RF Test Report

Report Number:	**208949-2** **Revision Level: 1**
Client:	**Alarm.com Incorporated**
	8281 Greensboro Drive, Suite 100, Tysons, VA 22102, USA
Equipment Under Test:	**Alarm.com 4MP Outdoor Wi-Fi Spotlight Camera**
Product Name:	**V730**
Model:	**ADC-V730**
FCC ID:	**YL6-143V730**
IC:	**9111A-143V730**
Applicable Standards:	**FCC Part 15 Subpart C, § 15.407**
	RSS-247 Issue 3, August 2023
Report issued on:	**February 27, 2025**
Test Result:	**Compliant**

FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 1935.01
This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

Prepared by: Andreas Gillmeier, Sr. Engineer, Wireless

Reviewed by: Martin Taylor, RF/EMC Project Engineer

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1 Summary of Test Results

Test Description	Test Specification	Test Result
Occupied Bandwidth	15.407(a)(2) and (e) / RSS-Gen 6.7 and RSS-247 6.2.4.2	Compliant
Spectral Density	15.407(a)(1)(iv), (a)(2), (a)(3)(i) / RSS-247 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.2	Compliant
Conducted Output Power	15.407(a)(1)(iv), (a)(2), (a)(3)(i) / RSS-247 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.2	Compliant
Radiated Spurious Emissions	15.407(b)(1), (b)(2), (b)(3), (4)(i) / 15.209 / RSS-247 6.2.1.2, 6.2.2.2, 6.2.3.2, 6.2.4.3	Compliant
AC Powerline Conducted Emissions	15.207 / RSS-GEN S8.8	Compliant

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name:	Alarm.com Incorporated
Address:	8281 Greensboro Drive, Suite 100,
City, State, Zip, Country:	Tysons, Virginia 22102, USA

2.2 *Test Laboratory*

Name:	SGS North America, Inc.
Address:	12310 World Trade Drive, Suite 106/107
City, State, Zip, Country:	San Diego, CA 92128, USA
Accrediting Body:	A2LA
Type of lab:	Testing Laboratory
Certificate Number:	1935.01
Designation Number:	US1346
CAB Identifier:	US0236

2.3 *General Information of EUT*

Marketing Name:	V730
Model:	ADC-V730
Serial Number:	504074C00096, 504074C00312 (radiated tests) 504074C00D4, 504074C00446 (conducted tests)
Firmware Version:	18.15 RC1.49
FCC ID:	YL6-143V730
IC:	9111A-143V730
Frequency Range:	5180 to 5825 MHz
Modulation type:	OFDM
Channel bandwidth:	20 MHz, 40 MHz, 80 MHz

Antenna/Gain*: 2 x PCB Omnidirectional Antenna (ALX23F-222AA4-00); peak gain 5.3dBi*

	Frequency(MHz)	2400	2450	2500	5150	5350	5550	5750	5850
Ant.1	Peak Gain(dBi)	3.0	3.1	2.9	5.2	5.3	5.0	4.0	3.9
	Efficiency(%)	64	62	58	73	76	78	73	69

Rated Voltage: 100 – 240 VAC / 50 – 60 Hz
Test Voltage: 120 VAC / 60 Hz
Sample Received Date: July 10, 2024
Dates of testing: July 11 – January 22, 2025

* SGS is not responsible for accuracy of Data that was not measured by SGS laboratory, e.g. Data that was obtained by customer, specification sheet, previous filing or other.

2.4 *Operating Modes and Conditions*

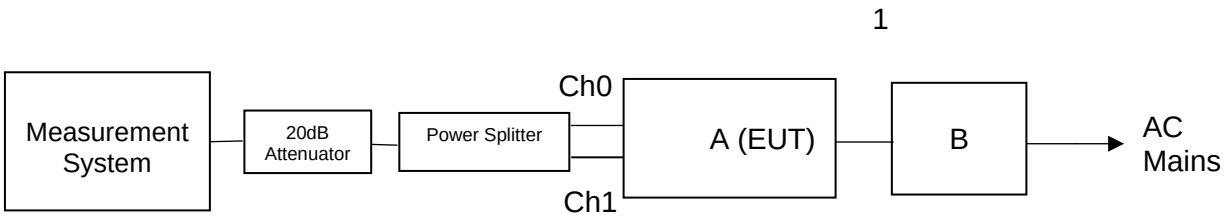
Modulations used: For fundamental and spurious measurements, the EUT was configured to operate continuously with Wi-Fi modulation enabled.

As specified in Section 5.10.5 of ANSI C63.10:2013:

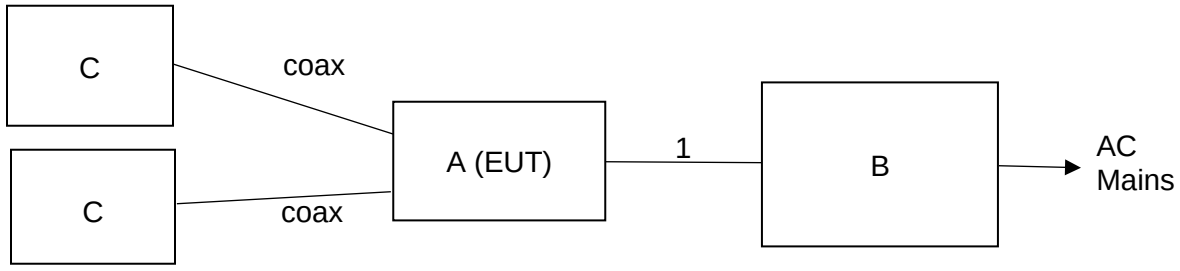
- The software allowed configuration and operation on all available unlicensed wireless device channels.
- The software allowed configuration and operation using all available modulations and data rates.
- The software allowed configuration and operation on all available power out levels.

2.5 *EUT Connection Block Diagram*

Conducted:



Radiated:



2.6 *System Configurations*

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Alarm.Com	V730	ADC-V730	N/A
B1	Asian Power Devices Inc.	AC adapter	WB-12G12FU	D3J120374100
B2	PYS	AC adapter	PYS-18UP120150U	- - -
C	LYNwave	Dual Band WLAN antenna	ALX23F-222AA4-00	N/A

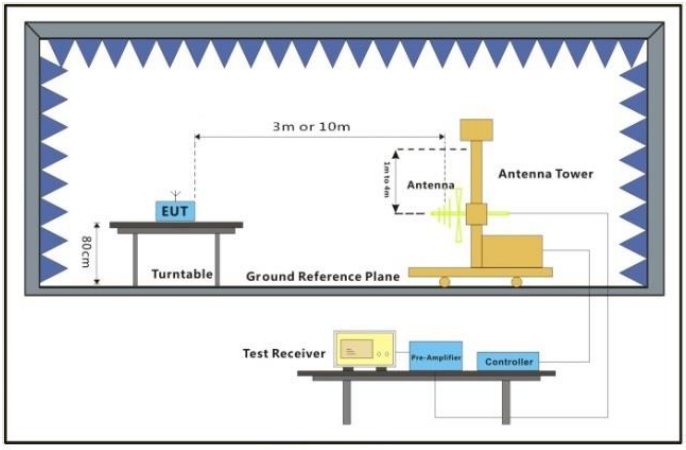
2.7 *Cable List*

Cable reference	Port Name	Start	End	Cable Length (m)	Ferrite installed?	Shielded?
1	DC out	AC/DC power adapter	DC plug	2.9	No	No

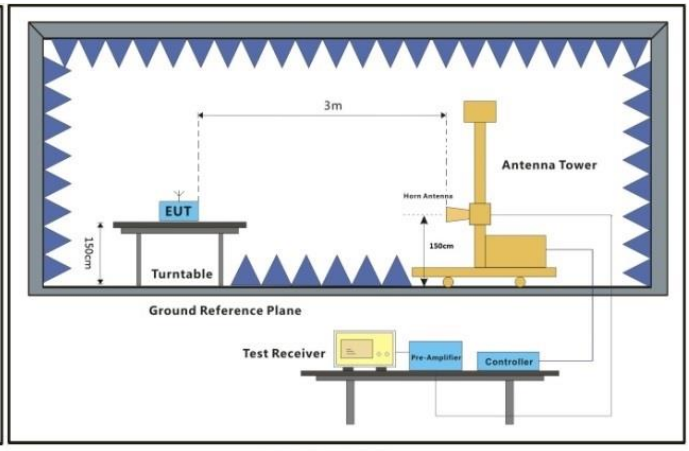
2.8 *Supporting Test Equipment*

Manufacturer	Description	Model Number
Dell	Support laptop to set parameters on the EUT	P117F

2.9 *Test Setup Diagrams (Radiated)*



30MHz-1GHz



Above 1GHz

3 Occupied Bandwidth

3.1 *Test Result*

Test Description	Basic Standards	Test Result
26 dB bandwidth	15.407(a)(2)	Reference Only (UNII1, UNII2a, UNII2c)
6 dB bandwidth	15.407(e)	Compliant
99% bandwidth	RSS-Gen 6.7 and RSS-247 6.2.4.2	For Reference Only

3.2 *Test Method*

The procedures from ANSI C63.10 (2013) clause 6.9 were used to determine the 26/6 dB bandwidth.

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
3. 26dB Bandwidth Measurement:
   The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
   Set the spectrum analyzer as 1% of emission
   BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold,
   Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
   Mark the peak frequency and –26dB (upper and lower) frequency.
   Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
4. Minimum Emission Bandwidth (6dB) for the UNII3 band (5.725-5.850GHz).
   The testing follows the measurement procedure listed in FCC KDB 558074 D01.
   Set the spectrum analyzer as
   RBW = 100 kHz,
   VBW = 3 x RBW,
   Span = large enough to capture all products of the modulation process,
   Detector=Peak, Sweep=auto
   Mark the peak frequency and –6dB (upper and lower) frequency.
   Repeat above procedures until all the default channel is completed.
5. For 99% Bandwidth:
   The testing follows the measurement procedure listed in RSS-Gen section 6.7.
   Set the spectrum analyzer as
   RBW = 1% to 5% of 99% bandwidth,
   VBW ≥ 3 x RBW,
   Span = large enough to capture all products of the modulation process,
   Sweep=auto, Detector=Peak, Trace Mode = Max Hold,
   Turn on the 99% bandwidth function, max reading.
   Repeat above procedures until all the default channel is completed.

Limit
Reference only (UNII1, UNII2a, UNII2c)
>=0.5 MHz (UNII3)

3.3 *Test Site and Environmental Condition*

EMC Laboratory, San Diego, CA

Temperature: 20 – 25 °C
Relative Humidity: 35 – 50 %

3.4 *Test Equipment*

Test Dates: August 02 to December 16, 2024 Tester: Alex Chang, Andreas Gillmeier

Asset No.	Type of Equipment	Model	Serial No.	Manufacturer	Cal Date	Cal Due Date
Conducted Testing						
2003	Signal Analyzer	N9030B	MY61330812	Keysight	01/29/2024	01/29/2025
#2	RF Cable	W60-1524.1195.00	N/A	Unknown	N/A (verified before use)	
-	20 dB Attenuator	3M-20	93495	WEINSCHEL	N/A (verified before use)	
-	Power Splitter	ZN2PD2-63-S+	SUU71801931	Mini-Circuits	N/A (verified before use)	
-	Test Software	Radio Test Software	v.23	SGS Taiwan	N/A	
2036	Temp/Humidity Data Logger	GSP-8	CMA231100002	Elitech	09/07/2024	09/07/2025

3.5 *Test Setup Photographs*

Test setup photographs are located in a separate report (208949-8).

3.6 *Test Data*

UNII1:

Mode	Frequency (MHz)	Power Level	Data Rate (Mbps)	26dB Bandwidth (MHz)		99% Bandwidth (MHz)		Verdict
				Both Antennas Combined	Limit	Both Antennas Combined	Limit	
802.11a NOHT	5180	66	12	20.32	N/A	16.106	N/A	N/A
	5200	66	12	19.90	N/A	15.907	N/A	N/A
	5240	66	9	19.84	N/A	16.102	N/A	N/A
802.11 n20	5180	59	mcs7	20.58	N/A	16.992	N/A	N/A
	5200	66	mcs2	20.74	N/A	16.973	N/A	N/A
	5240	66	mcs2	20.63	N/A	16.971	N/A	N/A
802.11 n40	5190	55	mcs6	38.87	N/A	36.425	N/A	N/A
	5230	64	mcs1	39.17	N/A	36.28	N/A	N/A
802.11 ac20	5180	59	mcs6	20.65	N/A	16.981	N/A	N/A
	5200	66	mcs2	20.67	N/A	17.001	N/A	N/A
	5240	66	mcs2	20.54	N/A	16.936	N/A	N/A
802.11 ac40	5190	55	mcs5	39.39	N/A	36.417	N/A	N/A
	5230	64	mcs1	39.41	N/A	36.154	N/A	N/A
802.11 ac80	5210	58	mcs3	80.17	N/A	75.929	N/A	N/A
802.11 ax20	5180	59	mcs7	21.11	N/A	19.034	N/A	N/A
	5200	66	mcs1	20.49	N/A	18.996	N/A	N/A
	5240	66	mcs1	20.76	N/A	19.020	N/A	N/A
802.11 ax40	5190	55	mcs5	38.99	N/A	36.590	N/A	N/A
	5230	64	mcs0	39.47	N/A	36.358	N/A	N/A
802.11 ax80	5210	58	mcs3	80.14	N/A	76.179	N/A	N/A

UNII2a:

Mode	Frequency (MHz)	Power Level	Data Rate (Mbps)	26dB Bandwidth (MHz)		99% Bandwidth (MHz)		Verdict
				Both Antennas Combined	Limit	Both Antennas Combined	Limit	
802.11a NOHT	5260	66	12	19.95	N/A	15.870	N/A	N/A
	5280	66	9	20.00	N/A	16.040	N/A	N/A
	5320	66	18	20.11	N/A	16.070	N/A	N/A
802.11 n20	5260	66	mcs1	20.40	N/A	16.991	N/A	N/A
	5280	66	mcs1	20.92	N/A	16.959	N/A	N/A
	5320	56	mcs7	20.55	N/A	17.016	N/A	N/A

802.11 n40	5270	64	mcs2	39.72	N/A	36.243	N/A	N/A
	5310	53	mcs7	39.47	N/A	36.297	N/A	N/A
802.11 ac20	5260	66	mcs1	20.79	N/A	16.999	N/A	N/A
	5280	66	mcs1	20.68	N/A	16.916	N/A	N/A
	5320	56	mcs7	20.78	N/A	17.045	N/A	N/A
802.11 ac40	5270	64	mcs2	39.45	N/A	36.350	N/A	N/A
	5310	53	mcs5	39.31	N/A	36.298	N/A	N/A
802.11 ac80	5290	56	mcs5	80.34	N/A	76.058	N/A	N/A
802.11 ax20	5260	66	mcs0	20.39	N/A	18.998	N/A	N/A
	5280	66	mcs0	20.98	N/A	18.978	N/A	N/A
	5320	59	mcs7	20.91	N/A	19.036	N/A	N/A
802.11 ax40	5270	64	mcs2	39.33	N/A	36.621	N/A	N/A
	5310	53	mcs6	39.24	N/A	36.495	N/A	N/A
802.11 ax80	5290	56	mcs5	80.02	N/A	76.251	N/A	N/A

UNII2c:

Mode	Frequency (MHz)	Power Level	Data Rate (Mbps)	26dB Bandwidth (MHz)		99% Bandwidth (MHz)		Verdict
				Both Antennas Combined	Limit	Both Antennas Combined	Limit	
802.11a NOHT	5500	66	12	20.73	N/A	16.972	N/A	N/A
	5600	66	12	20.85	N/A	17.007	N/A	N/A
	5720	66	9	20.57	N/A	17.011	N/A	N/A
802.11 n20	5500	57	mcs6	20.68	N/A	17.052	N/A	N/A
	5600	66	mcs2	20.80	N/A	16.979	N/A	N/A
	5720	66	mcs1	20.82	N/A	16.984	N/A	N/A
802.11 n40	5510	58	mcs5	39.30	N/A	36.421	N/A	N/A
	5590	64	mcs0	39.54	N/A	36.212	N/A	N/A
	5710	64	mcs0	39.88	N/A	36.177	N/A	N/A
802.11 ac20	5500	57	mcs6	20.68	N/A	17.031	N/A	N/A
	5600	66	mcs1	20.44	N/A	17.003	N/A	N/A
	5720	66	mcs1	20.79	N/A	17.067	N/A	N/A
802.11 ac40	5510	58	mcs5	39.41	N/A	36.305	N/A	N/A
	5590	64	mcs0	39.89	N/A	36.284	N/A	N/A
	5710	64	mcs0	39.03	N/A	36.214	N/A	N/A
802.11 ac80	5530	58	mcs5	80.66	N/A	75.877	N/A	N/A
	5610	64	mcs2	80.96	N/A	75.967	N/A	N/A
	5690	64	mcs0	81.52	N/A	75.946	N/A	N/A
	5500	57	mcs5	21.00	N/A	19.046	N/A	N/A

802.11 ax20	5600	66	mcs0	20.84	N/A	18.994	N/A	N/A
	5720	66	mcs0	20.64	N/A	18.975	N/A	N/A
802.11 ax40	5510	58	mcs5	39.18	N/A	36.496	N/A	N/A
	5590	64	mcs0	39.46	N/A	36.669	N/A	N/A
	5710	64	mcs0	39.95	N/A	36.614	N/A	N/A
802.11 ax80	5530	58	mcs3	79.83	N/A	76.180	N/A	N/A
	5610	64	mcs2	80.23	N/A	76.305	N/A	N/A
	5690	64	mcs1	79.91	N/A	76.172	N/A	N/A

UNII3:

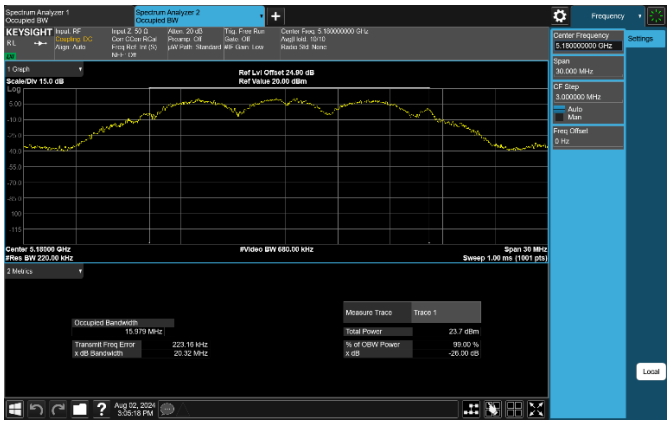
Mode	Frequency (MHz)	Power Level	Data Rate (Mbps)	6dB Bandwidth (MHz)		99% Bandwidth (MHz)		Verdict
				Both Antennas Combined	Limit	Both Antennas Combined	Limit	
802.11a NOHT	5745	66	12	13.00	0.5	15.735	N/A	Pass
	5785	66	12	12.66	0.5	15.889	N/A	Pass
	5825	66	12	12.37	0.5	15.886	N/A	Pass
802.11 n20	5745	66	mcs2	15.96	0.5	17.087	N/A	Pass
	5785	66	mcs1	15.11	0.5	17.082	N/A	Pass
	5825	66	mcs2	13.85	0.5	17.032	N/A	Pass
802.11 n40	5755	64	mcs0	36.16	0.5	36.216	N/A	Pass
	5795	64	mcs0	30.13	0.5	36.106	N/A	Pass
802.11 ac20	5745	66	mcs2	16.03	0.5	17.150	N/A	Pass
	5785	66	mcs2	16.11	0.5	17.009	N/A	Pass
	5825	66	mcs1	16.07	0.5	16.984	N/A	Pass
802.11 ac40	5755	64	mcs1	35.82	0.5	36.174	N/A	Pass
	5795	64	mcs0	32.64	0.5	36.307	N/A	Pass
802.11 ac80	5775	64	mcs2	70.25	0.5	75.828	N/A	Pass
802.11 ax20	5745	66	mcs0	17.58	0.5	18.950	N/A	Pass
	5785	66	mcs0	13.05	0.5	18.997	N/A	Pass
	5825	66	mcs0	17.59	0.5	19.007	N/A	Pass
802.11 ax40	5755	64	mcs0	35.84	0.5	36.388	N/A	Pass
	5795	64	mcs0	32.77	0.5	36.389	N/A	Pass
802.11 ax80	5775	64	mcs2	75.68	0.5	76.052	N/A	Pass

UNII1:

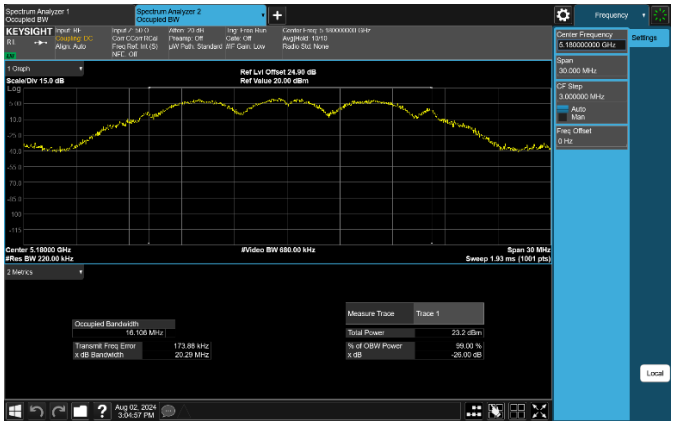
Low Channel – 802.11a NOHT, (5180MHz)

combined (both chains)

26 dB BW



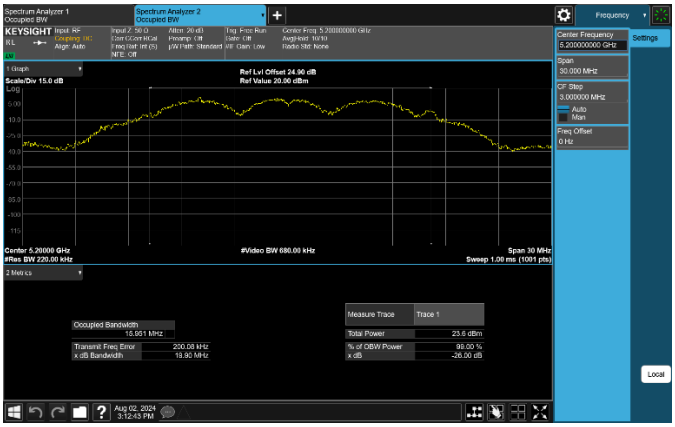
99% OBW



Mid Channel – 802.11a NOHT, (5200MHz)

combined (both chains)

26 dB BW



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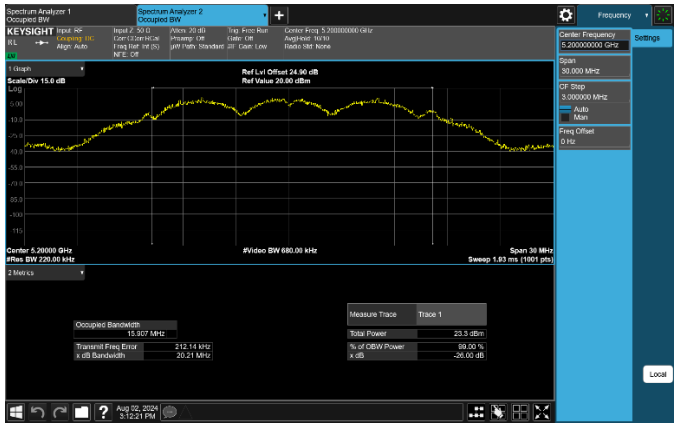
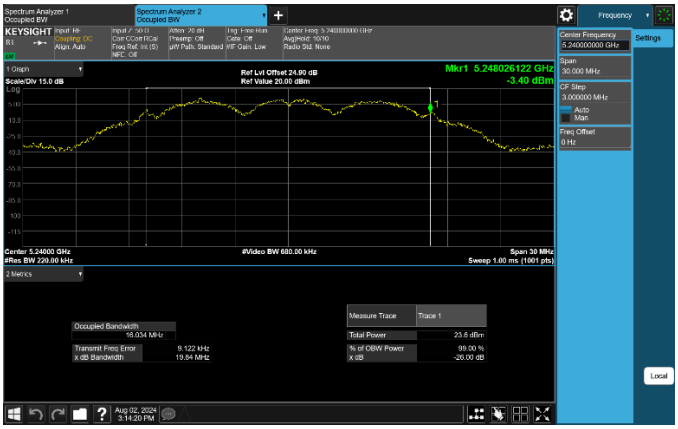


High Channel – 802.11a NOHT, (5240MHz)

combined (both chains)

26 dB BW



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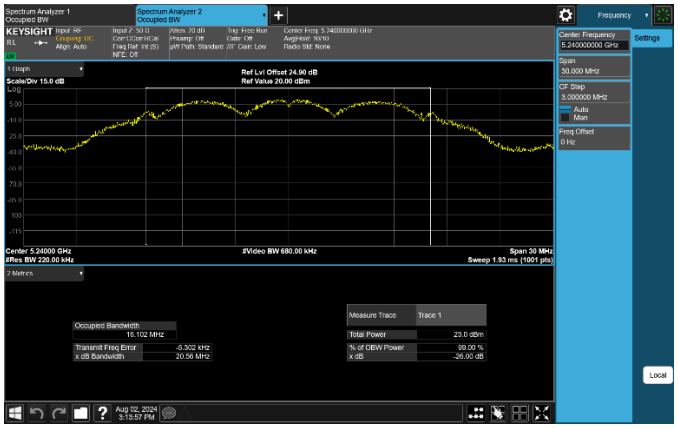
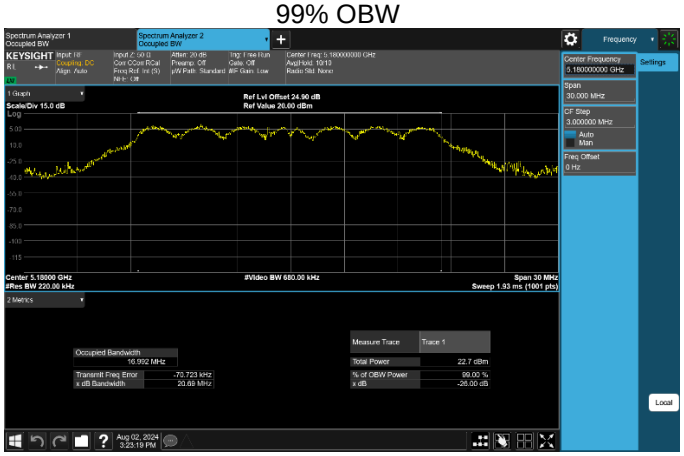


Low Channel – 802.11n20, (5180MHz)
combined (both chains)

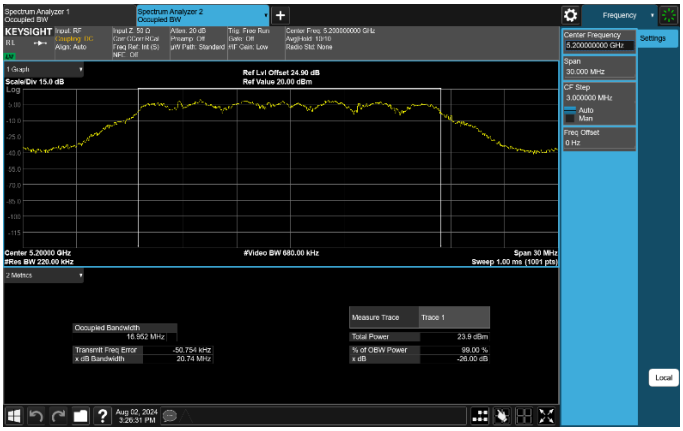
26 dB BW

99% OBW

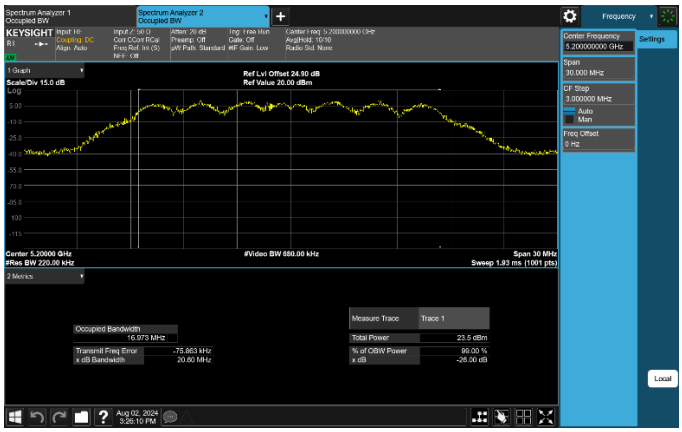


Mid Channel – 802.11n20, (5200MHz)
combined (both chains)

26 dB BW

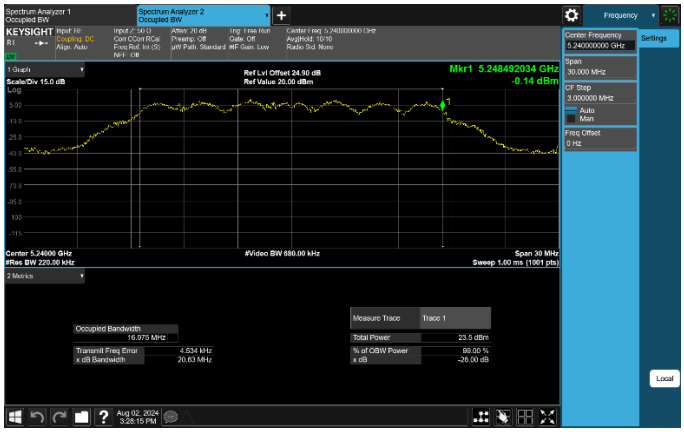


99% OBW

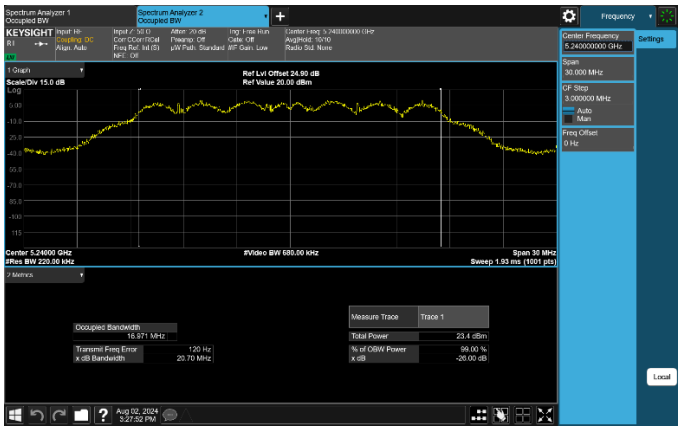


High Channel – 802.11n20, (5240MHz)
combined (both chains)

26 dB BW



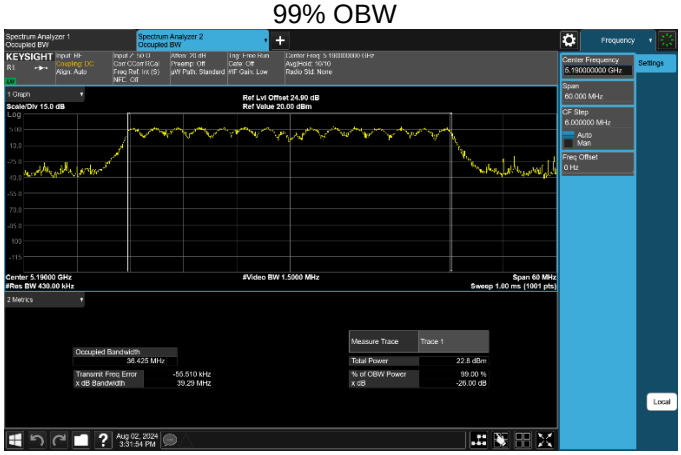
99% OBW



Low Channel – 802.11n40, (5190MHz)
combined (both chains)

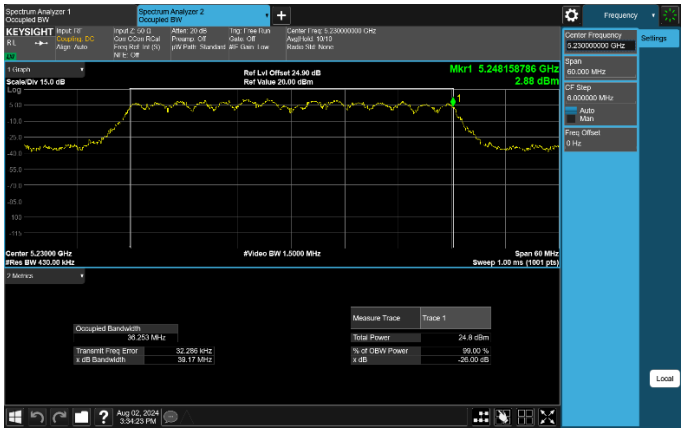
26 dB BW

99% OBW



High Channel – 802.11n40, (5230MHz)
combined (both chains)

26 dB BW

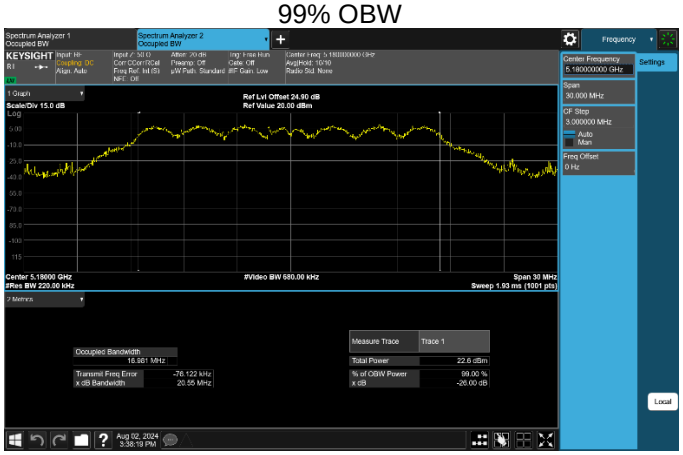


99% OBW

Low Channel – 802.11ac20, (5180MHz)
combined (both chains)

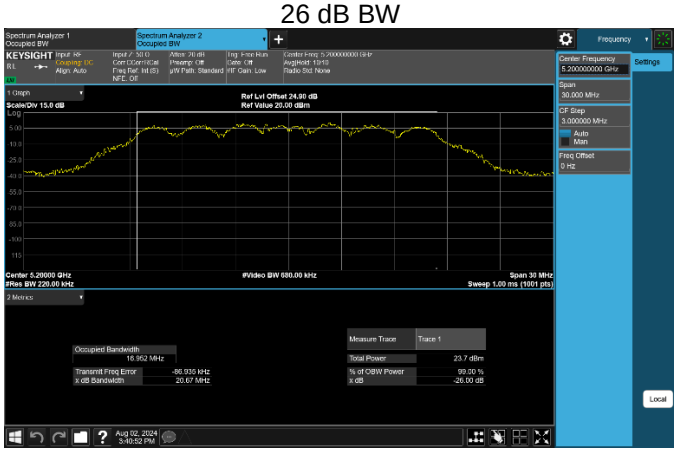
26 dB BW

99% OBW

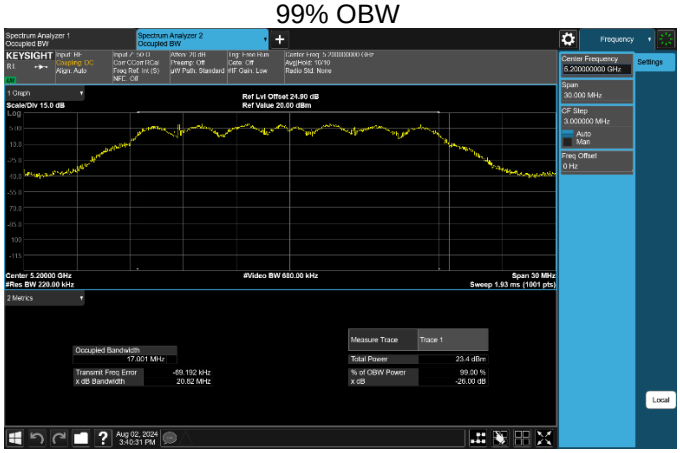


Mid Channel – 802.11ac20, (5200MHz)
combined (both chains)

26 dB BW

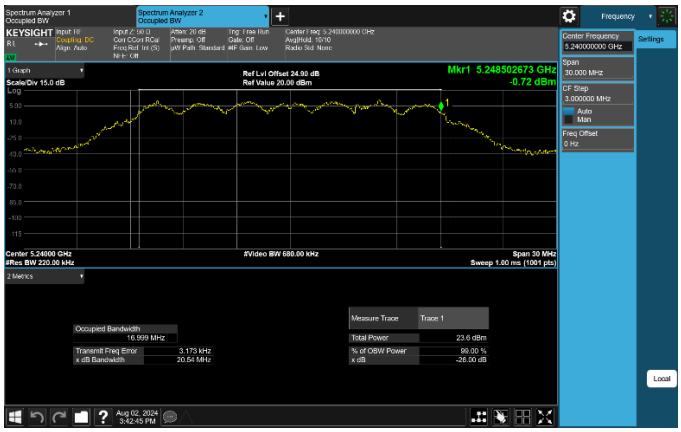


99% OBW

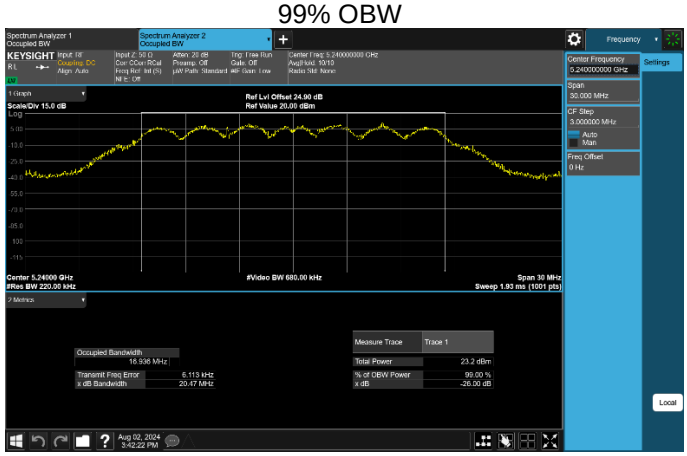


High Channel – 802.11ac20, (5240MHz)
combined (both chains)

26 dB BW

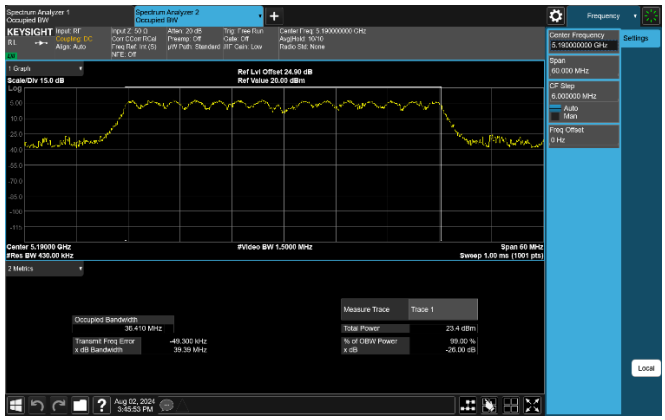


99% OBW



Low Channel – 802.11ac40, (5190MHz)
combined (both chains)

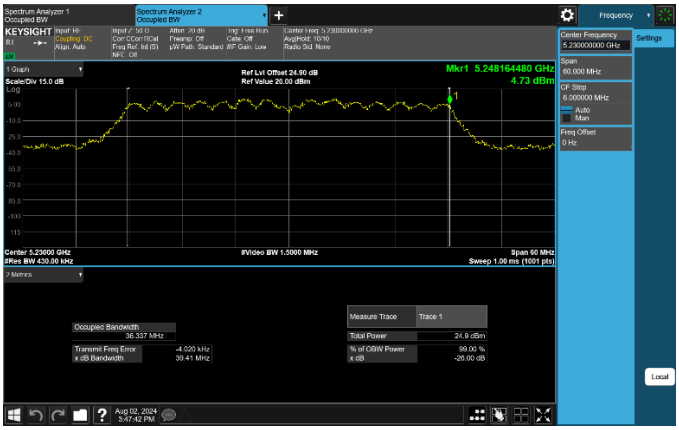
26 dB BW



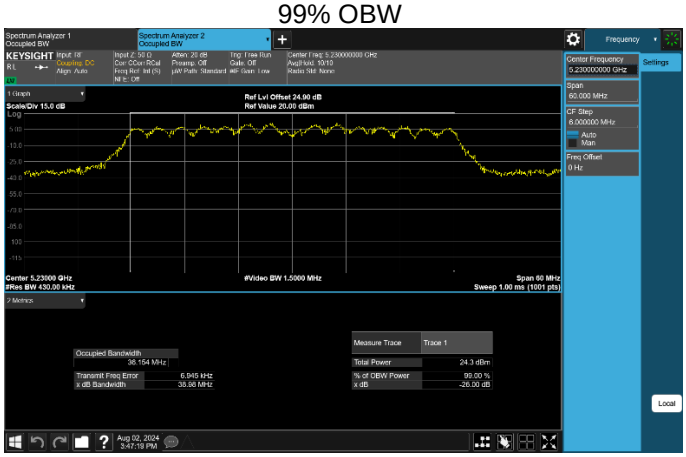
99% OBW

High Channel – 802.11ac40, (5230MHz)
combined (both chains)

26 dB BW

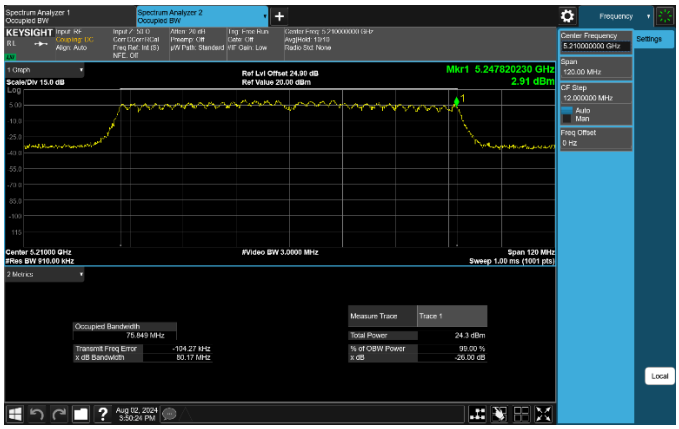


99% OBW

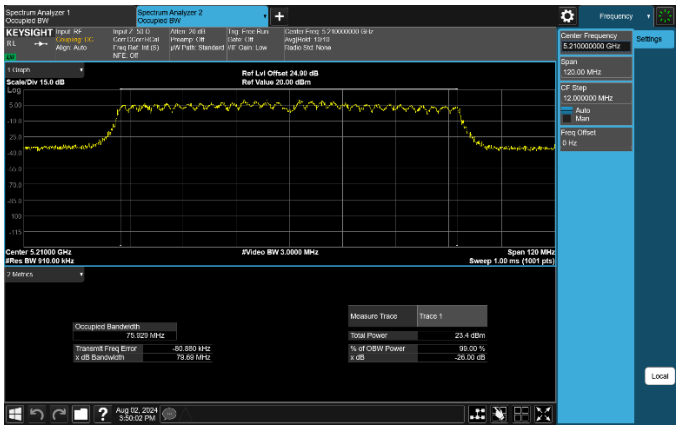


Mid Channel – 802.11ac80, (5210MHz)
combined (both chains)

26 dB BW



99% OBW



Low Channel – 802.11ax20, (5180MHz)
combined (both chains)

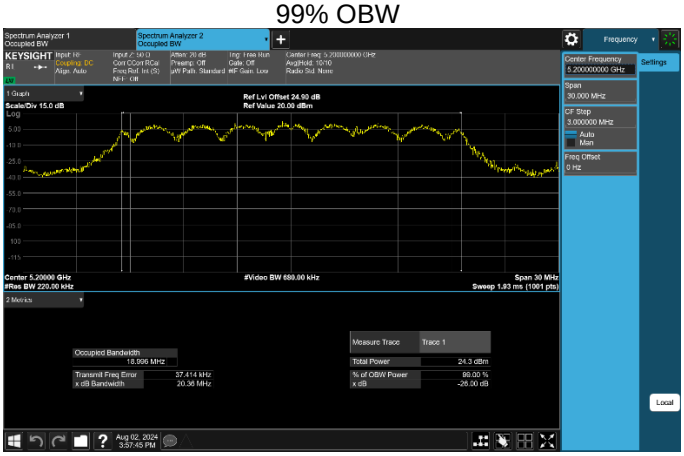
26 dB BW

99% OBW

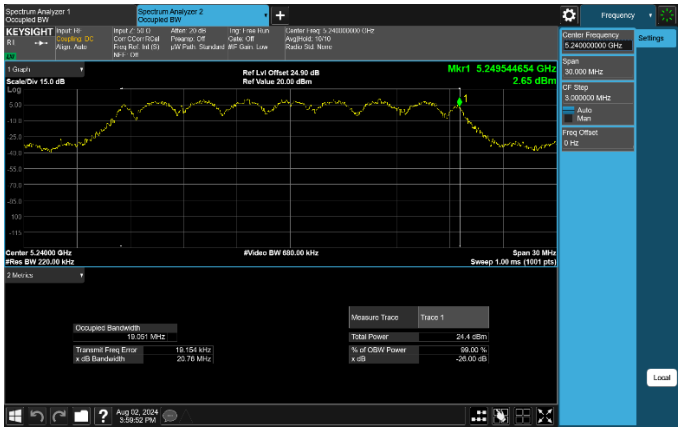
Mid Channel – 802.11ax20, (5200MHz)
combined (both chains)

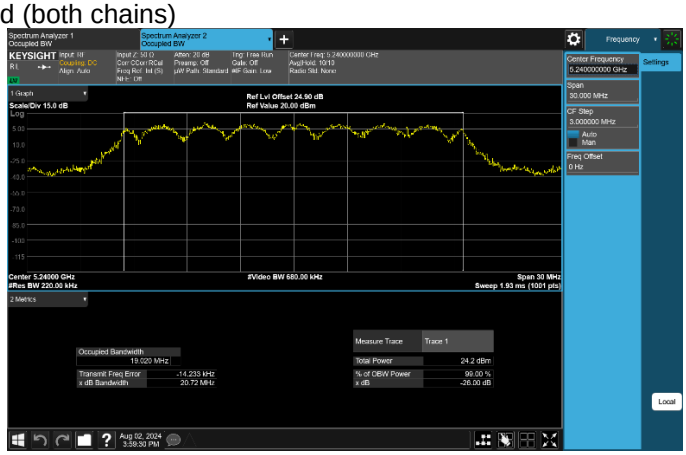
26 dB BW

99% OBW



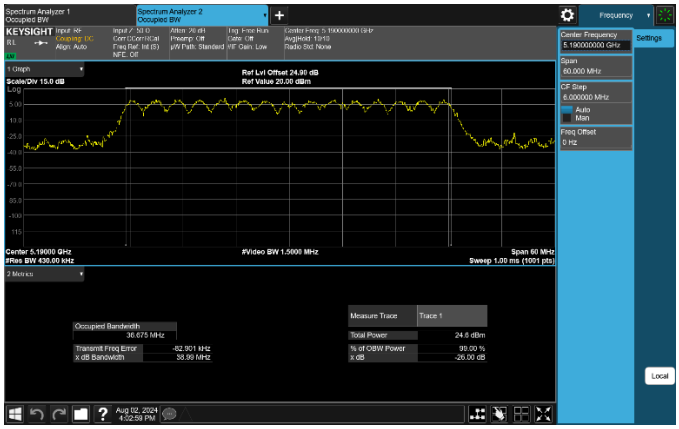
High Channel – 802.11ax20, (5240MHz)
combined (both chains)





Low Channel – 802.11ax40, (5190MHz)
combined (both chains)

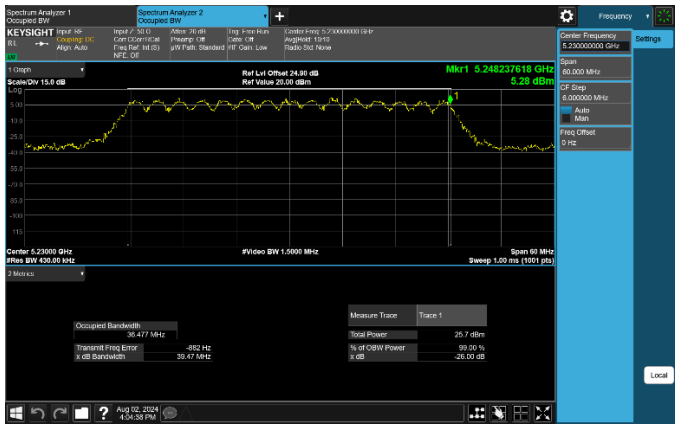
26 dB BW



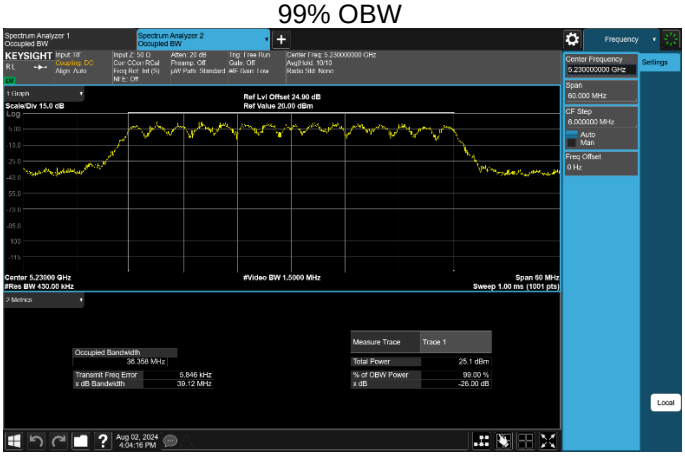
99% OBW

High Channel – 802.11ax40, (5230MHz)
combined (both chains)

26 dB BW

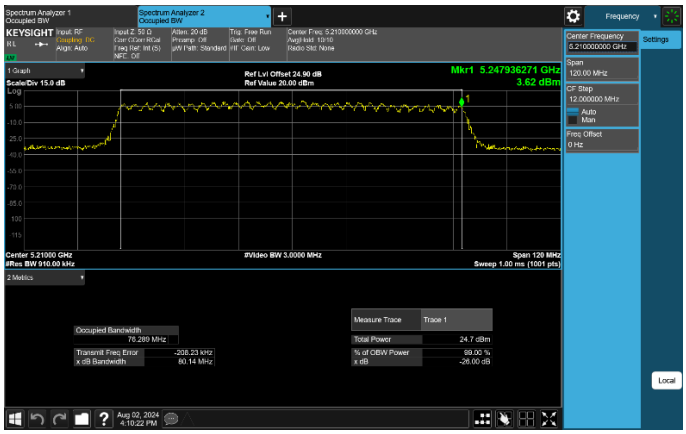


99% OBW

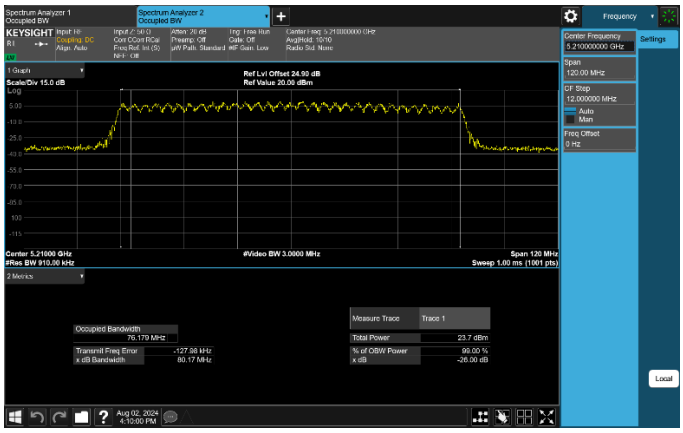


Mid Channel – 802.11ax80, (5210MHz)
combined (both chains)

26 dB BW



99% OBW

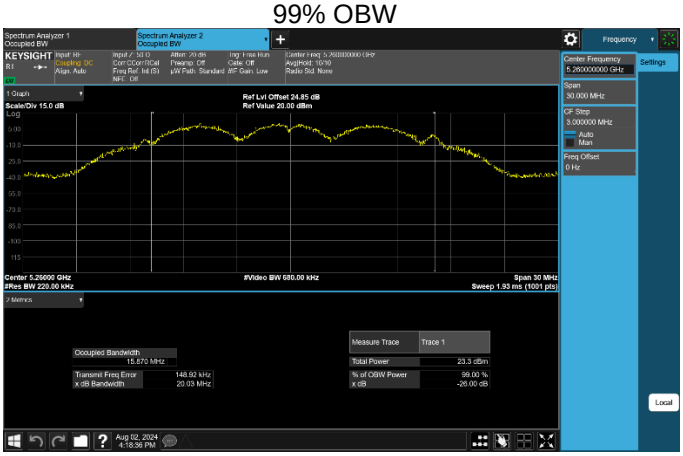


UNII2a:

Low Channel – 802.11a NOHT, (5260MHz)
combined (both chains)

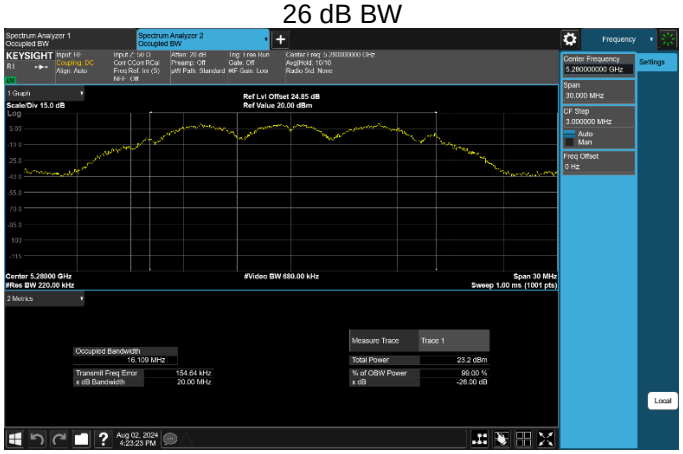
26 dB BW

99% OBW

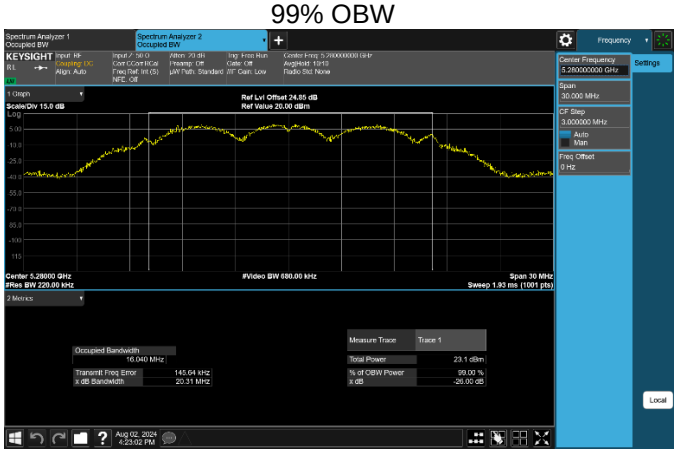


Mid Channel – 802.11a NOHT, (5280MHz)
combined (both chains)

26 dB BW

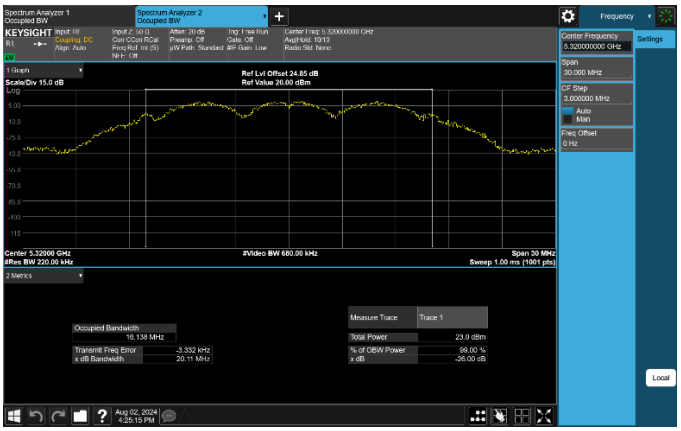


99% OBW

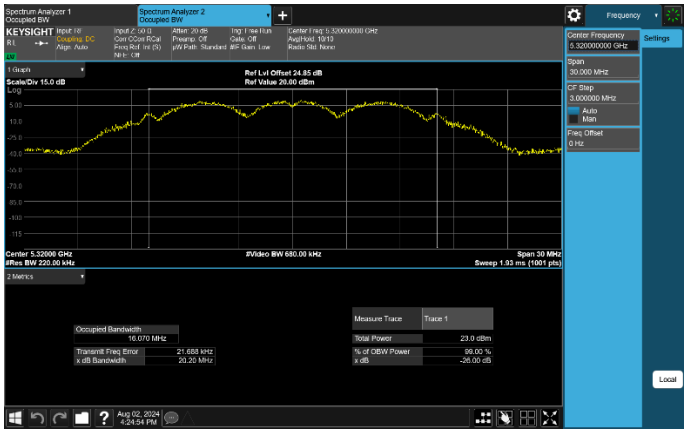


High Channel – 802.11a NOHT, (5320MHz)
combined (both chains)

26 dB BW

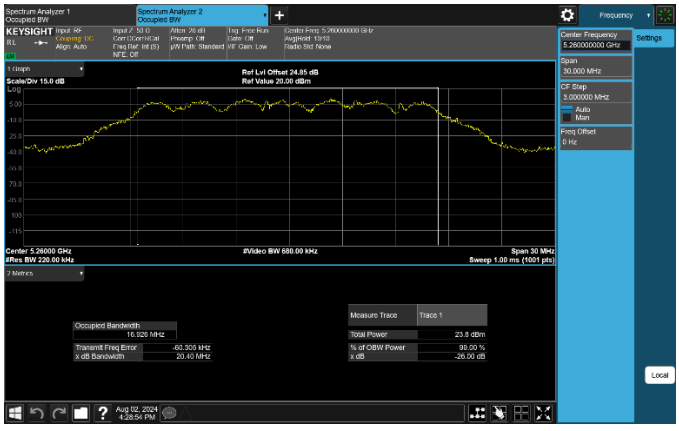


99% OBW

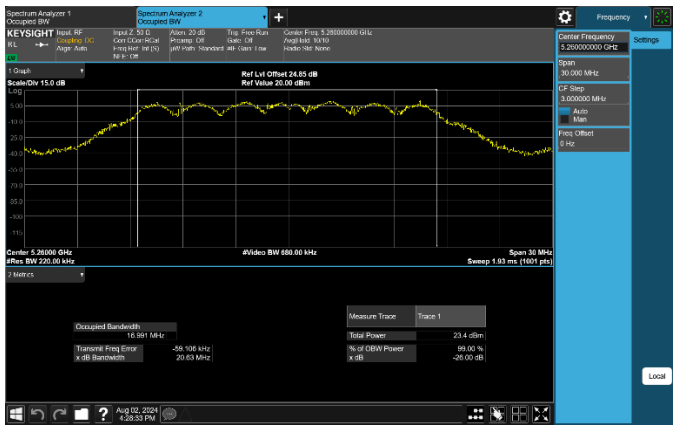


Low Channel – 802.11n20, (5260MHz)
combined (both chains)

26 dB BW

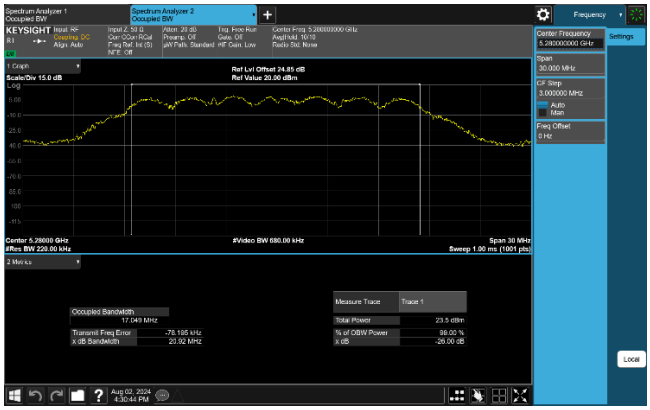


99% OBW

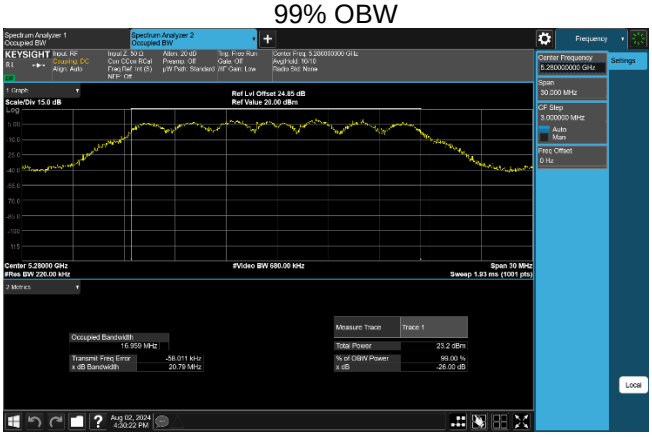


Mid Channel – 802.11n20, (5280MHz)
combined (both chains)

26 dB BW



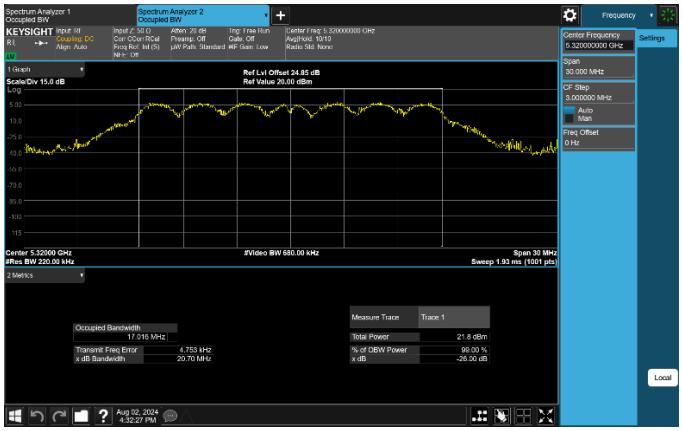
99% OBW



High Channel – 802.11n20, (5320MHz)
combined (both chains)

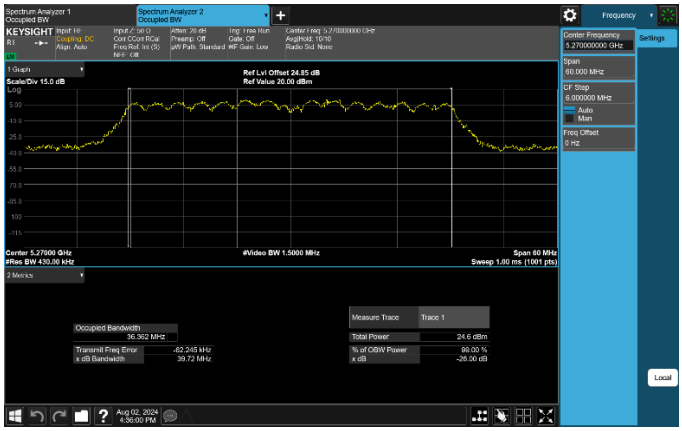
26 dB BW

99% OBW

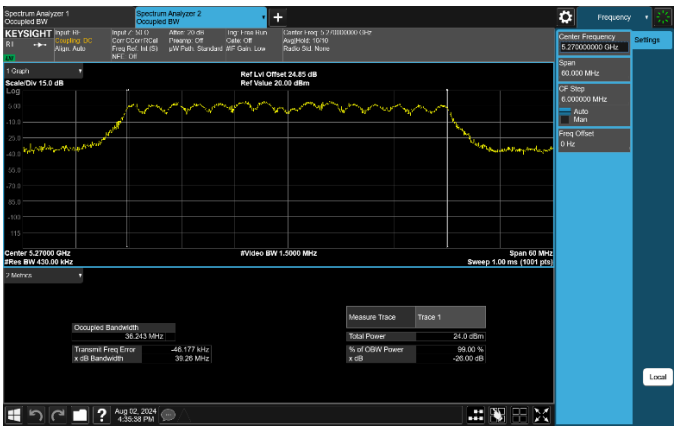


Low Channel – 802.11n40, (5270MHz)
combined (both chains)

26 dB BW

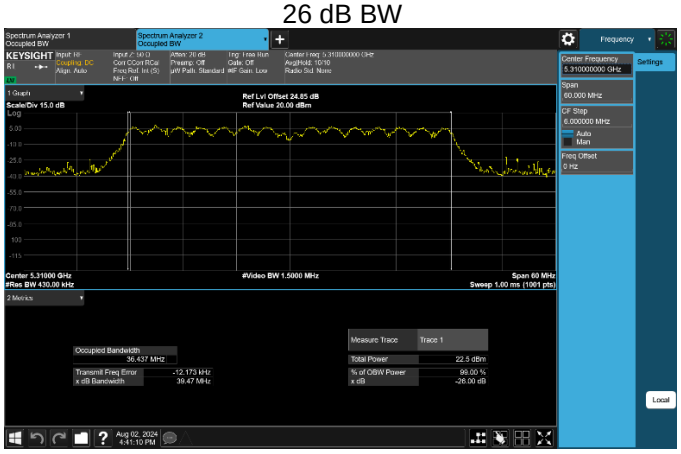


99% OBW

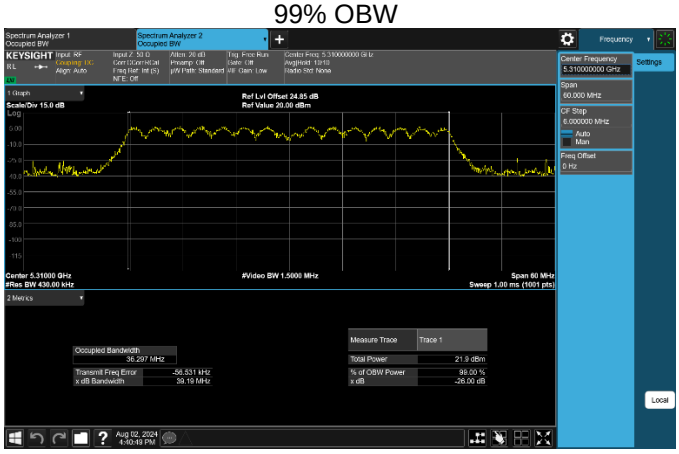


High Channel – 802.11n40, (5310MHz)
combined (both chains)

26 dB BW

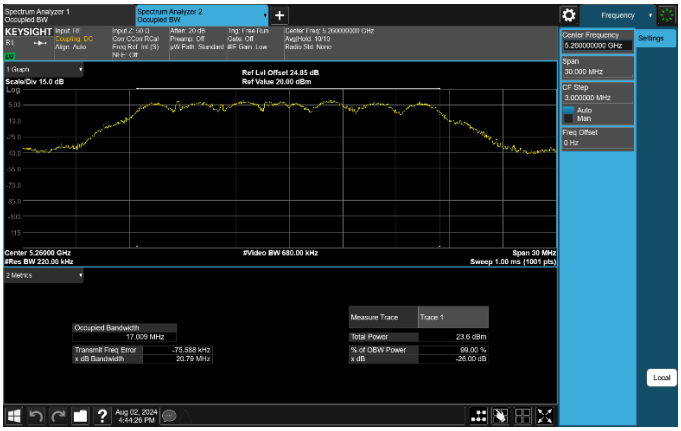


99% OBW

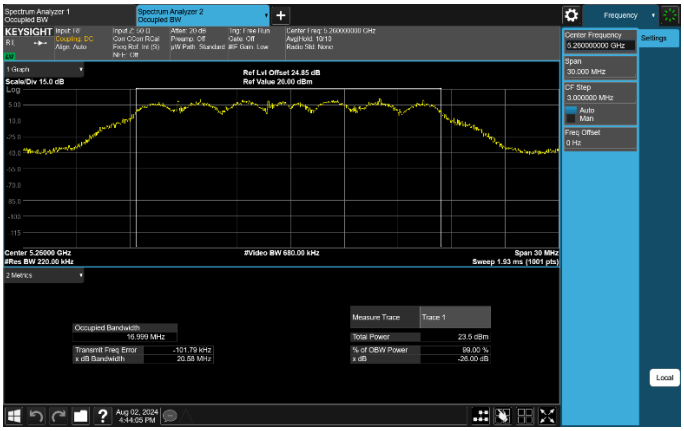


Low Channel – 802.11ac20, (5260MHz)
combined (both chains)

26 dB BW

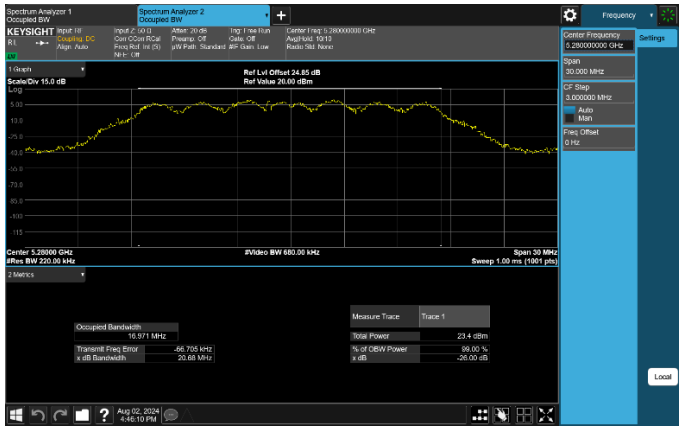


99% OBW

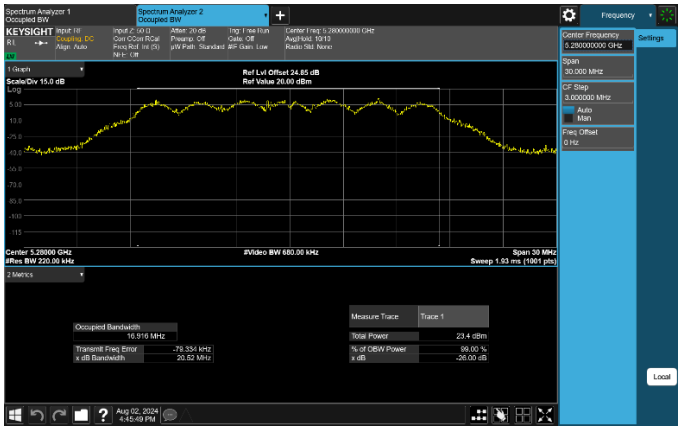


Mid Channel – 802.11ac20, (5280MHz)
combined (both chains)

26 dB BW



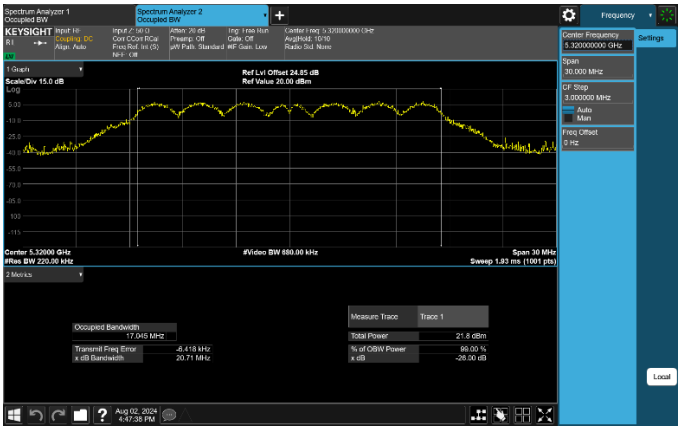
99% OBW



High Channel – 802.11ac20, (5320MHz)
combined (both chains)

26 dB BW

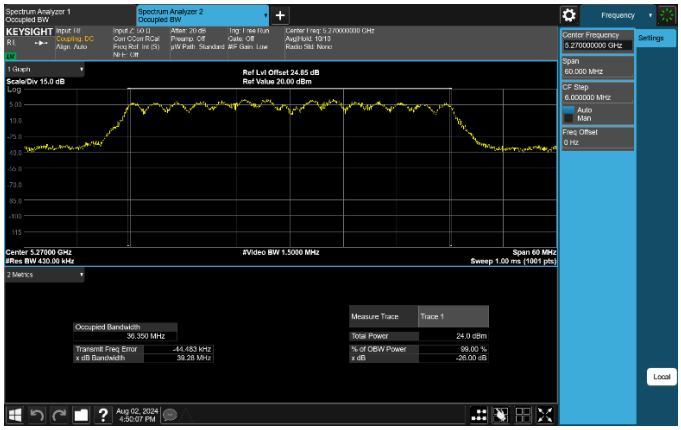
99% OBW



Low Channel – 802.11ac40, (5270MHz)
combined (both chains)

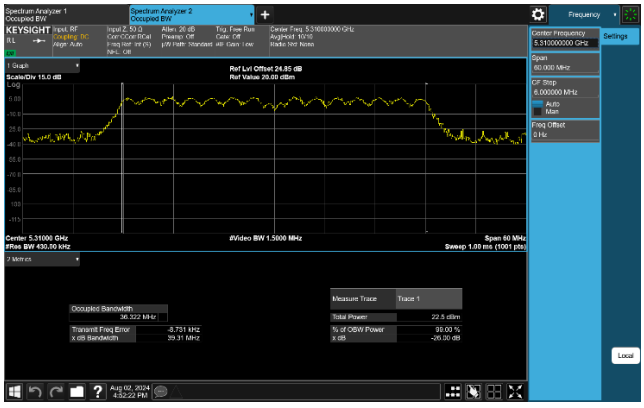
26 dB BW

99% OBW

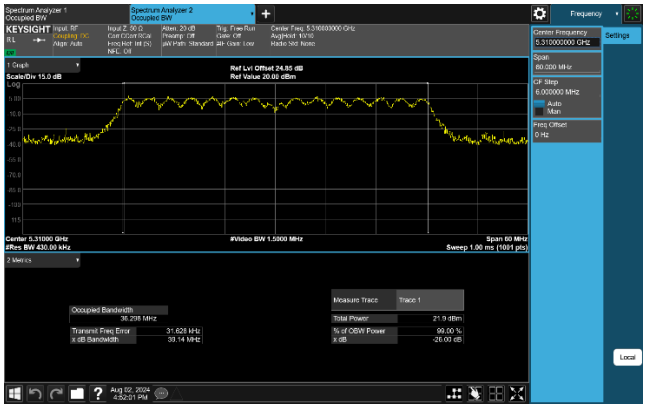


High Channel – 802.11ac40, (5310MHz)
combined (both chains)

26 dB BW



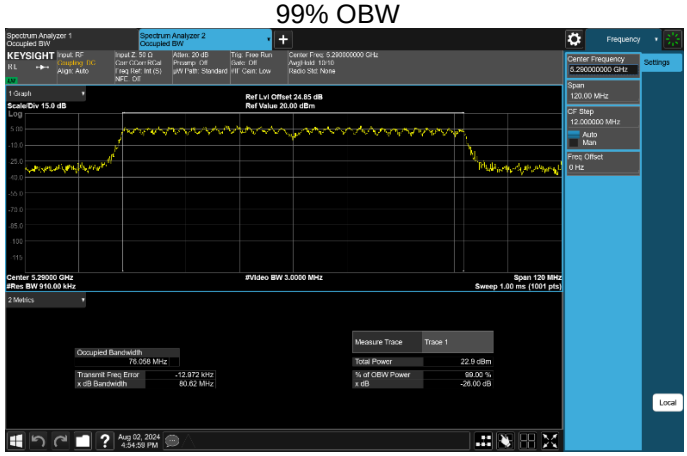
99% OBW



Mid Channel – 802.11ac80, (5290MHz)
combined (both chains)

26 dB BW

99% OBW



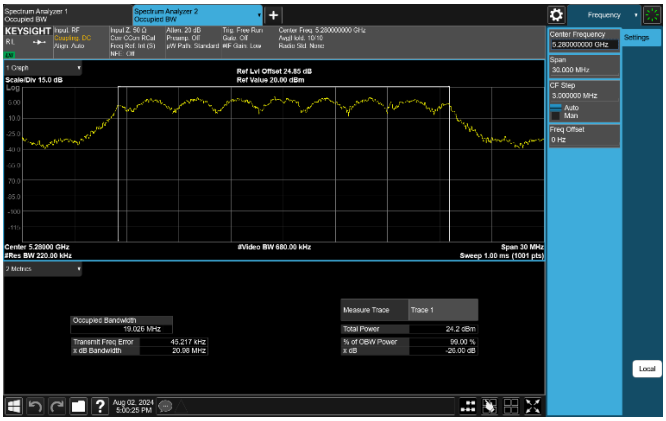
Low Channel – 802.11ax20, (5260MHz)
combined (both chains)

26 dB BW

99% OBW

Mid Channel – 802.11ax20, (5280MHz)
combined (both chains)

26 dB BW

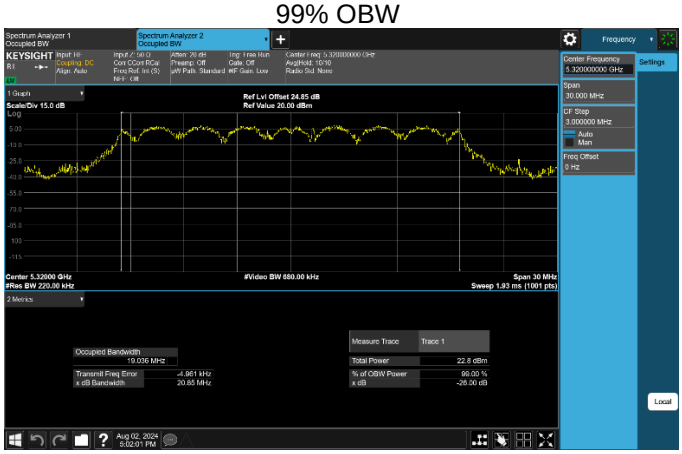


99% OBW

High Channel – 802.11ax20, (5320MHz)
combined (both chains)

26 dB BW

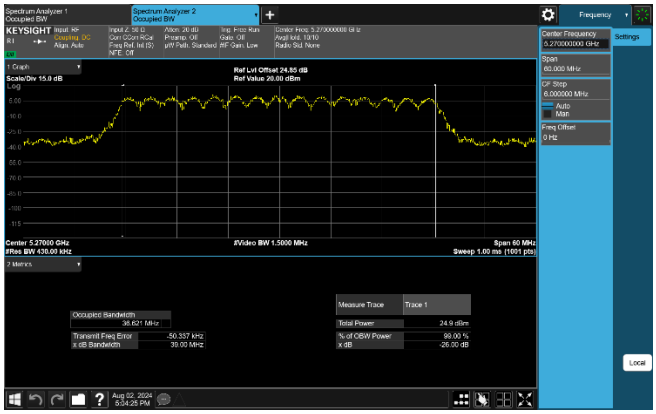
99% OBW



Low Channel – 802.11ax40, (5270MHz)
combined (both chains)

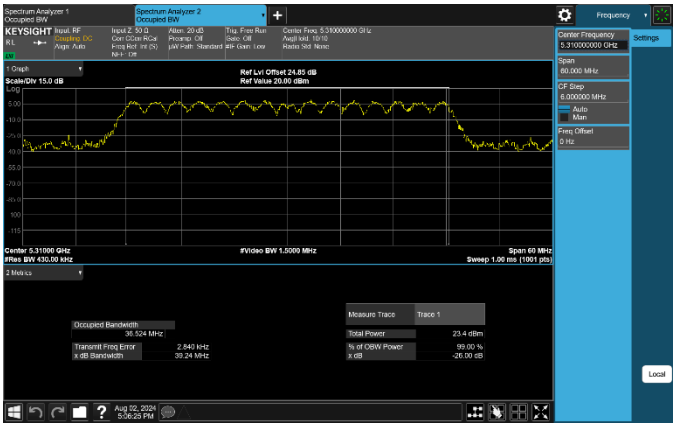
26 dB BW

99% OBW

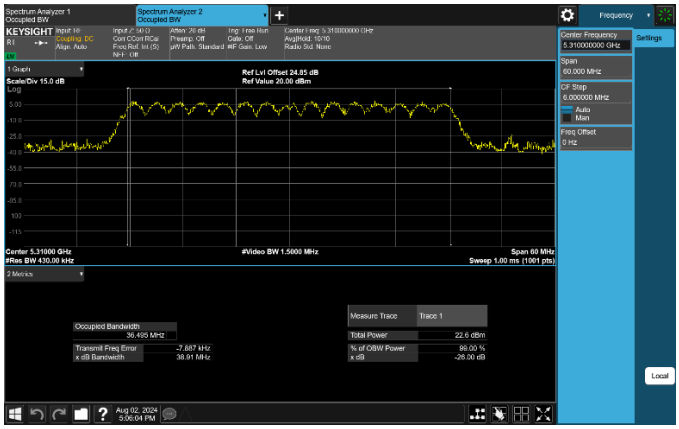


High Channel – 802.11ax40, (5310MHz)
combined (both chains)

26 dB BW

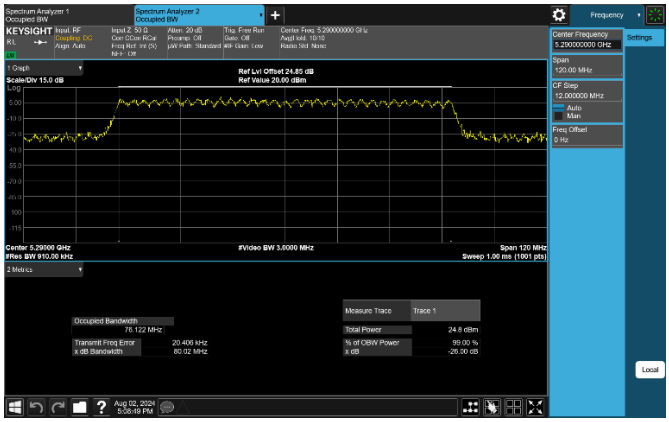


99% OBW

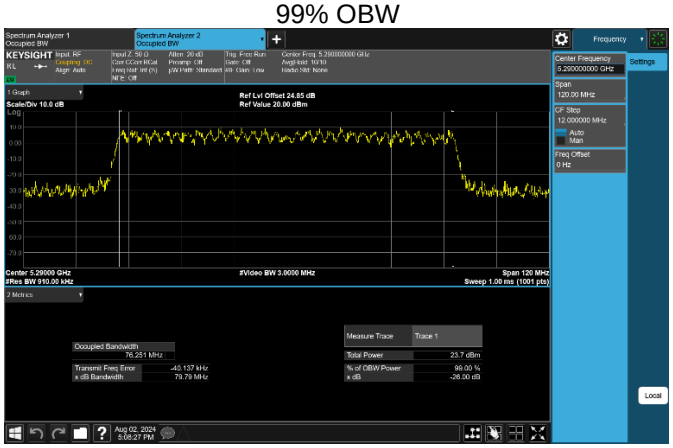


Mid Channel – 802.11ax80, (5290MHz)
combined (both chains)

26 dB BW



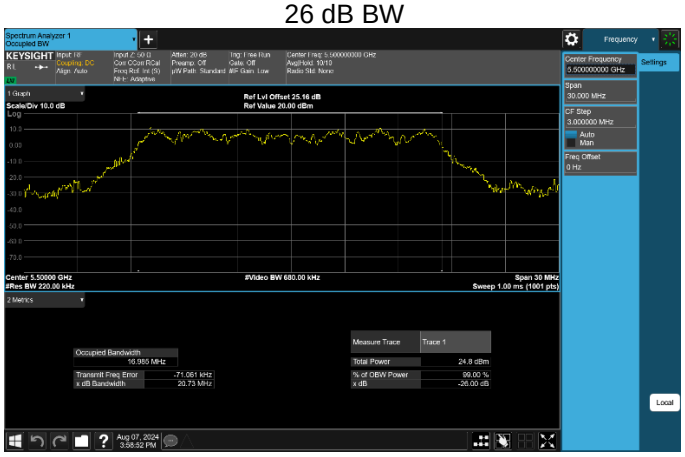
99% OBW



UNII2c:

Low Channel – 802.11a NOHT, (5500MHz)
combined (both chains)

26 dB BW

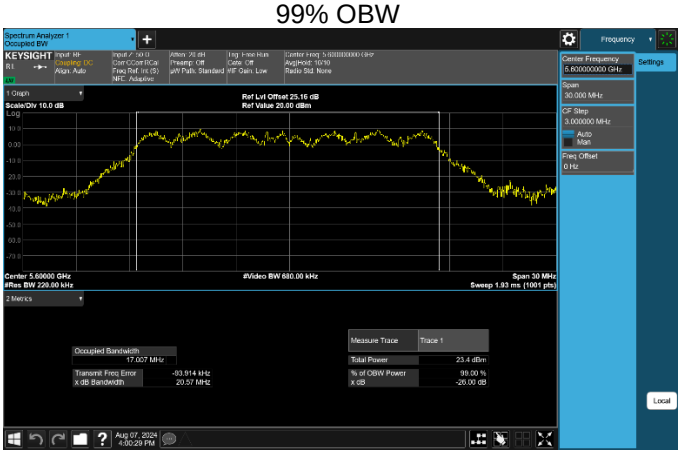


99% OBW

Mid Channel – 802.11a NOHT, (5600MHz)
combined (both chains)

26 dB BW

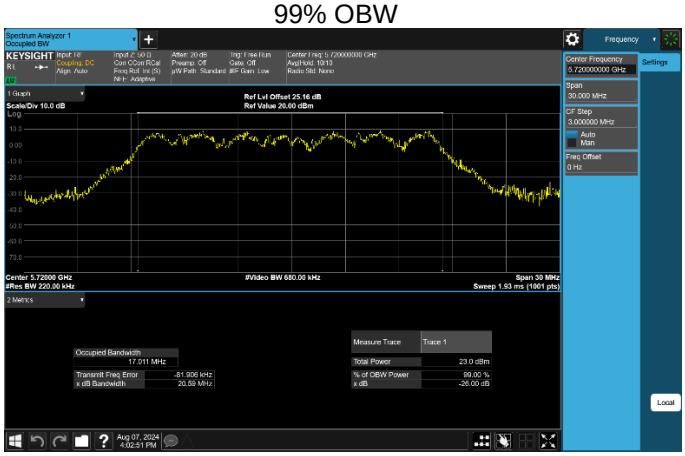
99% OBW



High Channel – 802.11a NOHT, (5720MHz)
combined (both chains)

26 dB BW

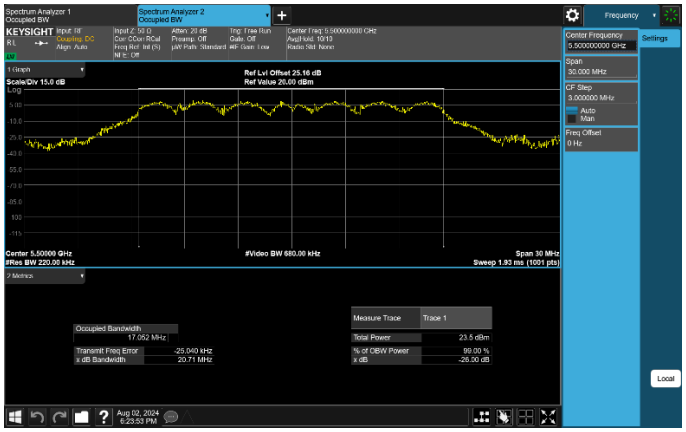
99% OBW



Low Channel – 802.11n20, (5500MHz)
combined (both chains)

26 dB BW

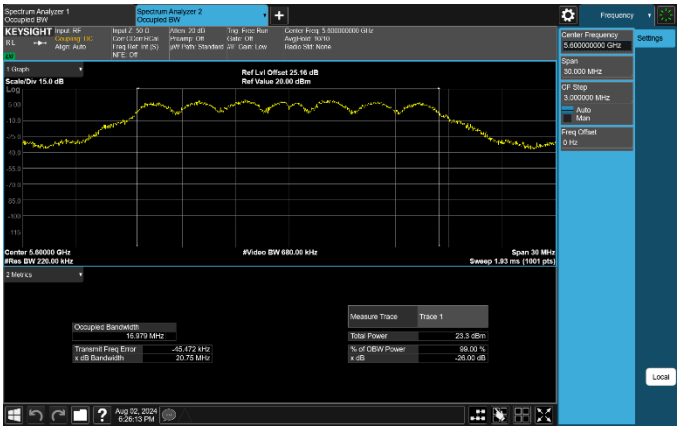
99% OBW



Mid Channel – 802.11n20, (5600MHz)
combined (both chains)

26 dB BW

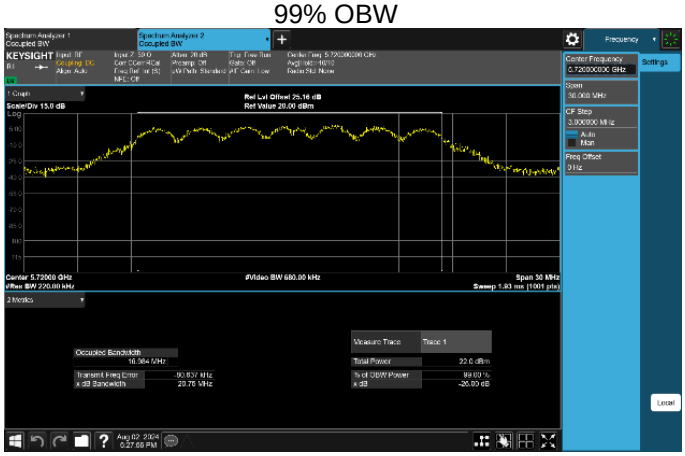
99% OBW



High Channel – 802.11n20, (5720MHz)
combined (both chains)

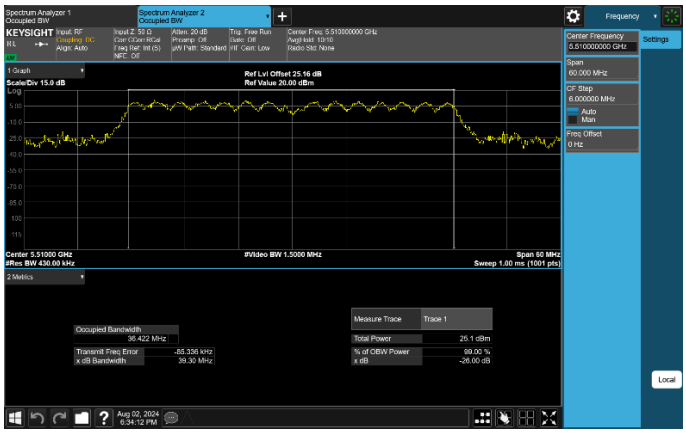
26 dB BW

99% OBW

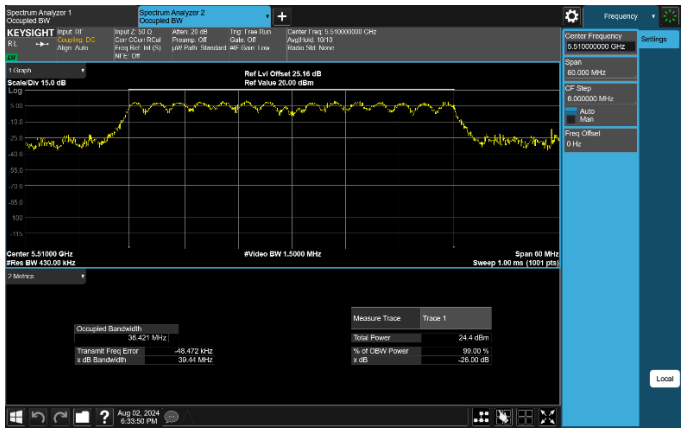


Low Channel – 802.11n40, (5510MHz)
combined (both chains)

26 dB BW

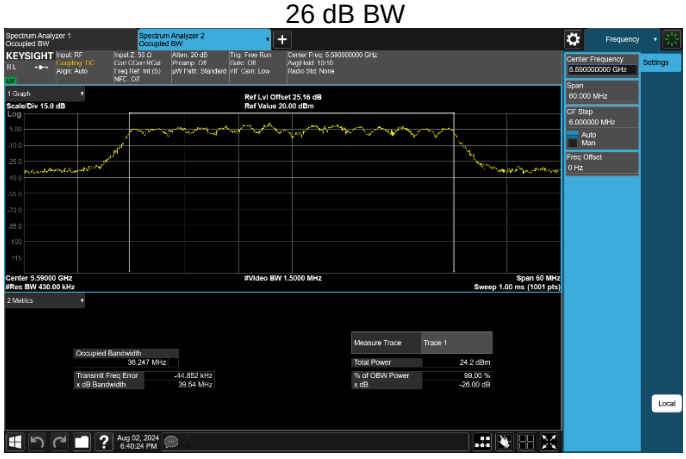


99% OBW



Mid Channel – 802.11n40, (5590MHz)
combined (both chains)

26 dB BW



99% OBW