

**MEASUREMENT REPORT**

**FCC PART 15.407 / ISED RSS-248 UNII 802.11a/ax OFDM WIFI 6E**

**Applicant Name:**

Apple Inc.  
 One Apple Park Way  
 Cupertino, CA 95014  
 United States

**Date of Testing:**

11/29/2023 - 04/04/2024

**Test Report Issue Date:**

4/4/2024

**Test Site/Location:**

Element Materials Technology Morgan Hill, CA, USA

**Test Report Serial No.:**

1C2311270063-13-R1 .BCG

<b>FCC ID:</b>	<b>BCGA2902</b>
<b>IC:</b>	<b>579C-A2902</b>
<b>APPLICANT:</b>	<b>Apple Inc.</b>

**Application Type:**

Certification

**Model/HVIN:**

A2902

**EUT Type:**

Tablet Device

**Frequency Range:**

5955 – 7115MHz

**Modulation Type:**

OFDM

**FCC Classification:**

15E 6GHz Low Power Dual Client (6CD)

**FCC Rule Part(s):**

Part 15 Subpart E (15.407)

**ISED Specification:**

RSS-248 Issue 2

**Test Procedure(s):**

ANSI C63.10-2013, KDB 789033 D02 v02r01  
 KDB 662911 D01 v02r01, KDB 987594 D02 v02r01  
 KDB 987594 D04 v02

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013 and KDB 789033 D02 v02r01. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 1C2311270063-13-R1) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose accordingly.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.




RJ Ortanez  
 Executive Vice President

**Prepared by:** WKR0000006164


**Reviewed by:** WKR0000005849

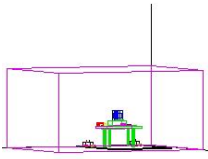


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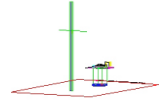
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UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	SISO				SDM	
				Antenna WF8		Antenna WF7a		Summed	
				Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)
5	20	802.11a/ax	5955 - 6415	10.000	10.00	7.413	8.70	9.791	9.91
6		802.11a/ax	6435 - 6515	4.955	6.95	6.998	8.45	6.721	8.27
7		802.11a/ax	6535 - 6875	5.433	7.35	6.839	8.35	6.900	8.39
8		802.11a/ax	6895 - 7115	7.674	8.85	8.610	9.35	8.123	9.10
5	40	802.11ax	5965 - 6405	18.867	12.76	14.048	11.48	19.180	12.83
6		802.11ax	6445 - 6525	9.886	9.95	13.964	11.45	13.318	11.24
7		802.11ax	6565 - 6845	10.705	10.30	13.646	11.35	13.673	11.36
8		802.11ax	6885 - 7085	15.244	11.83	17.179	12.35	16.282	12.12
5	80	802.11ax	5985 - 6385	39.811	16.00	28.840	14.60	38.980	15.91
6		802.11ax	6465	18.836	12.75	27.114	14.33	26.573	14.24
7		802.11ax	6545 - 6865	21.135	13.25	27.227	14.35	26.295	14.20
8		802.11ax	6945 - 7025	29.546	14.71	34.277	15.35	31.968	15.05
5	160	802.11ax	6025 - 6345	70.795	18.50	50.315	17.02	68.210	18.34
6		802.11ax	6505	34.104	15.33	47.195	16.74	47.146	16.73
7		802.11ax	6665 - 6825	37.879	15.78	47.907	16.80	47.629	16.78
8		802.11ax	6985	53.481	17.28	60.954	17.85	55.683	17.46

## EUT Overview Low Power Indoor (Low Rate)

UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	SISO				SDM	
				Antenna WF8		Antenna WF7a		Summed	
				Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)
5	20	802.11a/ax	5955 - 6415	9.748	9.89	7.396	8.69	9.679	9.86
6		802.11a/ax	6435 - 6515	4.955	6.95	6.820	8.34	6.721	8.27
7		802.11a/ax	6535 - 6875	5.433	7.35	6.839	8.35	6.790	8.32
8		802.11a/ax	6895 - 7115	7.674	8.85	8.610	9.35	8.161	9.12
5	40	802.11ax	5965 - 6405	19.552	12.91	14.345	11.57	18.529	12.68
6		802.11ax	6445 - 6525	9.886	9.95	13.964	11.45	13.410	11.27
7		802.11ax	6565 - 6845	10.539	10.23	13.646	11.35	13.486	11.30
8		802.11ax	6885 - 7085	15.311	11.85	16.998	12.30	16.282	12.12
5	80	802.11ax	5985 - 6385	39.811	16.00	28.874	14.61	38.181	15.82
6		802.11ax	6465	19.724	12.95	27.861	14.45	26.573	14.24
7		802.11ax	6545 - 6865	21.627	13.35	27.202	14.35	27.282	14.36
8		802.11ax	6945 - 7025	30.549	14.85	34.245	15.35	32.116	15.07
5	160	802.11ax	6025 - 6345	70.795	18.50	51.204	17.09	68.525	18.36
6		802.11ax	6505	35.075	15.45	48.596	16.87	47.582	16.77
7		802.11ax	6665 - 6825	37.094	15.69	48.417	16.85	48.851	16.89
8		802.11ax	6985	54.325	17.35	58.600	17.68	56.587	17.53

## EUT Overview Low Power Indoor (Mid Rate)

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UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	SISO				SDM	
				Antenna WF8		Antenna WF7a		Summed	
				Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)
5	20	802.11a/ax	5955 - 6415	9.924	9.97	7.173	8.56	9.591	9.82
6		802.11a/ax	6435 - 6515	4.955	6.95	6.998	8.45	6.706	8.26
7		802.11a/ax	6535 - 6875	5.433	7.35	6.839	8.35	6.884	8.38
8		802.11a/ax	6895 - 7115	7.674	8.85	8.610	9.35	8.161	9.12
5	40	802.11ax	5965 - 6405	19.289	12.85	14.099	11.49	19.224	12.84
6		802.11ax	6445 - 6525	9.886	9.95	13.964	11.45	13.349	11.25
7		802.11ax	6565 - 6845	10.720	10.30	13.646	11.35	13.548	11.32
8		802.11ax	6885 - 7085	15.101	11.79	17.179	12.35	16.282	12.12
5	80	802.11ax	5985 - 6385	39.811	16.00	29.161	14.65	38.623	15.87
6		802.11ax	6465	18.655	12.71	26.712	14.27	26.028	14.15
7		802.11ax	6545 - 6865	21.627	13.35	26.644	14.26	27.032	14.32
8		802.11ax	6945 - 7025	30.549	14.85	33.289	15.22	32.413	15.11
5	160	802.11ax	6025 - 6345	67.437	18.29	52.481	17.20	67.119	18.27
6		802.11ax	6505	32.614	15.13	48.495	16.86	47.146	16.73
7		802.11ax	6665 - 6825	36.627	15.64	46.935	16.72	47.084	16.73
8		802.11ax	6985	52.529	17.20	60.954	17.85	56.718	17.54

### EUT Overview Low Power Indoor (High Rate)

UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	SISO				CDD/SDM	
				Antenna WF8		Antenna WF7a		Summed	
				Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)
5	20	802.11a/ax	5955 - 6415	272.647	24.36	212.912	23.28	485.117	26.86
7		802.11a/ax	6535 - 6875	124.366	20.95	150.522	21.78	284.362	24.54
5	40	802.11ax	5965 - 6405	292.213	24.66	226.778	23.56	555.904	27.45
7		802.11ax	6565 - 6845	133.291	21.25	181.970	22.60	348.337	25.42
5	80	802.11ax	5985 - 6385	282.748	24.51	234.423	23.70	598.412	27.77
7		802.11ax	6545 - 6865	124.251	20.94	165.120	22.18	322.107	25.08
5	160	802.11ax	6025 - 6345	307.893	24.88	234.423	23.70	612.350	27.87
7		802.11ax	6665 - 6825	131.009	21.17	153.815	21.87	317.687	25.02

### EUT Overview Standard Power (Low Rate)


UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	SISO				CDD/SDM	
				Antenna WF8		Antenna WF7a		Summed	
				Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)
5	20	802.11a/ax	5955 - 6415	284.839	24.55	213.304	23.29	485.117	26.86
7		802.11a/ax	6535 - 6875	133.444	21.25	151.217	21.80	279.172	24.46
5	40	802.11ax	5965 - 6405	296.961	24.73	232.327	23.66	557.186	27.46
7		802.11ax	6565 - 6845	137.531	21.38	181.970	22.60	353.183	25.48
5	80	802.11ax	5985 - 6385	288.403	24.60	227.091	23.56	613.762	27.88
7		802.11ax	6545 - 6865	124.796	20.96	165.882	22.20	331.894	25.21
5	160	802.11ax	6025 - 6345	301.162	24.79	234.423	23.70	616.595	27.90
7		802.11ax	6665 - 6825	125.314	20.98	153.003	21.85	324.340	25.11

### EUT Overview Standard Power (Mid Rate)

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UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	SISO				CDD/SDM	
				Antenna WF8		Antenna WF7a		Summed	
				Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Max. e.i.r.p. (dBm)
5	20	802.11a/ax	5955 - 6415	274.979	24.39	208.113	23.18	471.896	26.74
7		802.11a/ax	6535 - 6875	124.394	20.95	145.781	21.64	274.077	24.38
5	40	802.11ax	5965 - 6405	293.495	24.68	223.203	23.49	553.350	27.43
7		802.11ax	6565 - 6845	132.099	21.21	175.833	22.45	352.371	25.47
5	80	802.11ax	5985 - 6385	286.484	24.57	222.638	23.48	576.766	27.61
7		802.11ax	6545 - 6865	117.166	20.69	156.351	21.94	304.789	24.84
5	160	802.11ax	6025 - 6345	289.668	24.62	225.061	23.52	594.292	27.74
7		802.11ax	6665 - 6825	122.546	20.88	143.648	21.57	311.172	24.93

**EUT Overview Standard Power (High Rate)**

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# 1.0 INTRODUCTION

## 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.


## 1.2 Element Materials Technology Test Location

These measurement tests were conducted at the Element Materials Technology facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

## 1.3 Test Facility / Accreditations

**Measurements were performed at Element Materials Technology located in Morgan Hill, CA 95037, U.S.A.**

- Element Materials Technology is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element Materials Technology facility is a registered (22831) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Agreements (MRAs)

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2902** and **IC: 579C-A2902**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter while operating in the 6GHz band.

Test Device Serial No.: CWF7TCY9J3, HJQ6KDT73J, YYW2W9H5YX, VNPP6G99NN, DLXH09000190000DHV, C5WG0GVJ6J

### 2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE1M, LE2M, HDR4, HDR8) 802.11a/ax WIFI 6E, NB UNII (1x, HDR4, HDR8)

This device supports BT Beamforming

Standard Power (SP) mode is supported for U-NII Bands 5 and 7. Lower Power Indoor (LPI) mode is supported for U-NII Bands 5, 6, 7, 8. Throughout report, data of Standard Power mode is denoted as SP while data of Lower Power Indoor mode is denoted as LPI.

Band 5		Band 6		Band 7		Band 8	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
1	5955	97	6435	117	6535	189	6895
:	:	:	:	:	:	:	:
45	6175	105	6475	149	6695	209	6995
:	:	:	:	:	:	:	:
93	6415	113	6515	185	6875	233	7115

Table 2-1. 802.11a / 802.11ax (20MHz) Frequency / Channel Operations

Band 5		Band 6		Band 7		Band 8	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
3	5965	99	6445	123	6565	187	6885
:	:	:	:	:	:	:	:
43	6165	107	6485	155	6725	211	7005
:	:	:	:	:	:	:	:
91	6405	115	6525	179	6845	227	7085

Table 2-2. 802.11ax (40MHz BW) Frequency / Channel Operations

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Band 5		Band 6		Band 7		Band 8	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
7	5985	103	6465	119	6545	199	6945
:	:			:	:	:	:
39	6145			151	6705	215	7025
:	:			:	:		
87	6385			183	6865		

**Table 2-3. 802.11ax (80MHz BW) Frequency / Channel Operations**

Band 5		Band 6		Band 7		Band 8	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
15	6025	111	6505	143	6665	207	6985
:	:			:	:		
47	6185			175	6825		
:	:						
79	6345						

**Table 2-4. 802.11ax (160MHz BW) Frequency / Channel Operations**

**Notes:**

- 6GHz NII operation is possible in 20MHz, 40MHz, 80MHz, and 160MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) KDB 789033 D02 v02r01 and ANSI C63.10-2013. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

802.11 Mode / Band		Duty Cycle [%]		
		Antenna WF8	Antenna WF7a	SDM
6GHz	11a (20MHz) (Low Rate)	97.95	97.72	-
	11a (20MHz) (Mid Rate)	95.94	95.94	-
	11a (20MHz) (High Rate)	91.83	92.04	-
	11ax(SU) (20MHz) (Low Rate)	96.38	95.72	95.50
	11ax(SU) (20MHz) (Mid Rate)	92.68	93.11	93.54
	11ax(SU) (20MHz) (High Rate)	87.50	87.70	87.70
	11ax(SU) (40MHz) (Low Rate)	95.72	95.94	95.72
	11ax(SU) (40MHz) (Mid Rate)	93.11	93.11	93.11
	11ax(SU) (40MHz) (High Rate)	86.50	87.10	86.50
	11ax(SU) (80MHz) (Low Rate)	95.50	95.94	95.50
	11ax(SU) (80MHz) (Mid Rate)	91.83	92.04	92.68
	11ax(SU) (80MHz) (High Rate)	85.90	86.70	85.90
	11ax(SU) (160MHz) (Low Rate)	94.41	94.19	94.19
	11ax(SU) (160MHz) (Mid Rate)	90.36	90.36	90.57
11ax(SU) (160MHz) (High Rate)	83.37	84.33	83.95	

**Table 2-5. Measured Duty Cycles**

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2. The device employs MIMO technology. Below are the possible configurations.

WiFi Configurations		SISO		CDD		SDM		STBC	
		Antenna WF8	Antenna WF7a	Antenna WF8	Antenna WF7a	Antenna WF8	Antenna WF7a	Antenna WF8	Antenna WF7a
5GHz	11a	✓	✓	✗	✗	✗	✗	✗	✗
	11ax(SU) (20MHz)	✓	✓	✓	✓	✓	✓	✓	✓
	11ax(SU) (40MHz)	✓	✓	✓	✓	✓	✓	✓	✓
	11ax(SU) (80MHz)	✓	✓	✓	✓	✓	✓	✓	✓
	11ax(SU) (160MHz)	✓	✓	✓	✓	✓	✓	✓	✓

**Table 2-6. WIFI Configurations**

✓ = Support ; ✗ = NOT Support  
**SISO** = Single Input Single Output  
**SDM** = Spatial Diversity Multiplexing – MIMO function  
**CDD** = Cyclic Delay Diversity - 2Tx Function  
**STBC** = Space-Time Block Coding – 2Tx Function

Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11a)  
 8/8.6, 16/17.2, 24/25.8, 33/34.4, 49/51.6, 65/68.8, 73/77.4, 81/86.0, 98/103.2, 108/114.7, 122/129.0, 135/143.4 (ax – 20MHz)  
 16/17.2, 33/34.4, 49/51.6, 65/68.8, 98/103.2, 130/137.6, 146/154.9, 163/172.1, 195/206.5, 217/229.4, 244/258.1, 271/286.8 (ax – 40MHz BW)  
 34/36.0, 68/72.1, 102/108.1, 136/144.1, 204/216.2, 272/288.2, 306/324.4, 340/360.3, 408/432.4, 453/480.4, 510/540.4, 567/600.5 (ax – 80MHz BW)  
 68.1/72.1, 136.1/144.1, 204.2/216.2, 272.2/288.2, 408.3/432.4, 544.4/576.5, 612.5/648.5, 680.6/720.6, 816.7/864.7, 907.4/960.8, 1020.8/1080.9, 1134.3/1201 (ax – 160Mhz BW)  
 16.3/17.2, 32.5/34.4, 48.8/51.6, 65/68.8, 97.5/103.2, 130/137.6, 146.3/154.9, 162.5/172.1, 195/206.5, 216.7/229.4, 243.8/258.1, 270.8/286.8 (MIMO ax – 20MHz)  
 32.5/34.4, 65/68.8, 97.5/103.2, 130/137.6, 195/206.5, 260/275.3, 292.5/309.7, 325/344.1, 390/412.9, 433.3/458.8, 487.5/516.2, 541.7/573.5 (MIMO ax – 40MHz BW)  
 68.1/72.1, 136.1/144.1, 204.2/216.2, 272.2/288.2, 408.3/432.4, 544.4/576.5, 612.5/648.5, 680.6/720.6, 816.7/864.7, 907.4/960.8, 1020.8/1080.9, 1134.3/1201 (MIMO ax – 80MHz BW)  
 136.1/144.1, 272.2/288.2, 408.3/432.4, 544.4/576.5, 816.7/864.7, 1088.9/1152.9, 1225/1297.1, 1361.1/1441.2, 1633.3/1729.4, 1814.8/1921.6, 2041.7/2161.8, 2268.5/2402 (MIMO ax – 160MHz BW)


3. This device supports simultaneous transmission operations, which allows for multiple transmitters to transmit simultaneously on the same antenna. The table below shows all configurations possible.

Antenna	Simultaneous Tx Config	Wifi 2GHz	Bluetooth	Thread	Wifi 5GHz	Wifi 6GHz	NB UNII
		802.11 b/g/n/ax	BDR, EDR, HDR4/8, LE1/2M	802.15.4	802.11 a/n/ac/ax	802.11 a/ax	BDR, HDR4/8
WF8	Config 1	✓	✗	✗	✗	✗	✓
WF8	Config 2	✗	✓	✗	✓	✗	✗
WF8	Config 3	✗	✓	✗	✗	✓	✗
WF8	Config 4	✗	✗	✓	✓	✗	✗
WF8	Config 5	✗	✗	✓	✗	✓	✗

**Table 2-7. Simultaneous Transmission Configurations**

✓ = Support; ✗ = Not Support

Note: All the above simultaneous transmission configurations have been tested and the worst-case configuration was found to be Config 2 and reported in Bluetooth and UNII OFDM test reports.

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4. Specific 2.4GHz Wi-Fi antenna that can only transmit simultaneously with 2.4GHz Bluetooth antenna is listed in the SAR test report. For BT (2.4GHz) in connected mode and Wi-Fi (2.4GHz) - Wi-Fi max power will not exceed minimum of (13.5dBm, SAR max cap, Reg max cap) power. For BT (2.4GHz) in disconnected mode and Wi-Fi (2.4GHz) - BT will be using iPA only and Wi-Fi max power will not exceed minimum of (SAR max cap, Reg max cap) power. Bluetooth can simultaneously transmit with IEEE 802.11a/n/ac/ax 5/6 GHz on separate antenna.

### 2.3 Antenna Description

Following antenna gains were provided by the manufacturer.


UNII Band	Tx Frequency (MHz)	Highest Antenna Gain		Lowest Antenna Gain	
		Antenna WF8	Antenna WF7a	Antenna WF8	Antenna WF7a
5	5955-6415	5.0	3.6	2.6	2.7
6	6435-6515	2.2	3.7	2.2	3.7
7	6535-6875	2.1	3.1	0.4	1.6
8	6895-7115	1.7	1.7	1.1	1.4

Table 2-8. Antenna Gains

### 2.4 Test Support Equipment

1	Apple MacBook Pro w/AC/DC Adapter	Model: A2141 Model: A2166	S/N: C02H604EQ05D S/N: C4H042705ZNP0WA6
2	Apple USB-C Cable	Model: Spartan	S/N: GXK1336018XKTR024
3	USB-C Cable w/ AC Adapter	Model: A246C Model: A2305	S/N: DWH80115BK826GV19 S/N: C4H95160004PF4F4V
4	Apple Pencil	Model: A2538	S/N: KJ26TCFXJW
5	DC Power Supply	Model: KPS3010D	S/N: N/A
6	Netgear AP	Model: RAXE500	S/N: 6JX215GA10A5
7	Broadcom AP	Model: N/A	S/N: N/A

Table 2-9. Test Support Equipment List

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## 2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013, KDB 789033 D02 v02r01 and KDB 987594 D02 v01r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.3 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5 and 7.6 for antenna port conducted emissions test setups.

There are two vendors of the WiFi/Bluetooth radio modules, variant 1 and variant 2. Both radio modules have the same mechanical outline, same on-board antenna matching circuit, identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances. The worst case configuration was found between the two variants. The EUT was also investigated with and without charger.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration. The emissions below 1GHz and above 18GHz were tested with the highest transmitting power and the worst case channel.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

For AC line conducted and radiated test below 1GHz, following configuration were investigated and EUT powered by AC/DC was the worst case.

- EUT powered by AC/DC adaptor via USB-C cable with wire charger
- EUT powered by host PC via USB-C cable with wire charger

802.11ax HE20/40/80 2TX SDM mode test data provided in this report covers 802.11ax HE20/40/80 2TX STBC mode.

For 802.11ax-RU test results, see separate UNII 6E OFDMA report, 1C2311270063-14.BCG.

The data rates have been classified into three different groups; low data rate, middle data rate, and high data rate. All three groups of data rate have been investigated and only the worst case data rate per group is reported. The worst case data rate for each group per mode are as follows:


- 802.11a:
  - Low Data Rate: 12Mbps
  - Mid Data Rate: 24Mbps
  - High Data Rate: 54Mbps
- 802.11ax(SU) HE20/HE40/HE80/HE160
  - Low Data Rate: MCS2
  - Mid Data Rate: MCS4
  - High Data Rate: MCS11

## 2.6 Software and Firmware

The test was conducted with firmware version 21E8197 installed on the EUT.

## 2.7 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 789033 D02 v02r01 were used in the measurement of the EUT.

Deviation from measurement procedure.....None


### 3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 7m x 3.66m x 2.7m shielded enclosure. The shielded enclosure is manufactured by AP Americas. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-6. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is EPCOS 2X60A Power Line Filter (100dB Attenuation, 14kHz-18GHz) and the two EPCOs 2X48A filters (100dB Minimum Insertion Loss, 14kHz - 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.9. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.50.40.

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### 3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.


Per KDB 414788, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was used while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

### 3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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## 4.0 ANTENNA REQUIREMENTS


**Excerpt from §15.203 of the FCC Rules/Regulations:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antennas of the EUT are **permanently attached**.
- There are no provisions for connection to an external antenna.

**Conclusion:**

The EUT complies with the requirement of §15.203.

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## 5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{CISPR}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty ( $\pm$ dB)
Conducted Bench Top Measurements	2.07
Line Conducted Disturbance	1.91
Radiated Disturbance (<30MHz)	4.12
Radiated Disturbance (30MHz - 1GHz)	4.85
Radiated Disturbance (1 - 18GHz)	5.08
Radiated Disturbance (>18GHz)	4.59

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## 6.0 TEST EQUIPMENT CALIBRATION DATA


Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	6/21/2023	Annual	6/21/2024	MY49430244
Anritsu	ML2496A	Power Meter	4/4/2023	Annual	4/4/2024	1840005
Anritsu	MA2411B	Pulse Power Sensor	8/22/2023	Annual	8/22/2024	1726262
Anritsu	MA2411B	Pulse Power Sensor	4/5/2023	Annual	4/5/2024	1726261
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	3/30/2023	Annual	3/30/2024	00218555
Keysight Technology	N9040B	UXA Signal Analyzer	3/10/2023	Annual	3/10/2024	MY57212015
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/31/2023	Annual	8/31/2024	100052
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/11/2023	Annual	5/11/2024	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	6/6/2023	Annual	6/6/2024	101668
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	6/22/2023	Annual	6/22/2024	102356
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/2/2023	Annual	6/2/2024	100050
Rohde & Schwarz	HFH2-Z2	Loop Antenna	5/1/2023	Annual	5/1/2024	100519
Rohde & Schwarz	ENV216	Two-Line V-Network	6/8/2023	Annual	6/8/2024	192052
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	4/17/2023	Annual	4/17/2024	00304

**Table 6-1. Test Equipment List**

**Note:**

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Apple Inc.  
 FCC ID: BCGA2902  
 IC: 579C-A2902  
 FCC Classification: 15E 6GHz Low Power Dual Client (6CD)


FCC Part Section(s) / KDB Reference	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049, 15.407(a)(10)	RSS Gen [6.7], RSS-248 [4.4]	Occupied Bandwidth/ 26dB Bandwidth	99% of the occupied bandwidth of any channel must be contained within each of its respective U-NII sub bands  < 320MHz (5.925 - 7.125GHz)	CONDUCTED	PASS	Section 7.2
15.407(a)(8)	RSS-248 [4.5.3]	Maximum Power Spectral Density	< -1dBm/MHz e.i.r.p. for Low Power Indoor		PASS	Section 7.4
15.407(a)(7)	RSS-248 [4.5.5]		< 17dBm/MHz e.i.r.p. for Standard Power		PASS	Section 7.4
15.407(a)(8)	RSS-248 [4.5.3]	Maximum Radiated Output Power	< 24dBm over the frequency band of operation for Low Power Indoor		PASS	Section 7.3
15.407(a)(7)	RSS-248 [4.5.5]		< 30dBm over the frequency band of operation for Standard Power		PASS	Section 7.3
15.407(b)(7)	RSS-248 [4.7.2]	In-Band Emissions	EUT must meet the limits detailed in 15.407(b)(7) and RSS-248 [4.7.2]b)		PASS	Section 7.5
15.407(d)(6)	RSS-248 [4.8]	Contention Based Protocol	EUT must detect AWGN signal with 90% (or better) certainty		PASS	Section 7.6
15.407(a)(7)	RSS-248 [4.5.4]	Proper Power Adjustment, Client Devices Connected to a Standard Power Access Point	EUT maintains its power level at least 6 dB lower than that of the standard-power access point		PASS	See UNII 6E OFDMA Test Report (1C231127-0063-14.BCG)
987594 D02 v02r01	N/A	Dual Client Test, Demonstration of Proper Power Adjustment based on Associated AP	EUT maximum power level shall not exceed 30dBm EIRP when connected to Standard Power AP, and 24dBm EIRP when connected to Low Power Indoor AP		PASS	
15.407(b)(6)	RSS-248 [4.7.2]	Undesirable Emissions	< -27dBm/MHz e.i.r.p. outside of the 5.925 – 7.125GHz band		RADIATED	PASS
15.205, 15.209	RSS-248 [4.7]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	PASS		Section 7.7, 7.8
15.407(b)(8)	RSS-248 [4.7]	AC Conducted Emissions (150kHz – 30MHz)	< FCC 15.207 & RSS-Gen [8.8] limits	LINE CONDUCTED	PASS	Section 7.9

**Table 7-1. Summary of Test Results**

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**Notes:**

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element EMC Software Tool v1.2.
- 5) For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element "Chamber Automation," Version 3.0.
- 6) All radiated measurements were tested at the highest supported power setting per band.

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## 7.2 26dB & 99% Bandwidth Measurement – 802.11a/ax(SU)

§2.1049; §15.407; RSS-Gen [6.7]

### Test Overview and Limit

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

### Test Procedure Used

ANSI C63.10-2013 – Section 12.4  
KDB 789033 D02 v02r01 – Section C

### Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth
3. VBW  $\geq$  3 x RBW
4. Detector = Peak
5. Trace mode = max hold

### Test Setup


The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-1. Test Instrument & Measurement Setup**

### Test Notes

1. All antenna configurations, power modes and data rates were investigated and only the worst case are reported.
2. The data rates have been classified into three different groups; Low Data Rate, Middle rate, and High Data Rate. All three data rate groups of data rate have been investigated and only the worst case data rate per group is reported.
3. Low, mid, and high channels were tested and tabular data has been reported. Only mid channel bandwidth plots have been reported.


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## 7.2.1 Antenna WF8 26dB & 99% Bandwidth Measurements


	Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
Band 5	5955	1	a	12	16.68	20.84	320	Pass
	6175	45	a	12	16.69	20.71	320	Pass
	6415	93	a	12	16.69	20.67	320	Pass
	5955	1	ax (20MHz)	24/25.8 (MCS2)	19.02	21.26	320	Pass
	6175	45	ax (20MHz)	24/25.8 (MCS2)	19.00	21.19	320	Pass
	6415	93	ax (20MHz)	24/25.8 (MCS2)	18.97	21.17	320	Pass
	5695	3	ax (40MHz)	49/51.6 (MCS2)	37.91	41.21	320	Pass
	6165	43	ax (40MHz)	49/51.6 (MCS2)	37.92	41.49	320	Pass
	6405	91	ax (40MHz)	49/51.6 (MCS2)	37.94	41.40	320	Pass
	5985	7	ax (80MHz)	102/108.1 (MCS2)	77.08	81.41	320	Pass
	6145	39	ax (80MHz)	102/108.1 (MCS2)	77.06	81.51	320	Pass
	6385	87	ax (80MHz)	102/108.1 (MCS2)	77.11	81.49	320	Pass
	6025	15	ax (160MHz)	183.8/216.2 (MCS2)	156.26	163.47	320	Pass
6185	47	ax (160MHz)	183.8/216.2 (MCS2)	156.10	163.96	320	Pass	
6345	79	ax (160MHz)	183.8/216.2 (MCS2)	156.12	164.42	320	Pass	
Band 6	6435	97	a	12	16.73	20.74	320	Pass
	6475	105	a	12	16.71	20.80	320	Pass
	6515	113	a	12	16.65	20.71	320	Pass
	6345	97	ax (20MHz)	24/25.8 (MCS2)	19.01	21.16	320	Pass
	6475	105	ax (20MHz)	24/25.8 (MCS2)	18.98	20.90	320	Pass
	6515	113	ax (20MHz)	24/25.8 (MCS2)	19.00	21.08	320	Pass
	6445	99	ax (40MHz)	49/51.6 (MCS2)	37.87	41.32	320	Pass
	6485	107	ax (40MHz)	49/51.6 (MCS2)	37.90	41.10	320	Pass
	6525	115	ax (40MHz)	49/51.6 (MCS2)	37.93	41.32	320	Pass
	6465	103	ax (80MHz)	102/108.1 (MCS2)	77.24	81.41	320	Pass
6505	111	ax (160MHz)	183.8/216.2 (MCS2)	156.31	165.94	320	Pass	
Band 7	6535	117	a	12	16.65	20.70	320	Pass
	6695	149	a	12	16.68	20.84	320	Pass
	6875	185	a	12	16.67	20.67	320	Pass
	6535	117	ax (20MHz)	24/25.8 (MCS2)	18.99	21.05	320	Pass
	6695	149	ax (20MHz)	24/25.8 (MCS2)	19.00	21.23	320	Pass
	6875	185	ax (20MHz)	24/25.8 (MCS2)	18.98	21.41	320	Pass
	6565	123	ax (40MHz)	49/51.6 (MCS2)	37.89	41.38	320	Pass
	6725	155	ax (40MHz)	49/51.6 (MCS2)	37.97	41.37	320	Pass
	6885	179	ax (40MHz)	49/51.6 (MCS2)	37.90	41.44	320	Pass
	6545	119	ax (80MHz)	102/108.1 (MCS2)	77.12	81.59	320	Pass
	6705	151	ax (80MHz)	102/108.1 (MCS2)	77.19	81.72	320	Pass
	6865	183	ax (80MHz)	102/108.1 (MCS2)	77.08	81.63	320	Pass
	6665	143	ax (160MHz)	183.8/216.2 (MCS2)	156.20	164.41	320	Pass
6825	175	ax (160MHz)	183.8/216.2 (MCS2)	156.23	165.76	320	Pass	
Band 8	6895	189	a	12	16.68	20.80	320	Pass
	6995	209	a	12	16.71	20.76	320	Pass
	7115	233	a	12	16.67	20.86	320	Pass
	6895	189	ax (20MHz)	24/25.8 (MCS2)	19.03	21.22	320	Pass
	6995	209	ax (20MHz)	24/25.8 (MCS2)	19.09	21.10	320	Pass
	7115	233	ax (20MHz)	24/25.8 (MCS2)	19.02	21.37	320	Pass
	6925	187	ax (40MHz)	49/51.6 (MCS2)	38.01	41.42	320	Pass
	7005	211	ax (40MHz)	49/51.6 (MCS2)	37.90	41.44	320	Pass
	7085	227	ax (40MHz)	49/51.6 (MCS2)	37.91	41.29	320	Pass
	6945	199	ax (80MHz)	102/108.1 (MCS2)	77.06	81.64	320	Pass
	7025	215	ax (80MHz)	102/108.1 (MCS2)	77.15	81.68	320	Pass
6985	207	ax (160MHz)	183.8/216.2 (MCS2)	156.34	164.31	320	Pass	

**Table 7-2. Conducted Bandwidth Measurements Antenna WF8 (Low Data Rate)**

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 20 of 336


	Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
Band 5	5955	1	a	24	16.67	20.67	320	Pass
	6175	45	a	24	16.67	20.86	320	Pass
	6415	93	a	24	16.66	20.85	320	Pass
	5955	1	ax (20MHz)	49/51.6 (MCS4)	19.01	21.28	320	Pass
	6175	45	ax (20MHz)	49/51.6 (MCS4)	18.99	21.15	320	Pass
	6415	93	ax (20MHz)	49/51.6 (MCS4)	18.99	20.84	320	Pass
	5695	3	ax (40MHz)	98/103.2 (MCS4)	37.92	41.26	320	Pass
	6165	43	ax (40MHz)	98/103.2 (MCS4)	37.95	40.98	320	Pass
	6405	91	ax (40MHz)	98/103.2 (MCS4)	37.94	41.21	320	Pass
	5985	7	ax (80MHz)	204/216.2 (MCS4)	77.03	81.22	320	Pass
	6145	39	ax (80MHz)	204/216.2 (MCS4)	77.22	81.45	320	Pass
	6385	87	ax (80MHz)	204/216.2 (MCS4)	77.26	81.34	320	Pass
6025	15	ax (160MHz)	367.5/432.4 (MCS4)	156.06	164.06	320	Pass	
6185	47	ax (160MHz)	367.5/432.4 (MCS4)	156.15	163.98	320	Pass	
6345	79	ax (160MHz)	367.5/432.4 (MCS4)	155.88	163.62	320	Pass	
Band 6	6435	97	a	24	16.68	20.84	320	Pass
	6475	105	a	24	16.65	20.73	320	Pass
	6515	113	a	24	16.67	20.89	320	Pass
	6345	97	ax (20MHz)	49/51.6 (MCS4)	18.97	21.13	320	Pass
	6475	105	ax (20MHz)	49/51.6 (MCS4)	18.99	21.15	320	Pass
	6515	113	ax (20MHz)	49/51.6 (MCS4)	19.03	20.89	320	Pass
	6445	99	ax (40MHz)	98/103.2 (MCS4)	37.92	41.25	320	Pass
	6485	107	ax (40MHz)	98/103.2 (MCS4)	37.95	41.09	320	Pass
	6525	115	ax (40MHz)	98/103.2 (MCS4)	37.89	41.36	320	Pass
	6465	103	ax (80MHz)	204/216.2 (MCS4)	77.16	81.41	320	Pass
6505	111	ax (160MHz)	367.5/432.4 (MCS4)	156.20	164.45	320	Pass	
Band 7	6535	117	a	24	16.63	20.69	320	Pass
	6695	149	a	24	16.67	20.62	320	Pass
	6875	185	a	24	16.63	20.71	320	Pass
	6535	117	ax (20MHz)	49/51.6 (MCS4)	18.97	21.11	320	Pass
	6695	149	ax (20MHz)	49/51.6 (MCS4)	19.02	21.30	320	Pass
	6875	185	ax (20MHz)	49/51.6 (MCS4)	19.00	21.26	320	Pass
	6565	123	ax (40MHz)	98/103.2 (MCS4)	37.87	41.57	320	Pass
	6725	155	ax (40MHz)	98/103.2 (MCS4)	37.94	41.08	320	Pass
	6885	179	ax (40MHz)	98/103.2 (MCS4)	37.85	41.01	320	Pass
	6545	119	ax (80MHz)	204/216.2 (MCS4)	77.03	81.39	320	Pass
	6705	151	ax (80MHz)	204/216.2 (MCS4)	77.29	81.65	320	Pass
	6865	183	ax (80MHz)	204/216.2 (MCS4)	77.11	81.45	320	Pass
6665	143	ax (160MHz)	367.5/432.4 (MCS4)	156.30	163.65	320	Pass	
6825	175	ax (160MHz)	367.5/432.4 (MCS4)	156.23	164.12	320	Pass	
Band 8	6895	189	a	24	16.65	20.84	320	Pass
	6995	209	a	24	16.65	20.77	320	Pass
	7115	233	a	24	16.68	20.76	320	Pass
	6895	189	ax (20MHz)	49/51.6 (MCS4)	18.98	21.15	320	Pass
	6995	209	ax (20MHz)	49/51.6 (MCS4)	18.98	21.29	320	Pass
	7115	233	ax (20MHz)	49/51.6 (MCS4)	19.03	21.06	320	Pass
	6925	187	ax (40MHz)	98/103.2 (MCS4)	37.91	41.13	320	Pass
	7005	211	ax (40MHz)	98/103.2 (MCS4)	37.91	41.24	320	Pass
	7085	227	ax (40MHz)	98/103.2 (MCS4)	37.98	41.07	320	Pass
	6945	199	ax (80MHz)	204/216.2 (MCS4)	77.04	81.66	320	Pass
7025	215	ax (80MHz)	204/216.2 (MCS4)	77.14	81.22	320	Pass	
6985	207	ax (160MHz)	367.5/432.4 (MCS4)	156.17	163.21	320	Pass	

**Table 7-3. Conducted Bandwidth Measurements Antenna WF8 (Mid Data Rate)**

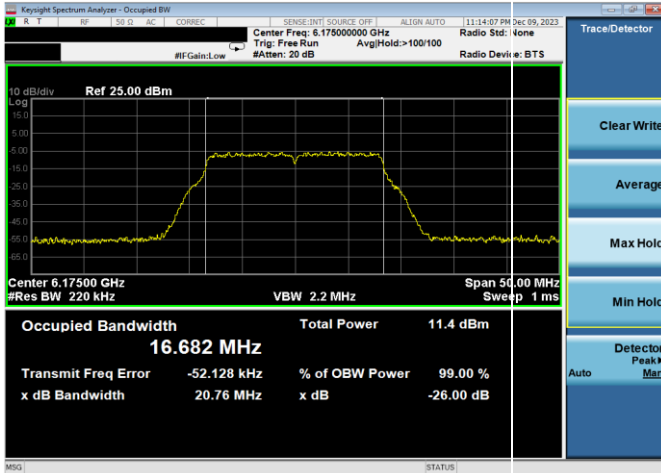
FCC ID: BCGA2902 IC: 579C-A2902		<b>MEASUREMENT REPORT</b> (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 21 of 336

	Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
Band 5	5955	1	a	54	16.64	20.61	320	Pass
	6175	45	a	54	16.66	20.47	320	Pass
	6415	93	a	54	16.61	20.59	320	Pass
	5955	1	ax (20MHz)	135/143.4 (MCS11)	19.00	21.33	320	Pass
	6175	45	ax (20MHz)	135/143.4 (MCS11)	18.98	21.19	320	Pass
	6415	93	ax (20MHz)	135/143.4 (MCS11)	19.01	21.25	320	Pass
	5695	3	ax (40MHz)	271/286.8 (MCS11)	37.90	40.97	320	Pass
	6165	43	ax (40MHz)	271/286.8 (MCS11)	37.84	41.20	320	Pass
	6405	91	ax (40MHz)	271/286.8 (MCS11)	37.84	40.86	320	Pass
	5985	7	ax (80MHz)	567/600.5 (MCS11)	77.08	81.43	320	Pass
	6145	39	ax (80MHz)	567/600.5 (MCS11)	77.07	81.61	320	Pass
	6385	87	ax (80MHz)	567/600.5 (MCS11)	77.14	81.18	320	Pass
	6025	15	ax (160MHz)	1020.8/1201 (MCS11)	155.85	164.68	320	Pass
6185	47	ax (160MHz)	1020.8/1201 (MCS11)	155.99	164.36	320	Pass	
6345	79	ax (160MHz)	1020.8/1201 (MCS11)	155.85	164.89	320	Pass	
Band 6	6435	97	a	54	16.62	20.69	320	Pass
	6475	105	a	54	16.65	20.60	320	Pass
	6515	113	a	54	16.63	20.63	320	Pass
	6345	97	ax (20MHz)	135/143.4 (MCS11)	18.98	20.77	320	Pass
	6475	105	ax (20MHz)	135/143.4 (MCS11)	19.00	21.24	320	Pass
	6515	113	ax (20MHz)	135/143.4 (MCS11)	19.02	21.12	320	Pass
	6445	99	ax (40MHz)	271/286.8 (MCS11)	37.87	41.19	320	Pass
	6485	107	ax (40MHz)	271/286.8 (MCS11)	37.84	41.51	320	Pass
	6525	115	ax (40MHz)	271/286.8 (MCS11)	37.89	41.21	320	Pass
	6465	103	ax (80MHz)	567/600.5 (MCS11)	77.04	81.17	320	Pass
	6505	111	ax (160MHz)	1020.8/1201 (MCS11)	156.12	164.43	320	Pass
Band 7	6535	117	a	54	16.61	20.59	320	Pass
	6695	149	a	54	16.58	20.64	320	Pass
	6875	185	a	54	16.62	20.62	320	Pass
	6535	117	ax (20MHz)	135/143.4 (MCS11)	18.96	21.03	320	Pass
	6695	149	ax (20MHz)	135/143.4 (MCS11)	18.99	21.22	320	Pass
	6875	185	ax (20MHz)	135/143.4 (MCS11)	19.02	20.94	320	Pass
	6565	123	ax (40MHz)	271/286.8 (MCS11)	37.87	41.43	320	Pass
	6725	155	ax (40MHz)	271/286.8 (MCS11)	37.93	41.27	320	Pass
	6885	179	ax (40MHz)	271/286.8 (MCS11)	37.85	41.52	320	Pass
	6545	119	ax (80MHz)	567/600.5 (MCS11)	77.20	81.63	320	Pass
	6705	151	ax (80MHz)	567/600.5 (MCS11)	77.10	81.18	320	Pass
	6865	183	ax (80MHz)	567/600.5 (MCS11)	77.13	81.29	320	Pass
	6665	143	ax (160MHz)	1020.8/1201 (MCS11)	156.23	164.43	320	Pass
6825	175	ax (160MHz)	1020.8/1201 (MCS11)	155.96	163.81	320	Pass	
Band 8	6895	189	a	54	16.60	20.48	320	Pass
	6995	209	a	54	16.61	20.45	320	Pass
	7115	233	a	54	16.56	20.41	320	Pass
	6895	189	ax (20MHz)	135/143.4 (MCS11)	19.05	20.87	320	Pass
	6995	209	ax (20MHz)	135/143.4 (MCS11)	19.02	21.03	320	Pass
	7115	233	ax (20MHz)	135/143.4 (MCS11)	18.99	21.20	320	Pass
	6925	187	ax (40MHz)	271/286.8 (MCS11)	37.85	41.22	320	Pass
	7005	211	ax (40MHz)	271/286.8 (MCS11)	37.90	41.09	320	Pass
	7085	227	ax (40MHz)	271/286.8 (MCS11)	37.89	41.17	320	Pass
	6945	199	ax (80MHz)	567/600.5 (MCS11)	77.17	81.30	320	Pass
	7025	215	ax (80MHz)	567/600.5 (MCS11)	77.04	81.25	320	Pass
6985	207	ax (160MHz)	1020.8/1201 (MCS11)	155.92	165.01	320	Pass	

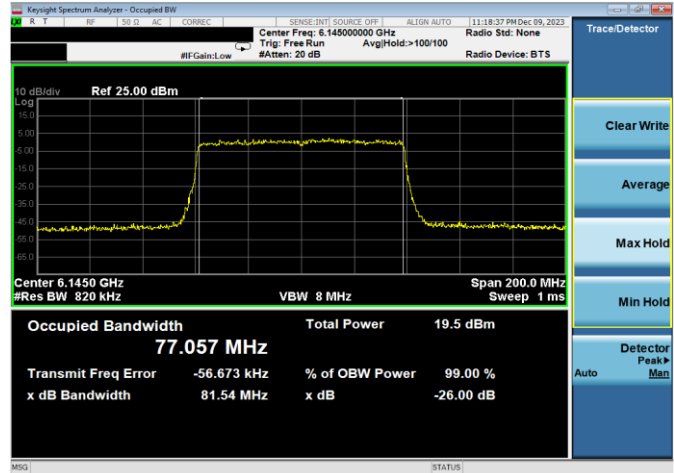
**Table 7-4. Conducted Bandwidth Measurements Antenna WF8 (High Data Rate)**

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 22 of 336

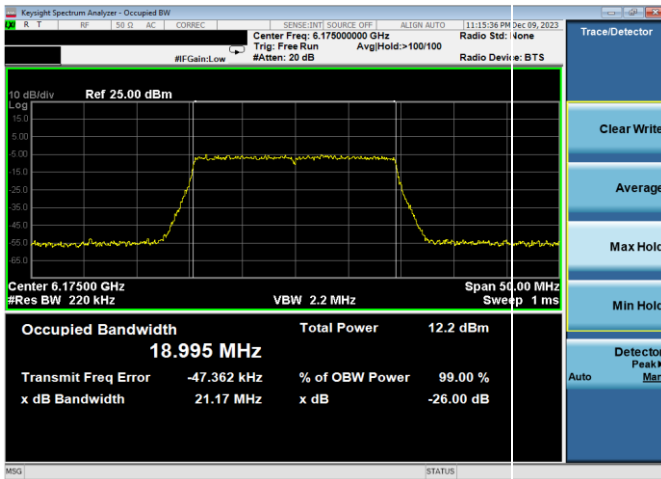
### Low Data Rate



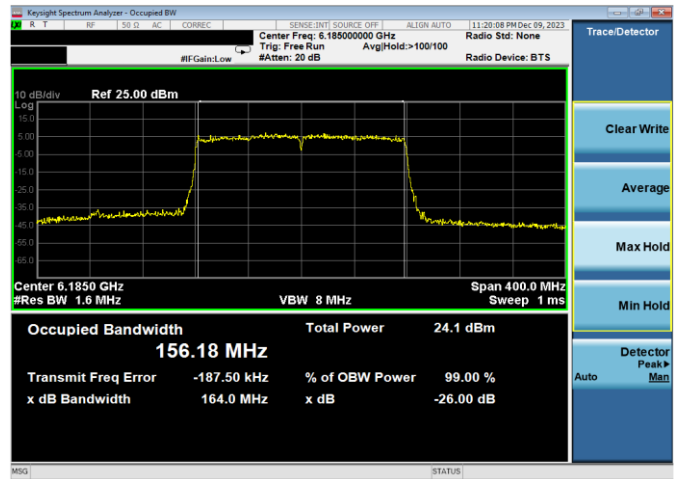
Plot 7-1. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 5) – Ch. 45, 12Mbps)



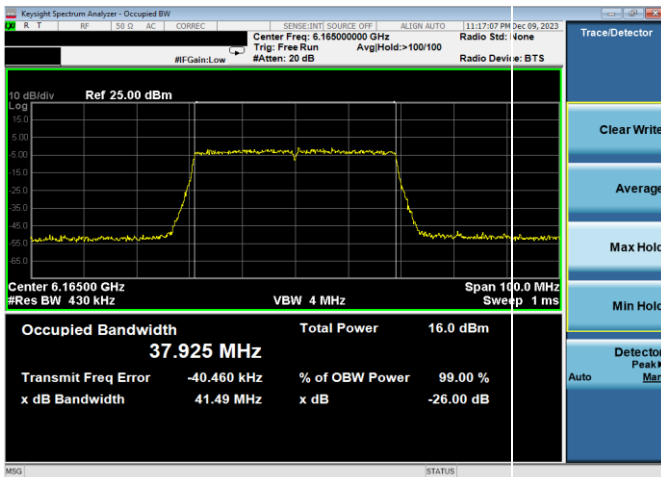
Plot 7-4. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 5) – Ch. 39, MCS2)



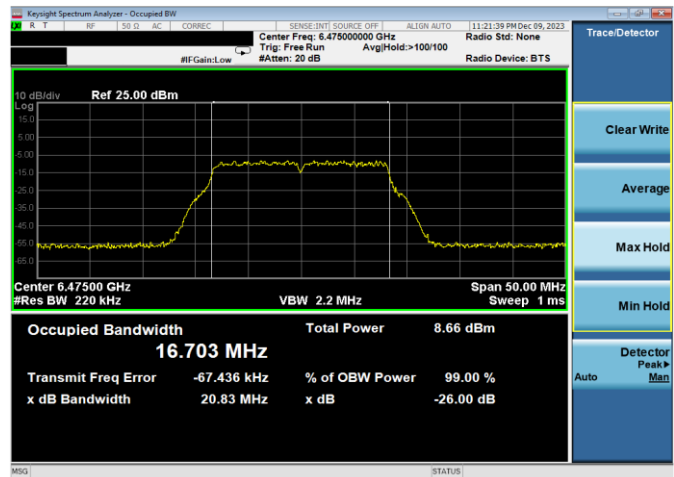
Plot 7-2. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 5) – Ch. 45, MCS2)



Plot 7-5. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 5) – Ch. 47, MCS2)



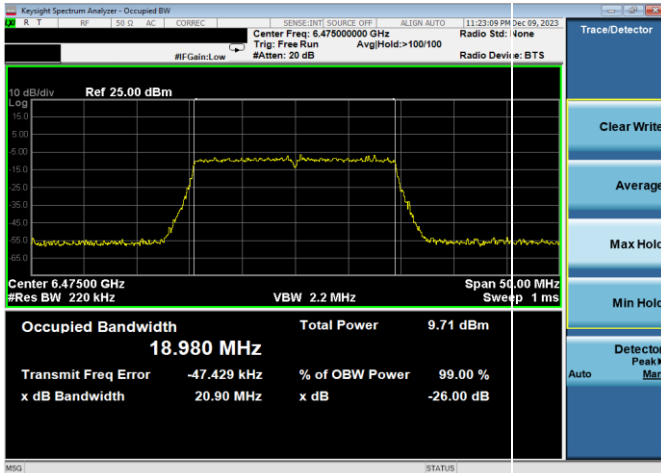
Plot 7-3. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 5) – Ch. 43, MCS2)



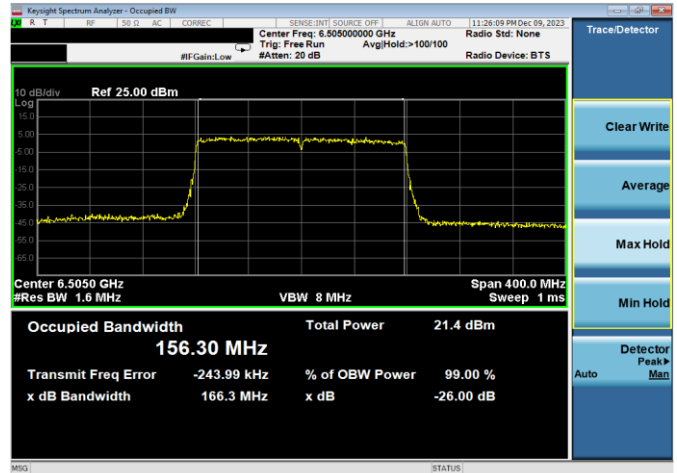
Plot 7-6. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 6) – Ch. 105, 12Mbps)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 23 of 336

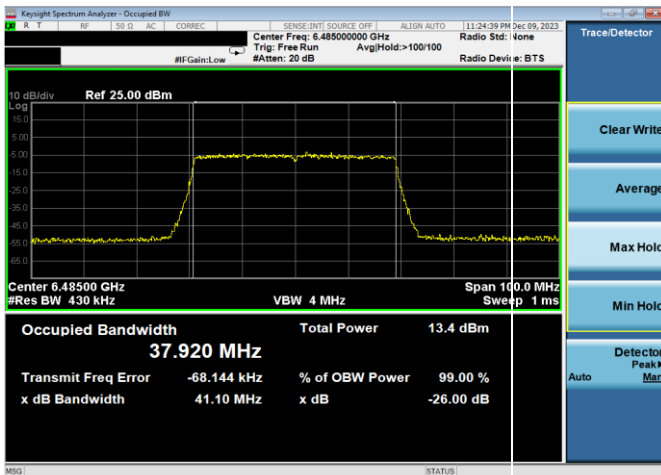




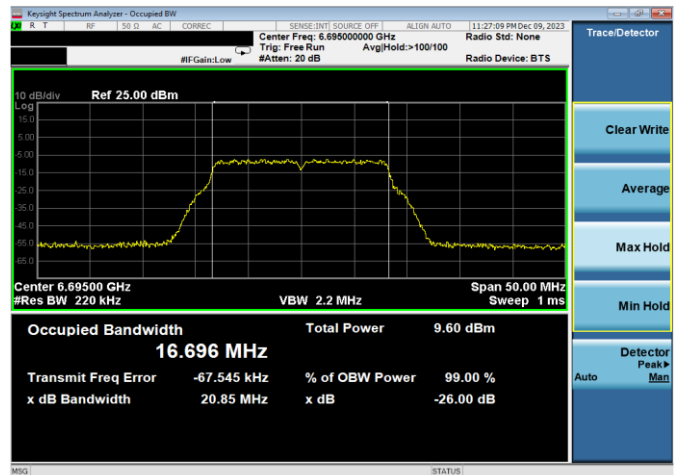
Plot 7-7. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 6) – Ch. 105, MCS2)



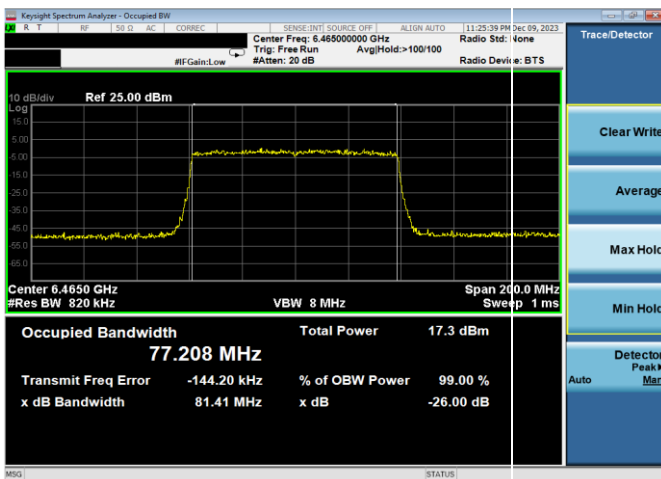
Plot 7-10. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 6) – Ch. 111, MCS2)



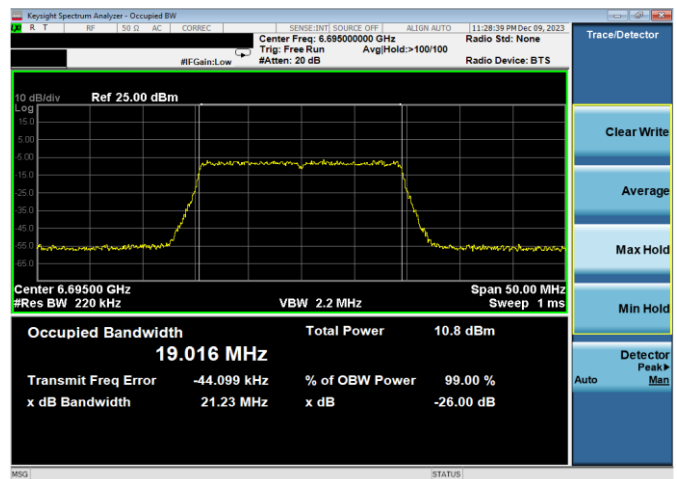
Plot 7-8. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 6) – Ch. 107, MCS2)



Plot 7-11. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 7) – Ch. 149, 12Mbps)



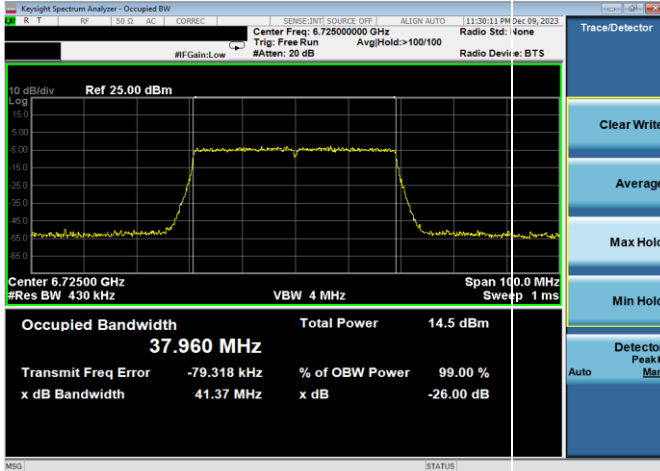
Plot 7-9. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 6) – Ch. 103, MCS2)



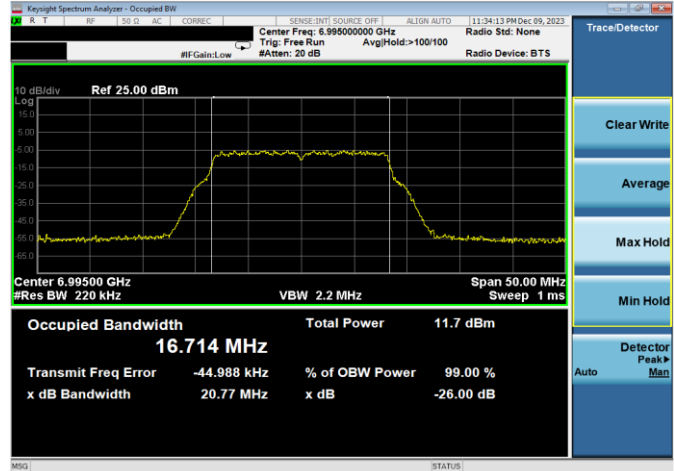
Plot 7-12. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 7) – Ch. 149, MCS2)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 24 of 336

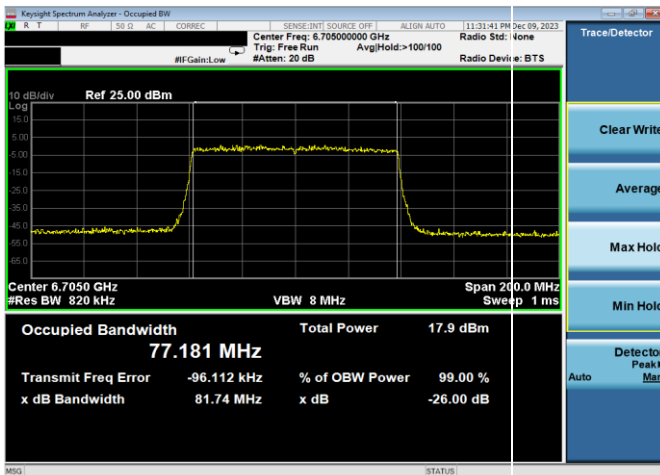




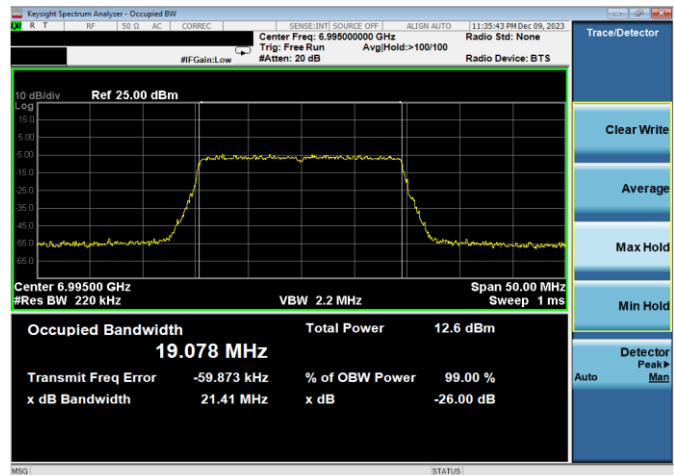
Plot 7-13. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 7) – Ch. 155, MCS2)



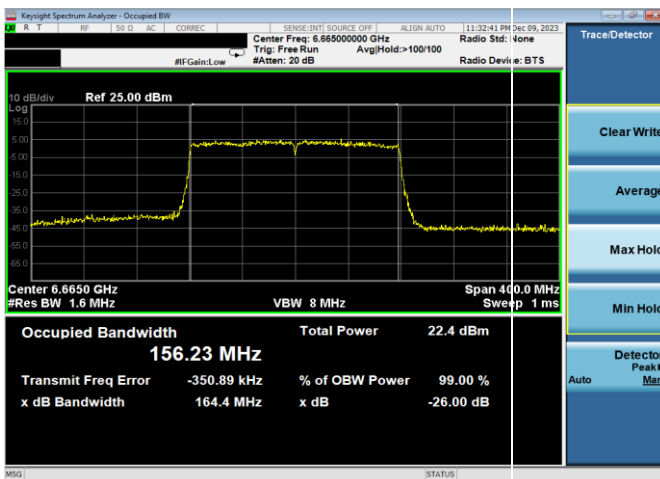
Plot 7-16. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 8) – Ch. 209, 12Mbps)



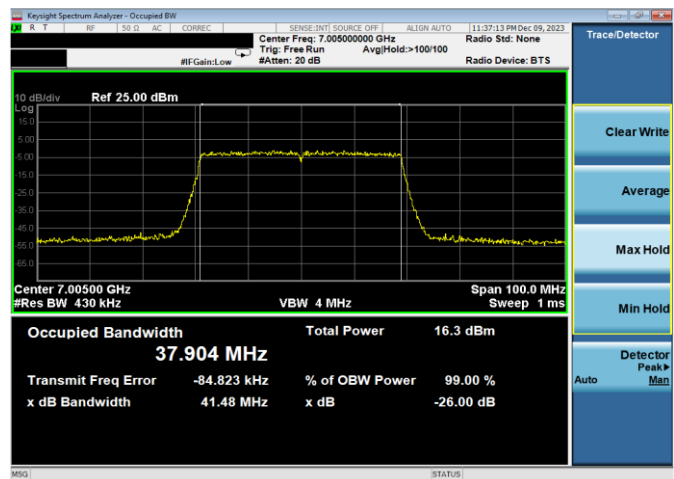
Plot 7-14. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 7) – Ch. 151, MCS2)



Plot 7-17. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 8) – Ch. 209, MCS2)

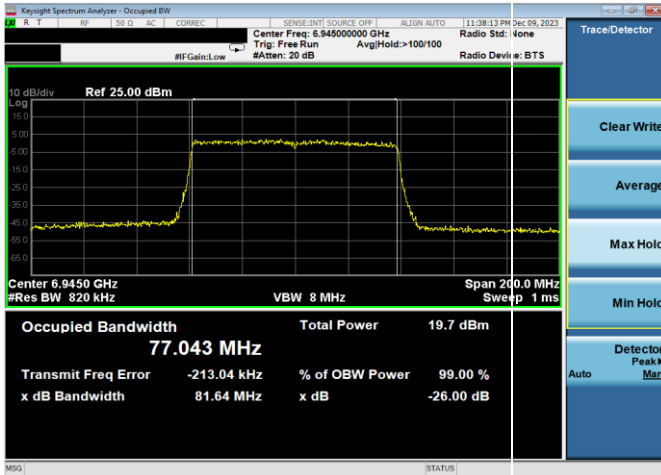


Plot 7-15. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 7) – Ch. 143, MCS2)

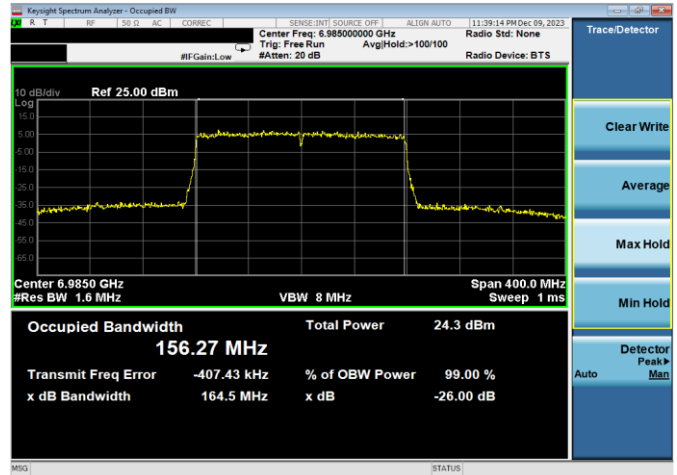


Plot 7-18. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 8) – Ch. 211, MCS2)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 25 of 336



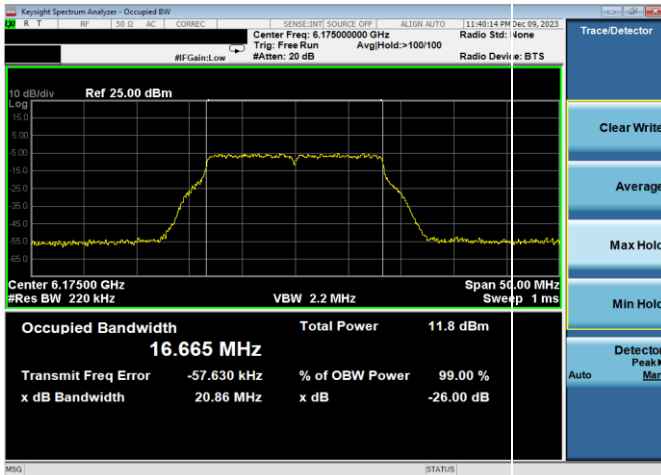
Plot 7-19. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 8) – Ch. 199, MCS2)



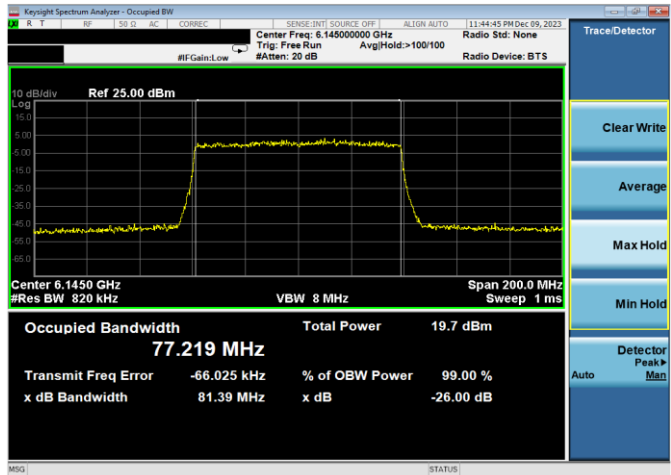
Plot 7-20. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 8) – Ch. 207, MCS2)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 26 of 336

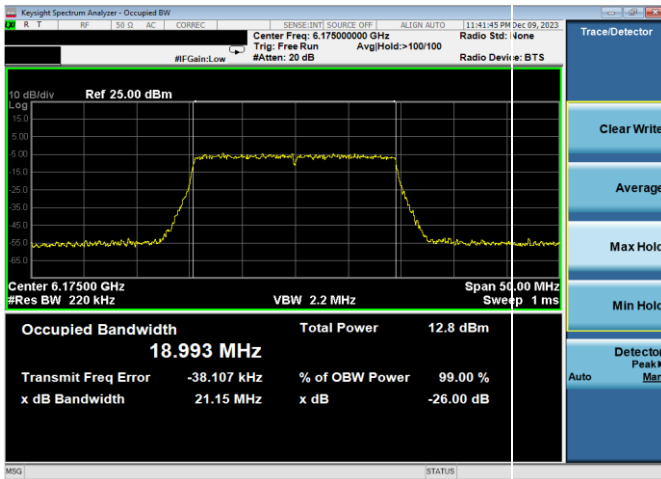
### Mid Data Rate



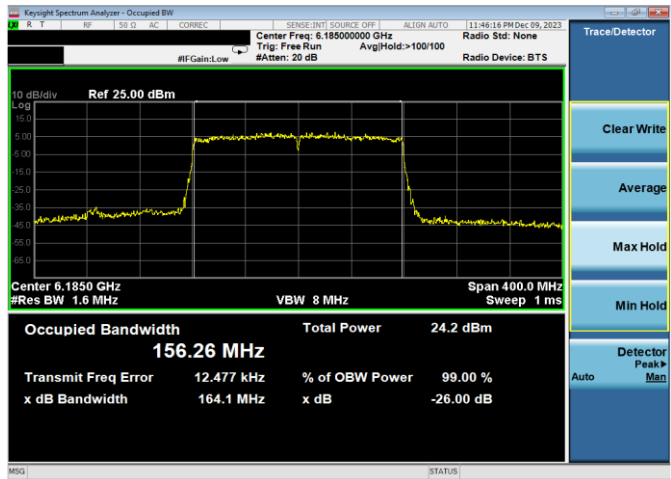
Plot 7-21. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 5) – Ch. 45, 24Mbps)



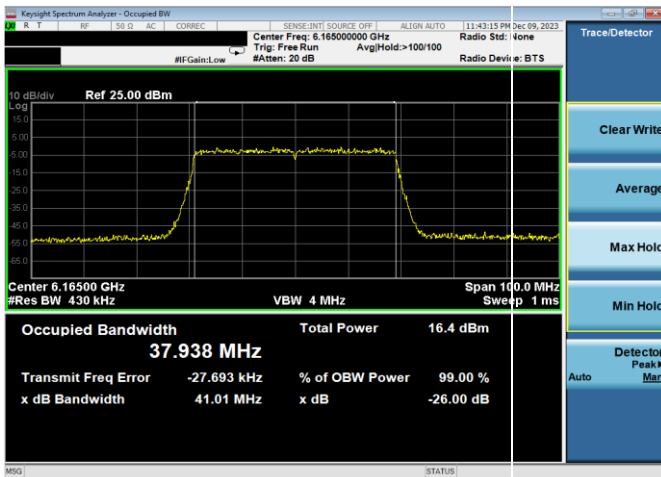
Plot 7-24. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 5) – Ch. 39, MCS4)



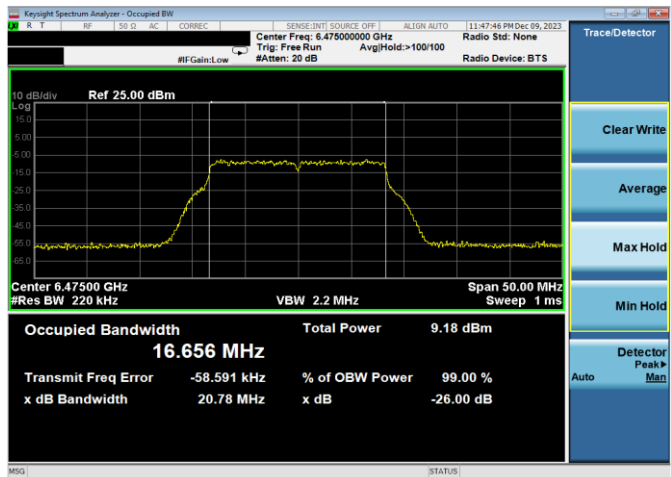
Plot 7-22. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 5) – Ch. 45, MCS4)



Plot 7-25. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 5) – Ch. 47, MCS4)

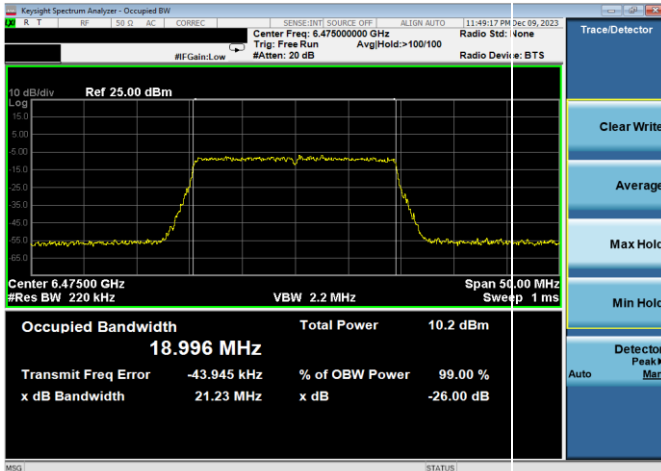


Plot 7-23. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 5) – Ch. 43, MCS4)

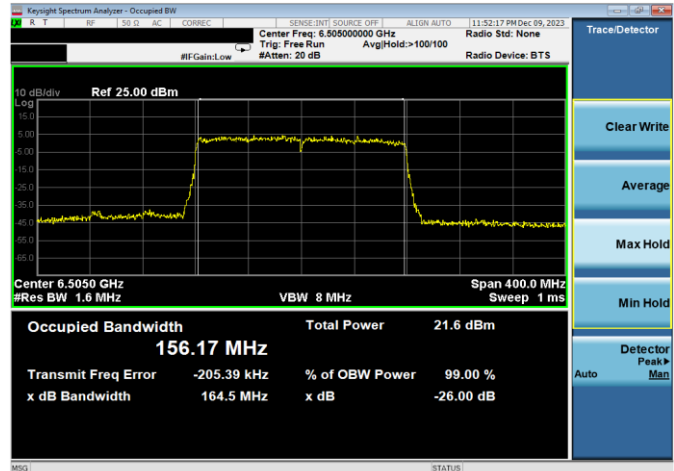


Plot 7-26. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 6) – Ch. 105, 24Mbps)

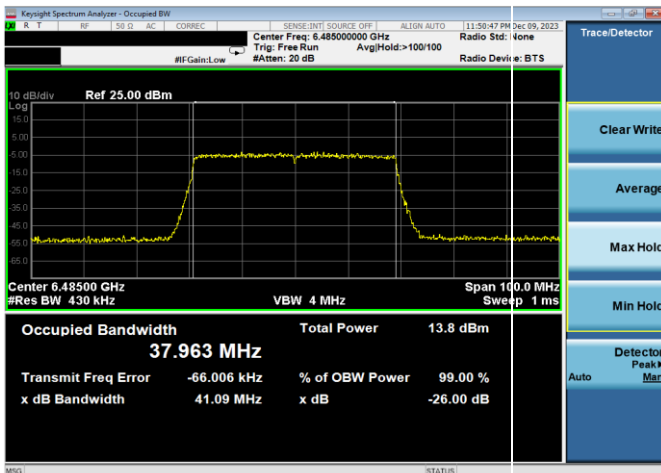
FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 27 of 336



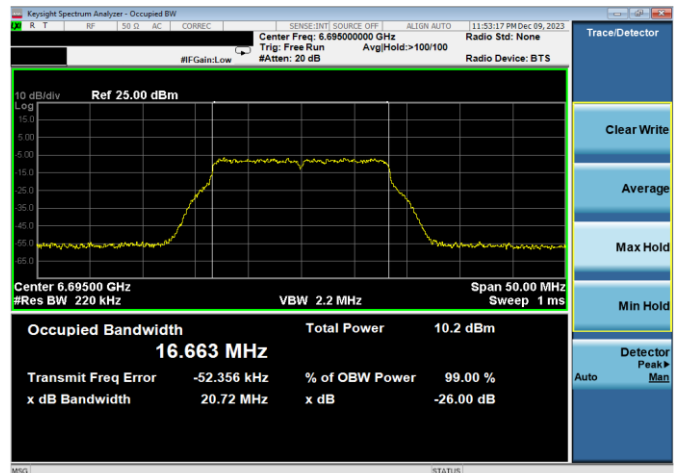
Plot 7-27. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 6) – Ch. 105, MCS4)



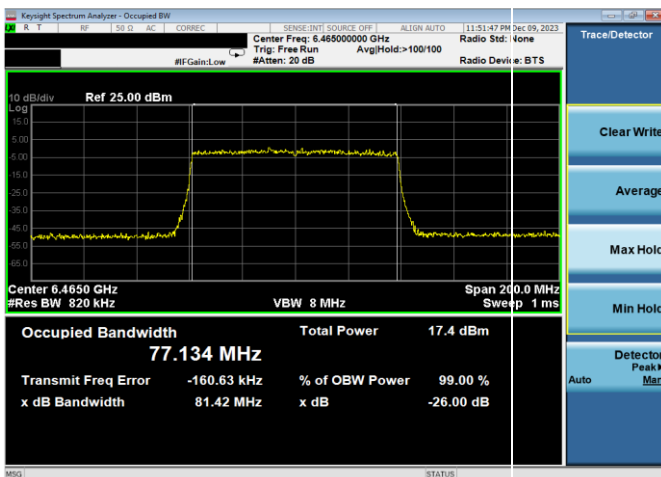
Plot 7-30. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 6) – Ch. 111, MCS4)



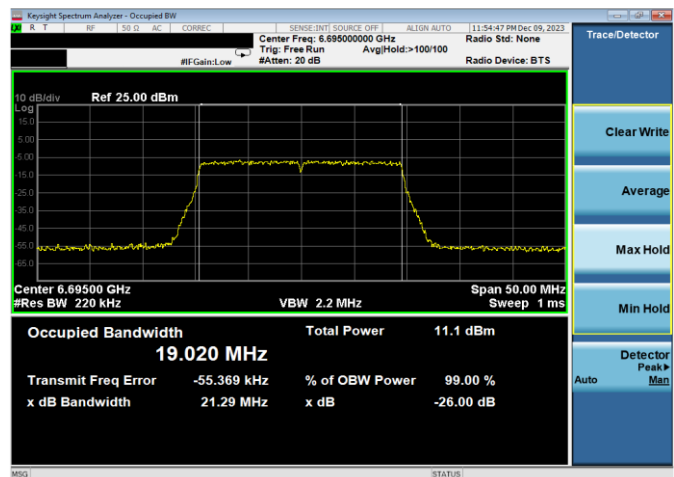
Plot 7-28. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 6) – Ch. 107, MCS4)



Plot 7-31. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 7) – Ch. 149, 24Mbps)

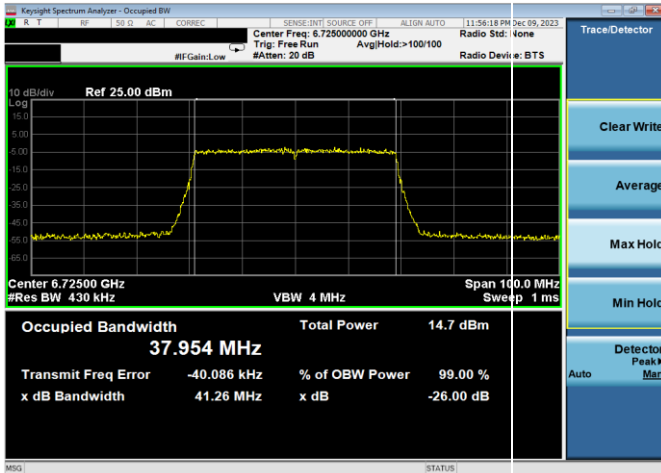


Plot 7-29. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 6) – Ch. 103, MCS4)

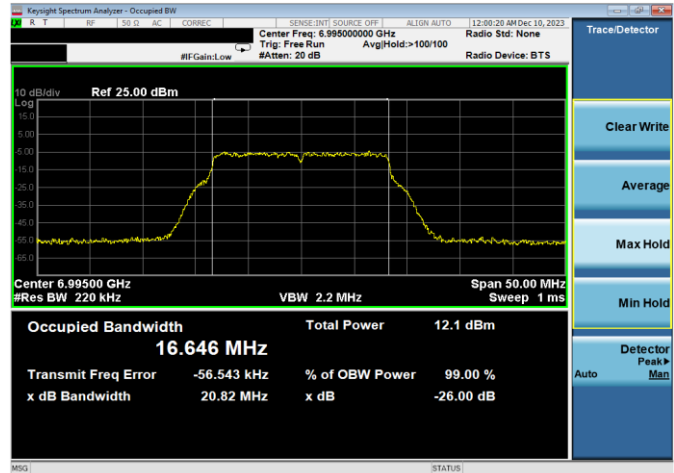


Plot 7-32. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 7) – Ch. 149, MCS4)

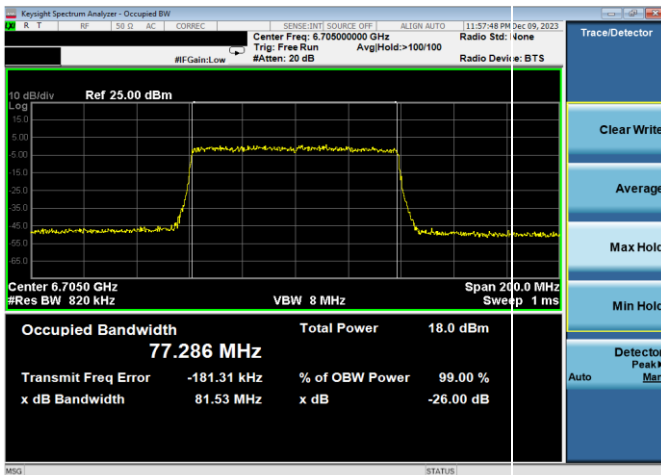
FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 28 of 336



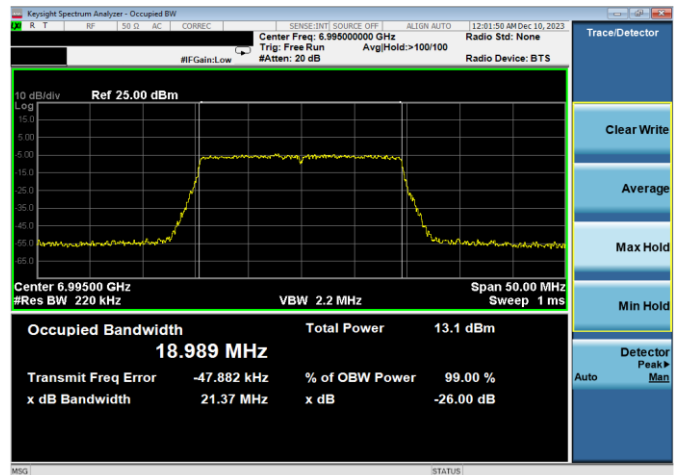
Plot 7-33. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 7) – Ch. 155, MCS4)



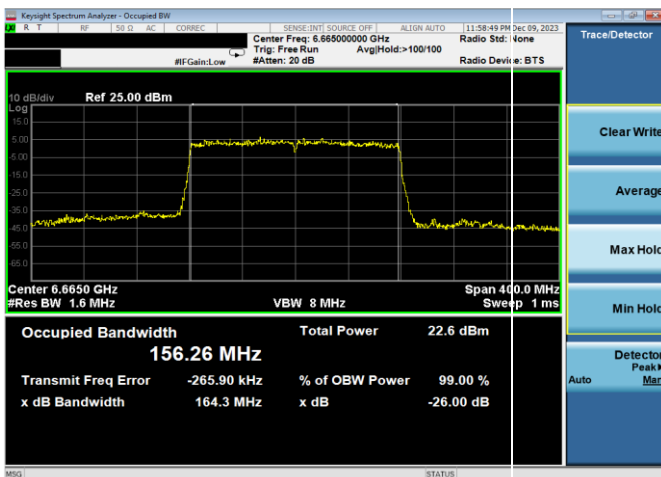
Plot 7-36. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 8) – Ch. 209, 24Mbps)



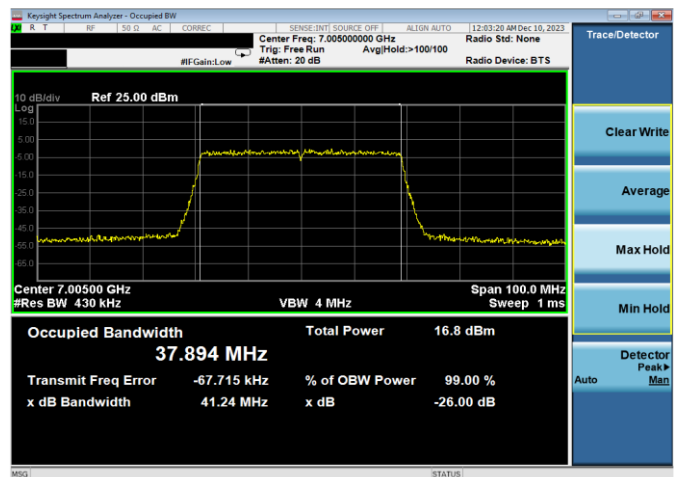
Plot 7-34. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 7) – Ch. 151, MCS4)



Plot 7-37. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 8) – Ch. 209, MCS4)

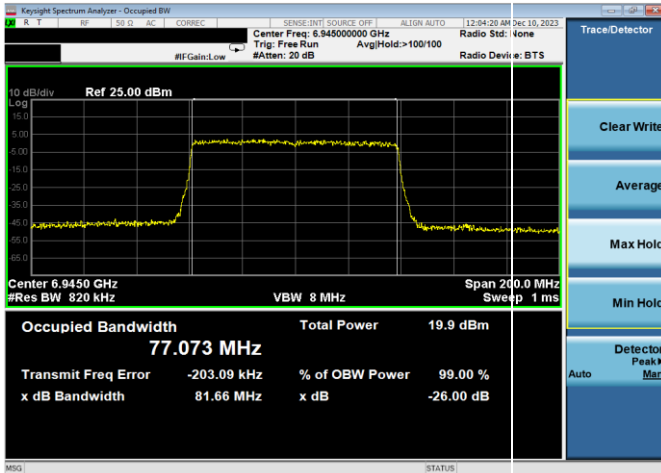


Plot 7-35. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 7) – Ch. 143, MCS4)

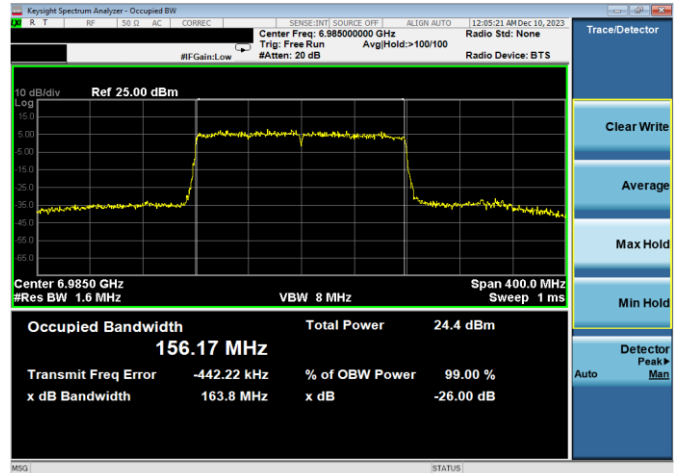


Plot 7-38. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 8) – Ch. 211, MCS4)


FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 29 of 336



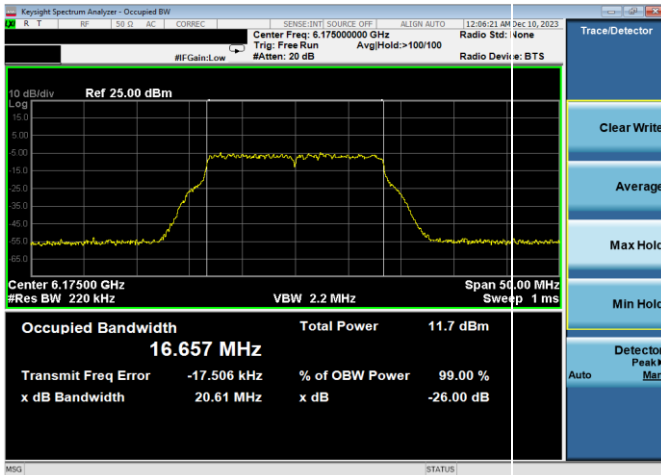
Plot 7-39. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz)  
 802.11ax (UNII Band 8) – Ch. 199, MCS4)



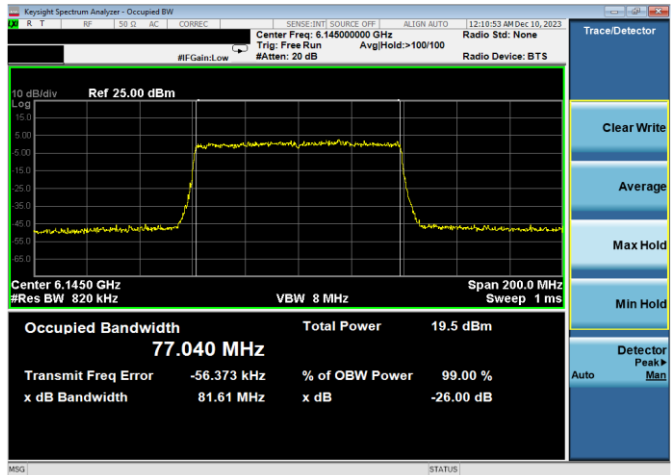
Plot 7-40. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz)  
 802.11ax (UNII Band 8) – Ch. 207, MCS4)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 30 of 336

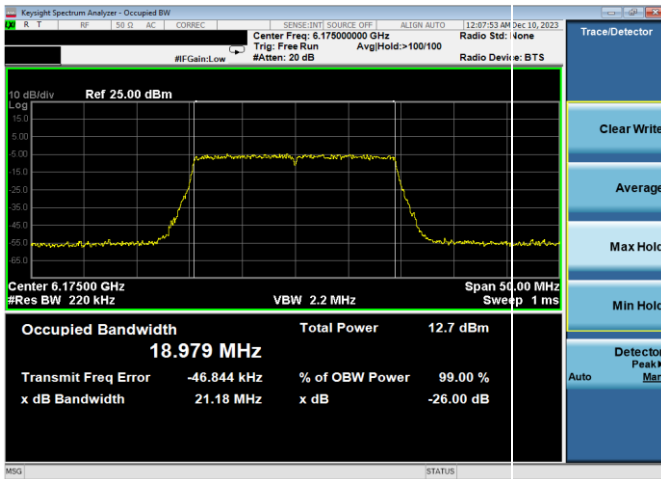
### High Data Rate



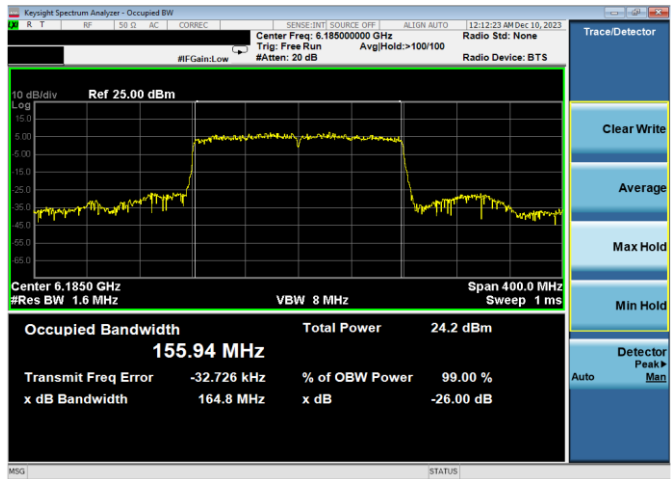
Plot 7-41. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 5) – Ch. 45, 54Mbps)



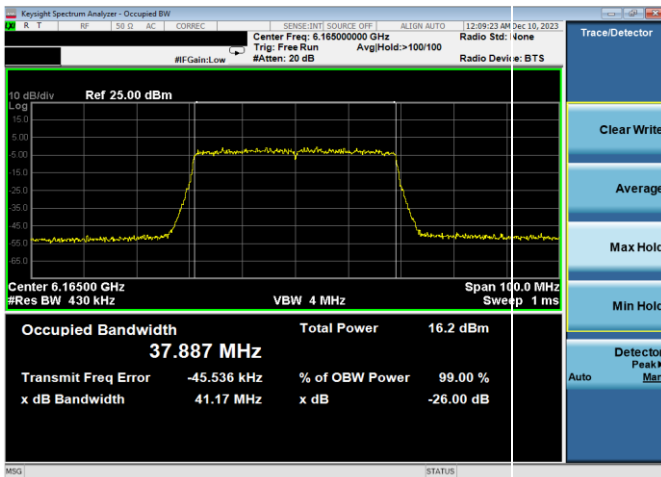
Plot 7-44. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 5) – Ch. 39, MCS11)



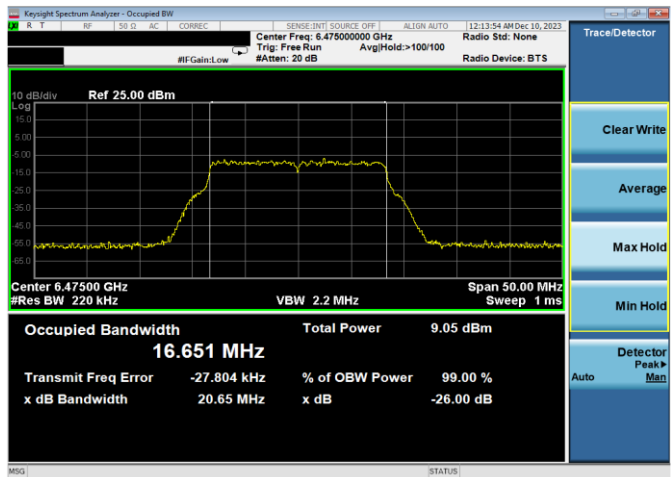
Plot 7-42. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 5) – Ch. 45, MCS11)



Plot 7-45. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 5) – Ch. 47, MCS11)

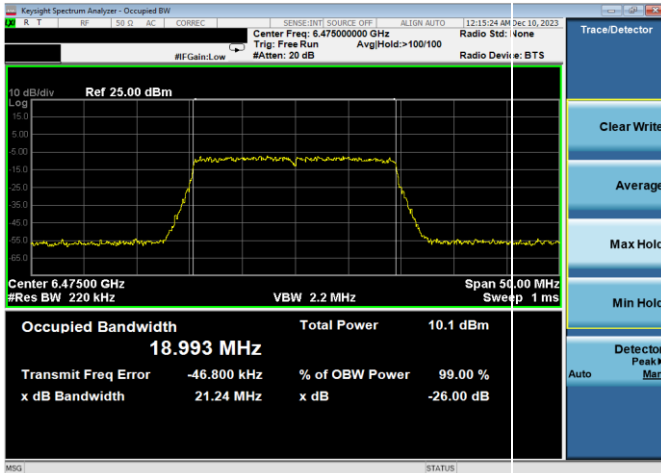


Plot 7-43. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 5) – Ch. 43, MCS11)

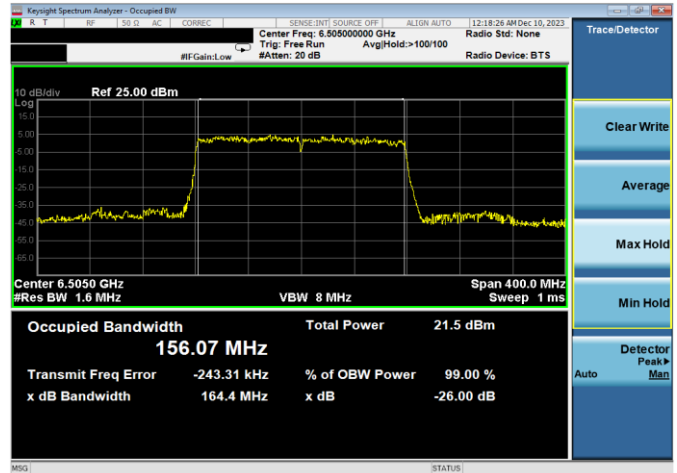


Plot 7-46. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 6) – Ch. 105, 54Mbps)

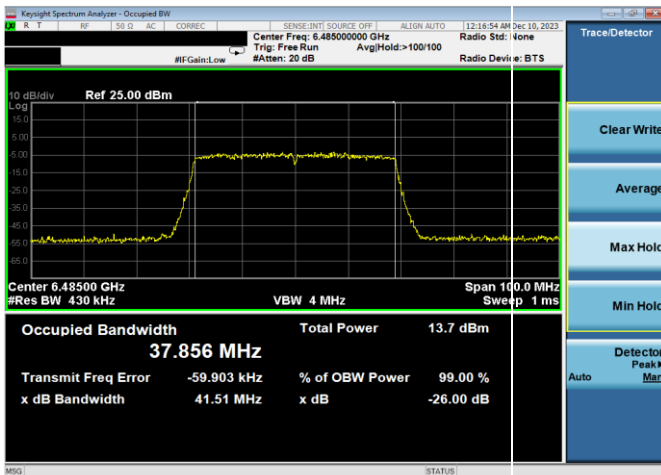
FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 31 of 336



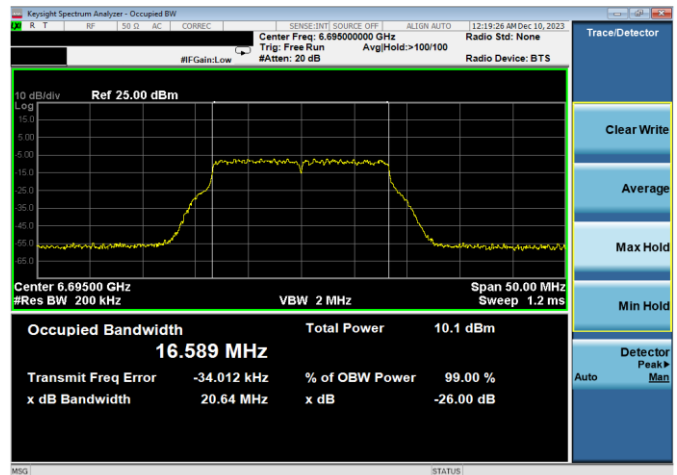
Plot 7-47. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 6) – Ch. 105, MCS11)



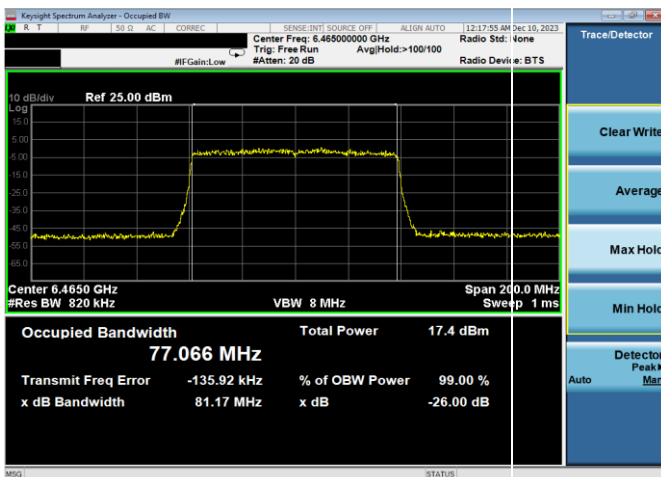
Plot 7-50. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 6) – Ch. 111, MCS11)



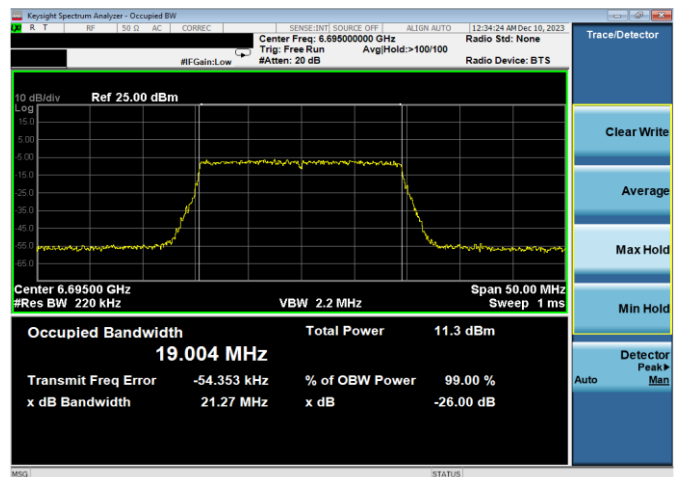
Plot 7-48. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 6) – Ch. 107, MCS11)



Plot 7-51. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 7) – Ch. 149, 54Mbps)



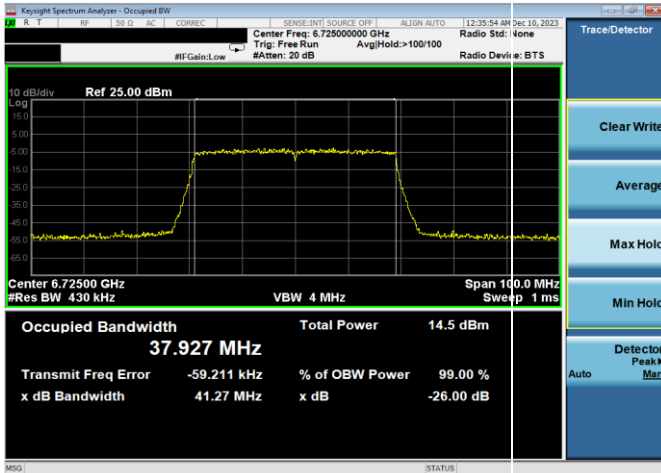
Plot 7-49. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 6) – Ch. 103, MCS11)



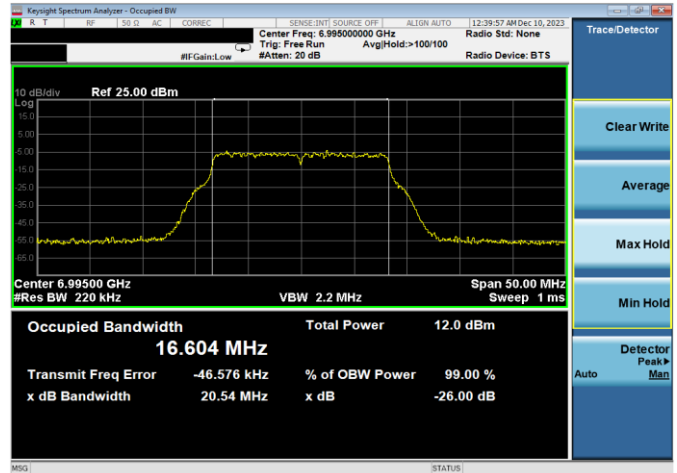
Plot 7-52. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 7) – Ch. 149, MCS11)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 32 of 336

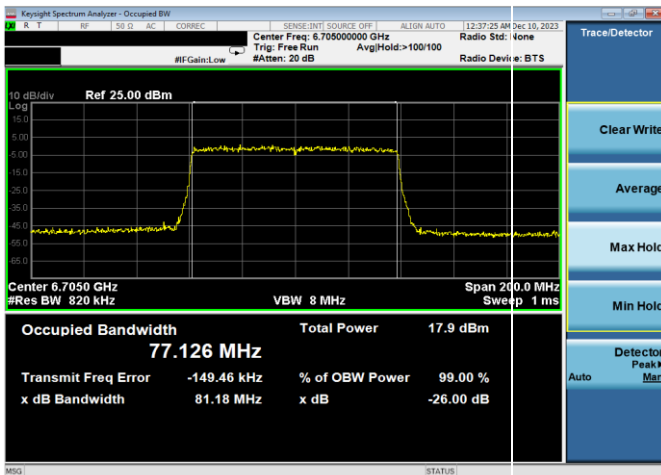




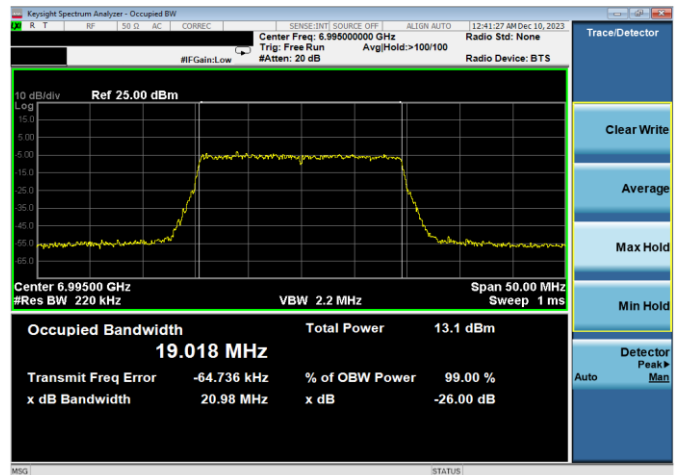
Plot 7-53. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 7) – Ch. 155, MCS11)



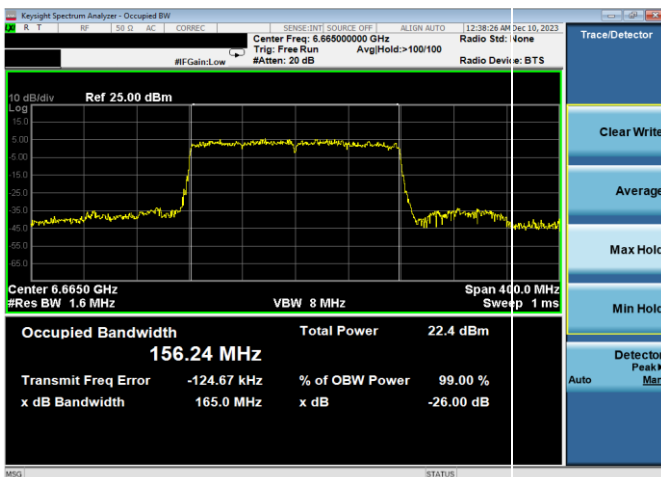
Plot 7-56. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 8) – Ch. 209, 54Mbps)



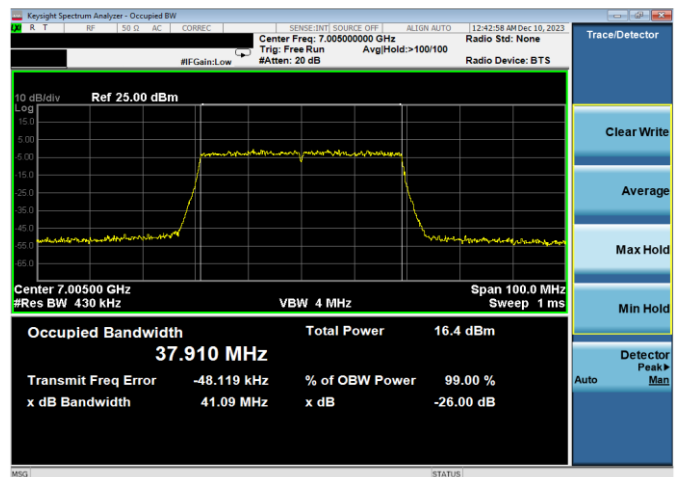
Plot 7-54. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 7) – Ch. 151, MCS11)



Plot 7-57. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 8) – Ch. 209, MCS11)

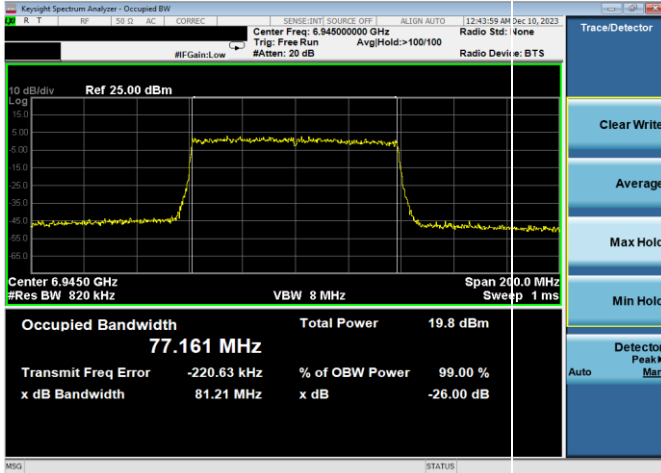


Plot 7-55. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 7) – Ch. 143, MCS11)

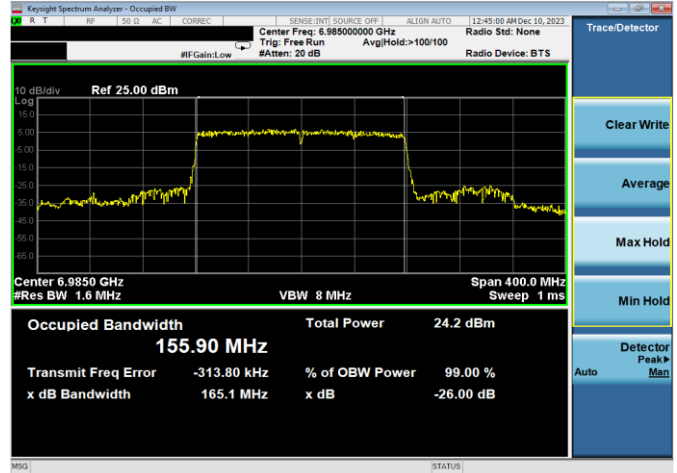


Plot 7-58. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 8) – Ch. 211, MCS11)


FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 33 of 336



Plot 7-59. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 8) – Ch. 199, MCS11)



Plot 7-60. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 8) – Ch. 207, MCS11)

FCC ID: BCGA2902 IC: 579C-A2902		<b>MEASUREMENT REPORT</b> (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 34 of 336

## 7.2.2 Antenna WF7a 26dB & 99% Bandwidth Measurements


	Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
Band 5	5955	1	a	12	16.72	20.90	320	Pass
	6175	45	a	12	16.73	20.80	320	Pass
	6415	93	a	12	16.65	20.71	320	Pass
	5955	1	ax (20MHz)	24/25.8 (MCS2)	19.01	21.21	320	Pass
	6175	45	ax (20MHz)	24/25.8 (MCS2)	19.05	21.44	320	Pass
	6415	93	ax (20MHz)	24/25.8 (MCS2)	19.02	21.30	320	Pass
	5695	3	ax (40MHz)	49/51.6 (MCS2)	37.93	41.13	320	Pass
	6165	43	ax (40MHz)	49/51.6 (MCS2)	37.88	41.16	320	Pass
	6405	91	ax (40MHz)	49/51.6 (MCS2)	37.91	41.12	320	Pass
	5985	7	ax (80MHz)	102/108.1 (MCS2)	77.20	81.52	320	Pass
	6145	39	ax (80MHz)	102/108.1 (MCS2)	77.10	81.75	320	Pass
	6385	87	ax (80MHz)	102/108.1 (MCS2)	77.06	81.71	320	Pass
	6025	15	ax (160MHz)	183.8/216.2 (MCS2)	156.06	164.94	320	Pass
	6185	47	ax (160MHz)	183.8/216.2 (MCS2)	156.13	165.09	320	Pass
6345	79	ax (160MHz)	183.8/216.2 (MCS2)	156.08	164.92	320	Pass	
Band 6	6435	97	a	12	16.68	20.69	320	Pass
	6475	105	a	12	16.67	20.66	320	Pass
	6515	113	a	12	16.70	20.66	320	Pass
	6345	97	ax (20MHz)	24/25.8 (MCS2)	19.01	21.16	320	Pass
	6475	105	ax (20MHz)	24/25.8 (MCS2)	19.03	21.02	320	Pass
	6515	113	ax (20MHz)	24/25.8 (MCS2)	19.01	21.48	320	Pass
	6445	99	ax (40MHz)	49/51.6 (MCS2)	37.95	41.35	320	Pass
	6485	107	ax (40MHz)	49/51.6 (MCS2)	37.92	41.38	320	Pass
	6525	115	ax (40MHz)	49/51.6 (MCS2)	37.90	41.33	320	Pass
	6465	103	ax (80MHz)	102/108.1 (MCS2)	77.10	81.64	320	Pass
6505	111	ax (160MHz)	183.8/216.2 (MCS2)	156.27	163.93	320	Pass	
Band 7	6535	117	a	12	16.73	20.57	320	Pass
	6695	149	a	12	16.71	20.87	320	Pass
	6875	185	a	12	16.69	20.83	320	Pass
	6535	117	ax (20MHz)	24/25.8 (MCS2)	19.01	21.03	320	Pass
	6695	149	ax (20MHz)	24/25.8 (MCS2)	19.03	20.99	320	Pass
	6875	185	ax (20MHz)	24/25.8 (MCS2)	19.02	21.20	320	Pass
	6565	123	ax (40MHz)	49/51.6 (MCS2)	37.89	41.48	320	Pass
	6725	155	ax (40MHz)	49/51.6 (MCS2)	37.91	41.25	320	Pass
	6885	179	ax (40MHz)	49/51.6 (MCS2)	37.92	41.39	320	Pass
	6545	119	ax (80MHz)	102/108.1 (MCS2)	77.05	81.17	320	Pass
	6705	151	ax (80MHz)	102/108.1 (MCS2)	77.23	81.79	320	Pass
	6865	183	ax (80MHz)	102/108.1 (MCS2)	77.20	81.34	320	Pass
	6665	143	ax (160MHz)	183.8/216.2 (MCS2)	156.36	164.24	320	Pass
	6825	175	ax (160MHz)	183.8/216.2 (MCS2)	156.16	164.37	320	Pass
Band 8	6895	189	a	12	16.71	20.86	320	Pass
	6995	209	a	12	16.69	20.83	320	Pass
	7115	233	a	12	16.68	20.84	320	Pass
	6895	189	ax (20MHz)	24/25.8 (MCS2)	19.02	21.01	320	Pass
	6995	209	ax (20MHz)	24/25.8 (MCS2)	19.03	21.26	320	Pass
	7115	233	ax (20MHz)	24/25.8 (MCS2)	19.02	20.94	320	Pass
	6925	187	ax (40MHz)	49/51.6 (MCS2)	37.90	41.51	320	Pass
	7005	211	ax (40MHz)	49/51.6 (MCS2)	37.91	41.63	320	Pass
	7085	227	ax (40MHz)	49/51.6 (MCS2)	37.95	41.36	320	Pass
	6945	199	ax (80MHz)	102/108.1 (MCS2)	77.28	80.89	320	Pass
	7025	215	ax (80MHz)	102/108.1 (MCS2)	77.13	81.21	320	Pass
	6985	207	ax (160MHz)	183.8/216.2 (MCS2)	156.16	164.81	320	Pass

Table 7-5. Conducted Bandwidth Measurements Antenna WF7a (Low Data Rate)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 35 of 336


	Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
Band 5	5955	1	a	24	16.66	20.80	320	Pass
	6175	45	a	24	16.66	20.73	320	Pass
	6415	93	a	24	16.70	20.77	320	Pass
	5955	1	ax (20MHz)	49/51.6 (MCS4)	19.02	21.09	320	Pass
	6175	45	ax (20MHz)	49/51.6 (MCS4)	19.00	21.09	320	Pass
	6415	93	ax (20MHz)	49/51.6 (MCS4)	19.05	21.06	320	Pass
	5695	3	ax (40MHz)	98/103.2 (MCS4)	37.89	41.15	320	Pass
	6165	43	ax (40MHz)	98/103.2 (MCS4)	37.90	41.18	320	Pass
	6405	91	ax (40MHz)	98/103.2 (MCS4)	37.93	41.14	320	Pass
	5985	7	ax (80MHz)	204/216.2 (MCS4)	77.15	81.15	320	Pass
	6145	39	ax (80MHz)	204/216.2 (MCS4)	77.09	81.80	320	Pass
	6385	87	ax (80MHz)	204/216.2 (MCS4)	77.06	81.42	320	Pass
	6025	15	ax (160MHz)	367.5/432.4 (MCS4)	156.14	164.66	320	Pass
6185	47	ax (160MHz)	367.5/432.4 (MCS4)	156.16	164.08	320	Pass	
6345	79	ax (160MHz)	367.5/432.4 (MCS4)	155.94	163.72	320	Pass	
Band 6	6435	97	a	24	16.66	20.74	320	Pass
	6475	105	a	24	16.69	20.70	320	Pass
	6515	113	a	24	16.69	20.69	320	Pass
	6345	97	ax (20MHz)	49/51.6 (MCS4)	19.02	20.86	320	Pass
	6475	105	ax (20MHz)	49/51.6 (MCS4)	19.00	21.07	320	Pass
	6515	113	ax (20MHz)	49/51.6 (MCS4)	19.00	21.01	320	Pass
	6445	99	ax (40MHz)	98/103.2 (MCS4)	37.92	41.31	320	Pass
	6485	107	ax (40MHz)	98/103.2 (MCS4)	37.90	41.17	320	Pass
	6525	115	ax (40MHz)	98/103.2 (MCS4)	37.89	41.48	320	Pass
	6465	103	ax (80MHz)	204/216.2 (MCS4)	77.17	81.46	320	Pass
	6505	111	ax (160MHz)	367.5/432.4 (MCS4)	156.26	164.12	320	Pass
Band 7	6535	117	a	24	16.65	20.67	320	Pass
	6695	149	a	24	16.68	20.83	320	Pass
	6875	185	a	24	16.66	20.79	320	Pass
	6535	117	ax (20MHz)	49/51.6 (MCS4)	19.00	21.28	320	Pass
	6695	149	ax (20MHz)	49/51.6 (MCS4)	19.02	21.05	320	Pass
	6875	185	ax (20MHz)	49/51.6 (MCS4)	19.01	21.08	320	Pass
	6565	123	ax (40MHz)	98/103.2 (MCS4)	37.82	41.17	320	Pass
	6725	155	ax (40MHz)	98/103.2 (MCS4)	37.92	41.04	320	Pass
	6885	179	ax (40MHz)	98/103.2 (MCS4)	37.95	40.99	320	Pass
	6545	119	ax (80MHz)	204/216.2 (MCS4)	77.28	81.49	320	Pass
	6705	151	ax (80MHz)	204/216.2 (MCS4)	77.23	81.28	320	Pass
	6865	183	ax (80MHz)	204/216.2 (MCS4)	77.05	81.03	320	Pass
	6665	143	ax (160MHz)	367.5/432.4 (MCS4)	156.04	163.78	320	Pass
6825	175	ax (160MHz)	367.5/432.4 (MCS4)	156.19	164.10	320	Pass	
Band 8	6895	189	a	24	16.64	20.78	320	Pass
	6995	209	a	24	16.65	20.91	320	Pass
	7115	233	a	24	16.66	20.61	320	Pass
	6895	189	ax (20MHz)	49/51.6 (MCS4)	19.02	21.15	320	Pass
	6995	209	ax (20MHz)	49/51.6 (MCS4)	18.97	20.95	320	Pass
	7115	233	ax (20MHz)	49/51.6 (MCS4)	19.01	21.24	320	Pass
	6925	187	ax (40MHz)	98/103.2 (MCS4)	37.91	40.96	320	Pass
	7005	211	ax (40MHz)	98/103.2 (MCS4)	37.96	41.24	320	Pass
	7085	227	ax (40MHz)	98/103.2 (MCS4)	37.90	41.21	320	Pass
	6945	199	ax (80MHz)	204/216.2 (MCS4)	77.04	81.27	320	Pass
7025	215	ax (80MHz)	204/216.2 (MCS4)	77.14	81.66	320	Pass	
6985	207	ax (160MHz)	367.5/432.4 (MCS4)	156.19	163.05	320	Pass	

**Table 7-6. Conducted Bandwidth Measurements Antenna WF7a (Mid Data Rate)**

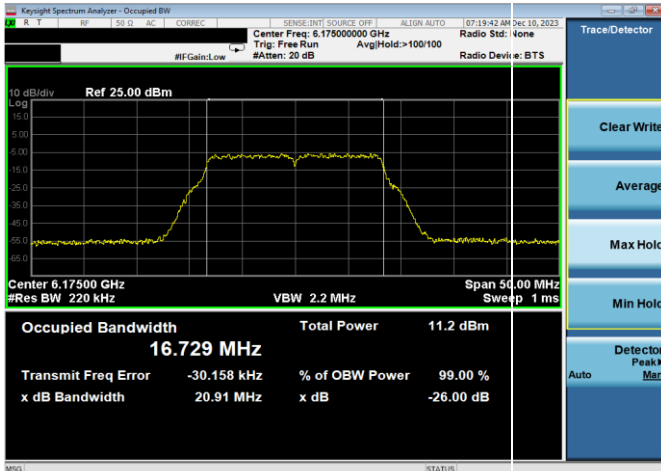
FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 36 of 336

	Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]	Maximum Bandwidth Limit [MHz]	Pass / Fail
Band 5	5955	1	a	54	16.59	20.57	320	Pass
	6175	45	a	54	16.62	20.51	320	Pass
	6415	93	a	54	16.64	20.76	320	Pass
	5955	1	ax (20MHz)	135/143.4 (MCS11)	19.00	21.13	320	Pass
	6175	45	ax (20MHz)	135/143.4 (MCS11)	19.02	21.29	320	Pass
	6415	93	ax (20MHz)	135/143.4 (MCS11)	19.02	21.06	320	Pass
	5695	3	ax (40MHz)	271/286.8 (MCS11)	37.89	41.15	320	Pass
	6165	43	ax (40MHz)	271/286.8 (MCS11)	37.86	40.95	320	Pass
	6405	91	ax (40MHz)	271/286.8 (MCS11)	37.91	41.24	320	Pass
	5985	7	ax (80MHz)	567/600.5 (MCS11)	77.09	81.81	320	Pass
	6145	39	ax (80MHz)	567/600.5 (MCS11)	77.10	81.29	320	Pass
	6385	87	ax (80MHz)	567/600.5 (MCS11)	77.15	81.03	320	Pass
	6025	15	ax (160MHz)	1020.8/1201 (MCS11)	155.95	165.02	320	Pass
	6185	47	ax (160MHz)	1020.8/1201 (MCS11)	156.12	163.90	320	Pass
6345	79	ax (160MHz)	1020.8/1201 (MCS11)	155.79	164.76	320	Pass	
Band 6	6435	97	a	54	16.64	20.55	320	Pass
	6475	105	a	54	16.63	20.65	320	Pass
	6515	113	a	54	16.65	20.35	320	Pass
	6345	97	ax (20MHz)	135/143.4 (MCS11)	19.01	21.20	320	Pass
	6475	105	ax (20MHz)	135/143.4 (MCS11)	18.98	20.99	320	Pass
	6515	113	ax (20MHz)	135/143.4 (MCS11)	19.03	21.01	320	Pass
	6445	99	ax (40MHz)	271/286.8 (MCS11)	37.82	41.06	320	Pass
	6485	107	ax (40MHz)	271/286.8 (MCS11)	37.83	41.24	320	Pass
	6525	115	ax (40MHz)	271/286.8 (MCS11)	37.89	41.04	320	Pass
	6465	103	ax (80MHz)	567/600.5 (MCS11)	77.10	80.97	320	Pass
	6505	111	ax (160MHz)	1020.8/1201 (MCS11)	156.05	164.11	320	Pass
Band 7	6535	117	a	54	16.59	20.57	320	Pass
	6695	149	a	54	16.61	20.43	320	Pass
	6875	185	a	54	16.62	20.66	320	Pass
	6535	117	ax (20MHz)	135/143.4 (MCS11)	19.00	21.09	320	Pass
	6695	149	ax (20MHz)	135/143.4 (MCS11)	19.00	20.92	320	Pass
	6875	185	ax (20MHz)	135/143.4 (MCS11)	19.01	21.31	320	Pass
	6565	123	ax (40MHz)	271/286.8 (MCS11)	37.85	41.18	320	Pass
	6725	155	ax (40MHz)	271/286.8 (MCS11)	37.85	41.40	320	Pass
	6885	179	ax (40MHz)	271/286.8 (MCS11)	37.85	41.07	320	Pass
	6545	119	ax (80MHz)	567/600.5 (MCS11)	77.24	81.60	320	Pass
	6705	151	ax (80MHz)	567/600.5 (MCS11)	77.21	81.50	320	Pass
	6865	183	ax (80MHz)	567/600.5 (MCS11)	77.15	81.74	320	Pass
	6665	143	ax (160MHz)	1020.8/1201 (MCS11)	156.13	164.57	320	Pass
	6825	175	ax (160MHz)	1020.8/1201 (MCS11)	155.97	164.76	320	Pass
Band 8	6895	189	a	54	16.63	20.71	320	Pass
	6995	209	a	54	16.65	20.49	320	Pass
	7115	233	a	54	16.61	20.61	320	Pass
	6895	189	ax (20MHz)	135/143.4 (MCS11)	19.04	21.14	320	Pass
	6995	209	ax (20MHz)	135/143.4 (MCS11)	19.03	21.20	320	Pass
	7115	233	ax (20MHz)	135/143.4 (MCS11)	18.97	21.10	320	Pass
	6925	187	ax (40MHz)	271/286.8 (MCS11)	37.89	41.05	320	Pass
	7005	211	ax (40MHz)	271/286.8 (MCS11)	37.89	41.31	320	Pass
	7085	227	ax (40MHz)	271/286.8 (MCS11)	37.93	41.06	320	Pass
	6945	199	ax (80MHz)	567/600.5 (MCS11)	77.11	81.52	320	Pass
	7025	215	ax (80MHz)	567/600.5 (MCS11)	77.10	81.45	320	Pass
6985	207	ax (160MHz)	1020.8/1201 (MCS11)	156.27	164.36	320	Pass	

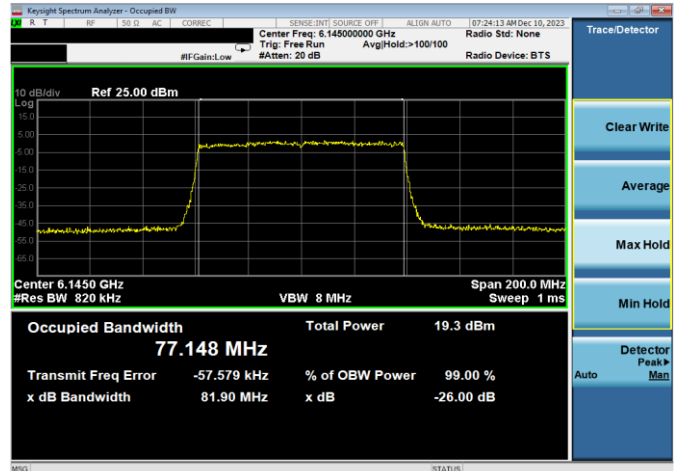
**Table 7-7. Conducted Bandwidth Measurements Antenna WF7a (High Data Rate)**

FCC ID: BCGA2902 IC: 579C-A2902		<b>MEASUREMENT REPORT</b> (Certification)	<b>Approved by:</b> Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 37 of 336

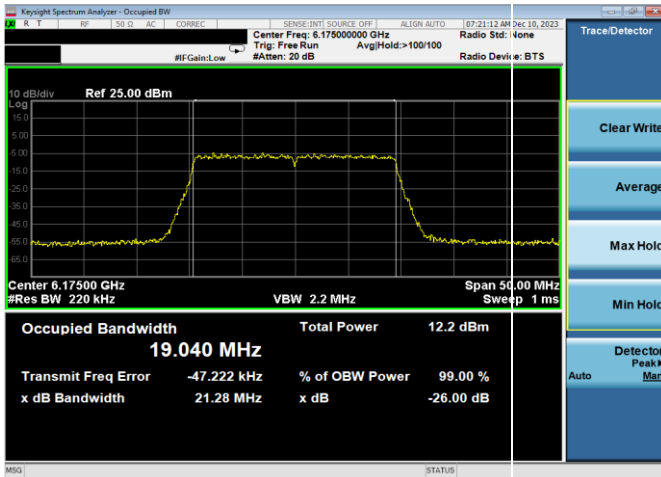
### Low Data Rate



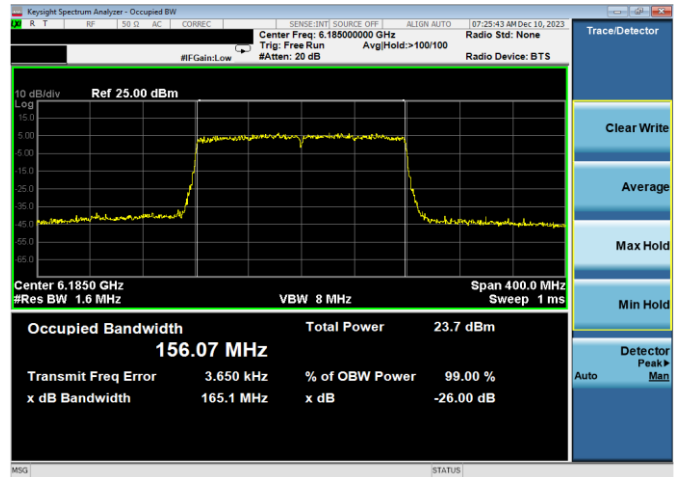
Plot 7-61. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 5) – Ch. 45, 12Mbps)



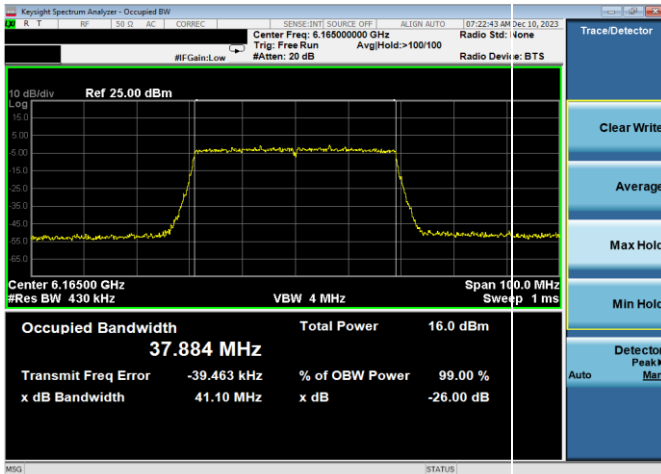
Plot 7-64. 26dB & 99% Bandwidth Plot Antenna WF8 (80MHz 802.11ax (UNII Band 5) – Ch. 39, MCS2)



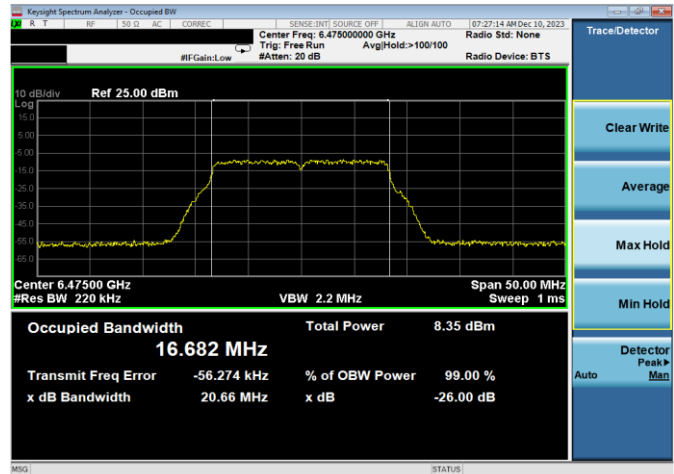
Plot 7-62. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11ax (UNII Band 5) – Ch. 45, MCS2)



Plot 7-65. 26dB & 99% Bandwidth Plot Antenna WF8 (160MHz 802.11ax (UNII Band 5) – Ch. 47, MCS2)



Plot 7-63. 26dB & 99% Bandwidth Plot Antenna WF8 (40MHz 802.11ax (UNII Band 5) – Ch. 43, MCS2)



Plot 7-66. 26dB & 99% Bandwidth Plot Antenna WF8 (20MHz 802.11a (UNII Band 6) – Ch. 105, 12Mbps)

FCC ID: BCGA2902 IC: 579C-A2902		MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N: 1C2311270063-13-R1.BCG	Test Dates: 11/29/2023 - 04/04/2024	EUT Type: Tablet Device	Page 38 of 336