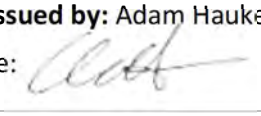
Test Report 3768-165-5G-UNII1-UNII2A

Equipment Under Test:	Module, SONA NX 611 M.2 2230, 2 MHF
Requirement(s):	eCFR 47 Part 15.407 | RSS-247
Test Date(s):	02/12/2024-07/10/2024
Prepared for:	Ezurio Attn: Brian Petted W66 N220 Commerce Ct. Cedarburg, WI 53012

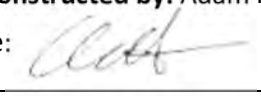
Report Issued by: Adam Hauke, EMC Engineer

Signature:  Date: 08/08/2024

Report Reviewed by: Adam Alger, Manager EMC Laboratory

Signature:  Date: 8/07/2024

Report Constructed by: Adam Hauke, EMC Engineer

Signature:  Date: 08/08/2024

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Ezurio Test Services in Review

The Ezurio laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:

A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope

A2LA Certificate Number: 1255.01

Scope of accreditation includes all test methods listed herein unless otherwise noted

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Federal Communications Commission (FCC) – USA

Accredited Test Firm Registration Number: 953492

Recognition of two 3 meter Semi-Anechoic Chambers

Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

1 TEST REPORT SUMMARY

During **02/15/2024-07/10/2024** the Equipment Under Test (EUT), **Module, SONA NX611 M.2 2230, 2 MHF** as provided by **Ezurio** was tested to the following requirements:

Operation in the 5.15-5.25 and 5.25-5.35 GHz bands

Requirements	Description	Method	Compliant
15.407(b)(1), (2), & (10) 15.209 RSS-247 Clause 6.2.1 & 6.2.2 RSS-GEN	Spurious Radiated Emissions in Restricted Bands 30-40000 MHz	ANSI C63.10 12.7	Yes
15.407(a)(5) RSS-247 Clause 6.2.1 & 6.2.2	26dB and 99% Occupied Bandwidth	ANSI C63.10 12.5	Yes
15.407(a)(1) & (2) RSS-247 Clause 6.2.1 & 6.2.2	RF Output Power	ANSI C63.10 12.4	Yes
15.407(b)(1) & (2) RSS-247 Clause 6.2.1 & 6.2.2	Conducted Out-of-band Emissions	ANSI C63.10 12.7	Yes
15.407(a)(1)(2) RSS-247 Claus 6.2.1 & 6.2.2	Power Spectral Density	ANSI C63.10 12.6	Yes
15.407(b)(9) 15.207 RSS-GEN	AC Conducted Emissions	ANSI C63.10 6.2	Yes
15.407(g)	Frequency Stability	ANSI C63.10 6.8	Reported

Notice:

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	0.5 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

2 CLIENT INFORMATION

Company Name	Ezurio
Contact Person	Brian Petted
Address	W66 N220 Commerce Ct. Cedarburg, WI 53012

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	Module, SONA NX611 M.2 2230, 2 MHF
Part Number	453-00165
Serial Number	00047
FCC ID	SQG-SONANX611M
IC ID	3147A-SONANX611M

2.2 Product Description

The NX611 is based upon NXP IW611 Wi-Fi 6 chipset. Feature-set includes 802.11 a/b/g/n/ac/ax Wi-Fi 6 and Dual-Mode Bluetooth v5.3 (BDR + EDR + BLE).

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 EUT Information

Power Supply – INPUT:100-240VAC 50/60 Hz 0.3A

OUTPUT: 5VDC 2A

Firmware - sduart_nw61x_v1.bin.se

Sduart_nw61x_v1_mfg.bin.se

2.6 Ancillary Equipment

Equipment used for EUT programming (not part of the EUT)

Development Kit, SU60-SOMC 6.0

P/N: 463-00138-K1 Rev 1

Power Supply: INPUT: 100-240 VAC 50/60Hz 0.7A

OUTPUT: 12VDC 2A

HP Elitebook 840G1

Labtool Version: 1.0.0.45.6

2.7 Antenna Information

Manufacturer	Model	Part Number	Dimension	Type	Peak Gain (dBi)	
					2400-2500 MHz	4900-5925 MHz
Laird Connectivity	FlexMIMO 6E	EFD2471A3S-10MH4L	39.5mm X 39.5mm X 4.7mm	PIFA	2.2	3.8
Laird Connectivity	FlexPIFA 6E	EFB2471A3S-10MH4L	16mm X 36mm X 2.5mm	PIFA	2.2	3.9
Laird Connectivity	Mini NanoBlade Flex 6E	EMF2471A3S-10MH4L	36mm X 12mm X 0.3mm	PCB Dipole	2.4	4.4
Joymax Electronics	N/A	TWX-100BRS3B	137mm X 13mm	Dipole	2.0	4.0
Laird Connectivity	FlexPIFA	EFB2455A3S-16MHF1	38.5mm X 12.7 mm X 2.5mm	PIFA	2.5	3.0

2.8 Test Channels

Channel	Frequency (MHz)	Bandwidth (MHz)	Data Rates
36	5180	20	802.11a – 6 and 54 Mbps 802.11n – MCS0 and MCS7 802.11ac – MCS0 and MCS9 802.11ax – MCS0 and MCS11
40	5200	20	
48	5240	20	
38	5190	40	
46	5230	40	
42	5210	80	
52	5260	20	
56	5280	20	
64	5320	20	
54	5270	40	
62	5310	40	
58	5290	80	

2.9 Power Table and Reduced Video Bandwidth for Average Measurements

802.11	Channel BW (MHz)	Data Rate	Minimum Average VBW (Hz)	Power Setting
a	20	6 Mbps	698	16
a	20	54 Mbps	5565	16
n	20	MCS0	746	14
n	20	MCS7	5959	14
ac	20	MCS0	742	14
ac	20	MCS8	6361	14
ax	20	MCS0	956	11
ax	20	MCS11	8628	10
n	40	MCS0	1506	13
n	40	MCS7	9980	13
ac	40	MCS0	1489	13
ac	40	MCS9	10870	12
ax	40	MCS0	1815	11
ax	40	MCS11	11737	10
ac	80	MCS0	3013	11
ac	80	MCS9	15601	11
ax	80	MCS0	3414	9
ax	80	MCS11	13280	9

3 WORST CASE TEST RESULTS SUMMARY

UNII-1

Requirement	Radio	Channel and Data Rate	Frequency (MHz)	Measurement	Limit	Margin
15.407(a)(5) RSS-247 Clause 6.2.1 26dB Bandwidth	802.11a	48 54 Mbps	-	19.0 MHz	at least 500 kHz	-
15.407(a)(1) RSS-247 Clause 6.2.1 Output Power	802.11a	40 54 Mbps	-	14.5 dBm	24.0 dBm	9.5 dB
15.407(a)(1) RSS-247 Clause 6.2.1 PSD	802.11ax20	40 MCS0 | RU26	-	10.4 dBm/1 MHz	11.0 dBm/1 MHz	0.6 dB
15.407(b)(1) RSS-247 Clause 6.2.1 Restricted Band	802.11ax80	58 MCS0 | RU52	5145.0	-29.8 dBm	-27.0 dBm	1.9 dB
15.407(b)(9) RSS-GEN Spurious Below 1 GHz	802.11a	36 6 Mbps	66.3	34.4 dBµV/m	40.0 dBµV/m	5.6 dB
15.407(b)(9) RSS-GEN AC Conducted	802.11a	36 6 Mbps	0.159	64.5 dBµV	65.5 dBµV	1.0 dB

UNII-2A

Requirement	Radio	Channel and Data Rate	Frequency (MHz)	Measurement	Limit	Margin
15.407(a)(5) RSS-247 Clause 6.2.1 26dB Bandwidth	802.11a	56 54 Mbps	-	19.1 MHz	at least 500 kHz	-
15.407(a)(1) RSS-247 Clause 6.2.1 Output Power	802.11a	52 54 Mbps	-	15.1 dBm	24.0 dBm	8.9 dB
15.407(a)(1) RSS-247 Clause 6.2.1 PSD	802.11ax40	62 MCS0 | RU26	-	9.9 dBm/1 MHz	11.0 dBm/1 MHz	1.1 dB
15.407(b)(1) RSS-247 Clause 6.2.1 Restricted Band	802.11ax80	58 MCS0 | RU52	5359.0	-29.8 dBm	-27.0 dBm	1.2 dB

4 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
FCC eCFR 47 Part 15	-	2023	-	-
ANSI C63.10	-	2020	-	-
RSS-247	3	2023	-	-
RSS-GEN	5	2018	2019	2021
KDB 558074 D01	-	2019	-	-

5 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of k = 2.

References
CISPR 16-4-1
CISPR 16-4-2
CISPR 32
ANSI C63.23
A2LA P103
A2LA P103c
ETSI TR 100-028

Measurement Type	Configuration	Uncertainty ±
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

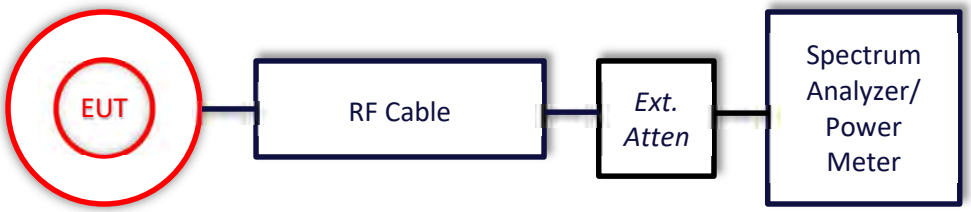
Parameter	ETSI U.C. ±	U.C. ±
Radio Frequency, from F0	$1x10^{-7}$	$0.55x10^{-7}$
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

6 TEST DATA

6.1 Antenna Port Conducted Emissions

Description of Measurement	The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter. The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.
Example Calculations	Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm) Margin (dB) = Limit (dBm) – Corrected Reading (dBm)

Block Diagram



6.1.1 26dB and 99% Occupied Bandwidth

Operator	Anthony Smith	**QA**	Adam Hauke
Temperature	21.9°C | 22.4°C	**R.H. %**	27.50% | 25.70%
Test Date	02/15/2024 | 03/28/2024	**Location**	Conducted RF Bench
Requirement	15.407 (a)(5) RSS-247 Clause 6.2.1 & 6.2.2	**Method**	ANSI C63.10 12.5

Limits: The minimum 26 dB bandwidth shall be at least 500 kHz

Test Parameters

Frequency	5150-5350 MHz		
RBW	20 MHZ BW – 200 kHz 40 MHz BW – 420 kHz 80 MHz BW – 1 MHz	**VBW**	20 MHZ BW – 620 kHz 40 MHz BW – 1.5 MHz 80 MHz BW – 3 MHz
Detector(s)	Peak	**Settings**	Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960173	Cable	A.H. Systems, Inc.	SAC-26G-1	388	6/13/2023	6/12/2024	Active Verification
EE 960088	Analyzer - EMI Receiver	Agilent	N9038A	MY51210138	4/10/2023	4/10/2024	Active Calibration

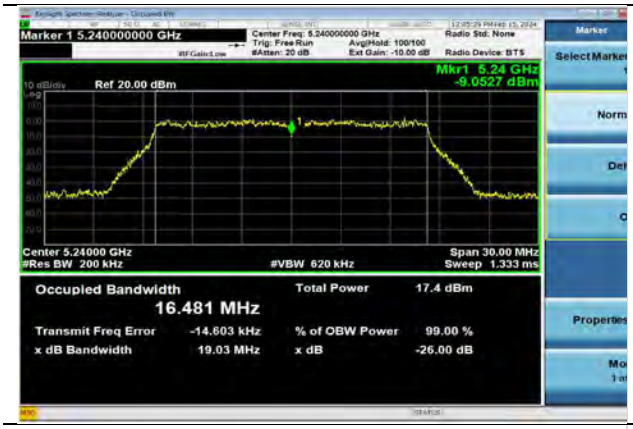
EUT Parameters

Input Power	120 VAC @ 60 Hz	**Mode**	5 GHz WLAN Tx
Frequency	5180-5320 MHz	**Channel**	See 2.8

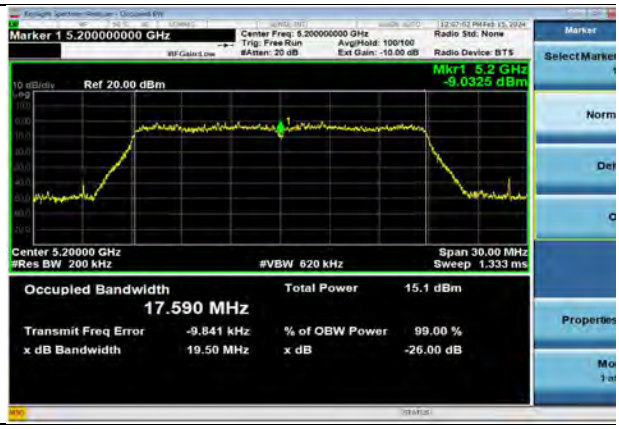
U-NII-1 Measurements

Mode	Rate	Channel	26 dB BW (MHz)	99% BW (MHz)
802.11a	6 Mbps	36	19.4	16.5
		40	19.7	16.5
		48	19.4	16.5
	54 Mbps	36	19.1	16.5
		40	19.1	16.5
		48	19.0	16.5
802.11n20	MCS0	36	19.6	17.6
		40	19.5	17.6
		48	19.8	17.6
	MCS7	36	19.5	17.6
		40	19.7	17.6
		48	19.7	17.6
802.11ac20	MCS0	36	19.7	17.6
		40	19.7	17.6
		48	19.8	17.6
	MCS8	36	19.7	17.6
		40	19.6	17.6
		48	19.5	17.6
802.11ax20	MCS0	36	20.3	18.8
		40	20.4	18.8
		48	20.3	18.8
	MCS11	36	20.3	18.8
		40	20.2	18.8
		48	20.0	18.7
802.11n40	MCS0	38	40.4	36.1
		46	40.3	36.1
	MCS7	38	40.3	37.5
		46	39.6	37.5
802.11ac40	MCS0	38	40.6	36.1
		46	40.0	36.1
	MCS9	38	40.3	36.2
		46	40.4	36.1
802.11ax40	MCS0	38	39.6	37.5
		46	40.3	37.5
	MCS11	38	40.2	37.5
		46	40.3	37.5
802.11ac80	MCS0	42	81.5	76.0
	MCS9	42	81.8	76.4
802.11ax80	MCS0	42	80.6	77.6
	MCS11	42	80.8	77.5

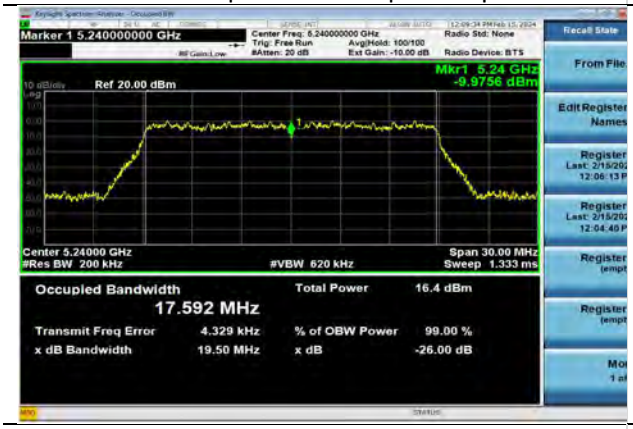
U-NII-1 Plots



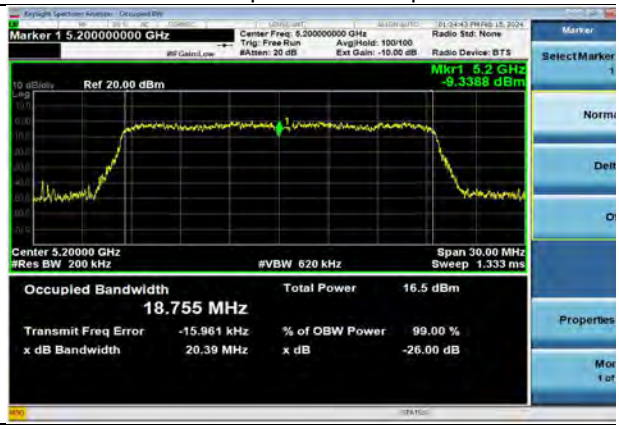
802.11a | Channel 48 | 54 Mbps



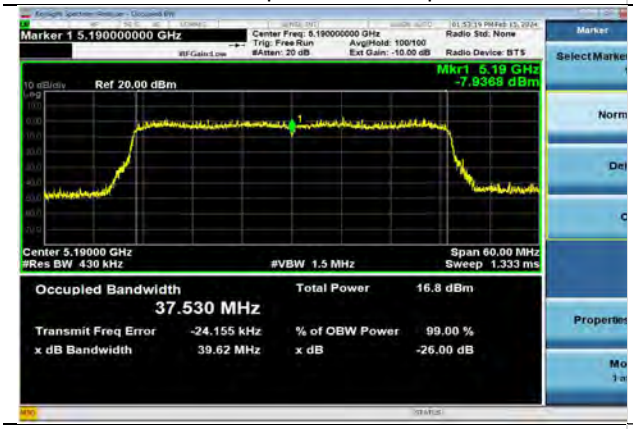
802.11n20 | Channel 40 | MCS0



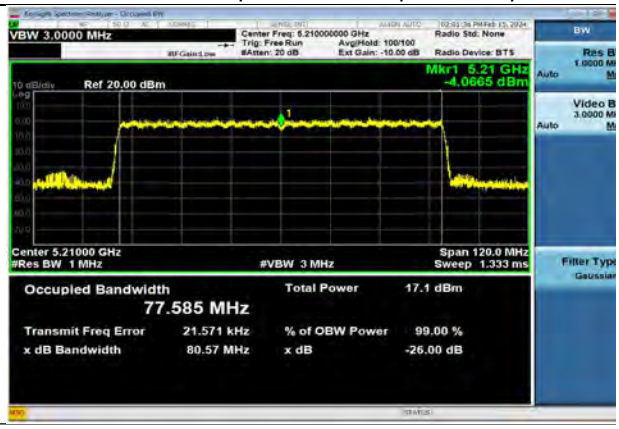
802.11ac20 | Channel 48 | MCS8



802.11ax20 | Channel 40 | MCS11 |



802.11ax40 | Channel 38 | MCS0

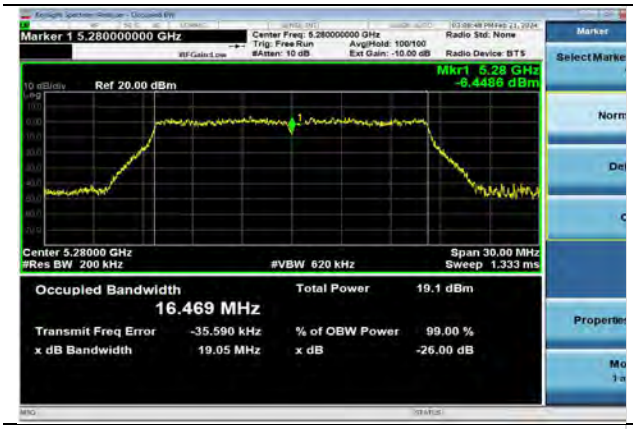


802.11ax80 | Channel 42 | MCS0

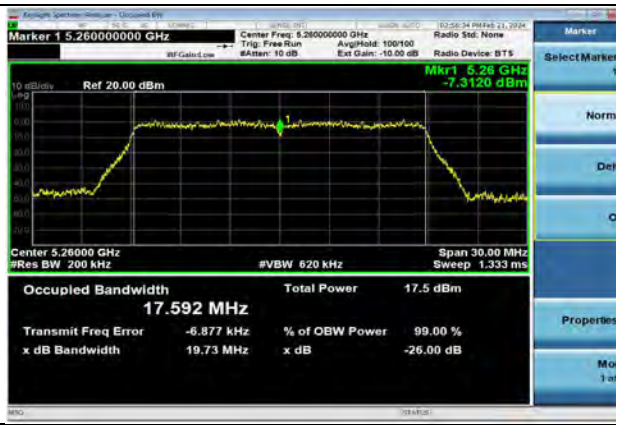
U-NII-2A Measurements

Mode	Rate	Channel	26 dB BW (MHz)	99% BW (MHz)
802.11a	6 Mbps	52	19.7	16.5
		56	19.2	16.5
		64	19.4	16.5
	54 Mbps	52	19.5	16.5
		56	19.1	16.5
		64	19.4	16.5
802.11n20	MCS0	52	19.7	17.6
		56	19.8	17.6
		64	19.7	17.6
	MCS7	52	19.5	17.6
		56	19.6	17.6
		64	19.7	17.6
802.11ac20	MCS0	52	19.7	17.6
		56	19.9	17.6
		64	19.7	17.6
	MCS8	52	19.5	17.6
		56	19.6	17.6
		64	19.7	17.6
802.11ax20	MCS0	52	20.2	18.8
		56	20.3	18.8
		64	20.4	18.8
	MCS11	52	20.0	18.7
		56	20.2	18.8
		64	20.1	18.7
802.11n40	MCS0	54	40.1	36.1
		62	40.4	36.1
	MCS7	54	39.4	36.1
		62	39.9	36.2
802.11ac40	MCS0	54	40.2	36.1
		62	40.0	36.1
	MCS9	54	40.2	36.2
		62	40.5	36.2
802.11ax40	MCS0	54	40.2	37.5
		62	40.3	37.5
	MCS11	54	40.3	37.5
		62	40.2	37.5
802.11ac80	MCS0	58	81.9	75.9
	MCS9	58	81.8	76.3
802.11ax80	MCS0	58	80.5	77.5
	MCS11	58	80.7	77.4

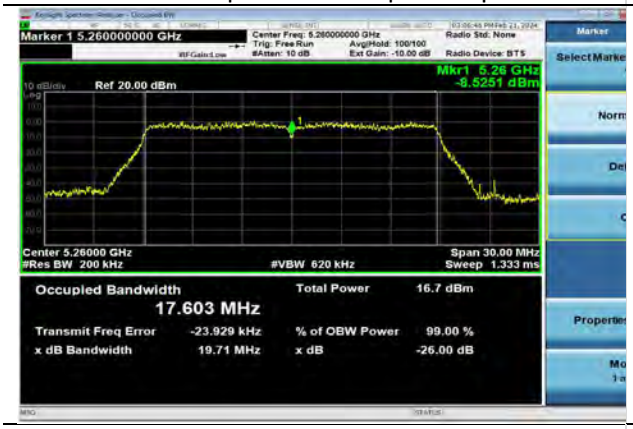
U-NII-2A Plots



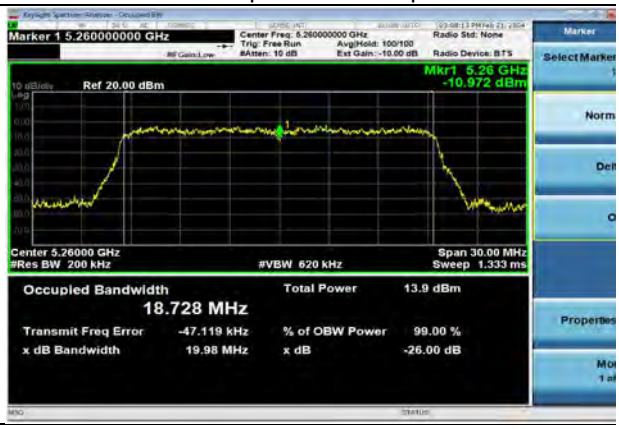
802.11a | Channel 56 | 54 Mbps



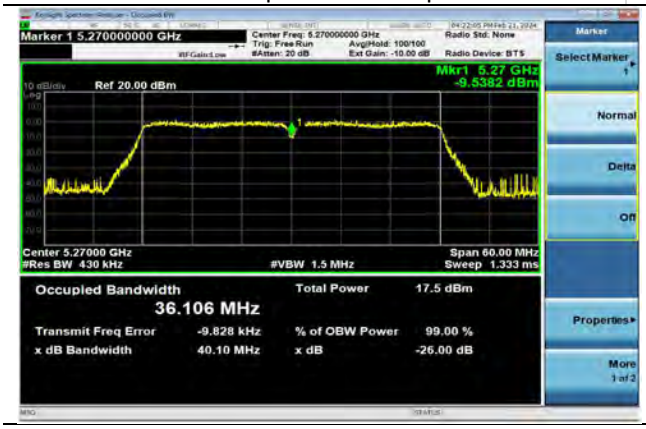
802.11n20 | Channel 52 | MCS0



802.11ac20 | Channel 52 | MCS0

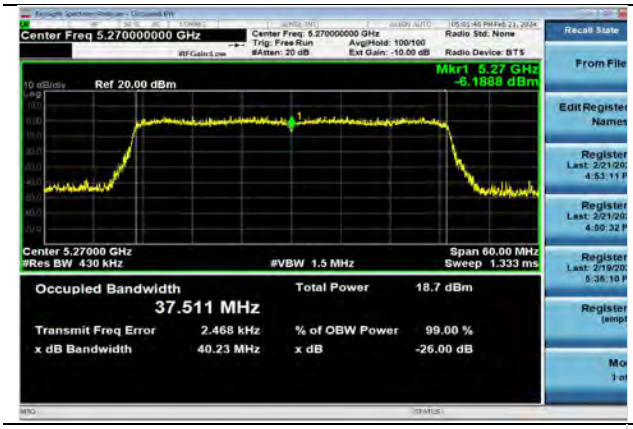


802.11ax20 | Channel 52 | MCS11

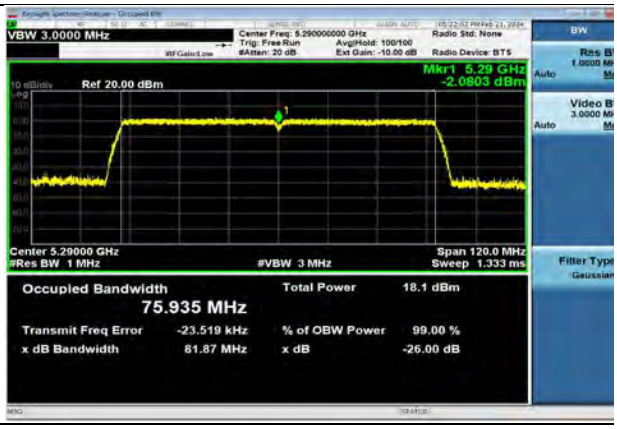


802.11n40 | Channel 54 | MCS0

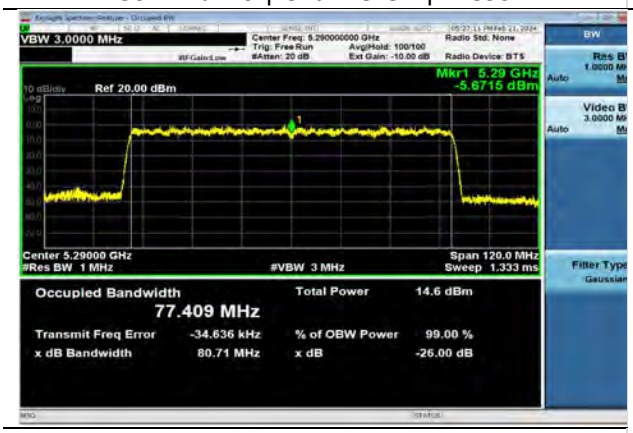
802.11ac40 | Channel 54 | MCS0



802.11ax40 | Channel 54 | MCS0



802.11ac80 | Channel 58 | MCS0



802.11ax80 | Channel 58 | MCS11

6.1.2 RF Output Power

Operator	Dylan Rosenfeldt	**QA**	Anthony Smith
Temperature	21.6°C | 22.1°C 21.8°C | 21.6°C	**R.H. %**	25.90% | 29.30% 53.50% | 44.40%
Test Date	02/26/2024-02/27/2024 04/29/2024-04/30/2024	**Location**	Conducted RF Bench
Requirement	15.407 (a)(1) & (2) RSS-247 Clause6.2.1 & 6.2.2	**Method**	ANSI C63.10 12.4 AVGSA-2

Limit: The maximum peak conducted output power of the intentional radiator shall not exceed 250 mW.

Test Parameters

Frequency	5150-5350 MHz	**Setup**	Antenna Port
RBW	1 MHz	**VBW**	3 MHz
Detector(s)	Peak	**Settings**	Max Hold Span: 30 MHz | 60 MHz | 120 MHz
Example Calculations	Average Output Power = Measured Power + 10*log(1/D) where D is the duty cycle.		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	06/13/2023	06/12/2024	Active Verification
EE 960087	Analyzer – Spectrum	Agilent	N9010A	MY53400296	04/11/2023	04/11/2024	Active Calibration

EUT Parameters

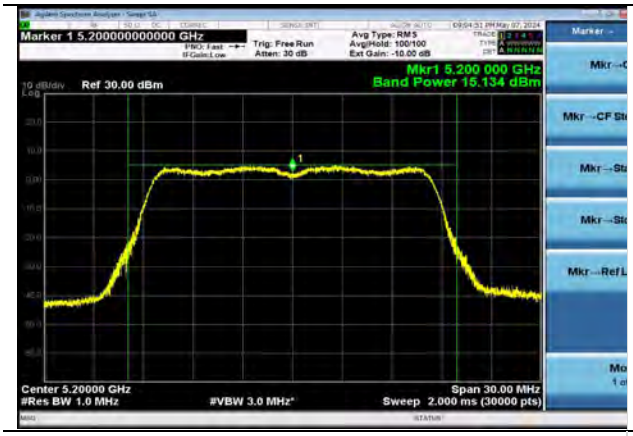
Input Power	120 VAC @ 60 Hz	**Mode**	5 GHz WLAN Tx
Frequency	5180-5320 MHz	**Channel**	See 2.9

U-NII-1 Measurements

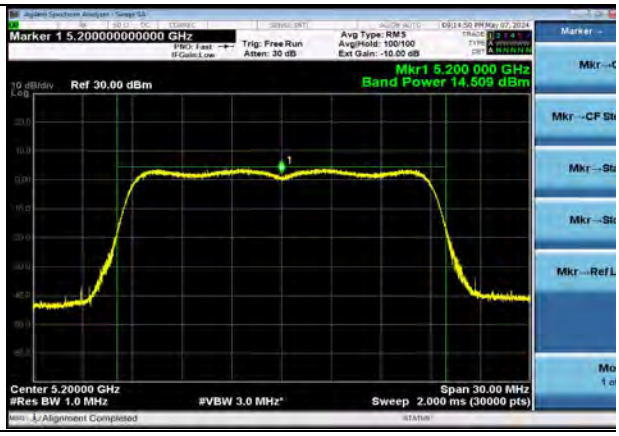
Mode	Rate	Channel	Average Output Power (dBm)	Duty Cycle Correction (dB)	Corrected Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	6 Mbps	36	15.2	-	15.2	24.0	8.8
		40	15.4	-	15.4	24.0	8.6
		48	15.3	-	15.3	24.0	8.7
	54 Mbps	36	14.9	0.4	15.3	24.0	8.7
		40	15.1	0.4	15.5	24.0	8.5
		48	15.0	0.4	15.4	24.0	8.6
802.11n20	MCS0	36	14.1	-	14.1	24.0	9.9
		40	14.5	-	14.5	24.0	9.5
		48	14.3	-	14.3	24.0	9.7
	MCS7	36	13.9	0.4	14.3	24.0	9.7
		40	14.1	0.4	14.5	24.0	9.5
		48	14.0	0.4	14.4	24.0	9.6
802.11ac20	MCS0	36	14.2	-	14.2	24.0	9.8
		40	14.5	-	14.5	24.0	9.5
		48	14.3	-	14.3	24.0	9.7
	MCS8	36	14.0	0.4	14.4	24.0	9.7
		40	14.1	0.4	14.5	24.0	9.5
		48	14.0	0.4	14.4	24.0	9.6
802.11ax20	MCS0	36	10.4	-	10.4	24.0	13.6
		40	10.6	-	10.6	24.0	13.4
		48	10.6	-	10.6	24.0	13.4
	MCS11	36	9.9	0.5	10.4	24.0	13.6
		40	10.1	0.5	10.6	24.0	13.4
		48	10.0	0.5	10.5	24.0	13.5
802.11n40	MCS0	38	14.3	0.1	14.4	24.0	9.6
		46	14.3	0.1	14.4	24.0	9.6
	MCS7	38	13.6	0.6	14.2	24.0	9.8
		46	13.8	0.6	14.4	24.0	9.6
802.11ac40	MCS0	38	14.2	0.1	14.3	24.0	9.7
		46	14.3	0.1	14.4	24.0	9.6
	MCS9	38	11.7	0.7	12.4	24.0	11.6
		46	11.8	0.7	12.5	24.0	11.5
802.11ax40	MCS0	38	10.4	0.1	10.5	24.0	13.5
		46	10.7	0.1	10.8	24.0	13.2
	MCS11	38	9.8	0.7	10.5	24.0	13.5
		46	10.0	0.7	10.7	24.0	13.3
802.11ac80	MCS0	42	12.8	0.2	13.0	24.0	11.0
	MCS9	42	11.9	1.0	12.9	24.0	11.1
802.11ax80	MCS0	42	10.0	0.2	10.2	24.0	13.8
	MCS11	42	9.3	0.8	10.1	24.0	13.9

Mode	Rate RU	Channel	Average Output Power (dBm)	Duty Cycle Correction (dB)	Corrected Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11ax20	MCS0 RU26	36	10.1	0.2	10.3	24.0	13.7
		40	10.2	0.2	10.4	24.0	13.6
		48	10.4	0.2	10.6	24.0	13.4
	MCS0 RU52	36	9.9	0.2	10.1	24.0	13.9
		40	10.3	0.2	10.5	24.0	13.5
		48	10.4	0.2	10.6	24.0	13.4
	MCS0 RU106	36	10.1	0.2	10.3	24.0	13.7
		40	10.5	0.2	10.7	24.0	13.3
		48	10.5	0.2	10.7	24.0	13.3
802.11ax40	MCS0 RU26	38	9.3	0.2	9.5	24.0	14.5
		46	9.6	0.2	9.8	24.0	14.2
	MCS0 RU52	38	10.1	0.2	10.3	24.0	13.7
		46	10.5	0.2	10.7	24.0	13.4
	MCS0 RU106	38	10.3	0.2	10.5	24.0	13.5
		46	10.5	0.2	10.7	24.0	13.3
	MCS0 RU242	38	10.4	0.2	10.6	24.0	13.4
		46	10.6	0.2	10.8	24.0	13.2
802.11ax80	MCS0 RU26	42	11.2	0.2	11.4	24.0	12.6
	MCS0 RU52	42	11.1	0.2	11.3	24.0	12.7
	MCS0 RU106	42	11.1	0.2	11.3	24.0	12.7
	MCS0 RU242	42	10.9	0.2	11.1	24.0	12.9
	MCS0 RU484	42	11.2	0.2	11.4	24.0	12.6

U-NII-1 Plots



802.11a | Channel 40 | 54 Mbps

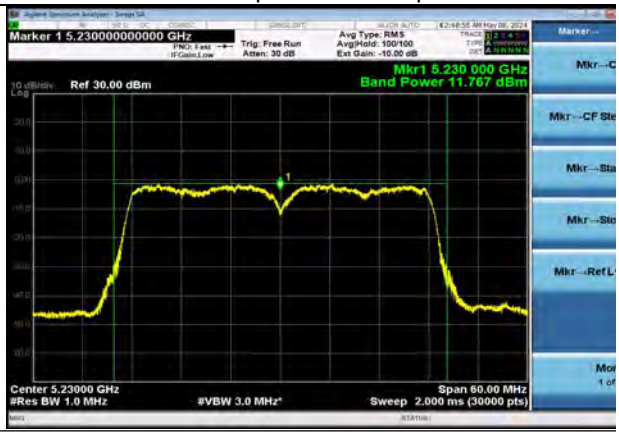


802.11n20 | Channel 40 | MCS0

802.11ac20 | Channel 40 | MCS0

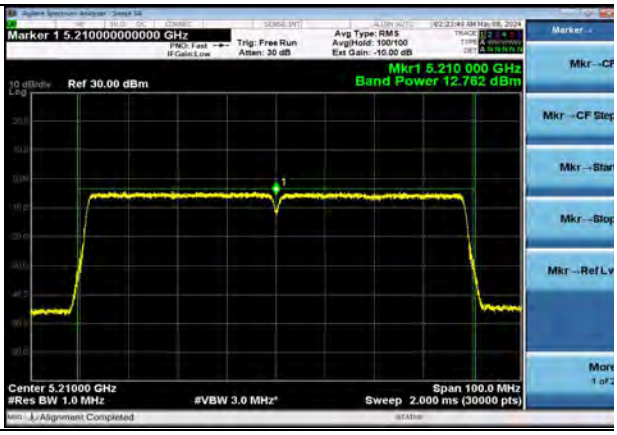
802.11ax20 | Channel 40 | MCS0

802.11n40 | Channel 38 | MCS7



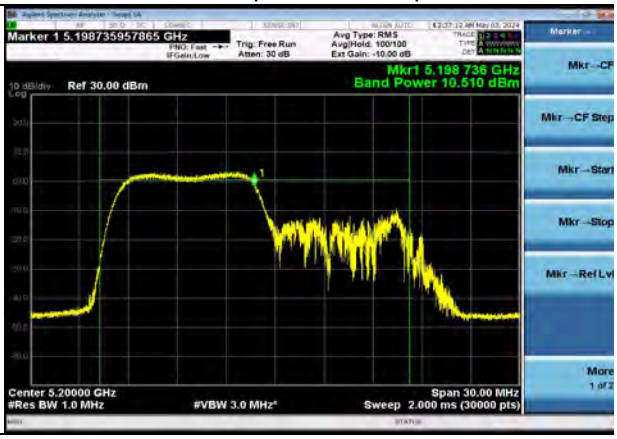
802.11ac40 | Channel 46 | MCS9

802.11ax40 | Channel 46 | MCS0

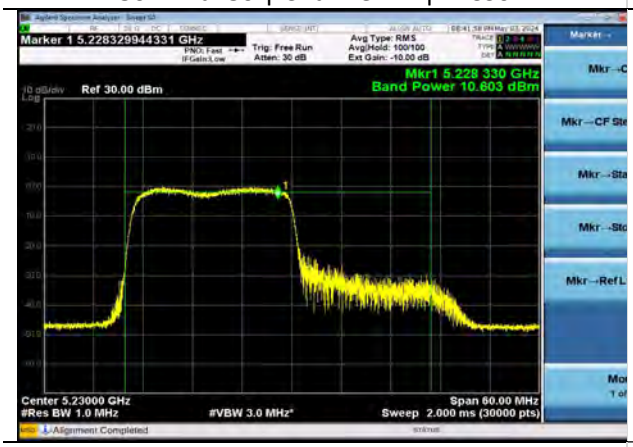


802.11ac80 | Channel 42 | MCS0

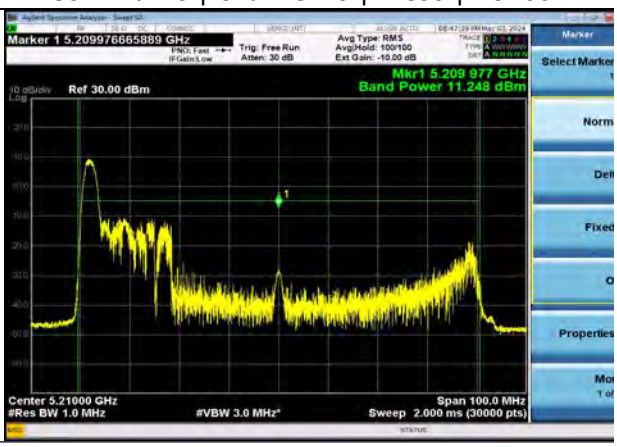
802.11ax80 | Channel 42 | MCS0



802.11ax20 | Channel 40 | MCS0 | RU106



802.11ax40 | Channel 46 | MCS0 | RU 242



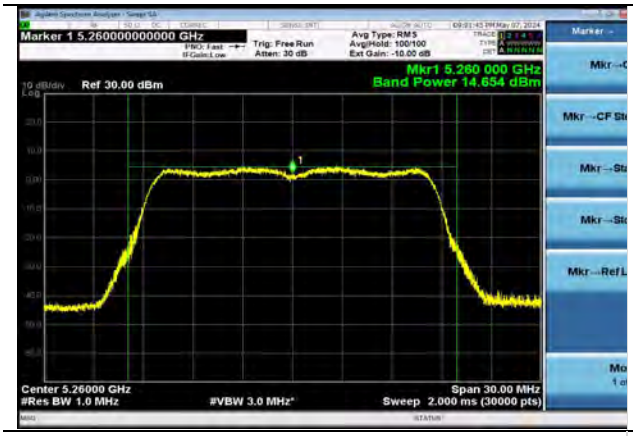
802.11ax80 | Channel 42 | MCS0 | RU26

U-NII-2A Measurements

Mode	Rate	Channel	Average Output Power (dBm)	Duty Cycle Correction (dB)	Corrected Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a	6 Mbps	52	14.9	-	14.9	24.0	9.1
		56	14.8	-	14.8	24.0	9.2
		64	14.6	-	14.6	24.0	9.4
	54 Mbps	52	14.7	0.4	15.1	24.0	8.9
		56	14.6	0.4	15.0	24.0	9.0
		64	14.3	0.4	14.7	24.0	9.3
802.11n20	MCS0	52	14.0	-	14.0	24.0	10.0
		56	13.9	-	13.9	24.0	10.1
		64	13.7	-	13.7	24.0	10.3
	MCS7	52	13.7	0.4	14.1	24.0	9.9
		56	13.7	0.4	14.1	24.0	9.9
		64	13.4	0.4	13.8	24.0	10.2
802.11ac20	MCS0	52	14.0	-	14.0	24.0	10.0
		56	14.0	-	14.0	24.0	10.0
		64	13.7	-	13.7	24.0	10.3
	MCS8	52	13.6	0.4	14.0	24.0	10.0
		56	13.6	0.4	14.0	24.0	10.0
		64	13.3	0.4	13.7	24.0	10.3
802.11ax20	MCS0	52	10.3	-	10.3	24.0	13.7
		56	10.3	-	10.3	24.0	13.7
		64	10.1	-	10.1	24.0	13.9
	MCS11	52	9.7	0.5	10.2	24.0	13.8
		56	9.8	0.5	10.3	24.0	13.7
		64	9.6	0.5	10.1	24.0	13.9
802.11n40	MCS0	54	13.9	0.1	14.0	24.0	10.0
		62	13.8	0.1	13.9	24.0	10.1
	MCS7	54	13.5	0.6	14.1	24.0	9.9
		62	13.3	0.6	13.9	24.0	10.1
802.11ac40	MCS0	54	13.8	0.1	13.9	24.0	10.1
		62	13.7	0.1	13.8	24.0	10.2
	MCS9	54	11.4	0.7	12.1	24.0	11.9
		62	11.2	0.7	11.9	24.0	12.1
802.11ax40	MCS0	54	10.2	0.1	10.3	24.0	13.7
		62	10.1	0.1	10.2	24.0	13.8
	MCS11	54	9.7	0.7	10.4	24.0	13.6
		62	9.6	0.7	10.3	24.0	13.7
802.11ac80	MCS0	58	12.1	0.2	12.3	24.0	11.7
	MCS9	58	11.4	1.0	12.4	24.0	11.6
802.11ax80	MCS0	58	9.5	0.2	9.7	24.0	14.3
	MCS11	58	8.9	0.8	9.7	24.0	14.3

Mode	Rate RU	Channel	Average Output Power (dBm)	Duty Cycle Correction (dB)	Corrected Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11ax20	MCS0 RU26	52	9.9	0.2	10.1	24.0	13.9
		56	10.0	0.2	10.2	24.0	13.8
		64	9.8	0.2	10.0	24.0	14.1
	MCS0 RU52	52	9.9	0.2	10.1	24.0	13.9
		56	10.1	0.2	10.3	24.0	13.7
		64	9.9	0.2	10.1	24.0	14.0
	MCS0 RU106	52	10.1	0.2	10.3	24.0	13.7
		56	10.1	0.2	10.3	24.0	13.7
		64	10.0	0.2	10.2	24.0	13.8
802.11ax40	MCS0 RU26	54	9.2	0.2	9.4	24.0	14.7
		62	9.3	0.2	9.5	24.0	14.6
	MCS0 RU52	54	10.0	0.2	10.2	24.0	13.8
		62	10.1	0.2	10.3	24.0	13.7
	MCS0 RU106	54	10.0	0.2	10.2	24.0	13.8
		62	10.1	0.2	10.3	24.0	13.7
	MCS0 RU242	54	10.4	0.2	10.6	24.0	13.4
		62	10.3	0.2	10.5	24.0	13.5
802.11ax80	MCS0 RU26	58	10.9	0.2	11.1	24.0	13.0
	MCS0 RU52	58	10.9	0.2	11.1	24.0	12.9
	MCS0 RU106	58	10.6	0.2	10.8	24.0	13.2
	MCS0 RU242	58	10.5	0.2	10.7	24.0	13.3
	MCS0 RU484	58	10.5	0.2	10.7	24.0	13.3

U-NII-2A Plots



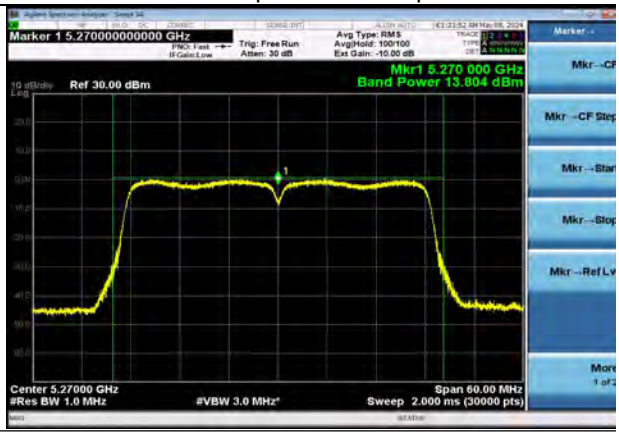
802.11a | Channel 52 | 54 Mbps

802.11n20 | Channel 52 | MCS7

802.11ac20 | Channel 52 | MCS0

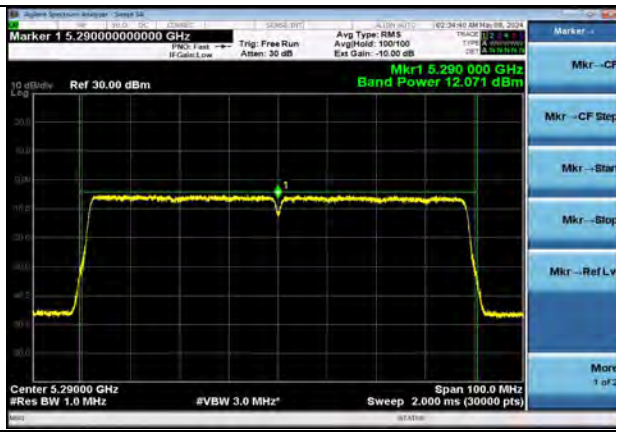
802.11ax20 | Channel 52 | MCS0

802.11n40 | Channel 54 | MCS7



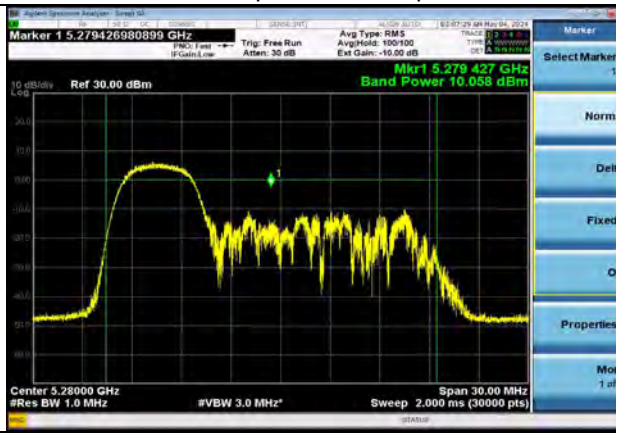
802.11ac40 | Channel 54 | MCS0

802.11ax40 | Channel 54 | MCS11

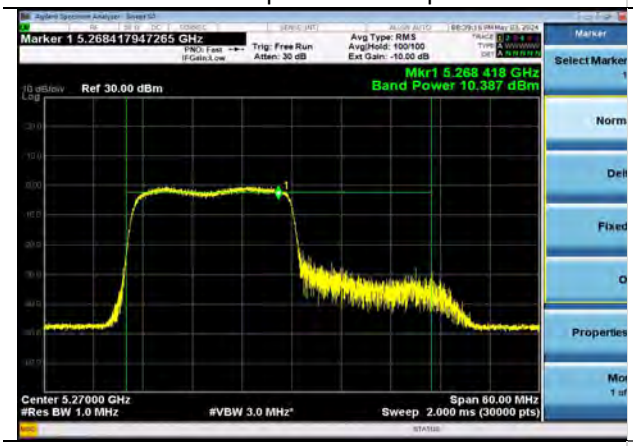


802.11ac80 | Channel 58 | MCS9

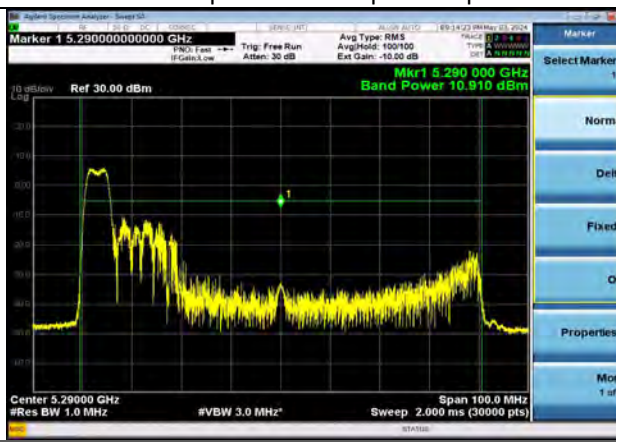
802.11ax80 | Channel 58 | MCS0



802.11ax20 | Channel 56 | MCS0 | RU52



802.11ax40 | Channel 54 | MCS0 | RU 242



802.11ax80 | Channel 58| MCS0 | RU52

6.1.3 Power Spectral Density

Operator	Dylan Rosenfeldt | Anthony Smith	**QA**	Adam Hauke
Temperature	21.8°C-22.2°C	**R.H. %**	44.80%-50.40%
Test Date	05/01/2024-05/17/2024	**Location**	Conducted RF Bench
Requirement	15.407 (a)(1) & (2) RSS-247 Clause 6.2.1 & 6.2.2	**Method**	ANSI C63.10 12.6 AVGPSD-2

Limits: Power spectral density shall not be greater than 11 dBm in any 1 MHz band.

Test Parameters

Frequency	5150-5350 MHz	**Detector(s)**	Avg (RMS)
RBW	1 MHz	**VBW**	3 MHz
Notes	The same method of determining the conducted output power shall be used to determine the power spectral density		
Example Calculations	Average PSD = Measured PSD + 10*log(1/D0 where D is the duty cycle.		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	06/13/2023	06/12/2024	Active Verification
EE 960087	Analyzer – Spectrum	Agilent	N9010A	MY53400296	04/11/2023	04/11/2024	Active Calibration

EUT Parameters

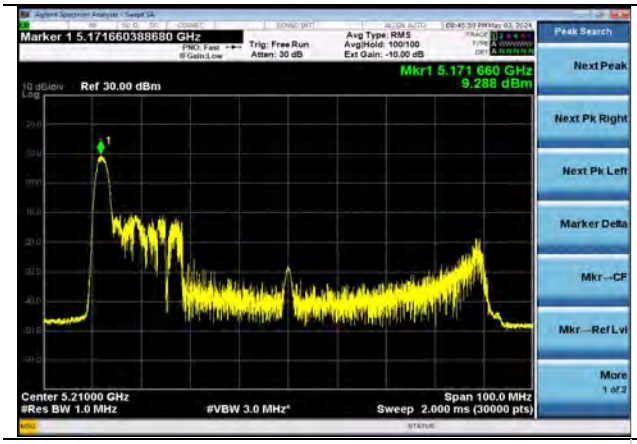
Input Power	120 VAC @ 60 Hz	**Mode**	5 GHz WLAN Tx
Frequency	5180-5320 MHz	**Channel**	See 2.9

U-NII-1 Measurements

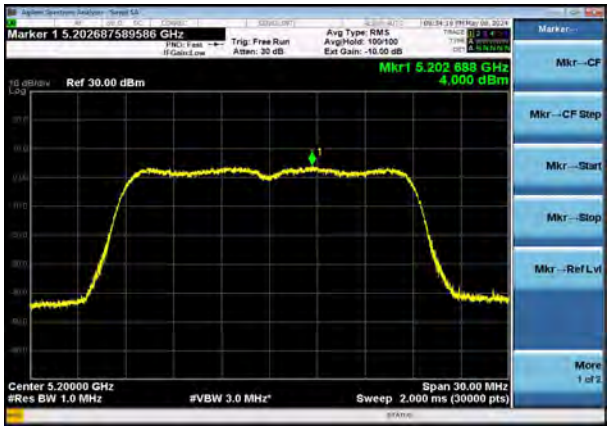
Mode	Rate	Channel	Maximum Average PSD (dBm/1 MHz)	Duty Cycle Correction (dB)	Corrected Output Value (dBm/1 MHz)	Limit (dBm/1 MHz)	Margin (dB)
802.11a	6 Mbps	36	5.0	-	5.0	11.0	6.0
		40	5.3	-	5.3	11.0	5.7
		48	5.2	-	5.2	11.0	5.8
	54 Mbps	36	5.3	0.4	5.7	11.0	5.3
		40	5.3	0.4	5.7	11.0	5.3
		48	4.7	0.4	5.1	11.0	5.9
802.11n20	MCS0	36	4.3	-	4.3	11.0	6.7
		40	4.2	-	4.2	11.0	6.8
		48	4.1	-	4.1	11.0	6.9
	MCS7	36	3.9	0.4	4.3	11.0	6.7
		40	4.0	0.4	4.4	11.0	6.6
		48	3.6	0.4	4.0	11.0	7.0
802.11ac20	MCS0	36	3.8	-	3.8	11.0	7.2
		40	3.9	-	3.9	11.0	7.2
		48	4.1	-	4.1	11.0	6.9
	MCS8	36	3.9	0.4	4.3	11.0	6.7
		40	4.0	0.4	4.4	11.0	6.6
		48	3.9	0.4	4.3	11.0	6.7
802.11ax20	MCS0	36	-0.2	-	-0.2	11.0	11.2
		40	0.0	-	0.0	11.0	11.0
		48	-0.2	-	-0.2	11.0	11.2
	MCS11	36	-0.3	0.5	0.2	11.0	10.8
		40	-0.4	0.5	0.2	11.0	10.9
		48	-0.2	0.5	0.3	11.0	10.7
802.11n40	MCS0	38	0.9	0.1	1.0	11.0	10.0
		46	1.0	0.1	1.1	11.0	9.9
	MCS7	38	1.0	0.6	1.6	11.0	9.4
		46	0.8	0.6	1.4	11.0	9.6
802.11ac40	MCS0	38	1.1	0.1	1.2	11.0	9.8
		46	1.1	0.1	1.2	11.0	9.8
	MCS9	38	-1.5	0.7	-0.8	11.0	11.8
		46	-1.4	0.7	-0.7	11.0	11.7
802.11ax40	MCS0	38	-2.8	0.1	-2.7	11.0	13.7
		46	-2.8	0.1	-2.7	11.0	13.7
	MCS11	38	-3.2	0.7	-2.5	11.0	13.5
		46	-3.0	0.7	-2.3	11.0	13.3
802.11ac80	MCS0	42	-4.2	0.2	-4.0	11.0	15.0
	MCS9	42	-4.5	1.0	-3.5	11.0	14.5
802.11ax80	MCS0	42	-6.8	0.2	-6.6	11.0	17.6
	MCS11	42	-7.2	0.8	-6.4	11.0	17.4

Mode	Rate RU	Channel	Maximum Average PSD (dBm/1 MHz)	Duty Cycle Correction (dB)	Corrected Output Value (dBm/1 MHz)	Limit (dBm/1 MHz)	Margin (dB)
802.11ax20	MCS0 RU26	36	9.2	0.2	9.4	11.0	1.6
		40	10.2	0.2	10.4	11.0	0.6
		48	9.7	0.2	9.9	11.0	1.1
	MCS0 RU52	36	6.1	0.2	6.3	11.0	4.7
		40	6.3	0.2	6.5	11.0	4.5
		48	6.1	0.2	6.3	11.0	4.7
	MCS0 RU106	36	2.9	0.2	3.1	11.0	7.9
		40	3.1	0.2	3.3	11.0	7.7
		48	3.3	0.2	3.5	11.0	7.5
802.11ax40	MCS0 RU26	38	9.7	0.2	9.9	11.0	1.1
		46	9.9	0.2	10.1	11.0	0.9
	MCS0 RU52	38	6.2	0.2	6.4	11.0	4.6
		46	6.3	0.2	6.5	11.0	4.5
	MCS0 RU106	38	3.3	0.2	3.5	11.0	7.5
		46	3.4	0.2	3.6	11.0	7.4
	MCS0 RU242	38	-0.2	0.2	0.0	11.0	11.0
		46	0.0	0.2	0.2	11.0	10.8
802.11ax80	MCS0 RU26	42	9.3	0.2	9.5	11.0	1.5
	MCS0 RU52	42	6.3	0.2	6.5	11.0	4.5
	MCS0 RU106	42	3.9	0.2	4.1	11.0	7.0
	MCS0 RU242	42	0.5	0.2	0.7	11.0	10.3
	MCS0 RU484	42	-2.3	0.2	-2.1	11.0	13.1

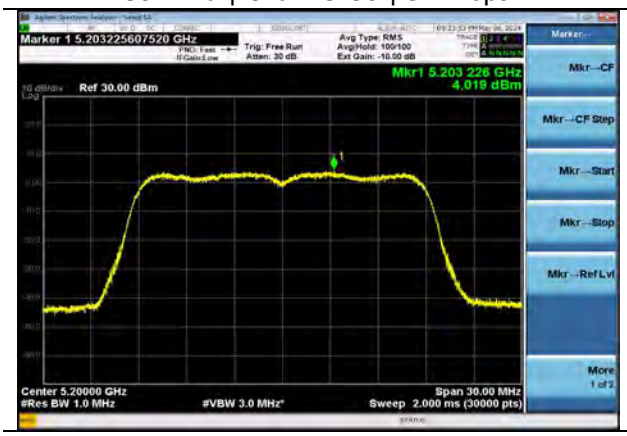
U-NII-1 Plots



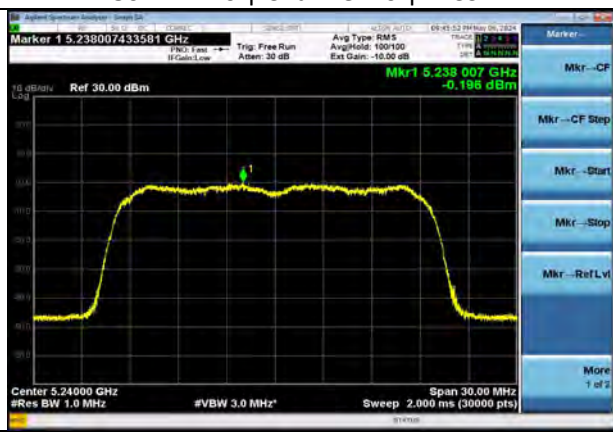
802.11a | Channel 36 | 54 Mbps



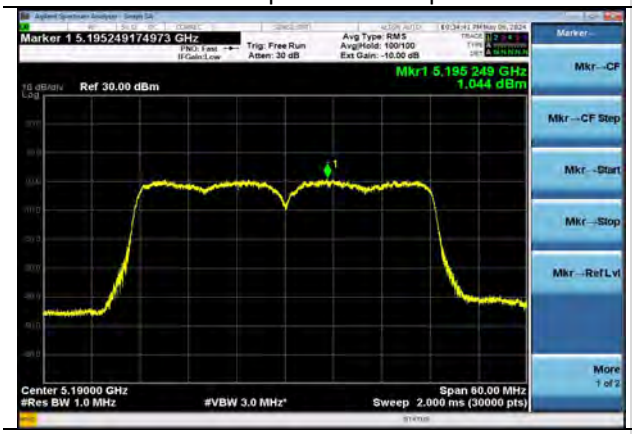
802.11n20 | Channel 40 | MCS7



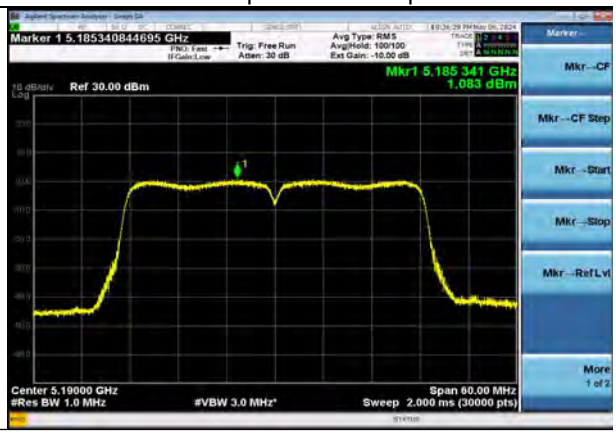
802.11ac20 | Channel 40 | MCS8



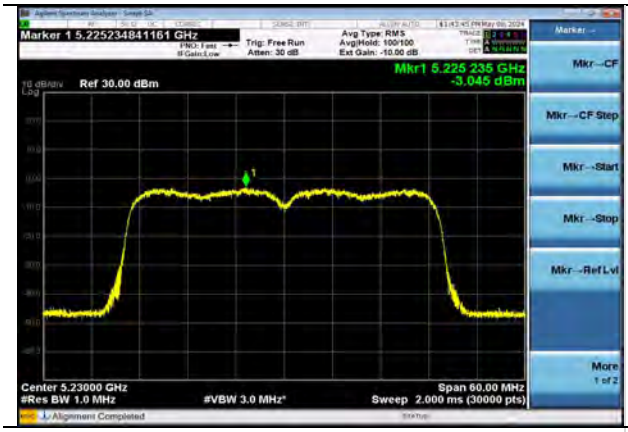
802.11ax20 | Channel 48 | MCS11



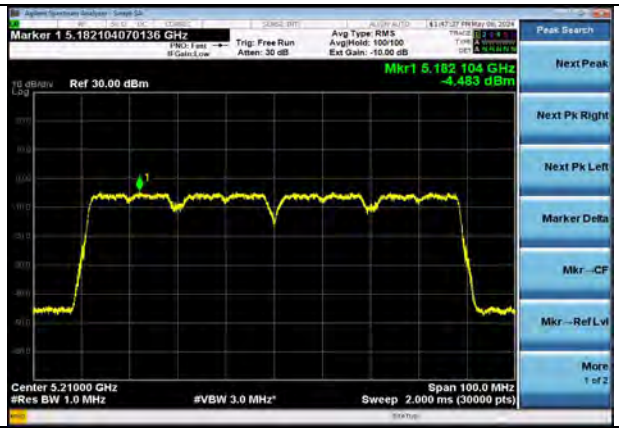
802.11n40 | Channel 38 | MCS7



802.11ac40 | Channel 38 | MCS0

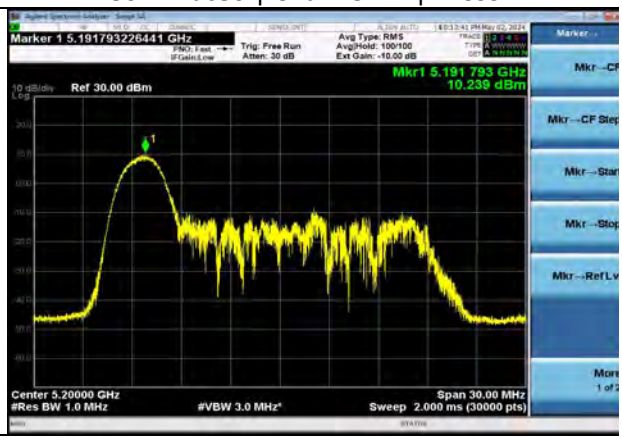


802.11ax40 | Channel 46 | MCS11

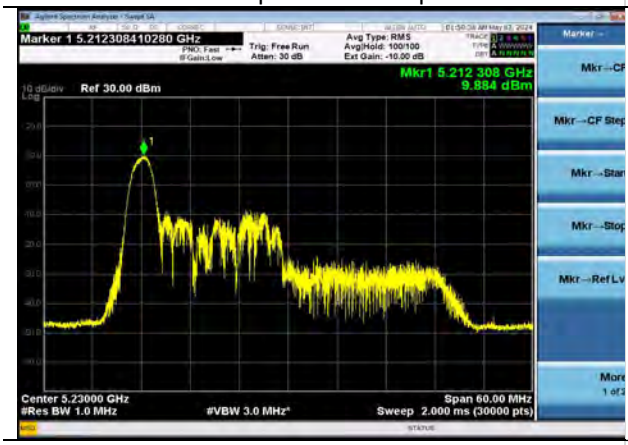


802.11ac80 | Channel 42 | MCS9

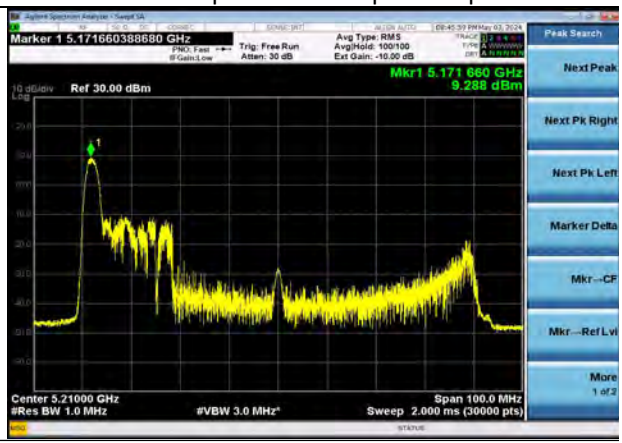
802.11ax80 | Channel 42 | MCS11



802.11ax20 | Channel 40 | MCS0 | RU26



802.11ax40 | Channel 46 | MCS0 | RU26



802.11ax80 | Channel 42 | MCS0 | RU26

U-NII-2A Measurements

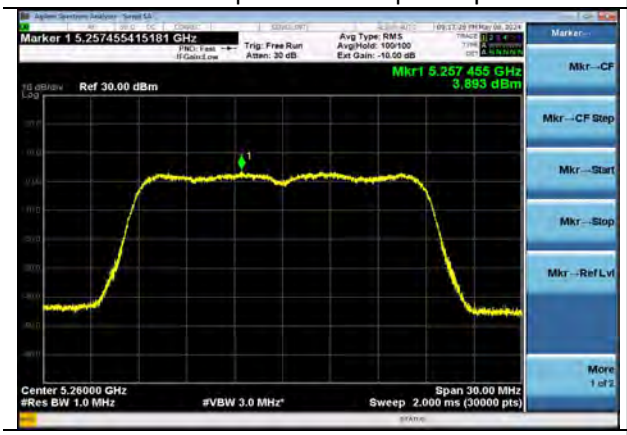
Mode	Rate	Channel	Maximum Average PSD (dBm/1 MHz)	Duty Cycle Correction (dB)	Corrected Output Value (dBm/1 MHz)	Limit (dBm/1 MHz)	Margin (dB)
802.11a	6 Mbps	52	5.1		5.1	11.0	5.9
		56	4.7		4.7	11.0	6.3
		64	4.6		4.6	11.0	6.4
	54 Mbps	52	4.7	0.4	5.1	11.0	5.9
		56	4.5	0.4	4.9	11.0	6.1
		64	4.3	0.4	4.7	11.0	6.3
802.11n20	MCS0	52	3.5		3.5	11.0	7.5
		56	3.4		3.4	11.0	7.6
		64	3.3		3.3	11.0	7.7
	MCS7	52	3.5	0.4	3.9	11.0	7.1
		56	3.4	0.4	3.8	11.0	7.2
		64	3.6	0.4	4.0	11.0	7.0
802.11ac20	MCS0	52	3.8		3.8	11.0	7.2
		56	3.6		3.6	11.0	7.4
		64	3.3		3.3	11.0	7.7
	MCS8	52	3.9	0.4	4.3	11.0	6.7
		56	3.3	0.4	3.7	11.0	7.3
		64	3.1	0.4	3.5	11.0	7.5
802.11ax20	MCS0	52	-0.2		-0.2	11.0	11.2
		56	-0.2		-0.2	11.0	11.2
		64	-0.7		-0.7	11.0	11.7
	MCS11	52	-0.2	0.5	0.3	11.0	10.7
		56	-0.9	0.5	-0.4	11.0	11.4
		64	-0.7	0.5	-0.2	11.0	11.2
802.11n40	MCS0	54	0.6	0.1	0.7	11.0	10.3
		62	0.4	0.1	0.5	11.0	10.5
	MCS7	54	0.5	0.6	1.1	11.0	9.9
		62	0.0	0.6	0.6	11.0	10.4
802.11ac40	MCS0	54	0.4	0.1	0.5	11.0	10.5
		62	0.6	0.1	0.7	11.0	10.4
	MCS9	54	-1.8	0.7	-1.1	11.0	12.1
		62	-1.8	0.7	-1.1	11.0	12.1
802.11ax40	MCS0	54	-3.3	0.1	-3.2	11.0	14.2
		62	-3.4	0.1	-3.3	11.0	14.3
	MCS11	54	-3.6	0.7	-2.9	11.0	13.9
		62	-3.4	0.7	-2.7	11.0	13.7
802.11ac80	MCS0	58	-5.1	0.2	-4.9	11.0	15.9
	MCS9	58	-5.1	1.0	-4.1	11.0	15.1
802.11ax80	MCS0	58	-7.3	0.2	-7.1	11.0	18.1
	MCS11	58	-7.6	0.8	-6.8	11.0	17.8

Mode	Rate RU	Channel	Maximum Average PSD (dBm/1 MHz)	Duty Cycle Correction (dB)	Corrected Output Value (dBm/1 MHz)	Limit (dBm/1 MHz)	Margin (dB)
802.11ax20	MCS0 RU26	52	9.2	0.2	9.4	11.0	1.6
		56	9.3	0.2	9.5	11.0	1.5
		64	8.8	0.2	9.0	11.0	2.0
	MCS0 RU52	52	6.0	0.2	6.2	11.0	4.8
		56	5.8	0.2	6.0	11.0	5.0
		64	5.8	0.2	6.0	11.0	5.0
	MCS0 RU106	52	2.9	0.2	3.1	11.0	7.9
		56	3.2	0.2	3.4	11.0	7.6
		64	2.6	0.2	2.8	11.0	8.2
802.11ax40	MCS0 RU26	54	9.2	0.2	9.4	11.0	1.6
		62	9.7	0.2	9.9	11.0	1.1
	MCS0 RU52	54	5.8	0.2	6.0	11.0	5.1
		62	6.2	0.2	6.4	11.0	4.6
	MCS0 RU106	54	2.9	0.2	3.1	11.0	7.9
		62	2.9	0.2	3.1	11.0	7.9
	MCS0 RU242	54	-0.1	0.2	0.1	11.0	10.9
		62	-0.3	0.2	-0.1	11.0	11.1
802.11ax80	MCS0 RU26	58	9.0	0.2	9.2	11.0	1.8
	MCS0 RU52	58	5.9	0.2	6.1	11.0	4.9
	MCS0 RU106	58	3.2	0.2	3.4	11.0	7.6
	MCS0 RU242	58	-0.1	0.2	0.1	11.0	10.9
	MCS0 RU484	58	-2.9	0.2	-2.7	11.0	13.7

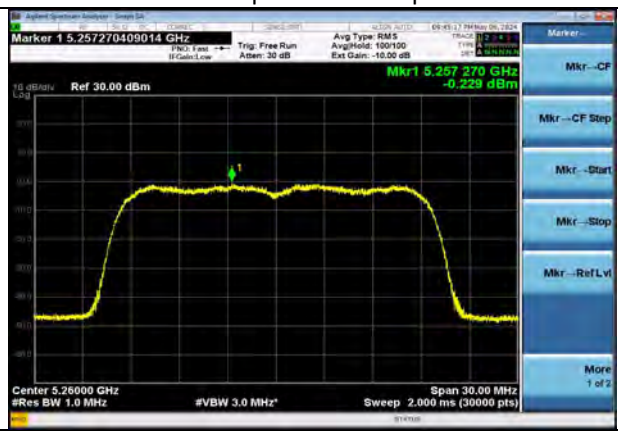
U-NII-2A Plots

802.11a | Channel 52 | 6 Mbps

802.11n20 | Channel 64 | MCS7



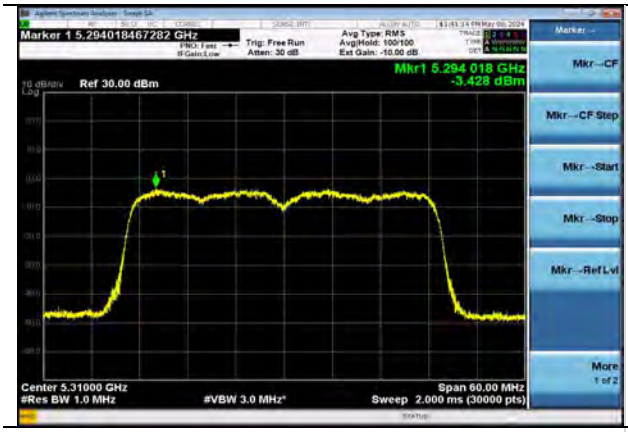
802.11ac20 | Channel 52 | MCS8



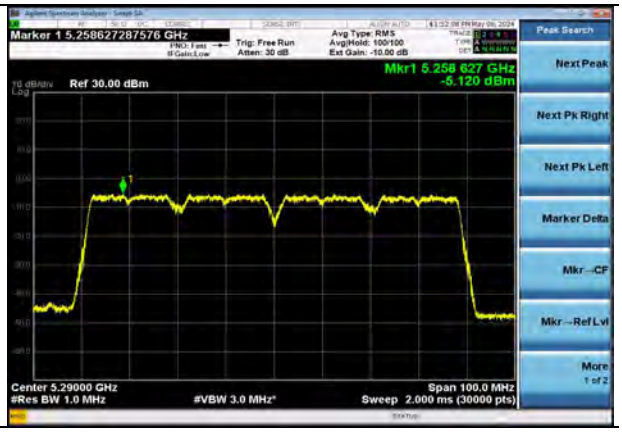
802.11ax20 | Channel 52 | MCS11

802.11n40 | Channel 54 | MCS7

802.11ac40 | Channel 62 | MCS0

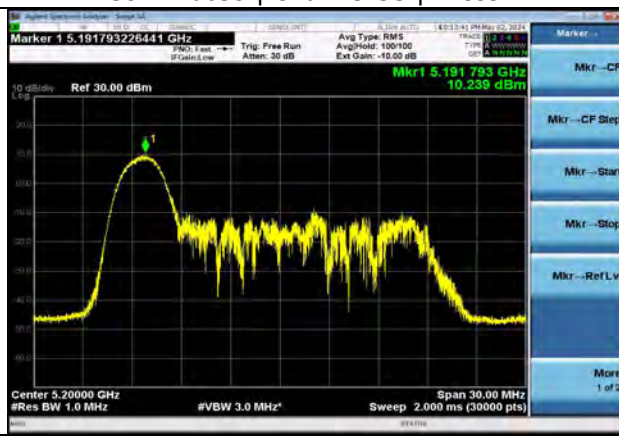


802.11ax40 | Channel 62 | MCS11

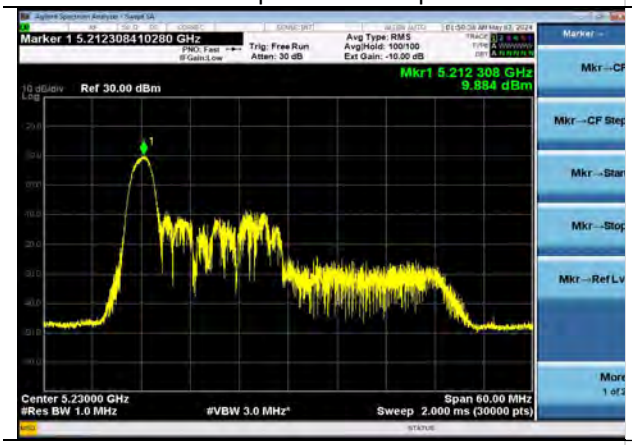


802.11ac80 | Channel 58 | MCS9

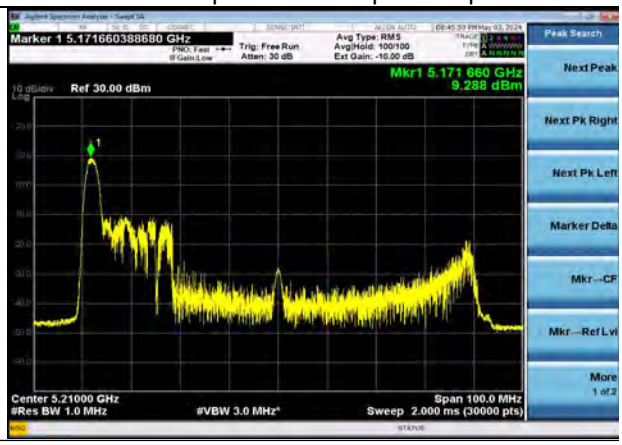
802.11ax80 | Channel 58 | MCS11



802.11ax20 | Channel 40 | MCS0 | RU26



802.11ax40 | Channel 46 | MCS0 | RU26



802.11ax80 | Channel 42 | MCS0 | RU26

6.1.4 Out-of-band Emissions

Operator	Anthony Smith | Dylan Rosenfeldt	**QA**	Adam Hauke
Temperature	21.6°C-21.9°C 21.8°C-22.2°C	**R.H. %**	19.90%-41.10% 29.70%-38.0%
Test Date	02/29/2024-03/05/2024 04/05/2024-04/08/2024	**Location**	Conducted RF Bench
Requirement	15.407(b)(1) & (2) RSS-247 Clause 6.2.1 & 6.2.2	**Method**	ANSI C63.10 12.7

Limits: For transmitters operating in the 5.15-5.25 GHZ band and 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.

15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-40000	-	54.0	74.0

Test Parameters

Frequency	30-40000 MHz	**Setup**	Antenna Port
RBW	1 MHz	**VBW**	3 MHz
Detector(s)	Peak and Average (RMS)		
Notes	Declared antenna gain for band edge – 4.4 dBi		
Example Calculations	Correction Factor = 20 log (1/D), where D is the duty cycle		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	06/13/2023	06/12/2024	Active Verification
EE 960087	Analyzer – Spectrum	Agilent	N9010A	MY53400296	04/11/2023	04/11/2024	Active Calibration

Input Power	120 VAC @ 60 Hz	**Mode**	5 GHz WLAN Tx
Frequency	5180-5320 MHz	**Channel**	See 2.9

U-NII-1 Measurements – Lower Band Edge

Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	Antenna Gain (dBi)	Duty Cycle Correction (dB)	Limit (dBm)	Margin (dB)
802.11a	6 Mbps	36	Peak	5148.9	-43.5	4.4	-	-27.0	12.1
		36	Average	5149.8	-54.0	4.4	-	-41.2	8.4
	54 Mbps	36	Peak	5149.2	-40.5	4.4	-	-27.0	9.1
		36	Average	5149.7	-52.5	4.4	0.4	-41.2	6.5
802.11n20	MCS0	36	Peak	5149.5	-40.5	4.4	-	-27.0	9.1
		36	Average	5149.0	-54.5	4.4	-	-41.2	8.9
	MCS7	36	Peak	5148.2	-44.7	4.4	-	-27.0	13.3
		36	Average	5147.9	-55.5	4.4	0.4	-41.2	9.5
802.11ac20	MCS0	36	Peak	5149.1	-44.4	4.4	-	-27.0	13.0
		36	Average	5149.6	-54.5	4.4	-	-41.2	8.9
	MCS8	36	Peak	5150.0	-46.2	4.4	-	-27.0	14.8
		36	Average	5149.8	-55.1	4.4	0.4	-41.2	9.1
802.11ax20	MCS0	36	Peak	5149.8	-43.0	4.4	-	-27.0	11.6
		36	Average	5146.8	-54.6	4.4	-	-41.2	9.0
	MCS11	36	Peak	5147.5	-40.5	4.4	-	-27.0	9.1
		36	Average	5148.4	-59.8	4.4	0.5	-41.2	13.7
802.11n40	MCS0	38	Peak	5147.9	-33.3	4.4	-	-27.0	1.9
		38	Average	5146.7	-50.8	4.4	0.1	-41.2	5.1
	MCS7	38	Peak	5148.2	-41.7	4.4	-	-27.0	10.3
		38	Average	5148.1	-52.8	4.4	0.6	-41.2	6.6
802.11ac40	MCS0	38	Peak	5142.0	-40.9	4.4	-	-27.0	9.5
		38	Average	5144.4	-52.1	4.4	0.1	-41.2	6.4
	MCS9	38	Peak	5145.1	-47.4	4.4	-	-27.0	16.0
		38	Average	5148.9	-55.9	4.4	0.7	-41.2	9.6
802.11ax40	MCS0	38	Peak	5146.8	-40.6	4.4	-	-27.0	9.2
		38	Average	5147.0	-52.4	4.4	0.1	-41.2	6.7
	MCS11	38	Peak	5149.7	-42.0	4.4	-	-27.0	10.6
		38	Average	5149.9	-56.8	4.4	0.7	-41.2	10.5
802.11ac80	MCS0	42	Peak	5141.4	-39.1	4.4	-	-27.0	7.7
		42	Average	5146.8	-51.0	4.4	0.2	-41.2	5.2
	MCS9	42	Peak	5143.4	-39.5	4.4	-	-27.0	8.1
		42	Average	5146.4	-50.4	4.4	1.0	-41.2	3.8
802.11ax80	MCS0	42	Peak	5134.8	-34.7	4.4	-	-27.0	3.3
		42	Average	5136.5	-49.2	4.4	0.2	-41.2	3.4
	MCS11	42	Peak	5147.9	-44.2	4.4	-	-27.0	12.8
		42	Average	5139.1	-54.4	4.4	0.8	-41.2	8.0

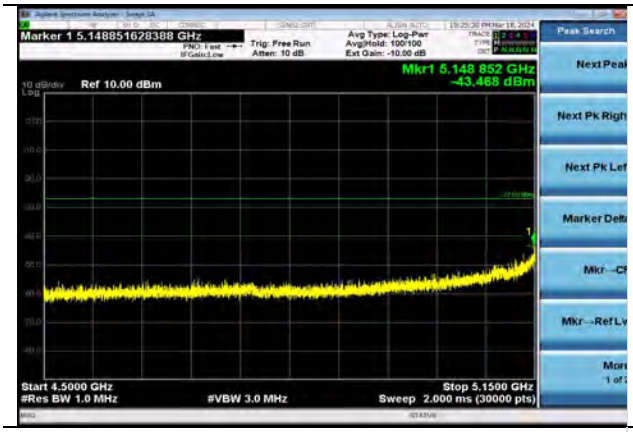
Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	Antenna Gain (dBi)	Duty Cycle Correction (dB)	Limit (dBm)	Margin (dB)
802.11ax20	MCS0 RU26	36	Peak	5136.7	-38.6	4.4	-	-27.0	7.2
		36	Average	5138.0	-56.0	4.4	0.2	-41.2	10.2
	MCS0 RU52	36	Peak	5147.2	-44.6	4.4	-	-27.0	13.2
		36	Average	5139.4	-54.9	4.4	0.2	-41.2	9.1
	MCS0 RU106	36	Peak	5146.7	-43.6	4.4	-	-27.0	12.2
		36	Average	5148.0	-55.8	4.4	0.2	-41.2	10.0
802.11ax40	MCS0 RU26	38	Peak	5132.2	-41.5	4.4	-	-27.0	10.1
		38	Average	5136.2	-52.6	4.4	0.2	-41.2	6.8
	MCS0 RU52	38	Peak	5139.8	-41.0	4.4	-	-27.0	9.6
		38	Average	5139.8	-52.2	4.4	0.2	-41.2	6.4
	MCS0 RU106	38	Peak	5113.6	-35.4	4.4	-	-27.0	4.0
		38	Average	5148.7	-53.3	4.4	0.2	-41.2	7.5
	MCS0 RU242	38	Peak	5124.3	-43.3	4.4	-	-27.0	11.9
		38	Average	5149.8	-53.9	4.4	0.2	-41.2	8.1
802.11ax80	MCS0 RU26	42	Peak	5101.3	-34.8	4.4	-	-27.0	3.4
		42	Average	5145.9	-52.4	4.4	0.2	-41.2	6.6
	MCS0 RU52	42	Peak	5141.1	-33.8	4.4	-	-27.0	2.4
		42	Average	5106.4	-54.3	4.4	0.2	-41.2	8.5
	MCS0 RU106	42	Peak	5105.3	-43.95	4.4	-	-27.0	12.6
		42	Average	5103.1	-56.5	4.4	0.2	-41.2	10.7
	MCS0 RU242	42	Peak	5149.5	-38.7	4.4	-	-27.0	7.3
		42	Average	5149.2	-56.1	4.4	0.2	-41.2	10.3
	MCS0 RU484	42	Peak	5142.3	-43.7	4.4	-	-27.0	12.3
		42	Average	5149.7	-55.0	4.4	0.2	-41.2	9.2

U-NII-2A Measurements – Upper Band Edge

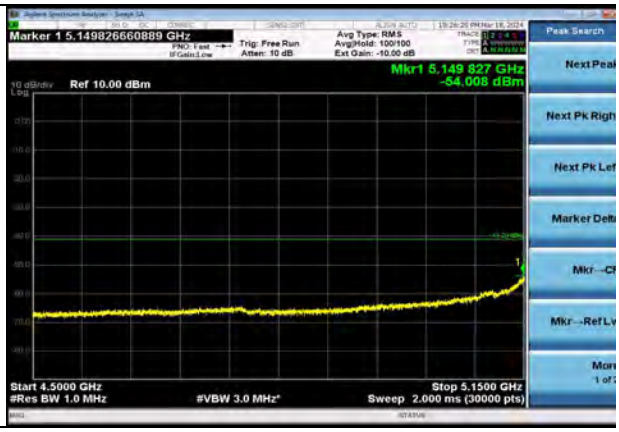
Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	Antenna Gain (dBi)	Duty Cycle Correction (dB)	Limit (dBm)	Margin (dB)
802.11a	6 Mbps	64	Peak	5353.4	-42.2	4.4	-	-27.0	10.8
		64	Average	5350.4	-54.7	4.4	-	-41.2	9.1
	54 Mbps	64	Peak	5350.2	-40.4	4.4	-	-27.0	9.0
		64	Average	5350.3	-55.3	4.4	0.4	-41.2	9.3
802.11n20	MCS0	64	Peak	5353.6	-45.3	4.4	-	-27.0	13.9
		64	Average	5351.3	-55.8	4.4	-	-41.2	10.2
	MCS7	64	Peak	5350.1	-37.6	4.4	-	-27.0	6.2
		64	Average	5351.5	-55.0	4.4	0.4	-41.2	9.0
802.11ac20	MCS0	64	Peak	5351.5	-42.4	4.4	-	-27.0	11.0
		64	Average	5350.7	-56.3	4.4	-	-41.2	10.7
	MCS8	64	Peak	5350.5	-46.0	4.4	-	-27.0	14.6
		64	Average	5352.6	-56.0	4.4	0.4	-41.2	10.0
802.11ax20	MCS0	64	Peak	5352.5	-42.9	4.4	-	-27.0	11.5
		64	Average	5350.8	-55.4	4.4	-	-41.2	9.8
	MCS11	64	Peak	5352.1	-43.7	4.4	-	-27.0	12.3
		64	Average	5351.2	-58.6	4.4	0.5	-41.2	12.5
802.11n40	MCS0	62	Peak	5350.4	-32.8	4.4	-	-27.0	1.4
		62	Average	5350.1	-49.1	4.4	0.1	-41.2	3.4
	MCS7	62	Peak	5352.7	-41.1	4.4	-	-27.0	9.7
		62	Average	5351.0	-52.0	4.4	0.6	-41.2	5.8
802.11ac40	MCS0	62	Peak	5351.8	-40.3	4.4	-	-27.0	8.9
		62	Average	5350.4	-51.4	4.4	0.1	-41.2	5.7
	MCS9	62	Peak	5358.1	-44.9	4.4	-	-27.0	13.5
		62	Average	5352.7	-55.1	4.4	0.7	-41.2	8.8
802.11ax40	MCS0	62	Peak	5355.9	-36.7	4.4	-	-27.0	5.3
		62	Average	5351.5	-50.5	4.4	0.1	-41.2	4.8
	MCS11	62	Peak	5352.2	-39.3	4.4	-	-27.0	7.9
		62	Average	5351.5	-54.2	4.4	0.7	-41.2	7.9
802.11ac80	MCS0	58	Peak	5361.3	-39.9	4.4	-	-27.0	8.5
		58	Average	5350.0	-50.5	4.4	0.2	-41.2	4.7
	MCS9	58	Peak	5351.5	-40.6	4.4	-	-27.0	9.2
		58	Average	5354.0	-50.6	4.4	1.0	-41.2	4.0
802.11ax80	MCS0	58	Peak	5351.6	-37.9	4.4	-	-27.0	6.5
		58	Average	5354.6	-50.6	4.4	0.2	-41.2	4.8
	MCS11	58	Peak	5350.7	-42.5	4.4	-	-27.0	11.1
		58	Average	5356.1	-53.7	4.4	0.8	-41.2	7.3

Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	Antenna Gain (dBi)	Duty Cycle Correction (dB)	Limit (dBm)	Margin (dB)
802.11ax20	MCS0 RU26	64	Peak	5362.3	-36.8	4.4		-27.0	5.4
		64	Average	5362.4	-56.3	4.4	0.2	-41.2	10.5
	MCS0 RU52	64	Peak	5355.6	-36.3	4.4		-27.0	4.9
		64	Average	5359.8	-54.1	4.4	0.2	-41.2	8.3
	MCS0 RU106	64	Peak	5361.0	-42.0	4.4		-27.0	10.6
		64	Average	5353.4	-55.7	4.4	0.2	-41.2	9.9
802.11ax40	MCS0 RU26	62	Peak	5360.4	-35.7	4.4		-27.0	4.3
		62	Average	5363.5	-54.7	4.4	0.2	-41.2	8.9
	MCS0 RU52	62	Peak	5355.1	-35.8	4.4		-27.0	4.4
		62	Average	5359.0	-52.6	4.4	0.2	-41.2	6.8
	MCS0 RU106	62	Peak	5356.8	-40.8	4.4		-27.0	9.4
		62	Average	5350.7	-55.0	4.4	0.2	-41.2	9.2
	MCS0 RU242	62	Peak	5353.7	-41.5	4.4		-27.0	10.1
		62	Average	5350.3	-54.0	4.4	0.2	-41.2	8.2
802.11ax80	MCS0 RU26	58	Peak	5405.4	-37.1	4.4		-27.0	5.7
		58	Average	5366.2	-53.3	4.4	0.2	-41.2	7.5
	MCS0 RU52	58	Peak	5372.1	-32.6	4.4		-27.0	1.2
		58	Average	5360.8	-49.3	4.4	0.2	-41.2	3.5
	MCS0 RU106	58	Peak	5381.4	-40.7	4.4		-27.0	9.3
		58	Average	5359.9	-55.9	4.4	0.2	-41.2	10.1
	MCS0 RU242	58	Peak	5371.7	-42.9	4.4		-27.0	11.5
		58	Average	5362.0	-55.0	4.4	0.2	-41.2	9.2
	MCS0 RU484	58	Peak	5351.3	-43.1	4.4		-27.0	11.7
		58	Average	5350.1	-53.8	4.4	0.2	-41.2	8.0

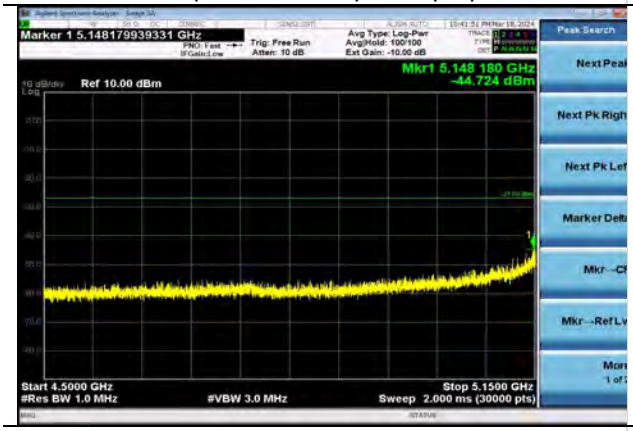
Worst Case Plots



802.11a | Channel 36 | 6 Mbps | Peak

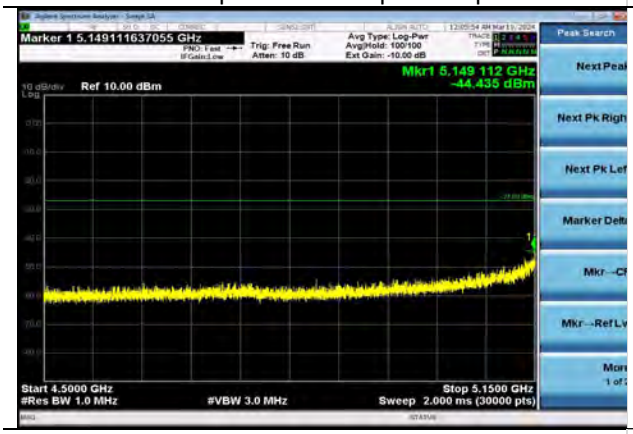


802.11a | Channel 36 | 6 Mbps | Average

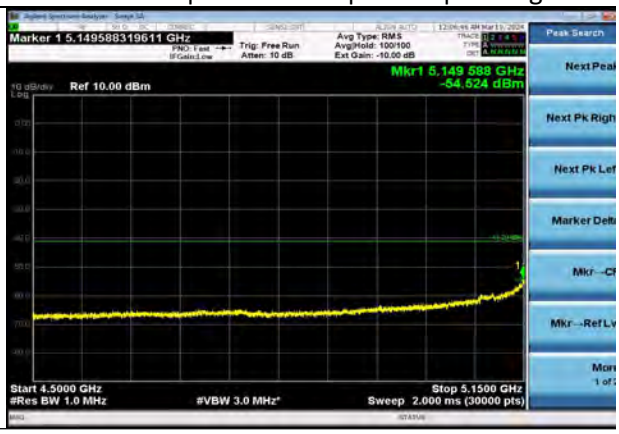


802.11n20 | Channel 36 | MCS7 | Peak

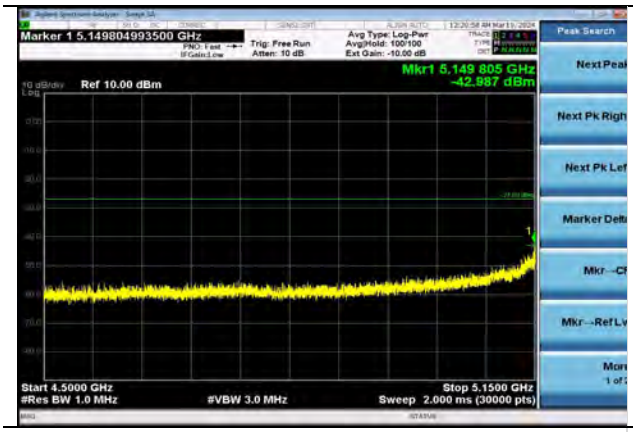
802.11n20 | Channel 36 | MCS7 | Average



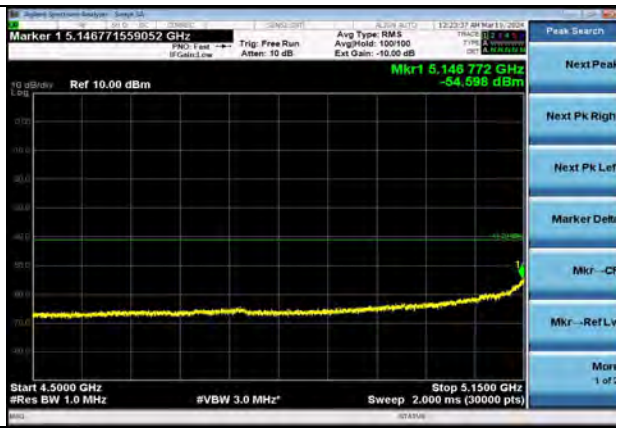
802.11ac20 | Channel 36 | MCS0 | Peak



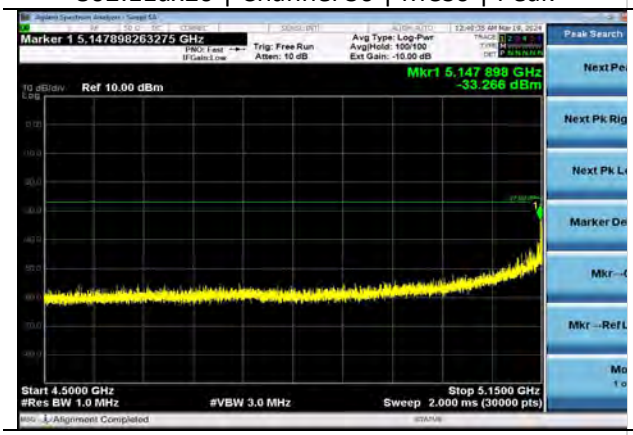
802.11ac20 | Channel 36 | MCS0 | Average



802.11ax20 | Channel 36 | MCS0 | Peak

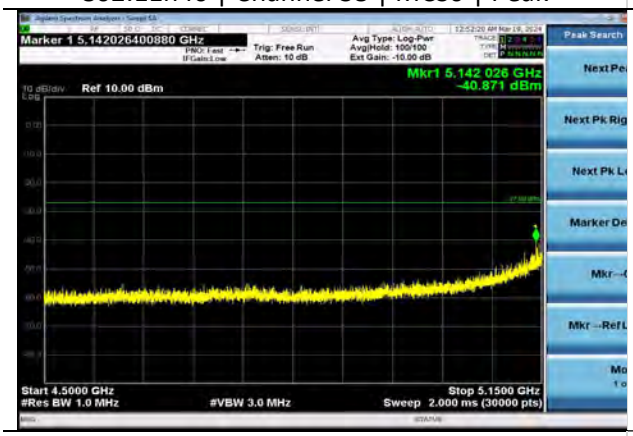


802.11ax20 | Channel 36 | MCS0 | Average



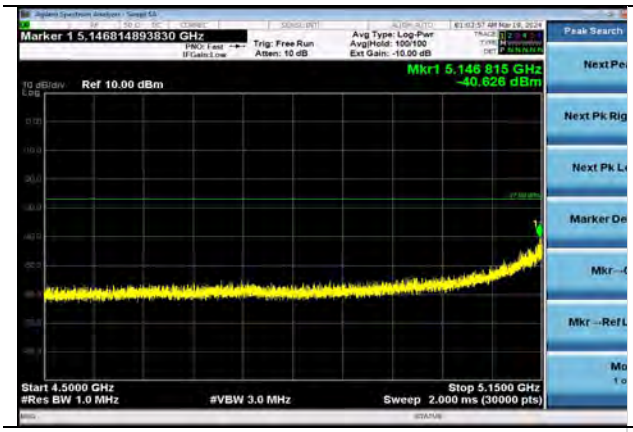
802.11n40 | Channel 38 | MCS0 | Peak

802.11ax20 | Channel 38 | MCS0 | Average



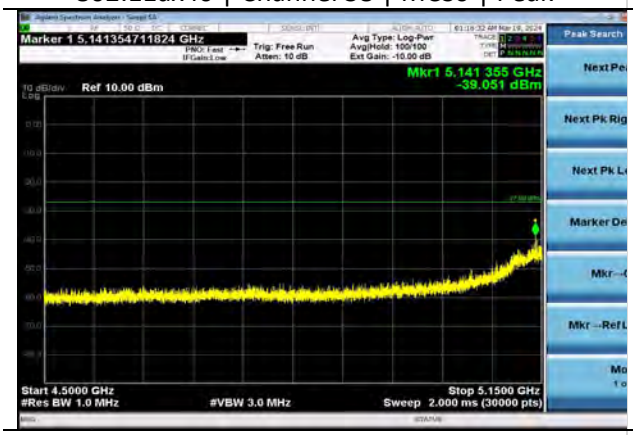
802.11ac40 | Channel 38 | MCS0 | Peak

802.11ac40 | Channel 38 | MCS0 | Average



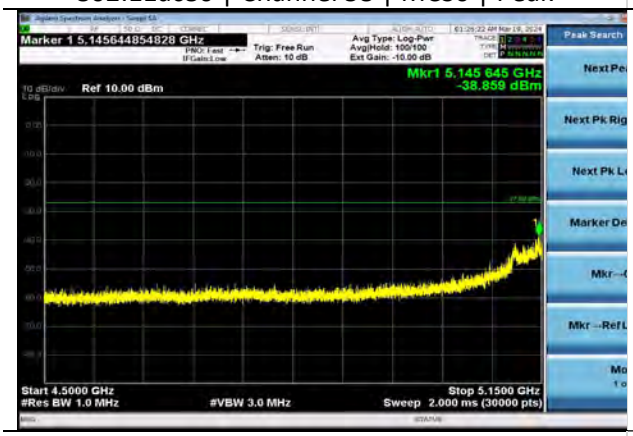
802.11ax40 | Channel 38 | MCS0 | Peak

802.11ax40 | Channel 38 | MCS0 | Average



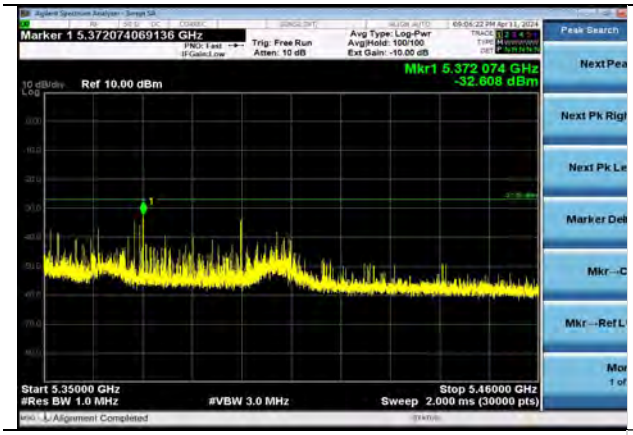
802.11ac80 | Channel 58 | MCS0 | Peak

802.11ac80 | Channel 58 | MCS0 | Average



802.11ax80 | Channel 42 | MCS7 | Peak

802.11ax80 | Channel 42 | MCS7 | Average

	
802.11ax80 | Channel 58 | MCS0 | RU52 | Peak	802.11ax20 | Channel 64 | MCS0 | RU52 | Average

6.1.5 Spurious Emissions In Restricted Bands

Operator	Anthony Smith	**QA**	Anthony Smith
Temperature	21.8°C	**R.H. %**	35.90%
Test Date	03/04/2024	**Location**	Conducted RF Bench
Requirement	15.407(b)(1),(2),(9), & 10 RSS-247 Clause 6.2.1 & 6.2.2 RSS-GEN	**Method**	ANSI C63.10 12.7

Limits: For transmitters operating in the 5.15-5.25 GHzband and 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.

15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-40000	-	54.0	74.0

Test Parameters

Frequency	30-40000 MHz	**Setup**	Terminated Method
RBW	1 MHz	**VBW**	3 MHz
Detector(s)	Peak	**Settings**	
Notes	Declared antenna gain– 4.4 dBi		
Example Calculations	Correction Factor = 20 log (1/D), where D is the duty cycle		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960173	Cable	A.H. Systems, Inc.	SAC-26G-1	387	06/13/2023	06/12/2024	Active Verification
EE 960085	Analyzer – Spectrum	Agilent	N9010A	MY53400296	04/11/2023	04/11/2024	Active Calibration
AA 960161	Filter - Highpass 5 GHz	K&L Microwave	11SH10-8000	2	4/11/2023	4/11/2024	Active Calibration

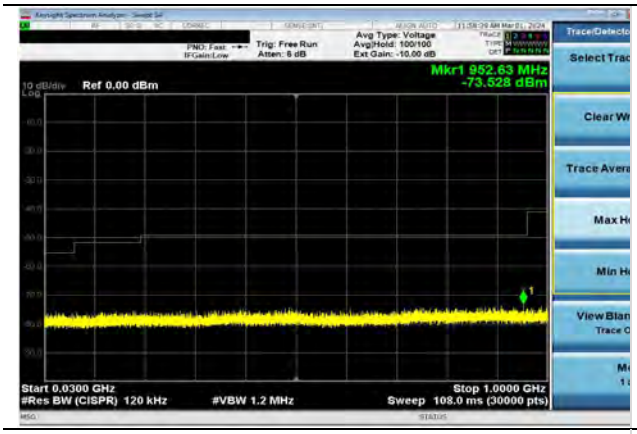
EUT Parameters

Input Power	120 VAC @ 60 Hz	**Mode**	5 GHz WLAN Tx
Frequency	5180-5320 MHz	**Channel**	36, 38, 40, 48, 52, 62

Table

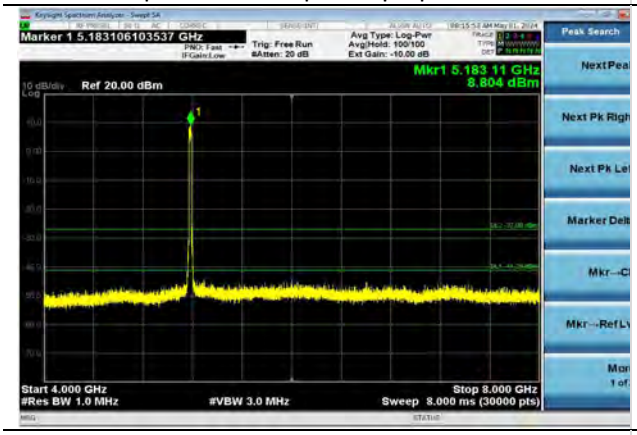
Mode	Rate	Channel	Measurement Type	Frequency (MHz)	Measurement (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin (dB)
802.11a	6 Mbps	36	Peak	10360.4	-50.2	-45.8	-27.0	18.8
		36	Average					
802.11a	6 Mbps	40	Peak	10400.5	-48.5	-44.1	-27.0	17.1
		40	Average					
802.11a	6 Mbps	64	Peak	10635.7	-56.2	-51.8	-27.0	24.8
		64	Average	10635.8	-66.9	-62.5	-41.2	21.3
802.11n	MCS0	64	Peak	10637.5	-59.6	-55.2	-27.0	28.2
		64	Average	10640.0	-69.8	-65.4	-41.2	24.2
802.11ac20	MCS0	64	Peak	10632.1	-59.6	-55.2	-27.0	28.2
		64	Average	10640.1	-69.9	-65.5	-41.2	24.3
802.11ax20	MCS0	64	Peak	10637.7	-59.3	-54.9	-27.0	27.9
		64	Average	10641.1	-70.0	-65.6	-41.2	24.4

Worst Case Plots

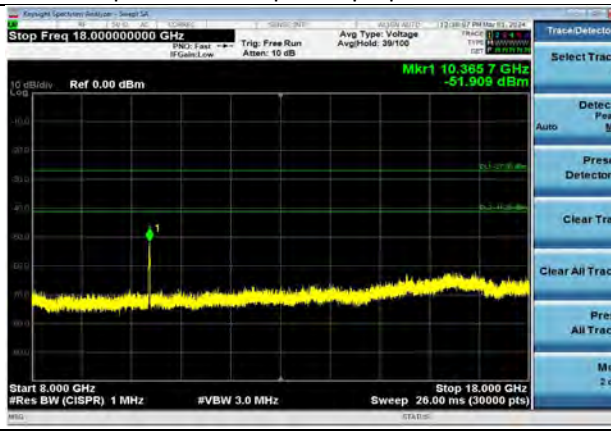


802.11a | Channel 36 | 6 Mbps | 30-1000 MHz

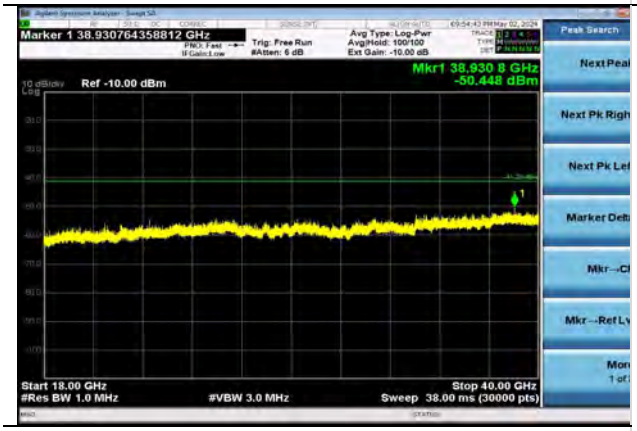
802.11a | Channel 36 | 6 Mbps | 1000-4000 MHz



802.11a | Channel 36 | 6 Mbps | 4000-8000 MHz



802.11a | Channel 36 | 6 Mbps | 8000-18000 MHz



802.11a | Channel 36 | 6 Mbps | 18000-40000 MHz

6.1.6 Frequency Stability

Operator	Dylan Rosenfeldt	**QA**	Anthony Smith
Temperature	21.8°C	**R.H. %**	31.90%
Test Date	04/25/2024	**Location**	Conducted RF Bench
Requirement	15.407(g) RSS-GEN Clause 6.11	**Method**	ANSI C63.10 6.8

Test Parameters

Frequency	5170-5330 MHz	**Voltage**	4.3 VDC, 5 VDC, and 5.8 VDC
Detector(s)	Peak	**Settings**	Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960173	Cable	A.H. Systems, Inc.	SAC-26G-1	387	06/13/2023	06/12/2024	Active Verification
EE 960088	Analyzer - EMI Receiver	Agilent	N9038A	MY51210138	4/10/2023	4/10/2024	Active Calibration

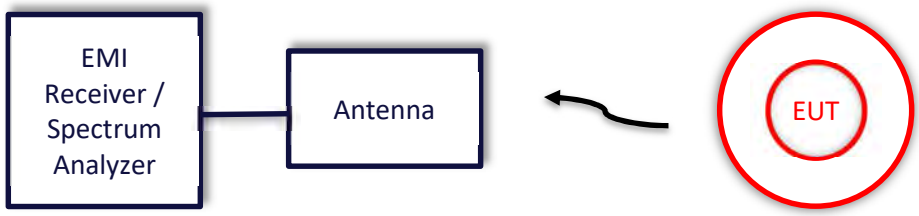
Table

Channel	Voltage (VDC)	Center Frequency (Hz)
36	5	5180002505
	4.3	5180002317
	5.8	5180002236
40	5	5200002354
	4.3	5200002400
	5.8	5200002895
48	5	5240003023
	4.3	5240002898
	5.8	5240002821
52	5	5260003713
	4.3	5260003516
	5.8	5260003919
56	5	5280003579
	4.3	5280003666
	5.8	5280003510
64	5	5320004071
	4.3	5320004077
	5.8	5320004137

6.2 Radiated Emissions

Description of Measurement	The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna. The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values. The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.
Example Calculations	Measurement (dBµV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBµV/m) Margin (dB) = Limit (dBµV/m) - Corrected Reading (dBµV/m) Example at 4000 MHz: Reading = 40 dBµV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBµV/m Average Limit = 20 log (500) = 54 dBµV/m Margin = 54 dBµV/m - 50.8 dBµV/m = 3.2 dB

Block Diagram



6.2.1 Spurious Radiated Emissions in the Restricted Bands

Operator	Mitchell Freund | Nicole Sedmak Jon Dilley | Zachary Brown	**QA**	Anthony Smith | Adam Alger Adam Hauke | Dylan Rosenfeldt
Temperature	23.2°C-25.1°C	**R.H. %**	21.30%-25.90%
Test Date	02/12/2024-04/03/2024	**Location**	Chamber 3 | Chamber 5
Requirement	15.247 (b)(1),(2),(9) & (10) RSS-247 Clause 6.2.1 & 6.2.2 RSS-GEN Clause 8.9	**Method**	ANSI C63.10 12.7

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

15.209 Limits:

Frequency (MHz)	Quasi-Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Peak Limit (dBµV/m)
30-88	40.0	-	-
88-216	43.5	-	-
216-960	46.0	-	-
960-1000	54.0	-	-
1000-40000	-	54.0	74.0

Test Parameters

Frequency	30-40000 MHz	**Distance**	3 m
Detector(s)	Peak Trac Peak and Average Final	**Table height**	150 cm
RBW	<1000 MHz – 120 kHz >1000 – 1 MHz	**VBW**	<1000 – 1.2 MHz >1000 – See 2.9

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960007	Antenna - Double Ridge Horn	EMCO	3115	9311-4138	8/10/2023	8/10/2024	Active Calibration
AA 960081	Antenna - Double Ridge Horn	EMCO	3115	6907	1/11/2024	1/11/2025	Active Calibration
AA 960158	Antenna - Double Ridge Horn	ETS Lindgren	3117	109300	2/7/2024	2/7/2025	Active Calibration
AA 960161	Filter - Highpass 5 GHz	K&L Microwave	11SH10-8000	2	4/11/2023	4/11/2024	Active Calibration

AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	8/10/2023	8/10/2024	Active Calibration
AA 960217	Antenna - Biconical	A.H. Systems, Inc.	SAS-540	852	7/17/2023	7/17/2024	Active Calibration
AA 960220	Cable	A.H. Systems, Inc.	SAC-26G-6	552	2/16/2023	2/16/2025	Active Verification
AA 960221	Cable	A.H. Systems, Inc.	SAC-26G-6	524	6/13/2023	6/13/2024	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/27/2023	4/27/2024	Active Calibration
EE 960203	Analyzer - EMI Receiver	Keysight	N9038A	MY56400072	4/11/2023	4/11/2024	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	1/5/2024	1/5/2025	Active Verification
LSC-500	Cable	Chamber 5 Emissions	-	-	1/8/2024	1/8/2025	Active Verification

EUT Parameters

Input Power	120 VAC @ 60 Hz	**Mode**	5 GHz WLAN Tx
EUT	X, Y, Z Plane Orientations Antenna ports terminated with 50 Ω SMA terminators	**AE**	HP Elitebook 840G1 Ezurio – SOM60 Development Kit
Notes	6000 MHz Emission from auxiliary equipment. Not a function of the EUT. No Spurious emissions observed 1000-40000 MHz. Only worst case EUT orientation reported.		

Radiated Spurious – 30-1000 MHz – All Modes

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Quasi-Peak Reading (dBµV/m)	Quasi-Peak Limit (dBµV/m)	Margin (dB)
66.3	H	122	200	34.4	40.0	5.6
111.1	V	224	171	39.9	43.5	13.6
113.2	H	145	120	28.7	43.5	14.8
395.6	H	100	212	38.8	46.0	7.2
479.2	H	176	203	35.7	46.0	10.3
625.0	H	148	45	40.7	46.0	5.3

*The spurious signals detected do not depend on either the operating channel or the modulation mode

1000-40000 MHz – 802.11a

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
6 Mbps	36	X Plane	Peak	4607.4	Vertical	50.8	68.2	17.4
			Average	4614.3	Vertical	39.4	54.0	14.6
	64	Z Plane	Peak	5353.0	Horizontal	50.4	68.2	17.8
			Average	5428.1	Horizontal	39.3	54.0	14.7
54 Mbps	36	X Plane	Peak	4667.3	Vertical	51.2	68.2	17.0
			Average	4639.1	Vertical	41.1	54.0	12.9
	64	Z Plane	Peak	5381.7	Horizontal	50.8	68.2	17.4
			Average	5384.8	Horizontal	41.1	54.0	12.9

1000-40000 MHz – 802.11n20

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	36	X Plane	Peak	4860.4	Vertical	51.5	68.2	16.7
			Average	4621.8	Vertical	39.4	54.0	14.6
	64	Z Plane	Peak	5356.7	Horizontal	50.9	68.2	17.3
			Average	5354.5	Horizontal	39.4	54.0	14.6
MCS7	36	X Plane	Peak	4525.1	Vertical	50.7	68.2	17.5
			Average	4638.1	Vertical	41.4	54.0	12.6
	64	Z Plane	Peak	5433.1	Horizontal	50.8	68.2	17.4
			Average	5351.7	Horizontal	41.4	54.0	12.6

1000-40000 MHz – 802.11ac20

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	36	X Plane	Peak	4856.6	Vertical	50.9	68.2	17.3
			Average	4649.8	Vertical	39.2	54.0	14.8
	64	Z Plane	Peak	5384.7	Horizontal	50.6	68.2	17.6
			Average	5390.8	Horizontal	39.4	54.0	14.6
MCS8	36	X Plane	Peak	4752.0	Vertical	51.2	68.2	17.0
			Average	4554.1	Vertical	41.3	54.0	12.7
	64	Z Plane	Peak	5407.2	Horizontal	50.4	68.2	17.8
			Average	5350.8	Horizontal	41.3	54.0	12.7

1000-40000 MHz – 802.11ax20

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	36	Z Plane	Peak	4596.0	Vertical	50.8	68.2	17.4
			Average	4602.9	Vertical	39.6	54.0	14.4
	64	X Plane	Peak	5374.4	Horizontal	50.3	68.2	17.9
			Average	5401.5	Horizontal	39.5	54.0	14.5
MCS11	36	Z Plane	Peak	4790.6	Vertical	51.4	68.2	16.8
			Average	4658.3	Vertical	41.8	54.0	12.2
	64	X Plane	Peak	5397.9	Horizontal	50.7	68.2	17.5
			Average	5396.1	Horizontal	41.8	54.0	12.2

1000-40000 MHz – 802.11n40

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	38	X Plane	Peak	4625.1	Vertical	51.5	68.2	16.7
			Average	4664.8	Vertical	39.7	54.0	14.3
	62	Z Plane	Peak	5373.9	Horizontal	51.1	68.2	17.1
			Average	5352.9	Horizontal	39.7	54.0	14.3
MCS7	38	X Plane	Peak	4784.2	Vertical	50.7	68.2	17.5
			Average	4546.0	Vertical	41.9	54.0	12.1
	62	Z Plane	Peak	5397.4	Horizontal	50.9	68.2	17.3
			Average	5401.6	Horizontal	42.0	54.0	12.0

1000-40000 MHz – 802.11ac40

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	38	Z Plane	Peak	4855.2	Vertical	51.2	68.2	17.0
			Average	4625.9	Vertical	39.5	54.0	14.5
	62	Z Plane	Peak	5378.1	Horizontal	49.9	68.2	18.3
			Average	5385.3	Horizontal	39.6	54.0	14.4
MCS9	38	Z Plane	Peak	4783.1	Vertical	50.7	68.2	17.5
			Average	4653.3	Vertical	41.8	54.0	12.2
	62	Z Plane	Peak	5454.5	Horizontal	50.5	68.2	17.7
			Average	5371.8	Horizontal	42.1	54.0	11.9

1000-40000 MHz – 802.11ax40

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	38	X Plane	Peak	4575.3	Vertical	51.3	68.2	16.9
			Average	4593.3	Vertical	40.0	54.0	14.0
	62	Z Plane	Peak	5445.9	Horizontal	50.6	68.2	17.6
			Average	5352.6	Horizontal	39.9	54.0	14.1
MCS11	38	X Plane	Peak	4600.9	Vertical	50.5	68.2	17.7
			Average	4726.2	Vertical	42.2	54.0	11.8
	62	Z Plane	Peak	5363.5	Horizontal	51.3	68.2	16.9
			Average	5391.5	Horizontal	42.1	54.0	11.9

1000-40000 MHz – 802.11ac80

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	42	Y Plane	Peak	4600.1	Horizontal	51.4	68.2	16.8
			Average	4653.8	Horizontal	40.2	54.0	13.8
	58	Y Plane	Peak	5402.0	Horizontal	50.3	68.2	17.9
			Average	5409.1	Horizontal	40.6	54.0	13.4
MCS11	42	Y Plane	Peak	4720.4	Horizontal	51.1	68.2	17.1
			Average	4513.0	Horizontal	43.3	54.0	10.7
	58	Y Plane	Peak	5443.6	Horizontal	50.8	68.2	17.4
			Average	5434.8	Horizontal	42.7	54.0	11.3

1000-40000 MHz – 802.11ax80

Band Edge

Rate	Channel	EUT Orientation	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
MCS0	42	Y Plane	Peak	4579.9	Horizontal	50.3	68.2	17.9
			Average	4538.6	Horizontal	40.5	54.0	13.5
	58	X Plane	Peak	5365.4	Horizontal	50.1	68.2	18.1
			Average	5353.3	Horizontal	40.5	54.0	13.5
MCS11	42	Y Plane	Peak	4524.1	Horizontal	50.3	68.2	17.9
			Average	4510.7	Horizontal	42.4	54.0	11.6
	58	X Plane	Peak	5427.3	Horizontal	50.6	68.2	17.6
			Average	5419.6	Horizontal	42.8	54.0	11.2

1000-40000 MHz – 802.11ax20 – MU-RU – MCS0

Band Edge

EUT Orientation	Channel	RU	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
X Plane	36	0	Peak	4846.2	Vertical	48.9	68.2	19.3
			Average	5096.8	Vertical	38.3	54.0	15.7
		3	Peak	4636.7	Vertical	48.2	68.2	20.0
			Average	5099.2	Vertical	38.2	54.0	15.8
		8	Peak	4767.0	Vertical	48.9	68.2	19.3
			Average	5100.9	Vertical	38.3	54.0	15.7
		37	Peak	4660.6	Vertical	49.0	68.2	19.2
			Average	5134.0	Vertical	38.2	54.0	15.8
		38	Peak	4702.0	Vertical	49.1	68.2	19.1
			Average	5134.4	Vertical	38.2	54.0	15.8
		40	Peak	5147.5	Vertical	48.1	68.2	20.1
			Average	5114.8	Vertical	38.2	54.0	15.8
		53	Peak	4822.5	Vertical	48.2	68.2	20.0
			Average	5086.5	Vertical	38.2	54.0	15.8
		54	Peak	4810.8	Vertical	48.6	68.2	19.6
			Average	5083.9	Vertical	38.2	54.0	15.8
Z Plane	64	0	Peak	5418.0	Horizontal	49.3	68.2	18.9
			Average	5432.7	Horizontal	38.5	54.0	15.5
		3	Peak	5399.8	Horizontal	49.3	68.2	18.9
			Average	5448.3	Horizontal	38.5	54.0	15.5
		8	Peak	5363.4	Horizontal	50.4	68.2	17.8
			Average	5458.9	Horizontal	38.6	54.0	15.4
		37	Peak	5376.9	Horizontal	50.2	68.2	18.0
			Average	5447.9	Horizontal	38.5	54.0	15.5
		38	Peak	5403.4	Horizontal	49.4	68.2	18.8
			Average	5449.4	Horizontal	38.6	54.0	15.4
		40	Peak	5440.7	Horizontal	49.8	68.2	18.4
			Average	5433.7	Horizontal	38.5	54.0	15.5
		53	Peak	5435.2	Horizontal	49.8	68.2	18.4
			Average	5446.3	Horizontal	38.6	54.0	15.4
		54	Peak	5485.9	Horizontal	50.6	68.2	17.6
			Average	5398.3	Horizontal	38.5	54.0	15.5

1000-40000 MHz – 802.11ax40 – MU-RU – MCS0

Band Edge

EUT Orientation	Channel	RU	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
X Plane	38	0	Peak	4536.4	Vertical	47.9	68.2	20.3
			Average	5116.3	Vertical	38.2	54.0	15.8
		8	Peak	5023.4	Vertical	48.1	68.2	20.1
			Average	5099.3	Vertical	38.6	54.0	15.4
		17	Peak	4529.8	Vertical	48.6	68.2	19.6
			Average	4940.8	Vertical	38.6	54.0	15.4
		37	Peak	4792.3	Vertical	48.3	68.2	19.9
			Average	5100.0	Vertical	38.6	54.0	15.4
		40	Peak	4604.0	Vertical	48.7	68.2	19.5
			Average	5097.6	Vertical	38.7	54.0	15.3
		44	Peak	4669.3	Vertical	48.8	68.2	19.4
			Average	5133.5	Vertical	38.5	54.0	15.5
		53	Peak	4618.0	Vertical	48.8	68.2	19.4
			Average	5100.5	Vertical	38.6	54.0	15.4
		54	Peak	4798.4	Vertical	48.5	68.2	19.7
			Average	5102.1	Vertical	38.5	54.0	15.5
		56	Peak	4865.4	Vertical	47.8	68.2	20.4
			Average	5130.2	Vertical	38.5	54.0	15.5
		61	Peak	5141.4	Vertical	48.9	68.2	19.3
			Average	5132.9	Vertical	38.6	54.0	15.4
		62	Peak	5083.6	Vertical	48.3	68.2	19.9
			Average	5143.5	Vertical	38.5	54.0	15.5
Z Plane	62	0	Peak	5351.7	Horizontal	49.0	68.2	19.2
			Average	5459.5	Horizontal	38.9	54.0	15.1
		8	Peak	5377.8	Horizontal	49.3	68.2	18.9
			Average	5450.2	Horizontal	38.9	54.0	15.1
		17	Peak	5403.2	Horizontal	49.5	68.2	18.7
			Average	5398.3	Horizontal	38.9	54.0	15.1

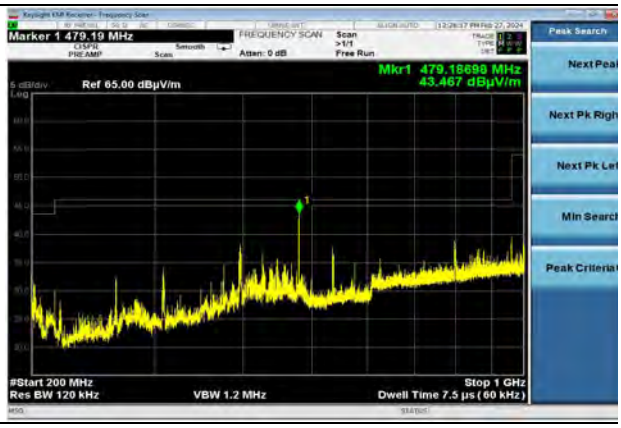
1000-40000 MHz – 802.11ax80 – MU-RU – MCS0

Band Edge

EUT Orientation	Channel	RU	Measurement Type	Frequency (MHz)	Antenna Polarity	Measurement (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Y Plane	42	0	Peak	4785.2	Horizontal	48.9	68.2	19.3
			Average	5105.5	Horizontal	39.1	54.0	14.9
		17	Peak	4806.5	Horizontal	48.4	68.2	19.8
			Average	5112.7	Horizontal	39.1	54.0	14.9
		36	Peak	4795.5	Horizontal	48.1	68.2	20.1
			Average	5145.8	Horizontal	39.1	54.0	14.9
		37	Peak	4795.5	Horizontal	48.5	68.2	19.7
			Average	5093.1	Horizontal	39.1	54.0	14.9
		44	Peak	5102.1	Horizontal	47.9	68.2	20.3
			Average	5114.8	Horizontal	39.1	54.0	14.9
		52	Peak	4531.1	Horizontal	48.3	68.2	19.9
			Average	5126.1	Horizontal	39.0	54.0	15.0
		53	Peak	4517.2	Horizontal	48.3	68.2	19.9
			Average	4908.4	Horizontal	38.9	54.0	15.1
		56	Peak	4772.3	Horizontal	48.7	68.2	19.5
			Average	5031.3	Horizontal	39.1	54.0	14.9
		60	Peak	5030.0	Horizontal	48.1	68.2	20.1
			Average	5148.4	Horizontal	39.1	54.0	14.9
		61	Peak	4702.0	Horizontal	49.2	68.2	19.0
			Average	5092.5	Horizontal	39.0	54.0	15.0
		62	Peak	5144.3	Horizontal	48.7	68.2	19.5
			Average	5124.6	Horizontal	39.1	54.0	14.9
		64	Peak	5136.6	Horizontal	49.1	68.2	19.1
			Average	5105.1	Horizontal	38.8	54.0	15.2
		65	Peak	4765.0	Horizontal	48.5	68.2	19.7
			Average	5126.0	Horizontal	39.3	54.0	14.7
		66	Peak	4568.5	Horizontal	49.4	68.2	18.8
			Average	5127.7	Horizontal	38.9	54.0	15.1
Z Plane	58	0	Peak	5437.0	Horizontal	49.6	68.2	18.6
			Average	5449.7	Horizontal	39.5	54.0	14.5
		17	Peak	5437.7	Horizontal	49.3	68.2	18.9
			Average	5447.1	Horizontal	39.3	54.0	14.7
		36	Peak	5439.3	Horizontal	49.2	68.2	19.0
			Average	5367.4	Horizontal	39.3	54.0	14.7

Worst Case Plots

802.11a | Channel 36 | 6 Mbps | Y Plane
30-200 MHz | Vertical



802.11a | Channel 36 | 6 Mbps | Y Plane
200-1000 MHz | Vertical

802.11a | Channel 36 | 6 Mbps
1000-4000 MHz | Horizontal

802.11a | Channel 36 | 6 Mbps | Y Plane
4000-4500 MHz | Horizontal

802.11a | Channel 36 | 6 Mbps | Y Plane
5470-8000 MHz | Vertical

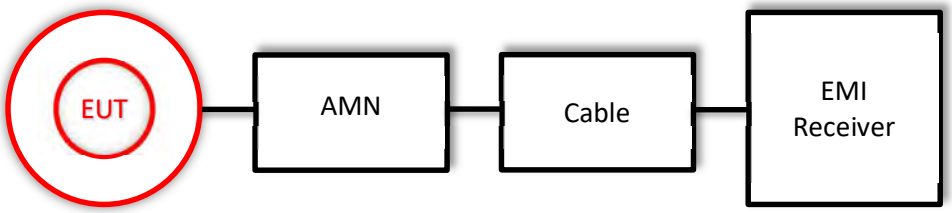
802.11a | Channel 36 | 6 Mbps | X Plane
8000-18000 MHz | Vertical

802.11a | Channel 36 | 6 Mbps | Z Plane
18000-40000 MHz | Horizontal

6.3 AC Mains Conducted Emissions

Description of Measurement	A line impedance stabilization network (LISN) or artificial mains network (AMN) allows the emissions of the power supply conductors to be measured while isolating the EUT from the supply mains. The AMN, cable, and other necessary measurement system correction factors are loaded onto the EMI receiver when the measurements are performed. The data is gathered and reported as the corrected values. Maximum emissions are determined with a peak max hold trace then measurements at a selection of the highest points are made with quasi-peak and average detectors. Results are recorded and compared to limit for each line. (e.g. line and neutral)
Example Calculations	Measurement (dBµV) + Cable factor (dB) + Other (dB) = Corrected Reading (dBµV) Margin (dB) = Limit (dBµV) - Corrected Reading (dBµV)

Block Diagram



6.3.1 AC Mains Conducted Emissions

Operator	Jon Dilley	**QA**	Adam Hauke
Temperature	21.2°C	**R.H. %**	28.40%
Test Date	04/05/2024	**Location**	AC Conducted Bench
Requirement	15.407(b)(9) RSS-GEN	**Method**	ANSI C63.10 6.2

Limits:

Frequency (MHz)	Quasi-Peak Limit (dBµV)	Average Limit (dBµV)
0.15-0.5	66.0-56.0*	56.0-46.0*
0.5-5	56.0	46.0
5-30	60.0	50.0

*Decreases with the logarithm of the frequency.

Test Parameters

Frequency	0.15-30 MHz	**Distance**	40 cm from wall 80 cm from LISN
Detector(s)	Peak Trace Quasi-Peak, Average Final	**Table height**	80 cm
RBW	9 kHz	**VBW**	62 kHz
Notes	Channel has no effect on emission		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960088	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/27/2023	4/27/2024	Active Calibration
EE 960089	LISN	COM-POWER	LI-215A	191943	4/10/2023	4/10/2024	Active Calibration
EE 960162	LISN	COM-POWER	LI-215A	191969	4/10/2023	4/10/2024	Active Calibration
LSC-212	Cable	Micro-Coax	UFB311A-0-1440-70U70U	64639 224071-001	1/8/2024	1/8/2025	Active Verification

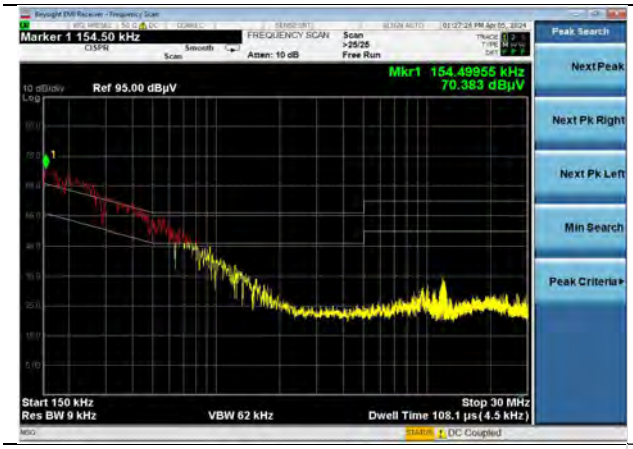
EUT Parameters

Input Power	120 VAC @ 60 Hz	**Mode**	5 GHz WLAN Tx Channel 64

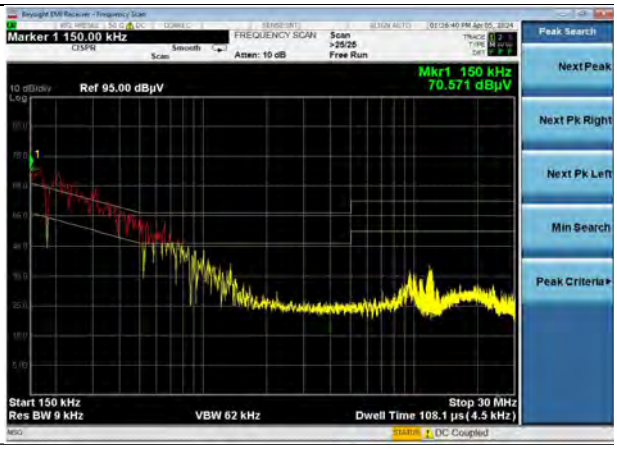
Measurements

Line	Frequency (MHz)	Quasi Peak Reading (dBµV)	Quasi-Peak Limit (dBµV)	Quasi Peak Margin (dB)	Average Reading (dBµV)	Average Limit (dBµV)	Average Margin (dB)
1	0.159	64.5	65.5	1.0	36.9	55.5	18.6
1	0.532	47.1	56.0	8.9	25.0	46.0	21.0
1	12.080	34.6	60.0	25.4	23.4	50.0	26.6
2	0.163	63.7	65.3	1.6	36.3	55.3	19.0
2	0.500	44.2	56.0	11.8	24.4	46.0	21.6
2	12.098	28.9	60.0	31.1	15.4	50.0	34.6

Plots



Line 1



Line 2

7 REVISION HISTORY

Version	Date	Notes	Person
0.0	08/05/2024	Initial Draft	Adam Hauke
1.0	08/08/2024	Final Draft	Adam Hauke

END OF REPORT