고 객 비 밀
CUSTOMER SECRET

TEST REPORT

FCC/ISED UNII Test for LGSBWAC23
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2207-FI007

DATE OF ISSUE
July 20, 2022

Tested by
Kyung Jun Woo

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 LGSBWAC23

REPORT NO.
HCT-RF-2207-FI007

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 LGSBWAC23
FCC ID IC	BEJLGSBWAC23 2703H-LGSBWAC23
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	LGSBWAC23	
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)	LGSBWAC23	
FVIN (Firmware Version Identification Number)	1.0	
HMN (Host Marketing Name)	N/A	
EUT serial numbers	Radiated: ETWCFRBC01-01 Conducted : ETWCFRBC01-02	
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	

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 G_N is the gain of the nth antenna and N_{ANT} 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	
		Ant. 1 Power		Ant. 2 Power		Ant. 1 + Ant. 2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	12.83	0.019	12.91	0.020	15.88	0.039
	802.11n (HT20)	12.77	0.019	12.85	0.019	15.82	0.038
	802.11n (HT40)	12.64	0.018	12.63	0.018	15.65	0.037
	802.11ac (VHT20)	12.15	0.016	12.19	0.017	15.18	0.033
	802.11ac (VHT40)	11.85	0.015	11.84	0.015	14.86	0.031
	802.11ac (VHT80)	11.61	0.014	11.62	0.015	14.63	0.029
UNII2A	802.11a	12.96	0.020	13.23	0.021	16.11	0.041
	802.11n (HT20)	13.08	0.020	13.27	0.021	16.10	0.041
	802.11n (HT40)	13.27	0.021	13.33	0.022	16.31	0.043
	802.11ac (VHT20)	11.93	0.016	12.08	0.016	15.02	0.032
	802.11ac (VHT40)	12.50	0.018	12.54	0.018	15.53	0.036
	802.11ac (VHT80)	12.24	0.017	12.32	0.017	15.29	0.034
UNII2C	802.11a	13.66	0.023	13.72	0.024	16.70	0.047
	802.11n (HT20)	13.34	0.022	13.49	0.022	16.37	0.043
	802.11n (HT40)	13.02	0.020	13.23	0.021	16.14	0.041
	802.11ac (VHT20)	12.46	0.018	12.65	0.018	15.57	0.036
	802.11ac (VHT40)	12.48	0.018	12.57	0.018	15.54	0.036
	802.11ac (VHT80)	12.31	0.017	12.42	0.017	15.38	0.034
UNII3	802.11a	13.66	0.023	13.84	0.024	16.76	0.047
	802.11n (HT20)	13.50	0.022	13.57	0.023	16.55	0.045
	802.11n (HT40)	12.40	0.017	12.74	0.019	15.58	0.036
	802.11ac (VHT20)	12.40	0.017	12.74	0.019	15.58	0.036
	802.11ac (VHT40)	12.45	0.018	12.51	0.018	15.49	0.035
	802.11ac (VHT80)	12.33	0.017	12.41	0.017	15.38	0.035

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.

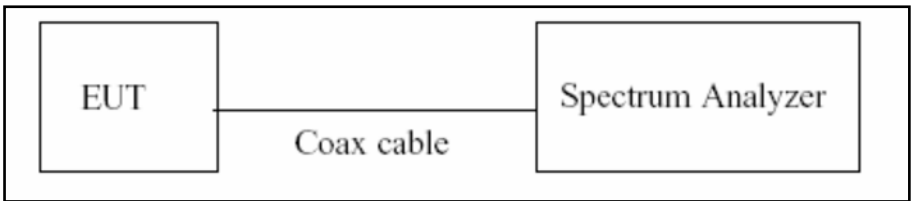
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance

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.

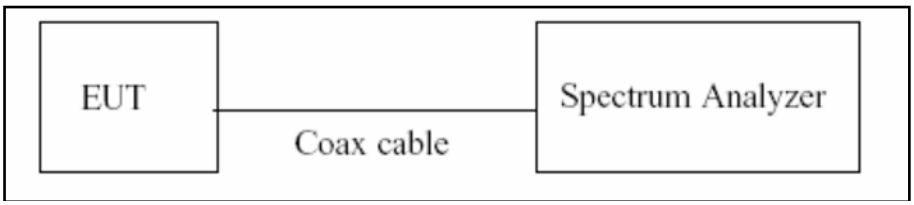
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

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

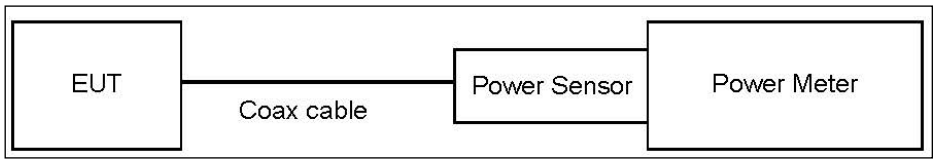
Allow the trace to stabilize

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

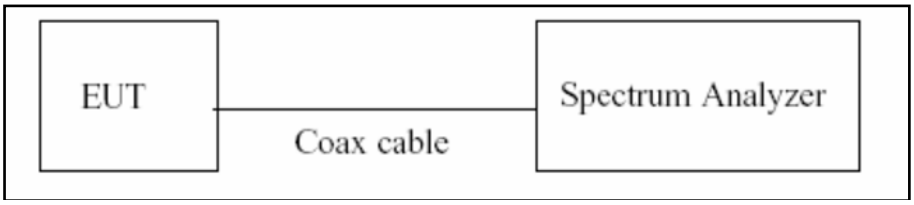
8.3. Output Power Measurement

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

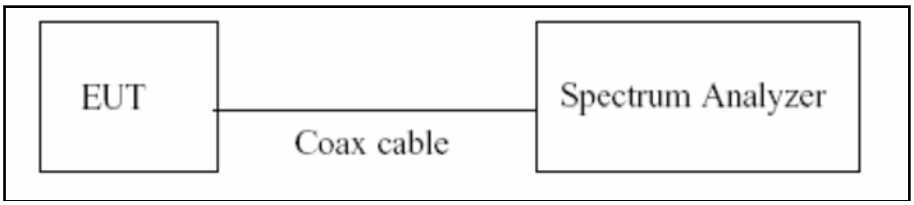
1. Spectrum reading values are not plot data.
   The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	11.74
UNII 2A	11.74
UNII 2C	11.74
UNII 3	11.74

(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	11.74
UNII 2A	11.74
UNII 2C	11.74
UNII 3	11.74

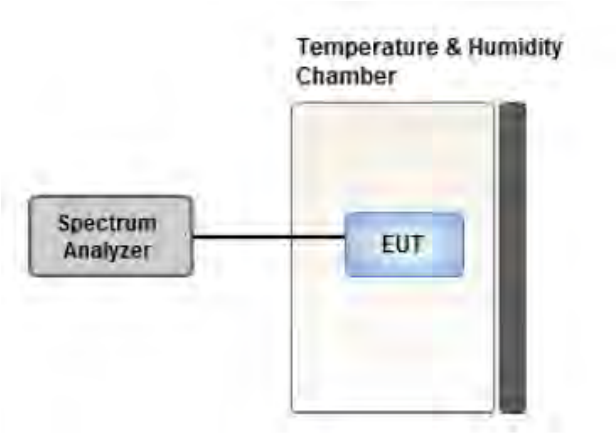
(Actual value of loss for the attenuator and cable combination)

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

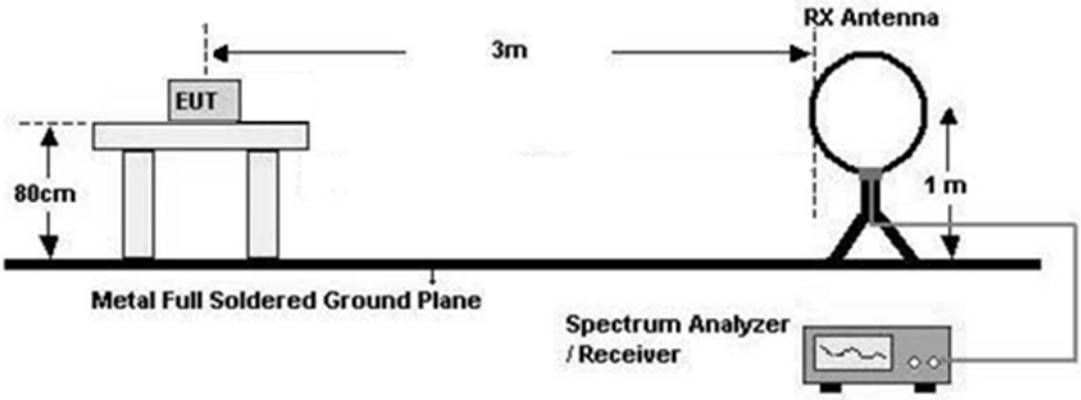
Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	6.37/F(kHz)	300
0.490 – 1.705	63.7/F(kHz)	30
1.705 – 30	0.08	30

FCC&ISED

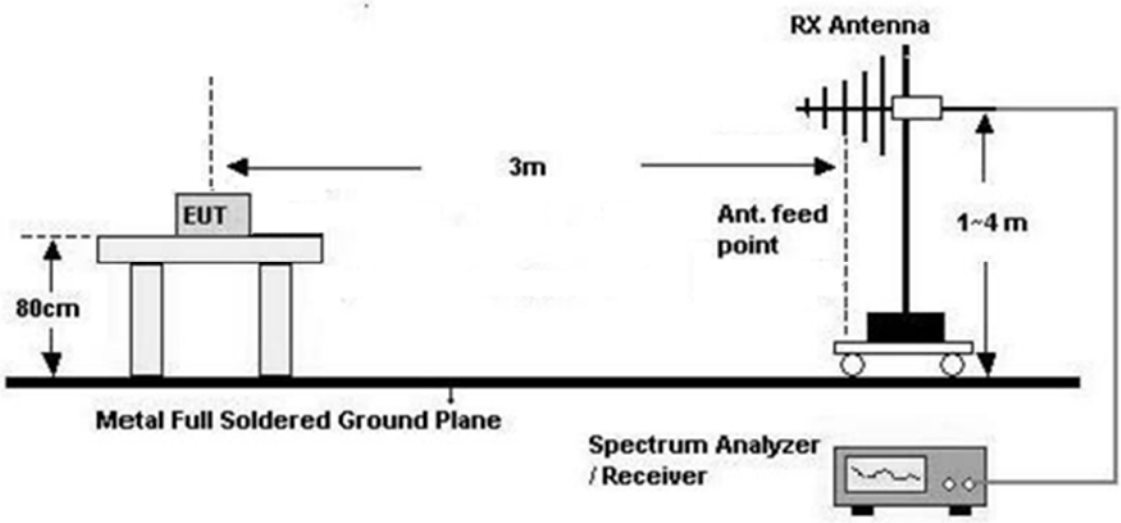
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

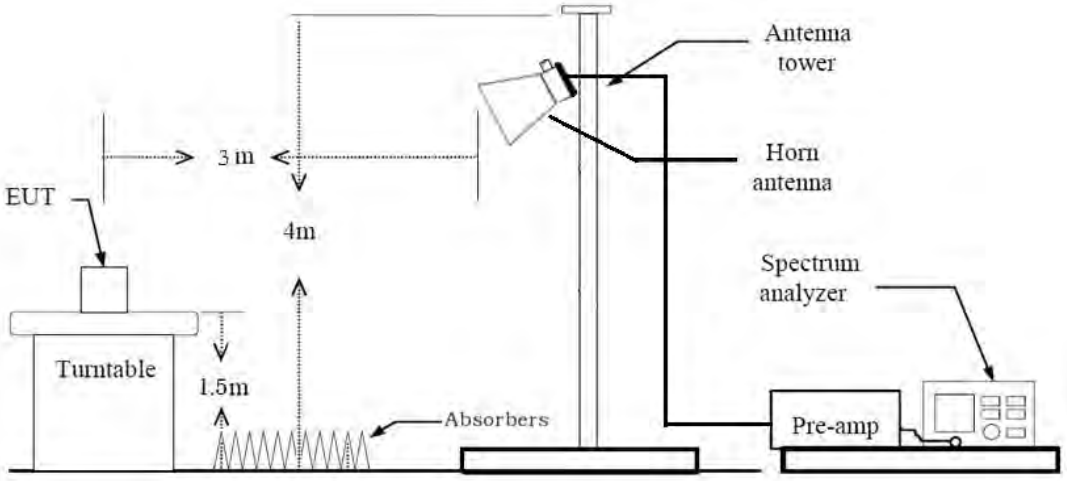
Below 30 MHz



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

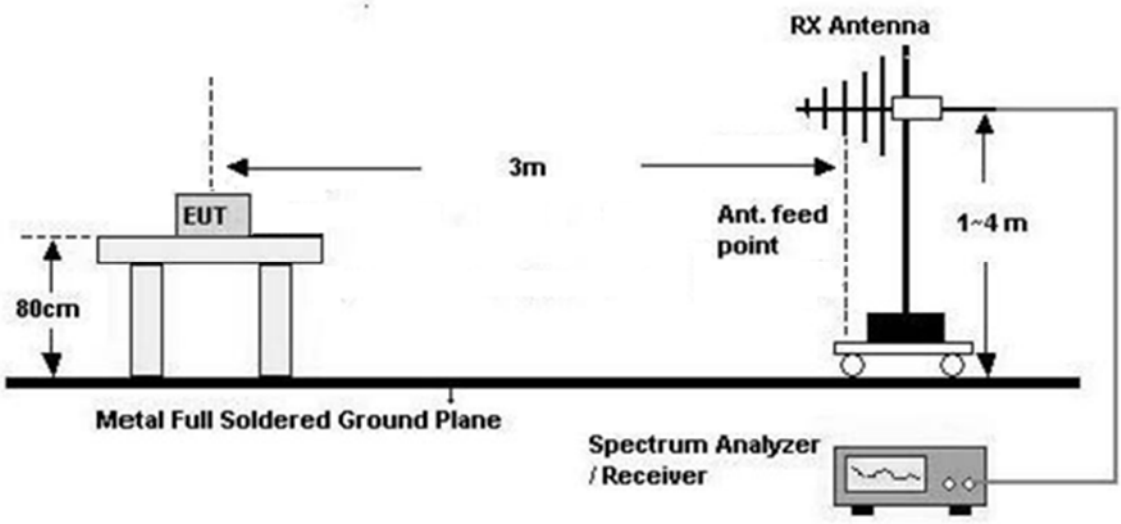
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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):

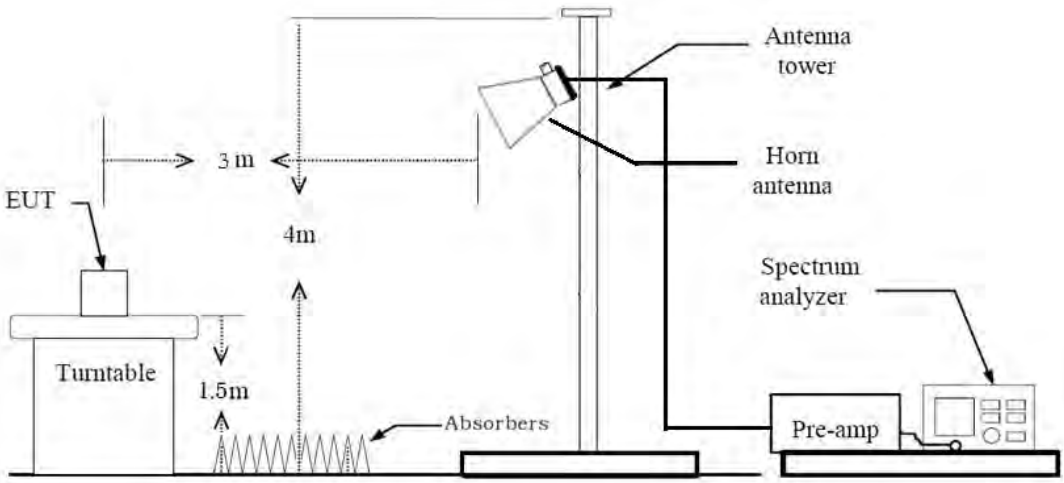
- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW ≥ 3 x RBW

(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

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 : 6Mbps
   - 802.11n20 : MCS0
   - 802.11n40 : MCS0
   - 802.11ac20 : MCS0
   - 802.11ac40 : MCS0
   - 802.11ac80 : MCS0
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	18.40	16.356
5200	40	18.44	16.344
5240	48	18.43	16.365
5260	52	18.47	16.350
5300	60	18.40	16.355
5320	64	18.35	16.360
5500	100	18.43	16.357
5580	116	18.48	16.359
5720	144	18.48	16.359
5745	149	18.37	16.365
5785	157	18.46	16.352
5825	165	18.45	16.355

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.44	17.558
5200	40	19.34	17.547
5240	48	19.36	17.559
5260	52	19.41	17.566
5300	60	19.37	17.554
5320	64	19.29	17.559
5500	100	19.28	17.560
5580	116	19.30	17.551
5720	144	19.43	17.554
5745	149	19.41	17.553
5785	157	19.45	17.553
5825	165	19.42	17.553

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.06	36.079
5230	46	41.07	36.049
5270	54	40.88	36.064
5310	62	41.00	36.056
5510	102	40.85	36.051
5550	110	41.03	36.068
5710	142	41.18	36.084
5755	151	41.45	36.057
5795	159	40.82	36.045

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.35	17.557
5200	40	19.39	17.558
5240	48	19.35	17.552
5260	52	19.42	17.558
5300	60	19.40	17.555
5320	64	19.49	17.552
5500	100	19.34	17.558
5580	116	19.44	17.557
5720	144	19.39	17.554
5745	149	19.50	17.559
5785	157	19.45	17.555
5825	165	19.41	17.558

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.86	36.034
5230	46	40.81	36.028
5270	54	41.29	36.037
5310	62	40.75	36.050
5510	102	41.03	36.082
5550	110	40.98	36.032
5710	142	40.96	36.060
5755	151	41.21	36.068
5795	159	41.05	36.082

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	80.91	74.606
5290	58	80.82	74.575
5530	106	80.89	74.561
5690	138	80.72	74.670
5775	155	81.03	74.642

[ANT2]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	18.40	16.369
5200	40	18.41	16.362
5240	48	18.36	16.365
5260	52	18.38	16.364
5300	60	18.47	16.352
5320	64	18.44	16.368
5500	100	18.31	16.351
5580	116	18.41	16.358
5720	144	18.41	16.363
5745	149	18.37	16.369
5785	157	18.36	16.366
5825	165	18.40	16.369

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.33	17.555
5200	40	19.35	17.555
5240	48	19.42	17.550
5260	52	19.43	17.553
5300	60	19.41	17.546
5320	64	19.38	17.553
5500	100	19.34	17.551
5580	116	19.46	17.549
5720	144	19.36	17.553
5745	149	19.38	17.551
5785	157	19.45	17.559
5825	165	19.47	17.559

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.97	36.043
5230	46	40.80	36.029
5270	54	40.95	36.066
5310	62	41.03	36.053
5510	102	41.07	36.084
5550	110	41.12	36.048
5710	142	40.91	36.075
5755	151	40.92	36.060
5795	159	40.96	36.053

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.36	17.554
5200	40	19.44	17.557
5240	48	19.32	17.550
5260	52	19.38	17.547
5300	60	19.38	17.549
5320	64	19.31	17.546
5500	100	19.44	17.564
5580	116	19.34	17.557
5720	144	19.45	17.556
5745	149	19.39	17.554
5785	157	19.39	17.562
5825	165	19.36	17.554

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.73	36.034
5230	46	40.82	36.023
5270	54	40.87	36.045
5310	62	40.72	36.036
5510	102	41.28	36.059
5550	110	41.08	36.035
5710	142	40.89	36.016
5755	151	40.82	36.037
5795	159	41.06	36.055

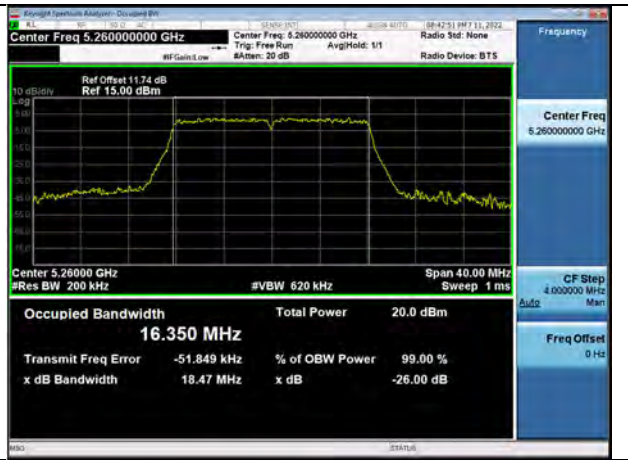
802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	80.84	74.562
5290	58	80.70	74.571
5530	106	80.75	74.556
5690	138	80.91	74.638
5775	155	80.60	74.598

[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 40)	802.11a UNII 2A BAND 26dB Bandwidth (CH 52)
	
802.11a UNII 2C BAND 26dB Bandwidth (CH 116)	802.11a UNII 3 BAND 26dB Bandwidth (CH 157)
	

▣ Test Plots(802.11n(HT20))

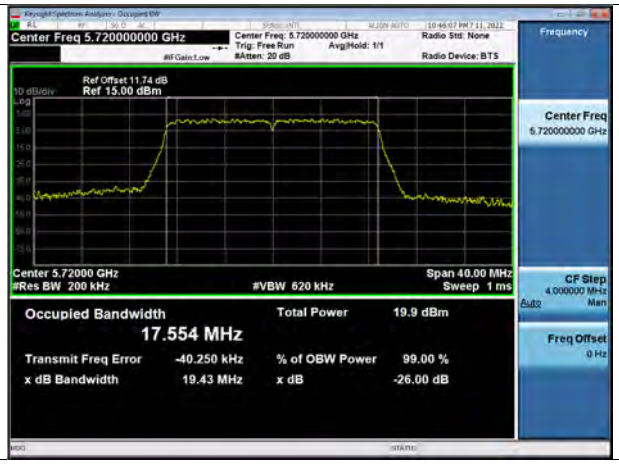
Note:

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

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

802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 52)

802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 144)



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 62)

802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 142)

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 40)

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

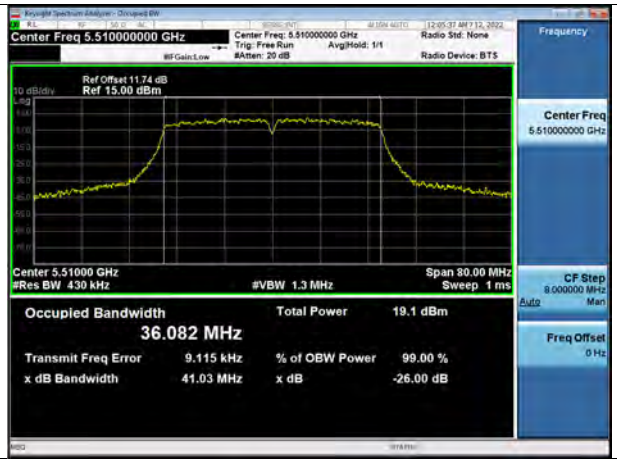
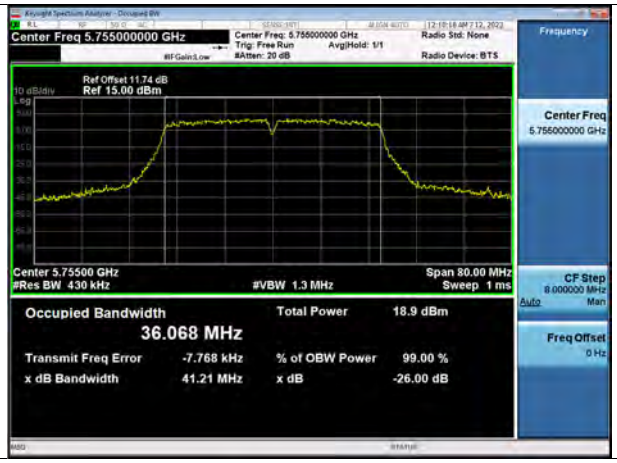
802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 116)

802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 149)

▣ Test Plots(802.11ac(VHT40))

Note:

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

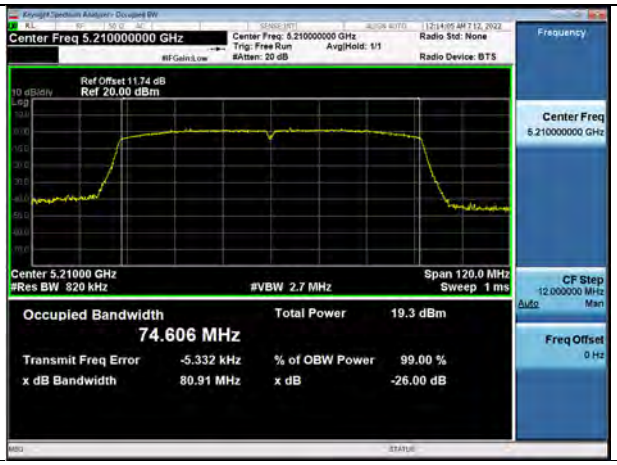
802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)
	
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)	802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)
	

▣ Test Plots(802.11ac(VHT80))

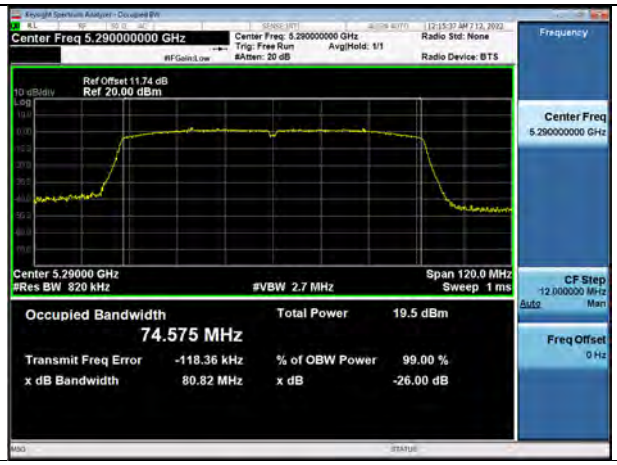
Note:

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

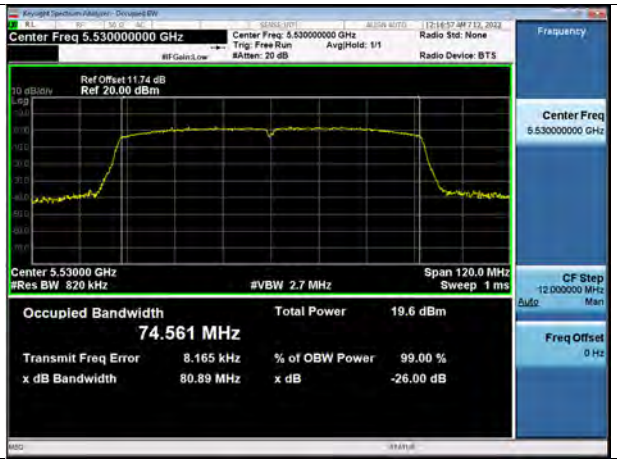
802.11ac_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)



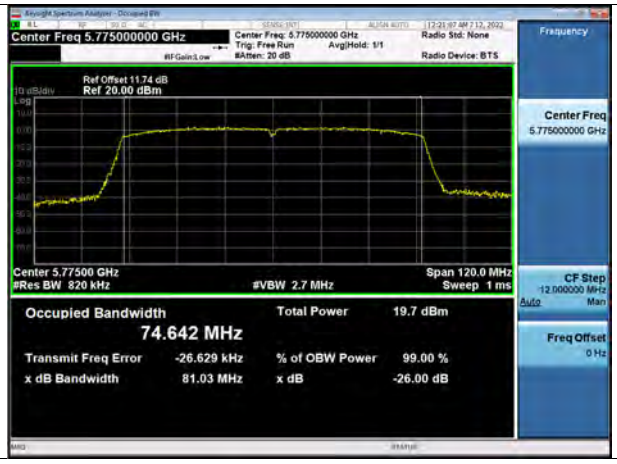
802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)



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



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



[ANT2]

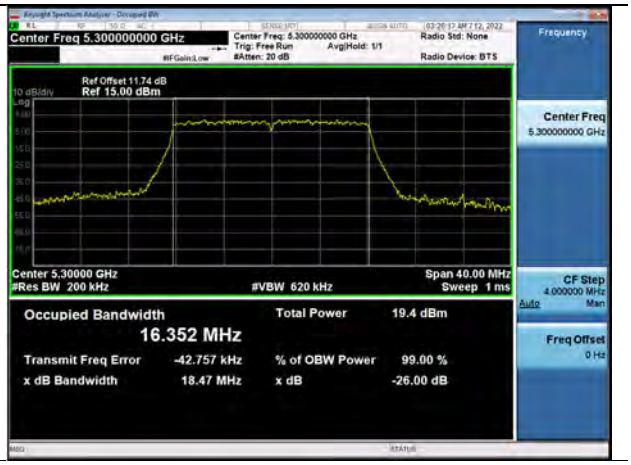
▣ Test Plots(802.11a)

Note:

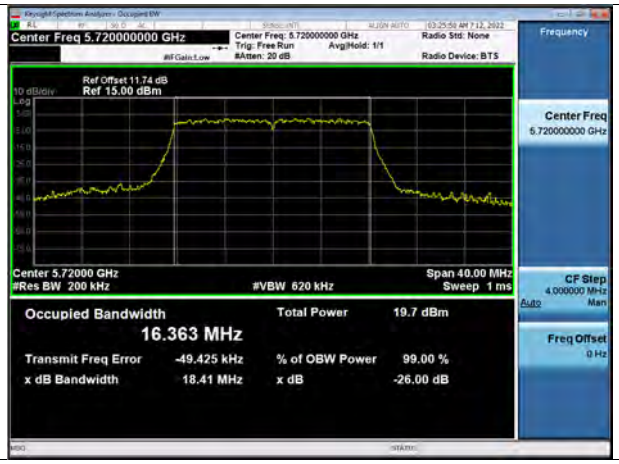
In order to simplify the report, attached plots were only the most wide channel.

802.11a UNII 1 BAND 26dB Bandwidth (CH 40)

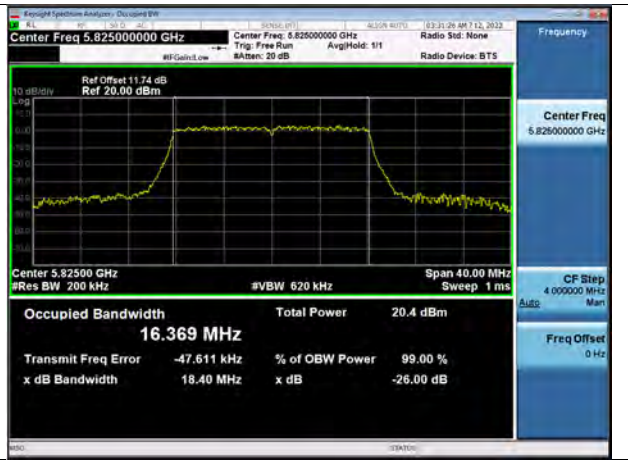
802.11a UNII 2A BAND 26dB Bandwidth (CH 60)



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



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

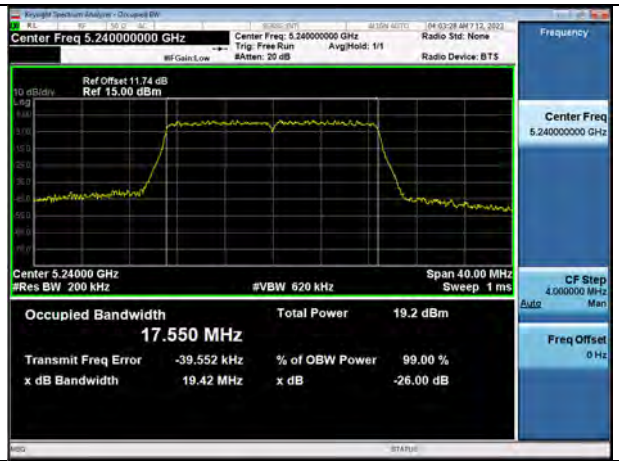


▣ Test Plots(802.11n(HT20))

Note:

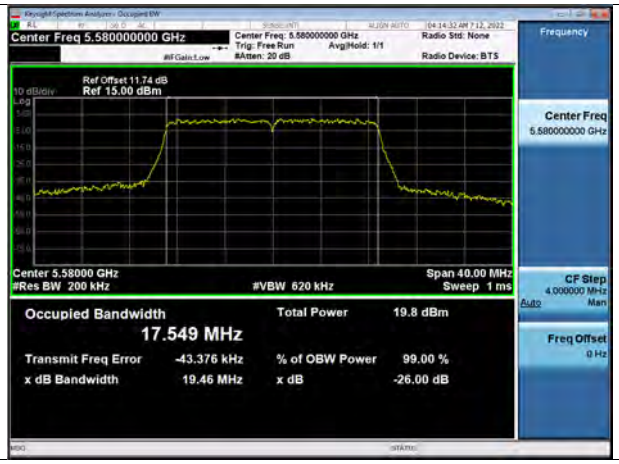
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 48)



802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 52)

802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 116)



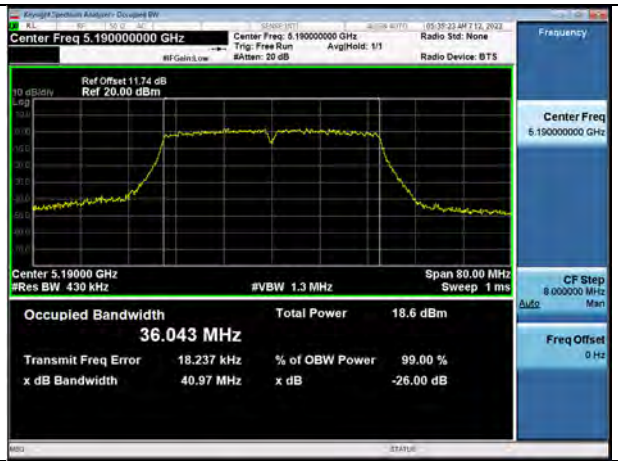
802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 165)

▣ Test Plots(802.11n(HT40))

Note:

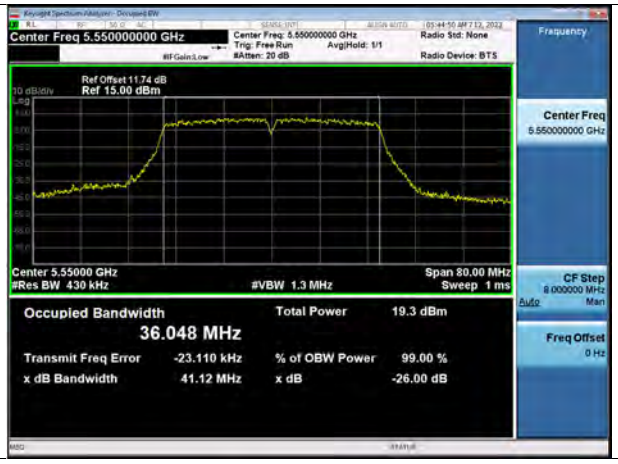
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 38)



802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 62)

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



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

▣ Test Plots(802.11ac(VHT20))

Note:

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

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 40)

802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 60)

802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)

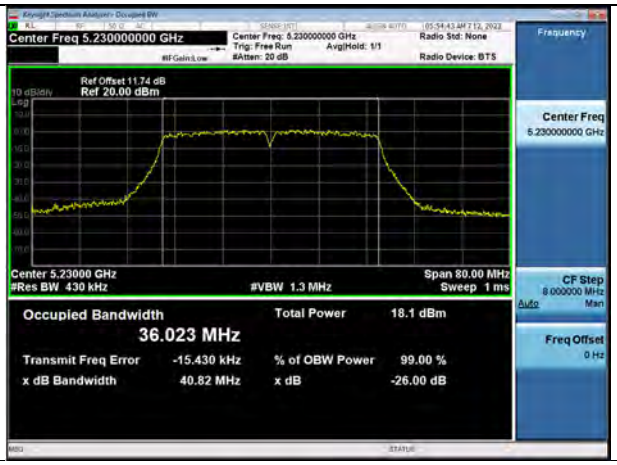
802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)

▣ Test Plots(802.11ac(VHT40))

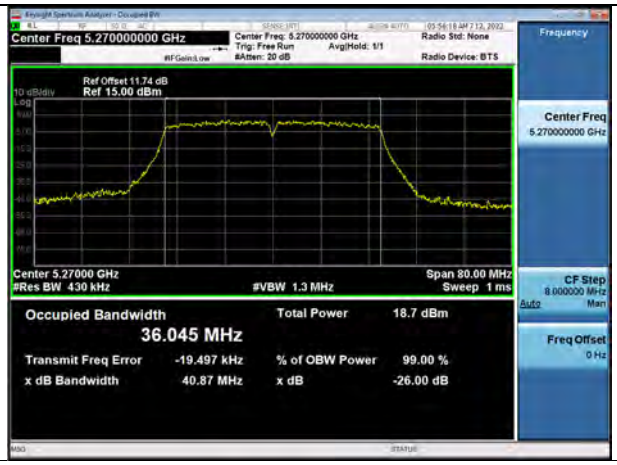
Note:

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

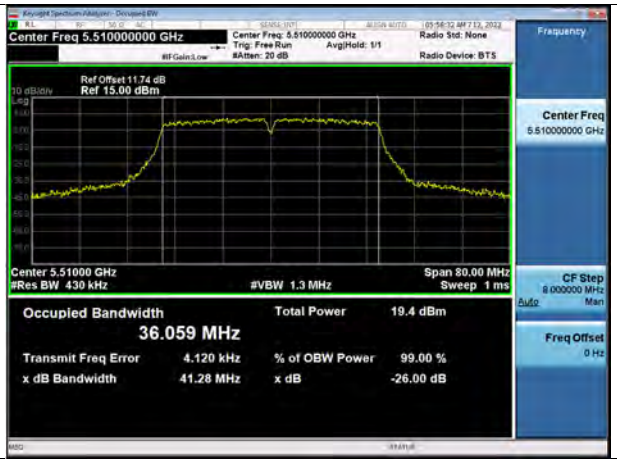
802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 46)



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



802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)



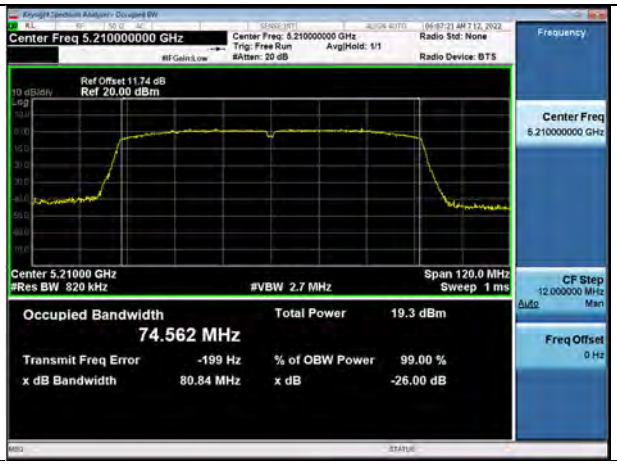
802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)

▣ Test Plots(802.11ac(VHT80))

Note:

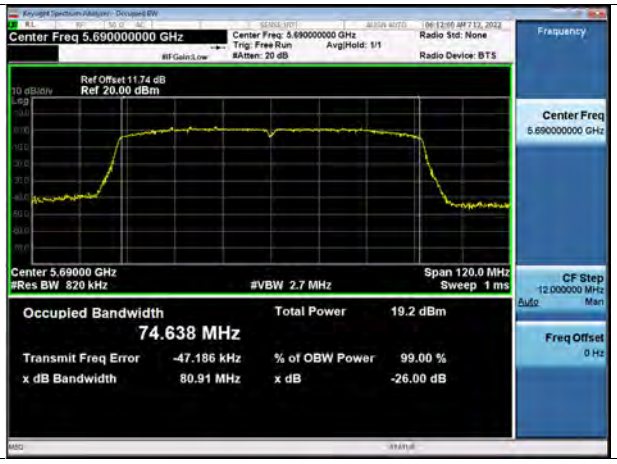
In order to simplify the report, attached plots were only the most wide channel.

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

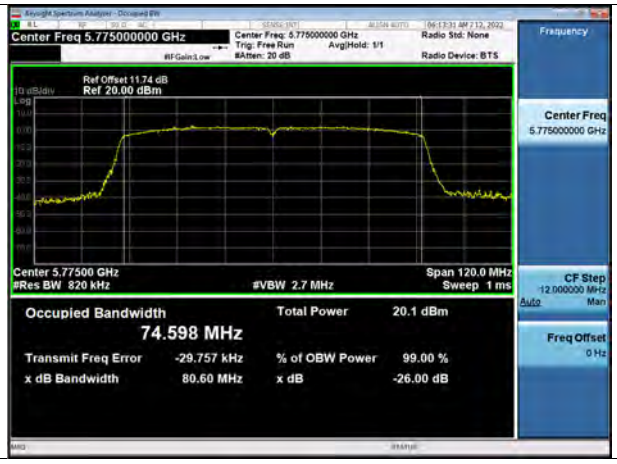


802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)

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



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



10.2 6DB BANDWIDTH

[ANT1]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.52	> 0.5	Pass
5785	157	16.52	> 0.5	Pass
5825	165	16.52	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.68	> 0.5	Pass
5785	157	17.72	> 0.5	Pass
5825	165	17.70	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.47	> 0.5	Pass
5795	159	36.47	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.69	> 0.5	Pass
5785	157	17.73	> 0.5	Pass
5825	165	17.72	> 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	36.44	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.70	> 0.5	Pass

[ANT2]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.50	> 0.5	Pass
5785	157	16.48	> 0.5	Pass
5825	165	16.49	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.71	> 0.5	Pass
5785	157	17.70	> 0.5	Pass
5825	165	17.72	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.48	> 0.5	Pass
5795	159	36.47	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.67	> 0.5	Pass
5785	157	17.71	> 0.5	Pass
5825	165	17.74	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.42	> 0.5	Pass
5795	159	36.45	> 0.5	Pass

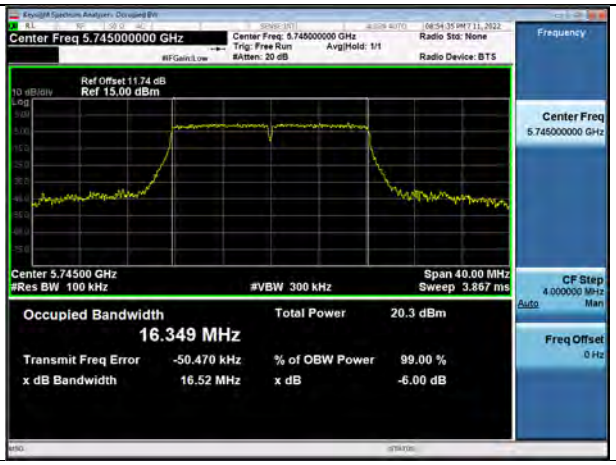
802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.08	> 0.5	Pass

[ANT1]

▣ Test Plots

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

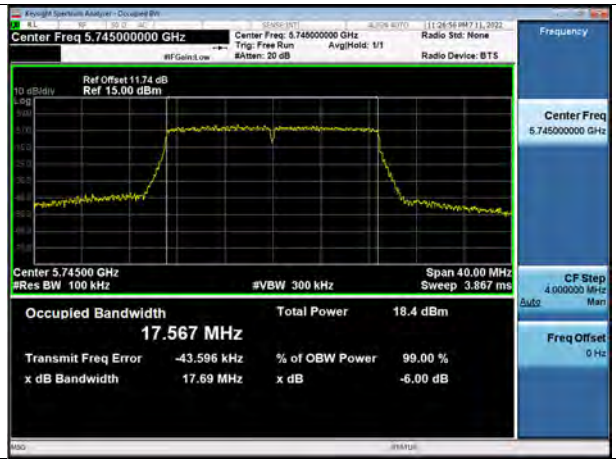
802.11a (CH.149)



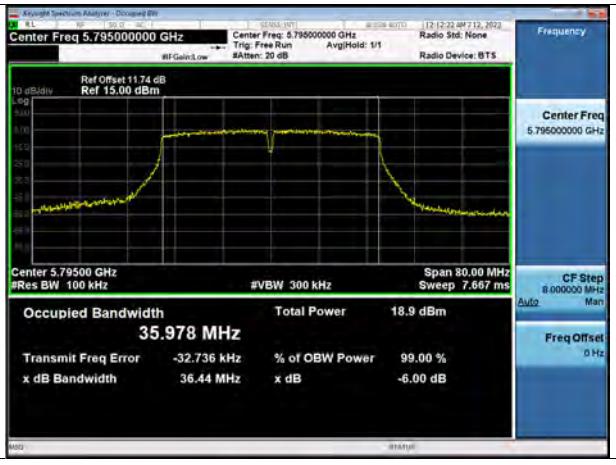
802.11n(HT20) (CH.149)

802.11n(HT40) (CH.151)

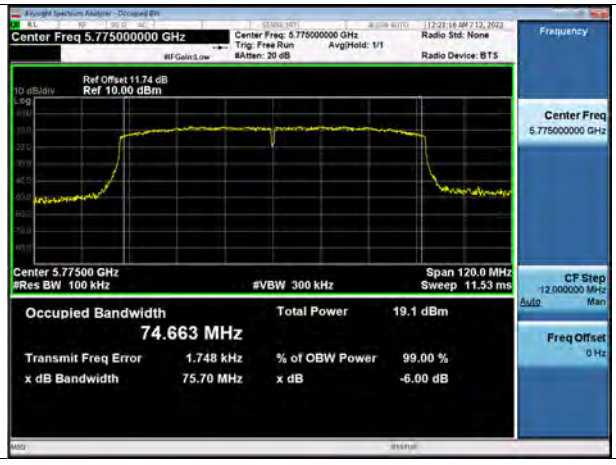
802.11ac(VHT20) (CH.149)



802.11ac(VHT40) (CH.159)



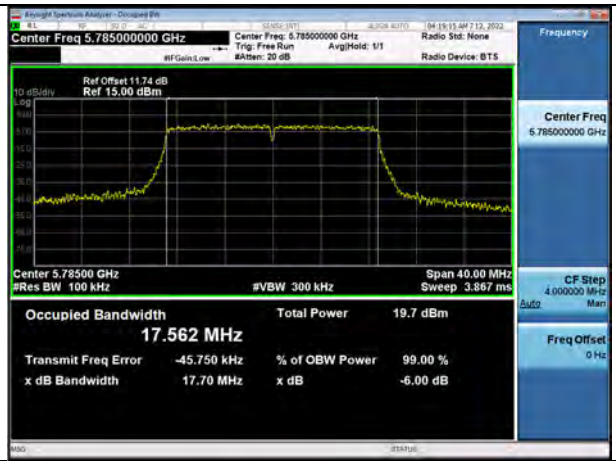
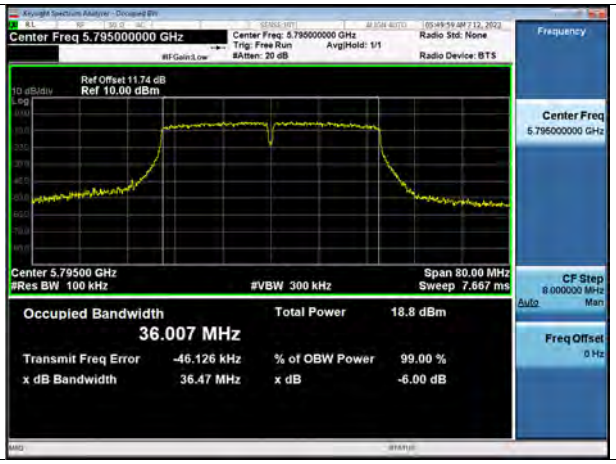
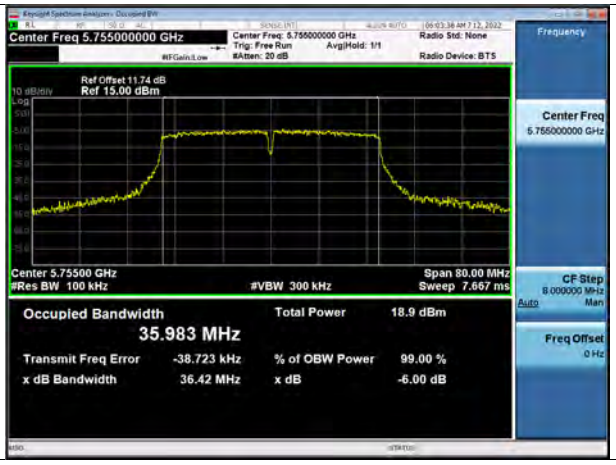
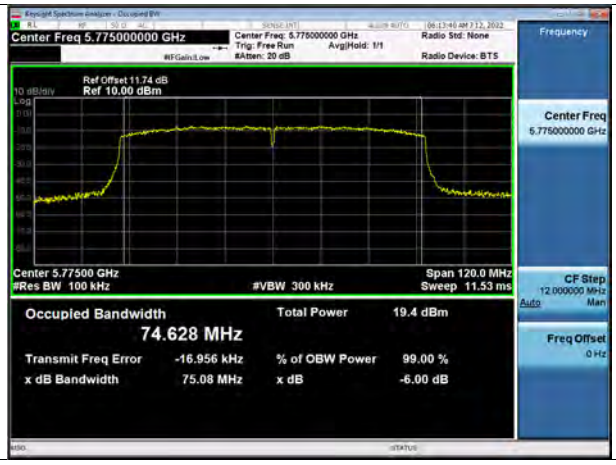
802.11ac(VHT80) (CH.155)



[ANT2]

▣ Test Plots

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

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

10.3 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 caculations follow Setion 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	23.64
			Ant 2	23.66
	UNII 2C		Ant 1	23.64
			Ant 2	23.66
	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			23.64
	UNII 2C			23.63
	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	22.13	N/A
			Ant. 2	22.14	N/A
	UNII 2A		Ant. 1	29.14	23.14
			Ant. 2	29.14	23.14
	UNII 2C		Ant. 1	29.14	23.14
			Ant. 2	29.14	23.14
	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	22.13	N/A
	UNII 2A			29.14	23.14
	UNII 2C			29.14	23.14
	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	12.41	1.50	13.91	12.66	1.50	14.16
	5200	40		12.54		14.04	12.63		14.13
	5240	48		12.83		14.33	12.91		14.41
	5260	52		12.95	1.50	14.45	13.10	1.50	14.60
	5300	60		12.96		14.46	13.05		14.55
	5320	64		12.96		14.46	13.23		14.73
	5500	100		13.39	1.48	14.87	13.63	1.46	15.09
	5580	116		13.38		14.86	13.58		15.04
	5720	144		13.66		15.14	13.72		15.18
	5745	149		13.54	-	-	13.65	-	-
	5785	157		13.18		-	13.27		-
	5825	165		13.66		-	13.84		-

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	MCS 0 (6.5 Mbps)	12.61	1.50	14.11	12.67	1.50	14.17
	5200	40		12.77		14.27	12.85		14.35
	5240	48		12.55		14.05	12.64		14.14
	5260	52		13.08	1.50	14.58	13.01	1.50	14.51
	5300	60		12.90		14.40	13.27		14.77
	5320	64		12.80		14.30	13.11		14.61
	5500	100		13.13	1.48	14.61	13.35	1.46	14.81
	5580	116		13.22		14.70	13.49		14.95
	5720	144		13.34		14.82	13.32		14.78
	5745	149		13.50	-	-	13.57	-	-
	5785	157		13.45		-	13.43		-
	5825	165		13.45		-	13.42		-

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	MCS 0 (6.5 Mbps)	12.09	1.50	13.59	12.11	1.50	13.61
	5200	40		12.15		13.65	12.19		13.69
	5240	48		12.01		13.51	12.10		13.60
	5260	52		11.76	1.50	13.26	11.83	1.50	13.33
	5300	60		11.31		12.81	11.41		12.91
	5320	64		11.93		13.43	12.08		13.58
	5500	100		11.84	1.48	13.32	12.07	1.46	13.53
	5580	116		12.22		13.70	12.36		13.82
	5720	144		12.46		13.94	12.65		14.11
	5745	149		12.30	-	-	12.44	-	-
	5785	157		12.25		-	12.39		-
	5825	165		12.40		-	12.74		-

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	MCS 0 (13.5 Mbps)	12.35	1.50	13.85	12.40	1.50	13.90
	5230	46		12.64		14.14	12.63		14.13
	5270	54		12.86	1.50	14.36	12.94	1.50	14.44
	5310	62		13.27		14.77	13.33		14.83
	5510	102		12.92	1.48	14.40	13.05	1.46	14.51
	5550	110		12.82		14.30	13.08		14.54
	5710	142		13.02		14.50	13.23		14.69
	5755	151		13.14	-	-	13.11	-	-
	5795	159		13.13		-	13.18		-

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 (VHT40)	5190	38	MCS 0 (13.5 Mbps)	11.85	1.50	13.35	11.84	1.50	13.34
	5230	46		11.53		12.03	11.41		12.91
	5270	54		12.04	1.50	13.54	12.15	1.50	13.65
	5310	62		12.50		14.00	12.54		14.04
	5510	102		12.48	1.48	13.96	12.57	1.46	14.03
	5550	110		12.43		13.91	12.55		14.01
	5710	142		12.27		13.75	12.25		13.71
	5755	151		12.30	-	-	12.40	-	-
	5795	159		12.45		-	12.51		-

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)	11.61	1.50	13.11	11.62	1.50	13.12
	5290	58		12.24	1.50	13.74	12.32	1.50	13.82
	5530	106		12.31	1.48	13.79	12.42	1.46	13.88
	5690	138		12.19		13.67	12.23		13.69
	5775	155		12.33	-	-	12.41	-	-

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	15.55	4.51	20.06
	5200	40		15.60		20.11
	5240	48		15.88		20.39
	5260	52		16.04	4.51	20.55
	5300	60		16.02		20.53
	5320	64		16.11		20.62
	5500	100		16.52	4.48	21.00
	5580	116		16.49		20.97
	5720	144		16.70		21.18
	5745	149		16.61	-	-
	5785	157		16.24		-
	5825	165		16.76		-

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)	15.65	4.51	20.16
	5200	40		15.82		20.33
	5240	48		15.61		20.12
	5260	52		16.06	4.51	20.57
	5300	60		16.10		20.61
	5320	64		15.97		20.48
	5500	100		16.25	4.48	20.73
	5580	116		16.37		20.85
	5720	144		16.34		20.82
	5745	149		16.55	-	-
	5785	157		16.45		-
	5825	165		16.45		-

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)	15.11	4.51	19.62
	5200	40		15.18		19.69
	5240	48		15.07		19.58
	5260	52		14.80	4.51	19.31
	5300	60		14.37		18.88
	5320	64		15.02		19.53
	5500	100		14.97	4.48	19.45
	5580	116		15.30		19.78
	5720	144		15.57		20.05
	5745	149		15.38	-	-
	5785	157		15.33		-
	5825	165		15.58		-

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)	15.39	4.51	19.90
	5230	46		15.65		20.16
	5270	54		15.91	4.51	20.42
	5310	62		16.31		20.82
	5510	102		16.00	4.48	20.48
	5550	110		15.96		20.44
	5710	142		16.14		20.62
	5755	151		16.14	-	-
	5795	159		16.17		-

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)	14.86	4.51	19.37
	5230	46		14.48		18.99
	5270	54		15.11	4.51	19.62
	5310	62		15.53		20.04
	5510	102		15.54	4.48	20.02
	5550	110		15.50		19.98
	5710	142		15.27		19.75
	5755	151		15.36	-	-
	5795	159		15.49		-

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)	14.63	4.51	19.14
	5230	46		15.29	4.51	19.80
	5270	54		15.38	4.48	19.86
	5310	62		15.22		19.70
	5510	102		15.38	-	-

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	1.511	3.011
5200	40		1.447	2.947
5240	48		1.781	3.281
5260	52		2.055	-
5300	60		1.831	-
5320	64		1.887	-
5500	100		2.405	-
5580	116		2.455	-
5720	144		2.564	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11a	-0.326
5785	157		-0.697
5825	165		0.019

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11n (HT20)	1.415	2.915
5200	40		1.545	3.045
5240	48		1.205	2.705
5260	52		1.713	-
5300	60		1.615	-
5320	64		1.487	-
5500	100		1.904	-
5580	116		1.871	-
5720	144		2.274	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11n (HT20)	-0.503
5785	157		-0.518
5825	165		-0.279

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11ac (VHT20)	1.117	2.617
5200	40		1.230	2.730
5240	48		1.433	2.933
5260	52		1.909	-
5300	60		1.710	-
5320	64		1.677	-
5500	100		1.726	-
5580	116		1.822	-
5720	144		1.815	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11ac (VHT20)	-1.931
5785	157		-1.888
5825	165		-2.185

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11n (HT40)	-2.313	-0.813
5230	46		-2.573	-1.073
5270	54		-2.354	-
5310	62		-2.282	-
5510	102		-1.591	-
5500	110		-1.535	-
5710	142		-1.562	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11n (HT40)	-4.460
5795	159		-4.268

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11ac (VHT40)	-2.061	-0.561
5230	46		-2.524	-1.024
5270	54		-2.082	-
5310	62		-1.480	-
5510	102		-1.503	-
5500	110		-1.492	-
5710	142		-1.557	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11ac (VHT40)	-4.645
5795	159		-4.491

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5210	42	802.11ac (VHT80)	-5.647	-4.147
5290	58		-4.967	-
5530	106		-4.707	-
5690	138		-4.982	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5775	155	802.11ac (VHT80)	-7.629

[Ant. 2]

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11a	1.683	3.183
5200	40		1.696	3.196
5240	48		1.862	3.362
5260	52		2.121	-
5300	60		1.989	-
5320	64		2.201	-
5500	100		2.540	-
5580	116		2.327	-
5720	144		3.035	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11a	0.031
5785	157		-0.459
5825	165		0.134

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11n (HT20)	1.502	3.002
5200	40		1.619	3.119
5240	48		1.417	2.917
5260	52		1.712	-
5300	60		1.837	-
5320	64		1.868	-
5500	100		2.135	-
5580	116		2.150	-
5720	144		2.064	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11n (HT20)	-0.531
5785	157		-0.789
5825	165		-0.649

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11ac (VHT20)	1.413	2.913
5200	40		1.328	2.828
5240	48		1.697	3.197
5260	52		2.051	-
5300	60		1.744	-
5320	64		1.595	-
5500	100		1.926	-
5580	116		1.911	-
5720	144		1.922	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11ac (VHT20)	-1.993
5785	157		-1.810
5825	165		-1.701

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11n (HT40)	-2.255	-0.755
5230	46		-2.472	-0.972
5270	54		-2.011	-
5310	62		-2.075	-
5510	102		-1.709	-
5500	110		-1.629	-
5710	142		-1.558	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11n (HT40)	-4.482
5795	159		-4.256

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11ac (VHT40)	-2.210	-0.710
5230	46		-2.428	-0.928
5270	54		-1.808	-
5310	62		-1.614	-
5510	102		-1.377	-
5500	110		-1.487	-
5710	142		-1.866	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11ac (VHT40)	-4.491
5795	159		-4.508

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5210	42	802.11ac (VHT80)	-5.539	-4.039
5290	58		-4.980	-
5530	106		-4.469	-
5690	138		-5.007	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5775	155	802.11ac (VHT80)	-7.372

[MIMO(CDD)]

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11a	4.608	9.118
5200	40		4.583	9.093
5240	48		4.832	9.342
5260	52		5.098	-
5300	60		4.921	-
5320	64		5.056	-
5500	100		5.483	-
5580	116		5.402	-
5720	144		5.813	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11a	2.865
5785	157		2.433
5825	165		3.087

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11n (HT20)	4.469	8.979
5200	40		4.592	9.103
5240	48		4.322	8.832
5260	52		4.723	-
5300	60		4.737	-
5320	64		4.690	-
5500	100		5.031	-
5580	116		5.022	-
5720	144		5.180	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11n (HT20)	2.493
5785	157		2.358
5825	165		2.548

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5180	36	802.11ac (VHT20)	4.277	8.787
5200	40		4.289	8.800
5240	48		4.576	9.087
5260	52		4.991	-
5300	60		4.737	-
5320	64		4.646	-
5500	100		4.837	-
5580	116		4.877	-
5720	144		4.879	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5745	149	802.11ac (VHT20)	1.048
5785	157		1.161
5825	165		1.071

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11n (HT40)	0.726	5.237
5230	46		0.488	4.998
5270	54		0.829	-
5310	62		0.832	-
5510	102		1.361	-
5500	110		1.428	-
5710	142		1.450	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11n (HT40)	-1.461
5795	159		-1.252

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5190	38	802.11ac (VHT40)	0.875	5.385
5230	46		0.534	5.045
5270	54		1.066	-
5310	62		1.464	-
5510	102		1.571	-
5500	110		1.521	-
5710	142		1.300	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5755	151	802.11ac (VHT40)	-1.557
5795	159		-1.489

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density	
			PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
5210	42	802.11ac (VHT80)	-2.583	1.928
5290	58		-1.963	-
5530	106		-1.577	-
5690	138		-1.984	-

Frequency (MHz)	Channel No.	Mode	Max. Power Spectral Density
			PSD (dBm/510 kHz)
5775	155	802.11ac (VHT80)	-4.489

[Ant1]

Note:

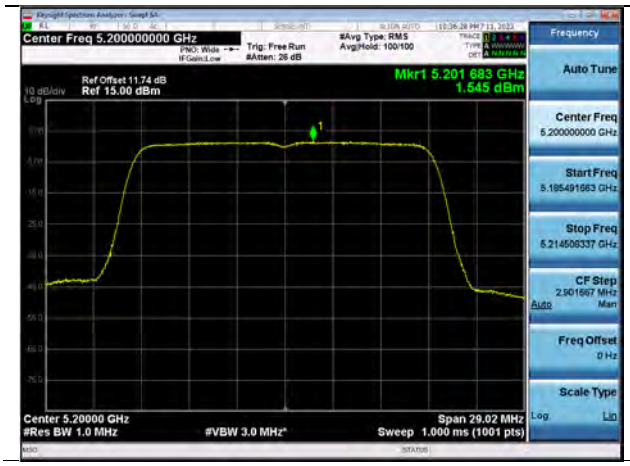
In order to simplify the report, attached plots were only channel of highest power.

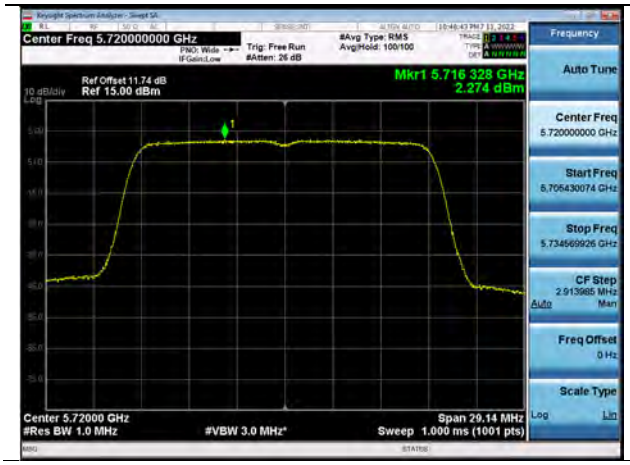
▣ Test Plots(802.11a)

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

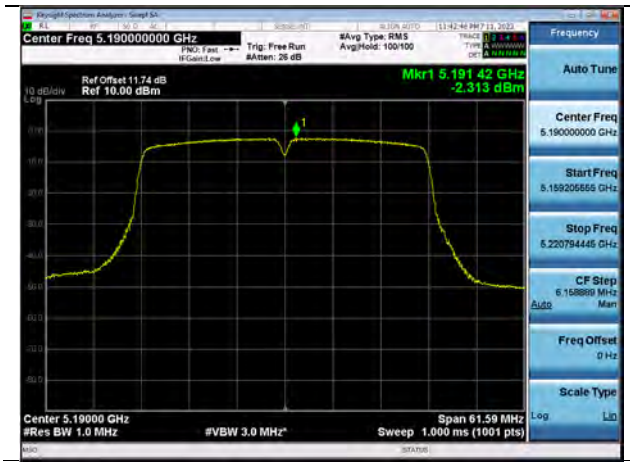
UNII 2C (Ch. 144)	UNII 3 (Ch. 165)
	

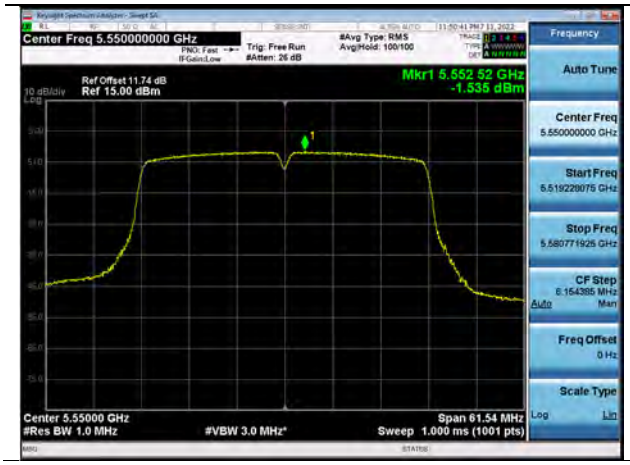
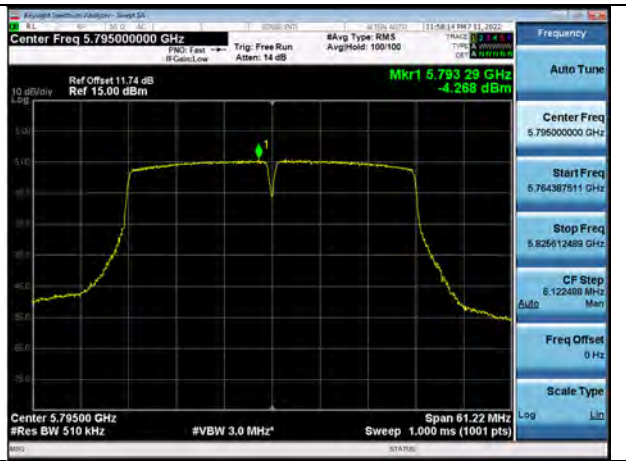
▣ Test Plots(802.11n(HT20))

UNII 1 (Ch. 40)	UNII 2A (Ch. 52)
	

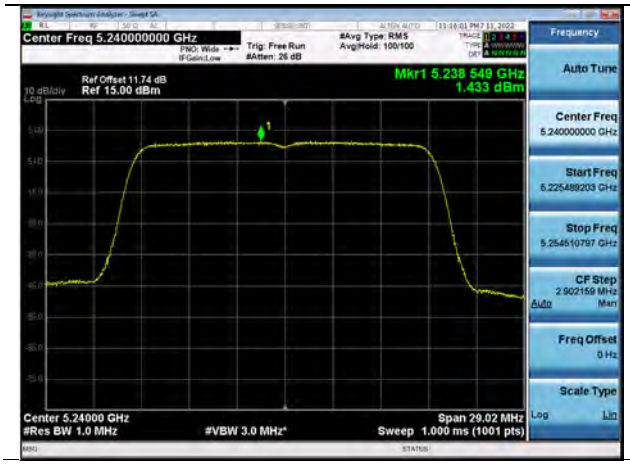
UNII 2C (Ch. 144)	UNII 3 (Ch. 165)
	

▣ Test Plots(802.11n(HT40))

UNII 1 (Ch. 38)	UNII 2A (Ch. 62)
	

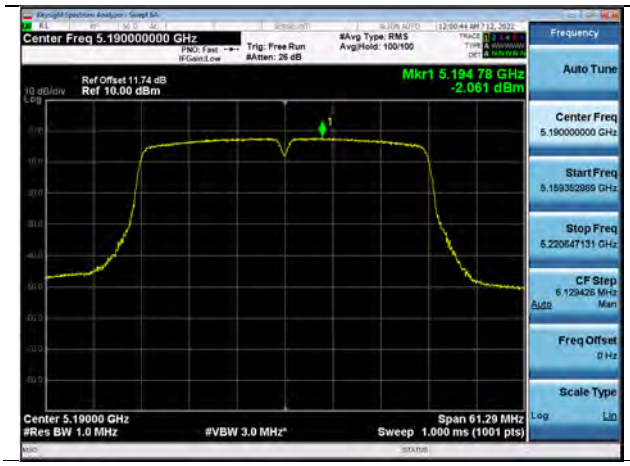
UNII 2C (Ch. 110)	UNII 3 (Ch. 159)
	

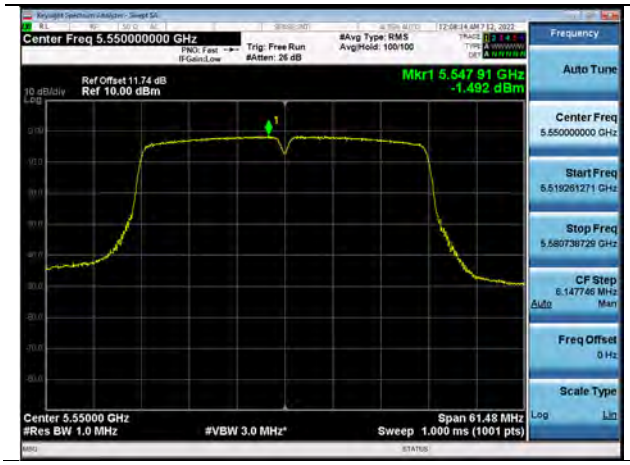
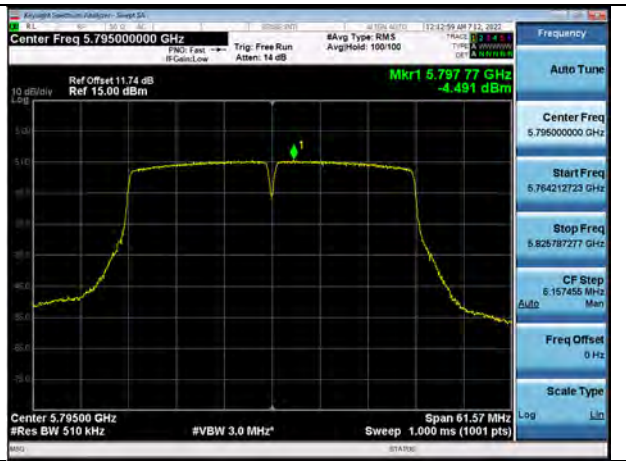
▣ Test Plots(802.11ac(VHT20))

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

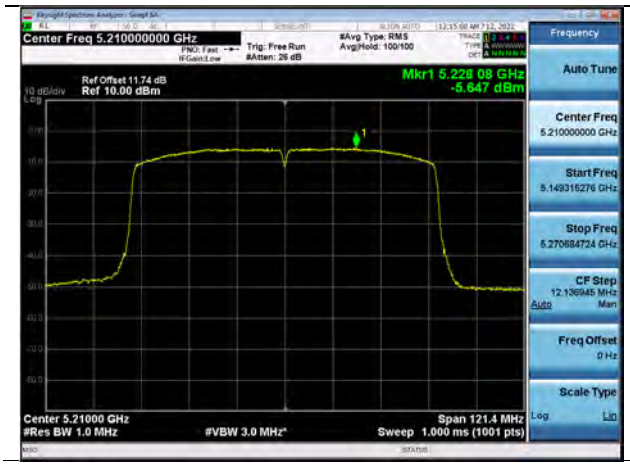
UNII 2C (Ch. 116)	UNII 3 (Ch. 157)
	

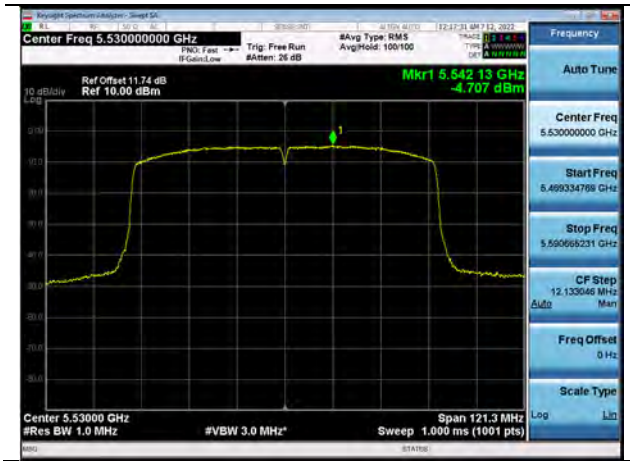
▣ Test Plots(802.11ac(VHT40))

UNII 1 (Ch. 38)	UNII 2A (Ch. 62)
	

UNII 2C (Ch. 110)	UNII 3 (Ch. 159)
	

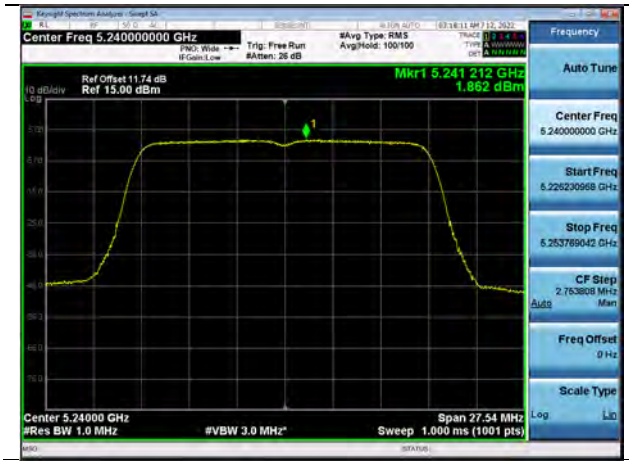
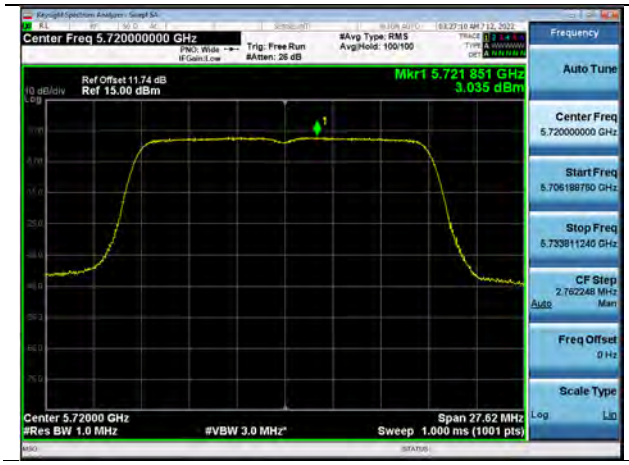
▣ Test Plots(802.11ac(VHT80))

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

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

[Ant2]

▣ Test Plots(802.11a)

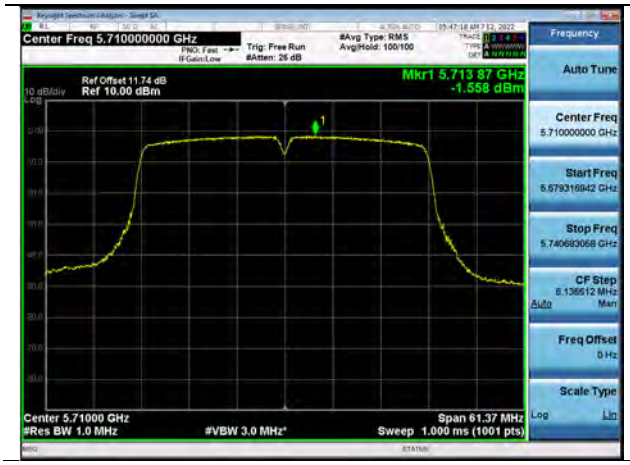
UNII 1 (Ch. 48)	UNII 2A (Ch. 64)
	
UNII 2C (Ch. 144)	**UNII 3 (Ch. 165)**
	

▣ Test Plots(802.11n(HT20))

UNII 1 (Ch. 40)	UNII 2A (Ch. 64)
	
UNII 2C (Ch. 116)	**UNII 3 (Ch. 149)**
	

▣ Test Plots(802.11n(HT40))

UNII 1 (Ch. 38)	UNII 2A (Ch. 54)
	

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

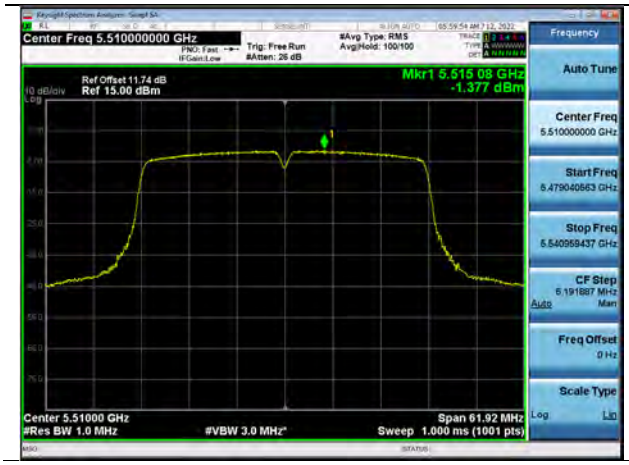
▣ Test Plots(802.11ac(VHT20))

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

UNII 2C (Ch. 116)	UNII 3 (Ch. 157)
	

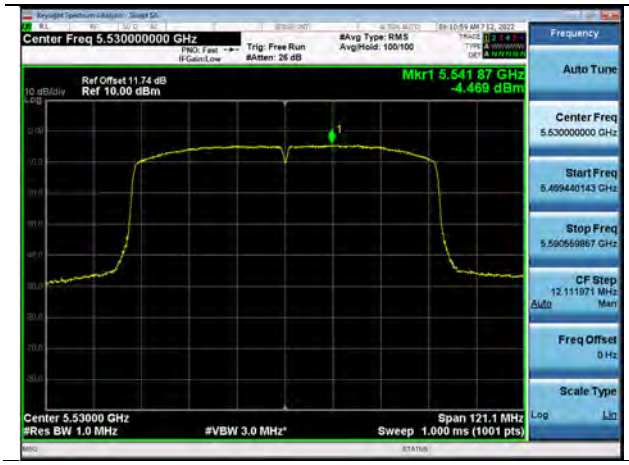
▣ Test Plots(802.11ac(VHT40))

UNII 1 (Ch. 38)	UNII 2A (Ch. 62)
	

UNII 2C (Ch. 102)	UNII 3 (Ch. 151)
	

▣ Test Plots(802.11ac(VHT80))

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

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

10.5 FREQUENCY STABILITY.

10.5.1 80 MHz 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)	5210047.86	47.86
100 %		-30	5210056.27	56.27
100 %		-20	5210024.91	24.91
100 %		-10	5210029.71	29.71
100 %		0	5210068.26	68.26
100 %		+10	5210094.83	94.83
100 %		+30	5210043.40	43.40
100 %		+40	5210079.96	79.96
100 %		+50	5210067.60	67.60
Max	3.6	+20	5210067.88	67.88
Min	3.14	+20	5210013.17	13.17

Note:

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

OPERATING BAND:	UNII Band 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)	5290007.76	7.76
100 %		-30	5290080.60	80.60
100 %		-20	5290063.63	63.63
100 %		-10	5290018.92	18.92
100 %		0	5290035.31	35.31
100 %		+10	5290083.36	83.36
100 %		+30	5290063.09	63.09
100 %		+40	5290051.29	51.29
100 %		+50	5290076.15	76.15
Max	3.6	+20	5290039.41	39.41
Min	3.14	+20	5290086.42	86.42

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)	5530084.69	84.69
100 %		-30	5530023.25	23.25
100 %		-20	5530058.64	58.64
100 %		-10	5530022.03	22.03
100 %		0	5530052.66	52.66
100 %		+10	5530074.80	74.8
100 %		+30	5530091.68	91.68
100 %		+40	5530083.42	83.42
100 %		+50	5530059.64	59.64
Max	3.6	+20	5530018.46	18.46
Min	3.14	+20	5530011.93	11.93

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 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)	5775076.89	76.89
100 %		-30	5775023.10	23.10
100 %		-20	5775054.17	54.17
100 %		-10	5775019.09	19.09
100 %		0	5775085.55	85.55
100 %		+10	5775065.02	65.02
100 %		+30	5775070.41	70.41
100 %		+40	5775030.47	30.47
100 %		+50	5775009.86	9.86
Max	3.6	+20	5775017.07	17.07
Min	3.14	+20	5775009.81	9.81

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)	5210083.16	83.16
100 %		-30	5210069.16	69.16
100 %		-20	5210060.54	60.54
100 %		-10	5210080.55	80.55
100 %		0	5210040.47	40.47
100 %		+10	5210028.99	28.99
100 %		+30	5210002.83	2.83
100 %		+40	5210072.09	72.09
100 %		+50	5210076.26	76.26
Max	3.6	+20	5210069.91	69.91
Min	3.14	+20	5210043.33	43.33

Note:

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

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

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100 %	3.3	+20(Ref)	5290093.38	93.38
100 %		-30	5290056.47	56.47
100 %		-20	5290002.71	2.71
100 %		-10	5290075.24	75.24
100 %		0	5290044.71	44.71
100 %		+10	5290059.13	59.13
100 %		+30	5290056.14	56.14
100 %		+40	5290009.90	9.9
100 %		+50	5290027.42	27.42
Max	3.6	+20	5290070.53	70.53
Min	3.14	+20	5290050.93	50.93

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)	5530092.02	92.02
100 %		-30	5530077.35	77.35
100 %		-20	5530051.27	51.27
100 %		-10	5530031.38	31.38
100 %		0	5530031.46	31.46
100 %		+10	5530082.63	82.63
100 %		+30	5530018.99	18.99
100 %		+40	5530021.47	21.47
100 %		+50	5530071.99	71.99
Max	3.6	+20	5530073.26	73.26
Min	3.14	+20	5530093.08	93.08

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)	5775057.65	57.65
100 %		-30	5775090.47	90.47
100 %		-20	5775079.35	79.35
100 %		-10	5775065.11	65.11
100 %		0	5775017.70	17.7
100 %		+10	5775084.25	84.25
100 %		+30	5775052.14	52.14
100 %		+40	5775066.33	66.33
100 %		+50	5775085.19	85.19
Max	3.6	+20	5775016.71	16.71
Min	3.14	+20	5775046.20	46.2

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)	5210022.10	22.10
100 %		-30	5210063.20	63.20
100 %		-20	5210038.05	38.05
100 %		-10	5210049.32	49.32
100 %		0	5210018.62	18.62
100 %		+10	5210047.53	47.53
100 %		+30	5210002.72	2.72
100 %		+40	5210089.90	89.90
100 %		+50	5210063.19	63.19
Max	3.6	+20	5210009.48	9.48
Min	3.14	+20	5210075.93	75.93

Note:

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

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

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100 %	3.3	+20(Ref)	5290036.98	36.98
100 %		-30	5290018.07	18.07
100 %		-20	5290066.78	66.78
100 %		-10	5290004.52	4.52
100 %		0	5290024.85	24.85
100 %		+10	5290081.24	81.24
100 %		+30	5290088.14	88.14
100 %		+40	5290085.12	85.12
100 %		+50	5290052.62	52.62
Max	3.6	+20	5290004.90	4.90
Min	3.14	+20	5290030.08	30.08

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)	5530086.26	86.26
100 %		-30	5530076.53	76.53
100 %		-20	5530025.13	25.13
100 %		-10	5530010.06	10.06
100 %		0	5530044.88	44.88
100 %		+10	5530089.20	89.2
100 %		+30	5530053.65	53.65
100 %		+40	5530023.04	23.04
100 %		+50	5530095.29	95.29
Max	3.6	+20	5530049.52	49.52
Min	3.14	+20	5530068.08	68.08

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)	5775088.14	88.14
100 %		-30	5775067.51	67.51
100 %		-20	5775012.53	12.53
100 %		-10	5775010.19	10.19
100 %		0	5775093.03	93.03
100 %		+10	5775047.66	47.66
100 %		+30	5775036.40	36.4
100 %		+40	5775005.88	5.88
100 %		+50	5775024.10	24.10
Max	3.6	+20	5775020.97	20.97
Min	3.14	+20	5775075.40	75.4

Note:

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

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)	5210026.41	26.41
100 %		-30	5210060.89	60.89
100 %		-20	5210065.53	65.53
100 %		-10	5210059.75	59.75
100 %		0	5210073.84	73.84
100 %		+10	5210026.30	26.30
100 %		+30	5210083.46	83.46
100 %		+40	5210016.54	16.54
100 %		+50	5210076.53	76.53
Max	3.6	+20	5210010.15	10.15
Min	3.14	+20	5210039.96	39.96

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)	5290069.87	69.87
100 %		-30	5290027.22	27.22
100 %		-20	5290096.58	96.58
100 %		-10	5290038.21	38.21
100 %		0	5290076.67	76.67
100 %		+10	5290065.14	65.14
100 %		+30	5290060.29	60.29
100 %		+40	5290011.96	11.96
100 %		+50	5290065.51	65.51
Max	3.6	+20	5290069.24	69.24
Min	3.14	+20	5290079.76	79.76

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)	5530087.12	87.12
100 %		-30	5530073.49	73.49
100 %		-20	5530094.50	94.5
100 %		-10	5530079.38	79.38
100 %		0	5530009.54	9.54
100 %		+10	5530039.89	39.89
100 %		+30	5530060.31	60.31
100 %		+40	5530048.84	48.84
100 %		+50	5530050.56	50.56
Max	3.6	+20	5530015.51	15.51
Min	3.14	+20	5530042.04	42.04

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 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)	5775080.83	80.83
100 %		-30	5775088.08	88.08
100 %		-20	5775053.59	53.59
100 %		-10	5775005.04	5.04
100 %		0	5775018.81	18.81
100 %		+10	5775032.56	32.56
100 %		+30	5775099.30	99.3
100 %		+40	5775018.66	18.66
100 %		+50	5775063.48	63.48
Max	3.6	+20	5775053.81	53.81
Min	3.14	+20	5775093.88	93.88

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)	5210028.49	28.49
100 %		-30	5210034.87	34.87
100 %		-20	5210037.36	37.36
100 %		-10	5210030.57	30.57
100 %		0	5210047.67	47.67
100 %		+10	5210037.30	37.30
100 %		+30	5210047.69	47.69
100 %		+40	5210031.58	31.58
100 %		+50	5210079.92	79.92
Max	3.6	+20	5210001.39	1.39
Min	3.14	+20	5210097.95	97.95

Note:

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

OPERATING BAND:	UNII Band 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)	5290022.79	22.79
100 %		-30	5290023.87	23.87
100 %		-20	5290012.61	12.61
100 %		-10	5290082.89	82.89
100 %		0	5290031.25	31.25
100 %		+10	5290056.60	56.6
100 %		+30	5290088.49	88.49
100 %		+40	5290029.70	29.7
100 %		+50	5290002.15	2.15
Max	3.6	+20	5290018.06	18.06
Min	3.14	+20	5290079.91	79.91

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)	5530022.29	22.29
100 %		-30	5530043.62	43.62
100 %		-20	5530006.27	6.27
100 %		-10	5530076.66	76.66
100 %		0	5530064.32	64.32
100 %		+10	5530012.07	12.07
100 %		+30	5530055.78	55.78
100 %		+40	5530064.40	64.4
100 %		+50	5530005.44	5.44
Max	3.6	+20	5530059.84	59.84
Min	3.14	+20	5530040.41	40.41

Note:

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

OPERATING BAND:	UNII Band 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)	5775065.96	65.96
100 %		-30	5775016.96	16.96
100 %		-20	5775064.62	64.62
100 %		-10	5775075.96	75.96
100 %		0	5775069.63	69.63
100 %		+10	5775070.84	70.84
100 %		+30	5775039.48	39.48
100 %		+40	5775057.02	57.02
100 %		+50	5775084.20	84.20
Max	3.6	+20	5775084.81	84.81
Min	3.14	+20	5775077.50	77.5

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)	5210030.26	30.26
100 %		-30	5210002.58	2.58
100 %		-20	5210045.50	45.50
100 %		-10	5210001.16	1.16
100 %		0	5210037.19	37.19
100 %		+10	5210088.67	88.67
100 %		+30	5210054.58	54.58
100 %		+40	5210065.63	65.63
100 %		+50	5210013.68	13.68
Max	3.6	+20	5210040.58	40.58
Min	3.14	+20	5210087.27	87.27

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)	5290042.26	42.26
100 %		-30	5290075.48	75.48
100 %		-20	5290089.89	89.89
100 %		-10	5290017.81	17.81
100 %		0	5290079.43	79.43
100 %		+10	5290038.32	38.32
100 %		+30	5290045.80	45.8
100 %		+40	5290023.03	23.03
100 %		+50	5290036.42	36.42
Max	3.6	+20	5290092.16	92.16
Min	3.14	+20	5290065.67	65.67

Note:

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

OPERATING BAND:	UNII Band 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)	5530009.04	9.04
100 %		-30	5530034.69	34.69
100 %		-20	5530046.76	46.76
100 %		-10	5530047.77	47.77
100 %		0	5530043.30	43.3
100 %		+10	5530068.86	68.86
100 %		+30	5530032.79	32.79
100 %		+40	5530009.97	9.97
100 %		+50	5530081.59	81.59
Max	3.6	+20	5530043.91	43.91
Min	3.14	+20	5530099.13	99.13

Note:

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

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)	5775053.51	53.51
100 %		-30	5775040.33	40.33
100 %		-20	5775029.86	29.86
100 %		-10	5775030.23	30.23
100 %		0	5775075.37	75.37
100 %		+10	5775013.78	13.78
100 %		+30	5775059.41	59.41
100 %		+40	5775010.40	10.4
100 %		+50	5775033.28	33.28
Max	3.6	+20	5775085.46	85.46
Min	3.14	+20	5775039.53	39.53

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)	5210052.54	52.54
100 %		-30	5210060.14	60.14
100 %		-20	5210037.91	37.91
100 %		-10	5210028.35	28.35
100 %		0	5210080.21	80.21
100 %		+10	5210059.55	59.55
100 %		+30	5210019.32	19.32
100 %		+40	5210078.62	78.62
100 %		+50	5210048.47	48.47
Max	3.6	+20	5210099.07	99.07
Min	3.14	+20	5210033.93	33.93

Note:

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

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

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100 %	3.3	+20(Ref)	5290073.86	73.86
100 %		-30	5290079.79	79.79
100 %		-20	5290053.90	53.9
100 %		-10	5290074.52	74.52
100 %		0	5290086.83	86.83
100 %		+10	5290038.20	38.2
100 %		+30	5290072.50	72.5
100 %		+40	5290027.49	27.49
100 %		+50	5290091.69	91.69
Max	3.6	+20	5290048.07	48.07
Min	3.14	+20	5290006.77	6.77

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)	5530004.84	4.84
100 %		-30	5530006.56	6.56
100 %		-20	5530099.47	99.47
100 %		-10	5530057.39	57.39
100 %		0	5530006.71	6.71
100 %		+10	5530087.62	87.62
100 %		+30	5530080.77	80.77
100 %		+40	5530061.80	61.8
100 %		+50	5530033.90	33.90
Max	3.6	+20	5530075.12	75.12
Min	3.14	+20	5530016.58	16.58

Note:

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

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

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100 %	3.3	+20(Ref)	5775076.85	76.85
100 %		-30	5775025.88	25.88
100 %		-20	5775056.81	56.81
100 %		-10	5775091.11	91.11
100 %		0	5775054.48	54.48
100 %		+10	5775087.77	87.77
100 %		+30	5775080.56	80.56
100 %		+40	5775047.61	47.61
100 %		+50	5775033.78	33.78
Max	3.6	+20	5775034.42	34.42
Min	3.14	+20	5775006.75	6.75

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)	5210017.56	17.56
100 %		-30	5210010.74	10.74
100 %		-20	5210078.44	78.44
100 %		-10	5210011.14	11.14
100 %		0	5210079.57	79.57
100 %		+10	5210098.97	98.97
100 %		+30	5210016.04	16.04
100 %		+40	5210015.48	15.48
100 %		+50	5210024.20	24.20
Max	3.6	+20	5210078.59	78.59
Min	3.14	+20	5210055.70	55.70

Note:

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

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

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100 %	3.3	+20(Ref)	5290090.44	90.44
100 %		-30	5290062.49	62.49
100 %		-20	5290027.65	27.65
100 %		-10	5290037.79	37.79
100 %		0	5290008.35	8.35
100 %		+10	5290029.23	29.23
100 %		+30	5290085.96	85.96
100 %		+40	5290079.65	79.65
100 %		+50	5290006.38	6.38
Max	3.6	+20	5290022.12	22.12
Min	3.14	+20	5290089.81	89.81

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)	5530084.80	84.80
100 %		-30	5530031.85	31.85
100 %		-20	5530052.14	52.14
100 %		-10	5530054.87	54.87
100 %		0	5530087.56	87.56
100 %		+10	5530019.43	19.43
100 %		+30	5530011.13	11.13
100 %		+40	5530029.68	29.68
100 %		+50	5530057.57	57.57
Max	3.6	+20	5530035.50	35.50
Min	3.14	+20	5530071.55	71.55

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	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100 %	3.3	+20(Ref)	5775038.07	38.07
100 %		-30	5775054.19	54.19
100 %		-20	5775069.19	69.19
100 %		-10	5775046.49	46.49
100 %		0	5775093.68	93.68
100 %		+10	5775017.82	17.82
100 %		+30	5775079.80	79.8
100 %		+40	5775097.36	97.36
100 %		+50	5775046.67	46.67
Max	3.6	+20	5775056.20	56.20
Min	3.14	+20	5775072.81	72.81

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	5710.64	14.36
802.11n(HT20)				5710.24	14.76
802.11ac(VHT20)				5710.20	14.80
802.11a	UNII 3	5720	144	5729.12	4.12
802.11n(HT20)				5729.68	4.68
802.11ac(VHT20)				5729.64	4.64

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.44	35.56
802.11ac(VHT40)				5689.52	35.48
802.11n(HT40)	UNII 3	5710	142	5730.40	5.40
802.11ac(VHT40)				5730.40	5.40

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	5730.44	5.44

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	5710.68	14.32
802.11n(HT20)				5710.28	14.72
802.11ac(VHT20)				5710.24	14.76
802.11a	UNII 3	5720	144	5729.16	4.16
802.11n(HT20)				5729.64	4.64
802.11ac(VHT20)				5729.72	4.72

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.52	35.48
802.11ac(VHT40)				5689.52	35.48
802.11n(HT40)	UNII 3	5710	142	5730.48	5.48
802.11ac(VHT40)				5730.24	5.24

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.92	75.08
	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

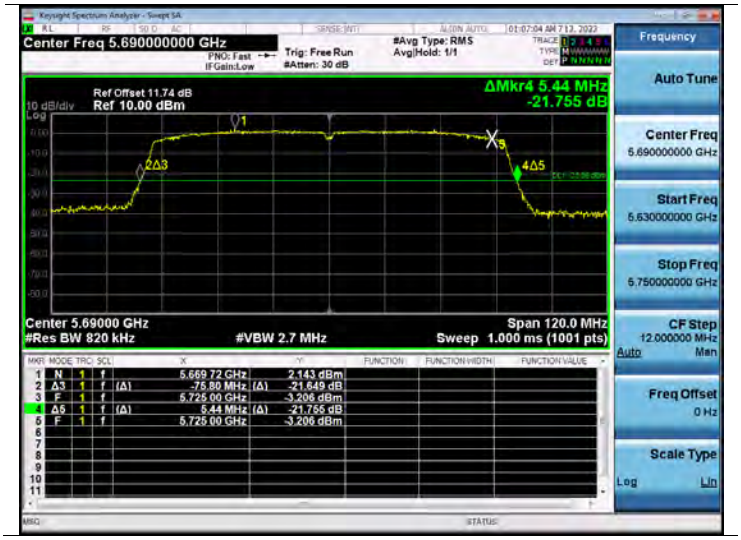
802.11ac(VHT20) UNII Band

▣ 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	5728.20	3.20	> 0.5
802.11n(HT20)				5728.80	3.80	> 0.5
802.11ac(VHT20)				5728.80	3.80	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5728.24	3.24	> 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	5727.80	2.80	> 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	5728.20	3.20	> 0.5
802.11n(HT20)				5728.80	3.80	> 0.5
802.11ac(VHT20)				5728.80	3.80	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5728.24	3.24	> 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	5726.96	1.96	> 0.5

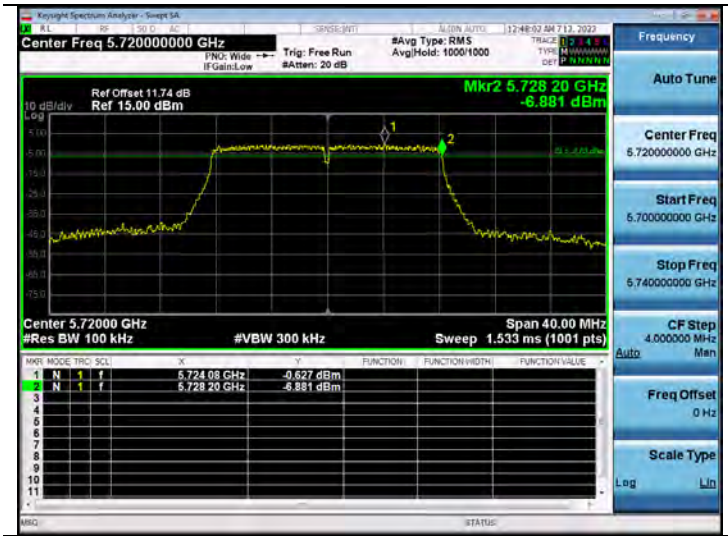
Note:

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

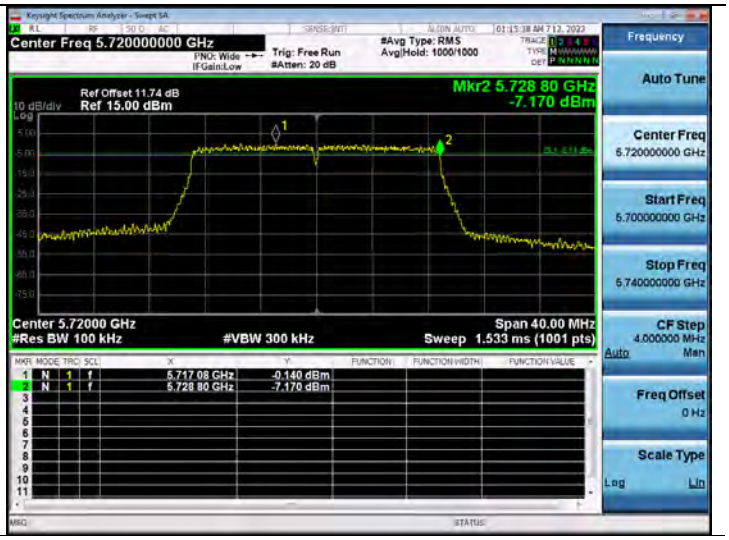
[ANT1]

▣ Test Plots(UNII 3 Band 6dB Bandwidth)

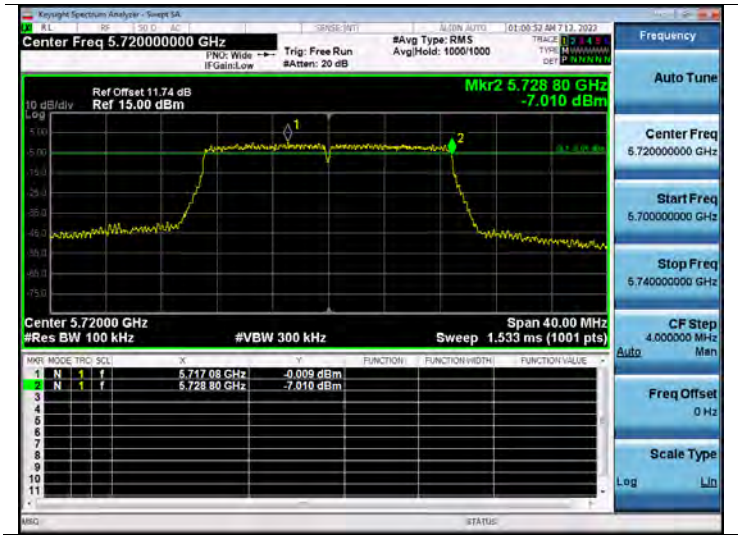
802.11a CH.144



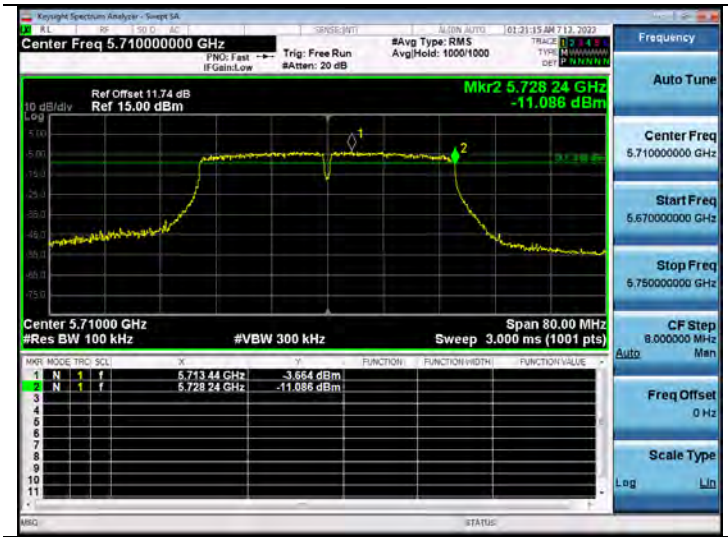
802.11n_HT20 CH.144



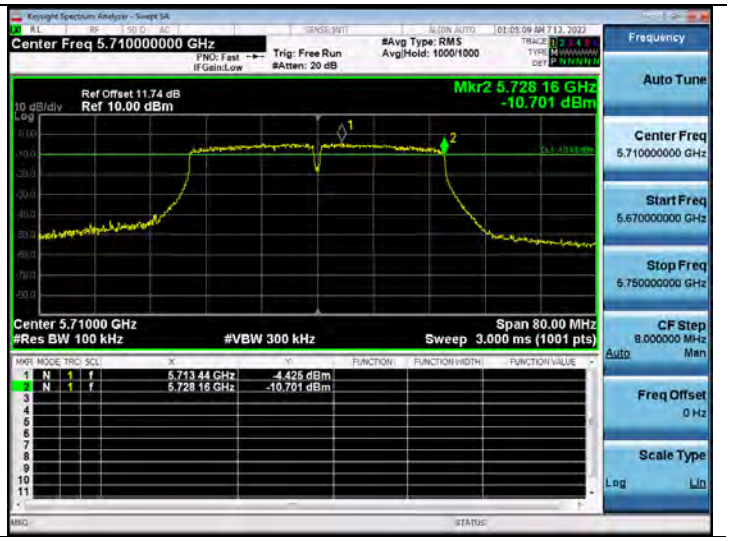
802.11ac_VHT20 CH.144



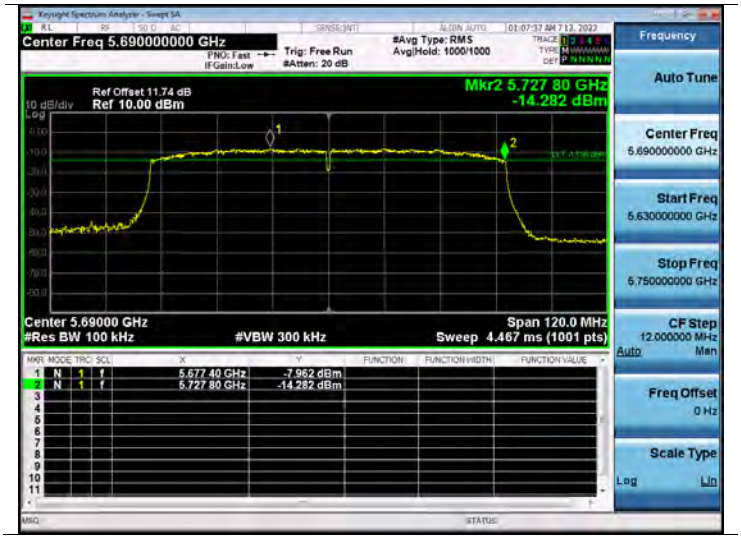
802.11n_HT40 CH.142



802.11ac_VHT40 CH.142



802.11ac_VHT80 CH.138



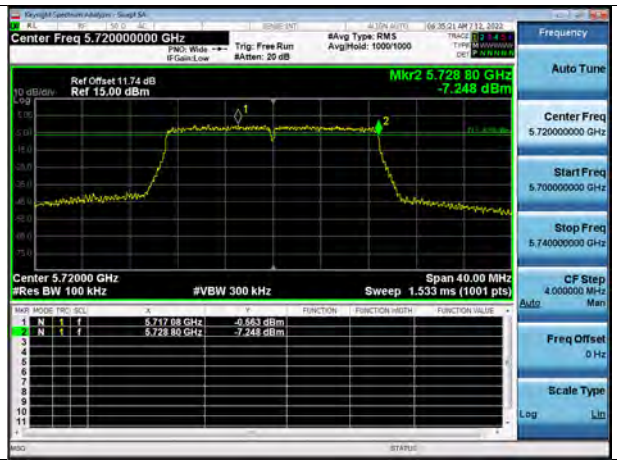
[ANT2]

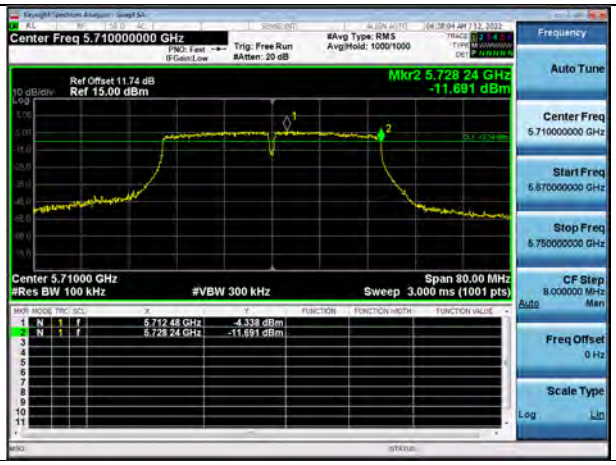
▣ Test Plots(UNII 3 Band 6dB Bandwidth)

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	12.59	23.14
802.11n(HT20)			12.48	23.14
802.11ac(VHT20)			12.63	23.14
802.11a	5720 (UNII 3 Band)	144	6.10	30.00
802.11n(HT20)			6.50	30.00
802.11ac(VHT20)			6.65	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	12.35	23.98
802.11ac(VHT40)			12.07	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	0.66	30.00
802.11ac(VHT40)			0.40	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	11.98	23.98
	5690 (UNII 3 Band)	138	-5.09	30.00

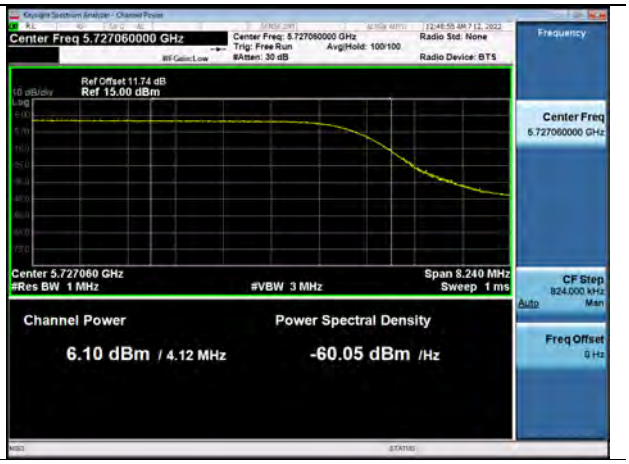
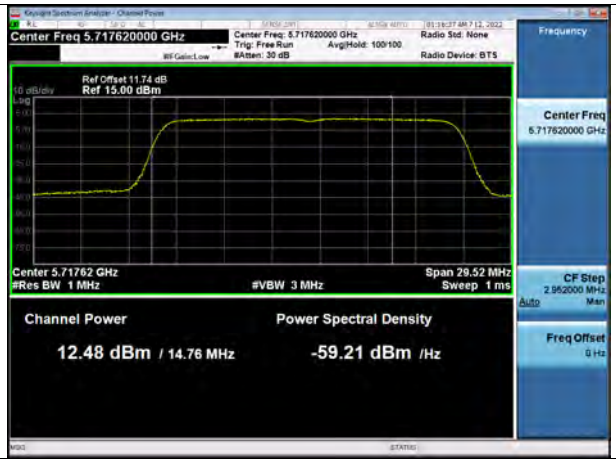
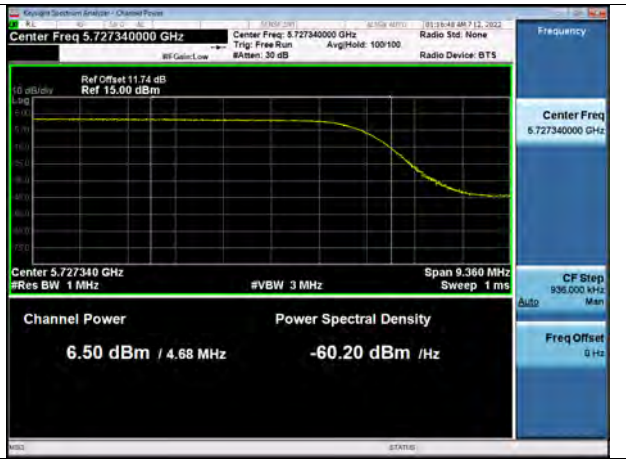
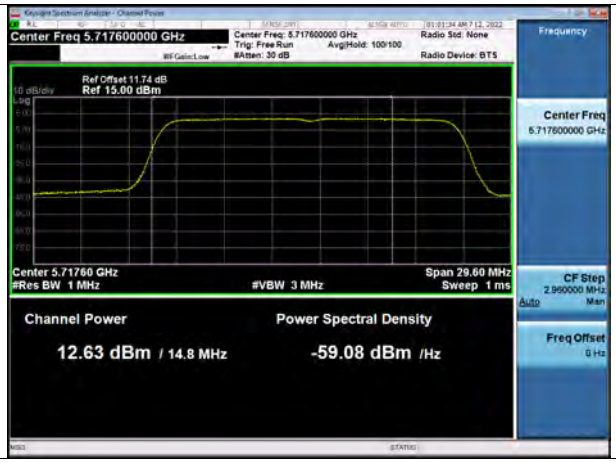
[ANT2]

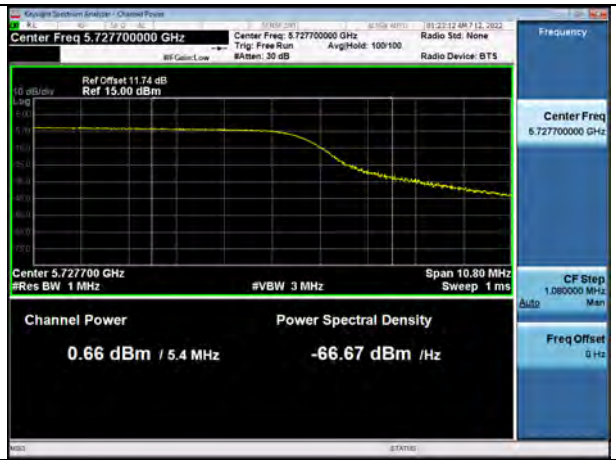
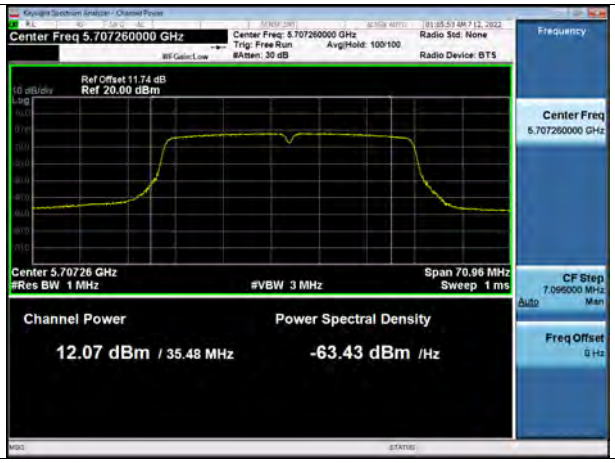
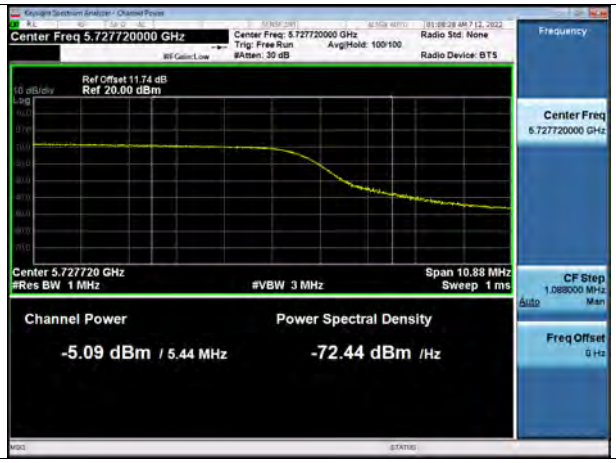
Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	13.06	23.14
802.11n(HT20)			12.45	23.14
802.11ac(VHT20)			12.49	23.14
802.11a	5720 (UNII 3 Band)	144	6.55	30.00
802.11n(HT20)			6.53	30.00
802.11ac(VHT20)			6.52	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	12.18	23.98
802.11ac(VHT40)			11.95	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	0.43	30.00
802.11ac(VHT40)			0.20	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	12.23	23.98
	5690 (UNII 3 Band)	138	-5.16	30.00

▣ Test Plots_**[ANT1]**

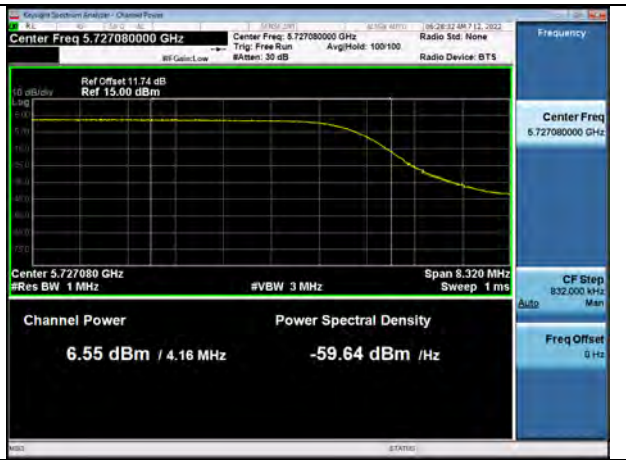
802.11a UNII 2C Band	802.11a UNII 3 Band
	
802.11n(HT20) UNII 2C Band	802.11n(HT20) UNII 3 Band
	
802.11ac(VHT20) UNII 2C Band	802.11ac(VHT20) UNII 3 Band
	

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

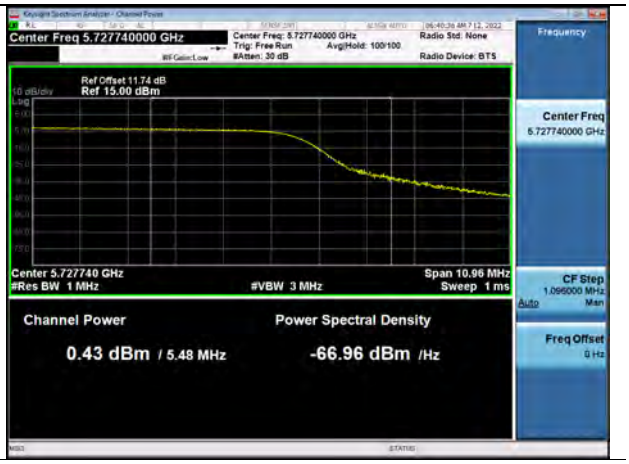
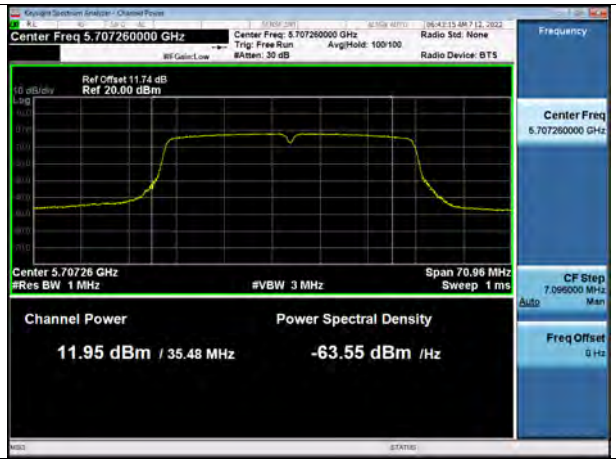
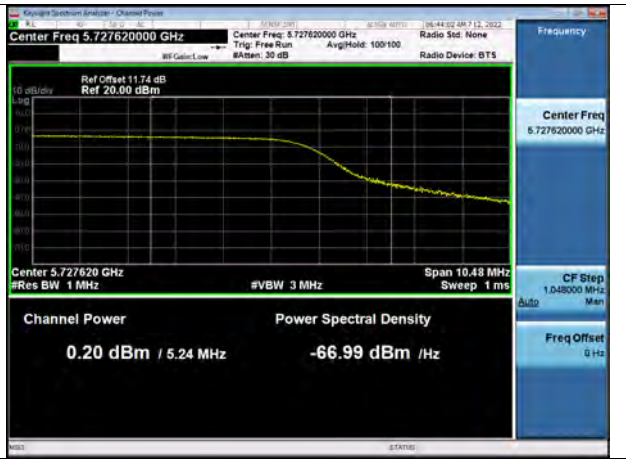
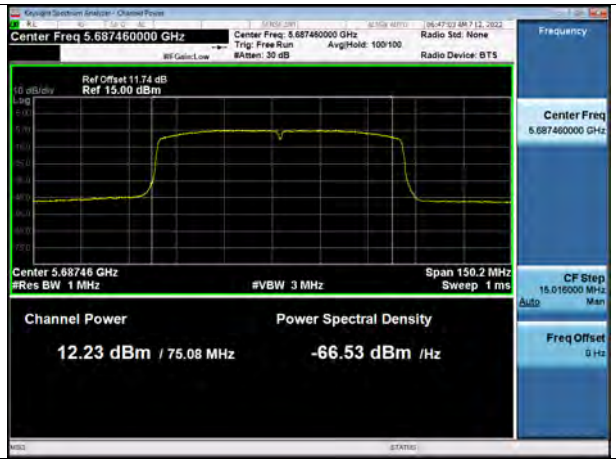


802.11n(HT20) UNII 2C Band

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	2.397	11 dBm/MHz
802.11n(HT20)			2.202	
802.11ac(VHT20)			2.257	
802.11a	5720 (UNII 3 Band)	144	-1.546	30 dBm/500kHz
802.11n(HT20)			-1.170	
802.11ac(VHT20)			-1.162	

Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	-1.499	11 dBm/MHz
802.11ac(VHT40)			-1.551	
802.11n(HT40)	5710 (UNII 3 Band)	142	-6.206	30 dBm/500kHz
802.11ac(VHT40)			-6.398	

Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-4.877	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-11.944	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	2.873	11 dBm/MHz
802.11n(HT20)			2.158	
802.11ac(VHT20)			1.953	
802.11a	5720 (UNII 3 Band)	144	-0.758	30 dBm/500kHz
802.11n(HT20)			-1.209	
802.11ac(VHT20)			-1.074	

Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	-1.591	11 dBm/MHz
802.11ac(VHT40)			-1.808	
802.11n(HT40)	5710 (UNII 3 Band)	142	-6.643	30 dBm/500kHz
802.11ac(VHT40)			-6.760	

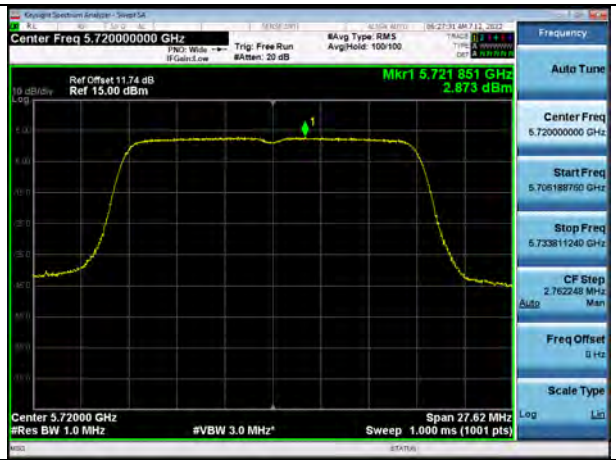
Mode	Frequency [MHz]	Channel	PSD (dBm/MHz, UNII 2C) (dBm/510 kHz, UNII 3)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-4.929	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-11.967	30 dBm/500kHz

▣ 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.

[Olny 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	50.93	4.62	V	55.55	68.20	12.65	PK
15540	50.16	5.19	V	55.35	73.98	18.63	PK
15540	35.14	5.19	V	40.33	53.98	13.65	AV
10360	52.42	4.62	H	57.04	68.20	11.16	PK
15540	52.51	5.19	H	57.70	73.98	16.28	PK
15540	37.38	5.19	H	42.57	53.98	11.41	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	50.99	4.10	V	55.09	68.20	13.11	PK
15600	50.12	3.72	V	53.84	73.98	20.14	PK
15600	35.28	3.72	V	39.00	53.98	14.98	AV
10400	52.66	4.10	H	56.76	68.20	11.44	PK
15600	51.88	3.72	H	55.60	73.98	18.38	PK
15600	36.82	3.72	H	40.54	53.98	13.44	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	51.06	5.11	V	56.17	68.20	12.03	PK
15720	54.28	3.36	V	57.64	73.98	16.34	PK
15720	37.16	3.36	V	40.52	53.98	13.46	AV
10480	52.68	5.11	H	57.79	68.20	10.41	PK
15720	55.52	3.36	H	58.88	73.98	15.10	PK
15720	38.90	3.36	H	42.26	53.98	11.72	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	50.85	4.77	V	55.62	68.20	12.58	PK
15780	53.26	3.59	V	56.85	73.98	17.13	PK
15780	37.15	3.59	V	40.74	53.98	13.24	AV
10520	51.86	4.77	H	56.63	68.20	11.57	PK
15780	54.35	3.59	H	57.94	73.98	16.04	PK
15780	38.11	3.59	H	41.70	53.98	12.28	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	51.85	4.75	V	56.60	73.98	17.38	PK
10600	37.06	4.75	V	41.81	53.98	12.17	AV
15900	53.06	6.09	V	59.15	73.98	14.83	PK
15900	36.24	6.09	V	42.33	53.98	11.65	AV
10600	52.13	4.75	H	56.88	73.98	17.10	PK
10600	38.98	4.75	H	43.73	53.98	10.25	AV
15900	54.99	6.09	H	61.08	73.98	12.90	PK
15900	37.70	6.09	H	43.79	53.98	10.19	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	51.06	5.04	V	56.10	73.98	17.88	PK
10640	38.61	5.04	V	43.65	53.98	10.33	AV
15960	51.85	4.55	V	56.40	73.98	17.58	PK
15960	37.69	4.55	V	42.24	53.98	11.74	AV
10640	52.89	5.04	H	57.93	73.98	16.05	PK
10640	39.31	5.04	H	44.35	53.98	9.63	AV
15960	54.57	4.55	H	59.12	73.98	14.86	PK
15960	38.48	4.55	H	43.03	53.98	10.95	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	51.98	5.17	V	57.15	73.98	16.83	PK
11000	37.69	5.17	V	42.86	53.98	11.12	AV
16500	48.93	8.27	V	57.20	68.20	11.00	PK
11000	53.36	5.17	H	58.53	73.98	15.45	PK
11000	39.34	5.17	H	44.51	53.98	9.47	AV
16500	49.90	8.27	H	58.17	68.20	10.03	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	51.25	4.25	V	55.50	73.98	18.48	PK
11160	37.85	4.25	V	42.10	53.98	11.88	AV
16740	49.35	7.93	V	57.28	68.20	10.92	PK
11160	52.33	4.25	H	56.58	73.98	17.40	PK
11160	38.51	4.25	H	42.76	53.98	11.22	AV
16740	49.63	7.93	H	57.56	68.20	10.64	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	48.13	4.69	V	52.82	73.98	21.16	PK
11440	34.18	4.69	V	38.87	53.98	15.11	AV
17160	38.94	8.92	V	47.86	68.20	20.34	PK
11440	49.45	4.69	H	54.14	73.98	19.84	PK
11440	35.39	4.69	H	40.08	53.98	13.90	AV
17160	49.75	8.92	H	58.67	68.20	9.53	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	48.56	4.55	V	53.11	73.98	20.87	PK
11490	35.10	4.55	V	39.65	53.98	14.33	AV
17235	45.87	10.31	V	56.18	68.20	12.02	PK
11490	49.64	4.55	H	54.19	73.98	19.79	PK
11490	35.48	4.55	H	40.03	53.98	13.95	AV
17235	46.99	10.31	H	57.30	68.20	10.90	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	47.12	4.82	V	51.94	73.98	22.04	PK
11570	33.90	4.82	V	38.72	53.98	15.26	AV
17355	47.89	9.73	V	57.62	68.20	10.58	PK
11570	48.16	4.82	H	52.98	73.98	21.00	PK
11570	34.63	4.82	H	39.45	53.98	14.53	AV
17355	48.18	9.73	H	57.91	68.20	10.29	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	48.14	4.42	V	52.56	73.98	21.42	PK
11650	35.06	4.42	V	39.48	53.98	14.50	AV
17475	50.36	10.15	V	60.51	68.20	7.69	PK
11650	49.13	4.42	H	53.55	73.98	20.43	PK
11650	36.18	4.42	H	40.60	53.98	13.38	AV
17475	51.43	10.15	H	61.58	68.20	6.62	PK

Note:

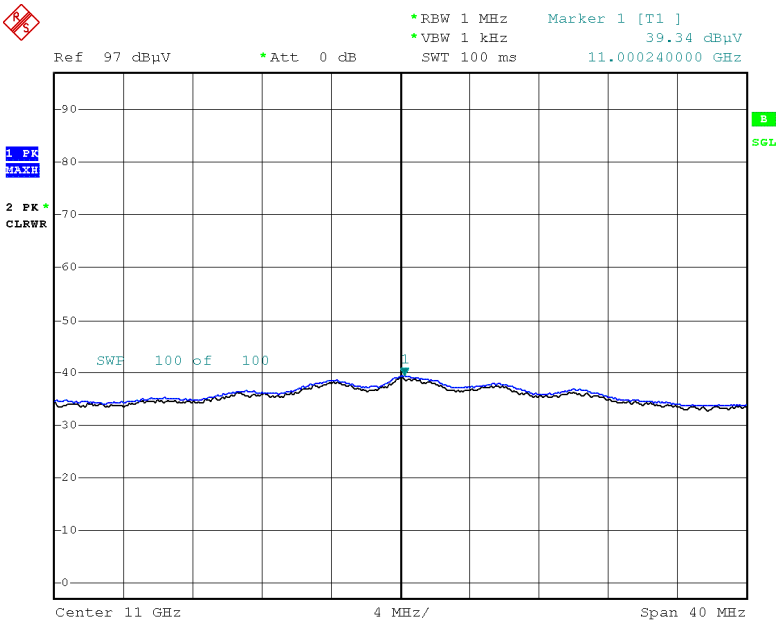
All Modes of operation were investigated and the worst case configuration results are reported.

[Worst case]

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

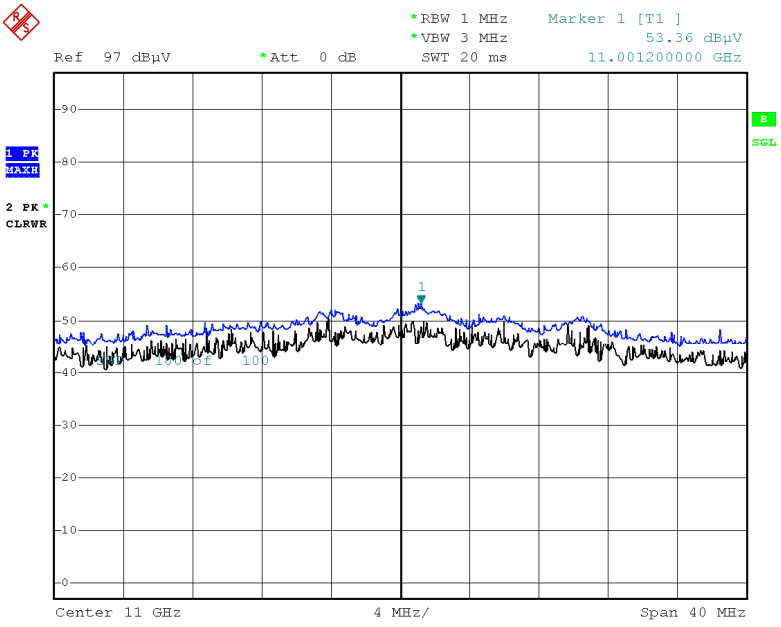
▣ Test Plots

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



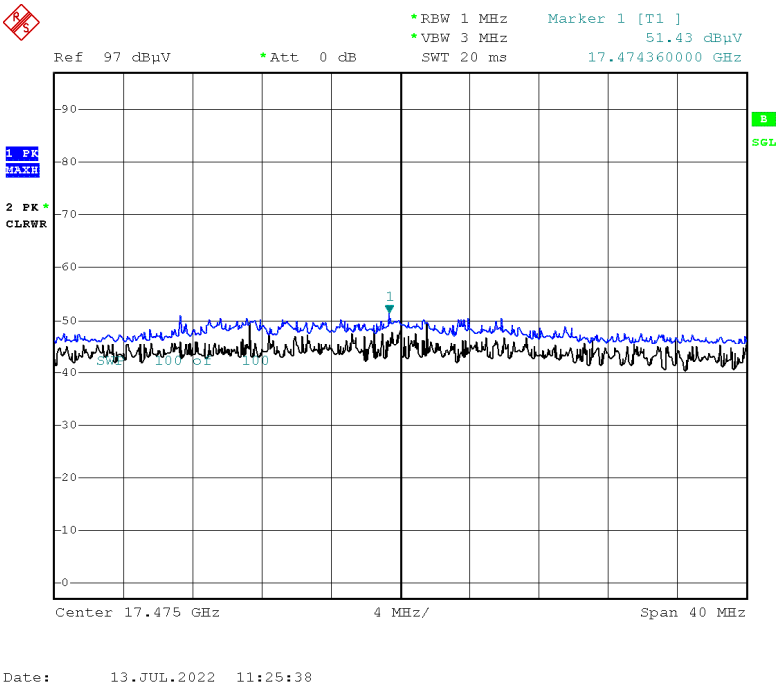
Date: 11.JUL.2022 16:13:06

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



Date: 11.JUL.2022 16:13:17

Peak Reading (802.11a, Ch.165 3rd Harmonic, Y-H)



Note:

Only the worst case plots for Radiated Spurious Emissions.

10.8 RADIATED RESTRICTED BAND EDGE

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

Frequency	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	45.31	11.85	H	57.16	73.98	16.82	PK
5150	31.85	11.85	H	43.70	53.98	10.28	AV
5150	45.30	11.85	V	57.15	73.98	16.83	PK
5150	32.64	11.85	V	44.49	53.98	9.49	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	44.42	11.89	H	56.31	73.98	17.67	PK
5350	31.65	11.89	H	43.54	53.98	10.44	AV
5350	45.95	11.89	V	57.84	73.98	16.14	PK
5350	33.25	11.89	V	45.14	53.98	8.84	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	46.56	12.31	H	58.87	73.98	15.11	PK
5460	31.75	12.31	H	44.06	53.98	9.92	AV
5470	45.68	12.53	H	58.21	68.20	9.99	PK
5460	45.00	12.31	V	57.31	73.98	16.67	PK
5460	32.20	12.31	V	44.51	53.98	9.47	AV
5470	45.12	12.53	V	57.65	68.20	10.55	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	44.89	11.85	H	56.74	73.98	17.24	PK
5150	31.92	11.85	H	43.77	53.98	10.21	AV
5150	47.02	11.85	V	58.87	73.98	15.11	PK
5150	32.78	11.85	V	44.63	53.98	9.35	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	44.69	11.89	H	56.58	73.98	17.40	PK
5350	31.73	11.89	H	43.62	53.98	10.36	AV
5350	48.10	11.89	V	59.99	73.98	13.99	PK
5350	33.30	11.89	V	45.19	53.98	8.79	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	45.85	12.31	H	58.16	73.98	15.82	PK
5460	31.66	12.31	H	43.97	53.98	10.01	AV
5470	45.14	12.53	H	57.67	68.20	10.53	PK
5460	44.91	12.31	V	57.22	73.98	16.76	PK
5460	32.09	12.31	V	44.40	53.98	9.58	AV
5470	45.27	12.53	V	57.80	68.20	10.40	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	45.28	11.85	H	57.13	73.98	16.85	PK
5150	32.11	11.85	H	43.96	53.98	10.02	AV
5150	45.42	11.85	V	57.27	73.98	16.71	PK
5150	32.87	11.85	V	44.72	53.98	9.26	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	44.69	11.89	H	56.58	73.98	17.40	PK
5350	31.33	11.89	H	43.22	53.98	10.76	AV
5350	47.34	11.89	V	59.23	73.98	14.75	PK
5350	33.50	11.89	V	45.39	53.98	8.59	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	45.52	12.31	H	57.83	73.98	16.15	PK
5460	31.56	12.31	H	43.87	53.98	10.11	AV
5470	44.85	12.53	H	57.38	68.20	10.82	PK
5460	45.17	12.31	V	57.48	73.98	16.50	PK
5460	31.91	12.31	V	44.22	53.98	9.76	AV
5470	46.18	12.53	V	58.71	68.20	9.49	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	45.02	11.85	H	56.87	73.98	17.11	PK
5150	31.96	11.85	H	43.81	53.98	10.17	AV
5150	47.40	11.85	V	59.25	73.98	14.73	PK
5150	35.44	11.85	V	47.29	53.98	6.69	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	44.18	11.89	H	56.07	73.98	17.91	PK
5350	32.26	11.89	H	44.15	53.98	9.83	AV
5350	51.49	11.89	V	63.38	73.98	10.60	PK
5350	35.09	11.89	V	46.98	53.98	7.00	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	45.63	12.31	H	57.94	73.98	16.04	PK
5460	32.47	12.31	H	44.78	53.98	9.20	AV
5470	48.92	12.53	H	61.45	68.20	6.75	PK
5460	46.89	12.31	V	59.20	73.98	14.78	PK
5460	33.11	12.31	V	45.42	53.98	8.56	AV
5470	49.69	12.53	V	62.22	68.20	5.98	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	45.14	11.85	H	56.99	73.98	16.99	PK
5150	32.04	11.85	H	43.89	53.98	10.09	AV
5150	49.35	11.85	V	61.20	73.98	12.78	PK
5150	36.01	11.85	V	47.86	53.98	6.12	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	48.40	11.89	H	60.29	73.98	13.69	PK
5350	34.20	11.89	H	46.09	53.98	7.89	AV
5350	51.53	11.89	V	63.42	73.98	10.56	PK
5350	35.85	11.89	V	47.74	53.98	6.24	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	44.95	12.31	H	57.26	73.98	16.72	PK
5460	32.52	12.31	H	44.83	53.98	9.15	AV
5470	48.01	12.53	H	60.54	68.20	7.66	PK
5460	46.79	12.31	V	59.10	73.98	14.88	PK
5460	33.04	12.31	V	45.35	53.98	8.63	AV
5470	49.40	12.53	V	61.93	68.20	6.27	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	44.64	11.85	H	56.49	73.98	17.49	PK
5150	32.79	11.85	H	44.64	53.98	9.34	AV
5150	49.02	11.85	V	60.87	73.98	13.11	PK
5150	35.68	11.85	V	47.53	53.98	6.45	AV

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

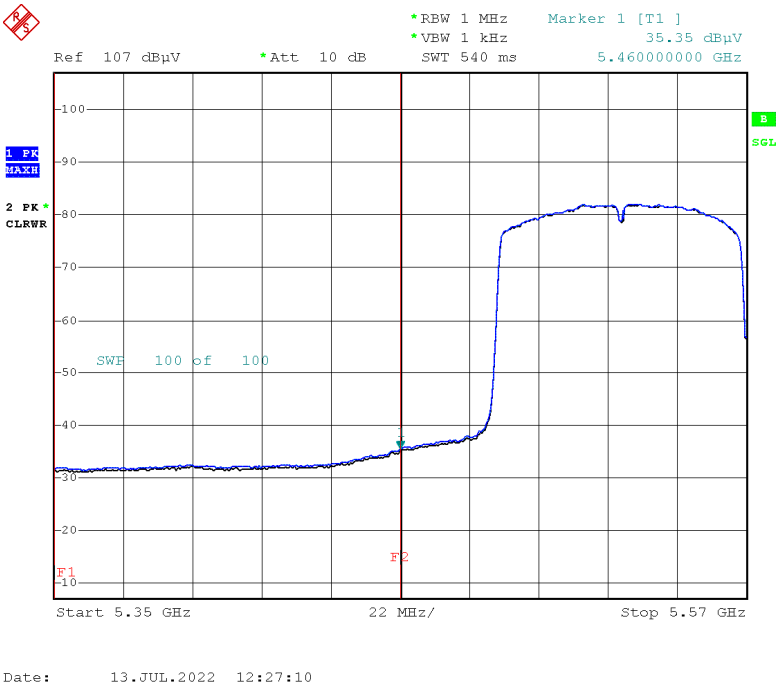
Frequency	Measured Value	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	[dBµV/m]	[dB/m]	[H/V]	[dBµV/m]	[dBµV/m]	[dB]	
5350	48.24	11.89	H	60.13	73.98	13.85	PK
5350	34.16	11.89	H	46.05	53.98	7.93	AV
5350	51.49	11.89	V	63.38	73.98	10.60	PK
5350	37.00	11.89	V	48.89	53.98	5.09	AV

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	47.81	12.31	H	60.12	73.98	13.86	PK
5460	34.70	12.31	H	47.01	53.98	6.97	AV
5470	49.08	12.53	H	61.61	68.20	6.59	PK
5460	50.94	12.31	V	63.25	73.98	10.73	PK
5460	35.35	12.31	V	47.66	53.98	6.32	AV
5470	51.51	12.53	V	64.04	68.20	4.16	PK

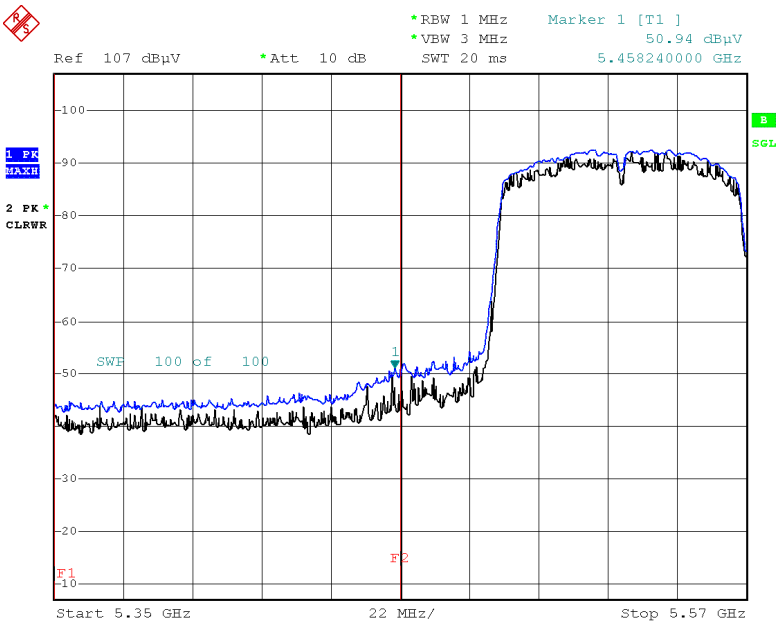
▣ Test Plots(UNII 1, 2A, 2C)

Average Reading (802.11ac(80M), Ch.106, **Y-V**)



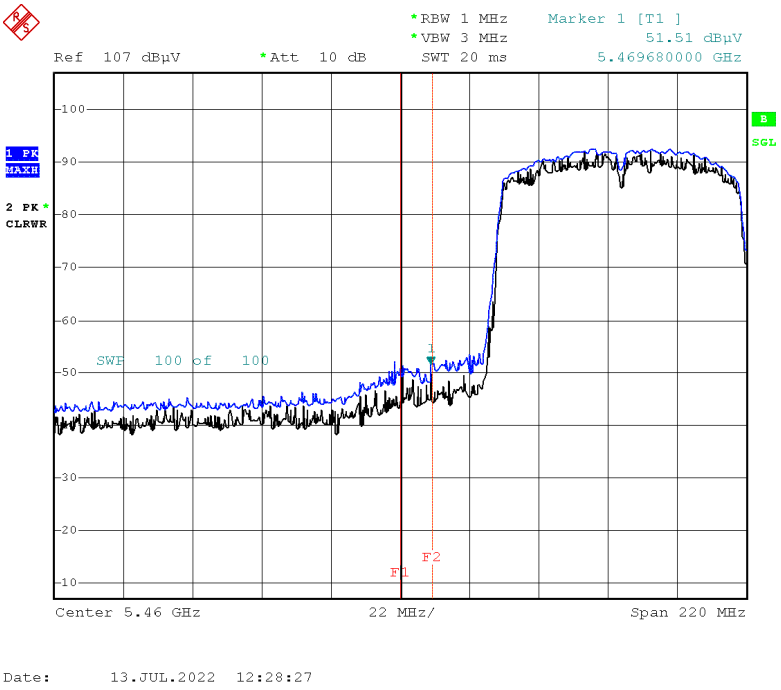
Date: 13.JUL.2022 12:27:10

Peak Reading (802.11ac(80M), Ch.106, **Y-V**)



Date: 13.JUL.2022 12:27:33

Peak Reading (802.11ac(80M), Ch.106, **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)

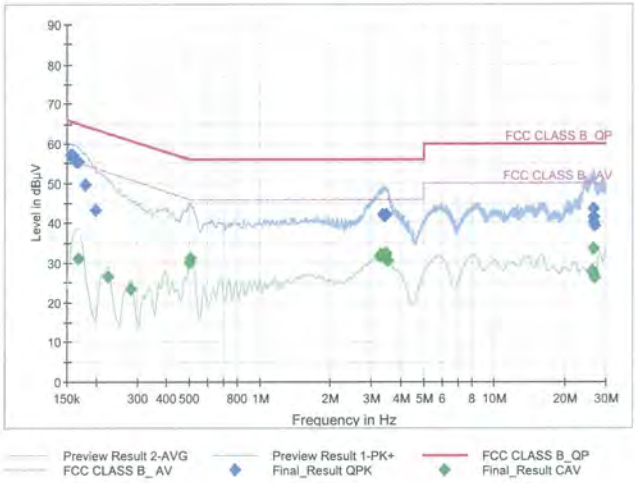
Test 1 / 2

Test Report

Common Information

EUT :	LGSBWAC23
Manufacturer :	LG Innotek
Test Site:	SHIELD ROOM
Operating Conditions :	5G WLAN_L1 Mode
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	57.10	65.75	8.65	9.000	L1	OFF	9.6
0.1590	57.09	65.52	8.43	9.000	L1	OFF	9.6
0.1635	55.29	65.28	10.00	9.000	L1	OFF	9.6
0.1680	55.37	65.06	9.69	9.000	L1	OFF	9.6
0.1793	49.65	64.52	14.88	9.000	L1	OFF	9.6
0.1995	43.25	63.63	20.38	9.000	L1	OFF	9.6
3.3373	42.07	56.00	13.93	9.000	L1	OFF	9.7
3.3620	42.02	56.00	13.98	9.000	L1	OFF	9.7
3.3935	41.97	56.00	14.03	9.000	L1	OFF	9.7
3.4070	41.85	56.00	14.15	9.000	L1	OFF	9.7
3.4385	41.84	56.00	14.16	9.000	L1	OFF	9.7
3.4475	42.03	56.00	13.97	9.000	L1	OFF	9.7
26.4313	41.47	60.00	18.53	9.000	L1	OFF	9.9
26.5798	41.25	60.00	18.75	9.000	L1	OFF	9.9
26.6000	43.42	60.00	16.58	9.000	L1	OFF	9.9
26.6270	41.18	60.00	18.82	9.000	L1	OFF	9.9
26.6450	40.21	60.00	19.79	9.000	L1	OFF	9.9
26.8273	39.09	60.00	20.91	9.000	L1	OFF	9.9

2022-07-14 오후 5:13:12

Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1680	31.28	55.06	23.78	9.000	L1	OFF	9.6
0.2243	26.54	52.66	26.12	9.000	L1	OFF	9.6
0.2805	23.45	50.80	27.36	9.000	L1	OFF	9.6
0.5000	29.87	46.00	16.13	9.000	L1	OFF	9.6
0.5045	31.04	46.00	14.96	9.000	L1	OFF	9.6
3.2383	31.69	46.00	14.31	9.000	L1	OFF	9.7
3.2653	31.88	46.00	14.12	9.000	L1	OFF	9.7
3.3080	31.99	46.00	14.01	9.000	L1	OFF	9.7
3.3958	31.46	46.00	14.54	9.000	L1	OFF	9.7
3.4070	31.40	46.00	14.60	9.000	L1	OFF	9.7
3.4588	32.41	46.00	13.59	9.000	L1	OFF	9.7
3.5150	30.50	46.00	15.50	9.000	L1	OFF	9.7
26.1770	28.06	50.00	21.94	9.000	L1	OFF	9.9
26.3300	28.12	50.00	21.88	9.000	L1	OFF	9.9
26.4088	33.48	50.00	16.52	9.000	L1	OFF	9.9
26.6000	27.12	50.00	22.88	9.000	L1	OFF	9.9
26.6450	27.04	50.00	22.96	9.000	L1	OFF	9.9
26.8250	26.34	50.00	23.66	9.000	L1	OFF	9.9

2022-07-14 오후 5:13:12

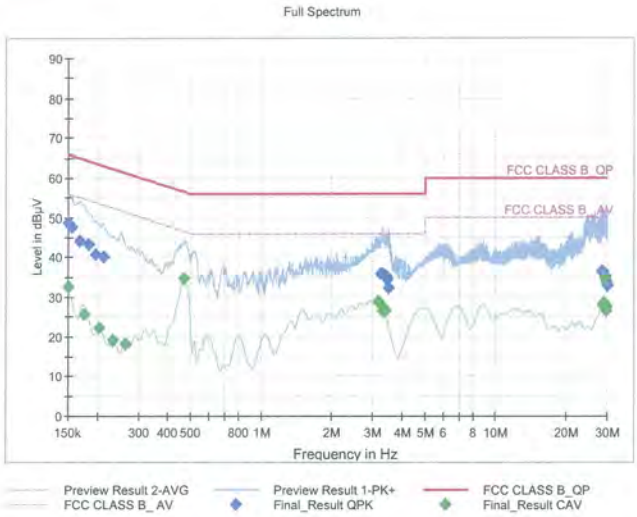
Conducted Emissions (Line 2)

Test 1 / 2

Test Report

Common Information

EUT :	LGSBWAC23
Manufacturer :	LG Innotek
Test Site:	SHIELD ROOM
Operating Conditions :	5G WLAN_N Mode
Operator Name:	
Comment:	



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	48.66	66.00	17.34	9.000	N	OFF	9.6
0.1545	47.51	65.75	18.24	9.000	N	OFF	9.6
0.1680	44.18	65.06	20.88	9.000	N	OFF	9.6
0.1838	43.33	64.31	20.99	9.000	N	OFF	9.6
0.1973	40.80	63.73	22.93	9.000	N	OFF	9.6
0.2130	40.20	63.09	22.88	9.000	N	OFF	9.6
3.2450	35.63	56.00	20.37	9.000	N	OFF	9.7
3.3035	35.66	56.00	20.34	9.000	N	OFF	9.7
3.3260	35.74	56.00	20.26	9.000	N	OFF	9.7
3.4295	35.21	56.00	20.79	9.000	N	OFF	9.7
3.4453	34.39	56.00	21.61	9.000	N	OFF	9.7
3.4858	32.42	56.00	23.58	9.000	N	OFF	9.7
28.3168	36.27	60.00	23.73	9.000	N	OFF	9.9
28.4450	36.45	60.00	23.55	9.000	N	OFF	9.9
28.6385	36.29	60.00	23.71	9.000	N	OFF	9.9
29.4823	35.25	60.00	24.75	9.000	N	OFF	9.9
29.6803	33.84	60.00	26.16	9.000	N	OFF	9.9
29.9435	32.88	60.00	27.12	9.000	N	OFF	9.9

2022-07-14 오후 2:51:32

Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	32.50	56.00	23.50	9.000	N	OFF	9.6
0.1748	25.71	54.73	29.02	9.000	N	OFF	9.6
0.2040	22.24	53.45	31.21	9.000	N	OFF	9.6
0.2333	18.92	52.33	33.42	9.000	N	OFF	9.6
0.2625	18.20	51.35	33.15	9.000	N	OFF	9.6
0.4650	34.50	46.60	12.11	9.000	N	OFF	9.6
3.1573	28.75	46.00	17.25	9.000	N	OFF	9.7
3.2968	26.58	46.00	19.42	9.000	N	OFF	9.7
3.3125	27.31	46.00	18.69	9.000	N	OFF	9.7
3.3418	26.53	46.00	19.47	9.000	N	OFF	9.7
3.3553	27.01	46.00	18.99	9.000	N	OFF	9.7
3.3710	26.52	46.00	19.48	9.000	N	OFF	9.7
28.8343	27.94	50.00	22.06	9.000	N	OFF	9.9
29.0953	28.53	50.00	21.47	9.000	N	OFF	9.9
29.1313	28.65	50.00	21.35	9.000	N	OFF	9.9
29.3540	34.59	50.00	15.41	9.000	N	OFF	9.9
29.6780	27.77	50.00	22.23	9.000	N	OFF	9.9
29.7455	26.56	50.00	23.44	9.000	N	OFF	9.9

2022-07-14 오후 2:51:32

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-FI007-P