

Emissions Test Report

EUT Name: eero 6 and eero 6 Extender

Model No.: N010001 and Q010001

CFR 47 Part 15.407 2020 and RSS 247: 2017

Prepared for:

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Report/Issue Date: July 24, 2020
Job # 0234155861
Report Number: 32062991.001

Statement of Compliance

Manufacturer: eero LLC
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Name of Equipment: eero 6 and eero 6 Extender
Model No. N010001 and Q010001

Type of Equipment: Intentional Radiator

Application of Regulations: CFR 47 Part 15.407 2020 and RSS 247: 2017

Test Dates: June 12, 2020 to July 24, 2020

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.



Kerwinn Corpuz

James Borrott

Test Engineer

Date July 24, 2020

Reviewer Signature

Date August 31, 2020



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 2020 and RSS 247: 2017 based on the results of testing performed on June 12, 2020 to July 24, 2020 on the eero 6 and eero 6 Extender Model N010001 and Q010001 manufactured by eero LLC. 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 5180 MHz – 5240 MHz and 5745 MHz to 5825 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 Section 3.5	N/A
Spurious Emission in Transmit Mode	CFR47 15.209, CFR47 15.407 (b) RSS-GEN Sect.8.9, RSS 247 Sect. 6.2.1.2	Class B	-0.21 dB Margin	Complied
Restricted Bands of Operation	CFR47 15.205, RSS GEN Sect.8.10	Class B		Complied
AC Power Conducted Emission	CFR47 15.207, RSS-GEN Sect.8.8	Class B	-10.16 dB Margin	Complied
Occupied Bandwidth	CFR47 15.407 (a) & (e), RSS GEN Sect.6.7, RSS-247 Sect.6.2.4.1	DTS \geq 500 kHz	99% BW: 16.39 – 75.37 MHz 26dB BW: 20.57 – 82.37 MHz DTS BW: 15.53 – 75.06 MHz	Complied
Maximum Output Power	CFR47 15.407 (a) RSS 247 Sect. 6.2.4.1 [see Note 1]	UNII1: 1W UNII3: 1W	UNII1: 25.18dBm/ 329.61mW UNII3: 24.56dBm/ 285.76mW	Complied
Maximum Output Power	RSS 247 Sect. 6.2.1.1 & 6.2.4.1 [see Note 2]	UNII1: 200mW	UNII1: 19.36dBm/ 86.30mW	Complied
Power Spectral Density	CFR47 15.407 (a) RSS 247 Sect. 6.2.4.1	UNII1: 17dBm/MHz UNII3: 30dBm/0.5MHz	UNII1: 14.63 dBm/ MHz UNII3: 9.69 dBm/ 500kHz	Complied
	RSS 247 Sect.6.2.1.1	< 10 dBm/MHz (e.i.r.p)	UNII1: 6.18 dBm/ MHz	Complied
Conducted Emission – Antenna Port	CFR47 15.407 (b)(1) (2)(3) RSS 247 Sect.6.2.1.2	< -27 dBm/MHz	-9.03 dB Margin	Complied
	CFR47 15.407 (b)(4) RSS 247 Sect.6.2.4	Spectrum Mask	> -16 dB Margin	Complied
Frequency Stability	CFR47 15.407 (g), RSS GEN Sect. 6.11	\pm 20 ppm	Manufacturer Declaration	Complied
Voltage Variation	CFR47 15.31(e) RSS-Gen Sect. 6.11	\pm 20 ppm	Manufacturer Declaration	Complied

Note: 1. Measurements are conducted 2x2 total power for correlated.
 2. UNII-1 band measurements are conducted max power for non-correlated.
 * = max PSD for non-correlated.

1.4 Special Accessories

No special accessories were necessary in order to achieve compliance.

1.5 Equipment Modifications

None

2 Laboratory Information

2.1 Accreditations & Endorsements

2.1.1 US Federal Communications Commission



TUV Rheinland of North America at 1279 Quarry Ln, Pleasanton, CA 94566 is 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 (US1131). The laboratory scope of accreditation includes: Title 47 CFR Parts 15, 18, and 90. The accreditation is updated every 3 years.

2.1.2 NIST / A2LA



TUV Rheinland of North America is accredited by the National Voluntary Laboratory Accreditation Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Guide 17025:2017 and ISO 9002 (Lab Code Testing Cert #3331.02). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Canada



TUV Rheinland of North America at the 1279 Quarry Ln, Pleasanton, CA 94566 address is accredited by Industry Canada for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by Industry Canada (File Number 2932M). This reference number is the indication to the Industry Canada Certification Officers that the site meets the requirements of RSS 212, Issue 1 (Provisional). The accreditation is updated every 3 years.

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 at 1279 Quarry Ln, Pleasanton, CA 94566 has been assessed and approved in accordance with the Regulations for Voluntary Control Measures.

VCCI Registration No. for Pleasanton: A-0326

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

All of the test facilities are located at 1279 Quarry Lane, Pleasanton, California 94566, USA.

2.2.1 Emission Test Facility

The Semi-Anechoic chamber and AC Line Conducted measurement facility used to collect the radiated and conducted data has been constructed in accordance with ANSI C63.7:1992. The site has been measured in accordance with and verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2014, at a test distance of 3 and 5 meters. The site is listed with the FCC and accredited by A2LA (Lab Code Testing Cert #3331.02). The 3/5-meter semi-anechoic chamber used to collect the radiated data has been verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2014, at a test distance of 3 meter and 5 meters. A report detailing this site can be obtained from TUV Rheinland of North America.

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 7.3m x 4.3m x 4.1m anechoic chamber.

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

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

2.3 Measurement Uncertainty

Two types of measurement uncertainty are expressed in this report, per *ISO Guide To The Expression Of Uncertainty In Measurement*, 1st Edition, 1995.

The Combined Standard Uncertainty is the standard uncertainty of the result of a measurement when that result is obtained from the values of a number of other quantities; it is equal to the positive square root of the sum of the variances or co-variances of these other quantities, weighted according to how the measurement result varies with changes in these quantities. The term *standard uncertainty* is the result of a measurement expressed as a standard deviation.

2.3.1 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 (dBuV/m)

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

2.3.2 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.

2.4 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 N010001 and Q010001, eero 6 and eero 6 Extender, is a 2x2 home Wi-Fi router. It is intended to operate as a dual band (2.4 GHz and 5 GHz) wireless router over 20 MHz, 40 MHz and 80 MHz channels. The router will be in compliance with regulatory standards of regions it will be operating in.

Model differences:

N010001, eero 6 Gateway, contains two RJ45 ports and USB-C AC/DC adapter port.

Q010001, eero 6 Extender, USB-C AC/DC adapter port; No RJ45 ports. BLE/802.15.4 RF circuitry has been removed.

Both have the same WLAN radio hardware.

Model N010001 is considered worst case and used for testing.

3.2 Equipment Configuration

A description of the equipment configuration is given in the Test Plan Section. 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 Test Plan Section. 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 N010001 has 3 internal antennas. BLE and ZigBee uses 1 Stamped Metal, Planar Inverted F, Antenna and 2 Flex PCB for WiFi in the band 2.4 GHz and 5 GHz.

The Q010001 has 2 internal antennas, 2 Flex PCB for WiFi in the band 2.4 GHz and 5 GHz.

Max Antenna Gain		Antenna Type		
	dBi			
BLE/ZigBee (2.4-2483.5 GHz)	3.46	Stamped metal, Planar Inverted F		
Wi-Fi			<u>Antenna 1</u> (dBi)	<u>Antenna 2</u> (dBi)
2.4-2483.5 GHz	3.72	Flexible Printed Circuit Board (FPCB)	3.72	3.25
U-NII-1 (5.15-5.25 GHz)	3.42	Flexible Printed Circuit Board (FPCB)	2.52	3.42
U-NII-2A (5.25-5.35 GHz)	2.37		1.69	2.37
U-NII-2C (5.47-5.725 GHz)	3.57		2.72	3.57
U-NII-3 (5.725-5.85 GHz)	4.17		4.04	4.17

3.5 Duty Cycle

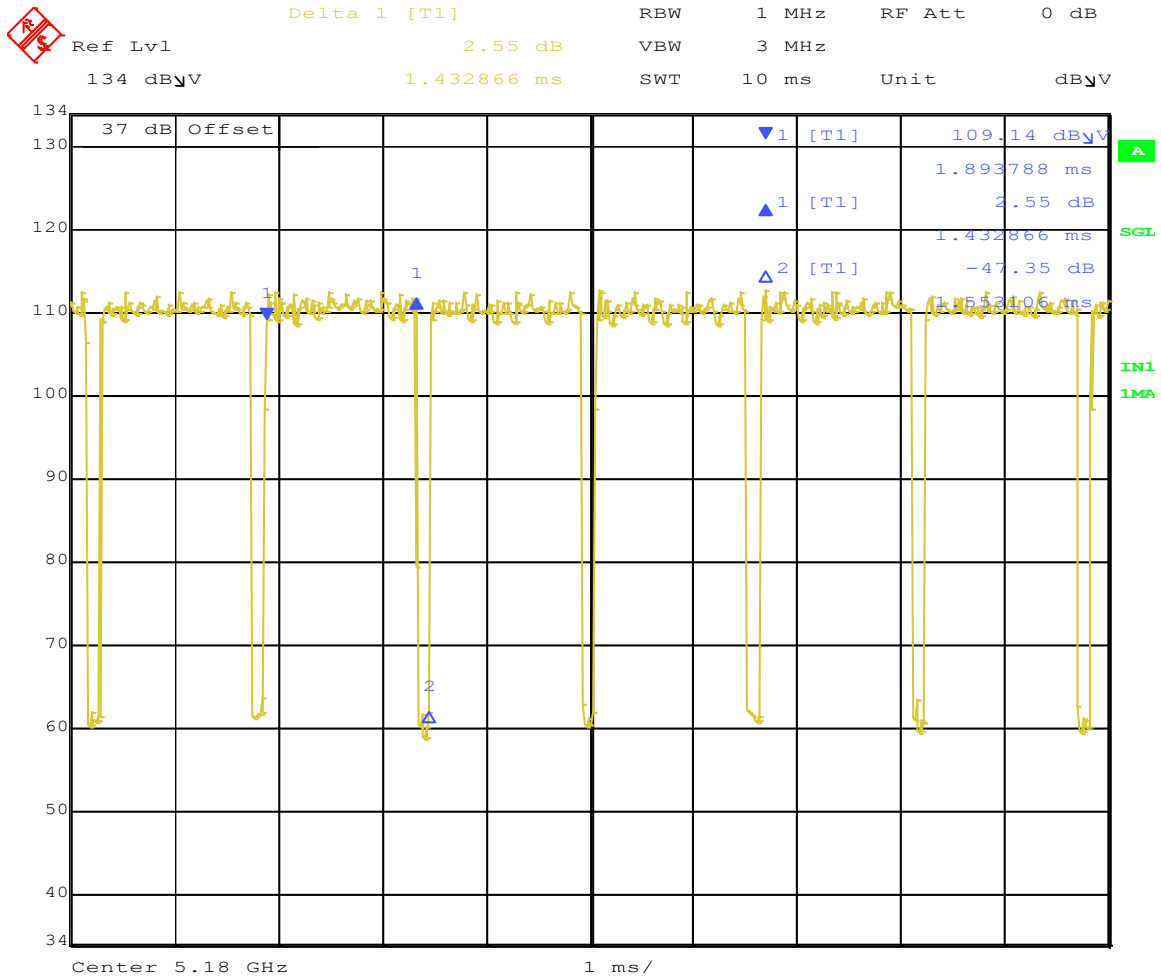
The N010001 and Q010001 were measured for the duty cycle.

Calculation of transmit duty cycle. Duty cycle (%) = (ON time / Period) * 100%

3.5.1 Results

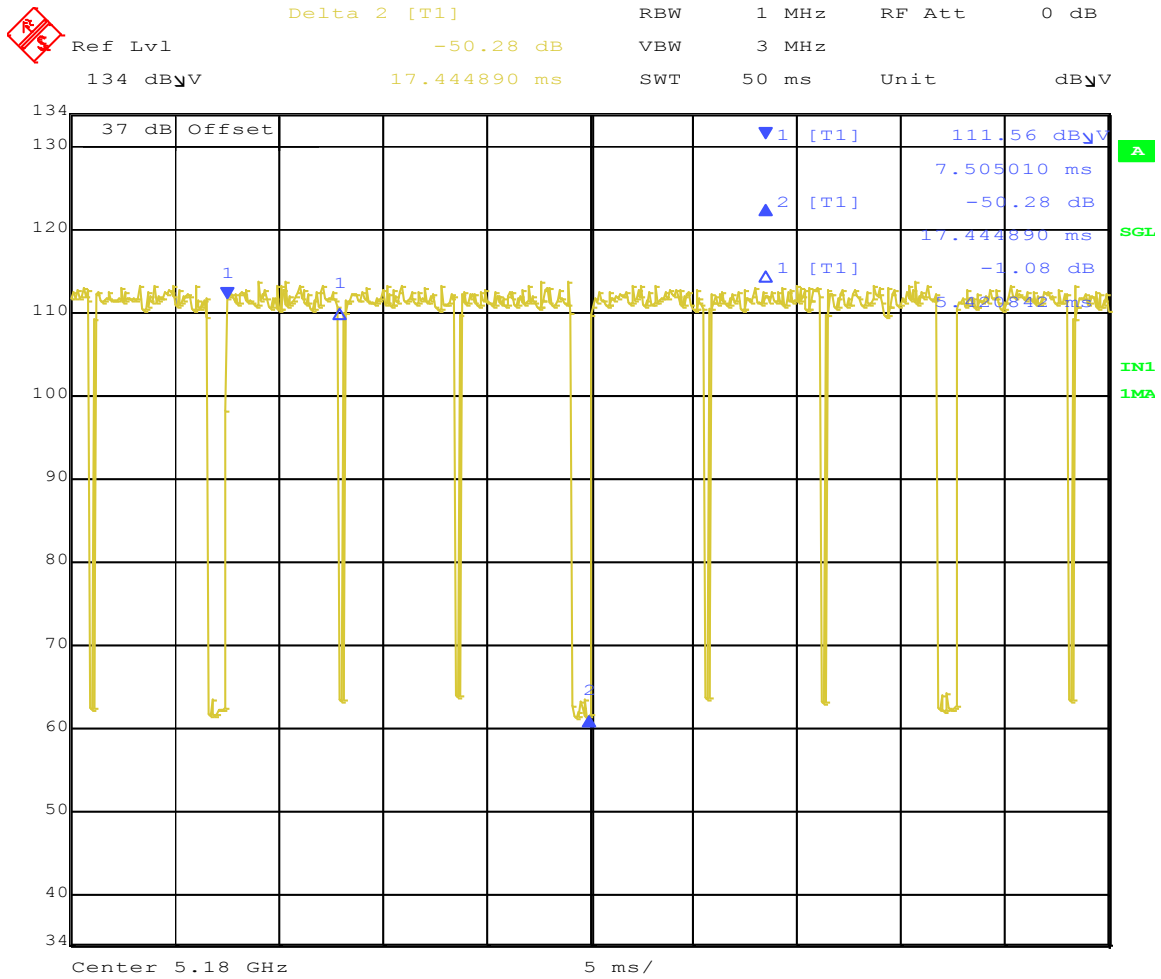
Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Factor (dB)	Remark
802.11a	1.43	1.55	92.3	0.7	Radiated Bandedge
802.11n HT20	16.26	17.44	93.2	0.6	Radiated Bandedge
802.11n HT40	5.41	5.65	95.7	0.38	Radiated Bandedge
802.11ac VHT80	5.41	5.65	95.7	0.38	Radiated Bandedge
802.11a	1.43	1.55	92.3	0.35	Conducted
802.11n HT20	16.26	17.44	93.2	0.3	Conducted
802.11n HT40	5.41	5.65	95.7	0.19	Conducted
802.11ac VHT80	5.41	5.65	95.7	0.19	Conducted

Note: EUT configured and measured for duty cycle. Duty factor will be used toward RF measurement offset.



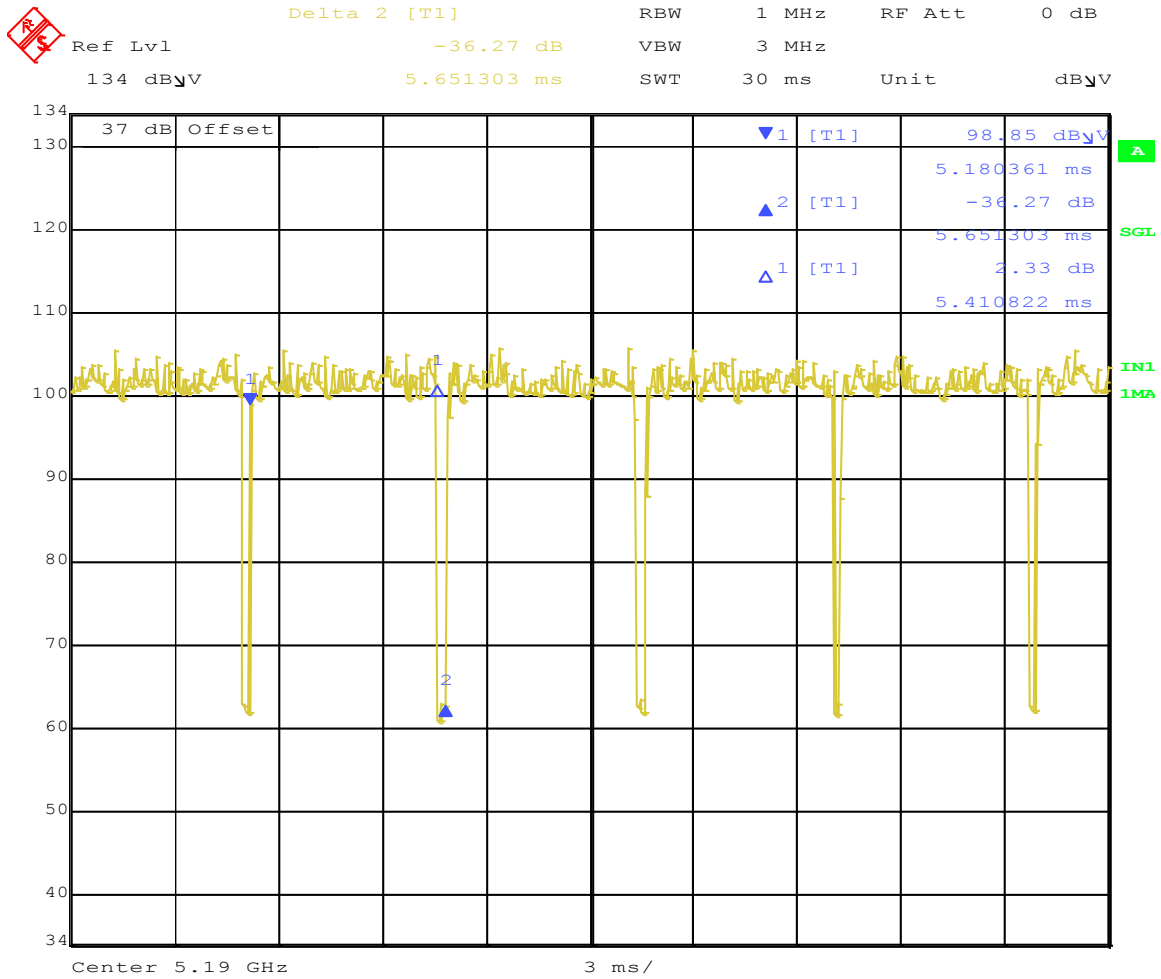
Date: 18.JUN.2020 12:27:47

Figure 1: Duty Cycle for 802.11a



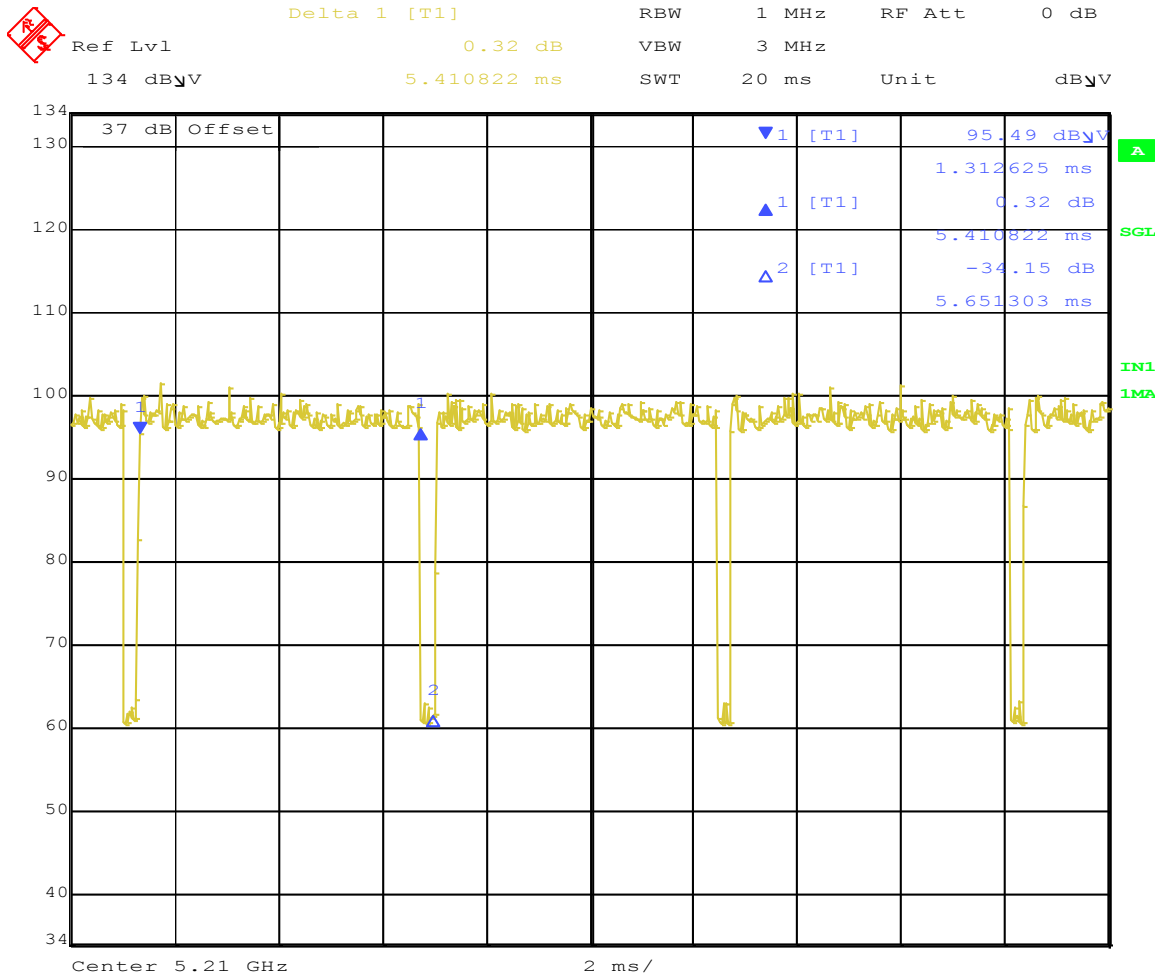
Date: 18.JUN.2020 12:23:09

Figure 2: Duty Cycle for 802.11n HT20



Date: 18.JUN.2020 12:33:06

Figure 3: Duty Cycle for 802.11n HT40



Date: 18.JUN.2020 12:39:47

Figure 4: Duty Cycle for 802.11ac VHT80

4 Emissions

Testing was performed in accordance with CFR 47 Part 15.407: 2020 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

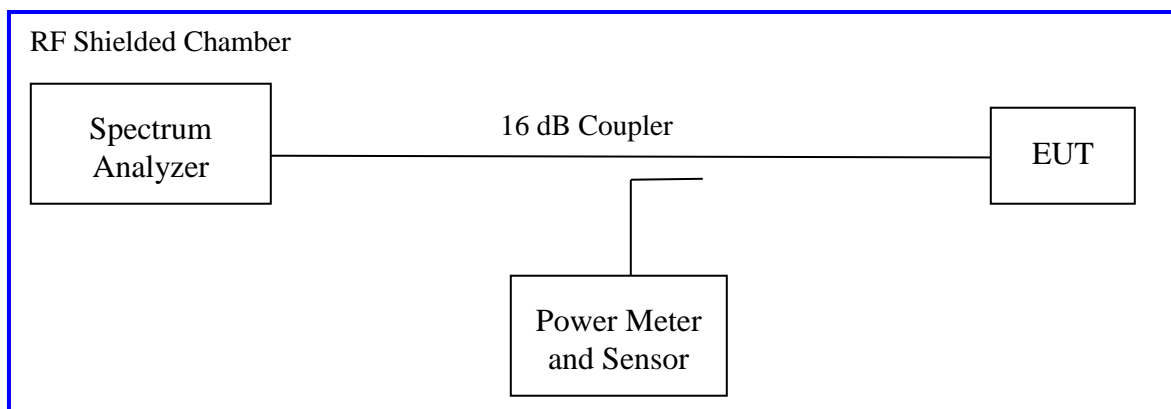
RSS 247 Sect. 6.2.4.1 – Band 5725-5850 MHz: 1 W

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.

Test Setup:



Method SA-2 of “KDB 789033 D02 – Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices” applies since the EUT continuously transmit; where duty cycle is less than 98%. Sample detector was used.

4.1.2 Results

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

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

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated			Signal State: Modulated at 92.3%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11a at 6 Mbps (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5180	19.37	19.28	0.35	19.72	30.00	-10.28
5200	22.40	22.10	0.35	22.75	30.00	-7.25
5240	22.52	22.34	0.35	22.87	30.00	-7.13
802.11a at 6 Mbps (RSS-247 Limit)						
5180	15.91	16.11	0.35	16.46	19.58	-3.12
5200	16.10	16.16	0.35	16.51	19.58	-3.07
5240	15.83	15.88	0.35	16.23	19.58	-3.35
802.11a at 6 Mbps (FCC and RSS-247 Limit)						
5745	20.58	20.51	0.35	20.93	30.00	-9.07
5785	22.13	22.10	0.35	22.48	30.00	-7.52
5825	21.15	20.54	0.35	21.50	30.00	-8.50
Note: 1. Worst case was observed at 6 Mbps. 2. RSS-247 Limit (5150-5250MHz) = 23 dBm – 3.42 dBi = 19.58 dBm. 3. 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 3: RF Output Power at the Antenna Port – Test Results Continued

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated			Signal State: Modulated at 93.2%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT20 at MCS0 (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5180	19.26	19.10	0.30	19.56	30.00	-10.44
5200	21.73	21.50	0.30	22.03	30.00	-7.97
5240	21.95	21.77	0.30	22.25	30.00	-7.75
802.11n HT20 at MCS0 (RSS-247 Limit)						
5180	16.04	15.89	0.30	16.34	19.58	-3.24
5220	16.15	16.02	0.30	16.45	19.58	-3.13
5240	16.35	16.24	0.30	16.65	19.58	-2.93
802.11n HT20 at MCS0 (FCC & RSS-247 Limit)						
5745	19.57	19.34	0.30	19.87	30.00	-10.13
5785	20.01	19.89	0.30	20.31	30.00	-9.69
5825	20.36	19.82	0.30	20.66	30.00	-9.34
Note: 1. Worst case was observed at MCS0. HT20 is worst case and VHT20 is covered. 2. RSS-247 Limit (5150-5250MHz) = 23 dBm – 3.42 dBi = 19.58 dBm. 3. 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 4: RF Output Power at the Antenna Port – Test Results Continued

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated			Signal State: Modulated at 95.7%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT40 at MCS0 (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5190	18.64	18.44	0.19	18.83	30.00	-11.17
5230	21.27	21.03	0.19	21.46	30.00	-8.54
802.11n HT40 at MCS0 (RSS-247 Limit)						
5190	18.49	18.3	0.19	18.68	19.58	-0.90
5230	19.17	19.11	0.19	19.36	19.58	-0.22
802.11n HT40 at MCS0 (FCC & RSS-247 Limit)						
5755	21.28	21.21	0.19	21.47	30.00	-8.53
5795	21.33	21.28	0.19	21.52	30.00	-8.48
802.11ac VHT80 at MCS0 (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max Power [dBm]	Limit [dBm]	Margin [dB]
5210	17.52	17.55	0.19	17.74	30.00	-12.26
802.11ac VHT80 at MCS0 (RSS-247 Limit)						
5210	17.34	17.41	0.19	17.60	19.58	-1.98
802.11ac VHT80 at MCS0 (FCC & RSS-247 Limit)						
5775	19.92	19.68	0.19	20.11	30.00	-9.89
<p>Note: 1. Worst case was observed at MCS0. HT40 is worst case and VHT40 is covered. 2. RSS-247 Limit (5150-5250MHz) = 23 dBm – 3.42 dBi = 19.58 dBm. 3. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the report, Highlighted Plots are placed in the report.</p>						

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

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Total Antenna Gain: UNII1 = 5.99 dBi; UNII3 = 7.12 dBi			
Operating Mode: Correlated			Signal State: Modulated at 93.2%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT20 at MCS0 (FCC Limit)						
Frequency [MHz]	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Total Power [dBm]	Limit [dBm]	Margin [dB]
5180	19.30	19.15	0.30	22.54	30.00	-7.46
5200	21.80	21.57	0.30	25.00	30.00	-5.00
5240	21.98	21.75	0.30	25.18	30.00	-4.82
802.11n HT20 at MCS0 (RSS-247 Limit)						
5180	10.90	11.00	0.30	14.26	17.01	-2.75
5220	10.89	10.94	0.30	14.23	17.01	-2.78
5240	10.92	10.78	0.30	14.16	17.01	-2.85
802.11n HT20 at MCS0 (FCC & RSS-247 Limit)						
5745	19.58	19.39	0.30	22.80	28.88	-6.08
5785	20.02	19.92	0.30	23.28	28.88	-5.60
5825	20.46	19.83	0.30	23.46	28.88	-5.42
Note: 1. Worst case was observed at MCS0. HT20 is worst case and VHT20 is covered. 2. The sum of Ch0 and Ch1 = Total Power. 3. RSS-247 Limit (5150-5250MHz) = 23 dBm – 5.99 dBi = 17.01 dBm. 4. Limit (5745-5825MHz) = 30 dBm – (7.12 dBi – 6 dBi) = 28.88 dBm 5. 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 6: RF Output Power at the Antenna Port – Test Results Continued

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Total Antenna Gain: UNII1 = 5.99 dBi; UNII3 = 7.12 dBi			
Operating Mode: Correlated			Signal State: Modulated at 95.7%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT40 at MCS0 (FCC Limit)						
Frequency [MHz]	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Total Power [dBm]	Limit [dBm]	Margin [dB]
5190	18.68	18.50	0.19	21.79	30.00	-8.21
5230	21.35	21.07	0.19	24.41	30.00	-5.59
802.11n HT40 at MCS0 (RSS-247 Limit)						
5190	12.78	12.83	0.19	16.01	17.01	-1.00
5230	12.80	13.33	0.19	16.27	17.01	-0.74
802.11n HT40 at MCS0 (FCC & RSS-247 Limit)						
5755	21.30	21.31	0.19	24.51	28.88	-4.37
5795	21.38	21.34	0.19	24.56	28.88	-4.32
802.11ac VHT80 at MCS0 (FCC Limit)						
Frequency [MHz]	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Total Power [dBm]	Limit [dBm]	Margin [dB]
5210	17.60	17.58	0.19	20.79	30.00	-9.21
802.11ac VHT80 at MCS0 (RSS-247 Limit)						
5210	13.08	13.63	0.19	16.56	17.01	-0.45
802.11ac VHT80 at MCS0 (FCC & RSS-247 Limit)						
5775	19.93	19.74	0.19	23.04	28.88	-5.84
<p>Note: 1. Worst case was observed at MCS0. HT40 is worst case and VHT20 is covered. 2. The sum of Ch0 and Ch1 = Total Power. 3. RSS-247 Limit (5150-5250MHz) = 23 dBm – 5.99 dBi = 17.01 dBm. 4. Limit (5745-5825MHz) = 30 dBm – (7.12 dBi – 6 dBi) = 28.88 dBm 5. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the report, Highlighted Plots are placed in the report.</p>						



Figure 5: FCC Uncorrelated Max Conducted Power-5240 MHz-802.11a-6 Mbps-Ch0



Figure 6: RSS Uncorrelated Max Conducted Power-5200 MHz-802.11a-6 Mbps-Ch1

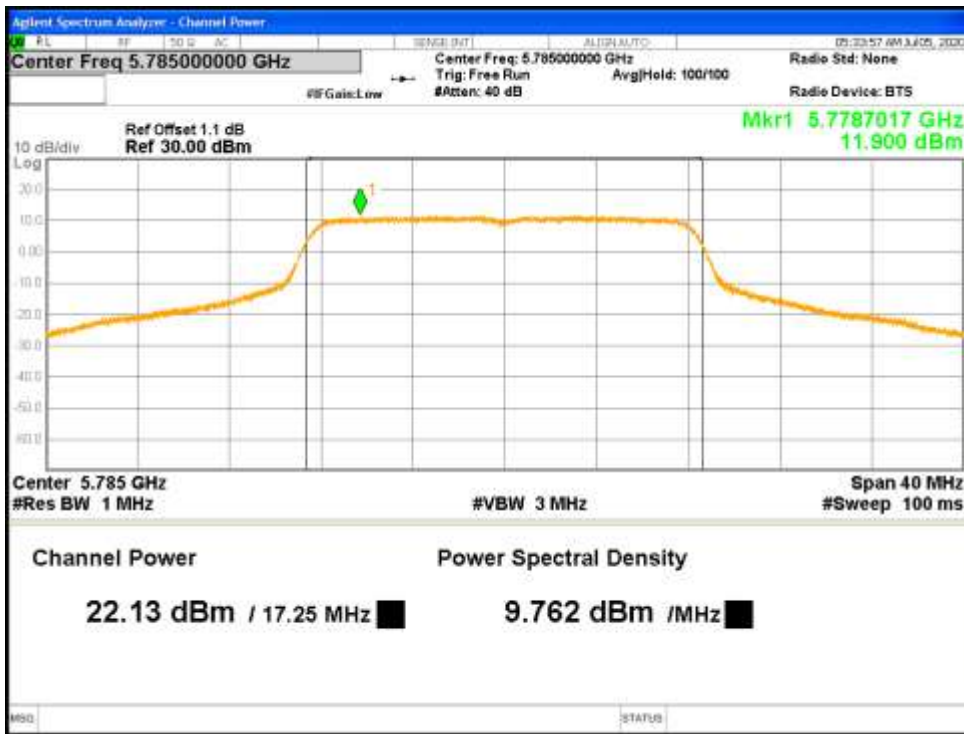


Figure 7: Uncorrelated Max Conducted Power-5785 MHz-802.11a-6 Mbps-Ch0

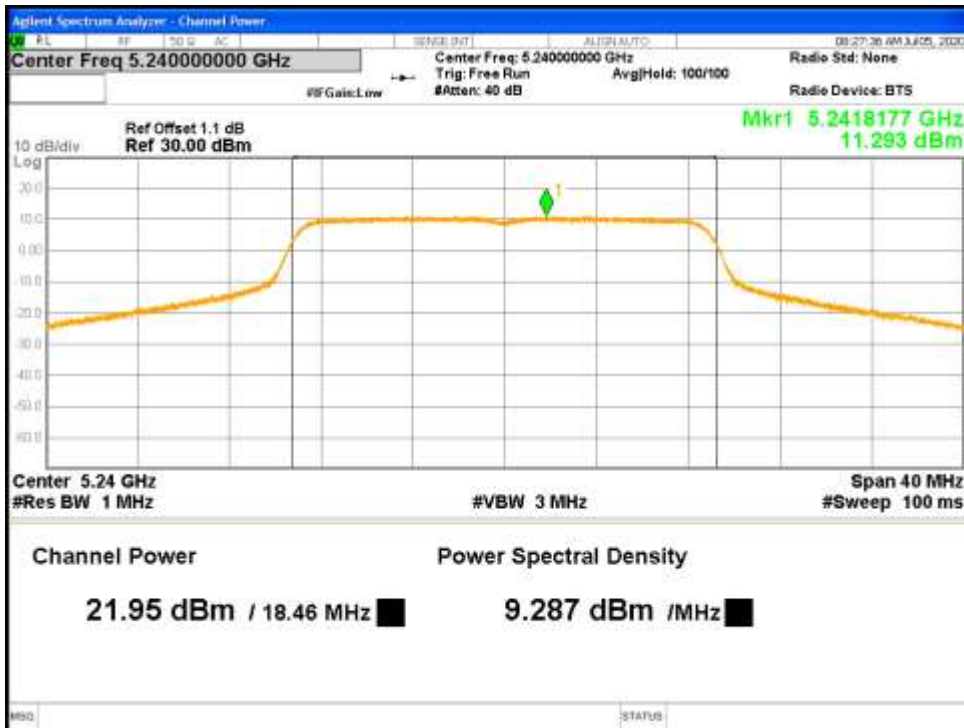


Figure 8: FCC Uncorrelated Max Conducted Power-5240 MHz-802.11n-HT20-MCS0-Ch0



Figure 9: RSS Uncorrelated Max Conducted Power-5240 MHz-802.11n-HT20-MCS0-Ch0



Figure 10: Uncorrelated Max Conducted Power-5825 MHz-802.11n-HT20-MCS0-Ch0

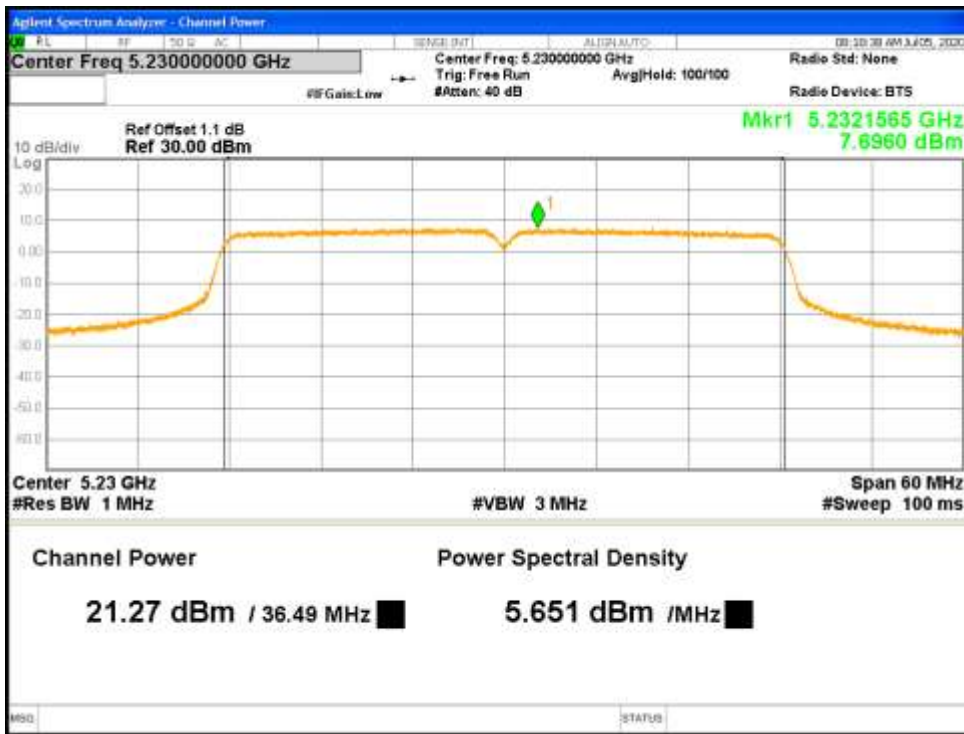


Figure 11: FCC Uncorrelated Max Conducted Power-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 12: RSS Uncorrelated Max Conducted Power-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 13: Uncorrelated Max Conducted Power-5795 MHz-802.11n-HT40-MCS0-Ch0



Figure 14: FCC Uncorrelated Max Conducted Power-5210 MHz-802.11ac-VHT80-MCS0-Ch1



Figure 15: RSS Uncorrelated Max Conducted Power-5210 MHz-802.11ac-VHT80-MCS0-Ch1



Figure 16: Uncorrelated Max Conducted Power-5775 MHz-802.11ac-VHT80-MCS0-Ch0



Figure 17: FCC Correlated Max Conducted Power-5240 MHz-802.11n-HT20-MCS0-Ch0



Figure 18: FCC Correlated Max Conducted Power-5240 MHz-802.11n-HT20-MCS0-Ch1



Figure 19: RSS Correlated Max Conducted Power-5180 MHz-802.11n-HT20-MCS0-Ch0



Figure 20: RSS Correlated Max Conducted Power-5180 MHz-802.11n-HT20-MCS0-Ch1



Figure 21: Correlated Max Conducted Power-5825 MHz-802.11n-HT20-MCS0-Ch0



Figure 22: Correlated Max Conducted Power-5825 MHz-802.11n-HT20-MCS0-Ch1



Figure 23: FCC Correlated Max Conducted Power-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 24: FCC Correlated Max Conducted Power-5230 MHz-802.11n-HT40-MCS0-Ch1

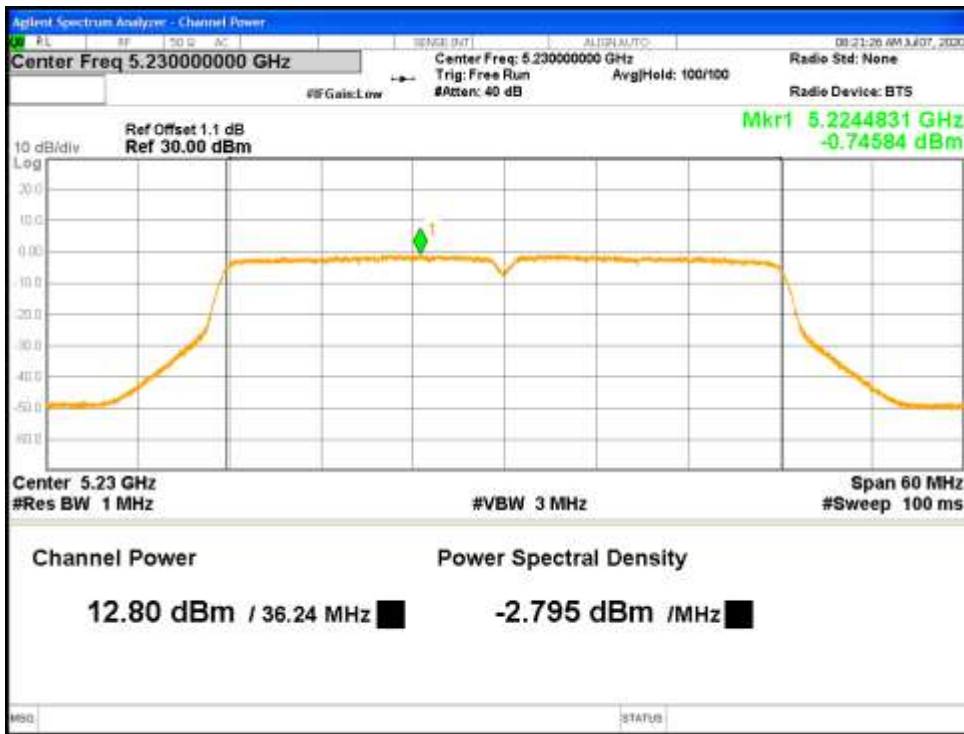


Figure 25: RSS Correlated Max Conducted Power-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 26: RSS Correlated Max Conducted Power-5230 MHz-802.11n-HT40-MCS0-Ch1



Figure 27: Correlated Max Conducted Power-5795 MHz-802.11n-HT40-MCS0-Ch0

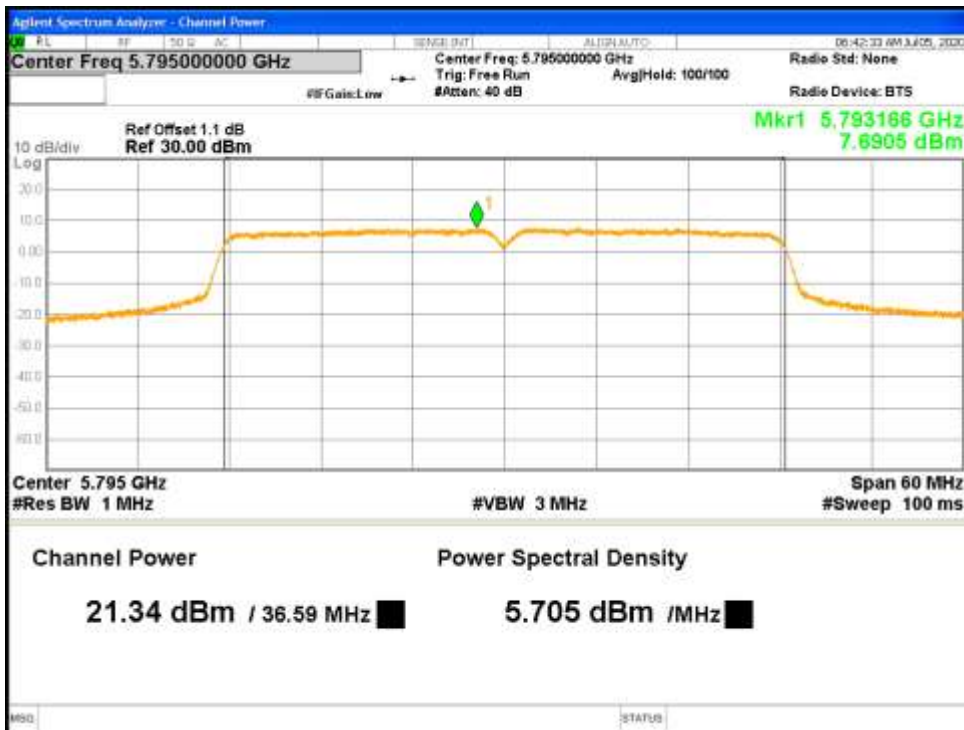


Figure 28: Correlated Max Conducted Power-5795 MHz-802.11n-HT40-MCS0-Ch1



Figure 29: FCC Correlated Max Conducted Power-5210 MHz-802.11ac-VHT80-MCS0-Ch0

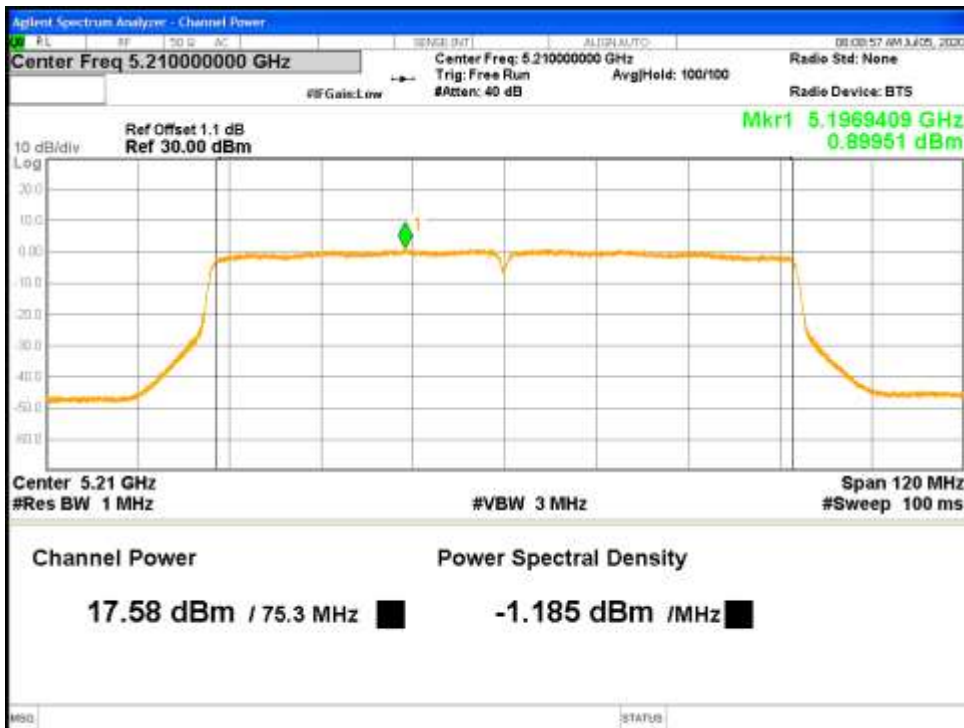


Figure 30: FCC Correlated Max Conducted Power-5210 MHz-802.11ac-VHT80-MCS0-Ch1



Figure 31: RSS Correlated Max Conducted Power-5210 MHz-802.11ac-VHT80-MCS0-Ch0

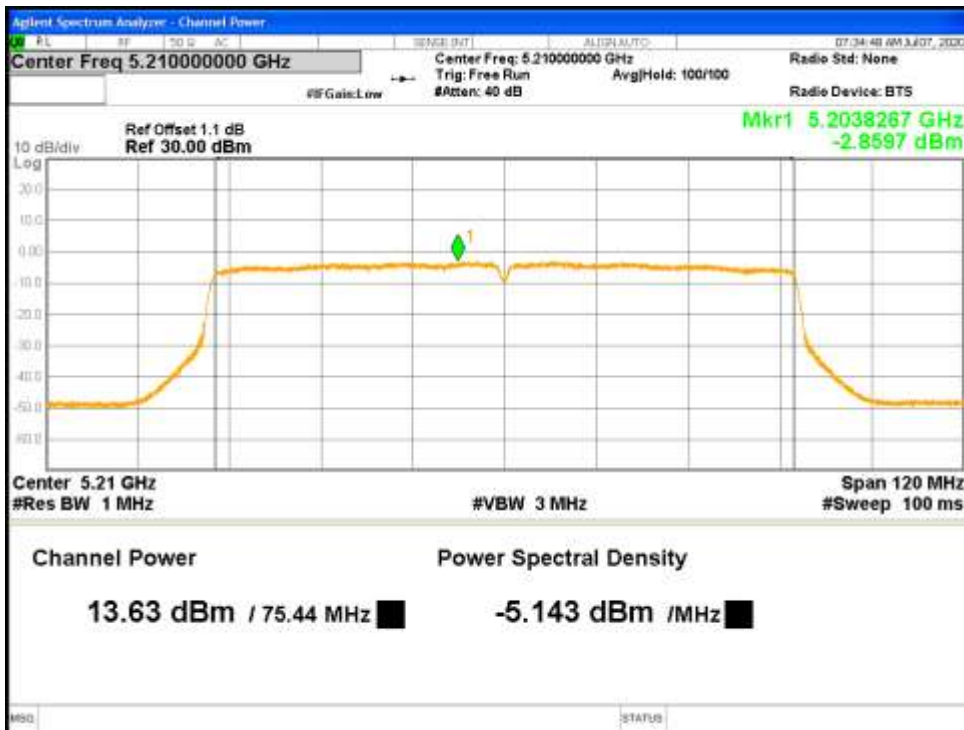


Figure 32: RSS Correlated Max Conducted Power-5210 MHz-802.11ac-VHT80-MCS0-Ch1



Figure 33: Correlated Max Conducted Power-5775 MHz-802.11ac-VHT80-MCS0-Ch0

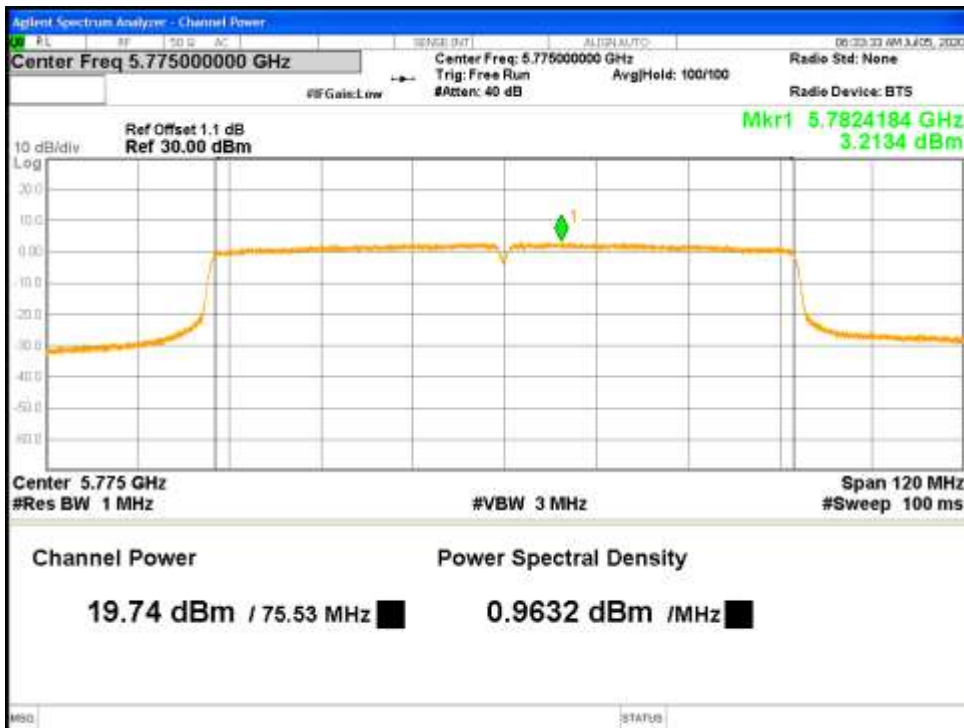


Figure 34: Correlated Max Conducted Power-5775 MHz-802.11ac-VHT80-MCS0-Ch1

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.

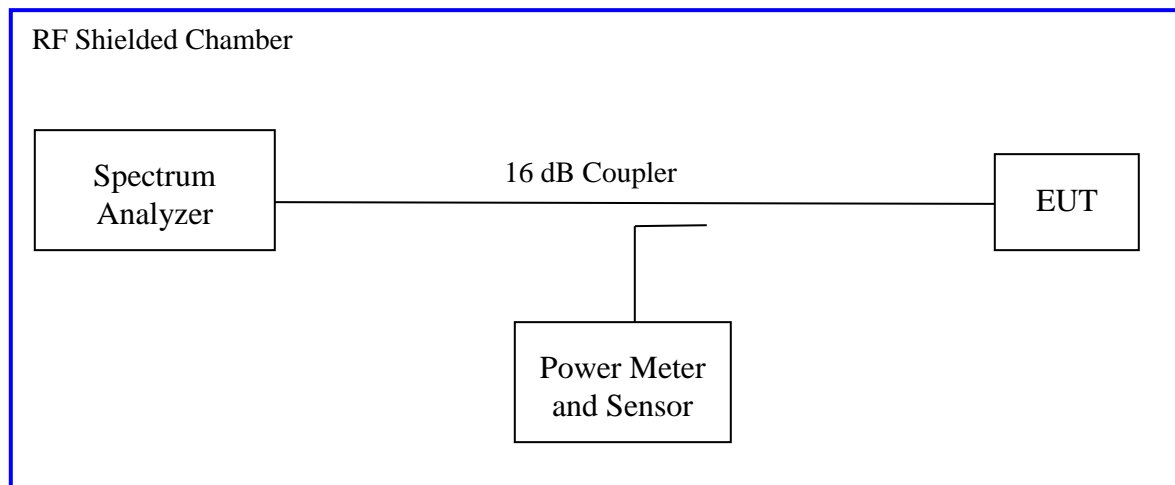
The minimum 6 dB bandwidth shall be at least 500 kHz per Section CFR47 15.407(e) and RSS 247 Sect.6.2.4.1

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 7: Occupied Bandwidth – Test Results

Date: July 8 - 22, 2020		Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements		Power Setting: See test plan.			
Antenna Type: FPCB		Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated		Signal State: Modulated at 92.3% (11a); 93.2% (HT20)			
Ambient Temp.: 22 - 23 °C		Relative Humidity: 35 - 38%			
802.11a, 6Mbps					
Frequency (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5180	16.430	16.599	20.860	23.860	NA
5220	16.387	17.141	20.570	29.960	NA
5240	16.485	17.341	22.310	30.340	NA
Frequency (MHz)	99% Bandwidth (MHz)		6 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5745	16.795	16.461	15.640	16.290	500
5785	16.908	16.436	15.700	15.530	500
5825	16.810	16.435	15.900	15.720	500
802.11n HT20, MCS0					
Frequency (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5180	17.602	18.111	21.680	30.050	NA
5220	17.569	17.998	21.220	28.070	NA
5240	17.677	18.061	22.720	30.050	NA
Frequency (MHz)	99% Bandwidth (MHz)		6 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5745	17.867	17.644	16.790	16.770	500
5785	17.932	17.641	16.510	16.770	500
5825	17.836	17.627	16.790	16.160	500
<p>Note: 1. The 99% bandwidth measurements are informative, and 26 dB bandwidths are used to determine the output power limits. 2. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of The report, Highlighted Plots are placed in the report.</p>					

Table 8: Occupied Bandwidth – Test Results

Date: July 8 - 22, 2020		Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements		Power Setting: See test plan.			
Antenna Type: FPCB		Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated		Signal State: Modulated at 95.7% (HT40 & VHT80)			
Ambient Temp.: 22 - 23 °C		Relative Humidity: 35 - 38%			
802.11n HT40, MCS0					
Frequency (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5190	36.095	36.154	41.130	46.000	NA
5230	36.056	36.241	40.740	52.080	NA
Frequency (MHz)	99% Bandwidth (MHz)		6 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5755	36.984	36.253	36.300	36.030	500
5795	37.623	36.228	36.300	36.010	500
802.11ac VHT80, MCS0					
Frequency (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5210	75.337	75.369	82.060	82.370	NA
Frequency (MHz)	99% Bandwidth (MHz)		6 dB Bandwidth (MHz)		Limit (kHz)
	Ch0	Ch1	Ch0	Ch1	
5775	76.176	75.577	75.060	72.660	500
<p>Note: 1. The 99% bandwidth measurements are informative, and 26 dB bandwidths are used to determine the output power limits. 2. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of The report, Highlighted Plots are placed in the report.</p>					

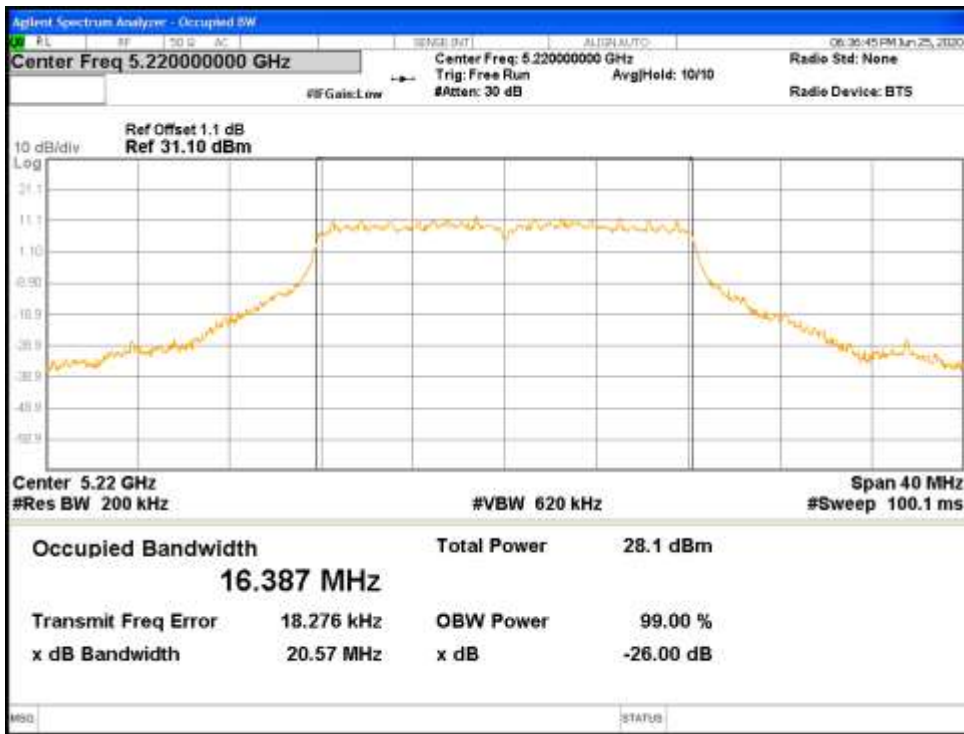


Figure 35: Occupied Bandwidth-5220 MHz-802.11a



Figure 36: Occupied Bandwidth-5825 MHz-802.11a

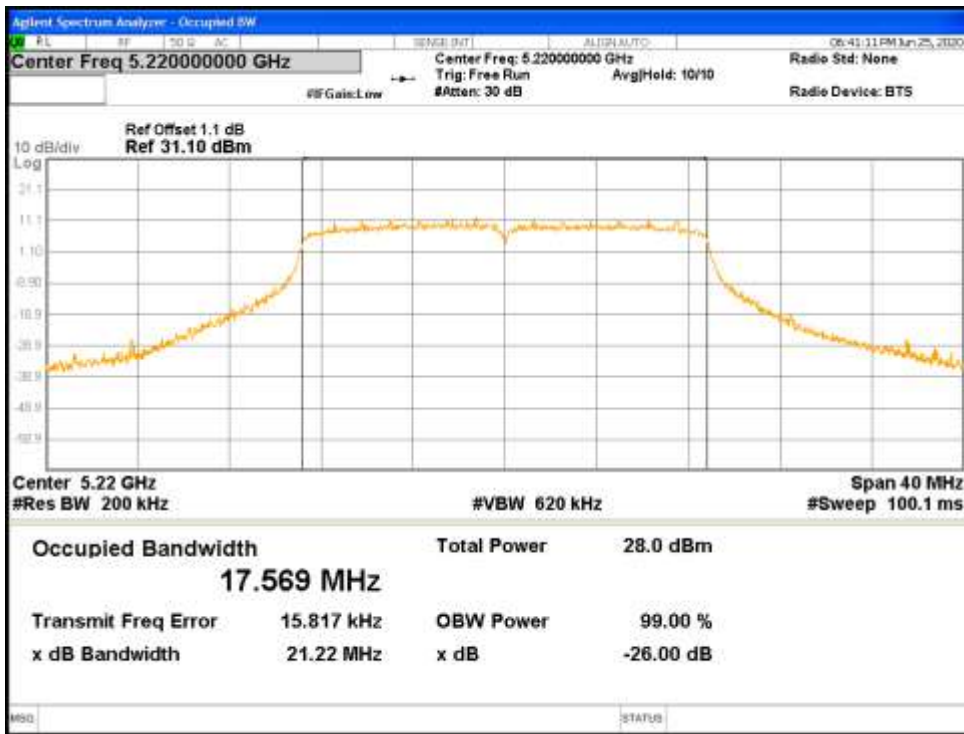


Figure 37: Occupied Bandwidth-5220 MHz-802.11n HT20

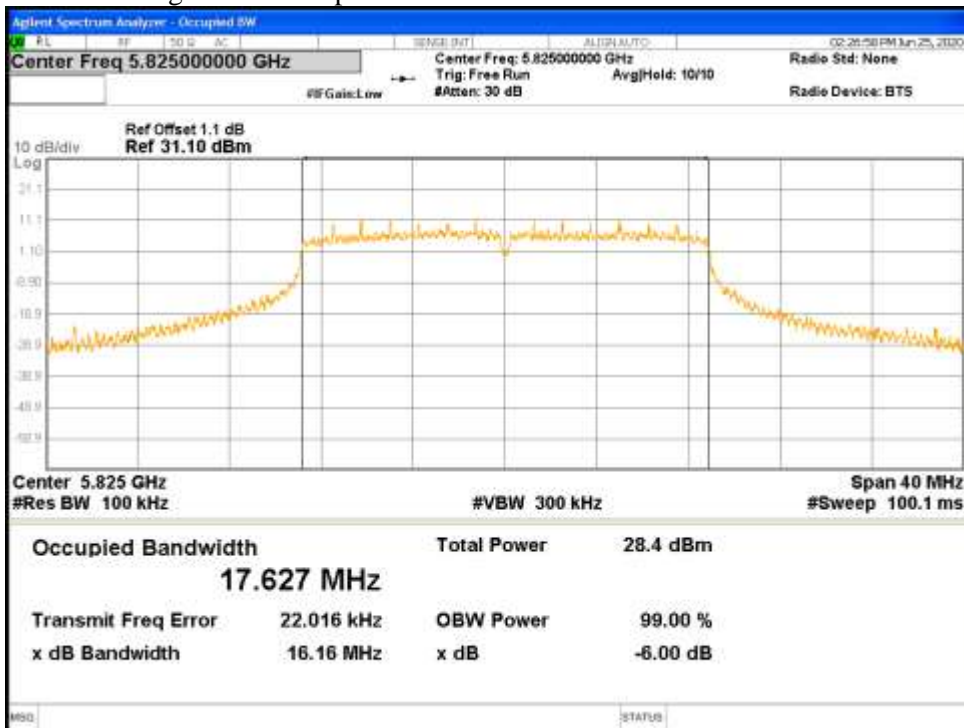


Figure 38: Occupied Bandwidth-5825 MHz-802.11n HT20

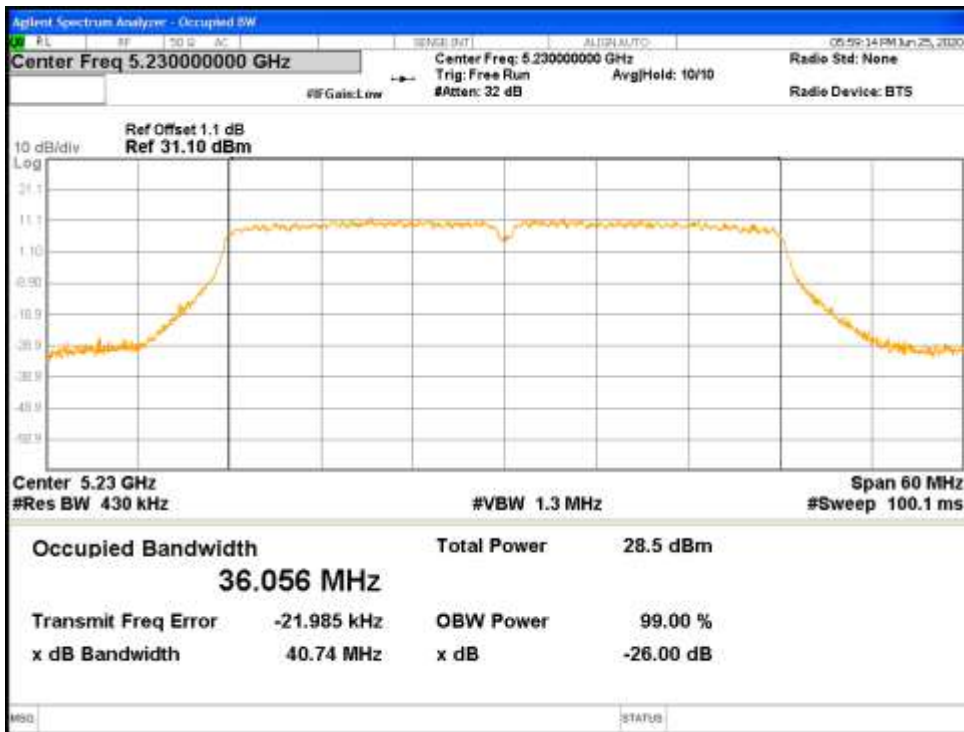


Figure 39: Occupied Bandwidth-5230 MHz-802.11n HT40

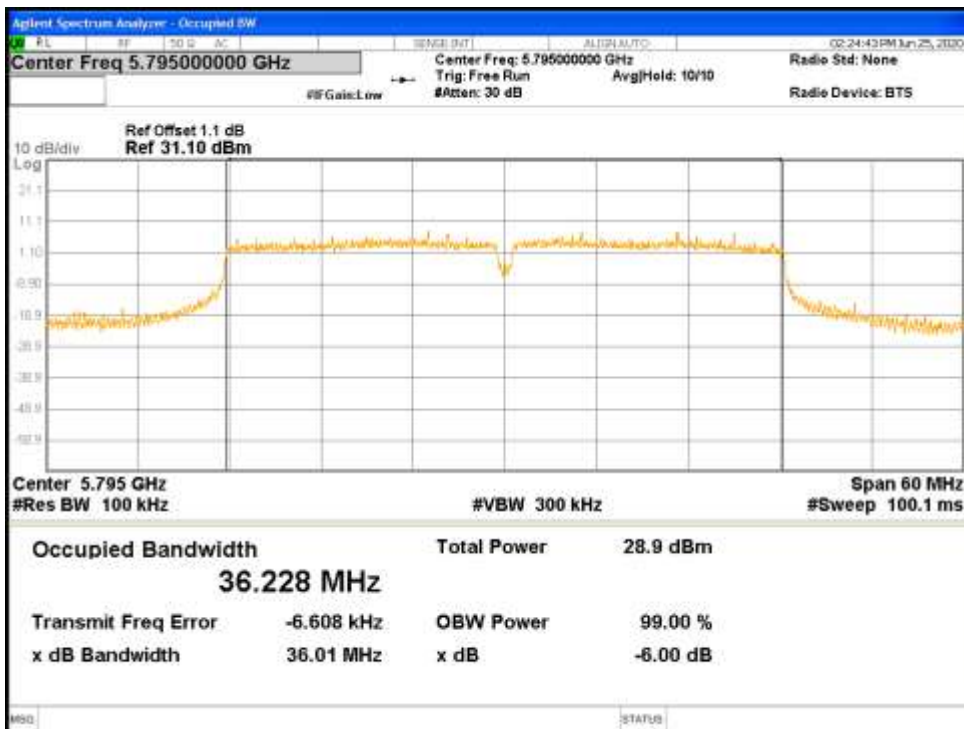


Figure 40: Occupied Bandwidth-5795 MHz-802.11n HT40

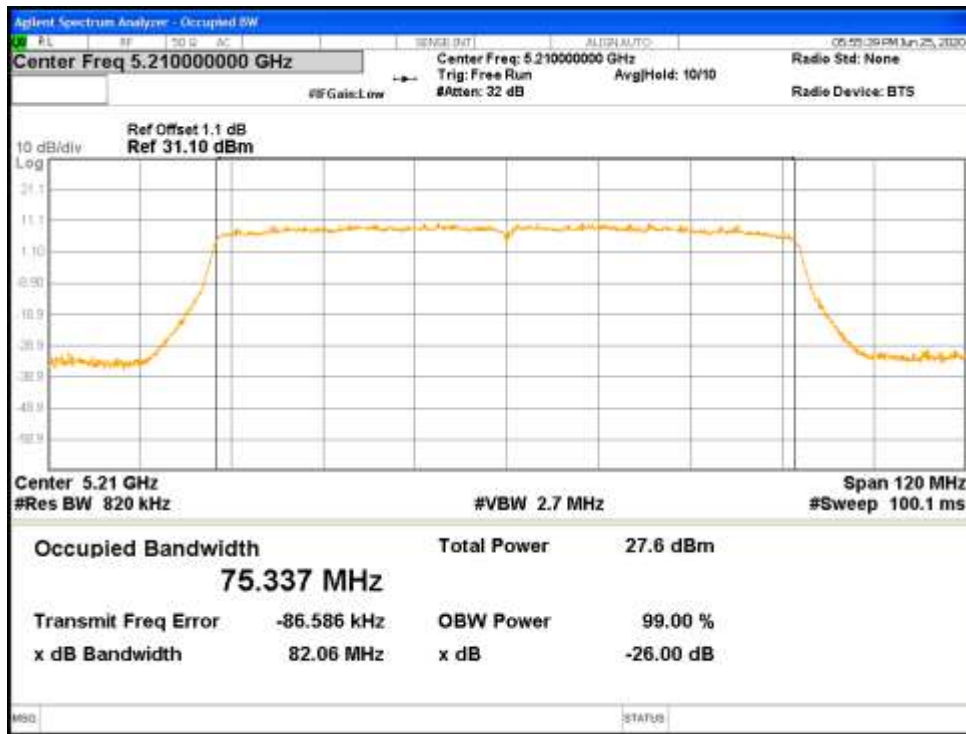


Figure 41: Occupied Bandwidth-5210 MHz-802.11ac VHT80

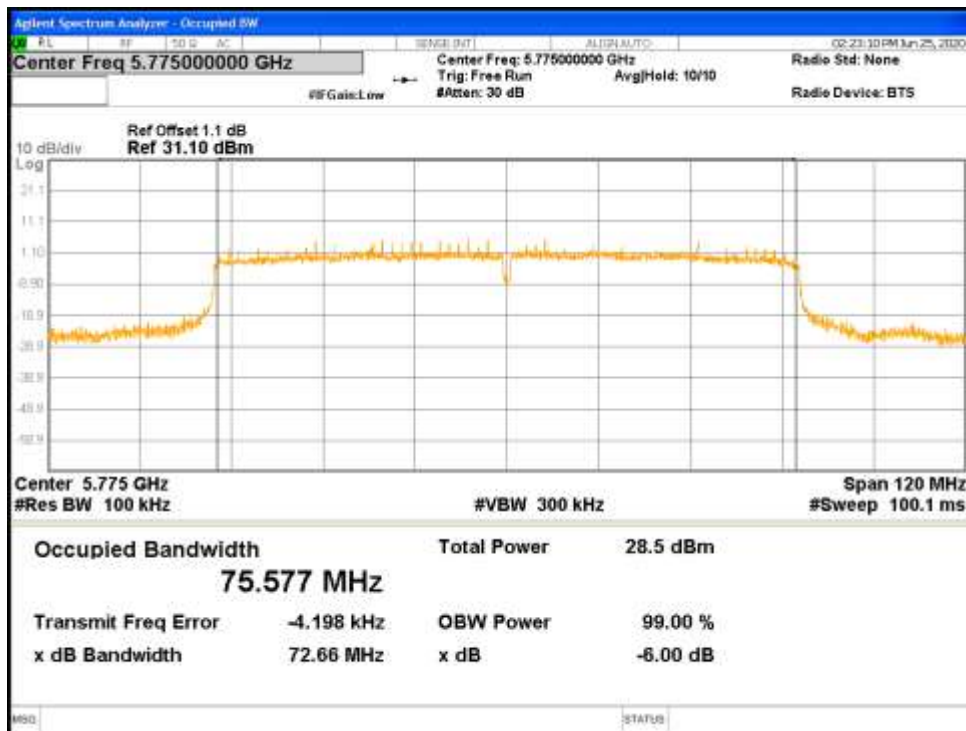


Figure 42: Occupied Bandwidth-5775 MHz-802.11ac VHT80

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.

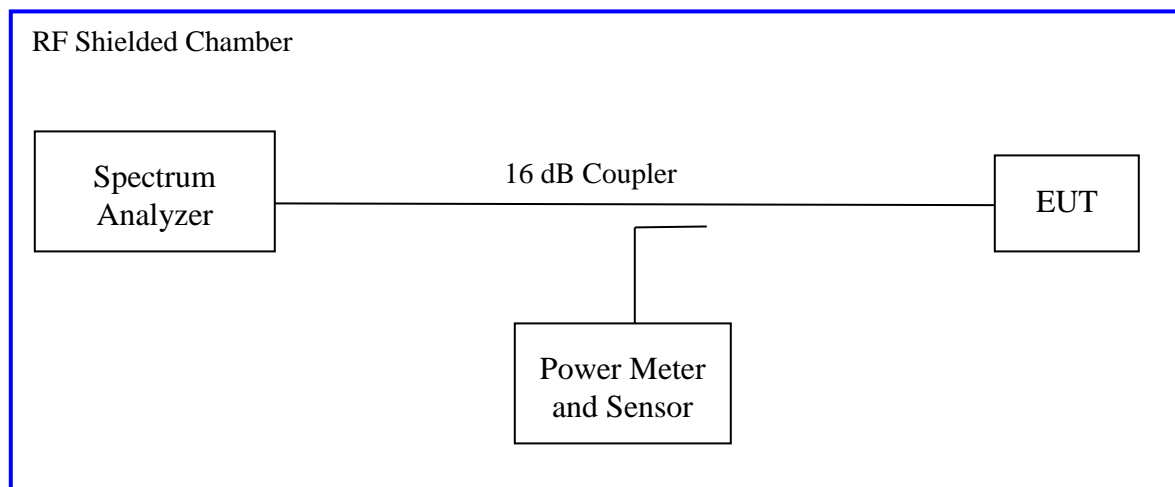
Band 5250-5350 MHz, and 5470-5725 MHz: 11 dBm in any 1 MHz band

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).

Table 9: Power Spectral Density – Test Results

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated			Signal State: Modulated at 92.3%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11a at 6 Mbps (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm]	Limit [dBm]	Margin [dB]
5180	9.24	8.98	0.35	9.59	17.00	-7.41
5200	12.17	11.66	0.35	12.52	17.00	-4.48
5240	12.12	12.11	0.35	12.47	17.00	-4.53
802.11a at 6 Mbps (RSS-247 Limit)						
5180	5.75	5.71	0.35	6.10	6.58	-0.48
5220	5.77	5.83	0.35	6.18	6.58	-0.40
5240	5.82	5.67	0.35	6.17	6.58	-0.41
802.11a at 6 Mbps (FCC and RSS-247 Limit)						
5745	7.29	7.32	0.35	7.67	30.00	-22.34
5785	8.72	8.76	0.35	9.11	30.00	-20.90
5825	7.84	7.27	0.35	8.19	30.00	-21.81
Note: 1. Worst case was observed at 6 Mbps. 2. RSS-247 Limit (5150-5250MHz) = 10 dBm – 3.42 dBi = 6.58 dBm. 3. 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 10: Power Spectral Density – Test Results Continued

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated			Signal State: Modulated at 93.2%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT20 at MCS0 (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm]	Limit [dBm]	Margin [dB]
5180	8.71	8.67	0.30	9.01	17.00	-7.99
5220	11.03	11.04	0.30	11.34	17.00	-5.66
5240	11.35	11.25	0.30	11.65	17.00	-5.35
802.11n HT20 at MCS0 (RSS-247 Limit)						
5180	5.41	5.63	0.30	5.93	6.58	-0.65
5220	5.75	5.79	0.30	6.09	6.58	-0.49
5240	5.83	5.73	0.30	6.13	6.58	-0.45
802.11n HT20 at MCS0 (FCC and RSS-247 Limit)						
5745	5.99	5.66	0.30	6.29	30.00	-23.71
5785	6.51	6.40	0.30	6.81	30.00	-23.19
5825	6.88	6.37	0.30	7.18	30.00	-22.82
Note: 1. Worst case was observed at MCS0. HT20 is worst case and VHT20 is covered. 2. RSS-247 Limit (5150-5250MHz) = 10 dBm – 3.42 dBi = 6.58 dBm. 3. 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 11: Power Spectral Density – Test Results Continued

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi			
Operating Mode: Uncorrelated			Signal State: Modulated at 95.7%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT40 at MCS0 (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm]	Limit [dBm]	Margin [dB]
5190	5.09	4.92	0.19	5.28	17.00	-11.72
5230	7.71	7.51	0.19	7.90	17.00	-9.10
802.11n HT40 at MCS0 (RSS-247 Limit)						
5190	4.85	4.65	0.19	5.04	6.58	-1.54
5230	5.83	5.61	0.19	6.02	6.58	-0.56
802.11n HT40 at MCS0 (FCC and RSS-247 Limit)						
5755	4.60	4.72	0.19	4.91	30.00	-25.09
5795	4.83	4.67	0.19	5.02	30.00	-24.98
802.11ac VHT80 at MCS0 (FCC Limit)						
Frequency (MHz)	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Max PSD [dBm]	Limit [dBm]	Margin [dB]
5210	0.90	0.79	0.19	1.09	17.00	-15.91
802.11ac VHT80 at MCS0 (RSS-247 Limit)						
5210	0.78	0.58	0.19	0.97	6.58	-5.61
802.11ac VHT80 at MCS0 (FCC and RSS-247 Limit)						
5775	0.32	0.17	0.19	0.51	30.00	-29.49
<p>Note: 1. Worst case was observed at MCS0. HT40 is worst case and VHT40 is covered. 2. RSS-247 Limit (5150-5250MHz) = 10 dBm – 3.42 dBi = 6.58 dBm. 3. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the report, Highlighted Plots are placed in the report.</p>						

Table 12: Power Spectral Density – Test Results Continued

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Total Antenna Gain: UNII1 = 5.99 dBi; UNII3 = 7.12 dBi			
Operating Mode: Correlated			Signal State: Modulated at 93.2%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT20 at MCS0 (FCC Limit)						
Frequency [MHz]	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
5180	9.05	8.69	0.30	12.18	17.00	-4.82
5200	11.34	11.29	0.30	14.63	17.00	-2.37
5240	11.38	11.26	0.30	14.63	17.00	-2.37
802.11n HT20 at MCS0 (RSS-247 Limit)						
5180	0.41	0.59	0.30	3.81	4.01	-0.20
5220	0.33	0.61	0.30	3.78	4.01	-0.23
5240	0.56	0.36	0.30	3.77	4.01	-0.24
802.11n HT20 at MCS0 (FCC & RSS-247 Limit)						
5745	6.14	5.84	0.30	9.30	28.88	-19.58
5785	6.93	6.42	0.30	9.99	28.88	-18.89
5825	7.03	6.27	0.30	9.97	28.88	-18.91
Note: 1. Worst case was observed at MCS0. HT20 is worst case and VHT20 is covered. 2. The sum of Ch0 and Ch1 = Total Power. 3. RSS-247 Limit (5150-5250MHz) = 10 dBm – 5.99 dBi = 4.01 dBm. 4. Limit (5745-5825MHz) = 30 dBm – (7.12 dBi – 6 dBi) = 28.88 dBm 5. 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: Power Spectral Density – Test Results Continued

Date: July 8 - 22, 2020			Tested By: Kerwinn Corpuz			
Test Method: Conducted Measurements			Power Setting: See test plan.			
Antenna Type: FPCB			Total Antenna Gain: UNII1 = 5.99 dBi; UNII3 = 7.12 dBi			
Operating Mode: Correlated			Signal State: Modulated at 95.7%			
Ambient Temp.: 22 - 23 °C			Relative Humidity: 35 - 38%			
802.11n HT40 at MCS0 (FCC Limit)						
Frequency [MHz]	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
5190	5.38	5.06	0.19	8.42	17.00	-8.58
5230	7.78	7.91	0.19	11.04	17.00	-5.96
802.11n HT40 at MCS0 (RSS-247 Limit)						
5190	-0.61	-0.57	0.19	2.61	4.01	-1.40
5230	-0.70	-0.06	0.19	2.83	4.01	-1.18
802.11n HT40 at MCS0 (FCC & RSS-247 Limit)						
5755	4.87	4.81	0.19	8.04	28.88	-20.84
5795	4.98	4.86	0.19	8.12	28.88	-20.76
802.11ac VHT80 at MCS0 (FCC Limit)						
Frequency [MHz]	CH 0 Output [dBm]	CH 1 Output [dBm]	Duty Cycle [dB]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
5210	0.94	1.02	0.19	4.18	17.00	-12.82
802.11ac VHT80 at MCS0 (RSS-247 Limit)						
5210	-3.60	-2.83	0.19	0.00	4.01	-4.01
802.11ac VHT80 at MCS0 (FCC & RSS-247 Limit)						
5775	0.31	0.20	0.19	3.45	28.88	-25.43
<p>Note: 1. Worst case was observed at MCS0. HT40 is worst case and VHT40 is covered. 2. The sum of Ch0 and Ch1 = Total Power. 3. RSS-247 Limit (5150-5250MHz) = 10 dBm – 5.99 dBi = 4.01 dBm. 4. Limit (5745-5825MHz) = 30 dBm – (7.12 dBi – 6 dBi) = 28.88 dBm 5. Plots for all the measurements stated above were taken. To reduce complexity and bulkiness of the report, Highlighted Plots are placed in the report.</p>						

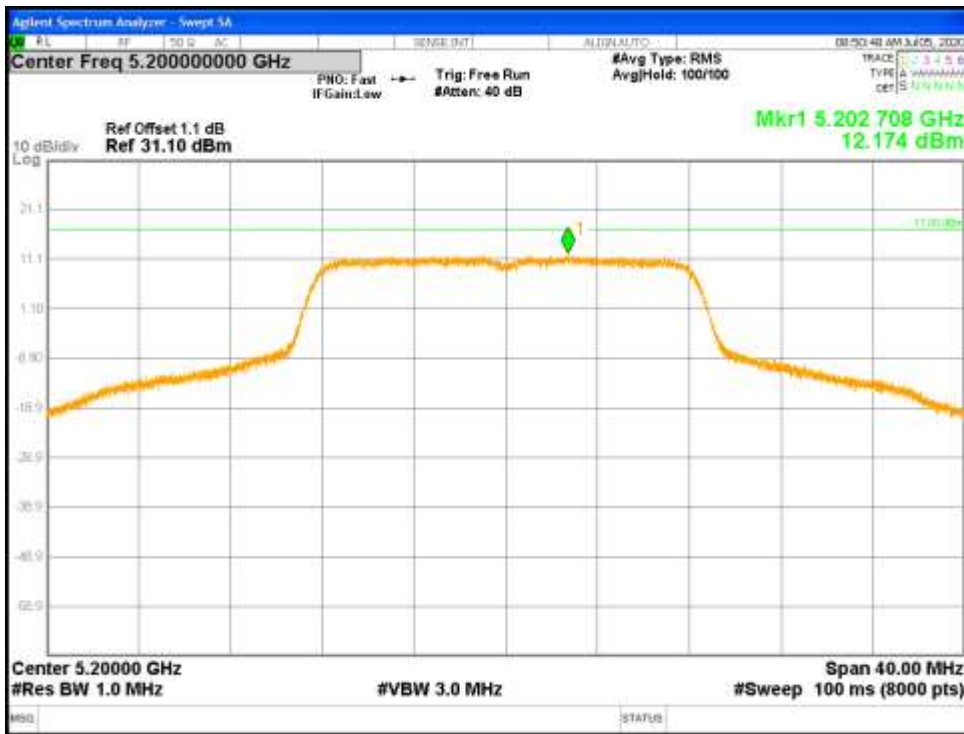


Figure 43: FCC Uncorrelated Power Spectral Density-5200 MHz-802.11a-6 Mbps-Ch0



Figure 44: RSS Uncorrelated Power Spectral Density-5220 MHz-802.11a-6 Mbps-Ch1



Figure 45: Uncorrelated Power Spectral Density-5785 MHz-802.11a-6 Mbps-Ch1



Figure 46: FCC Uncorrelated Power Spectral Density-5240 MHz-802.11n-HT20-MCS0-Ch0



Figure 47: RSS Uncorrelated Power Spectral Density-5240 MHz-802.11n-HT20-MCS0-Ch0



Figure 48: Uncorrelated Power Spectral Density-5825 MHz-802.11n-HT20-MCS0-Ch0



Figure 49: FCC Uncorrelated Power Spectral Density-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 50: RSS Uncorrelated Power Spectral Density-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 51: Uncorrelated Power Spectral Density-5795 MHz-802.11n-HT40-MCS0-Ch0



Figure 52: FCC Uncorrelated Power Spectral Density-5210 MHz-802.11ac-VHT80-MCS0-Ch0



Figure 53: RSS Uncorrelated Power Spectral Density-5210 MHz-802.11ac-VHT80-MCS0-Ch0



Figure 54: Uncorrelated Power Spectral Density-5775 MHz-802.11ac-VHT80-MCS0-Ch0

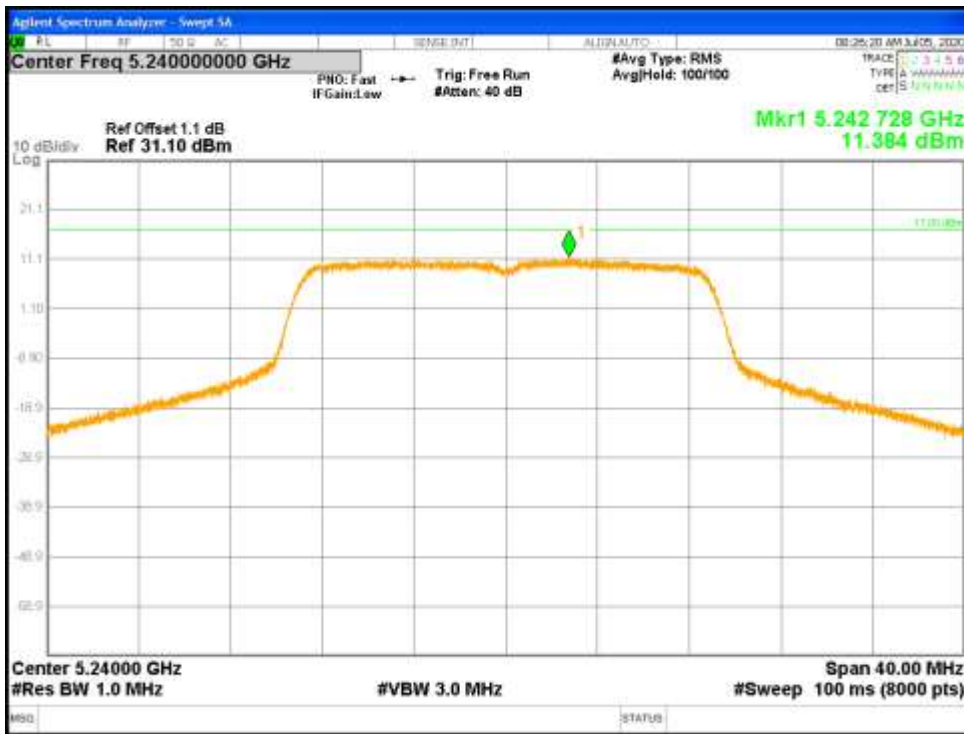


Figure 55: FCC Correlated Power Spectral Density-5240 MHz-802.11n-HT20-MCS0-Ch0

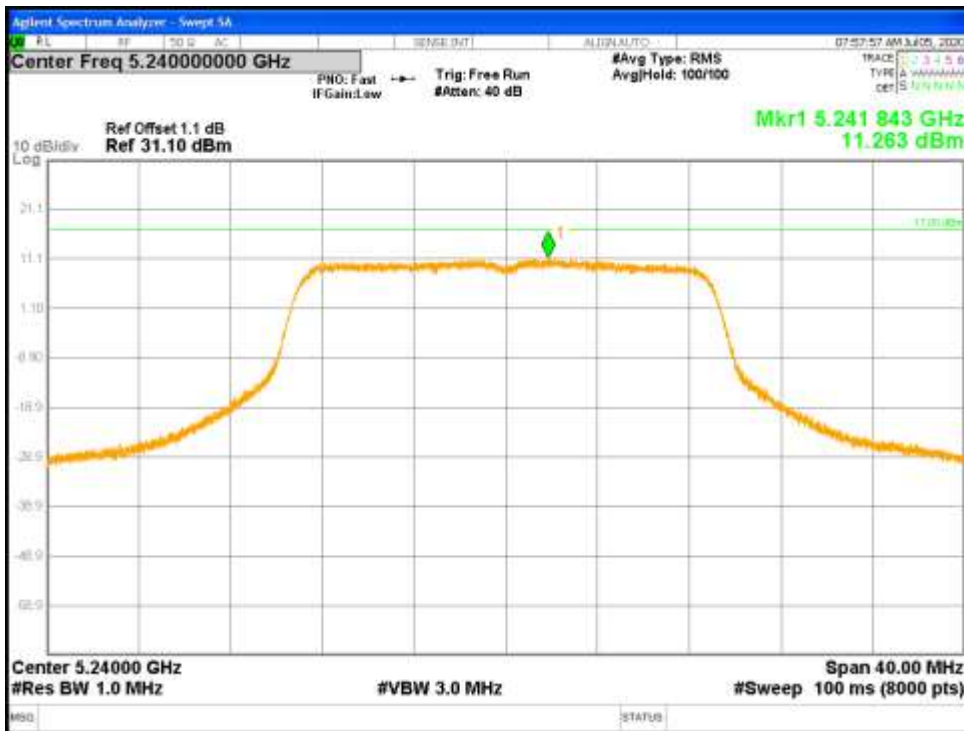


Figure 56: FCC Correlated Power Spectral Density-5240 MHz-802.11n-HT20-MCS0-Ch1



Figure 57: RSS Correlated Power Spectral Density-5180 MHz-802.1 In-HT20-MCS0-Ch0



Figure 58: RSS Correlated Power Spectral Density-5180 MHz-802.1 In-HT20-MCS0-Ch1



Figure 59: Correlated Power Spectral Density-5785 MHz-802.11n-HT20-MCS0-Ch0



Figure 60: Correlated Power Spectral Density-5785 MHz-802.11n-HT20-MCS0-Ch1



Figure 61: FCC Correlated Power Spectral Density-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 62: FCC Correlated Power Spectral Density-5230 MHz-802.11n-HT40-MCS0-Ch1



Figure 63: RSS Correlated Power Spectral Density-5230 MHz-802.11n-HT40-MCS0-Ch0



Figure 64: RSS Correlated Power Spectral Density-5230 MHz-802.11n-HT40-MCS0-Ch1



Figure 65: Correlated Power Spectral Density-5795 MHz-802.11n-HT40-MCS0-Ch0



Figure 66: Correlated Power Spectral Density-5795 MHz-802.11n-HT40-MCS0-Ch1



Figure 67: FCC Correlated Power Spectral Density-5210 MHz-802.11ac-VHT80-MCS0-Ch0



Figure 68: FCC Correlated Power Spectral Density-5210 MHz-802.11ac-VHT80-MCS0-Ch1



Figure 69: RSS Correlated Power Spectral Density-5210 MHz-802.11ac-VHT80-MCS0-Ch0



Figure 70: RSS Correlated Power Spectral Density-5210 MHz-802.11ac-VHT80-MCS0-Ch1



Figure 71: Correlated Power Spectral Density-5775 MHz-802.11ac-VHT80-MCS0-Ch0



Figure 72: Correlated Power Spectral Density-5775 MHz-802.11ac-VHT80-MCS0-Ch1

4.4 Undesirable Emission Limits

CFR47 15.407 (b) and RSS 247 Sect.6.2.1.2, 6.2.2.2, and 6.2.3.2: The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

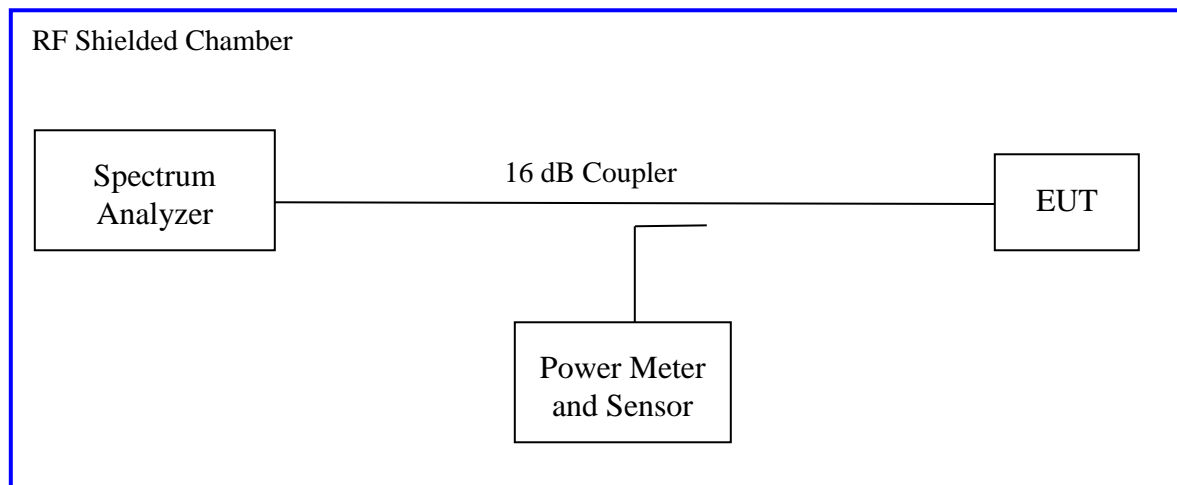
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: 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.

4.4.1 Test Method

The conducted method was used to measure the undesirable emission requirement. The measurement was performed with modulation. This test was conducted on 3 channels of Sample in each mode on Sample. The worst sample result indicated below.

Test Setup:



4.4.2 Results

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

Table 14: Undesired Emissions – Test Results

Date: June 29-30, 2020					Tested By: Kerwinn Corpuz				
Test Method: Conducted Measurements					Power Setting: See test plan.				
Antenna Type: FPCB					Max Antenna Gain: UNII1 = 3.42 dBi; UNII3 = 4.17 dBi				
Operating Mode: Uncorrelated					Signal State: Modulated at 92.3% (11a), 93.2% (HT20), 95.7% (HT40 & VHT80)				
Ambient Temp.: 23 °C					Relative Humidity: 35-37%				
Undesired Emissions for 802.11a, 6Mbps									
Frequency	Raw	CF	Ant. Gain	Level	Det.	Port	Limit	Margin	Comments
MHz	dBm	dB	dBi	dBm		Ch 0/1	dBm	dB	Operating Frequency
31942.19	-43.72	1.75	3.42	-38.55	Pk	Ch 1	-27	-11.55	5180MHz, 11a
33550.72	-42.44	1.83	3.42	-37.19	Pk	Ch 1	-27	-10.19	5180MHz, 11a
30333.67	-43.30	1.70	3.42	-38.18	Pk	Ch 1	-27	-11.18	5200MHz, 11a
34248.76	-43.68	1.81	3.42	-38.45	Pk	Ch 1	-27	-11.45	5200MHz, 11a
29732.93	-42.88	1.69	3.42	-37.76	Pk	Ch 1	-27	-10.76	5240MHz, 11a
33999.72	-43.14	1.80	3.42	-37.91	Pk	Ch 1	-27	-10.91	5240MHz, 11a
29624.02	-43.48	1.70	4.17	-37.61	Pk	Ch 1	-27	-10.61	5745MHz, 11a
33251.69	-43.72	1.81	4.17	-37.74	Pk	Ch 1	-27	-10.74	5745MHz, 11a
29838.26	-43.59	1.71	4.17	-37.71	Pk	Ch 1	-27	-10.71	5785MHz, 11a
32721.46	-43.46	1.77	4.17	-37.52	Pk	Ch 1	-27	-10.52	5785MHz, 11a
35286.00	-42.18	1.82	4.17	-36.19	Pk	Ch 1	-27	-9.19	5825MHz, 11a
36626.74	-42.09	1.89	4.17	-36.03	Pk	Ch 1	-27	-9.03	5825MHz, 11a
Undesired Emissions for 802.11n HT20, MCS0									
Frequency	Raw	CF	Ant. Gain	Level	Det.	Port	Limit	Margin	Comments
MHz	dBm	dB	dBi	dBm		Ch 0/1	dBm	dB	Operating Frequency
33279.36	-43.05	1.81	3.42	-37.82	Pk	Ch 1	-27	-10.82	5180MHz, HT20
34268.40	-43.26	1.81	3.42	-38.03	Pk	Ch 1	-27	-11.03	5180MHz, HT20
32065.38	-43.55	1.76	3.42	-38.37	Pk	Ch 1	-27	-11.37	5200MHz, HT20
34065.77	-43.83	1.86	3.42	-38.55	Pk	Ch 1	-27	-11.55	5200MHz, HT20
33380.23	-42.44	1.81	3.42	-37.21	Pk	Ch 1	-27	-10.21	5240MHz, HT20
34804.87	-42.27	1.80	3.42	-37.05	Pk	Ch 1	-27	-10.05	5240MHz, HT20
30439.89	-44.11	1.71	4.17	-38.23	Pk	Ch 1	-27	-11.23	5745MHz, HT20
32563.47	-44.37	1.77	4.17	-38.43	Pk	Ch 1	-27	-11.43	5745MHz, HT20

32116.26	-43.95	1.76	4.17	-38.02	Pk	Ch 1	-27	-11.02	5785MHz, HT20
33738.17	-44.29	1.80	4.17	-38.32	Pk	Ch 1	-27	-11.32	5785MHz, HT20
30190.85	-43.7	1.70	4.17	-37.83	Pk	Ch 1	-27	-10.83	5825MHz, HT20
33602.49	-43.96	1.83	4.17	-37.96	Pk	Ch 1	-27	-10.96	5825MHz, HT20

Undesired Emissions for 802.11n HT40, MCS0

Frequency	Raw	CF	Ant. Gain	Level	Det.	Port	Limit	Margin	Comments
MHz	dBm	dB	dBi	dBm		Ch 0/1	dBm	dB	Operating Frequency
26992.54	-42.85	1.68	3.42	-37.75	Pk	Ch 1	-27	-10.75	5190MHz, HT40
33681.94	-43.54	1.80	3.42	-38.32	Pk	Ch 1	-27	-11.32	5190MHz, HT40
33508.77	-43.41	1.81	3.42	-38.17	Pk	Ch 1	-27	-11.17	5230MHz, HT40
34729.00	-42.46	1.81	3.42	-37.23	Pk	Ch 1	-27	-10.23	5230MHz, HT40
30245.30	-43.77	1.72	4.17	-37.88	Pk	Ch 1	-27	-10.88	5755MHz, HT40
34386.23	-43.84	1.79	4.17	-37.88	Pk	Ch 1	-27	-10.88	5755MHz, HT40
33206.16	-43.96	1.78	4.17	-38.01	Pk	Ch 1	-27	-11.01	5795MHz, HT40
34451.39	-44.05	1.81	4.17	-38.07	Pk	Ch 1	-27	-11.07	5795MHz, HT40

Undesired Emissions for 802.11ac VHT80, MCS0

Frequency	Raw	CF	Ant. Gain	Level	Det.	Port	Limit	Margin	Comments
MHz	dBm	dB	dBi	dBm		Ch 0/1	dBm	dB	Operating Frequency
34881.64	-42.04	1.88	3.42	-36.74	Pk	Ch 1	-27	-9.74	5210MHz, VHT80
36510.69	-41.34	1.84	3.42	-36.08	Pk	Ch 1	-27	-9.08	5210MHz, VHT80
30026.60	-44.10	1.73	4.17	-38.21	Pk	Ch 1	-27	-11.21	5775MHz, VHT80
33976.51	-44.20	1.81	4.17	-38.23	Pk	Ch 1	-27	-11.23	5775MHz, VHT80

Note: 1. Worst case observed at Chain 1. Emissions detected, noise floor.
 2. All out of band emissions are below the -27dBm level.
 3. Emissions of UNII3 channels (5745-5825MHz) met the band-edge spectrum mask.
 4. 99% OBW emission of the operating channel did not leak into 5250 -5350 MHz band. See Fig. 109, 110, 111 and 112.

a. for 11a: $((17.341 \text{ MHz}/2)+5240 \text{ MHz} = 5248.6705 \text{ MHz}$
 b. for HT20: $((18.061 \text{ MHz}/2)+5240 \text{ MHz} = 5249.0305 \text{ MHz}$
 c. for HT40: $((36.241 \text{ MHz}/2)+5230 \text{ MHz} = 5248.1205 \text{ MHz}$
 d. for VHT80: $((75.369 \text{ MHz}/2)+5210 \text{ MHz} = 5247.6845 \text{ MHz}$

Since the 99% bandwidth emission did not cross over into the UNII2A band, DFS is not required.

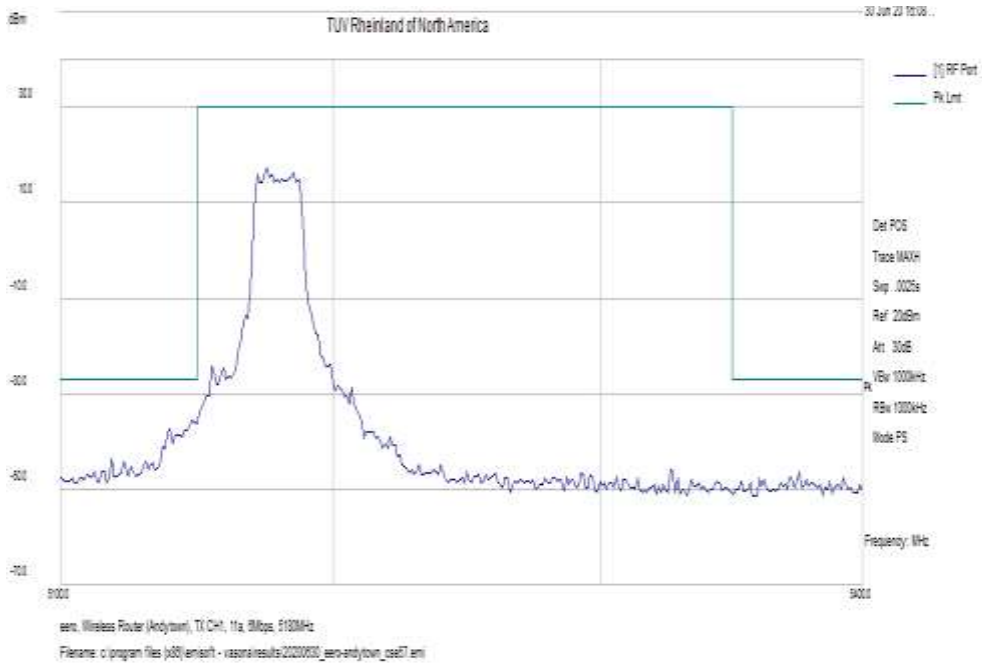


Figure 73: Measured Band-edge for 802.11a-6 Mbps at 5180 MHz, Ch 1

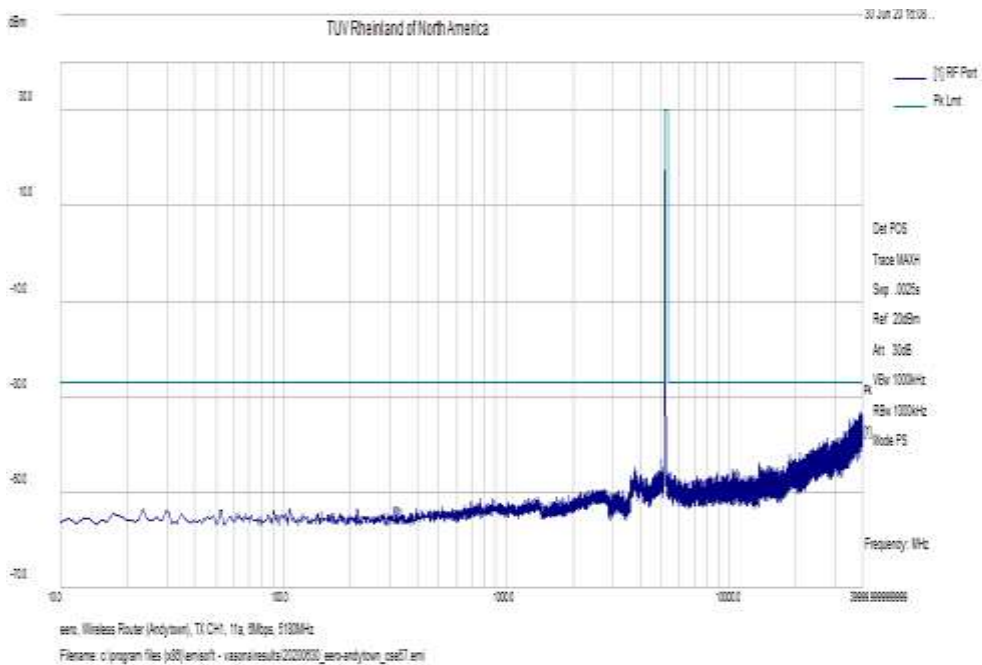


Figure 74: Undesirable Emission for 802.11a-6 Mbps at 5180 MHz, Ch 1

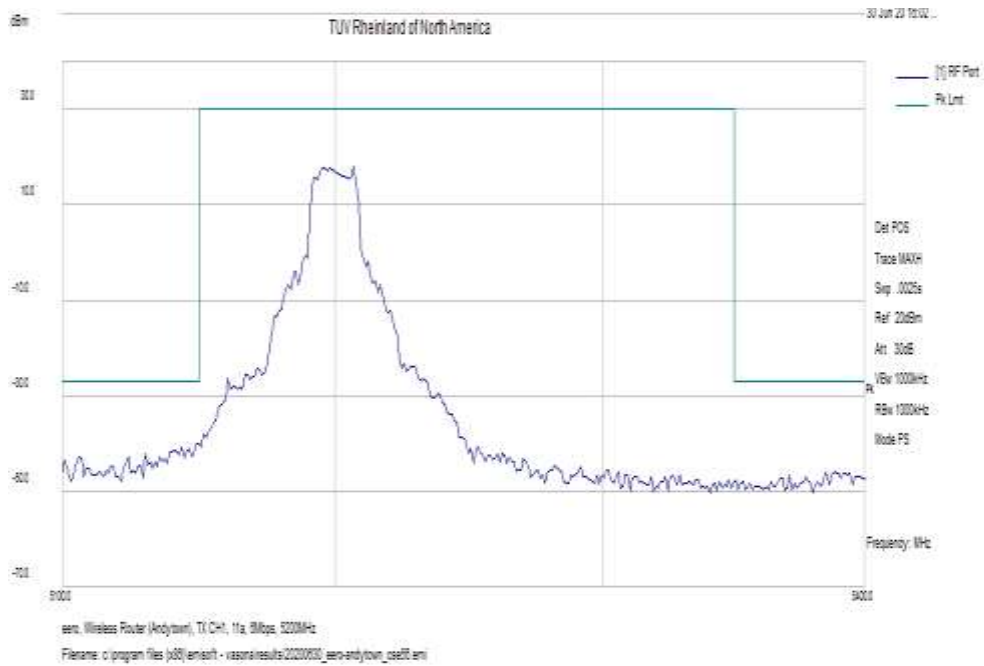


Figure 75: Measured Band-edge for 802.11a-6 Mbps at 5200 MHz, Ch 1

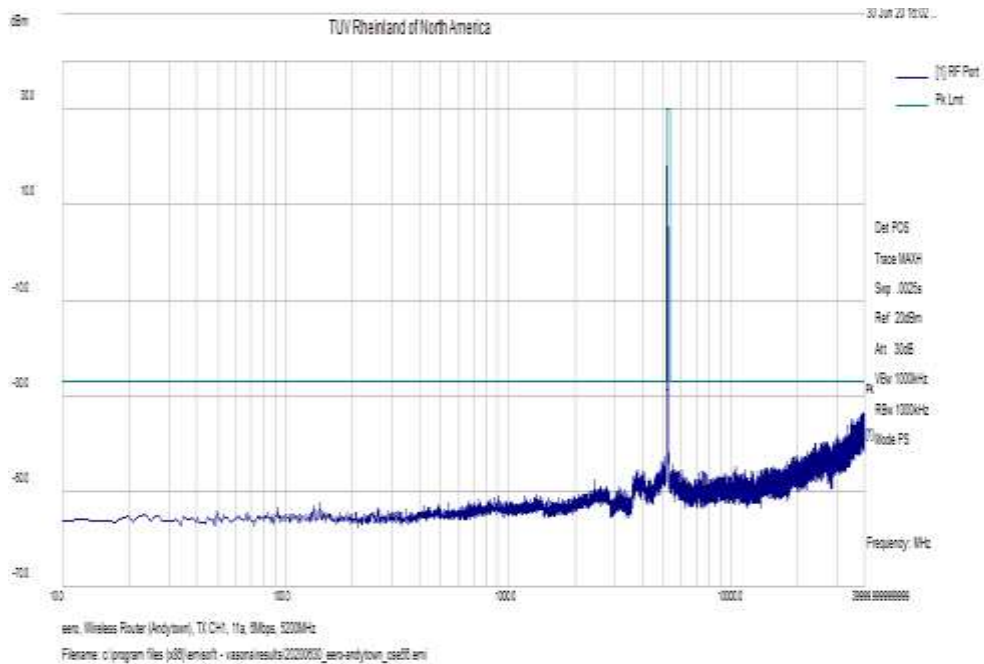


Figure 76: Undesirable Emission for 802.11a-6 Mbps at 5200 MHz, Ch 1

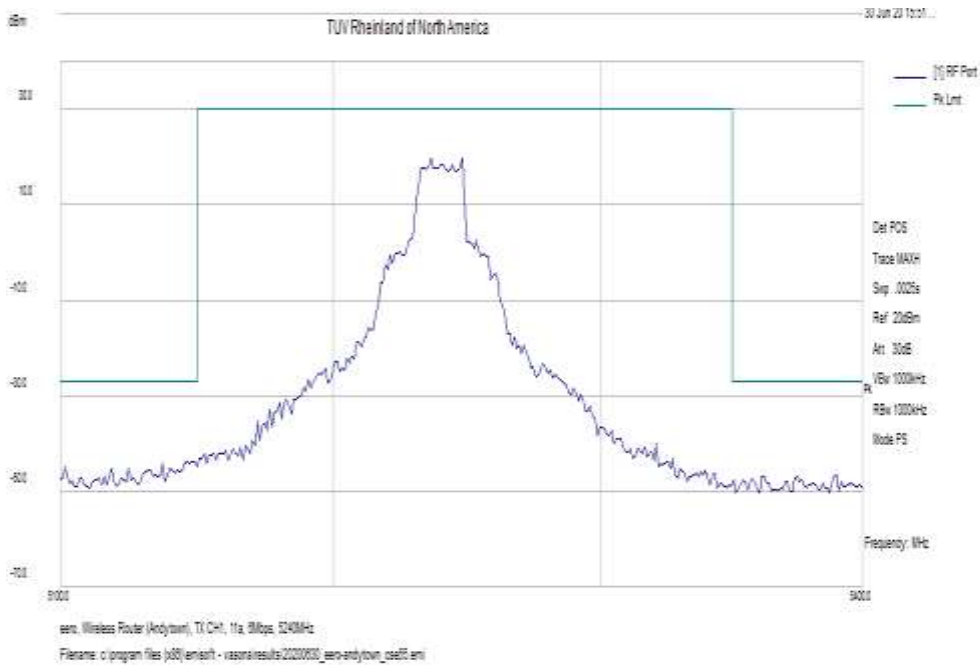


Figure 77: Measured Band-edge for 802.11a-6 Mbps at 5240 MHz, Ch 1

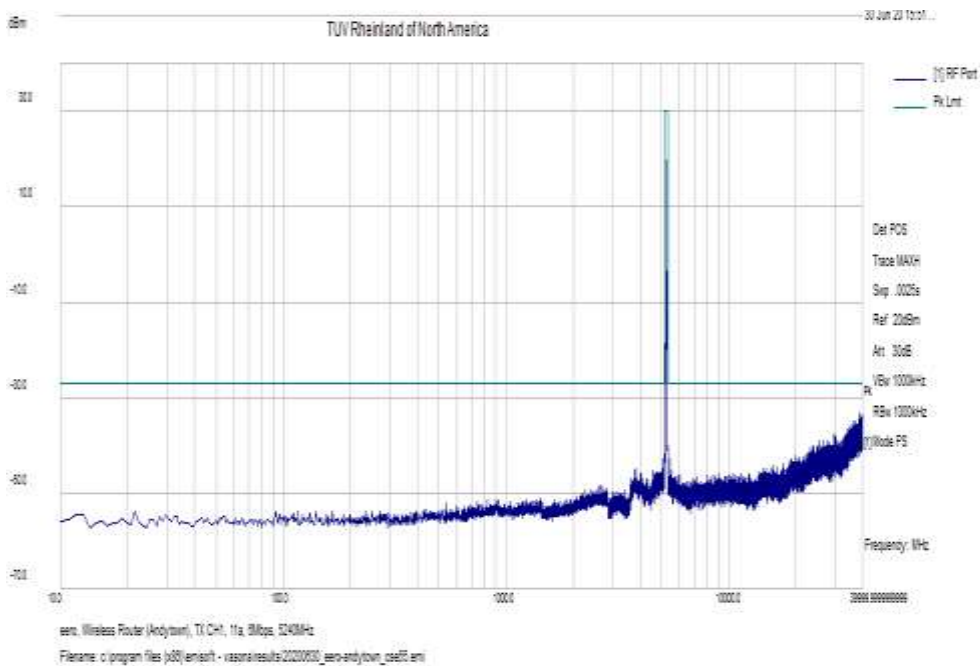


Figure 78: Undesirable Emission for 802.11a-6 Mbps at 5240 MHz, Ch 1

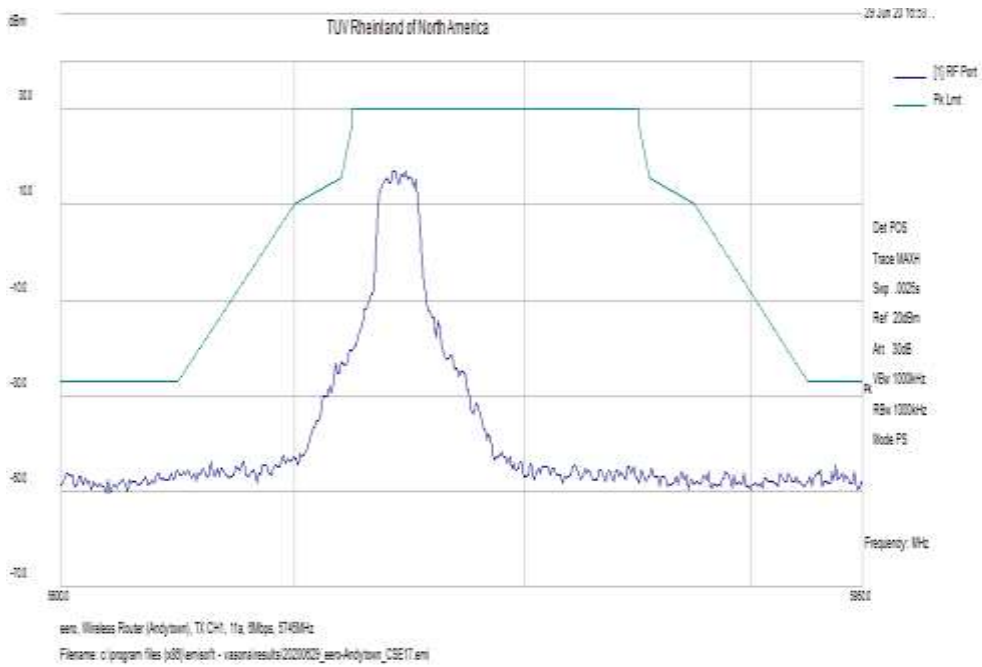


Figure 79: Measured Band-edge for 802.11a-6 Mbps at 5745 MHz, Ch 1

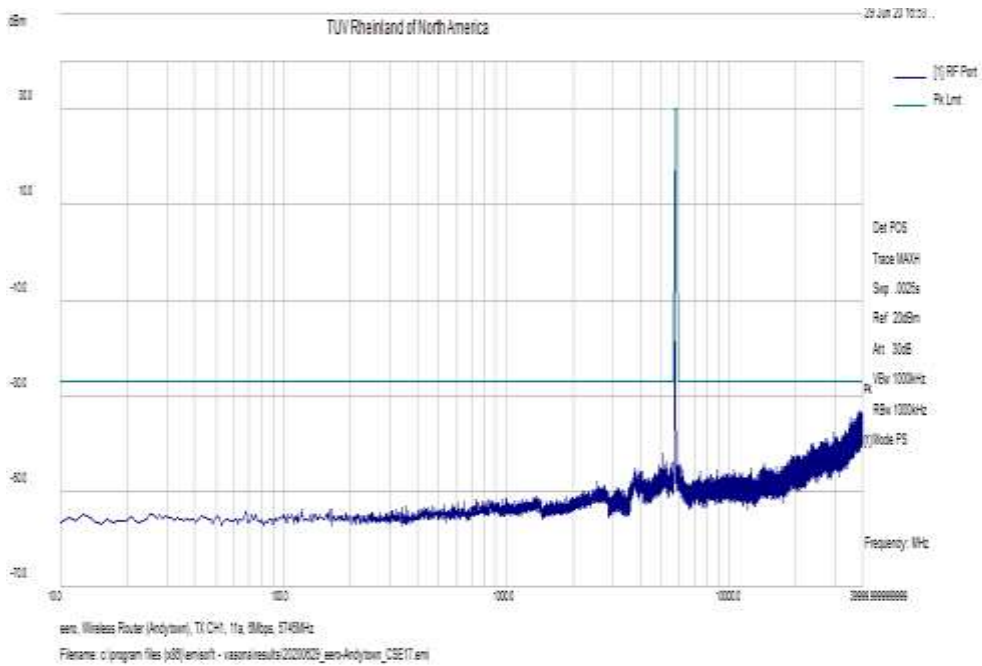


Figure 80: Undesirable Emission for 802.11a-6 Mbps at 5745 MHz, Ch 1

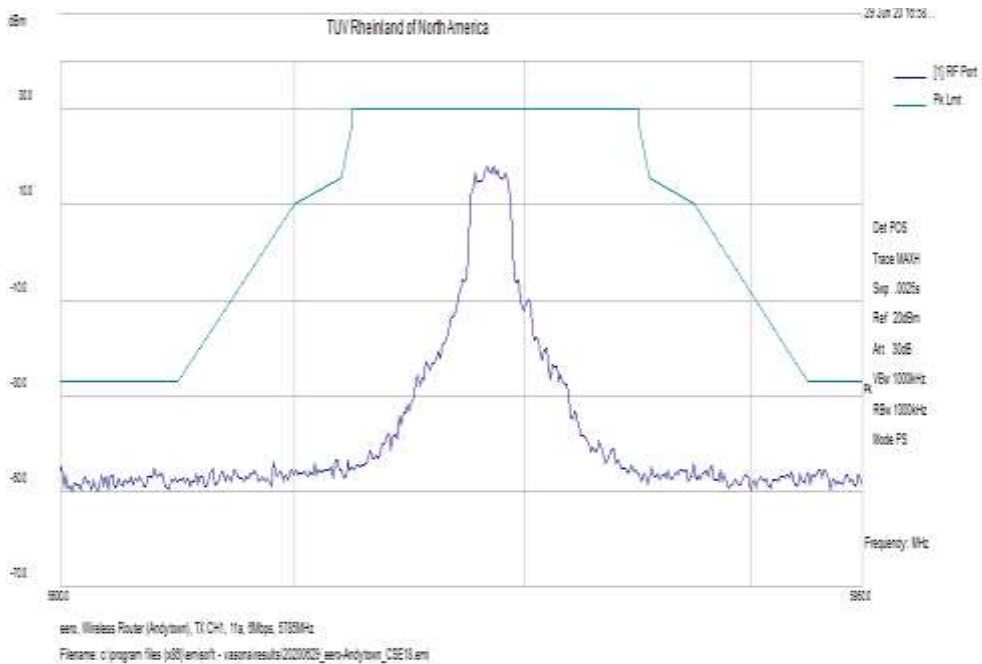


Figure 81: Measured Band-edge for 802.11a-6 Mbps at 5785 MHz, Ch 1

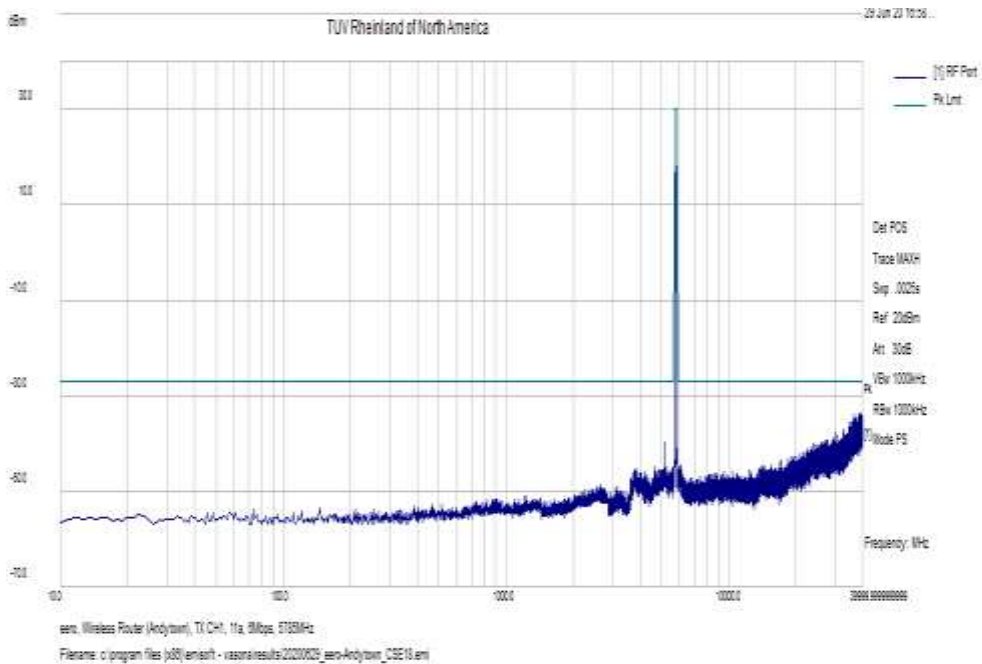


Figure 82: Undesirable Emission for 802.11a-6 Mbps at 5785 MHz, Ch 1

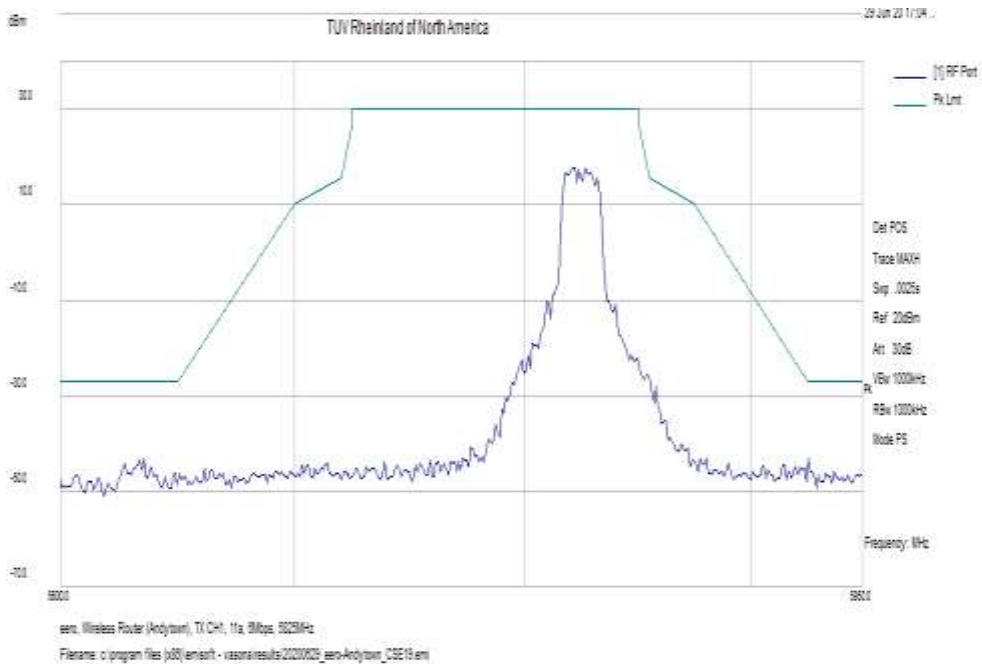


Figure 83: Measured Band-edge for 802.11a-6 Mbps at 5825 MHz, Ch 1

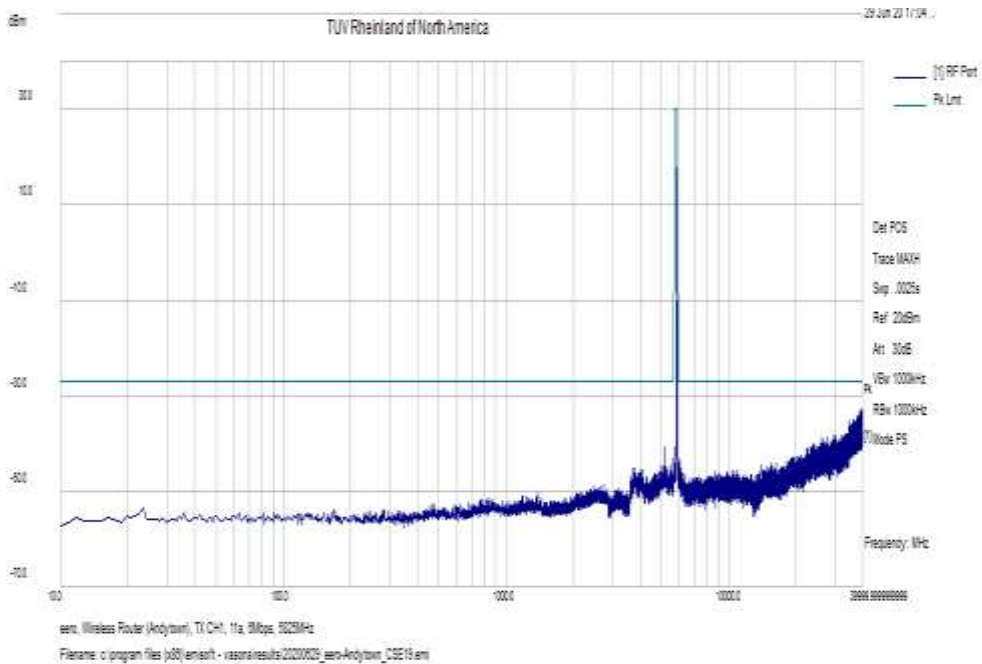


Figure 84: Undesirable Emission for 802.11a-6 Mbps at 5825 MHz, Ch 1

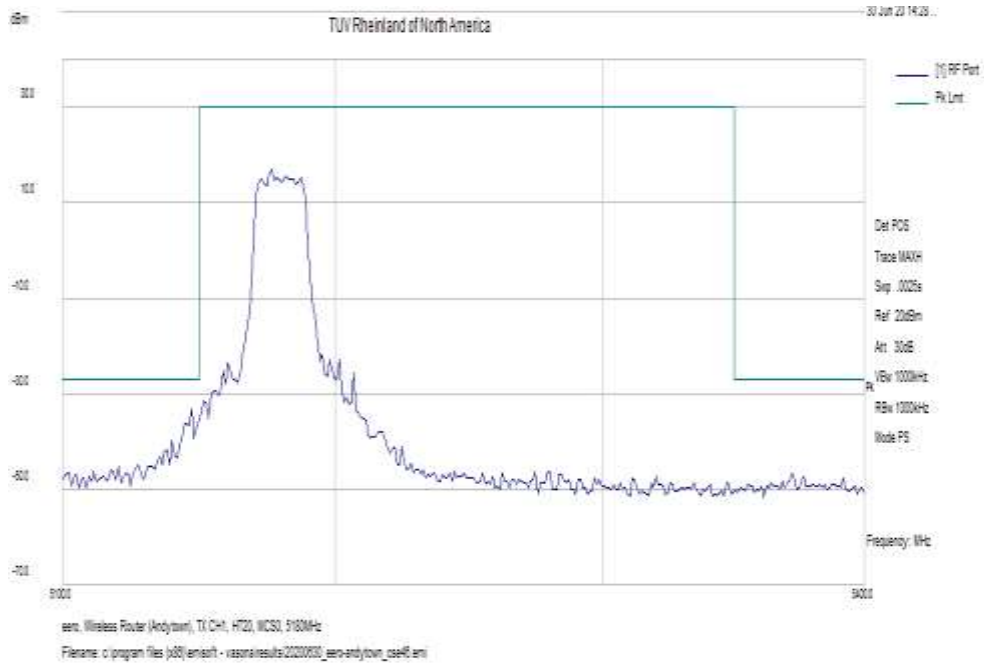


Figure 85: Measured Band-edge for HT20-MCS0 at 5180 MHz, Ch 1

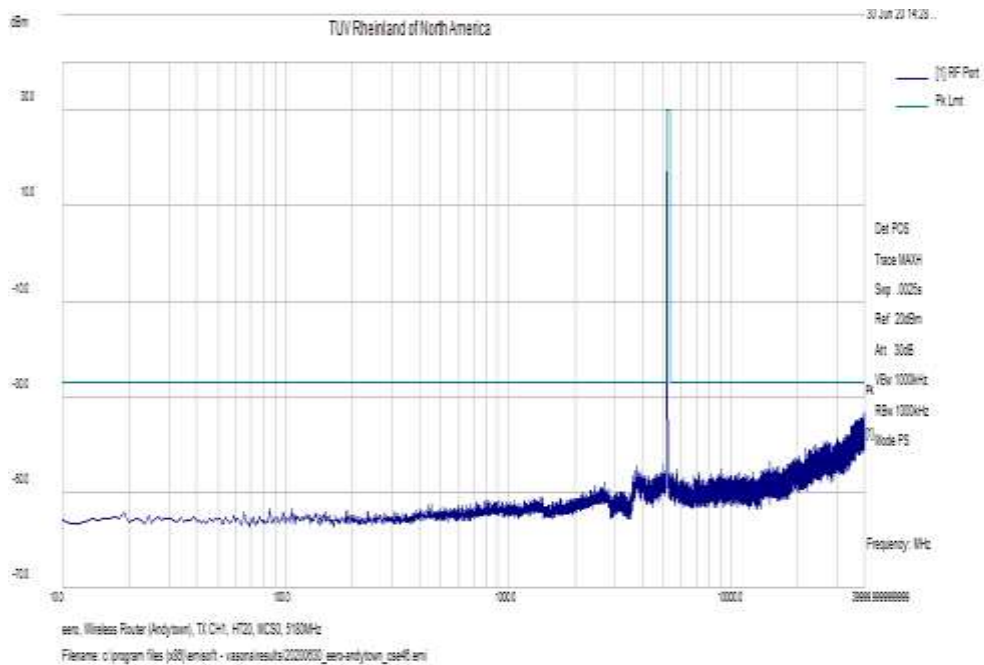


Figure 86: Undesirable Emission for HT20-MCS0 at 5180 MHz, Ch 1

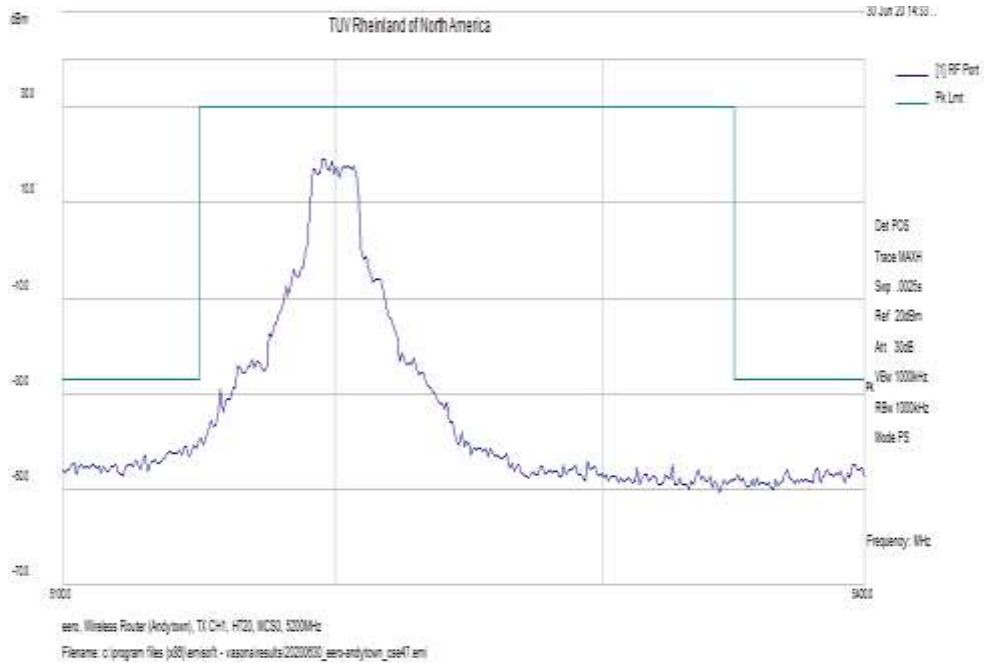


Figure 87: Measured Band-edge for HT20-MCS0 at 5200 MHz, Ch 1

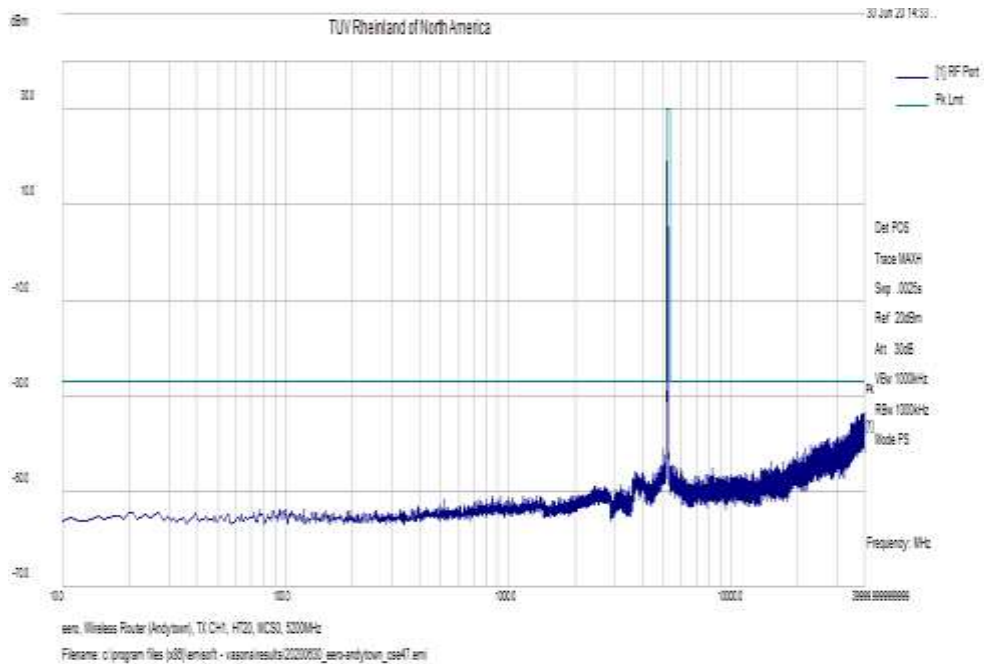


Figure 88: Undesirable Emission for HT20-MCS0 at 5200 MHz, Ch 1

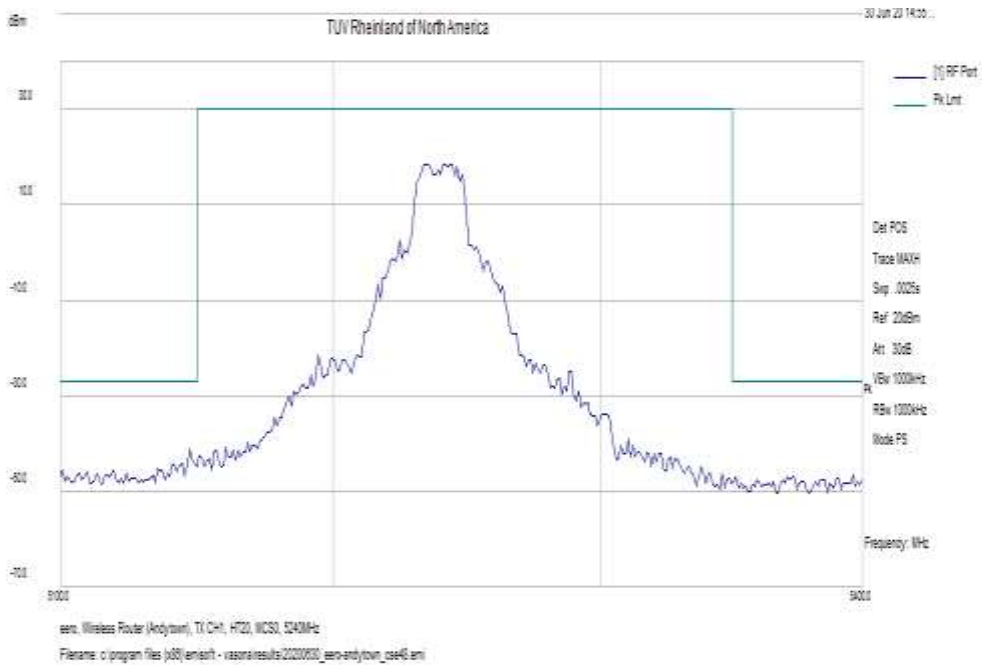


Figure 89: Measured Band-edge for HT20-MCS0 at 5240 MHz, Ch 1

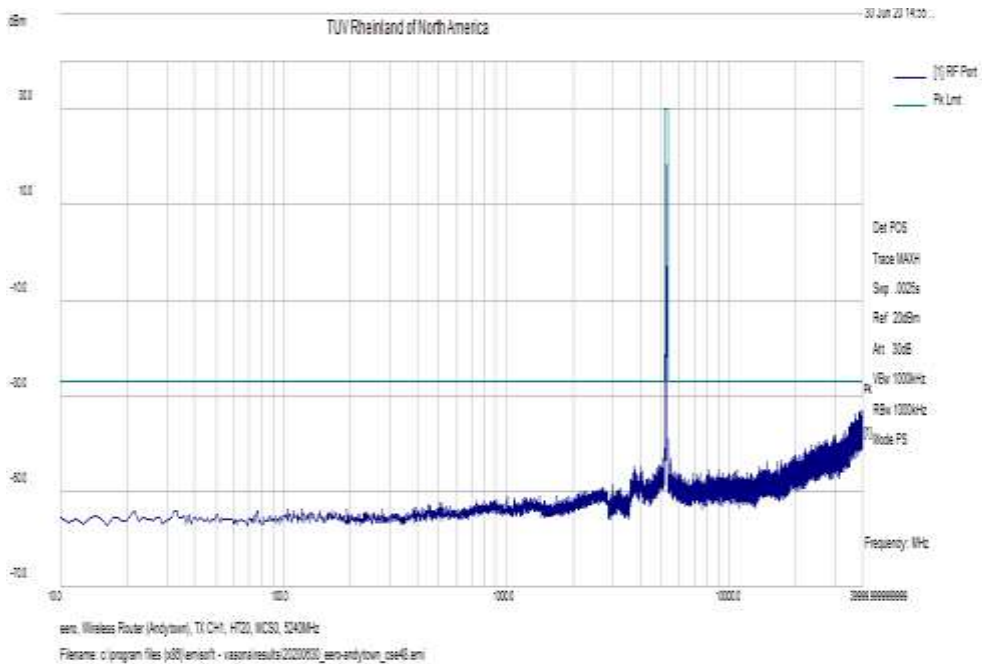


Figure 90: Undesirable Emission for HT20-MCS0 at 5240 MHz, Ch 1

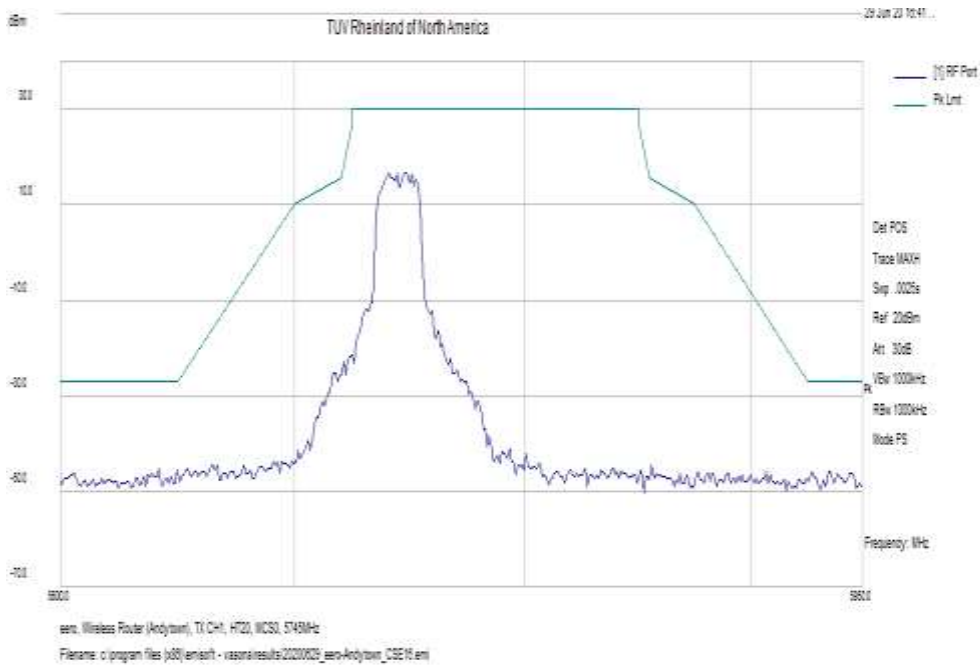


Figure 91: Measured Band-edge for HT20-MCS0 at 5745 MHz, Ch 1

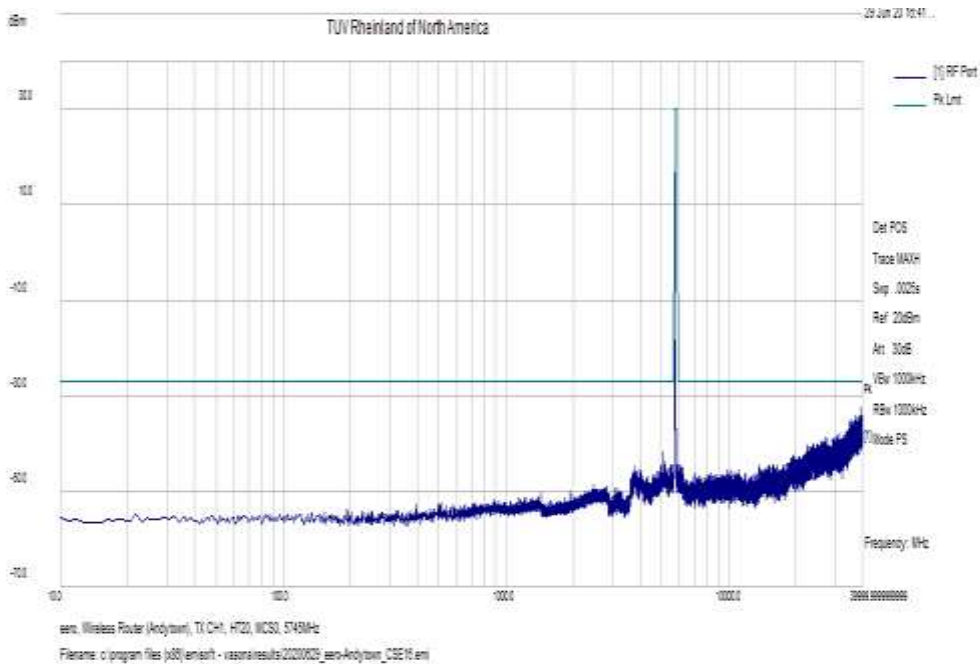


Figure 92: Undesirable Emission for HT20-MCS0 at 5745 MHz, Ch 1

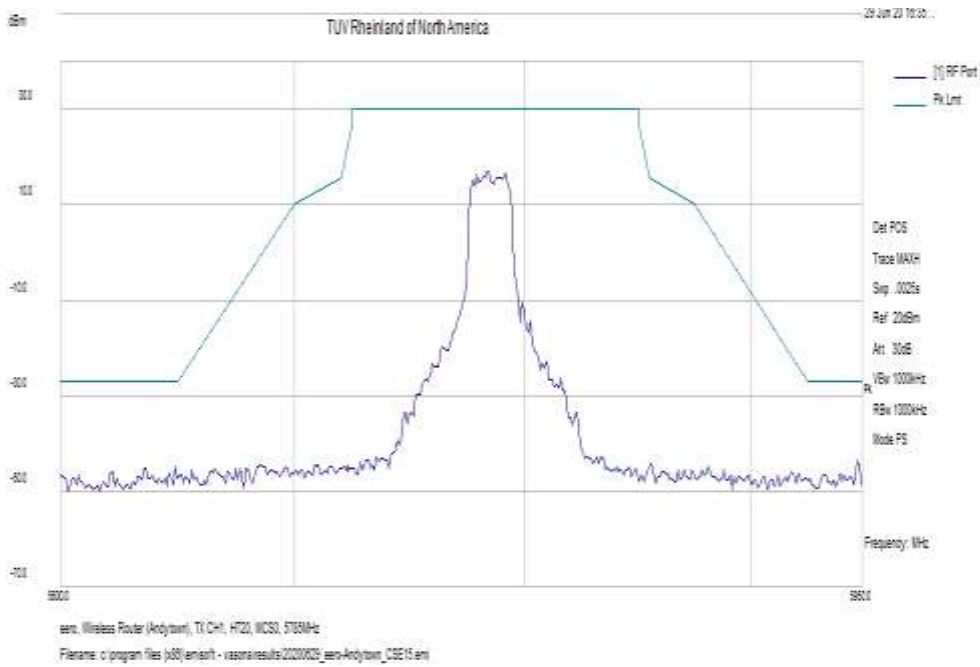


Figure 93: Measured Band-edge for HT20-MCS0 at 5785 MHz, Ch 1

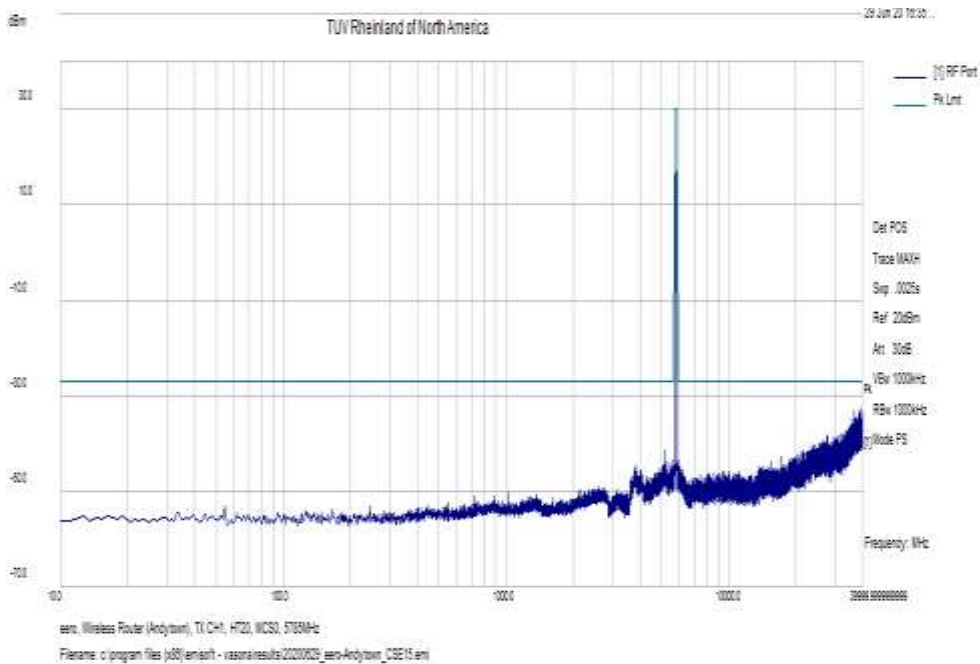


Figure 94: Undesirable Emission for HT20-MCS0 at 5785 MHz, Ch 1

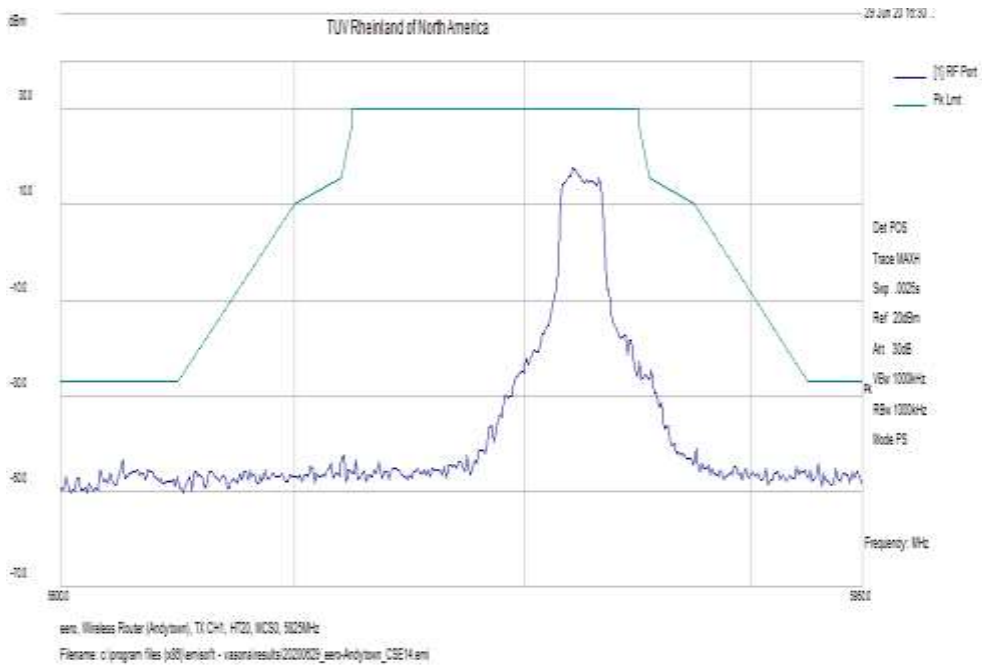


Figure 95: Measured Band-edge for HT20-MCS0 at 5825 MHz, Ch 1

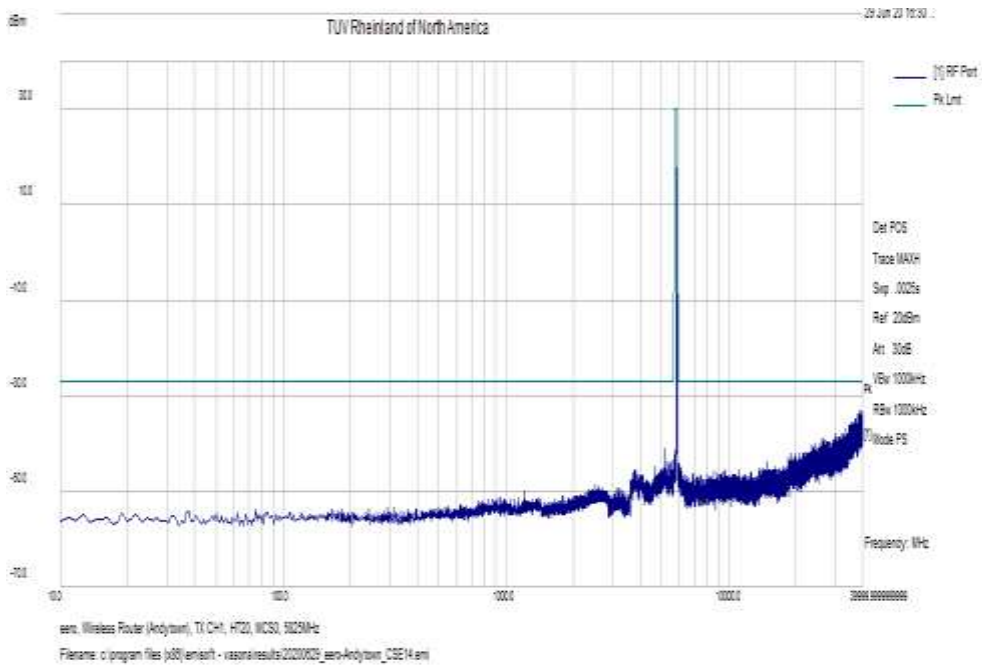


Figure 96: Undesirable Emission for HT20-MCS0 at 5825 MHz, Ch 1

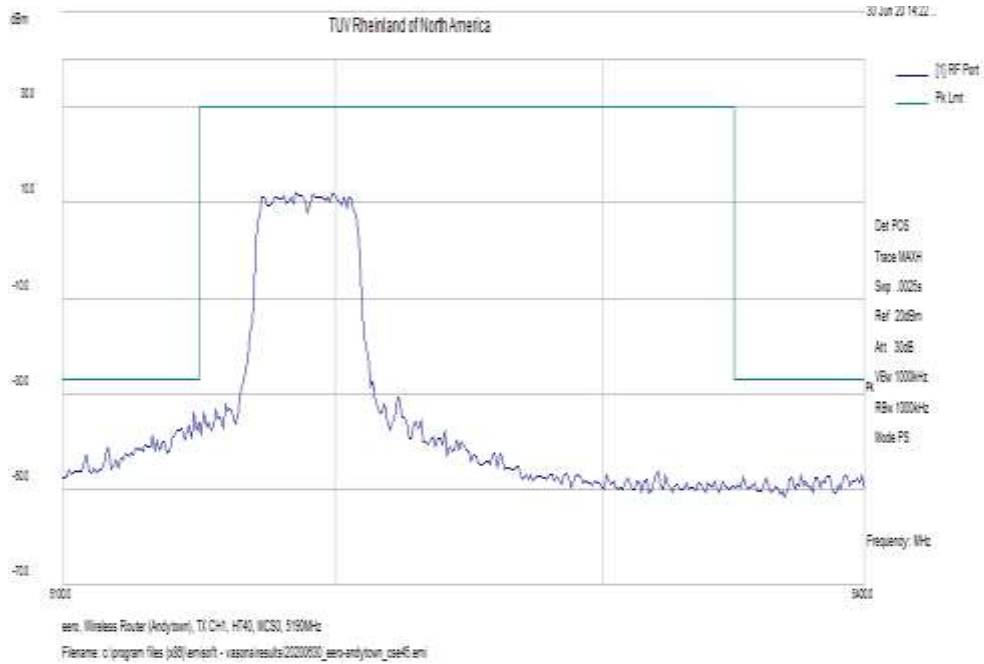


Figure 97: Measured Band-edge for HT40-MCS0 at 5190 MHz, Ch 1

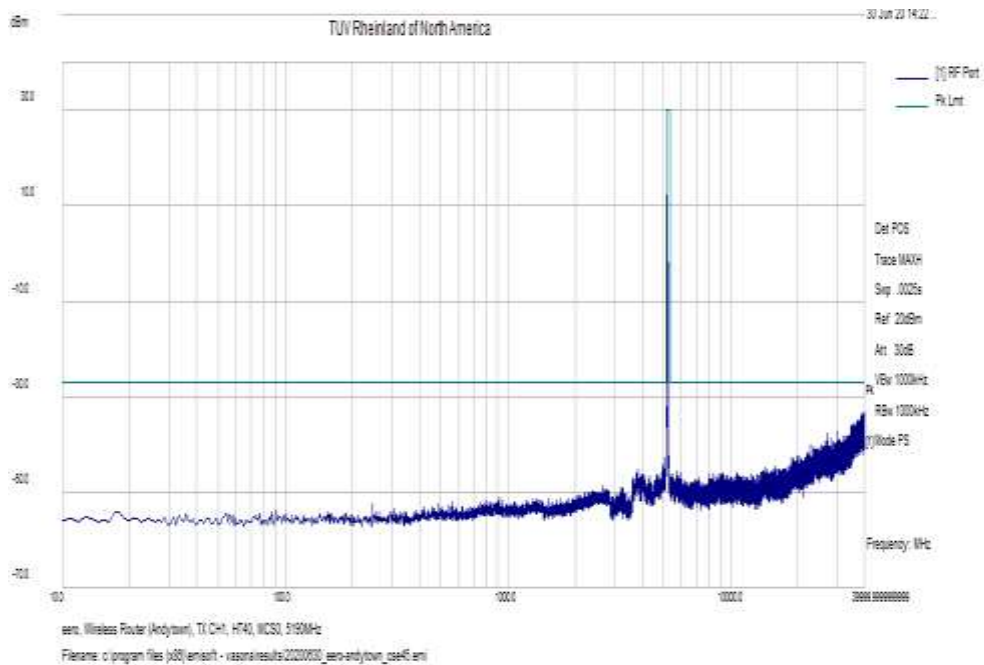


Figure 98: Undesirable Emission for HT40-MCS0 at 5190 MHz, Ch 1

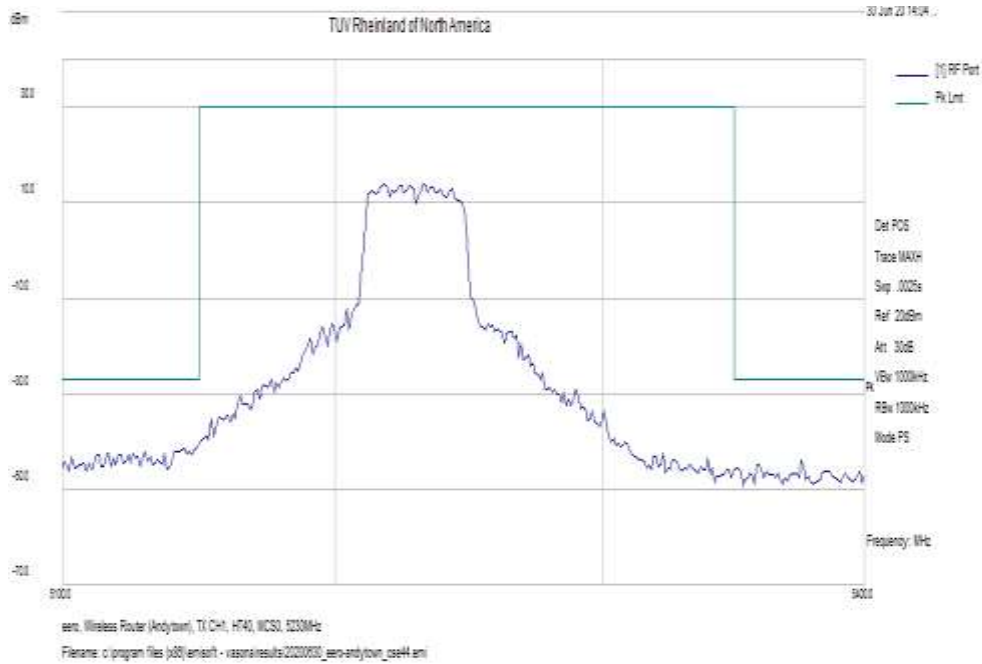


Figure 99: Measured Band-edge for HT40-MCS0 at 5230 MHz, Ch 1

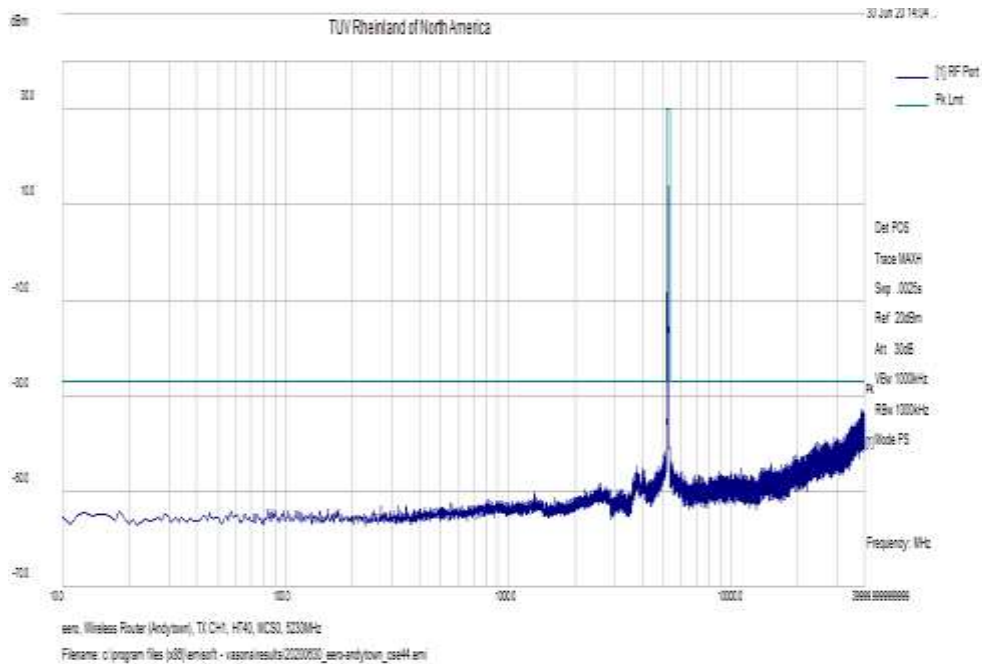


Figure 100: Undesirable Emission for HT40-MCS0 at 5230 MHz, Ch 1

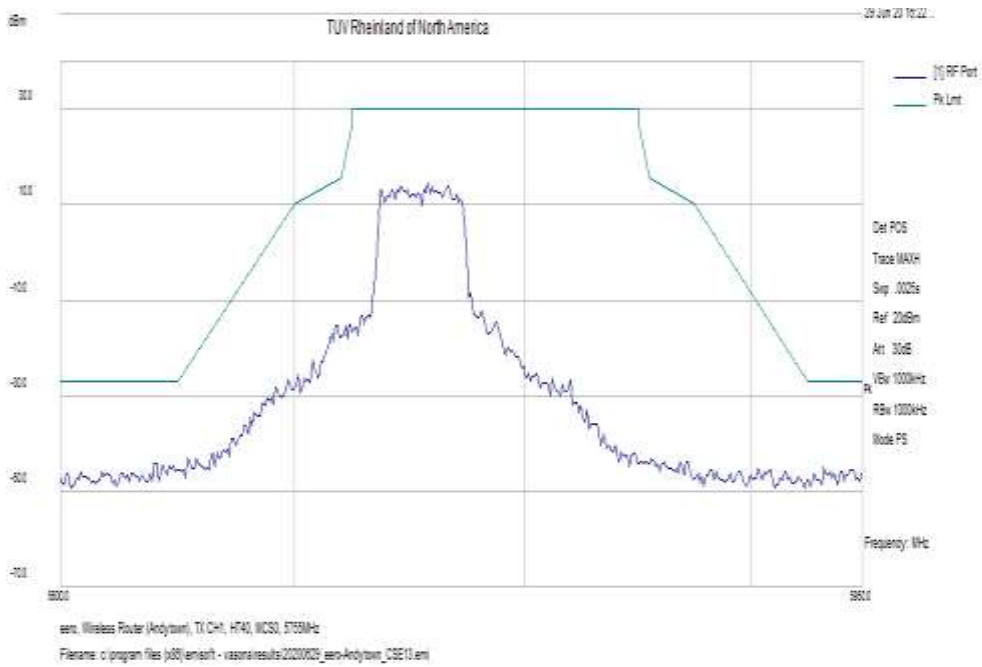


Figure 101: Measured Band-edge for HT40-MCS0 at 5755 MHz, Ch 1

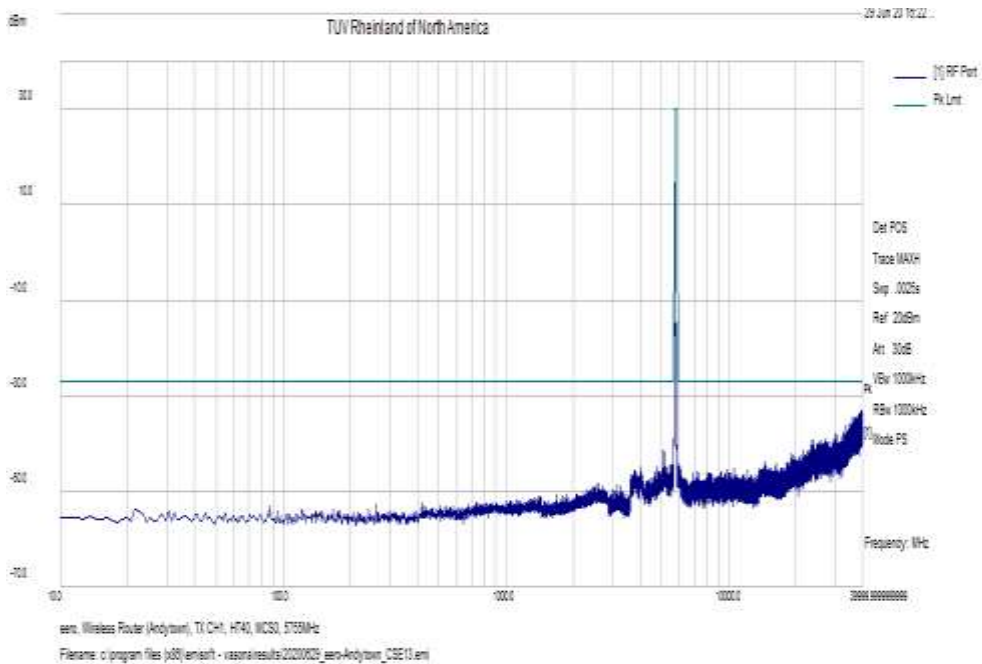


Figure 102: Undesirable Emission for HT40-MCS0 at 5755 MHz, Ch 1

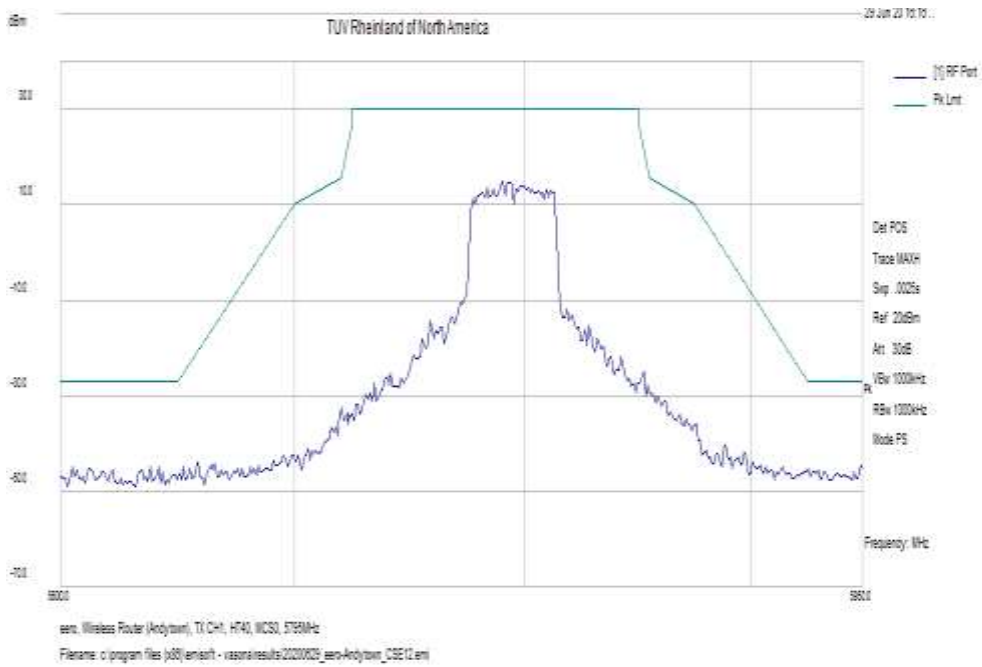


Figure 103: Measured Band-edge for HT40-MCS0 at 5795 MHz, Ch 1

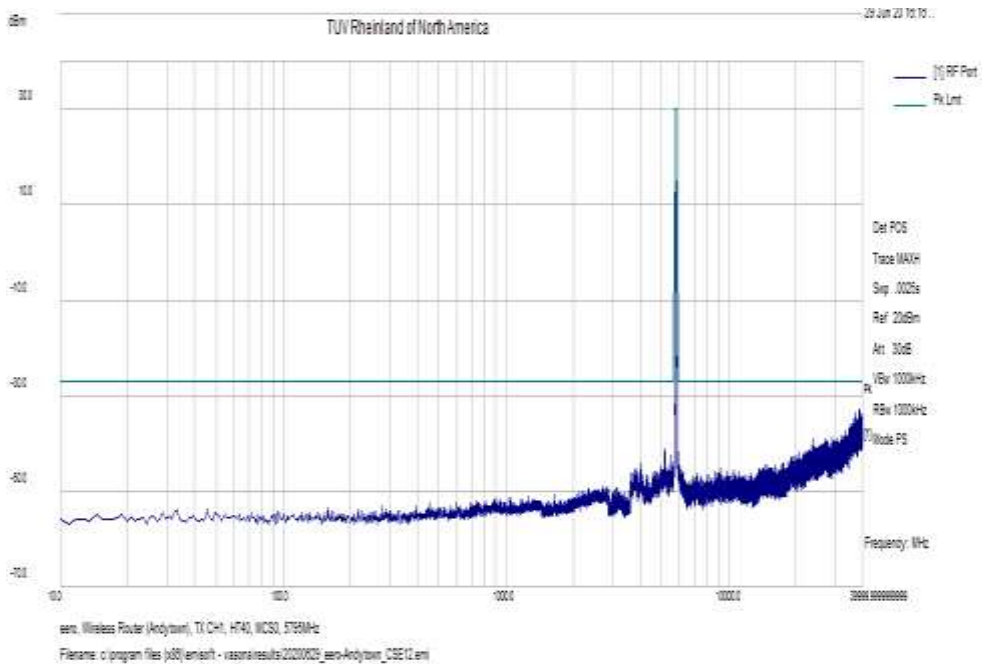


Figure 104: Undesirable Emission for HT40-MCS0 at 5795 MHz, Ch 1

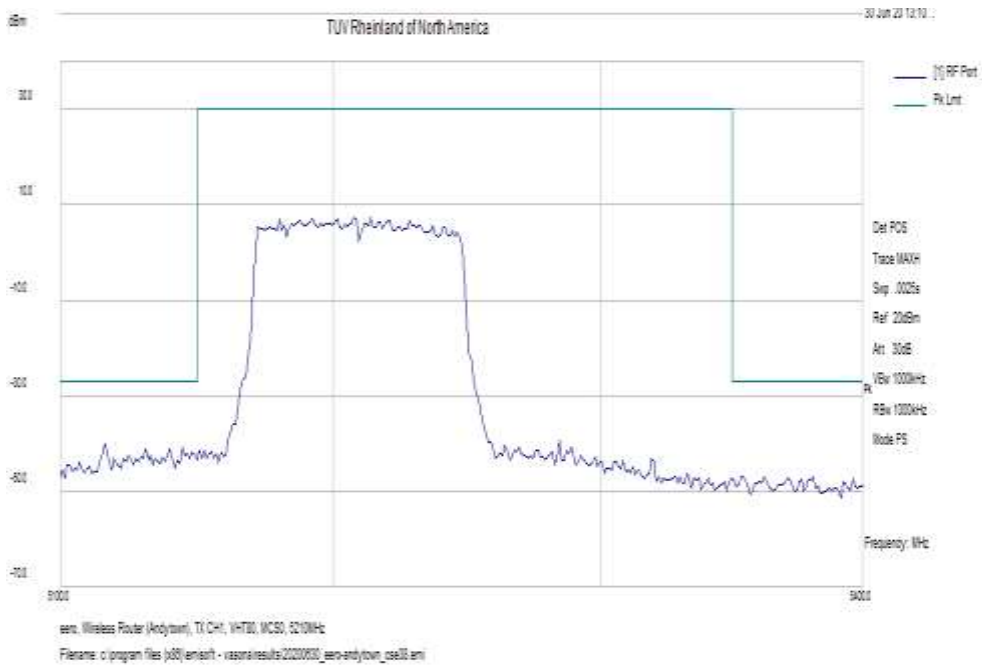


Figure 105: Measured Band-edge for VHT80-MCS0 at 5210 MHz, Ch 1

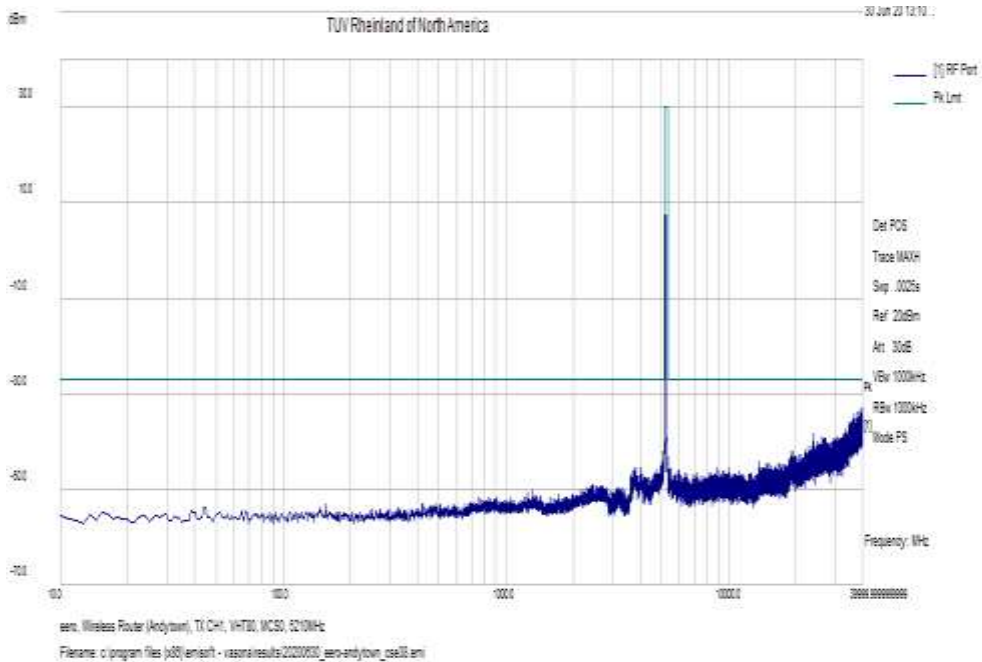


Figure 106: Undesirable Emission for VHT80-MCS0 at 5210 MHz, Ch 1

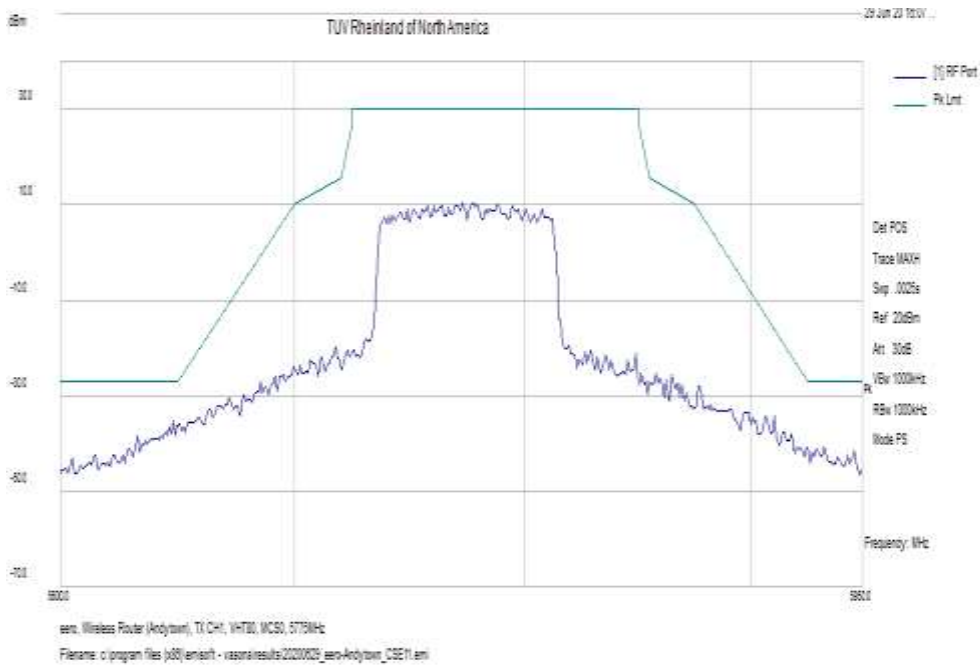


Figure 107: Measured Band-edge for VHT80-MCS0 at 5775 MHz, Ch 1

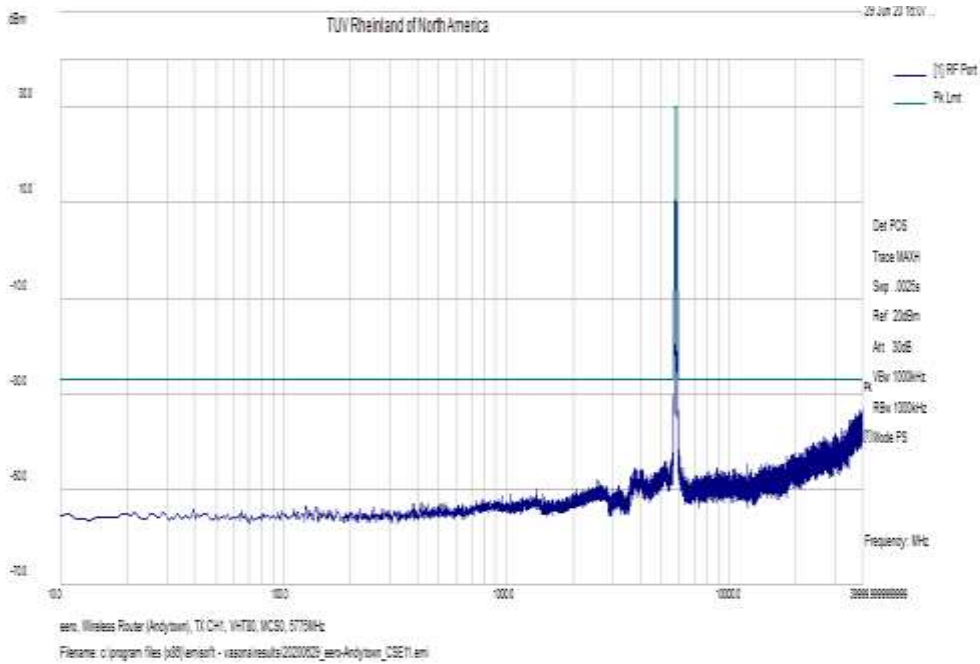


Figure 108: Undesirable Emission for VHT80-MCS0 at 5775 MHz, Ch 1

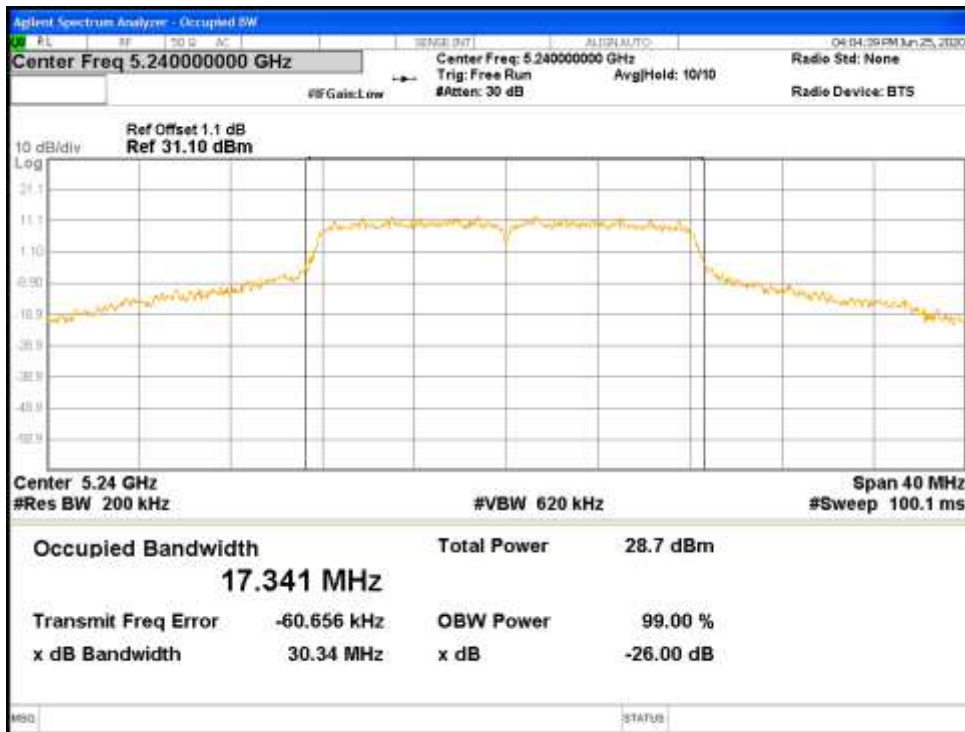


Figure 109: Measured In-Band-edge for 802.11a-6 Mbps at 5240 MHz, Ch 1

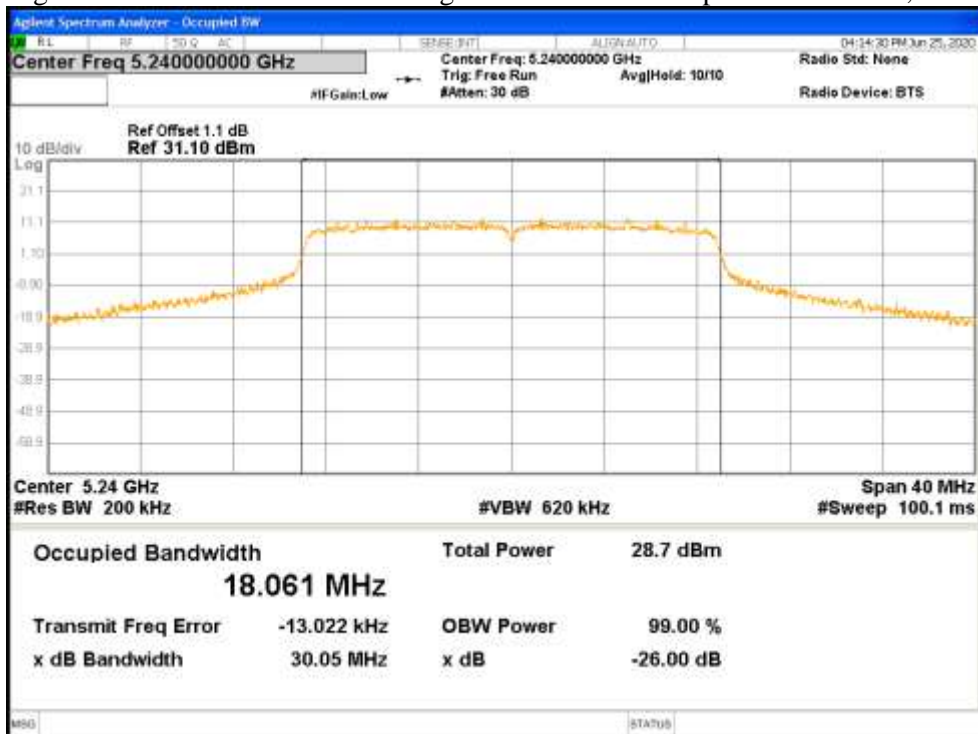


Figure 110: Measured In-Band-edge for 802.11n HT20-MCS0 at 5240 MHz, Ch 1

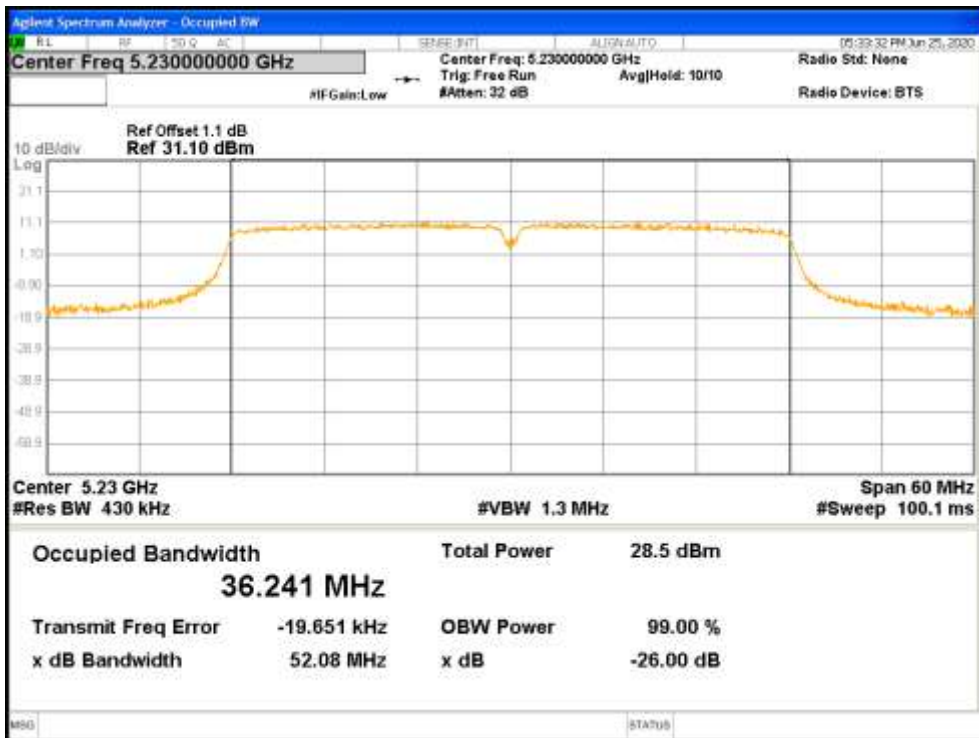


Figure 111: Measured In-Band-edge for 802.11n HT40-MCS0 at 5230 MHz, Ch 1

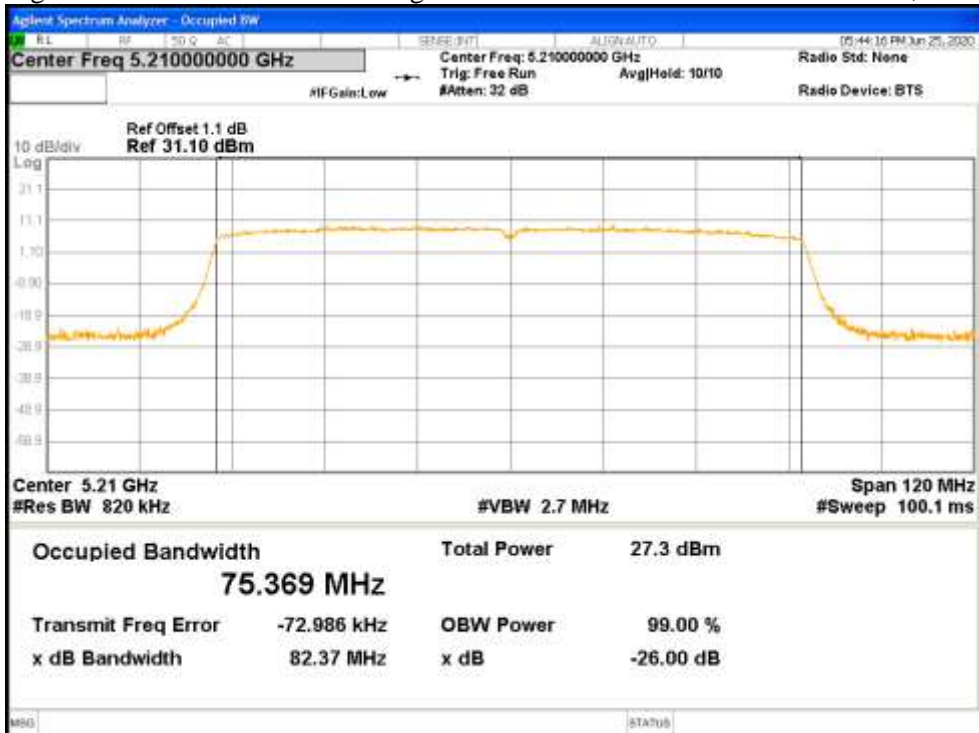


Figure 112: Measured In-Band-edge for 802.11ac VHT80-MCS0 at 5210 MHz, Ch 1

4.5 Transmitter Spurious Emissions

Transmitter spurious emissions are emissions outside the frequency range of the equipment when the equipment is in transmit mode; per requirement of CFR47 15.205:2020, 15.209:2020, 15.407(b):2020, RSS 247 Sect. 6:2017, RSS GEN Sect.8.9 and 8.10:2019

4.5.1 Test Methodology

4.5.1.1 Preliminary Test

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. The frequency range of interest was divided into sub-ranges to yield a frequency resolution of approximately 120 kHz and provide a reading at each frequency for no more than 12° of turntable rotation. For each frequency sub-range the turntable was rotated 360° while peak emission data was recorded and plotted over the frequency range of interest in horizontal and vertical antenna polarization's.

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm (<1 GHz) and 150cm (>1 GHz) above the floor. The EUT was positioned as shown in the setup photographs. The receiving antenna was placed at a distance of 3m at a fixed height of 1m. Measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT.

Pres-scans were performed to determine the worst, data rate / chains for 802.11a, 802.11n (HT20 and HT40) and 802.11ac (VHT80).

4.5.1.2 Final Test

For each frequency measured, the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation. The six highest emissions relative to the limit were measured unless such emissions were more than 20 dB below the limit. If less than six emissions are within 20 dB of the limit, than the noise level of the receiver is measured at frequencies where emissions are expected. Multiples of all oscillator and microprocessor frequencies were also checked.

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm (<1 GHz) and 150cm (>1 GHz) above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

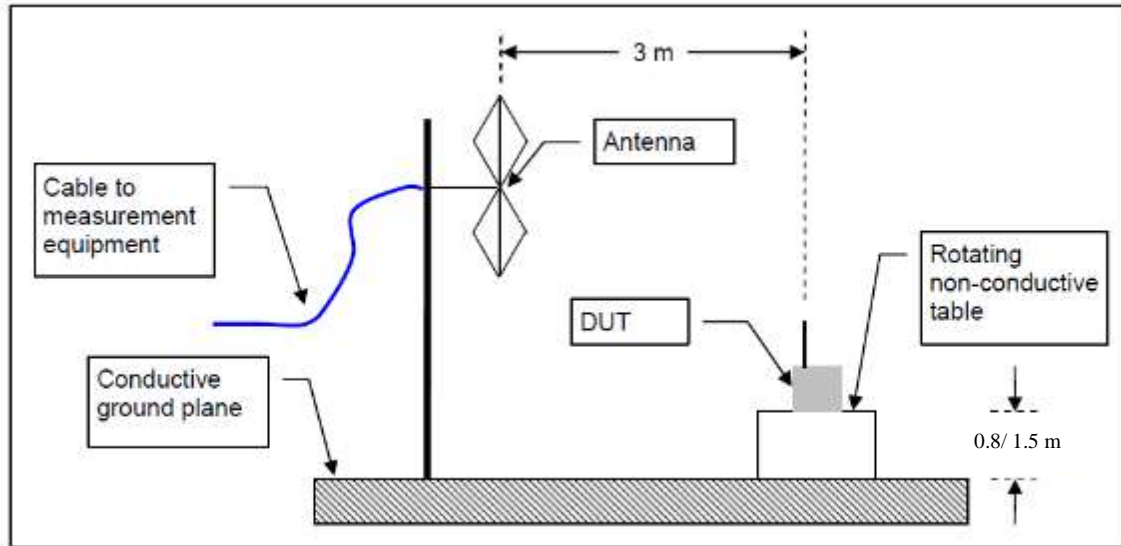
Final results are:

802.11a at 6 Mbps and 802.11n (HT20 and HT40) at MCS0 and 802.11ac (VHT80) at MCS0.

4.5.1.3 Deviations

None.

Test Setup:



4.5.2 Transmitter Spurious Emission Limit

The spurious emissions of the transmitter shall not exceed the values in CFR47 Part 15.205, 15.209, RSS 247 Sect. 6, RSS GEN Sect. 8.9 and 8.10

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

According to CFR47 15.407 (b) and RSS 247 Sect. 6.2, all harmonics and spurious emissions which are outside the 5150 MHz - 5250 MHz, 5250 MHz – 5350 MHz, or 5470 MHz – 5725 MHz shall not exceed -27 dBm/MHz. This is equivalent to 68.2 dBuV/m at 3 meter distance.

4.5.3 Results

The final measurement data was taken under the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and test plan.

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

Table 15: Transmit Spurious Emissions at Band-Edge Requirements

Date: June 18, 2020					Tested By: Kerwinn Corpuz				
Test Method: Radiated Measurements					Power Setting: See test plan.				
Antenna Type: FPCB					Max Antenna Gain: 3.42 dBi				
Operating Mode: Uncorrelated					Signal State: Modulated at 92.3% (11a), 93.2% (HT20), 95.7% (HT40 & VHT80)				
Ambient Temp.: 20 °C					Relative Humidity: 36%				
Band-Edge Results for 5150 MHz									
Freq. (MHz)	Level (dBuV/m)	Pol. (H/V)	Limit (dBuV/m)	Margin (dB)	Det.	Table Deg.	Tower (cm)	Note	
5146.71	67.20	V	74.00	-6.80	Pk	262	166	5180MHz-11a-6Mbps-TP41-Ch0 & 1	
5150.00	53.18	V	54.00	-0.82	Ave	262	166	5180MHz-11a-6Mbps-TP41-Ch0 & 1	
5150.00	67.94	H	74.00	-6.06	Pk	158	190	5180MHz-11a-6Mbps-TP41-Ch0 & 1	
5150.00	53.79	H	54.00	-0.21	Ave	158	190	5180MHz-11a-6Mbps-TP41-Ch0 & 1	
5149.84	66.07	V	74.00	-7.93	Pk	265	151	5180MHz-HT20-MCS0-TP41-Ch0 & 1	
5149.84	51.45	V	54.00	-2.55	Ave	265	151	5180MHz-HT20-MCS0-TP41-Ch0 & 1	
5149.72	67.61	H	74.00	-6.39	Pk	154	206	5180MHz-HT20-MCS0-TP41-Ch0 & 1	
5149.80	52.78	H	54.00	-1.22	Ave	154	206	5180MHz-HT20-MCS0-TP41-Ch0 & 1	
5149.40	66.02	V	74.00	-7.98	Pk	264	159	5190MHz-HT40-MCS0-TP38-Ch0 & 1	
5150.00	51.59	V	54.00	-2.41	Ave	264	159	5190MHz-HT40-MCS0-TP38-Ch0 & 1	
5149.80	68.70	H	74.00	-5.30	Pk	176	231	5190MHz-HT40-MCS0-TP38-Ch0 & 1	
5150.00	53.40	H	54.00	-0.60	Ave	176	231	5190MHz-HT40-MCS0-TP38-Ch0 & 1	
5143.13	68.86	V	74.00	-5.14	Pk	262	171	5210MHz-VHT80-MCS0-TP37-Ch0 & 1	
5143.55	52.80	V	54.00	-1.20	Ave	262	171	5210MHz-VHT80-MCS0-TP37-Ch0 & 1	
5148.04	68.55	H	74.00	-5.45	Pk	172	239	5210MHz-VHT80-MCS0-TP37-Ch0 & 1	
5150.00	53.77	H	54.00	-0.23	Ave	172	239	5210MHz-VHT80-MCS0-TP37-Ch0 & 1	
<p>Note: 1. Band-edge frequencies were evaluated at 5150 MHz since 5250-5350 MHz is not a restricted band. 2. All of the band-edge measurements met the restricted band requirements of CFR47 15.205. 3. For 5250 MHz In-band-edge, refer to Section 4.4.2. 4. Since the band-edge measurements have margins in the presence of in-band leakage, the band-edge plots were captured with the spectrum analyzer's span wider than 2 MHz. 5. The Duty Cycle Factor is added into the test equipment reference level offset accordingly. 6. Refer to Figure 113 – 128 for above configuration plots.</p>									

Table 16: Transmit Spurious Emissions at Band-Edge Requirements Continued

Date: June 19, 2020				Tested By: Kerwinn Corpuz				
Test Method: Radiated Measurements				Power Setting: See test plan.				
Antenna Type: FPCB				Max Antenna Gain: 4.17 dBi				
Operating Mode: Uncorrelated				Signal State: Modulated at 92.3% (11a), 93.2% (HT20), 95.7% (HT40 & VHT80)				
Ambient Temp.: 20 °C				Relative Humidity: 37%				
Band-Edge Results for 5725 MHz to 5850 MHz								
Freq. (MHz)	Level (dBuV/m)	Pol. (H/V)	Limit (dBuV/m)	Margin (dB)	Det.	Table Deg.	Tower (cm)	Note
5938.08	66.26	V	68.23	-1.97	Pk	75	206	5745MHz-11a-6Mbps-TP45-Ch0 & 1
5626.15	65.98	H	68.23	-2.25	Pk	210	155	5745MHz-11a-6Mbps-TP45-Ch0 & 1
5945.09	66.46	V	68.23	-1.77	Pk	238	175	5825MHz-11a-6Mbps-TP45-Ch0 & 1
5930.36	66.45	H	68.23	-1.78	Pk	207	165	5825MHz-11a-6Mbps-TP45-Ch0 & 1
5942.99	67.04	V	68.23	-1.19	Pk	71	208	5745MHz-HT20-MCS0-TP43-Ch0 & 1
5621.94	65.41	H	68.23	-2.82	Pk	215	156	5745MHz-HT20-MCS0-TP43-Ch0 & 1
5942.99	66.88	V	68.23	-1.35	Pk	236	179	5825MHz-HT20-MCS0-TP44-Ch0 & 1
5926.85	66.59	H	68.23	-1.64	Pk	199	168	5825MHz-HT20-MCS0-TP44-Ch0 & 1
5648.93	67.08	V	68.23	-1.15	Pk	65	146	5755MHz-HT40-MCS0-TP45-Ch0 & 1
5636.47	67.67	H	68.23	-0.56	Pk	221	167	5755MHz-HT40-MCS0-TP45-Ch0 & 1
5936.67	67.37	V	68.23	-0.86	Pk	238	174	5795MHz-HT40-MCS0-TP45-Ch0 & 1
5933.87	67.32	H	68.23	-0.91	Pk	198	164	5795MHz-HT40-MCS0-TP45-Ch0 & 1
5646.12	66.95	V	68.23	-1.28	Pk	63	139	5775MHz-VHT80-MCS0-TP43-Ch0 & 1
5925.45	67.13	H	68.23	-1.10	Pk	223	162	5775MHz-VHT80-MCS0-TP43-Ch0 & 1
<p>Note: 1. The spectrum mask was evaluated at band-edge frequencies for the lowest and highest operating channels. 2. All of the band-edge measurements met the undesired emission limit, where -27dBm eirp is 68.2 dBuV/m at 3m. 3. Refer to Section 4.4.2 for additional undesired emissions at the band-edge. 4. The Duty Cycle Factor is added into the test equipment reference level offset accordingly. 4. Figures 129 to 142 show the full spectrum mask for the above configurations.</p>								

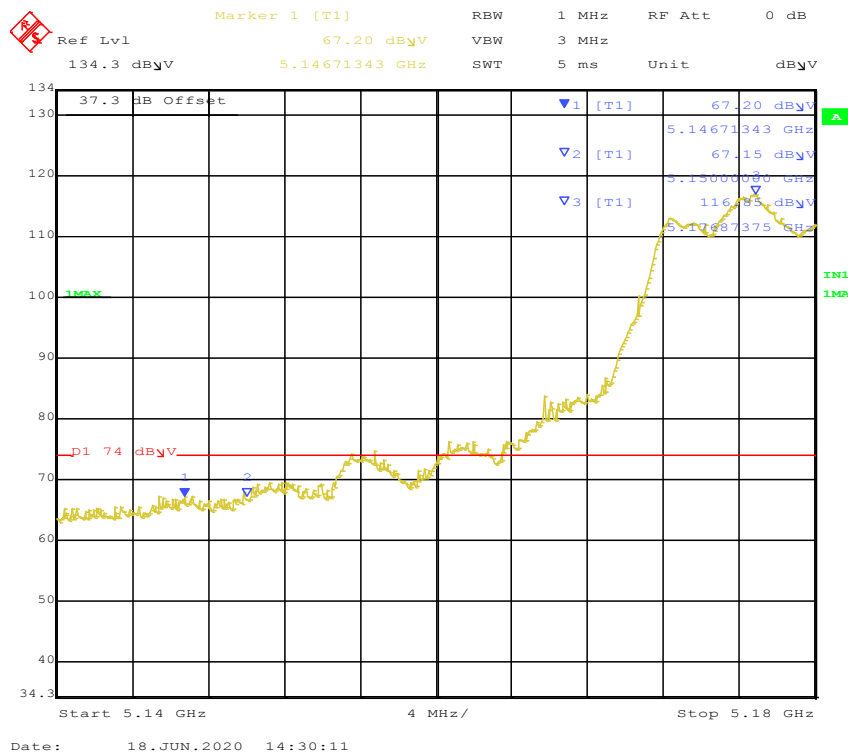


Figure 113: Radiated Emission 5150 MHz Edge for 802.11a 5180 MHz – Vert. (Pk)

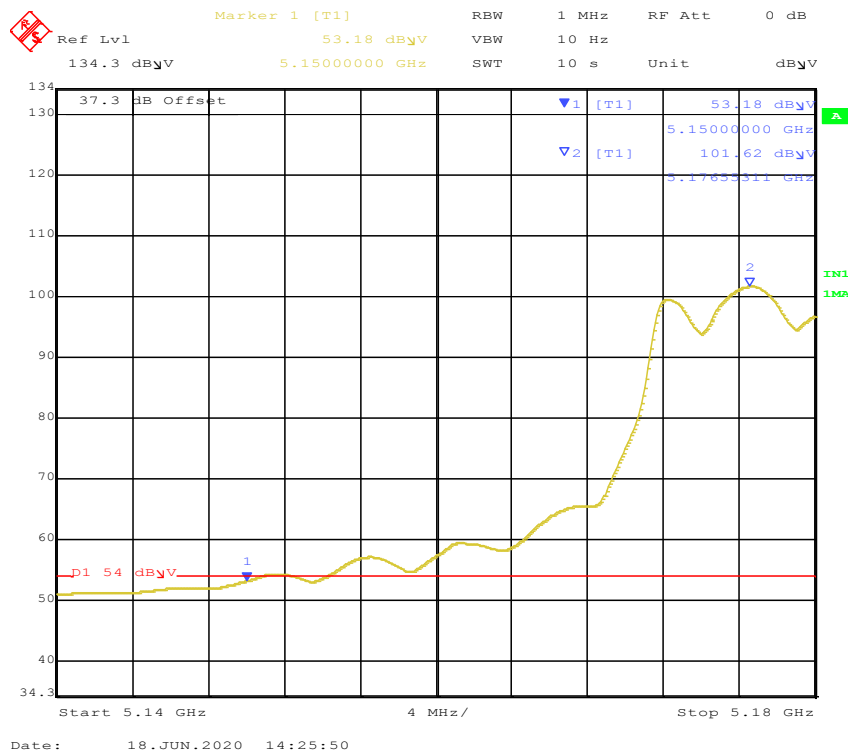


Figure 114: Radiated Emission 5150 MHz Edge for 802.11a 5180 MHz – Vert. (Ave)

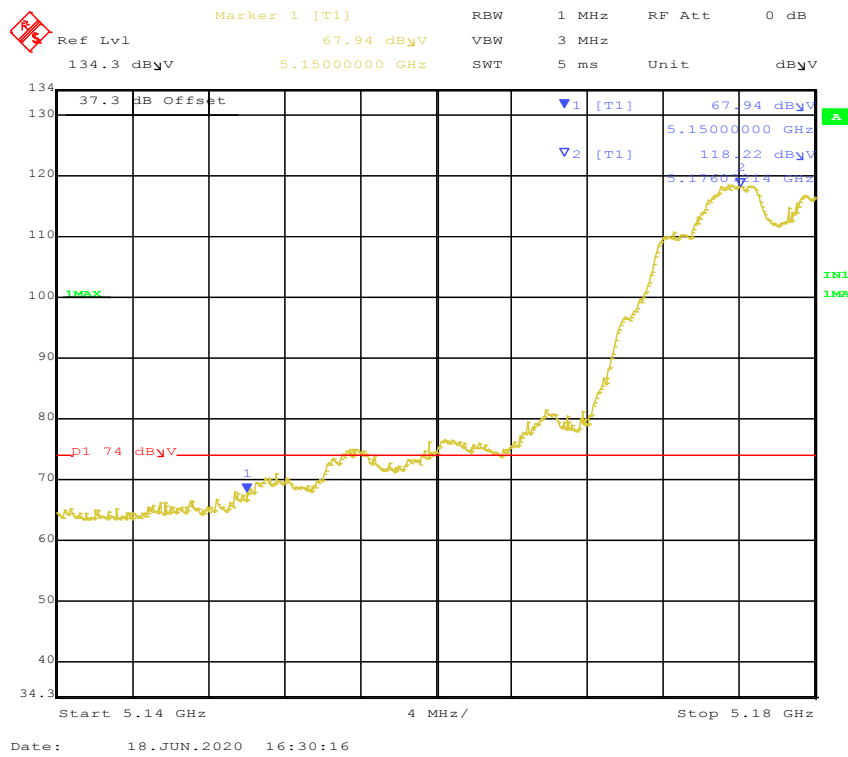


Figure 115: Radiated Emission 5150.0 MHz Edge for 802.11a 5180 MHz – Horiz. (Pk)

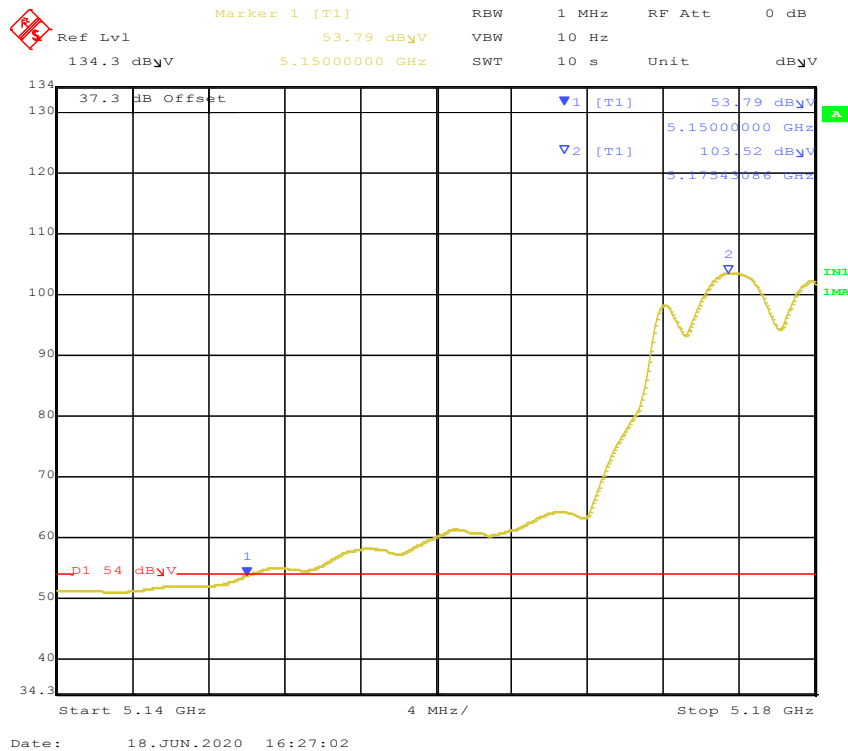


Figure 116: Radiated Emission 5150 MHz Edge for 802.11a 5180 MHz – Horiz. (Ave)

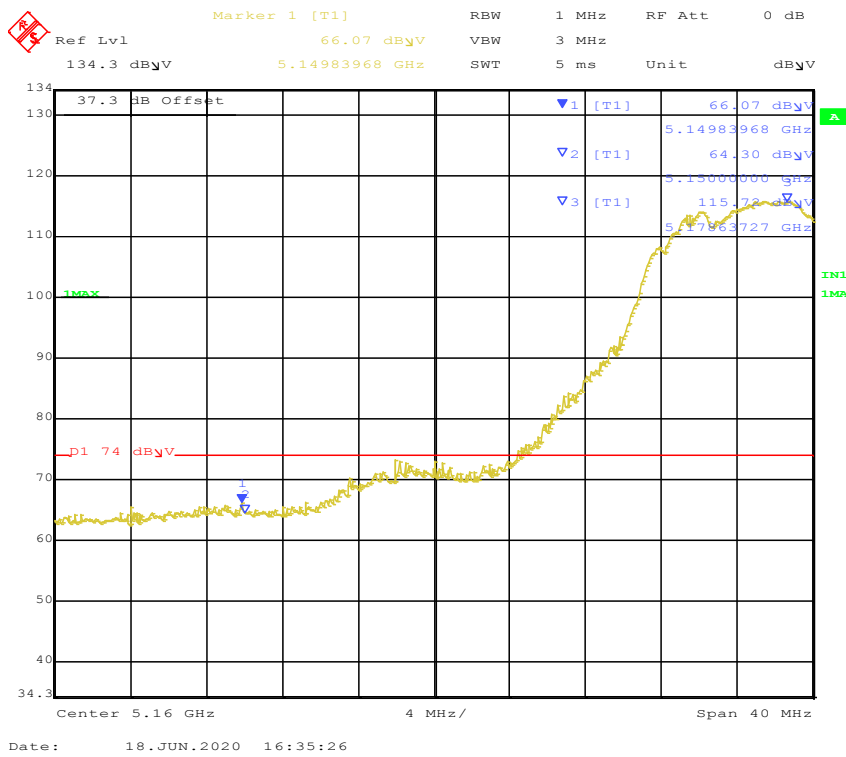


Figure 117: Radiated Emission 5150 MHz Edge for 802.11n HT20 5180 MHz – Vert. (Pk)

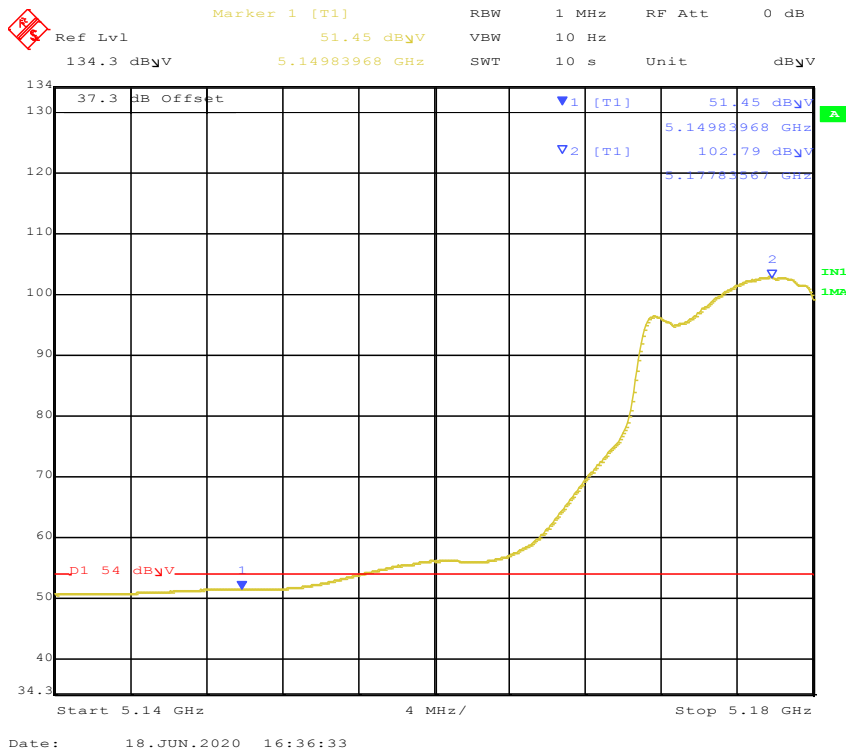


Figure 118: Radiated Emission 5150 MHz Edge for 802.11n HT20 5180 MHz – Vert. (Ave)

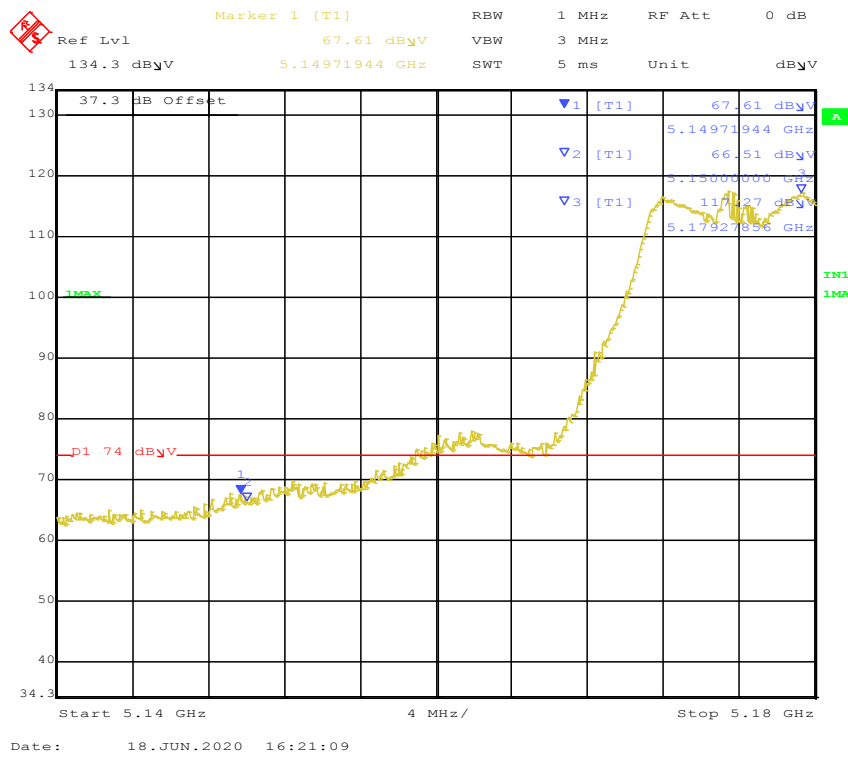


Figure 119: Radiated Emission 5150 MHz Edge for 802.11n HT20 5180 MHz – Horz. (Pk)

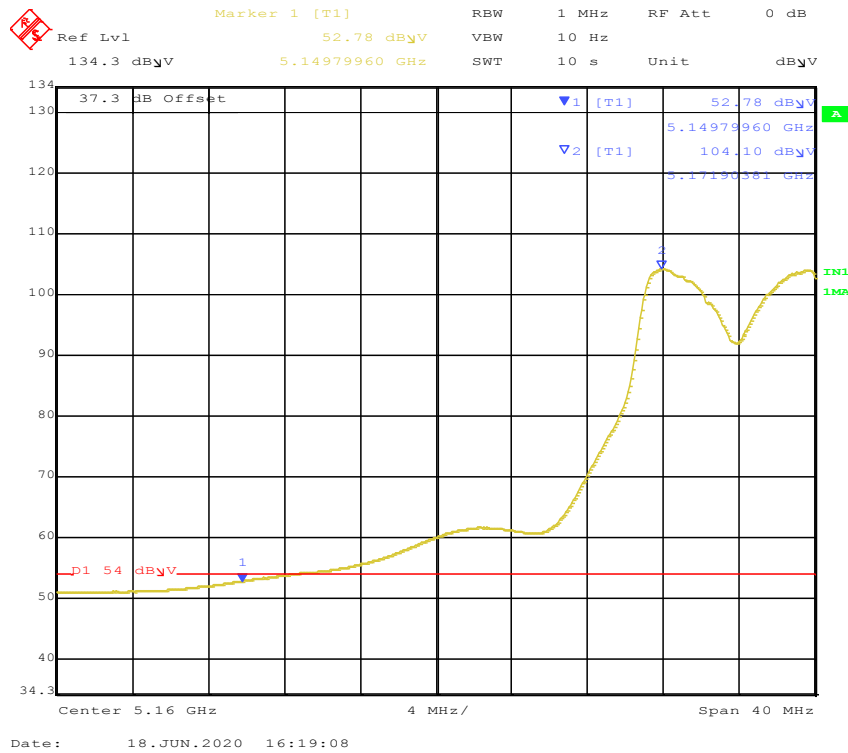


Figure 120: Radiated Emission 5150 MHz Edge for 802.11n HT20 5180 MHz – Horz. (Ave)

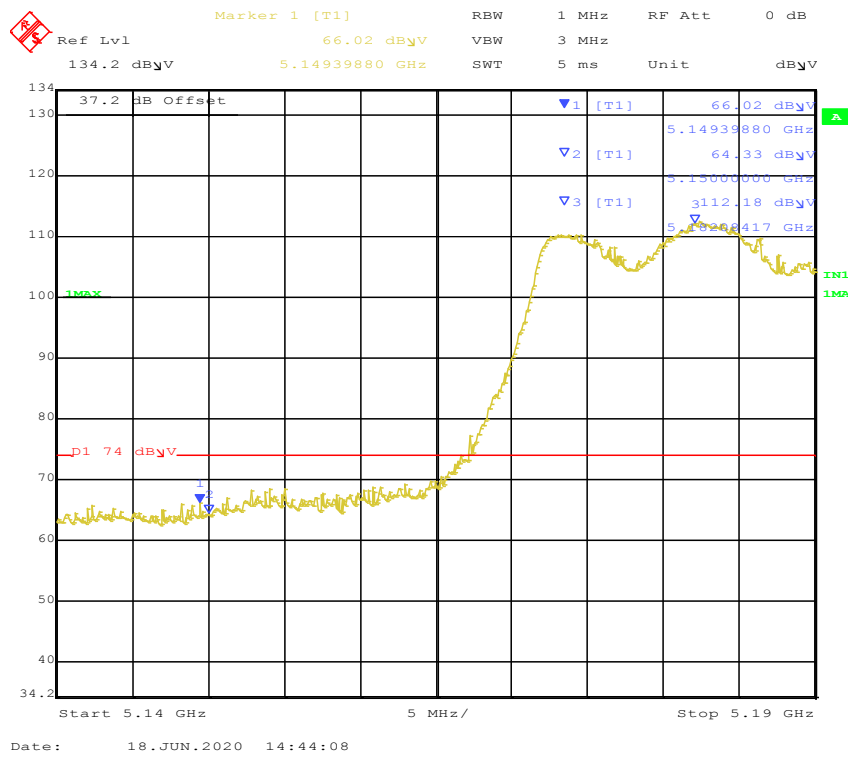


Figure 121: Radiated Emission 5150 MHz Edge for 802.11n HT40 5190 MHz – Vert. (Pk)

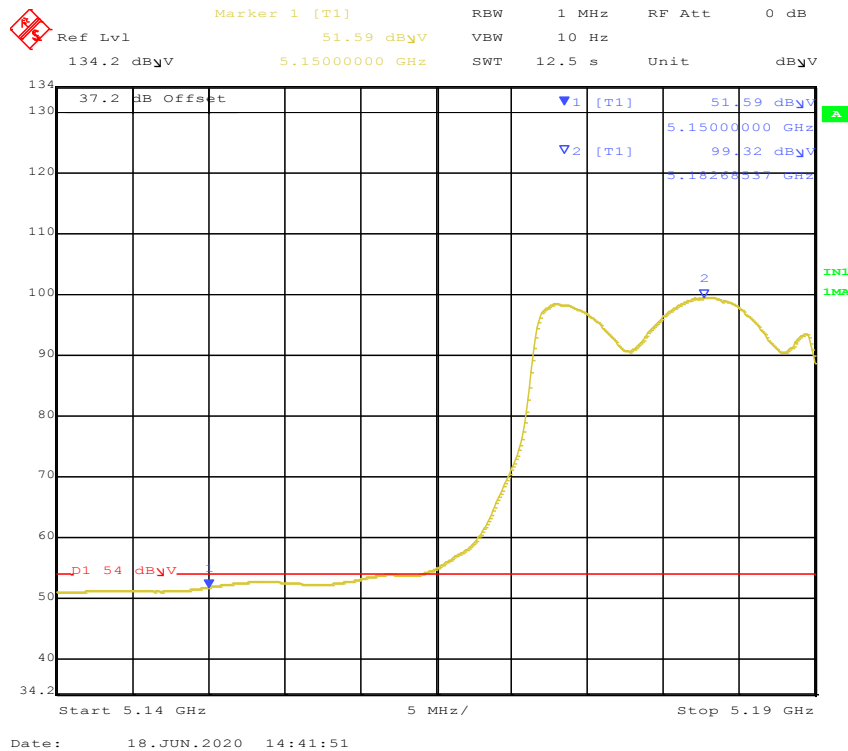


Figure 122: Radiated Emission 5150 MHz Edge for 802.11n HT40 5190 MHz – Vert. (Ave)

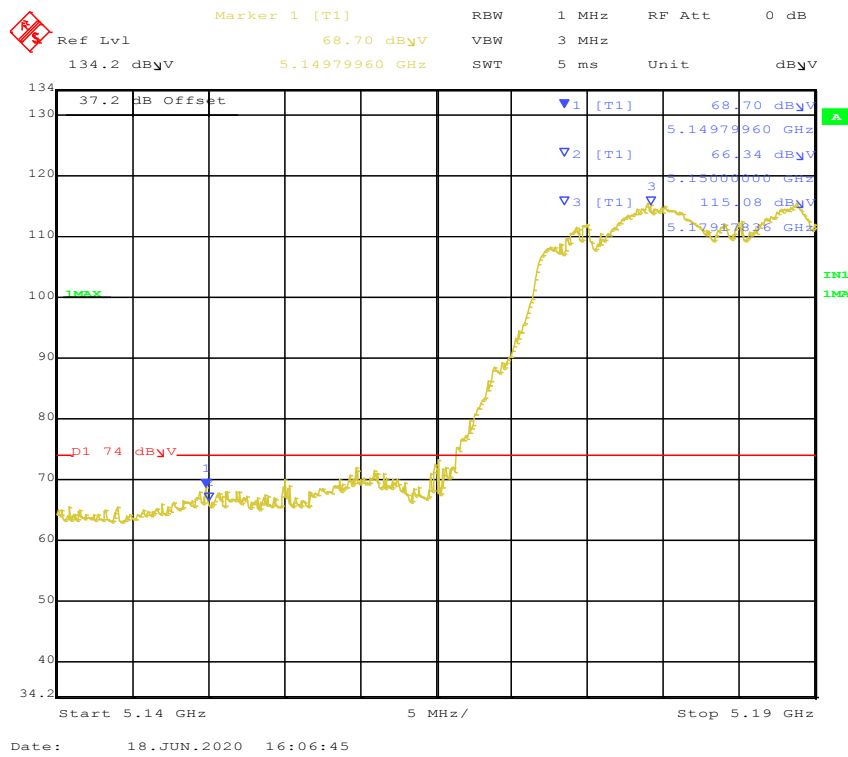


Figure 123: Radiated Emission 5150 MHz Edge for 802.11n HT40 5190 MHz – Horz. (Pk)

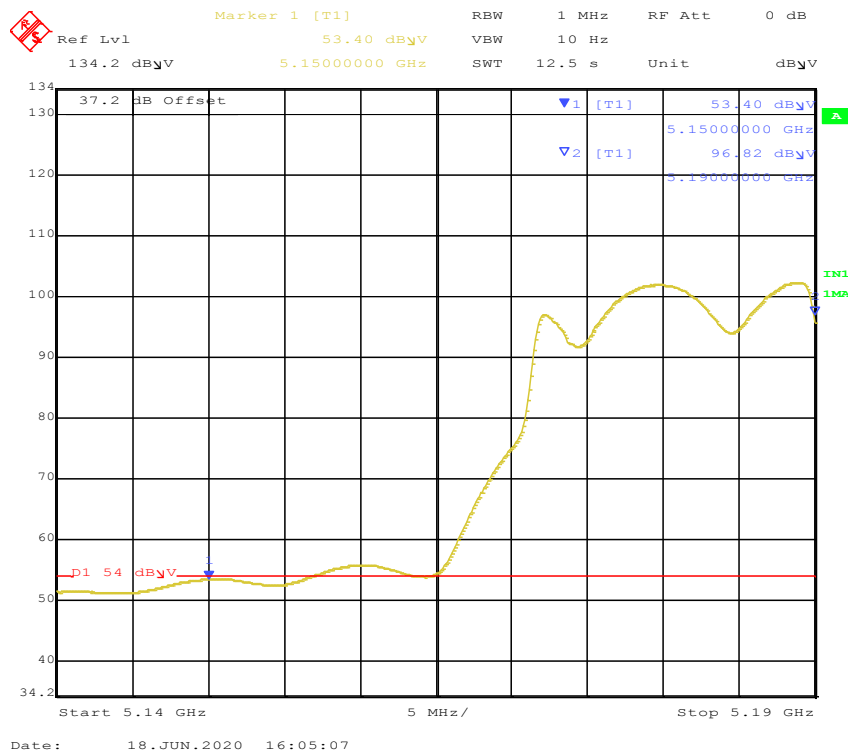


Figure 124: Radiated Emission 5150 MHz Edge for 802.11n HT40 5190 MHz – Horz. (Ave)

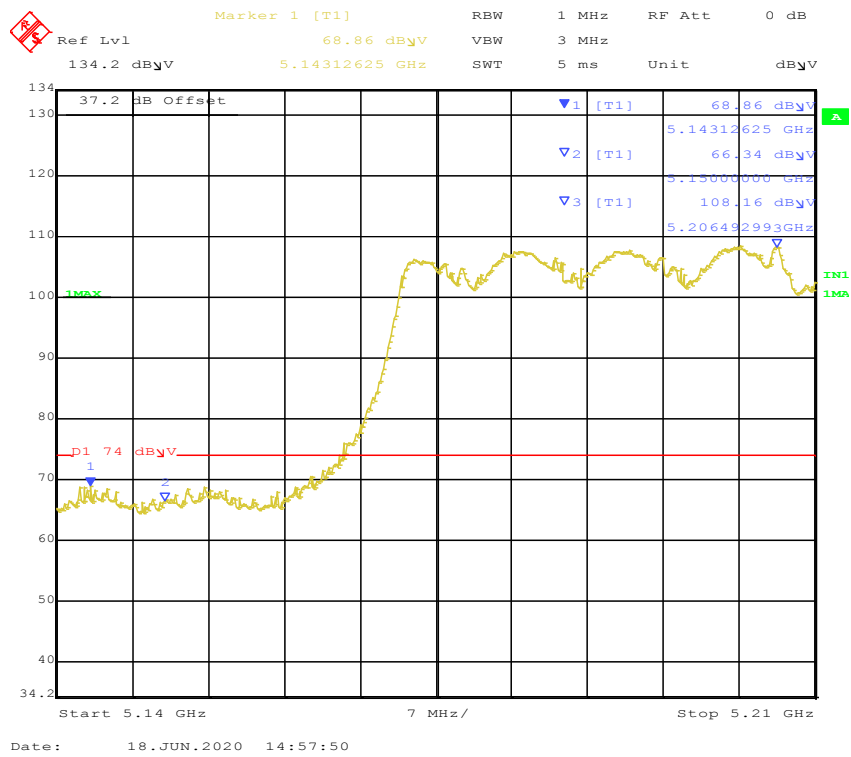


Figure 125: Radiated Emission 5150 MHz Edge for 802.11ac VHT80 5210 MHz – Vert. (Pk)

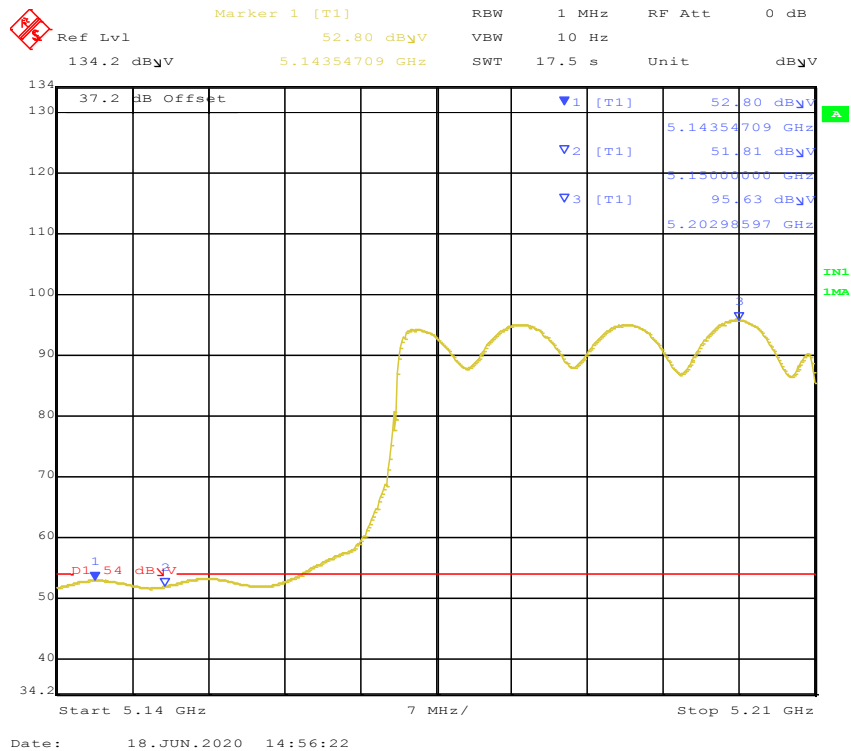


Figure 126: Radiated Emission 5150 MHz Edge for 802.11ac VHT80 5210 MHz – Vert. (Ave)

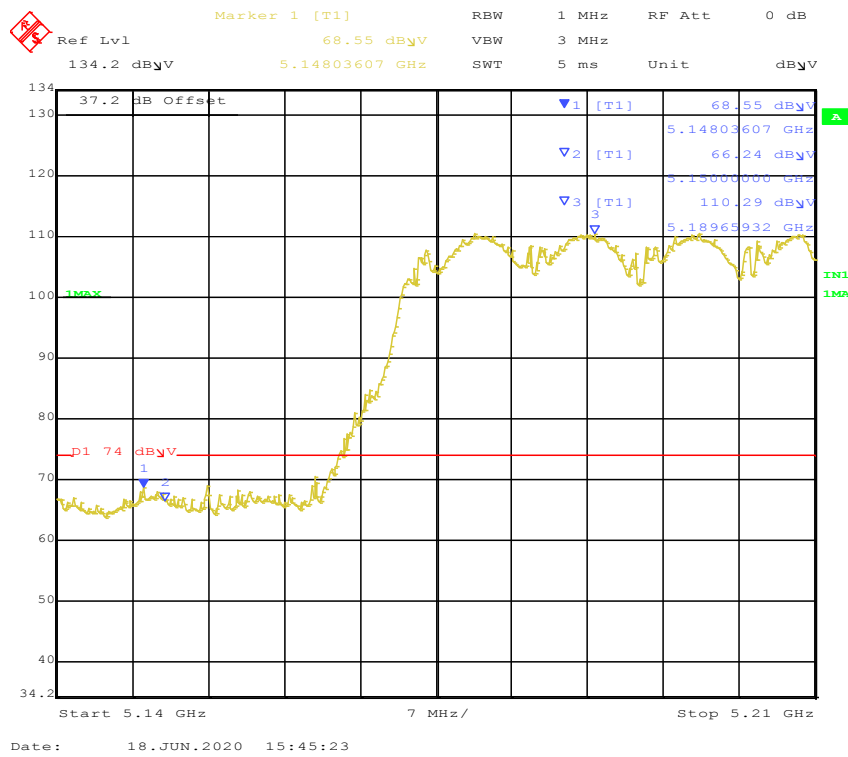


Figure 127: Radiated Emission 5150 MHz Edge for 802.11ac VHT80 5210 MHz – Horz. (Pk)

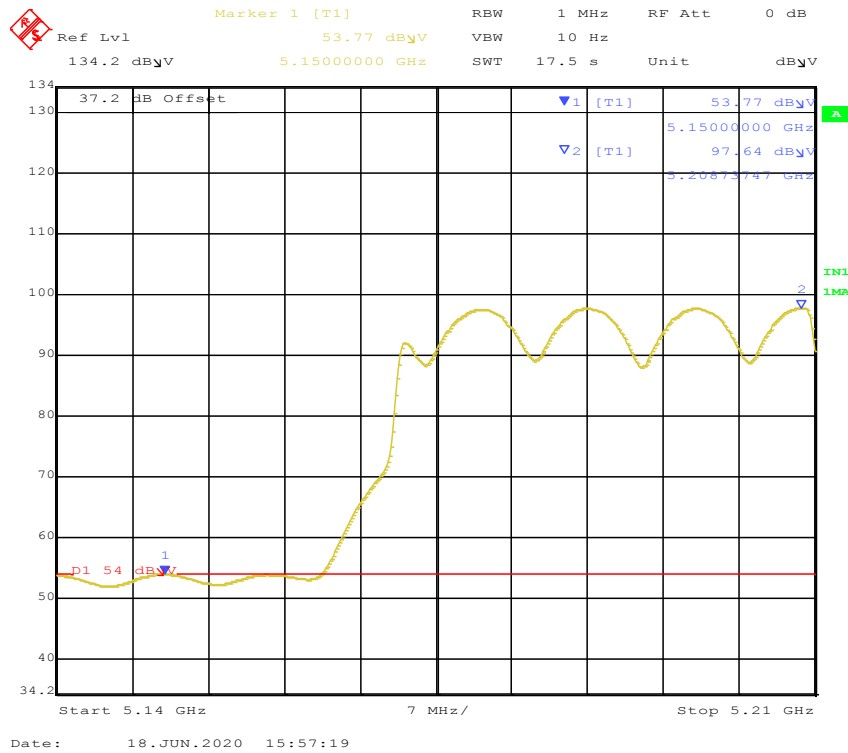


Figure 128: Radiated Emission 5150 MHz Edge for 802.11ac VHT80 5210 MHz – Horz. (Ave)

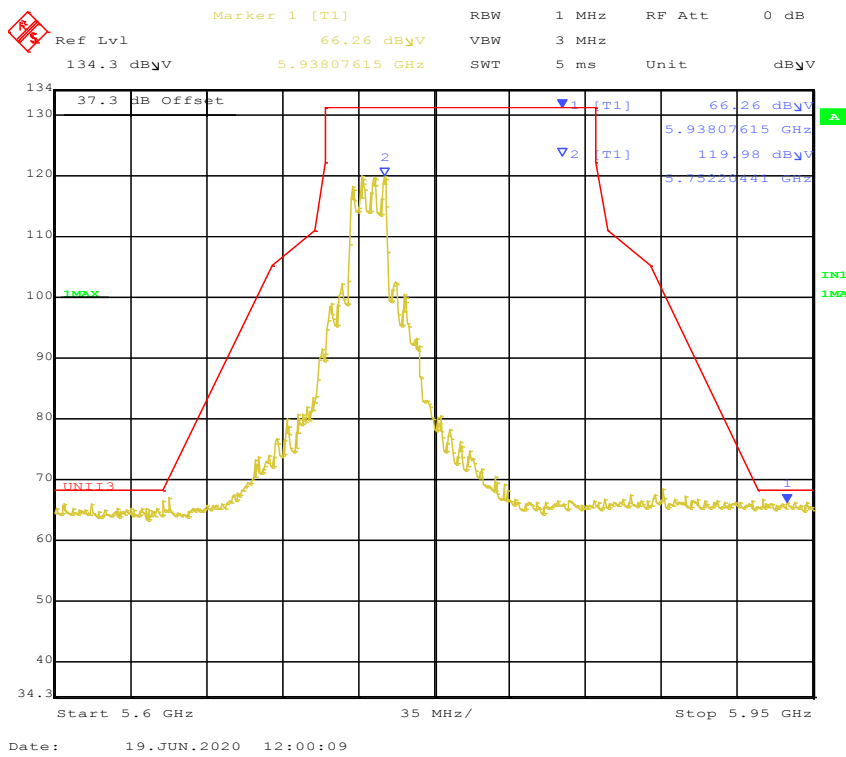


Figure 129: Radiated Emission 5725 MHz Edge for 802.11a 5745 MHz – Vert. (Pk)

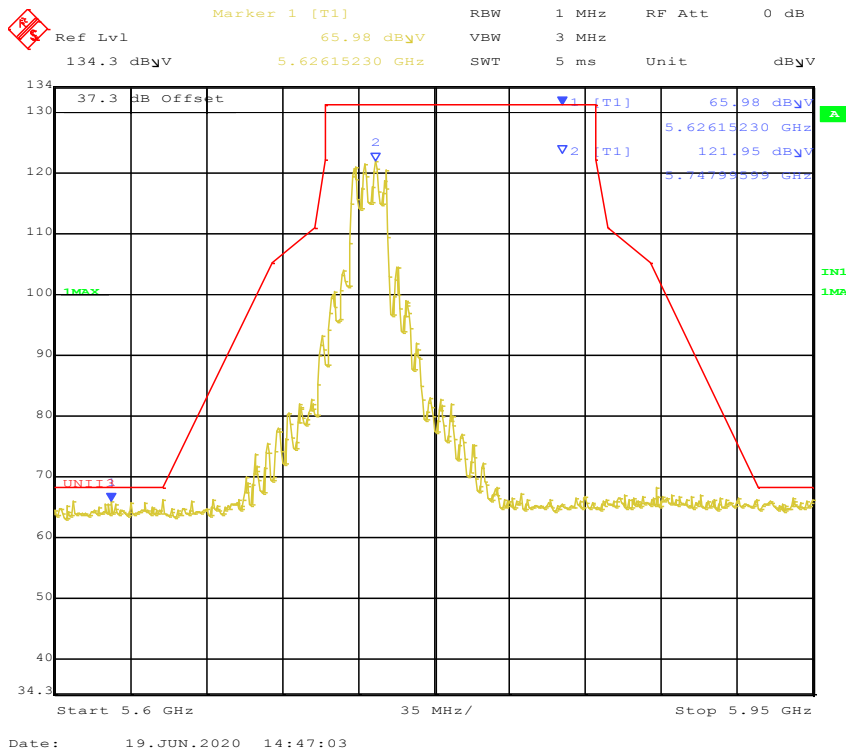


Figure 130: Radiated Emission 5725 MHz Edge for 802.11a 5745 MHz – Horz. (Pk)

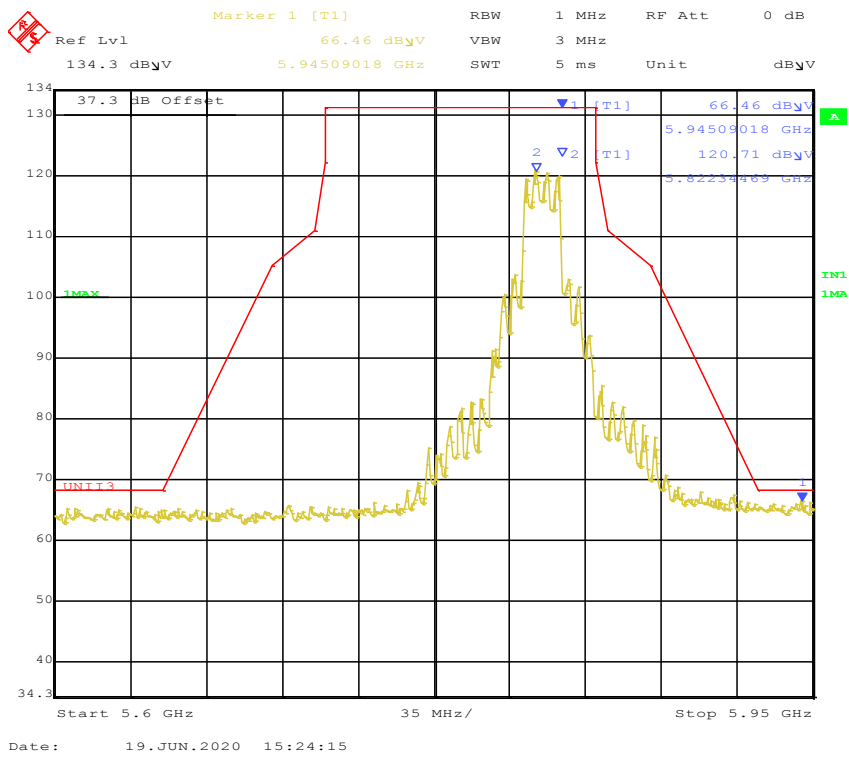


Figure 131: Radiated Emission 5850 MHz Edge for 802.11a 5825 MHz – Vert. (Pk)

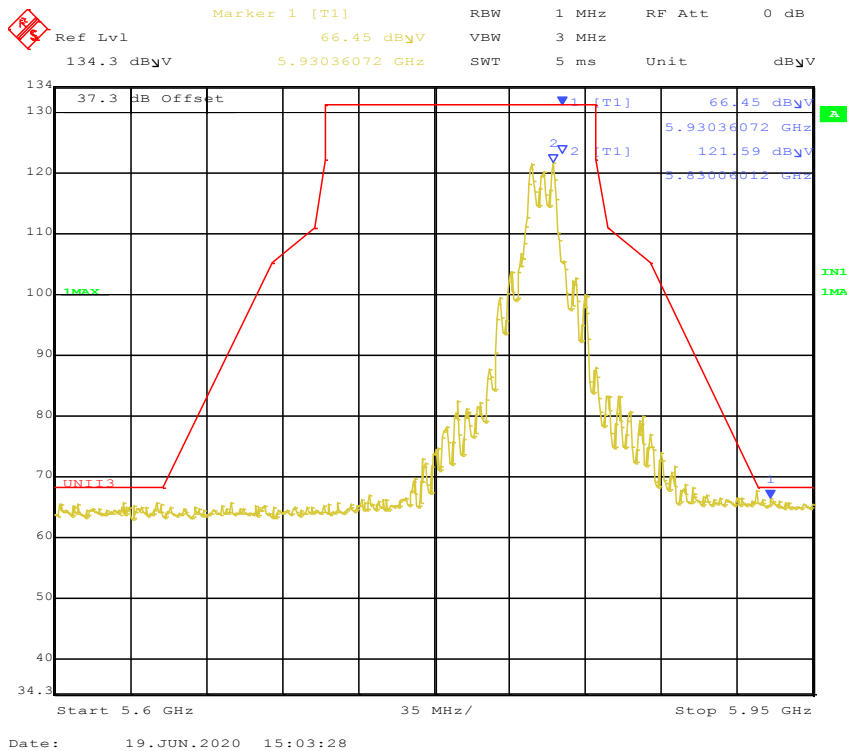


Figure 132: Radiated Emission 5850 MHz Edge for 802.11a 5825 MHz – Horz. (Pk)

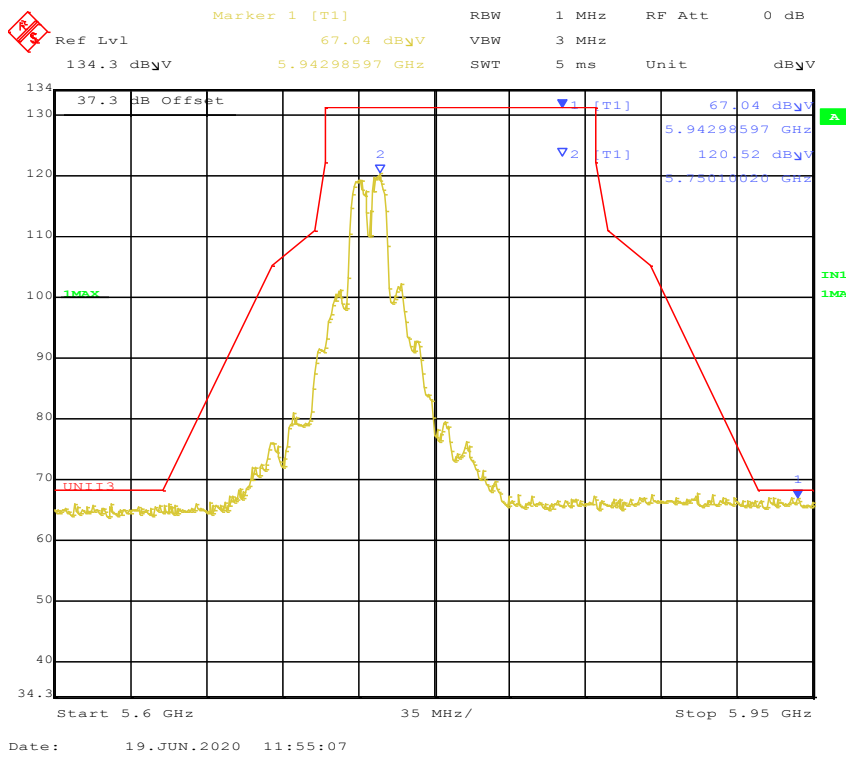


Figure 133: Radiated Emission 5725 MHz Edge for 802.11n HT20 5745 MHz –Vert. (Pk)

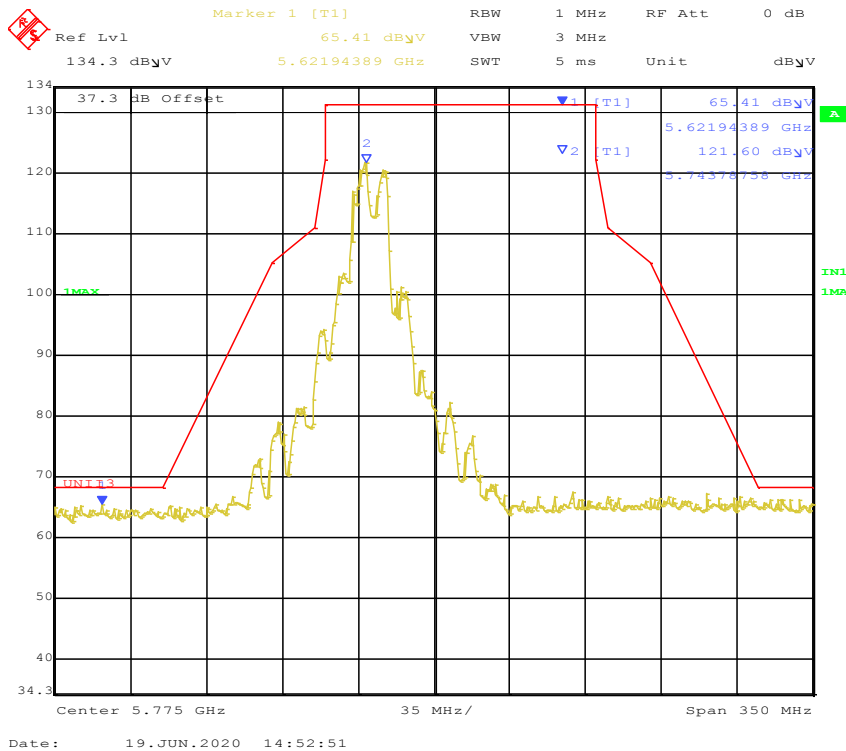


Figure 134: Radiated Emission 5725 MHz Edge for 802.11n HT20 5745 MHz – Horz. (Pk)

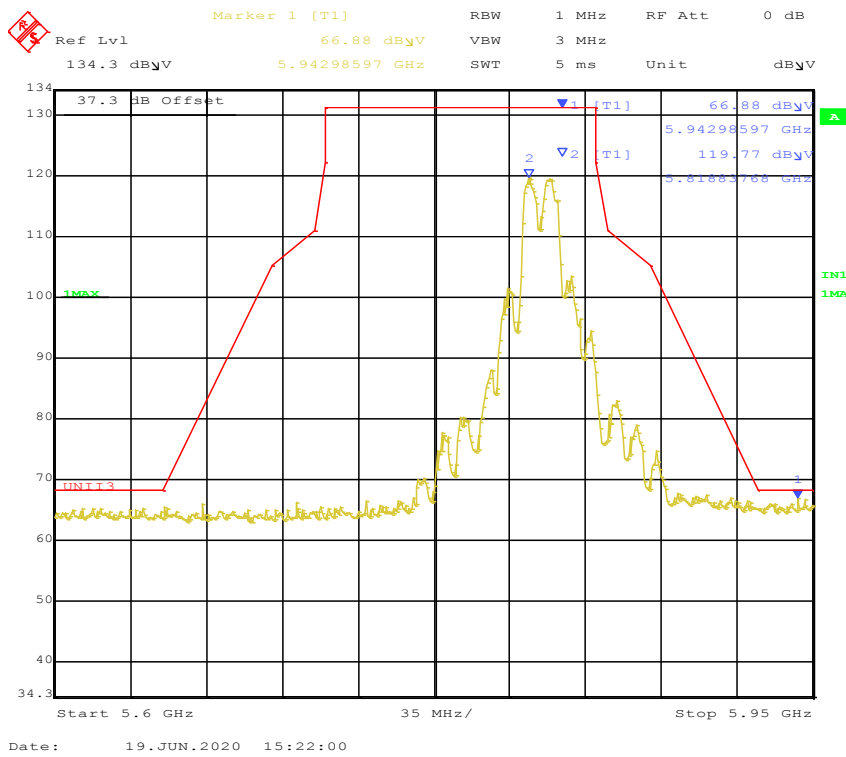


Figure 135: Radiated Emission 5850 MHz Edge for 802.11n HT20 5825 MHz – Vert. (Pk)

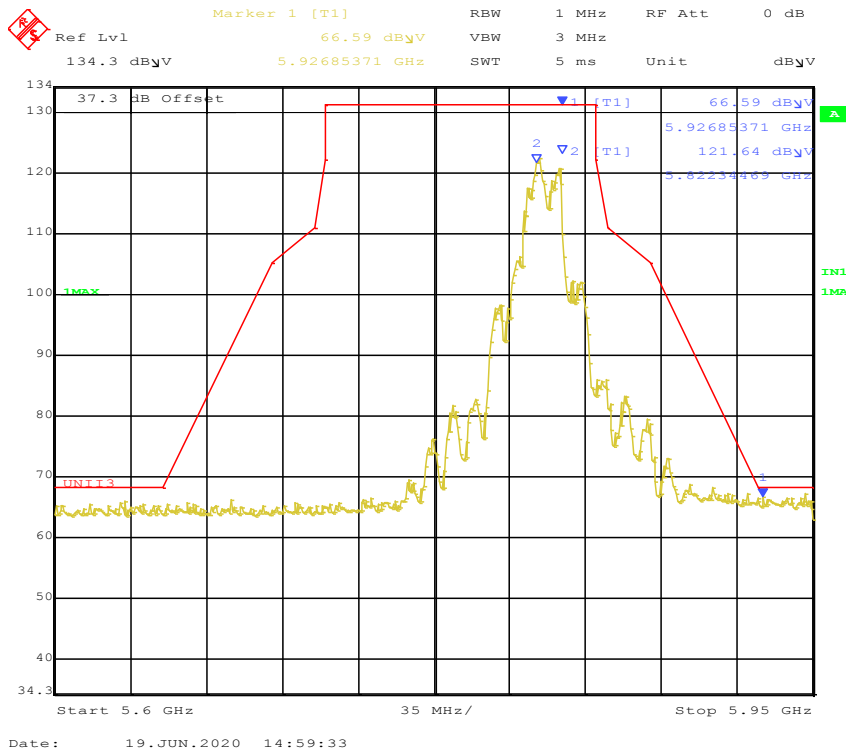


Figure 136: Radiated Emission 5850 MHz Edge for 802.11n HT20 5825 MHz – Horz. (Pk)

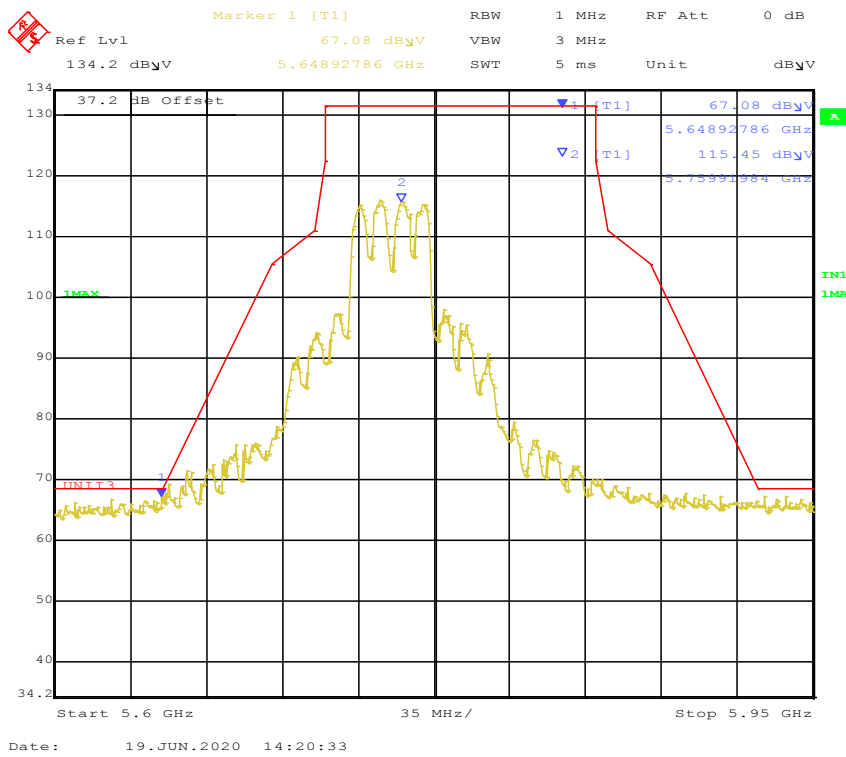


Figure 137: Radiated Emission 5725 MHz Edge for 802.11n HT40 5755 MHz – Vert. (Pk)

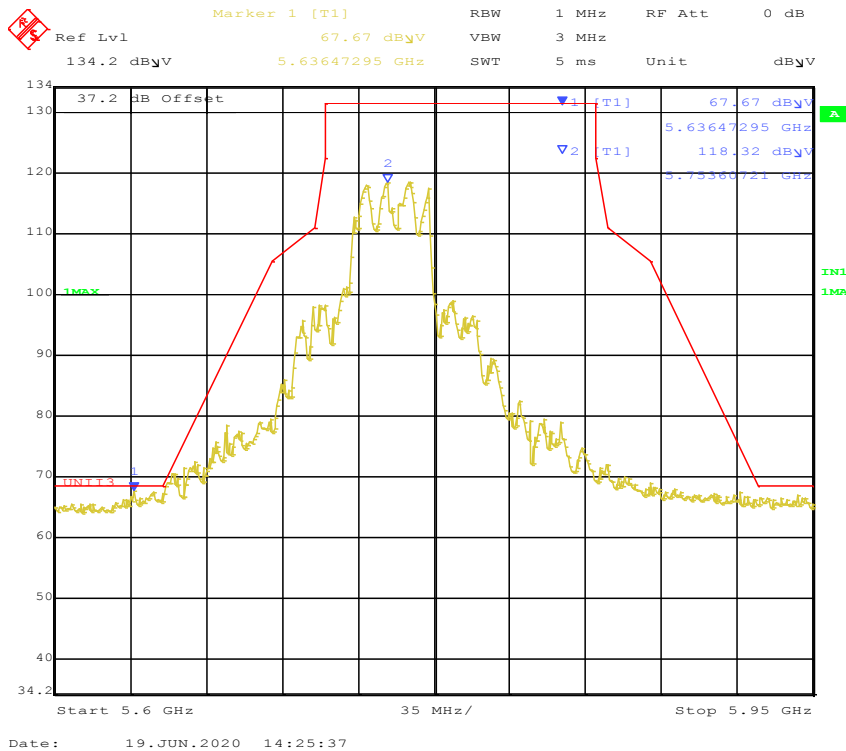


Figure 138: Radiated Emission 5725 MHz Edge for 802.11n HT40 5755 MHz – Horz. (Pk)

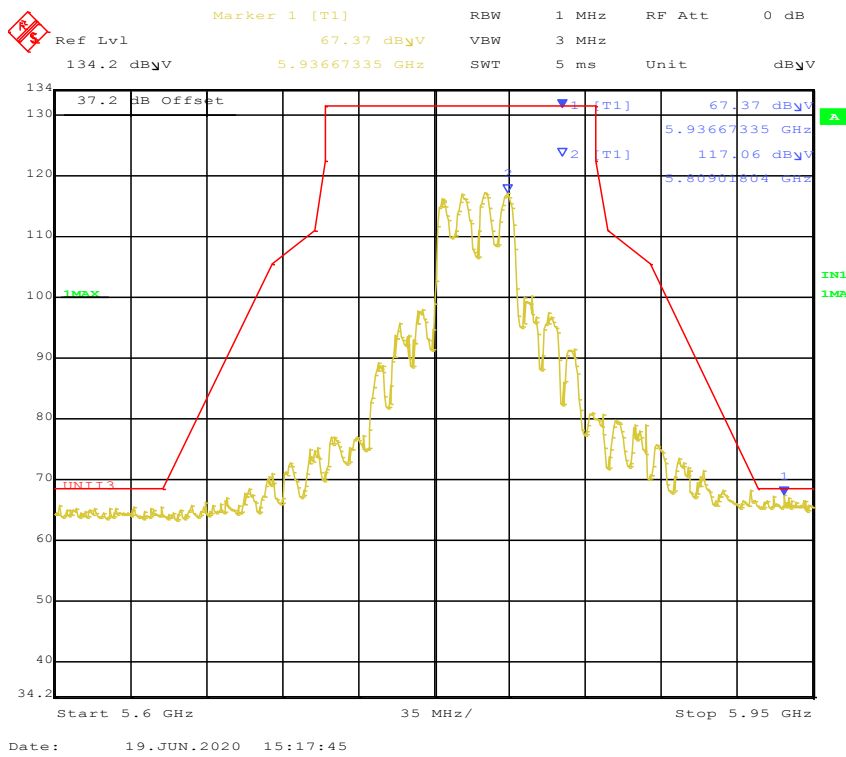


Figure 139: Radiated Emission 5825 MHz Edge for 802.11n HT40 5795 MHz – Vert. (Pk)

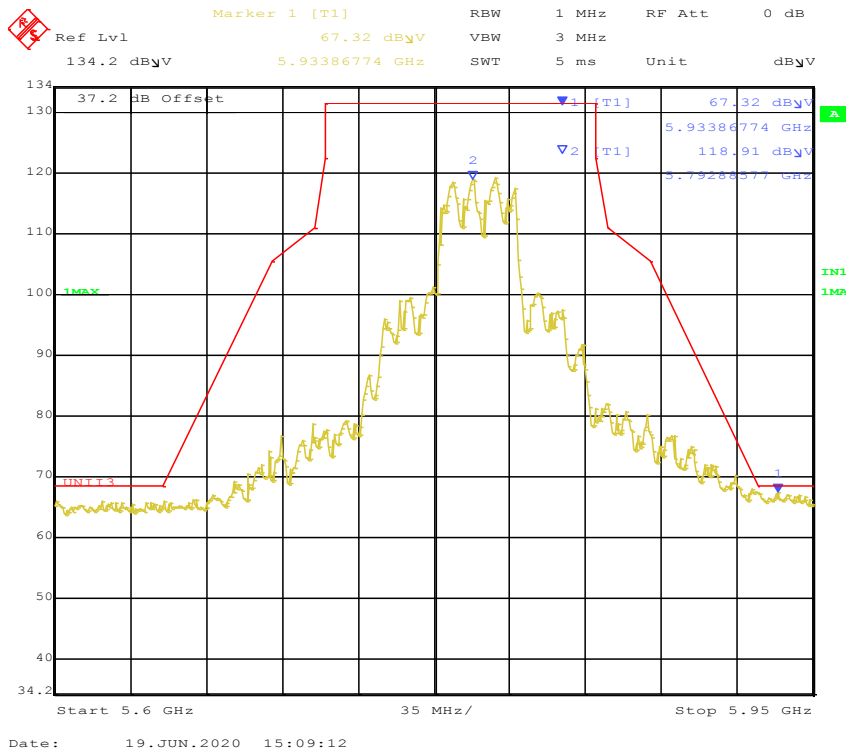


Figure 140: Radiated Emission 5825 MHz Edge for 802.11n 5795 MHz – Horz. (Pk)

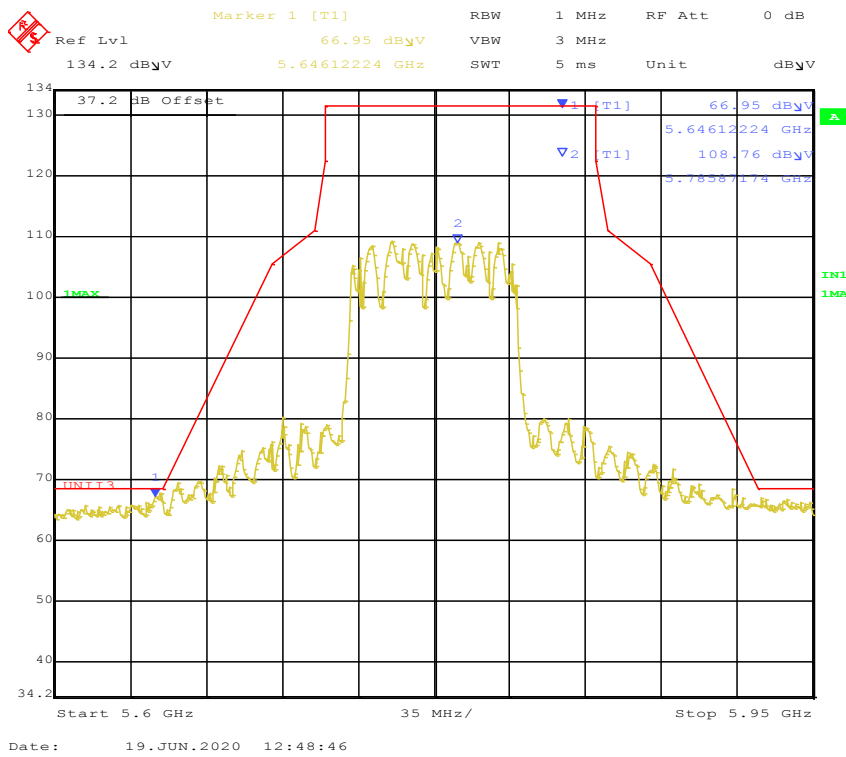


Figure 141: Radiated Emission 5725-5850 MHz Edge for 802.11ac VHT80 5775 MHz – Vert. (Pk)

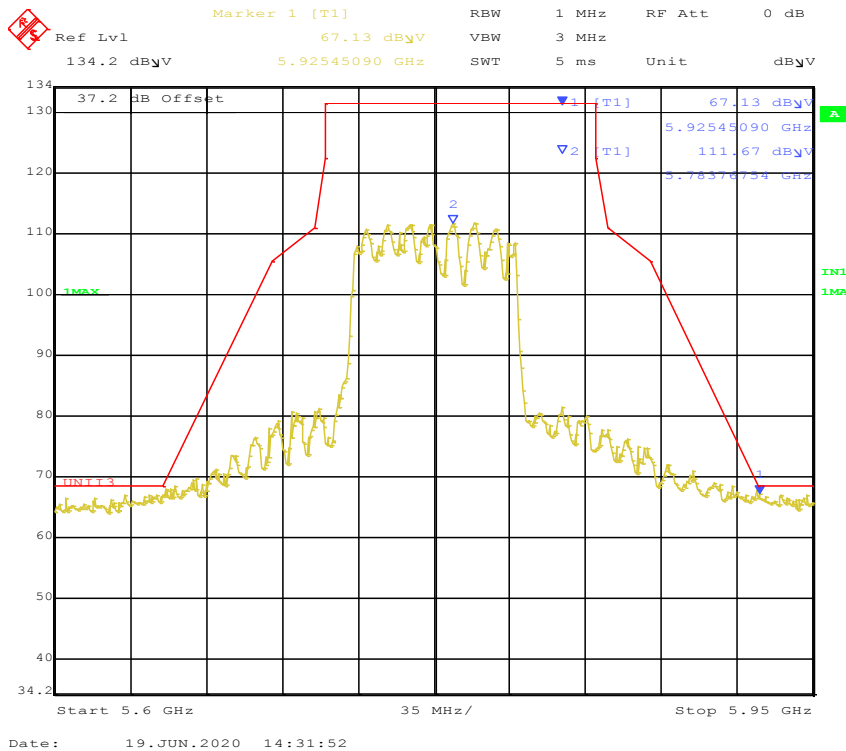


Figure 142: Radiated Emission 5725-5850 MHz Edge for 802.11ac VHT80 5775 MHz – Horz. (Pk)

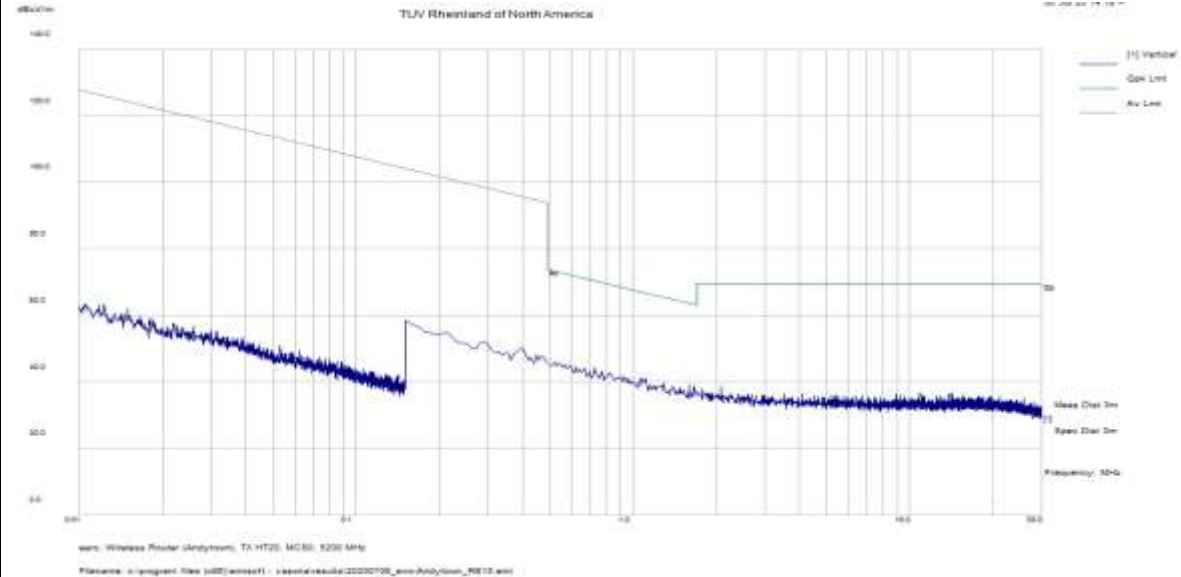
SOP 1 Radiated Emissions						Tracking # 32062991.001 Page 1 of 30					
EUT Name	eero 6 and eero 6 Extender					Date	July 6, 2020				
EUT Model	N010001					Temp / Hum in	20° C / 37%rh				
EUT Serial	NA4V-0034-0FZS-B958					Temp / Hum out	N/A				
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1					Line AC / Freq	110 Vac / 60 Hz				
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN					RBW / VBW	Per ANSI C63.10				
Dist/Ant Used	3m / JB3 & 6505					Performed by	Kerwinn Corpuz				
9 kHz – 1 GHz Transmit at 5200 MHz											
Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin	
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
0.73	31.73	2.28	10.37	44.38	Pk	V	100	348	70.39	-26.01	
1.06	28.00	2.30	10.60	40.90	Pk	V	100	219	67.10	-26.20	
35.66	37.39	2.52	-10.71	29.20	QP	V	106	176	40.00	-10.80	
63.98	51.86	2.70	-20.39	34.17	QP	V	106	234	40.00	-5.83	
70.48	53.69	2.75	-19.99	36.46	QP	V	109	240	40.00	-3.54	
78.43	52.16	2.78	-20.22	34.71	QP	V	135	38	40.00	-5.29	
85.76	55.05	2.82	-20.67	37.19	QP	V	163	62	40.00	-2.81	
100.19	46.13	2.88	-17.80	31.21	QP	V	113	134	43.50	-12.29	
Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty											
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp											
Note: 1. Modes tested are 802.11a and 802.11n HT20, (low, mid & high channels).											
2. Worst case emission was observed on 802.11n HT20 at MCS0, 5200 MHz mode for 20MHz channel BW.											
3. No significant emission was observed below 30 MHz. Detected noise floor.											

SOP 1 Radiated Emissions

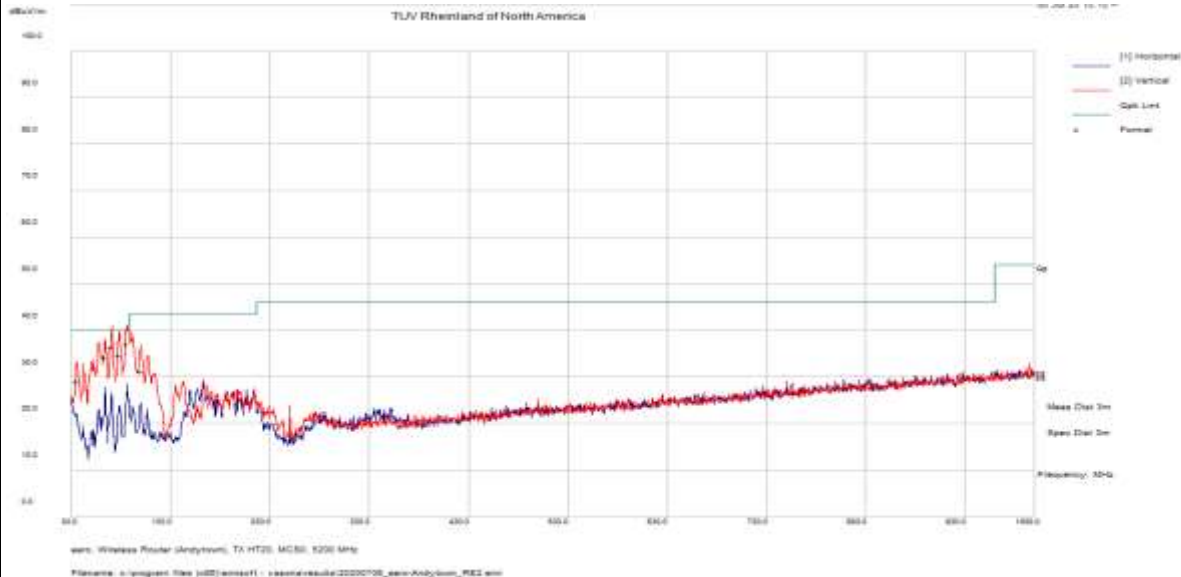
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EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Date	Kerwinn Corpuz

9 kHz to 30 MHz Plot



30 MHz to 1 GHz Plot



Notes: Transmit at 5200 MHz.

SOP 1 Radiated Emissions				Tracking # 32062991.001 Page 3 of 30			
EUT Name	eero 6 and eero 6 Extender			Date	June 12 - July 16, 2020		
EUT Model	N010001			Temp / Hum in	20° C / 36-38%rh		
EUT Serial	NA4V-0034-0FZS-B958			Temp / Hum out	N/A		
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1			Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN			RBW / VBW	Per ANSI C63.10		
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840			Performed by	Kerwinn Corpuz		

1 – 40 GHz Transmit at 5180 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
15544.86	68.42	3.78	-15.84	56.36	Pk	V	251	304	74.00	-17.64
15544.86	52.01	3.78	-15.84	39.95	Ave	V	251	304	54.00	-14.05
20839.93	48.39	7.60	-9.15	46.84	Pk	V	158	78	74.00	-27.16
20839.93	44.40	7.60	-9.10	42.90	Ave	V	158	78	54.00	-11.10
36458.35	46.20	10.20	-4.90	51.60	Pk	H	159	12	74.00	-22.40
36458.35	36.50	10.20	-4.90	41.90	Ave	H	159	12	54.00	-12.10

1 – 40 GHz Transmit at 5200 MHz (Middle Channel)

10406.33	64.39	2.93	-16.10	51.21	Pk	H	255	36	74.00	-22.79
10406.33	51.33	2.93	-16.10	38.15	Ave	H	255	36	54.00	-15.85
15614.72	72.74	3.81	-15.99	60.56	Pk	V	253	273	74.00	-13.44
15614.72	57.11	3.81	-15.99	44.93	Ave	V	253	273	54.00	-9.07
20817.84	56.15	7.60	-9.07	54.68	Pk	V	160	110	74.00	-19.32
20817.84	47.40	7.60	-9.10	45.90	Ave	V	160	110	54.00	-8.10

1 – 40 GHz Transmit at 5240 MHz (High Channel)

10475.88	64.29	2.96	-16.24	51.02	Pk	H	222	154	74.00	-22.98
10475.88	51.69	2.96	-16.24	38.42	Ave	H	222	154	54.00	-15.58
15710.74	81.13	3.81	-16.48	68.46	Pk	V	222	304	74.00	-5.54
15710.74	65.08	3.81	-16.48	52.41	Ave	V	222	304	54.00	-1.59
20951.93	57.94	7.60	-9.37	56.16	Pk	V	195	92	74.00	-17.84
20951.93	44.70	7.60	-9.40	42.90	Ave	V	195	92	54.00	-11.10

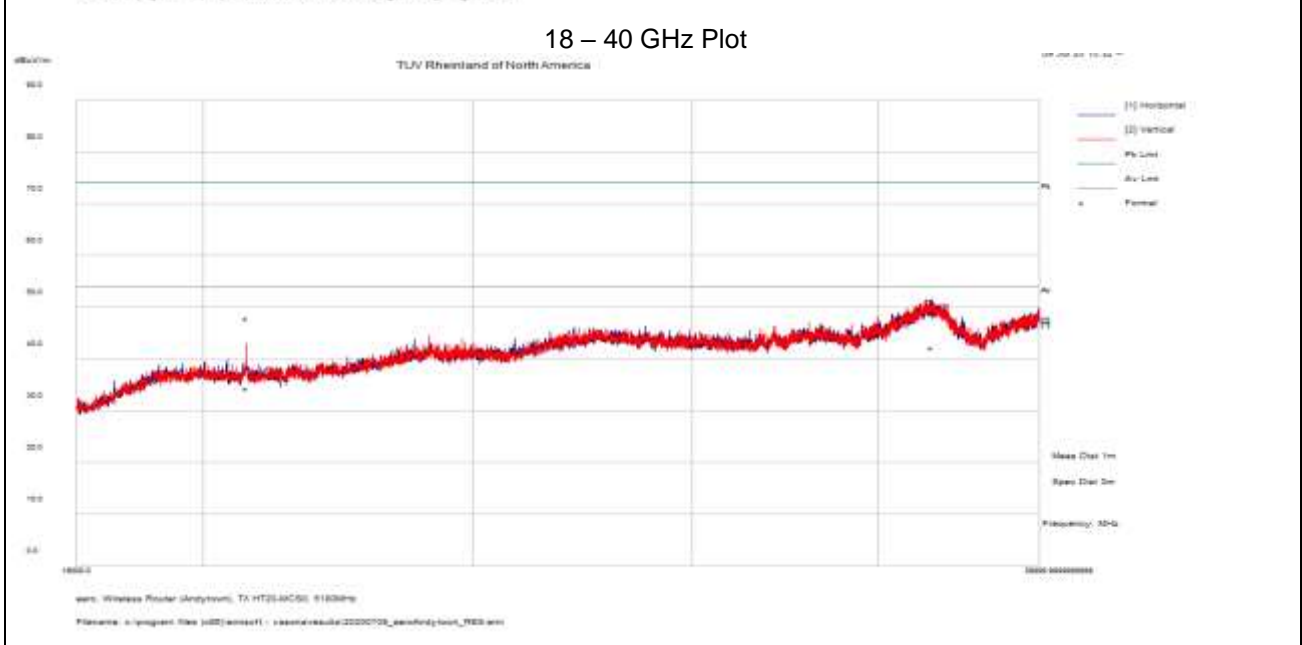
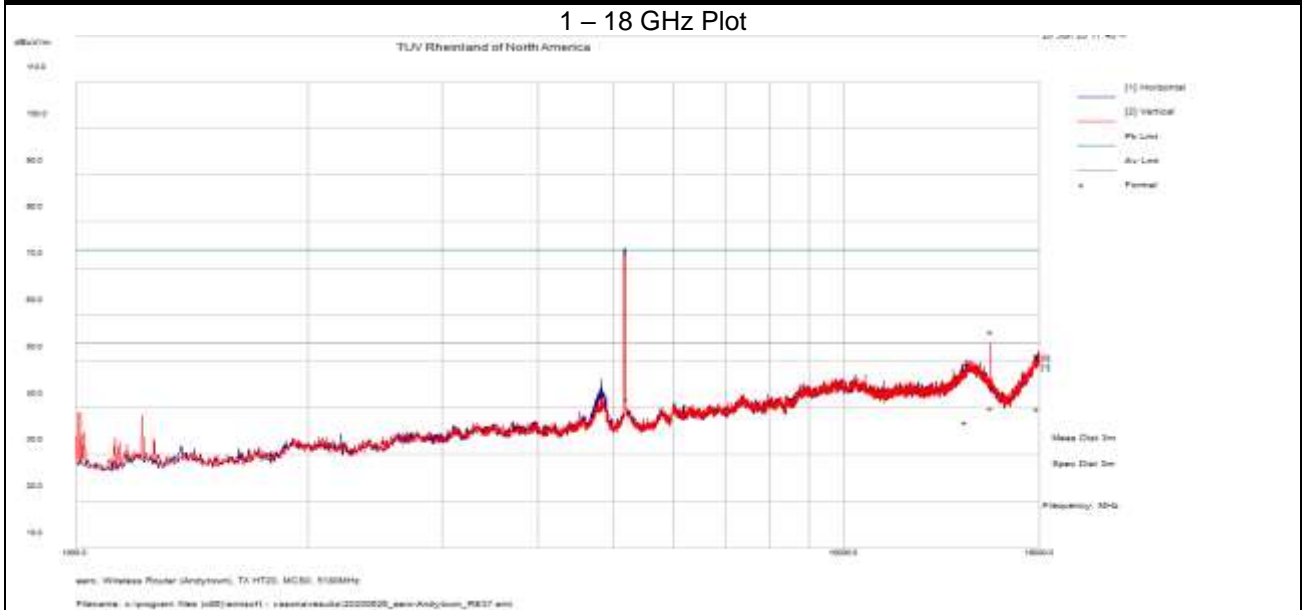
Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
 Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case was observed at 802.11n HT20 mode, MCS0.

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz

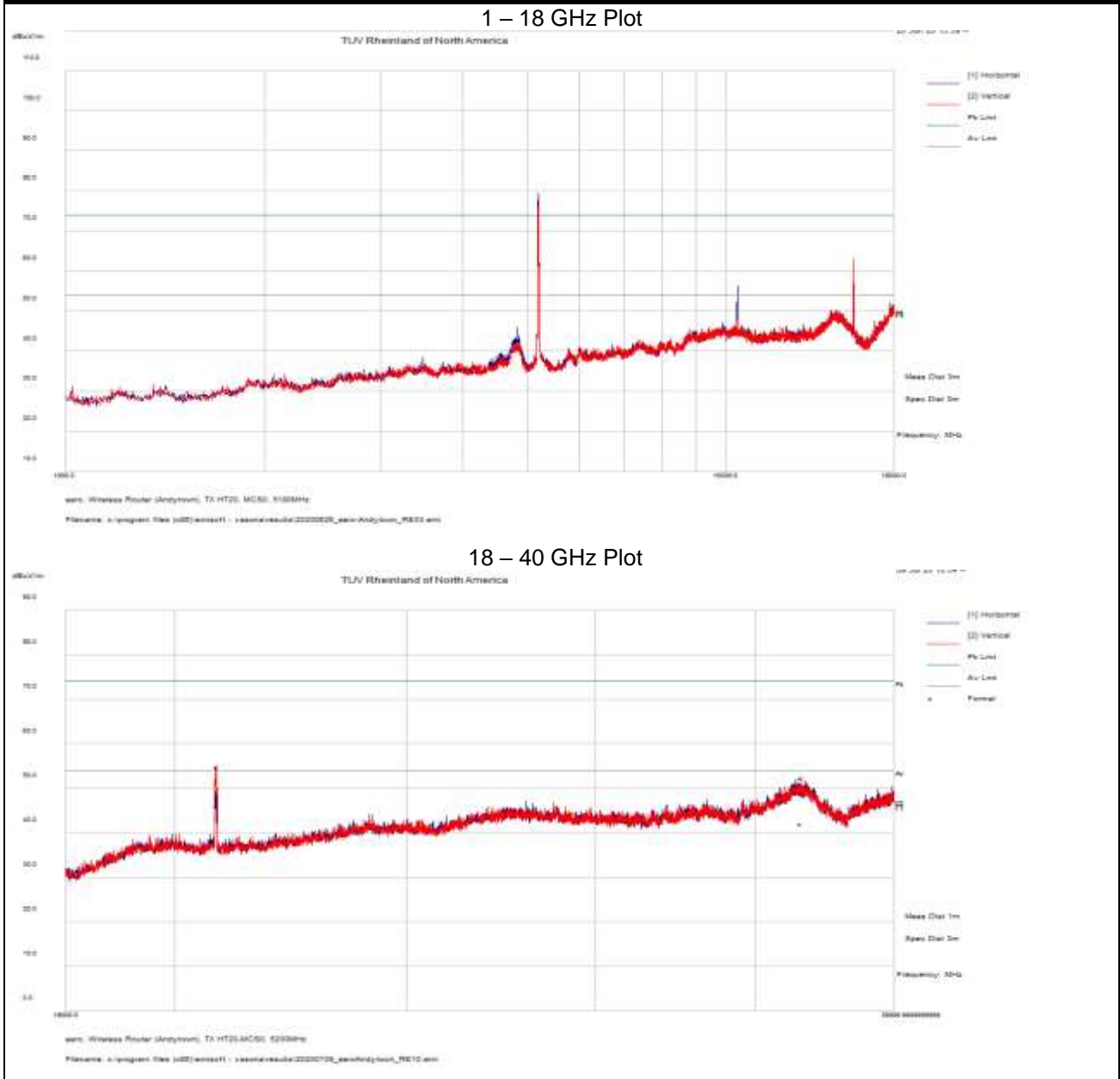


Notes: 1. Transmit at 5180 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 – July16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz



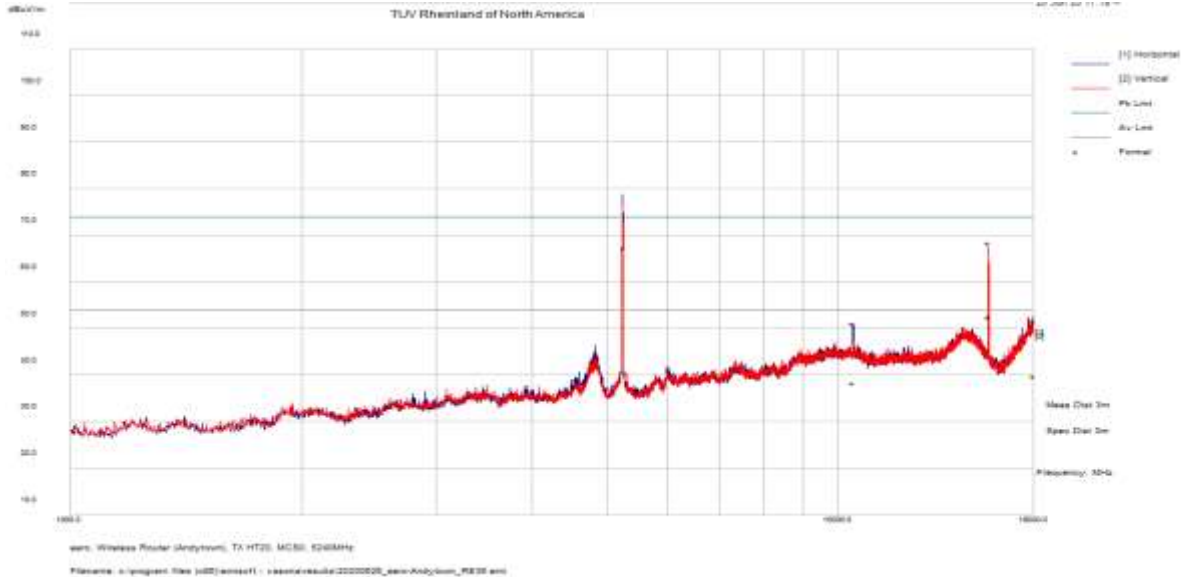
Notes: 1. Transmit at 5200 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions

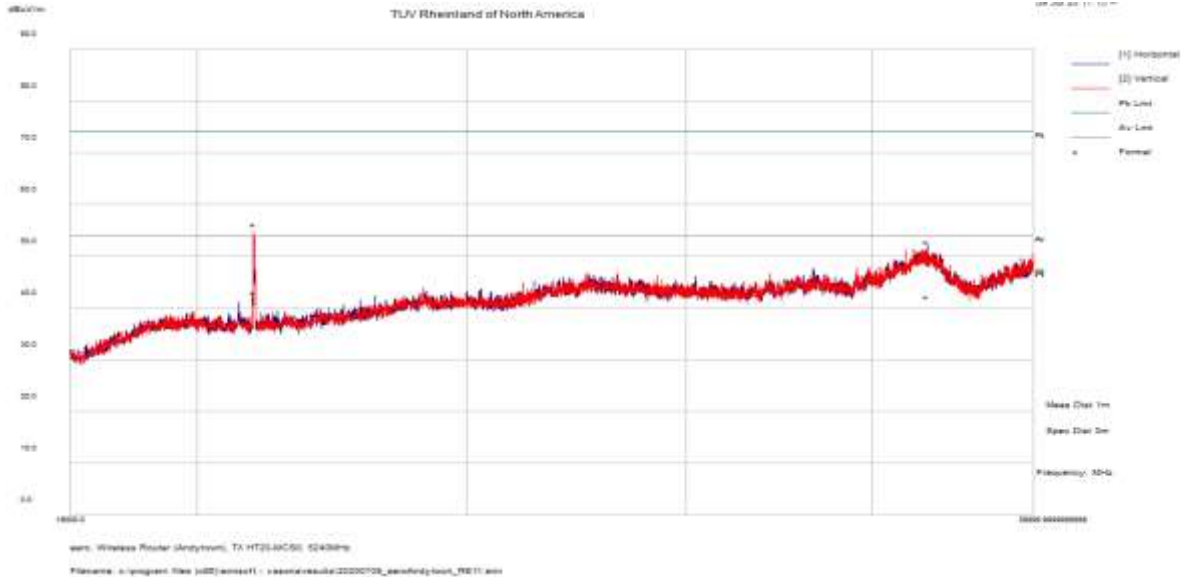
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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz

1 – 18 GHz Plot



18 – 40 GHz Plot



Notes: 1. Transmit at 5240 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions		Tracking # 32062991.001 Page 7 of 30	
EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Performed by	Kerwinn Corpuz

9 kHz – 1 GHz Transmit at 5785 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
0.69	30.68	2.28	10.40	43.35	Pk	V	100	339	70.85	-27.50
1.08	27.37	2.30	10.60	40.28	Pk	V	100	160	66.95	-26.67
35.36	38.42	2.51	-10.44	30.49	QP	V	102	116	40.00	-9.51
64.02	50.46	2.70	-20.39	32.78	QP	V	137	0	40.00	-7.23
70.46	53.20	2.75	-19.99	35.96	QP	V	133	164	40.00	-4.04
77.91	52.32	2.78	-20.17	34.93	QP	V	115	4	40.00	-5.07
86.41	54.57	2.82	-20.67	36.72	QP	V	133	0	40.00	-3.28
99.49	47.27	2.87	-18.01	32.13	QP	V	135	70	43.50	-11.37

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty

Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

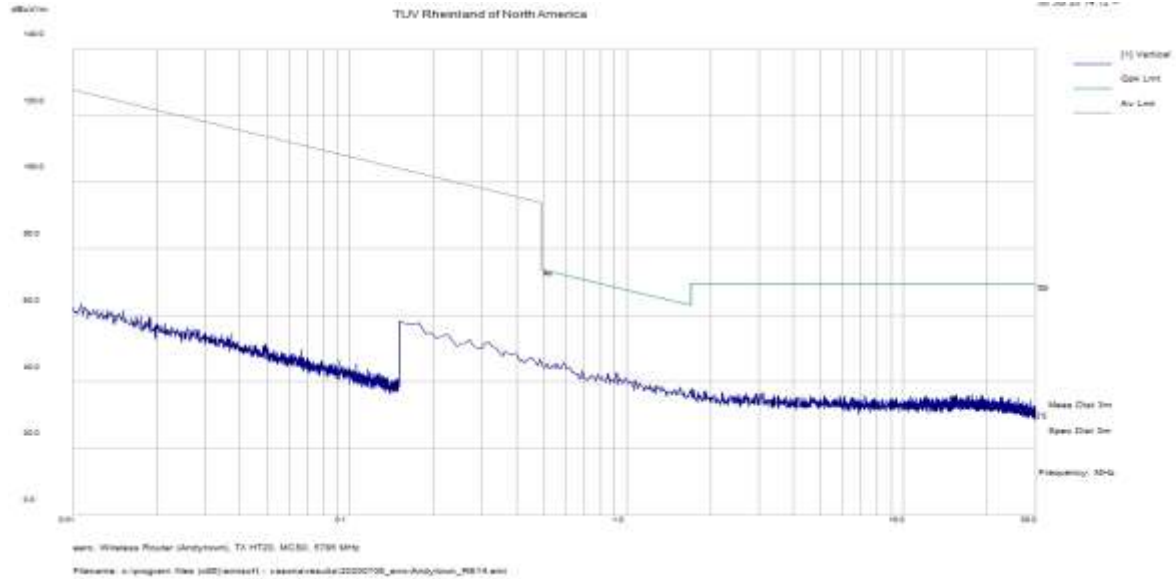
- Note: 1. Modes tested are 802.11a and 802.11n HT20, (low, mid & high channels).
 2. Worst case emission was observed on 802.11n HT20 at MCS0, 5785 MHz mode for 20MHz channel BW.
 3. No significant emission was observed below 30 MHz. Detected noise floor.

SOP 1 Radiated Emissions

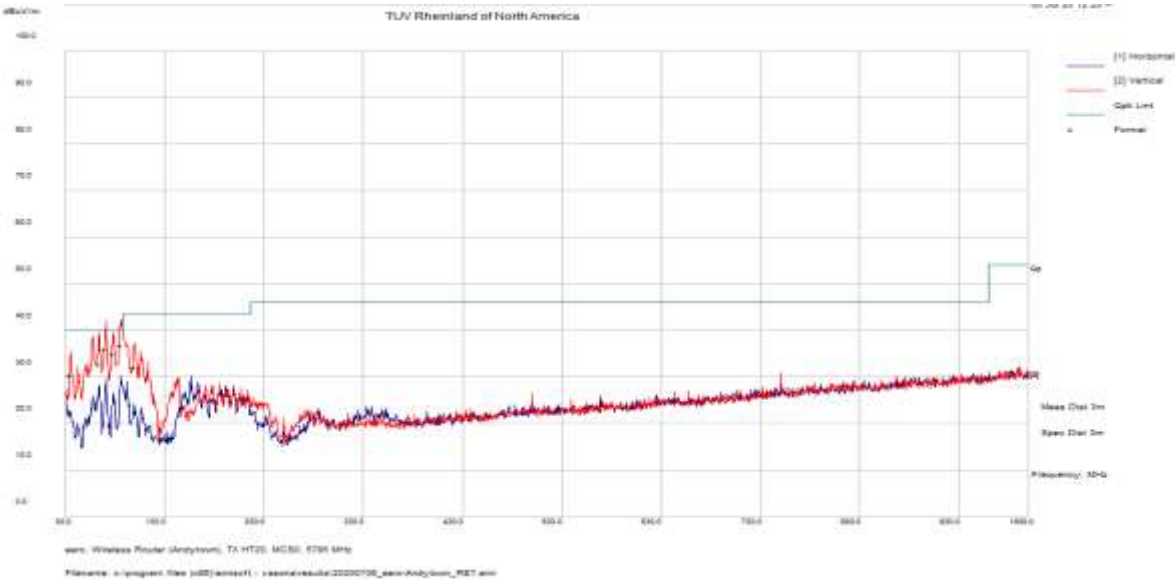
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EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Date	Kerwinn Corpuz

9 kHz to 30 MHz Plot



30 MHz to 1 GHz Plot



Notes: Transmit at 5785 MHz.

SOP 1 Radiated Emissions				Tracking # 32062991.001 Page 9 of 30			
EUT Name	eero 6 and eero 6 Extender			Date	June 12 - July 16, 2020		
EUT Model	N010001			Temp / Hum in	20° C / 36-38%rh		
EUT Serial	NA4V-0034-0FZS-B958			Temp / Hum out	N/A		
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1			Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN			RBW / VBW	Per ANSI C63.10		
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840			Performed by	Kerwinn Corpuz		

1 – 40 GHz Transmit at 5745 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
11490.97	61.04	3.15	-17.31	46.88	Pk	H	240	361	74.00	-27.12
11490.97	48.97	3.15	-17.31	34.82	Ave	H	240	361	54.00	-19.19
17229.98	76.53	4.00	-12.52	68.00	Pk	V	232	102	68.23	-0.23
22980.41	54.06	7.64	-7.91	53.79	Pk	V	163	84	74.00	-20.21
22980.41	46.80	7.60	-7.90	46.50	Ave	V	163	84	54.00	-7.50

1 – 40 GHz Transmit at 5785 MHz (Middle Channel)

11572.90	67.36	3.12	-17.66	52.82	Pk	V	259	102	74.00	-21.19
11572.90	54.18	3.12	-17.66	39.63	Ave	V	259	102	54.00	-14.37
17360.86	74.80	3.96	-11.61	67.15	Pk	V	242	88	68.23	-1.08
23141.00	55.94	7.73	-7.94	55.73	Pk	V	168	86	74.00	-18.27
23141.00	47.30	7.70	-7.90	47.10	Ave	V	168	86	54.00	-6.90
28926.29	46.50	8.70	-5.50	49.70	Pk	V	194	352	74.00	-24.30
28926.29	36.10	8.70	-5.50	39.30	Ave	V	194	352	54.00	-14.70

1 – 40 GHz Transmit at 5825 MHz (High Channel)

11659.07	64.63	3.25	-17.30	50.58	Pk	V	217	102	74.00	-23.43
11659.07	52.01	3.25	-17.30	37.95	Ave	V	217	102	54.00	-16.05
17481.58	72.69	3.94	-10.53	66.10	Pk	V	252	112	68.23	-2.13
23301.51	53.43	7.66	-7.70	53.39	Pk	V	174	146	74.00	-20.61
23301.51	42.70	7.70	-7.70	42.70	Ave	V	174	146	54.00	-11.30
29122.31	47.20	8.80	-6.10	49.80	Pk	V	141	360	74.00	-24.20
29122.31	33.90	8.80	-6.10	36.50	Ave	V	141	360	54.00	-17.50

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty

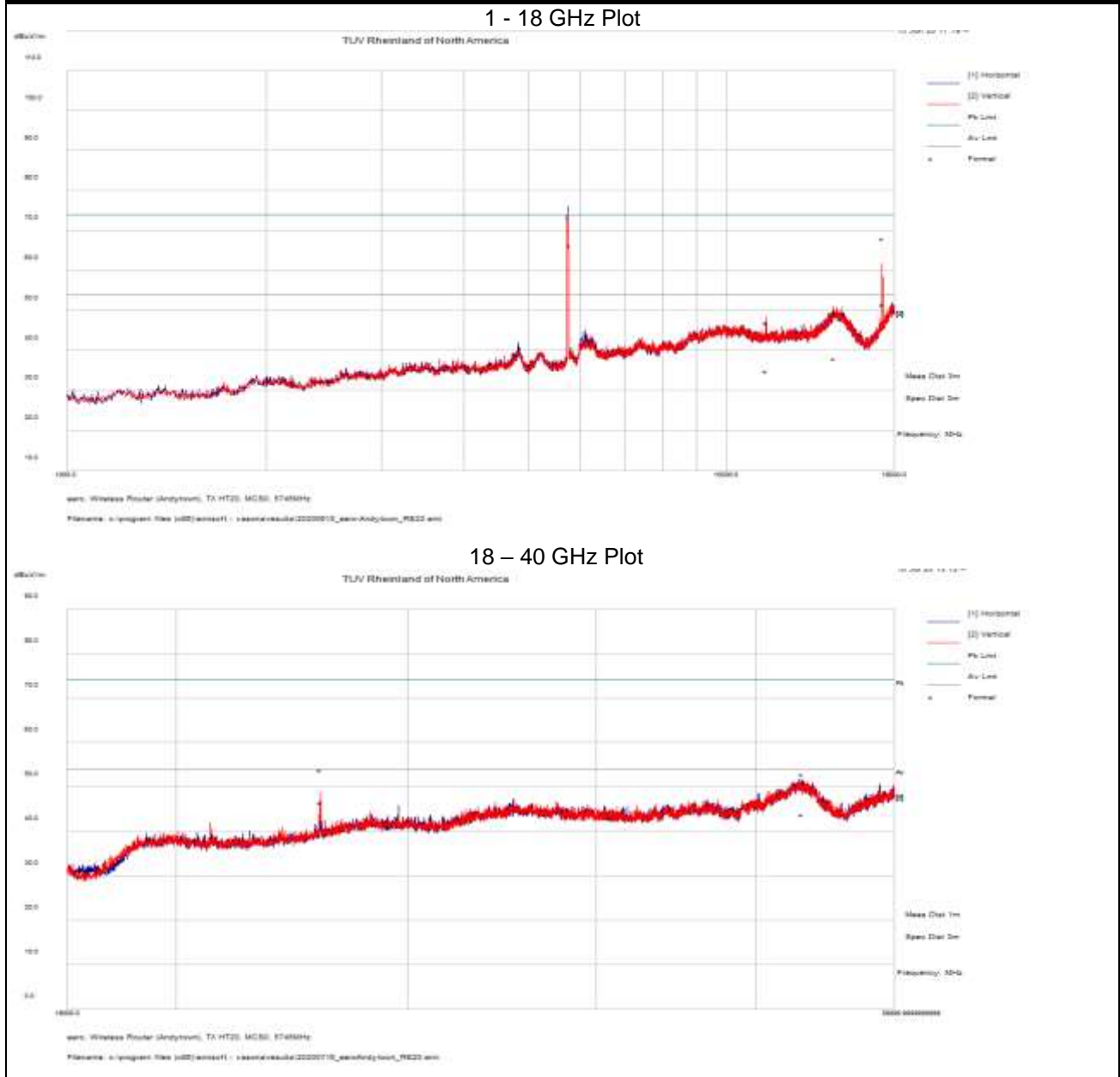
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case was observed at 802.11n HT20 mode, MCS0.

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz

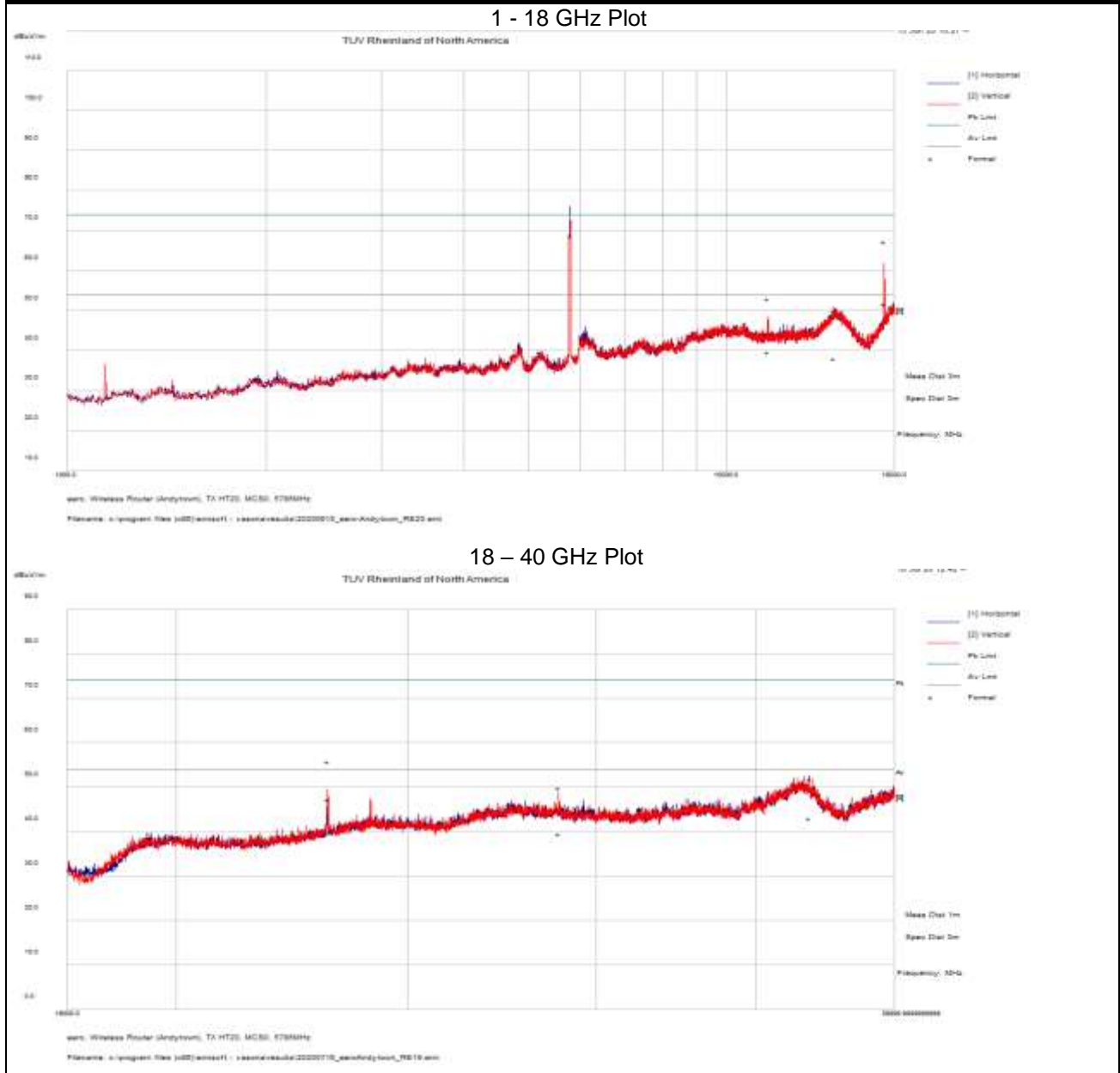


Notes: 1. Transmit at 5745 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz

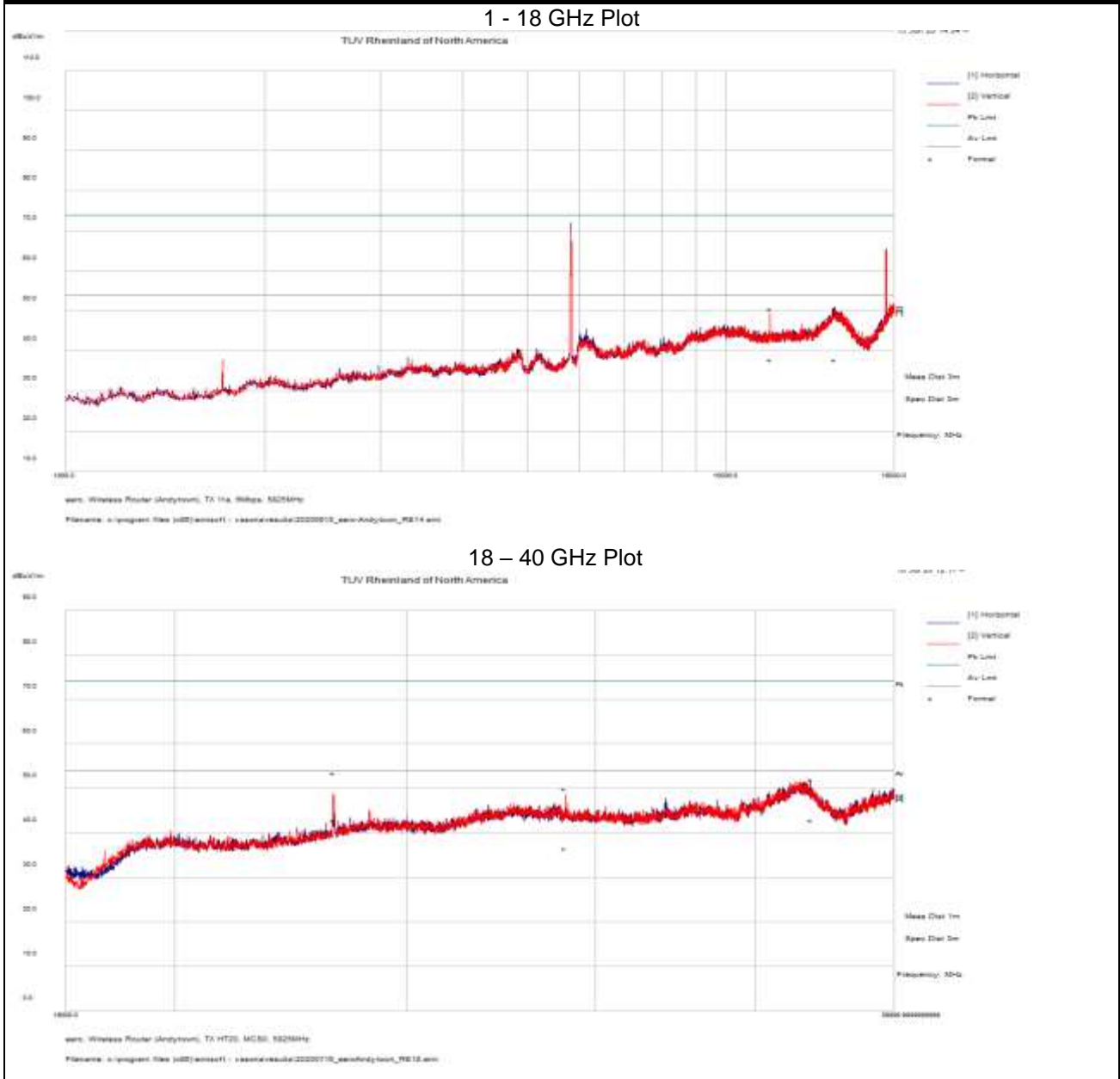


Notes: 1. Transmit at 5785 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT20 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz



Notes: 1. Transmit at 5825 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions				Tracking # 32062991.001 Page 13 of 30			
EUT Name	eero 6 and eero 6 Extender			Date	July 6, 2020		
EUT Model	N010001			Temp / Hum in	20° C / 37%rh		
EUT Serial	NA4V-0034-0FZS-B958			Temp / Hum out	N/A		
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1			Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN			RBW / VBW	Per ANSI C63.10		
Dist/Ant Used	3m / JB3 & 6505			Performed by	Kerwinn Corpuz		

9 kHz – 1 GHz Transmit at 5230 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
0.72	30.15	2.28	10.38	42.81	Pk	V	100	122	70.50	-27.69
1.63	25.73	2.32	10.60	38.66	Pk	V	100	134	63.38	-24.72
35.40	36.94	2.51	-10.48	28.98	QP	V	111	234	40.00	-11.02
57.04	50.89	2.67	-20.80	32.76	QP	V	214	142	40.00	-7.24
62.50	49.91	2.70	-20.54	32.06	QP	V	158	360	40.00	-7.94
70.86	53.17	2.76	-19.98	35.95	QP	V	102	128	40.00	-4.06
78.36	51.12	2.78	-20.22	33.69	QP	V	131	220	40.00	-6.31
85.91	54.22	2.82	-20.67	36.37	QP	V	176	98	40.00	-3.63

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty

Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: 1. Modes tested are 802.11n HT40, (low & high channels).

2. Worst case emission was observed on 802.11n HT40 at MCS0, 5230 MHz mode for 40MHz channel BW.

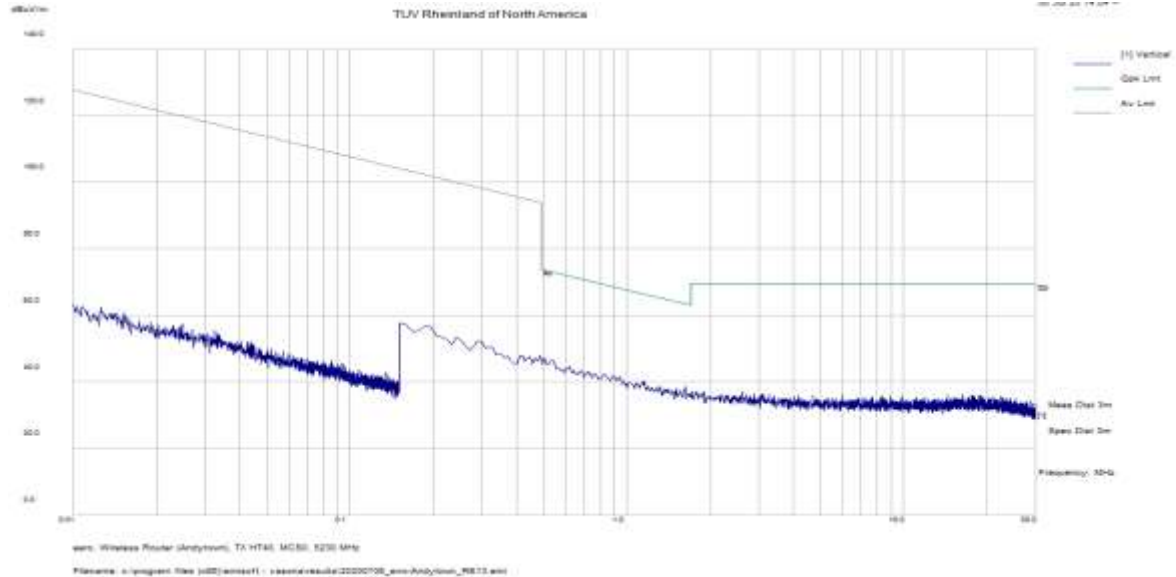
3. No significant emission was observed below 30 MHz. Detected noise floor.

SOP 1 Radiated Emissions

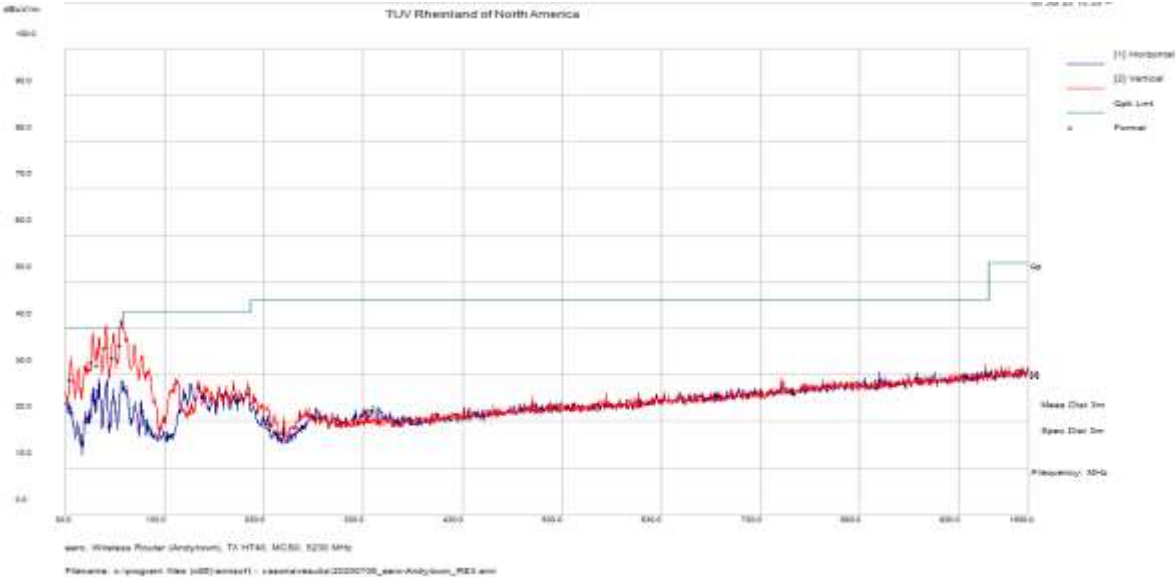
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EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Date	Kerwinn Corpuz

9 kHz to 30 MHz Plot



30 MHz to 1 GHz Plot



Notes: Transmit at 5230 MHz.

SOP 1 Radiated Emissions				Tracking # 32062991.001 Page 15 of 30			
EUT Name	eero 6 and eero 6 Extender			Date	June 12 - July 16, 2020		
EUT Model	N010001			Temp / Hum in	20° C / 36-38%rh		
EUT Serial	NA4V-0034-0FZS-B958			Temp / Hum out	N/A		
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1			Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN			RBW / VBW	Per ANSI C63.10		
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840			Performed by	Kerwinn Corpuz		

1 – 40 GHz Transmit at 5190 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
10375.42	60.41	2.82	-16.03	47.20	Pk	H	200	172	74.00	-26.80
10375.42	48.40	2.82	-16.03	35.19	Ave	H	200	172	54.00	-18.81
17909.89	55.83	4.11	-7.93	52.01	Pk	V	123	124	74.00	-21.99
17909.89	44.13	4.11	-7.93	40.32	Ave	V	123	124	54.00	-13.68
20757.36	48.50	7.60	-9.10	47.00	Pk	V	113	360	74.00	-27.00
20757.36	42.98	7.60	-9.07	41.51	Ave	V	113	360	54.00	-12.49
36820.65	47.60	10.30	-5.50	52.30	Pk	V	139	55	74.00	-21.70
36820.65	37.50	10.30	-5.50	42.20	Ave	V	139	55	54.00	-11.80

1 – 40 GHz Transmit at 5230 MHz (High Channel)

15686.57	72.28	3.81	-16.37	59.72	Pk	V	261	304	74.00	-14.28
15686.57	60.54	3.81	-16.37	47.98	Ave	V	261	304	54.00	-6.02
17990.06	55.78	4.11	-7.73	52.17	Pk	V	142	282	74.00	-21.83
17990.06	43.34	4.11	-7.73	39.72	Ave	V	142	282	54.00	-14.28
36476.22	46.50	10.20	-4.90	51.90	Pk	H	122	254	74.00	-22.10
36476.22	36.40	10.20	-4.90	41.80	Ave	H	122	254	54.00	-12.20
20920.11	56.18	7.60	-9.37	54.42	Pk	V	167	75	74.00	-19.58
20920.11	47.30	7.60	-9.40	45.50	Ave	V	167	75	54.00	-8.50

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty

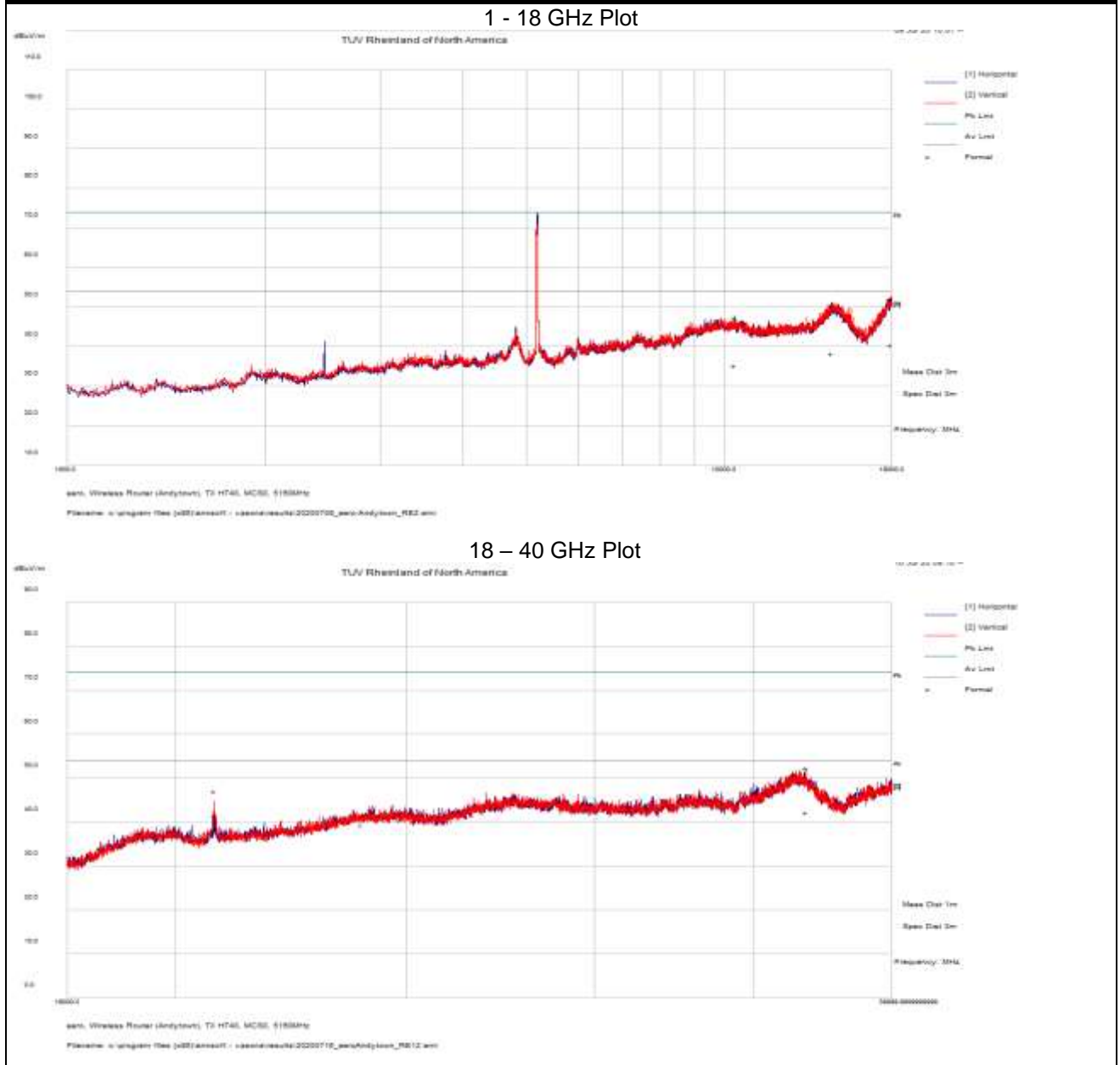
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: None

SOP 1 Radiated Emissions

Tracking # 32062991.001 Page 16 of 30

EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz

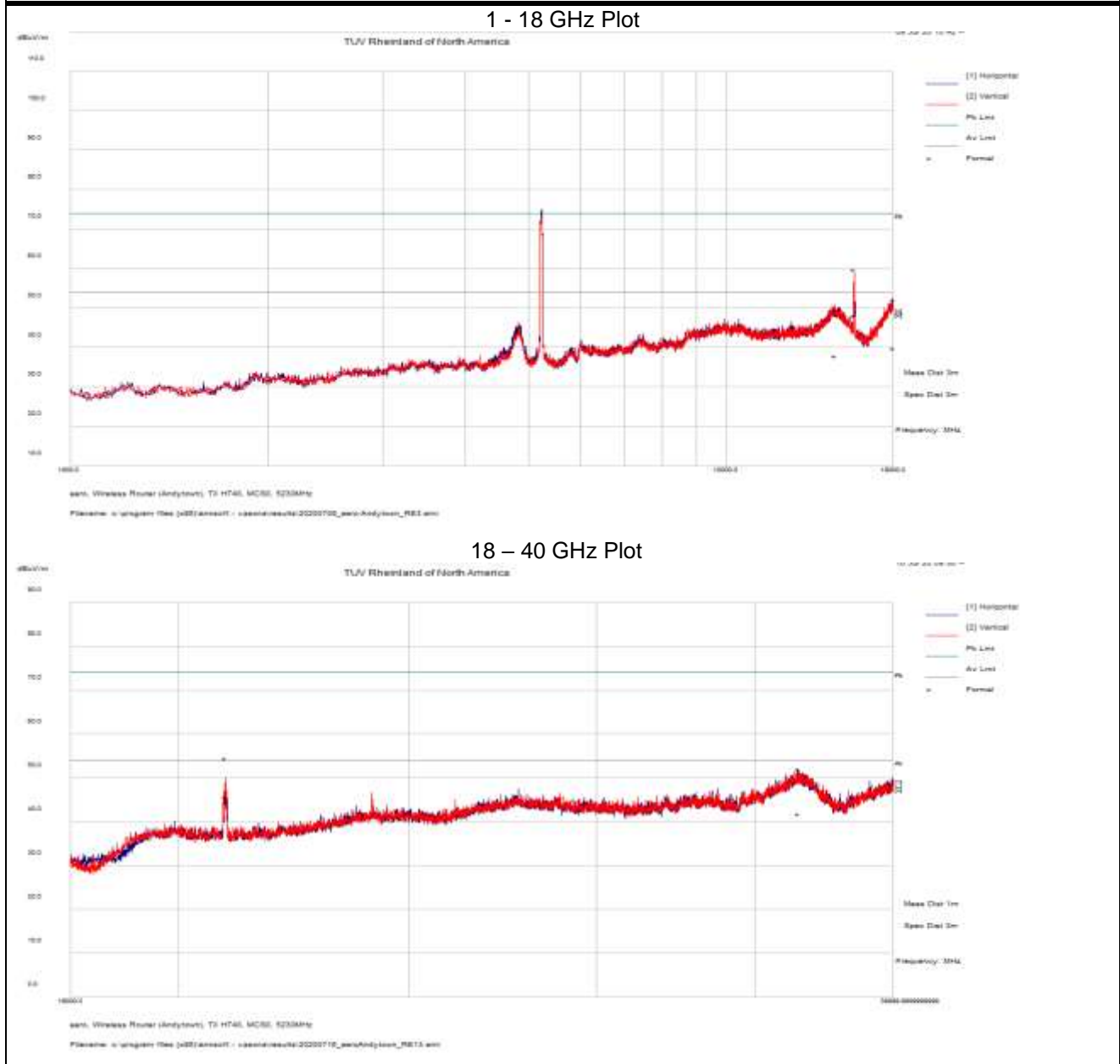


Notes: 1. Transmit at 5190 MHz.
 2. For 1-18 GHz Plot, emission above the Ave & near the Pk limit is the fundamental.

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz



Notes: 1. Transmit at 5230 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions				Tracking # 32062991.001 Page 18 of 30			
EUT Name	eero 6 and eero 6 Extender			Date	July 6, 2020		
EUT Model	N010001			Temp / Hum in	20° C / 37%rh		
EUT Serial	NA4V-0034-0FZS-B958			Temp / Hum out	N/A		
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1			Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN			RBW / VBW	Per ANSI C63.10		
Dist/Ant Used	3m / JB3 & 6505			Performed by	Kerwinn Corpuz		

9 kHz – 1 GHz Transmit at 5795 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
0.90	30.17	2.29	10.40	42.87	Pk	V	100	233	68.50	-25.63
1.38	25.84	2.32	10.60	38.75	Pk	V	100	227	64.78	-26.02
34.98	35.60	2.51	-10.10	28.01	QP	V	129	202	40.00	-11.99
56.70	52.92	2.67	-20.80	34.79	QP	V	116	89	40.00	-5.21
70.85	52.52	2.76	-19.98	35.29	QP	V	125	234	40.00	-4.71
78.37	53.69	2.78	-20.22	36.25	QP	V	109	202	40.00	-3.75
86.60	54.75	2.82	-20.67	36.90	QP	V	155	184	40.00	-3.10
99.48	47.80	2.87	-18.02	32.66	QP	V	102	18	43.50	-10.84

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty

Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: 1. Modes tested are 802.11n HT40, (low & high channels).

2. Worst case emission was observed on 802.11n HT40 at MCS0, 5795 MHz mode for 40MHz channel BW.

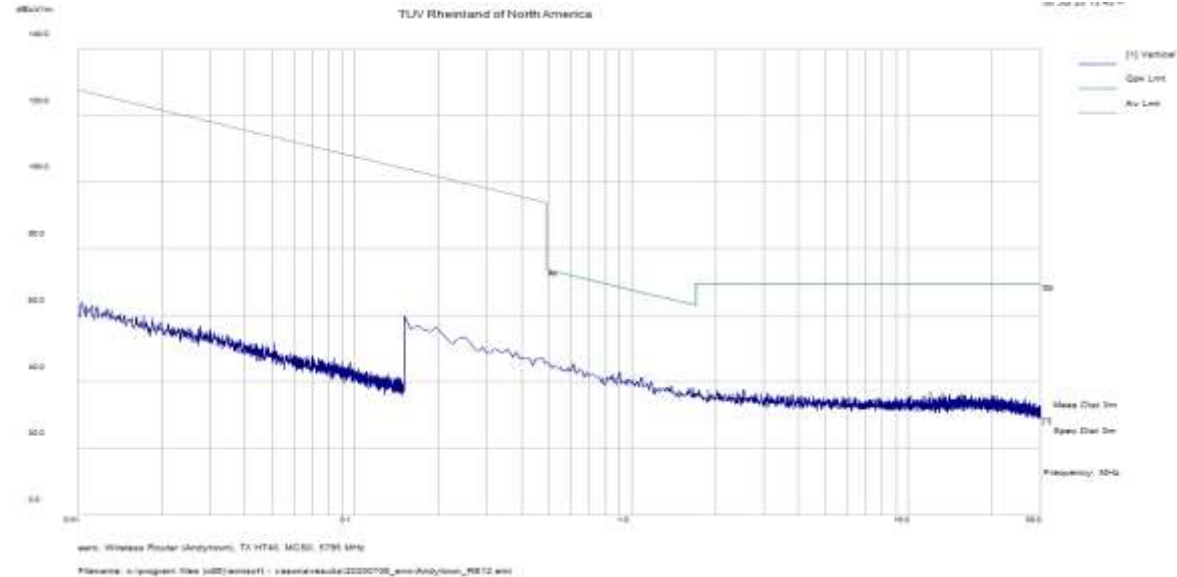
3. No significant emission was observed below 30 MHz. Detected noise floor.

SOP 1 Radiated Emissions

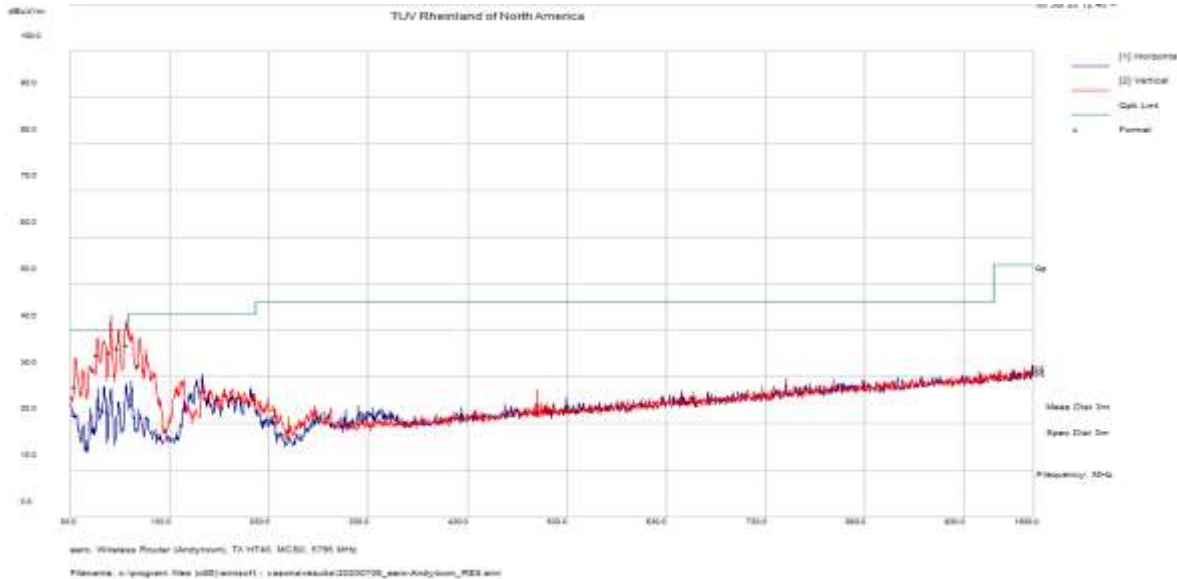
Tracking # 32062991.001 Page 19 of 30

EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Date	Kerwinn Corpuz

9 kHz to 30 MHz Plot



30 MHz to 1 GHz Plot



Notes: Transmit at 5795 MHz.

SOP 1 Radiated Emissions				Tracking # 32062991.001 Page 20 of 30			
EUT Name	eero 6 and eero 6 Extender			Date	June 12 - July 16, 2020		
EUT Model	N010001			Temp / Hum in	20° C / 36-38%rh		
EUT Serial	NA4V-0034-0FZS-B958			Temp / Hum out	N/A		
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1			Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN			RBW / VBW	Per ANSI C63.10		
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840			Performed by	Kerwinn Corpuz		

1 – 40 GHz Transmit at 5755 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
11513.03	62.08	3.14	-17.20	48.02	Pk	H	239	192	74.00	-25.98
11513.03	49.68	3.14	-17.20	35.62	Ave	H	239	192	54.00	-18.38
17264.41	74.47	3.96	-12.12	66.32	Pk	V	257	86	68.23	-1.91
23020.35	56.53	7.64	-7.84	56.33	Pk	V	168	84	74.00	-17.67
23020.35	49.00	7.60	-7.80	48.80	Ave	V	168	84	54.00	-5.20
28783.78	49.90	8.80	-5.70	53.00	Pk	V	178	62	74.00	-21.00
28783.78	35.70	8.80	-5.70	38.80	Ave	V	178	62	54.00	-15.20
36439.71	47.00	10.20	-4.90	52.40	Pk	V	193	86	74.00	-21.60
36439.71	38.50	10.20	-4.90	43.90	Ave	V	193	86	54.00	-10.10

1 – 40 GHz Transmit at 5795 MHz (High Channel)

11586.50	63.04	3.11	-17.71	48.45	Pk	V	234	327	74.00	-25.55
11586.50	50.20	3.11	-17.71	35.61	Ave	V	234	327	54.00	-18.39
17380.21	74.65	3.97	-11.33	67.29	Pk	V	263	88	68.23	-0.94
23180.50	57.22	7.76	-8.02	56.96	Pk	V	174	86	74.00	-17.05
23180.50	46.80	7.80	-8.00	46.50	Ave	V	174	86	54.00	-7.50
28976.61	49.25	8.78	-6.03	52.00	Pk	V	166	58	74.00	-22.00
28976.61	37.80	8.80	-6.00	40.50	Ave	V	166	58	54.00	-13.50
36416.70	47.36	10.23	-4.87	52.72	Pk	H	192	84	74.00	-21.28
36416.70	38.50	10.20	-4.90	43.90	Ave	H	192	84	54.00	-10.10

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty

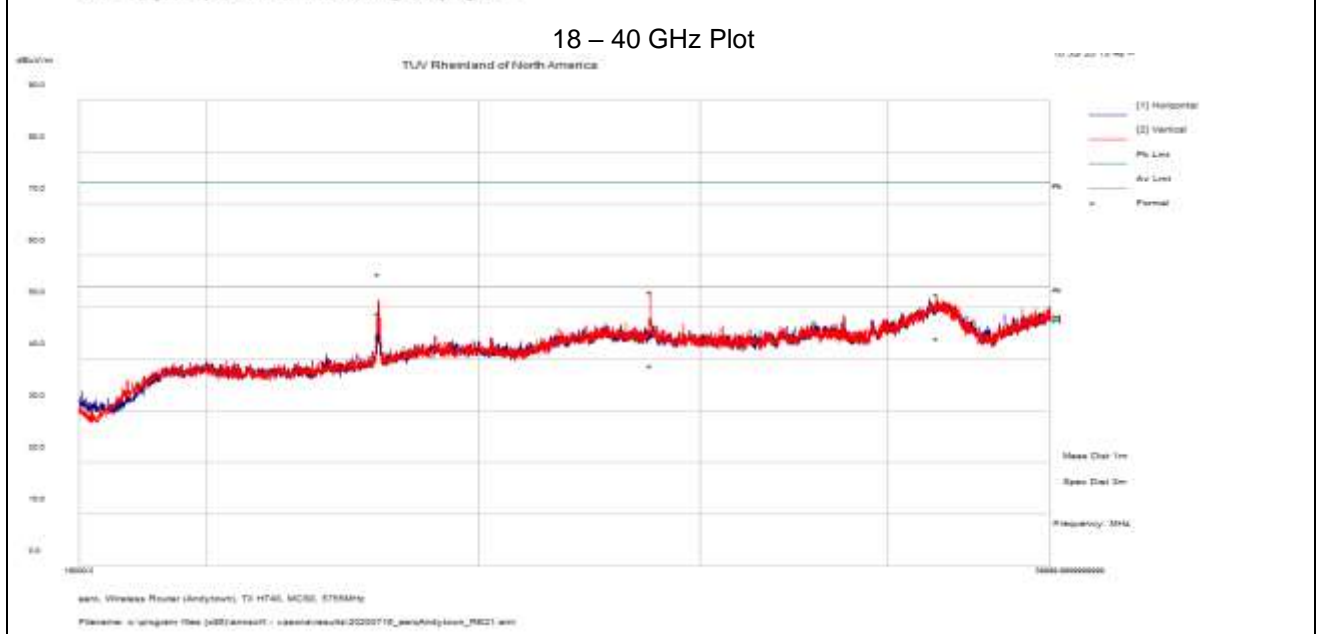
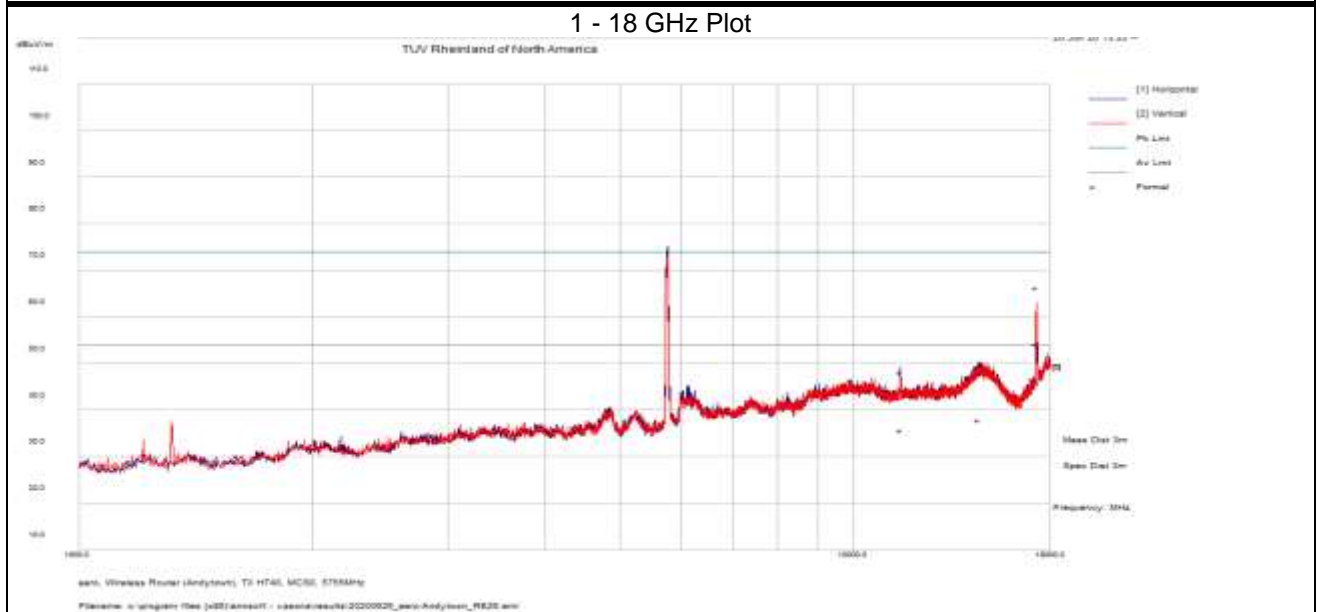
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: None

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz

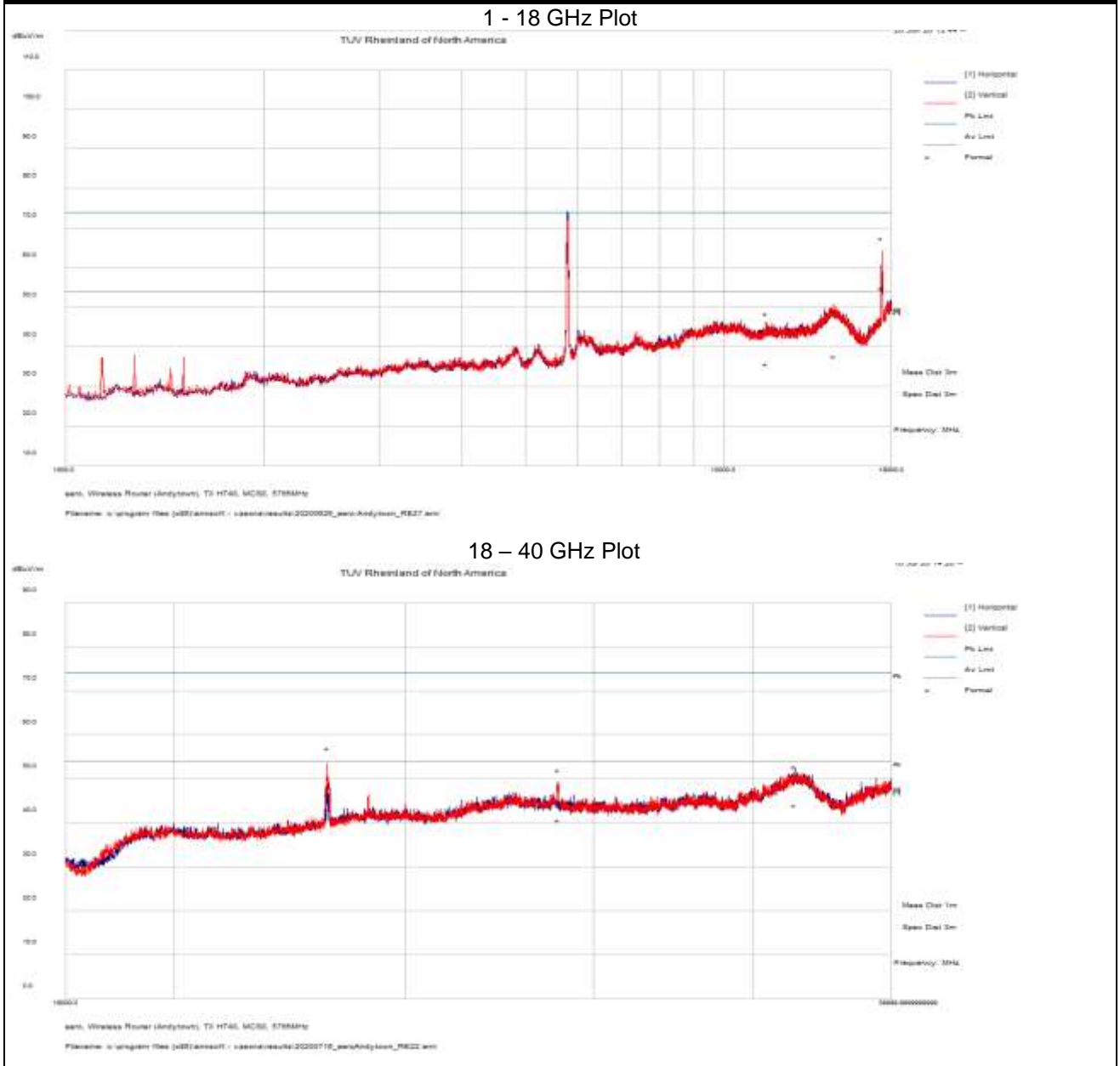


Notes: 1. Transmit at 5755 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11n HT40 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz



Notes: 1. Transmit at 5795 MHz.
 2. For 1-18 GHz Plot, emission above the Pk & Ave limit is the fundamental.

SOP 1 Radiated Emissions		Tracking # 32062991.001 Page 23 of 30	
EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Performed by	Kerwinn Corpuz

9 kHz – 1 GHz Transmit at 5210 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
0.81	28.89	2.29	10.31	41.49	Pk	V	100	69	69.45	-27.96
1.58	26.23	2.32	10.60	39.16	Pk	V	100	301	63.63	-24.48
35.44	35.93	2.51	-10.51	27.93	QP	V	162	336	40.00	-12.07
63.52	51.63	2.70	-20.44	33.89	QP	V	120	256	40.00	-6.11
70.59	53.65	2.75	-19.98	36.42	QP	V	104	166	40.00	-3.58
78.53	53.20	2.78	-20.23	35.75	QP	V	116	124	40.00	-4.25
85.88	55.16	2.82	-20.67	37.31	QP	V	156	48	40.00	-2.69
99.06	47.38	2.87	-18.14	32.11	QP	V	127	0	43.50	-11.40

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
 Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

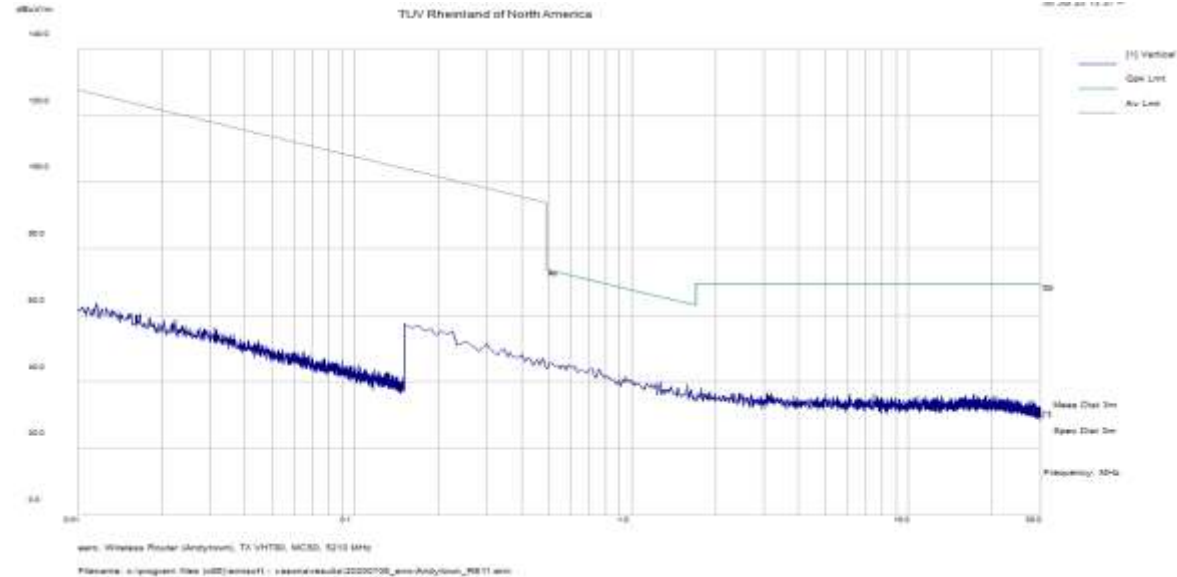
Note: No significant emission was observed below 30 MHz. Detected noise floor.

SOP 1 Radiated Emissions

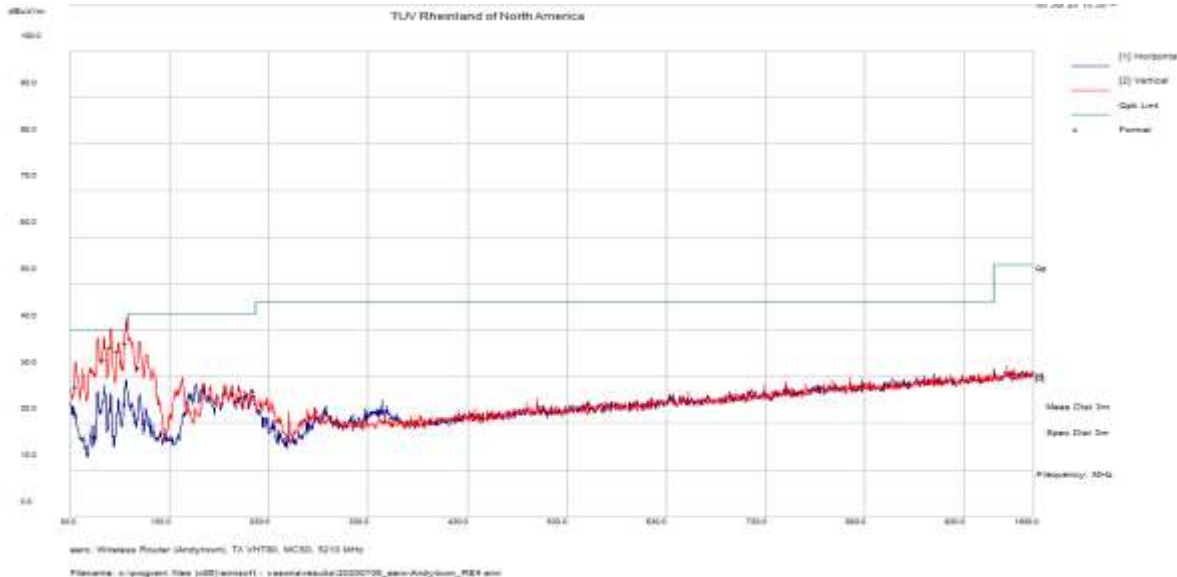
Tracking # 32062991.001 Page 24 of 30

EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Date	Kerwinn Corpuz

9 kHz to 30 MHz Plot



30 MHz to 1 GHz Plot



Notes: Transmit at 5210 MHz.

SOP 1 Radiated Emissions				Tracking # 32062991.001 Page 25 of 30			
EUT Name	eero 6 and eero 6 Extender			Date	June 12 - July 16, 2020		
EUT Model	N010001			Temp / Hum in	20° C / 36-38%rh		
EUT Serial	NA4V-0034-0FZS-B958			Temp / Hum out	N/A		
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1			Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN			RBW / VBW	Per ANSI C63.10		
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840			Performed by	Kerwinn Corpuz		

1 – 40 GHz Transmit at 5210 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
14594.83	59.32	3.59	-13.05	49.87	Pk	H	153	94	74.00	-24.13
14594.83	47.29	3.59	-13.05	37.83	Ave	H	153	94	54.00	-16.17
17755.94	55.50	4.07	-8.34	51.22	Pk	V	142	31	74.00	-22.78
17755.94	43.63	4.07	-8.34	39.35	Ave	V	142	31	54.00	-14.65
20839.93	48.39	7.60	-9.15	46.84	Pk	V	158	78	74.00	-27.16
20839.93	44.40	7.60	-9.10	42.90	Ave	V	158	78	54.00	-11.10
36458.35	46.20	10.20	-4.90	51.60	Pk	H	159	12	74.00	-22.40
36458.35	36.50	10.20	-4.90	41.90	Ave	H	159	12	54.00	-12.10

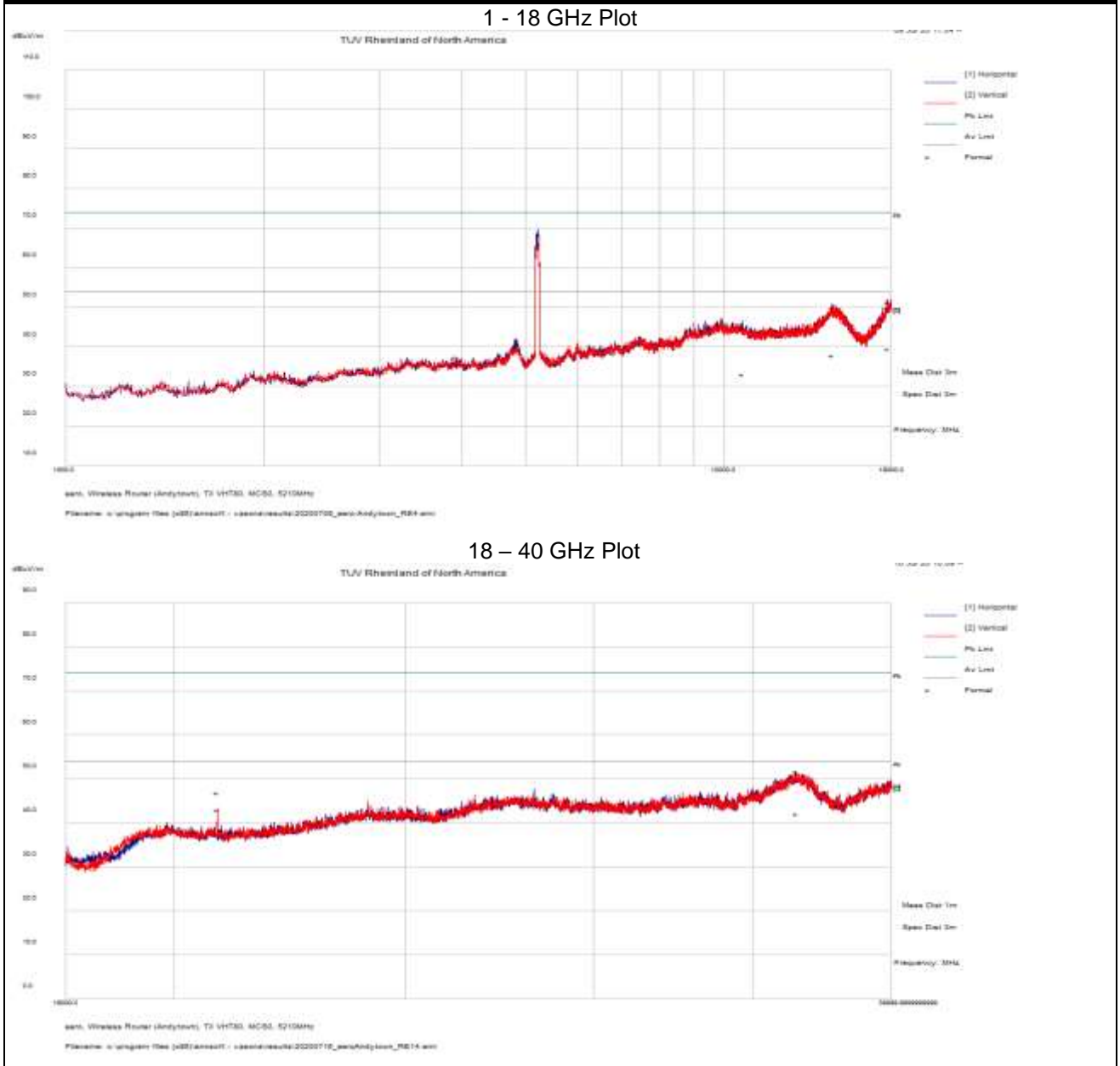
Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
 Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: None

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz



Notes: 1. Transmit at 5210 MHz.
 2. For 1-18 GHz Plot, emission above the Ave & near the Pk limit is the fundamental.

SOP 1 Radiated Emissions		Tracking # 32062991.001 Page 27 of 30	
EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Performed by	Kerwinn Corpuz

9 kHz – 1 GHz Transmit at 5775 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
0.56	32.56	2.26	10.40	45.22	Pk	V	100	87	72.67	-27.44
0.99	28.11	2.30	10.59	41.00	Pk	V	100	360	67.65	-26.65
34.74	34.34	2.51	-9.89	26.96	QP	V	153	58	40.00	-13.04
56.80	52.38	2.67	-20.80	34.25	QP	V	152	160	40.00	-5.75
63.15	50.28	2.70	-20.47	32.51	QP	V	156	314	40.00	-7.49
71.12	52.25	2.76	-19.98	35.03	QP	V	125	184	40.00	-4.97
78.32	50.79	2.78	-20.21	33.36	QP	V	186	360	40.00	-6.64
85.61	56.26	2.81	-20.67	38.40	QP	V	131	42	40.00	-1.60

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
 Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

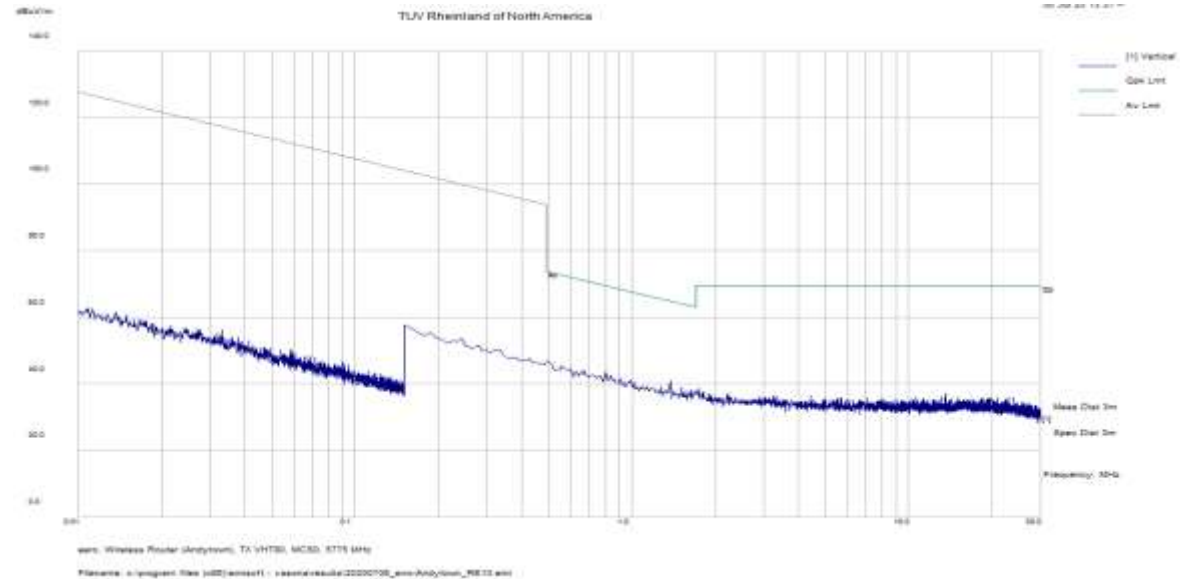
Note: No significant emission was observed below 30 MHz. Detected noise floor.

SOP 1 Radiated Emissions

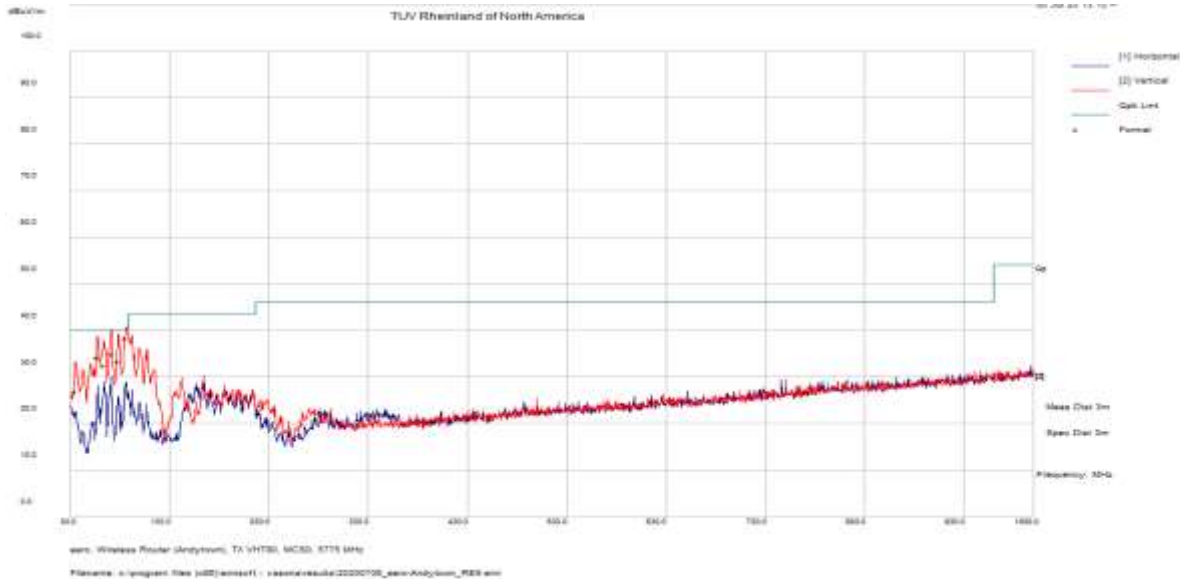
Tracking # 32062991.001 Page 28 of 30

EUT Name	eero 6 and eero 6 Extender	Date	July 6, 2020
EUT Model	N010001	Temp / Hum in	20° C / 37%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / JB3 & 6505	Date	Kerwinn Corpuz

9 kHz to 30 MHz Plot



30 MHz to 1 GHz Plot



Notes: Transmit at 5775 MHz.

SOP 1 Radiated Emissions		Tracking # 32062991.001 Page 29 of 30	
EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz

1 – 40 GHz Transmit at 5775 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
14618.15	59.77	3.60	-12.95	50.41	Pk	H	221	360	74.00	-23.59
14618.15	46.99	3.60	-12.95	37.63	Ave	H	221	360	54.00	-16.37
17299.46	66.93	3.90	-11.97	58.85	Pk	V	182	92	68.23	-9.38
23100.02	51.70	7.70	-7.80	51.60	Pk	V	158	88	74.00	-22.40
23100.02	46.50	7.70	-7.80	46.40	Ave	V	158	88	54.00	-7.60
36559.75	47.48	10.23	-4.88	52.83	Pk	H	169	2	74.00	-21.17
36559.75	39.20	10.20	-4.90	44.60	Ave	H	169	2	54.00	-9.40

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty

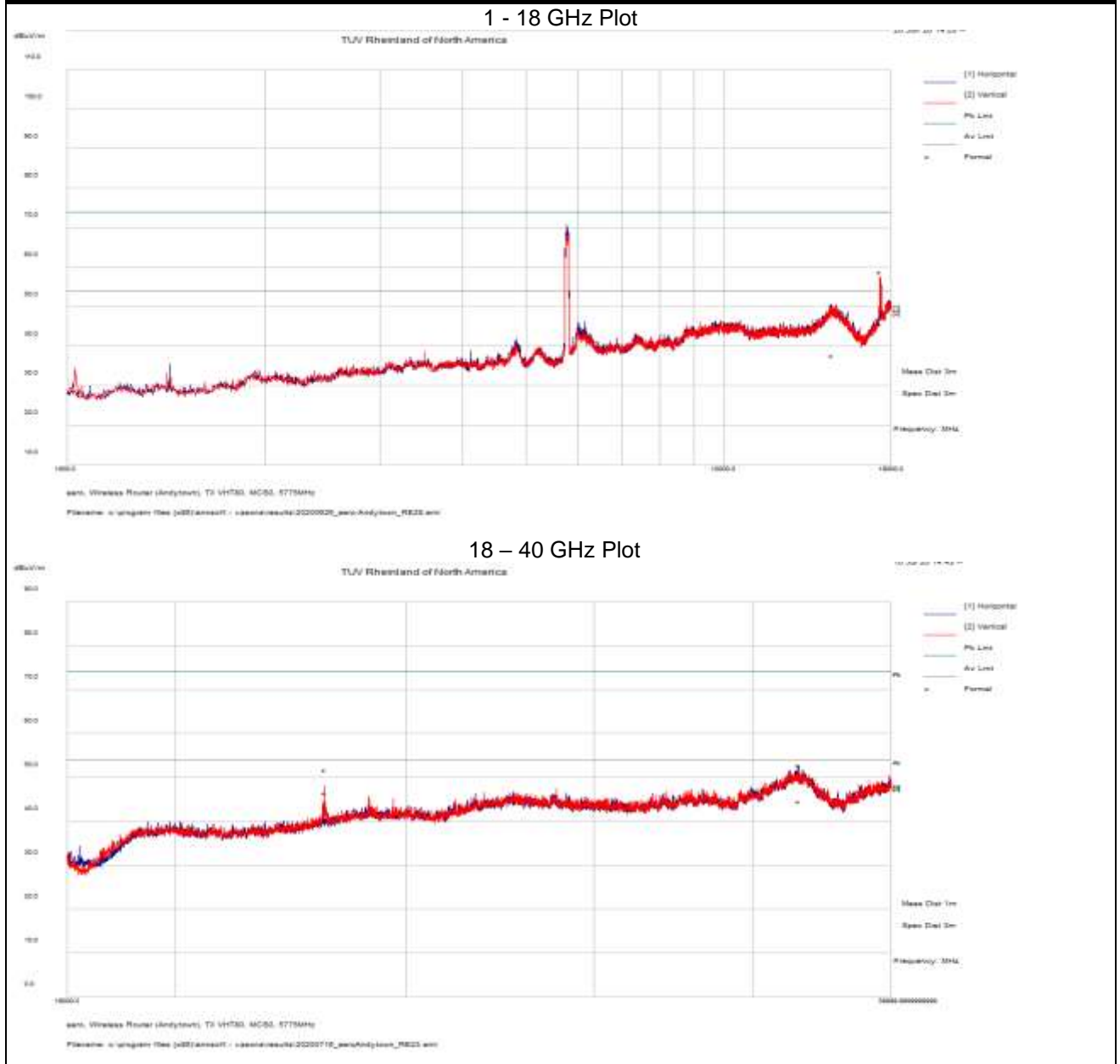
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: None

SOP 1 Radiated Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	June 12 - July 16, 2020
EUT Model	N010001	Temp / Hum in	20° C / 36-38%rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	802.11ac VHT80 mode at MCS0 / chain 0 & 1	Line AC / Freq	110 Vac / 60 Hz
Standard	CFR47 Part 15 Subpart E, RSS-247, RSS-GEN	RBW / VBW	Per ANSI C63.10
Dist/Ant Used	3m / EMCO-3115, 1m / COM-POWER AHA-840	Performed by	Kerwinn Corpuz



Notes: 1. Transmit at 5775 MHz.
 2. For 1-18 GHz Plot, emission above the Ave & near the Pk limit is the fundamental.

4.6 AC Conducted Emissions

Testing was performed in accordance with ANSI C63.4: 2014. These test methods are listed under the laboratory's A2LA Scope of Accreditation.

This test measures the levels emanating from the EUT's AC input port, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

The AC conducted emissions of equipment under test shall not exceed the values in CFR47 Part 15.207: 2020 and RSS GEN: 2019.

4.6.1 Test Methodology

A test program that controls instrumentation and data logging was used to automate the AC Power Line Conducted emission test procedure. The frequency range of interest was divided into sub-ranges such as to yield a frequency resolution of 9 kHz. Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a set of 50µH / 50Ω LISNs.

Testing is performed in Lab 5. The setup photographs clearly identify which site was used. The vertical ground plane used in the semi-anechoic chamber is a 2m x 2m solid aluminum frame and panel, and it is bonded to the horizontal ground plane.

In the case of tabletop equipment, the EUT is placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane and 40cm from a vertical ground reference plane. The rear of the EUT was positioned flush with the backside of the table and directly over the LISNs. The power and I/O cables were routed over the edge of the table and bundled approximately 40cm from the ground plane. Support equipment was powered from a separate LISN.

4.6.1.1 Deviations

There were no deviations from this test methodology.

4.6.2 Test Results

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

Table 17: AC Conducted Emissions – Test Results

Test Conditions: Conducted Measurement at Normal Conditions only		Date: May 29, 2020
Antenna Type: FPCB		Power Level: See Test Plan
AC Power: 110 Vac/60 Hz		Configuration: Tabletop
Ambient Temperature: 22° C		Relative Humidity: 35% RH
Configuration	Frequency Range	Test Result
Line 1 (Hot)	0.15 to 30 MHz	Pass
Line 2 (Neutral)	0.15 to 30 MHz	Pass

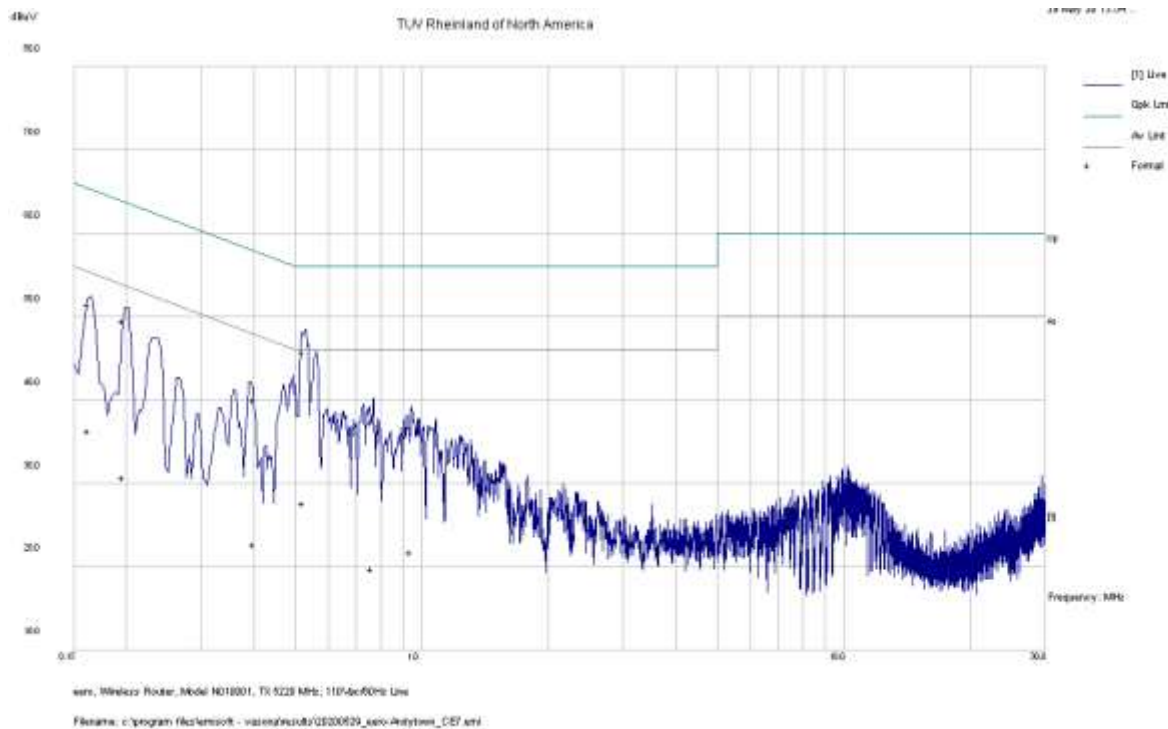
SOP 2 Conducted Emissions						Tracking # 32062991.001 Page 1 of 4			
EUT Name		eero 6 and eero 6 Extender				Date		May 29, 2020	
EUT Model		N010001				Temp / Hum in		22° C / 35% rh	
EUT Serial		NA4V-0034-0FZS-B958				Temp / Hum out		N/A	
EUT Config.		TX mode: 802.11n HT20, MCS0, 5200 MHz				Line AC / Freq		110 Vac / 60 Hz	
Standard		CFR47 Part 15.207 and RSS Gen				RBW / VBW		9 kHz / 30 kHz	
Lab/LISN		Lab #5 /Com-Power, Line 1				Performed by		Kerwinn Corpuz	
Frequency	Raw	Limiter	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.162	41.49	9.95	0.09	51.53	QP	Live	65.34	-13.81	Pass
0.162	26.24	9.95	0.09	36.28	Ave	Live	55.34	-19.06	Pass
0.196	39.55	9.95	0.07	49.57	QP	Live	63.79	-14.22	Pass
0.196	20.73	9.95	0.07	30.75	Ave	Live	53.79	-23.04	Pass
0.401	30.00	9.97	0.04	40.01	QP	Live	57.84	-17.82	Pass
0.401	12.70	9.97	0.04	22.71	Ave	Live	47.84	-25.13	Pass
0.523	35.82	9.98	0.04	45.84	QP	Live	56.00	-10.16	Pass
0.523	17.58	9.98	0.04	27.60	Ave	Live	46.00	-18.40	Pass
0.763	27.32	9.99	0.04	37.34	QP	Live	56.00	-18.66	Pass
0.763	9.68	9.99	0.04	19.70	Ave	Live	46.00	-26.30	Pass
0.940	26.77	9.99	0.04	36.80	QP	Live	56.00	-19.20	Pass
0.940	11.67	9.99	0.04	21.70	Ave	Live	46.00	-24.30	Pass
Spec Margin = QP./Ave. - Limit, ± Uncertainty									
Combined Standard Uncertainty $U_c(y) = \pm 1.2$ dB Expanded Uncertainty $U = kU_c(y)$ $k = 2$ for 95% confidence									
Notes: EUT was setup as table top equipment and transmitted at 5200 MHz in 802.11n HT20 mode at MCS0. Pre-Scan test on 5200 MHz and 5785 MHz, found 5200 MHz as worse case.									

SOP 2 Conducted Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	May 29, 2020
EUT Model	N010001	Temp / Hum in	22° C / 35% rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	TX mode: 802.11n HT20, MCS0, 5200 MHz	Line AC	110 Vac / 60 Hz
Standard	CFR47 Part 15.207 and RSS Gen	RBW / VBW	9 kHz / 30 kHz
Lab/LISN	Lab #5 /Com-Power, Line 1	Performed by	Kerwinn Corpuz

150 kHz to 30 MHz Plot for Line 1 (Live)



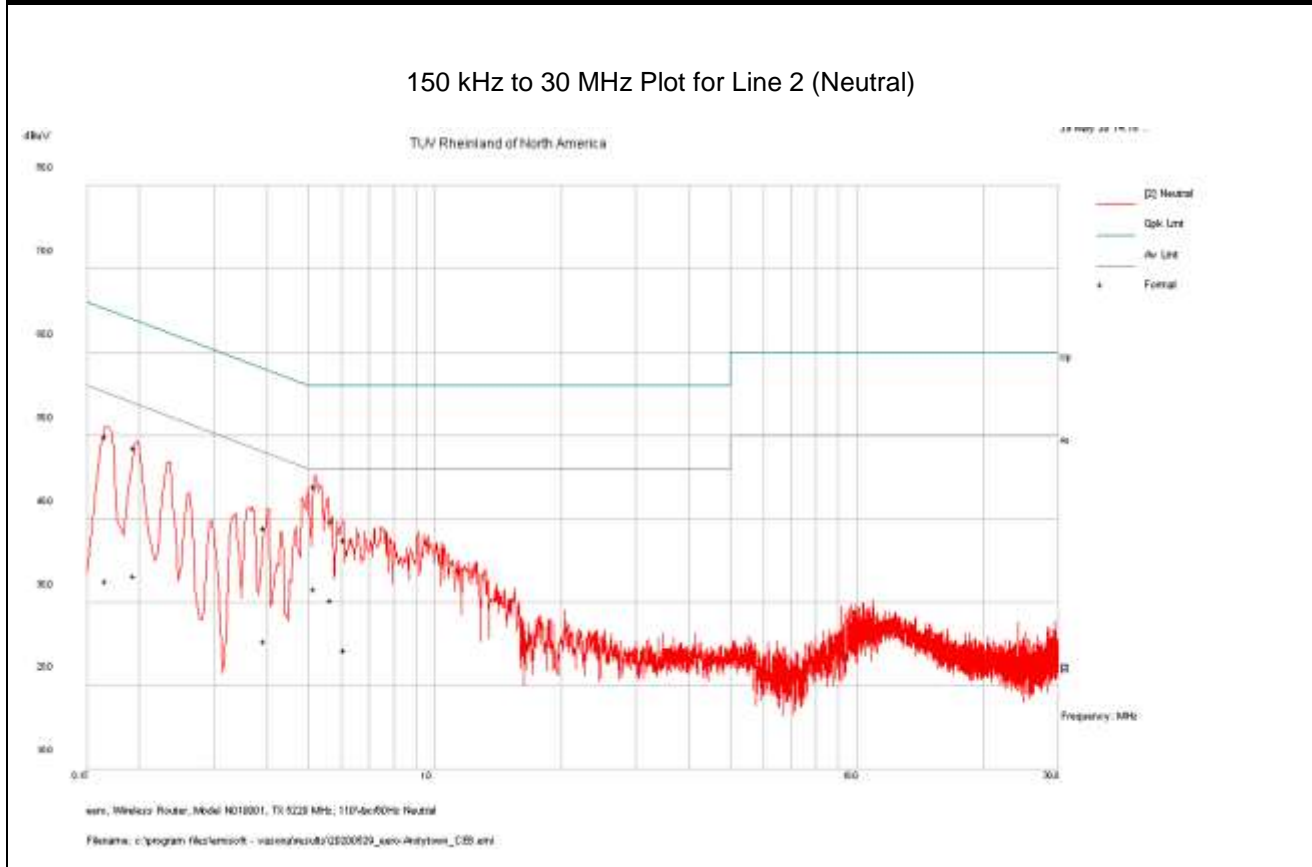
Note: Met FCC Class B limit.

SOP 2 Conducted Emissions						Tracking # 32062991.001 Page 3 of 4			
EUT Name	eero 6 and eero 6 Extender					Date	May 29, 2020		
EUT Model	N010001					Temp / Hum in	22° C / 35% rh		
EUT Serial	NA4V-0034-0FZS-B958					Temp / Hum out	N/A		
EUT Config.	TX mode: 802.11n HT20, MCS0, 5200 MHz					Line AC / Freq	110 Vac / 60 Hz		
Standard	CFR47 Part 15.207 and RSS Gen					RBW / VBW	9 kHz / 30 kHz		
Lab/LISN	Lab #5 /Com-Power, Line 2					Performed by	Kerwinn Corpuz		
Frequency	Raw	Limiter	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.166	39.93	9.95	0.08	49.96	QP	Neutral	65.14	-15.18	Pass
0.166	22.53	9.95	0.08	32.57	Ave	Neutral	55.14	-22.57	Pass
0.195	38.52	9.95	0.07	48.54	QP	Neutral	63.84	-15.30	Pass
0.195	23.23	9.95	0.07	33.25	Ave	Neutral	53.84	-20.59	Pass
0.398	28.93	9.97	0.04	38.94	QP	Neutral	57.90	-18.97	Pass
0.398	15.41	9.97	0.04	25.42	Ave	Neutral	47.90	-22.49	Pass
0.520	33.85	9.98	0.04	43.87	QP	Neutral	56.00	-12.13	Pass
0.520	21.57	9.98	0.04	31.59	Ave	Neutral	46.00	-14.41	Pass
0.569	29.73	9.98	0.04	39.75	QP	Neutral	56.00	-16.25	Pass
0.569	20.30	9.98	0.04	30.32	Ave	Neutral	46.00	-15.68	Pass
0.615	27.52	9.98	0.04	37.54	QP	Neutral	56.00	-18.46	Pass
0.615	14.33	9.98	0.04	24.35	Ave	Neutral	46.00	-21.65	Pass
0.166	39.93	9.95	0.08	49.96	QP	Neutral	65.14	-15.18	Pass
0.166	22.53	9.95	0.08	32.57	Ave	Neutral	55.14	-22.57	Pass
Spec Margin = QP./Ave. - Limit, ± Uncertainty									
Combined Standard Uncertainty $u_c(y) = \pm 1.2$ dB Expanded Uncertainty $U = k u_c(y)$ $k = 2$ for 95% confidence									
Notes: EUT was setup as table top equipment and transmitted at 5200 MHz in 802.11n HT20 mode at MCS0. Pre-Scan test on 5200 MHz and 5785 MHz, found 5200 MHz as worse case.									

SOP 2 Conducted Emissions

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EUT Name	eero 6 and eero 6 Extender	Date	May 29, 2020
EUT Model	N010001	Temp / Hum in	22° C / 35% rh
EUT Serial	NA4V-0034-0FZS-B958	Temp / Hum out	N/A
EUT Config.	TX mode: 802.11n HT20, MCS0, 5200 MHz	Line AC	110 Vac / 60 Hz
Standard	CFR47 Part 15.207 and RSS Gen	RBW / VBW	9 kHz / 30 kHz
Lab/LISN	Lab #5 /Com-Power, Line 2	Performed by	Kerwinn Corpuz



Note: Met FCC Class B Limit.

4.7 Frequency Stability

In accordance with 47 CFR Part 15.407(g) and RSS GEN Sect. 8.8 the frequency stability of U-NII devices must be such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual. The Manufacturer calls out operating temperature ranges of +0° to +35° C.

The frequency stability of the reference oscillator sets the frequency stability of the RF transceiver signals. Therefore all of the RF signal should have ± 20 ppm stability.

This stability accounts for room temp tolerance of the crystal oscillator circuit, frequency variation across temperature, and crystal ageing.

4.7.1 Test Methodology

The manufacturer of the equipment is responsible for ensuring that the frequency stability is such that emissions are always maintained within the band of operation under all conditions. This test performs according to ANSI C63.10-2013 Section 6.8.

4.7.2 Limit

CFR47 Part 15.407(g) and RSS GEN Sect. 6.11 - Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

4.7.3 Manufacturer Declaration

Eero LLC declares that the N010001 and Q010001 WiFi Module is compliant to CFR47 Part 15.31(e), 15.407(g) and RSS GEN Sect. 6.11 requirements. The N010001 and Q010001 maintains the fundamental emission within the bands of operation under all conditions of normal operation as specified in the user's manual.

5 Test Equipment List

5.1 Equipment List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yyyy	Next Cal mm/dd/yyyy
LISN	Com-Power	LI-200	12100	02/21/2020	02/21/2021
Loop Antenna	EMCO	6502	9110-2683	06/16/2020	06/16/2022
Bilog Antenna	Sunol Sciences	JB3	A102606	08/01/2018	08/01/2020
Horn Ant. (1-18GHz)	EMCO	3115	9211-3969	06/20/2019	06/20/2021
Horn Ant. w/ Pre-Amp	Com-Power	AHA-840	105005	09/03/2019	09/03/2021
EMI Receiver	Agilent	N9038A	MY52260210	02/15/2020	02/15/2021
Spectrum Analyzer	Agilent	N9030A	MY52350885	10/26/2019	10/26/2020
EMI Receiver	Rohde & Schwarz	ESIB40	100180	09/20/2019	09/20/2020
Preamplifier	Sonoma Inst.	310	185516	02/12/2020	02/12/2021
Preamplifier	Miteq	TTA1800-30-HG	184252	02/12/2020	02/12/2021
RF Power Meter	Agilent	E4418A	MY45103902	02/13/2020	02/13/2021
Power Sensor	Agilent	8481A	US37295801	02/13/2020	02/13/2021
Thermometer	Extech Instruments	SD700	A095319	03/18/2020	03/18/2021
Thermo Chamber	Espec	BTZ-133	0613436	12/20/2019	12/20/2020
DC Power Supply	Agilent	E3634A	MY400004331	02/15/2020	02/15/2021
Signal Generator	Anritsu	MG3694A	042803	02/13/2020	02/13/2021
Notch Filter	Micro-Tronics	BRM50716	003	VBU	VBU
Notch Filter	Micro-Tronics	BRM50702	037	VBU	VBU

* 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 so that the test laboratory may perform the requested testing.

6.2 Customer

Table 18: Customer Information

Company Name	eero LLC
Address	660 3rd Street
City, State, Zip	San Francisco, CA 94107
Country	U.S.A.
Phone	+1 415-738-7972

Table 19: Technical Contact Information

Name	eero LLC
E-mail	cliff@eero.com
Phone	+1 415-738-7972

6.3 Equipment Under Test (EUT)

Table 20: EUT Specifications

EUT Specifications	
AC Input	100-240V AC, 50 – 60 Hz, 0.5A
DC Input	5 VDC, 3 A, 15W
Environment	Indoor
Operating Temperature Range:	0 to 35 degrees C
Multiple Feeds:	<input type="checkbox"/> Yes and how many <input checked="" type="checkbox"/> No
Product Marketing Name (PMN)	N010001 and Q010001
Hardware Version Identification Number (HVIN)	N010001 and Q010001
Firmware Version Identification Number (FVIN)	eeroOS 5.0.0
802.11-radio modules	
Operating Mode	802.11a, 802.11b, 802.11g, 802.11n (HT20 & HT40), 802.11ac (VHT20, VHT40 & VHT80)
Transmitter Frequency Band	2.4 – 2.4835 GHz, 5.15– 5.25 GHz, 5.25– 5.35 GHz, 5.47– 5.72 GHz, and 5.725– 5.85 GHz
Total Rated Power Output	25.18 dBm
Power Setting @ Operating Channel	See Table 21: EUT Channel Power Specifications.
Antenna Type	Refer to Section 3.4.1
Max. Peak Antenna Gain	Refer to Section 3.4.1
Modulation Type	<input checked="" type="checkbox"/> Thread (Zigbee) <input checked="" type="checkbox"/> BLE <input checked="" type="checkbox"/> DSSS <input checked="" type="checkbox"/> OFDM <input type="checkbox"/> Other describe:
Data Rate	802.11a: 1 Spatial Stream: 6, 9,12, 18, 24, 36, 48, 54 Mbps 802.11n HT20: 2 Spatial Streams: 13, 26, 39, 52, 78, 104, 117, 130 Mbps 802.11n HT40: 2 Spatial Streams: 27, 54, 81, 108, 162, 216, 243, 270 Mbps 802.11ac VHT20: 2 Spatial Streams: 13, 26, 39, 52, 78, 104, 117, 130, 156 Mbps 802.11ac VHT40: 2 Spatial Streams: 27, 54, 81, 108, 240, 270, 300, 360, 400 Mbps 802.11ac VHT80: 2 Spatial Streams: 58.5, 117, 175.5, 234, 351, 468, 526.5, 585, 702, 780 Mbps

EUT Specifications	
TX/RX Chain (s)	MIMO (2x2)
Directional Gain Type	<input checked="" type="checkbox"/> Correlated <input checked="" type="checkbox"/> Beam-Forming <input type="checkbox"/> Other describe:
Type of Equipment	<input checked="" type="checkbox"/> Table Top <input type="checkbox"/> Wall-mount <input type="checkbox"/> Floor standing cabinet <input type="checkbox"/> Other:
Note: 1. All two chains will be on / transmitted at all time. 2. EUT software: eero test image 4470b6a83278; Fri may 29 18:01:48 UTC 2020.	

Table 21: EUT Channel Power Specifications

No.	Freq. (MHz)	Target Power Value dBm										
		Uncorrelated Mode						Correlated Mode				
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT20	802.11ac VHT40	802.11ac VHT80	802.11n HT20	802.11n HT40	802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
Power Setting (TP)												
36	5180	41	41		41			41		41		
38	5190			38		38			38		38	
40	5200	47	46		46			46		46		
42	5210						37					37
44	5220	47	46		46			46		46		
46	5230			43		43			43		43	
48	5240	47	46		46			46		46		
149	5745	45	43		43			43		43		
151	5755			45		45			45		45	
155	5775						43					43
157	5785	48	44		44			44		44		
159	5795			45		45			45		4.5	
165	5825	45	44		44			44		44		

Note: The adjusted power target values are updated at the evaluated frequencies.

Table 22: 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?
RJ45	Terminated to Host Ethernet Port	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Metric:2m	<input checked="" type="checkbox"/> N/A

Table 23: Supported Equipment

Equipment	Manufacturer	Model	Serial	Used for
Laptop	DELL	Latitude 5420	GBGHMQ1	Set test mode

Table 24: Description of Sample used for Testing

Device	Serial Number	Configuration	Used For
N010001	NA4V-0034-0FZS-B958	Radiated Sample	Radiated Emissions. Conducted Emission
N010001	NA4V-003K-J9V4-FP58	Conducted Sample	Output Power, Occupied Bandwidth, Conducted Spurious Emissions, Peak Power Spectral Density
Note: None			

Table 25: Description of Test Configuration used for Radiated Measurement.

Device	Antenna	Mode	Setup Description
N010001	Integrated	Transmit & Receive	positioned tabletop.
Note: This is the final setup configuration used for testing on its normal positioned.			

6.4 Test Specifications

Table 26: Test Specifications

Emissions	
Regulation Rules / Standards	Requirement
CFR 47 Part 15.407: 2020	All
RSS 247 Issue 2, 2017	All

END OF REPORT