.46	0.035	14.91	0.031	18.20	0.066
	802.11n (HT20)	15.26	0.034	14.75	0.030	18.02	0.063
	802.11n (HT40)	15.08	0.032	14.86	0.031	17.98	0.063
	802.11ac (VHT20)	15.15	0.033	14.71	0.030	17.95	0.062
	802.11ac (VHT40)	15.03	0.032	14.83	0.030	17.94	0.062
	802.11ac (VHT80)	9.29	0.008	8.94	0.008	12.13	0.016
UNII2C	802.11a	15.36	0.034	15.04	0.032	18.21	0.066
	802.11n (HT20)	15.13	0.033	14.85	0.031	18.00	0.063
	802.11n (HT40)	14.85	0.031	14.45	0.028	17.66	0.058
	802.11ac (VHT20)	15.15	0.033	14.92	0.031	18.05	0.064
	802.11ac (VHT40)	14.79	0.030	14.33	0.027	17.58	0.057
	802.11ac (VHT80)	16.39	0.044	16.08	0.041	19.25	0.084
UNII3	802.11a	16.84	0.048	17.31	0.054	20.09	0.102
	802.11n (HT20)	16.60	0.046	17.18	0.052	19.91	0.098
	802.11n (HT40)	16.70	0.047	17.09	0.051	19.91	0.098
	802.11ac (VHT20)	16.70	0.047	17.09	0.051	19.91	0.098
	802.11ac (VHT40)	18.12	0.065	18.05	0.064	21.10	0.129
	802.11ac (VHT80)	16.24	0.042	16.11	0.041	19.19	0.083

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, 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 January 26, 2021 (CAB identifier: KR0032).

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203, § 15.407 / RSS-Gen (Issue 5) Section 8:

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

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

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

7. MEASUREMENT UNCERTAINTY

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

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

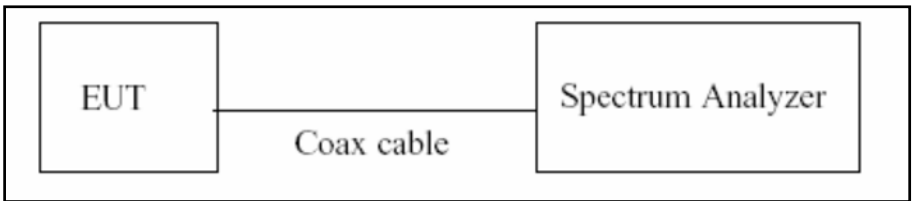
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	2.00 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.74 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.51 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.92 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.48 (Confidence level about 95 %, k=2)

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.

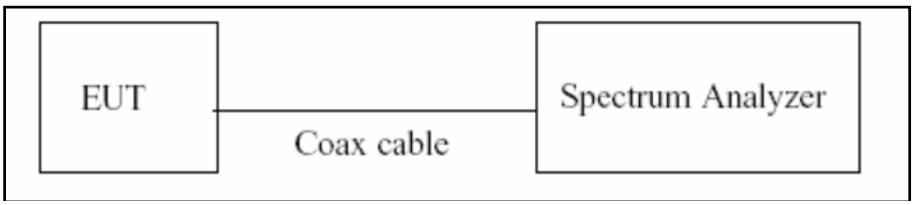
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

8.2. 6 dB Bandwidth & 26 dB 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 (26 dB 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 (6 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

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

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

Note:

1. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

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

Test Procedure (99 % Bandwidth for ISED)

The transmitter output is connected to the spectrum analyzer.

RBW = 1% ~ 5% of the occupied bandwidth

VBW ≒ 3 x RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

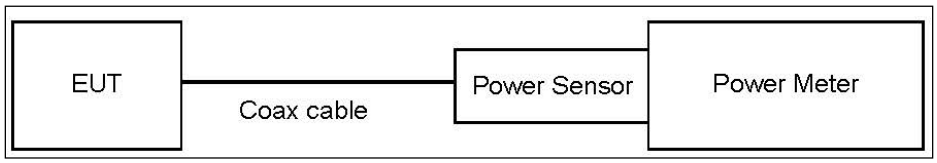
Allow the trace to stabilize

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

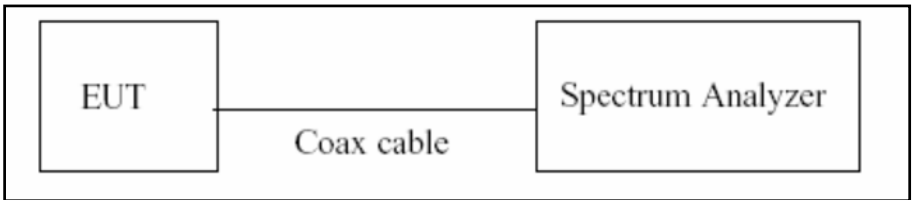
8.3. Output Power Measurement

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

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

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

Test Procedure(Spectrum Analyzer)

The transmitter output is connected to the Spectrum Analyzer.

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

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

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW ≥ 3 MHz.
5. Number of points in sweep ≥ 2 x span/RBW.
6. Sweep time = auto.
7. Detector = RMS.

8. Do not use sweep triggering. Allow the sweep to “free run”.
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. Add 10log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

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

Note

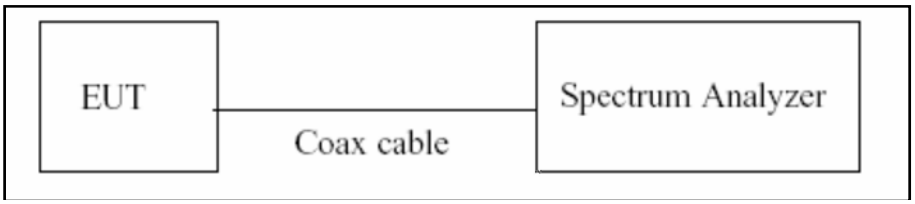
1. Spectrum reading values are not plot data.
   The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss+ Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	10.87
UNII 2A	10.87
UNII 2C	10.87
UNII 3	10.87

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

8.4. Power Spectral Density

Test Configuration



Test Procedure

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

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

Sample Calculation

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

Note

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

Band	Loss(dB)
UNII 1	10.87
UNII 2A	10.87
UNII 2C	10.87
UNII 3	10.87

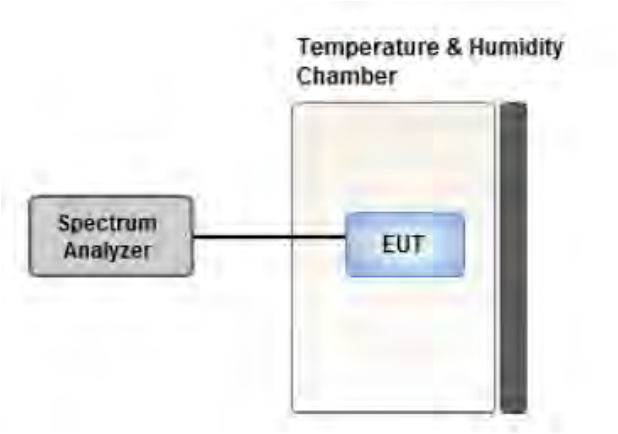
(Actual value of loss for the attenuator and cable combination)

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 μH/50 ohms line impedance stabilization network (LISN).

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

[a]Decreases with the logarithm of the frequency.

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

Test Configuration

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

Test Procedure

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

Sample Calculation

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

8.7. Radiated Test

Limit

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

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

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

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

FCC

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30

ISED

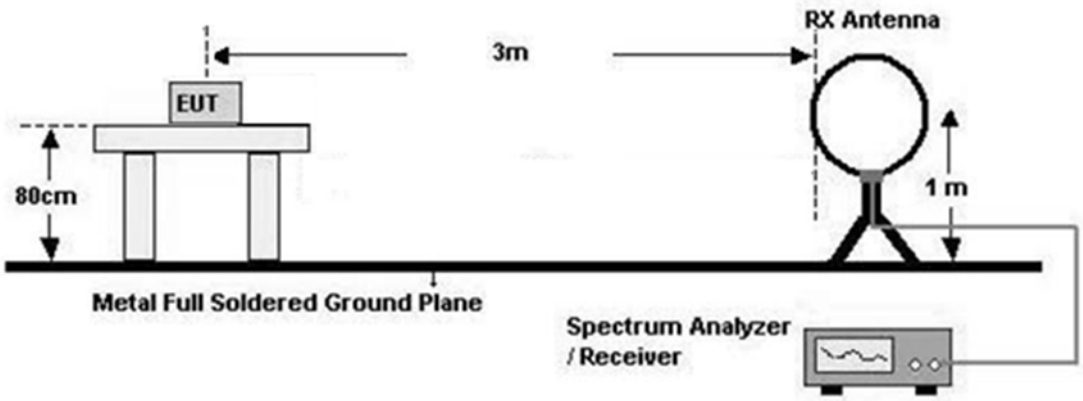
Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	6.37/F(kHz)	300
0.490 – 1.705	63.7/F(kHz)	30
1.705 – 30	0.08	30

FCC&ISED

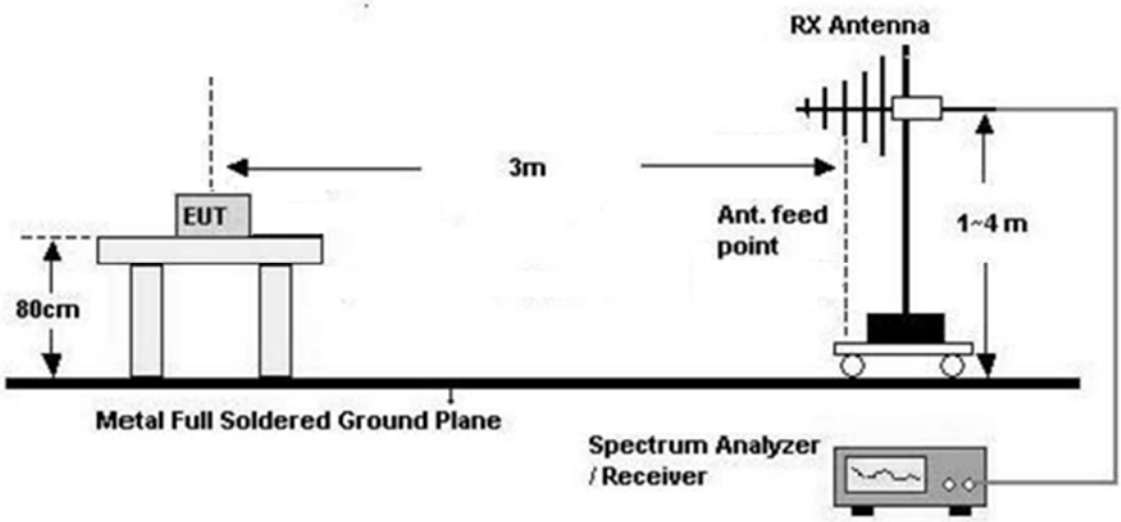
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

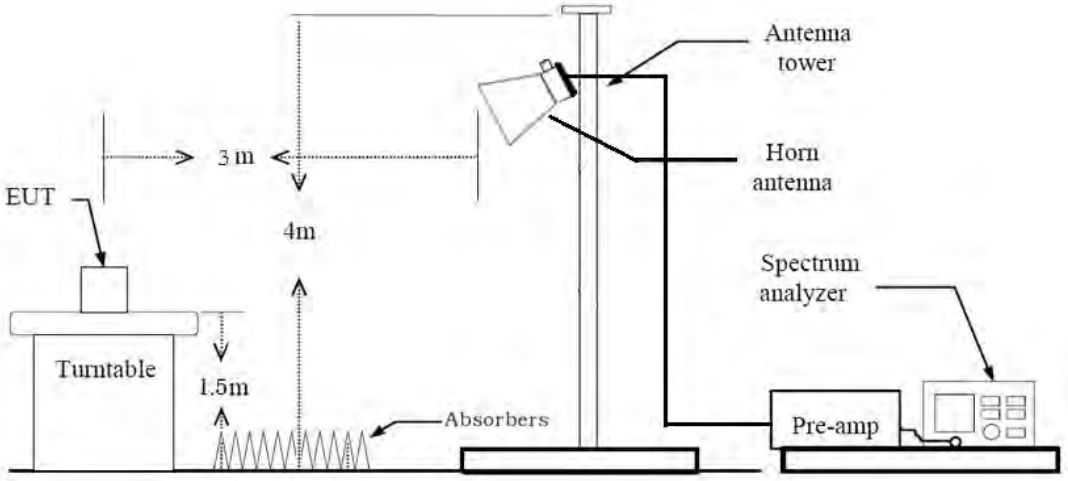
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

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

KDB 414788 OFS and Chamber Correlation Justification

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

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

Test Procedure of Radiated spurious emissions(Below 1GHz)

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

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

Test Procedure of Radiated spurious emissions (Above 1 GHz)

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

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

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

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

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

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

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

Test Procedure of Radiated Restricted Band Edge

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting
   (1) Measurement Type(Peak, G.5 in KDB 789033 v02r01):
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep Time = auto
   - Trace mode = max hold
   - Allow sweeps to continue until the trace stabilizes.
     Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

   (2) Measurement Type(Average, G.6.d in KDB 789033 v02r01):
   - RBW = 1 MHz
   - VBW(Duty cycle ≥ 98 %) = VBW ≤ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
   - VBW(Duty cycle is < 98 %) = VBW ≥ 1/T, where T is the minimum transmission duration.
   - The analyzer is set to linear detector mode.
   - Detector = Peak.
   - Sweep time = auto.
   - Trace mode = max hold.
   - Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 % duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.

9. Measured Frequency Range :
   - 4500MHz ~ 5150MHz
   - 5350MHz ~ 5460MHz
   - 5460MHz ~ 5470MHz
   - (75 MHz or more below the 5725MHz) ~ 5725MHz
   - 5850MHz ~ (75 MHz or more above the 5850MHz)

10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)

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

8.8. Receiver Spurious Emissions

Limit

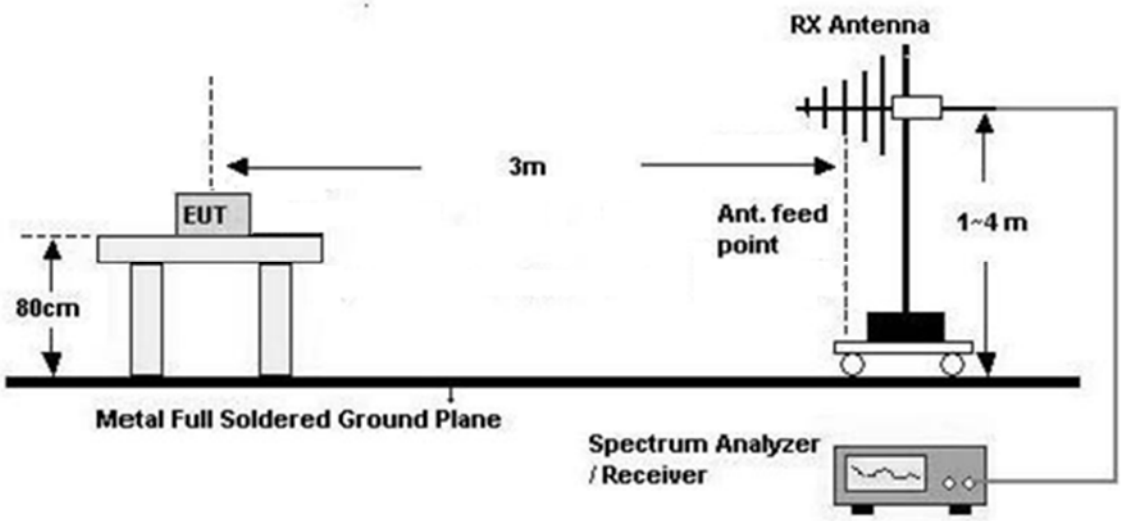
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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):

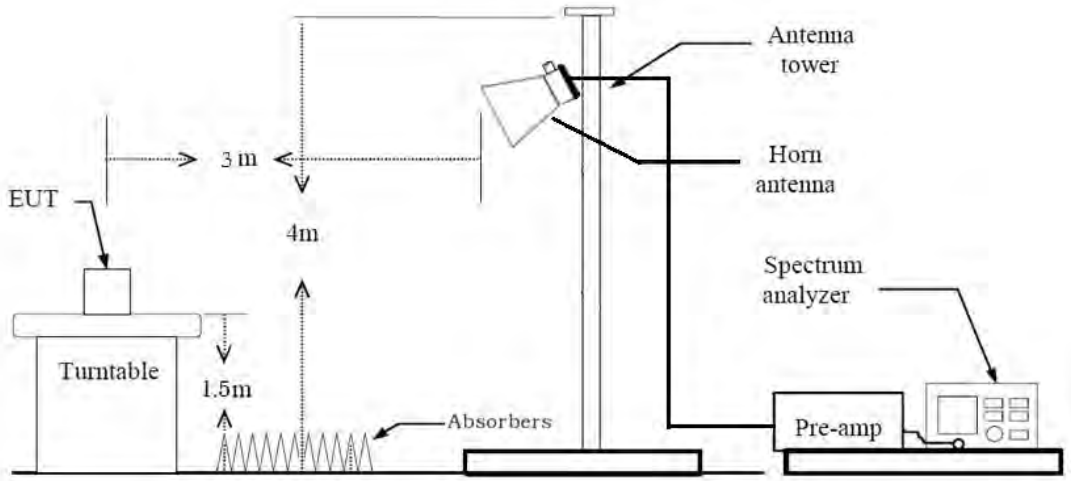
- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW ≥ 3 x RBW

(2) Measurement Type(Quasi-peak):

- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Quasi-Peak
- RBW = 120 kHz

7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)

Above 1 GHz



Test Procedure of Radiated spurious emissions (Above 1 GHz)

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

6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 1 GHz – 25 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 1 MHz
      - VBW ≥ 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 ≥ 1/τ Hz, where τ = 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 = 20log (test distance / 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.
2. All configurations of antenna were investigated and the worst case configuration results are reported.
   - Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(CDD,SDM)
   - Worstcase : Ant1+Ant2(CDD)
3. EUT Axis
   - Radiated Spurious Emissions : Z
   - Radiated Restricted Band Edge : Z
4. All data rate of operation were investigated and the worst case data rate results are reported
   - 802.11a : 6Mbps
   - 802.11n : MCS0
   - 802.11ac : MCS0
5. Radiated Spurious Emission
   - All modulation of operation were investigated and the worst case modulation results are reported.

   (Worstcase : 802.11a_6 Mbps)
6. 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
7. Top connector_FFC Cable Type, Bottom Connector_FFC Cable Type were tested and the worst case results are reported.

(Worst case : Bottom Connector_FFC Cable Type)

AC Power line Conducted Emissions

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

- Mode : Stand alone

Conducted test

1. All data rate of operation were investigated and the worst case data rate results are reported.
   - 802.11a : 36 Mbps
   - 802.11n20 : MCS2
   - 802.11n40 : MCS4
   - 802.11ac20 : MCS6
   - 802.11ac40 : MCS0
   - 802.11ac80 : MCS6

2. SISO & MIMO were tested and the all case results are reported.
   - Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(CDD)

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	Conducted	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 $\log_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $\log_{10}$ (BW) dBm (5470-5725 MHz) <1 W(5725-5850 MHz)		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),(2),(3),(4)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.7 (UNII 3)	Radiated	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(9),(10)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

ISED

Test Description	ISED Part Section(s)	Test Limit	Test Condition	Test Result
99% Bandwidth	RSS-GEN, 6.7	N/A	CONDUCTED	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 $_{10}$ (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 $_{10}$ (BW) dBm (5150-5250 MHz) < 1 W or 17+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 1 W or 17+10 log $_{10}$ (BW) dBm (5470-5725 MHz) Whichever power is less		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
Undesirable Emissions	RSS-247, 6.2.1 2	26 dBc at 5250~5350 MHz (5150~5350 MHz)		PASS
	RSS-247, 6.2	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)	RADIATED	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		PASS
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3		PASS

10. TEST RESULT

10.1 26DB BANDWIDTH & 99 % BANDWIDTH

[ANT1]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.76	16.466
5200	40	19.65	16.483
5240	48	19.70	16.463
5260	52	19.71	16.475
5300	60	19.76	16.497
5320	64	20.48	16.567
5500	100	20.15	16.566
5580	116	19.82	16.496
5720	144	20.81	16.542
5745	149	22.67	16.611
5785	157	19.84	16.538
5825	165	21.51	16.586

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.40	17.623
5200	40	20.23	17.610
5240	48	20.00	17.671
5260	52	20.17	17.626
5300	60	20.12	17.644
5320	64	21.43	17.686
5500	100	20.33	17.665
5580	116	20.26	17.678
5720	144	20.11	17.680
5745	149	20.84	17.738
5785	157	21.20	17.728
5825	165	20.33	17.677

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	39.93	36.122
5230	46	40.28	36.263
5270	54	40.29	36.172
5310	62	40.19	36.139
5510	102	40.10	36.251
5550	110	40.43	36.119
5710	142	40.27	36.210
5755	151	40.20	36.172
5795	159	39.97	36.176

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.44	17.646
5200	40	19.99	17.628
5240	48	20.12	17.625
5260	52	20.05	17.638
5300	60	19.93	17.627
5320	64	20.17	17.639
5500	100	20.10	17.636
5580	116	20.16	17.664
5720	144	19.96	17.622
5745	149	20.09	17.677
5785	157	20.06	17.679
5825	165	20.25	17.720

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.23	36.270
5230	46	40.75	36.123
5270	54	40.63	36.261
5310	62	40.35	36.110
5510	102	40.42	36.280
5550	110	40.39	36.150
5710	142	40.44	36.242
5755	151	40.46	36.302
5795	159	40.75	36.263

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.54	75.658
5290	58	81.10	75.812
5530	106	80.78	75.818
5690	138	80.80	75.773
5775	155	80.78	75.774

[ANT2]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.04	16.565
5200	40	19.59	16.435
5240	48	19.89	16.514
5260	52	19.58	16.475
5300	60	19.70	16.521
5320	64	19.56	16.480
5500	100	19.56	16.514
5580	116	19.66	16.520
5720	144	19.86	16.487
5745	149	19.84	16.533
5785	157	20.57	16.541
5825	165	19.97	16.569

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.23	17.618
5200	40	20.27	17.618
5240	48	20.24	17.669
5260	52	20.09	17.644
5300	60	20.18	17.633
5320	64	20.20	17.707
5500	100	20.32	17.676
5580	116	20.39	17.653
5720	144	20.24	17.642
5745	149	20.65	17.702
5785	157	20.34	17.737
5825	165	21.63	17.720

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.04	36.237
5230	46	40.11	36.168
5270	54	40.46	36.134
5310	62	40.16	36.158
5510	102	40.55	36.148
5550	110	40.06	36.183
5710	142	40.34	36.160
5755	151	40.41	36.154
5795	159	40.51	36.187

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	20.15	17.635
5200	40	19.94	17.611
5240	48	20.17	17.624
5260	52	20.24	17.578
5300	60	20.00	17.638
5320	64	20.15	17.638
5500	100	19.97	17.664
5580	116	20.07	17.659
5720	144	19.96	17.655
5745	149	20.11	17.684
5785	157	20.18	17.652
5825	165	20.17	17.749

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.78	36.278
5230	46	40.50	36.232
5270	54	40.89	36.184
5310	62	40.65	36.154
5510	102	40.90	36.150
5550	110	41.17	36.180
5710	142	40.66	36.217
5755	151	40.66	36.283
5795	159	40.85	36.282

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.09	75.816
5290	58	80.94	75.848
5530	106	81.21	75.846
5690	138	80.89	75.893
5775	155	81.49	75.867

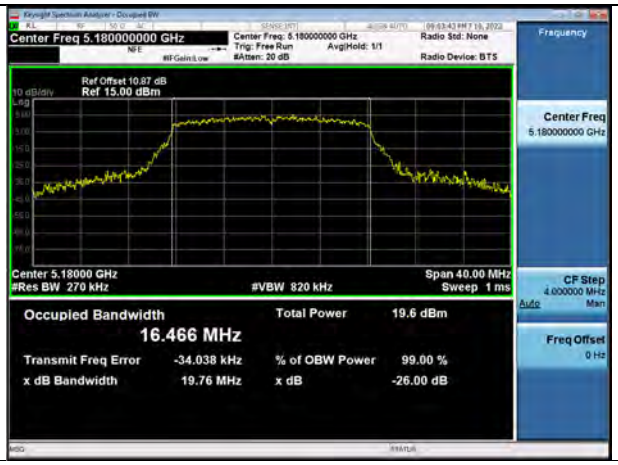
[ANT1]

▣ Test Plots(802.11a)

Note:

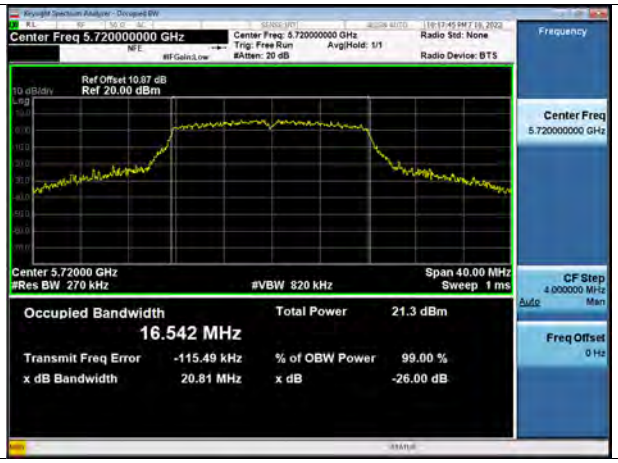
In order to simplify the report, attached plots were only the most wide channel.

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



802.11a UNII 2A BAND 26dB Bandwidth (CH 64)

802.11a UNII 2C BAND 26dB Bandwidth (CH 144)



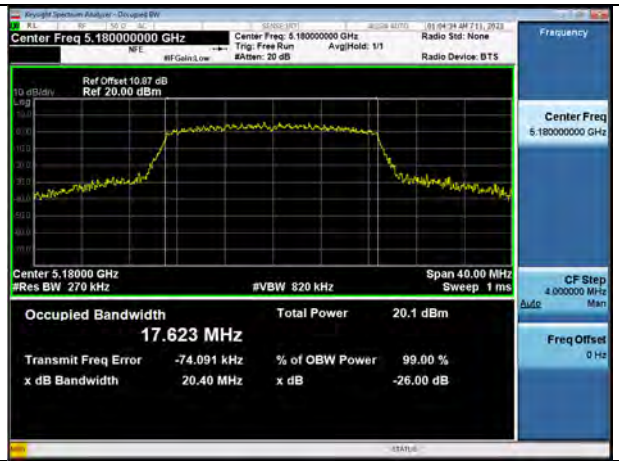
802.11a UNII 3 BAND 26dB Bandwidth (CH 149)

▣ Test Plots(802.11n(HT20))

Note:

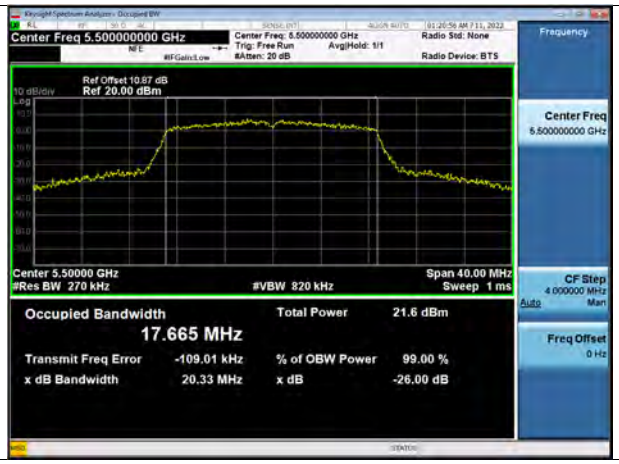
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)

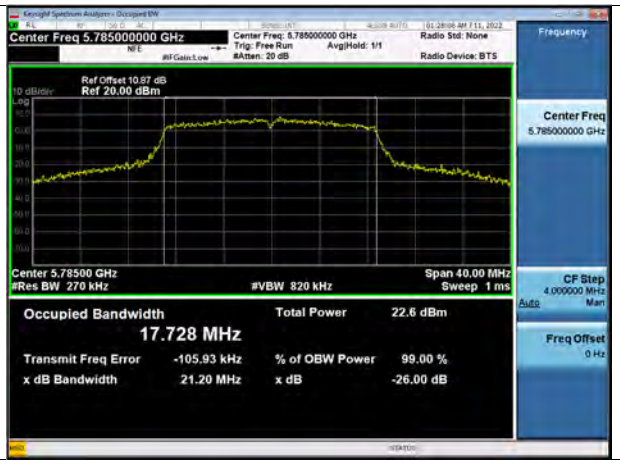


802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 64)

802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 100)



802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)



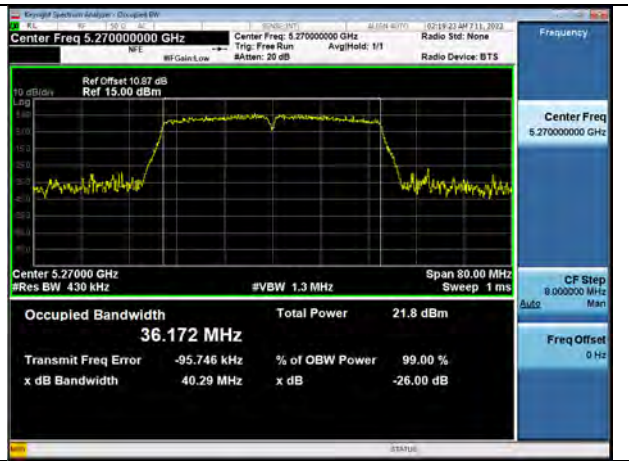
▣ Test Plots(802.11n(HT40))

Note:

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

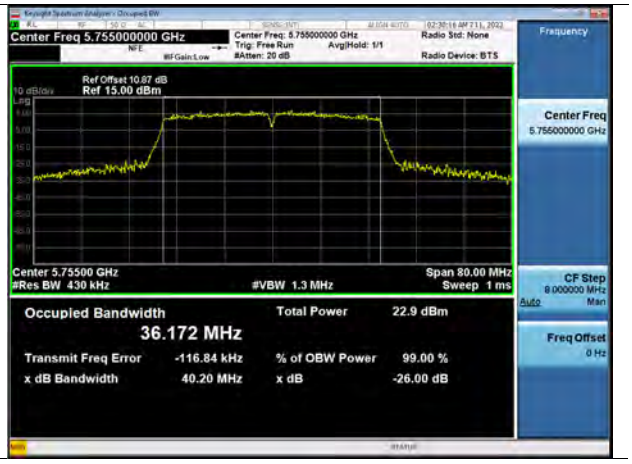
802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 46)

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



802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 110)

802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 151)



▣ Test Plots(802.11ac(VHT20))

Note:

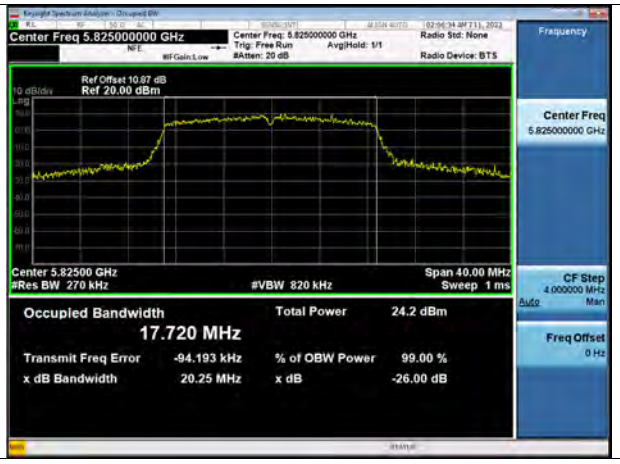
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 36)

802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)

802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 116)

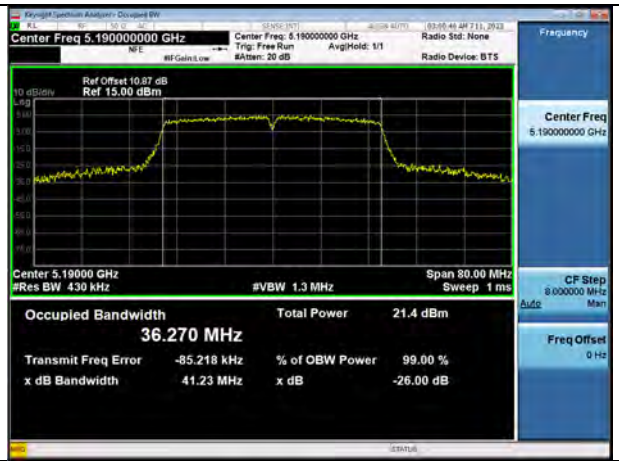
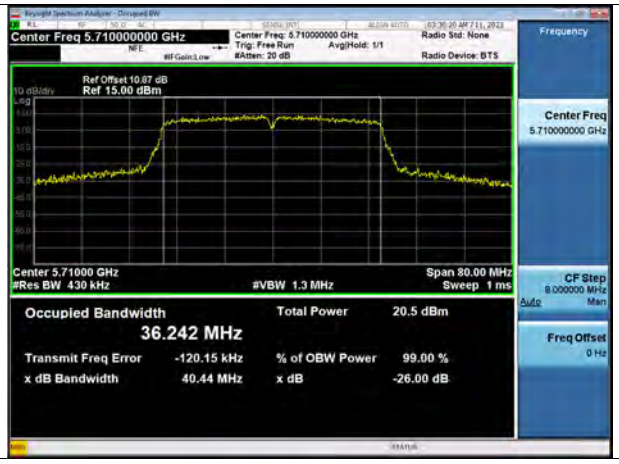
802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 165)



▣ Test Plots(802.11ac(VHT40))

Note:

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

802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)
	
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 142)	802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)
	

▣ Test Plots(802.11ac(VHT80))

Note:

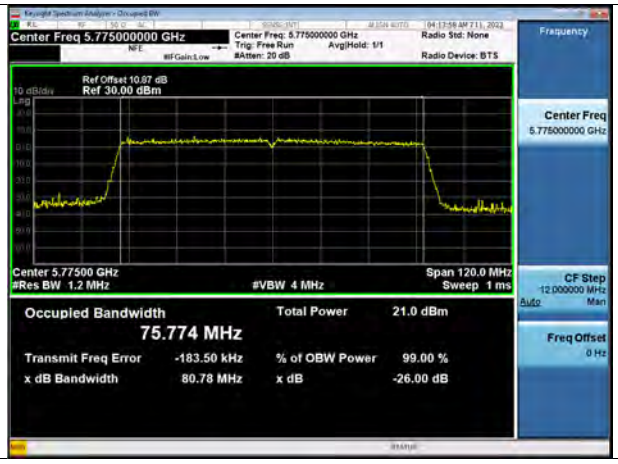
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)

802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)

802.11ac_VHT80 UNII 2C BAND 26dB Bandwidth(CH 138)

802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)



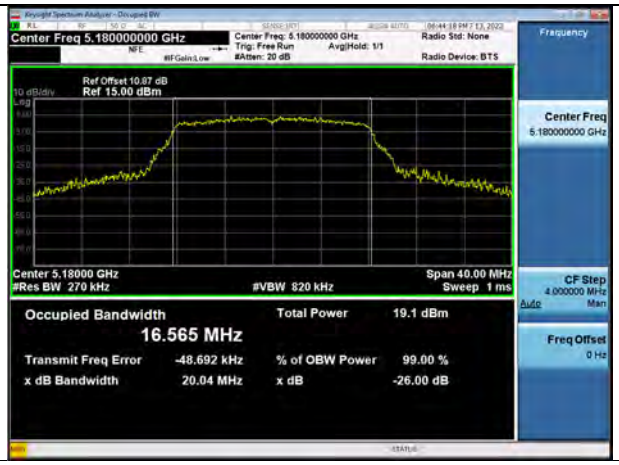
[ANT2]

▣ Test Plots(802.11a)

Note:

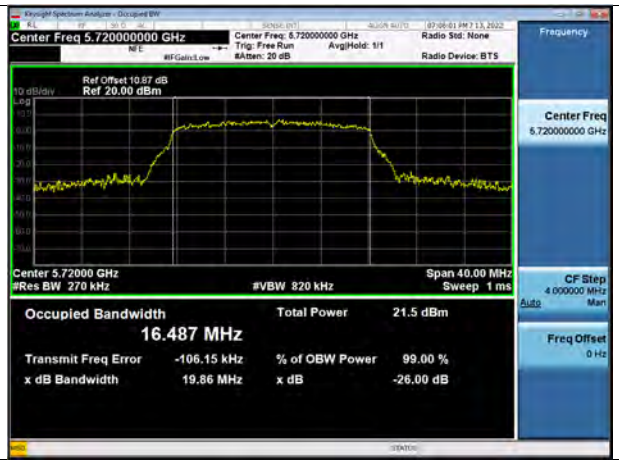
In order to simplify the report, attached plots were only the most wide channel.

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

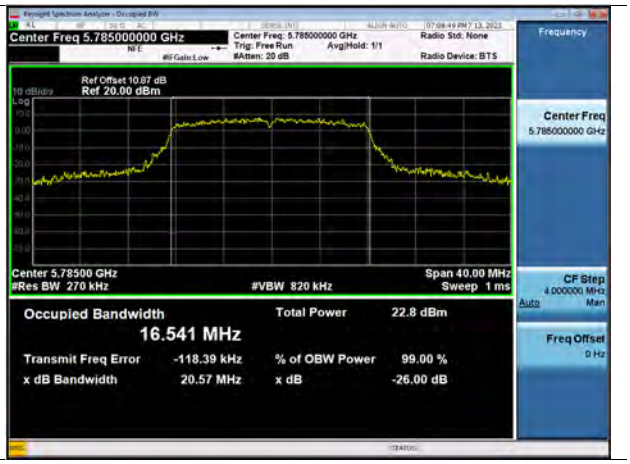


802.11a UNII 2A BAND 26dB Bandwidth (CH 60)

802.11a UNII 2C BAND 26dB Bandwidth (CH 144)



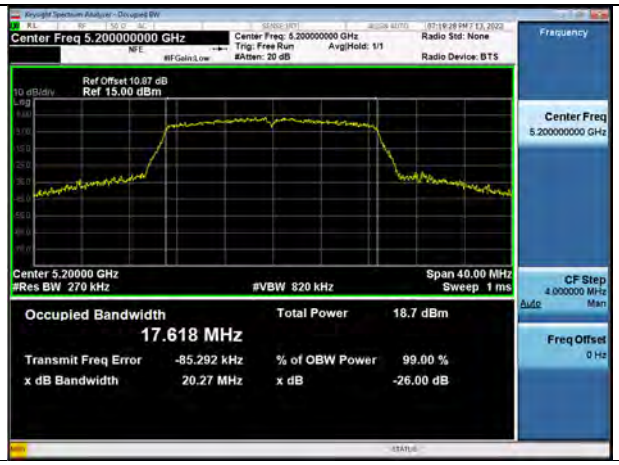
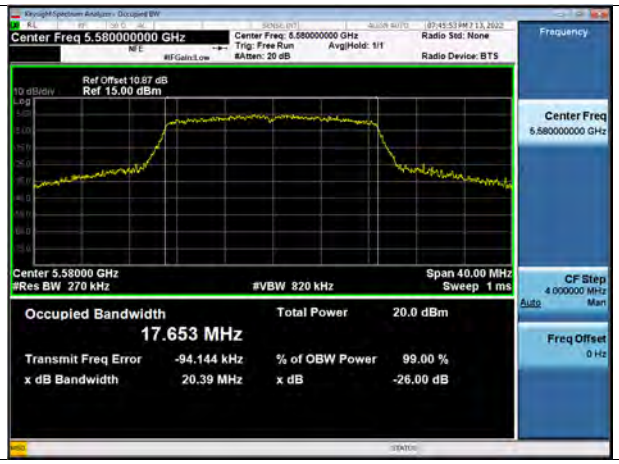
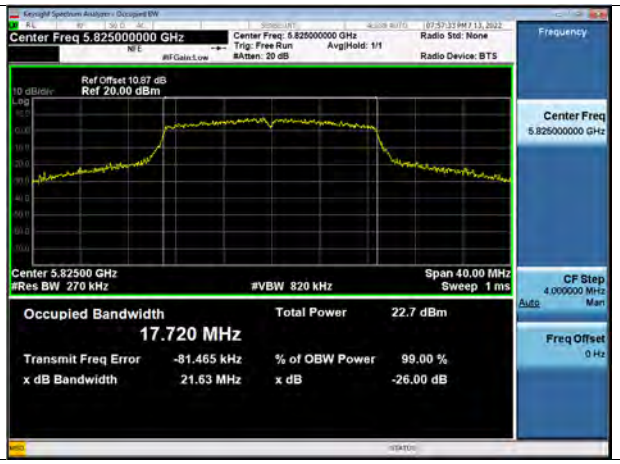
802.11a UNII 3 BAND 26dB Bandwidth (CH 157)



▣ Test Plots(802.11n(HT20))

Note:

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

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 40)	802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 64)
	
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 116)	802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 165)
	

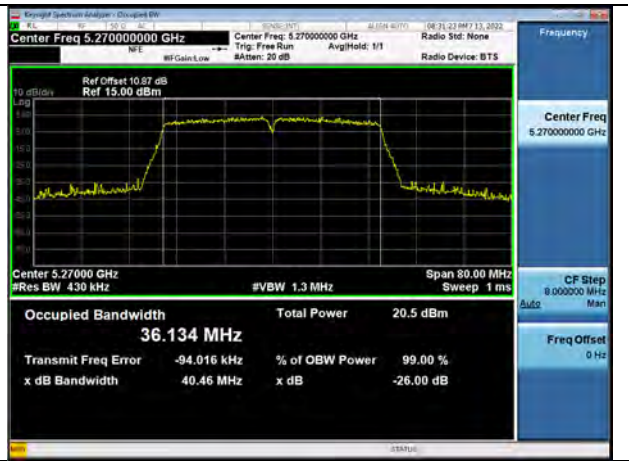
▣ Test Plots(802.11n(HT40))

Note:

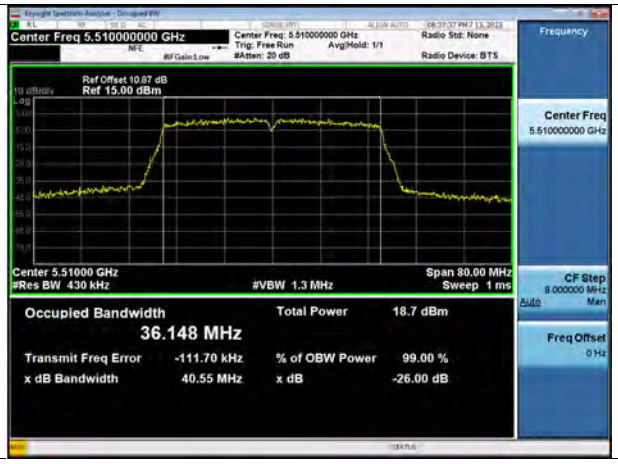
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 46)

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



802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 102)



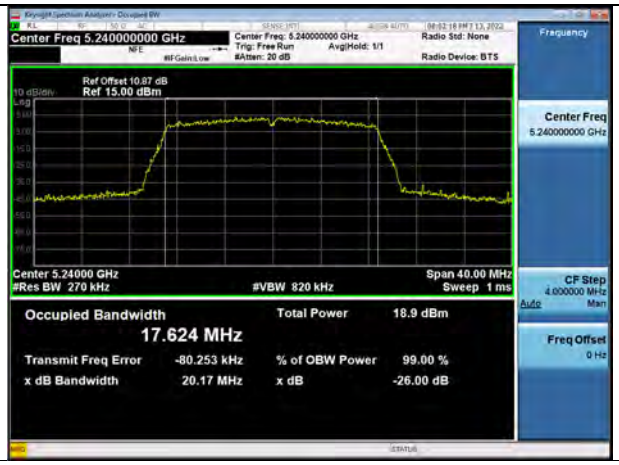
802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)

▣ Test Plots(802.11ac(VHT20))

Note:

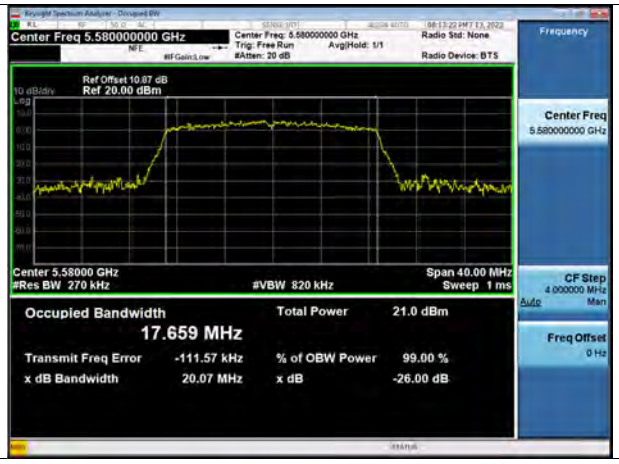
In order to simplify the report, attached plots were only the most wide channel.

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 48)

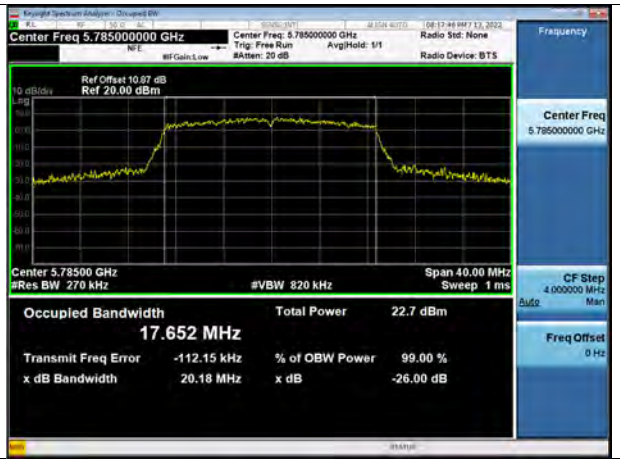


802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 52)

802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 116)



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.

802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)

802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)

802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 110)

802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)

▣ Test Plots(802.11ac(VHT80))

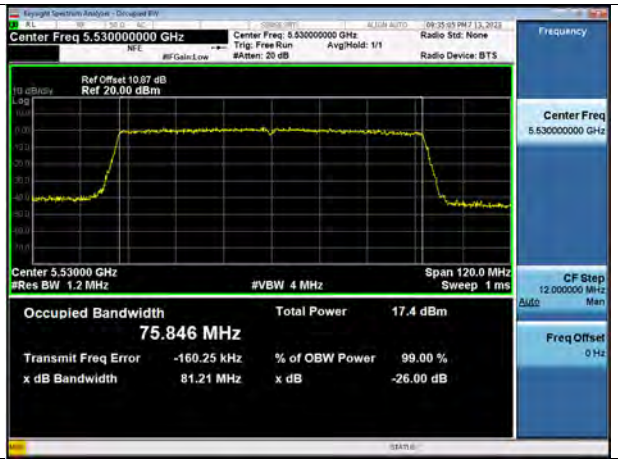
Note:

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

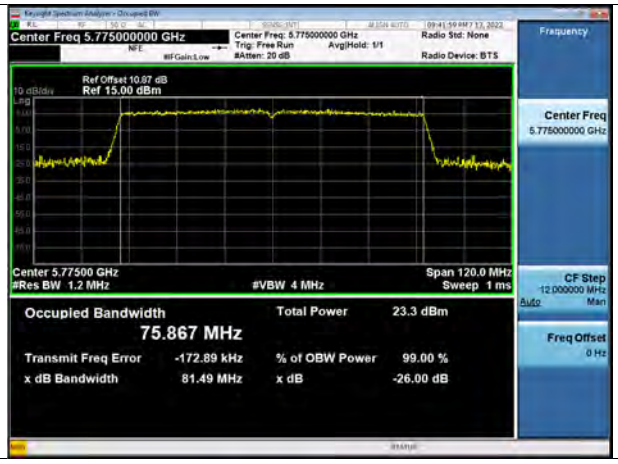
802.11ac_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)

802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)

802.11ac_VHT80 UNII 2C BAND 26dB Bandwidth(CH 106)



802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)



10.2 6DB BANDWIDTH

[ANT1]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.40	> 0.5	Pass
5785	157	16.33	> 0.5	Pass
5825	165	16.25	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.64	> 0.5	Pass
5785	157	17.65	> 0.5	Pass
5825	165	17.65	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.52	> 0.5	Pass
5795	159	36.48	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.58	> 0.5	Pass
5785	157	17.65	> 0.5	Pass
5825	165	17.68	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.44	> 0.5	Pass
5795	159	36.43	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	76.61	> 0.5	Pass

[ANT2]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.32	> 0.5	Pass
5785	157	16.49	> 0.5	Pass
5825	165	16.40	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.40	> 0.5	Pass
5785	157	17.61	> 0.5	Pass
5825	165	17.66	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.46	> 0.5	Pass
5795	159	36.50	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.51	> 0.5	Pass
5785	157	17.55	> 0.5	Pass
5825	165	17.61	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.46	> 0.5	Pass
5795	159	36.41	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	76.58	> 0.5	Pass

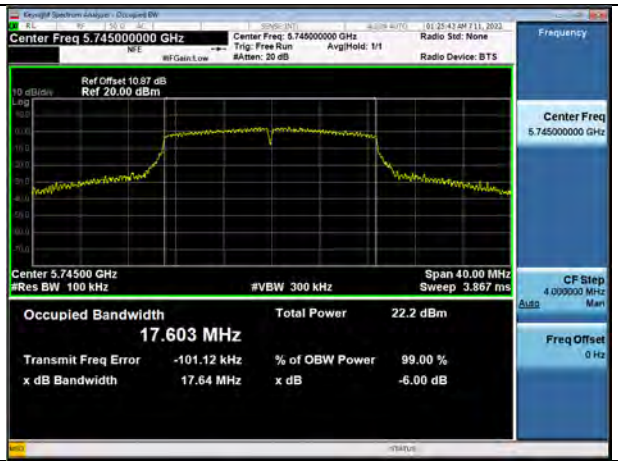
[ANT1]

▣ Test Plots

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

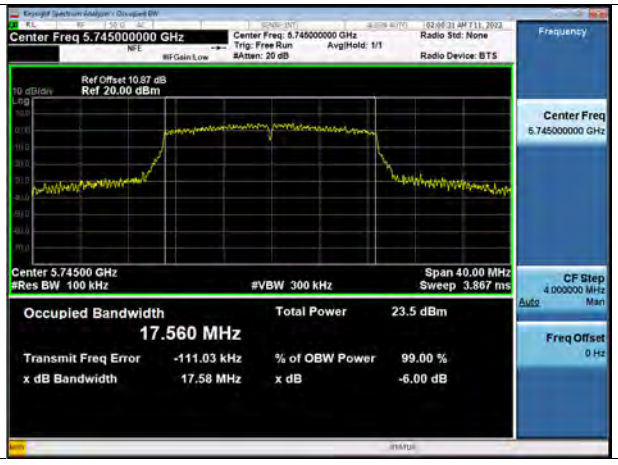
802.11a (CH.165)

802.11n(HT20) (CH.149)



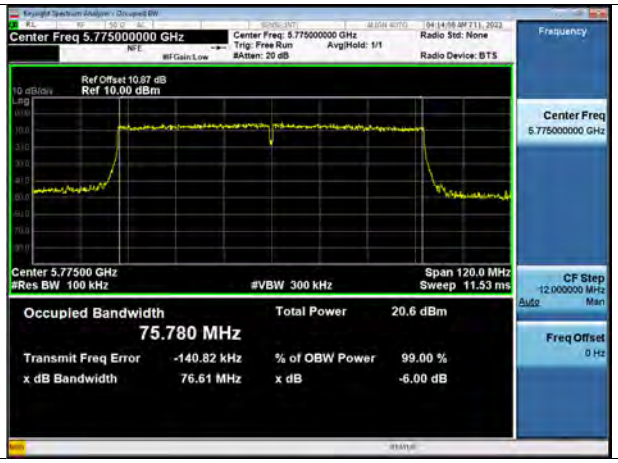
802.11n(HT40) (CH.159)

802.11ac(VHT20) (CH.149)



802.11ac(VHT40) (CH.159)

802.11ac(VHT80) (CH.155)



[ANT2]

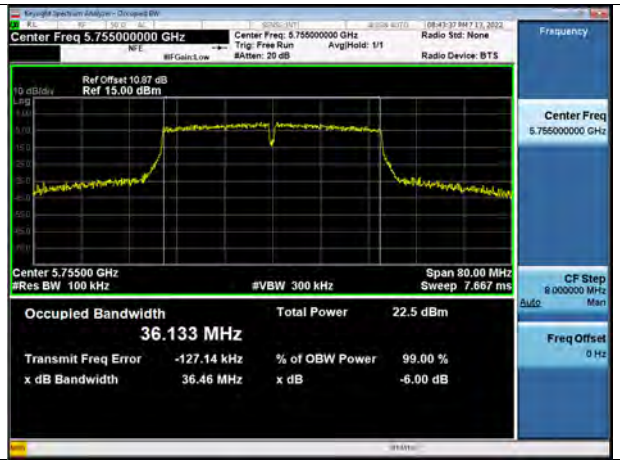
▣ Test Plots

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

802.11a (CH.149)

802.11n(HT20) (CH.149)

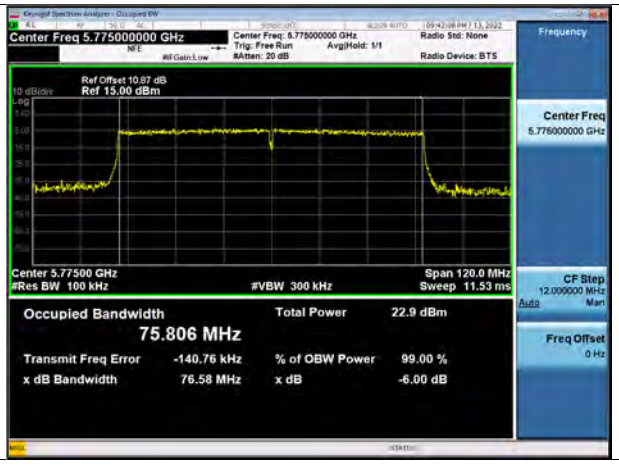
802.11n(HT40) (CH.151)



802.11ac(VHT20) (CH.149)

802.11ac(VHT40) (CH.159)

802.11ac(VHT80) (CH.155)



10.3 OUTPUT POWER MEASUREMENT

Note:
1. Straddle channel data in the table below are for reporting purposes only.
Straddle channel data were added in section 10.7.3.

2. FCC & ISED Limit

Limit calculations follow Section 9.

in order to simplify the report, the limits are calculated as the narrowest BW of each mode.

FCC Limit

Antenna Configuration	Band	Mode	Operating Ant.	Conducted Limit (dBm)
SISO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	Ant 1	23.98
			Ant 2	23.98
	UNII 2A		Ant 1	23.95
			Ant 2	23.91
	UNII 2C		Ant 1	23.97
			Ant 2	23.91
	UNII 3		Ant 1	30.00
			Ant 2	30.00
MIMO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	Ant 1 & Ant 2	23.98
	UNII 2A			23.91
	UNII 2C			23.91
	UNII 3			30.00
SISO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	Ant 1	23.98
			Ant 2	23.98
	UNII 2A		Ant 1	23.98
			Ant 2	23.98
	UNII 2C		Ant 1	23.98
			Ant 2	23.98
	UNII 3		Ant 1	30.00
			Ant 2	30.00
MIMO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	Ant 1 & Ant 2	23.98
	UNII 2A			23.98
	UNII 2C			23.98
	UNII 3			30.00

ISED Limit

Antenna Configuration	Band	Mode	Operating Ant.	E.I.R.P Limit (dBm)	Conducted Limit (dBm)
SISO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	Ant. 1	22.17	N/A
			Ant. 2	22.16	N/A
	UNII 2A		Ant. 1	29.17	23.17
			Ant. 2	29.17	23.17
	UNII 2C		Ant. 1	29.17	23.17
			Ant. 2	29.17	23.17
	UNII 3		Ant. 1	N/A	30.00
			Ant. 2	N/A	30.00
MIMO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	Ant. 1 & Ant. 2	22.16	N/A
	UNII 2A			29.17	23.17
	UNII 2C			29.17	23.17
	UNII 3			N/A	30.00
SISO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	Ant. 1	23.01	N/A
			Ant. 2	23.01	N/A
	UNII 2A		Ant. 1	30.00	23.98
			Ant. 2	30.00	23.98
	UNII 2C		Ant. 1	30.00	23.98
			Ant. 2	30.00	23.98
	UNII 3		Ant. 1	N/A	23.98
			Ant. 2	N/A	23.98
MIMO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	Ant. 1 & Ant. 2	23.01	N/A
	UNII 2A			30.00	23.98
	UNII 2C			30.00	23.98
	UNII 3			N/A	23.98

SISO

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	Ant. 1 Max. Power			Ant. 2 Max. Power		
				Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)	Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11a	5180	36	6 Mbps	13.86	1.50	15.36	13.62	1.50	15.12
	5200	40		13.92		15.42	13.65		15.15
	5240	48		14.03		15.53	13.67		15.17
	5260	52		13.48	1.50	14.98	13.19	1.50	14.69
	5300	60		13.65		15.15	13.38		14.88
	5320	64		15.46		16.96	14.91		16.41
	5500	100		15.36	1.48	16.84	15.04	1.46	16.50
	5580	116		14.94		16.42	14.47		15.93
	5720	144		14.95		16.43	14.64		16.10
	5745	149		16.05	-	-	16.32	-	-
	5785	157		16.35		-	16.48		-
	5825	165		16.84		-	17.31		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	Ant. 1 Max. Power			Ant. 2 Max. Power		
				Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)	Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11n (HT20)	5180	36	MCS0 (6.5 Mbps)	13.68	1.50	15.18	13.43	1.50	14.93
	5200	40		13.82		15.32	13.53		15.03
	5240	48		13.69		15.19	13.38		14.88
	5260	52		13.37	1.50	14.87	13.10	1.50	14.60
	5300	60		13.74		15.24	13.34		14.84
	5320	64		15.26		16.76	14.75		16.25
	5500	100		15.13	1.48	16.61	14.85	1.46	16.31
	5580	116		14.83		16.31	14.34		15.80
	5720	144		14.91		16.39	14.59		16.05
	5745	149		15.66	-	-	16.12	-	-
	5785	157		15.78		-	16.25		-
	5825	165		16.60		-	17.18		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	Ant. 1 Max. Power			Ant. 2 Max. Power		
				Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)	Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11ac (VHT20)	5180	36	MCS0 (6.5 Mbps)	13.61	1.50	15.11	13.43	1.50	14.93
	5200	40		13.68		15.18	13.39		14.89
	5240	48		13.71		15.21	13.43		14.93
	5260	52		13.29	1.50	14.79	12.95	1.50	14.45
	5300	60		13.74		15.24	13.41		14.91
	5320	64		15.15		16.65	14.71		16.21
	5500	100		15.15	1.48	16.63	14.92	1.46	16.38
	5580	116		14.93		16.41	14.37		15.83
	5720	144		14.97		16.45	14.65		16.11
	5745	149		16.45	-	-	16.21	-	-
	5785	157		16.23		-	16.16		-
	5825	165		16.70		-	17.09		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	Ant. 1 Max. Power			Ant. 2 Max. Power		
				Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)	Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11n (HT40)	5190	38	MCS0 (13.5 Mbps)	14.47	1.50	15.97	14.15	1.50	15.65
	5230	46		14.23		15.73	13.92		15.42
	5270	54		15.08	1.50	16.58	14.86	1.50	16.36
	5310	62		12.37		13.87	11.63		13.13
	5510	102		12.07	1.48	13.55	11.51	1.46	12.97
	5550	110		14.76		16.24	13.96		15.42
	5710	142		14.85		16.33	14.45		15.91
	5755	151		16.21	-	-	16.01	-	-
	5795	159		18.06		-	18.03		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	Ant. 1 Max. Power			Ant. 2 Max. Power		
				Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)	Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11ac (VHT40)	5190	38	MCS0 (13.5 Mbps)	13.91	1.50	15.41	13.62	1.50	15.12
	5230	46		14.14		15.64	13.77		15.27
	5270	54		15.03	1.50	16.53	14.83	1.50	16.33
	5310	62		11.32		12.82	10.94		12.44
	5510	102		11.34	1.48	12.82	10.76	1.46	12.22
	5550	110		14.58		16.06	13.87		15.33
	5710	142		14.79		16.27	14.33		15.79
	5755	151		16.13	-	-	15.97	-	-
	5795	159		18.12		-	18.05		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	Ant. 1 Max. Power			Ant. 2 Max. Power		
				Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)	Average Output Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11ac (VHT80)	5210	42	MCS0 (29.3 Mbps)	9.98	1.50	11.48	9.80	1.50	11.30
	5290	58		9.29	1.50	10.79	8.94	1.50	10.44
	5530	106		10.06	1.48	11.54	9.54	1.46	11.00
	5690	138		16.39		17.87	16.08		17.54
	5775	155		16.24	-	-	16.11	-	-

MIMO

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	MIMO Max. Power (dBm) (CDD)		
				Average Output Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11a	5180	36	6Mbps	16.75	4.51	21.26
	5200	40		16.80		21.31
	5240	48		16.86		21.37
	5260	52		16.35	4.51	20.86
	5300	60		16.53		21.04
	5320	64		18.20		22.71
	5500	100		18.21	4.48	22.69
	5580	116		17.72		17.72
	5720	144		17.81		22.29
	5745	149		19.20	-	-
	5785	157		19.43		-
	5825	165		20.09		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	MIMO Max. Power (dBm) (CDD)		
				Average Output Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11n (HT20)	5180	36	MCS0 (6.5 Mbps)	16.57	4.51	21.08
	5200	40		16.69		21.20
	5240	48		16.55		21.06
	5260	52		16.25	4.51	20.76
	5300	60		16.55		21.07
	5320	64		18.02		22.53
	5500	100		18.00	4.48	22.48
	5580	116		17.60		22.08
	5720	144		17.76		22.24
	5745	149		18.91	-	-
	5785	157		19.03		-
	5825	165		19.91		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	MIMO Max. Power (dBm) (CDD)		
				Average Output Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11ac (VHT20)	5180	36	MCS0 (6.5 Mbps)	16.53	4.51	21.04
	5200	40		16.55		21.06
	5240	48		16.58		21.09
	5260	52		16.13	4.51	20.64
	5300	60		16.59		21.10
	5320	64		17.95		22.46
	5500	100		18.05	4.48	22.53
	5580	116		17.67		22.15
	5720	144		17.82		22.30
	5745	149		19.34	-	-
	5785	157		19.21		-
	5825	165		19.91		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	MIMO Max. Power (dBm) (CDD)		
				Average Output Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11n (HT40)	5190	38	MCS0 (13.5 Mbps)	17.32	4.51	21.83
	5230	46		17.09		21.83
	5270	54		17.98	4.51	22.49
	5310	62		15.03		19.54
	5510	102		14.81	4.48	19.29
	5550	110		17.39		21.87
	5710	142		17.66		22.15
	5755	151		19.12	-	-
	5795	159		21.06		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	MIMO Max. Power (dBm) (CDD)		
				Average Output Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11ac (VHT40)	5190	38	MCS0 (13.5 Mbps)	16.78	4.51	21.29
	5230	46		16.97		21.48
	5270	54		17.94	4.51	22.45
	5310	62		14.14		18.65
	5510	102		14.07	4.48	18.55
	5550	110		17.25		21.73
	5710	142		17.58		22.06
	5755	151		19.06	-	-
	5795	159		21.10		-

Mode	Frequency [MHz]	Channel No.	Worst Data rate (Mbps)	MIMO Max. Power (dBm) (CDD)		
				Average Output Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P Power (dBm)
802.11ac (VHT80)	5190	38	MCS0 (29.3 Mbps)	12.90	4.51	17.41
	5230	46		12.13	4.51	16.64
	5270	54		12.82	4.48	17.30
	5310	62		19.25		23.73
	5510	102		19.19	-	-

10.4 POWER SPECTRAL DENSITY

Note:
1. Straddle channel data in the table below are for reporting purposes only.
Straddle channel data were added in section 10.7.34

2. FCC & ISED Limit

FCC & ISED PSD Limit : 11 dBm/MHz (UNII 1, UNII 2A, UNII 2C)
30 dBm/500 kHz (UNII 3)

ISED EIRP PSD Limit : 10 dBm/MHz (UNII 1)

[Ant. 1]

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11a	3.067	4.567
5200	40		2.827	4.327
5240	48		2.710	4.210
5260	52		2.389	-
5300	60		3.344	-
5320	64		4.767	-
5500	100		4.543	-
5580	116		4.416	-
5720	144		4.648	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11a	3.564
5785	157		3.493
5825	165		3.726

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11n (HT20)	2.908	4.408
5200	40		2.650	4.150
5240	48		2.252	3.752
5260	52		2.138	-
5300	60		2.932	-
5320	64		4.386	-
5500	100		4.271	-
5580	116		4.058	-
5720	144		4.045	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11n (HT20)	3.257
5785	157		3.160
5825	165		3.448

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11ac (VHT20)	3.144	4.644
5200	40		2.721	4.221
5240	48		2.695	4.195
5260	52		2.447	-
5300	60		2.646	-
5320	64		4.542	-
5500	100		4.822	-
5580	116		3.963	-
5720	144		4.503	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11ac (VHT20)	3.264
5785	157		3.894
5825	165		3.664

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11n (HT40)	0.168	1.668
5230	46		-0.100	1.400
5270	54		0.918	-
5310	62		-1.209	-
5510	102		-1.761	-
5500	110		0.214	-
5710	142		-0.168	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11n (HT40)	-0.902
5795	159		-0.144

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11ac (VHT40)	0.900	2.400
5230	46		-0.124	1.376
5270	54		0.267	-
5310	62		-2.170	-
5510	102		-2.922	-
5500	110		0.236	-
5710	142		0.086	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11ac (VHT40)	-1.538
5795	159		0.695

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5210	42	802.11ac (VHT80)	-7.044	-5.544
5290	58		-7.810	-
5530	106		-7.814	-
5690	138		-1.182	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5775	155	802.11ac (VHT80)	-1.892

[Ant. 2]

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11a	3.052	4.552
5200	40		2.559	4.059
5240	48		2.203	3.703
5260	52		2.172	-
5300	60		2.602	-
5320	64		4.346	-
5500	100		4.412	-
5580	116		3.723	-
5720	144		4.233	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11a	2.739
5785	157		3.003
5825	165		4.046

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11n (HT20)	1.922	3.422
5200	40		1.682	3.182
5240	48		1.128	2.628
5260	52		1.350	-
5300	60		1.907	-
5320	64		3.475	-
5500	100		3.702	-
5580	116		3.103	-
5720	144		3.584	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11n (HT20)	1.997
5785	157		1.842
5825	165		2.661

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11ac (VHT20)	2.011	3.511
5200	40		1.938	3.438
5240	48		1.294	2.794
5260	52		1.333	-
5300	60		2.227	-
5320	64		3.530	-
5500	100		3.831	-
5580	116		3.474	-
5720	144		3.946	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11ac (VHT20)	2.519
5785	157		2.463
5825	165		3.343

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11n (HT40)	-0.787	0.713
5230	46		-1.284	0.216
5270	54		0.028	-
5310	62		-2.436	-
5510	102		-2.303	-
5500	110		-0.233	-
5710	142		-0.344	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11n (HT40)	-1.676
5795	159		1.038

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11ac (VHT40)	-0.748	0.752
5230	46		-0.876	0.624
5270	54		-0.459	-
5310	62		-3.101	-
5510	102		-3.099	-
5500	110		-0.397	-
5710	142		-0.278	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11ac (VHT40)	-1.631
5795	159		0.563

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5210	42	802.11ac (VHT80)	-8.667	-7.167
5290	58		-8.956	-
5530	106		-8.111	-
5690	138		-1.710	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5775	155	802.11ac (VHT80)	-3.518

[MIMO(CDD)]

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11a	6.070	10.580
5200	40		5.704	10.215
5240	48		5.470	9.981
5260	52		5.291	-
5300	60		5.991	-
5320	64		7.569	-
5500	100		7.488	-
5580	116		7.087	-
5720	144		7.453	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11a	6.172
5785	157		6.262
5825	165		6.898

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11n (HT20)	5.439	9.950
5200	40		5.190	9.700
5240	48		4.718	9.229
5260	52		4.763	-
5300	60		5.445	-
5320	64		6.953	-
5500	100		7.001	-
5580	116		6.604	-
5720	144		6.828	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11n (HT20)	5.660
5785	157		5.536
5825	165		6.074

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11ac (VHT20)	5.606	10.117
5200	40		5.349	9.859
5240	48		5.033	9.543
5260	52		4.918	-
5300	60		5.449	-
5320	64		7.061	-
5500	100		7.351	-
5580	116		6.732	-
5720	144		7.239	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11ac (VHT20)	5.910
5785	157		6.218
5825	165		6.515

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11n (HT40)	2.714	7.224
5230	46		2.338	6.849
5270	54		3.495	-
5310	62		1.209	-
5510	102		0.983	-
5500	110		3.004	-
5710	142		2.755	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11n (HT40)	1.730
5795	159		3.477

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11ac (VHT40)	3.125	7.636
5230	46		2.518	7.029
5270	54		2.922	-
5310	62		0.387	-
5510	102		0.000	-
5500	110		2.936	-
5710	142		2.916	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11ac (VHT40)	
5795	159		

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5210	42	802.11ac (VHT80)	-4.807	-0.297
5290	58		-5.354	-
5530	106		-4.951	-
5690	138		1.568	-

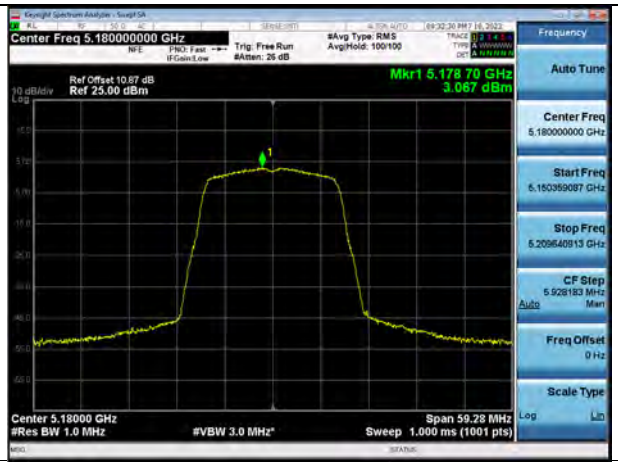
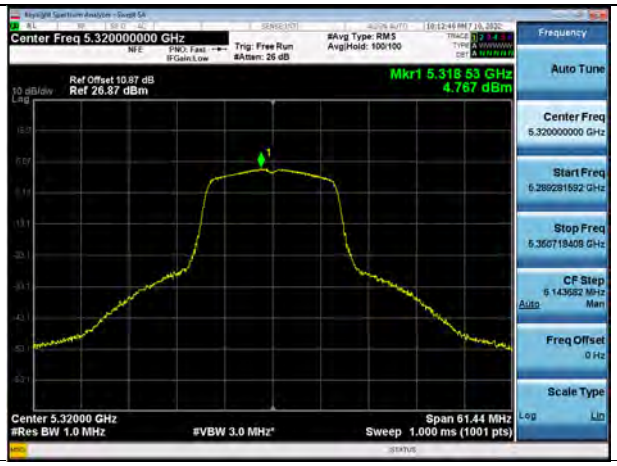
Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5775	155	802.11ac (VHT80)	0.343

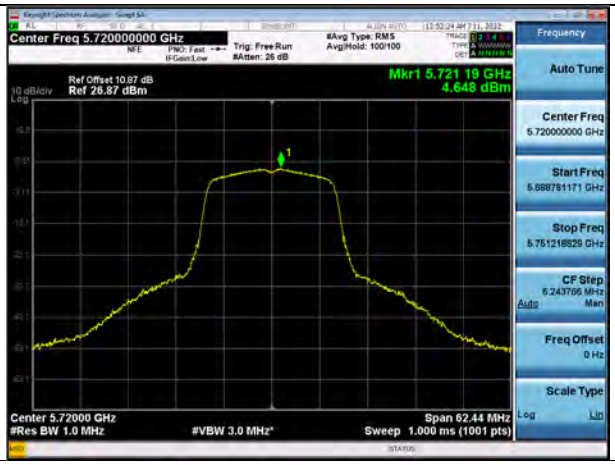
[Ant1]

▣ Test Plots(802.11a)

Note:

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

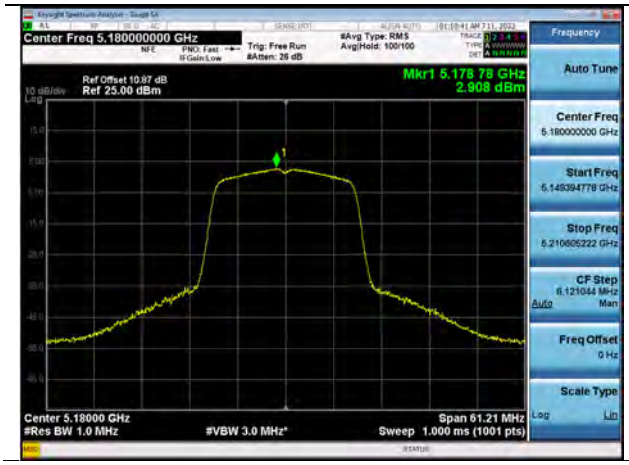
UNII 1 (Ch. 36)	UNII 2A (Ch. 64)
	

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

▣ Test Plots(802.11n(HT20))

Note:

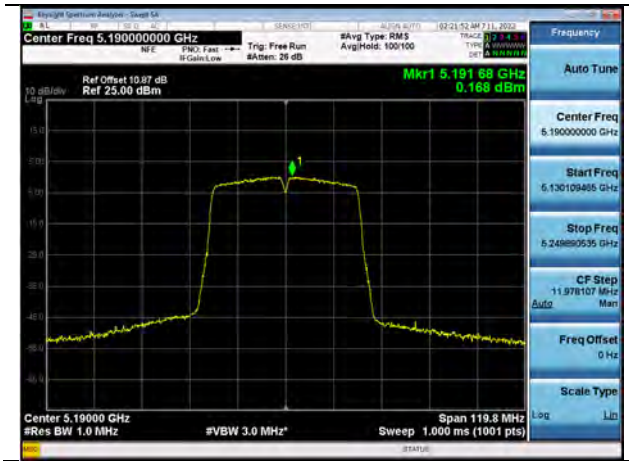
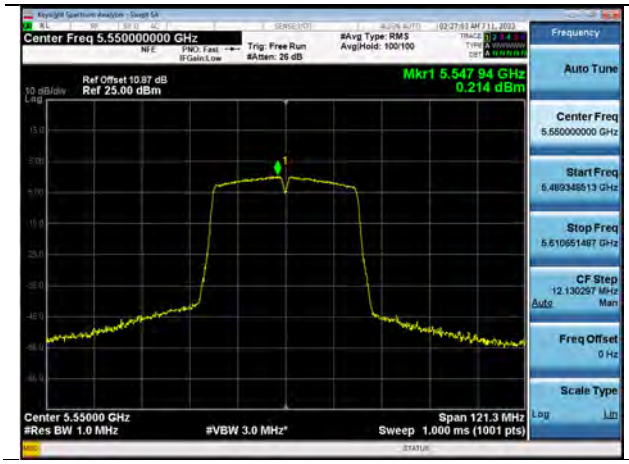
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 36)	UNII 2A (Ch. 64)
	
UNII 2C (Ch. 100)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11n(HT40))

Note:

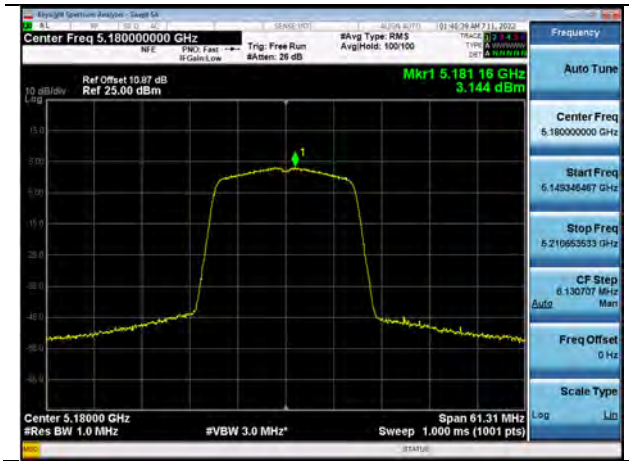
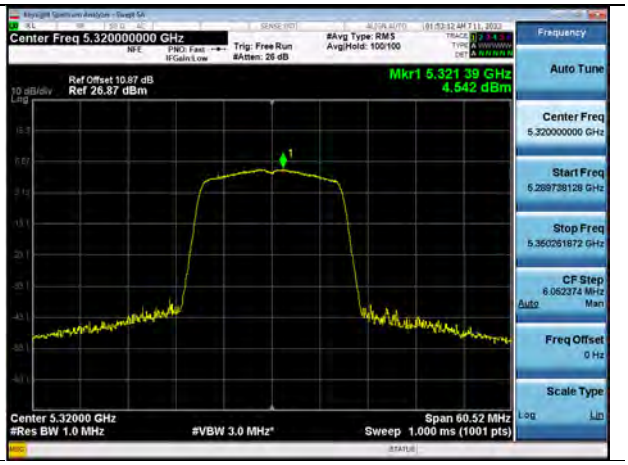
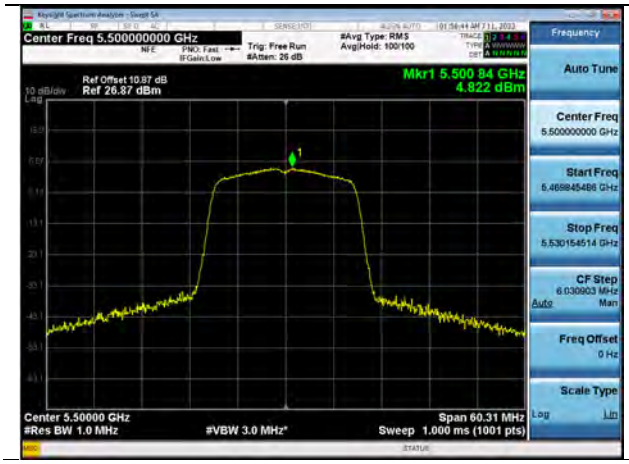
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)	UNII 2A (Ch. 54)
	
UNII 2C (Ch. 110)	UNII 3 (Ch. 159)
	

▣ Test Plots(802.11ac(VHT20))

Note:

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

UNII 1 (Ch. 36)	UNII 2A (Ch. 64)
	
UNII 2C (Ch. 100)	UNII 3 (Ch. 157)
	

▣ Test Plots(802.11ac(VHT40))

Note:

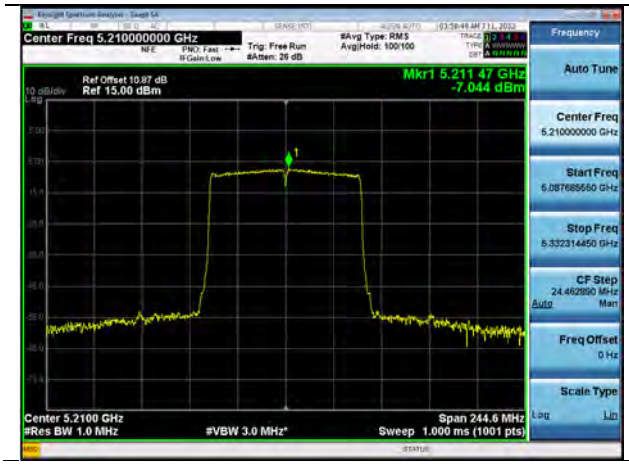
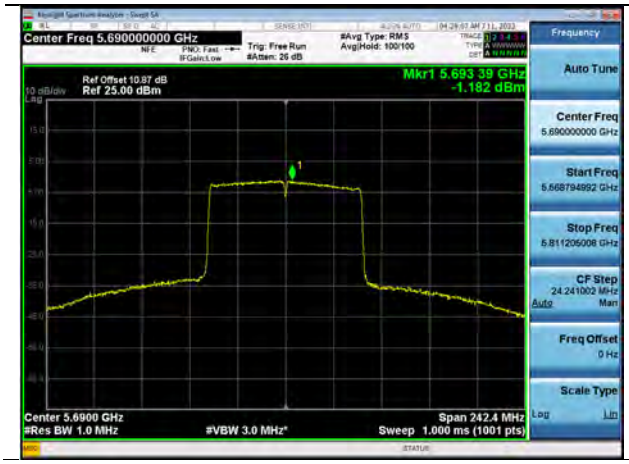
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)	UNII 2A (Ch. 54)
	
UNII 2C (Ch. 110)	UNII 3 (Ch. 159)
	

▣ Test Plots(802.11ac(VHT80))

Note:

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

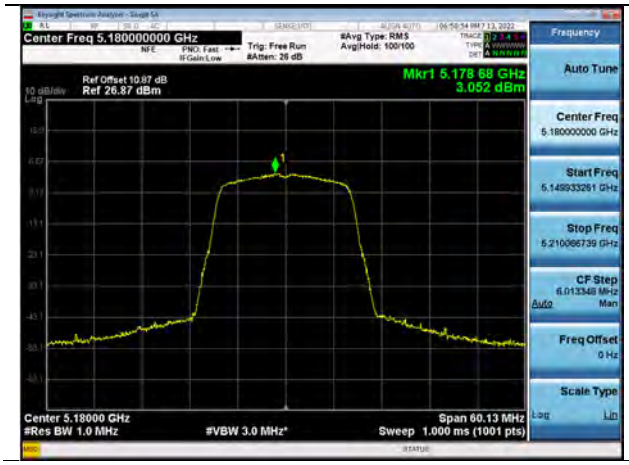
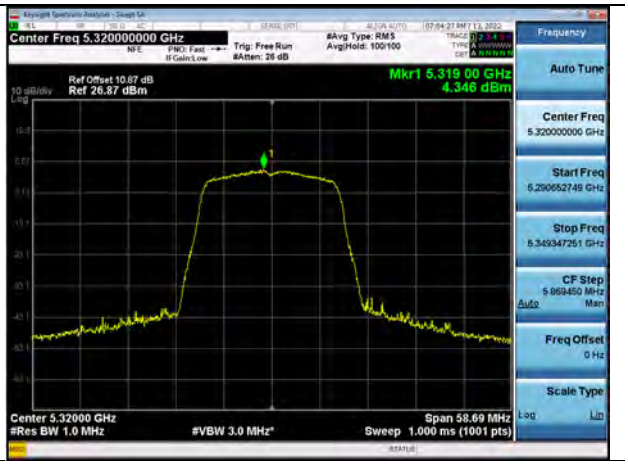
UNII 1 (Ch. 42)	UNII 2A (Ch. 58)
	
UNII 2C (Ch. 138)	UNII 3 (Ch. 155)
	

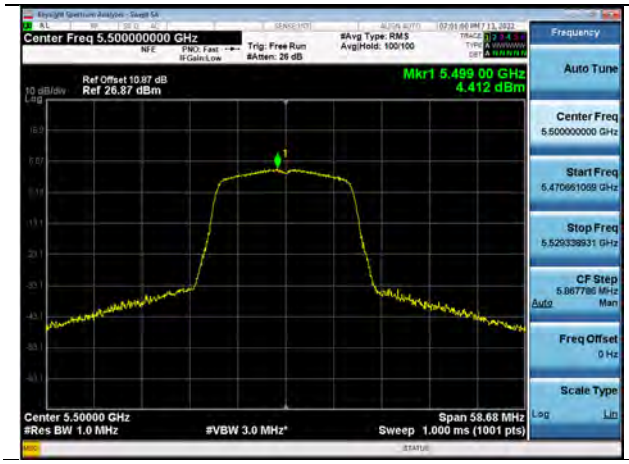
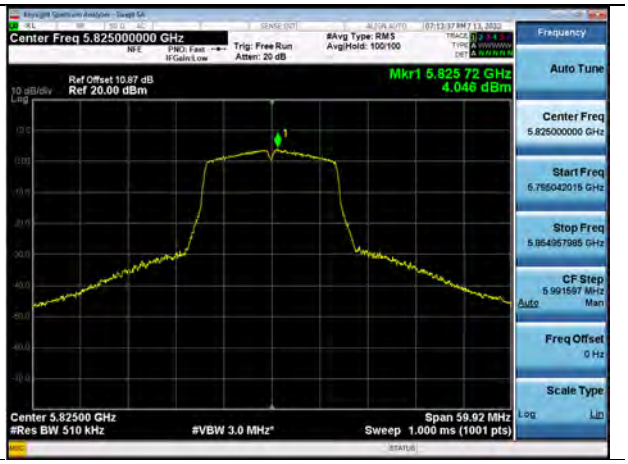
[Ant2]

▣ Test Plots(802.11a)

Note:

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

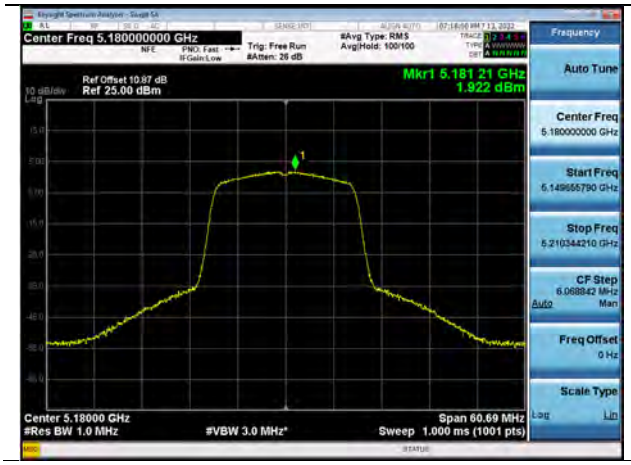
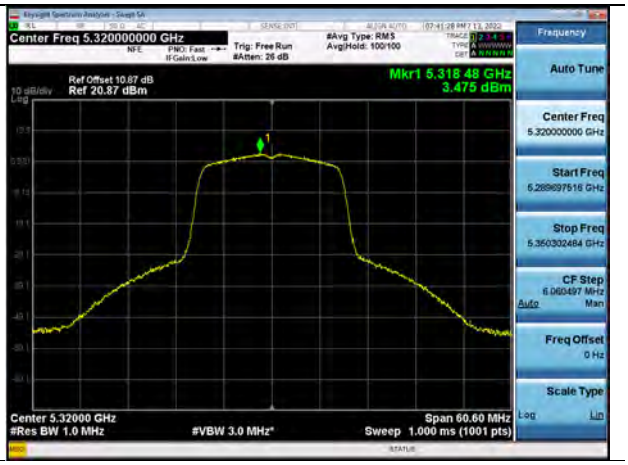
UNII 1 (Ch. 36)	UNII 2A (Ch. 64)
	

UNII 2C (Ch. 100)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11n(HT20))

Note:

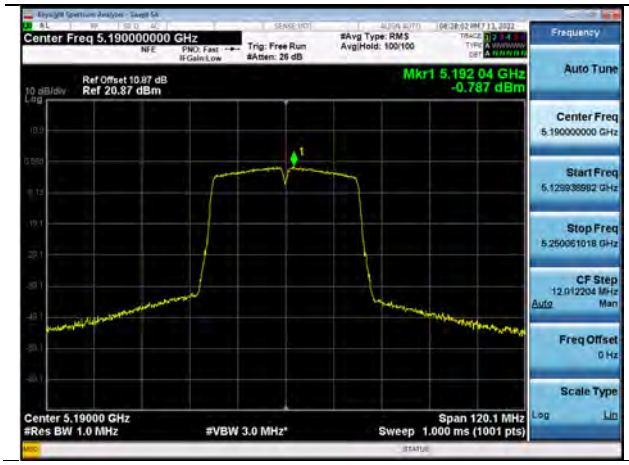
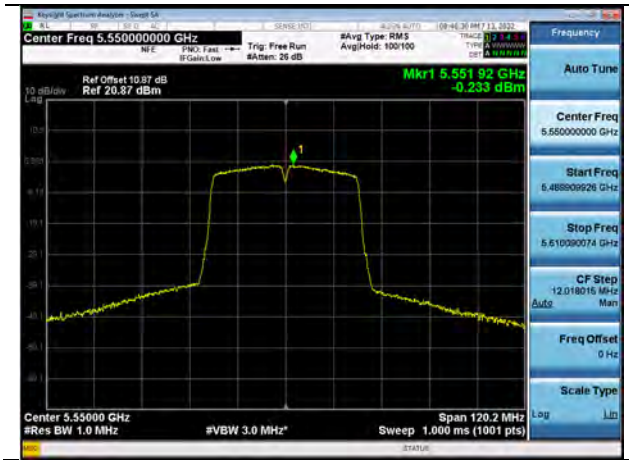
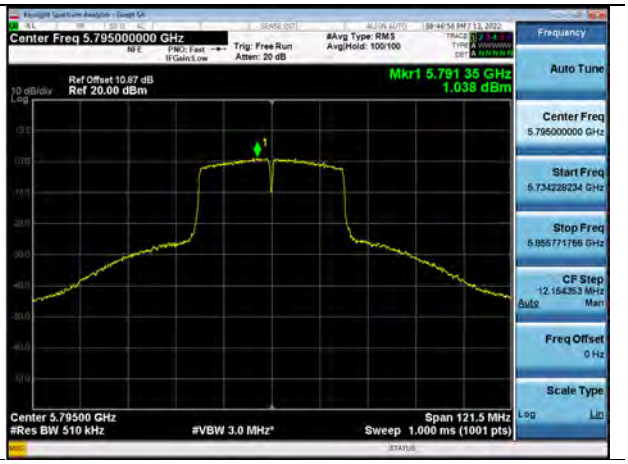
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 36)	UNII 2A (Ch. 64)
	
UNII 2C (Ch. 100)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11n(HT40))

Note:

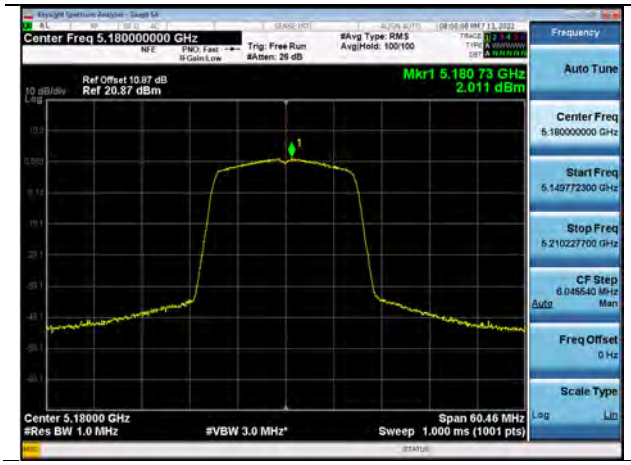
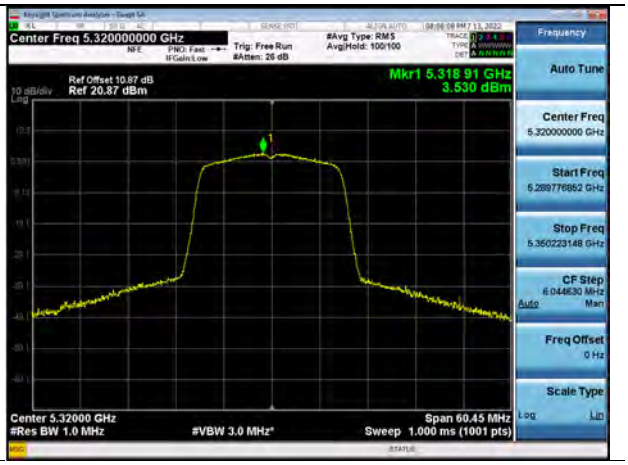
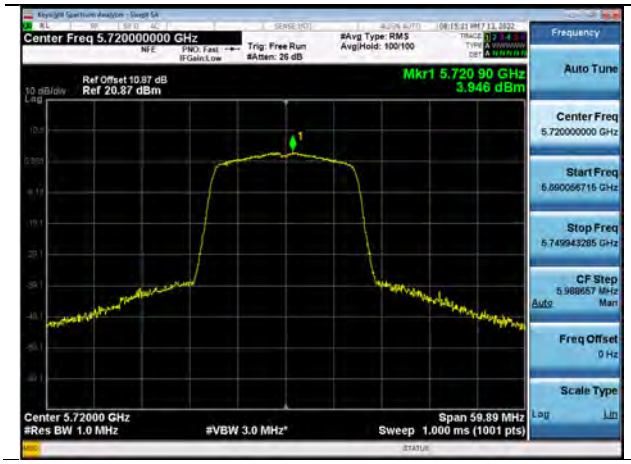
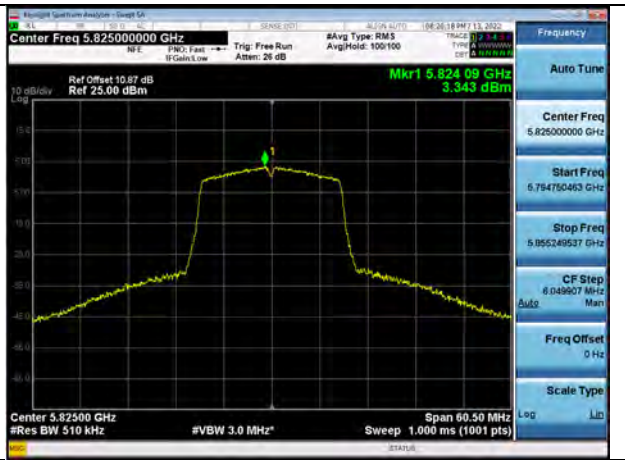
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)	UNII 2A (Ch. 54)
	
UNII 2C (Ch. 110)	UNII 3 (Ch. 159)
	

▣ Test Plots(802.11ac(VHT20))

Note:

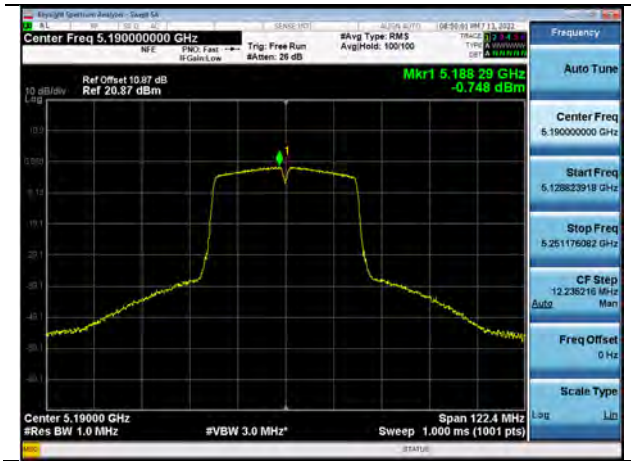
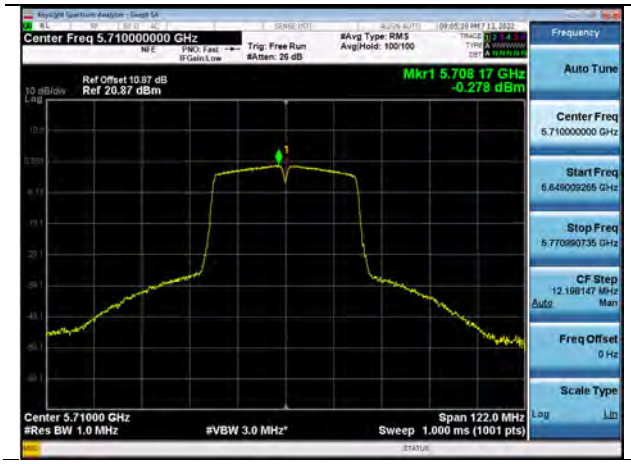
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 36)	UNII 2A (Ch. 64)
	
UNII 2C (Ch. 144)	**UNII 3 (Ch. 165)**
	

▣ Test Plots(802.11ac(VHT40))

Note:

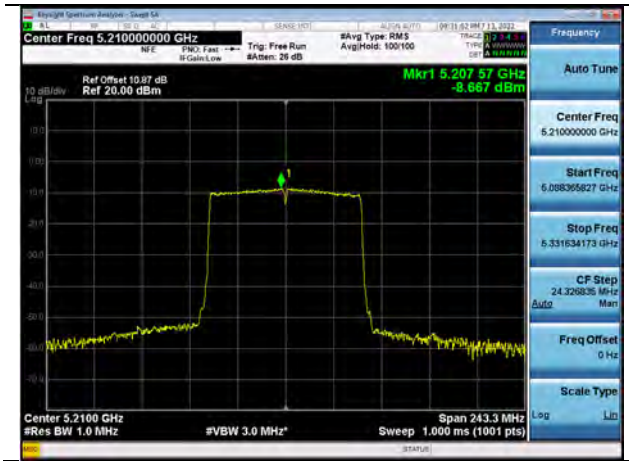
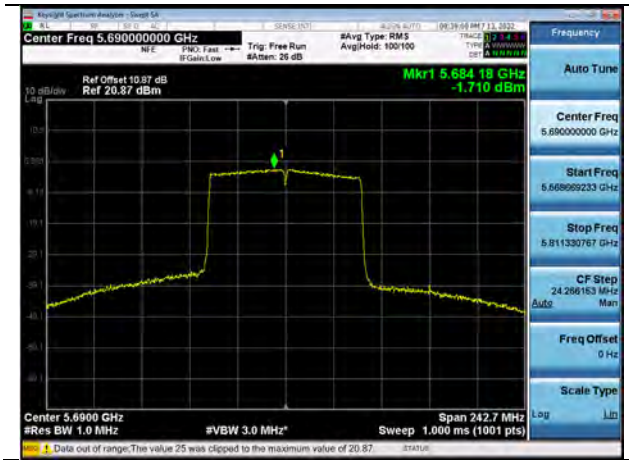
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)	UNII 2A (Ch. 54)
	
UNII 2C (Ch. 142)	UNII 3 (Ch. 159)
	

▣ Test Plots(802.11ac(VHT80))

Note:

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

UNII 1 (Ch. 42)	UNII 2A (Ch. 58)
	
UNII 2C (Ch. 138)	**UNII 3 (Ch. 155)**
	

10.5 FREQUENCY STABILITY.

10.5.1 80MHz BW

[ANT1]

Startup after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5210074.98	74.98
100%		-30	5210024.81	24.81
100%		-20	5210002.34	2.34
100%		-10	5210006.46	6.46
100%		0	5210053.89	53.89
100%		+10	5210021.42	21.42
100%		+30	5210051.03	51.03
100%		+40	5210080.62	80.62
100%		+50	5210009.91	9.91
Max	3.6	+20	5210009.79	9.79
Min	3.14	+20	5210045.04	45.04

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290072.74	72.74
100%		-30	5290098.28	98.28
100%		-20	5290094.89	94.89
100%		-10	5290079.49	79.49
100%		0	5290076.76	76.76
100%		+10	5290002.94	2.94
100%		+30	5290059.59	59.59
100%		+40	5290078.34	78.34
100%		+50	5290005.37	5.37
Max	3.6	+20	5290028.70	28.70
Min	3.14	+20	5290005.77	5.77

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530053.37	53.37
100%		-30	5530016.72	16.72
100%		-20	5530028.61	28.61
100%		-10	5530075.80	75.8
100%		0	5530035.74	35.74
100%		+10	5530004.39	4.39
100%		+30	5530056.59	56.59
100%		+40	5530047.71	47.71
100%		+50	5530078.21	78.21
Max	3.6	+20	5530059.53	59.53
Min	3.14	+20	5530049.78	49.78

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775081.86	81.86
100%		-30	5775014.45	14.45
100%		-20	5775061.57	61.57
100%		-10	5775067.56	67.56
100%		0	5775059.50	59.5
100%		+10	5775044.70	44.7
100%		+30	5775097.64	97.64
100%		+40	5775069.42	69.42
100%		+50	5775078.37	78.37
Max	3.6	+20	5775044.07	44.07
Min	3.14	+20	5775059.51	59.51

Note:

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

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210012.74	12.74
100%		-30	5210075.33	75.33
100%		-20	5210071.18	71.18
100%		-10	5210043.49	43.49
100%		0	5210028.25	28.25
100%		+10	5210042.44	42.44
100%		+30	5210047.61	47.61
100%		+40	5210008.31	8.31
100%		+50	5210098.81	98.81
Max	3.6	+20	5210087.71	87.71
Min	3.14	+20	5210053.30	53.30

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5290081.84	81.84
100%		-30	5290078.52	78.52
100%		-20	5290020.60	20.6
100%		-10	5290022.37	22.37
100%		0	5290011.57	11.57
100%		+10	5290061.80	61.8
100%		+30	5290082.22	82.22
100%		+40	5290058.53	58.53
100%		+50	5290087.90	87.90
Max	3.6	+20	5290027.40	27.40
Min	3.14	+20	5290084.89	84.89

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.3 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5530016.61	16.61
100%		-30	5530075.07	75.07
100%		-20	5530004.32	4.32
100%		-10	5530015.49	15.49
100%		0	5530080.57	80.57
100%		+10	5530045.50	45.5
100%		+30	5530069.08	69.08
100%		+40	5530010.49	10.49
100%		+50	5530059.60	59.60
Max	3.6	+20	5530071.82	71.82
Min	3.14	+20	5530006.94	6.94

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775013.07	13.07
100%		-30	5775007.37	7.37
100%		-20	5775044.03	44.03
100%		-10	5775038.32	38.32
100%		0	5775016.13	16.13
100%		+10	5775094.12	94.12
100%		+30	5775026.06	26.06
100%		+40	5775052.73	52.73
100%		+50	5775071.35	71.35
Max	3.6	+20	5775059.61	59.61
Min	3.14	+20	5775047.97	47.97

Note:

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

5 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210027.06	27.06
100%		-30	5210045.28	45.28
100%		-20	5210049.07	49.07
100%		-10	5210054.79	54.79
100%		0	5210048.22	48.22
100%		+10	5210046.23	46.23
100%		+30	5210065.66	65.66
100%		+40	5210053.48	53.48
100%		+50	5210001.85	1.85
Max	3.6	+20	5210033.36	33.36
Min	3.14	+20	5210096.96	96.96

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290055.22	55.22
100%		-30	5290013.12	13.12
100%		-20	5290065.50	65.5
100%		-10	5290072.40	72.4
100%		0	5290068.40	68.4
100%		+10	5290091.11	91.11
100%		+30	5290017.69	17.69
100%		+40	5290034.97	34.97
100%		+50	5290024.60	24.60
Max	3.6	+20	5290066.17	66.17
Min	3.14	+20	5290045.34	45.34

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530008.61	8.61
100%		-30	5530009.66	9.66
100%		-20	5530046.05	46.05
100%		-10	5530016.33	16.33
100%		0	5530050.83	50.83
100%		+10	5530096.09	96.09
100%		+30	5530060.80	60.8
100%		+40	5530060.07	60.07
100%		+50	5530091.79	91.79
Max	3.6	+20	5530020.74	20.74
Min	3.14	+20	5530077.66	77.66

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775074.08	74.08
100%		-30	5775091.91	91.91
100%		-20	5775016.79	16.79
100%		-10	5775013.93	13.93
100%		0	5775030.05	30.05
100%		+10	5775058.63	58.63
100%		+30	5775029.33	29.33
100%		+40	5775054.48	54.48
100%		+50	5775008.68	8.68
Max	3.6	+20	5775094.82	94.82
Min	3.14	+20	5775087.96	87.96

Note:

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

10 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210010.16	10.16
100%		-30	5210037.77	37.77
100%		-20	5210038.20	38.20
100%		-10	5210050.12	50.12
100%		0	5210060.26	60.26
100%		+10	5210028.03	28.03
100%		+30	5210020.84	20.84
100%		+40	5210014.65	14.65
100%		+50	5210025.32	25.32
Max	3.6	+20	5210055.25	55.25
Min	3.14	+20	5210052.24	52.24

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290053.52	53.52
100%		-30	5290028.52	28.52
100%		-20	5290045.32	45.32
100%		-10	5290009.42	9.42
100%		0	5290042.49	42.49
100%		+10	5290099.97	99.97
100%		+30	5290079.03	79.03
100%		+40	5290061.67	61.67
100%		+50	5290094.99	94.99
Max	3.6	+20	5290082.62	82.62
Min	3.14	+20	5290096.30	96.3

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530027.16	27.16
100%		-30	5530008.48	8.48
100%		-20	5530047.25	47.25
100%		-10	5530037.24	37.24
100%		0	5530051.98	51.98
100%		+10	5530018.67	18.67
100%		+30	5530074.63	74.63
100%		+40	5530090.11	90.11
100%		+50	5530042.40	42.40
Max	3.6	+20	5530062.41	62.41
Min	3.14	+20	5530093.60	93.6

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775049.45	49.45
100%		-30	5775024.80	24.80
100%		-20	5775023.57	23.57
100%		-10	5775066.20	66.2
100%		0	5775004.38	4.38
100%		+10	5775008.18	8.18
100%		+30	5775025.51	25.51
100%		+40	5775044.32	44.32
100%		+50	5775022.16	22.16
Max	3.6	+20	5775093.93	93.93
Min	3.14	+20	5775016.22	16.22

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.

[ANT2]

Startup after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210004.95	4.95
100%		-30	5210065.21	65.21
100%		-20	5210010.86	10.86
100%		-10	5210034.12	34.12
100%		0	5210056.40	56.40
100%		+10	5210089.57	89.57
100%		+30	5210054.89	54.89
100%		+40	5210096.17	96.17
100%		+50	5210092.47	92.47
Max	3.6	+20	5210072.39	72.39
Min	3.14	+20	5210099.79	99.79

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290002.47	2.47
100%		-30	5290035.05	35.05
100%		-20	5290097.18	97.18
100%		-10	5290058.67	58.67
100%		0	5290001.91	1.91
100%		+10	5290017.98	17.98
100%		+30	5290034.70	34.7
100%		+40	5290070.34	70.34
100%		+50	5290020.57	20.57
Max	3.6	+20	5290008.80	8.80
Min	3.14	+20	5290095.36	95.36

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530025.69	25.69
100%		-30	5530055.67	55.67
100%		-20	5530093.99	93.99
100%		-10	5530064.62	64.62
100%		0	5530061.45	61.45
100%		+10	5530013.05	13.05
100%		+30	5530008.61	8.61
100%		+40	5530080.68	80.68
100%		+50	5530072.82	72.82
Max	3.6	+20	5530062.91	62.91
Min	3.14	+20	5530067.55	67.55

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5775055.30	55.30
100%		-30	5775059.38	59.38
100%		-20	5775088.83	88.83
100%		-10	5775046.69	46.69
100%		0	5775040.73	40.73
100%		+10	5775092.89	92.89
100%		+30	5775097.35	97.35
100%		+40	5775083.95	83.95
100%		+50	5775007.62	7.62
Max	3.6	+20	5775070.26	70.26
Min	3.14	+20	5775079.92	79.92

Note:

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

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210036.45	36.45
100%		-30	5210067.65	67.65
100%		-20	5210056.14	56.14
100%		-10	5210041.40	41.40
100%		0	5210043.95	43.95
100%		+10	5210036.29	36.29
100%		+30	5210001.34	1.34
100%		+40	5210051.11	51.11
100%		+50	5210015.02	15.02
Max	3.6	+20	5210018.94	18.94
Min	3.14	+20	5210052.79	52.79

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5290057.28	57.28
100%		-30	5290067.10	67.10
100%		-20	5290067.19	67.19
100%		-10	5290098.28	98.28
100%		0	5290045.84	45.84
100%		+10	5290013.44	13.44
100%		+30	5290077.19	77.19
100%		+40	5290045.78	45.78
100%		+50	5290034.81	34.81
Max	3.6	+20	5290012.36	12.36
Min	3.14	+20	5290057.52	57.52

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530094.08	94.08
100%		-30	5530072.24	72.24
100%		-20	5530099.49	99.49
100%		-10	5530016.35	16.35
100%		0	5530054.59	54.59
100%		+10	5530008.34	8.34
100%		+30	5530074.15	74.15
100%		+40	5530042.20	42.2
100%		+50	5530063.96	63.96
Max	3.6	+20	5530003.39	3.39
Min	3.14	+20	5530005.21	5.21

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775024.97	24.97
100%		-30	5775087.31	87.31
100%		-20	5775033.48	33.48
100%		-10	5775070.79	70.79
100%		0	5775016.61	16.61
100%		+10	5775037.17	37.17
100%		+30	5775089.05	89.05
100%		+40	5775093.17	93.17
100%		+50	5775034.37	34.37
Max	3.6	+20	5775053.30	53.30
Min	3.14	+20	5775010.37	10.37

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.

5 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210029.99	29.99
100%		-30	5210027.57	27.57
100%		-20	5210093.86	93.86
100%		-10	5210070.40	70.40
100%		0	5210009.76	9.76
100%		+10	5210005.90	5.90
100%		+30	5210018.21	18.21
100%		+40	5210024.58	24.58
100%		+50	5210078.97	78.97
Max	3.6	+20	5210064.16	64.16
Min	3.14	+20	5210005.03	5.03

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290028.57	28.57
100%		-30	5290058.75	58.75
100%		-20	5290009.29	9.29
100%		-10	5290080.88	80.88
100%		0	5290066.46	66.46
100%		+10	5290061.46	61.46
100%		+30	5290048.57	48.57
100%		+40	5290035.54	35.54
100%		+50	5290015.98	15.98
Max	3.6	+20	5290077.38	77.38
Min	3.14	+20	5290060.37	60.37

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:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530086.54	86.54
100%		-30	5530031.69	31.69
100%		-20	5530085.53	85.53
100%		-10	5530080.45	80.45
100%		0	5530053.23	53.23
100%		+10	5530029.48	29.48
100%		+30	5530076.29	76.29
100%		+40	5530057.38	57.38
100%		+50	5530053.82	53.82
Max	3.6	+20	5530001.27	1.27
Min	3.14	+20	5530014.22	14.22

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5775039.83	39.83
100%		-30	5775074.28	74.28
100%		-20	5775078.67	78.67
100%		-10	5775025.50	25.50
100%		0	5775056.62	56.62
100%		+10	5775005.74	5.74
100%		+30	5775050.68	50.68
100%		+40	5775025.68	25.68
100%		+50	5775011.41	11.41
Max	3.6	+20	5775030.85	30.85
Min	3.14	+20	5775058.49	58.49

Note:

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

10 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1
OPERATING FREQUENCY:	5,210,000,000 Hz
CHANNEL:	42
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210019.45	19.45
100%		-30	5210027.65	27.65
100%		-20	5210080.98	80.98
100%		-10	5210083.54	83.54
100%		0	5210027.76	27.76
100%		+10	5210014.06	14.06
100%		+30	5210064.53	64.53
100%		+40	5210066.09	66.09
100%		+50	5210095.36	95.36
Max	3.6	+20	5210092.92	92.92
Min	3.14	+20	5210029.23	29.23

Note:

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

OPERATING BAND:	UNII Band 2A
OPERATING FREQUENCY:	5,290,000,000 Hz
CHANNEL:	58
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290041.60	41.60
100%		-30	5290038.93	38.93
100%		-20	5290011.90	11.9
100%		-10	5290036.07	36.07
100%		0	5290039.73	39.73
100%		+10	5290046.83	46.83
100%		+30	5290072.44	72.44
100%		+40	5290005.98	5.98
100%		+50	5290075.23	75.23
Max	3.6	+20	5290007.21	7.21
Min	3.14	+20	5290021.93	21.93

Note:

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

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,530,000,000 Hz
CHANNEL:	106
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530048.28	48.28
100%		-30	5530028.97	28.97
100%		-20	5530067.02	67.02
100%		-10	5530074.45	74.45
100%		0	5530039.46	39.46
100%		+10	5530045.71	45.71
100%		+30	5530016.26	16.26
100%		+40	5530089.64	89.64
100%		+50	5530030.15	30.15
Max	3.6	+20	5530062.17	62.17
Min	3.14	+20	5530070.84	70.84

Note:

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

OPERATING BAND:	UNII Band 3
OPERATING FREQUENCY:	5,775,000,000 Hz
CHANNEL:	155
REFERENCE VOLTAGE:	3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775094.68	94.68
100%		-30	5775080.42	80.42
100%		-20	5775004.43	4.43
100%		-10	5775068.53	68.53
100%		0	5775043.48	43.48
100%		+10	5775017.65	17.65
100%		+30	5775061.89	61.89
100%		+40	5775010.27	10.27
100%		+50	5775053.88	53.88
Max	3.6	+20	5775074.76	74.76
Min	3.14	+20	5775062.49	62.49

Note:

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

10.6 STRADDLE CHANNEL

10.6.1 26dB Bandwidth

[ANT1]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5710.08	14.92
802.11n(HT20)				5709.88	15.12
802.11ac(VHT20)				5709.92	15.08
802.11a	UNII 3	5720	144	5729.72	4.72
802.11n(HT20)				5729.92	4.92
802.11ac(VHT20)				5729.76	4.76

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.76	35.24
802.11ac(VHT40)				5689.52	35.48
802.11n(HT40)	UNII 3	5710	142	5729.84	4.84
802.11ac(VHT40)				5730.00	5.00

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.56	75.44
	UNII 3	5690	138	5730.32	5.32

Note:

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

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

[ANT2]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5710.04	14.96
802.11n(HT20)				5709.80	15.20
802.11ac(VHT20)				5709.96	15.04
802.11a	UNII 3	5720	144	5729.64	4.64
802.11n(HT20)				5730.08	5.08
802.11ac(VHT20)				5729.84	4.84

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.84	35.16
802.11ac(VHT40)				5689.60	35.40
802.11n(HT40)	UNII 3	5710	142	5730.00	5.00
802.11ac(VHT40)				5729.92	4.92

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.20	75.80
	UNII 3	5690	138	5730.32	5.32

Note:

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

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

[ANT1]

▣ Test Plots (26dB Bandwidth)

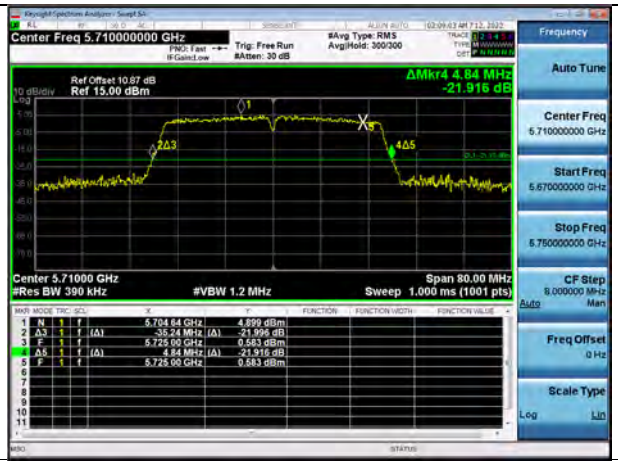
802.11a UNII Band

802.11n(HT20) UNII Band

802.11ac(VHT20) UNII Band

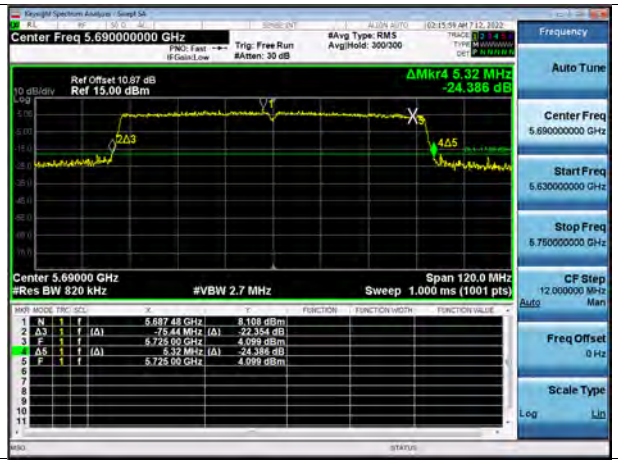
▣ Test Plots (26dB Bandwidth)

802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band

802.11ac(VHT80) UNII Band



[ANT2]

▣ Test Plots (26dB Bandwidth)

802.11a UNII Band	802.11n(HT20) UNII Band
	

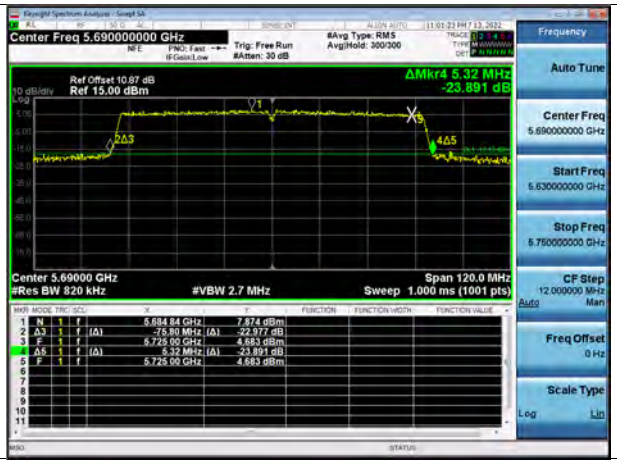
802.11ac(VHT20) UNII Band

▣ Test Plots (26dB Bandwidth)

802.11n(HT40) UNII Band

802.11ac(VHT40) UNII Band

802.11ac(VHT80) UNII Band



10.6.2 6dB Bandwidth

[ANT1]

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)				5728.76	3.76	> 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)				5728.16	3.16	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5728.28	3.28	> 0.5

Note:

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

[ANT2]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII 3	5720	144	5728.12	3.12	> 0.5
802.11n(HT20)				5728.76	3.76	> 0.5
802.11ac(VHT20)				5728.68	3.68	> 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)				5728.16	3.16	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5728.28	3.28	> 0.5

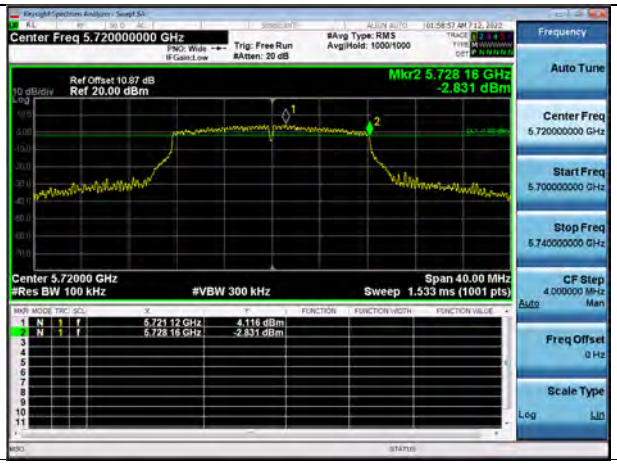
Note:

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

[ANT1]

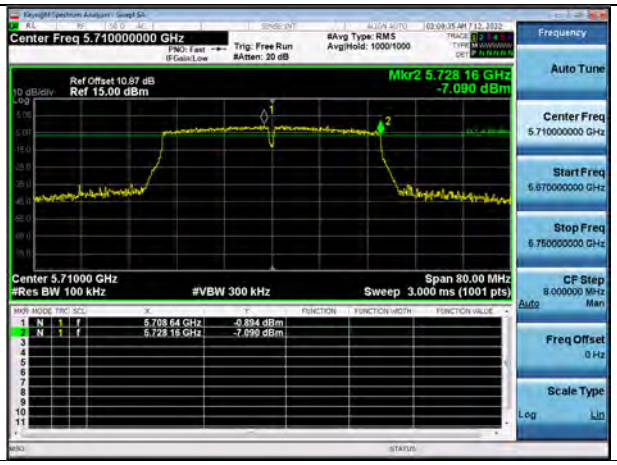
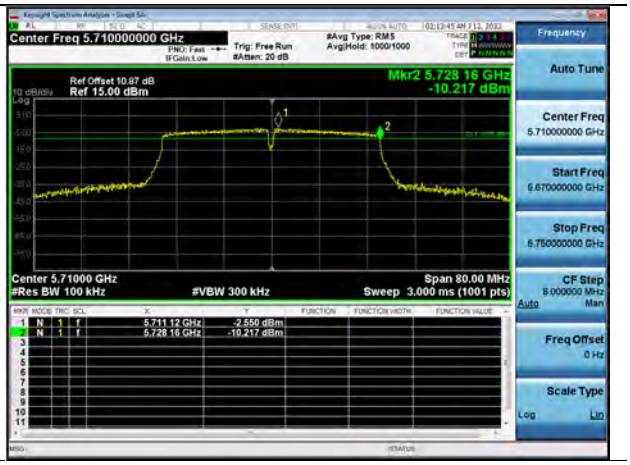
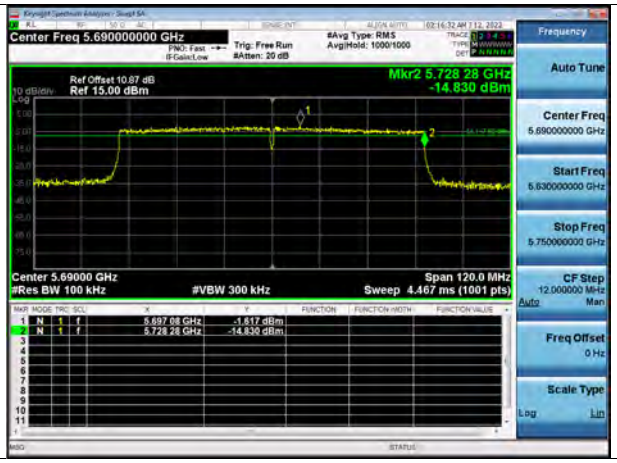
▣ Test Plots(UNII 3 Band 6dB Bandwidth)

802.11a CH.144



802.11n_HT20 CH.144

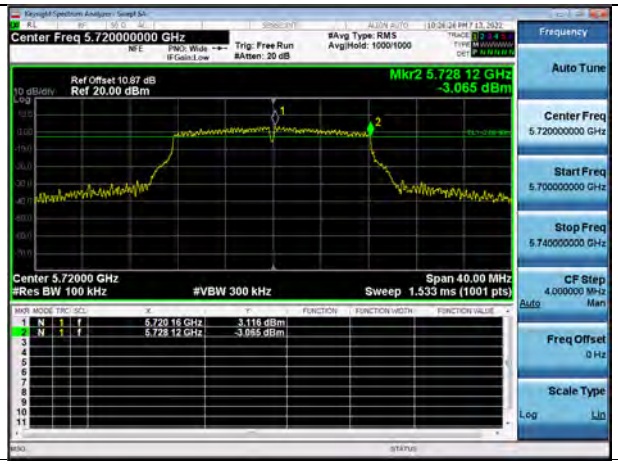
802.11ac_VHT20 CH.144

802.11n_HT40 CH.142	802.11ac_VHT40 CH.142
	
802.11ac_VHT80 CH.138	
	

[ANT2]

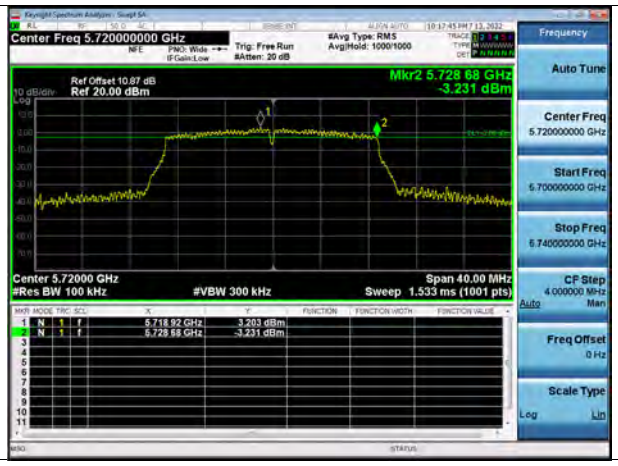
▣ Test Plots(UNII 3 Band 6dB Bandwidth)

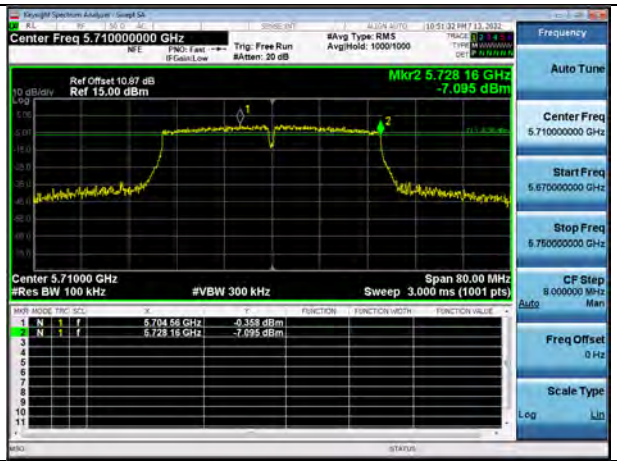
802.11a CH.144



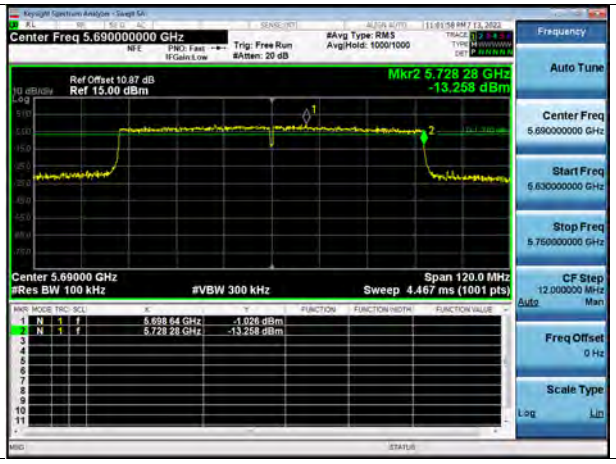
802.11n_HT20 CH.144

802.11ac_VHT20 CH.144



802.11n_HT40 CH.142	802.11ac_VHT40 CH.142
	

802.11ac_VHT80 CH.138



10.6.3 Output Power

[ANT1]

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	14.77	23.17
802.11n(HT20)			13.95	23.17
802.11ac(VHT20)			14.11	23.17
802.11a	5720 (UNII 3 Band)	144	6.92	30.00
802.11n(HT20)			6.50	30.00
802.11ac(VHT20)			6.72	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	13.48	23.98
802.11ac(VHT40)			13.46	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	1.56	30.00
802.11ac(VHT40)			1.50	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	15.92	23.98
	5690 (UNII 3 Band)	138	1.15	30.00

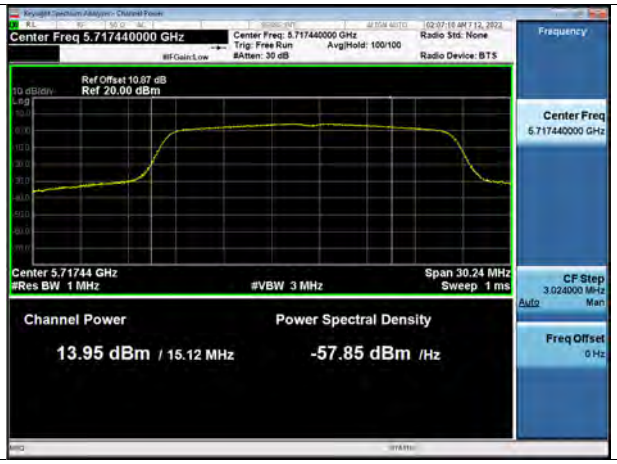
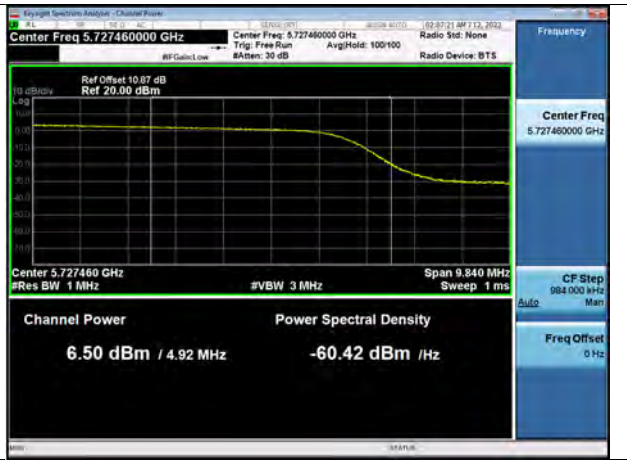
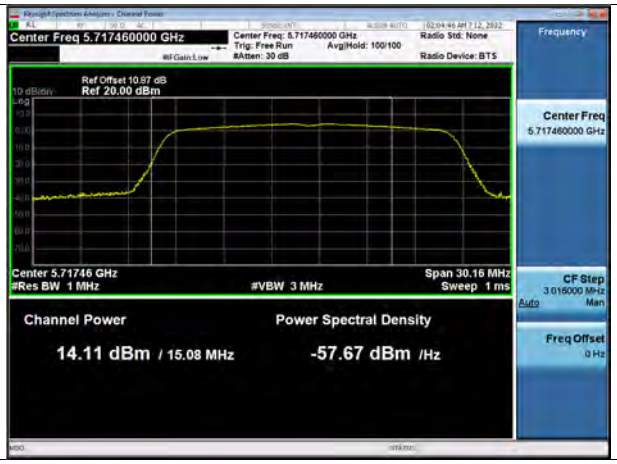
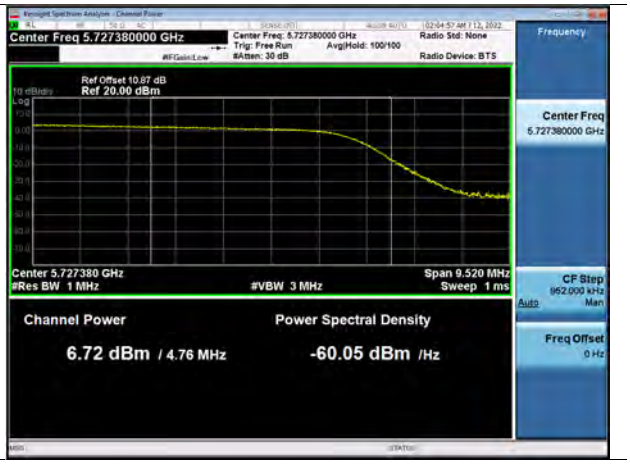
[ANT2]

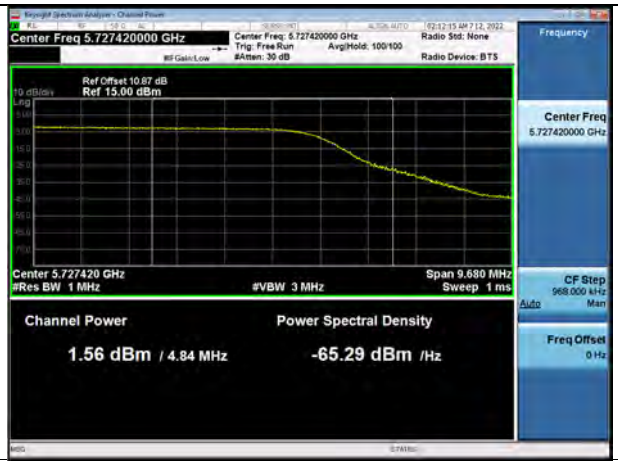
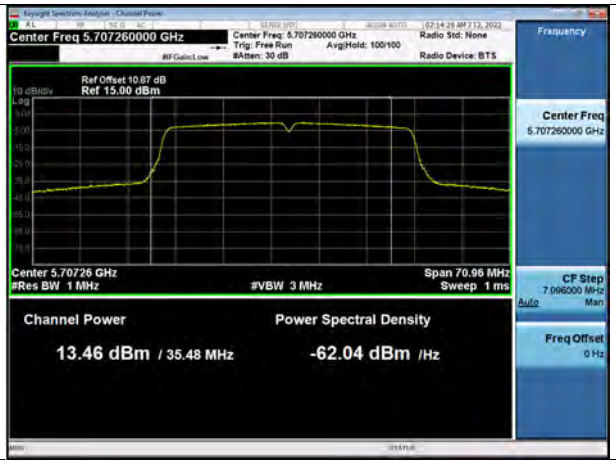
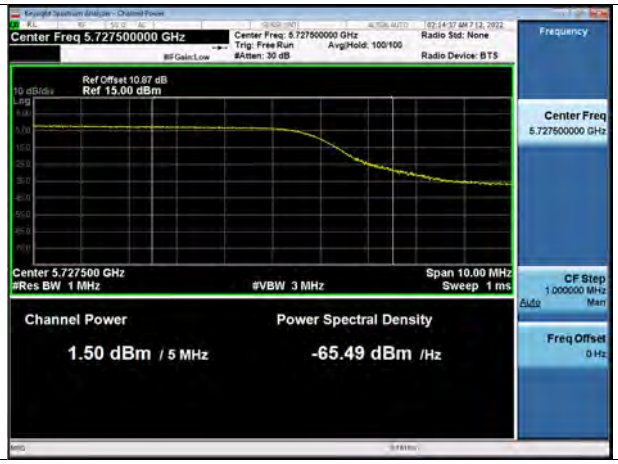
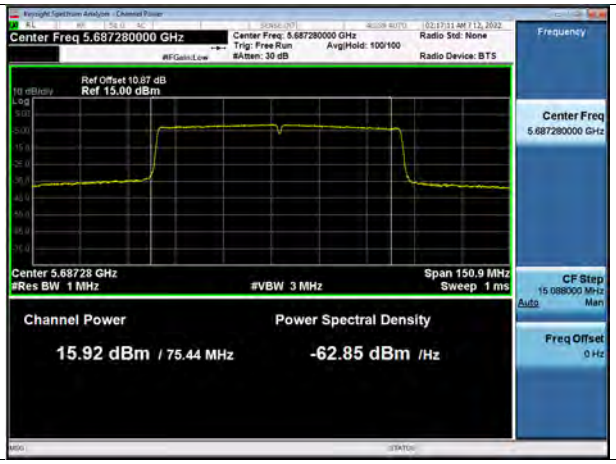
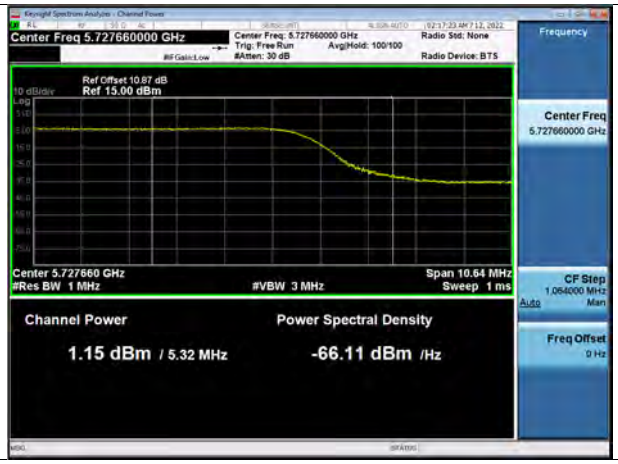
Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	13.92	23.17
802.11n(HT20)			13.64	23.17
802.11ac(VHT20)			13.42	23.17
802.11a	5720 (UNII 3 Band)	144	6.05	30.00
802.11n(HT20)			6.26	30.00
802.11ac(VHT20)			6.04	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	13.91	23.98
802.11ac(VHT40)			13.65	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	2.01	30.00
802.11ac(VHT40)			1.74	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	16.08	23.98
	5690 (UNII 3 Band)	138	1.40	30.00

▣ Test Plots_**[ANT1]**

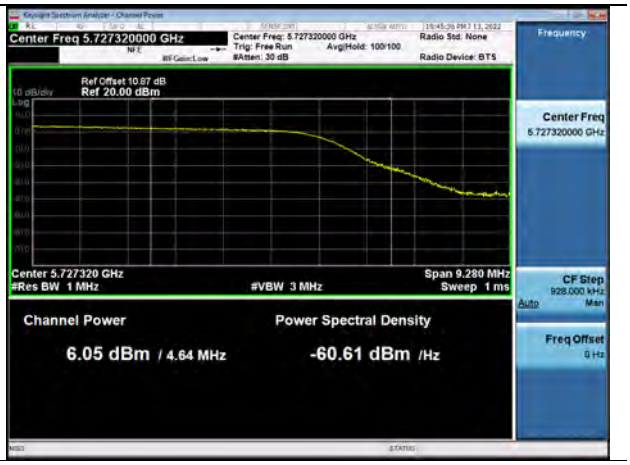
802.11a UNII 2C Band	802.11a UNII 3 Band
	
802.11n(HT20) UNII 2C Band	802.11n(HT20) UNII 3 Band
	
802.11ac(VHT20) UNII 2C Band	802.11ac(VHT20) UNII 3 Band
	

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
	

▣ Test Plots_[ANT2]

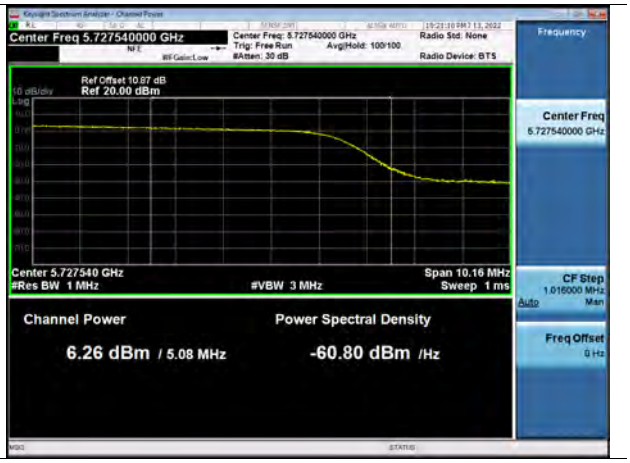
802.11a UNII 2C Band

802.11a UNII 3 Band



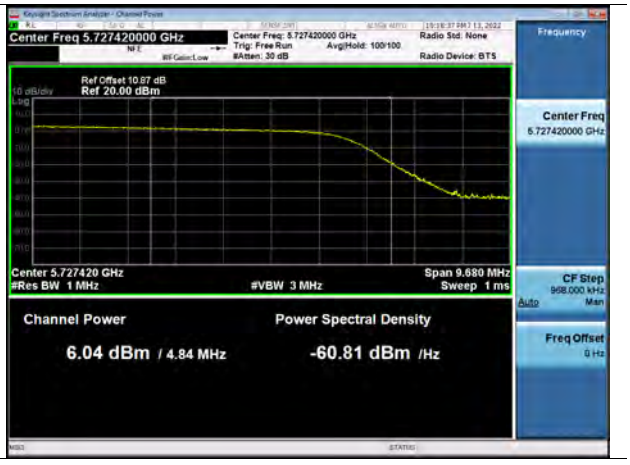
802.11n(HT20) UNII 2C Band

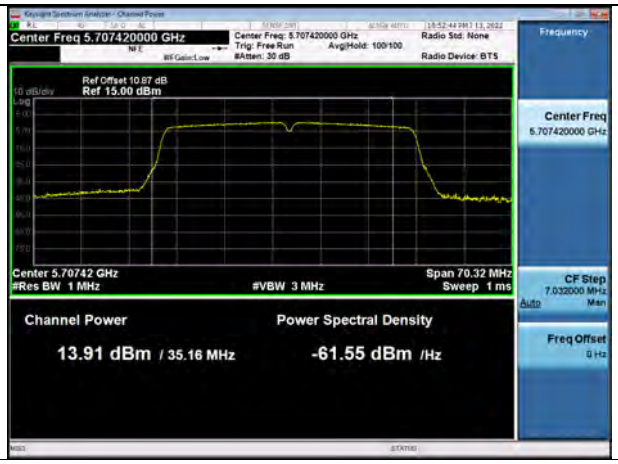
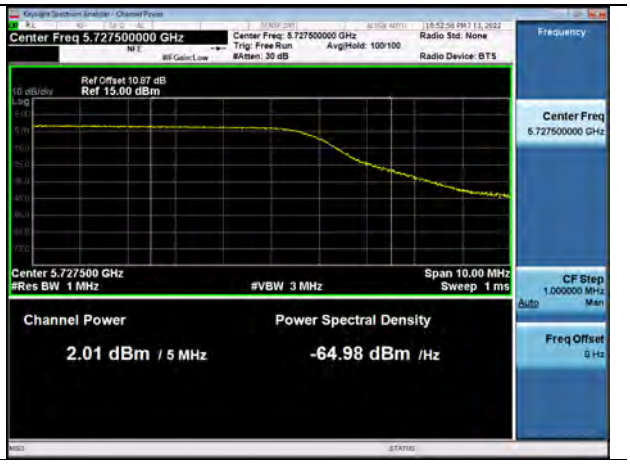
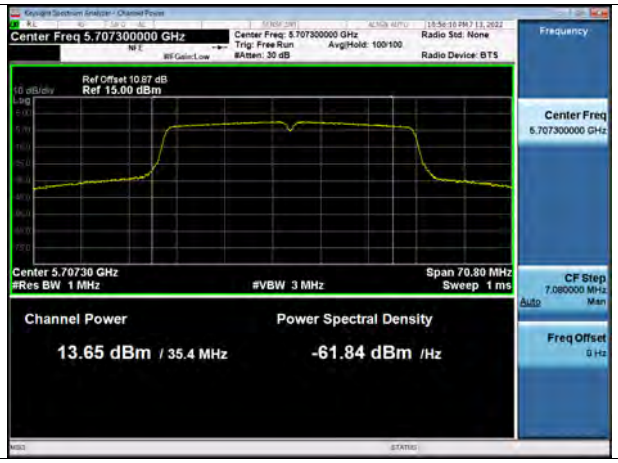
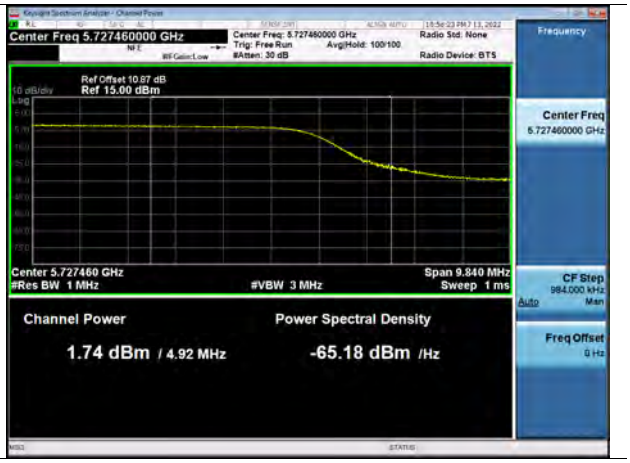
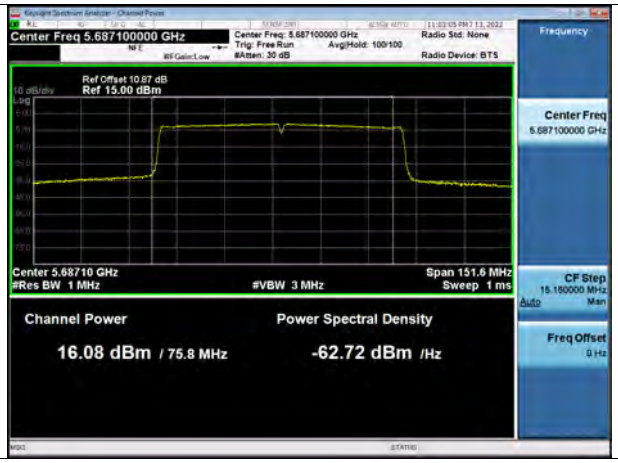
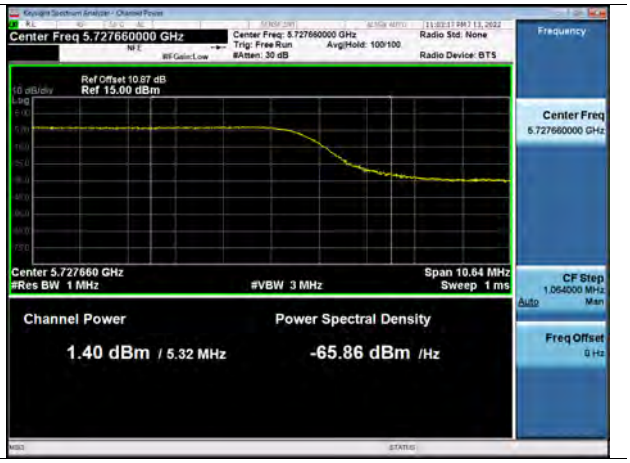
802.11n(HT20) UNII 3 Band



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
	

10.6.4 Power Spectral Density

[ANT1]

Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11a	5720 (UNII 2C Band)	144	5.540	11 dBm/MHz
802.11n(HT20)			4.617	
802.11ac(VHT20)			4.573	
802.11a	5720 (UNII 3 Band)	144	0.621	30 dBm/500kHz
802.11n(HT20)			-0.383	
802.11ac(VHT20)			-0.342	

Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	0.022	11 dBm/MHz
802.11ac(VHT40)			0.032	
802.11n(HT40)	5710 (UNII 3 Band)	142	-5.486	30 dBm/500kHz
802.11ac(VHT40)			-5.683	

Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-1.025	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-6.165	30 dBm/500kHz

[ANT2]

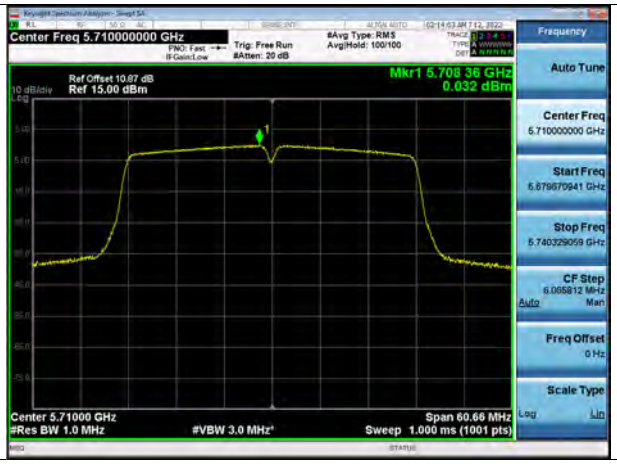
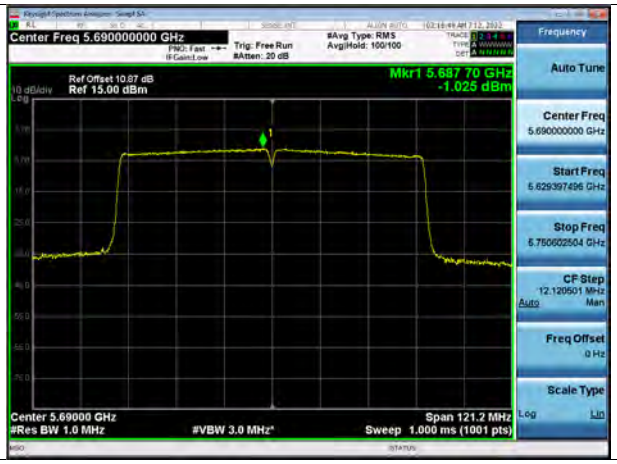
Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11a	5720 (UNII 2C Band)	144	4.355	11 dBm/MHz
802.11n(HT20)			4.036	
802.11ac(VHT20)			3.763	
802.11a	5720 (UNII 3 Band)	144	-0.468	30 dBm/500kHz
802.11n(HT20)			-0.758	
802.11ac(VHT20)			-1.006	

Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	0.558	11 dBm/MHz
802.11ac(VHT40)			0.155	
802.11n(HT40)	5710 (UNII 3 Band)	142	-4.932	30 dBm/500kHz
802.11ac(VHT40)			-5.185	

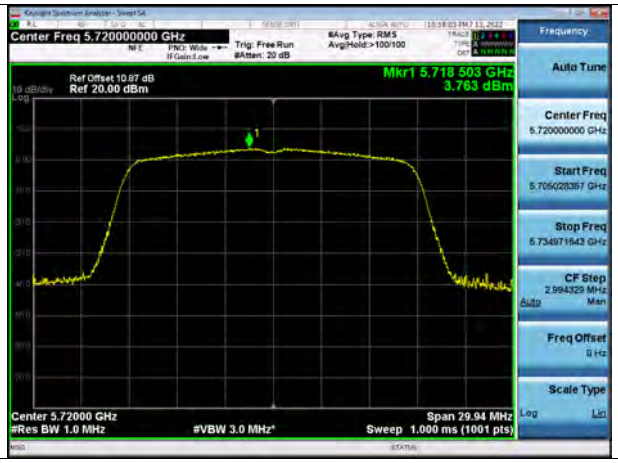
Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-0.896	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-5.699	30 dBm/500kHz

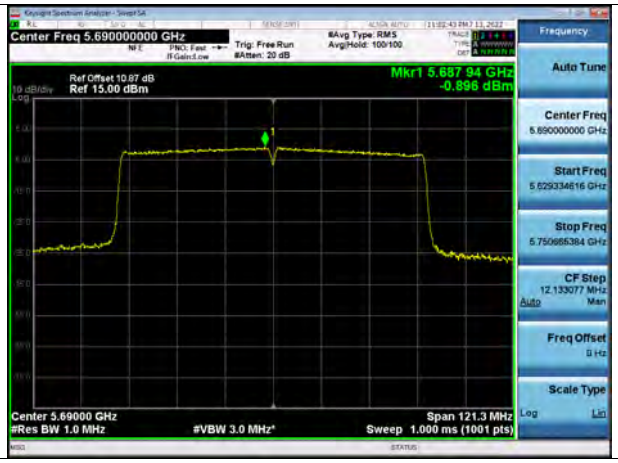
▣ Test Plots_[ANT1]

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
	

▣ Test Plots_**[ANT2]**

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 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

Frequency	Measured Value	A.F+C.L+D.F	Ant. POL	Total	Limit	Margin
[MHz]	[dBµV]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]
No Critical peaks found						

Note:

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

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	Ant. POL	Total	Limit	Margin
[MHz]	[dBµV]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/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.

[Only MIMO]

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	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
10360	50.73	4.62	V	55.35	68.20	12.85	PK
15540	47.36	5.19	V	52.55	73.98	21.43	PK
15540	33.59	5.19	V	38.78	53.98	15.20	AV
10360	50.09	4.62	H	54.71	68.20	13.49	PK
15540	47.77	5.19	H	52.96	73.98	21.02	PK
15540	33.77	5.19	H	38.96	53.98	15.02	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
10400	50.50	4.10	V	54.60	68.20	13.60	PK
15600	48.43	3.72	V	52.15	73.98	21.83	PK
15600	33.89	3.72	V	37.61	53.98	16.37	AV
10400	49.93	4.10	H	54.03	68.20	14.17	PK
15600	48.43	3.72	H	52.15	73.98	21.83	PK
15600	33.89	3.72	H	37.61	53.98	16.37	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
10480	50.19	5.11	V	55.30	68.20	12.90	PK
15720	46.57	3.36	V	49.93	73.98	24.05	PK
15720	33.27	3.36	V	36.63	53.98	17.35	AV
10480	49.67	5.11	H	54.78	68.20	13.42	PK
15720	46.99	3.36	H	50.35	73.98	23.63	PK
15720	33.28	3.36	H	36.64	53.98	17.34	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
10520	50.65	4.77	V	55.42	68.20	12.78	PK
15780	47.69	3.59	V	51.28	73.98	22.70	PK
15780	33.04	3.59	V	36.63	53.98	17.35	AV
10520	49.99	4.77	H	54.76	68.20	13.44	PK
15780	47.75	3.59	H	51.34	73.98	22.64	PK
15780	33.31	3.59	H	36.90	53.98	17.08	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
10600	51.01	4.75	V	55.76	73.98	18.22	PK
10600	37.23	4.75	V	41.98	53.98	12.00	AV
15900	46.04	6.09	V	52.13	73.98	21.85	PK
15900	32.33	6.09	V	38.42	53.98	15.56	AV
10600	50.94	4.75	H	55.69	73.98	18.29	PK
10600	37.19	4.75	H	41.94	53.98	12.04	AV
15900	46.18	6.09	H	52.27	73.98	21.71	PK
15900	32.69	6.09	H	38.78	53.98	15.20	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
10640	52.51	5.04	V	57.55	73.98	16.43	PK
10640	38.14	5.04	V	43.18	53.98	10.80	AV
15960	47.10	4.55	V	51.65	73.98	22.33	PK
15960	33.17	4.55	V	37.72	53.98	16.26	AV
10640	51.75	5.04	H	56.79	73.98	17.19	PK
10640	38.13	5.04	H	43.17	53.98	10.81	AV
15960	47.52	4.55	H	52.07	73.98	21.91	PK
15960	33.27	4.55	H	37.82	53.98	16.16	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
11000	50.68	5.17	V	55.85	73.98	18.13	PK
11000	37.24	5.17	V	42.41	53.98	11.57	AV
16500	46.56	8.27	V	54.83	68.20	13.37	PK
11000	51.92	5.17	H	57.09	73.98	16.89	PK
11000	38.56	5.17	H	43.73	53.98	10.25	AV
16500	46.25	8.27	H	54.52	68.20	13.68	PK

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
11160	49.96	4.25	V	54.21	73.98	19.77	PK
11160	36.41	4.25	V	40.66	53.98	13.32	AV
16740	46.37	7.93	V	54.30	68.20	13.90	PK
11160	50.77	4.25	H	55.02	73.98	18.96	PK
11160	36.77	4.25	H	41.02	53.98	12.96	AV
16740	46.10	7.93	H	54.03	68.20	14.17	PK

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
11440	49.17	4.69	V	53.86	73.98	20.12	PK
11440	35.51	4.69	V	40.20	53.98	13.78	AV
17160	46.49	8.92	V	55.41	68.20	12.79	PK
11440	50.15	4.69	H	54.84	73.98	19.14	PK
11440	36.15	4.69	H	40.84	53.98	13.14	AV
17160	46.39	8.92	H	55.31	68.20	12.89	PK

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
11490	50.64	4.55	V	55.19	73.98	18.79	PK
11490	36.47	4.55	V	41.02	53.98	12.96	AV
17235	46.54	10.31	V	56.85	68.20	11.35	PK
11490	51.26	4.55	H	55.81	73.98	18.17	PK
11490	36.79	4.55	H	41.34	53.98	12.64	AV
17235	46.62	10.31	H	56.93	68.20	11.27	PK

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
11570	50.68	4.82	V	55.50	73.98	18.48	PK
11570	36.15	4.82	V	40.97	53.98	13.01	AV
17355	47.28	9.73	V	57.01	68.20	11.19	PK
11570	51.33	4.82	H	56.15	73.98	17.83	PK
11570	36.99	4.82	H	41.81	53.98	12.17	AV
17355	47.43	9.73	H	57.16	68.20	11.04	PK

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
11650	52.58	4.42	V	57.00	73.98	16.98	PK
11650	37.69	4.42	V	42.11	53.98	11.87	AV
17475	47.19	10.15	V	57.34	68.20	10.86	PK
11650	53.47	4.42	H	57.89	73.98	16.09	PK
11650	39.27	4.42	H	43.69	53.98	10.29	AV
17475	47.60	10.15	H	57.75	68.20	10.45	PK

Note:

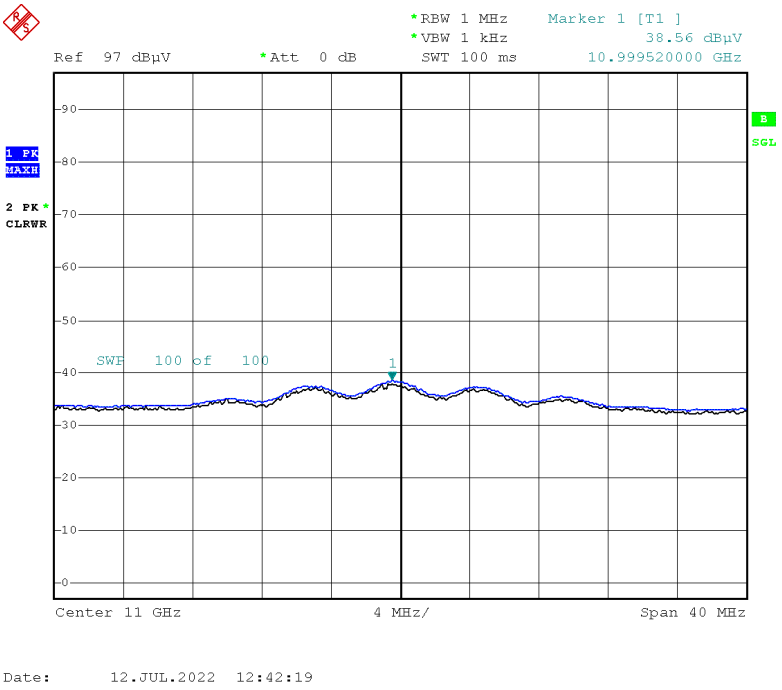
All Modes of operation were investigated and the worst case configuration results are reported.

[Worst case]

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

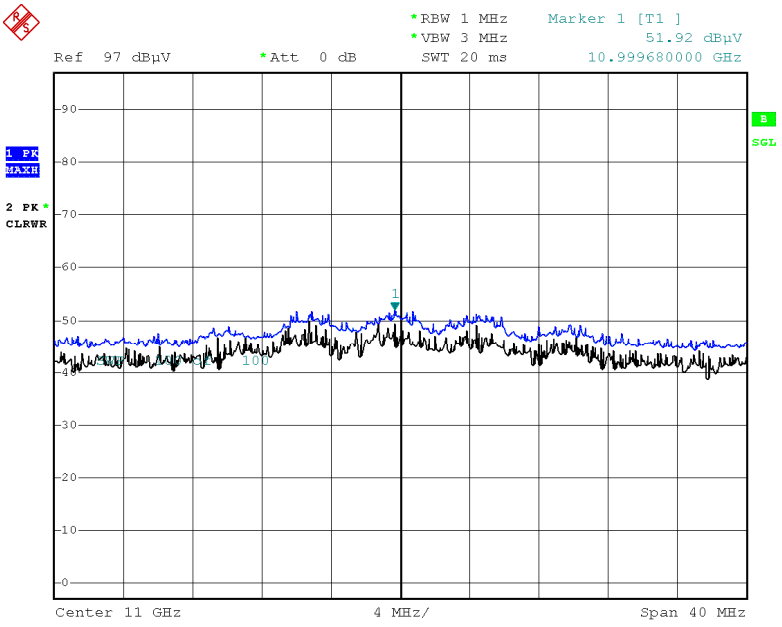
▣ Test Plots

Average Reading (802.11a, Ch.100 2nd Harmonic, Z-H)



Date: 12.JUL.2022 12:42:19

Peak Reading (802.11a, Ch.100 2nd Harmonic, Z-H)



Date: 12.JUL.2022 12:42:30

Note:

Only the worst case plots for Radiated Spurious Emissions.

10.8 RADIATED RESTRICTED BAND EDGE

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5150	45.81	11.85	H	57.66	73.98	16.32	PK
5150	33.49	11.85	H	45.34	53.98	8.64	AV
5150	45.93	11.85	V	57.78	73.98	16.20	PK
5150	33.82	11.85	V	45.67	53.98	8.31	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5350	45.14	11.89	H	57.03	73.98	16.95	PK
5350	32.81	11.89	H	44.70	53.98	9.28	AV
5350	44.97	11.89	V	56.86	73.98	17.12	PK
5350	32.59	11.89	V	44.48	53.98	9.50	AV

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

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5460	46.28	12.31	H	58.59	73.98	15.39	PK
5460	33.54	12.31	H	45.85	53.98	8.13	AV
5470	46.99	12.53	H	59.52	68.20	8.68	PK
5460	46.44	12.31	V	58.75	73.98	15.23	PK
5460	33.63	12.31	V	45.94	53.98	8.04	AV
5470	47.10	12.53	V	59.63	68.20	8.57	PK

Band :	UNII 1
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5150	45.82	11.85	H	57.67	73.98	16.31	PK
5150	33.64	11.85	H	45.49	53.98	8.49	AV
5150	46.34	11.85	V	58.19	73.98	15.79	PK
5150	33.88	11.85	V	45.73	53.98	8.25	AV

Band :	UNII 2A
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5350	45.32	11.89	H	57.21	73.98	16.77	PK
5350	32.94	11.89	H	44.83	53.98	9.15	AV
5350	45.09	11.89	V	56.98	73.98	17.00	PK
5350	32.67	11.89	V	44.56	53.98	9.42	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
Transfer MCS Index:	0
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBμV/m]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
5460	46.24	12.31	H	58.55	73.98	15.43	PK
5460	33.42	12.31	H	45.73	53.98	8.25	AV
5470	46.66	12.53	H	59.19	68.20	9.01	PK
5460	46.46	12.31	V	58.77	73.98	15.21	PK
5460	33.59	12.31	V	45.90	53.98	8.08	AV
5470	47.07	12.53	V	59.60	68.20	8.60	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5150	45.93	11.85	H	57.78	73.98	16.20	PK
5150	33.57	11.85	H	45.42	53.98	8.56	AV
5150	46.05	11.85	V	57.90	73.98	16.08	PK
5150	33.97	11.85	V	45.82	53.98	8.16	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5350	45.50	11.89	H	57.39	73.98	16.59	PK
5350	32.75	11.89	H	44.64	53.98	9.34	AV
5350	45.33	11.89	V	57.22	73.98	16.76	PK
5350	32.47	11.89	V	44.36	53.98	9.62	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT20
Transfer MCS Index:	0
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5460	46.74	12.31	H	59.05	73.98	14.93	PK
5460	33.49	12.31	H	45.80	53.98	8.18	AV
5470	46.93	12.53	H	59.46	68.20	8.74	PK
5460	46.87	12.31	V	59.18	73.98	14.80	PK
5460	33.57	12.31	V	45.88	53.98	8.10	AV
5470	47.19	12.53	V	59.72	68.20	8.48	PK

Band :	UNII 1
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	0
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5150	53.18	11.85	H	65.03	73.98	8.95	PK
5150	37.69	11.85	H	49.54	53.98	4.44	AV
5150	53.61	11.85	V	65.46	73.98	8.52	PK
5150	38.35	11.85	V	50.20	53.98	3.78	AV

Band :	UNII 1
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	0
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5350	52.87	11.89	H	64.76	73.98	9.22	PK
5350	35.80	11.89	H	47.69	53.98	6.29	AV
5350	51.99	11.89	V	63.88	73.98	10.10	PK
5350	35.24	11.89	V	47.13	53.98	6.85	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT40
Transfer MCS Index:	0
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5460	46.28	12.31	H	58.59	73.98	15.39	PK
5460	33.19	12.31	H	45.50	53.98	8.48	AV
5470	49.31	12.53	H	61.84	68.20	6.36	PK
5460	46.74	12.31	V	59.05	73.98	14.93	PK
5460	33.39	12.31	V	45.70	53.98	8.28	AV
5470	50.61	12.53	V	63.14	68.20	5.06	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5150	53.91	11.85	H	65.76	73.98	8.22	PK
5150	38.66	11.85	H	50.51	53.98	3.47	AV
5150	54.19	11.85	V	66.04	73.98	7.94	PK
5150	38.94	11.85	V	50.79	53.98	3.19	AV

Band :	UNII 1
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5350	54.48	11.89	H	66.37	73.98	7.61	PK
5350	36.50	11.89	H	48.39	53.98	5.59	AV
5350	54.34	11.89	V	66.23	73.98	7.75	PK
5350	36.51	11.89	V	48.40	53.98	5.58	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT40
Transfer MCS Index:	0
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5460	45.68	12.31	H	57.99	73.98	15.99	PK
5460	33.09	12.31	H	45.40	53.98	8.58	AV
5470	47.29	12.53	H	59.82	68.20	8.38	PK
5460	45.94	12.31	V	58.25	73.98	15.73	PK
5460	33.11	12.31	V	45.42	53.98	8.56	AV
5470	47.33	12.53	V	59.86	68.20	8.34	PK

Band :	UNII 1
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5210 MHz
Channel No.	42 Ch

Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5150	47.40	11.85	H	59.25	73.98	14.73	PK
5150	34.61	11.85	H	46.46	53.98	7.52	AV
5150	47.54	11.85	V	59.39	73.98	14.59	PK
5150	34.71	11.85	V	46.56	53.98	7.42	AV

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

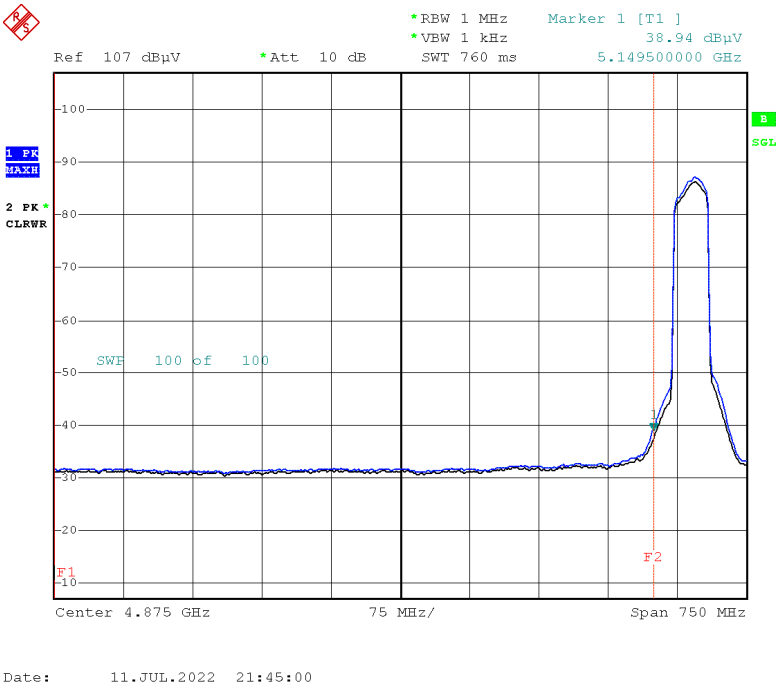
Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5350	46.81	11.89	H	58.70	73.98	15.28	PK
5350	32.96	11.89	H	44.85	53.98	9.13	AV
5350	46.27	11.89	V	58.16	73.98	15.82	PK
5350	32.55	11.89	V	44.44	53.98	9.54	AV

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

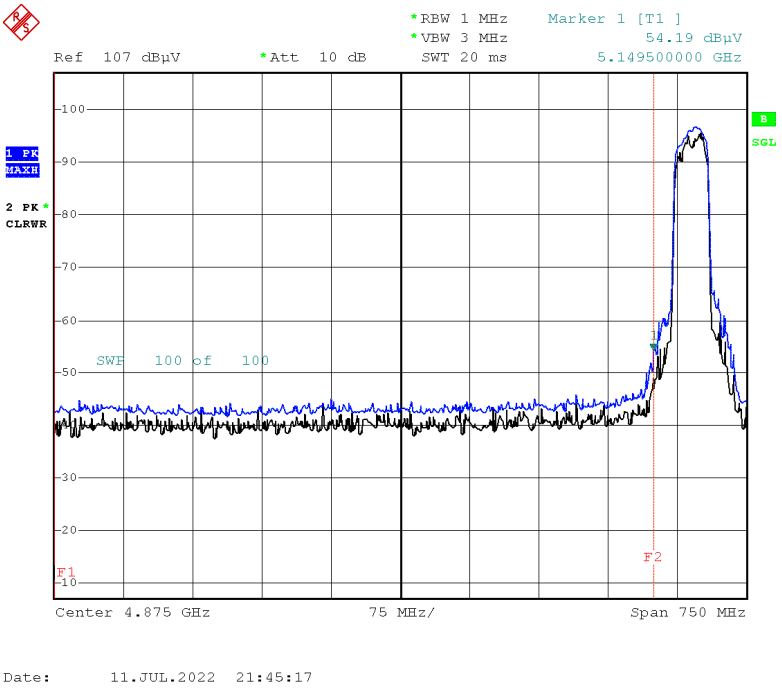
Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5460	45.17	12.31	H	57.48	73.98	16.50	PK
5460	32.08	12.31	H	44.39	53.98	9.59	AV
5470	45.88	12.53	H	58.41	68.20	9.79	PK
5460	45.50	12.31	V	57.81	73.98	16.17	PK
5460	32.39	12.31	V	44.70	53.98	9.28	AV
5470	45.93	12.53	V	58.46	68.20	9.74	PK

▣ Test Plots(UNII 1, 2A, 2C)

AverageReading (802.11ac(40M), Ch.38, **Y-V**)



Peak Reading (802.11ac(40M), Ch.38, **Y-V**)



Note:

Only the worst case plots for Radiated Restricted Band Edge.

10.9 RECEIVER SPURIOUS EMISSIONS

Frequency Range : Below 1 GHz

Frequency	Measured Value	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	[dBµV/m]	dBm/m	dBm	(H/V)	[dBµV/m]	[dBµV/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	Measured Value	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	[dBµV/m]	dBm/m	dBm	(H/V)	[dBµV/m]	[dBµV/m]	dB
No Critical peaks found							

10.10 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

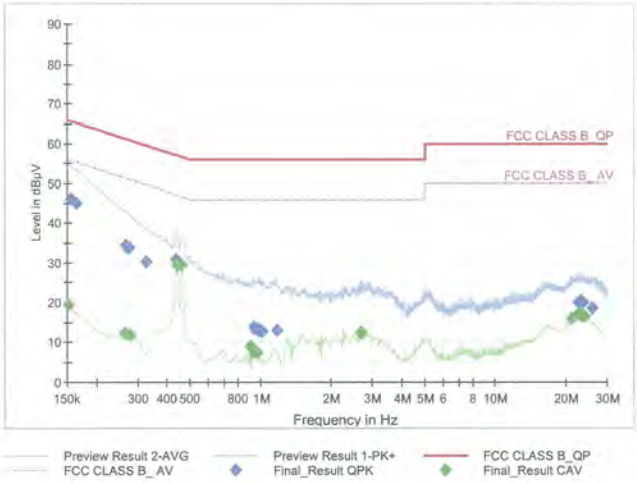
Test 1 / 2

Test Report

Common Information

EUT :	LGSBWAC97
Manufacturer :	LG Innotek
Test Site:	SHIELD ROOM
Operating Conditions :	5G WLAN_L1
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	46.01	65.75	19.74	9.000	L1	OFF	9.6
0.1635	45.01	65.28	20.27	9.000	L1	OFF	9.6
0.2670	34.37	61.21	26.84	9.000	L1	OFF	9.6
0.2760	33.62	60.94	27.32	9.000	L1	OFF	9.6
0.3255	30.22	59.57	29.35	9.000	L1	OFF	9.6
0.4358	30.84	57.14	26.30	9.000	L1	OFF	9.6
0.9365	13.88	56.00	42.12	9.000	L1	OFF	9.6
0.9478	13.34	56.00	42.66	9.000	L1	OFF	9.6
0.9860	13.04	56.00	42.96	9.000	L1	OFF	9.6
0.9905	13.14	56.00	42.86	9.000	L1	OFF	9.6
1.0130	12.79	56.00	43.21	9.000	L1	OFF	9.6
1.1728	12.97	56.00	43.03	9.000	L1	OFF	9.6
22.7278	20.05	60.00	39.96	9.000	L1	OFF	9.9
23.1755	20.11	60.00	39.89	9.000	L1	OFF	9.9
23.3623	20.16	60.00	39.84	9.000	L1	OFF	9.9
23.4275	20.11	60.00	39.89	9.000	L1	OFF	9.9
23.7425	19.93	60.00	40.07	9.000	L1	OFF	9.9
25.8283	18.50	60.00	41.50	9.000	L1	OFF	9.9

2022-06-24 오전 8:21:01

Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	19.25	55.88	36.62	9.000	L1	OFF	9.6
0.2625	12.38	51.35	38.98	9.000	L1	OFF	9.6
0.2693	12.14	51.14	39.00	9.000	L1	OFF	9.6
0.2783	11.90	50.87	38.96	9.000	L1	OFF	9.6
0.4403	29.43	47.06	17.63	9.000	L1	OFF	9.6
0.4605	29.48	46.68	17.21	9.000	L1	OFF	9.6
0.9028	8.99	46.00	37.01	9.000	L1	OFF	9.6
0.9343	7.30	46.00	38.70	9.000	L1	OFF	9.6
0.9658	7.24	46.00	38.76	9.000	L1	OFF	9.6
0.9748	7.16	46.00	38.84	9.000	L1	OFF	9.6
2.6713	12.45	46.00	33.55	9.000	L1	OFF	9.7
2.7005	12.46	46.00	33.54	9.000	L1	OFF	9.7
21.2585	15.86	50.00	34.14	9.000	L1	OFF	9.9
22.7255	16.91	50.00	33.09	9.000	L1	OFF	9.9
23.2025	16.78	50.00	33.22	9.000	L1	OFF	9.9
23.2408	16.77	50.00	33.23	9.000	L1	OFF	9.9
23.4253	16.79	50.00	33.21	9.000	L1	OFF	9.9
23.8640	16.56	50.00	33.44	9.000	L1	OFF	9.9

2022-06-24 오전 8:21:01

Conducted Emissions (Line 2)

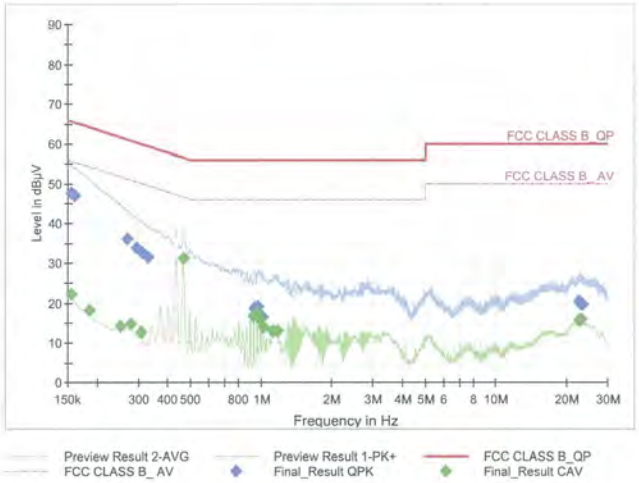
Test 1 / 2

Test Report

Common Information

EUT :	LGSBWAC97
Manufacturer :	LG Innotek
Test Site:	SHIELD ROOM
Operating Conditions :	5G WLAN_N
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	47.57	65.75	18.18	9.000	N	OFF	9.6
0.1613	46.93	65.40	18.47	9.000	N	OFF	9.6
0.2693	35.92	61.14	25.22	9.000	N	OFF	9.6
0.2940	33.83	60.41	26.58	9.000	N	OFF	9.6
0.3120	32.60	59.92	27.32	9.000	N	OFF	9.6
0.3300	31.45	59.45	28.00	9.000	N	OFF	9.6
0.9365	18.74	56.00	37.26	9.000	N	OFF	9.6
0.9410	18.54	56.00	37.46	9.000	N	OFF	9.6
0.9680	18.94	56.00	37.06	9.000	N	OFF	9.6
0.9770	17.42	56.00	38.58	9.000	N	OFF	9.6
0.9838	16.09	56.00	39.91	9.000	N	OFF	9.6
1.0108	16.54	56.00	39.46	9.000	N	OFF	9.6
22.7143	20.47	60.00	39.53	9.000	N	OFF	9.9
22.8763	19.83	60.00	40.17	9.000	N	OFF	9.9
22.9528	20.09	60.00	39.91	9.000	N	OFF	9.9
23.1013	19.99	60.00	40.01	9.000	N	OFF	9.9
23.2048	19.84	60.00	40.16	9.000	N	OFF	9.9
23.4365	19.74	60.00	40.26	9.000	N	OFF	9.9

2022-06-23 오후 9:54:58

Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	22.31	55.75	33.45	9.000	N	OFF	9.6
0.1860	18.18	54.21	36.04	9.000	N	OFF	9.6
0.2513	14.23	51.72	37.49	9.000	N	OFF	9.6
0.2783	14.79	50.87	36.08	9.000	N	OFF	9.6
0.3098	12.84	49.98	37.14	9.000	N	OFF	9.6
0.4673	31.14	46.56	15.42	9.000	N	OFF	9.6
0.9320	16.72	46.00	29.28	9.000	N	OFF	9.6
0.9635	17.28	46.00	28.72	9.000	N	OFF	9.6
0.9950	15.98	46.00	30.02	9.000	N	OFF	9.6
1.0265	13.74	46.00	32.26	9.000	N	OFF	9.6
1.1188	13.08	46.00	32.92	9.000	N	OFF	9.6
1.1795	12.87	46.00	33.13	9.000	N	OFF	9.6
22.7120	15.60	50.00	34.40	9.000	N	OFF	9.9
22.7863	15.54	50.00	34.46	9.000	N	OFF	9.9
22.8965	15.60	50.00	34.40	9.000	N	OFF	9.9
22.9753	15.58	50.00	34.42	9.000	N	OFF	9.9
23.0405	15.75	50.00	34.25	9.000	N	OFF	9.9
23.1868	15.74	50.00	34.26	9.000	N	OFF	9.9

2022-06-23 오후 9:54:58

11. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/23/2022	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	06/07/2023	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	03/04/2023	Annual
Signal Analyzer	N9030A	Keysight	MY55410508	09/07/2022	Annual
Power Meter	N1911A	Agilent	MY45100523	03/24/2023	Annual
Power Sensor	N1921A	Agilent	MY57820067	03/24/2023	Annual
Directional Coupler	87300B	Agilent	3116A03621	11/02/2022	Annual
Power Splitter	11667B	Hewlett Packard	10545	02/03/2023	Annual
DC Power Supply	E3646A	Agilent	MY40002937	12/14/2022	Annual
Attenuator(10 dB) (DC-26.5 GHz)	5910-N-50-010	H+S	00801	10/29/2022	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	03/07/2023	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A
Bluetooth Tester	CBT	Rohde & Schwarz	100808	02/22/2023	Annual

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

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
Controller	EM2090	Emco	060520	N/A	N/A
Turn Table	N/A	Ets	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/17/2024	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	09/04/2022	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/18/2023	Biennial
Horn Antenna (15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Amp & Filter Bank Switch Controller	FBSM-01A	TNM system	0	N/A	N/A
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/06/2023	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/13/2023	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/13/2023	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/07/2023	Annual
ATT(3 dB) + LNA2(6~18 GHz)	18B-03, CBL06185030	WEINSCHEL CERNEX	N/A	12/22/2022	Annual
ATT(10 dB) + LNA1(0.1~18 GHz)	56-10, CBLU1183540B-01	Api tech, CERNEX	N/A	12/22/2022	Annual
High Pass Filter	WHKX10-2700-3000-18000-40SS	Wainwright Instruments	N/A	12/22/2022	Annual
High Pass Filter	WHKX8-6090-7000-18000-40SS	Wainwright Instruments	N/A	12/22/2022	Annual
Thru	COAXIAL ATTENUATOR	T&M SYSTEM	N/A	12/22/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/02/2022	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/11/2023	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	04/05/2023	Annual
Spectrum Analyzer	FSP(9 kHz ~ 30 GHz)	Rohde & Schwarz	836650/016	09/13/2022	Annual
Spectrum Analyzer	FSV40-N(9 kHz ~ 30 GHz)	Rohde & Schwarz	101068-SZ	09/15/2022	Annual

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-2207-FI012-P