

TEST REPORT

FCC UNII Test for SM-S721B/DS
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2407-FC071

DATE OF ISSUE
July 24, 2024

Tested by
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**TEST
REPORT****REPORT NO.**

HCT-RF-2407-FC071

DATE OF ISSUE

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Additional Model

SM-S721B

Applicant**SAMSUNG Electronics Co., Ltd.**

129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Product Name

Mobile Phone

Model Name

SM-S721B/DS

FCC ID

A3LSMS721B

Date of Test

June 03, 2024 ~ July 23, 2024

FCC Classification

Unlicensed National Information Infrastructure(NII)

Test Standard Used

FCC Rule Part(s): Part 15.407

Test Results

PASS

Location of Test☒ Permanent Testing Lab ☐ On Site Testing Lab

(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	July 24, 2024	Initial Release

Notice

Content

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

The laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

Test results provided by external providers are marked ***.

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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1. GENERAL INFORMATION

EUT DESCRIPTION

Model	SM-S721B/DS	
Additional Model	SM-S721B	
EUT Type	Mobile Phone	
Power Supply	DC 3.88 V	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20 MHz BW : 5180 - 5240 40 MHz BW : 5190 - 5230 80 MHz BW : 5210 160 MHz BW : 5250
	U-NII-2A	20 MHz BW : 5260 - 5320 40 MHz BW : 5270 - 5310 80 MHz BW : 5290 160 MHz BW : 5250
	U-NII-2C	20 MHz BW : 5500 - 5720 40 MHz BW : 5510 - 5710 80 MHz BW : 5530 - 5690 160 MHz BW : 5570
	U-NII-3	20 MHz BW : 5745 - 5825 40 MHz BW : 5755 - 5795 80 MHz BW : 5775 160 MHz BW : 5815
	U-NII-4	20 MHz BW : 5845 - 5885 40 MHz BW : 5835 - 5875 80 MHz BW : 5855 160 MHz BW : 5815
Straddle channel	Supported	
TDWR Band	Supported	
Dynamic Frequency Selection	Slave without radar detection	
Antenna Specification	Type: Metal	
Serial number	Conducted : R3CX503F4BK Radiated : R3CX40LGFHH	

ANTENNA CONFIGURATIONS

1. Antenna configuration

Configurations	SISO		MIMO	
	Ant.1	Ant.2	CDD	SDM
802.11a	O	O	O	X
802.11n	O	O	O	O
802.11ac	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.This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 2.4 GHz and 5 GHz or 6GHz Bands simultaneously on each antenna.

RSDB Scenario	Bluetooth Ant.1	Bluetooth Ant.2	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	6 GHz WiFi Ant.1	6 GHz WiFi Ant.2	Test Case
2.4 GHz WiFi MIMO + 5 GHz WiFi MIMO			on	on	on	on			Scenario1
2.4 GHz WiFi MIMO + 6 GHz WiFi MIMO			on	on			on	on	
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 5 GHz WiFi MIMO	on			on	on	on			Scenario2
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 6 GHz WiFi MIMO	on			on			on	on	
Dual Bluetooth + 5 GHz WiFi MIMO	on	on				on	on		
Dual Bluetooth + 6 GHz WiFi MIMO	on	on					on	on	Scenario3

3. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) e) (iii), f) ii)

$$\text{Directional Gain(CDD)} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left(\sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right]$$

$$\text{Directional gain(SDM)} = G_{\max} + 10 \cdot \text{LOG}(N_{ANT} / N_{SS})$$

Band	Ant Gain (dBi)		N _{ANT} / N _{SS}	Directional Gain (dBi)	
	ANT1	ANT2		CDD	SDM
UNII 1	-2.55	-4.12	2 / 2	-0.29	-2.55
UNII 2A	-3.52	-5.66		-1.51	-3.52
UNII 2C	-4.72	-5.67		-2.17	-4.72
UNII 3	-6.75	-3.43		-1.92	-3.43
UNII 4	-7.44	-3.87		-2.46	-3.87

Note

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

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

$$\text{Directional gain(SDM)} = G_{\max} + 10 \cdot \text{LOG}(N_{ANT} / N_{SS})$$

Sample Calculation (Conducted Power, MIMO):

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

$$\text{Ant1} + \text{Ant 2} = \text{MIMO}$$

$$(11.58 \text{ dBm} + 12.08 \text{ dBm}) = (14.387 \text{ mW} + 16.143 \text{ mW}) = 30.53 \text{ mW} = 14.88 \text{ dBm}$$

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

$$\text{Conducted Power} = (15.35 \text{ dBm} + 15.12 \text{ dBm}) = (34.276 \text{ mW} + 32.508 \text{ mW}) = 66.784 \text{ mW} = 18.25 \text{ dBm}$$

$$\text{E.I.R.P} = 18.25 \text{ dBm} + 3 \text{ dBi} = 21.25 \text{ dBm}$$

2. MAXIMUM OUTPUT POWER

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

Band	Mode	MIMO_CDD(Ant.1+ Ant.2)					
		Ant.1 Power		Ant.2 Power		Ant.1 + Ant.2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	15.53	0.036	14.19	0.026	17.92	0.062
	802.11n (HT20)	15.56	0.036	14.28	0.027	17.98	0.063
	802.11n (HT40)	13.45	0.022	14.16	0.026	16.83	0.048
	802.11ac (VHT20)	15.54	0.036	14.22	0.026	17.94	0.062
	802.11ac (VHT40)	13.40	0.022	14.21	0.026	16.83	0.048
	802.11ac (VHT80)	13.55	0.023	14.14	0.026	16.87	0.049
UNII2A	802.11a	14.66	0.029	15.22	0.033	17.96	0.063
	802.11n (HT20)	14.63	0.029	15.24	0.033	17.96	0.062
	802.11n (HT40)	14.05	0.025	14.33	0.027	17.20	0.053
	802.11ac (VHT20)	14.66	0.029	15.36	0.034	18.03	0.064
	802.11ac (VHT40)	13.89	0.024	14.31	0.027	17.12	0.051
	802.11ac (VHT80)	13.57	0.023	14.06	0.025	16.83	0.048
UNII2C	802.11a	14.95	0.031	15.04	0.032	18.01	0.063
	802.11n (HT20)	15.01	0.032	15.03	0.032	18.03	0.064
	802.11n (HT40)	14.25	0.027	14.19	0.026	17.23	0.053
	802.11ac (VHT20)	15.11	0.032	15.13	0.033	18.13	0.065
	802.11ac (VHT40)	14.18	0.026	14.14	0.026	17.17	0.052
	802.11ac (VHT80)	14.27	0.027	13.79	0.024	17.05	0.051
UNII3	802.11a	14.90	0.031	14.81	0.030	17.87	0.061
	802.11n (HT20)	14.92	0.031	14.82	0.030	17.88	0.061
	802.11n (HT40)	13.45	0.022	14.27	0.027	16.89	0.049
	802.11ac (VHT20)	15.02	0.032	14.95	0.031	18.00	0.063
	802.11ac (VHT40)	13.93	0.025	13.92	0.025	16.94	0.049
	802.11ac (VHT80)	13.64	0.023	13.55	0.023	16.61	0.046
UNII4 (Conducted For inf.)	802.11a	15.11	0.032	14.87	0.031	18.00	0.063
	802.11n (HT20)	14.45	0.028	15.35	0.034	17.93	0.062
	802.11n (HT40)	13.15	0.021	14.23	0.026	16.73	0.047
	802.11ac (VHT20)	14.38	0.027	15.41	0.035	17.94	0.062
	802.11ac (VHT40)	13.25	0.021	14.27	0.027	16.80	0.048
	802.11ac (VHT80)	13.85	0.024	14.32	0.027	17.10	0.051
UNII1-2A	802.11ac (VHT160)	11.74	0.015	11.88	0.015	14.82	0.030
UNII2C	802.11ac (VHT160)	11.53	0.014	11.97	0.016	14.77	0.030
UNII3&4	802.11ac (VHT160)	11.48	0.014	11.44	0.014	14.47	0.028

Band	Mode	MIMO_CDD(Ant.1+ Ant.2) (EIRP)											
		Ant.1 Power				Ant.2 Power				(Ant.1 + Ant.2) Power			
		(dBm)	ANT Gain(dBi)	EIRP (dBm)	(W)	(dBm)	ANT Gain(dBi)	EIRP (dBm)	(W)	(dBm)	ANT Gain(dBi)	EIRP (dBm)	(W)
UNII4 (E.I.R.P)	802.11a	15.11	-7.44	7.67	0.006	14.87	-3.87	11.00	0.013	18.00	-2.46	15.54	0.036
	802.11n (HT20)	14.45	-7.44	7.01	0.005	15.35	-3.87	11.48	0.014	17.93	-2.46	15.47	0.035
	802.11n (HT40)	13.15	-7.44	5.71	0.004	14.23	-3.87	10.36	0.011	16.73	-2.46	14.27	0.027
	802.11ac (VHT20)	14.38	-7.44	6.94	0.005	15.41	-3.87	11.54	0.014	17.94	-2.46	15.47	0.035
	802.11ac (VHT40)	13.25	-7.44	5.81	0.004	14.27	-3.87	10.40	0.011	16.80	-2.46	14.34	0.027
	802.11ac (VHT80)	13.85	-7.44	6.41	0.004	14.32	-3.87	10.45	0.011	17.10	-2.46	14.64	0.029
	802.11ac (VHT160)	11.48	-7.44	4.04	0.003	11.44	-3.87	7.57	0.006	14.47	-2.46	12.01	0.016

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. Additionally, for U-NII-4 band, use the following measurement procedure KDB 291074 D02 EMC Measurement v01

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average Measurement Type or modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated March 11, 2024 (Registration Number: KR0032).

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak Measurement Typeors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6. AntENNA REQUIREMENTS

According to FCC 47 CFR § 15.203, § 15.407:

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

- (1) The antennas of this E.U.T are permanently attached.
- (2) The E.U.T Complies with the requirement of § 15.203, § 15.407

7. MEASUREMENT UNCERTAINTY

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

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

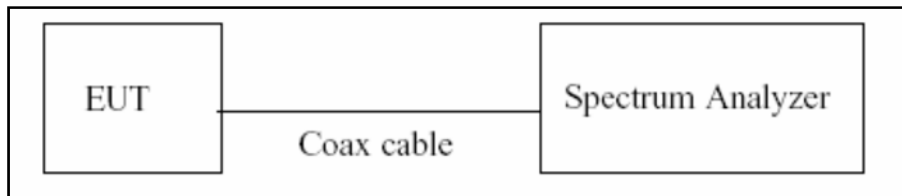
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (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.

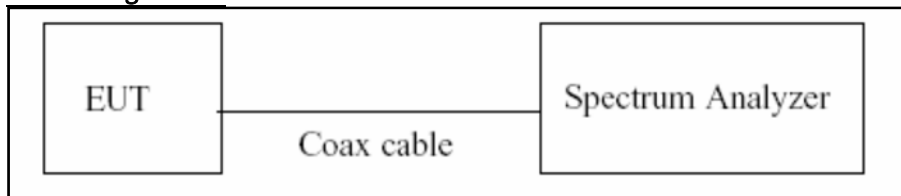
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Measurement Type or = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10\log(1/\text{Duty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

8.2. 6 dB Bandwidth & 26 dB Bandwidth

Limit

Within the 5.725-5.85 GHz(NII-3) & 5.85-5.925 GHz(NII-4) 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 $\geq 3 \times$ RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note:

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

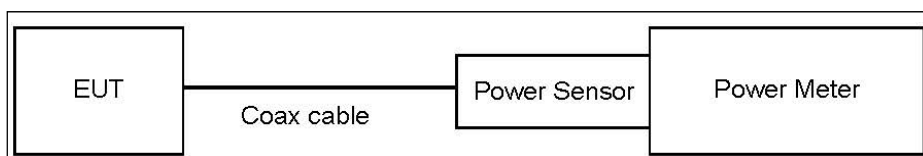
8.3. Output Power Measurement

Limit

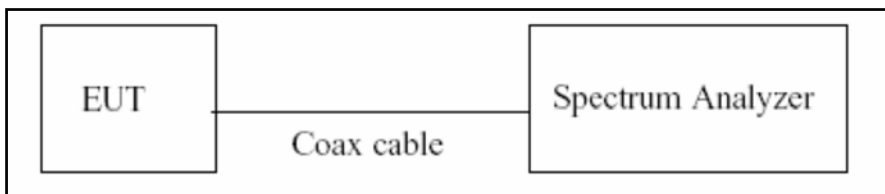
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30 dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30 dBm)
UNII 4	EIRP 30 dBm

Test Configuration

Power Meter



Spectrum Analyzer(Only Straddle Channel)



Test Procedure(Power Meter)

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

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

Test Procedure(Spectrum Analyzer)

The transmitter output is connected to the Spectrum Analyzer.

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

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

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW $\geq$ 3 MHz.
5. Number of points in sweep $\geq 2 \times \text{span}/\text{RBW}$.
6. Sweep time = auto.
7. Measurement Typeor = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. Add $10\log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

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

Note

1. Spectrum Measured Levels are not plot data.

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

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

Band	Loss(dB)
UNII 1	11.82
UNII 2A	11.82
UNII 2C	11.82
UNII 3&4	11.82

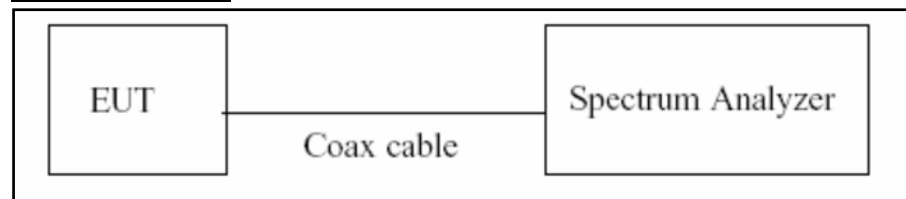
(Actual value of loss for the attenuator and cable combination)

8.4. Power Spectral Density

Limit

Band	Limit
UNII 1	11 dBm/MHz
UNII 2A, 2C	11 dBm/MHz
UNII 3	30 dBm/500 kHz
UNII 4	EIRP 14 dBm/MHz

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)
→ For portion within the NII-3 be used RBW 510kHz
3. VBW $\geq$ 3 MHz
4. Number of points in sweep $\geq$ 2 x span/RBW.
5. Sweep time = auto.
6. Measurement Typeor = RMS(i.e., power averaging), if available. Otherwise, use sample Measurement Typeor 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) = Measured Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

Note

1. Spectrum Measured Levels are not plot data.

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

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

Band	Loss(dB)
UNII 1	11.82
UNII 2A	11.82
UNII 2C	11.82
UNII 3&4	11.82

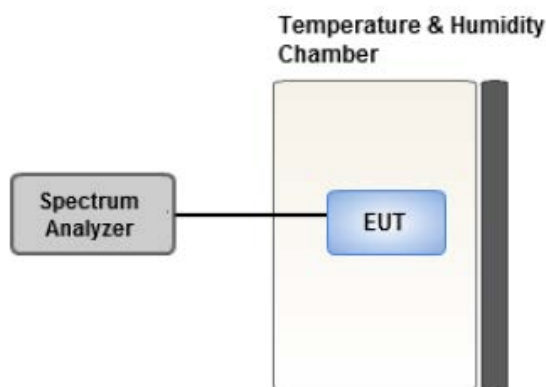
(Actual value of loss for the attenuator and cable combination)

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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56 ^(a)	56 to 46 ^(a)
0.50 to 5	56	46
5 to 30	60	50

^(a)Decreases with the logarithm of the frequency.

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

Test Configuration

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

Test Procedure

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

Sample Calculation

Quasi-peak(Final Result) = Measured 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. UNII 4: [Low Channel O.O.B.E] measured with a Peak detector
For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of -27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of 27 dBm/MHz at 5.725 GHz.

[High Channel O.O.B.E] measured with an RMS detector

For a client device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of -5 dBm/MHz and shall decrease linearly to an e.i.r.p. of -27 dBm/MHz at or above 5.925 GHz.

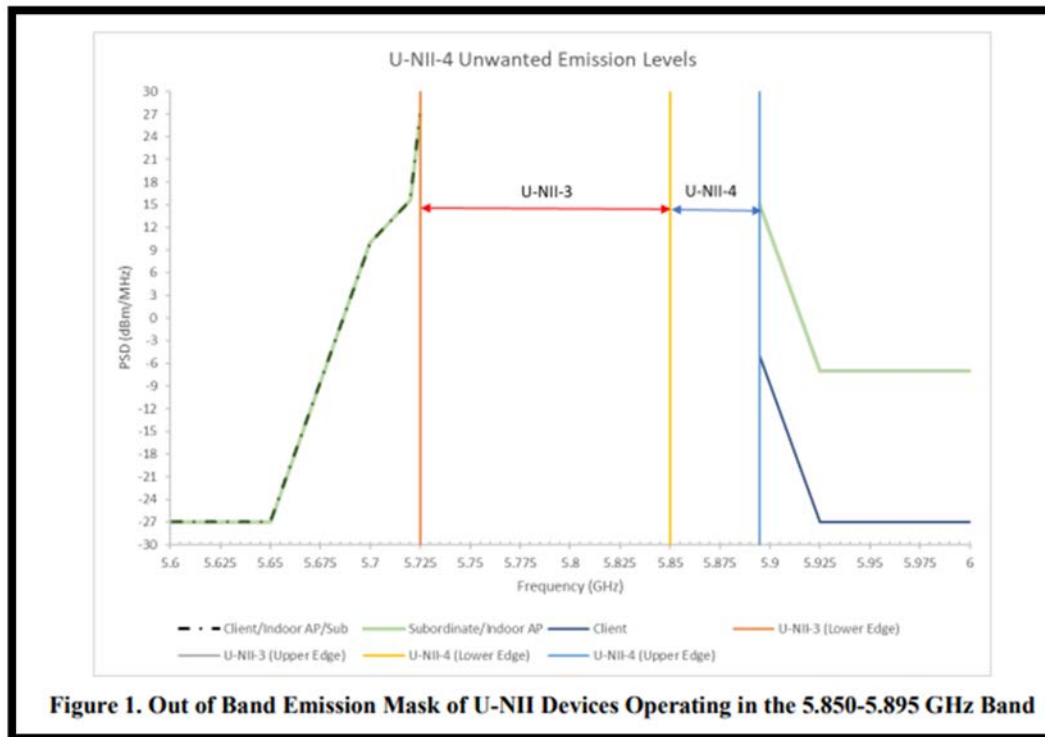


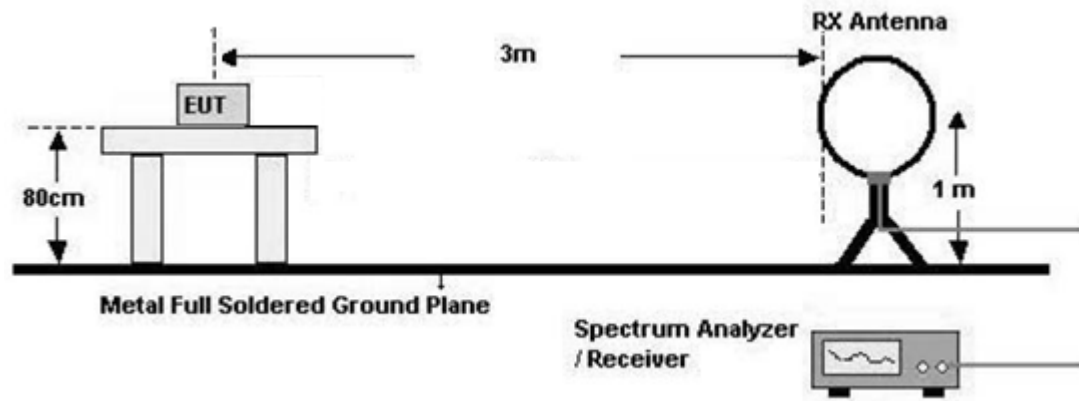
Figure 1. Out of Band Emission Mask of U-NII Devices Operating in the 5.850-5.895 GHz Band

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

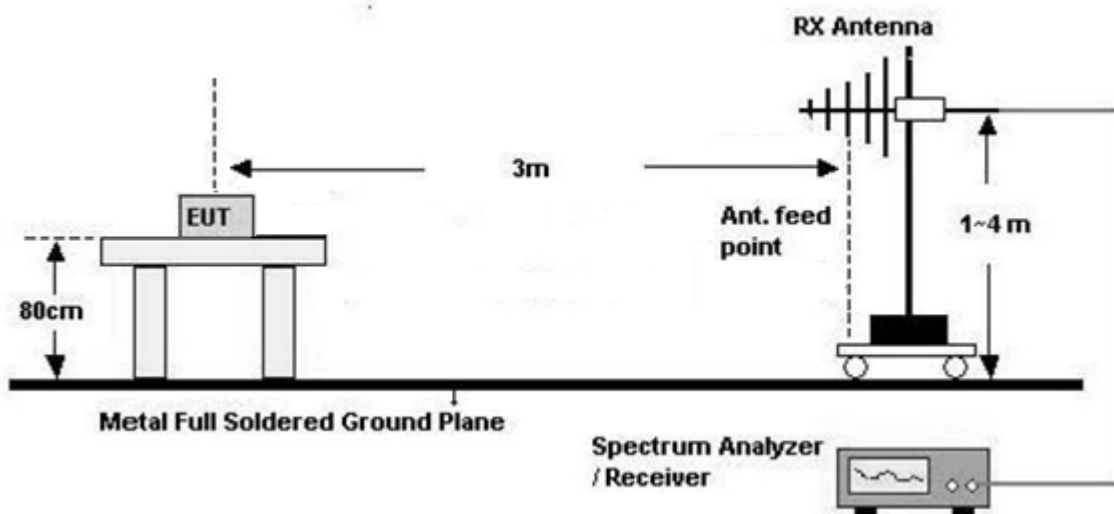
Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

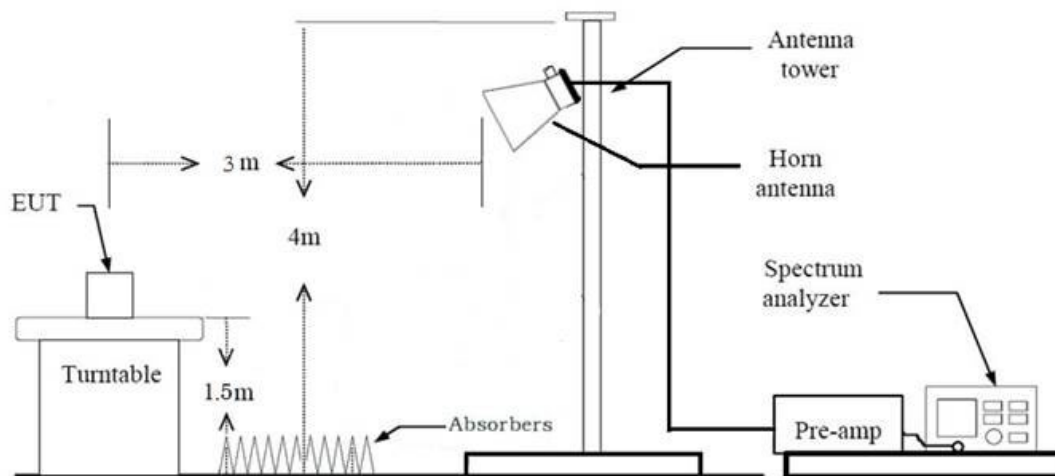
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. .We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = $40\log(3\text{ m}/300\text{ m}) = -80\text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3\text{ m}/30\text{ m}) = -40\text{ dB}$
Measurement Distance : 3 m
8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Max Hold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ RBW
9. Total = Measured 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 1 GHz)

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 3 m from the EUT, which is varied from 1 m to 4 m 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 = Max Hold
 - RBW = 100 kHz
 - VBW $\geq 3 \times$ RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range : 30 MHz – 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
- ※In general, (1) is used mainly
- 7.Total = Measured 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 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting

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

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

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

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

- RBW = 1 MHz
- VBW(Duty cycle $\geq$ 98 percent) = VBW $\leq$ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
- VBW(Duty cycle is < 98 percent) = VBW $\geq$ $1/T$, where T is the minimum transmission duration.
- The analyzer is set to linear detector mode.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = Max Hold.
- Allow Max Hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the 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 = $20\log(\text{test distance} / \text{specific distance})$ (dB)
12. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.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 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.

8. Spectrum Setting

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

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = Max Hold
- Allow sweeps to continue until the trace stabilizes.

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

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

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

9. Measured Frequency Range :

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

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

11. Total = Measured Value

- We apply to the offset in the range 1 GHz - 18 GHz.
- The offset
- = Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F) - Amp Gain(A.G) + Attenuator(ATT)

The actual setting value of VBW

Mode	Worst Data rate (Mbps)	Duty Cycle	Duty Cycle Factor (dB)	The actual setting value of VBW (Hz)
802.11a	6	0.937	0.284	1 000
802.11n(HT20)	MCS0	0.927	0.329	1 000
802.11n(HT40)	MCS0	0.862	0.646	2 000
802.11ac(VHT20)	MCS0	0.927	0.330	1 000
802.11ac(VHT40)	MCS0	0.864	0.634	2 000
802.11ac(VHT80)	MCS0	0.760	1.192	5 000
802.11ac(VHT160)	MCS0	0.720	1.427	5 000

8.8. Worst case configuration and mode

Conducted test

1. All datarate of operation were investigated and the worst case datarate results are reported.
2. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.
(Worst case: SM-S721B/DS)

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
 - Worstcase : Stand alone
2. EUT Axis
 - Radiated Spurious Emissions : Z
 - Radiated Restricted Band Edge : Z, X
3. All datarate of operation were investigated and the worst case datarate results are reported.
 - Mode : SISO, Ant.1+Ant.2(SDM), Ant.1+Ant.2(CDD)
 - Worstcase : Ant.1+Ant.2(CDD)
 - 802.11a : 6 Mbps
 - 802.11n_HT20 : MCS0
 - 802.11n_HT40 : MCS0
 - 802.11ac_VHT20 : MCS0
 - 802.11ac_VHT40 : MCS0
 - 802.11ac_VHT80 : MCS0
 - 802.11ac_VHT160: MCS0
4. Radiated Spurious Emission
 - All modulation of operation were investigated and the worst case modulation results are reported.
Worst-case : 802.11a_6 Mbps
5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
 - Position: Horizontal, Vertical, Parallel to the ground plane
6. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.
(Worst case: SM-S721B/DS)

Radiated test(RSDB)

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

- Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
- Worstcase : Stand alone

2. EUT Axis

- Radiated Spurious Emissions : X, Z

3. All of RSDB Scenario were investigated and the worst case configuration results are reported.

RSDB Scenario	Bluetooth Ant.1	Bluetooth Ant.2	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	6 GHz WiFi Ant.1	6 GHz WiFi Ant.2	Test Case
2.4 GHz WiFi MIMO + 5 GHz WiFi MIMO			on	on	on	on			Scenario1
2.4 GHz WiFi MIMO + 6 GHz WiFi MIMO			on	on			on	on	
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 5 GHz WiFi MIMO	on			on	on	on			Scenario2
Bluetooth ANT.1 + 2.4 GHz WiFi ANT.2 + 6 GHz WiFi MIMO	on			on			on	on	
Dual Bluetooth + 5 GHz WiFi MIMO	on	on				on	on		
Dual Bluetooth + 6 GHz WiFi MIMO	on	on					on	on	Scenario3
Bluetooth ANT.2 + 2.4 GHz WiFi ANT.2 + 5 GHz WiFi MIMO		on			on	on			
Bluetooth ANT.2 + 2.4 GHz WiFi ANT.2 + 6 GHz WiFi MIMO		on					on	on	

4. The RSDB mode test investigated both intermodulation and radiated spurious emissions.

And the worst results were reported.

- Worst result: Radiated spurious emissions
- Intermodulation: No signals are generated.
- Radiated spurious emissions: cf. Section 10.8.

5. The following tables show the worst case configurations determined during testing.

(Worst case: The lowest margin condition the channels and modes were selected for test.)

RSDB Scenario 2	Description	Bluetooth Emission	2.4GHz Emission	5 GHz Emission
Bluetooth ANT.1 +	Antenna	Dual	ANT2	Ant All
	Channel	78	1	165
2.4 GHz WiFi ANT.2 +	Data Rate	1 Mbps	1 Mbps	6 Mbps
5 GHz WiFi MIMO	Mode	GFSK	802.11b	802.11a

Note : BT, DTS RSDB Data refer to [BT], [DTS] Test Report

6. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.

(Worst case: SM-S721B/DS)

AC Power line Conducted Emissions

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

- Mode : Stand alone + External accessories (Earphone,etc) + Travel Adapter,

Stand alone + Travel Adapter

- Worstcase : Stand alone + Travel Adapter

2. SM-S721B/DS, SM-S721B were tested and the worst case results are reported.

(Worst case: SM-S721B/DS)

9. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26 dB Bandwidth	§ 15.407 (for Power Measurement)	N/A	Conducted	PASS
6 dB Bandwidth	§ 15.407(e)	>500 kHz (5725-5850 MHz)(UNII-3) (5850-5895 MHz)(UNII-4)		PASS
Maximum Conducted Output Power	§ 15.407(a)(1),(2),(3)	< 250 mW(5150-5250 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10log ₁₀ (BW) dBm (5470-5725 MHz) <1 W (5725-5850 MHz)		PASS
Maximum EIRP Output Power	§ 15.407(a)(1)(3)(iii)	< EIRP 30dBm (5850-5925 MHz)		PASS
Maximum 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) < EIRP 14 dBm/MHz(5850-5895 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) § 15.407(b)(5)(ii),(iii) § 15.35(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.6 (UNII 3&4)	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

10. TEST RESULT

10.1 DUTY CYCLE

Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11a	6	1.466	1.565	0.937	0.284
	9	0.983	1.084	0.907	0.426
	12	0.745	0.844	0.883	0.541
	18	0.507	0.603	0.840	0.755
	24	0.385	0.484	0.796	0.992
	36	0.266	0.365	0.729	1.372
	48	0.205	0.339	0.604	2.186
	54	0.185	0.357	0.518	2.859

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11n (HT20)	0	1.246	1.344	0.927	0.329
	1	0.646	0.745	0.867	0.618
	2	0.441	0.540	0.817	0.878
	3	0.339	0.441	0.770	1.134
	4	0.243	0.347	0.701	1.544
	5	0.190	0.352	0.540	2.680
	6	0.175	0.352	0.496	3.042
	7	0.162	0.360	0.451	3.461
802.11n (HT40)	0	0.618	0.718	0.862	0.646
	1	0.327	0.426	0.768	1.147
	2	0.231	0.410	0.562	2.505
	3	0.182	0.408	0.447	3.495
	4	0.137	0.377	0.362	4.408
	5	0.111	0.380	0.293	5.326
	6	0.104	0.375	0.277	5.575
	7	0.096	0.375	0.257	5.905

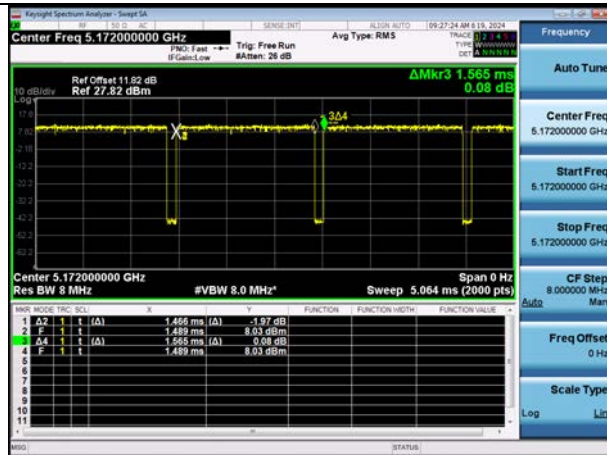
Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT20)	0	1.254	1.353	0.927	0.330
	1	0.649	0.747	0.868	0.616
	2	0.446	0.545	0.819	0.869
	3	0.347	0.443	0.783	1.063
	4	0.243	0.352	0.691	1.607
	5	0.195	0.355	0.550	2.596
	6	0.177	0.347	0.511	2.916
	7	0.165	0.345	0.478	3.206
	8	0.144	0.352	0.410	3.871
802.11ac (VHT40)	0	0.624	0.722	0.864	0.634
	1	0.332	0.431	0.771	1.132
	2	0.236	0.380	0.620	2.076
	3	0.187	0.367	0.510	2.921
	4	0.139	0.372	0.374	4.270
	5	0.119	0.395	0.301	5.210
	6	0.109	0.405	0.269	5.707
	7	0.101	0.370	0.274	5.623
	8	0.099	0.450	0.220	6.576
	9	0.086	0.420	0.205	6.888
802.11ac (VHT80)	0	0.312	0.411	0.760	1.192
	1	0.255	0.350	0.729	1.370
	2	0.250	0.350	0.715	1.456
	3	0.236	0.334	0.705	1.521
	4	0.193	0.304	0.633	1.984
	5	0.170	0.304	0.558	2.531
	6	0.165	0.336	0.491	3.089
	7	0.156	0.320	0.488	3.120
	8	0.140	0.296	0.472	3.258
	9	0.139	0.309	0.451	3.460

Mode	MCS Index	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor(dB)
802.11ac (VHT160)	0	0.252	0.350	0.720	1.427
	1	0.236	0.334	0.705	1.521
	2	0.193	0.327	0.589	2.298
	3	0.167	0.319	0.524	2.808
	4	0.144	0.322	0.449	3.479
	5	0.138	0.323	0.427	3.693
	6	0.132	0.319	0.413	3.844
	7	0.127	0.317	0.400	3.979
	8	0.124	0.319	0.389	4.102
	9	0.120	0.319	0.376	4.246

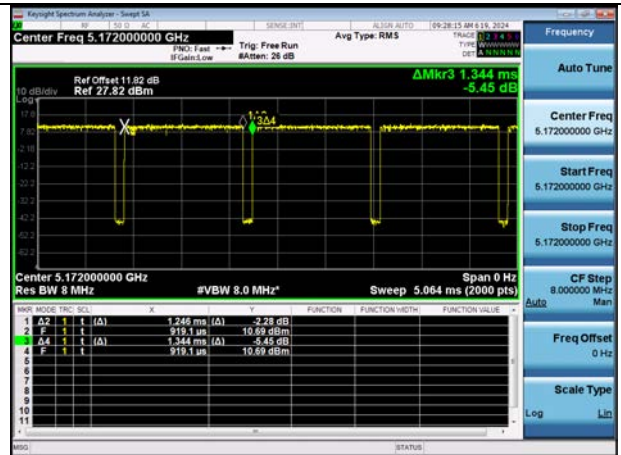
Note:

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

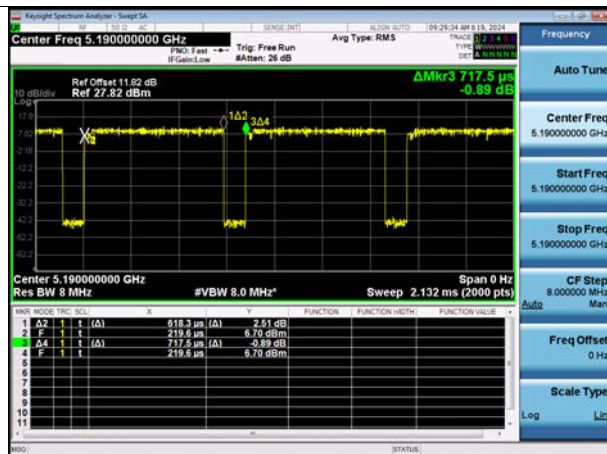
802.11a



802.11n(HT20)



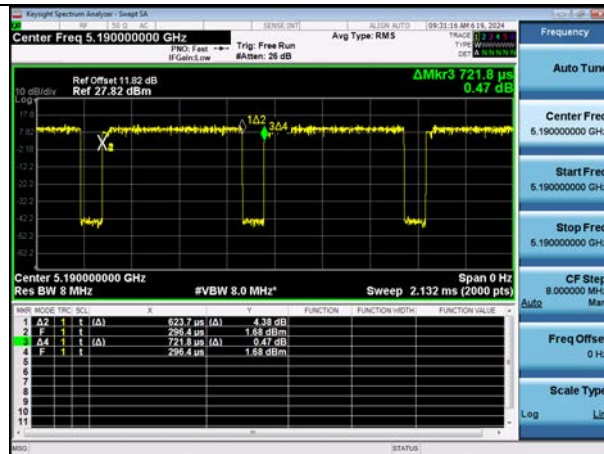
802.11n(HT40)



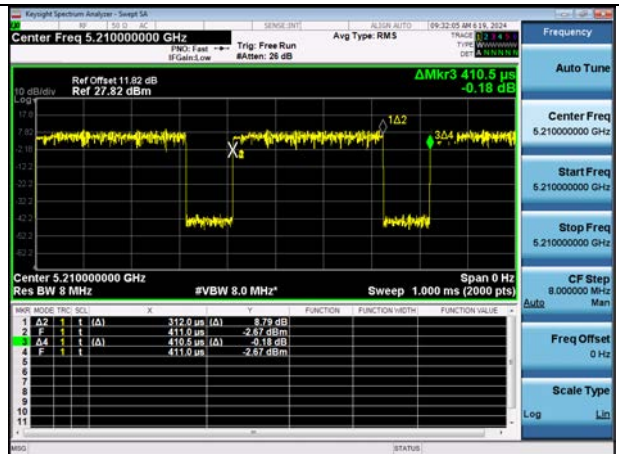
802.11ac(VHT20)



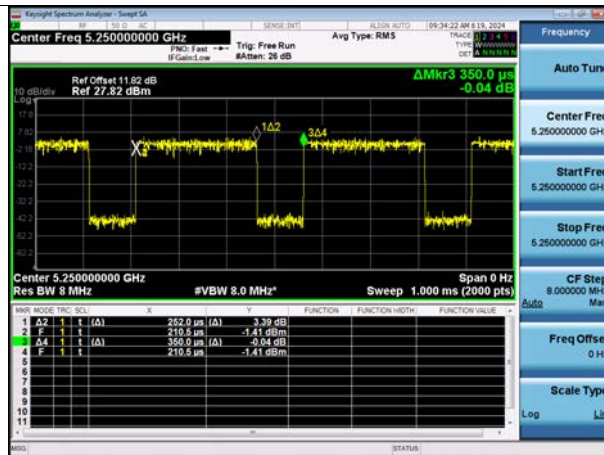
802.11ac(VHT40)



802.11ac(VHT80)



802.11ac(VHT160)



10.2 26 dB Bandwidth

Straddle channel data in the table below are for reporting purposes only. Straddle channel data were added in section 10.7.1.

[Ant.1]

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11a	5180	36	21.08	16.677
	5200	40	21.23	16.706
	5240	48	21.35	16.664
	5260	52	21.35	16.695
	5300	60	21.35	16.704
	5320	64	21.47	16.706
	5500	100	21.31	16.697
	5600	120	21.07	16.702
	5720	144	21.27	16.714
	5745	149	21.38	16.696
	5785	157	21.24	16.703
	5825	165	21.07	16.715
	5845	169	21.41	16.673
	5865	173	21.28	16.698
	5885	177	21.40	16.704

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11n (HT20)	5180	36	21.40	17.830
	5200	40	21.43	17.844
	5240	48	21.54	17.825
	5260	52	21.09	17.816
	5300	60	21.11	17.804
	5320	64	21.50	17.821
	5500	100	21.39	17.824
	5600	120	21.49	17.841
	5720	144	21.84	17.851
	5745	149	21.48	17.843
	5785	157	21.56	17.829
	5825	165	21.66	17.839
	5845	169	21.56	17.846
	5865	173	21.82	17.819
	5885	177	21.36	17.826

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT20)	5180	36	21.38	17.842
	5200	40	21.22	17.820
	5240	48	21.60	17.842
	5260	52	21.43	17.846
	5300	60	21.47	17.830
	5320	64	21.42	17.819
	5500	100	21.41	17.822
	5600	120	21.65	17.848
	5720	144	21.66	17.821
	5745	149	21.73	17.840
	5785	157	21.51	17.839
	5825	165	21.65	17.835
	5845	169	21.45	17.826
	5865	173	21.31	17.848
	5885	177	21.62	17.836

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11n (HT40)	5190	38	43.05	36.525
	5230	46	42.52	36.493
	5270	54	42.22	36.433
	5310	62	42.47	36.528
	5510	102	42.89	36.540
	5590	118	42.59	36.507
	5710	142	43.09	36.511
	5755	151	43.04	36.520
	5795	159	42.49	36.552
	5835	167	42.77	36.475
	5875	175	42.66	36.535

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT40)	5190	38	42.74	36.506
	5230	46	43.10	36.514
	5270	54	42.50	36.443
	5310	62	42.53	36.543
	5510	102	42.84	36.522
	5590	118	42.80	36.538
	5710	142	42.43	36.461
	5755	151	42.51	36.536
	5795	159	42.62	36.551
	5835	167	42.62	36.440
	5875	175	42.61	36.532

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT80)	5210	42	92.99	76.578
	5290	58	93.01	76.586
	5530	106	93.11	76.535
	5610	122	91.57	76.519
	5690	138	92.69	76.650
	5775	155	92.47	76.729
	5855	171	91.13	76.492

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT160)	5250	50	178.9	155.81
	5570	114	174.3	155.95
	5815	163	180.6	155.86

[Ant.2]

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11a	5180	36	21.15	16.699
	5200	40	20.90	16.706
	5240	48	21.10	16.677
	5260	52	21.19	16.673
	5300	60	21.17	16.687
	5320	64	20.84	16.683
	5500	100	20.80	16.703
	5600	120	21.45	16.681
	5720	144	20.95	16.696
	5745	149	20.83	16.669
	5785	157	21.46	16.659
	5825	165	21.20	16.657
	5845	169	21.17	16.736
	5865	173	21.10	16.721
	5885	177	21.37	16.701

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11n (HT20)	5180	36	21.40	17.812
	5200	40	21.90	17.823
	5240	48	21.77	17.823
	5260	52	21.48	17.831
	5300	60	21.48	17.819
	5320	64	21.52	17.823
	5500	100	21.32	17.834
	5600	120	21.46	17.822
	5720	144	21.43	17.837
	5745	149	21.79	17.838
	5785	157	21.47	17.809
	5825	165	21.46	17.828
	5845	169	21.84	17.835
	5865	173	21.71	17.861
	5885	177	21.48	17.816

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT20)	5180	36	21.45	17.839
	5200	40	21.52	17.816
	5240	48	21.35	17.827
	5260	52	21.44	17.818
	5300	60	21.53	17.827
	5320	64	21.41	17.838
	5500	100	21.38	17.832
	5600	120	21.22	17.833
	5720	144	21.51	17.813
	5745	149	21.52	17.831
	5785	157	21.51	17.839
	5825	165	21.70	17.840
	5845	169	22.05	17.853
	5865	173	21.80	17.858
	5885	177	21.43	17.838

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11n (HT40)	5190	38	42.55	36.473
	5230	46	42.60	36.516
	5270	54	42.59	36.519
	5310	62	42.53	36.517
	5510	102	42.53	36.478
	5590	118	42.57	36.506
	5710	142	42.61	36.553
	5755	151	42.59	36.527
	5795	159	42.65	36.521
	5835	167	42.59	36.483
	5875	175	42.51	36.548

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT40)	5190	38	42.52	36.539
	5230	46	42.62	36.492
	5270	54	42.58	36.498
	5310	62	42.26	36.524
	5510	102	42.96	36.532
	5590	118	42.82	36.531
	5710	142	42.97	36.526
	5755	151	43.10	36.530
	5795	159	42.83	36.550
	5835	167	42.82	36.492
	5875	175	42.63	36.578

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT80)	5210	42	92.91	76.544
	5290	58	93.25	76.512
	5530	106	93.03	76.605
	5610	122	92.85	76.716
	5690	138	92.74	76.459
	5775	155	93.19	76.739
	5855	171	91.97	76.353

Mode	Frequency [MHz]	Channel No.	26 dB Bandwidth [MHz]	99% Occupied Bandwidth [MHz]
802.11ac (VHT160)	5250	50	179.2	155.78
	5570	114	180.5	156.07
	5815	163	182.2	156.01

[ANT. 1]

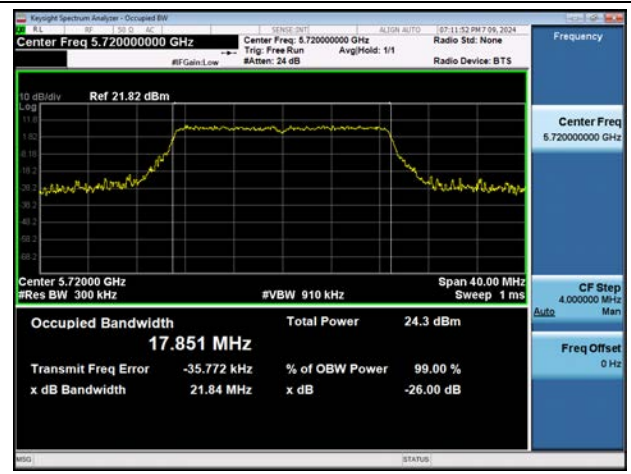
Test Plots

Note: In order to simplify the report, attached plots were only the widest channel per channel bandwidth.

802.11a 26 dB Bandwidth (CH 64)



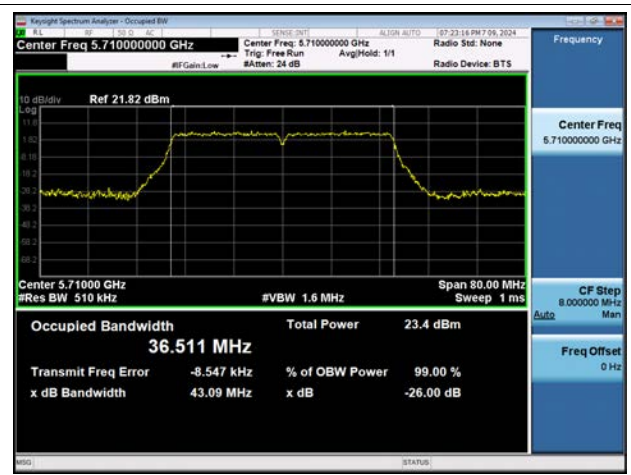
802.11n(HT20) 26 dB Bandwidth (CH 144)



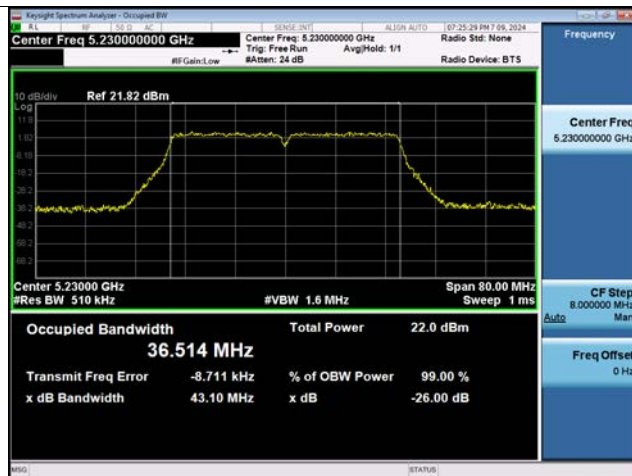
802.11ac(VHT20) 26 dB Bandwidth (CH 149)



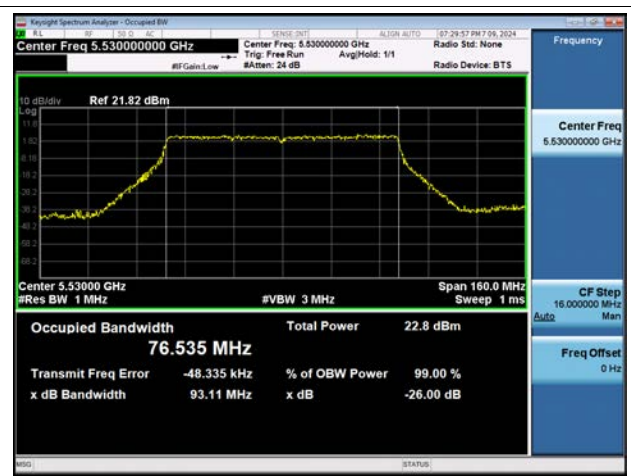
802.11n(HT40) 26 dB Bandwidth (CH 142)



802.11ac(VHT40) 26 dB Bandwidth (CH 46)



802.11ac(VHT80) 26 dB Bandwidth (CH 106)



802.11ac(VHT160) 26 dB Bandwidth (CH 163)



[ANT. 2]

Test Plots

Note: In order to simplify the report, attached plots were only the widest channel per channel bandwidth.

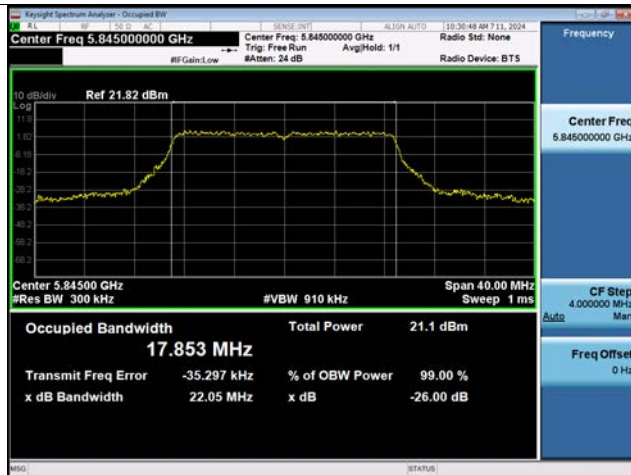
802.11a 26 dB Bandwidth (CH 157)



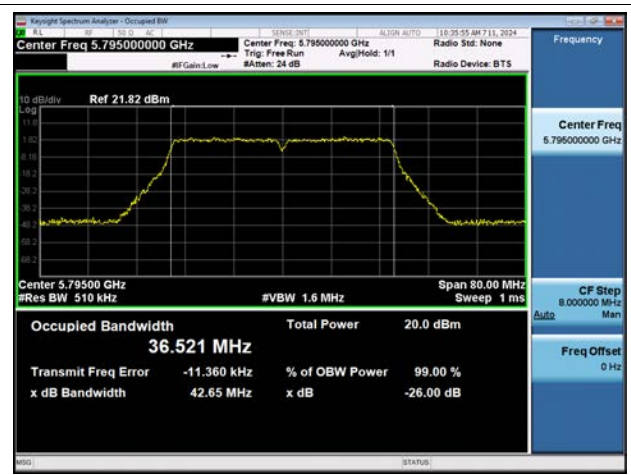
802.11n(HT20) 26 dB Bandwidth (CH 40)



802.11ac(VHT20) 26 dB Bandwidth (CH 169)



802.11n(HT40) 26 dB Bandwidth (CH 159)



802.11ac(VHT40) 26 dB Bandwidth (CH 151)



802.11ac(VHT80) 26 dB Bandwidth (CH 58)



802.11ac(VHT160) 26 dB Bandwidth (CH 163)



10.3 6 dB BANDWIDTH

[Ant.1]

Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11a	5745	149	16.41	> 0.5
	5785	157	16.41	> 0.5
	5825	165	16.40	> 0.5
	5845	169	16.41	> 0.5
	5865	173	16.40	> 0.5
	5885	177	16.42	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT20)	5745	149	17.64	> 0.5
	5785	157	17.64	> 0.5
	5825	165	17.64	> 0.5
	5845	169	17.64	> 0.5
	5865	173	17.63	> 0.5
	5885	177	17.63	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT20)	5745	149	17.64	> 0.5
	5785	157	17.63	> 0.5
	5825	165	17.63	> 0.5
	5845	169	17.64	> 0.5
	5865	173	17.63	> 0.5
	5885	177	17.62	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	5755	151	36.44	> 0.5
	5795	159	36.44	> 0.5
	5835	167	36.44	> 0.5
	5875	175	36.42	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT40)	5755	151	36.45	> 0.5
	5795	159	36.43	> 0.5
	5835	167	36.45	> 0.5
	5875	175	36.43	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	5775	155	76.49	> 0.5
802.11ac(VHT80)	5855	171	76.51	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT160)	5815	163	155.8	> 0.5

[Ant.2]

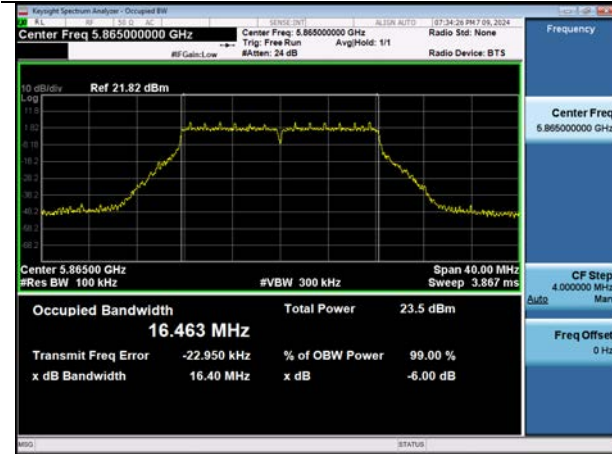
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11a	5745	149	16.39	> 0.5
	5785	157	16.42	> 0.5
	5825	165	16.40	> 0.5
	5845	169	16.42	> 0.5
	5865	173	16.39	> 0.5
	5885	177	16.40	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT20)	5745	149	17.63	> 0.5
	5785	157	17.65	> 0.5
	5825	165	17.63	> 0.5
	5845	169	17.63	> 0.5
	5865	173	17.63	> 0.5
	5885	177	17.63	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT20)	5745	149	17.63	> 0.5
	5785	157	17.64	> 0.5
	5825	165	17.64	> 0.5
	5845	169	17.63	> 0.5
	5865	173	17.63	> 0.5
	5885	177	17.63	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	5755	151	36.45	> 0.5
	5795	159	36.46	> 0.5
	5835	167	36.45	> 0.5
	5875	175	36.45	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT40)	5755	151	36.45	> 0.5
	5795	159	36.43	> 0.5
	5835	167	36.46	> 0.5
	5875	175	36.44	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	5775	155	76.50	> 0.5
802.11ac(VHT80)	5855	171	76.25	> 0.5
Mode	Frequency [MHz]	Channel No.	6 dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT160)	5815	163	156.0	> 0.5

[ANT. 1]

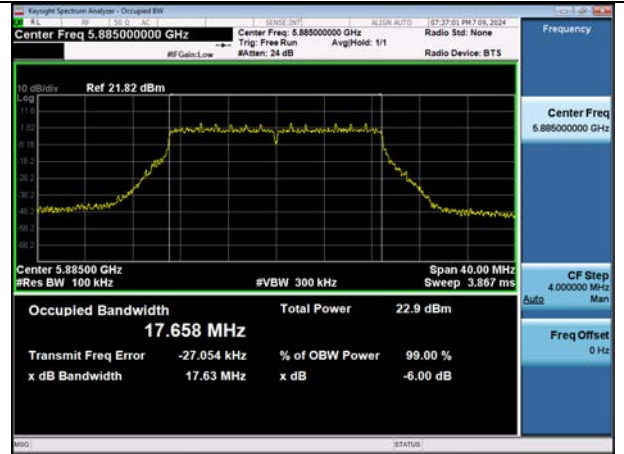
Test Plots

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

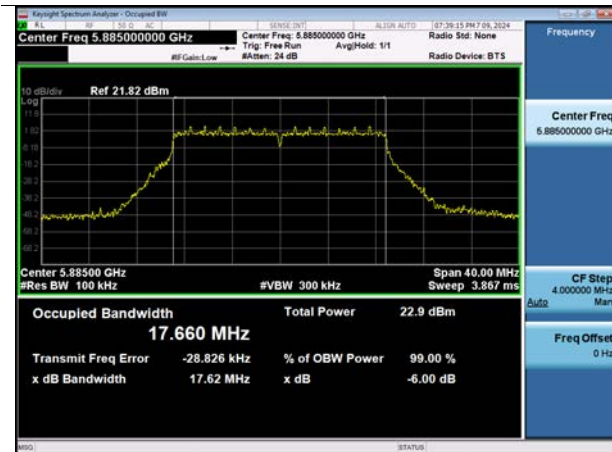
802.11a (CH.173)



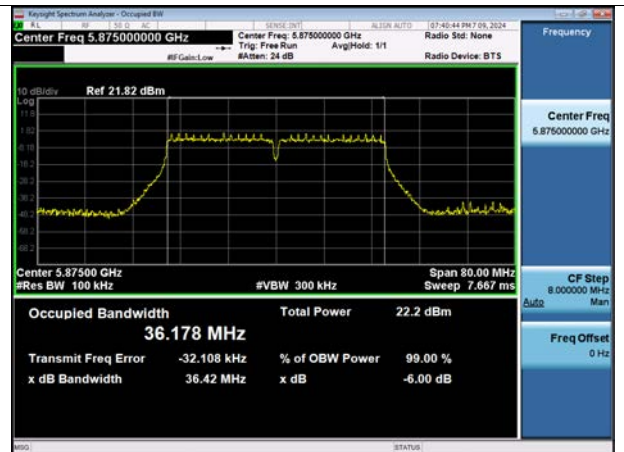
802.11n(HT20) (CH.177)



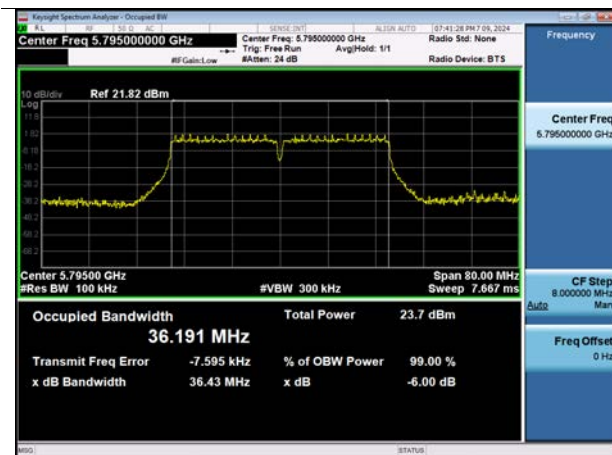
802.11ac(VHT20) (CH.177)



802.11n(HT40) (CH.175)



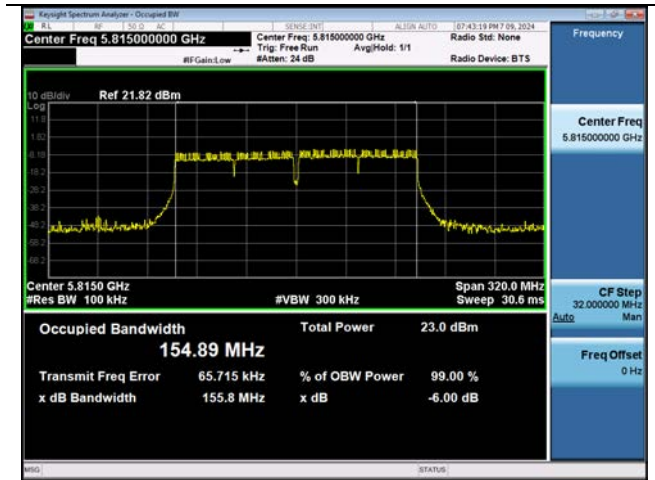
802.11ac(VHT40) (CH.159)



802.11ac(VHT80) (CH.155)



802.11ac(VHT160) (CH.163)



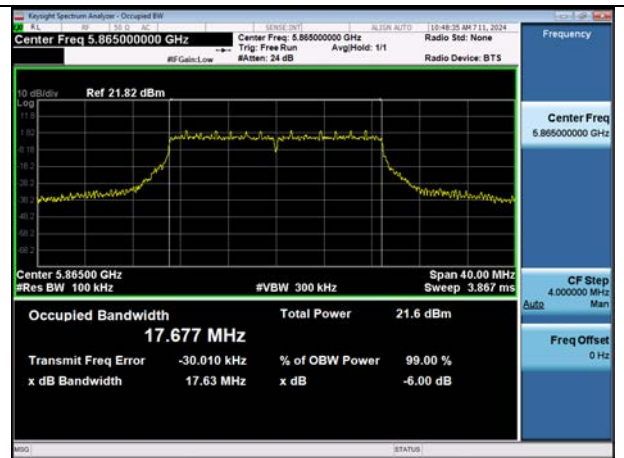
[ANT. 2]

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

802.11a (CH.149)



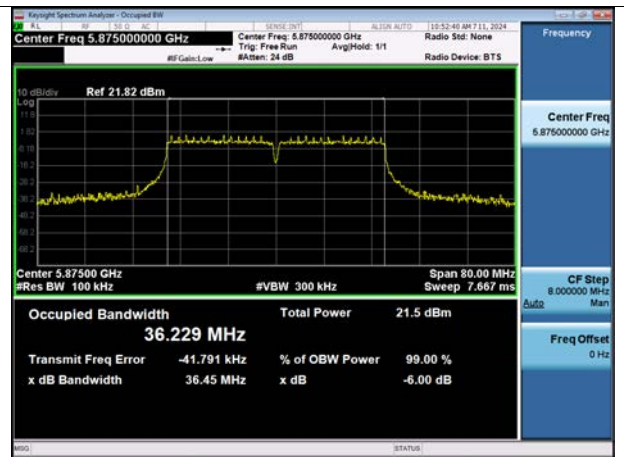
802.11n(HT20) (CH.173)



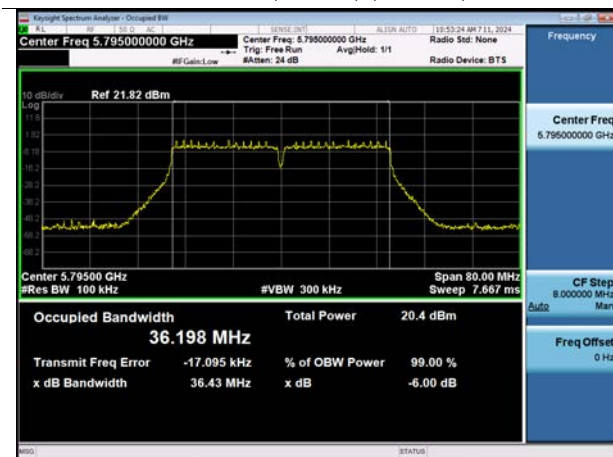
802.11ac(VHT20) (CH.173)



802.11n(HT40) (CH.175)



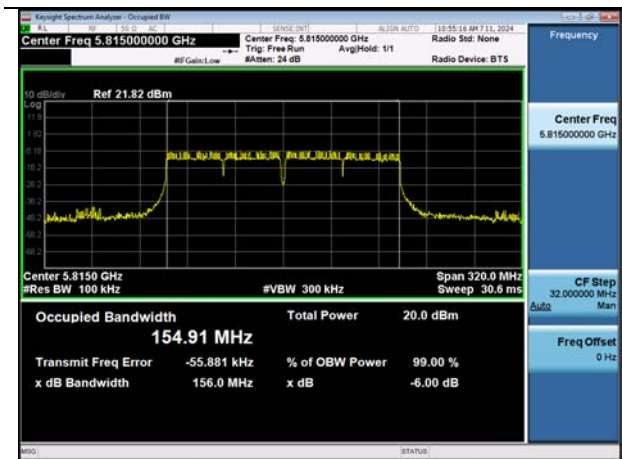
802.11ac(VHT40) (CH.159)



802.11ac(VHT80) (CH.171)



802.11ac(VHT160) (CH.163)



10.4 OUTPUT POWER MEASUREMENT

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

Straddle channel data were added in section 10.7.3.

Limit

(UNII 1) : 23.98 dBm

(UNII 2A, 2C) : 23.98 dBm or $11 \text{ dBm} + 10 \log B$, (where B is the 26 dB emission bandwidth in megahertz.)

(UNII 3) : 30.00 dBm

(UNII 4) : EIRP 30.0 dBm/MHz

(UNII 3&4) : Worst limit 30.00 dBm → UNII 4 Band Antenna Gain Negative

[MIMO_CDD(Ant.1+ Ant.2)]

Ant Total Power [dBm] = Measured Power [dBm] + Duty Cycle Factor [dB]

MIMO_CDD(Ant.1+ Ant.2) Total Power [dBm] = Ant.1 Total Power [dBm] + Ant.2 Total Power [dBm]

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	Ant.1 Measured Power [dBm] + Duty Cycle Factor[dB]	Ant.2 Measured Power [dBm] + Duty Cycle Factor[dB]	MIMO Total Power [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5180	36	6M	a	15.53	14.19	17.92	-	-	23.98
5200	40	6M	a	14.88	14.36	17.64	-	-	23.98
5240	48	6M	a	14.72	14.82	17.78	-	-	23.98
5260	52	6M	a	14.66	15.22	17.96	-	-	23.98
5300	60	6M	a	15.08	14.49	17.81	-	-	23.98
5320	64	6M	a	15.06	14.38	17.74	-	-	23.98
5500	100	6M	a	15.34	14.28	17.85	-	-	23.98
5600	120	6M	a	14.28	14.58	17.44	-	-	23.98
5720	144	6M	a	14.95	15.04	18.01	-	-	23.98
5745	149	6M	a	14.53	15.11	17.84	-	-	30.00
5785	157	6M	a	14.90	14.81	17.87	-	-	30.00
5825	165	6M	a	14.44	14.43	17.45	-	-	30.00
5845	169	6M	a	15.11	14.87	18.00	-2.46	15.54	EIRP ≤ 30dBm
5865	173	6M	a	14.57	15.03	17.82	-2.46	15.35	EIRP ≤ 30dBm
5885	177	6M	a	14.47	15.27	17.90	-2.46	15.44	EIRP ≤ 30dBm

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	Ant.1 Measured Power [dBm] + Duty Cycle Factor[dB]	Ant.2 Measured Power [dBm] + Duty Cycle Factor[dB]	MIMO Total Power [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5180	36	MCS0	n20	15.56	14.28	17.98	-	-	23.98
5200	40	MCS0	n20	14.84	14.46	17.66	-	-	23.98
5240	48	MCS0	n20	14.66	14.83	17.76	-	-	23.98
5260	52	MCS0	n20	14.63	15.24	17.96	-	-	23.98
5300	60	MCS0	n20	15.26	14.53	17.92	-	-	23.98
5320	64	MCS0	n20	15.03	14.43	17.75	-	-	23.98
5500	100	MCS0	n20	15.36	14.20	17.83	-	-	23.98
5600	120	MCS0	n20	14.33	14.71	17.53	-	-	23.98
5720	144	MCS0	n20	15.01	15.03	18.03	-	-	23.98
5745	149	MCS0	n20	14.62	15.09	17.87	-	-	30.00
5785	157	MCS0	n20	14.92	14.82	17.88	-	-	30.00
5825	165	MCS0	n20	14.48	14.43	17.47	-	-	30.00
5845	169	MCS0	n20	14.66	14.72	17.70	-2.46	15.24	EIRP ≤ 30dBm
5865	173	MCS0	n20	14.42	15.04	17.75	-2.46	15.29	EIRP ≤ 30dBm
5885	177	MCS0	n20	14.45	15.35	17.93	-2.46	15.47	EIRP ≤ 30dBm

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	Ant.1 Measured Power [dBm] + Duty Cycle Factor[dB]	Ant.2 Measured Power [dBm] + Duty Cycle Factor[dB]	MIMO Total Power [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5180	36	MCS0	ac20	15.54	14.22	17.94	-	-	23.98
5200	40	MCS0	ac20	14.84	14.61	17.74	-	-	23.98
5240	48	MCS0	ac20	14.76	14.94	17.86	-	-	23.98
5260	52	MCS0	ac20	14.66	15.36	18.03	-	-	23.98
5300	60	MCS0	ac20	15.13	14.66	17.91	-	-	23.98
5320	64	MCS0	ac20	15.01	14.55	17.80	-	-	23.98
5500	100	MCS0	ac20	15.47	14.36	17.96	-	-	23.98
5600	120	MCS0	ac20	14.37	14.74	17.57	-	-	23.98
5720	144	MCS0	ac20	15.11	15.13	18.13	-	-	23.98
5745	149	MCS0	ac20	14.63	15.15	17.91	-	-	30.00
5785	157	MCS0	ac20	15.02	14.95	18.00	-	-	30.00
5825	165	MCS0	ac20	14.43	14.63	17.54	-	-	30.00
5845	169	MCS0	ac20	14.81	14.91	17.87	-2.46	15.41	EIRP ≤ 30dBm
5865	173	MCS0	ac20	14.60	15.17	17.90	-2.46	15.44	EIRP ≤ 30dBm
5885	177	MCS0	ac20	14.38	15.41	17.94	-2.46	15.47	EIRP ≤ 30dBm

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	Ant.1 Measured Power [dBm] + Duty Cycle Factor[dB]	Ant.2 Measured Power [dBm] + Duty Cycle Factor[dB]	MIMO Total Power [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5190	38	MCS0	n40	13.70	13.65	16.69	-	-	23.98
5230	46	MCS0	n40	13.45	14.16	16.83	-	-	23.98
5270	54	MCS0	n40	13.36	14.15	16.78	-	-	23.98
5310	62	MCS0	n40	14.05	14.33	17.20	-	-	23.98
5510	102	MCS0	n40	14.25	14.19	17.23	-	-	23.98
5590	118	MCS0	n40	13.32	14.07	16.72	-	-	23.98
5710	142	MCS0	n40	14.08	14.16	17.13	-	-	23.98
5755	151	MCS0	n40	13.45	14.27	16.89	-	-	30.00
5795	159	MCS0	n40	13.85	13.85	16.86	-	-	30.00
5835	167	MCS0	n40	13.70	13.58	16.65	-2.46	14.19	EIRP ≤ 30dBm
5875	175	MCS0	n40	13.15	14.23	16.73	-2.46	14.27	EIRP ≤ 30dBm

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	Ant.1 Measured Power [dBm] + Duty Cycle Factor[dB]	Ant.2 Measured Power [dBm] + Duty Cycle Factor[dB]	MIMO Total Power [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5190	38	MCS0	ac40	13.69	13.53	16.62	-	-	23.98
5230	46	MCS0	ac40	13.40	14.21	16.83	-	-	23.98
5270	54	MCS0	ac40	13.89	14.31	17.12	-	-	23.98
5310	62	MCS0	ac40	14.26	13.87	17.08	-	-	23.98
5510	102	MCS0	ac40	14.39	13.80	17.12	-	-	23.98
5590	118	MCS0	ac40	13.33	14.12	16.75	-	-	23.98
5710	142	MCS0	ac40	14.18	14.14	17.17	-	-	23.98
5755	151	MCS0	ac40	13.47	14.29	16.91	-	-	30.00
5795	159	MCS0	ac40	13.93	13.92	16.94	-	-	30.00
5835	167	MCS0	ac40	13.75	13.65	16.71	-2.46	14.25	EIRP ≤ 30dBm
5875	175	MCS0	ac40	13.25	14.27	16.80	-2.46	14.34	EIRP ≤ 30dBm

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	Ant.1 Measured Power [dBm] + Duty Cycle Factor[dB]	Ant.2 Measured Power [dBm] + Duty Cycle Factor[dB]	MIMO Total Power [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5210	42	MCS0	ac80	13.55	14.14	16.87	-	-	23.98
5290	58	MCS0	ac80	13.57	14.06	16.83	-	-	23.98
5530	106	MCS0	ac80	13.41	13.45	16.44	-	-	23.98
5610	122	MCS0	ac80	13.44	14.33	16.92	-	-	23.98
5690	138	MCS0	ac80	14.27	13.79	17.05	-	-	23.98
5775	155	MCS0	ac80	13.64	13.55	16.61	-	-	30.00
5855	171	MCS0	ac80	13.85	14.32	17.10	-2.46	14.64	EIRP ≤ 30dBm

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	Ant.1 Measured Power [dBm] + Duty Cycle Factor[dB]	Ant.2 Measured Power [dBm] + Duty Cycle Factor[dB]	MIMO Total Power [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5250	50	MCS0	ac160	11.74	11.88	14.82	-	-	23.98
5570	114	MCS0	ac160	11.53	11.97	14.77	-	-	23.98
5815	163	MCS0	ac160	11.48	11.44	14.47	-2.46	12.01	EIRP ≤ 30dBm

10.5 POWER SPECTRAL DENSITY

[MIMO_CDD(Ant.1+ Ant.2)]

Ant Total PSD [dBm] = Measured PSD [dBm] + Duty Cycle Factor [dB]

MIMO_CDD(ANT.1+ ANT.2)Total PSD [dBm] = Ant.1 Total PSD [dBm] + Ant.2 Total PSD [dB]

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5180	36	6M	a	4.348	2.454	6.514	-	-	11 dBm/MHz
5200	40	6M	a	3.695	2.627	6.204	-	-	11 dBm/MHz
5240	48	6M	a	3.611	3.087	6.367	-	-	11 dBm/MHz
5260	52	6M	a	3.662	3.515	6.599	-	-	11 dBm/MHz
5300	60	6M	a	3.936	2.632	6.343	-	-	11 dBm/MHz
5320	64	6M	a	3.848	2.492	6.233	-	-	11 dBm/MHz
5500	100	6M	a	4.307	2.510	6.511	-	-	11 dBm/MHz
5600	120	6M	a	3.362	2.912	6.153	-	-	11 dBm/MHz
5720	144	6M	a	3.913	3.330	6.641	-	-	11 dBm/MHz
5745	149	6M	a	0.502	0.326	3.425	-	-	30 dBm/500kHz
5785	157	6M	a	0.866	-0.049	3.443	-	-	30 dBm/500kHz
5825	165	6M	a	0.706	-0.133	3.317	-	-	30 dBm/500kHz
5845	169	6M	a	3.525	2.987	6.274	-2.46	3.811	14 dBm/EIRP
5865	173	6M	a	3.094	3.177	6.146	-2.46	3.683	14 dBm/EIRP
5885	177	6M	a	3.125	3.871	6.524	-2.46	4.061	14 dBm/EIRP

Frequency [MHz]	Channel No.	Worstcase Data rate	Mode(802.11)	ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5180	36	MCS0	n20	4.370	2.212	6.434	-	-	11 dBm/MHz
5200	40	MCS0	n20	3.496	2.358	5.974	-	-	11 dBm/MHz
5240	48	MCS0	n20	3.391	2.940	6.181	-	-	11 dBm/MHz
5260	52	MCS0	n20	3.459	3.235	6.359	-	-	11 dBm/MHz
5300	60	MCS0	n20	3.794	2.478	6.196	-	-	11 dBm/MHz
5320	64	MCS0	n20	3.430	2.231	5.882	-	-	11 dBm/MHz
5500	100	MCS0	n20	4.161	2.244	6.318	-	-	11 dBm/MHz
5600	120	MCS0	n20	3.080	2.669	5.889	-	-	11 dBm/MHz
5720	144	MCS0	n20	3.838	3.042	6.468	-	-	11 dBm/MHz
5745	149	MCS0	n20	0.272	0.071	3.183	-	-	30 dBm/500kHz
5785	157	MCS0	n20	0.553	-0.080	3.258	-	-	30 dBm/500kHz
5825	165	MCS0	n20	0.483	-0.550	3.007	-	-	30 dBm/500kHz
5845	169	MCS0	n20	3.434	2.824	6.150	-2.46	3.687	14 dBm/EIRP
5865	173	MCS0	n20	2.868	2.956	5.922	-2.46	3.459	14 dBm/EIRP
5885	177	MCS0	n20	2.838	3.646	6.271	-2.46	3.808	14 dBm/EIRP

Frequency [MHz]	Channel No.	Worstcase Data rate	Mode(802.11)	ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5180	36	MCS0	ac20	4.368	2.193	6.426	-	-	11 dBm/MHz
5200	40	MCS0	ac20	3.432	2.281	5.905	-	-	11 dBm/MHz
5240	48	MCS0	ac20	3.432	2.900	6.184	-	-	11 dBm/MHz
5260	52	MCS0	ac20	3.426	3.248	6.348	-	-	11 dBm/MHz
5300	60	MCS0	ac20	3.805	2.529	6.224	-	-	11 dBm/MHz
5320	64	MCS0	ac20	3.503	2.174	5.899	-	-	11 dBm/MHz
5500	100	MCS0	ac20	4.184	2.278	6.345	-	-	11 dBm/MHz
5600	120	MCS0	ac20	3.114	2.651	5.899	-	-	11 dBm/MHz
5720	144	MCS0	ac20	3.888	2.962	6.460	-	-	11 dBm/MHz
5745	149	MCS0	ac20	0.084	0.186	3.146	-	-	30 dBm/500kHz
5785	157	MCS0	ac20	0.226	-0.313	2.975	-	-	30 dBm/500kHz
5825	165	MCS0	ac20	0.257	-0.403	2.950	-	-	30 dBm/500kHz
5845	169	MCS0	ac20	3.075	2.764	5.933	-2.46	3.470	14 dBm/EIRP
5865	173	MCS0	ac20	2.910	2.936	5.933	-2.46	3.470	14 dBm/EIRP
5885	177	MCS0	ac20	2.708	3.674	6.228	-2.46	3.765	14 dBm/EIRP

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5190	38	MCS0	n40	-0.886	-1.737	1.720	-	-	11 dBm/MHz
5230	46	MCS0	n40	-1.205	-1.027	1.895	-	-	11 dBm/MHz
5270	54	MCS0	n40	-1.255	-1.115	1.826	-	-	11 dBm/MHz
5310	62	MCS0	n40	-0.147	-0.999	2.458	-	-	11 dBm/MHz
5510	102	MCS0	n40	0.320	-1.038	2.704	-	-	11 dBm/MHz
5590	118	MCS0	n40	-1.295	-0.952	1.890	-	-	11 dBm/MHz
5710	142	MCS0	n40	-0.262	-1.085	2.356	-	-	11 dBm/MHz
5755	151	MCS0	n40	-4.202	-3.728	-0.948	-	-	30 dBm/500kHz
5795	159	MCS0	n40	-3.671	-4.274	-0.952	-	-	30 dBm/500kHz
5835	167	MCS0	n40	-0.632	-1.276	2.068	-2.46	-0.395	14 dBm/EIRP
5875	175	MCS0	n40	-1.205	-0.378	2.239	-2.46	-0.224	14 dBm/EIRP

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5190	38	MCS0	ac40	-0.706	-1.750	1.814	-	-	11 dBm/MHz
5230	46	MCS0	ac40	-1.313	-0.889	1.915	-	-	11 dBm/MHz
5270	54	MCS0	ac40	-1.171	-0.964	1.944	-	-	11 dBm/MHz
5310	62	MCS0	ac40	0.045	-1.051	2.542	-	-	11 dBm/MHz
5510	102	MCS0	ac40	0.421	-0.926	2.810	-	-	11 dBm/MHz
5590	118	MCS0	ac40	-1.387	-0.739	1.960	-	-	11 dBm/MHz
5710	142	MCS0	ac40	-0.222	-1.170	2.341	-	-	11 dBm/MHz
5755	151	MCS0	ac40	-4.254	-3.820	-1.021	-	-	30 dBm/500kHz
5795	159	MCS0	ac40	-3.724	-4.348	-1.014	-	-	30 dBm/500kHz
5835	167	MCS0	ac40	-0.725	-1.435	1.945	-2.46	-0.518	14 dBm/EIRP
5875	175	MCS0	ac40	-1.133	-0.119	2.414	-2.46	-0.049	14 dBm/EIRP

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5210	42	MCS0	ac80	-3.599	-3.475	-0.527	-	-	11 dBm/MHz
5290	58	MCS0	ac80	-4.008	-4.062	-1.025	-	-	11 dBm/MHz
5530	106	MCS0	ac80	-3.988	-4.343	-1.152	-	-	11 dBm/MHz
5610	122	MCS0	ac80	-4.178	-4.293	-1.225	-	-	11 dBm/MHz
5690	138	MCS0	ac80	-3.121	-4.214	-0.623	-	-	11 dBm/MHz
5775	155	MCS0	ac80	-0.125	-7.191	0.654	-	-	30 dBm/500kHz
5855	171	MCS0	ac80	-3.368	-3.671	-0.507	-2.46	-2.970	14 dBm/EIRP

Frequency [MHz]	Channel No.	Worstcase Datarate	Mode(802.11)	ANT.1 Measured PSD[dBm] + Duty Cycle Factor [dB]	ANT.2 Measured PSD[dBm] + Duty Cycle Factor [dB]	MIMO Total PSD [dBm]	Directional Gain [dBi]	E.I.R.P [dBm]	Limit [dBm]
5250	50	MCS0	ac160	-8.498	-8.704	-5.590	-	-	11 dBm/MHz
5570	114	MCS0	ac160	-8.495	-7.910	-5.183	-	-	11 dBm/MHz
5815	163	MCS0	ac160	-8.865	-9.485	-6.154	-2.46	-8.617	14 dBm/EIRP

[MIMO_CDD(Ant.1+ Ant.2)]

☒ Test Plots

Note:

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

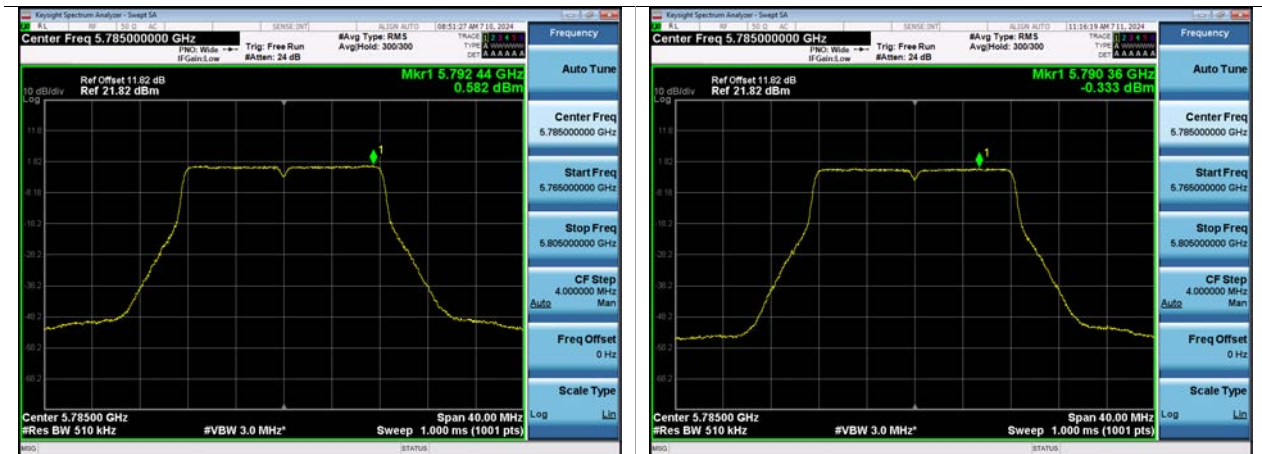
ANT. 1

ANT. 2

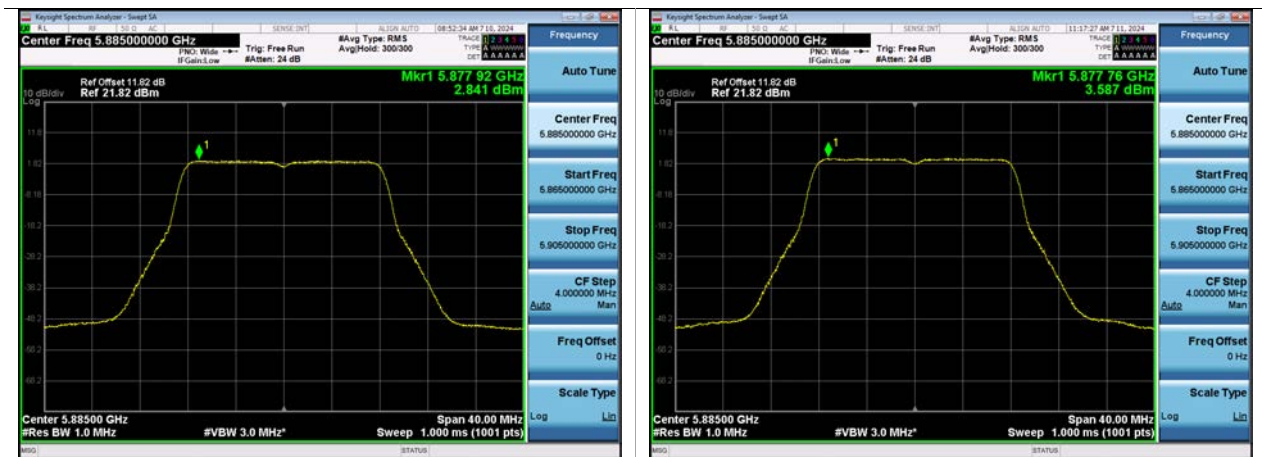
802.11a UNII 1-2C (Ch. 144)



802.11a UNII 3 (Ch. 157)



802.11a UNII 4 (Ch. 177)



ANT. 1

ANT. 2

802.11n(HT20) UNII 1-2C (Ch. 144)



802.11 n(HT20) UNII 3 (Ch. 157)



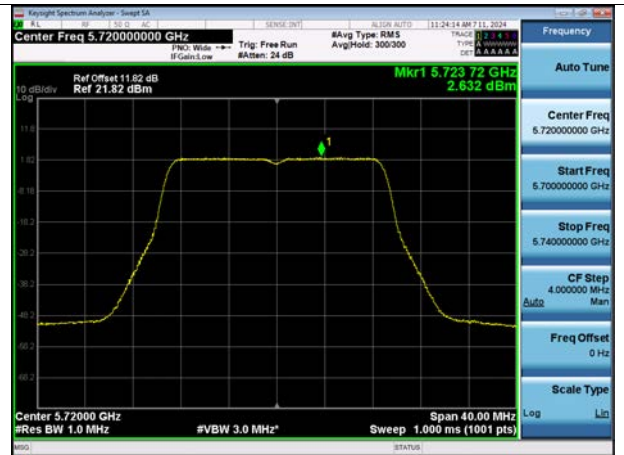
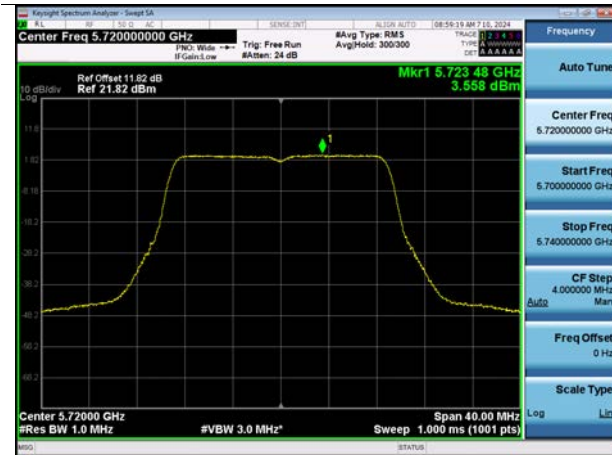
802.11 n(HT20) UNII 4 (Ch. 177)



ANT. 1

ANT. 2

802.11ac(VHT20) UNII 1-2C (Ch. 144)



802.11 ac(VHT20) UNII 3 (Ch. 149)



802.11 ac(VHT20) UNII 4 (Ch. 177)



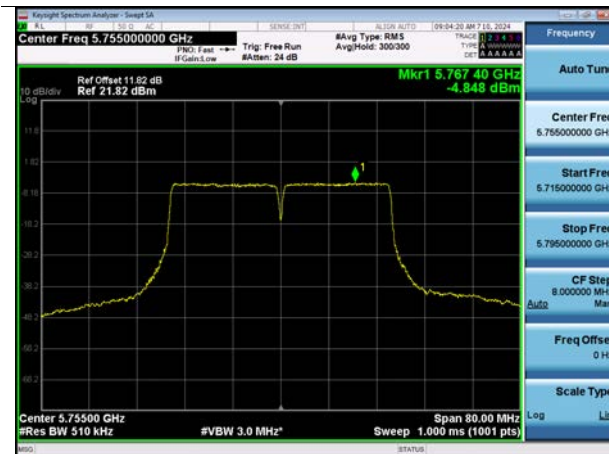
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ANT. 2

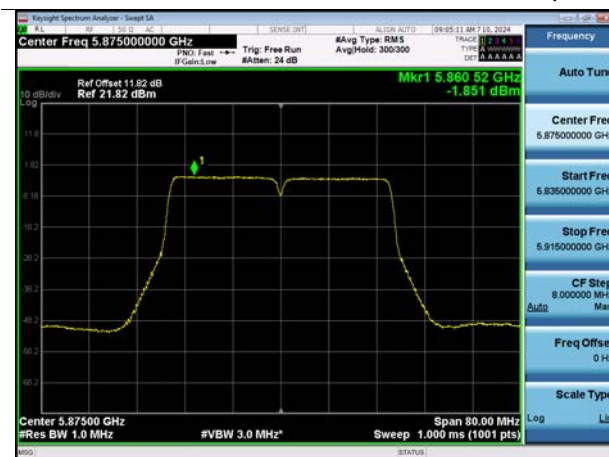
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802.11 n(HT40) UNII 3 (Ch. 151)



802.11 n(HT40) UNII 4 (Ch. 175)



ANT. 1

ANT. 2

802.11ac(VHT40) UNII 1-2C (Ch. 102)



802.11 ac(VHT40) UNII 3 (Ch. 159)



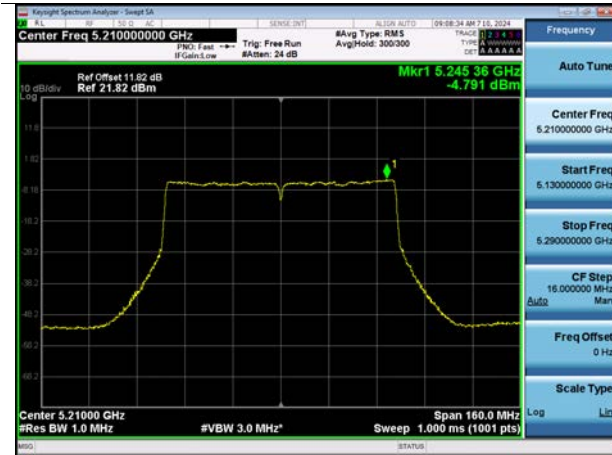
802.11 ac(VHT40) UNII 4 (Ch. 175)



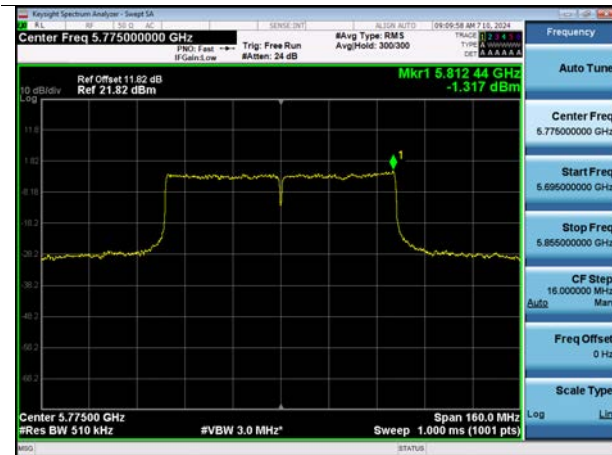
ANT. 1

ANT. 2

802.11ac(VHT80) UNII 1-2C (Ch. 42)



802.11 ac(VHT80) UNII 3 (Ch. 155)



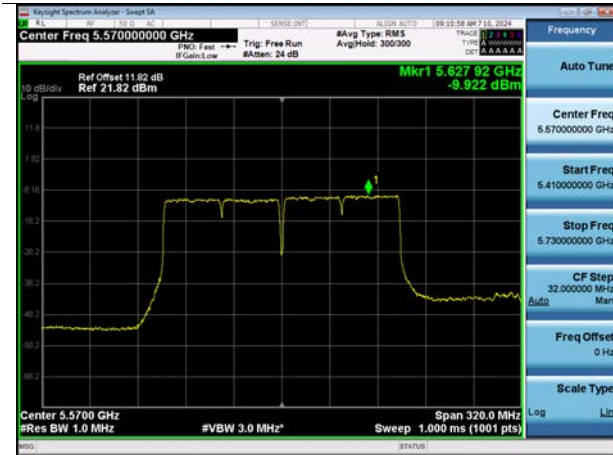
802.11 ac(VHT80) UNII 4 (Ch. 171)



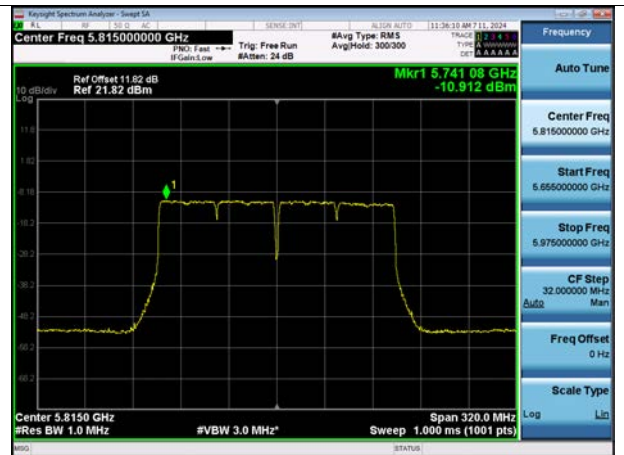
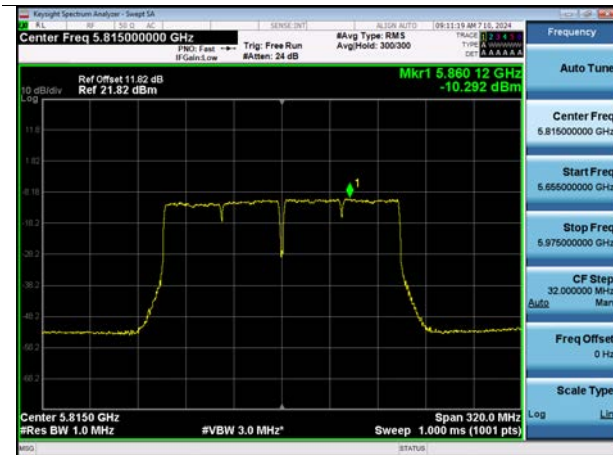
ANT. 1

ANT. 2

802.11ac(VHT160) UNII 1-2C (Ch. 114)



802.11 ac(VHT160) UNII 3-4 (Ch. 163)



10.6 FREQUENCY STABILITY

Note:

1. All modes of operation were investigated and the worst case configuration results are reported.
2. 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.

10.6.1 802.11ac 160 MHz BW

[MIMO_CDD(Ant1+Ant2)]

Startup after the EUT is energized

OPERATING BAND:	UNII Band 1 & 2A
OPERATING FREQUENCY:	5,250,000,000 Hz
CHANNEL:	50
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5250024.66	24.66
100%		-30	5250012.32	12.32
100%		-20	5250033.92	33.92
100%		-10	5250037.55	37.55
100%		0	5250027.52	27.52
100%		+10	5250024.66	24.66
100%		+30	5250034.19	34.19
100%		+40	5250026.84	26.84
100%		+50	5250022.43	22.43
High	4.45	+20	5250039.21	39.21
Low	3.70	+20	5250039.05	39.05

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,570,000,000 Hz
CHANNEL:	114
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5570033.57	33.57
100%		-30	5570008.80	8.80
100%		-20	5570012.94	12.94
100%		-10	5570035.97	35.97
100%		0	5570034.72	34.72
100%		+10	5570023.90	23.90
100%		+30	5570048.79	48.79
100%		+40	5570045.71	45.71
100%		+50	5570031.37	31.37
High	4.45	+20	5570048.62	48.62
Low	3.70	+20	5570048.56	48.56

OPERATING BAND:	UNII Band 3 & 4
OPERATING FREQUENCY:	5,815,000,000 Hz
CHANNEL:	163
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5815035.42	35.42
100%		-30	5815008.43	8.43
100%		-20	5815011.62	11.62
100%		-10	5815034.25	34.25
100%		0	5815021.01	21.01
100%		+10	5815027.56	27.56
100%		+30	5815047.79	47.79
100%		+40	5815038.61	38.61
100%		+50	5815027.16	27.16
High	4.45	+20	5815041.85	41.85
Low	3.70	+20	5815041.46	41.46

2 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1 & 2A
OPERATING FREQUENCY:	5,250,000,000 Hz
CHANNEL:	50
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5250032.42	32.42
100%		-30	5250011.41	11.41
100%		-20	5250030.61	30.61
100%		-10	5250025.93	25.93
100%		0	5250033.29	33.29
100%		+10	5250027.76	27.76
100%		+30	5250036.08	36.08
100%		+40	5250042.63	42.63
100%		+50	5250028.89	28.89
High	4.45	+20	5250026.11	26.11
Low	3.70	+20	5250027.86	27.86

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,570,000,000 Hz
CHANNEL:	114
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5570034.12	34.12
100%		-30	5570011.51	11.51
100%		-20	5570012.94	12.94
100%		-10	5570020.85	20.85
100%		0	5570021.06	21.06
100%		+10	5570024.02	24.02
100%		+30	5570027.83	27.83
100%		+40	5570030.92	30.92
100%		+50	5570022.96	22.96
High	4.45	+20	5570036.92	36.92
Low	3.70	+20	5570035.44	35.44

OPERATING BAND:	UNII Band 3 & 4
OPERATING FREQUENCY:	5,815,000,000 Hz
CHANNEL:	163
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5815032.06	32.06
100%		-30	5815010.40	10.40
100%		-20	5815011.62	11.62
100%		-10	5815037.04	37.04
100%		0	5815037.10	37.10
100%		+10	5815033.14	33.14
100%		+30	5815026.97	26.97
100%		+40	5815041.21	41.21
100%		+50	5815043.83	43.83
High	4.45	+20	5815033.57	33.57
Low	3.70	+20	5815020.41	20.41

5 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1 & 2A
OPERATING FREQUENCY:	5,250,000,000 Hz
CHANNEL:	50
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5250038.38	38.38
100%		-30	5250014.85	14.85
100%		-20	5250030.34	30.34
100%		-10	5250022.19	22.19
100%		0	5250037.79	37.79
100%		+10	5250027.64	27.64
100%		+30	5250031.65	31.65
100%		+40	5250028.17	28.17
100%		+50	5250048.08	48.08
High	4.45	+20	5250035.11	35.11
Low	3.70	+20	5250021.15	21.15

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,570,000,000 Hz
CHANNEL:	114
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5570033.23	33.23
100%		-30	5570008.44	8.44
100%		-20	5570012.94	12.94
100%		-10	5570024.47	24.47
100%		0	5570038.38	38.38
100%		+10	5570022.73	22.73
100%		+30	5570020.89	20.89
100%		+40	5570033.29	33.29
100%		+50	5570022.99	22.99
High	4.45	+20	5570035.99	35.99
Low	3.70	+20	5570040.06	40.06

OPERATING BAND:	UNII Band 3 & 4
OPERATING FREQUENCY:	5,815,000,000 Hz
CHANNEL:	163
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5815030.37	30.37
100%		-30	5815012.79	12.79
100%		-20	5815011.62	11.62
100%		-10	5815024.52	24.52
100%		0	5815020.25	20.25
100%		+10	5815023.92	23.92
100%		+30	5815042.15	42.15
100%		+40	5815040.05	40.05
100%		+50	5815029.85	29.85
High	4.45	+20	5815034.28	34.28
Low	3.70	+20	5815035.49	35.49

10 minutes after the EUT is energized

OPERATING BAND:	UNII Band 1 & 2A
OPERATING FREQUENCY:	5,250,000,000 Hz
CHANNEL:	50
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5250034.92	34.92
100%		-30	5250013.83	13.83
100%		-20	5250031.72	31.72
100%		-10	5250039.91	39.91
100%		0	5250030.13	30.13
100%		+10	5250021.99	21.99
100%		+30	5250039.95	39.95
100%		+40	5250039.05	39.05
100%		+50	5250037.43	37.43
High	4.45	+20	5250040.91	40.91
Low	3.70	+20	5250021.18	21.18

OPERATING BAND:	UNII Band 2C
OPERATING FREQUENCY:	5,570,000,000 Hz
CHANNEL:	114
REFERENCE VOLTAGE:	3.88 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.88	+20(Ref)	5570038.76	38.76
100%		-30	5570014.44	14.44
100%		-20	5570012.94	12.94
100%		-10	5570020.11	20.11
100%		0	5570031.53	31.53
100%		+10	5570034.76	34.76
100%		+30	5570030.88	30.88
100%		+40	5570044.16	44.16
100%		+50	5570039.27	39.27
High	4.45	+20	5570036.11	36.11
Low	3.70	+20	5570028.54	28.54

OPERATING BAND:	UNII Band 3 & 4
OPERATING FREQUENCY:	5,815,000,000 Hz
CHANNEL:	163
REFERENCE VOLTAGE:	3.88 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.88	+20(Ref)	5815031.15	31.15
100%		-30	5815012.84	12.84
100%		-20	5815011.62	11.62
100%		-10	5815023.44	23.44
100%		0	5815035.13	35.13
100%		+10	5815039.05	39.05
100%		+30	5815044.93	44.93
100%		+40	5815036.54	36.54
100%		+50	5815031.14	31.14
High	4.45	+20	5815024.56	24.56
Low	3.70	+20	5815027.07	27.07

10.7 STRADDLE CHANNEL

10.7.1 26 dB Bandwidth

[ANT. 1]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5709.20	15.80
802.11n(HT20)				5709.04	15.96
802.11ac(VHT20)				5709.04	15.96
802.11a	UNII 3	5720	144	5730.52	5.52
802.11n(HT20)				5730.68	5.68
802.11ac(VHT20)				5730.60	5.60

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5688.56	36.44
802.11ac(VHT40)				5688.48	36.52
802.11n(HT40)	UNII 3	5710	142	5731.84	6.84
802.11ac(VHT40)				5731.28	6.28

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5643.44	81.56
	UNII 3	5690	138	5736.88	11.88

Note:

[UNII 2C] 26 dB Bandwidth = 5 725 MHz - Measured Frequency[MHz]

[UNII 3C] 26 dB Bandwidth = Measured Frequency[MHz] – 5 725 MHz

[ANT. 2]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5709.36	15.64
802.11n(HT20)				5708.92	16.08
802.11ac(VHT20)				5709.04	15.96
802.11a	UNII 3	5720	144	5730.64	5.64
802.11n(HT20)				5730.60	5.60
802.11ac(VHT20)				5730.64	5.64

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5688.48	36.52
802.11ac(VHT40)				5688.48	36.52
802.11n(HT40)	UNII 3	5710	142	5731.60	6.60
802.11ac(VHT40)				5731.28	6.28

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26 dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5643.44	81.56
	UNII 3	5690	138	5736.40	11.40

Note:

[UNII 2C] 26 dB Bandwidth = 5 725 MHz - Measured Frequency[MHz]

[UNII 3C] 26 dB Bandwidth = Measured Frequency[MHz] – 5 725 MHz

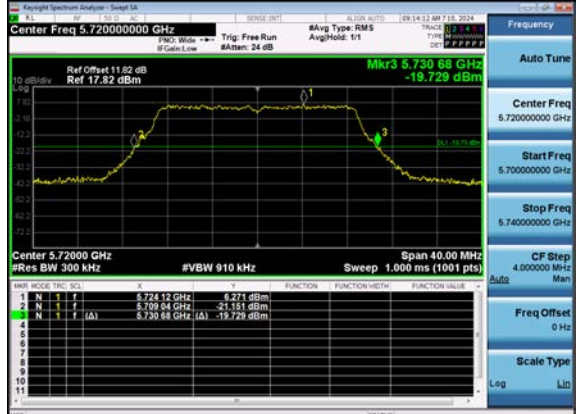
[ANT. 1]

▣ Test Plots (26 dB Bandwidth)

802.11a UNII Band



802.11n(HT20) UNII Band



802.11ac(VHT20) UNII Band



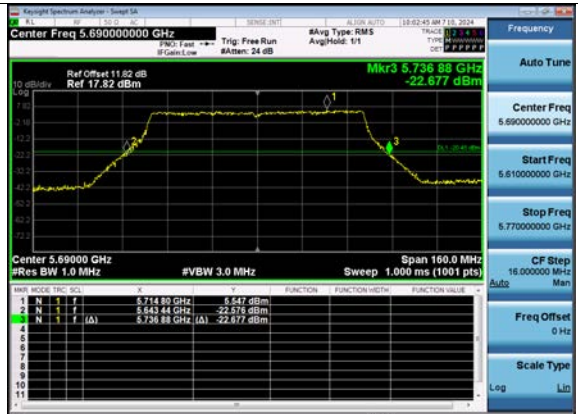
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



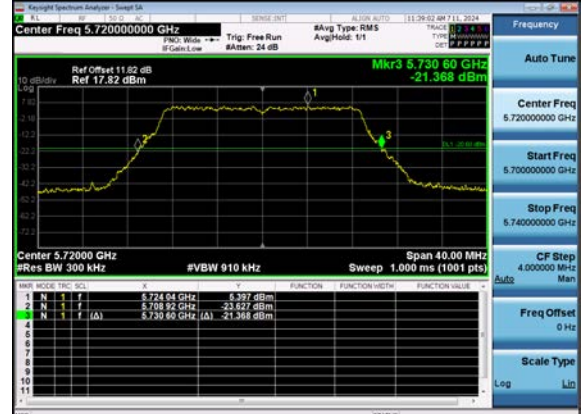
[ANT. 2]

■ Test Plots (26 dB Bandwidth)

802.11a UNII Band



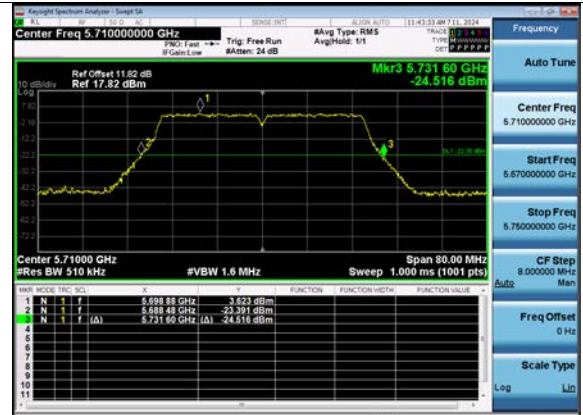
802.11n(HT20) UNII Band



802.11ac(VHT20) UNII Band



802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



10.7.2 6 dB Bandwidth

[ANT. 1]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII3	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
802.11n(HT40)	UNII3	5710	142	5728.24	3.24	> 0.5
802.11ac(VHT40)				5728.24	3.24	> 0.5
802.11ac(VHT80)	UNII3	5690	138	5728.24	3.24	> 0.5

[ANT. 2]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII3	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
802.11n(HT40)	UNII3	5710	142	5728.24	3.24	> 0.5
802.11ac(VHT40)				5728.24	3.24	> 0.5
802.11ac(VHT80)	UNII3	5690	138	5728.24	3.24	> 0.5

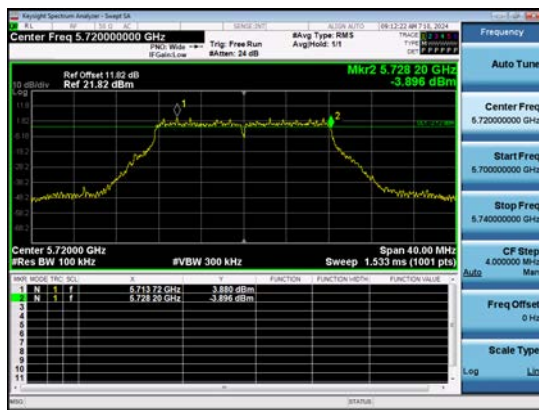
Note:

6 dB Bandwidth = Measured Frequency[MHz] – 5 725MHz

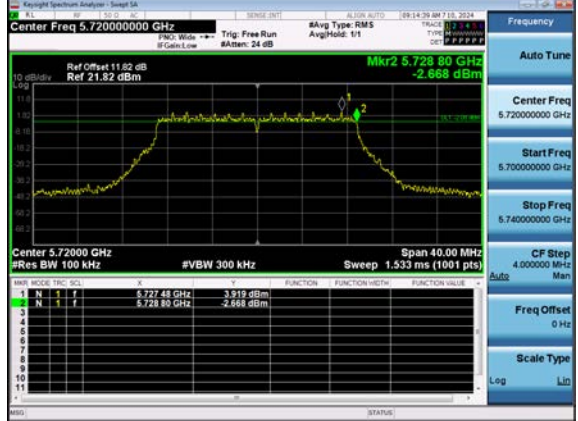
[ANT. 1]

Test Plots(UNII 3 Band 6 dB Bandwidth)

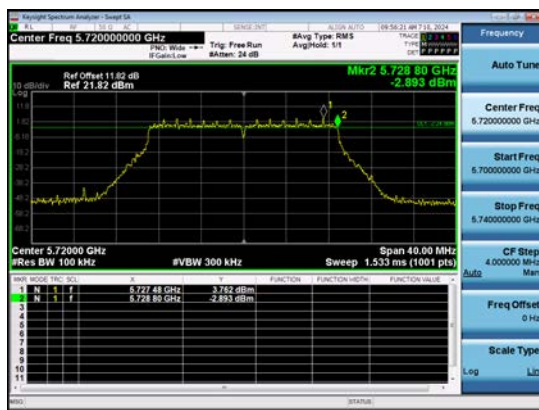
802.11a UNII Band



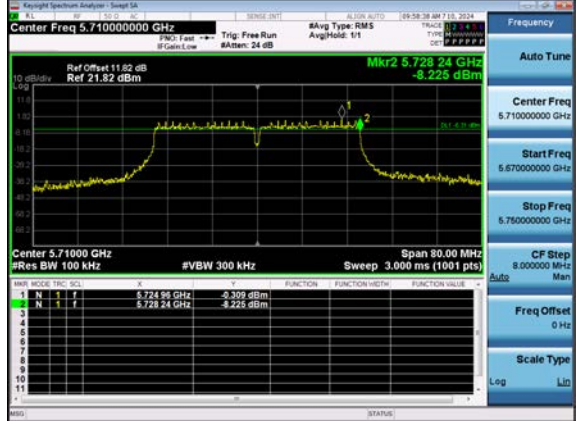
802.11n(HT20) UNII Band



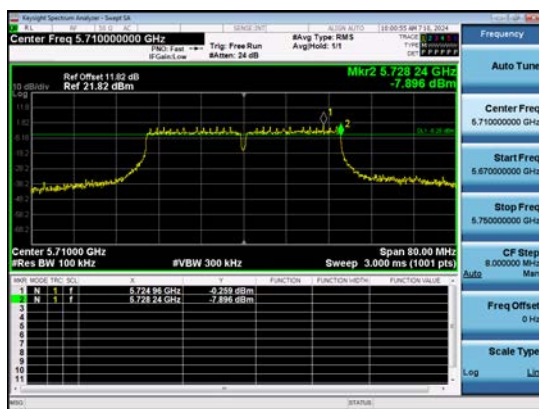
802.11ac(VHT20) UNII Band



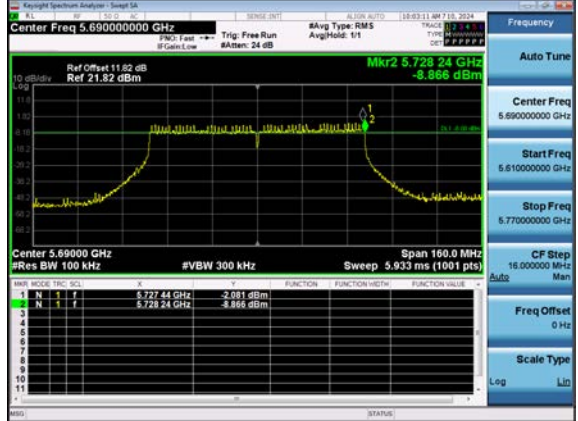
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



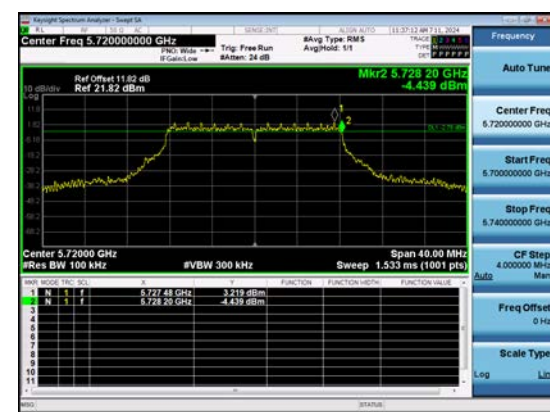
802.11ac(VHT80) UNII Band



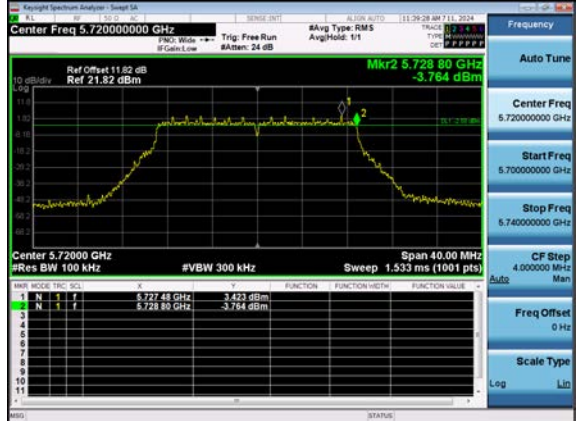
[ANT. 2]

■ Test Plots(UNII 3 Band 6 dB Bandwidth)

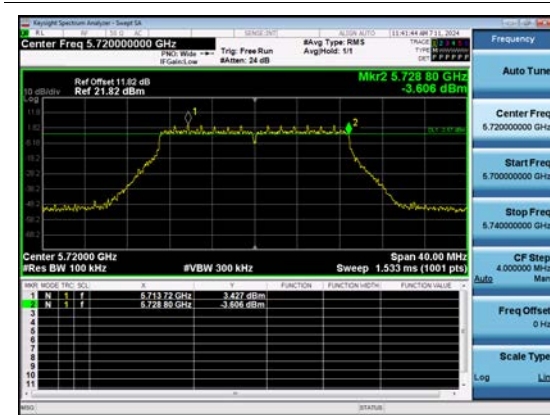
802.11a UNII Band



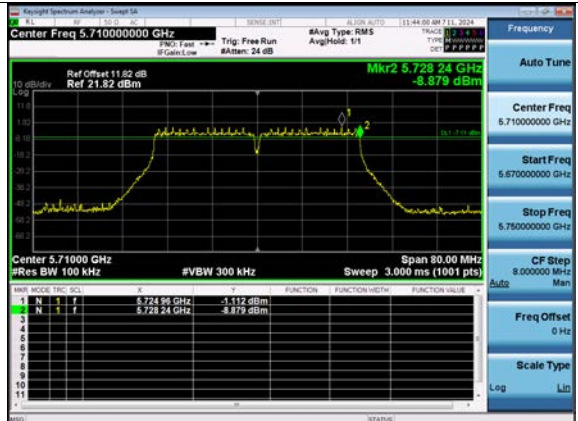
802.11n(HT20) UNII Band



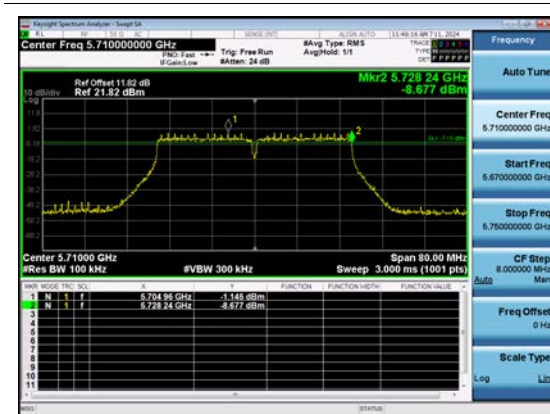
802.11ac(VHT20) UNII Band



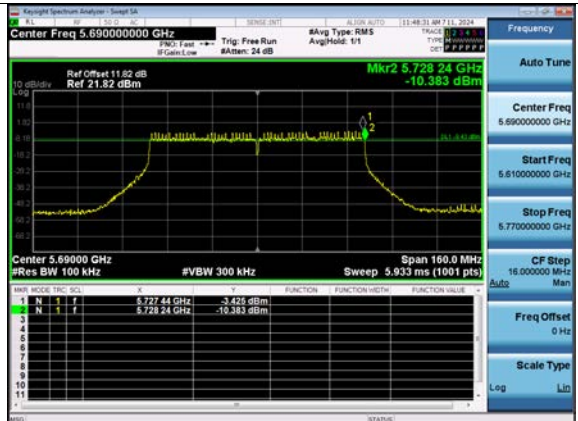
802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



10.7.3 Output Power

[ANT. 1]

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720	144	13.99	0.284	14.28	22.99	6 Mbps
802.11n(HT20)	(UNII 2C		13.85	0.329	14.18	23.03	MCS0
802.11ac(VHT20)	Band)		13.52	0.330	13.85	23.03	MCS0
802.11a	5720	144	8.10	0.284	8.39	30.00	6 Mbps
802.11n(HT20)	(UNII 3		8.52	0.329	8.84	30.00	MCS0
802.11ac(VHT20)	Band)		8.25	0.330	8.58	30.00	MCS0

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11n(HT40)	5710	142	12.97	0.646	13.62	23.98	MCS0
802.11ac(VHT40)	(UNII 2C Band)		12.98	0.634	13.62	23.98	MCS0
802.11n(HT40)	5710	142	3.46	0.646	4.11	30.00	MCS0
802.11ac(VHT40)	(UNII 3 Band)		3.43	0.634	4.06	30.00	MCS0

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11ac(VHT80)	5690 (UNII 2C Band)	138	12.69	1.192	13.88	23.98	MCS0
	5690 (UNII 3 Band)	138	0.52	1.192	1.71	30.00	MCS0

[ANT. 2]

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720	144	13.33	0.284	13.61	22.94	6 Mbps
802.11n(HT20)	(UNII 2C Band)		13.22	0.329	13.55	23.06	MCS0
802.11ac(VHT20)			13.23	0.330	13.56	23.03	MCS0
802.11a	5720	144	7.38	0.284	7.67	30.00	6 Mbps
802.11n(HT20)	(UNII 3 Band)		7.83	0.329	8.16	30.00	MCS0
802.11ac(VHT20)			7.84	0.330	8.17	30.00	MCS0

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11n(HT40)	5710	142	12.62	0.646	13.27	23.98	MCS0
802.11ac(VHT40)	(UNII 2C Band)		12.62	0.634	13.26	23.98	MCS0
802.11n(HT40)	5710	142	2.70	0.646	3.34	30.00	MCS0
802.11ac(VHT40)	(UNII 3 Band)		2.69	0.634	3.32	30.00	MCS0

Mode	Frequency [MHz]	Channel	Measured Power [dBm]	Duty Cycle Factor [dB]	Total Power [dBm]	Limit [dBm]	Worstcase Datarate
802.11ac(VHT80)	5690	138	11.66	1.192	12.86	23.98	MCS0
	(UNII 2C Band)						
	5690	138	-0.79	1.192	0.40	30.00	MCS0
	(UNII 3 Band)						

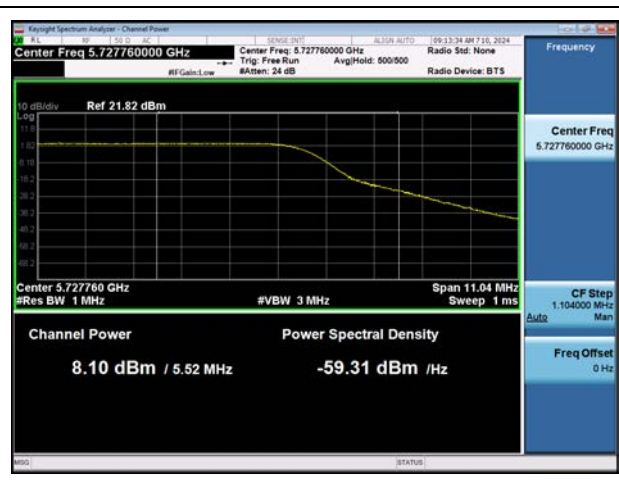
[ANT. 1]

Test Plots

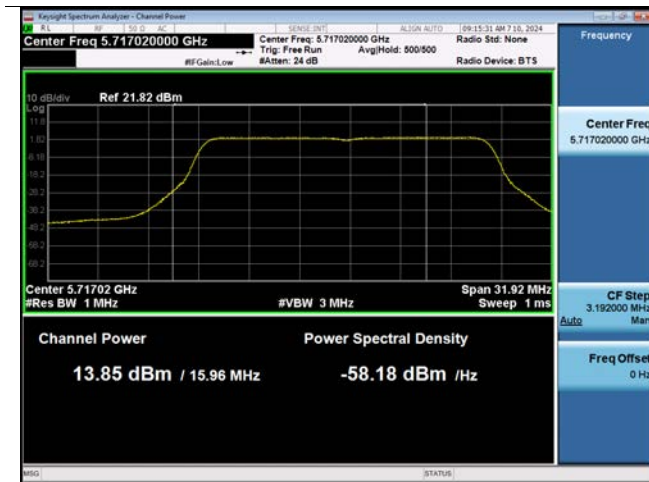
802.11a UNII 2C Band



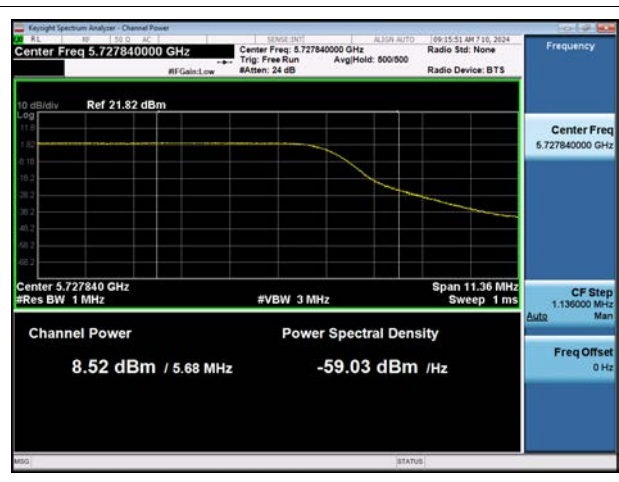
802.11a UNII 3 Band



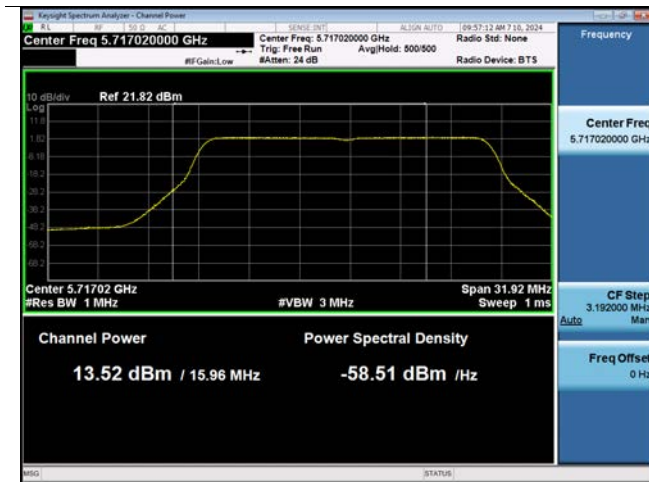
802.11n(HT20) UNII 2C Band



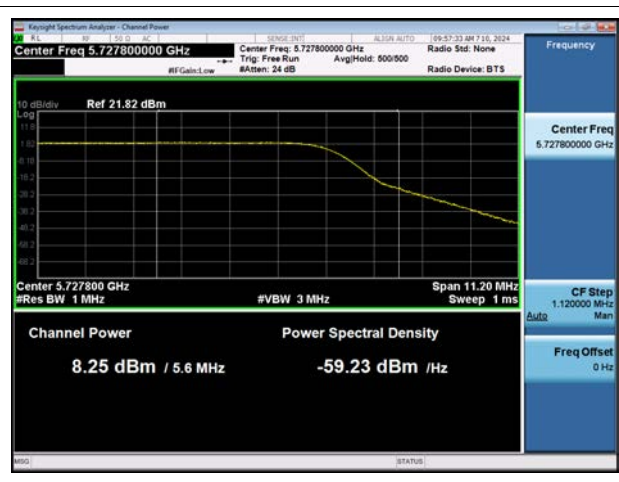
802.11n(HT20) UNII 3 Band



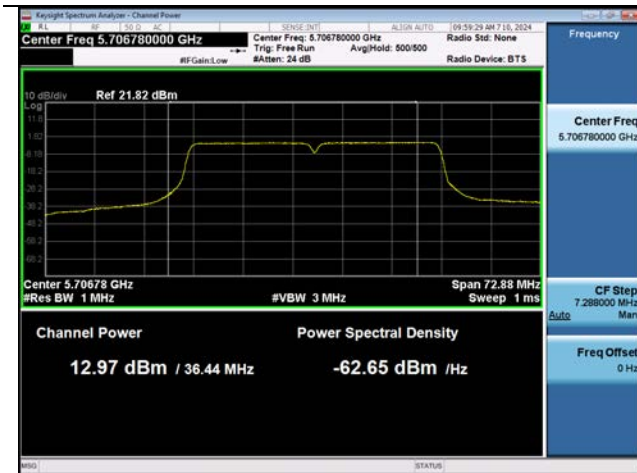
802.11ac(VHT20) UNII 2C Band



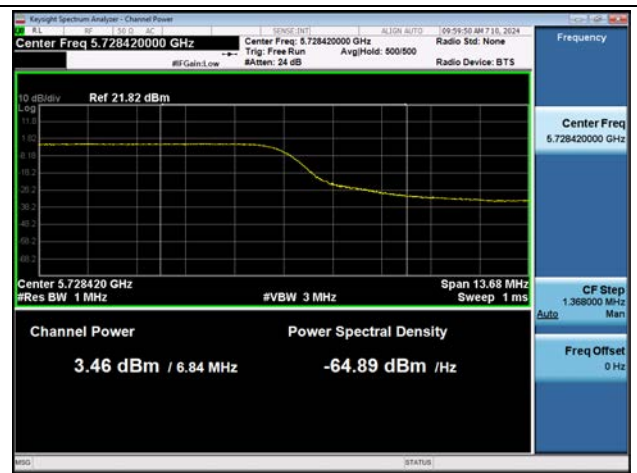
802.11ac(VHT20) UNII 3 Band



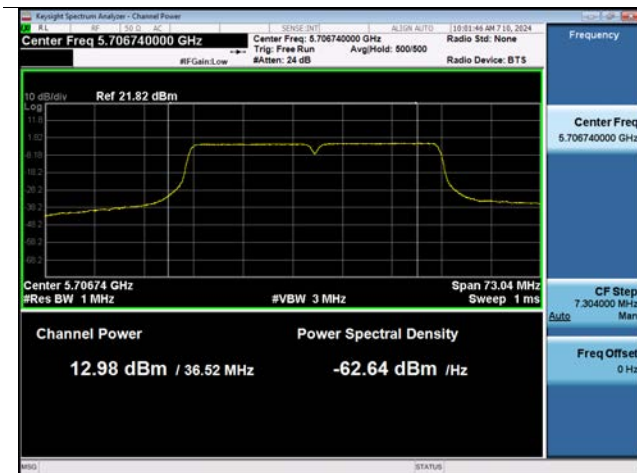
802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



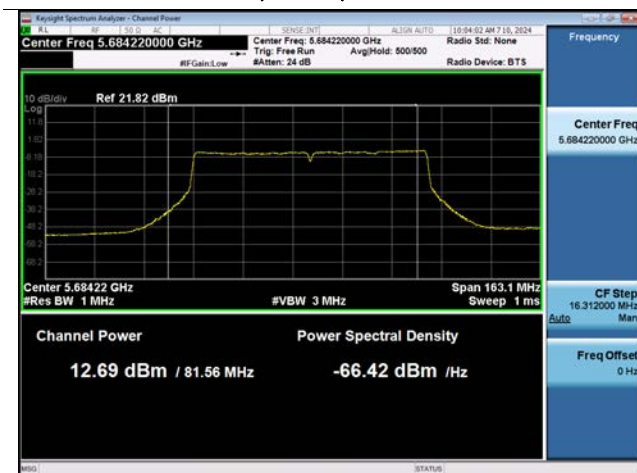
802.11ac(VHT40) UNII 2C Band



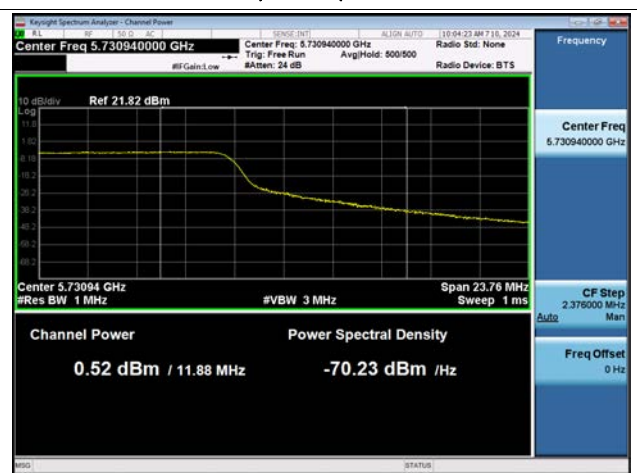
802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band

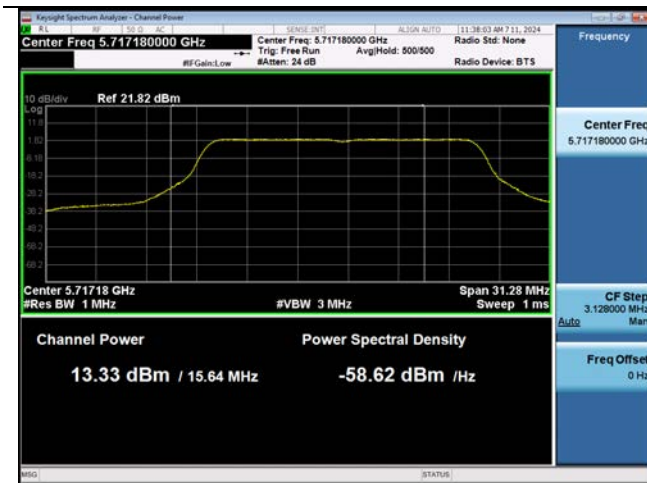


802.11ac(VHT80) UNII 3 Band

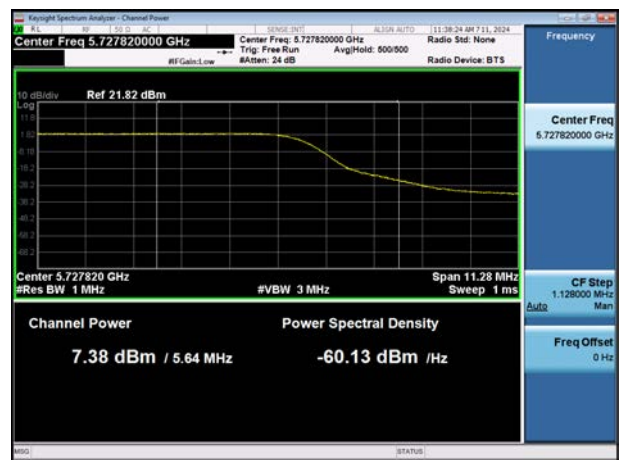


[ANT. 2]
☒ Test Plots

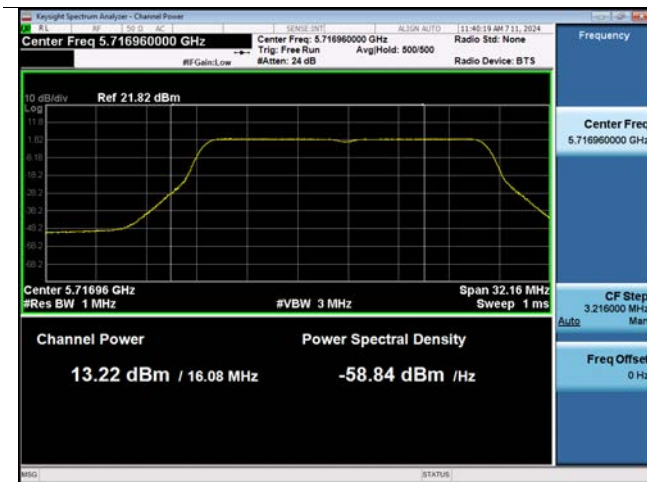
802.11a UNII 2C Band



802.11a UNII 3 Band



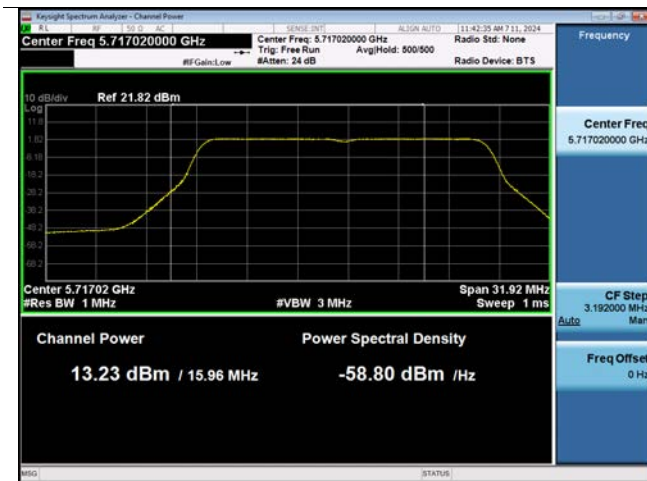
802.11n(HT20) UNII 2C Band



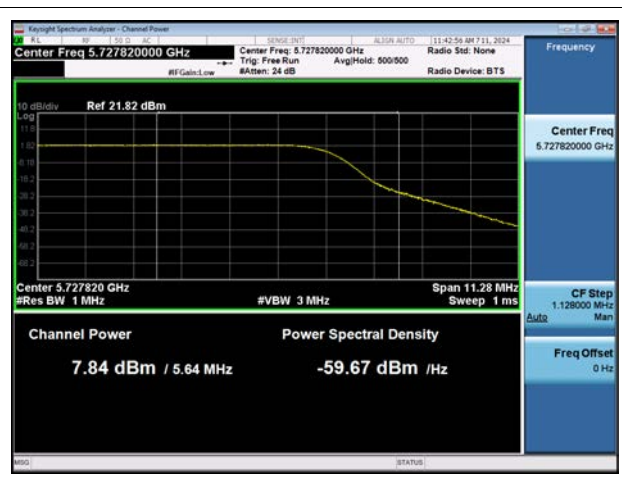
802.11n(HT20) UNII 3 Band



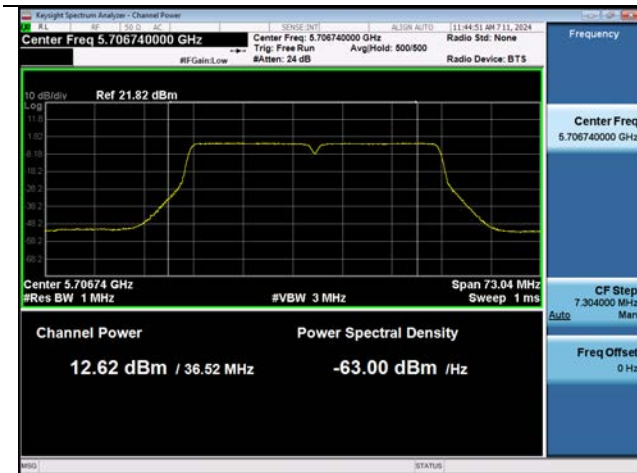
802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band



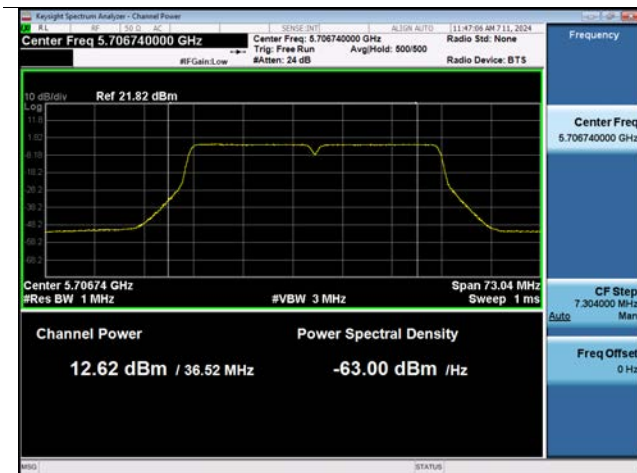
802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



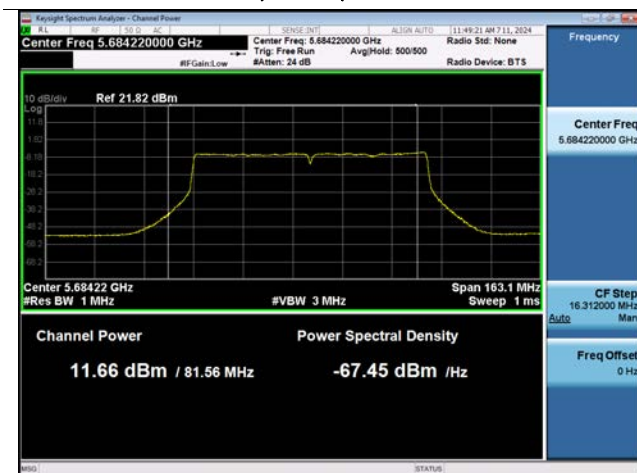
802.11ac(VHT40) UNII 2C Band



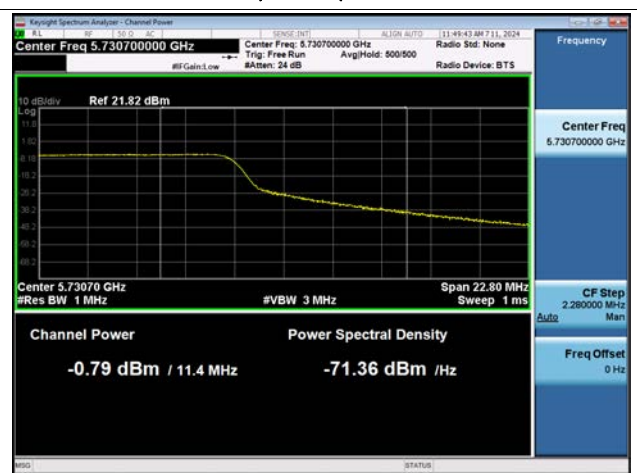
802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band



10.7.4 Power Spectral Density

[ANT. 1]

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720	144	3.660	0.284	3.944	11	6 Mbps
802.11n(HT20)	(UNII 2C		3.380	0.329	3.708	dBm/ MHz	MCS0
802.11ac(VHT20)	Band)		2.950	0.330	3.280		MCS0
802.11a	5720	144	0.812	0.284	1.096	30	6 Mbps
802.11n(HT20)	(UNII 3		0.549	0.329	0.878	dBm/ 500 kHz	MCS0
802.11ac(VHT20)	Band)		0.102	0.330	0.432		MCS0

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11n(HT40)	5710	142	-1.057	0.646	-0.411	11	MCS0
802.11ac(VHT40)	(UNII 2C Band)		-0.890	0.634	-0.255	dBm/ MHz	MCS0
802.11n(HT40)	5710	142	-3.828	0.646	-3.182	30 dB	MCS0
802.11ac(VHT40)	(UNII 3 Band)		-3.925	0.634	-3.291	m/500 kHz	MCS0

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11ac(VHT80)	5690	138	-4.175	1.192	-2.984	11	MCS0
	(UNII 2C Band)					dBm/ MHz	
	5690	138	-6.944	1.192	-5.753	30 dB	MCS0
	(UNII 3 Band)					m/500 kHz	

[ANT. 2]

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11a	5720	144	3.025	0.284	3.309	11	6 Mbps
802.11n(HT20)	(UNII 2C		2.694	0.329	3.023	dBm/ MHz	MCS0
802.11ac(VHT20)	Band)		2.551	0.330	2.881		MCS0
802.11a	5720	144	0.131	0.284	0.415	30 dB	6 Mbps
802.11n(HT20)	(UNII 3		-0.478	0.329	-0.149	m/500 kHz	MCS0
802.11ac(VHT20)	Band)		-0.173	0.330	0.157		MCS0

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11n(HT40)	5710	142	-1.600	0.646	-0.953	11	MCS0
802.11ac(VHT40)	(UNII 2C Band)		-1.435	0.634	-0.800	dBm/ MHz	MCS0
802.11n(HT40)	5710	142	-4.750	0.646	-4.104	30 dB	MCS0
802.11ac(VHT40)	(UNII 3 Band)		-4.561	0.634	-3.927	m/500 kHz	MCS0

Mode	Frequency [MHz]	Channel	Measured Density [dBm]	Duty Cycle Factor [dB]	Total PSD [dBm]	Limit [dBm]	Worstcase Datarate
802.11ac(VHT80)	5690	138	-5.778	1.192	-4.587	11	MCS0
	(UNII 2C Band)					dBm/ MHz	
	5690	138	-7.955	1.192	-6.763	30 dB	MCS0
	(UNII 3 Band)					m/500 kHz	

[ANT. 1]

Test Plots

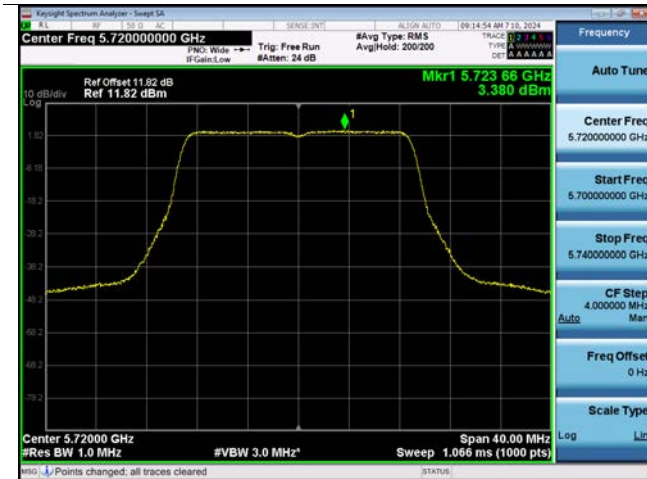
802.11a UNII 2C Band



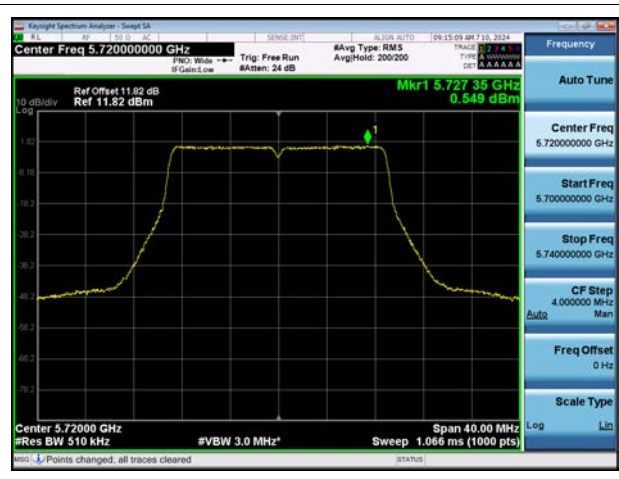
802.11a UNII 3 Band



802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band

