

8/9/2023

Viavi Solutions, LLC
10200 W. York Street
Wichita, KS 67215
USA

Dear Todd Salisbury,

Enclosed is the EMC Wireless test report for compliance testing of the Viavi Solutions, LLC CX100 as tested to the requirements of FCC Part 15.407 and RSS-247 Issue 2 for Intentional Radiators (limited to radiated spurious emissions and restricted band edge.)

Thank you for using the services of Eurofins MET Labs. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
EUROFINS MET LABS



Nancy LaBrecque
Documentation Department

Reference: WIRA121793 - Spurious - 5GHz WiFi

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5GHz UNII Band WiFi Test Report
for the

Viavi Solutions, LLC
CX100

Tested under
FCC Part 15.407 and RSS-247 Issue 2
For Intentional Radiators
(Limited to Radiated Spurious Emissions and Restricted Band Edge)



Bryan Taylor, Wireless Team Lead
Electromagnetic Compatibility Lab



Nancy LaBrecque
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules Part 15.247 under normal use and maintenance.



Matthew Hinojosa
EMC Manager, Austin Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	8/9/2023	Initial Issue.

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List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
<i>d</i>	Measurement Distance
dB	Decibels
dB μ A	Decibels above one microamp
dB μ V	Decibels above one microvolt
dB μ A/m	Decibels above one microamp per meter
dB μ V/m	Decibels above one microvolt per meter
DC	Direct Current
E	Electric Field
DSL	Digital Subscriber Line
ESD	Electrostatic Discharge
EUT	Equipment Under Test
<i>f</i>	Frequency
FCC	Federal Communications Commission
GRP	Ground Reference Plane
H	Magnetic Field
HCP	Horizontal Coupling Plane
Hz	Hertz
IEC	International Electrotechnical Commission
kHz	Kilohertz
kPa	Kilopascal
kV	Kilovolt
LISN	Line Impedance Stabilization Network
MHz	Megahertz
μ H	Microhenry
μ	Microfarad
μ s	Microseconds
PRF	Pulse Repetition Frequency
RF	Radio Frequency
RMS	Root-Mean-Square
TWT	Traveling Wave Tube
V/m	Volts per meter
VCP	Vertical Coupling Plane

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Viavi Solutions, LLC CX100, with the requirements of FCC Part 15.407 and RSS-247 Issue 2. Viavi Solutions, LLC should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the CX100, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15.407 and RSS-247 Issue 2, in accordance with Viavi Solutions, LLC purchase order number 2751009918. All tests were conducted using measurement procedures ANSI C63.4-2014 and ANSI C63.10-2013.

Testing was specifically limited to radiated spurious emissions and restricted band edge emissions in order to support a permissive change application for the CX100 device.

FCC Reference	Description	Results
§15.203	Antenna Requirement	Reference original filing ¹
§15.407(b)(9)	Conducted Emission Limits	
§15.403(i)	26dB Occupied Bandwidth	
§15.407 (a)	Maximum Conducted Output Power	
§15.407 (a)	Maximum Power Spectral Density	
§15.407(g)	Frequency Stability	
§15.407 (b)	Undesirable Emissions	Compliant

Table 1. Executive Summary of FCC Part 15.407 Compliance Testing

ISED Reference	Description	Results
RSS-Gen (8.7)	Conducted Emission Limits	Reference original filing ¹
RSS-Gen (6.7)	99% Occupied Bandwidth	
RSS-247 (6.2)	26dB Occupied Bandwidth	
RSS-247 (6.2)	Maximum Conducted Output Power	
RSS-247 (6.2)	Effective Isotropic Radiated Power	
RSS-247 (6.2)	Maximum Power Spectral Density	
RSS-247 (6.2)	EIRP Spectral Density	
RSS-247 (6.2)	Frequency Stability	
RSS-247 (6.2)	Undesirable Emissions	Compliant

Table 2. Executive Summary of ISED Compliance Testing

¹ These tests were not performed as part of the permissive change application since no changes were performed to the actual transmitter circuitry onboard the CX100. The radio, antenna, and mechanical design of transmitter portions of the product are unchanged from the originally certified device.

II. Equipment Configuration

A. Overview

Eurofins MET Labs was contracted by Viavi Solutions, LLC to perform testing on the CX100, under Viavi Solutions, LLC's purchase order number 2751009918.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Viavi Solutions, LLC CX100.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	CX100		
Model(s) Covered:	CX100		
EUT Specifications:	Primary Power: 120VAC		
	FCCID:	WUW-22100382	
	IC:	9613A-22100382	
	Integrated Transmitter Module	Laird TiWi5 Bluetooth / WiFi Module	
	Type of Modulations:	802.11a, 802.11n (20MHz Bandwidth)	
	Equipment Code:	NII	
	Antenna Gain ² :	4.5dBi	
	EUT Frequency Ranges:	U-NII-1:	5150 – 5250 MHz
		U-NII-2A:	5250 – 5350 MHz
		U-NII-2C:	5470 – 5725 MHz
		U-NII-3:	5725 – 5850 MHz
Analysis:	The results obtained relate only to the item(s) tested.		
Environmental Test Conditions:	Temperature: 22.7° C		
	Relative Humidity: 55.3%		
	Barometric Pressure: 97.8kPa		
Evaluated by:	Bryan Taylor, Sergio Gutierrez, An Dang		
Report Date(s):	7/27/2023 through 8/7/2023		

Table 3. EUT Summary

² The antenna gain information was provided by Viavi Solutions, LLC at the time of testing.

B. References

CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
RSS-247: Issue 2	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
RSS-Gen: Issue 5	General Requirements for Compliance of Radio Apparatus
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
789033 D02 General UNII Test Procedures New Rules v02	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

Table 4. References

C. Test Site

All testing was performed at Eurofins MET Labs, Inc., 13501 McCallen Pass, Austin TX 78753. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 10 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at Eurofins MET Labs.

D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
RF Frequencies	±4.52 Hz	2	95%
RF Power Conducted Emissions	±2.97 dB	2	95%
RF Power Radiated Emissions	±2.95 dB	2	95%

Table 5. Uncertainty Calculations Summary

E. Description of Test Sample

The Viavi Solutions, LLC CX100 , is a hand-held communications test set that supports bench and field radio testing. The CX100 provides the capabilities needed to test a variety of radios, as well as commercial radio applications. The CX100 is capable of performing high power measurements, as well as fault finding for antennas, power amplifiers and interconnects. The CX100 ComXpert is powered by an internal, rechargeable battery that provides up to 3 hours of continuous operation. The CX100 is equipped with a DC input connector that supports battery charging and use of an AC power adapter for connection to an AC power supply.

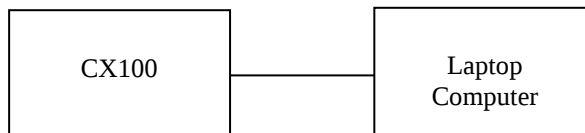


Figure 1. Block Diagram of Test Configuration

F. Equipment Configuration

The EUT was set up as outlined in **Error! Reference source not found.**, Block Diagram of Test Setup. The laptop computer was used to send test commands to force the transmitters to operate in the appropriate test mode.

G. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Ref. ID	Name / Description	Manufacturer	Model Number	Customer Supplied Calibration Data
1	Laptop Computer	Lenovo	ThinkPad W520	None

Table 6. Support Equipment

H. Mode of Operation

The support laptop provided a direct means of controlling transmitter parameters. Unless otherwise stated or shown, all tests were performed at worst-case modulation and data rates on the following channels.

Transmit Band	Operating Mode	Worst Case Transmission Bandwidth	Channel Numbers Tested	Channel Frequencies Tested
U-NII-1	802.11a	20MHz	36 / 40 / 48	5180MHz / 5200MHz / 5240MHz
	802.11n	20MHz	36 / 40 / 48	5180MHz / 5200MHz / 5240MHz
U-NII-2A	802.11a	20MHz	52 / 56 / 64	5260MHz / 5280MHz / 5320MHz
	802.11n	20MHz	52 / 56 / 64	5260MHz / 5280MHz / 5320MHz
U-NII-2A	802.11a	20MHz	100 / 120 / 144	5500MHz / 5600MHz / 5720MHz
	802.11n	20MHz	100 / 120 / 144	5500MHz / 5600MHz / 5720MHz
U-NII-3	802.11a	20MHz	149 / 157 / 165	5745MHz / 5785MHz / 5825MHz
	802.11n	20MHz	149 / 157 / 165	5745MHz / 5785MHz / 5825MHz

Table 7. Test Channels Utilized

I. Method of Monitoring EUT Operation

A spectrum analyzer was used to confirm proper transmitter operation.

J. Modifications**a) Modifications to EUT**

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

K. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Polycom Inc. upon completion of testing.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§15.407(b)(1 – 4, 9, 10) Undesirable Emissions

Test Requirements:

§ 15.407(b)(1): 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 EIRP of -27 dBm/MHz.

§ 15.407(b)(2): 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.

§ 15.407(b)(3): 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

§ 15.407(b)(4): For transmitters operating solely in the 5.725-5.850 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

§ 15.407(b)(9): Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

§ 15.407(b)(10): The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Test Procedure:

ANSI C63.10: 2013 was used as reference to perform the radiated spurious emission tests. A radiated scan was performed with the antenna of proper impedance installed. The transmitter was turned on. Measurements were performed of the low, mid and high Channels. The EUT was rotated orthogonally through all three axes if multiple mounting orientations are supported. Measurements were performed with the receiving antenna polarized vertically as well as horizontally. For measurements below 30MHz, a receiving loop antenna was used. Plots shown are corrected for both antenna correction factor and distance and compared to a 3 m limit line. Radiated measurements below 30MHz were performed in a semi-anechoic chamber that has been correlated to an open area site.

Measurements in the spurious domain were performed with a band-reject filter in line with the preamplifier in order to attenuate the fundamental emission and allow for the accurate measurement of the low-level spurious signals. Measurements at the restricted band edge were performed without a filter in place and without an in-line preamplifier in order to show that the fundamental emissions did not infringe upon the restricted bands immediately adjacent to the transmit band.

The -27dBm/MHz limit was converted to field strength using the formula shown in ANSI C63.27 Section 12.7.2

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2 \text{ (for a measurement distance of 3m)}$$

$$\text{Limit} [\text{dBuV/m}] = -27\text{dBm} + 95.2$$

$$\text{Limit} = 68.2\text{dBuV/m}$$

Since 68.2dBuV/m is higher than the limit used for restricted bands, the restricted band limits are shown in the plots and in the tabular data.

Test Results:

The EUT was compliant with the requirements of this section. The worst-case tabular data for each UNII band is shown below. Due to the similarity of the low, mid, and high channel plots, the low and high channel plots have been omitted from this report in an effort to reduce the overall file size. The worst-case tabular data have been presented for low mid and high channels.

There were no emissions exceeding the -27dBm/MHz (68.2dBuV/m) limit, the general field strength limits, or the restricted band limits.

Test Engineer(s):

Bryan Taylor, Sergio Gutierrez, An Dang

Test Date(s):

7/27/2023 - 8/7/2023

U-NII-1 Worst Case Tabular Spurious Emission Results:

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.049	59.47	113.72	54.25	11.71	V	47.4	1	0.200	Pass
0.050	68.69	113.63	44.94	11.67	H	327.3	1	0.200	Pass
0.098	48.21	107.77	59.56	11.36	V	243.9	1	0.200	Pass
0.100	56.68	107.61	50.94	11.27	H	303.7	1	0.200	Pass
0.150	60.69	104.08	43.39	11.26	V	32.2	1	9.000	Pass
0.195	62.80	101.80	39.00	11.34	H	289.6	1	9.000	Pass
0.299	58.37	98.10	39.73	11.22	H	307.4	1	9.000	Pass
0.443	49.95	94.69	44.73	11.28	V	21.5	1	9.000	Pass
0.492	54.35	73.76	19.41	11.31	H	337.5	1	9.000	Pass
0.744	46.98	70.17	23.19	11.46	V	243.5	1	9.000	Pass
0.821	48.99	69.32	20.33	11.47	H	333.8	1	9.000	Pass
0.992	44.87	67.67	22.81	11.76	V	250	1	9.000	Pass
11.216	24.54	69.50	44.96	10.78	H	331.9	1	9.000	Pass
12.714	28.91	69.50	40.59	10.66	V	219.3	1	9.000	Pass
16.625	30.27	69.50	39.23	10.53	V	141.9	1	9.000	Pass

Table 8. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-1, 802.11a³

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
37.650	20.64	40.00	19.36	-6.45	H	325.1	1.302	120.000	Pass
37.740	21.05	40.00	18.95	-6.50	V	311.5	1.871	120.000	Pass
116.340	25.72	43.52	17.80	-7.60	V	149.2	1	120.000	Pass
116.370	16.53	43.52	26.99	-7.60	H	297.1	3.765	120.000	Pass
127.650	16.79	43.52	26.73	-7.75	V	156.6	1.079	120.000	Pass
135.660	11.79	43.52	31.73	-8.17	H	126.8	3.644	120.000	Pass
252.030	10.98	46.02	35.04	-6.27	V	162.1	2.773	120.000	Pass
271.530	23.99	46.02	22.03	-6.22	H	136.3	2.502	120.000	Pass
271.530	25.59	46.02	20.43	-6.22	V	25.9	3.278	120.000	Pass

Table 9. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-1, 802.11a⁵

³ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	44.99	74.00	29.01	40.55	54.00	13.45	-1.25	H	341.2	1.762	Pass
1,500.000	45.37	74.00	28.63	39.14	54.00	14.86	-1.25	V	24	3.08	Pass
2,376.000	43.88	74.00	30.12	33.12	54.00	20.88	-2.40	V	337.3	3.159	Pass
4,800.000	45.86	74.00	28.14	42.03	54.00	11.97	-4.64	H	17.8	1.133	Pass
4,800.000	45.99	74.00	28.01	42.00	54.00	12.00	-4.64	V	17.8	1.1	Pass
4,999.500	49.04	74.00	24.96	44.14	54.00	9.86	-4.69	H	340.2	2.26	Pass
4,999.500	46.80	74.00	27.20	40.29	54.00	13.71	-4.69	V	9.9	2.973	Pass

Table 10. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-1, 802.11a (Low Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	45.42	74.00	28.58	39.12	54.00	14.88	-1.25	H	46.1	3.08	Pass
2,376.000	42.06	74.00	31.94	31.08	54.00	22.92	-2.40	H	182.7	2.821	Pass
2,376.000	43.04	74.00	30.96	32.02	54.00	21.98	-2.40	V	345.1	2.922	Pass
4,800.000	45.68	74.00	28.32	41.87	54.00	12.13	-4.64	H	17.3	1.294	Pass
4,800.000	45.53	74.00	28.47	41.89	54.00	12.11	-4.64	V	18.1	1	Pass
4,999.500	49.23	74.00	24.77	44.70	54.00	9.30	-4.69	H	338	2.275	Pass
4,999.500	47.05	74.00	26.95	41.14	54.00	12.86	-4.69	V	5.3	2.931	Pass
8,350.000	41.55	74.00	32.45	32.79	54.00	21.21	-3.64	H	360.1	1	Pass
20,800.000	52.33	74.00	21.67	40.97	54.00	13.03	12.55	H	2.6	2.114	Pass
23,106.500	51.13	74.00	22.87	38.13	54.00	15.87	14.23	V	246.9	2.648	Pass
31,430.000	54.51	74.00	19.49	41.38	54.00	12.62	16.63	H	121.3	2.5	Pass
31,507.000	55.21	74.00	18.79	41.91	54.00	12.09	16.77	V	268.4	1.395	Pass

Table 11. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-1, 802.11a (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	44.76	74.00	29.24	40.40	54.00	13.60	-1.25	H	340.2	1.727	Pass
1,500.000	45.53	74.00	28.47	39.08	54.00	14.92	-1.25	V	29.4	3.041	Pass
4,800.000	45.69	74.00	28.31	41.87	54.00	12.13	-4.64	H	18.9	1.106	Pass
4,800.000	45.78	74.00	28.22	41.70	54.00	12.30	-4.64	V	17.7	1.098	Pass
4,999.500	49.05	74.00	24.95	44.26	54.00	9.74	-4.69	H	339.4	2.232	Pass
4,999.500	46.77	74.00	27.23	41.48	54.00	12.52	-4.69	V	289.8	3.03	Pass
7,499.500	43.13	74.00	30.87	32.27	54.00	21.73	-3.67	H	297	3.323	Pass

Table 12. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-1, 802.11a (High Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.050	66.81	113.67	46.86	11.69	H	0.050	324.7	1	Pass
0.051	54.60	113.51	58.91	11.67	V	0.051	5.2	1	Pass
0.097	53.35	107.86	54.51	11.42	H	0.097	337.5	1	Pass
0.146	52.76	104.33	51.57	11.33	H	0.146	340.2	1	Pass
0.641	47.21	71.47	24.26	11.36	V	0.641	32	1	Pass
0.776	50.07	69.81	19.74	11.46	H	0.776	313.2	1	Pass
12.543	27.83	69.50	41.67	10.68	V	12.543	272.9	1	Pass

Table 13. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-1, 802.11n⁴

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
37.860	20.38	40.00	19.62	-6.57	V	204.7	1.764	120.000	Pass
116.340	25.77	43.52	17.75	-7.60	V	154.2	1.11	120.000	Pass
121.470	14.60	43.52	28.92	-7.57	V	135	1.362	120.000	Pass
124.560	10.52	43.52	33.00	-7.66	H	224.7	3.871	120.000	Pass
135.540	12.18	43.52	31.34	-8.15	V	225.2	4.002	120.000	Pass
135.570	8.46	43.52	35.06	-8.16	H	45.1	2.938	120.000	Pass
271.500	22.65	46.02	23.37	-6.22	H	160.8	2.501	120.000	Pass

Table 14. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-1, 802.11n⁶

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	44.61	74.00	29.39	40.24	54.00	13.76	-1.25	H	340.1	1.413	Pass
1,500.000	41.43	74.00	32.57	33.61	54.00	20.39	-1.25	V	0	2.5	Pass
2,376.000	41.73	74.00	32.27	31.19	54.00	22.81	-2.40	V	344.6	1.771	Pass
4,800.000	45.47	74.00	28.53	41.87	54.00	12.13	-4.64	H	16.9	1.39	Pass
4,800.000	43.79	74.00	30.21	38.98	54.00	15.02	-4.64	V	14.9	1.356	Pass
4,999.500	49.70	74.00	24.30	44.98	54.00	9.02	-4.69	H	342.1	2.256	Pass
4,999.500	46.74	74.00	27.26	41.37	54.00	12.63	-4.69	V	10.3	1.961	Pass

Table 15. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-1, 802.11n (Low Channel)

⁴ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	42.12	74.00	31.88	37.41	54.00	16.59	-1.25	H	339.6	2.877	Pass
2,376.000	42.52	74.00	31.48	31.57	54.00	22.43	-2.40	H	337.9	1.381	Pass
2,500.000	43.79	74.00	30.21	39.22	54.00	14.78	-2.40	V	252.5	2.576	Pass
4,800.000	46.28	74.00	27.72	42.68	54.00	11.32	-4.64	H	22.1	1.336	Pass
4,800.000	46.33	74.00	27.67	42.67	54.00	11.33	-4.64	V	23.5	1.313	Pass
4,999.500	49.94	74.00	24.06	45.47	54.00	8.53	-4.69	H	344.8	2.173	Pass
4,999.500	50.04	74.00	23.96	42.61	54.00	11.39	-4.69	V	287.2	2.998	Pass
19,103.000	51.92	74.00	22.08	38.61	54.00	15.39	12.69	V	248	3.011	Pass
20,800.000	53.07	74.00	20.93	41.33	54.00	12.67	12.55	H	339.7	2.952	Pass
20,800.000	52.05	74.00	21.95	39.73	54.00	14.27	12.55	V	7.2	3.071	Pass
31,506.000	55.04	74.00	18.96	41.97	54.00	12.03	16.77	V	240.4	2.424	Pass
31,510.500	55.23	74.00	18.77	41.92	54.00	12.08	16.77	H	296.2	1.501	Pass

Table 16. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-1, 802.11n (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	44.73	74.00	29.27	40.27	54.00	13.73	-1.25	H	339.8	1.501	Pass
1,500.000	41.07	74.00	32.93	33.95	54.00	20.05	-1.25	V	0	2.479	Pass
2,500.000	45.49	74.00	28.51	41.07	54.00	12.93	-2.40	H	34	3.291	Pass
4,800.000	45.68	74.00	28.32	42.07	54.00	11.93	-4.64	H	-0.1	1.134	Pass
4,800.000	41.62	74.00	32.38	34.85	54.00	19.15	-4.64	V	0	1.418	Pass
4,999.500	49.25	74.00	24.75	44.74	54.00	9.26	-4.69	H	339.5	2.271	Pass
4,999.500	46.63	74.00	27.37	41.39	54.00	12.61	-4.69	V	10	1.99	Pass
8,350.000	41.24	74.00	32.76	32.60	54.00	21.40	-3.64	V	275.4	1.001	Pass

Table 17. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-1, 802.11n (High Channel)

U-NII-2A Worst Case Tabular Spurious Emission Results:

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.048	56.55	113.91	57.36	11.81	V	247.1	1	0.200	Pass
0.049	67.43	113.79	46.36	11.75	H	300.7	1	0.200	Pass
0.097	51.93	107.85	55.92	11.42	V	252	1	0.200	Pass
0.100	56.83	107.61	50.78	11.27	H	311.7	1	0.200	Pass
0.150	64.98	104.08	39.09	11.26	H	321.8	1	9.000	Pass
0.470	53.56	94.17	40.61	11.25	H	0	1	9.000	Pass
0.519	48.32	73.30	24.98	11.34	V	246.9	1	9.000	Pass
0.771	45.90	69.86	23.96	11.46	V	238.8	1	9.000	Pass
0.933	48.63	68.20	19.57	11.63	H	340	1	9.000	Pass
12.575	28.97	69.50	40.53	10.68	V	153.9	1	9.000	Pass
16.688	29.25	69.50	40.25	10.55	V	75.1	1	9.000	Pass

Table 18. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-2A, 802.11a⁵

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
37.710	19.88	40.00	20.12	-6.48	V	194.9	2.073	120.000	Pass
109.380	20.84	43.52	22.68	-7.92	V	180.2	1	120.000	Pass
116.340	19.35	43.52	24.17	-7.60	H	89.5	3.84	120.000	Pass
116.370	26.86	43.52	16.66	-7.60	V	0	1.145	120.000	Pass
135.600	12.09	43.52	31.43	-8.16	V	148.4	4	120.000	Pass
135.630	10.18	43.52	33.34	-8.16	H	135	3.503	120.000	Pass
251.880	8.43	46.02	37.59	-6.29	H	155.8	1.61	120.000	Pass
271.500	24.94	46.02	21.08	-6.22	V	32.7	3.101	120.000	Pass
271.530	22.75	46.02	23.27	-6.22	H	150.8	2.502	120.000	Pass

Table 19. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-2A, 802.11a⁵

⁵ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	36.74	74.00	37.26	24.67	54.00	29.33	-1.25	V	0	1.725	Pass
2,376.000	43.82	74.00	30.18	32.24	54.00	21.76	-2.40	H	342.9	1	Pass
4,800.000	45.85	74.00	28.15	41.94	54.00	12.06	-4.64	H	22.2	1.226	Pass
4,800.000	43.72	74.00	30.28	38.50	54.00	15.50	-4.64	V	15.6	1.501	Pass
4,999.500	50.48	74.00	23.52	46.06	54.00	7.94	-4.69	H	343.8	2.121	Pass
4,999.500	47.45	74.00	26.55	42.18	54.00	11.82	-4.69	V	19.4	2.056	Pass

Table 20. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2A, 802.11a (Low Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
2,500.000	44.79	74.00	29.21	40.21	54.00	13.79	-2.40	H	49.9	3.343	Pass
2,500.000	44.03	74.00	29.97	39.05	54.00	14.95	-2.40	V	253.2	2.5	Pass
4,800.000	45.91	74.00	28.09	42.30	54.00	11.70	-4.64	H	23.7	1.276	Pass
4,999.500	50.62	74.00	23.38	46.38	54.00	7.62	-4.69	H	342.3	2.334	Pass
4,999.500	47.55	74.00	26.45	41.52	54.00	12.48	-4.69	V	285.9	2.996	Pass
19,099.500	51.54	74.00	22.46	38.55	54.00	15.45	12.70	V	122.7	2.662	Pass
21,200.000	51.81	74.00	22.19	41.26	54.00	12.74	12.23	H	24.1	2.913	Pass
31,506.000	55.46	74.00	18.54	41.98	54.00	12.02	16.77	H	104.9	1.254	Pass

Table 21. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2A, 802.11a (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	36.44	74.00	37.56	24.07	54.00	29.93	-1.25	V	0	1.729	Pass
2,500.000	44.01	74.00	29.99	38.53	54.00	15.47	-2.40	H	31.3	3.339	Pass
4,800.000	43.41	74.00	30.59	38.41	54.00	15.59	-4.64	V	16.6	1.276	Pass
4,999.500	50.54	74.00	23.46	46.12	54.00	7.88	-4.69	H	343.6	2.197	Pass
4,999.500	47.37	74.00	26.63	42.19	54.00	11.81	-4.69	V	20.7	1.944	Pass

Table 22. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2A, 802.11a (High Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.049	60.23	113.84	53.61	11.77	V	268.3	1	0.200	Pass
0.050	65.89	113.70	47.81	11.70	H	4.4	1	0.200	Pass
0.099	58.54	107.69	49.15	11.32	H	338.3	1	0.200	Pass
0.100	49.21	107.62	58.41	11.28	V	220.7	1	0.200	Pass
0.191	62.38	102.00	39.63	11.33	H	332.1	1	9.000	Pass
0.537	54.29	73.00	18.72	11.35	H	334.4	1	9.000	Pass
0.542	50.55	72.93	22.38	11.35	V	259	1	9.000	Pass
0.888	48.45	68.63	20.19	11.52	H	360.2	1	9.000	Pass
0.888	45.60	68.63	23.03	11.52	V	252.9	1	9.000	Pass
12.476	28.11	69.50	41.39	10.69	V	196.8	1	9.000	Pass
16.809	27.44	69.50	42.06	10.58	V	44.8	1	9.000	Pass

Table 23. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-2A, 802.11n⁶

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
38.070	20.33	40.00	19.67	-6.68	V	187.7	1.704	120.000	Pass
109.320	17.82	43.52	25.70	-7.93	V	151.4	1	120.000	Pass
116.340	24.11	43.52	19.41	-7.60	V	174.6	1.501	120.000	Pass
116.370	21.18	43.52	22.34	-7.60	H	118.1	2.5	120.000	Pass
123.360	16.31	43.52	27.21	-7.60	V	9.9	1.501	120.000	Pass
135.450	10.56	43.52	32.96	-8.15	H	135.2	3.502	120.000	Pass
135.510	12.96	43.52	30.56	-8.15	V	344.2	1.269	120.000	Pass
251.850	10.27	46.02	35.75	-6.29	V	180	2.94	120.000	Pass
252.000	9.07	46.02	36.95	-6.28	H	128.5	2.066	120.000	Pass
271.530	25.64	46.02	20.38	-6.22	V	21.6	3.331	120.000	Pass

Table 24. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-2A, 802.11n⁶
⁶ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
2,500.000	43.96	74.00	30.04	38.88	54.00	15.12	-2.40	H	32.3	3.339	Pass
2,500.000	43.93	74.00	30.07	39.02	54.00	14.98	-2.40	V	253.7	3.005	Pass
4,800.000	46.26	74.00	27.74	42.13	54.00	11.87	-4.64	V	360.1	1.292	Pass
4,999.500	50.40	74.00	23.60	46.02	54.00	7.98	-4.69	H	343.8	2.101	Pass
4,999.500	49.97	74.00	24.03	44.32	54.00	9.68	-4.69	V	17.3	1.755	Pass

Table 25. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2A, 802.11n (Low Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	41.97	74.00	32.03	36.79	54.00	17.21	-1.25	H	338.9	2.517	Pass
4,800.000	45.83	74.00	28.17	42.08	54.00	11.92	-4.64	H	360.1	1.38	Pass
4,800.000	43.57	74.00	30.43	38.43	54.00	15.57	-4.64	V	15.4	1.5	Pass
4,999.500	50.81	74.00	23.19	46.14	54.00	7.86	-4.69	H	341.9	2.226	Pass
4,999.500	46.64	74.00	27.36	40.59	54.00	13.41	-4.69	V	0	2.264	Pass
19,961.500	51.82	74.00	22.18	38.29	54.00	15.71	12.33	V	258.4	2.6	Pass
21,200.000	51.47	74.00	22.53	40.19	54.00	13.81	12.23	H	347.2	2.942	Pass
23,665.500	51.86	74.00	22.14	37.96	54.00	16.04	14.48	H	281.4	2.768	Pass
31,444.500	54.74	74.00	19.26	41.34	54.00	12.66	16.66	V	82.2	1.976	Pass

Table 26. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2A, 802.11n (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
2,500.000	44.66	74.00	29.34	39.58	54.00	14.42	-2.40	H	36.7	3.32	Pass
2,500.000	43.48	74.00	30.52	38.29	54.00	15.71	-2.40	V	10	2.977	Pass
4,800.000	45.99	74.00	28.01	42.18	54.00	11.82	-4.64	H	360.1	1.391	Pass
4,999.500	50.50	74.00	23.50	46.29	54.00	7.71	-4.69	H	342.8	2.201	Pass
4,999.500	47.39	74.00	26.61	42.28	54.00	11.72	-4.69	V	20.2	1.975	Pass

Table 27. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2A, 802.11n (High Channel)

U-NII-2C Worst Case Tabular Spurious Emission Results:

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.049	67.88	113.81	45.92	11.76	H	297.5	1	0.200	Pass
0.050	62.01	113.58	51.56	11.66	V	256	1	0.200	Pass
0.098	58.61	107.79	49.18	11.38	H	331.1	1	0.200	Pass
0.195	58.48	101.80	43.32	11.34	V	55	1	9.000	Pass
0.542	53.57	72.93	19.36	11.35	H	342	1	9.000	Pass
0.555	50.53	72.72	22.18	11.42	V	266.7	1	9.000	Pass
0.789	50.81	69.66	18.85	11.51	H	328	1	9.000	Pass
11.594	24.76	69.50	44.74	10.77	H	334.6	1	9.000	Pass
12.395	28.99	69.50	40.51	10.70	V	263.9	1	9.000	Pass
16.620	29.27	69.50	40.23	10.53	V	118.4	1	9.000	Pass

Table 28. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-2C, 802.11a⁷

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
37.530	20.73	40.00	19.27	-6.39	V	317.5	1.776	120.000	Pass
116.340	25.15	43.52	18.37	-7.60	V	12.6	1.5	120.000	Pass
116.370	21.28	43.52	22.24	-7.60	H	45	3.808	120.000	Pass
135.450	11.22	43.52	32.30	-8.15	V	328.3	1	120.000	Pass
135.600	7.67	43.52	35.85	-8.16	H	225	2.873	120.000	Pass
170.280	13.05	43.52	30.47	-9.69	H	128.8	3.328	120.000	Pass
252.240	10.31	46.02	35.71	-6.25	V	143.2	2.5	120.000	Pass
271.530	23.99	46.02	22.03	-6.22	H	44.9	2.447	120.000	Pass
271.530	25.76	46.02	20.26	-6.22	V	18.1	3.243	120.000	Pass

Table 29. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-2C, 802.11a⁷

⁷ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	42.44	74.00	31.56	37.33	54.00	16.67	-1.25	H	334	2.238	Pass
2,500.000	44.75	74.00	29.25	39.99	54.00	14.01	-2.40	H	34.8	3.366	Pass
2,500.000	43.92	74.00	30.08	38.48	54.00	15.52	-2.40	V	9.9	2.992	Pass
4,800.000	45.86	74.00	28.14	41.89	54.00	12.11	-4.64	H	360.2	1.5	Pass
4,999.500	50.38	74.00	23.62	46.00	54.00	8.00	-4.69	H	343.1	2.146	Pass
4,999.500	47.92	74.00	26.08	43.29	54.00	10.71	-4.69	V	25.7	2.951	Pass

Table 30. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2C, 802.11a (Low Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	41.73	74.00	32.27	36.53	54.00	17.47	-1.25	H	336.7	2.824	Pass
2,500.000	43.53	74.00	30.47	38.30	54.00	15.70	-2.40	V	10	3.086	Pass
4,800.000	45.87	74.00	28.13	41.90	54.00	12.10	-4.64	H	360.2	1.331	Pass
4,999.500	49.35	74.00	24.65	44.42	54.00	9.58	-4.69	H	342	2.326	Pass
4,999.500	47.16	74.00	26.84	42.03	54.00	11.97	-4.69	V	20	1.953	Pass
19,093.500	51.87	74.00	22.13	38.60	54.00	15.40	12.68	H	214.3	1.293	Pass
20,694.000	50.46	74.00	23.54	37.63	54.00	16.37	12.59	H	286.2	3.503	Pass
22,979.500	51.53	74.00	22.47	38.01	54.00	15.99	13.97	V	143.4	3.431	Pass
31,441.000	54.32	74.00	19.68	41.27	54.00	12.73	16.65	V	79.2	2.001	Pass

Table 31. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2C, 802.11a (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
2,376.000	42.48	74.00	31.52	31.90	54.00	22.10	-2.40	H	315.9	3.052	Pass
2,499.500	42.48	74.00	31.52	35.97	54.00	18.03	-2.40	V	360.2	3.006	Pass
4,800.000	45.82	74.00	28.18	42.03	54.00	11.97	-4.64	H	360.2	1.501	Pass
4,999.500	50.55	74.00	23.45	46.24	54.00	7.76	-4.69	H	341.9	2.345	Pass
4,999.500	46.87	74.00	27.13	41.78	54.00	12.22	-4.69	V	19.7	2.091	Pass

Table 32. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2C, 802.11a (High Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.049	66.64	113.81	47.17	11.76	H	317.4	1	0.200	Pass
0.050	59.41	113.63	54.22	11.67	V	248.2	1	0.200	Pass
0.098	53.50	107.81	54.31	11.39	H	293.2	1	0.200	Pass
0.101	50.52	107.53	57.01	11.27	V	248.4	1	0.200	Pass
0.200	61.90	101.60	39.71	11.35	H	333	1	9.000	Pass
0.497	54.12	73.69	19.56	11.28	H	338.5	1	9.000	Pass
0.515	47.90	73.38	25.47	11.35	V	74	1	9.000	Pass
0.911	48.35	68.41	20.07	11.51	H	315.2	1	9.000	Pass
0.951	44.72	68.04	23.31	11.59	V	246	1	9.000	Pass
12.584	28.64	69.50	40.86	10.68	V	206.5	1	9.000	Pass
16.764	29.06	69.50	40.44	10.57	V	47.7	1	9.000	Pass

Table 33. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-2C, 802.11n⁸

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
116.340	22.20	43.52	21.32	-7.60	V	325.7	1	120.000	Pass
116.370	20.12	43.52	23.40	-7.60	H	45.2	3.747	120.000	Pass
135.600	9.70	43.52	33.82	-8.16	V	125.1	3.5	120.000	Pass
135.870	10.92	43.52	32.60	-8.19	H	131.8	3.678	120.000	Pass
252.000	11.14	46.02	34.88	-6.28	V	155.2	2.874	120.000	Pass
252.060	10.05	46.02	35.97	-6.27	H	135.2	2.407	120.000	Pass
271.500	24.91	46.02	21.11	-6.22	V	37.5	3.039	120.000	Pass
271.530	24.02	46.02	22.00	-6.22	H	45	2.434	120.000	Pass

Table 34. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-2C, 802.11n⁸
⁸ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
2,500.000	43.65	74.00	30.35	38.32	54.00	15.68	-2.40	H	29	3.357	Pass
2,500.000	43.45	74.00	30.55	37.87	54.00	16.13	-2.40	V	7.3	3.09	Pass
4,800.000	46.02	74.00	27.98	42.09	54.00	11.91	-4.64	H	360.1	1.5	Pass
4,999.500	49.86	74.00	24.14	45.55	54.00	8.45	-4.69	H	345.7	2.205	Pass
4,999.500	47.28	74.00	26.72	42.13	54.00	11.87	-4.69	V	20.1	1.951	Pass

Table 35. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2C, 802.11n (Low Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	41.82	74.00	32.18	36.82	54.00	17.18	-1.25	H	333.5	2.501	Pass
2,500.000	43.18	74.00	30.82	37.39	54.00	16.61	-2.40	V	0	3.014	Pass
4,800.000	45.80	74.00	28.20	42.04	54.00	11.96	-4.64	H	354.5	1.502	Pass
4,999.500	50.13	74.00	23.87	45.82	54.00	8.18	-4.69	H	343.5	2.327	Pass
4,999.500	47.33	74.00	26.67	42.29	54.00	11.71	-4.69	V	20.1	2.022	Pass
19,262.500	51.21	74.00	22.79	37.91	54.00	16.09	12.47	H	245.7	3.068	Pass
22,541.000	50.19	74.00	23.81	37.22	54.00	16.78	13.60	H	344.6	1.084	Pass
22,562.000	50.74	74.00	23.26	37.22	54.00	16.78	13.64	V	212	2.633	Pass
31,373.000	54.13	74.00	19.87	40.78	54.00	13.22	16.61	V	74	3.724	Pass

Table 36. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2C, 802.11n (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
2,500.000	42.97	74.00	31.03	37.65	54.00	16.35	-2.40	V	360.2	3.027	Pass
4,800.000	45.97	74.00	28.03	42.03	54.00	11.97	-4.64	H	-0.1	1.5	Pass
4,999.500	50.30	74.00	23.70	46.08	54.00	7.92	-4.69	H	341.9	2.166	Pass
4,999.500	47.26	74.00	26.74	42.32	54.00	11.68	-4.69	V	20.4	2.015	Pass

Table 37. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-2C, 802.11n (High Channel)

U-NII-3 Worst Case Tabular Spurious Emission Results:

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.049	66.45	113.79	47.34	11.75	H	308.5	1	0.200	Pass
0.050	58.34	113.63	55.29	11.67	V	50.5	1	0.200	Pass
0.098	53.68	107.77	54.09	11.36	H	330.9	1	0.200	Pass
0.456	55.11	94.42	39.32	11.22	H	324.1	1	9.000	Pass
0.551	50.80	72.79	21.99	11.43	V	269.9	1	9.000	Pass
0.753	50.55	70.06	19.51	11.45	H	315	1	9.000	Pass
1.023	43.69	67.40	23.72	11.77	V	231.5	1	9.000	Pass
1.032	47.50	67.32	19.83	11.77	H	324.5	1	9.000	Pass
16.418	28.68	69.50	40.82	10.47	V	15	1	9.000	Pass

Table 38. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-3, 802.11a⁹

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
37.710	20.56	40.00	19.44	-6.48	V	14.2	2.072	120.000	Pass
116.340	17.79	43.52	25.73	-7.60	H	307.3	3.5	120.000	Pass
116.370	24.51	43.52	19.01	-7.60	V	149.1	1.082	120.000	Pass
135.600	13.14	43.52	30.38	-8.16	V	155.6	3.953	120.000	Pass
135.840	11.32	43.52	32.20	-8.18	H	225	3.222	120.000	Pass
171.480	15.99	43.52	27.53	-9.75	V	135	3.816	120.000	Pass
251.820	10.78	46.02	35.24	-6.29	V	154.3	3.004	120.000	Pass
252.210	8.27	46.02	37.75	-6.25	H	308.5	1.639	120.000	Pass
271.500	25.27	46.02	20.75	-6.22	V	18.2	3.152	120.000	Pass
271.530	16.51	46.02	29.51	-6.22	H	50.6	1	120.000	Pass

Table 39. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-3, 802.11a⁹

⁹ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	42.44	74.00	31.56	37.24	54.00	16.76	-1.25	H	334.6	2.167	Pass
2,500.000	41.94	74.00	32.06	33.35	54.00	20.65	-2.40	H	349.5	1	Pass
2,500.000	43.35	74.00	30.65	37.69	54.00	16.31	-2.40	V	360.1	2.963	Pass
4,999.500	50.62	74.00	23.38	46.41	54.00	7.59	-4.69	H	340	2.388	Pass
4,999.500	47.52	74.00	26.48	42.45	54.00	11.55	-4.69	V	11.6	2.102	Pass

Table 40. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-3, 802.11a (Low Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,375.000	42.81	74.00	31.19	34.68	54.00	19.32	0.19	H	354	2.22	Pass
1,500.000	41.77	74.00	32.23	36.62	54.00	17.38	-1.25	H	334	2.547	Pass
2,500.000	44.10	74.00	29.90	39.40	54.00	14.60	-2.40	V	251.9	2.992	Pass
4,999.500	48.05	74.00	25.95	42.96	54.00	11.04	-4.69	V	286.2	3.016	Pass
19,141.500	51.34	74.00	22.66	38.46	54.00	15.54	12.60	H	205.9	1.423	Pass
22,615.000	50.50	74.00	23.50	37.52	54.00	16.48	13.75	H	69.2	1.104	Pass
23,746.500	50.99	74.00	23.01	38.15	54.00	15.85	14.53	V	93.8	3.856	Pass
31,439.500	54.58	74.00	19.42	41.55	54.00	12.45	16.65	V	281.1	2.501	Pass

Table 41. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-3, 802.11a (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	42.23	74.00	31.77	36.97	54.00	17.03	-1.25	H	334.2	2.194	Pass
2,500.000	43.10	74.00	30.90	37.65	54.00	16.35	-2.40	V	360.1	2.993	Pass
4,999.500	50.56	74.00	23.44	46.36	54.00	7.64	-4.69	H	338.2	2.166	Pass

Table 42. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-3, 802.11a (High Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.050	61.38	113.54	52.16	11.67	V	265.3	1	0.200	Pass
0.051	56.40	113.37	56.97	11.68	H	255.1	1	0.200	Pass
0.098	57.57	107.80	50.23	11.38	H	311.4	1	0.200	Pass
0.546	52.90	72.86	19.96	11.39	H	331.9	1	9.000	Pass
0.758	49.61	70.01	20.40	11.43	H	0	1	9.000	Pass
1.221	41.99	65.86	23.88	11.71	V	264.1	1	9.000	Pass
1.374	37.47	64.84	27.36	11.70	V	6.3	1	9.000	Pass
1.536	37.42	63.87	26.45	11.69	V	257.2	1	9.000	Pass
12.561	29.47	69.50	40.03	10.68	V	263.5	1	9.000	Pass

Table 43. Worst Case Spurious Emissions, 9kHz – 30MHz, U-NII-3, 802.11n¹⁰

Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
109.380	9.04	43.52	34.48	-7.92	H	45	3.882	120.000	Pass
116.370	18.31	43.52	25.21	-7.60	H	307.4	3.711	120.000	Pass
116.370	24.39	43.52	19.13	-7.60	V	137.9	1.078	120.000	Pass
135.600	12.38	43.52	31.14	-8.16	H	135.1	3.852	120.000	Pass
135.660	12.80	43.52	30.72	-8.17	V	133.5	4	120.000	Pass
170.310	16.39	43.52	27.13	-9.69	H	180.1	3.872	120.000	Pass
251.760	10.18	46.02	35.84	-6.30	V	146	2.578	120.000	Pass
271.530	22.95	46.02	23.07	-6.22	H	145.2	2.346	120.000	Pass
271.530	25.59	46.02	20.43	-6.22	V	18.1	3.04	120.000	Pass

Table 44. Worst Case Spurious Emissions, 30MHz – 1GHz, U-NII-3, 802.11n¹⁰

¹⁰ These results represent the worst-case emissions across low, mid, and high transmit channels.

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,500.000	42.22	74.00	31.78	37.10	54.00	16.90	-1.25	H	333.2	2.243	Pass
2,500.000	43.72	74.00	30.28	38.48	54.00	15.52	-2.40	V	4.7	3.005	Pass
4,800.000	45.19	74.00	28.81	41.35	54.00	12.65	-4.64	H	360.2	1.369	Pass
4,999.500	48.04	74.00	25.96	43.67	54.00	10.33	-4.69	V	20.5	3.122	Pass

Table 45. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-3, 802.11n (Low Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,375.000	42.76	74.00	31.24	35.10	54.00	18.90	0.19	H	351.4	2.206	Pass
1,500.000	42.22	74.00	31.78	37.07	54.00	16.93	-1.25	H	328.4	2.295	Pass
2,500.000	44.68	74.00	29.32	39.81	54.00	14.19	-2.40	H	33.9	3.397	Pass
4,999.500	47.84	74.00	26.16	43.40	54.00	10.60	-4.69	V	20.3	3.137	Pass
19,058.000	51.09	74.00	22.91	38.11	54.00	15.89	12.60	H	259.8	3.607	Pass
22,403.500	50.99	74.00	23.01	37.25	54.00	16.75	13.64	H	175.5	3.066	Pass
23,730.000	51.03	74.00	22.97	38.06	54.00	15.94	14.52	V	314.1	1.636	Pass
31,393.000	53.90	74.00	20.10	41.05	54.00	12.95	16.59	V	332.2	2.379	Pass

Table 46. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-3, 802.11n (Middle Channel)

Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Result
1,202.500	39.03	74.00	34.97	29.99	54.00	24.01	0.14	H	325.7	3.169	Pass
1,500.000	42.05	74.00	31.95	36.87	54.00	17.13	-1.25	H	333.9	2.192	Pass
2,500.000	42.91	74.00	31.09	37.51	54.00	16.49	-2.40	V	360	3.006	Pass
4,999.500	49.08	74.00	24.92	44.78	54.00	9.22	-4.69	H	33.2	0.997	Pass
4,999.500	47.04	74.00	26.96	41.99	54.00	12.01	-4.69	V	17.6	1.982	Pass

Table 47. Worst Case Spurious Emissions, 1GHz – 40GHz, U-NII-3, 802.11n (High Channel)

Restricted Band Edge Emission Data:

Band Edge	Polarity (V/H)	Frequency (MHz)	Peak Amplitude (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Average Amplitude (dBuV/m)	Average Limit (dBuV/m)	Avg Margin (dB)	Result
U-NII-1 Low	V	5150	59.25	74.00	14.75	47.45	54.00	6.55	Pass
U-NII-1 Low	H	5150	60.21	74.00	13.79	47.92	54.00	6.08	Pass
U-NII-2A Upper	V	5350	59.26	74.00	14.74	47.39	54.00	6.61	Pass
U-NII-2A Upper	H	5350	60.47	74.00	13.53	48.14	54.00	5.86	Pass
U-NII-2C Low	V	5460	59.78	74.00	14.22	47.97	54.00	6.03	Pass
U-NII-2C Low	H	5460	59.34	74.00	14.66	47.78	54.00	6.22	Pass

Figure 2. Restricted Band Edge Measurements (802.11a)

Band Edge	Polarity (V/H)	Frequency (MHz)	Peak Amplitude (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Average Amplitude (dBuV/m)	Average Limit (dBuV/m)	Avg Margin (dB)	Result
U-NII-1 Low	V	5150	59.50	74.00	14.50	47.39	54.00	6.61	Pass
U-NII-1 Low	H	5150	58.39	74.00	15.61	47.43	54.00	6.57	Pass
U-NII-2A Upper	V	5350	60.20	74.00	13.80	48.07	54.00	5.93	Pass
U-NII-2A Upper	H	5350	60.14	74.00	13.86	48.13	54.00	5.87	Pass
U-NII-2C Low	V	5460	59.08	74.00	14.92	47.71	54.00	6.29	Pass
U-NII-2C Low	H	5460	59.54	74.00	14.46	47.72	54.00	6.28	Pass

Figure 3. Restricted Band Edge Measurements (802.11n)

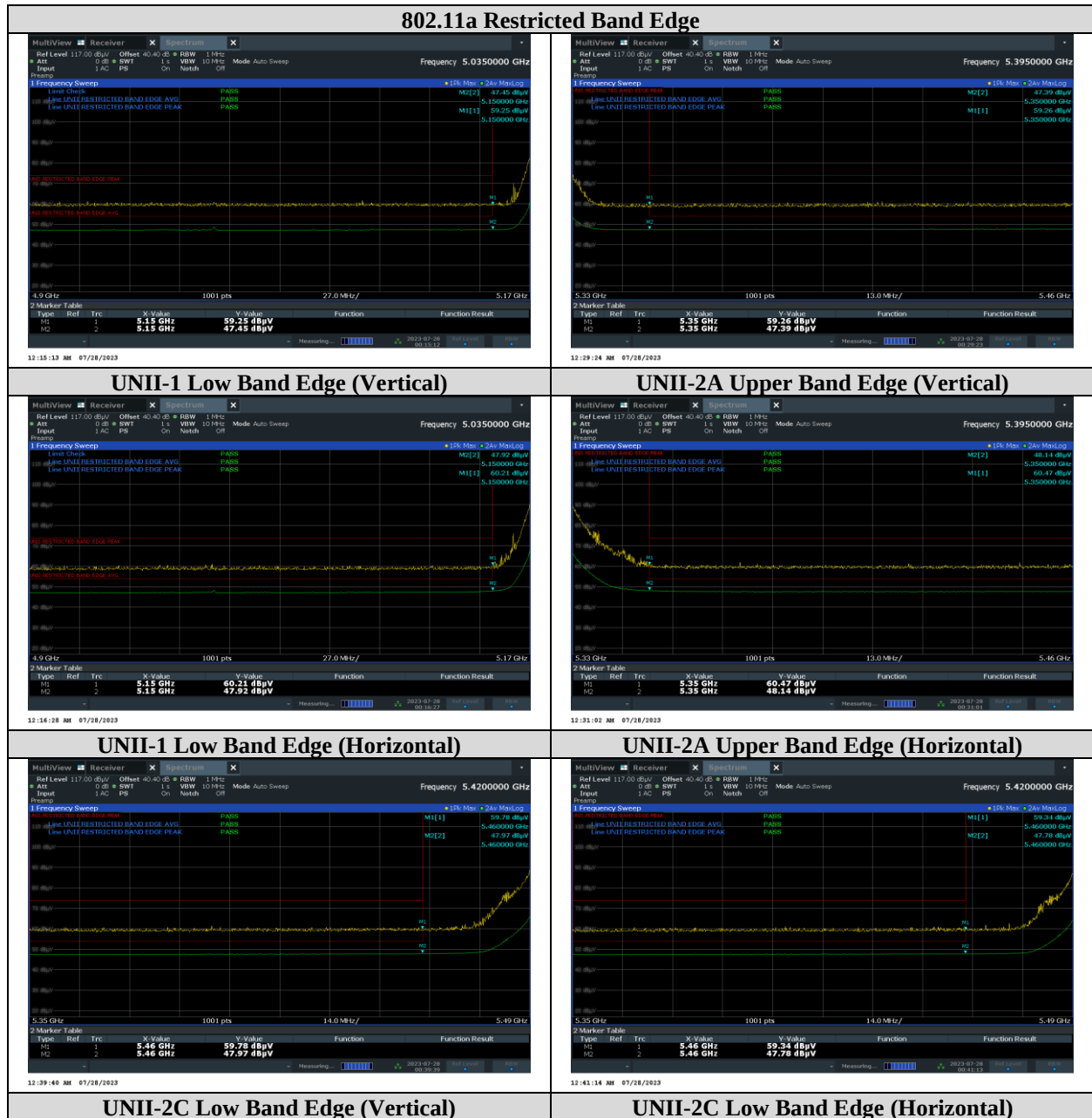


Figure 4. Restricted Band Edge Plots (802.11a)

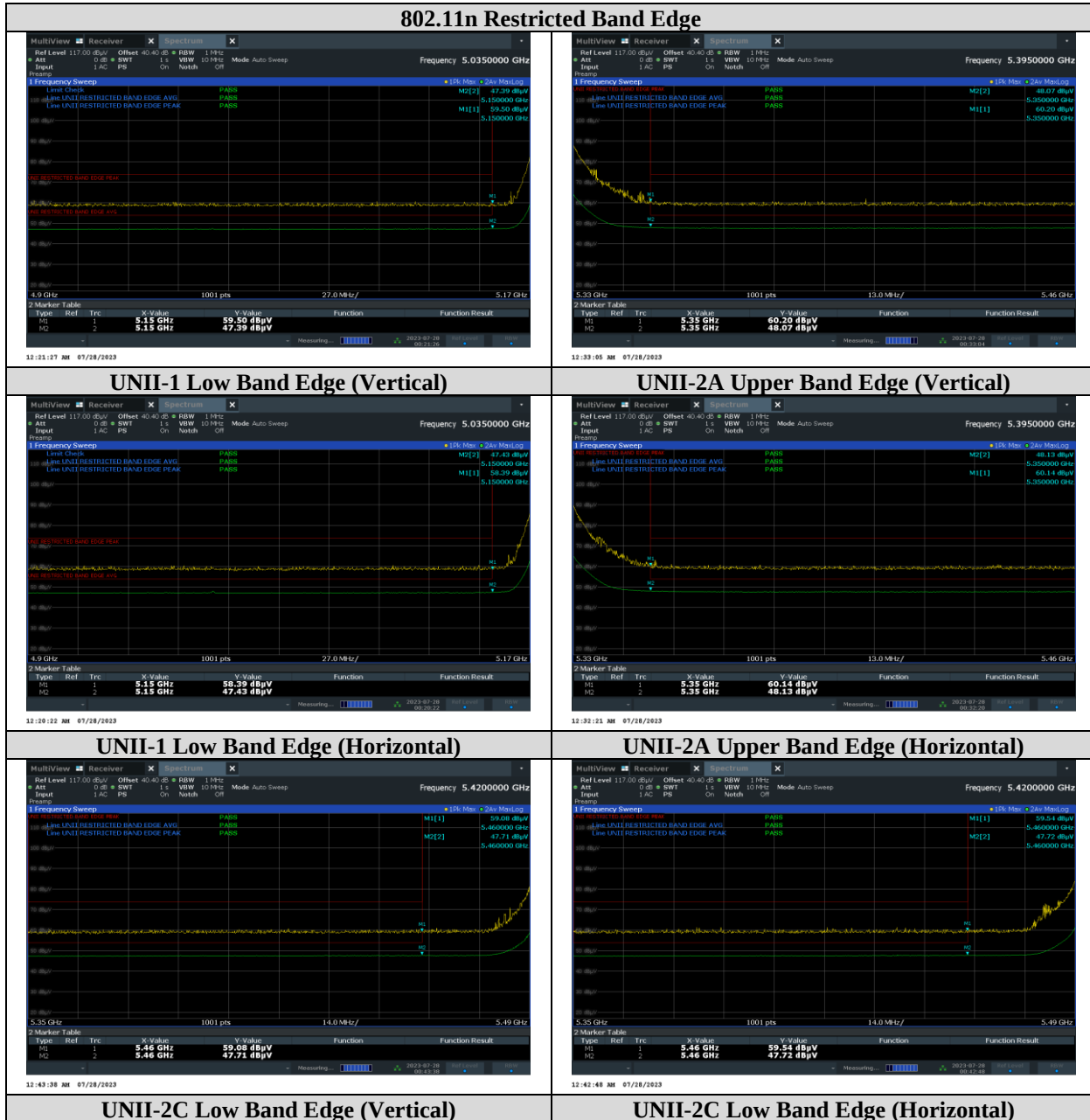


Figure 5. Restricted Band Edge Plots (802.11n)