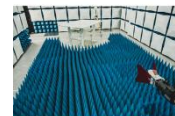




Element Materials Technology

(formerly PCTEST)
18855 Adams Court, Morgan Hill, CA 95037 USA
Tel. 408.538.5600
<http://www.element.com>



MEASUREMENT REPORT

FCC PART 15.247 / ISD RSS-247 WLAN 802.11b/g/n/ax

Applicant Name:

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

Date of Testing:

5/20/2024 - 7/01/2024

Test Report Issue Date:

9/3/2024

Test Site/Location:

Element Materials Technology Morgan Hill, CA, USA

Test Report Serial No.:

1C2405200017-03-R1.BCG

FCC ID:

BCGA2993

IC:

579C-A2993

APPLICANT:

Apple Inc.

Application Type:

Certification

Model/HVIN:

A2993

EUT Type:

Tablet Device

Frequency Range:

2412 – 2472MHz

FCC Classification:

Digital Transmission System (DTS)

FCC Rule Part(s):

Part 15 Subpart C (15.247)

ISED Specification:

RSS-247 Issue 3

Test Procedure(s):

ANSI C63.10-2020, KDB 558074 D01 v05r02,
KDB 662911 D01 v02r01

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 C63.10-2020 and KDB 558074 D01 v05r02. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 1C2405200017-03-R1.BCG) supersedes and replaces the previously issued test report on the same subject device from the same type of testing as included. 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: WKR0000007111

Reviewed by: WKR0000005849



FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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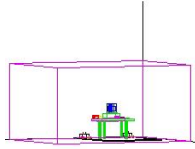
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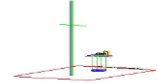
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MEASUREMENT REPORT



Mode	Tx Frequency (MHz)	Antenna WF8				Antenna WF7				CDD					
		Avg Conducted		Peak Conducted		Avg Conducted		Peak Conducted		Summed		Avg Conducted		Peak Conducted	
		Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
802.11g	2412 - 2472	189.234	22.77	567.545	27.54	193.642	22.87	554.626	27.44	305.492	24.85	877.001	29.43		
802.11n	2412 - 2472	189.671	22.78	582.103	27.65	192.309	22.84	574.116	27.59	294.442	24.69	912.011	29.60		
802.11ax (SU)	2412 - 2467	194.089	22.88	587.489	27.69	190.108	22.79	574.116	27.59	257.632	24.11	870.964	29.40		

EUT Overview (Low Data Rate)

Mode	Tx Frequency (MHz)	Antenna WF8				Antenna WF7				CDD			
		Avg Conducted		Peak Conducted		Avg Conducted		Peak Conducted		Summed			
		Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
802.11g	2412 - 2472	188.799	22.76	606.736	27.83	189.671	22.78	601.174	27.79	300.608	24.78	881.049	29.45
802.11n	2412 - 2472	191.867	22.83	620.869	27.93	190.108	22.79	616.595	27.90	293.089	24.67	887.156	29.48
802.11ax (SU)	2412 - 2467	192.309	22.84	620.869	27.93	191.426	22.82	615.177	27.89	266.686	24.26	879.023	29.44

EUT Overview (Mid Data Rate)

Mode	Tx Frequency (MHz)	Antenna WF8				Antenna WF7				CDD			
		Avg Conducted		Peak Conducted		Avg Conducted		Peak Conducted		Summed			
		Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
802.11b	2412 - 2472	199.067	22.99	362.243	25.59	194.984	22.90	355.631	25.51	N/A	N/A	N/A	N/A
802.11g	2412 - 2472	150.661	21.78	641.210	28.07	145.211	21.62	638.263	28.05	245.471	23.90	877.001	29.43
802.11n	2412 - 2472	154.170	21.88	638.263	28.05	144.877	21.61	636.796	28.04	247.172	23.93	868.960	29.39
802.11ax (SU)	2412 - 2467	151.008	21.79	647.143	28.11	145.546	21.63	639.735	28.06	249.459	23.97	883.080	29.46

EUT Overview (High Data 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.

- 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 Recognition 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: BCGA2993, IC: 579C-A2993**. The test data contained in this report pertains only to the emissions due to the EUT's WLAN (DTS) transmitter.

Test Device Serial No.: F2DC65676T, QRQXC0F4VX, QM1447F0Y2, CWNWRCFHJ9, TD7K46CKPJ, H9HH590003X00003MW, H9HH5L0000Z0000R50

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), WPT, 802.15.4

This device supports BT Beamforming

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13*	2472
7	2442		

Table 2-1. 802.11b/g/n/ax Frequency/Channel Operations

*Channel 13 is disabled for DTS 802.11ax HE20.

Note: 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 6.0 b) of KDB 558074 D01 v05r02 and ANSI C63.10-2020. 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:

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Measured Duty Cycles				
802.11 Mode/Band		Duty Cycles [%]		
		Antenna WF8	Antenna WF7	CDD
2.4GHz	b	100.0	100.0	N/A
	g (Low Data Rate)	98.2	98.1	97.6
	g (Mid Data Rate)	96.3	96.2	95.7
	g (High Data Rate)	94.2	94.3	93.9
	n (Low Data Rate)	96.8	96.9	96.3
	n (Mid Data Rate)	94.1	93.3	94.1
	n (High Data Rate)	91.0	91.0	91.6
	11ax (SU) (Low Data Rate)	96.1	95.4	96.1
	11ax (SU) (Mid Data Rate)	93.1	92.8	93.1
	11ax (SU) (High Data Rate)	87.9	88.2	87.6

Table 2-2. Measured Duty Cycles

The device employs CDD technology. Below are the possible configurations.

WiFi Configurations		SISO		SDM		CDD	
		Antenna WF8	Antenna WF7	Antenna WF8	Antenna WF7	Antenna WF8	Antenna WF7
2.4GHz	11b	✓	✓	✗	✗	✗	✗
	11g	✓	✓	✓	✓	✓	✓
	11n	✓	✓	✓	✓	✓	✓
	11ax	✓	✓	✓	✓	✓	✓

Table 2-3. Wi-Fi Configurations

✓ = Support ; ✗ = NOT Support

SISO = Single Input Single Output

SDM = Spatial Diversity Multiplexing – CDD function

CDD = Cyclic Delay Diversity - 2Tx Function

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The device supports the following data rates (shown in Mbps):

802.11b	802.11g	MCS Index		Spatial Stream	802.11n		OFDM (802.11ax)		
20MHz					20MHz		20MHz		
		HT	VHT		0.8μs GI	0.4μs GI	0.8μs GI	1.6μs GI	3.2μs GI
1	6	0	0	1	6.5	7.2	8.6	8.1	7.3
2	9	1	1	1	13	14.4	17.2	16.3	14.6
5.5	12	2	2	1	19.5	21.7	25.8	24.4	21.9
11	18	3	3	1	26	28.9	34.4	32.5	29.3
-	24	4	4	1	39	43.3	51.6	48.8	43.9
-	36	5	5	1	52	57.8	68.8	65	58.5
-	48	6	6	1	58.5	65	77.4	73.1	65.8
-	54	7	7	1	65	72.2	86	81.3	73.1
-	-	-	8	1	78	86.7	103.2	97.5	87.8
-	-	-	9	1	-	-	114.7	108.3	97.5
-	6	8	0	2	13	14.4	17.2	16.3	14.6
-	9	9	1	2	26	28.9	34.4	32.5	29.3
5.5	12	10	2	2	39	43.3	51.6	48.8	43.9
11	18	11	3	2	52	57.8	68.8	65	58.5
-	24	12	4	2	78	86.7	103.2	97.5	87.8
-	36	13	5	2	104	115.6	137.6	130	117
-	48	14	6	2	117	130	154.9	146.3	131.6
-	54	15	7	2	130	144.4	172.1	162.5	146.3
-	-	-	8	2	156	173.3	206.5	195	175.5
-	-	-	9	2	-	-	229.4	216.7	195

Table 2-4. Supported Data Rates

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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
WF2	Config 1	X	✓	X	X	✓	X
WF2	Config 2	X	✓	X	✓	X	X
WF2	Config 3	X	X	✓	X	✓	X
WF2	Config 4	X	X	✓	✓	X	X

Table 2-5. 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 RF Bluetooth and RF UNII test reports.

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 both connected and disconnected modes, and Wi-Fi (2.4GHz) - Wi-Fi max power will not exceed minimum of (13.5dBm, SAR max cap, Reg max cap) power. Bluetooth can simultaneously transmit with IEEE 802.11a/n/ac/ax 5/6 GHz on separate antenna.

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2.3 Antenna Description

Following antenna gains provided by manufacturer were used for the testing.

Frequency [GHz]	Antenna Gain (dBi)	
	Antenna WF8	Antenna WF7
2.4	0.7	0.8

Table 2-6. Highest Antenna Gain

2.4 Test Support Equipment

1	Apple MacBook Pro	Model:	A2141	S/N:	C02H604EQ05D
	w/AC/DC Adapter	Model:	A2166	S/N:	C4H042705ZNPM0WA6
2	Apple USB-C Cable	Model:	Spartan	S/N:	GXK1336018XKTR024
3	USB-C Cable	Model:	A246C	S/N:	DWH80115BK826GV19
	w/ AC Adapter	Model:	A2305	S/N:	C4H95160004PF4F4V
4	Apple Pencil	Model:	A2538	S/N:	KJ26TCFXJW
5	DC Power Supply	Model:	KPS3010D	S/N:	N/A

Table 2-7. Test Support Equipment List

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2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2020 and KDB 558074 D01 v05r02. ANSI C63.10-2020 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, Section 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 the worst case has been reported.

- 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

802.11n CDD mode test data provided in this report covers 802.11n SDM.

802.11ax-SU HE20 2TX CDD mode test data provided in this report covers 802.11ax-SU HE20 2TX SDM.

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:

- 802.11b
 - 11Mbps
- 802.11g
 - Low Data Rate: 12Mbps
 - Mid Data Rate: 24Mbps
 - High Data Rate: 54Mbps
- 802.11n
 - Low Data Rate: MCS2/MCS10 (SISO/CDD)
 - Mid Data Rate: MCS4/MCS12 (SISO/CDD)
 - High Data Rate: MCS7/MCS15 (SISO/CDD)
- 802.11ax(SU)
 - Low Data Rate: MCS2
 - Mid Data Rate: MCS4
 - High Data Rate: MCS9

For 802.11ax-RU test results, see separate WLAN (OFDMA) report, 1C2405200017-04.BCG

2.6 Software and Firmware

The test was conducted with firmware version 22A312 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 C63.10-2020) and the guidance provided in KDB 558074 D01 v05r02 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 groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that the 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 D01 v01r01, 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 rotated about its vertical axis 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 connections to an external antenna.

Conclusion:

The EUT unit 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)	5.22

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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-26.5GHz PXA Signal Analyzer	10/18/2023	Annual	10/18/2024	MY55330128
Anritsu	ML2495A	Power Meter	7/8/2024	Annual	7/8/2025	1039008
Anritsu	MA2411B	Pulse Power Sensor	7/1/2024	Annual	7/1/2025	1911105
Anritsu	MA2411B	Pulse Power Sensor	11/8/2023	Annual	11/8/2024	1027293
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	3/14/2024	Annual	3/14/2025	T058701-01
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	4/9/2024	Annual	4/9/2025	00218555
Fairview Microwave/MCL	FMCA1975-36/BW-K10-2W44+	30MHz-40GHz Conducted Cable/Attenuator *	6/10/2024	Annual	6/10/2025	-
Keysight Technology	N9040B	UXA Signal Analyzer	5/28/2024	Annual	5/28/2025	MY57212015
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/15/2023	Annual	8/15/2024	101639
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/14/2024	Annual	8/15/2025	101648
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/29/2024	Annual	5/29/2025	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	5/1/2024	Annual	5/1/2025	101867
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	7/3/2024	Annual	7/3/2025	102356
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/10/2024	Annual	6/10/2025	100057
Rohde & Schwarz	HFH2-Z2	Loop Antenna	6/21/2024	Annual	6/21/2025	100519
Rohde & Schwarz	ENV216	Two-Line V-Network	4/24/2024	Annual	4/24/2025	101364
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	4/29/2024	Annual	4/29/2025	00304

Table 6-1. Test Equipment List

Note:

1. 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.
2. denotes passive equipment that have been internally verified/calibrated.

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7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.

FCC ID: BCGA2993

IC: 579C-A2993

FCC Classification: Digital Transmission System (DTS)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	> 500kHz	CONDUCTED	PASS	Section 7.2
2.1049	RSS-Gen [6.7]	Occupied Bandwidth	N/A		N/A	Section 7.2
15.247(b)(3)	RSS-247 [5.4]	Transmitter Output Power	< 1 Watt		PASS	Sections 7.3
15.247(e)	RSS-247 [5.2]	Transmitter Power Spectral Density	< 8dBm / 3kHz Band		PASS	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	≥ 20dBc		PASS	Sections 7.5, 7.6
15.205 15.209	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])	RADIATED	PASS	Sections 7.7, 7.8
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits (RSS-Gen[8.8])	AC LINE CONDUCTED	PASS	Section 7.9

Table 7-1. Summary of Test Results

Notes:

1. All modes of operation and data rates were investigated. 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 "Conducted Automation Software," version 1.1.0.
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 3.0.0.

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7.2 6dB BW and 99% OBW Measurement

§15.247(a.2); §2.1049; RSS-247 [5.2]; RSS-Gen [6.7]

Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the transmitter antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated and the worst case configuration results are reported in this section.

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible 6dB bandwidth is 500 kHz.

Test Procedure Used

ANSI C63.10-2020 – Subclause 11.8.2 Option 2

KDB 558074 D01 v05r02 – Section 8.2

RSS-Gen [6.7]

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 99% occupied bandwidth and the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 6$. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 100kHz
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, step 2 – 7 were repeated after changing the RBW such that it would be within 1 -5% of the 99% occupied bandwidth observed in Step 7

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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

The data rates have been classified into three different groups: low data rate, middle data rate, and high data rate. All three data rate groups have been investigated and only the worst case data rate per groups is reported.

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7.2.1 Antenna WF8 6 dB BW and 99% OBW Measurements

Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass/Fail
2412	1	g	12	16.57	16.06	0.50	Pass
2437	6	g	12	16.45	16.42	0.50	Pass
2462	11	g	12	16.56	16.39	0.50	Pass
2412	1	n	19.5/21.7 (MCS2)	17.72	17.35	0.50	Pass
2437	6	n	19.5/21.7 (MCS2)	17.65	17.61	0.50	Pass
2462	11	n	19.5/21.7 (MCS2)	17.71	17.55	0.50	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	18.92	18.94	0.50	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	18.93	19.04	0.50	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	18.95	18.99	0.50	Pass

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

Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass/Fail
2412	1	g	24	16.47	16.53	0.50	Pass
2437	6	g	24	16.46	16.51	0.50	Pass
2462	11	g	24	16.45	16.51	0.50	Pass
2412	1	n	39/43.3 (MCS4)	17.66	17.74	0.50	Pass
2437	6	n	39/43.3 (MCS4)	17.65	17.72	0.50	Pass
2462	11	n	39/43.3 (MCS4)	17.65	17.73	0.50	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	18.93	19.07	0.50	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	18.94	19.09	0.50	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	18.93	19.11	0.50	Pass

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

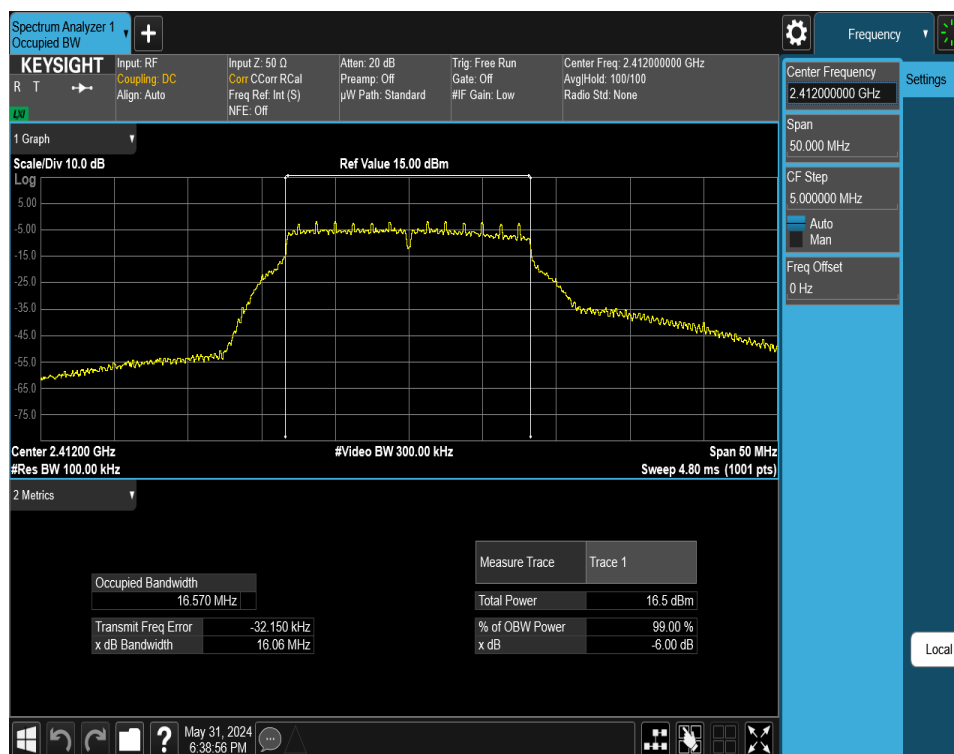
Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass/Fail
2412	1	b	11	12.79	8.51	0.50	Pass
2437	6	b	11	12.89	9.08	0.50	Pass
2462	11	b	11	12.84	8.95	0.50	Pass
2412	1	g	54	16.48	16.55	0.50	Pass
2437	6	g	54	16.50	16.54	0.50	Pass
2462	11	g	54	16.49	16.56	0.50	Pass
2412	1	n	65/72.2 (MCS7)	17.68	17.77	0.50	Pass
2437	6	n	65/72.2 (MCS7)	17.70	17.77	0.50	Pass
2462	11	n	65/72.2 (MCS7)	17.68	17.77	0.50	Pass
2412	1	ax (SU)	81/86 (MCS9)	18.96	19.12	0.50	Pass
2437	6	ax (SU)	81/86 (MCS9)	18.97	19.11	0.50	Pass
2462	11	ax (SU)	81/86 (MCS9)	18.96	19.10	0.50	Pass

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

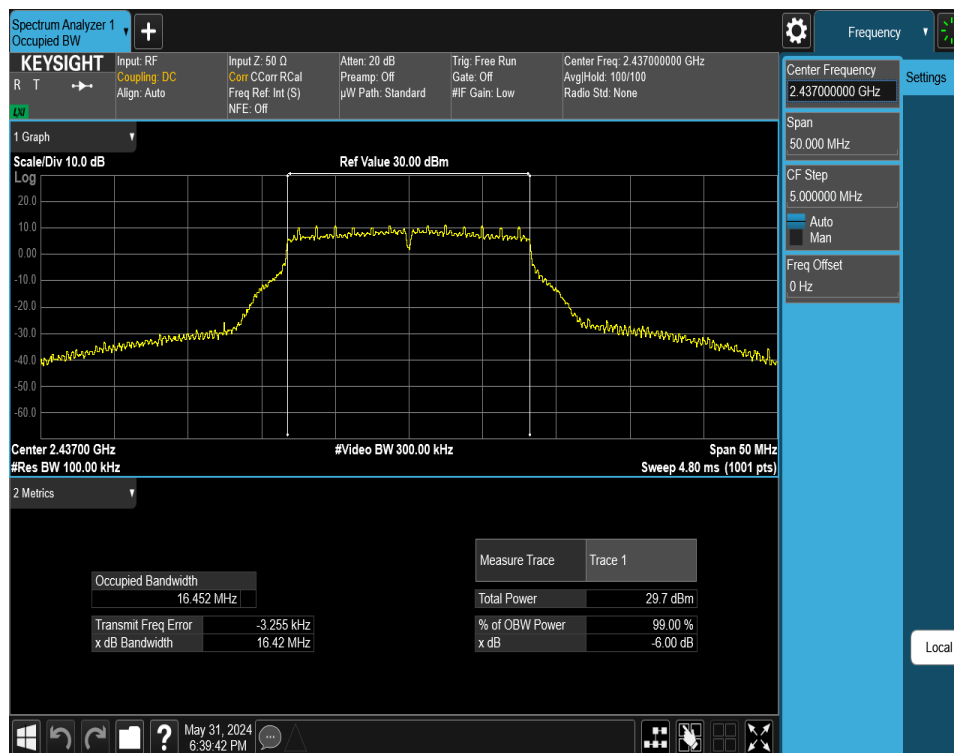
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Low Rate



Plot 7-1. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 1) – 12Mbps



Plot 7-2. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 6) – 12Mbps

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Plot 7-3. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 11) – 12Mbps

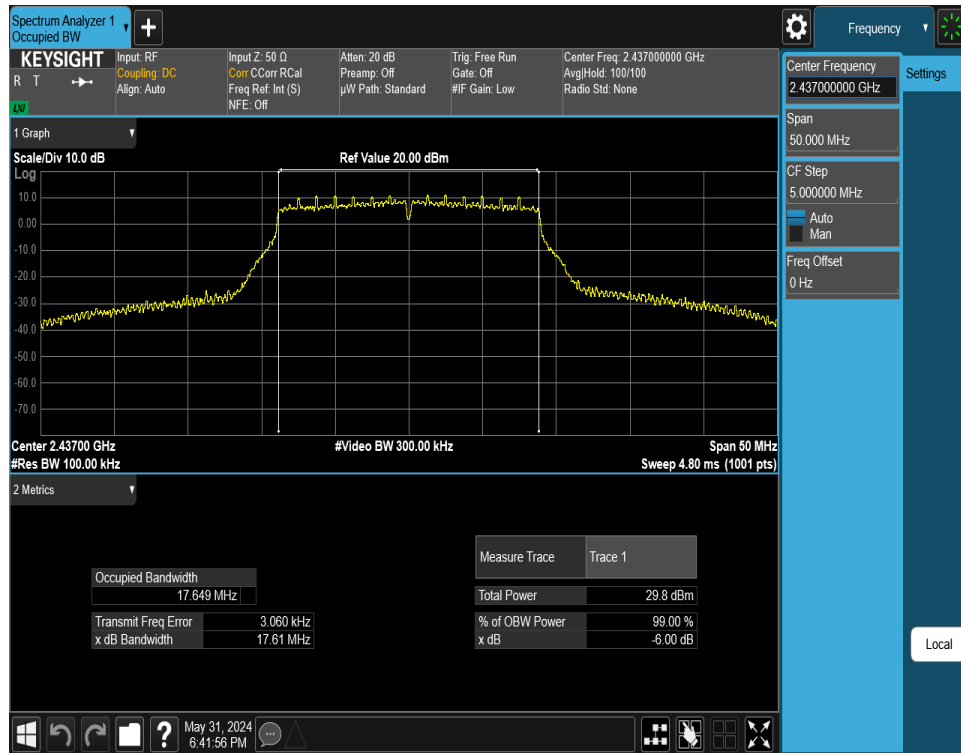


Plot 7-4. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 1) – MCS2

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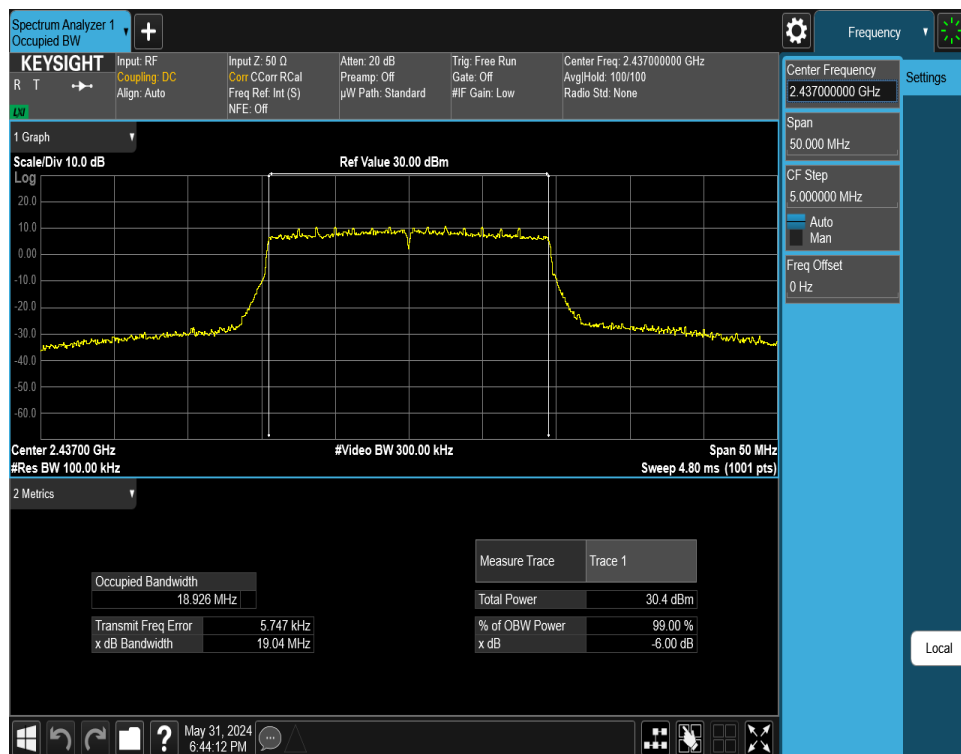
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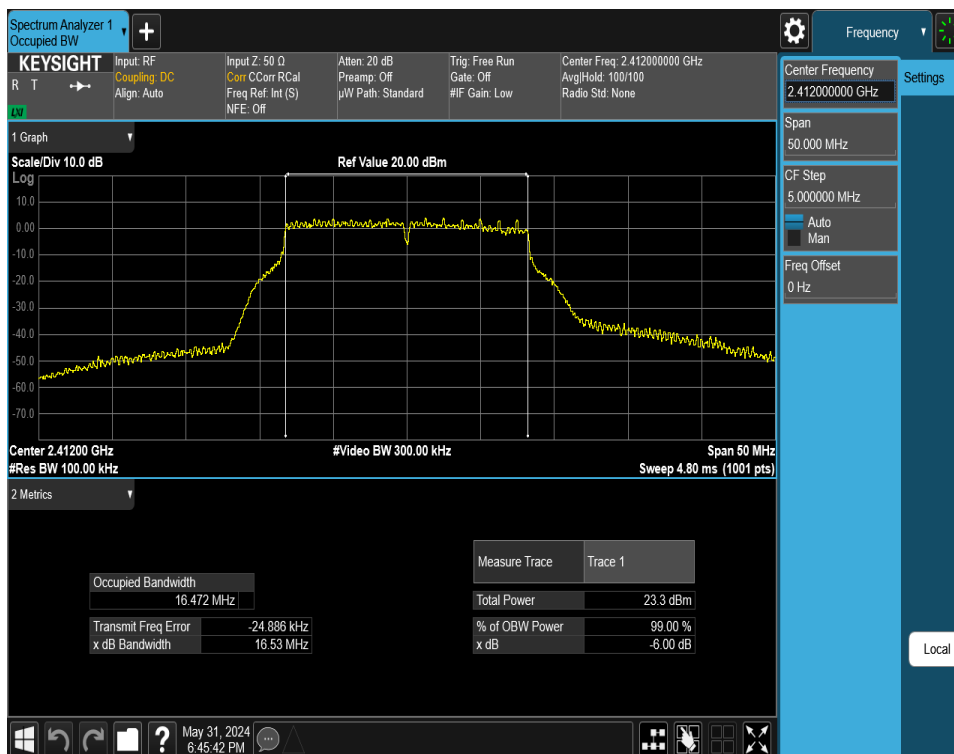
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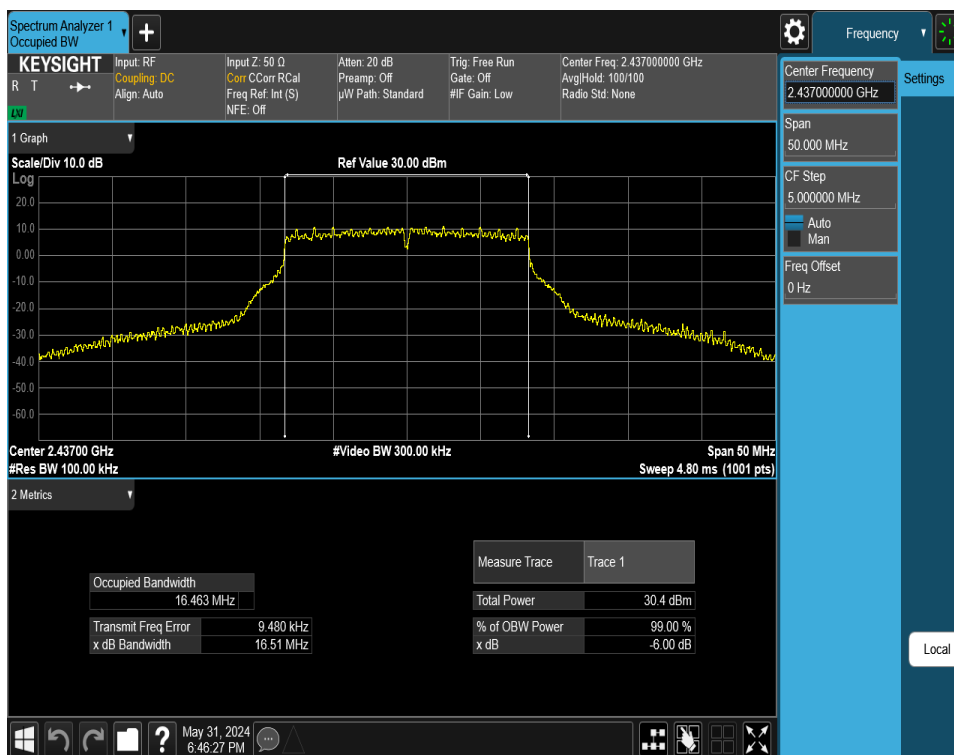
Plot 7-9. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS2

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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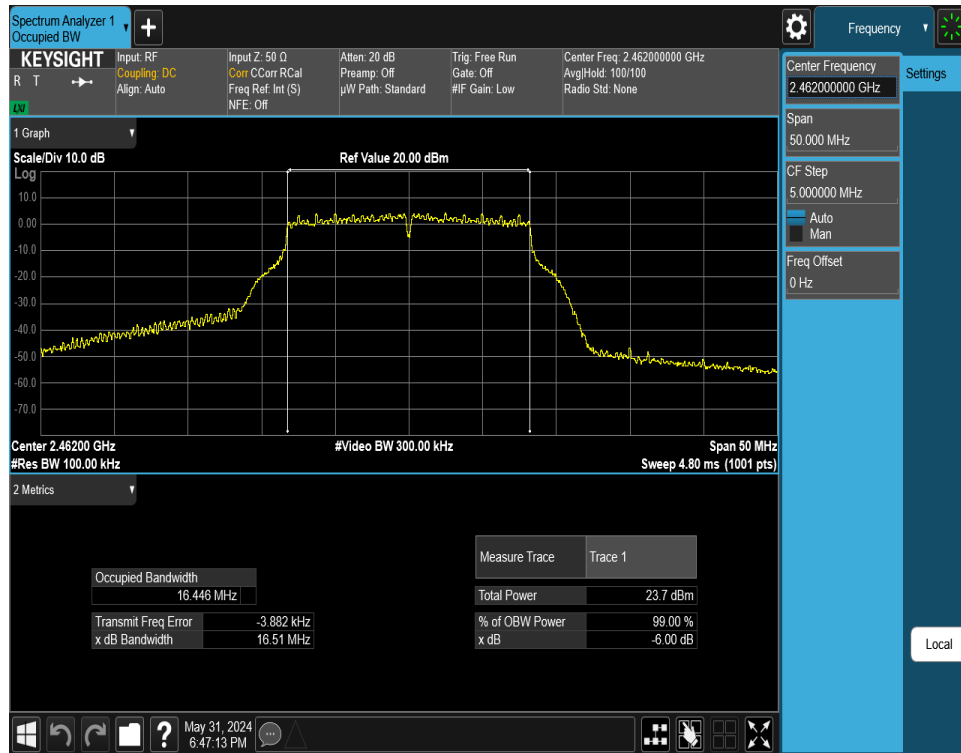


Plot 7-10. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 1) – 24Mbps

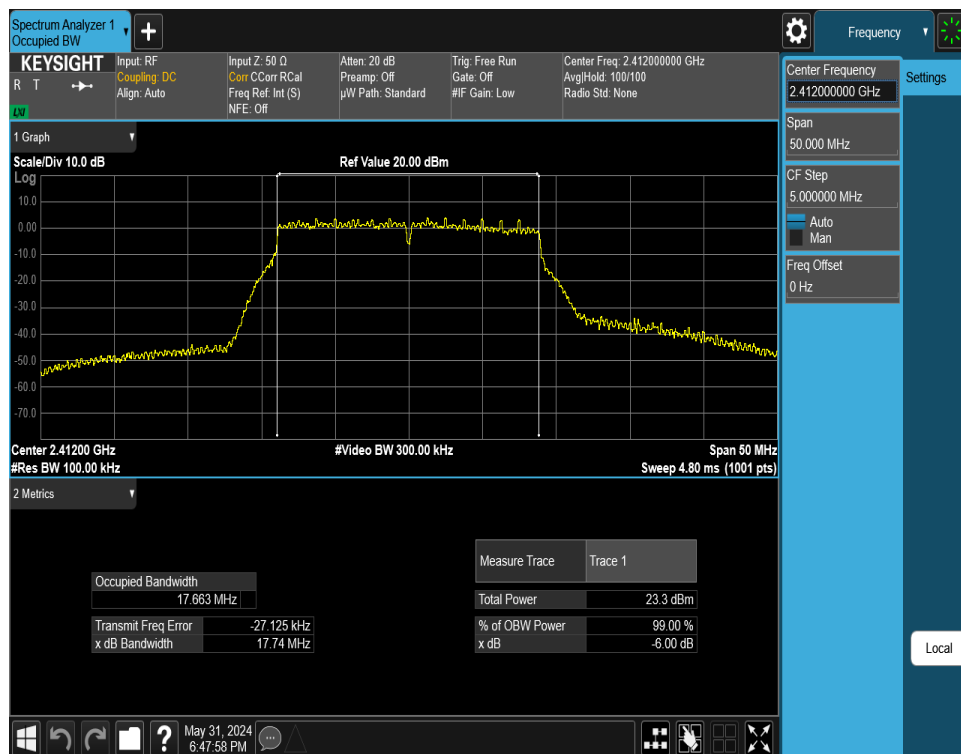


Plot 7-11. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 6) – 24Mbps

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Plot 7-12. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 11) – 24Mbps

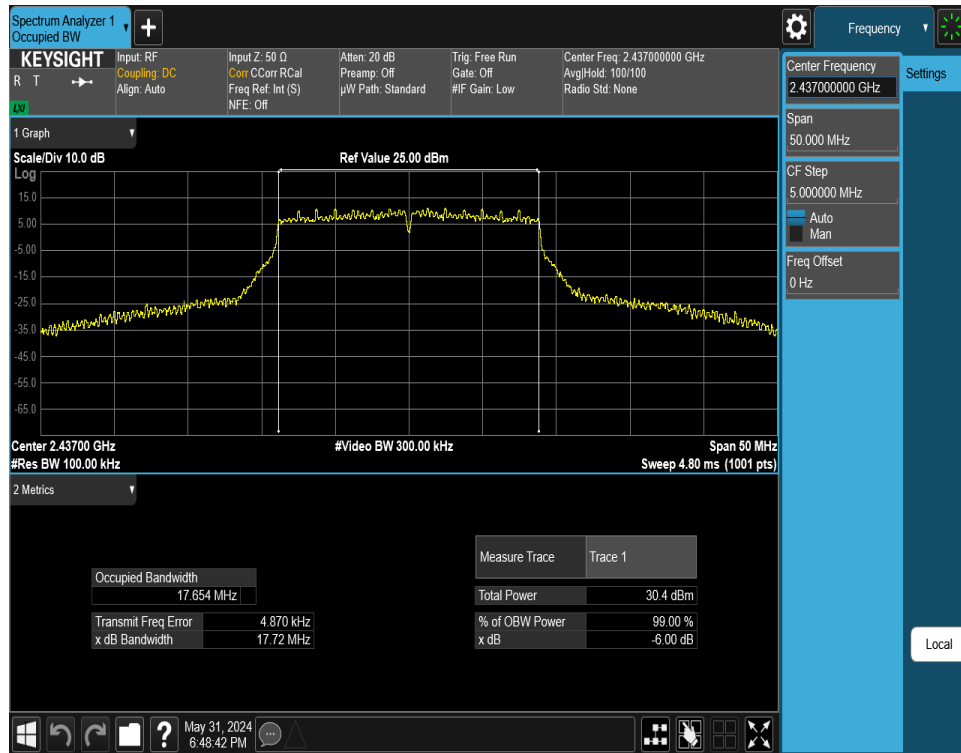


Plot 7-13. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 1) – MCS4

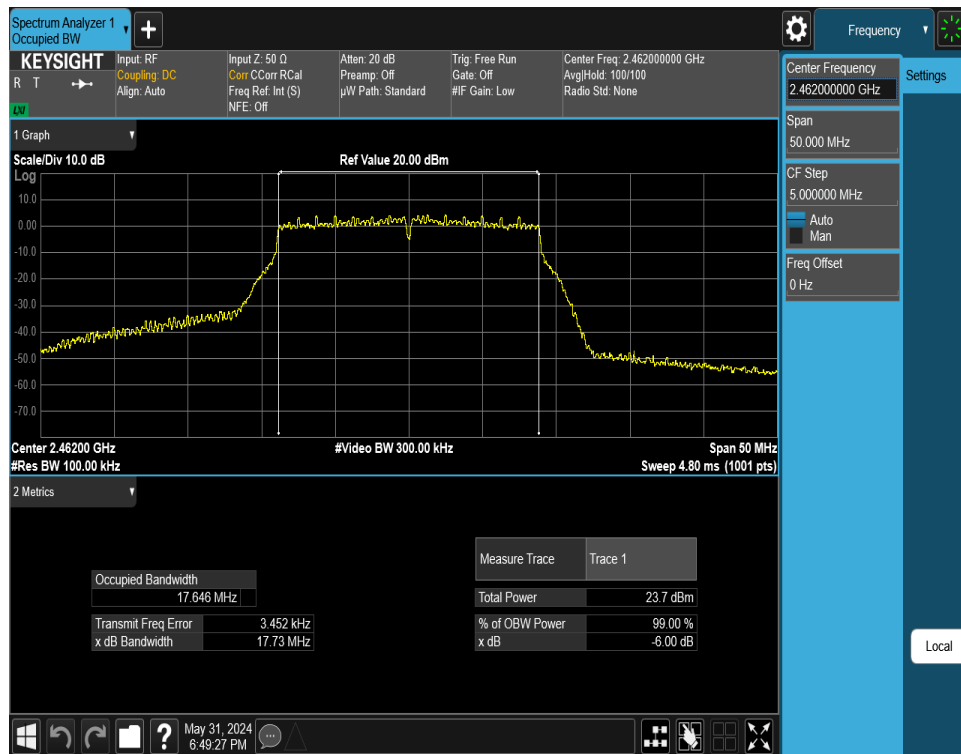
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 26 of 431

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Plot 7-14. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 6) – MCS4

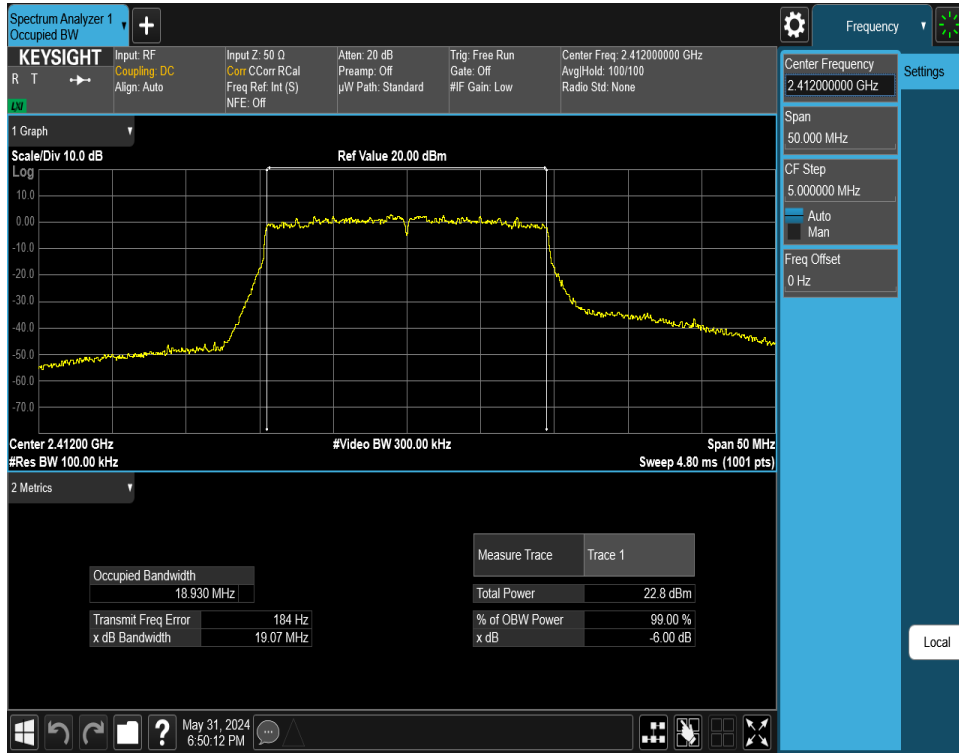


Plot 7-15. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 11) – MCS4

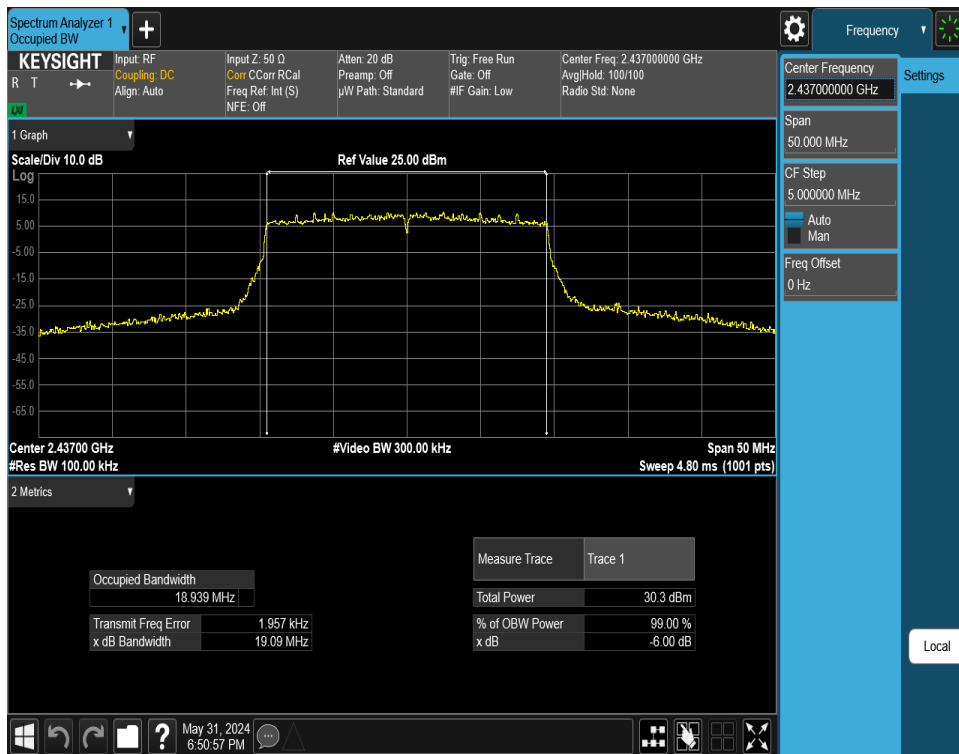
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 27 of 431

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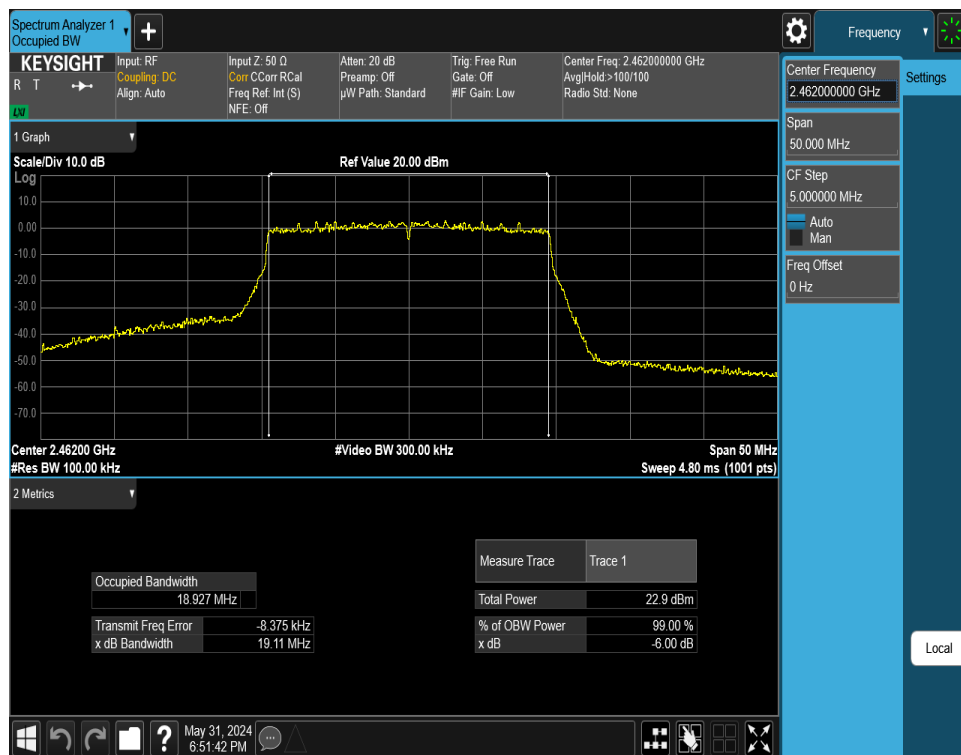


Plot 7-16. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS4



Plot 7-17. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS4

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 28 of 431



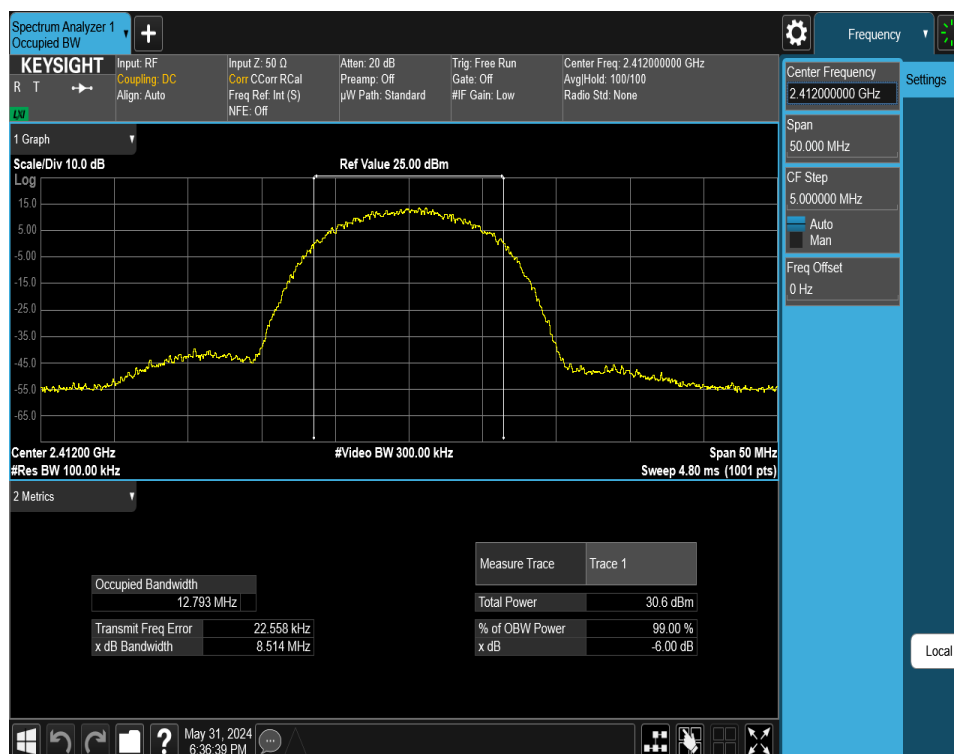
Plot 7-18. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS4

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 29 of 431

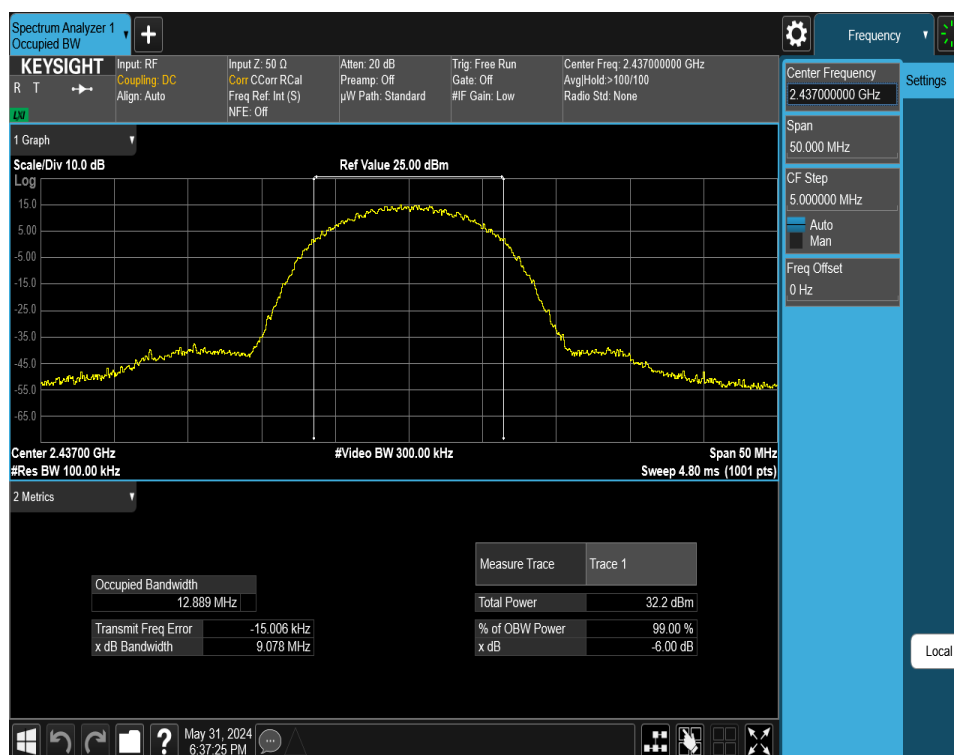
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High Rate



Plot 7-19. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11b – Ch. 1) – 11Mbps

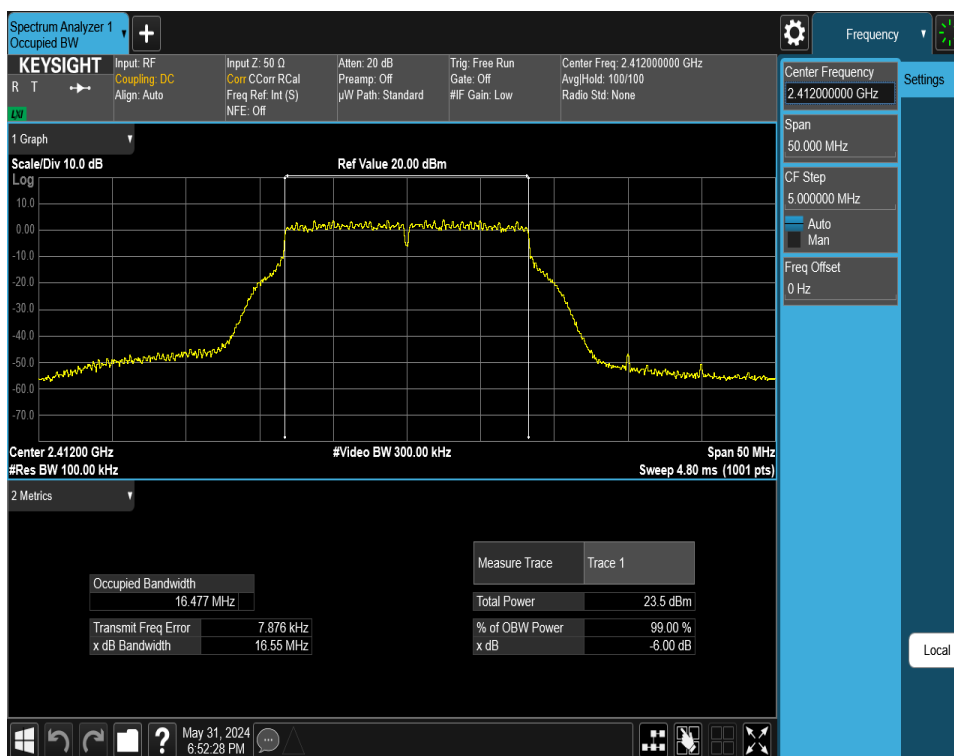


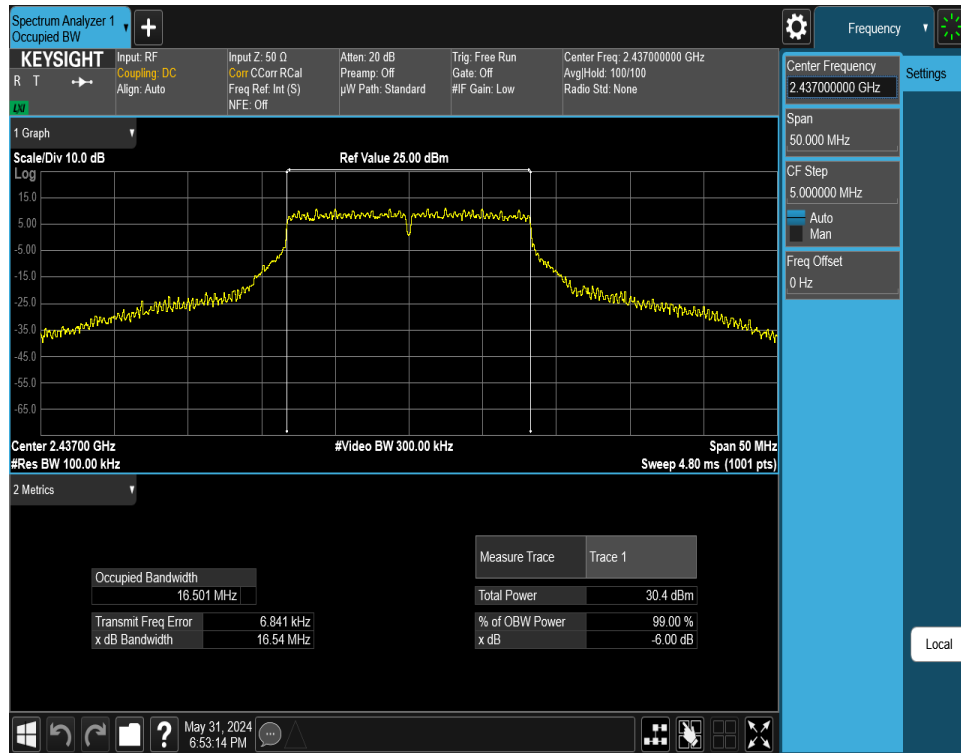
Plot 7-20. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11b – Ch. 6) – 11Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 30 of 431

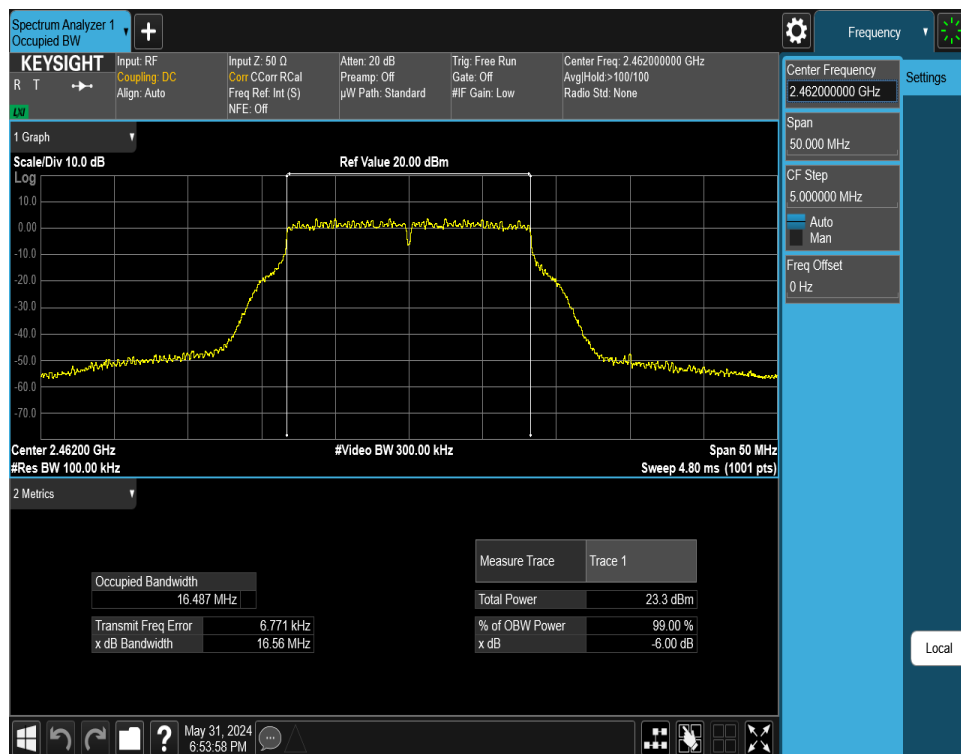
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Plot 7-23. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 6) – 54Mbps

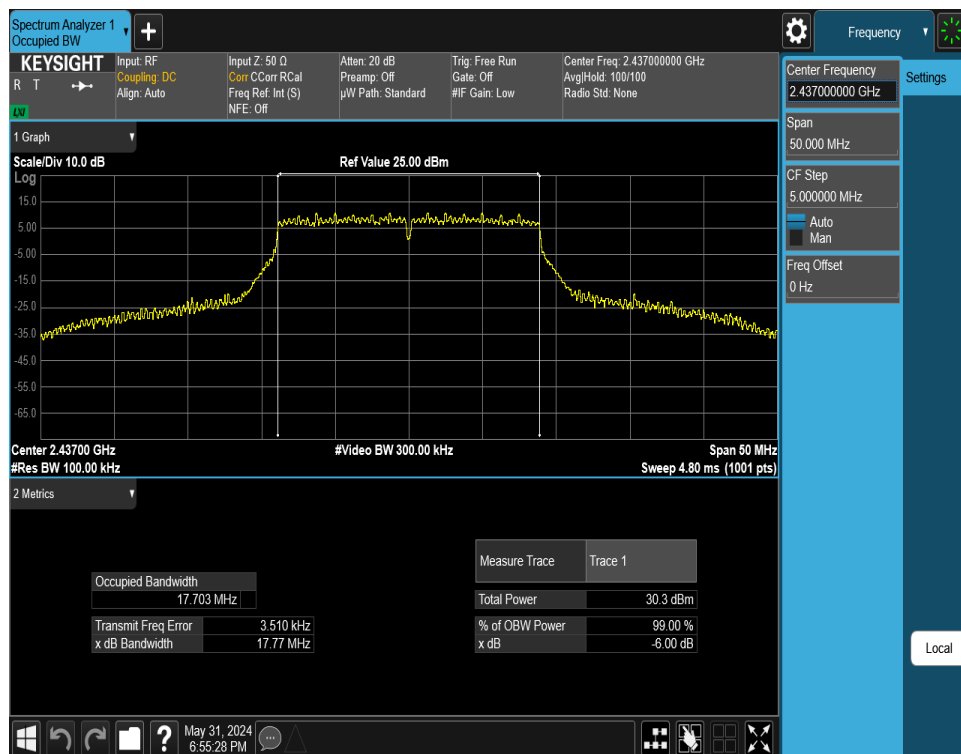
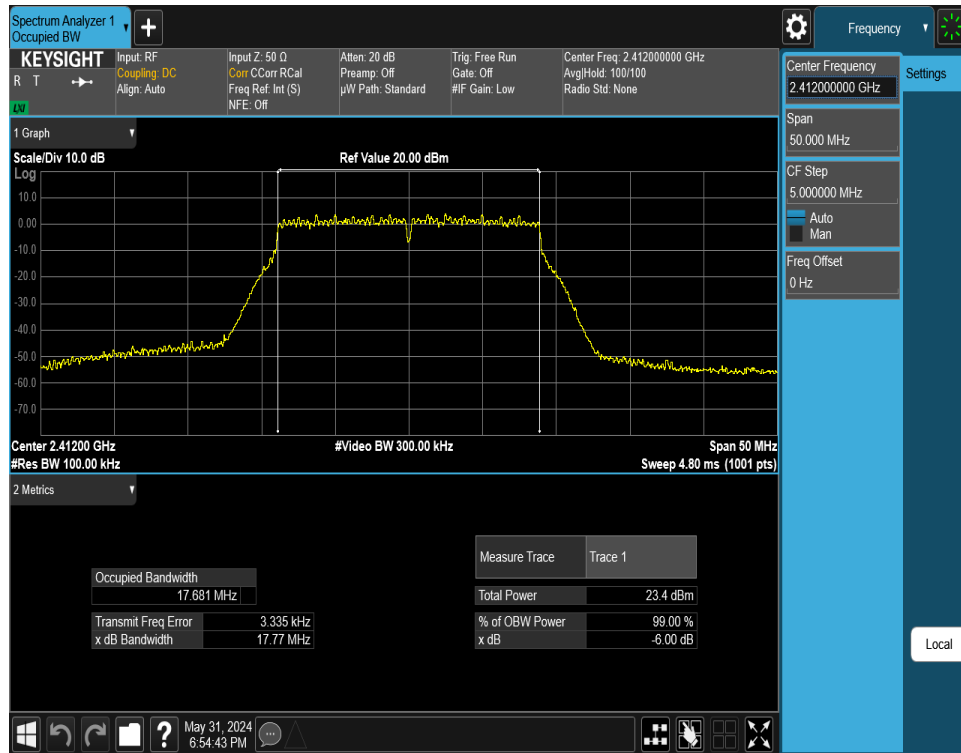


Plot 7-24. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11g – Ch. 11) – 54Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 33 of 431

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Spectrum Analyzer 1 +

Occupied BW

KEYSIGHT

Input: RF
Coupling: DC
Align: Auto

Input Z: 50 Ω
Corr: C Corr RCal
Freq Ref: Int (S)
NFE: Off

Atten: 20 dB
Preamp: Off
 μ W Path: Standard

Trig: Free Run
Gate: Off
#F Gain: Low

Center Freq: 2.41200000 GHz
Avg/Hold: 100/100
Radio Std: None

Center Frequency
2.41200000 GHz

Span
50.000 MHz

CF Step
5.000000 MHz

Auto
Man

Freq Offset
0 Hz

1 Graph

Scale/Div 10.0 dB

Log

Ref Value 20.00 dBm

Center 2.41200 GHz
#Res BW 100.0 kHz

#Video BW 300.0 kHz

Span 50 MHz
Sweep 4.80 ms (1001 pts)

2 Metrics

Occupied Bandwidth	
18.959 MHz	

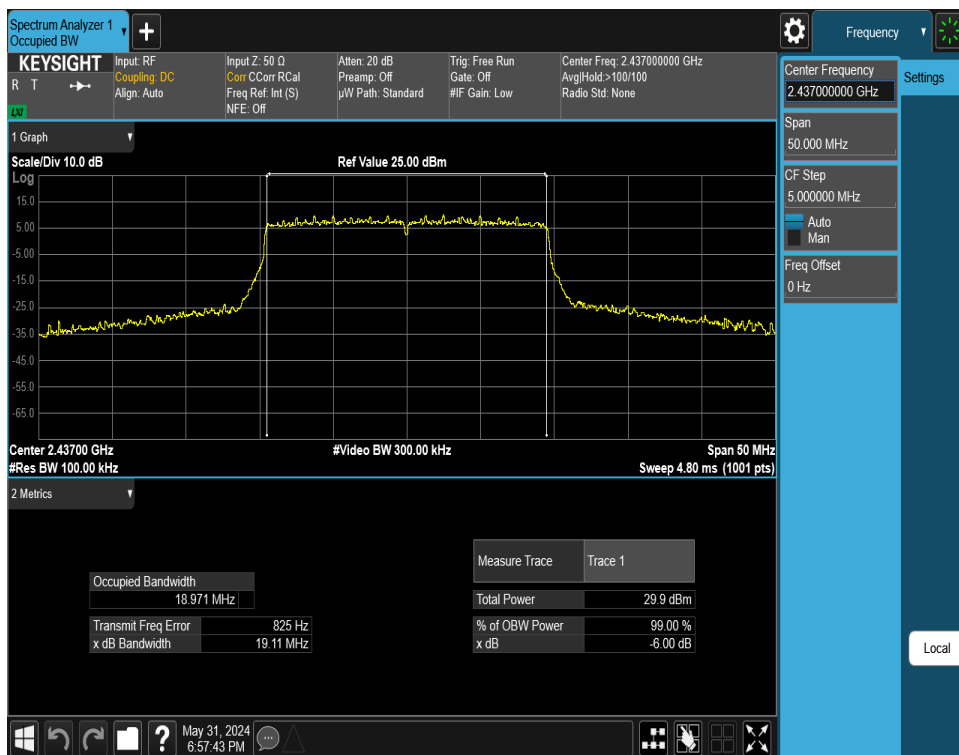
Transmit Freq Error	
5.889 kHz	

x dB Bandwidth	
19.12 MHz	

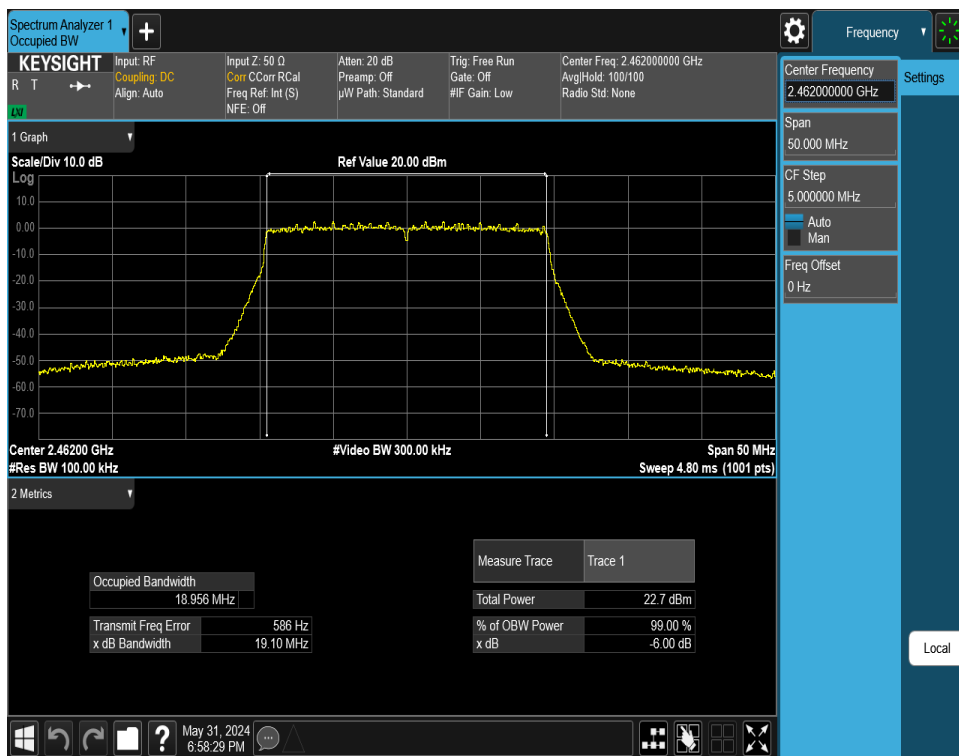
Measure Trace	
Trace 1	
Total Power	22.5 dBm
% of OBW Power	99.00 %
x dB	-6.00 dB

May 31, 2024
6:56:59 PM

Local



Plot 7-29. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS9



Plot 7-30. 6 dB BW and 99% OBW Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS9

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 35 of 431

7.2.2 Antenna WF7 6 dB BW and 99% OBW Measurements

Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass/Fail
2412	1	g	12	16.58	16.01	0.50	Pass
2437	6	g	12	16.44	16.44	0.50	Pass
2462	11	g	12	16.56	16.33	0.50	Pass
2412	1	n	19.5/21.7 (MCS2)	17.72	17.31	0.50	Pass
2437	6	n	19.5/21.7 (MCS2)	17.65	17.61	0.50	Pass
2462	11	n	19.5/21.7 (MCS2)	17.71	17.55	0.50	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	18.93	18.95	0.50	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	18.92	19.04	0.50	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	18.93	18.99	0.50	Pass

Table 7-5. Conducted Bandwidth Measurements Antenna WF7 (Low Data Rate)

Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass/Fail
2412	1	g	24	16.46	16.51	0.50	Pass
2437	6	g	24	16.45	16.50	0.50	Pass
2462	11	g	24	16.45	16.52	0.50	Pass
2412	1	n	39/43.3 (MCS4)	17.67	17.74	0.50	Pass
2437	6	n	39/43.3 (MCS4)	17.65	17.73	0.50	Pass
2462	11	n	39/43.3 (MCS4)	17.65	17.73	0.50	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	18.90	19.06	0.50	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	18.91	19.05	0.50	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	18.94	19.13	0.50	Pass

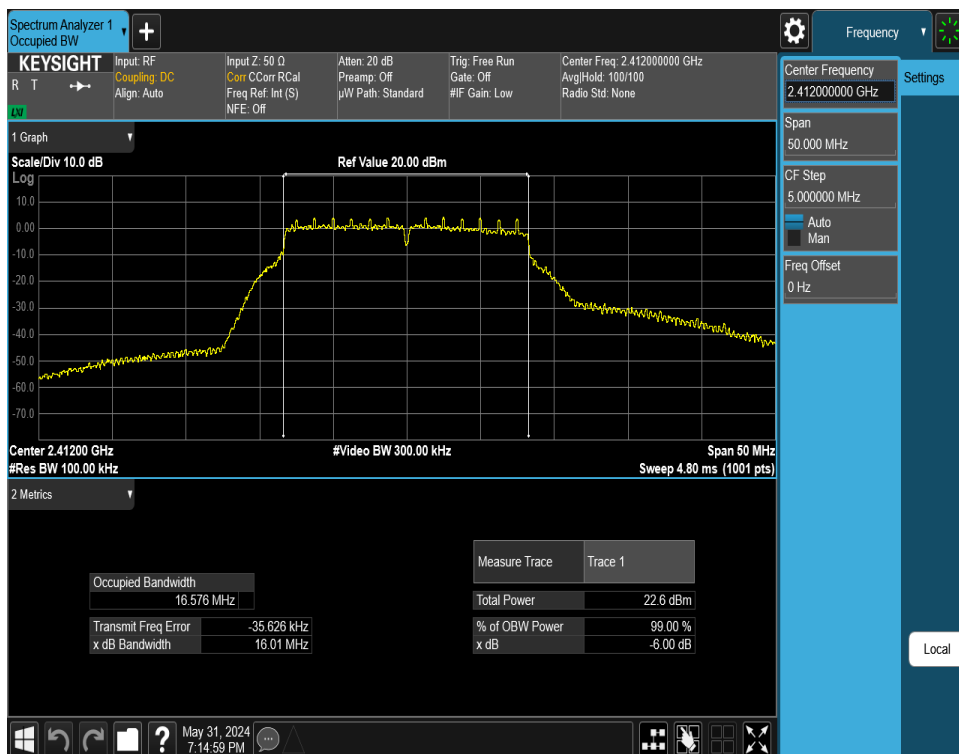
Table 7-6. Conducted Bandwidth Measurements Antenna WF7 (Mid Data Rate)

Frequency [MHz]	Channel	802.11 MODE	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass/Fail
2412	1	b	11	12.79	8.52	0.50	Pass
2437	6	b	11	12.88	8.83	0.50	Pass
2462	11	b	11	12.85	9.11	0.50	Pass
2412	1	g	54	16.48	16.56	0.50	Pass
2437	6	g	54	16.50	16.54	0.50	Pass
2462	11	g	54	16.49	16.55	0.50	Pass
2412	1	n	65/72.2 (MCS7)	17.69	17.77	0.50	Pass
2437	6	n	65/72.2 (MCS7)	17.69	17.76	0.50	Pass
2462	11	n	65/72.2 (MCS7)	17.68	17.77	0.50	Pass
2412	1	ax (SU)	81/86 (MCS9)	18.95	19.11	0.50	Pass
2437	6	ax (SU)	81/86 (MCS9)	18.97	19.12	0.50	Pass
2462	11	ax (SU)	81/86 (MCS9)	18.96	19.11	0.50	Pass

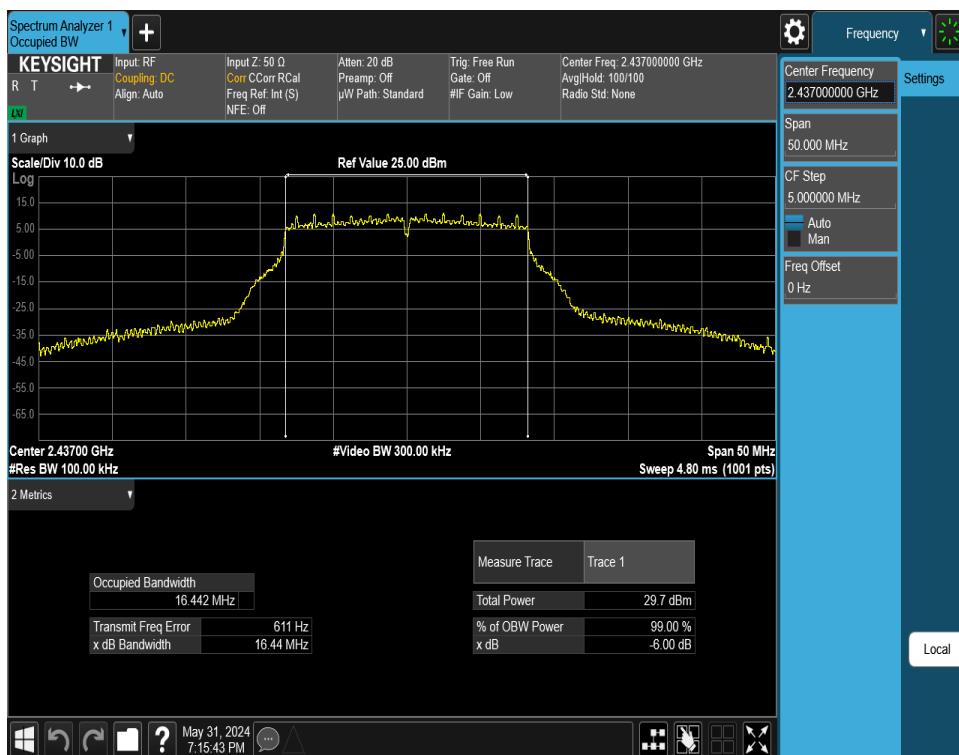
Table 7-7. Conducted Bandwidth Measurements Antenna WF7 (High Data Rate)

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 36 of 431

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Plot 7-31. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11g – Ch. 1) – 12Mbps

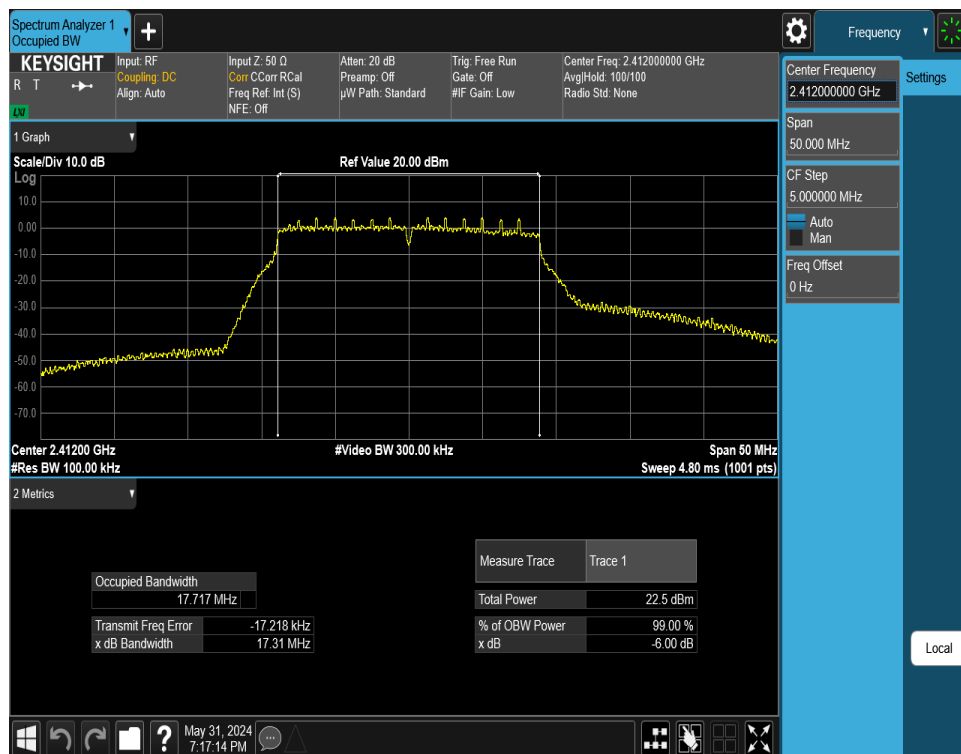


Plot 7-32. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11g – Ch. 6) – 12Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 37 of 431



Plot 7-33. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11g – Ch. 11) – 12Mbps

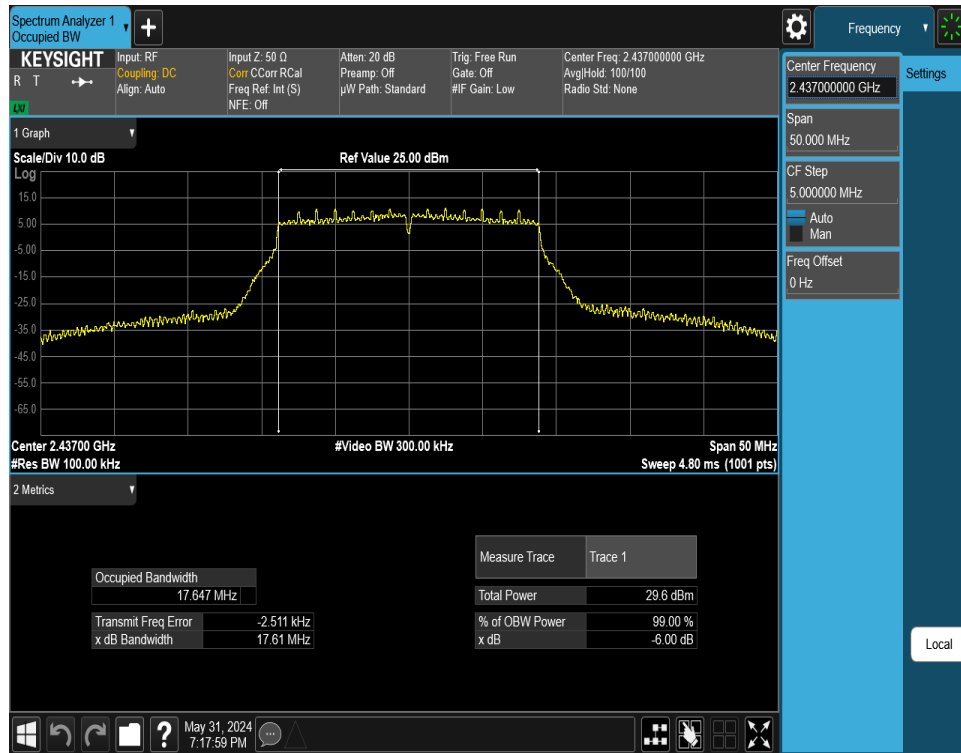


Plot 7-34. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11n (2.4GHz) – Ch. 1) – MCS2

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 38 of 431

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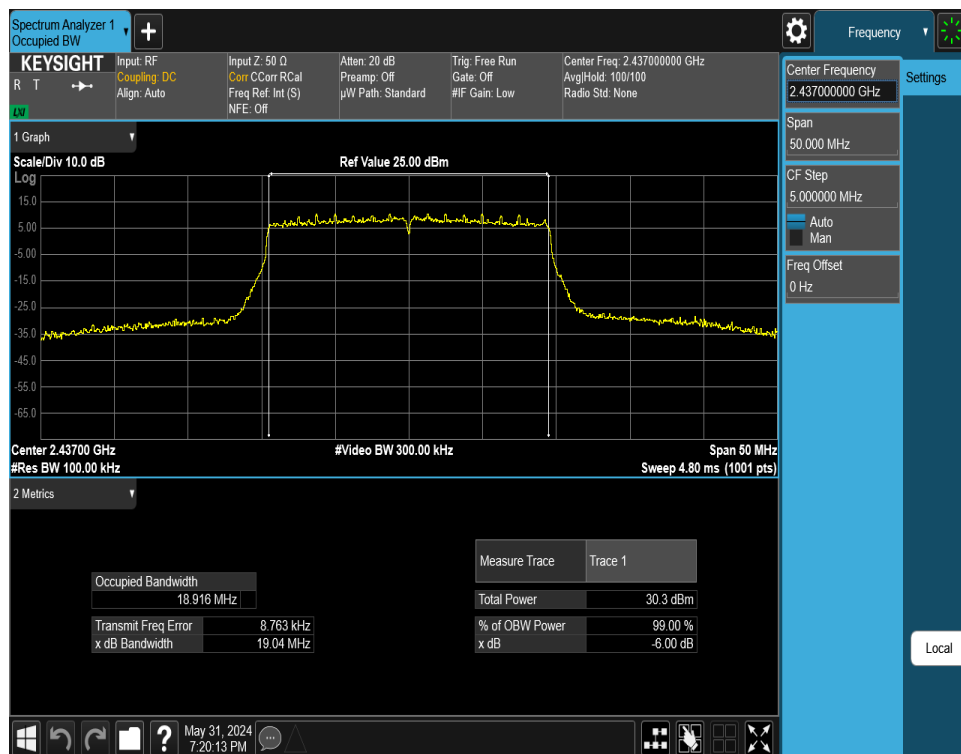
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 39 of 431

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Plot 7-37. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS2



Plot 7-38. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS2

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 40 of 431

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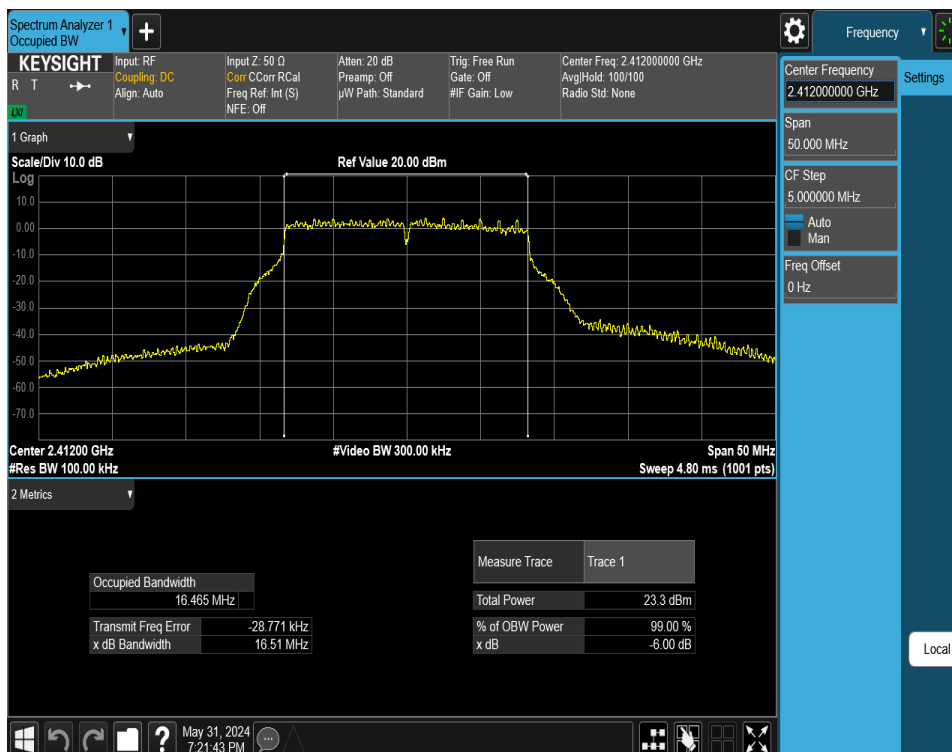


Plot 7-39. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS2

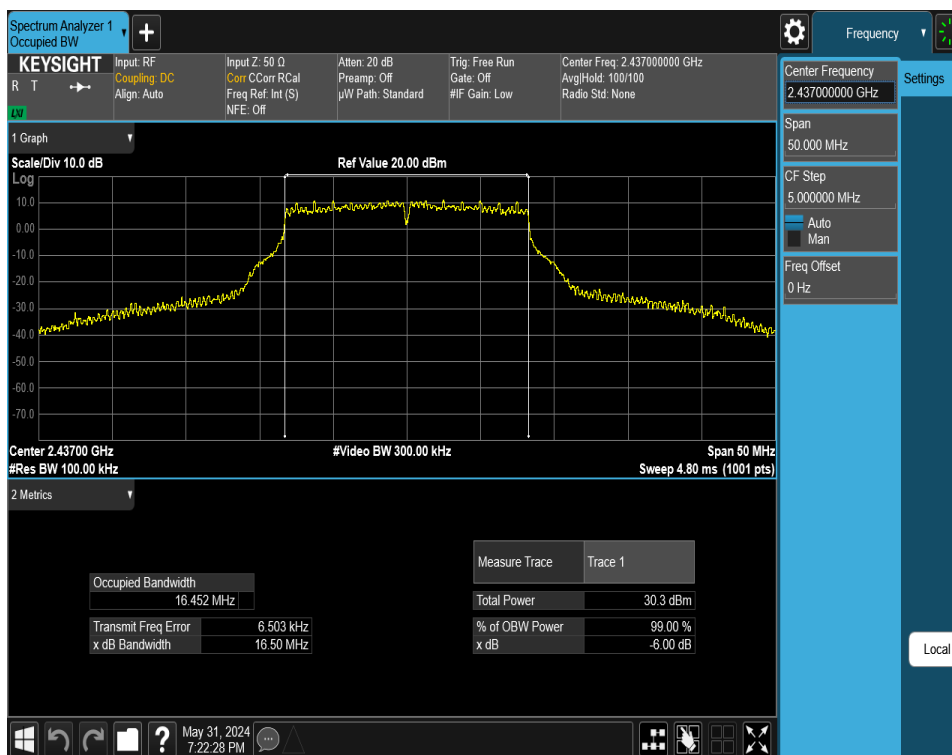
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 41 of 431

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Mid Rate



Plot 7-40. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11g – Ch. 1) – 24Mbps

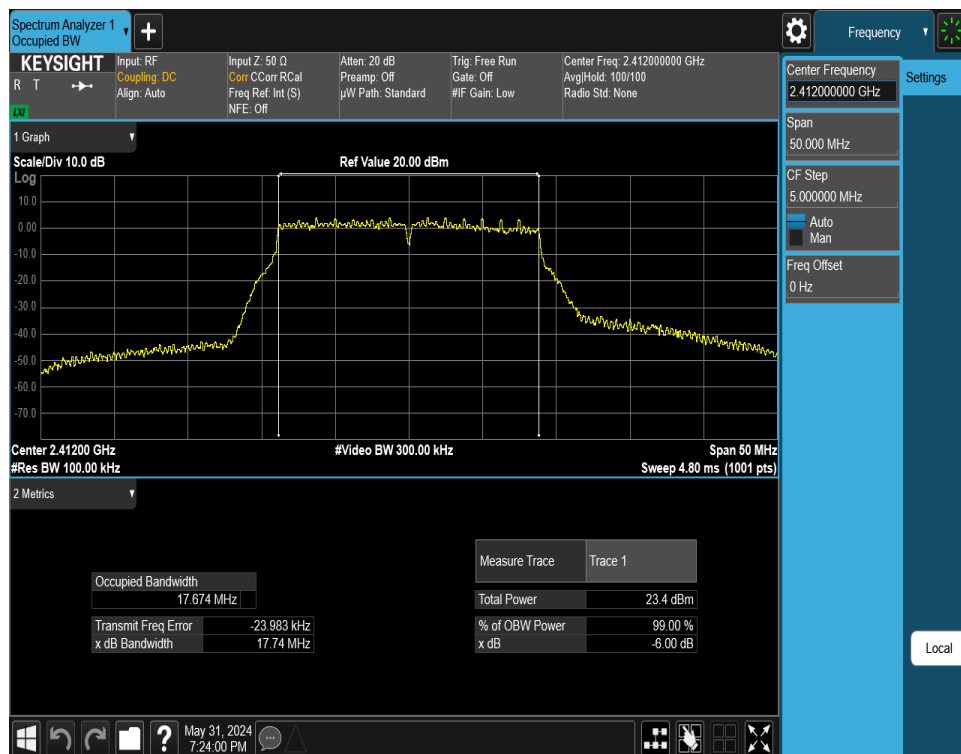
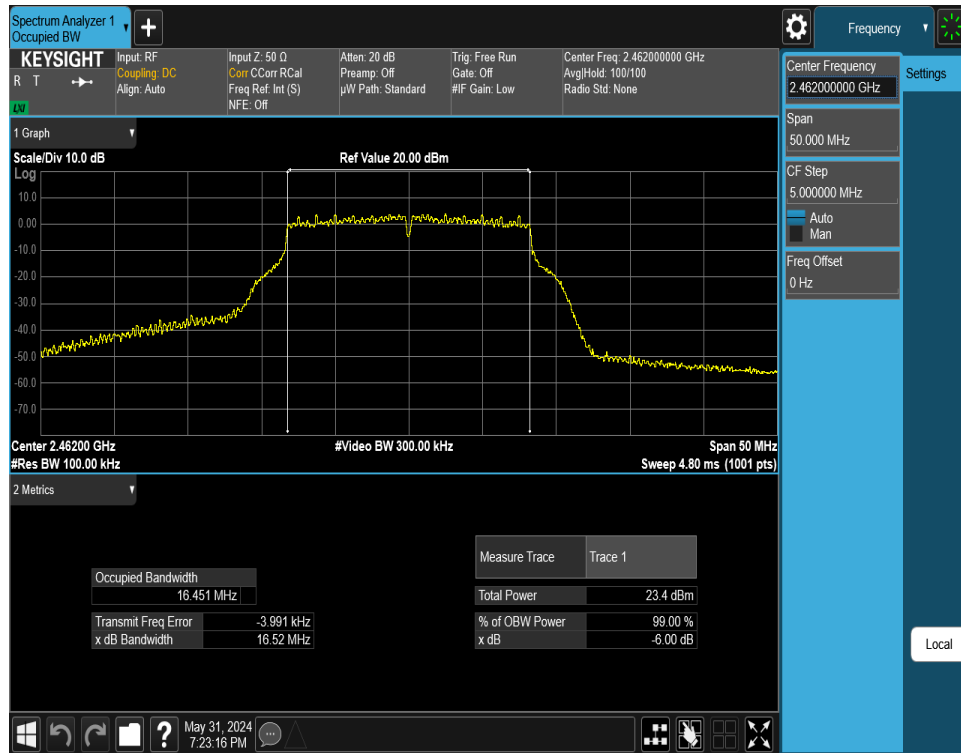


Plot 7-41. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11g – Ch. 6) – 24Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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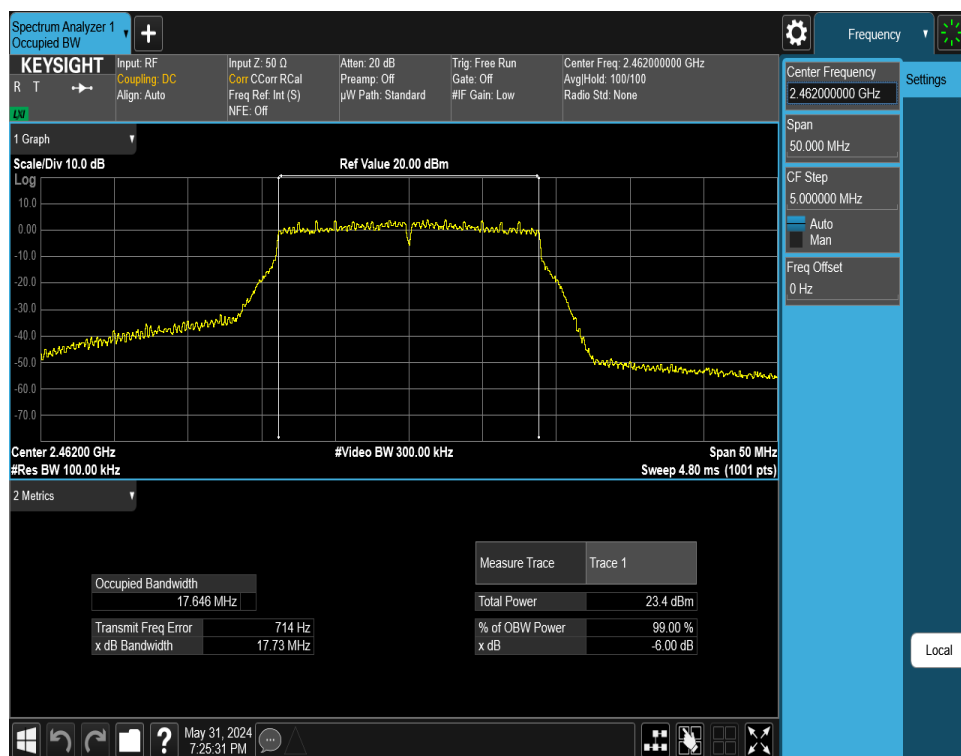
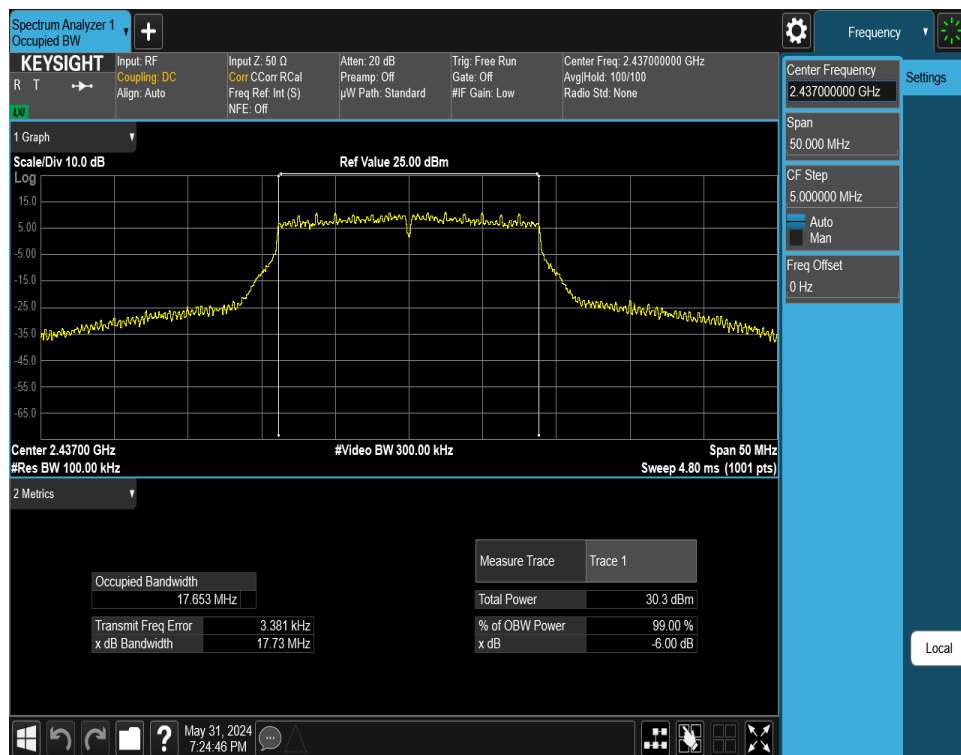
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Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 43 of 431

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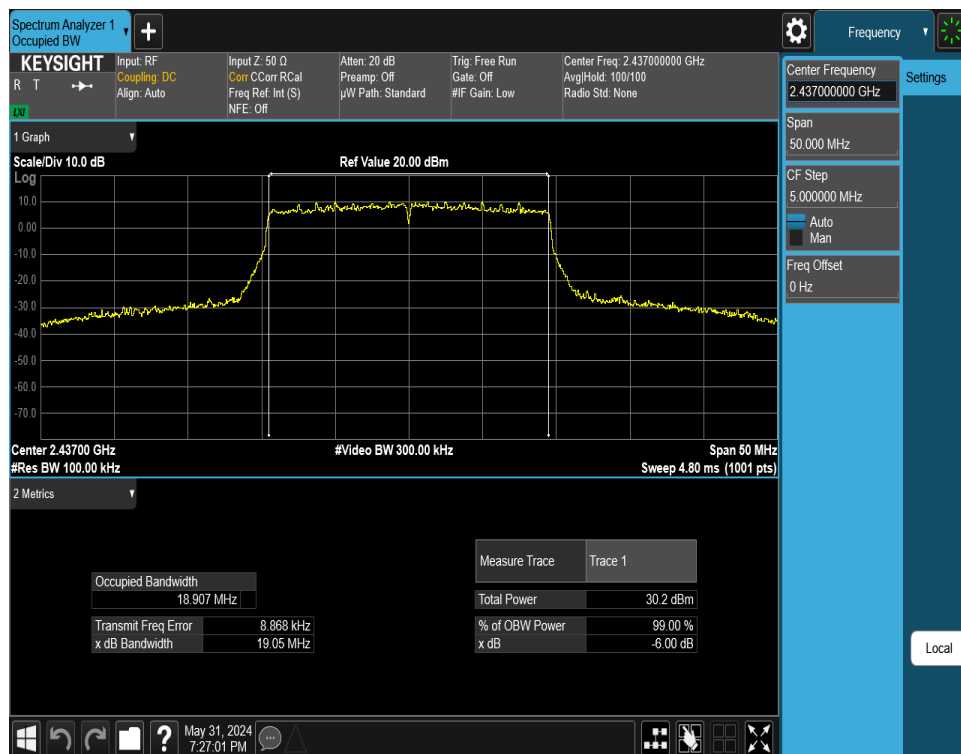
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 44 of 431

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Plot 7-46. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS4

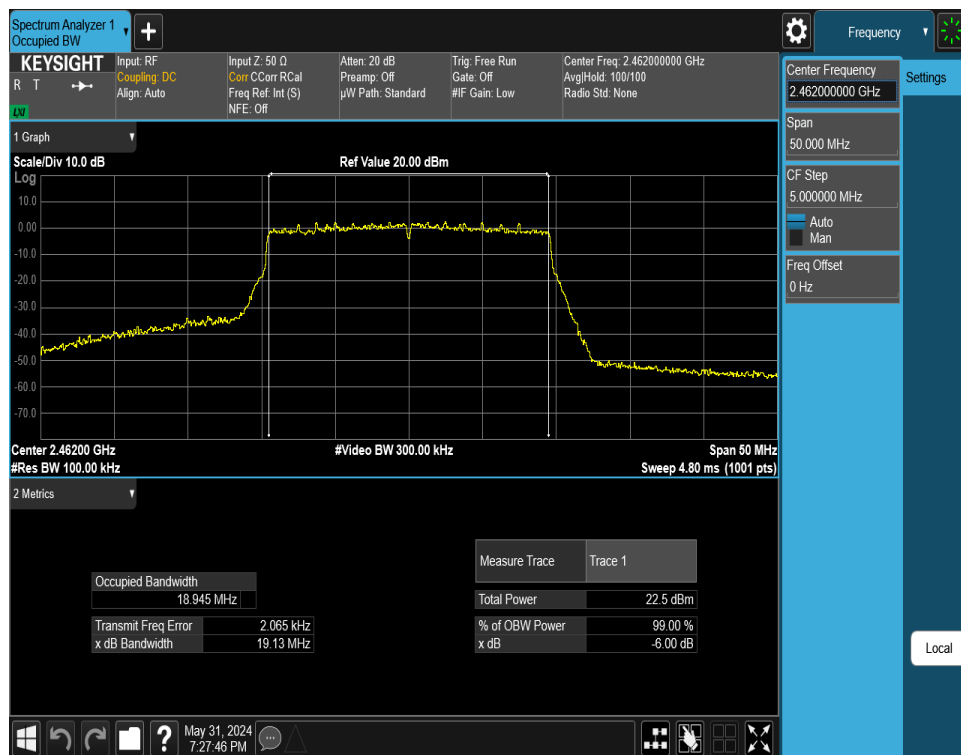


Plot 7-47. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS4

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 45 of 431

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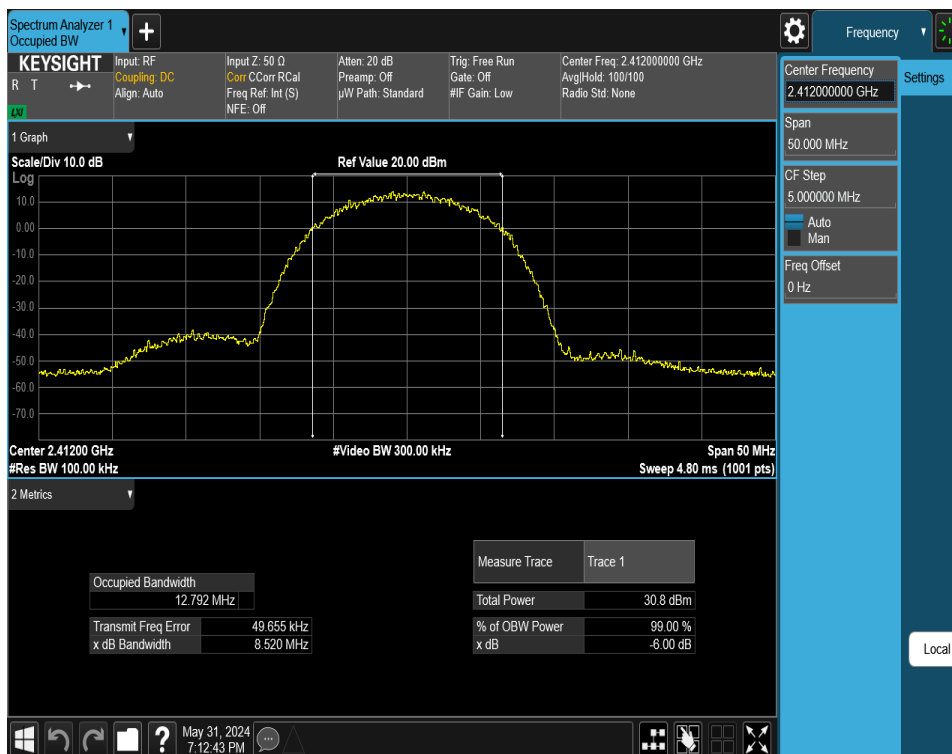
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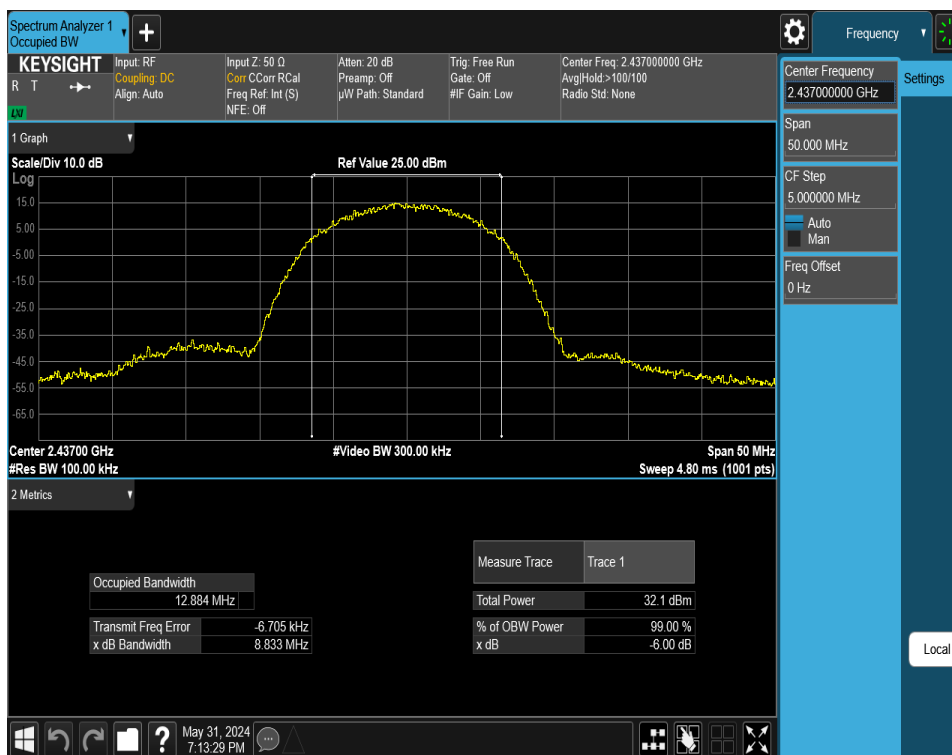
Plot 7-48. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS4

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 46 of 431

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Plot 7-49. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11b – Ch. 1) – 11Mbps



Plot 7-50. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11b – Ch. 6) – 11Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 47 of 431

Spectrum Analyzer 1
Occupied BW

KEYSIGHT

Input: RF
Coupling: DC
Align: Auto

Input Z: 50 Ω
Corr: C Corr: RCal
Freq Ref: Int (S)
NFE: Off

Atten: 20 dB
Preamp: Off
μW Path: Standard

Trig: Free Run
Gate: Off
#IF Gain: Low

Center Freq: 2.41200000 GHz
Avg/Hold: 100/100
Radio Std: None

Center Frequency
2.41200000 GHz

Span
50.000 MHz

CF Step
5.000000 MHz

Auto
Man

Freq Offset
0 Hz

1 Graph

Scale/Div 10.0 dB

Ref Value 20.00 dBm

Log

Center 2.41200 GHz
#Res BW 100.00 kHz

#Video BW 300.00 kHz

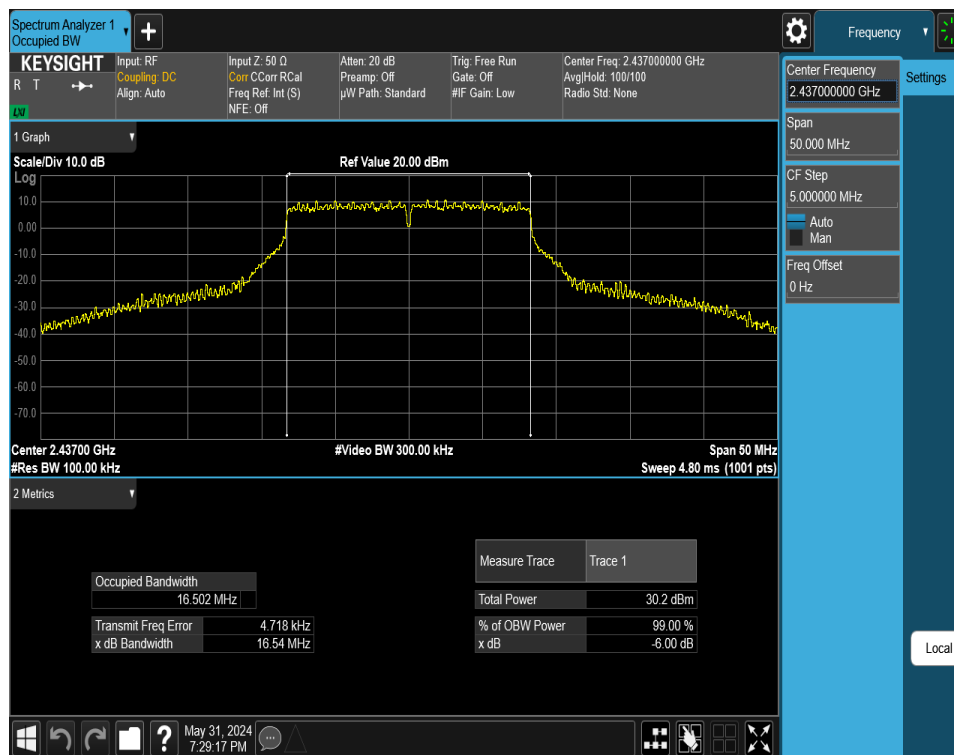
Span 50 MHz
Sweep 4.80 ms (1001 pts)

2 Metrics

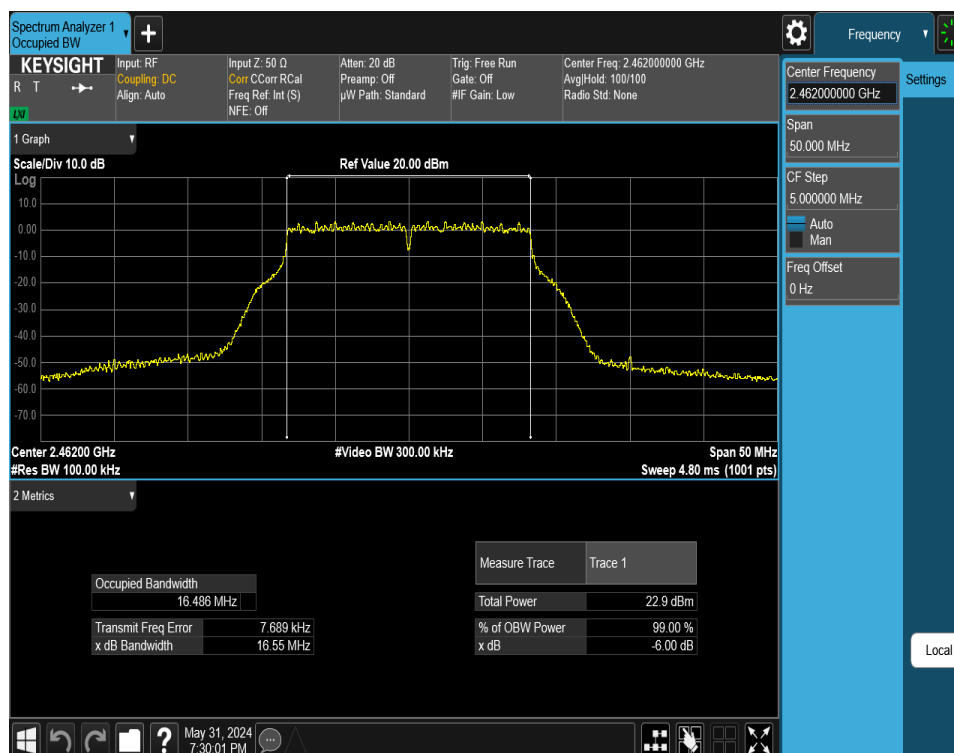
Measure Trace		Trace 1	
Occupied Bandwidth		Total Power	
16.483 MHz		23.5 dBm	
Transmit Freq Error		% of OBW Power	
8.945 kHz		99.00 %	
x dB Bandwidth		x dB	
16.56 MHz		-6.00 dB	

May 31, 2024
7:28:31 PM

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-53. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11g – Ch. 6) – 54Mbps

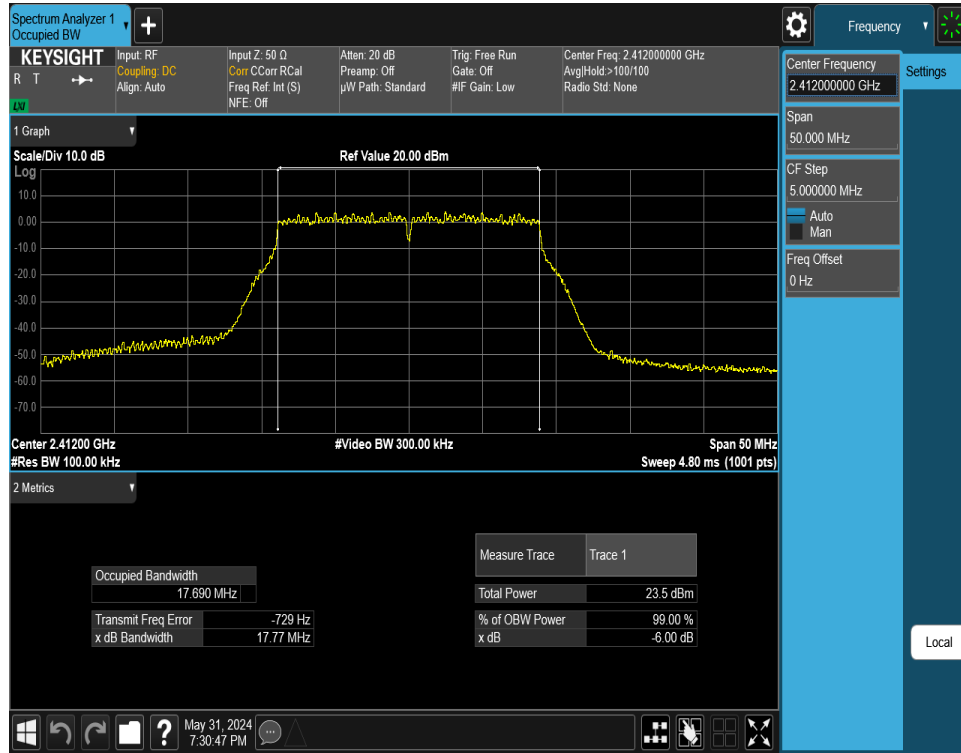


Plot 7-54. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11g – Ch. 11) – 54Mbps

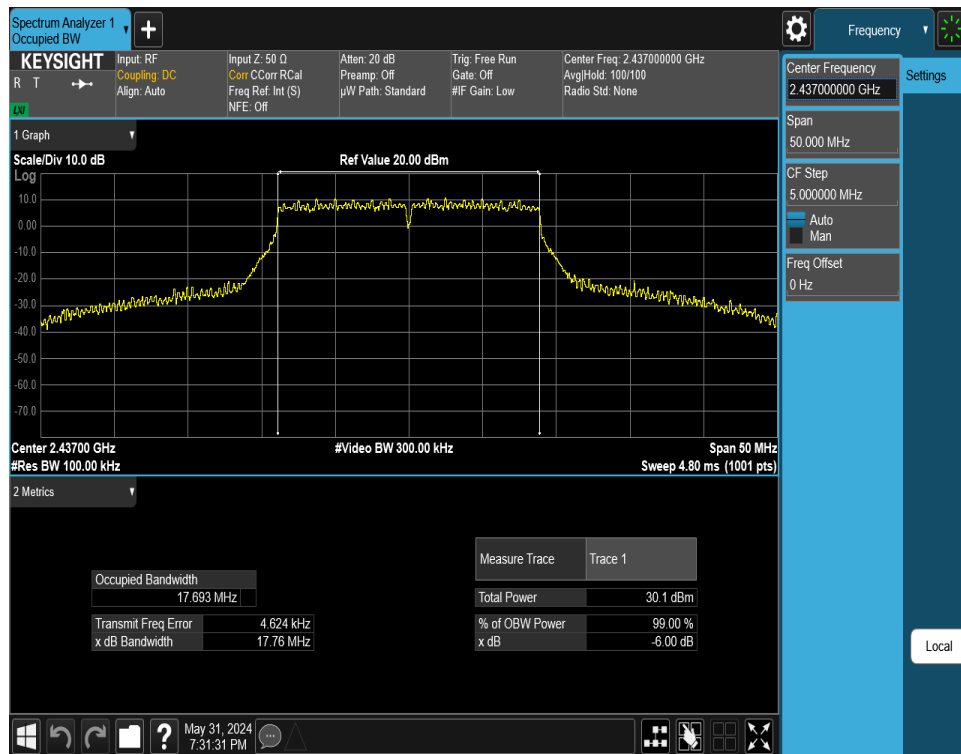
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-55. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11n (2.4GHz) – Ch. 1) – MCS7



Plot 7-56. 6 dB BW and 99% OBW Plot Antenna WF7 (802.11n (2.4GHz) – Ch. 6) – MCS7

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Spectrum Analyzer 1
Occupied BW

KEYSIGHT

Input: RF
Coupling: DC
Align: Auto

Input 2: 50 Ω
Corr: C Corr RCal
Freq Ref: Int (S)
NFE: Off

Atten: 20 dB
Preamp: Off
 μ W Path: Standard

Trig: Free Run
Gate: Off
#IF Gain: Low

Center Freq: 2.412000000 GHz
Avg/Hold: 100/100
Radio Std: None

Center Frequency
2.412000000 GHz

Span
50.000 MHz

CF Step
5.000000 MHz

Auto
Man

Freq Offset
0 Hz

1 Graph

Scale/Div 10.0 dB

Ref Value 20.00 dBm

Center 2.41200 GHz
#Res BW 100.00 kHz

#Video BW 300.00 kHz

Span 50 MHz
Sweep 4.80 ms (1001 pts)

2 Metrics

Occupied Bandwidth	
18.952 MHz	

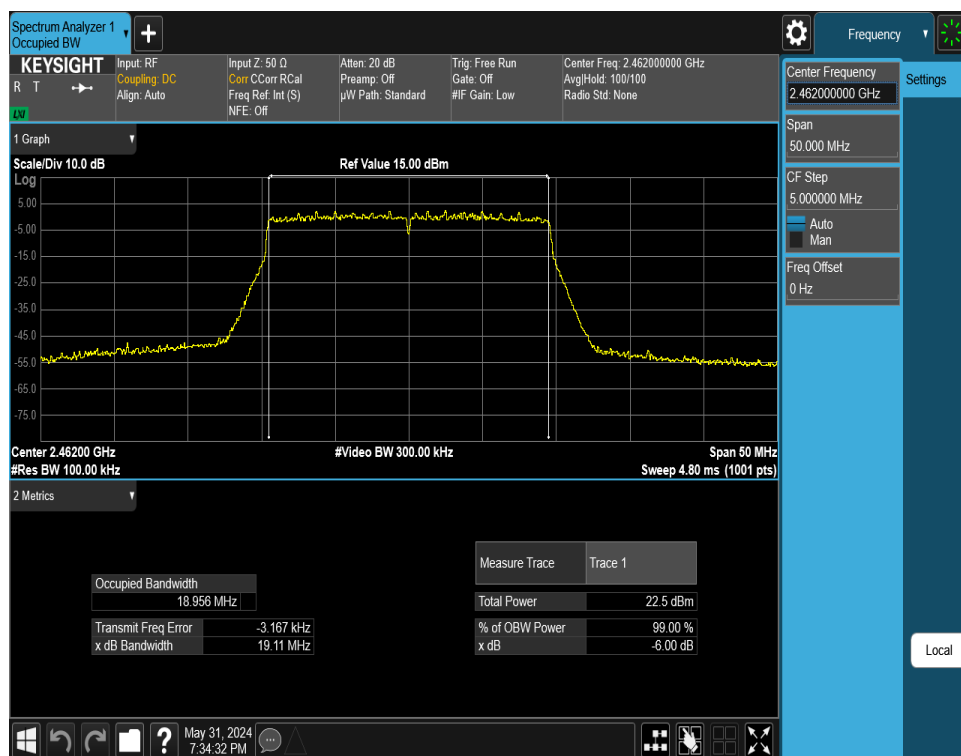
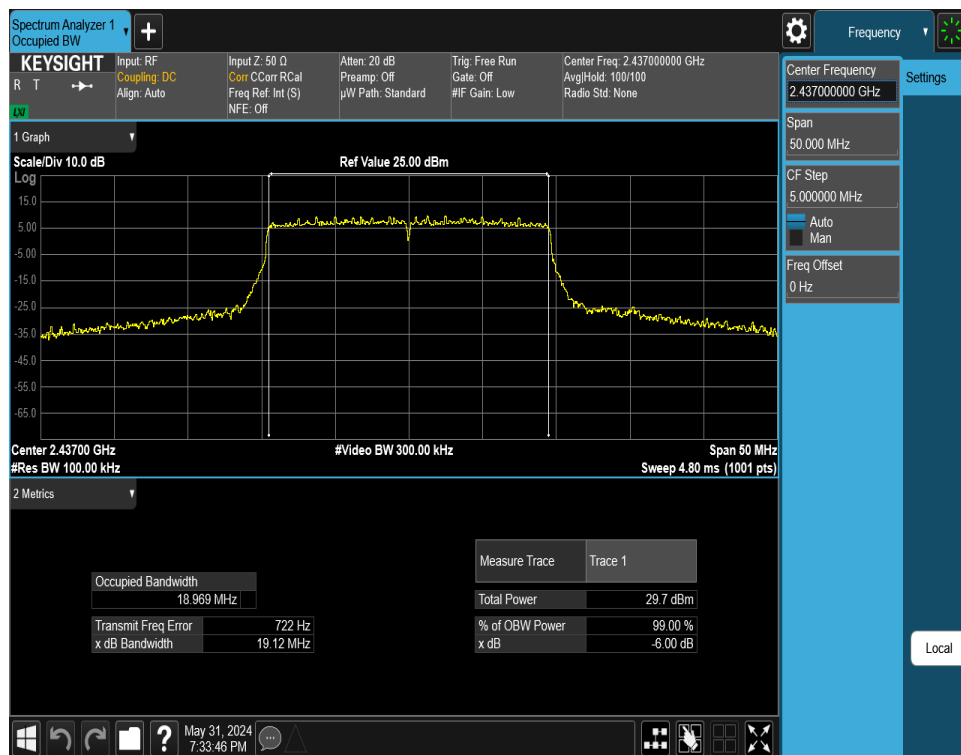
Transmit Freq Error	
-1.298 kHz	

x dB Bandwidth	
19.11 MHz	

Measure Trace		Trace 1	
Total Power	22.5 dBm		
% of OBW Power	99.00 %		
x dB	-6.00 dB		

May 31, 2024
7:33:02 PM

Local



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7.3 Output Power Measurement

§15.247(b.3); RSS-247 [5.4]

Test Overview and Limits

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

The maximum peak conducted output power of digital modulation systems operating in the 2400-2483.5 MHz band is 1 Watt.

The conducted output power limit on paragraph above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For DTSS employing digital modulation techniques operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W.

Test Procedure Used

ANSI C63.10-2020 – Subclause 11.9.1.2 PKPM1 Peak Power Method
 KDB 558074 D01 v05r02 – Section 8.3.1.3 PKPM1 Peak-reading Power Meter Method
 ANSI C63.10-2020 – Subclause 11.9.2.3.2 Method AVGPM-G
 KDB 558074 D01 v05r02 – Section 8.3.2.3 Measurement using a Power Meter (PM)
 ANSI C63.10-2020 – Subclause 14.4 Measure-and-Sum Technique
 KDB 662911 D01 v02r01 – Section E)1) Measure-and-Sum Technique

Test Settings

Method PKPM1 (Peak Power Measurement)

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

Method AVGPM-G (Average Power Measurement)

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup for Power Meter Measurements

Test Notes

1. For 802.11b, the worst case data rate was found to be 11Mbps.
2. 802.11ax does not support channel 13.

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7.3.1 Average Output Power Measurement

§15.247(b.3); RSS-247 [5.4]

Low Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	15.46	15.13	15.10	30.00	-14.54	0.70	16.16	36.02	-19.86
2417	2	AVG	19.72	19.64	17.71	30.00	-10.28	0.70	20.42	36.02	-15.60
2422	3	AVG	20.61	20.69	19.84	30.00	-9.31	0.70	21.39	36.02	-14.63
2427	4	AVG	21.49	21.23	19.66	30.00	-8.51	0.70	22.19	36.02	-13.83
2432	5	AVG	22.05	22.03	21.90	30.00	-7.95	0.70	22.75	36.02	-13.27
2437	6	AVG	22.77	22.78	22.88	30.00	-7.12	0.70	23.58	36.02	-12.44
2442	7	AVG	22.02	22.10	21.37	30.00	-7.90	0.70	22.80	36.02	-13.22
2447	8	AVG	21.41	21.16	21.20	30.00	-8.59	0.70	22.11	36.02	-13.91
2452	9	AVG	21.21	21.23	21.34	30.00	-8.66	0.70	22.04	36.02	-13.98
2457	10	AVG	20.60	20.66	18.81	30.00	-9.34	0.70	21.36	36.02	-14.66
2462	11	AVG	16.25	16.30	15.89	30.00	-13.71	0.70	17.00	36.02	-19.03
2467	12	AVG	14.69	14.63	13.88	30.00	-15.32	0.70	15.39	36.02	-20.64
2472	13	AVG	8.87	8.75	-	30.00	-21.13	0.70	9.57	36.02	-26.45

Table 7-8. Average Conducted Output Power Measurements Antenna WF8 – Low Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	15.27	15.19	15.25	30.00	-14.73	0.80	16.07	36.02	-19.95
2417	2	AVG	19.88	19.76	17.65	30.00	-10.12	0.80	20.68	36.02	-15.34
2422	3	AVG	20.70	20.99	19.92	30.00	-9.02	0.80	21.79	36.02	-14.24
2427	4	AVG	21.12	21.15	19.84	30.00	-8.85	0.80	21.95	36.02	-14.07
2432	5	AVG	21.98	22.06	21.80	30.00	-7.94	0.80	22.86	36.02	-13.16
2437	6	AVG	22.87	22.84	22.79	30.00	-7.13	0.80	23.67	36.02	-12.35
2442	7	AVG	22.05	21.97	21.29	30.00	-7.96	0.80	22.85	36.02	-13.18
2447	8	AVG	21.39	21.45	21.31	30.00	-8.55	0.80	22.25	36.02	-13.77
2452	9	AVG	21.26	21.33	21.12	30.00	-8.67	0.80	22.13	36.02	-13.89
2457	10	AVG	20.93	20.99	19.01	30.00	-9.01	0.80	21.79	36.02	-14.23
2462	11	AVG	16.28	16.11	15.79	30.00	-13.72	0.80	17.08	36.02	-18.94
2467	12	AVG	14.92	14.94	14.21	30.00	-15.06	0.80	15.74	36.02	-20.28
2472	13	AVG	8.82	8.80	-	30.00	-21.19	0.80	9.62	36.02	-26.41

Table 7-9. Average Conducted Output Power Measurements Antenna WF7 – Low Data Rate

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.83	13.94	16.89	30.00	-13.11	3.76	20.65	36.02	-15.37
2417	2	AVG	17.34	17.21	20.29	30.00	-9.71	3.76	24.05	36.02	-11.97
2422	3	AVG	18.96	19.11	22.05	30.00	-7.95	3.76	25.81	36.02	-10.21
2427	4	AVG	20.12	20.27	23.20	30.00	-6.80	3.76	26.96	36.02	-9.06
2432	5	AVG	21.11	21.45	24.29	30.00	-5.71	3.76	28.05	36.02	-7.97
2437	6	AVG	21.86	21.82	24.85	30.00	-5.15	3.76	28.61	36.02	-7.41
2442	7	AVG	20.80	20.77	23.80	30.00	-6.20	3.76	27.56	36.02	-8.46
2447	8	AVG	20.39	20.25	23.33	30.00	-6.67	3.76	27.09	36.02	-8.93
2452	9	AVG	20.32	20.34	23.34	30.00	-6.66	3.76	27.10	36.02	-8.92
2457	10	AVG	19.26	19.28	22.28	30.00	-7.72	3.76	26.04	36.02	-9.98
2462	11	AVG	15.75	15.59	18.68	30.00	-11.32	3.76	22.44	36.02	-13.58
2467	12	AVG	13.68	14.00	16.85	30.00	-13.15	3.76	20.61	36.02	-15.41
2472	13	AVG	7.54	7.63	10.60	30.00	-19.40	3.76	14.36	36.02	-21.66

Table 7-10. Average Conducted Output Power Measurements CDD (802.11g) – Low Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.91	13.64	16.79	30.00	-13.21	3.76	20.55	36.02	-15.47
2417	2	AVG	17.33	17.40	20.37	30.00	-9.63	3.76	24.13	36.02	-11.89
2422	3	AVG	19.06	18.91	21.99	30.00	-8.01	3.76	25.75	36.02	-10.27
2427	4	AVG	20.29	20.13	23.22	30.00	-6.78	3.76	26.98	36.02	-9.04
2432	5	AVG	21.28	21.21	24.26	30.00	-5.74	3.76	28.02	36.02	-8.00
2437	6	AVG	21.72	21.65	24.69	30.00	-5.31	3.76	28.45	36.02	-7.57
2442	7	AVG	20.83	20.96	23.91	30.00	-6.09	3.76	27.67	36.02	-8.35
2447	8	AVG	20.18	20.25	23.22	30.00	-6.78	3.76	26.98	36.02	-9.04
2452	9	AVG	20.25	20.43	23.35	30.00	-6.65	3.76	27.11	36.02	-8.91
2457	10	AVG	19.21	19.49	22.36	30.00	-7.64	3.76	26.12	36.02	-9.90
2462	11	AVG	15.43	15.56	18.50	30.00	-11.50	3.76	22.26	36.02	-13.76
2467	12	AVG	13.67	13.61	16.65	30.00	-13.35	3.76	20.41	36.02	-15.61
2472	13	AVG	7.54	7.65	10.61	30.00	-19.39	3.76	14.37	36.02	-21.65

Table 7-11. Average Conducted Output Power Measurements CDD (802.11n) – Low Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.75	13.87	16.82	30.00	-13.18	3.76	20.58	36.02	-15.44
2417	2	AVG	17.18	17.21	20.20	30.00	-9.80	3.76	23.96	36.02	-12.06
2422	3	AVG	19.02	19.06	22.05	30.00	-7.95	3.76	25.81	36.02	-10.21
2427	4	AVG	19.45	19.42	22.44	30.00	-7.56	3.76	26.20	36.02	-9.82
2432	5	AVG	20.67	20.69	23.69	30.00	-6.31	3.76	27.45	36.02	-8.57
2437	6	AVG	21.10	21.10	24.11	30.00	-5.89	3.76	27.87	36.02	-8.15
2442	7	AVG	20.72	20.53	23.63	30.00	-6.37	3.76	27.39	36.02	-8.63
2447	8	AVG	19.72	19.48	22.61	30.00	-7.39	3.76	26.37	36.02	-9.65
2452	9	AVG	19.60	19.62	22.62	30.00	-7.38	3.76	26.38	36.02	-9.64
2457	10	AVG	17.74	17.86	20.81	30.00	-9.19	3.76	24.57	36.02	-11.45
2462	11	AVG	15.17	15.24	18.22	30.00	-11.78	3.76	21.98	36.02	-14.04
2467	12	AVG	13.79	13.62	16.72	30.00	-13.28	3.76	20.48	36.02	-15.54

Table 7-12. Average Conducted Output Power Measurements CDD (802.11ax - SU) – Low Data Rate

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Mid Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	15.36	15.28	15.30	30.00	-14.65	0.70	16.06	36.02	-19.97
2417	2	AVG	19.27	19.24	17.25	30.00	-10.73	0.70	19.97	36.02	-16.05
2422	3	AVG	20.23	19.88	19.23	30.00	-9.77	0.70	20.93	36.02	-15.09
2427	4	AVG	21.09	21.01	19.21	30.00	-8.91	0.70	21.79	36.02	-14.23
2432	5	AVG	21.65	21.68	21.26	30.00	-8.32	0.70	22.38	36.02	-13.64
2437	6	AVG	22.76	22.83	22.84	30.00	-7.16	0.70	23.54	36.02	-12.48
2442	7	AVG	21.71	21.88	21.11	30.00	-8.12	0.70	22.58	36.02	-13.44
2447	8	AVG	20.98	20.79	20.17	30.00	-9.02	0.70	21.68	36.02	-14.34
2452	9	AVG	20.59	20.39	20.18	30.00	-9.41	0.70	21.29	36.02	-14.73
2457	10	AVG	18.74	18.99	18.14	30.00	-11.01	0.70	19.69	36.02	-16.33
2462	11	AVG	16.09	15.85	15.34	30.00	-13.91	0.70	16.79	36.02	-19.23
2467	12	AVG	13.98	13.75	13.93	30.00	-16.02	0.70	14.68	36.02	-21.34
2472	13	AVG	8.92	8.86	-	30.00	-21.08	0.70	9.62	36.02	-26.40

Table 7-13. Average Conducted Output Power Measurements Antenna WF8 – Mid Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	15.16	15.16	15.26	30.00	-14.74	0.80	16.06	36.02	-19.96
2417	2	AVG	19.27	19.23	17.19	30.00	-10.73	0.80	20.07	36.02	-15.95
2422	3	AVG	20.07	19.86	19.26	30.00	-9.93	0.80	20.87	36.02	-15.15
2427	4	AVG	21.01	20.86	19.39	30.00	-8.99	0.80	21.81	36.02	-14.21
2432	5	AVG	21.89	21.62	21.18	30.00	-8.11	0.80	22.69	36.02	-13.33
2437	6	AVG	22.78	22.79	22.82	30.00	-7.18	0.80	23.62	36.02	-12.40
2442	7	AVG	21.79	21.82	21.24	30.00	-8.18	0.80	22.62	36.02	-13.40
2447	8	AVG	20.92	20.76	20.36	30.00	-9.08	0.80	21.72	36.02	-14.30
2452	9	AVG	20.54	20.42	19.89	30.00	-9.46	0.80	21.34	36.02	-14.68
2457	10	AVG	18.68	18.95	18.16	30.00	-11.05	0.80	19.75	36.02	-16.27
2462	11	AVG	16.14	16.14	15.12	30.00	-13.86	0.80	16.94	36.02	-19.08
2467	12	AVG	13.73	13.96	13.69	30.00	-16.04	0.80	14.76	36.02	-21.26
2472	13	AVG	8.72	8.81	-	30.00	-21.19	0.80	9.61	36.02	-26.41

Table 7-14. Average Conducted Output Power Measurements Antenna WF7 – Mid Data Rate

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 56 of 431

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Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.63	13.80	16.73	30.00	-13.27	3.76	20.49	36.02	-15.53
2417	2	AVG	17.41	17.48	20.45	30.00	-9.55	3.76	24.21	36.02	-11.81
2422	3	AVG	18.79	18.55	21.68	30.00	-8.32	3.76	25.44	36.02	-10.58
2427	4	AVG	19.45	19.35	22.41	30.00	-7.59	3.76	26.17	36.02	-9.85
2432	5	AVG	20.85	20.94	23.91	30.00	-6.09	3.76	27.67	36.02	-8.35
2437	6	AVG	21.62	21.91	24.78	30.00	-5.22	3.76	28.54	36.02	-7.48
2442	7	AVG	20.91	20.88	23.90	30.00	-6.10	3.76	27.66	36.02	-8.36
2447	8	AVG	19.13	19.10	22.13	30.00	-7.87	3.76	25.89	36.02	-10.13
2452	9	AVG	19.06	18.97	22.02	30.00	-7.98	3.76	25.78	36.02	-10.24
2457	10	AVG	17.72	17.99	20.87	30.00	-9.13	3.76	24.63	36.02	-11.39
2462	11	AVG	15.37	15.48	18.44	30.00	-11.56	3.76	22.20	36.02	-13.82
2467	12	AVG	13.71	13.74	16.74	30.00	-13.26	3.76	20.50	36.02	-15.52
2472	13	AVG	7.38	7.43	10.41	30.00	-19.59	3.76	14.17	36.02	-21.85

Table 7-15. Average Conducted Output Power Measurements CDD (802.11g) – Mid Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.89	13.94	16.93	30.00	-13.07	3.76	20.69	36.02	-15.33
2417	2	AVG	17.30	17.43	20.37	30.00	-9.63	3.76	24.13	36.02	-11.89
2422	3	AVG	18.68	18.62	21.66	30.00	-8.34	3.76	25.42	36.02	-10.60
2427	4	AVG	19.55	19.47	22.52	30.00	-7.48	3.76	26.28	36.02	-9.74
2432	5	AVG	20.89	20.94	23.93	30.00	-6.07	3.76	27.69	36.02	-8.33
2437	6	AVG	21.66	21.67	24.67	30.00	-5.33	3.76	28.43	36.02	-7.59
2442	7	AVG	20.83	20.99	23.92	30.00	-6.08	3.76	27.68	36.02	-8.34
2447	8	AVG	19.41	19.27	22.35	30.00	-7.65	3.76	26.11	36.02	-9.91
2452	9	AVG	19.15	18.93	22.05	30.00	-7.95	3.76	25.81	36.02	-10.21
2457	10	AVG	17.66	17.65	20.67	30.00	-9.33	3.76	24.43	36.02	-11.59
2462	11	AVG	15.26	15.38	18.33	30.00	-11.67	3.76	22.09	36.02	-13.93
2467	12	AVG	13.61	13.96	16.80	30.00	-13.20	3.76	20.56	36.02	-15.46
2472	13	AVG	7.53	7.68	10.61	30.00	-19.39	3.76	14.37	36.02	-21.65

Table 7-16. Average Conducted Output Power Measurements CDD (802.11n) – Mid Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.66	13.70	16.69	30.00	-13.31	3.76	20.45	36.02	-15.57
2417	2	AVG	17.18	17.31	20.26	30.00	-9.74	3.76	24.02	36.02	-12.00
2422	3	AVG	18.70	18.72	21.72	30.00	-8.28	3.76	25.48	36.02	-10.54
2427	4	AVG	19.32	19.27	22.31	30.00	-7.69	3.76	26.07	36.02	-9.95
2432	5	AVG	20.70	20.72	23.72	30.00	-6.28	3.76	27.48	36.02	-8.54
2437	6	AVG	21.28	21.23	24.26	30.00	-5.74	3.76	28.02	36.02	-8.00
2442	7	AVG	20.37	20.38	23.39	30.00	-6.61	3.76	27.15	36.02	-8.87
2447	8	AVG	19.36	19.17	22.28	30.00	-7.72	3.76	26.04	36.02	-9.98
2452	9	AVG	18.85	18.63	21.75	30.00	-8.25	3.76	25.51	36.02	-10.51
2457	10	AVG	17.50	17.25	20.39	30.00	-9.61	3.76	24.15	36.02	-11.87
2462	11	AVG	14.85	14.72	17.79	30.00	-12.21	3.76	21.55	36.02	-14.47
2467	12	AVG	13.28	13.49	16.40	30.00	-13.60	3.76	20.16	36.02	-15.86

Table 7-17. Average Conducted Output Power Measurements CDD (802.11ax - SU) – Mid Data Rate

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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High Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]				Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11b	802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	22.76	15.40	15.19	14.26	30.00	-7.24	0.70	23.46	36.02	-12.56
2417	2	AVG	22.99	17.61	17.72	16.84	30.00	-7.01	0.70	23.69	36.02	-12.33
2422	3	AVG	22.56	19.26	19.25	18.27	30.00	-7.44	0.70	23.26	36.02	-12.76
2427	4	AVG	22.57	19.69	19.91	19.29	30.00	-7.43	0.70	23.27	36.02	-12.75
2432	5	AVG	22.70	21.12	21.25	20.13	30.00	-7.30	0.70	23.40	36.02	-12.62
2437	6	AVG	22.78	21.78	21.88	21.79	30.00	-7.22	0.70	23.48	36.02	-12.54
2442	7	AVG	22.67	20.97	20.94	20.95	30.00	-7.33	0.70	23.37	36.02	-12.65
2447	8	AVG	22.74	20.15	20.33	19.99	30.00	-7.26	0.70	23.44	36.02	-12.58
2452	9	AVG	22.77	19.76	19.96	19.36	30.00	-7.23	0.70	23.47	36.02	-12.55
2457	10	AVG	22.56	17.29	17.49	16.70	30.00	-7.45	0.70	23.26	36.02	-12.77
2462	11	AVG	22.70	15.38	15.35	14.15	30.00	-7.30	0.70	23.40	36.02	-12.62
2467	12	AVG	19.21	13.72	13.62	13.41	30.00	-10.79	0.70	19.91	36.02	-16.11
2472	13	AVG	17.49	8.99	8.62	-	30.00	-12.51	0.70	18.19	36.02	-17.83

Table 7-18. Average Conducted Output Power Measurements Antenna WF8 – High Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]				Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11b	802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	22.62	15.19	15.16	14.27	30.00	-7.38	0.80	23.42	36.02	-12.60
2417	2	AVG	22.78	17.61	17.80	16.79	30.00	-7.22	0.80	23.58	36.02	-12.44
2422	3	AVG	22.90	19.24	19.18	18.28	30.00	-7.10	0.80	23.70	36.02	-12.32
2427	4	AVG	22.72	19.77	19.96	19.27	30.00	-7.28	0.80	23.52	36.02	-12.50
2432	5	AVG	22.70	21.30	21.20	20.11	30.00	-7.30	0.80	23.50	36.02	-12.52
2437	6	AVG	22.72	21.62	21.61	21.63	30.00	-7.29	0.80	23.52	36.02	-12.51
2442	7	AVG	22.60	20.91	20.92	20.92	30.00	-7.40	0.80	23.40	36.02	-12.62
2447	8	AVG	22.64	20.40	20.15	19.98	30.00	-7.36	0.80	23.44	36.02	-12.58
2452	9	AVG	22.74	19.98	19.73	19.14	30.00	-7.27	0.80	23.54	36.02	-12.49
2457	10	AVG	22.75	17.30	17.20	16.95	30.00	-7.25	0.80	23.55	36.02	-12.47
2462	11	AVG	22.81	15.44	15.39	14.12	30.00	-7.19	0.80	23.61	36.02	-12.41
2467	12	AVG	19.27	13.95	13.91	13.42	30.00	-10.74	0.80	20.07	36.02	-15.96
2472	13	AVG	17.27	8.72	8.61	-	30.00	-12.73	0.80	18.07	36.02	-17.95

Table 7-19. Average Conducted Output Power Measurements Antenna WF7 – High Data Rate

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.69	13.74	16.73	30.00	-13.27	3.76	20.49	36.02	-15.53
2417	2	AVG	16.76	16.61	19.70	30.00	-10.30	3.76	23.46	36.02	-12.56
2422	3	AVG	18.19	18.16	21.18	30.00	-8.82	3.76	24.94	36.02	-11.08
2427	4	AVG	19.13	19.42	22.29	30.00	-7.71	3.76	26.05	36.02	-9.97
2432	5	AVG	20.16	20.36	23.27	30.00	-6.73	3.76	27.03	36.02	-8.99
2437	6	AVG	20.82	20.96	23.90	30.00	-6.10	3.76	27.66	36.02	-8.36
2442	7	AVG	20.39	20.26	23.34	30.00	-6.66	3.76	27.10	36.02	-8.92
2447	8	AVG	19.41	19.44	22.43	30.00	-7.57	3.76	26.19	36.02	-9.83
2452	9	AVG	17.61	17.99	20.81	30.00	-9.19	3.76	24.57	36.02	-11.45
2457	10	AVG	16.38	16.46	19.43	30.00	-10.57	3.76	23.19	36.02	-12.83
2462	11	AVG	14.27	14.48	17.38	30.00	-12.62	3.76	21.14	36.02	-14.88
2467	12	AVG	12.84	12.91	15.89	30.00	-14.11	3.76	19.65	36.02	-16.37
2472	13	AVG	7.38	7.61	10.50	30.00	-19.50	3.76	14.26	36.02	-21.76

Table 7-20. Average Conducted Output Power Measurements CDD (802.11g) – High Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	13.86	13.75	16.82	30.00	-13.18	3.76	20.58	36.02	-15.44
2417	2	AVG	16.70	16.79	19.76	30.00	-10.24	3.76	23.52	36.02	-12.50
2422	3	AVG	18.11	18.30	21.22	30.00	-8.78	3.76	24.98	36.02	-11.04
2427	4	AVG	19.26	19.37	22.32	30.00	-7.68	3.76	26.08	36.02	-9.94
2432	5	AVG	20.47	20.22	23.36	30.00	-6.64	3.76	27.12	36.02	-8.90
2437	6	AVG	20.94	20.89	23.93	30.00	-6.07	3.76	27.69	36.02	-8.33
2442	7	AVG	20.10	20.29	23.21	30.00	-6.79	3.76	26.97	36.02	-9.05
2447	8	AVG	19.28	19.24	22.27	30.00	-7.73	3.76	26.03	36.02	-9.99
2452	9	AVG	17.72	17.79	20.76	30.00	-9.24	3.76	24.52	36.02	-11.50
2457	10	AVG	16.28	16.38	19.34	30.00	-10.66	3.76	23.10	36.02	-12.92
2462	11	AVG	14.21	14.32	17.27	30.00	-12.73	3.76	21.03	36.02	-14.99
2467	12	AVG	12.98	12.83	15.92	30.00	-14.08	3.76	19.68	36.02	-16.34
2472	13	AVG	7.65	7.60	10.63	30.00	-19.37	3.76	14.39	36.02	-21.63

Table 7-21. Average Conducted Output Power Measurements CDD (802.11n) – High Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	AVG	12.70	12.71	15.71	30.00	-14.29	3.76	19.47	36.02	-16.55
2417	2	AVG	16.24	16.33	19.30	30.00	-10.70	3.76	23.06	36.02	-12.96
2422	3	AVG	17.64	17.80	20.73	30.00	-9.27	3.76	24.49	36.02	-11.53
2427	4	AVG	18.33	18.47	21.41	30.00	-8.59	3.76	25.17	36.02	-10.85
2432	5	AVG	20.30	20.10	23.21	30.00	-6.79	3.76	26.97	36.02	-9.05
2437	6	AVG	20.99	20.94	23.97	30.00	-6.03	3.76	27.73	36.02	-8.29
2442	7	AVG	19.94	19.97	22.97	30.00	-7.03	3.76	26.73	36.02	-9.29
2447	8	AVG	18.83	18.65	21.75	30.00	-8.25	3.76	25.51	36.02	-10.51
2452	9	AVG	17.19	17.27	20.24	30.00	-9.76	3.76	24.00	36.02	-12.02
2457	10	AVG	15.78	15.61	18.71	30.00	-11.29	3.76	22.47	36.02	-13.55
2462	11	AVG	13.82	13.92	16.88	30.00	-13.12	3.76	20.64	36.02	-15.38
2467	12	AVG	12.64	12.65	15.66	30.00	-14.34	3.76	19.42	36.02	-16.60

Table 7-22. Average Conducted Output Power Measurements CDD (802.11ax - SU) – High Data Rate

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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7.3.2 Peak Output Power Measurement

§15.247(b.3); RSS-247 [5.4]

Low Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	19.80	19.32	18.98	30.00	-10.20	0.70	20.50	36.02	-15.52
2417	2	PEAK	23.94	23.90	21.74	30.00	-6.06	0.70	24.64	36.02	-11.38
2422	3	PEAK	24.78	24.91	23.96	30.00	-5.09	0.70	25.61	36.02	-10.41
2427	4	PEAK	27.19	27.21	26.22	30.00	-2.79	0.70	27.91	36.02	-8.11
2432	5	PEAK	27.44	27.53	27.43	30.00	-2.47	0.70	28.23	36.02	-7.79
2437	6	PEAK	27.54	27.65	27.69	30.00	-2.31	0.70	28.39	36.02	-7.63
2442	7	PEAK	27.45	27.57	27.24	30.00	-2.43	0.70	28.27	36.02	-7.75
2447	8	PEAK	27.16	27.21	27.16	30.00	-2.80	0.70	27.91	36.02	-8.12
2452	9	PEAK	25.40	25.32	25.31	30.00	-4.60	0.70	26.10	36.02	-9.92
2457	10	PEAK	24.81	24.85	22.88	30.00	-5.15	0.70	25.55	36.02	-10.47
2462	11	PEAK	20.40	20.45	19.93	30.00	-9.55	0.70	21.15	36.02	-14.87
2467	12	PEAK	18.92	18.79	17.96	30.00	-11.08	0.70	19.62	36.02	-16.40
2472	13	PEAK	15.33	15.26	-	30.00	-14.67	0.70	16.03	36.02	-19.99

Table 7-23. Peak Conducted Output Power Measurements Antenna WF8 – Low Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	19.53	19.42	19.08	30.00	-10.47	0.80	20.33	36.02	-15.69
2417	2	PEAK	24.07	23.89	21.75	30.00	-5.93	0.80	24.87	36.02	-11.15
2422	3	PEAK	24.86	25.12	23.93	30.00	-4.88	0.80	25.92	36.02	-10.10
2427	4	PEAK	26.97	27.14	26.35	30.00	-2.86	0.80	27.94	36.02	-8.08
2432	5	PEAK	27.36	27.52	27.38	30.00	-2.48	0.80	28.32	36.02	-7.70
2437	6	PEAK	27.44	27.59	27.59	30.00	-2.41	0.80	28.39	36.02	-7.63
2442	7	PEAK	27.41	27.49	27.16	30.00	-2.51	0.80	28.29	36.02	-7.73
2447	8	PEAK	27.15	27.28	27.16	30.00	-2.72	0.80	28.08	36.02	-7.94
2452	9	PEAK	25.34	25.37	25.13	30.00	-4.63	0.80	26.17	36.02	-9.85
2457	10	PEAK	25.08	25.10	23.03	30.00	-4.90	0.80	25.90	36.02	-10.12
2462	11	PEAK	20.49	20.34	19.84	30.00	-9.51	0.80	21.29	36.02	-14.73
2467	12	PEAK	19.08	19.10	18.29	30.00	-10.90	0.80	19.90	36.02	-16.12
2472	13	PEAK	15.28	15.21	-	30.00	-14.72	0.80	16.08	36.02	-19.94

Table 7-24. Peak Conducted Output Power Measurements Antenna WF7 – Low Data Rate

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 60 of 431

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Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	18.15	18.27	21.22	30.00	-8.78	3.76	24.98	36.02	-11.04
2417	2	PEAK	21.51	21.44	24.48	30.00	-5.52	3.76	28.24	36.02	-7.78
2422	3	PEAK	23.23	23.27	26.26	30.00	-3.74	3.76	30.02	36.02	-6.00
2427	4	PEAK	26.39	26.42	29.42	30.00	-0.58	3.76	33.18	36.02	-2.84
2432	5	PEAK	26.30	26.13	29.23	30.00	-0.77	3.76	32.99	36.02	-3.03
2437	6	PEAK	26.34	26.31	29.34	30.00	-0.66	3.76	33.10	36.02	-2.92
2442	7	PEAK	26.33	26.38	29.37	30.00	-0.63	3.76	33.13	36.02	-2.89
2447	8	PEAK	26.39	26.44	29.43	30.00	-0.57	3.76	33.19	36.02	-2.83
2452	9	PEAK	24.57	24.47	27.53	30.00	-2.47	3.76	31.29	36.02	-4.73
2457	10	PEAK	23.47	23.44	26.46	30.00	-3.54	3.76	30.22	36.02	-5.80
2462	11	PEAK	19.99	19.76	22.88	30.00	-7.12	3.76	26.64	36.02	-9.38
2467	12	PEAK	17.94	18.21	21.09	30.00	-8.91	3.76	24.85	36.02	-11.17
2472	13	PEAK	14.20	14.25	17.23	30.00	-12.77	3.76	20.99	36.02	-15.03

Table 7-25. Peak Conducted Output Power Measurements CDD (802.11g) – Low Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	18.09	17.84	20.98	30.00	-9.02	3.76	24.74	36.02	-11.28
2417	2	PEAK	21.40	21.51	24.47	30.00	-5.53	3.76	28.23	36.02	-7.79
2422	3	PEAK	23.19	23.05	26.13	30.00	-3.87	3.76	29.89	36.02	-6.13
2427	4	PEAK	26.66	26.51	29.60	30.00	-0.40	3.76	33.36	36.02	-2.66
2432	5	PEAK	26.13	26.36	29.26	30.00	-0.74	3.76	33.02	36.02	-3.00
2437	6	PEAK	26.31	26.24	29.29	30.00	-0.71	3.76	33.05	36.02	-2.97
2442	7	PEAK	26.38	26.36	29.38	30.00	-0.62	3.76	33.14	36.02	-2.88
2447	8	PEAK	26.30	26.57	29.45	30.00	-0.55	3.76	33.21	36.02	-2.81
2452	9	PEAK	24.42	24.43	27.43	30.00	-2.57	3.76	31.19	36.02	-4.83
2457	10	PEAK	23.33	23.62	26.49	30.00	-3.51	3.76	30.25	36.02	-5.77
2462	11	PEAK	19.51	19.65	22.59	30.00	-7.41	3.76	26.35	36.02	-9.67
2467	12	PEAK	17.86	17.89	20.89	30.00	-9.11	3.76	24.65	36.02	-11.37
2472	13	PEAK	14.05	14.12	17.09	30.00	-12.91	3.76	20.85	36.02	-15.17

Table 7-26. Peak Conducted Output Power Measurements CDD (802.11n) – Low Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	17.64	17.81	20.74	30.00	-9.26	3.76	24.50	36.02	-11.52
2417	2	PEAK	21.33	21.27	24.31	30.00	-5.69	3.76	28.07	36.02	-7.95
2422	3	PEAK	23.13	23.12	26.13	30.00	-3.87	3.76	29.89	36.02	-6.13
2427	4	PEAK	26.12	26.08	29.11	30.00	-0.89	3.76	32.87	36.02	-3.15
2432	5	PEAK	26.39	26.39	29.40	30.00	-0.60	3.76	33.16	36.02	-2.86
2437	6	PEAK	26.14	26.09	29.12	30.00	-0.88	3.76	32.88	36.02	-3.14
2442	7	PEAK	26.31	26.37	29.35	30.00	-0.65	3.76	33.11	36.02	-2.91
2447	8	PEAK	26.31	26.07	29.20	30.00	-0.80	3.76	32.96	36.02	-3.06
2452	9	PEAK	23.72	23.69	26.71	30.00	-3.29	3.76	30.47	36.02	-5.55
2457	10	PEAK	21.81	21.96	24.90	30.00	-5.10	3.76	28.66	36.02	-7.36
2462	11	PEAK	19.26	19.34	22.31	30.00	-7.69	3.76	26.07	36.02	-9.95
2467	12	PEAK	17.90	17.73	20.83	30.00	-9.17	3.76	24.59	36.02	-11.43

Table 7-27. Peak Conducted Output Power Measurements CDD (802.11ax - SU) – Low Data Rate

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 61 of 431

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Mid Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	22.50	22.10	21.79	30.00	-7.50	0.70	23.20	36.02	-12.82
2417	2	PEAK	26.01	25.77	23.80	30.00	-3.99	0.70	26.71	36.02	-9.31
2422	3	PEAK	26.62	26.32	25.74	30.00	-3.38	0.70	27.32	36.02	-8.70
2427	4	PEAK	27.43	27.59	26.81	30.00	-2.42	0.70	28.29	36.02	-7.74
2432	5	PEAK	27.62	27.75	27.62	30.00	-2.25	0.70	28.45	36.02	-7.57
2437	6	PEAK	27.83	27.93	27.93	30.00	-2.07	0.70	28.63	36.02	-7.39
2442	7	PEAK	27.65	27.80	27.59	30.00	-2.20	0.70	28.50	36.02	-7.52
2447	8	PEAK	27.40	27.53	27.25	30.00	-2.48	0.70	28.23	36.02	-7.80
2452	9	PEAK	26.91	26.62	26.46	30.00	-3.09	0.70	27.61	36.02	-8.41
2457	10	PEAK	25.51	25.62	24.65	30.00	-4.38	0.70	26.32	36.02	-9.70
2462	11	PEAK	23.02	22.67	22.01	30.00	-6.99	0.70	23.72	36.02	-12.31
2467	12	PEAK	21.01	20.59	20.64	30.00	-8.99	0.70	21.71	36.02	-14.31
2472	13	PEAK	17.70	16.96	-	30.00	-12.30	0.70	18.40	36.02	-17.62

Table 7-28. Peak Conducted Output Power Measurements Antenna WF8 – Mid Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	22.20	21.86	21.57	30.00	-7.80	0.80	23.00	36.02	-13.02
2417	2	PEAK	25.95	25.68	23.62	30.00	-4.05	0.80	26.75	36.02	-9.27
2422	3	PEAK	26.53	26.25	25.69	30.00	-3.47	0.80	27.33	36.02	-8.69
2427	4	PEAK	27.37	27.51	26.94	30.00	-2.49	0.80	28.31	36.02	-7.71
2432	5	PEAK	27.66	27.72	27.57	30.00	-2.28	0.80	28.52	36.02	-7.50
2437	6	PEAK	27.79	27.90	27.89	30.00	-2.10	0.80	28.70	36.02	-7.32
2442	7	PEAK	27.63	27.77	27.60	30.00	-2.23	0.80	28.57	36.02	-7.45
2447	8	PEAK	27.34	27.48	27.29	30.00	-2.52	0.80	28.28	36.02	-7.74
2452	9	PEAK	26.78	26.64	26.10	30.00	-3.22	0.80	27.58	36.02	-8.44
2457	10	PEAK	25.43	25.50	24.65	30.00	-4.50	0.80	26.30	36.02	-9.72
2462	11	PEAK	23.06	22.76	21.69	30.00	-6.94	0.80	23.86	36.02	-12.16
2467	12	PEAK	20.65	20.69	20.42	30.00	-9.31	0.80	21.49	36.02	-14.53
2472	13	PEAK	17.51	16.91	-	30.00	-12.49	0.80	18.31	36.02	-17.71

Table 7-29. Peak Conducted Output Power Measurements Antenna WF7 – Mid Data Rate

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 62 of 431

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Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	20.81	20.92	23.88	30.00	-6.12	3.76	27.64	36.02	-8.38
2417	2	PEAK	24.13	24.38	27.27	30.00	-2.73	3.76	31.03	36.02	-4.99
2422	3	PEAK	25.65	25.35	28.51	30.00	-1.49	3.76	32.27	36.02	-3.75
2427	4	PEAK	26.38	26.31	29.36	30.00	-0.64	3.76	33.12	36.02	-2.90
2432	5	PEAK	26.35	26.39	29.38	30.00	-0.62	3.76	33.14	36.02	-2.88
2437	6	PEAK	26.32	26.37	29.36	30.00	-0.64	3.76	33.12	36.02	-2.90
2442	7	PEAK	26.39	26.34	29.37	30.00	-0.63	3.76	33.13	36.02	-2.89
2447	8	PEAK	26.49	26.39	29.45	30.00	-0.55	3.76	33.21	36.02	-2.81
2452	9	PEAK	25.81	25.67	28.75	30.00	-1.25	3.76	32.51	36.02	-3.51
2457	10	PEAK	24.56	24.77	27.68	30.00	-2.32	3.76	31.44	36.02	-4.58
2462	11	PEAK	22.28	22.42	25.36	30.00	-4.64	3.76	29.12	36.02	-6.90
2467	12	PEAK	20.72	20.67	23.70	30.00	-6.30	3.76	27.46	36.02	-8.56
2472	13	PEAK	16.24	16.21	19.24	30.00	-10.76	3.76	23.00	36.02	-13.02

Table 7-30. Peak Conducted Output Power Measurements CDD (802.11g) – Mid Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	20.78	20.86	23.83	30.00	-6.17	3.76	27.59	36.02	-8.43
2417	2	PEAK	23.86	24.15	27.01	30.00	-2.99	3.76	30.77	36.02	-5.25
2422	3	PEAK	25.39	25.19	28.30	30.00	-1.70	3.76	32.06	36.02	-3.96
2427	4	PEAK	26.32	26.36	29.35	30.00	-0.65	3.76	33.11	36.02	-2.91
2432	5	PEAK	26.48	26.46	29.48	30.00	-0.52	3.76	33.24	36.02	-2.78
2437	6	PEAK	26.37	26.34	29.36	30.00	-0.64	3.76	33.12	36.02	-2.90
2442	7	PEAK	26.45	26.46	29.47	30.00	-0.53	3.76	33.23	36.02	-2.79
2447	8	PEAK	26.39	26.39	29.40	30.00	-0.60	3.76	33.16	36.02	-2.86
2452	9	PEAK	25.67	25.52	28.60	30.00	-1.40	3.76	32.36	36.02	-3.66
2457	10	PEAK	24.49	24.31	27.41	30.00	-2.59	3.76	31.17	36.02	-4.85
2462	11	PEAK	21.99	22.12	25.06	30.00	-4.94	3.76	28.82	36.02	-7.20
2467	12	PEAK	20.46	20.77	23.62	30.00	-6.38	3.76	27.38	36.02	-8.64
2472	13	PEAK	15.77	15.78	18.79	30.00	-11.21	3.76	22.55	36.02	-13.47

Table 7-31. Peak Conducted Output Power Measurements CDD (802.11n) – Mid Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	20.13	20.00	23.07	30.00	-6.93	3.76	26.83	36.02	-9.19
2417	2	PEAK	23.91	23.68	26.81	30.00	-3.19	3.76	30.57	36.02	-5.45
2422	3	PEAK	25.18	25.20	28.20	30.00	-1.80	3.76	31.96	36.02	-4.06
2427	4	PEAK	26.36	26.35	29.37	30.00	-0.63	3.76	33.13	36.02	-2.89
2432	5	PEAK	26.43	26.41	29.43	30.00	-0.57	3.76	33.19	36.02	-2.83
2437	6	PEAK	26.31	26.55	29.44	30.00	-0.56	3.76	33.20	36.02	-2.82
2442	7	PEAK	26.30	26.28	29.30	30.00	-0.70	3.76	33.06	36.02	-2.96
2447	8	PEAK	26.36	26.33	29.36	30.00	-0.64	3.76	33.12	36.02	-2.90
2452	9	PEAK	25.30	25.01	28.17	30.00	-1.83	3.76	31.93	36.02	-4.09
2457	10	PEAK	24.12	23.68	26.91	30.00	-3.09	3.76	30.67	36.02	-5.35
2462	11	PEAK	21.47	21.27	24.38	30.00	-5.62	3.76	28.14	36.02	-7.88
2467	12	PEAK	20.04	20.07	23.07	30.00	-6.93	3.76	26.83	36.02	-9.19

Table 7-32. Peak Conducted Output Power Measurements CDD (802.11ax - SU) – Mid Data Rate

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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High Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]				Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11b	802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	25.38	25.54	25.41	24.69	30.00	-4.46	0.70	26.24	36.02	-9.78
2417	2	PEAK	25.59	26.99	27.09	26.62	30.00	-2.91	0.70	27.79	36.02	-8.23
2422	3	PEAK	25.18	27.56	27.62	27.25	30.00	-2.38	0.70	28.32	36.02	-7.70
2427	4	PEAK	25.23	27.83	27.86	27.58	30.00	-2.15	0.70	28.56	36.02	-7.47
2432	5	PEAK	25.17	27.97	27.98	27.80	30.00	-2.02	0.70	28.68	36.02	-7.34
2437	6	PEAK	25.14	28.07	28.05	28.11	30.00	-1.89	0.70	28.81	36.02	-7.21
2442	7	PEAK	25.09	27.95	27.92	27.92	30.00	-2.05	0.70	28.65	36.02	-7.37
2447	8	PEAK	25.09	27.77	27.84	27.75	30.00	-2.16	0.70	28.54	36.02	-7.48
2452	9	PEAK	25.07	27.73	27.75	27.63	30.00	-2.25	0.70	28.45	36.02	-7.57
2457	10	PEAK	25.24	26.86	26.99	26.48	30.00	-3.01	0.70	27.69	36.02	-8.33
2462	11	PEAK	25.33	25.61	25.58	24.58	30.00	-4.39	0.70	26.31	36.02	-9.71
2467	12	PEAK	21.94	24.10	24.10	23.89	30.00	-5.90	0.70	24.80	36.02	-11.22
2472	13	PEAK	20.21	19.27	19.00	-	30.00	-9.79	0.70	20.91	36.02	-15.11

Table 7-33. Peak Conducted Output Power Measurements Antenna WF8 – High Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]				Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			802.11b	802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	25.06	25.32	25.42	24.56	30.00	-4.58	0.80	26.22	36.02	-9.80
2417	2	PEAK	25.02	26.97	27.01	26.44	30.00	-2.99	0.80	27.81	36.02	-8.21
2422	3	PEAK	25.51	27.54	27.57	27.25	30.00	-2.43	0.80	28.37	36.02	-7.65
2427	4	PEAK	25.39	27.82	27.85	27.57	30.00	-2.15	0.80	28.65	36.02	-7.37
2432	5	PEAK	25.32	27.99	27.96	27.76	30.00	-2.01	0.80	28.79	36.02	-7.23
2437	6	PEAK	25.34	28.05	28.04	28.06	30.00	-1.94	0.80	28.86	36.02	-7.16
2442	7	PEAK	25.28	27.92	27.93	27.97	30.00	-2.03	0.80	28.77	36.02	-7.25
2447	8	PEAK	25.27	27.83	27.77	27.79	30.00	-2.17	0.80	28.63	36.02	-7.39
2452	9	PEAK	25.36	27.76	27.69	27.56	30.00	-2.24	0.80	28.56	36.02	-7.46
2457	10	PEAK	25.36	26.80	26.78	26.66	30.00	-3.20	0.80	27.60	36.02	-8.42
2462	11	PEAK	25.41	25.50	25.49	24.30	30.00	-4.50	0.80	26.30	36.02	-9.72
2467	12	PEAK	21.96	24.25	24.26	23.65	30.00	-5.74	0.80	25.06	36.02	-10.96
2472	13	PEAK	20.00	18.98	18.80	-	30.00	-10.01	0.80	20.80	36.02	-15.23

Table 7-34. Peak Conducted Output Power Measurements Antenna WF7 – High Data Rate

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Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	24.26	24.02	27.16	30.00	-2.84	3.76	30.92	36.02	-5.10
2417	2	PEAK	26.36	26.36	29.37	30.00	-0.63	3.76	33.13	36.02	-2.89
2422	3	PEAK	26.30	26.23	29.28	30.00	-0.72	3.76	33.04	36.02	-2.98
2427	4	PEAK	26.37	26.37	29.38	30.00	-0.62	3.76	33.14	36.02	-2.88
2432	5	PEAK	26.38	26.38	29.39	30.00	-0.61	3.76	33.15	36.02	-2.87
2437	6	PEAK	26.39	26.40	29.41	30.00	-0.59	3.76	33.17	36.02	-2.85
2442	7	PEAK	26.39	26.38	29.40	30.00	-0.60	3.76	33.16	36.02	-2.86
2447	8	PEAK	26.38	26.37	29.38	30.00	-0.62	3.76	33.14	36.02	-2.88
2452	9	PEAK	26.10	26.17	29.14	30.00	-0.86	3.76	32.90	36.02	-3.12
2457	10	PEAK	26.37	26.47	29.43	30.00	-0.57	3.76	33.19	36.02	-2.83
2462	11	PEAK	24.71	24.82	27.77	30.00	-2.23	3.76	31.53	36.02	-4.49
2467	12	PEAK	23.28	23.31	26.30	30.00	-3.70	3.76	30.06	36.02	-5.96
2472	13	PEAK	17.75	18.04	20.91	30.00	-9.09	3.76	24.67	36.02	-11.35

Table 7-35. Peak Conducted Output Power Measurements CDD (802.11g) – High Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	24.45	24.20	27.34	30.00	-2.66	3.76	31.10	36.02	-4.92
2417	2	PEAK	26.35	26.37	29.37	30.00	-0.63	3.76	33.13	36.02	-2.89
2422	3	PEAK	26.23	26.18	29.22	30.00	-0.78	3.76	32.98	36.02	-3.04
2427	4	PEAK	26.32	26.34	29.34	30.00	-0.66	3.76	33.10	36.02	-2.92
2432	5	PEAK	26.38	26.37	29.38	30.00	-0.62	3.76	33.14	36.02	-2.88
2437	6	PEAK	26.38	26.38	29.39	30.00	-0.61	3.76	33.15	36.02	-2.87
2442	7	PEAK	26.37	26.37	29.38	30.00	-0.62	3.76	33.14	36.02	-2.88
2447	8	PEAK	26.36	26.36	29.37	30.00	-0.63	3.76	33.13	36.02	-2.89
2452	9	PEAK	26.01	26.04	29.03	30.00	-0.97	3.76	32.79	36.02	-3.23
2457	10	PEAK	26.26	26.37	29.33	30.00	-0.67	3.76	33.09	36.02	-2.93
2462	11	PEAK	24.69	24.67	27.69	30.00	-2.31	3.76	31.45	36.02	-4.57
2467	12	PEAK	23.29	23.26	26.28	30.00	-3.72	3.76	30.04	36.02	-5.98
2472	13	PEAK	17.97	17.94	20.96	30.00	-9.04	3.76	24.72	36.02	-11.30

Table 7-36. Peak Conducted Output Power Measurements CDD (802.11n) – High Data Rate

Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
			Antenna WF8	Antenna WF7	Summed						
2412	1	PEAK	23.22	23.09	26.17	30.00	-3.83	3.76	29.93	36.02	-6.09
2417	2	PEAK	26.22	26.08	29.16	30.00	-0.84	3.76	32.92	36.02	-3.10
2422	3	PEAK	26.03	26.06	29.05	30.00	-0.95	3.76	32.81	36.02	-3.21
2427	4	PEAK	26.39	26.43	29.42	30.00	-0.58	3.76	33.18	36.02	-2.84
2432	5	PEAK	26.38	26.37	29.39	30.00	-0.61	3.76	33.15	36.02	-2.87
2437	6	PEAK	26.40	26.40	29.41	30.00	-0.59	3.76	33.17	36.02	-2.85
2442	7	PEAK	26.38	26.37	29.38	30.00	-0.62	3.76	33.14	36.02	-2.88
2447	8	PEAK	26.50	26.41	29.46	30.00	-0.54	3.76	33.22	36.02	-2.80
2452	9	PEAK	26.38	26.38	29.39	30.00	-0.61	3.76	33.15	36.02	-2.87
2457	10	PEAK	26.00	25.65	28.84	30.00	-1.16	3.76	32.60	36.02	-3.42
2462	11	PEAK	24.20	24.10	27.16	30.00	-2.84	3.76	30.92	36.02	-5.10
2467	12	PEAK	23.19	22.90	26.06	30.00	-3.94	3.76	29.82	36.02	-6.20

Table 7-37. Peak Conducted Output Power Measurements CDD (802.11ax - SU) – High Data Rate

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Note:

Per ANSI C63.10-2020 and KDB 662911 D01 v02r01 Section E)1), the conducted powers at Antenna WF8 and Antenna WF7 were first measured separately during CDD transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Per ANSI C63.10-2020 Section 14.6.3. the directional gain is calculated using the following formula, where G_N is the gain of the nth antenna and N_{ANT} , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi}$$

Sample CDD Calculation:

At 2412MHz the average conducted output power was measured to be 13.83 dBm for Antenna WF8 and 13.94 dBm for Antenna WF7.

$$\text{Antenna WF8} + \text{Antenna WF7} = \text{CDD}$$

$$(13.83 \text{ dBm} + 13.94 \text{ dBm}) = (24.155 \text{ mW} + 24.774 \text{ mW}) = 48.865 \text{ mW} = 16.89 \text{ dBm}$$

Sample e.i.r.p. Calculation:

At 2412MHz the average conducted output power was measured to be 16.89 dBm with directional gain of 3.77 dBi.

$$\text{e.i.r.p (dBm)} = \text{Conducted Power (dBm)} + \text{Ant gain (dBi)}$$

$$16.89 \text{ dBm} + 3.77 \text{ dBi} = 20.66 \text{ dBm}$$

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7.4 Power Spectral Density

§15.247(e); RSS-247 [5.2]

Test Overview and Limit

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated and the worst case configuration results are reported in this section.

The maximum permissible power spectral density is 8 dBm in any 3 kHz band.

Test Procedure Used

ANSI C63.10-2020 – Subclause 11.10.2 Method PKPSD

KDB 558074 D01 v05r02 – Section 8.4 DTS Maximum Power Spectral Density level in the fundamental emission

ANSI C63.10-2020 – Subclause 14.5.2.2 Measure-and-Sum Technique

KDB 662911 D01 v02r01 – Section E)2) Measure-and-Sum Technique

Test Settings

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = >1.5 times the DTS channel bandwidth
3. RBW = 3kHz
4. VBW = 1MHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

Test Notes

The data rates have been classified into three different groups: low data rate, middle data rate, and high data rate. All three data rate groups have been investigated and only the worst data rate per group is reported.

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7.4.1 Antenna WF8 Power Spectral Density Measurements

Frequency [MHz]	Channel No.	802.11 MODE	Data Rate [Mbps]	Measured Power Density [dBm/3kHz]	Max Power Density [dBm/3kHz]	Margin [dB]	Pass/Fail
2412	1	g	12	-6.62	8.00	-14.62	Pass
2437	6	g	12	-0.17	8.00	-8.17	Pass
2462	11	g	12	-6.51	8.00	-14.51	Pass
2412	1	n	19.5/21.7 (MCS2)	-8.06	8.00	-16.06	Pass
2437	6	n	19.5/21.7 (MCS2)	-1.07	8.00	-9.07	Pass
2462	11	n	19.5/21.7 (MCS2)	-6.87	8.00	-14.87	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	-9.51	8.00	-17.51	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	-2.22	8.00	-10.22	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	-9.45	8.00	-17.45	Pass

Table 7-38. Conducted Power Density Measurements Antenna WF8 (Low Data Rate)

Frequency [MHz]	Channel No.	802.11 MODE	Data Rate [Mbps]	Measured Power Density [dBm/3kHz]	Max Power Density [dBm/3kHz]	Margin [dB]	Pass/Fail
2412	1	g	24	-7.64	8.00	-15.64	Pass
2437	6	g	24	-0.51	8.00	-8.51	Pass
2462	11	g	24	-6.97	8.00	-14.97	Pass
2412	1	n	39/43.3 (MCS4)	-7.42	8.00	-15.42	Pass
2437	6	n	39/43.3 (MCS4)	-0.91	8.00	-8.91	Pass
2462	11	n	39/43.3 (MCS4)	-7.27	8.00	-15.27	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	-9.09	8.00	-17.09	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	-1.98	8.00	-9.98	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	-8.78	8.00	-16.78	Pass

Table 7-39. Conducted Power Density Measurements Antenna WF8 (Mid Data Rate)

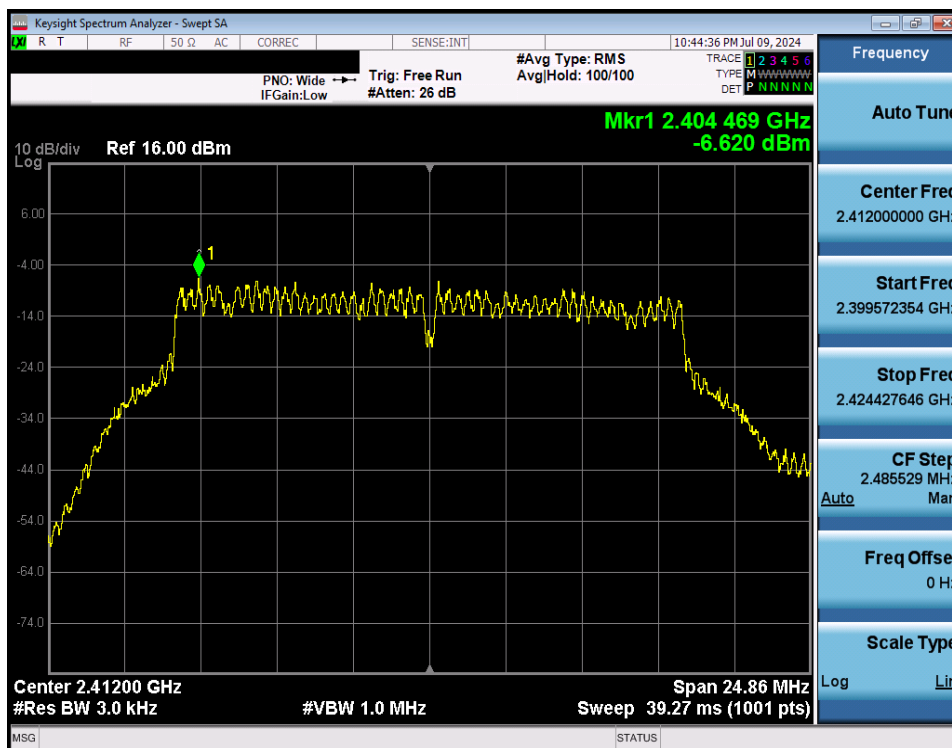
Frequency [MHz]	Channel No.	802.11 MODE	Data Rate [Mbps]	Measured Power Density [dBm/3kHz]	Max Power Density [dBm/3kHz]	Margin [dB]	Pass/Fail
2412	1	b	11	1.21	8.00	-6.79	Pass
2437	6	b	11	-0.38	8.00	-8.38	Pass
2462	11	b	11	0.18	8.00	-7.82	Pass
2412	1	g	54	-8.64	8.00	-16.64	Pass
2437	6	g	54	-2.53	8.00	-10.53	Pass
2462	11	g	54	-8.76	8.00	-16.76	Pass
2412	1	n	65/72.2 (MCS7)	-8.33	8.00	-16.33	Pass
2437	6	n	65/72.2 (MCS7)	-2.14	8.00	-10.14	Pass
2462	11	n	65/72.2 (MCS7)	-8.61	8.00	-16.61	Pass
2412	1	ax (SU)	81/86 (MCS9)	-9.74	8.00	-17.74	Pass
2437	6	ax (SU)	81/86 (MCS9)	-2.01	8.00	-10.01	Pass
2462	11	ax (SU)	81/86 (MCS9)	-9.72	8.00	-17.72	Pass

Table 7-40. Conducted Power Density Measurements Antenna WF8 (High Data Rate)

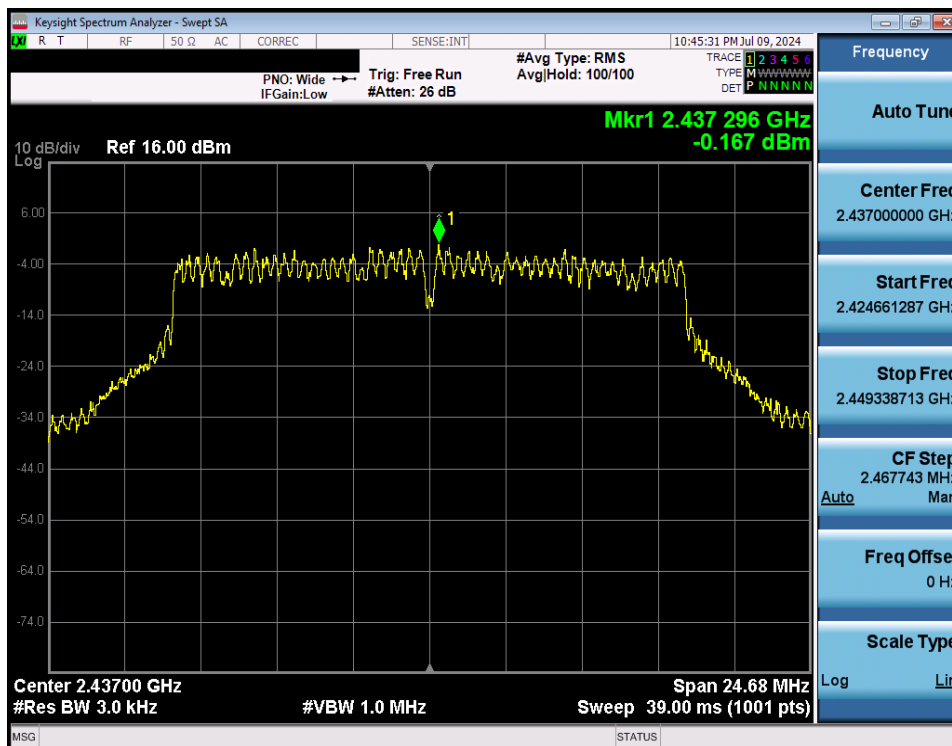
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Low Rate



Plot 7-61. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 1) – 12Mbps

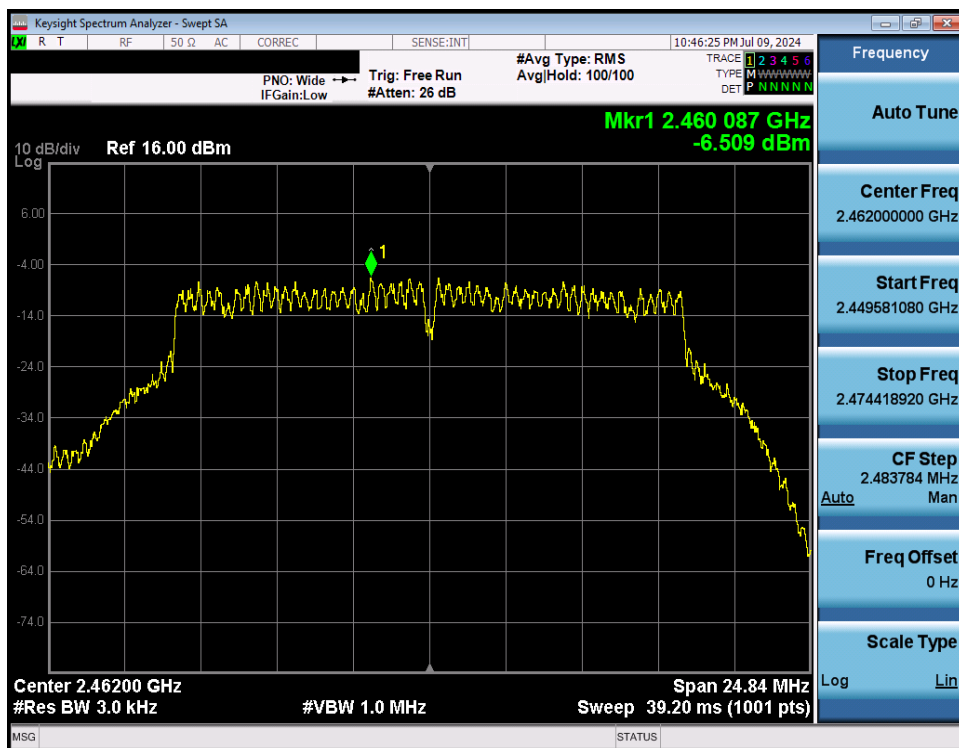


Plot 7-62. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 6) – 12Mbps

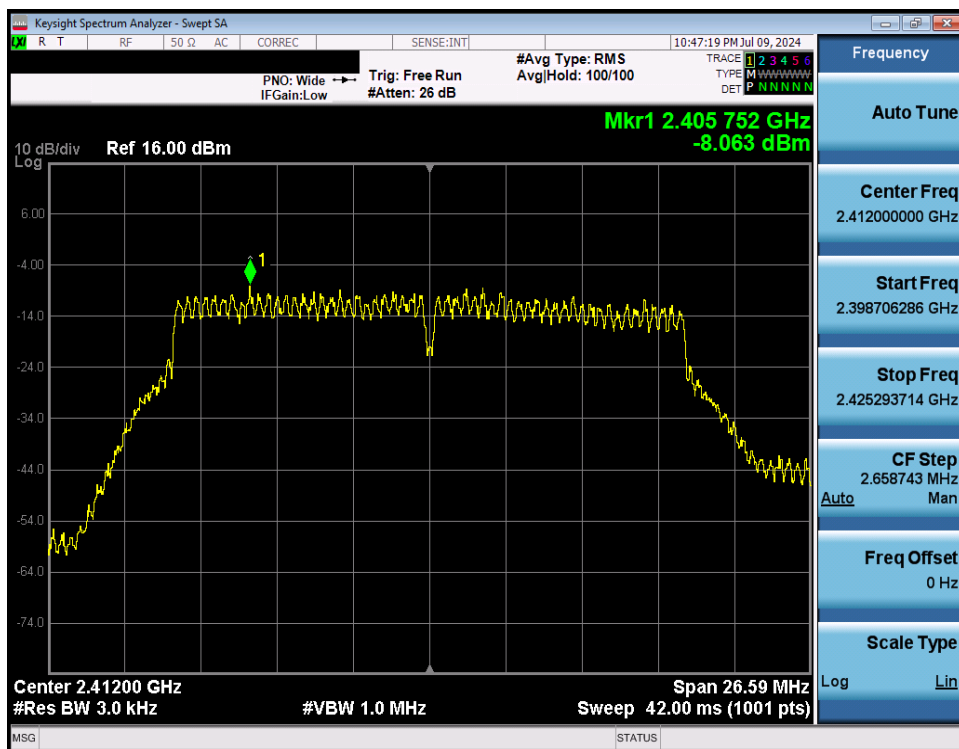
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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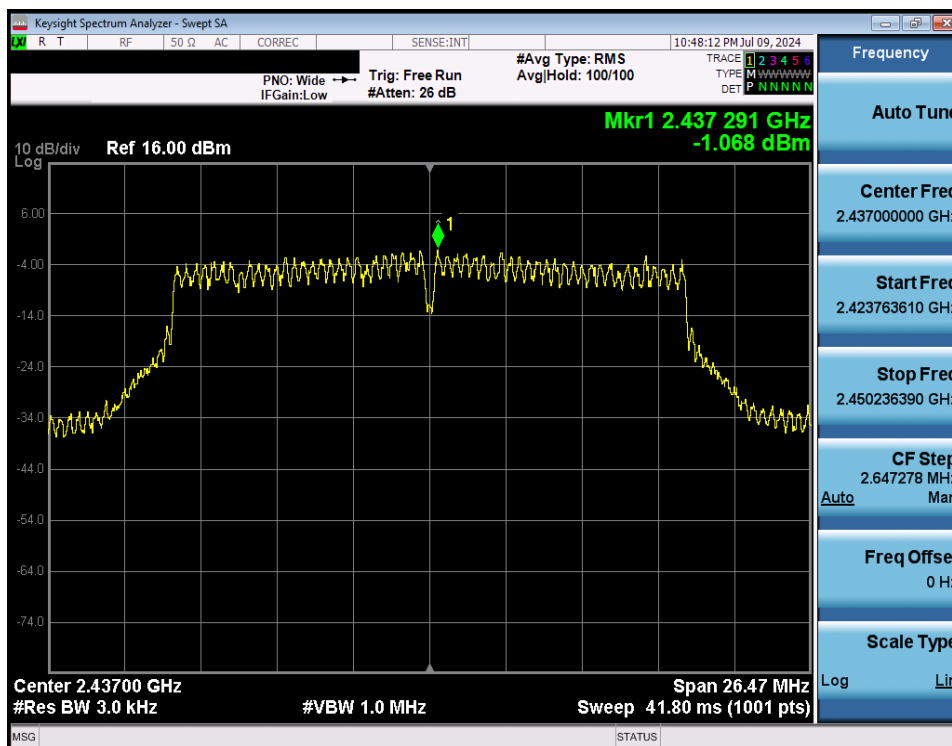
Plot 7-63. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 11) – 12Mbps



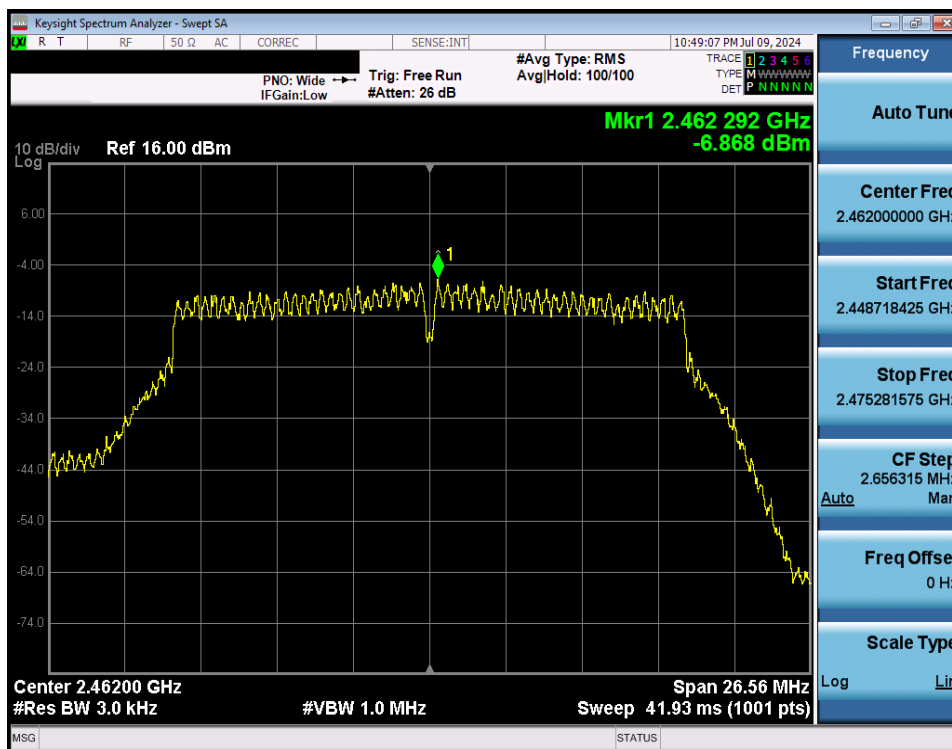
Plot 7-64. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 1) – MCS2

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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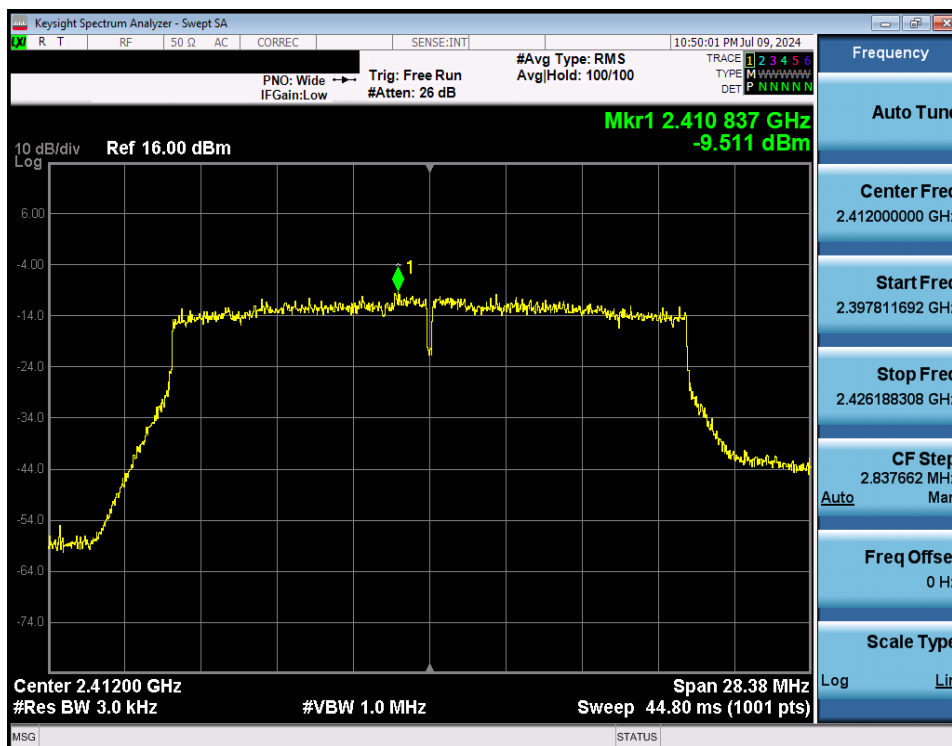
Plot 7-65. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 6) – MCS2



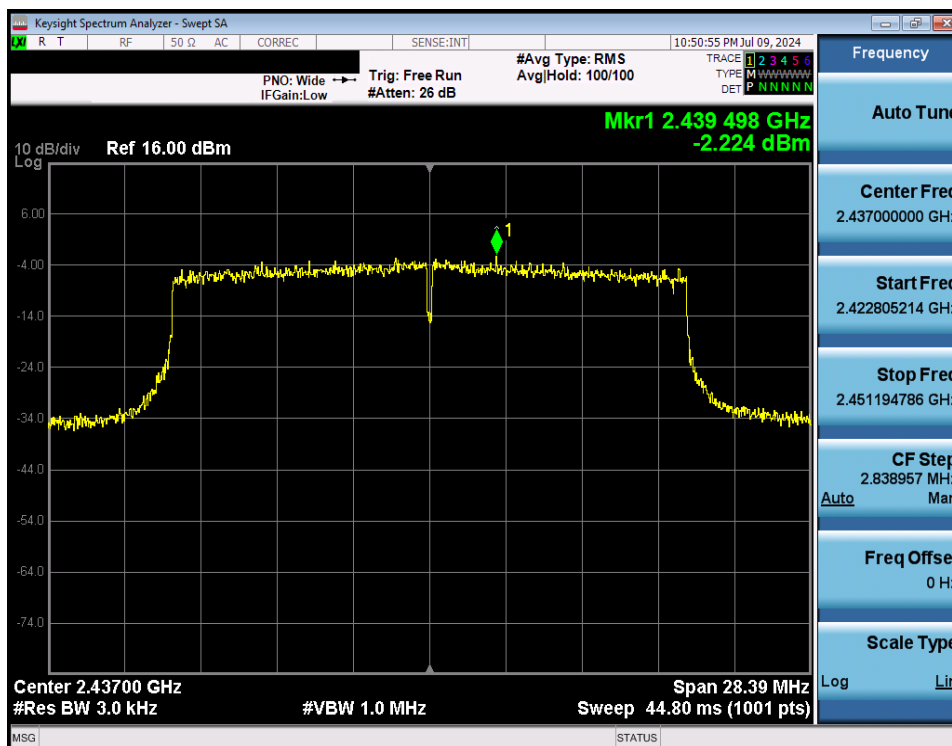
Plot 7-66. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 11) – MCS2

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-67. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) - Ch. 1) - MCS2

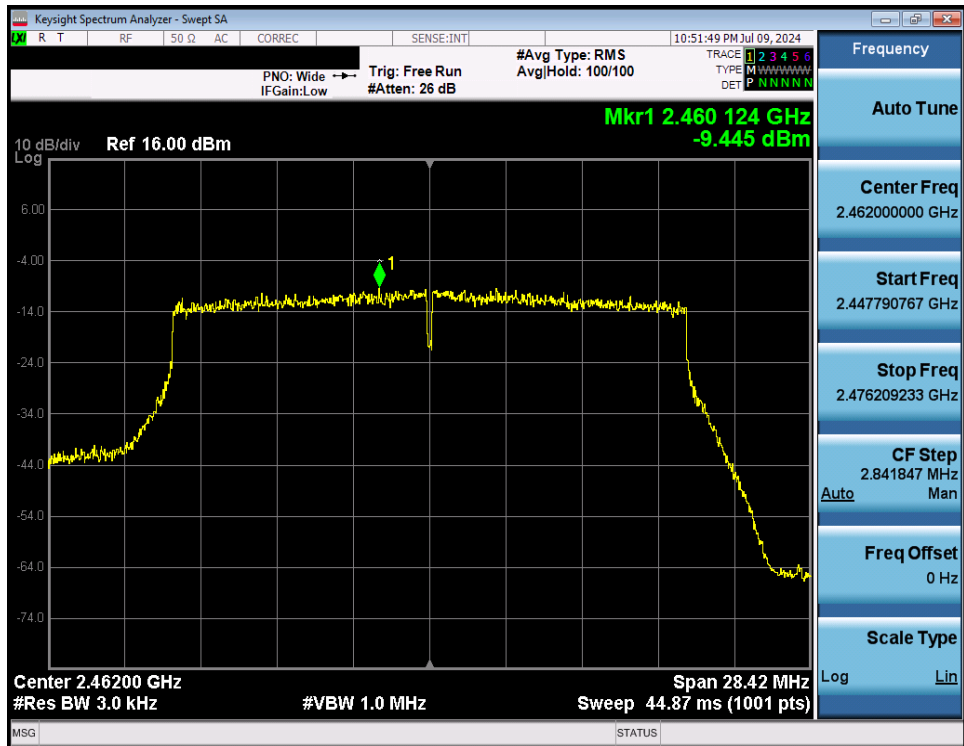


Plot 7-68. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) - Ch. 6) - MCS2

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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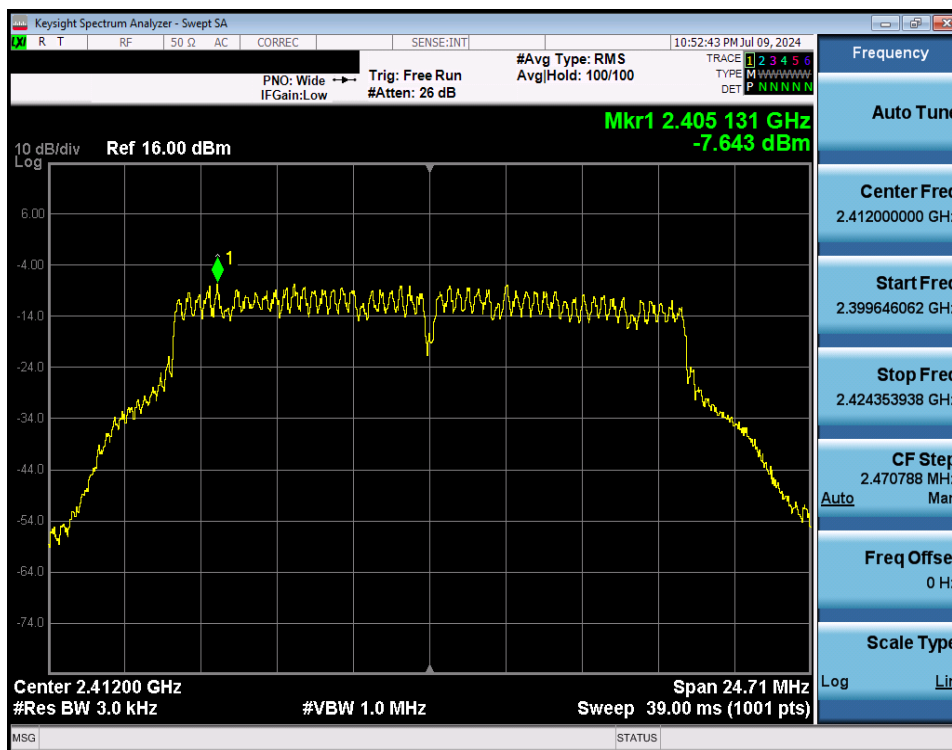
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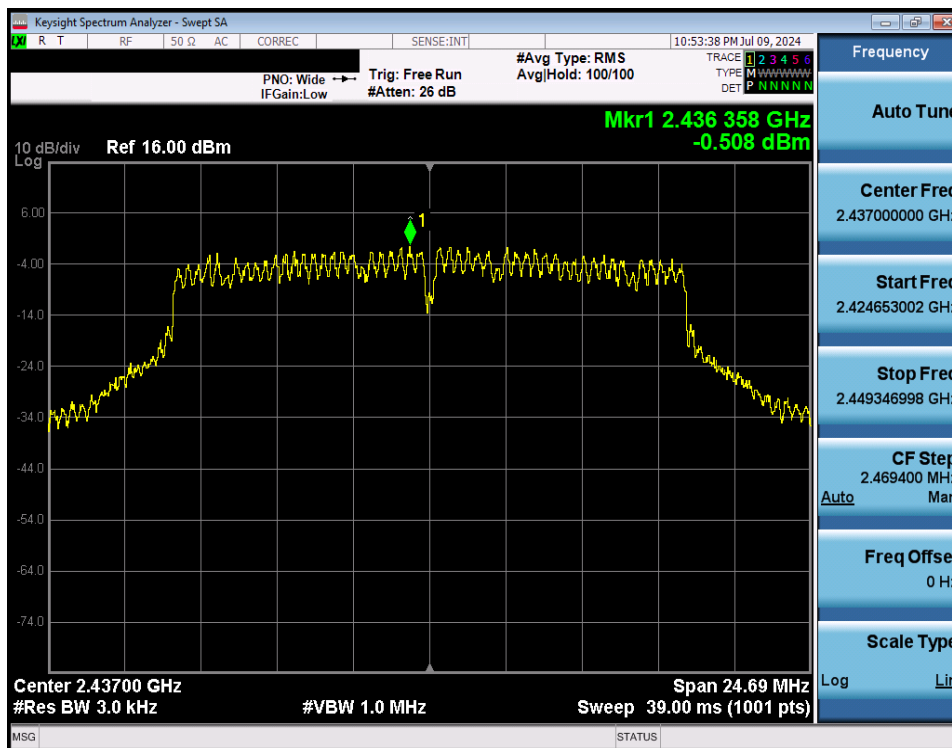


Plot 7-69. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS2

FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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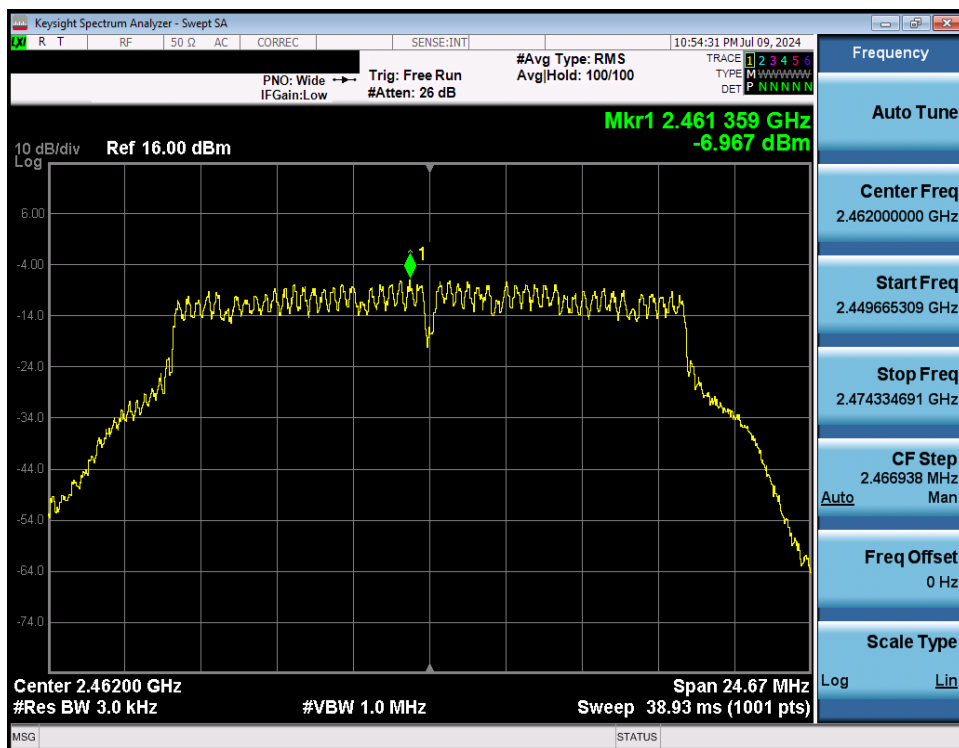


Plot 7-70. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 1) – 24Mbps

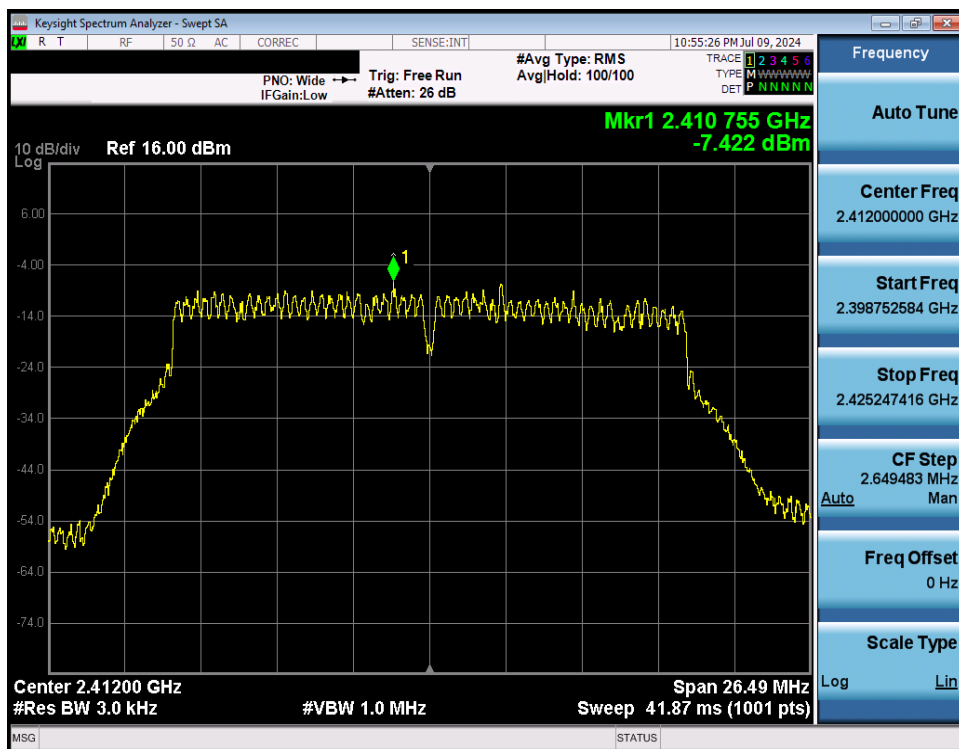


Plot 7-71. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 6) – 24Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-72. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 11) – 24Mbps

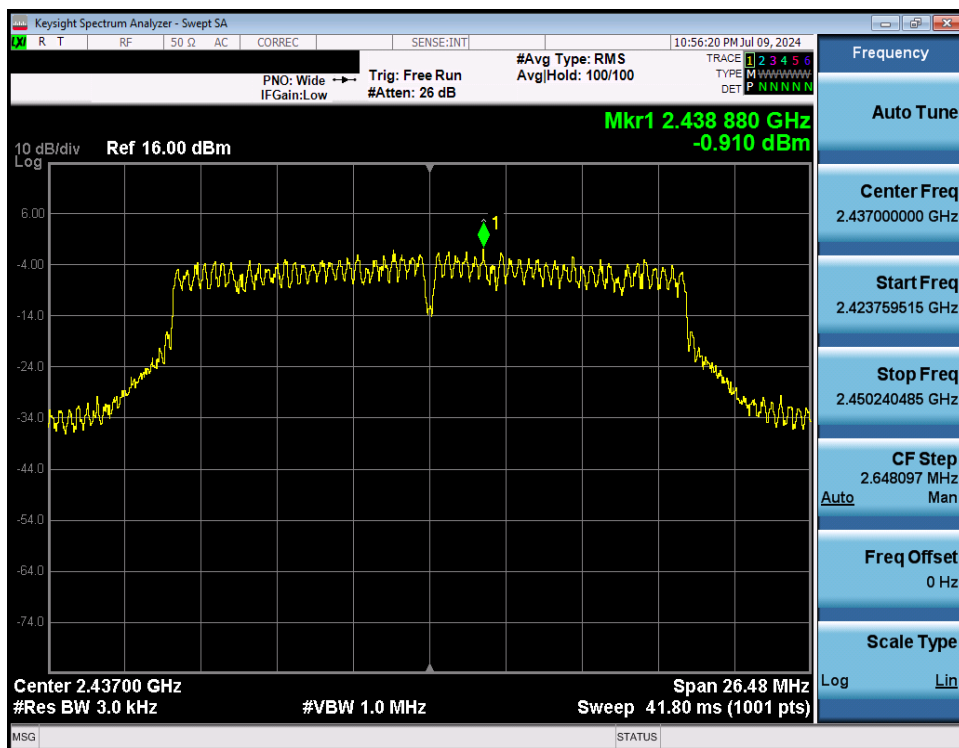


Plot 7-73. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 1) – MCS4

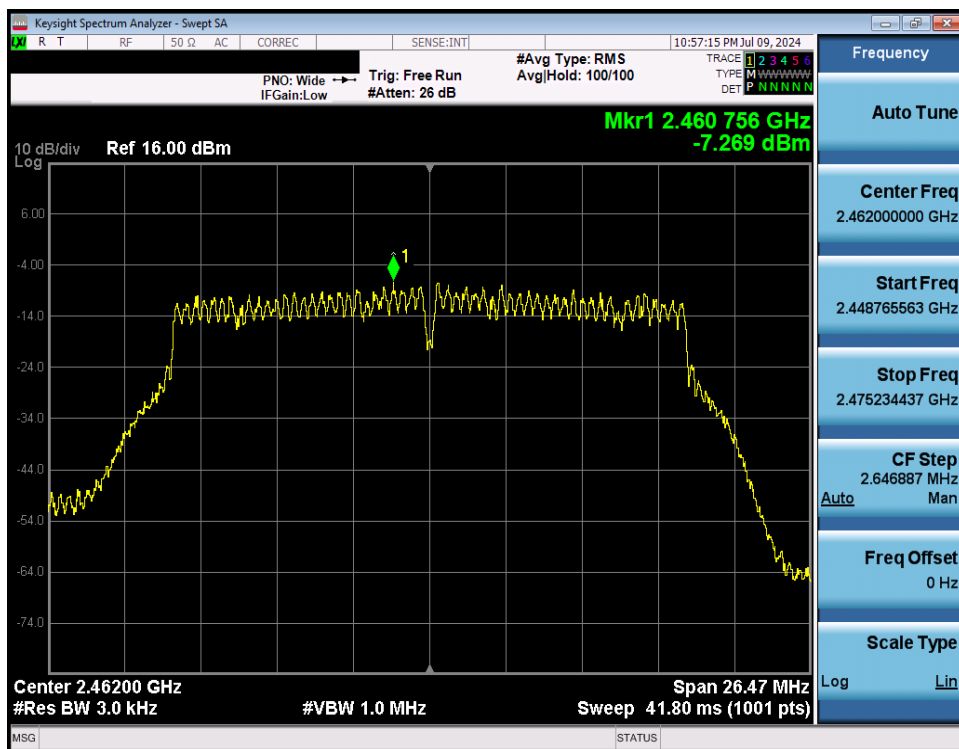
FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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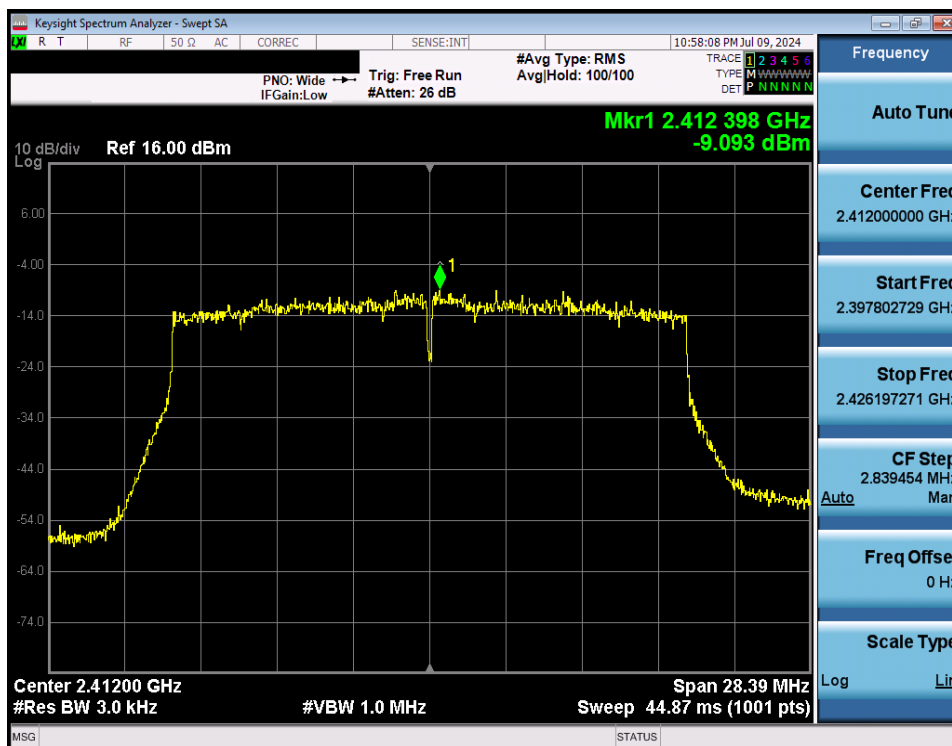
Plot 7-74. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 6) – MCS4



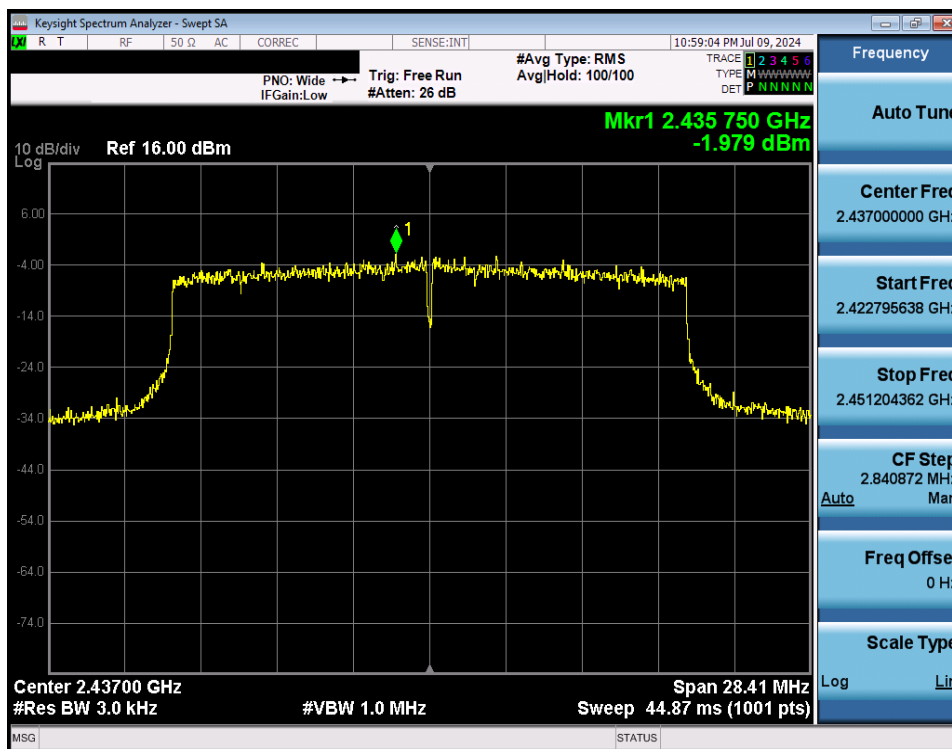
Plot 7-75. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 11) – MCS4

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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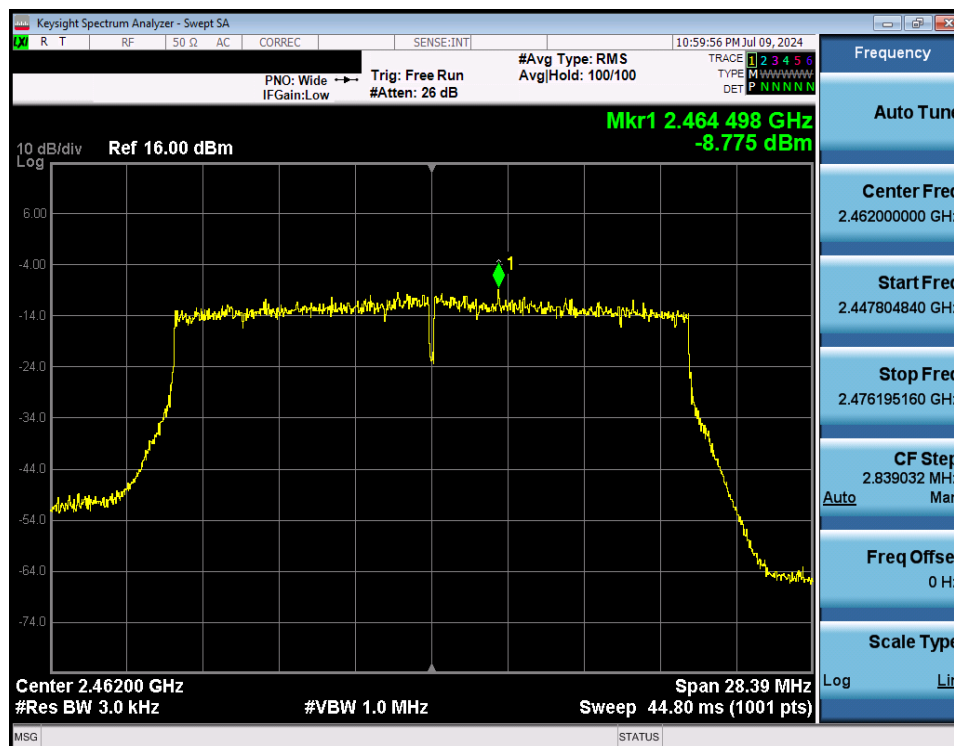
Plot 7-76. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) - Ch. 1) - MCS4



Plot 7-77. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) - Ch. 6) - MCS4

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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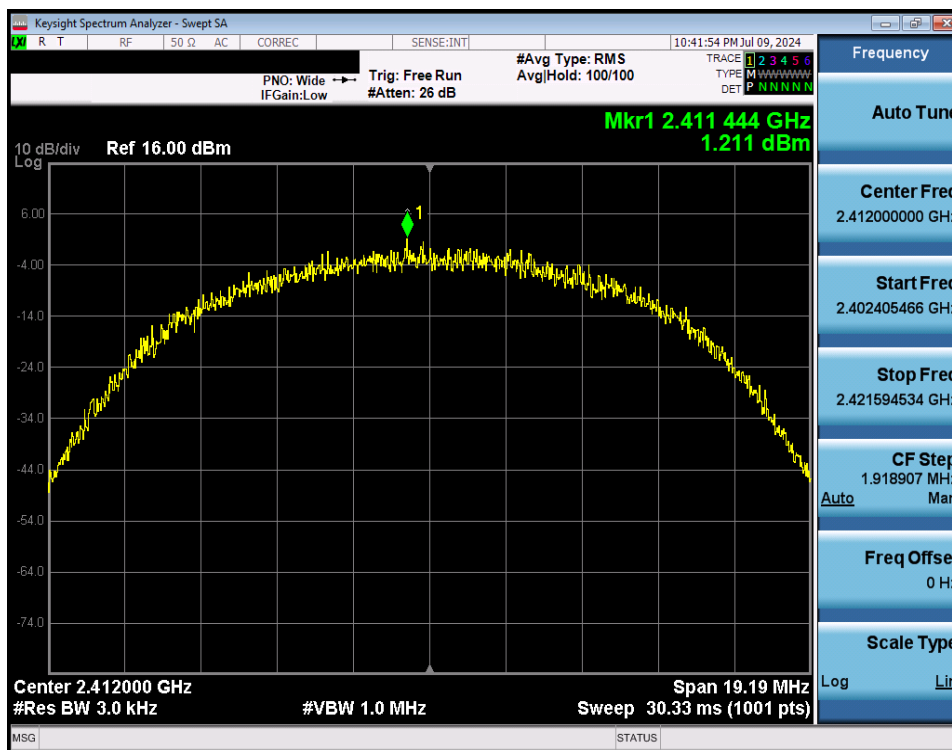


Plot 7-78. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS4

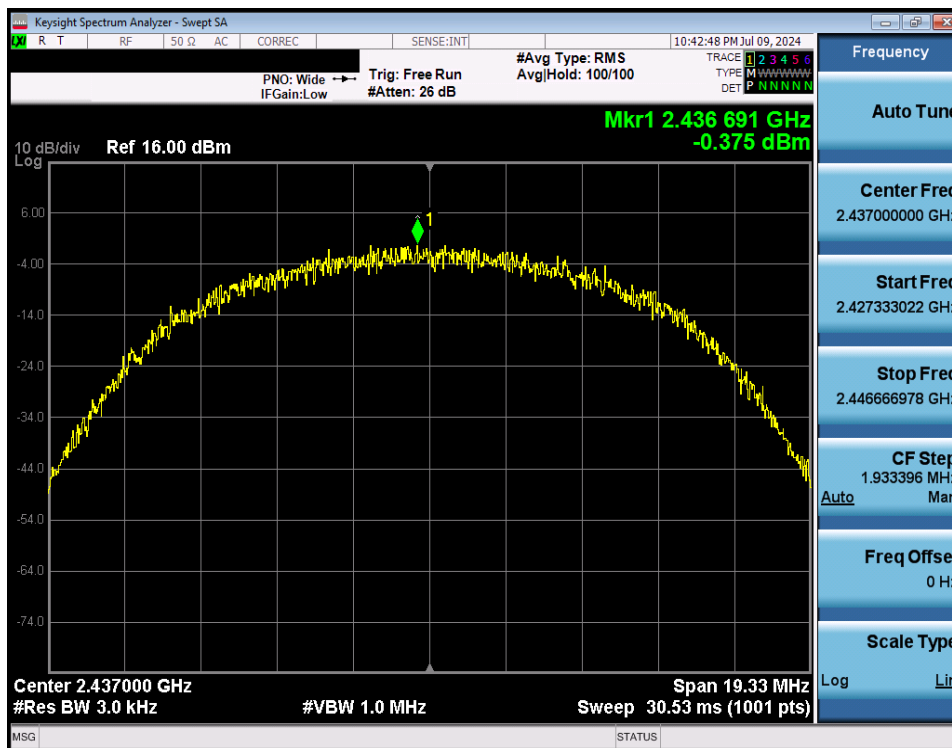
FCC ID: BCGA2993 IC: 579C-A2993	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2405200017-03-R1.BCG	Test Dates: 5/20/2024 - 7/01/2024	EUT Type: Tablet Device	Page 78 of 431

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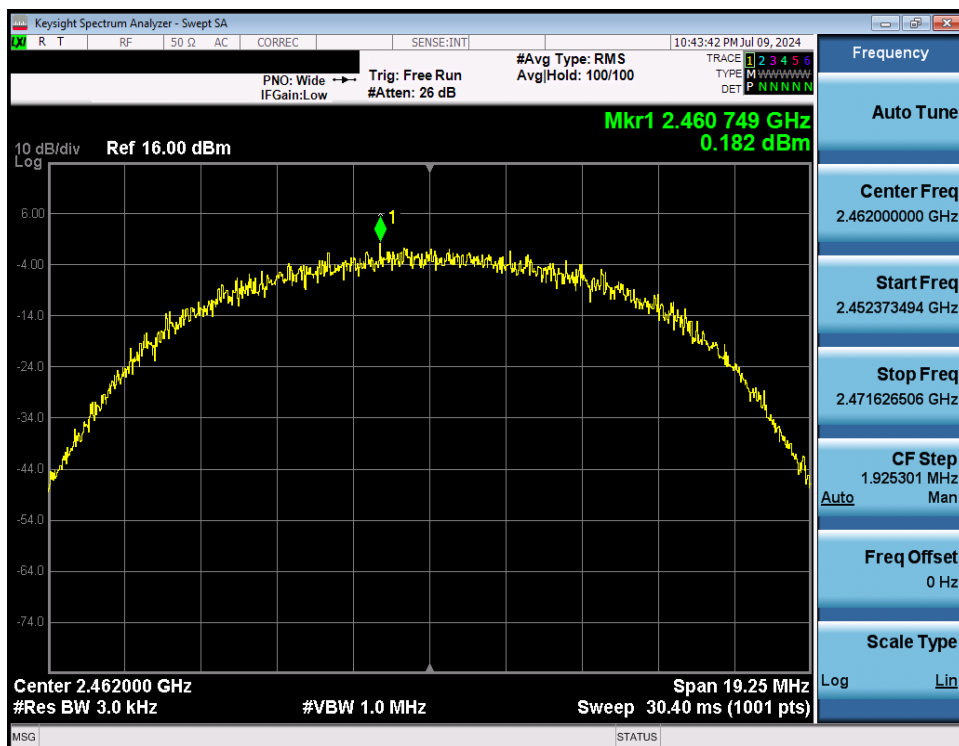


Plot 7-79. Power Spectral Density Plot Antenna WF8 (802.11b – Ch. 1) – 11Mbps

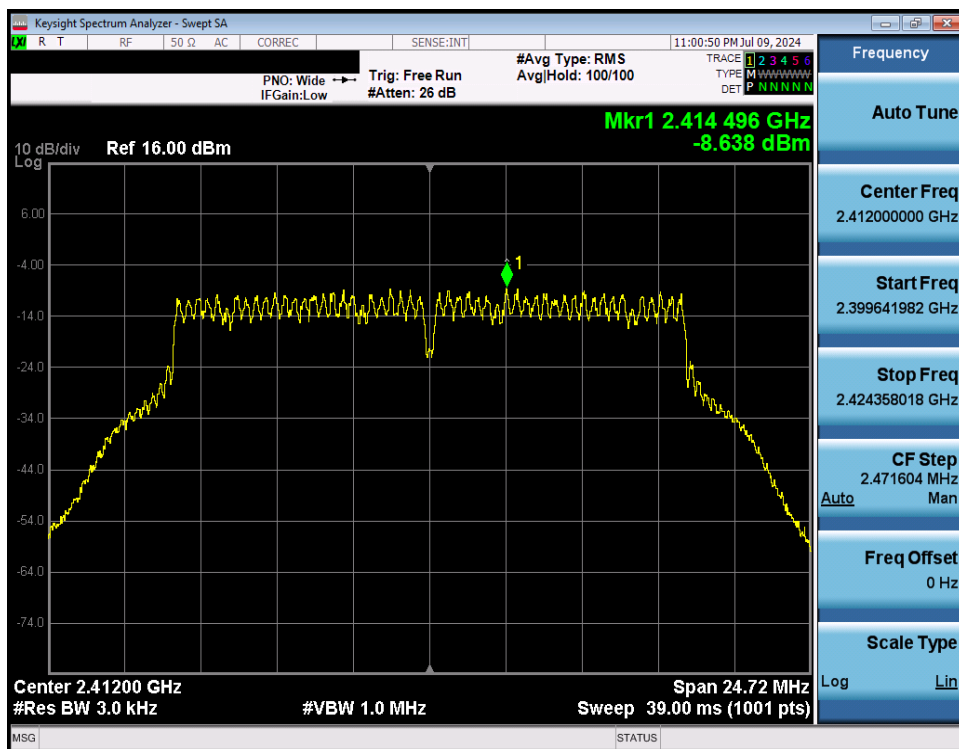


Plot 7-80. Power Spectral Density Plot Antenna WF8 (802.11b – Ch. 6) – 11Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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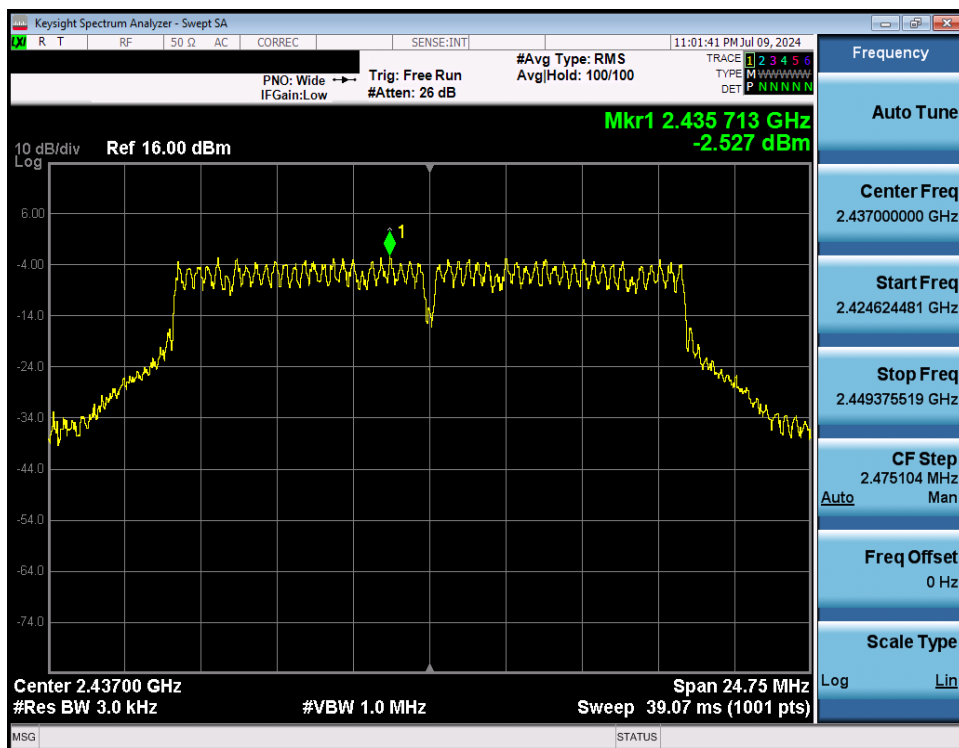
Plot 7-81. Power Spectral Density Plot Antenna WF8 (802.11b – Ch. 11) – 11Mbps



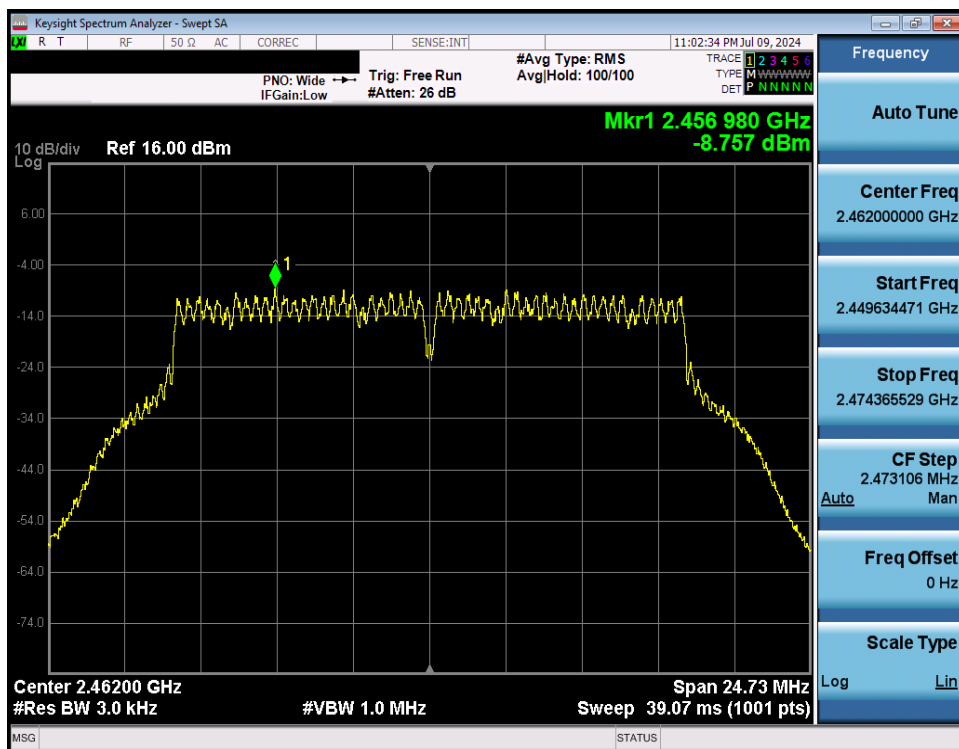
Plot 7-82. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 1) – 54Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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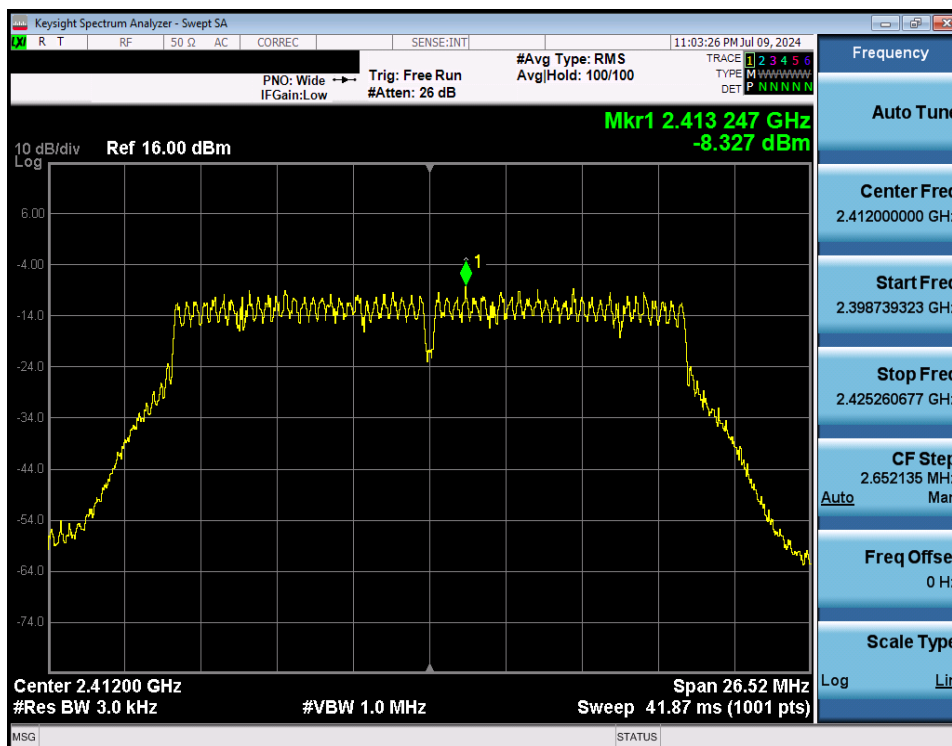


Plot 7-83. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 6) – 54Mbps

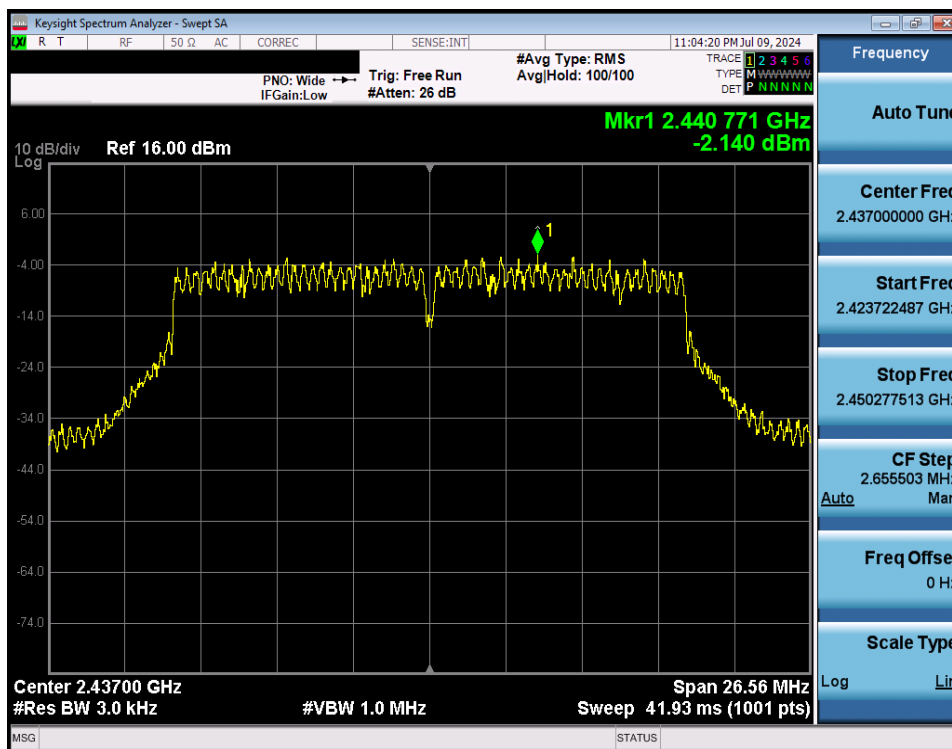


Plot 7-84. Power Spectral Density Plot Antenna WF8 (802.11g – Ch. 11) – 54Mbps

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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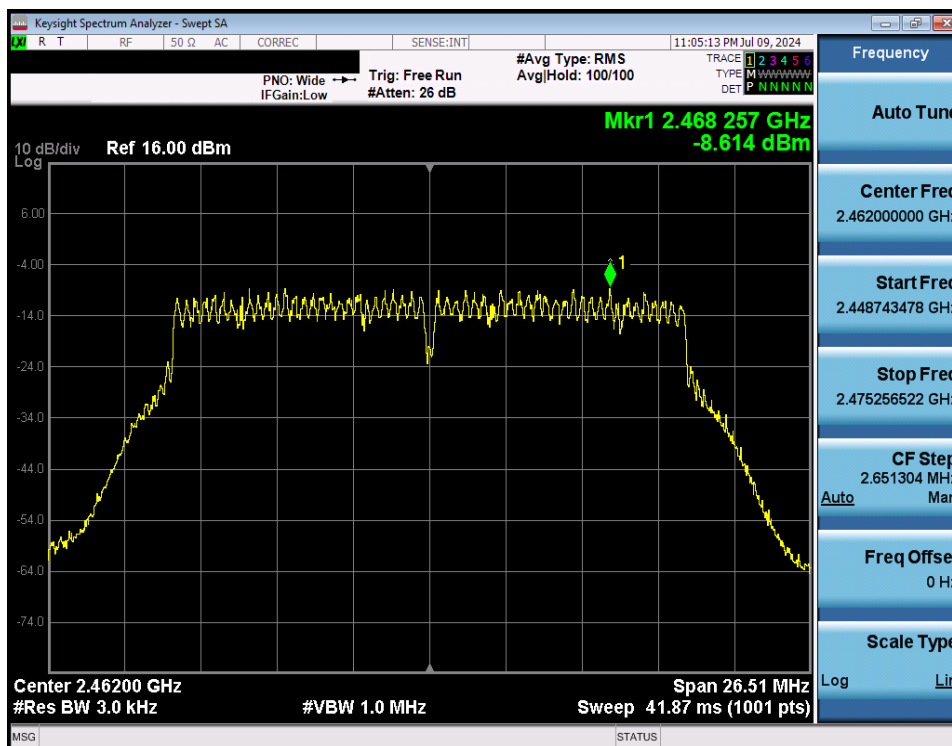
Plot 7-85. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 1) – MCS7



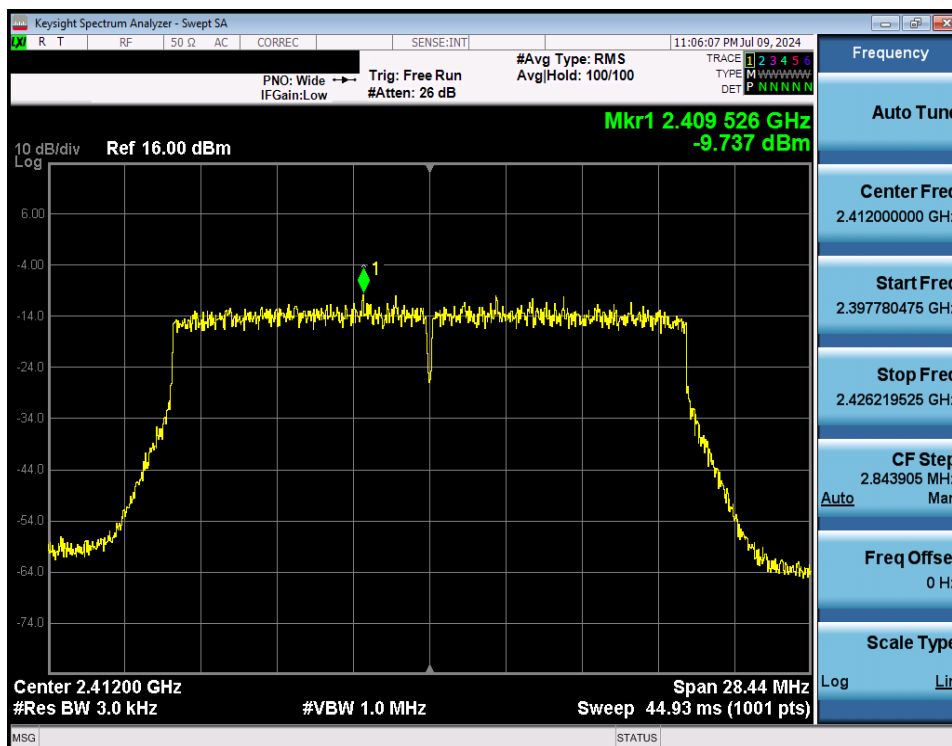
Plot 7-86. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 6) – MCS7

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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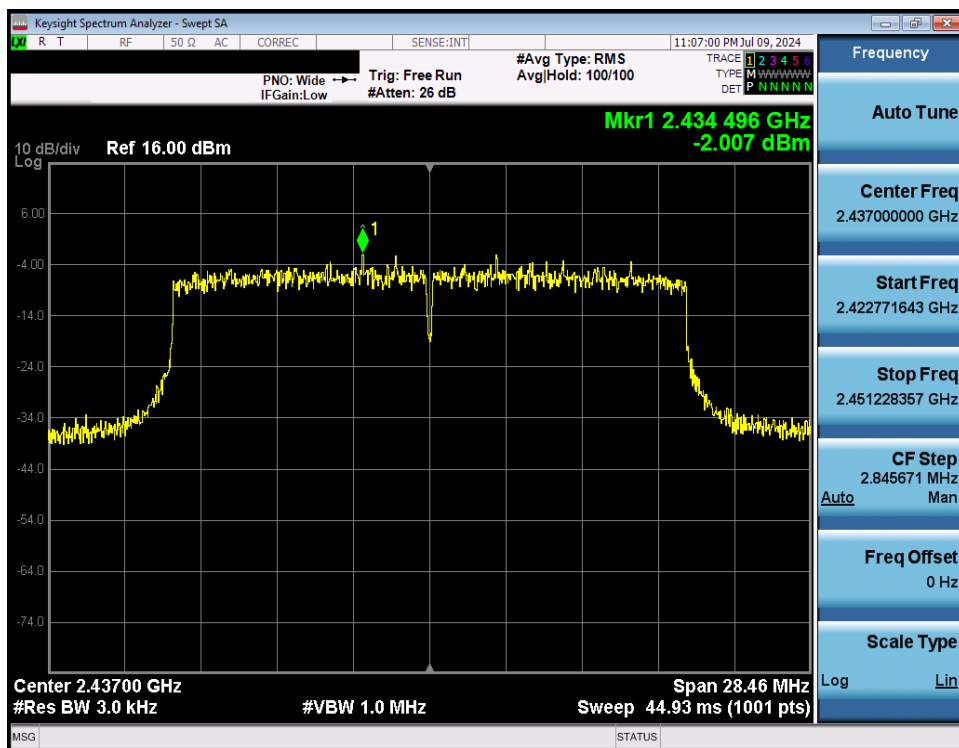
Plot 7-87. Power Spectral Density Plot Antenna WF8 (802.11n (2.4GHz) – Ch. 11) – MCS7



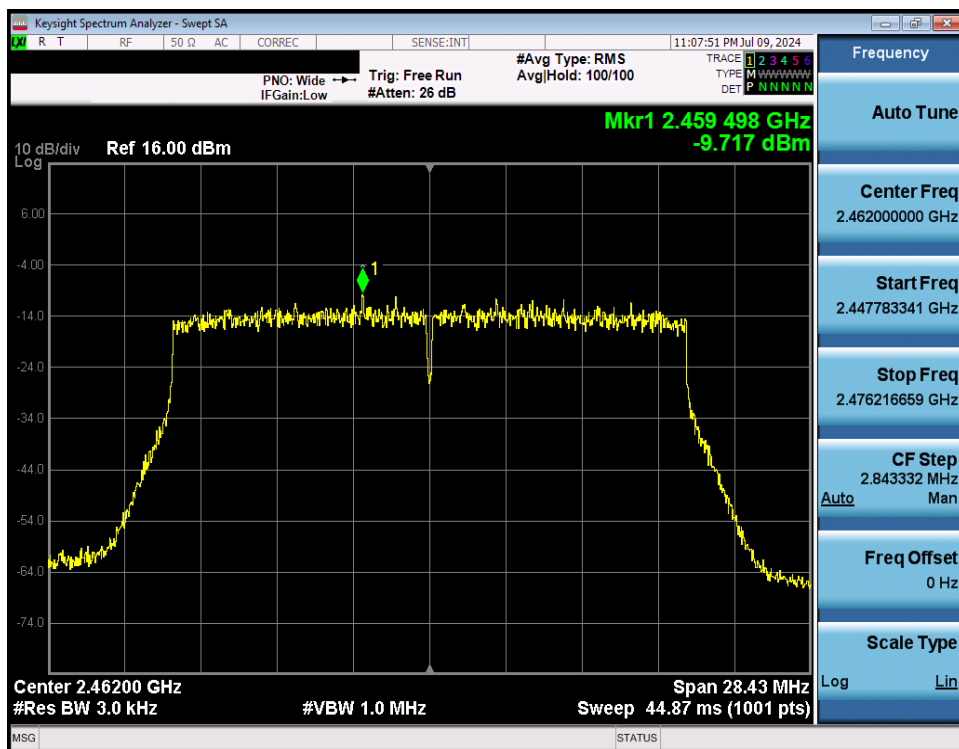
Plot 7-88. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS9

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-89. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS9



Plot 7-90. Power Spectral Density Plot Antenna WF8 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS9

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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7.4.2 Antenna WF7 Power Spectral Density Measurements

Frequency [MHz]	Channel No.	802.11 MODE	Data Rate [Mbps]	Measured Power Density [dBm/3kHz]	Max Power Density [dBm/3kHz]	Margin [dB]	Pass/Fail
2412	1	g	12	-6.57	8.00	-14.57	Pass
2437	6	g	12	-0.36	8.00	-8.36	Pass
2462	11	g	12	-6.48	8.00	-14.48	Pass
2412	1	n	19.5/21.7 (MCS2)	-8.12	8.00	-16.12	Pass
2437	6	n	19.5/21.7 (MCS2)	-0.63	8.00	-8.63	Pass
2462	11	n	19.5/21.7 (MCS2)	-7.81	8.00	-15.81	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	-9.60	8.00	-17.60	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	-1.92	8.00	-9.92	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	-9.17	8.00	-17.17	Pass

Table 7-41. Conducted Power Density Measurements Antenna WF7 (Low Data Rate)

Frequency [MHz]	Channel No.	802.11 MODE	Data Rate [Mbps]	Measured Power Density [dBm/3kHz]	Max Power Density [dBm/3kHz]	Margin [dB]	Pass/Fail
2412	1	g	24	-7.54	8.00	-15.54	Pass
2437	6	g	24	-0.48	8.00	-8.48	Pass
2462	11	g	24	-6.37	8.00	-14.37	Pass
2412	1	n	39/43.3 (MCS4)	-8.29	8.00	-16.29	Pass
2437	6	n	39/43.3 (MCS4)	-1.44	8.00	-9.44	Pass
2462	11	n	39/43.3 (MCS4)	-7.00	8.00	-15.00	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	-8.81	8.00	-16.81	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	-2.11	8.00	-10.11	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	-9.08	8.00	-17.08	Pass

Table 7-42. Conducted Power Density Measurements Antenna WF7 (Mid Data Rate)

Frequency [MHz]	Channel No.	802.11 MODE	Data Rate [Mbps]	Measured Power Density [dBm/3kHz]	Max Power Density [dBm/3kHz]	Margin [dB]	Pass/Fail
2412	1	b	11	1.42	8.00	-6.58	Pass
2437	6	b	11	0.34	8.00	-7.66	Pass
2462	11	b	11	-0.16	8.00	-8.16	Pass
2412	1	g	54	-8.30	8.00	-16.30	Pass
2437	6	g	54	-2.60	8.00	-10.60	Pass
2462	11	g	54	-8.40	8.00	-16.40	Pass
2412	1	n	65/72.2 (MCS7)	-8.42	8.00	-16.42	Pass
2437	6	n	65/72.2 (MCS7)	-2.36	8.00	-10.36	Pass
2462	11	n	65/72.2 (MCS7)	-8.24	8.00	-16.24	Pass
2412	1	ax (SU)	81/86 (MCS9)	-9.47	8.00	-17.47	Pass
2437	6	ax (SU)	81/86 (MCS9)	-2.29	8.00	-10.29	Pass
2462	11	ax (SU)	81/86 (MCS9)	-9.14	8.00	-17.14	Pass

Table 7-43. Conducted Power Density Measurements Antenna WF7 (High Data Rate)

FCC ID: BCGA2993 IC: 579C-A2993		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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