

Class 2 Permissive Change Test Report

Unii 3 with PS 23, 100% DC

EUT Name: SkydioLink 5GHz Radio

Model No.: SC78

CFR 47 Part 15.407 2021, RSS 247 Issue 2, 2017

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Revisions

Revision No.	Date MM/DD/YYYY	Reason for Change	Author
0	05/14/2021	Original Document	N/A
1	06/23/2021	Power settings reduction on Unii 3 from 27 to 23 was updated in the present report to match SAR data in report number SAR.20210501 issued May 27, 2021.	OC

Note: Latest revision report will replace all previous reports.

Statement of Compliance

Manufacturer: Skydio, Inc.
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Redwood City CA 94061
Requester / Applicant: Skydio, Inc.
925-766-1258
Name of Equipment: SkydioLink 5GHz Radio
Model No. SC78
Type of Equipment: Intentional Radiator
Application of Regulations: CFR 47 Part 15.407 2021, RSS 247 Issue 2, 2017
Test Dates: April 21, 2021 to June 14th, 2021

Guidance Documents:

Emissions: ANSI C63.10-2013, KDB 789033 D02 General UNII Test Procedures New Rules
v02r01, KDB 662911 D01 Multiple Transmitter Output v02r01

Test Methods:

Emissions: ANSI C63.10-2013, KDB 789033 D02 General UNII Test Procedures New Rules
v02r01, KDB 662911 D01 Multiple Transmitter Output v02r01

The electromagnetic compatibility test and documented data described in this report has been performed and recorded by TUV Rheinland, in accordance with the standards and procedures listed herein. As the responsible authorized agent of the EMC laboratory, I hereby declare that the equipment described above has been shown to be compliant with the EMC requirements of the stated regulations and standards based on these results. If any special accessories and/or modifications were required for compliance, they are listed in the Executive Summary of this report.

This report must not be used to claim product endorsement by A2LA or any agency of the U.S. Government. This report contains data that are not covered by A2LA accreditation. This report shall not be reproduced except in full, without the written authorization of TUV Rheinland of North America.

Osvaldo Casorla

Test Engineer

Date June 23rd, 2021

Richard Decker

Reviewer Signature

Date June 23rd, 2021



Government
of Canada

Gouvernement
du Canada

Testing Cert #3331.02

US1131

2932M

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1 Executive Summary

1.1 Scope

This report is intended to document the status of conformance with the requirements of the CFR 47 Part 15.407 2021, RSS 247 Issue 2, 2017 based on the results of testing performed on April 21, 2021 to June 14th, 2021 on the SkydioLink 5GHz Radio Model SC78 manufactured by Skydio, Inc. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report. The 5170.5 MHz – 5240.5 MHz and 5730.5 MHz to 5825.5 MHz frequency bands are covered in this document.

1.3 Summary of Test Results

Table 1: Summary of Test Results

Test	Test Method ANSI C63.10:2013	Test Parameters	Measured Value	Result
Duty Cycle	Information Only	N/A	See Note 4	Note 4
Spurious Emission in Transmit Mode	CFR47 15.209, CFR47 15.407 (b) RSS GEN Sect.8.10	Class B	-0.18 dB Margin	Note 4
Restricted Bands of Operation	CFR47 15.205 RSS-GEN Sect.8.8	Class B		Note 4
AC Power Conducted Emission	CFR47 15.207 RSS GEN Sect.6.7, RSS-247 Sect.6.2.4.1	Class B	N/A	Note 3
Occupied Bandwidth	CFR47 15.407 (a) & (e) RSS-GEN Sect.8.9, RSS 247 Sect. 6.2.1.2	DTS $\geq$ 500 kHz	DTS BW: 4.05 MHz	Note 4
Maximum Output Power	CFR47 15.407 (a)	UNII1: 1W	UNII1: 20.90 dBm	Complied
		UNII3: 1W	UNII3: 17.31 dBm	
	RSS 247 Sect. 6.2.1.1 & 6.2.4.1 [see Note 2]	UNII1: 200mW or 10 + 10Log(B) eirp	UNII1: 18.27 dBm eirp	Complied
		UNII3: 1W	UNII3: 17.31 dBm	Complied
Power Spectral Density	CFR47 15.407 (a)	UNII1: 17dBm/MHz	UNII1: 16.90 dBm/ MHz	Complied
		UNII3: 30dBm/0.5MHz	UNII3: 10.70 dBm/ 500kHz	
	RSS 247 Sect.6.2.1.1 RSS 247 Sect. 6.2.4.1	< 10 dBm/MHz eirp	UNII1: 9.98 dBm/ MHz eirp	Complied
		UNII3: 30dBm/ 0.5MHz	UNII3: 10.70 dBm/ 500kHz	Complied
Conducted Emission – Antenna Port	CFR47 15.407 (b)(1) (2)(3) RSS 247 Sect.6.2.1.2	< -27 dBm/MHz	-1.89 dB Margin	Note 4
	CFR47 15.407 (b)(4) RSS 247 Sect.6.2.4	Spectrum Mask	-1.81 dB Margin	Note 4

Note: 1. Measurements are conducted 2x2 total power for non-correlated.

2. UNII-1 band measurements are conducted max power for non-correlated.

* = max PSD for non-correlated.

3. Not applicable due to the unit's power source is Vdc: 12VDC.

4. Covered by Original Module test report number US21P0XG.001 with FCC ID: 2ATQRSMO5GV1 issued April 15, 2021 and report number NN21TKD1.001 with IC ID: 25280-SMO5GV1 issued April 14, 2021.

1.4 Special Accessories

No special accessories were necessary in order to achieve compliance.

1.5 Equipment Modifications

None

2 Laboratory Information

2.1.1 US Federal Communications Commission



TUV Rheinland of North America EMC test facilities located at 1279 Quarry Lane, Ste. A, Pleasanton, CA, 94566, and 5015 Brandin Ct, Fremont, CA. 94538, are recognized by the Commission for performing testing services for the general public on a fee basis. These laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Pleasanton Registration No. US1131, Fremont Registration No. US1131). The laboratory Scopes of Accreditation include Title 47 CFR Parts 15, 18 and 90. The accreditations are updated every three years.

2.1.2 A2LA



TUV Rheinland of North America EMC test facilities are accredited by the American Association for Laboratory Accreditation (A2LA). The laboratories have been assessed and accredited by A2LA in accordance with ISO Standard 17025:2017 (Testing Certificate #3331.02). The Scope of Laboratory Accreditation includes emission and immunity testing. The accreditations are updated annually.

2.1.3 Industry Canada



Industry
Canada Industrie
Canada

The Pleasanton 5-meter Semi-Anechoic Chamber, Registration No. 2932M-1, has been accepted by Industry Canada to perform testing to 3 and 5 meters based on the test procedures described in ANSI C63.4-2014. The Fremont 10-meter Semi-Anechoic Chamber, Registration No. 2932D-1, has been accepted by Industry Canada to perform testing to 3 and 10 meters based on the test procedures described in ANSI C63.4-2014.

2.1.4 Japan – VCCI



The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland of North America EMC test facilities located at 1279 Quarry Lane, Ste. A, Pleasanton, CA, 94566, and 5051 Brandin Ct, Fremont, CA. 94538, have been assessed and approved in accordance with the Regulations for Voluntary Control Measures.

VCCI Registration No. for Pleasanton: A-0326

VCCI Registration No. for Fremont: A-0327

2.1.5 Acceptance by Mutual Recognition Arrangement



The United States has an established agreement with specific countries under the Asia Pacific Laboratory Accreditation Corporation (APLAC) Mutual Recognition Arrangement. Under this agreement, all TUV Rheinland at 1279 Quarry Ln, Pleasanton, CA 94566 test results and test reports within the scope of the laboratory NIST / A2LA accreditation will be accepted by each member

country.

2.2 Test Facilities & EMC Software

Test facilities are located at 1279 Quarry Lane, Ste. A, Pleasanton, California 94566, U.S.A. and 5015 Brandin Ct, Fremont, CA. 94538, U.S.A. (Fremont is the Pleasanton Annex).

2.2.1 Emission Test Facility

The Semi-Anechoic Chambers and AC Line Conducted measurement facilities used to collect radiated and conducted emissions data have been constructed in accordance with ANSI C63.7:1992. The Fremont 10 meter semi-anechoic chamber has been measured in accordance with and verified to comply with the theoretical volumetric normalized site attenuation of ANSI C63.4-2014 and SVSWR requirements of CISPR 16-1-4 Consol. Ed. 3.0 (2010-04), at test distances of 3 and 10 meters. This site has been described in reports dated November 1st, 2006, submitted to the FCC, and accepted by letter dated November 28, 2006. The site is listed with the FCC and accredited by A2LA (Testing Certificate #3331.02). The Pleasanton 5 meter semi-anechoic chamber has been verified to comply with the theoretical volumetric normalized site attenuation of ANSI C63.4-2014 and SVSWR requirements of CISPR 16-1-4 Consol. Ed. 3.0 (2010-04) at a test distance of 3 meters. This site has been described in reports dated November 1st, 2006, submitted to the FCC, and accepted by letter dated November 28, 2006. The site is listed with the FCC and accredited by A2LA (Testing Certificate #3331.02).

2.2.2 Immunity Test Facility

ESD, EFT, Surge, PQF: These tests are performed in an environmentally controlled room with a 3.7 m x 4.8 m x 3.175 mm thick aluminum floor connected to PE ground.

For ESD testing, tabletop equipment is placed on an insulated mat with a surface resistivity of 10^9 Ohms/square on a 1.6 m x 0.8 m x 0.8 m high non-conductive table with a 3.175 mm aluminum top (Horizontal Coupling Plane). The HCP is connected to the main ground plane via a low impedance ground strap through two 470-k Ω resistors. The Vertical Coupling Plane consists of an aluminum plate 50 cm x 50 cm x 3.175 mm thick. The VCP is connected to the main ground plane via a low impedance ground strap through two 470-k Ω resistors.

For EFT, Surge, PQF, the HCP and VCP are removed.

RF Field Immunity testing is performed in a 7.3 m x 4.3 m x 4.1 m anechoic chamber.

RF Conducted and Magnetic Field Immunity testing is performed on a 4.8 m x 3.7 m x 3.175 mm thick aluminum ground plane.

All test areas allow a minimum distance of 1 meter from the EUT to walls or conducting objects.

2.2.3 Sample Calculation – radiated & conducted emissions

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{RAW} - \text{AMP} + \text{CBL} + \text{ACF}$$

Where: RAW = Measured level before correction (dB μ V)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu\text{V/m} = 10^{\frac{\text{dB}\mu\text{V/m}}{20}}$$

Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dB μ V/m)

$$25 \text{ dB}\mu\text{V/m} + 17.5 \text{ dB} - 20 \text{ dB} + 1.0 \text{ dB} = 23.5 \text{ dB}\mu\text{V/m}$$

2.2.4 Measurement Uncertainty

Per CISPR 16-4-2	U _{lab}	U _{cispr}
Radiated Disturbance @ 10 meters		
30 – 1,000 MHz	2.25 dB	4.51 dB
Radiated Disturbance @ 3 meters		
30 – 1,000 MHz	2.26 dB	4.52 dB
1 – 6 GHz	2.12 dB	4.25 dB
6 – 40 GHz	2.47 dB	4.93 dB
Conducted Disturbance @ Mains Terminals		
150 kHz – 30 MHz	1.09 dB	2.18 dB
Disturbance Power		
30 MHz – 300 MHz	3.92 dB	4.3 dB

Voltech PM6000A

The estimated combined standard uncertainty for harmonic current and flicker measurements is $\pm 5.0\%$.	Per CISPR 16-4-2 Methods
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Measurement Uncertainty - EMC Immunity

The estimated combined standard uncertainty for ESD immunity measurements is $\pm 8.2\%$.	Per IEC 61000-4-2
The estimated combined standard uncertainty for radiated immunity measurements is ± 4.10 dB.	Per IEC 61000-4-3
The estimated combined standard uncertainty for conducted immunity measurements with CDN is ± 3.66 dB	Per IEC 61000-4-6
The estimated combined standard uncertainty for power frequency magnetic field immunity is $\pm 2.9\%$.	Per IEC 61000-4-8
The estimated combined standard uncertainty for EFT fast transient immunity measurements is $\pm 2.6\%$.	Per IEC 61000-4-4
The estimated combined standard uncertainty for surge immunity measurements is $\pm 2.6\%$.	Per IEC 61000-4-5
The estimated combined standard uncertainty for voltage variation and interruption measurements is $\pm 1.74\%$.	Per IEC 61000-4-11

Measurement Uncertainty – Radio Testing

The estimated combined standard uncertainty for frequency error measurements is ± 3.88 Hz
The estimated combined standard uncertainty for carrier power measurements is ± 0.70 dB.
The estimated combined standard uncertainty for adjacent channel power measurements is ± 1.47 dB.
The estimated combined standard uncertainty for modulation frequency response measurements is ± 0.46 dB.
The estimated combined standard uncertainty for transmitter conducted emission measurements is ± 2.06 dB

The expanded uncertainty at a level of 95% confidence is obtained by multiplying the combined standard uncertainty by a coverage factor of 2. Compliance criteria are not based on measurement uncertainty. on measurement uncertainty.

2.3 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2017. Equipment calibration records are kept on file at the test facility.

3 Product Information

3.1 Product Description

The Model SC78, SkydioLink 5GHz Radio, is a 2x2 5GHz controller designed for UAV applications. It is intended to operate as a 5GHz band wireless over 5 MHz, 10 MHz, 20 MHz, 40 MHz channels. The Radio will be in compliance with regulatory standards of regions it will be operating in.

3.2 Equipment Configuration

A description of the equipment configuration is given in the Section 6. The EUT was tested as called for in the test standard and was configured and operated in a manner consistent with its intended use. The EUT was connected to rated power and allowed to reach intended operating conditions. The placement of the EUT system components was guided by the test standard and selected to represent typical installation conditions.

In the case of an EUT that can operate in more than one configuration, preliminary testing was performed to determine the configuration that produced maximum radiation.

The final configuration was selected to produce the worst case radiation for emissions testing and to place the EUT in the most susceptible state for immunity testing.

3.3 Operating Mode

A description of the operation mode is given in the Section 6. In the case of an EUT that can operate in more than one state, preliminary testing was performed to determine the operating mode that produced maximum radiation.

The final operating mode was selected to produce the worst case radiation for emissions testing and to place the EUT in the most susceptible state for immunity testing.

3.4 Unique Antenna Connector

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of CFR47 Parts 15.211, 15.213, 15.217, 15.219, or 15.221.

3.4.1 Results

The SC78 has 2 integral antennas. 2 Omni Antennas dedicated for WiFi in the band 5 GHz that has a maximum gain of 5.80 dBi in Unii 1 and 7.36 dBi in Unii 3.

Refer to Table 29 for additional antenna information.

4 Emissions

Testing was performed in accordance with CFR 47 Part 15.407: 2021 and RSS 247: 2017. These test methods are listed under the laboratory's A2LA Scope of Accreditation. This test measures the levels emanating from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Procedures described in section 8 of the standard were used.

4.1 Output Power Requirements

The maximum output power requirement is the maximum equivalent isotropic radiated power delivering at the transmitting antenna under specified conditions of measurements in the presence of modulation.

The maximum transmitted power limits per CFR47 Part 15.407 and RSS-247 are

Part 15.407(a)(1)(iv) – Band 5150-5250 MHz: 1 W.

Part 15.407(a)(2) – Band 5250-5350 MHz, 5470-5725 MHz: 250 mW or 11 dBm + 10Log B.

Part 15.407(a)(3) – Band 5725-5825 MHz: 1 W

RSS 247 Sect. 6.2.1.1 – Band 5150-5250 MHz (e.i.r.p.): 200 mW or 10 + 10Log(B)

RSS 247 Sect. 6.2.2.1, 6.2.3.1 – Band 5250-5350 MHz, 5470-5725 MHz: 250 mW or 11 dBm + 10Log B.

RSS 247 Sect. 6.2.2.3 (b) – Band 5250-5350 MHz (e.i.r.p.): 200 mW

RSS 247 Sect. 6.2.4.1 – Band 5725-5850 MHz: 1 W

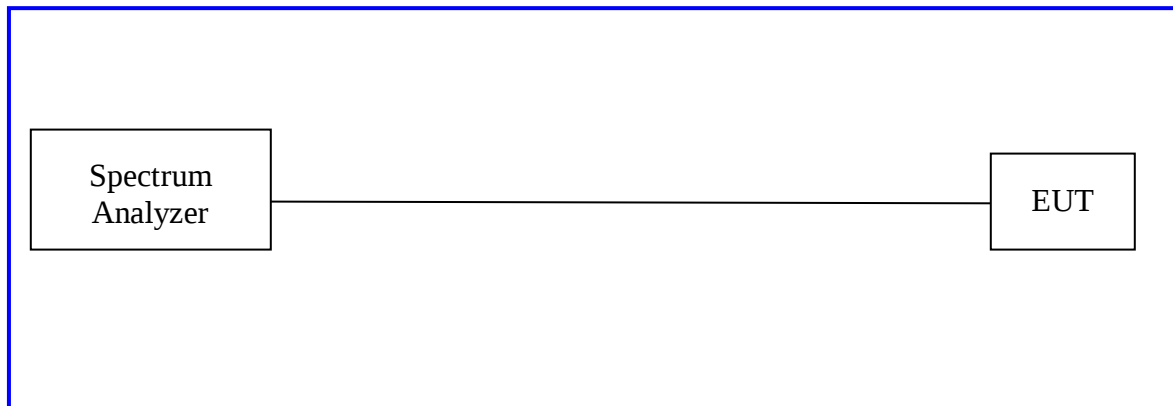
Note: B is the 99% emission bandwidth.

4.1.1 Test Method

The ANSI C63.10-2013 Section 12.3.2.2 conducted method was used to measure the channel power output. The preliminary investigation was performed at different data rate/ chain to determine the highest power output for each mode. The worst findings were conducted on 3 channels in each operating range per CFR47 Part 15.407(a) and RSS 247 Sect. 6.2.1.1. The worst mode results indicated below.

Method SA-2 of KDB 789033 D02 – Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices.

Test Setup:



4.1.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

4.1.2.1 FCC RF Output Power

Table 2: RF Output Power at the Antenna Port – Test Results

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11a at 6 Mbps (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5170.5	13.70	13.76	- 0.18	16.92	30.00	-13.08
5200.5	13.56	13.66	- 0.18	16.80	30.00	-13.20
5240.5	13.35	13.27	- 0.18	16.50	30.00	-13.50
802.11a at 6 Mbps (10 MHz)						
5170	17.22	17.04	- 0.22	20.36	30.00	-9.64
5200	18.22	17.03	- 0.22	20.90	30.00	-9.10
5240	17.64	17.52	- 0.22	20.81	30.00	-9.19
802.11a at 6 Mbps (20 MHz)						
5180	10.44	10.30	- 0.46	13.84	30.00	-16.16
5220	11.66	11.59	- 0.46	15.09	30.00	-14.91
5240	11.88	11.57	- 0.46	15.20	30.00	-14.80
U-NII-3 (5725-5850MHz)						
802.11a at 6 Mbps (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5730.5	13.77	13.58	- 0.22	16.91	28.64	-11.73
5795.5	13.23	13.25	- 0.22	16.47	28.64	-12.17
5825.5	13.05	13.03	- 0.22	16.27	28.64	-12.37
802.11a at 6 Mbps (10 MHz)						
5730	13.84	13.68	- 0.18	16.95	28.64	-11.69
5795	13.30	13.25	- 0.18	16.46	28.64	-12.18
5825	13.08	13.01	- 0.18	16.23	28.64	-12.41
802.11a at 6 Mbps (20 MHz)						
5745	14.13	13.73	- 0.36	17.31	28.64	-11.33
5785	13.11	13.05	- 0.36	16.45	28.64	-12.19
5825	12.71	12.52	- 0.36	15.99	28.64	-12.65
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm						

Table 3: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11n at HT MCS0 (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5170.5	13.11	12.90	- 0.46	16.47	30.00	-13.53
5200.5	13.09	12.97	- 0.46	16.50	30.00	-13.50
5240.5	12.89	13.13	- 0.46	16.48	30.00	-13.52
802.11n at HT MCS0 (10 MHz)						
5170	16.93	16.79	- 0.32	20.19	30.00	-9.81
5200	16.67	16.75	- 0.32	20.04	30.00	-9.96
5240	16.68	17.13	- 0.32	20.24	30.00	-9.76
802.11n at HT MCS0 (20 MHz)						
5180	10.98	10.81	- 0.56	14.46	30.00	-15.54
5220	11.09	10.98	- 0.56	14.60	30.00	-15.40
5240	11.04	10.92	- 0.56	14.55	30.00	-15.45
U-NII-3 (5725-5850MHz)						
802.11n at HT MCS0 (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5730.5	13.68	13.63	- 0.27	16.93	28.64	-11.71
5795.5	13.13	13.04	- 0.27	16.36	28.64	-12.28
5825.5	12.80	12.62	- 0.27	15.99	28.64	-12.65
802.11n at HT MCS0 (10 MHz)						
5730	13.38	13.21	- 0.32	16.62	28.64	-12.02
5795	13.02	12.83	- 0.32	16.25	28.64	-12.39
5825	12.40	12.51	- 0.32	15.78	28.64	-12.86
802.11n at HT MCS0 (20 MHz)						
5745	12.91	12.76	- 0.51	16.35	28.64	-12.29
5785	12.44	12.35	- 0.51	15.91	28.64	-12.73
5825	12.14	12.08	- 0.51	15.63	28.64	-13.01
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm						

Table 4: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11n HT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5190	2.70	2.79	- 0.66	6.41	30.00	-23.59
5230	8.05	8.15	- 0.66	11.77	30.00	-18.23
U-NII-3 (5725-5850MHz)						
802.11n HT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5755	10.03	9.90	- 0.51	13.48	28.64	-15.16
5795	9.55	9.44	- 0.51	13.01	28.64	-15.63
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm						

Table 5: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11ac VHT20 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5180	10.87	10.80	- 0.51	14.40	30.00	-15.60
5220	10.95	10.88	- 0.51	14.48	30.00	-15.52
5240	11.06	10.96	- 0.51	14.58	30.00	-15.42
U-NII-3 (5725-5850MHz)						
802.11ac VHT20 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5745	12.64	12.59	- 0.51	16.13	28.64	-12.51
5785	12.30	12.27	- 0.51	15.80	28.64	-12.84
5825	12.03	11.99	- 0.51	15.53	28.64	-13.11
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm						

Table 6: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11ac VHT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5190	3.76	3.74	- 0.76	7.42	30.00	-22.58
5230	8.23	8.19	- 0.76	11.88	30.00	-18.12
U-NII-3 (5725-5850MHz)						
802.11ac VHT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5755	10.19	9.97	- 0.86	13.60	28.64	-15.04
5795	9.66	9.61	- 0.86	13.15	28.64	-15.49
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm						

4.1.2.2 IC RF Output Power

Table 7: RF Output Power at the Antenna Port – Test Results

Date: April 21, 2021 to June 14th, 2021					Tested By: Osvaldo Casorla				
Test Method: Conducted Measurements					Power Setting: See Section 6 Table 21.				
Antenna Type: Omni					Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi				
Operating Mode: Uncorrelated					Signal State: See Section 3.5.1				
Ambient Temp.: 22 - 23 °C					Relative Humidity: 35 - 38%				
U-NII-1 (5150-5250MHz)									
802.11a at 6 Mbps (5 MHz)									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Antenna Gain (dBi)	OBW (MHz)	EIRP (dBm)	EIRP Limit [dBm]	Margin [dB]
5170.5	3.74	3.29	- 0.18	6.53	5.14	4.09	12.51	16.12	-3.61
5200.5	3.76	3.84	- 0.18	6.81	5.14	4.09	12.79	16.12	-3.33
5240.5	4.11	4.05	- 0.18	7.09	5.14	4.09	13.07	16.12	-3.05
802.11a at 6 Mbps (10 MHz)									
5170	6.45	6.38	- 0.22	9.43	5.14	8.17	15.45	19.12	-3.67
5200	6.68	6.60	- 0.22	9.65	5.14	8.17	15.67	19.12	-3.45
5240	6.64	6.78	- 0.22	9.72	5.14	8.17	15.74	19.12	-3.38
802.11a at 6 Mbps (20 MHz)									
5180	8.28	8.29	- 0.46	11.30	5.14	16.28	17.55	22.12	-4.56
5220	8.30	8.27	- 0.46	11.30	5.14	16.41	17.55	22.15	-4.60
5240	8.57	8.55	- 0.46	11.57	5.14	16.41	17.83	22.15	-4.32
U-NII-3 (5725-5850MHz)									
802.11a at 6 Mbps (5 MHz)									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]			
5730.5	13.77	13.58	- 0.22	16.91	28.64	-11.73			
5795.5	13.23	13.25	- 0.22	16.47	28.64	-12.17			
5825.5	13.05	13.03	- 0.22	16.27	28.64	-12.37			
802.11a at 6 Mbps (10 MHz)									
5730	13.84	13.68	- 0.18	16.95	28.64	-11.69			
5795	13.30	13.25	- 0.18	16.46	28.64	-12.18			
5825	13.08	13.01	- 0.18	16.23	28.64	-12.41			
802.11a at 6 Mbps (20 MHz)									
5745	14.13	13.73	- 0.36	17.31	28.64	-11.33			
5785	13.11	13.05	- 0.36	16.45	28.64	-12.19			
5825	12.71	12.52	- 0.36	15.99	28.64	-12.65			
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report.									
2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm									

Table 8: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021				Tested By: Osvaldo Casorla					
Test Method: Conducted Measurements				Power Setting: See Section 6 Table 21.					
Antenna Type: Omni				Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi					
Operating Mode: Uncorrelated				Signal State: See Section 3.5.1					
Ambient Temp.: 22 - 23 °C				Relative Humidity: 35 - 38%					
U-NII-1 (5150-5250MHz)									
802.11n at HT MCS0 (5 MHz)									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Antenna Gain (dBi)	OBW (MHz)	EIRP (dBm)	EIRP Limit [dBm]	Margin [dB]
5170.5	2.92	2.84	- 0.46	5.89	5.14	4.36	12.15	16.39	-4.25
5200.5	3.62	3.58	- 0.46	6.61	5.14	4.36	12.87	16.39	-3.53
5240.5	3.66	3.51	- 0.46	6.60	5.14	4.36	12.85	16.39	-3.54
802.11n at HT MCS0 (10 MHz)									
5170	5.94	6.01	- 0.32	8.99	5.14	8.72	15.10	19.41	-4.30
5200	6.00	5.97	- 0.32	9.00	5.14	8.72	15.11	19.41	-4.29
5240	6.39	6.41	- 0.32	9.41	5.14	8.75	15.53	19.42	-3.89
802.11n at HT MCS0 (20 MHz)									
5180	8.71	8.58	- 0.56	11.66	5.14	17.44	18.01	22.42	-4.40
5220	8.93	8.87	- 0.56	11.91	5.14	17.50	18.27	22.43	-4.16
5240	8.88	8.89	- 0.56	11.90	5.14	17.50	18.25	22.43	-4.18
U-NII-3 (5725-5850MHz)									
802.11n at HT MCS0 (5 MHz)									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]			Limit [dBm]		Margin [dB]
5730.5	13.68	13.63	- 0.27	16.93			28.64		-11.71
5795.5	13.13	13.04	- 0.27	16.36			28.64		-12.28
5825.5	12.80	12.62	- 0.27	15.99			28.64		-12.65
802.11n at HT MCS0 (10 MHz)									
5730	13.38	13.21	- 0.32	16.62			28.64		-12.02
5795	13.02	12.83	- 0.32	16.25			28.64		-12.39
5825	12.40	12.51	- 0.32	15.78			28.64		-12.86
802.11n at HT MCS0 (20 MHz)									
5745	12.91	12.76	- 0.51	16.35			28.64		-12.29
5785	12.44	12.35	- 0.51	15.91			28.64		-12.73
5825	12.14	12.08	- 0.51	15.63			28.64		-13.01
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm									

Table 9: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021				Tested By: Osvaldo Casorla					
Test Method: Conducted Measurements				Power Setting: See Section 6 Table 21.					
Antenna Type: Omni				Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi					
Operating Mode: Uncorrelated				Signal State: See Section 3.5.1					
Ambient Temp.: 22 - 23 °C				Relative Humidity: 35 - 38%					
U-NII-1 (5150-5250MHz)									
802.11n HT40 at MCS0									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Antenna Gain (dBi)	OBW (MHz)	EIRP (dBm)	EIRP Limit [dBm]	Margin [dB]
5190	2.02	1.97	- 0.66	5.01	5.14	36.03	11.46	23.00	-11.54
5230	8.11	8.02	- 0.66	11.08	5.14	36.28	17.53	23.00	-5.47
U-NII-3 (5725-5850MHz)									
802.11n HT40 at MCS0									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]		Margin [dB]		
5755	10.03	9.90	- 0.51	13.48	28.64		-15.16		
5795	9.55	9.44	- 0.51	13.01	28.64		-15.63		
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm									

Table 10: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021				Tested By: Osvaldo Casorla					
Test Method: Conducted Measurements				Power Setting: See Section 6 Table 21.					
Antenna Type: Omni				Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi					
Operating Mode: Uncorrelated				Signal State: See Section 3.5.1					
Ambient Temp.: 22 - 23 °C				Relative Humidity: 35 - 38%					
U-NII-1 (5150-5250MHz)									
802.11ac VHT20 at MCS0									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Antenna Gain (dBi)	OBW (MHz)	EIRP (dBm)	EIRP Limit [dBm]	Margin [dB]
5180	8.72	8.67	- 0.51	11.71	5.14	17.44	18.01	22.42	-4.40
5220	8.89	8.88	- 0.51	11.90	5.14	17.50	18.20	22.43	-4.23
5240	8.88	8.84	- 0.51	11.87	5.14	17.44	18.18	22.42	-4.24
U-NII-3 (5725-5850MHz)									
802.11ac VHT20 at MCS0									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]		Margin [dB]		
5745	12.64	12.59	- 0.51	16.13	28.64		-12.51		
5785	12.30	12.27	- 0.51	15.80	28.64		-12.84		
5825	12.03	11.99	- 0.51	15.53	28.64		-13.11		
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm									

Table 11: RF Output Power at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021				Tested By: Osvaldo Casorla					
Test Method: Conducted Measurements				Power Setting: See Section 6 Table 21.					
Antenna Type: Omni				Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi					
Operating Mode: Uncorrelated				Signal State: See Section 3.5.1					
Ambient Temp.: 22 - 23 °C				Relative Humidity: 35 - 38%					
U-NII-1 (5150-5250MHz)									
802.11ac VHT40 at MCS0									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Antenna Gain (dBi)	OBW (MHz)	EIRP (dBm)	EIRP Limit [dBm]	Margin [dB]
5190	3.18	3.16	- 0.76	6.18	5.14	36.03	12.74	23.00	-10.26
5230	8.31	8.26	- 0.76	11.30	5.14	36.28	17.85	23.00	-5.15
U-NII-3 (5725-5850MHz)									
802.11ac VHT40 at MCS0									
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]		Margin [dB]		
5755	10.19	9.97	- 0.86	13.60	28.64		-15.04		
5795	9.66	9.61	- 0.86	13.15	28.64		-15.49		
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30dBm - (7.36dBi-6dBi) = 28.64 dBm									

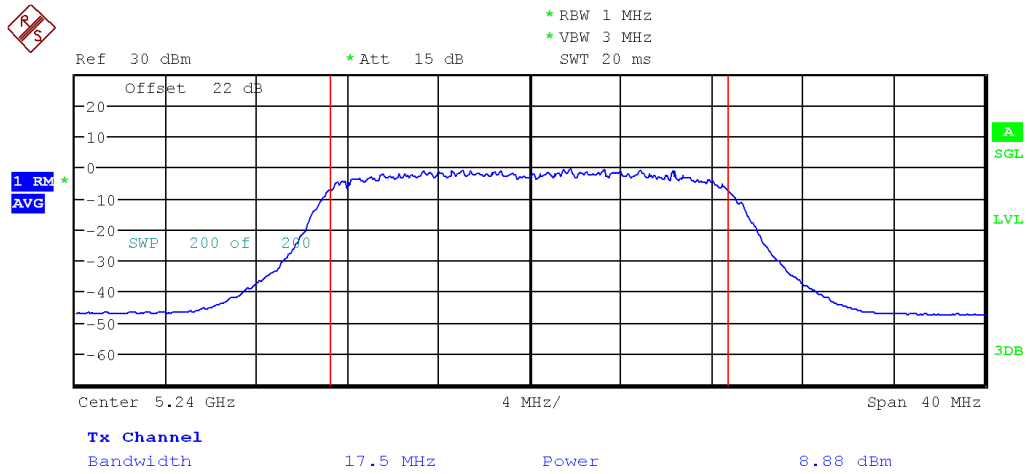


Figure 1: IC Uncorrelated Max Conducted Power-5240 MHz-802.11n-MCS 0-20MHz-Ch0

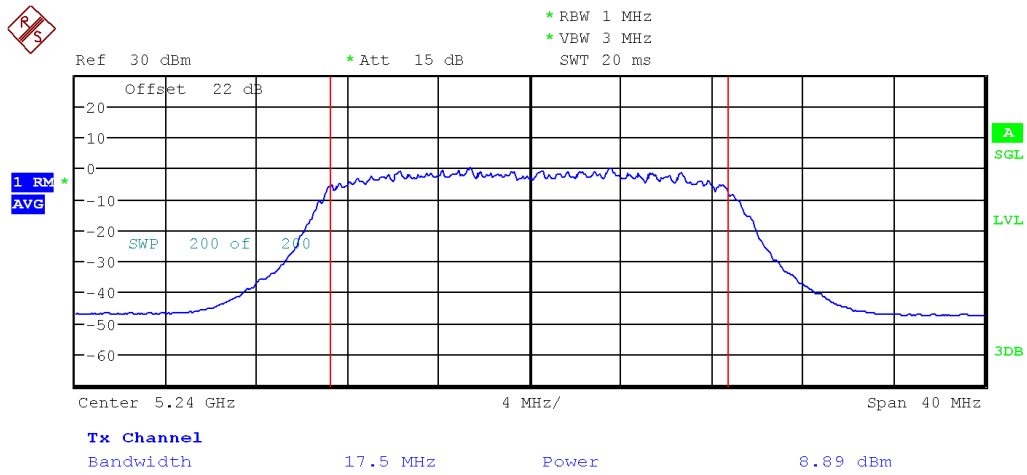


Figure 2: IC Uncorrelated Max Conducted Power-5240 MHz-802.11n-MCS 0-20MHz-Ch1

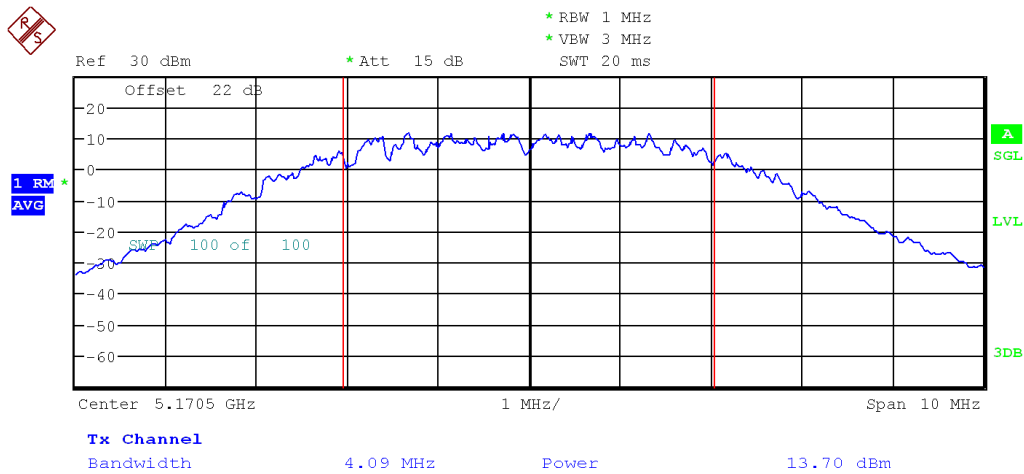


Figure 3: FCC Uncorrelated Max Conducted Power-5170.5 MHz-802.11a-6 Mnps-5MHz-Ch0

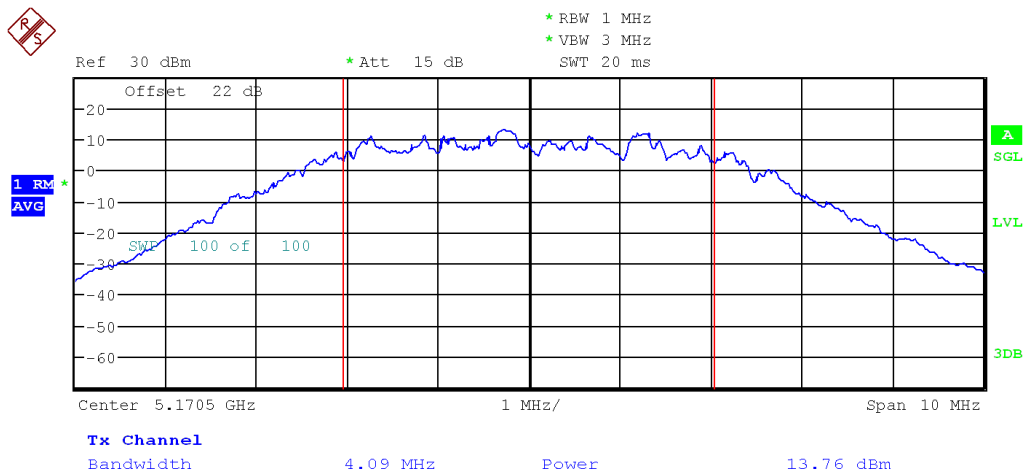


Figure 4: FCC Uncorrelated Max Conducted Power-5170.5 MHz-802.11a-6 Mbps-5MHz-Ch1

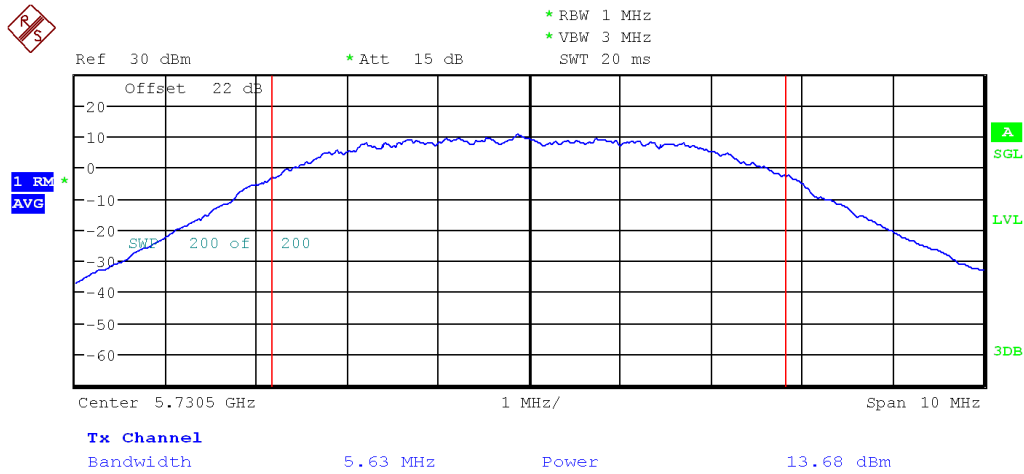


Figure 5: FCC Uncorrelated Max Conducted Power-5730.5 MHz-802.11n-MCS 0-5MHz-Ch0

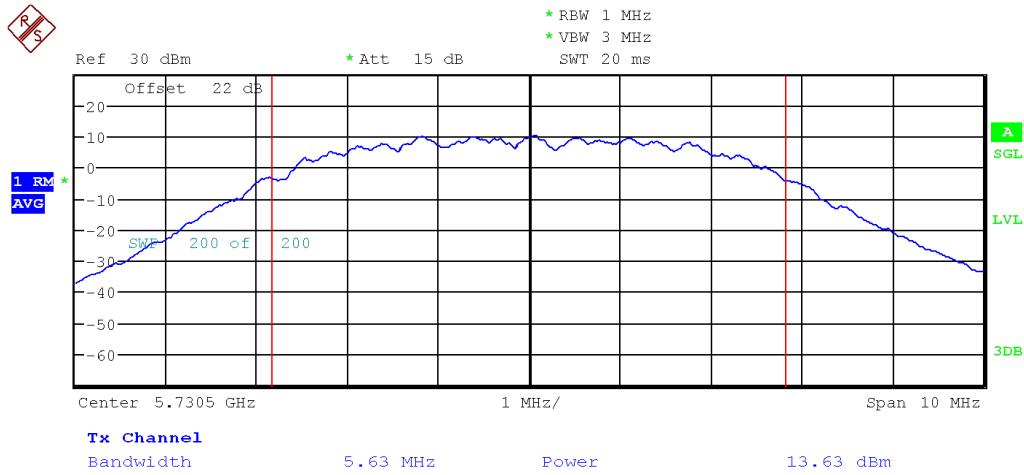


Figure 6: FCC Uncorrelated Max Conducted Power-5730.5 MHz-802.11n-MCS 0-5MHz-Ch1

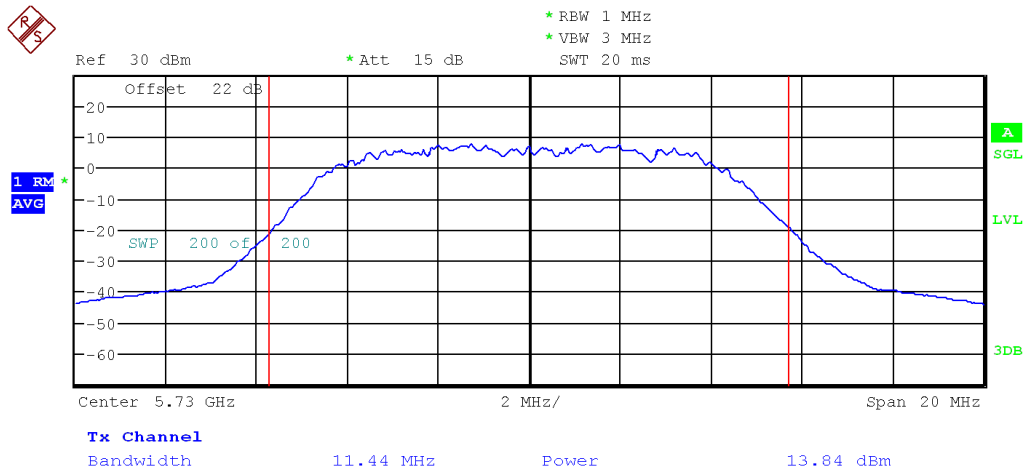


Figure 7: FCC Uncorrelated Max Conducted Power-5730 MHz-802.11a-6 Mbps -10MHz-Ch0

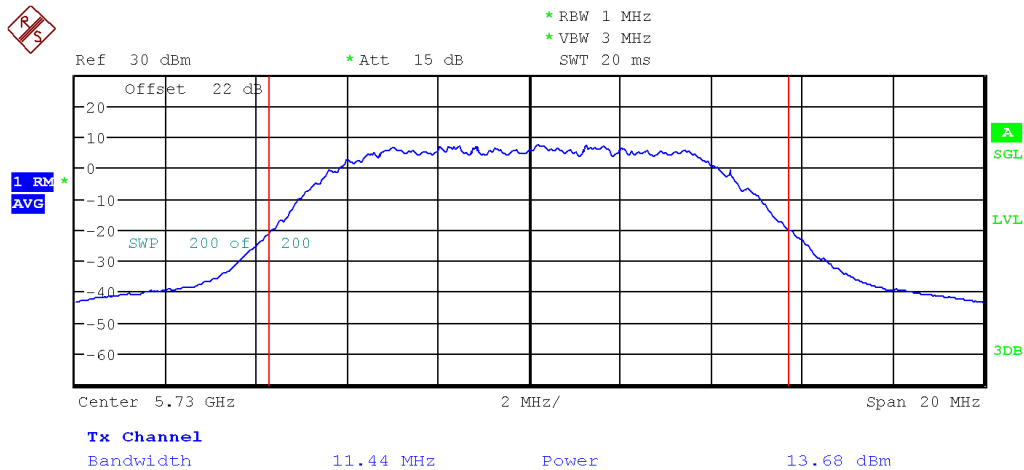


Figure 8: FCC Uncorrelated Max Conducted Power-5730 MHz-802.11a-6 Mbps -10MHz-Ch1

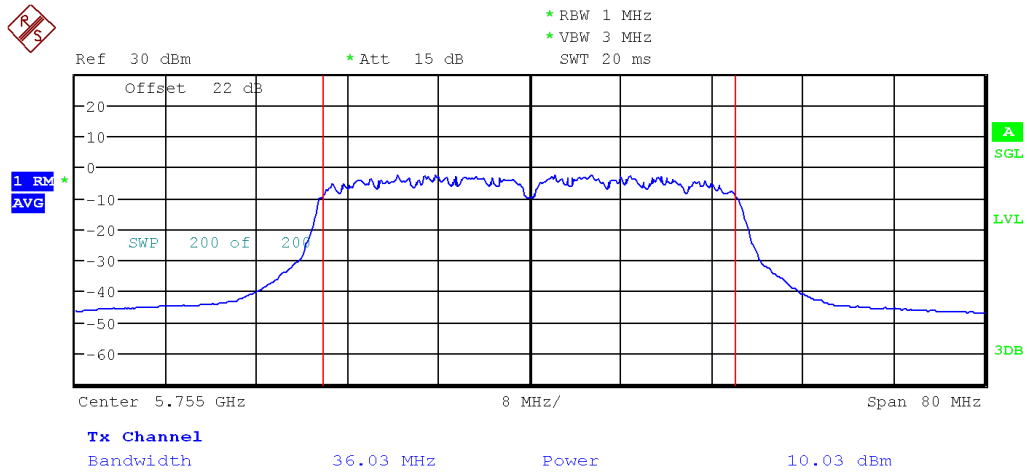


Figure 9: FCC Uncorrelated Max Conducted Power-5755 MHz-802.11ac-MCS 0-40MHz-Ch0

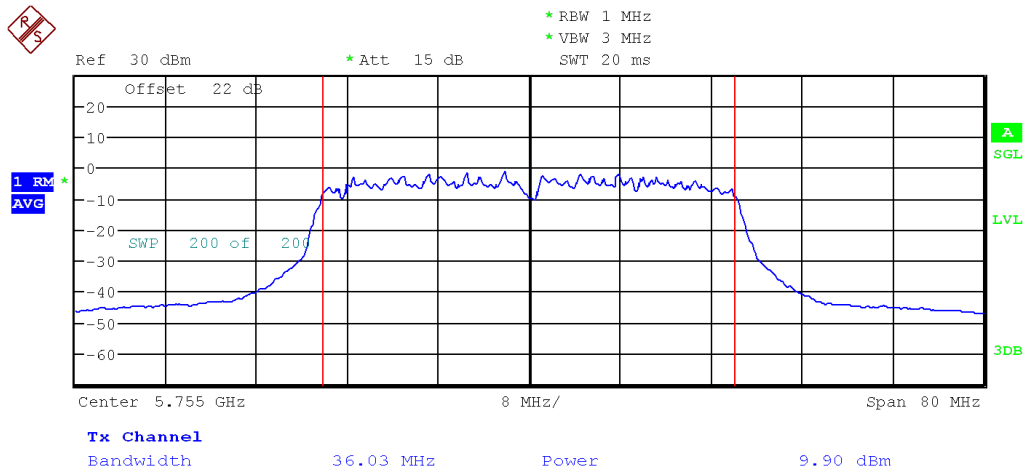


Figure 10: FCC Uncorrelated Max Conducted Power-5755 MHz-802.11ac-MCS 0-40MHz-Ch1

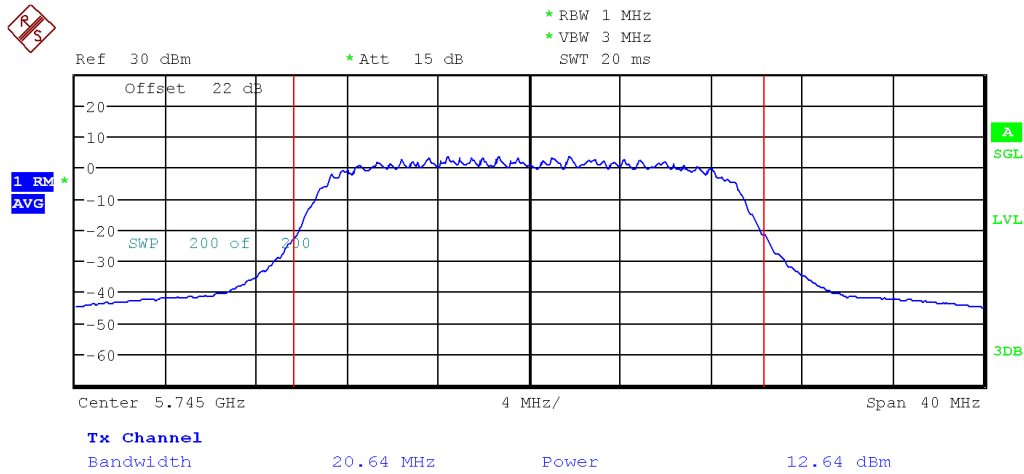


Figure 11: FCC Uncorrelated Max Conducted Power-5745 MHz-802.11ac VHT-MCS 0-20MHz - Ch0

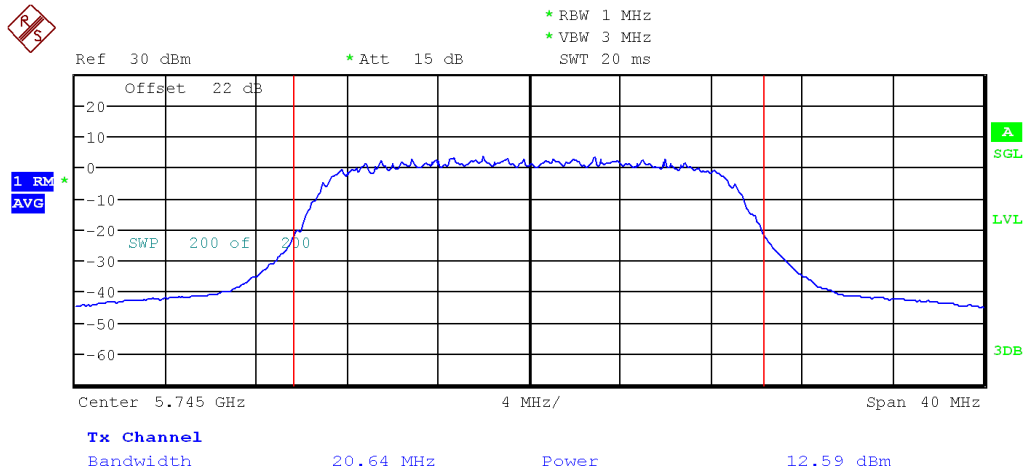


Figure 12: FCC Uncorrelated Max Conducted Power-5745 MHz-802.11ac VHT-MCS 0-20MHz- Ch1

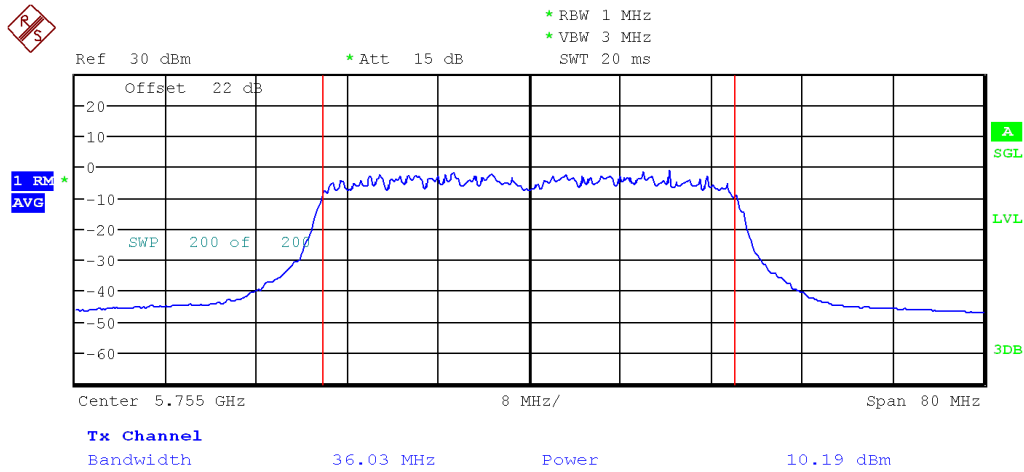


Figure 13: FCC Uncorrelated Max Conducted Power-5755 MHz-802.11ac VHT-MCS 0-40MHz - Ch0

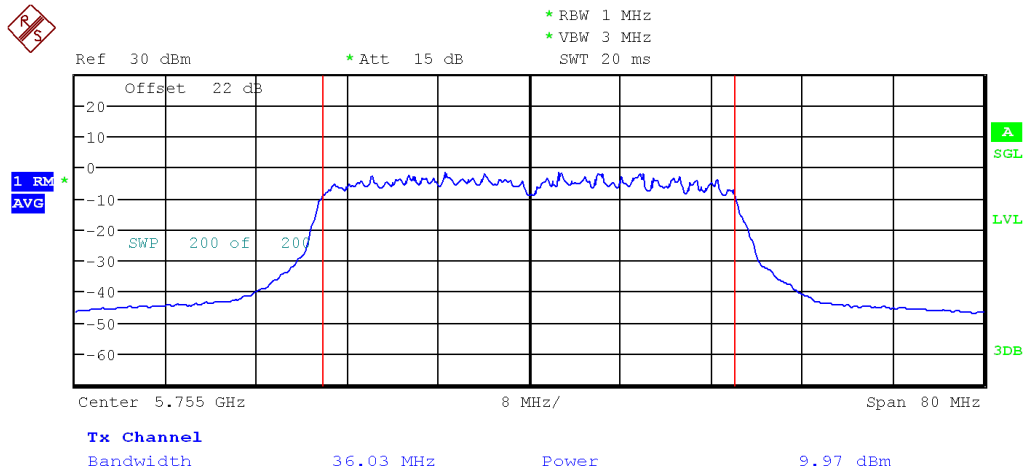


Figure 14: FCC Uncorrelated Max Conducted Power-5755 MHz-802.11ac VHT-MCS 0-40MHz- Ch1

4.2 Occupied Bandwidth

The occupied bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency.

The 99% bandwidth is the bandwidth in which 99% of the transmitted power occupied.

The 26 dB bandwidth is defined the bandwidth of 26 dBr from highest transmitted level of the fundamental frequency.

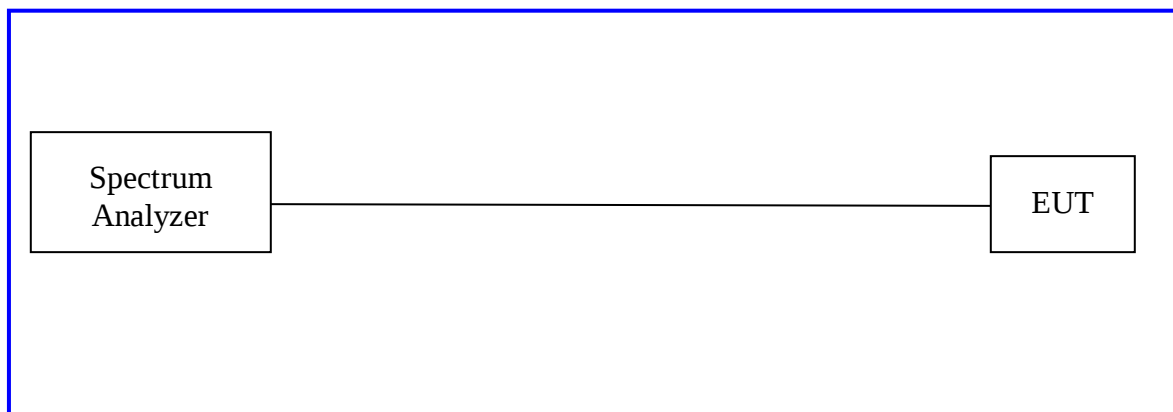
The minimum 6 dB bandwidth shall be at least 500 kHz per Section CFR47 15.407(e) and RSS 247 Sect.6.2.4.1

There is no restriction limits for the bandwidth. The 26 dB bandwidth was used to determine the limit for maximum conducted output power per CFR47 Part 15.407(a).

4.2.1 Test Method

The conducted method was used to measure the occupied bandwidth. The measurement was performed with modulation per CFR47 15.407(a)&(e), RSS Gen Sect.6.7 and RSS-247 Sect.6.2.4.1. The preliminary investigation was performed to find the narrowest 26 dB bandwidth for each operational mode at different data rates. This worst finding was performed on 3 channels in each operating frequency range. The worst results indicated below.

Test Setup:



4.2.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 12: Occupied Bandwidth – Test Results

Date: April 21, 2021 to June 14th, 2021		Tested By: Osvaldo Casorla	
Test Method: Conducted Measurements		Power Setting: See Section 6 Table 21.	
Antenna Type: Omni		Max Antenna Gain: UNII1 = 5.14 dBi; UNII3 = 5.35 dBi	
Operating Mode: Uncorrelated		Signal State: See Section 3.5.1	
Ambient Temp.: 22 - 23 °C		Relative Humidity: 35 - 38%	
U-NII-1 (5150-5250MHz)			
802.11a, 6Mbps 5MHz			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5170.5	4.09	4.97	NA
5200.5	4.09	5.02	NA
5240.5	4.09	5.32	NA
802.11a, 6Mbps 10MHz			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5170	8.17	10.26	NA
5200	8.17	10.16	NA
5240	8.17	10.96	NA
802.11a, 6Mbps 20MHz			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5180	16.28	20.00	NA
5220	16.41	20.26	NA
5240	16.41	21.35	NA
U-NII-3 (5725-5850MHz)			
802.11a, 6Mbps 5MHz			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5730.5	6.43	4.10	500
5795.5	6.23	4.05	500
5825.5	6.31	4.07	500
802.11a, 6Mbps 10MHz			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5730	11.44	8.16	500
5795	10.80	8.13	500
5825	10.86	8.10	500
802.11a, 6Mbps 20MHz			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5745	19.68	15.94	500
5785	20.38	16.19	500
5825	20.19	15.62	500
Note: 1 Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of The report, Highlighted Plots are placed in the report.			

Table 13: Occupied Bandwidth – Test Results Continued

Date: April 21, 2021 to June 14th, 2021		Tested By: Osvaldo Casorla	
Test Method: Conducted Measurements		Power Setting: See Section 6 Table 21.	
Antenna Type: Omni		Max Antenna Gain: UNII1 = 5.14 dBi; UNII3 = 5.35 dBi	
Operating Mode: Uncorrelated		Signal State: See Section 3.5.1	
Ambient Temp.: 22 - 23 °C		Relative Humidity: 35 - 38%	
U-NII-1 (5150-5250MHz)			
802.11n, HT MCS0 5MHz			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5170.5	4.36	5.27	NA
5200.5	4.36	5.16	NA
5240.5	4.36	5.32	NA
802.11n, HT MCS0 10MHz			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5170	8.72	10.45	NA
5200	8.72	10.38	NA
5240	8.75	10.80	NA
802.11n, HT MCS0 20MHz			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5180	17.44	20.19	NA
5220	17.50	21.35	NA
5240	17.50	21.41	NA
U-NII-3 (5725-5850MHz)			
802.11n, HT MCS0 5MHz			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5730.5	5.83	4.40	500
5795.5	5.63	4.35	500
5825.5	5.79	4.32	500
802.11n, HT MCS0 10MHz			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5730	11.25	8.64	500
5795	10.61	8.64	500
5825	10.87	8.64	500
802.11n, HT MCS0 20MHz			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5745	19.81	15.81	500
5785	19.81	16.32	500
5825	20.32	16.13	500
Note: 1 Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of The report, Highlighted Plots are placed in the report.			

Table 14: Occupied Bandwidth – Test Results Continued

Date: April 21, 2021 to June 14th, 2021		Tested By: Osvaldo Casorla	
Test Method: Conducted Measurements		Power Setting: See Section 6 Table 21.	
Antenna Type: Omni		Max Antenna Gain: UNII1 = 5.14 dBi; UNII3 = 5.35 dBi	
Operating Mode: Uncorrelated		Signal State: See Section 3.5.1	
Ambient Temp.: 22 - 23 °C		Relative Humidity: 35 - 38%	
802.11n HT40 at MCS0			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5190	36.03	42.44	NA
5230	36.28	44.10	NA
802.11n HT40 at MCS0			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5755	36.03	35.90	500
5795	36.03	35.87	500
Note: 1 Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of The report, Highlighted Plots are placed in the report.			

Table 15: Occupied Bandwidth – Test Results Continued

Date: April 21, 2021 to June 14th, 2021		Tested By: Osvaldo Casorla	
Test Method: Conducted Measurements		Power Setting: See Section 6 Table 21.	
Antenna Type: Omni		Max Antenna Gain: UNII1 = 5.14 dBi; UNII3 = 5.35 dBi	
Operating Mode: Uncorrelated		Signal State: See Section 3.5.1	
Ambient Temp.: 22 - 23 °C		Relative Humidity: 35 - 38%	
802.11ac VHT20 at MCS0			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
	5180	20.64	
	5220	21.35	
	5240	21.41	
802.11ac VHT20 at MCS0			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
	5745	16.00	
	5785	15.97	
	5825	16.64	
Note: 1 Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of The report, Highlighted Plots are placed in the report.			

Table 16: Occupied Bandwidth – Test Results Continued

Date: April 21, 2021 to June 14th, 2021		Tested By: Osvaldo Casorla	
Test Method: Conducted Measurements		Power Setting: See Section 6 Table 21.	
Antenna Type: Omni		Max Antenna Gain: UNII1 = 5.14 dBi; UNII3 = 5.35 dBi	
Operating Mode: Uncorrelated		Signal State: See Section 3.5.1	
Ambient Temp.: 22 - 23 °C		Relative Humidity: 35 - 38%	
802.11ac VHT40 at MCS0			
Frequency (MHz)	99% Bandwidth	26 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5190	36.15	42.05	NA
5230	36.28	43.21	NA
802.11ac VHT40 at MCS0			
Frequency (MHz)	99% Bandwidth	6 dB Bandwidth	Limit (kHz)
	(MHz)	(MHz)	
5755	36.03	35.52	500
5795	36.03	35.74	500
Note: 1 Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of The report, Highlighted Plots are placed in the report.			

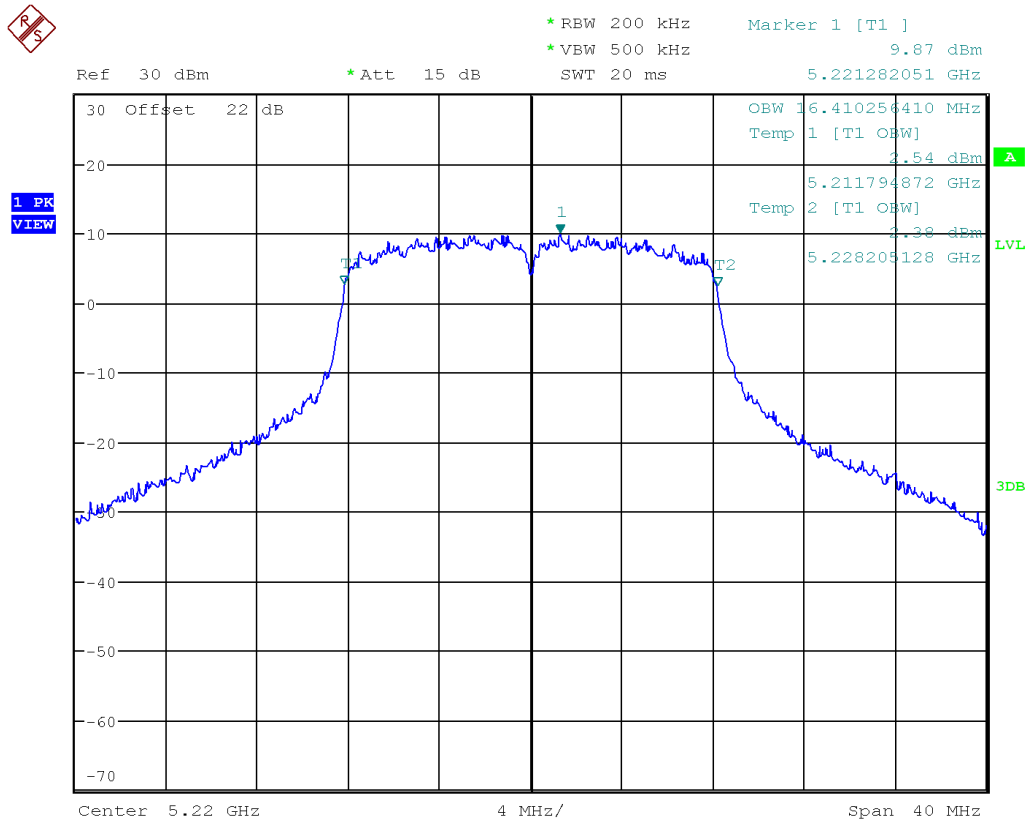


Figure 15: Occupied Bandwidth-5220 MHz-802.11a

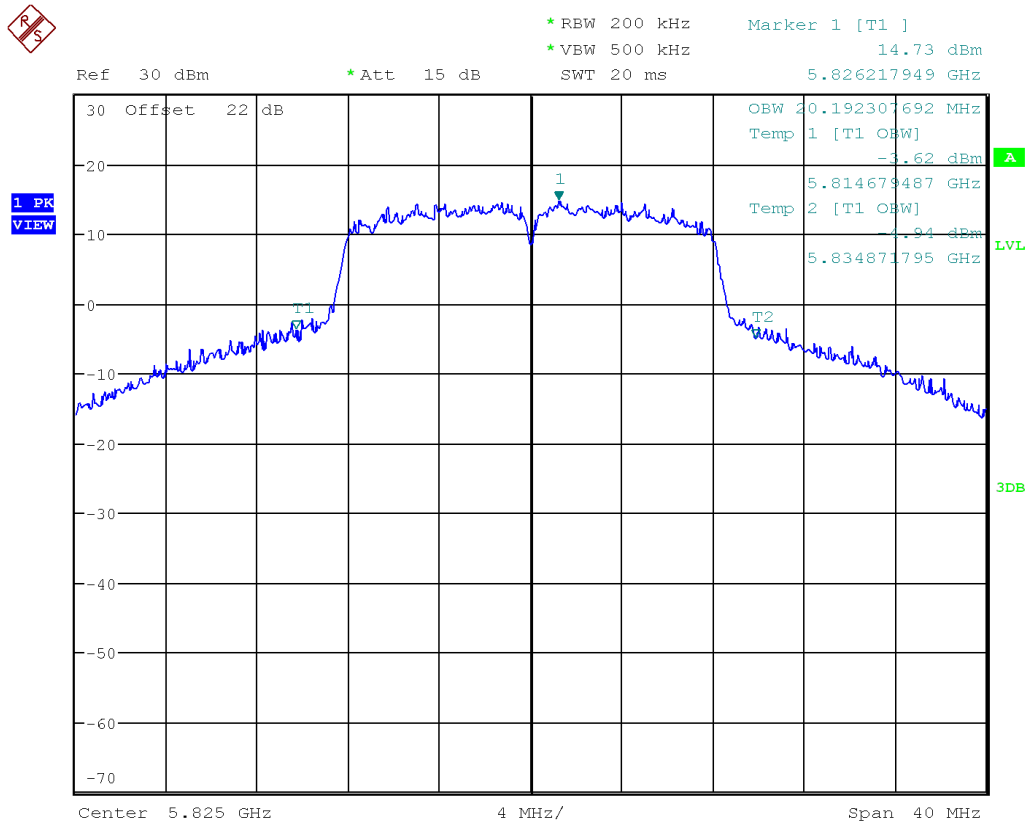


Figure 16: Occupied Bandwidth-5825 MHz-802.11a

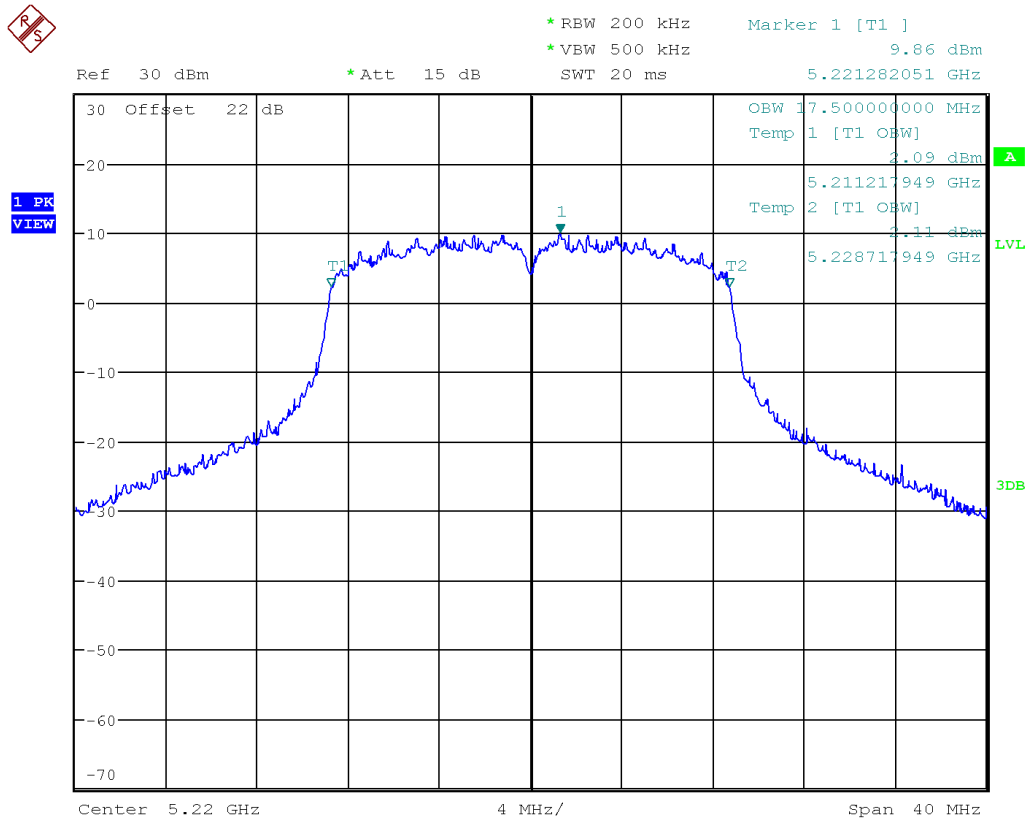


Figure 17: Occupied Bandwidth-5220 MHz-802.11n HT20

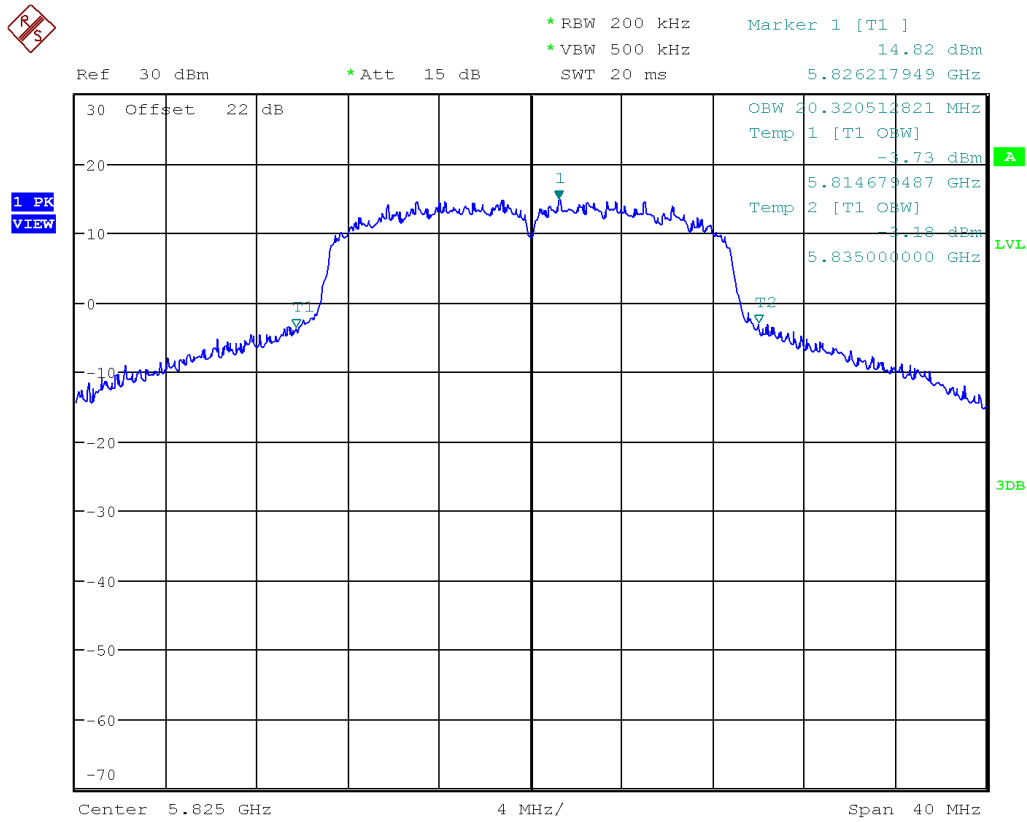


Figure 18: Occupied Bandwidth-5825 MHz-802.11n HT20

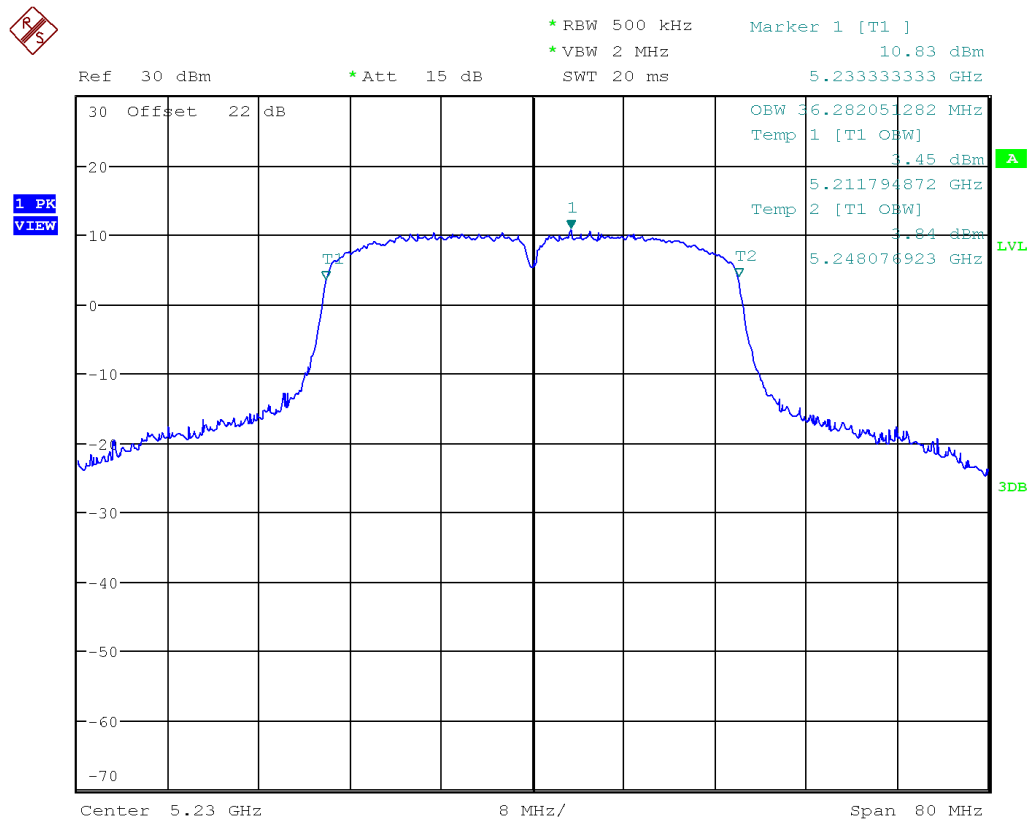


Figure 19: Occupied Bandwidth-5230 MHz-802.11n HT40

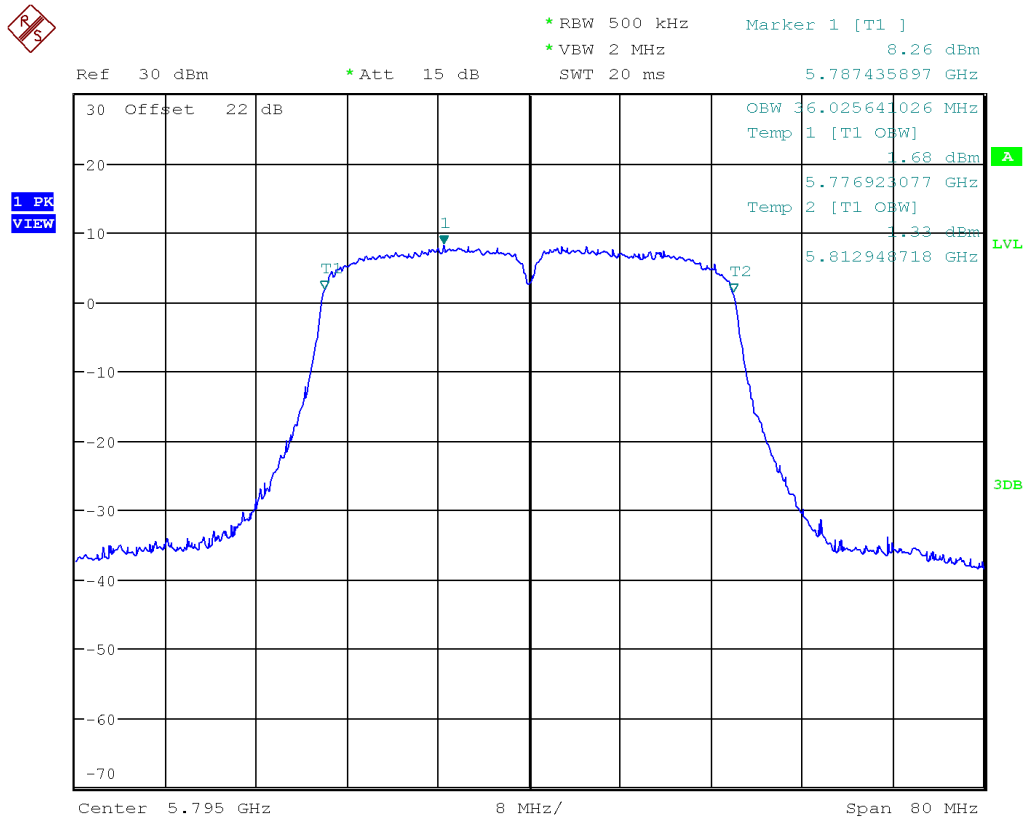


Figure 20: Occupied Bandwidth-5795 MHz-802.11n HT40

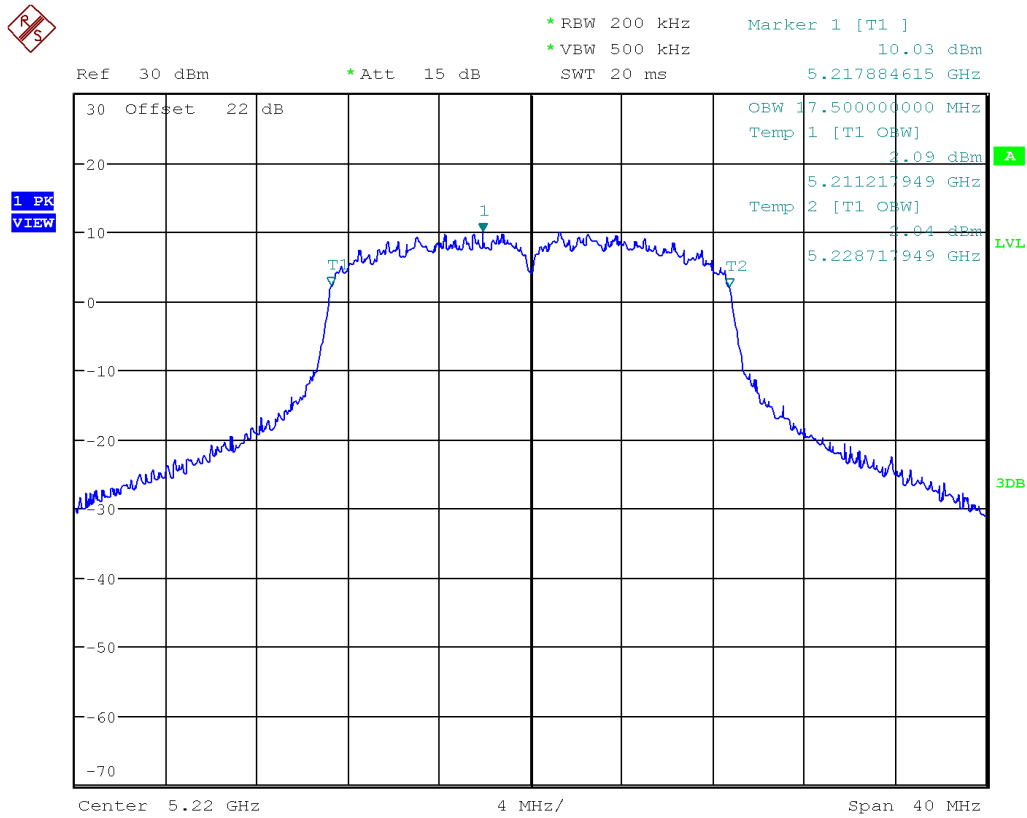


Figure 21: Occupied Bandwidth-5220 MHz-802.11ac VHT20

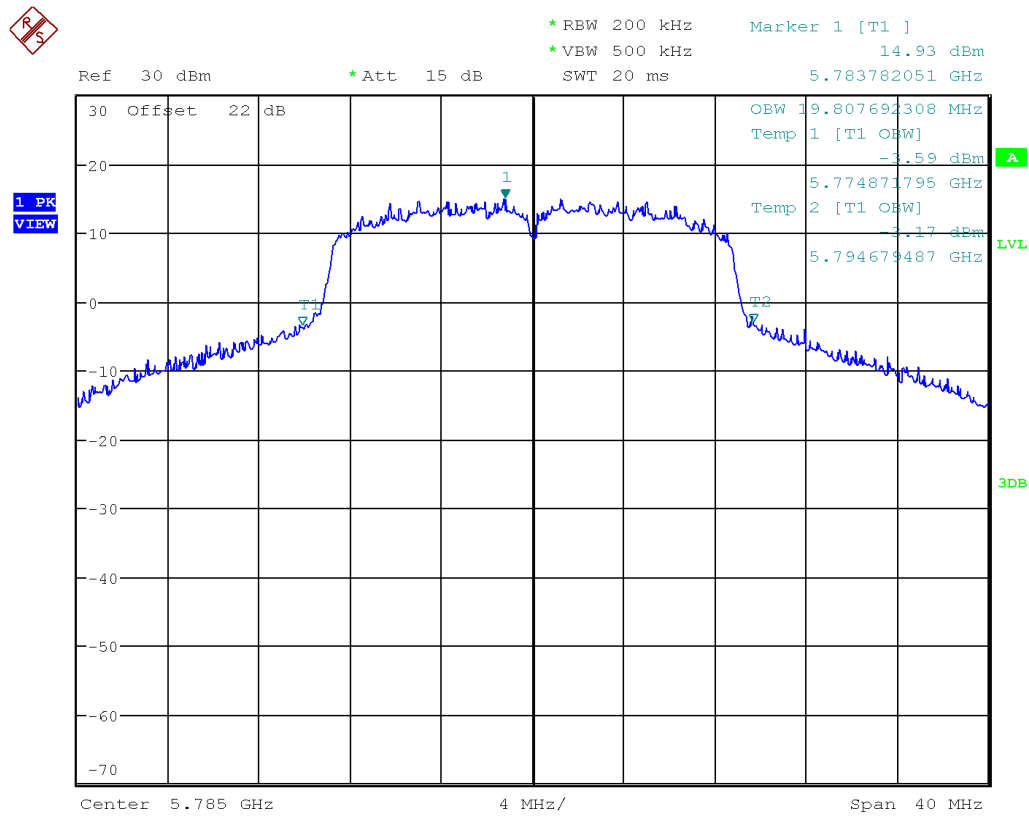


Figure 22: Occupied Bandwidth-5785 MHz-802.11ac VHT20

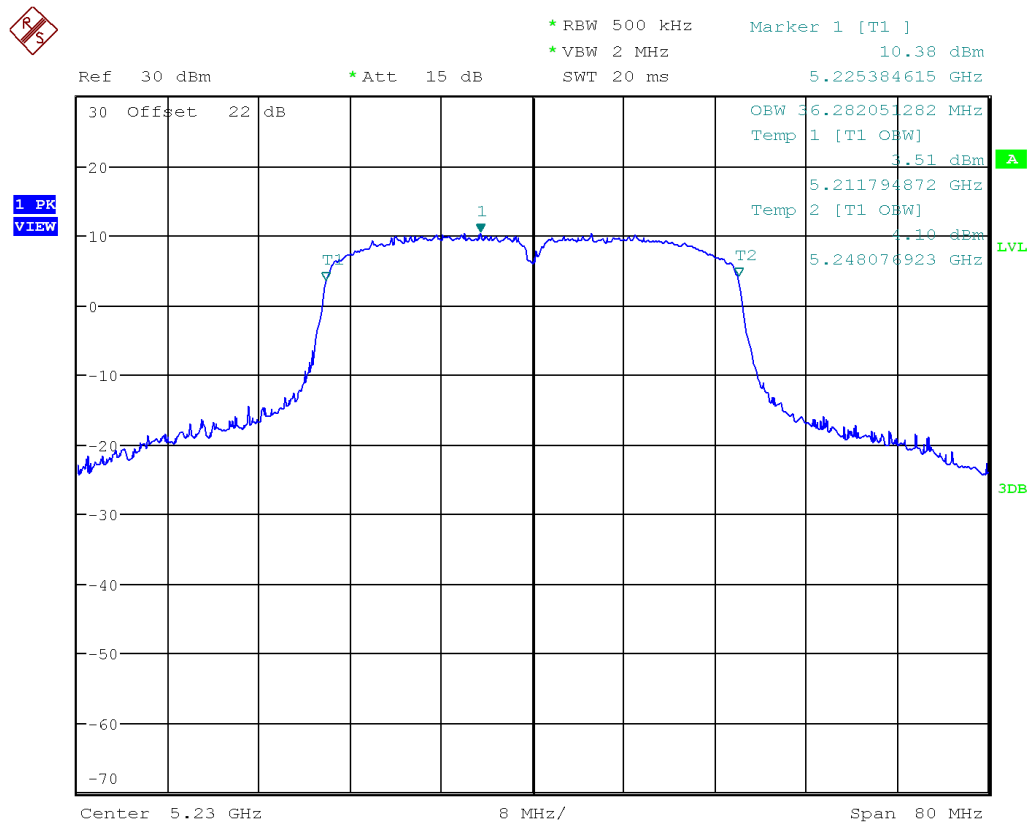


Figure 23: Occupied Bandwidth-5230 MHz-802.11ac VHT40

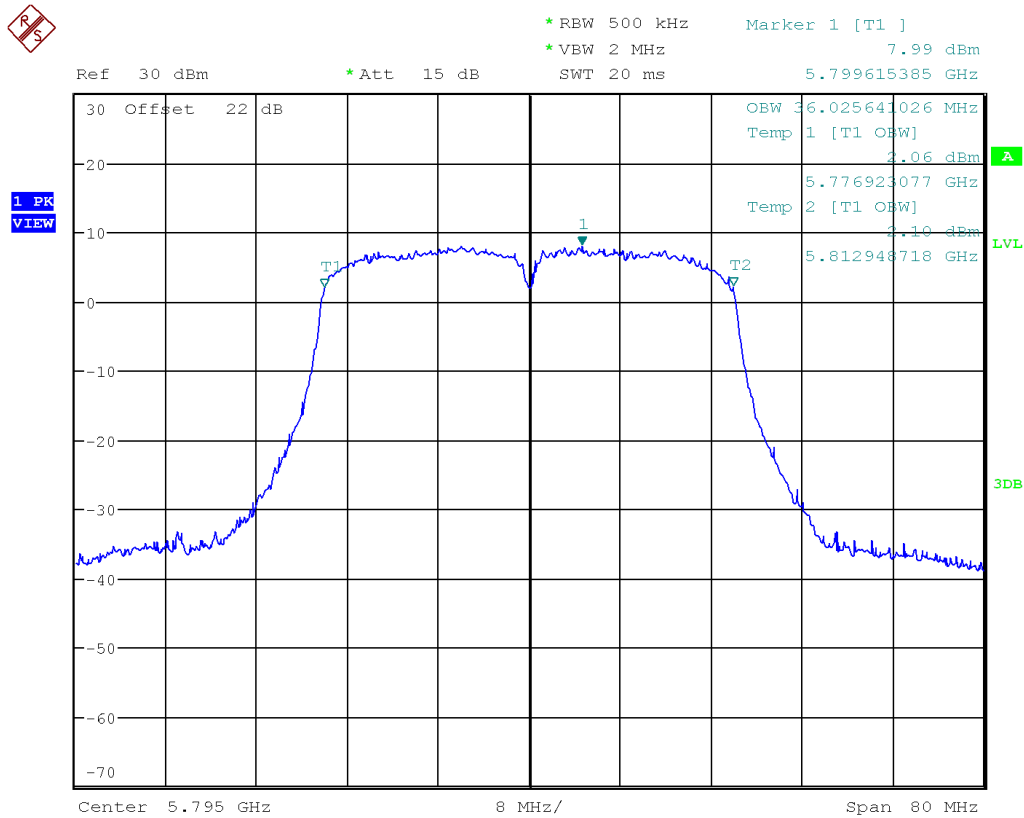


Figure 24: Occupied Bandwidth-5795 MHz-802.11ac VHT40

4.3 Power Spectral Density

According to the CFR47 Part 15.407 (a) and RSS 247 Sect. 6.2, the spectral power density output of the antenna port shall be as followed listed below during any time interval of continuous transmission.

The power spectral density limits per CFR47 Part 15.407 (a):

Band 5150-5250 MHz, 5250-5350 MHz, and 5470-5725 MHz: 11 dBm in any 1 MHz band

Band 5725-5850 MHz: 30 dBm in any 500 kHz band.

The power spectral density limits per RSS-247 Section 6.2:

Band 5150-5250 MHz: 10 dBm in any 1 MHz band, E.I.R.P.

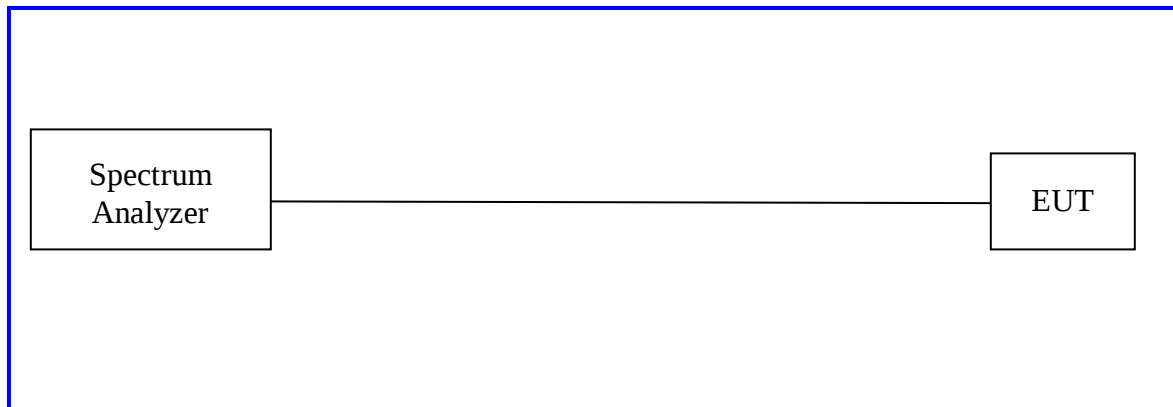
Band 5250-5350 MHz, and 5470-5725 MHz: 11 dBm in any 1 MHz band

Band 5725-5850 MHz: 30 dBm in any 500 kHz band

4.3.1 Test Method

The conducted method was used to measure the channel power output per ANSI C63.10-2013 Section 12.3.2.2. The measurement was performed with modulation per CFR47 Part 15.407 (a) and RSS 247 Sect. 6.2. The pre-evaluation was performed to find the worst modes. The worst findings were conducted on 3 channels in each operating frequency range. The worst sample result indicated below.

Test Setup:



4.3.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

4.3.2.1 FCC Peak Power Spectral Density

Table 17: Peak Power Spectral Density at the Antenna Port – Test Results

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11a at 6 Mbps (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
5170.5	13.58	13.85	- 0.18	16.90	17.00	-0.10
5200.5	13.10	12.97	- 0.18	16.22	17.00	-0.78
5240.5	14.08	12.97	- 0.18	16.75	17.00	-0.25
802.11a at 6 Mbps (10 MHz)						
5170	12.08	11.86	- 0.22	15.20	17.00	-1.80
5200	11.93	11.89	- 0.22	15.14	17.00	-1.86
5240	12.58	11.92	- 0.22	15.50	17.00	-1.50
802.11a at 6 Mbps (20 MHz)						
5180	1.24	1.44	- 0.46	4.81	17.00	-12.19
5220	3.04	2.75	- 0.46	6.37	17.00	-10.63
5240	2.40	2.30	- 0.46	5.82	17.00	-11.18
U-NII-3 (5725-5850MHz)						
802.11a at 6 Mbps (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Limit [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5730.5	7.58	7.36	- 0.22	10.70	28.64	-17.94
5795.5	6.96	7.07	- 0.22	10.25	28.64	-18.39
5825.5	6.60	6.61	- 0.22	9.84	28.64	-18.80
802.11a at 6 Mbps (10 MHz)						
5730	4.20	4.50	- 0.18	7.54	28.64	-21.10
5795	4.54	4.29	- 0.18	7.60	28.64	-21.04
5825	3.77	3.79	- 0.18	6.97	28.64	-21.67
802.11a at 6 Mbps (20 MHz)						
5745	0.77	0.74	- 0.36	4.13	28.64	-24.51
5785	0.73	0.86	- 0.36	4.17	28.64	-24.47
5825	0.54	0.71	- 0.36	4.00	28.64	-24.64
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 18: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11n at HT MCS0 (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
5170.5	10.44	13.37	- 0.46	15.62	17.00	-1.38
5200.5	10.08	12.33	- 0.46	14.82	17.00	-2.18
5240.5	10.43	12.62	- 0.46	15.13	17.00	-1.87
802.11n at HT MCS0 (10 MHz)						
5170	11.41	12.08	- 0.32	15.08	17.00	-1.92
5200	11.25	11.59	- 0.32	14.75	17.00	-2.25
5240	11.73	11.49	- 0.32	14.94	17.00	-2.06
802.11n at HT MCS0 (20 MHz)						
5180	1.58	1.03	- 0.56	4.88	17.00	-12.12
5220	2.54	2.23	- 0.56	5.95	17.00	-11.05
5240	2.65	2.51	- 0.56	6.15	17.00	-10.85
U-NII-3 (5725-5850MHz)						
802.11n at HT MCS0 (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5730.5	7.79	6.68	- 0.27	10.55	28.64	-18.09
5795.5	6.92	6.81	- 0.27	10.14	28.64	-18.50
5825.5	6.54	7.01	- 0.27	10.06	28.64	-18.58
802.11n at HT MCS0 (10 MHz)						
5730	3.97	3.99	- 0.32	7.31	28.64	-21.33
5795	3.38	3.43	- 0.32	6.73	28.64	-21.91
5825	2.51	3.15	- 0.32	6.17	28.64	-22.47
802.11n at HT MCS0 (20 MHz)						
5745	0.59	0.64	- 0.51	4.13	28.64	-24.51
5785	0.57	0.76	- 0.51	4.18	28.64	-24.46
5825	0.41	0.34	- 0.51	3.89	28.64	-24.75
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 19: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11n HT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
5190	-9.18	-9.76	- 0.66	-5.80	17.00	-22.80
5230	-1.72	-1.74	- 0.66	1.94	17.00	-15.06
U-NII-3 (5725-5850MHz)						
802.11n HT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5755	-5.06	-4.23	- 0.51	-1.11	28.64	-29.75
5795	-5.68	-5.04	- 0.51	-1.83	28.64	-30.47
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 20: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021				Tested By: Osvaldo Casorla		
Test Method: Conducted Measurements				Power Setting: See Section 6 Table 21.		
Antenna Type: Omni				Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi		
Operating Mode: Uncorrelated				Signal State: See Section 3.5.1		
Ambient Temp.: 22 - 23 °C				Relative Humidity: 35 - 38%		
U-NII-1 (5150-5250MHz)						
802.11ac VHT20 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
5180	2.39	2.21	- 0.51	5.87	17.00	-11.13
5220	2.39	2.21	- 0.51	6.17	17.00	-10.83
5240	2.59	2.42	- 0.51	6.07	17.00	-10.93
U-NII-3 (5725-5850MHz)						
802.11ac VHT20 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5745	0.57	0.34	- 0.51	3.97	28.64	-24.67
5785	0.54	0.71	- 0.51	4.14	28.64	-24.50
5825	0.24	0.36	- 0.51	3.82	28.64	-24.82
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 21: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11ac VHT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
5190	-8.64	-7.63	- 0.76	-4.44	17.00	-21.44
5230	-1.29	-1.70	- 0.76	2.18	17.00	-14.82
U-NII-3 (5725-5850MHz)						
802.11ac VHT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5755	-4.06	-3.94	- 0.86	-0.48	28.64	-29.12
5795	-5.10	-5.82	- 0.86	-1.93	28.64	-30.57
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

4.3.2.2 IC Peak Power Spectral Density

Table 22: Peak Power Spectral Density at the Antenna Port – Test Results

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11a at 6 Mbps (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	EIRP PSD [dBm/MHz]	EIRP Limit [dBm/MHz]	Margin [dB]
5170.5	0.79	0.83	- 0.18	9.80	10.00	-0.20
5200.5	0.74	1.09	- 0.18	9.91	10.00	-0.09
5240.5	1.10	0.80	- 0.18	9.94	10.00	-0.06
802.11a at 6 Mbps (10 MHz)						
5170	0.85	0.73	- 0.22	9.82	10.00	-0.18
5200	0.97	0.86	- 0.22	9.95	10.00	-0.05
5240	0.65	1.10	- 0.22	9.91	10.00	-0.09
802.11a at 6 Mbps (20 MHz)						
5180	0.54	0.55	- 0.46	9.81	10.00	-0.19
5220	0.40	0.79	- 0.46	9.87	10.00	-0.13
5240	0.62	0.46	- 0.46	9.81	10.00	-0.19
U-NII-3 (5725-5850MHz)						
802.11a at 6 Mbps (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5730.5	7.58	7.36	- 0.22	10.70	28.64	-17.94
5795.5	6.96	7.07	- 0.22	10.25	28.64	-18.39
5825.5	6.60	6.61	- 0.22	9.84	28.64	-18.80
802.11a at 6 Mbps (10 MHz)						
5730	4.20	4.50	- 0.18	7.54	28.64	-21.10
5795	4.54	4.29	- 0.18	7.60	28.64	-21.04
5825	3.77	3.79	- 0.18	6.97	28.64	-21.67
802.11a at 6 Mbps (20 MHz)						
5745	0.77	0.74	- 0.36	4.13	28.64	-24.51
5785	0.73	0.86	- 0.36	4.17	28.64	-24.47
5825	0.54	0.71	- 0.36	4.00	28.64	-24.64
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 23: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11n at HT MCS0 (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	EIRP PSD [dBm/MHz]	EIRP Limit [dBm/MHz]	Margin [dB]
5170.5	0.60	0.67	- 0.46	9.90	10.00	-0.10
5200.5	0.50	0.49	- 0.46	9.76	10.00	-0.24
5240.5	0.67	0.61	- 0.46	9.91	10.00	-0.09
802.11n at HT MCS0 (10 MHz)						
5170	0.48	0.61	- 0.32	9.67	10.00	-0.33
5200	0.48	0.53	- 0.32	9.63	10.00	-0.37
5240	0.92	0.56	- 0.32	9.87	10.00	-0.13
802.11n at HT MCS0 (20 MHz)						
5180	0.73	0.49	- 0.56	9.98	10.00	-0.02
5220	0.46	0.41	- 0.56	9.80	10.00	-0.20
5240	0.53	0.51	- 0.56	9.89	10.00	-0.11
U-NII-3 (5725-5850MHz)						
802.11n at HT MCS0 (5 MHz)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5730.5	7.79	6.68	- 0.27	10.55	28.64	-18.09
5795.5	6.92	6.81	- 0.27	10.14	28.64	-18.50
5825.5	6.54	7.01	- 0.27	10.06	28.64	-18.58
802.11n at HT MCS0 (10 MHz)						
5730	3.97	3.99	- 0.32	7.31	28.64	-21.33
5795	3.38	3.43	- 0.32	6.73	28.64	-21.91
5825	2.51	3.15	- 0.32	6.17	28.64	-22.47
802.11n at HT MCS0 (20 MHz)						
5745	0.59	0.64	- 0.51	4.13	28.64	-24.51
5785	0.57	0.76	- 0.51	4.18	28.64	-24.46
5825	0.41	0.34	- 0.51	3.89	28.64	-24.75
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 24: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11n HT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	EIRP PSD [dBm/MHz]	EIRP Limit [dBm/MHz]	Margin [dB]
5190	-8.55	-9.08	- 0.66	0.66	10.00	-9.34
5230	-0.15	-0.08	- 0.66	9.35	10.00	-0.65
U-NII-3 (5725-5850MHz)						
802.11n HT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5755	-5.06	-4.23	- 0.51	-1.11	28.64	-29.75
5795	-5.68	-5.04	- 0.51	-1.83	28.64	-30.47
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 25: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11ac VHT20 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	EIRP PSD [dBm/MHz]	EIRP Limit [dBm/MHz]	Margin [dB]
5180	0.49	0.59	- 0.51	9.86	10.00	-0.14
5220	0.42	0.59	- 0.51	9.82	10.00	-0.18
5240	0.74	0.41	- 0.51	9.89	10.00	-0.11
U-NII-3 (5725-5850MHz)						
802.11ac VHT20 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5745	0.57	0.34	- 0.51	3.97	28.64	-24.67
5785	0.54	0.71	- 0.51	4.14	28.64	-24.50
5825	0.24	0.36	- 0.51	3.82	28.64	-24.82
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

Table 26: Peak Power Spectral Density at the Antenna Port – Test Results Continued

Date: April 21, 2021 to June 14th, 2021			Tested By: Osvaldo Casorla			
Test Method: Conducted Measurements			Power Setting: See Section 6 Table 21.			
Antenna Type: Omni			Max Antenna Gain: UNII1 = 5.80 dBi; UNII3 = 7.36 dBi			
Operating Mode: Uncorrelated			Signal State: See Section 3.5.1			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
U-NII-1 (5150-5250MHz)						
802.11ac VHT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	EIRP PSD [dBm/MHz]	EIRP Limit [dBm/MHz]	Margin [dB]
5190	-8.30	-8.28	- 0.76	1.28	10.00	-8.72
5230	-0.59	-0.78	- 0.76	8.88	10.00	-1.12
U-NII-3 (5725-5850MHz)						
802.11ac VHT40 at MCS0						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm/500kHz]	Limit [dBm/500kHz]	Margin [dB]
5755	-4.06	-3.94	- 0.86	-0.48	28.64	-29.12
5795	-5.10	-5.82	- 0.86	-1.93	28.64	-30.57
Note: 1. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the Report, portion of plots are placed in the report. 2. The limit is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Limit UNII-3 (5725-5850MHz)= 30 dBm/ 500kHz - (7.36dBi-6dBi) = 28.64 dBm/ 500kHz.						

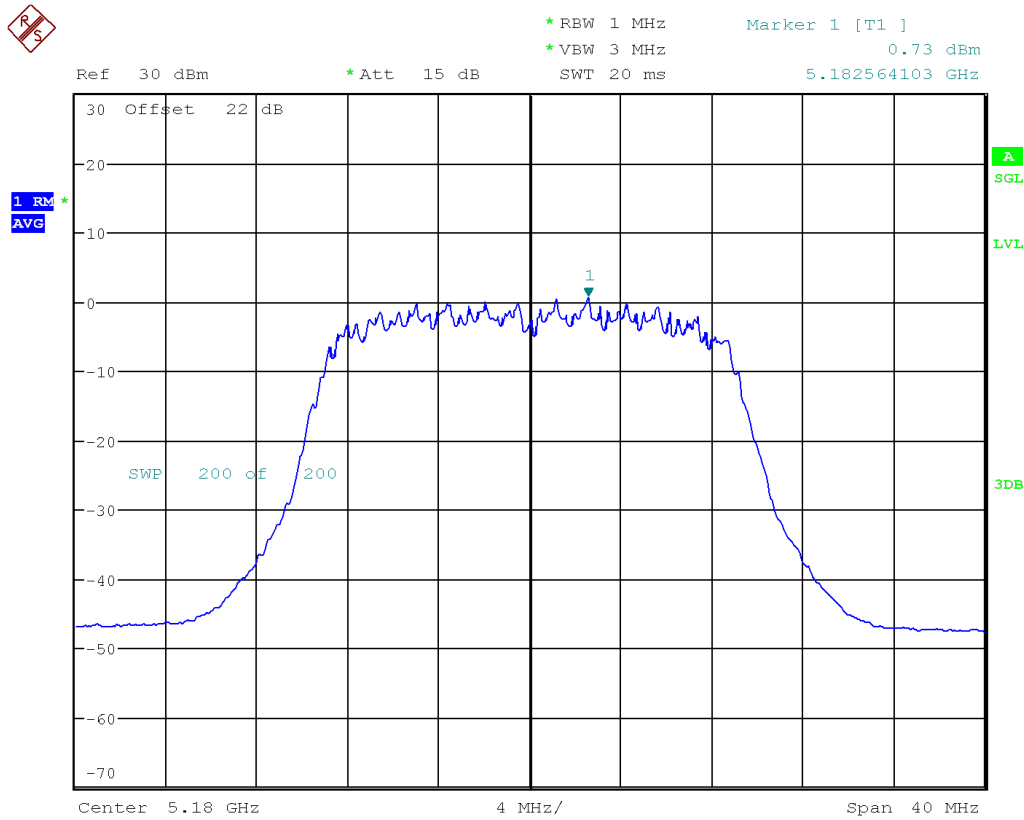


Figure 25: IC Uncorrelated Power Spectral Density-5180 MHz-802.11n-HT MCSO-20MHz -Ch0

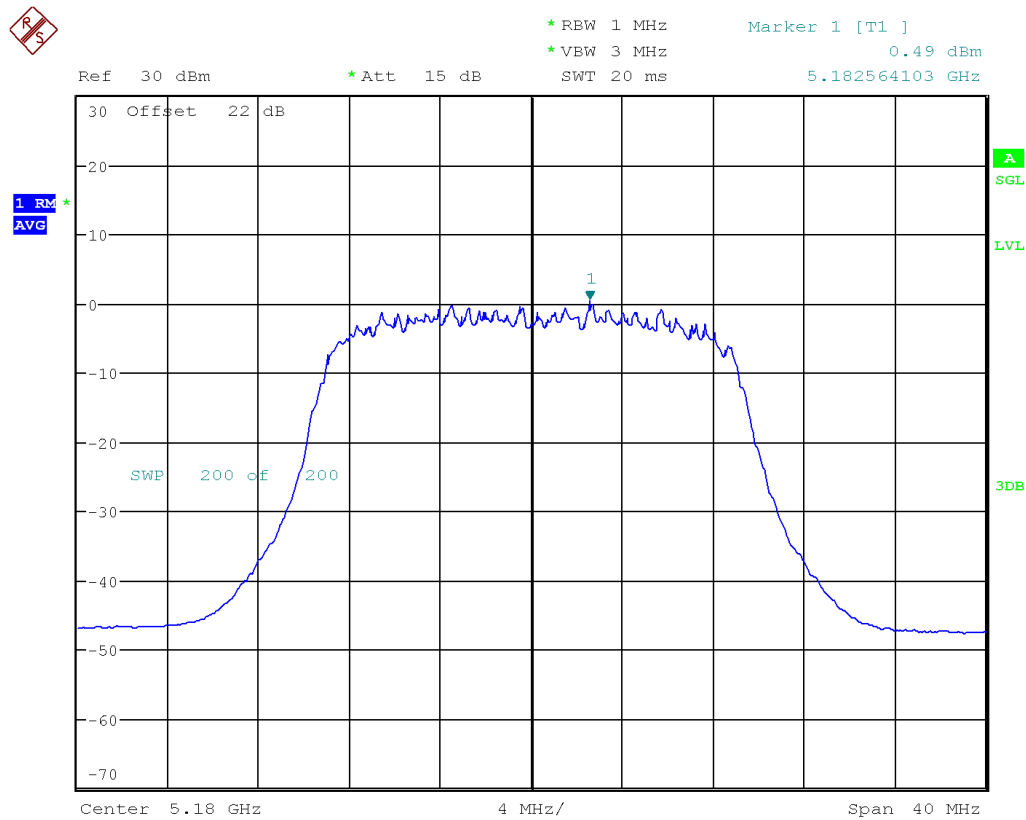


Figure 26: IC Uncorrelated Power Spectral Density-5180 MHz-802.11n-HT MCSO-20MHz-Ch1

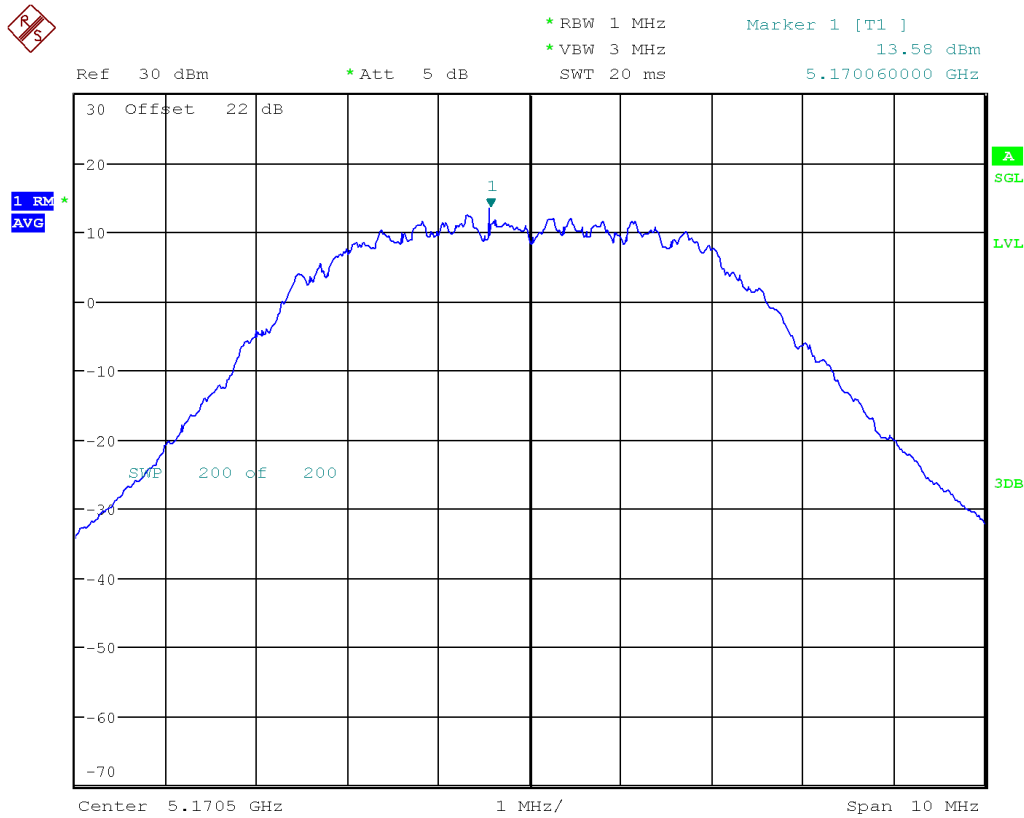


Figure 27: FCC Uncorrelated Power Spectral Density-5170.5 MHz-802.11a-6 Mbps-5MHz -Ch0

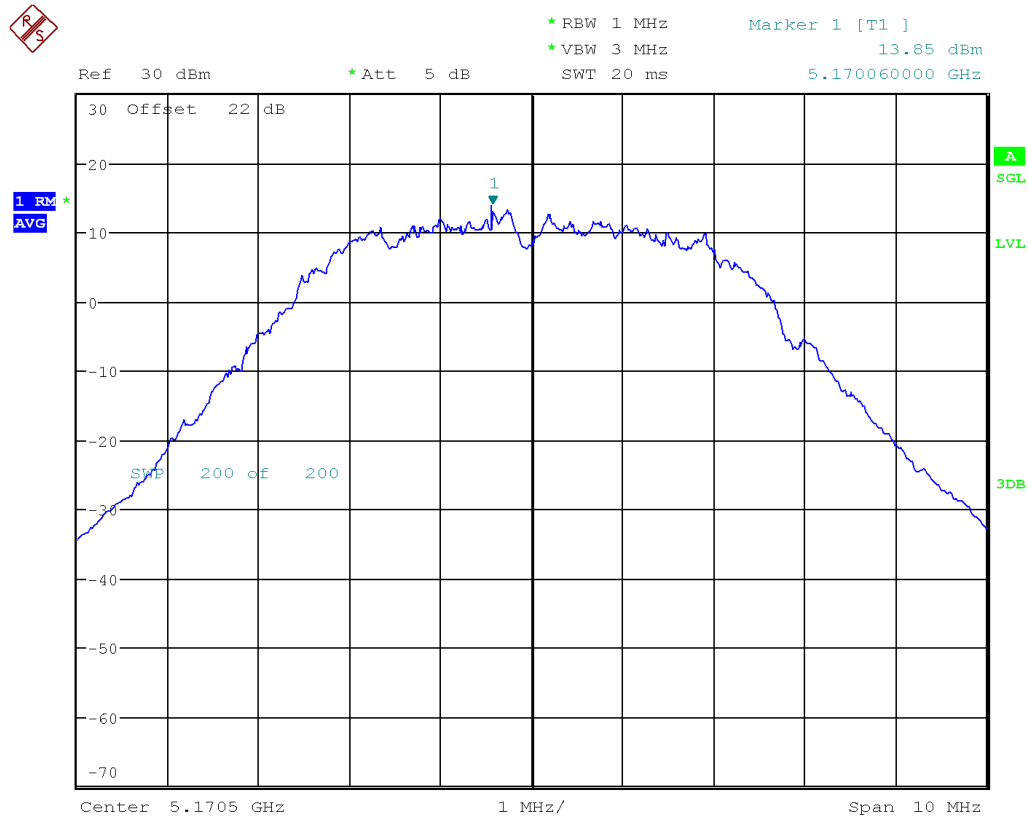
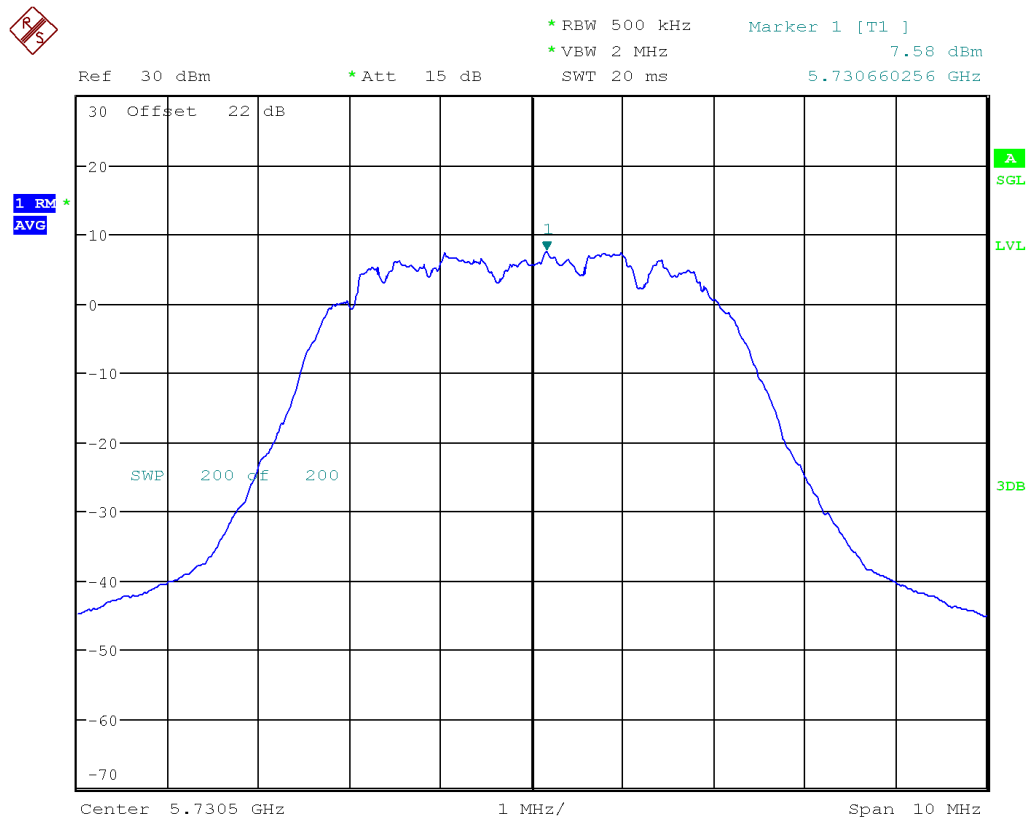
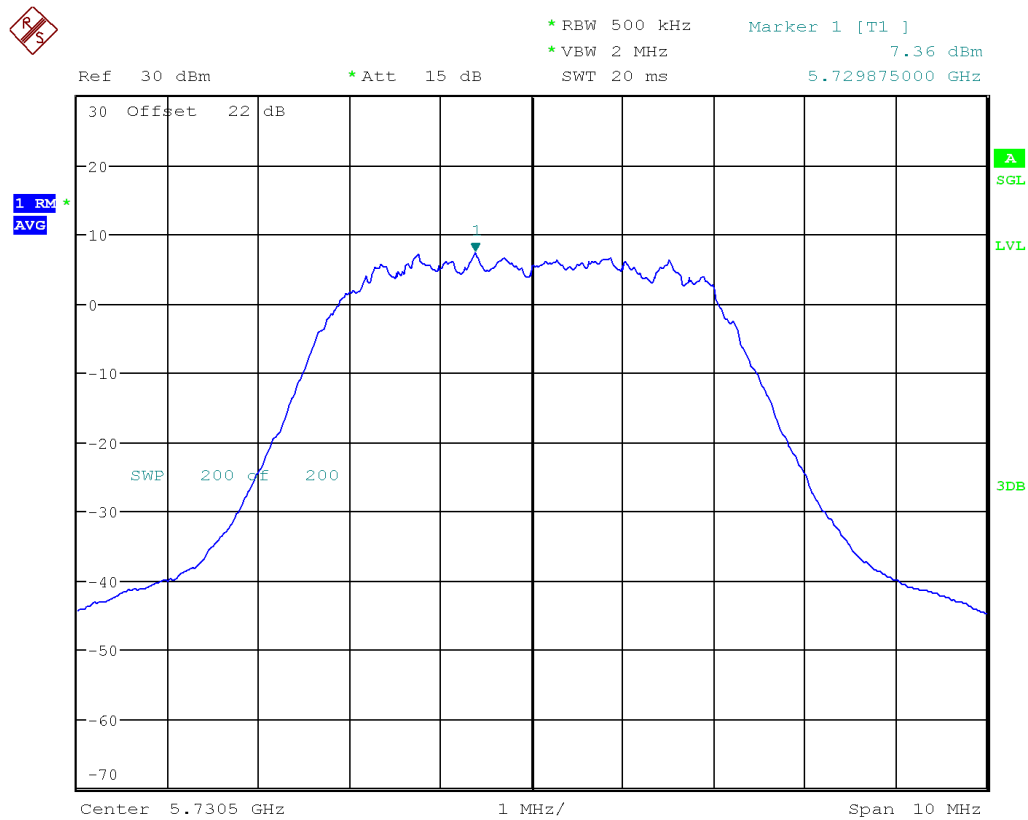


Figure 28: FCC Uncorrelated Power Spectral Density-5170.5 MHz-802.11a-6 Mbps-5MHz-Ch1



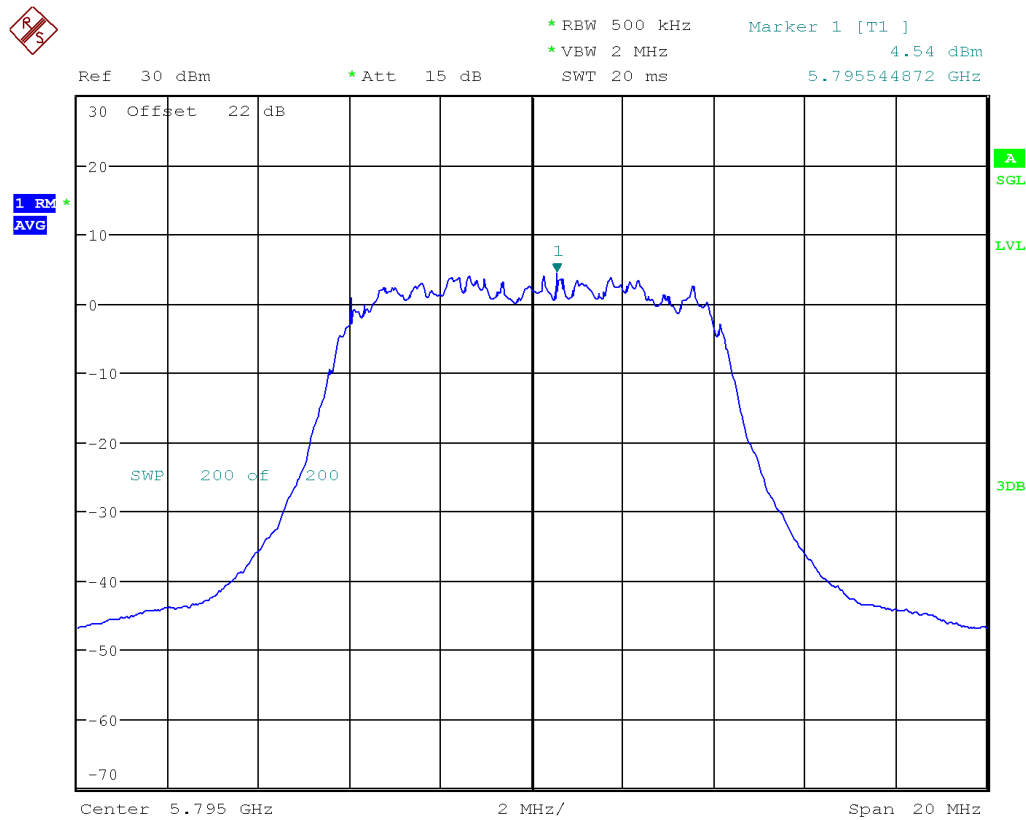
Date: 10.JUN.2021 15:49:18

Figure 29: FCC Uncorrelated Power Spectral Density-5730.5 MHz-802.11a-6 Mbps -5MHz -Ch0



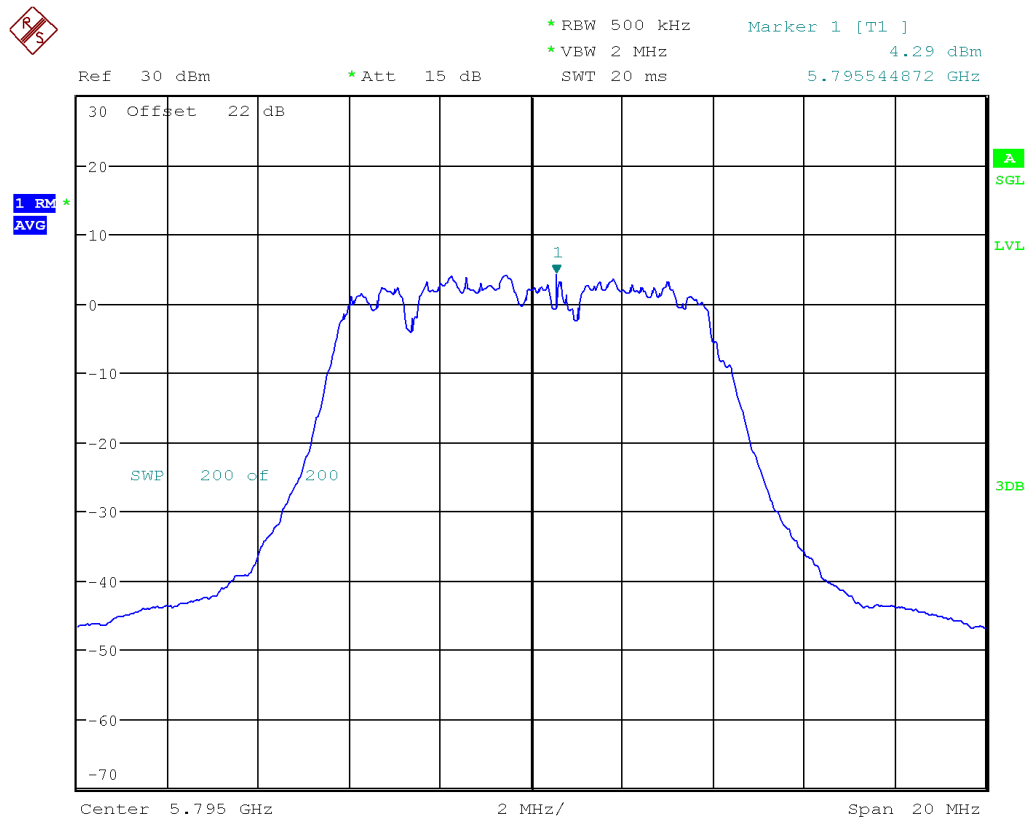
Date: 10.JUN.2021 15:49:55

Figure 30: FCC Uncorrelated Power Spectral Density-5730.5 MHz-802.11a-6 Mbps -5MHz –Ch1



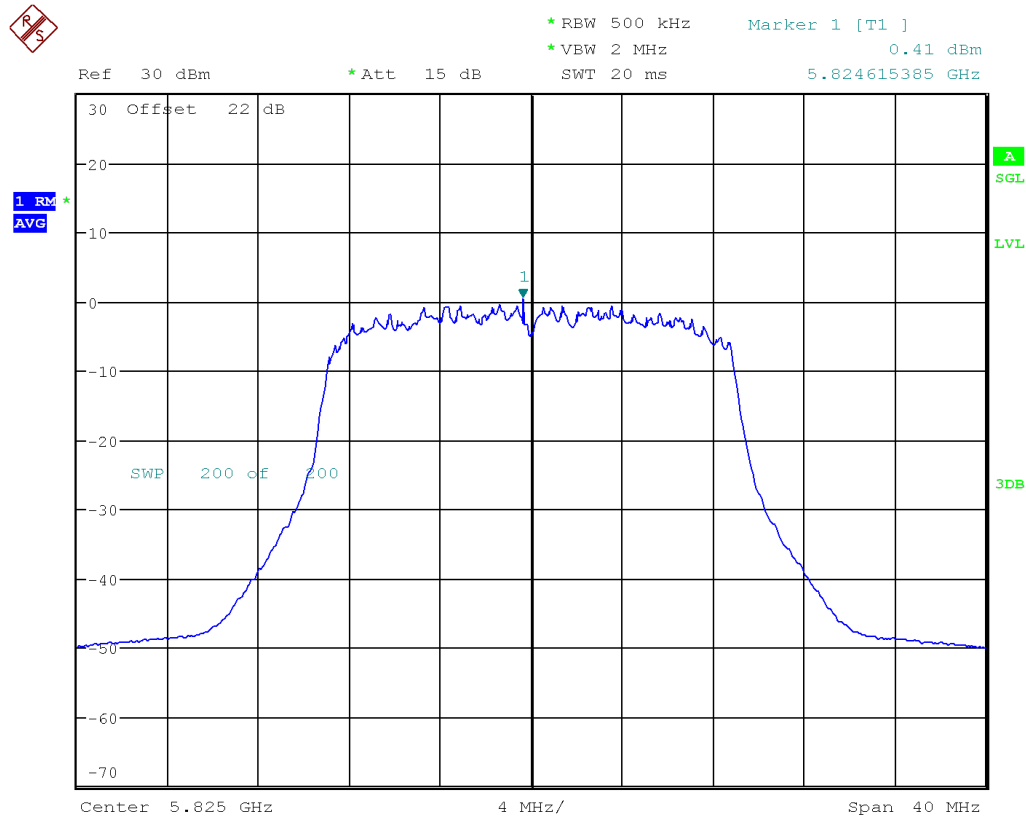
Date: 10.JUN.2021 16:44:19

Figure 31: FCC Uncorrelated Power Spectral Density-5795 MHz-802.11a-6 Mbps -10MHz -Ch0



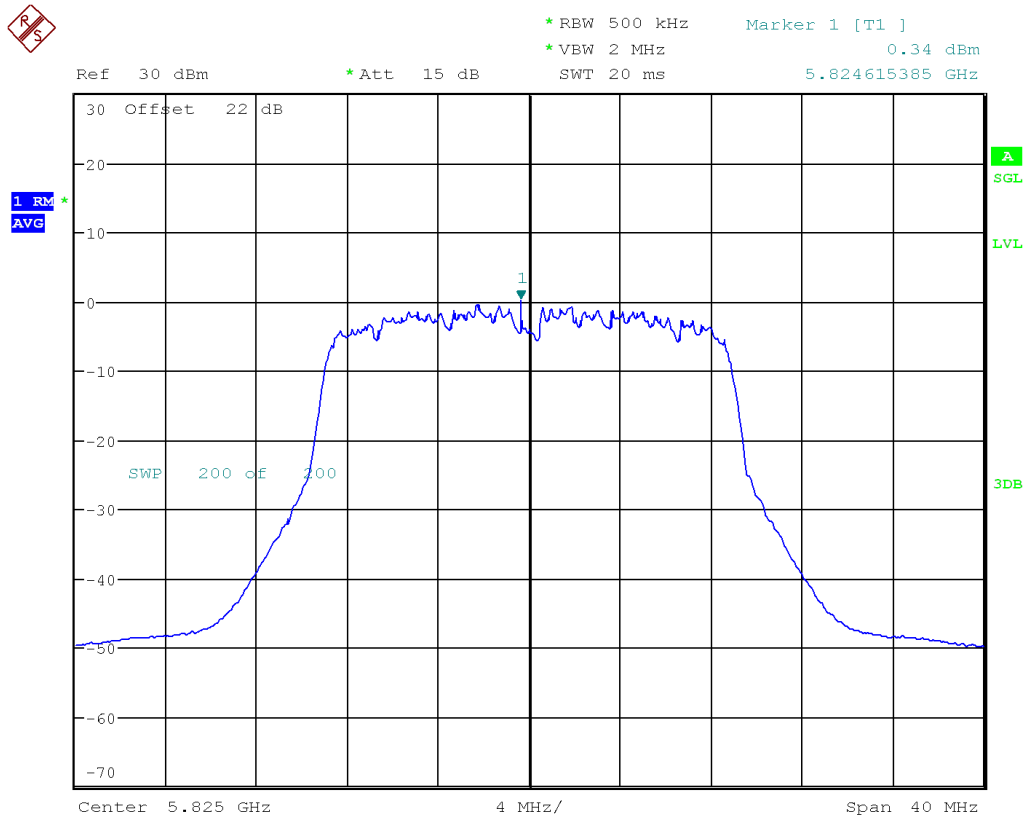
Date: 10.JUN.2021 16:44:53

Figure 32: FCC Uncorrelated Power Spectral Density-5795 MHz-802.11a-6 Mbps -10MHz-Ch1



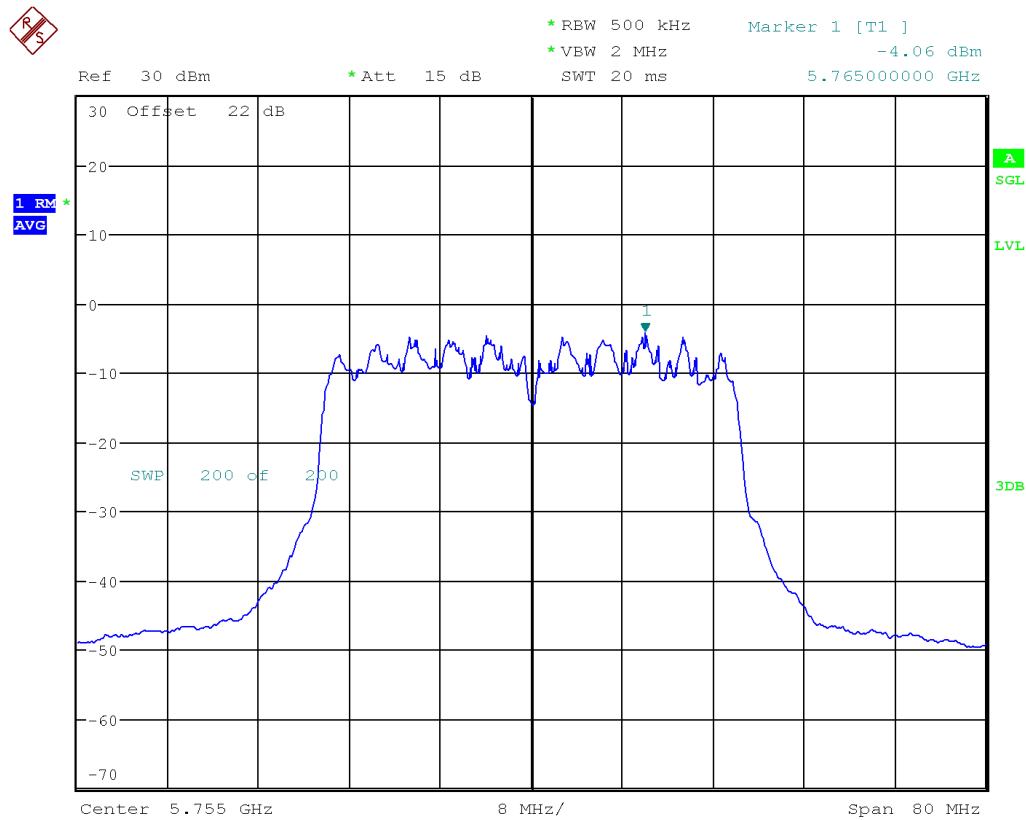
Date: 11.JUN.2021 14:25:28

Figure 33: FCC Uncorrelated Power Spectral Density-5825 MHz-802.11n-HT MCSO-20MHz-Ch0



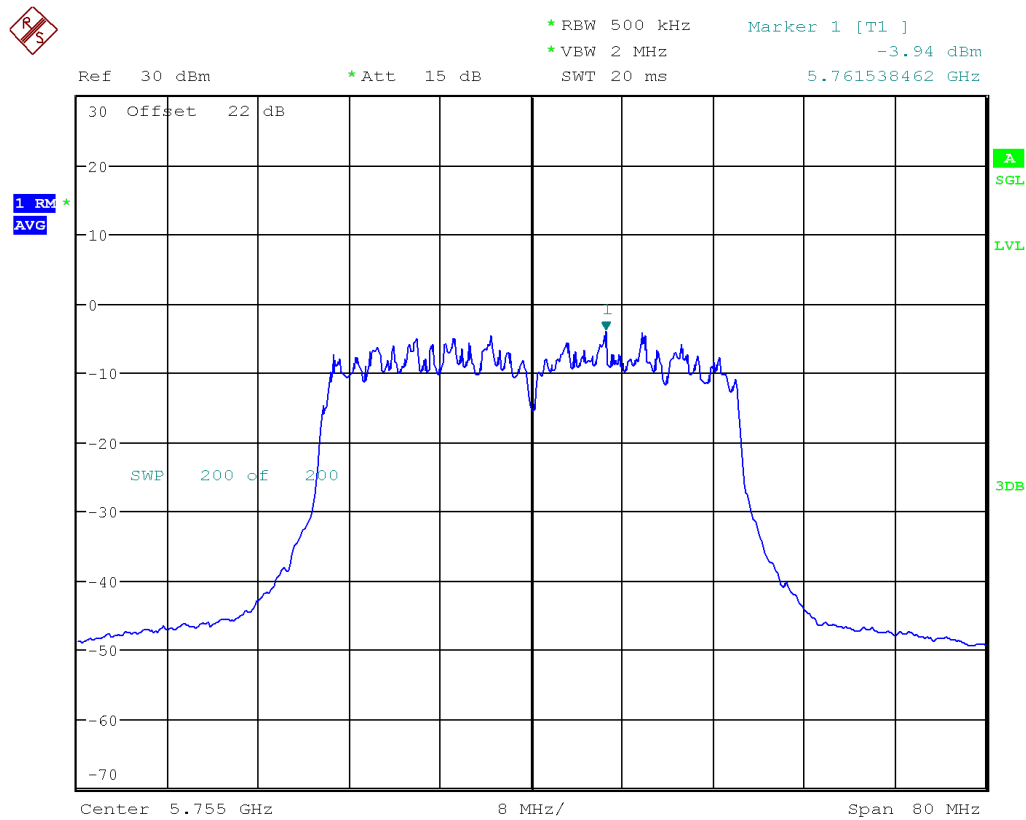
Date: 11.JUN.2021 14:25:59

Figure 34: FCC Uncorrelated Power Spectral Density-5825 MHz-802.11n-HT MCSO-20MHz -Ch1



Date: 11.JUN.2021 16:55:55

Figure 35: FCC Uncorrelated Power Spectral Density-5755 MHz-802.11ac-VHT MCSO-40MHz -Ch0



Date: 11.JUN.2021 17:03:05

Figure 36: FCC Uncorrelated Power Spectral Density-5755 MHz-802.11ac-VHT MCS0 -40MHz-Ch1

5 Test Equipment List

5.1 Equipment List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yy	Next Cal mm/dd/yy
EMI Receiver	Rohde & Schwarz	ESW, 2 Hz-44GHz	5000-2455-0027	2/28/2021	2/28/2022
Preamplifier, 30 MHz – 8 GHz	Rohde & Schwarz	TS-PR8	102353	2/26/2021	2/26/2022
Trilog Antenna	Rohde & Schwarz	VULB 9162	A102606	2/27/2021	2/27/2022
Preamplifier, 1-18GHz	Rohde & Schwarz	SFUNIT-RX	102143	3/23/2021	3/23/2022
Preamplifier, 1-18GHz	Rohde & Schwarz	TS-PR18	101649	3/23/2021	3/23/2022
Horn, 1-18GHz	Rohde & Schwarz	HF907	20-817094-C	7/10/2019	7/10/2021
Preamplifier, 18 – 40GHz	Rohde & Schwarz	TS-PR1840	100067	2/27/2020	2/27/2022
Horn, 18-40GHz	Rohde & Schwarz	180-442-KF	132596-01	4/17/2020	4/17/2022
Spectrum Analyzer	Rohde & Schwarz	FSU26.5	200050	2/24/2021	2/24/2022
1.6 GHz Low Pass Filter	K&L Microwave	8L120-X1600-0/09135-0249	UA691-35	N/A (See Note)	
3.5 GHz High Pass Filter	Hewlett Packard	84300-80038	820004	N/A (See Note)	
2.4 GHz Notch Filter	Micro-Tronics	BRM50702	009	N/A (See Note)	

Note: Equipment is characterized before use.

* Calibration of equipment past due for re-calibration will be performed expeditiously. If any equipment is found to be out of tolerance at that time, affected customers will be notified accordingly.

VBU = Verify Before Use.

6 EMC Test Plan

6.1 Introduction

This section provides a description of the Equipment Under Test (EUT), configurations, operating conditions, and performance acceptance criteria. It is an overview of information provided by the manufacturer (information supplied by the customer and can affect the validity of results) so that the test laboratory may perform the requested testing.

6.2 Customer

Table 27: Customer Information

Company Name	Skydio, Inc.
Address	114 Hazel Avenue
City, State, Zip	Redwood City CA 94061
Country	U.S.A.
Phone	925-766-1258

Table 28: Technical Contact Information

Name	Skydio, Inc.
E-mail	joe@skydio.com
Phone	925-766-1258

6.3 Equipment Under Test (EUT)

Table 29: EUT Specifications*

EUT Specifications	
DC Input	12 VDC, 3 Amps
Environment (Indoor / Outdoor)	Indoor / Outdoor
Operating Temperature Range:	0 - 40°C
Multiple Feeds:	☒ Yes and how many 2 ☐ No
Product Marketing Name (PMN)	SkydioLink 5GHz Radio
Model No.	SC78
Hardware Version Identification Number (HVIN)	720-205639-000-B
Firmware Version Identification Number (FVIN)	Version 2.02_revb_bdf.bin
RF Test Software Version	Version 4.0.00147.0
Operating Modes	802.11a (5MHz, 10 MHz, 20 MHz Bandwidth) 802.11n HT20 (5MHz, 10 MHz, 20 MHz Bandwidth) 802.11n HT40 (40 MHz Bandwidth) 802.11ac VHT20 (20 MHz Bandwidth) 802.11ac VHT40 (40 MHz Bandwidth)
Transmitter Frequency Band	5.15-5.25 GHz, U-NII-1 Band 5.725-5.85GHz, U-NII-3 Band
Antenna Type	Omni
Antenna Gain (dBi)	5150-5250 MHz: 5.80
	5725-5850 MHz: 7.36
Modulation Type	☐ BLE ☒ DSSS ☒ OFDM ☐ Other describe:
Directional Gain Type	☐ Correlated ☒ Uncorrelated ☐ Other describe:
Type of Equipment	☐ Table Top ☐ Wall-mount ☐ Floor standing cabinet ☒ Other: Controller
*All EUT specifications are provided by the manufacturer or the TUV direct customer. Note: Information supplied by the customer and can affect the validity of results.	

Table 30: EUT Channel Power Specifications

Freq. (MHz)	802.11a 5	802.11a 10	802.11a 20	802.11n HT5	802.11n HT10	802.11n HT20	802.11n HT40	802.11ac VHT20	802.11ac VHT40
FCC Power Setting									
5170.5	20			20					
5200.5	20			20					
5240.5	20			20					
5170		20			20				
5200		20			20				
5240		20			20				
5180			18.7			19.9		20	
5220			20			20		20	
5240			20			20		20	
5190							12.4		13.9
5230							20		20
5730.5	23			23					
5795.5	23			23					
5825.5	23			23					
5730		23			23				
5795		23			23				
5825		23			23				
5745			23			23		23	
5785			23			23		23	
5825			23			23		23	
5755							23		23
5795							23		23

Freq. (MHz)	802.11a 5	802.11a 10	802.11a 20	802.11n HT5	802.11n HT10	802.11n HT20	802.11n HT40	802.11ac VHT20	802.11ac VHT40
IC Power Setting									
5170.5	9			9					
5200.5	9			9					
5240.5	9			9					
5170		12.75			12.75				
5200		12.75			12.75				
5240		12.75			12.75				
5180			16			17		17	
5220			16			17		17	
5240			16			17		17	
5190							12.4		13.9
5230							20		20
5730.5	23			23					
5795.5	23			23					
5825.5	23			23					
5730		23			23				
5795		23			23				
5825		23			23				
5745			23			23		23	
5785			23			23		23	
5825			23			23		23	
5755							23		23
5795							23		23

Table 31: Interface Specifications

Interface Type	Cabled with what type of cable?	Is the cable shielded?	Maximum potential length of the cable?	Metallic (M), Coax (C), Fiber (F), or Not Applicable?
USB-C	Terminated to laptop	☒ No	☒ Metric:<1m	☒ N/A

Table 32: Supported Equipment

Equipment	Manufacturer	Model	Serial	Used for
Laptop	Dell	Precision 5510	-	Set test mode

Table 33: Description of Sample used for Testing

Device	Serial Number	Configuration	Used For
SC78	moltres026	Radiated Sample	Radiated Emissions
SC78	moltres026	Conducted Sample	Output Power, Peak Power Spectral Density
Note: None			

Table 34: Description of Test Configuration used for Radiated Measurement.

Device	Antenna	Mode	Setup Description
SC78	Internal	Transmit	positioned tabletop.
Note: This is the final setup configuration used for testing on its normal positioned.			

6.4 Test Specifications

Table 35: Test Specifications

Emissions	
Regulation Rules / Standards	Requirement
CFR 47 Part 15.247: 2021	All
RSS 247 Issue 2, 2017	All

END OF REPORT