



# Element Materials Technology

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## MEASUREMENT REPORT FCC PART 15.247 / ISED RSS-247 WLAN 802.11b/g/n/ax-SU

**Applicant Name:**

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

**Date of Testing:**

2/10/2023 - 4/25/2023

**Test Report Issue Date:**

11/30/2023

**Test Site/Location:**

Element Materials Technology Morgan Hill, CA, USA

**Test Report Serial No.:**

1C2302130007-05.BCG

**FCC ID:**

BCGA2117

**IC:**

579C-A2117

**APPLICANT:**

Apple Inc.

**Application Type:**

Certification

**Model/HVIN:**

A2117

**EUT Type:**

Head Mounted 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 C63.10-2013, 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 C63.10-2013 and KDB 558074 D01 v05r02. Test results reported herein relate only to the item(s) tested.

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



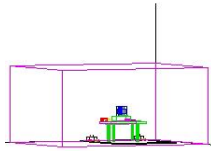
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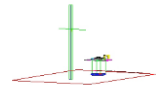
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Mode	Tx Frequency (MHz)	Ant1				Ant2			
		Avg Conducted		Peak Conducted		Avg Conducted		Peak Conducted	
		Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
802.11b	2412 - 2472	141.254	21.50	261.216	24.17	140.929	21.49	262.422	24.19
802.11g	2412 - 2472	139.316	21.44	385.478	25.86	136.773	21.36	430.527	26.34
802.11n	2412 - 2472	141.254	21.50	350.752	25.45	141.254	21.50	369.828	25.68
802.11ax (SU)	2412 - 2467	138.676	21.42	363.915	25.61	141.254	21.50	370.681	25.69

**EUT Overview SISO (Low Data Rate)**

Mode	Tx Frequency (MHz)	Ant1				Ant2				CDD			
		Avg Conducted		Peak Conducted		Avg Conducted		Peak Conducted		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)
802.11g	2412 - 2472	137.088	21.37	378.443	25.78	138.995	21.43	425.598	26.29	276.058	24.41	781.628	28.93
802.11n	2412 - 2472	140.281	21.47	367.282	25.65	141.254	21.50	373.250	25.72	281.838	24.50	741.310	28.70
802.11ax (SU)	2412 - 2467	140.281	21.47	367.282	25.65	134.896	21.30	369.828	25.68	275.423	24.40	737.904	28.68

**EUT Overview CDD (Low Data Rate)**

Mode	Tx Frequency (MHz)	Ant1				Ant2			
		Avg Conducted		Peak Conducted		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)
802.11g	2412 - 2472	141.254	21.50	385.478	25.86	138.995	21.43	383.707	25.84
802.11n	2412 - 2472	141.254	21.50	385.478	25.86	139.316	21.44	381.944	25.82
802.11ax (SU)	2412 - 2467	138.995	21.43	356.451	25.52	133.968	21.27	369.828	25.68

**EUT Overview SISO (Mid Data Rate)**

Mode	Tx Frequency (MHz)	Ant1				Ant2				CDD			
		Avg Conducted		Peak Conducted		Avg Conducted		Peak Conducted		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)
802.11g	2412 - 2472	140.605	21.48	389.045	25.90	140.605	21.48	404.576	26.07	281.190	24.49	794.328	29.00
802.11n	2412 - 2472	141.254	21.50	386.367	25.87	140.605	21.48	397.192	25.99	279.254	24.46	772.681	28.88
802.11ax (SU)	2412 - 2467	141.254	21.50	372.392	25.71	137.721	21.39	375.837	25.75	279.254	24.46	748.170	28.74

**EUT Overview CDD (Mid Data Rate)**

Mode	Tx Frequency (MHz)	Ant1				Ant2			
		Avg Conducted		Peak Conducted		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)
802.11g	2412 - 2472	139.959	21.46	472.063	26.74	139.637	21.45	483.059	26.84
802.11n	2412 - 2472	139.959	21.46	379.315	25.79	137.404	21.38	370.681	25.69
802.11ax (SU)	2412 - 2467	141.254	21.50	358.922	25.55	138.038	21.40	374.111	25.73

**EUT Overview SISO (High Data Rate)**

Mode	Tx Frequency (MHz)	Ant1				Ant2				CDD			
		Avg Conducted		Peak Conducted		Avg Conducted		Peak Conducted		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)
802.11g	2412 - 2472	138.995	21.43	472.063	26.74	139.637	21.45	485.289	26.86	277.332	24.43	957.194	29.81
802.11n	2412 - 2472	141.254	21.50	364.754	25.62	140.281	21.47	363.078	25.60	281.838	24.50	727.780	28.62
802.11ax (SU)	2412 - 2467	140.605	21.48	365.595	25.63	139.316	21.44	369.828	25.68	278.612	24.45	736.207	28.67

**EUT Overview CDD (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 Morgan Hill Test Location

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

### 1.3 Test Facility / Accreditations

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

- Element Materials Technology Morgan Hill 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 Morgan Hill 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 Head Mounted Device FCC ID: BCGA2117, IC: 579C-A2117**. The test data contained in this report pertains only to the emissions due to the EUT's WLAN (DTS) transmitter.

**Test Device Serial No.:** GPG3017001F20N78X, PYVWK6LLC6, WFGF7D9H60, MHP0XYH0XK, HP14K0WJ0Q

### 2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, LE1M, LE2M, HDR4, HDR8), NB UNII (1x, LE1M, LE2M, HDR4, HDR8, HDRp4, HDRp8)

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 C63.10-2013. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Measured Duty Cycles				
802.11 Mode/Band		Duty Cycle [%]		
		Ant1	Ant2	CDD
2.4GHz	b	100.0	100.0	N/A
	g (Low Data Rate)	97.8	97.8	97.6
	g (Mid Data Rate)	96.5	96.5	96.0
	g (High Data Rate)	92.5	92.5	93.5
	n (Low Data Rate)	96.8	96.8	96.6
	n (Mid Data Rate)	94.2	94.0	91.1
	n (High Data Rate)	91.0	91.1	94.1
	11ax (SU) (Low Data Rate)	96.0	95.6	96.7
	11ax (SU) (Mid Data Rate)	92.9	93.1	92.6
	11ax (SU) (High Data Rate)	87.9	88.3	88.0

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

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

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WiFi Configurations		SISO		SDM		CDD	
		ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
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

Data Rates Supported: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps (b)  
6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps (g)  
6.5/7.2Mbps, 13/14.4Mbps, 19.5/21.7Mbps, 26/28.9Mbps, 39/43.3Mbps, 52/57.8Mbps, 58.5/65Mbps, 65/72.2Mbps (n)  
13/14.4Mbps, 26/28.9Mbps, 39/43.3Mbps, 52/57.8Mbps, 78/86.7Mbps, 104/115.6Mbps, 117/130Mbps, 130/144.4Mbps (CDD n)  
8/8.6Mbps, 16/17.2Mbps, 24/25.8Mbps, 33/34.4Mbps, 49/51.6Mbps, 65/68.8Mbps, 73/77.4Mbps, 81/86.0Mbps, 98/103.2Mbps, 108/114.7Mbps (ax – 20MHz)  
16/17.2Mbps, 32/34.4Mbps, 48/51.6Mbps, 66/68.8Mbps, 98/103.2Mbps, 130/137.6Mbps, 146/154.8Mbps, 162/172Mbps, 196/206.4Mbps, 216/229.4Mbps (CDD ax – 20MHz)

This device supports simultaneous transmission operations. The table below shows all configurations possible.

Simultaneous Tx Config	Ant1			Ant2			NB UNII_L		NB UNII_R
	WLAN 2.4G 802.11 b/g/n/ax	BT 2.4G BDR, EDR, HDR4/8, LE1M/2M, HDRp4/p8	WIFI 5G 802.11 a/n/ac/ax	WLAN 2.4G 802.11 b/g/n/ax	BT 2.4G BDR, EDR, HDR4/8, LE1M/2M, HDRp4/p8	WIFI 5G 802.11 a/n/ac/ax	BT 2.4G BDR, EDR, HDR4/8, LE1M/2M, HDRp4/p8	NB_UNII 5G BDR, HDR4/8, LE1M/2M, HDRp4/p8	NB_UNII 5G BDR, HDR4/8, LE1M/2M, HDRp4/p8
Config 1	✓	✗	✓	✗	✗	✗	✗	✓	✓
Config 2	✗	✗	✗	✓	✗	✓	✗	✓	✓
Config 3	✗	✓	✓	✗	✗	✗	✗	✓	✓
Config 4	✗	✓	✗	✗	✗	✓	✗	✓	✓
Config 5	✗	✓	✓	✗	✓	✗	✗	✗	✗
Config 6	✗	✓	✗	✗	✓	✓	✗	✗	✗
Config 7	✓	✗	✓	✗	✗	✗	✓	✓	✓
Config 8	✓	✗	✗	✗	✗	✓	✓	✓	✓
Config 9	✓	✗	✓	✗	✓	✗	✗	✗	✗
Config 10	✓	✗	✗	✗	✓	✓	✗	✗	✗
Config 11	✓	✗	✓	✓	✗	✓	✗	✗	✗
Config 12	✗	✓	✓	✗	✗	✓	✗	✗	✗
Config 13	✓	✗	✓	✗	✗	✓	✓	✗	✗

**Table 2-4. Simultaneous Transmission Configurations**

✓ = Support; ✗ = Not Support

All possible simultaneous transmission configurations have been investigated and the worst case config has been reported.

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## 2.3 Antenna Description

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

Frequency [GHz]	Antenna Gain (dBi)	
	Ant1	Ant2
2.4	1.6	-1.0

Table 2-5. Highest Antenna Gain

## 2.4 Test Support Equipment

1	Apple Macbook Pro	Model:	A2289	S/N:	C02DV7VGMD6T
	w/ AD/DC Adapter	Model:	A2164	S/N:	N/A
2	Apple USB-C Cable	Model:	Spartan	S/N:	000MKTR02U
3	Right Temple	Model:	N/A	S/N:	HTFGR70005J000020R
	Left Temple	Model:	N/A	S/N:	HTFGR40004A00002GY
	Headband	Model:	N/A	S/N:	GKNGNC0001H0000215
4	Light Seal	Model:	N/A	S/N:	GKNGQF000RX00003KB
	Light Seal Padding	Model:	N/A	S/N:	GKNGQ8001RD00002XA
5	EUT Power Pack	Model:	N/A	S/N:	HTFGQW0009800001MV

Table 2-6. Test Support Equipment List

## 2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013 and KDB 558074 D01 v05r02. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 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 EUT powered by AC/DC was the worst case.

- EUT powered by AC/DC adaptor to USB-C Power Pack to Magnetic Charging Cable
- EUT powered by host PC via USB-C Power Pack to Magnetic Charging Cable

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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
  - 1Mbps
- 802.11g
  - Low Data Rate: 12Mbps
  - Mid Data Rate: 24Mbps
  - High Data Rate: 48Mbps
- 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, 1C2302130007-04.BCG

## 2.6 Software and Firmware

The test was conducted with firmware version 20.94.1.18 installed on the EUT.

## 2.7 EMI Suppression Device(s)/Modifications

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

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 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	1.77
Line Conducted Disturbance	2.70
Radiated Disturbance (<30MHz)	4.38
Radiated Disturbance (<1GHz)	4.75
Radiated Disturbance (>1GHz)	5.20
Radiated Disturbance (>18GHz)	4.72

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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 #
Agilent	N9020A	MXA Signal Analyzer	4/26/2022	Annual	4/26/2023	MY56470202
Anritsu	MA2411B	Pulse Power Sensor	5/19/2022	Annual	5/19/2023	1911106
Anritsu	ML2496A	Power Meter	10/17/2022	Annual	10/17/2023	2002005
ETS-Lindgren	3117	Double Ridged Guide Horn Antenna (1-18 GHz)	5/24/2022	Annual	5/24/2023	240049
Keysight Technologies	N9030A	PXA Signal Analyzer	6/10/2022	Annual	6/10/2023	MY49430244
Rohde & Schwarz	180-442A-KF	Horn (Small)	3/6/2023	Annual	3/6/2024	T058701-2
Rohde & Schwarz	ENV216	Two-Line V-Network	3/30/2023	Annual	3/30/2024	101364
Rohde & Schwarz	FSVA3044	Signal Analyzer 44GHz	5/12/2022	Annual	5/12/2023	101098
Rohde & Schwarz	FSW43	Signal and Spectrum Analyzer 2Hz to 43GHz	5/19/2022	Annual	5/19/2023	104093
Rohde & Schwarz	FSW67	Signal and Spectrum Analyzer (2Hz-67GHz)	4/21/2022	Annual	4/21/2023	101366
Rohde & Schwarz	HFH-2Z2	9kHz - 30MHz Loop Antenna	4/13/2022	Annual	4/13/2023	100546
Rohde & Schwarz	TS-PR1	Preamplifier - Antenna System; 30MHz - 1GHz	4/18/2022	Annual	4/18/2023	102081
Rohde & Schwarz	TS-PR18	Pre Amplifier 1-18GHz	3/3/2023	Annual	3/3/2024	102130
Rohde & Schwarz	TS-PR1840	Pre Amplifier 18-40GHz	4/18/2022	Annual	4/18/2023	100050
Schwarzbeck	VULB9162	Biconilog Antenna - (30MHz-6GHz)	7/27/2022	Annual	7/27/2023	121034

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

**Note:**

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

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## 7.0 TEST RESULTS

### 7.1 Summary


Company Name: Apple Inc.  
 FCC ID: BCGA2117  
 IC: 579C-A2117  
 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 “WLAN Automation,” Version 5.0.
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 2.0.

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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 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 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 minimum permissible 6dB bandwidth is 500 kHz.***

### Test Procedure Used

ANSI C63.10-2013 – 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 ≥ 3 x 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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## ANT1 6 dB BW and 99% OBW Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
2412	1	b	1	12.842	8.147	0.500	Pass
2437	6	b	1	12.749	8.577	0.500	Pass
2462	11	b	1	12.725	9.018	0.500	Pass
2412	1	g	12	16.452	15.820	0.500	Pass
2437	6	g	12	16.407	16.010	0.500	Pass
2462	11	g	12	16.458	16.010	0.500	Pass
2412	1	n	19.5/21.7 (MCS2)	17.653	16.430	0.500	Pass
2437	6	n	19.5/21.7 (MCS2)	17.630	17.040	0.500	Pass
2462	11	n	19.5/21.7 (MCS2)	17.649	16.380	0.500	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	18.863	17.800	0.500	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	18.883	18.880	0.500	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	18.889	18.650	0.500	Pass

**Table 7-2. Conducted Bandwidth Measurements ANT1 (Low Data Rate)**

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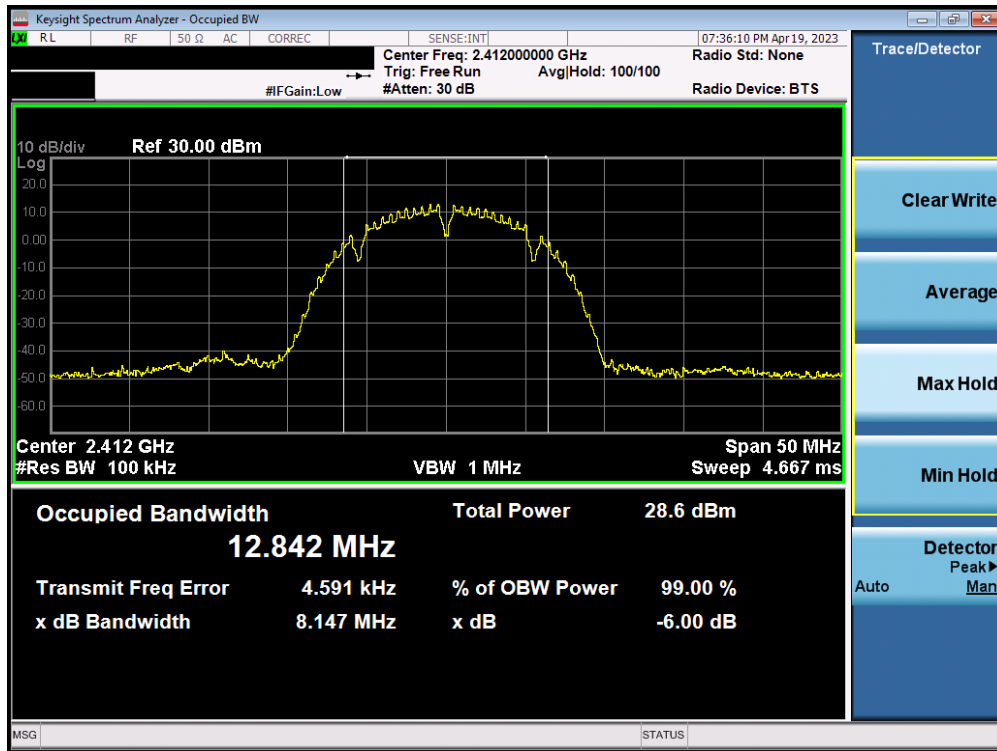
Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
2412	1	g	24	16.409	16.160	0.500	Pass
2437	6	g	24	16.423	16.410	0.500	Pass
2462	11	g	24	16.408	16.370	0.500	Pass
2412	1	n	39/43.3 (MCS4)	17.624	17.410	0.500	Pass
2437	6	n	39/43.3 (MCS4)	17.634	17.570	0.500	Pass
2462	11	n	39/43.3 (MCS4)	17.594	17.580	0.500	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	18.860	18.610	0.500	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	18.952	19.050	0.500	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	18.860	18.650	0.500	Pass

**Table 7-3. Conducted Bandwidth Measurements ANT1 (Mid Data Rate)**

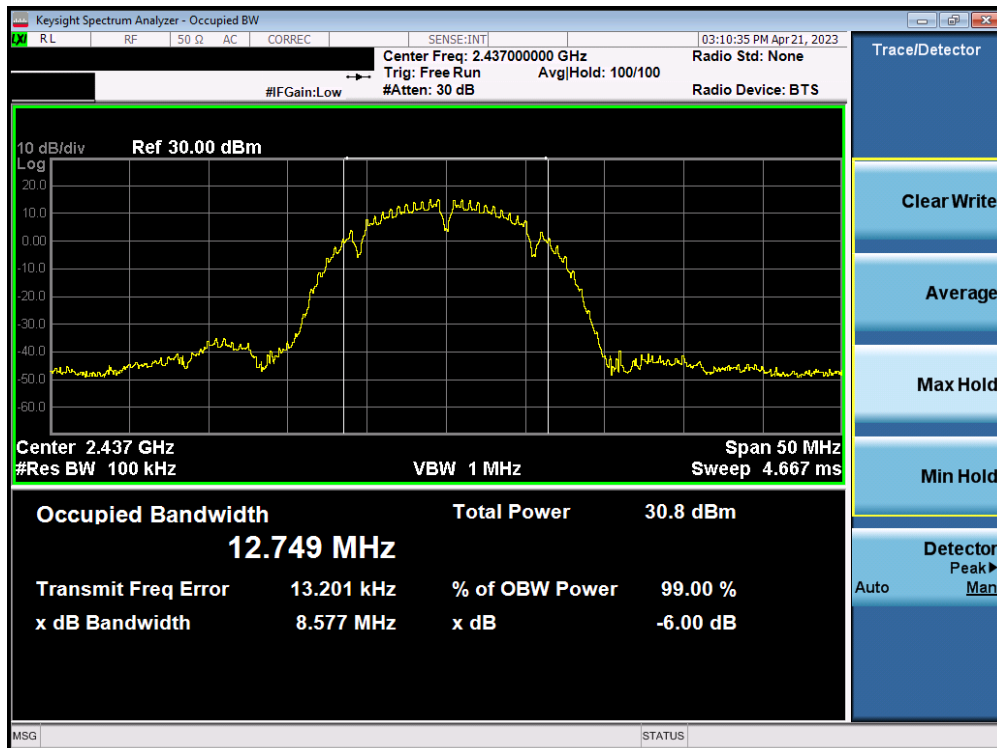
Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
2412	1	g	48	16.424	16.420	0.500	Pass
2437	6	g	48	16.426	16.420	0.500	Pass
2462	11	g	48	16.420	16.370	0.500	Pass
2412	1	n	65/72.2 (MCS7)	17.622	17.620	0.500	Pass
2437	6	n	65/72.2 (MCS7)	17.647	17.380	0.500	Pass
2462	11	n	65/72.2 (MCS7)	17.655	17.650	0.500	Pass
2412	1	ax (SU)	108/114.7 (MCS9)	18.892	18.830	0.500	Pass
2437	6	ax (SU)	108/114.7 (MCS9)	18.941	18.890	0.500	Pass
2462	11	ax (SU)	108/114.7 (MCS9)	18.912	18.850	0.500	Pass

**Table 7-4. Conducted Bandwidth Measurements ANT1 (High Data Rate)**

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	Approved by: Technical Manager
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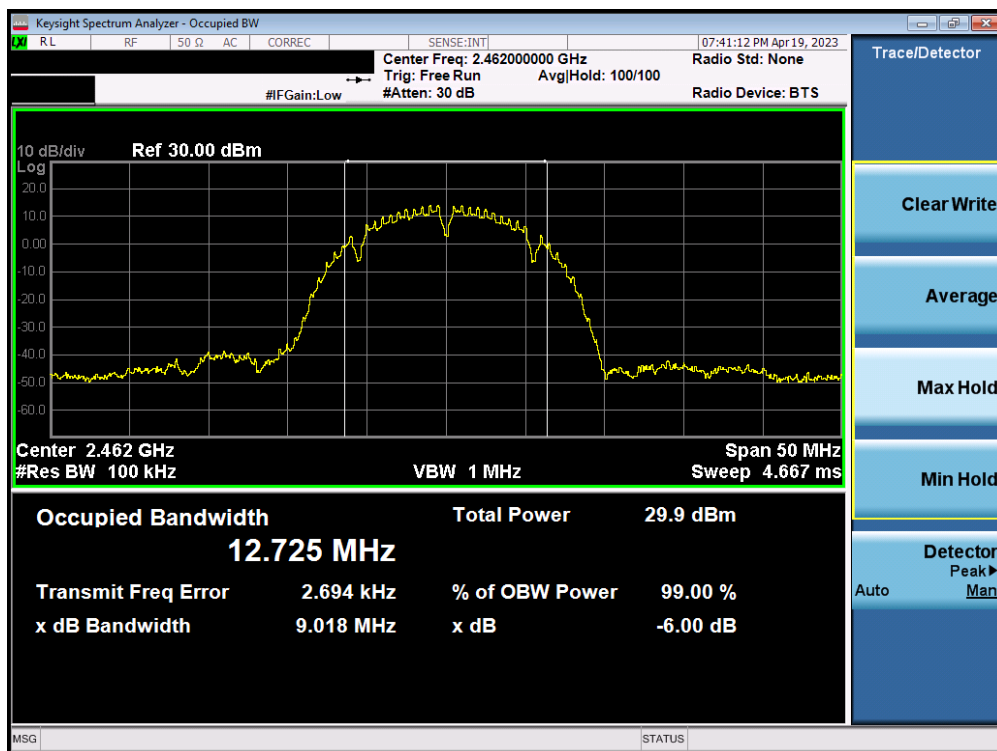


Plot 7-1. 6dB Bandwidth Plot ANT1 (802.11b – Ch. 1) – 1Mbps

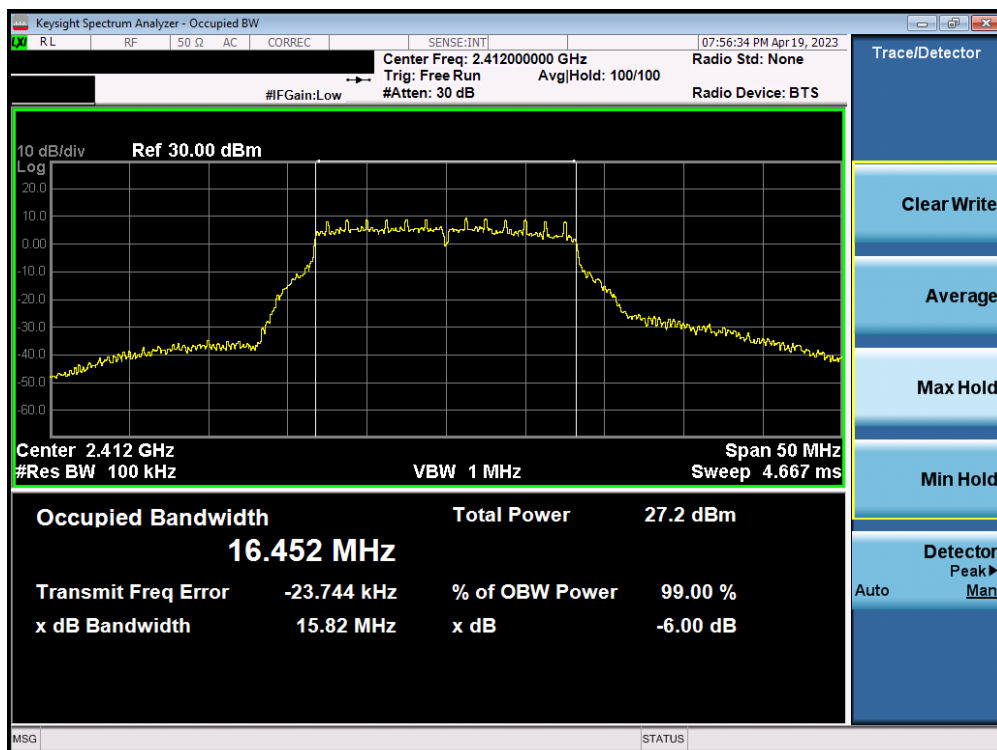


Plot 7-2. 6dB Bandwidth Plot ANT1 (802.11b – Ch. 6) – 1Mbps


FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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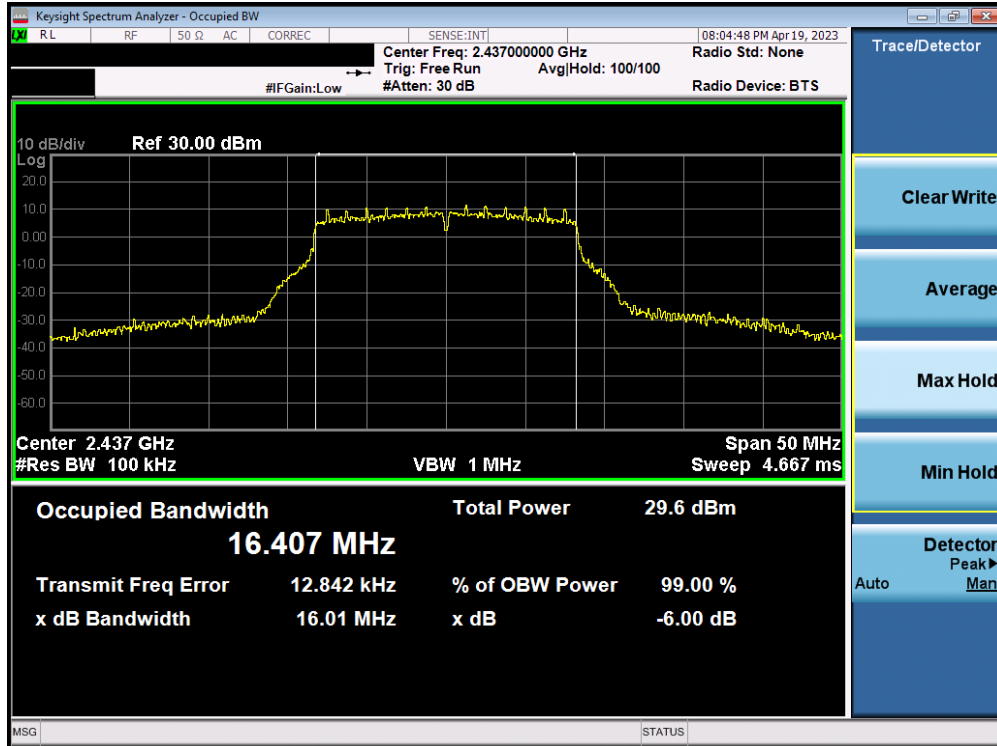


Plot 7-3. 6dB Bandwidth Plot ANT1 (802.11b – Ch. 11) – 1Mbps

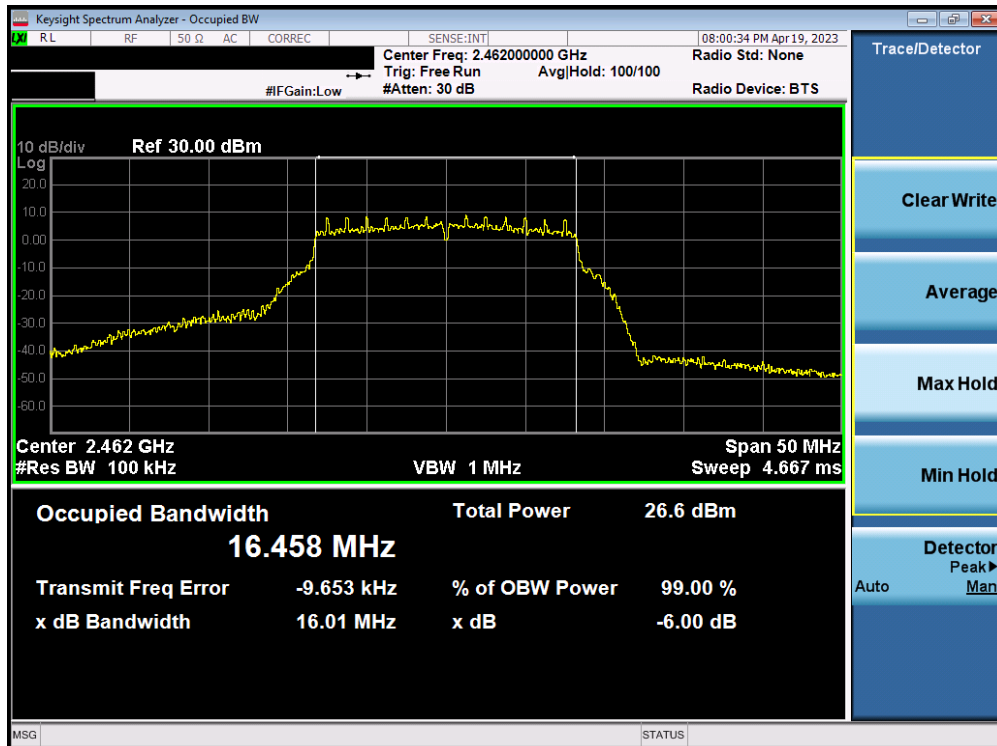


Plot 7-4. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 1) – 12Mbps

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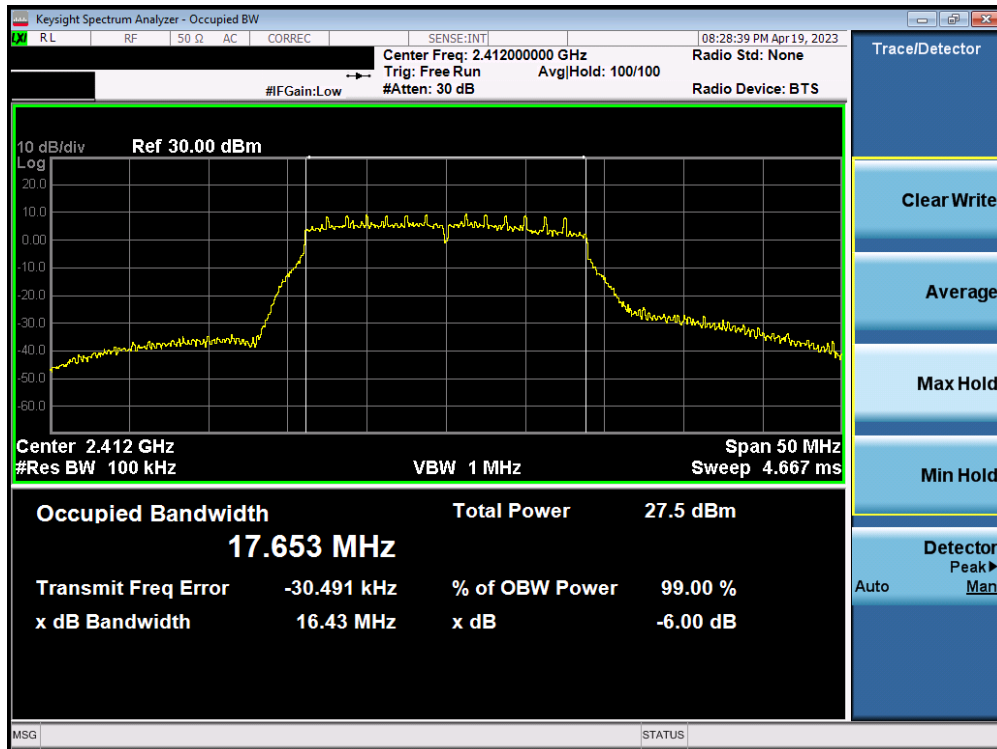


Plot 7-5. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 6) – 12Mbps

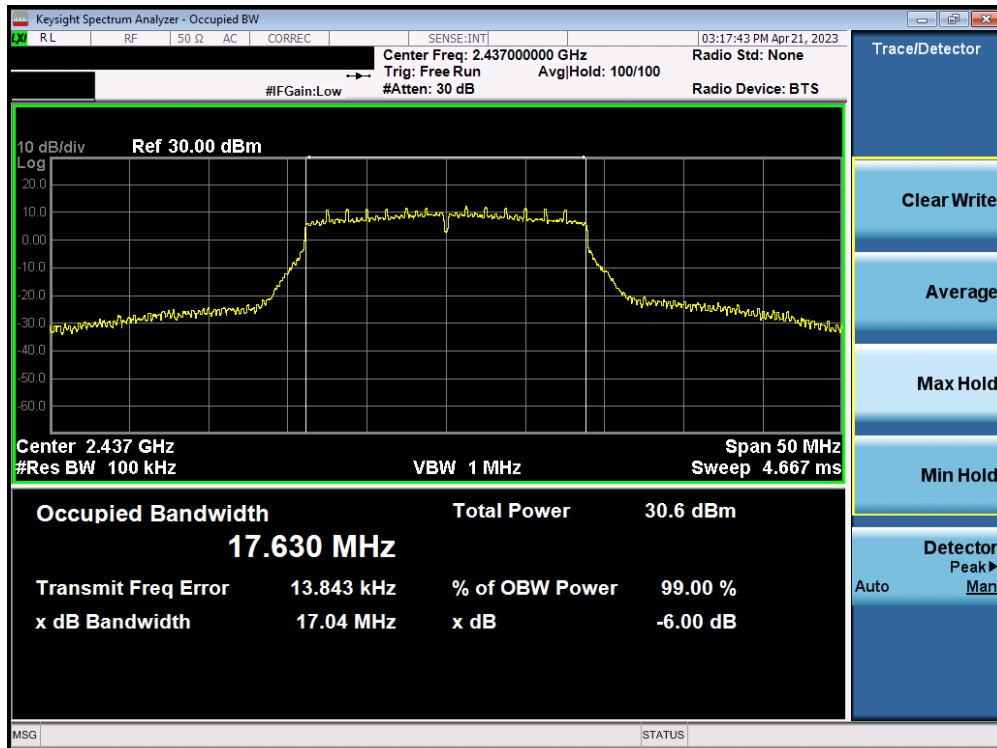


Plot 7-6. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 11) – 12Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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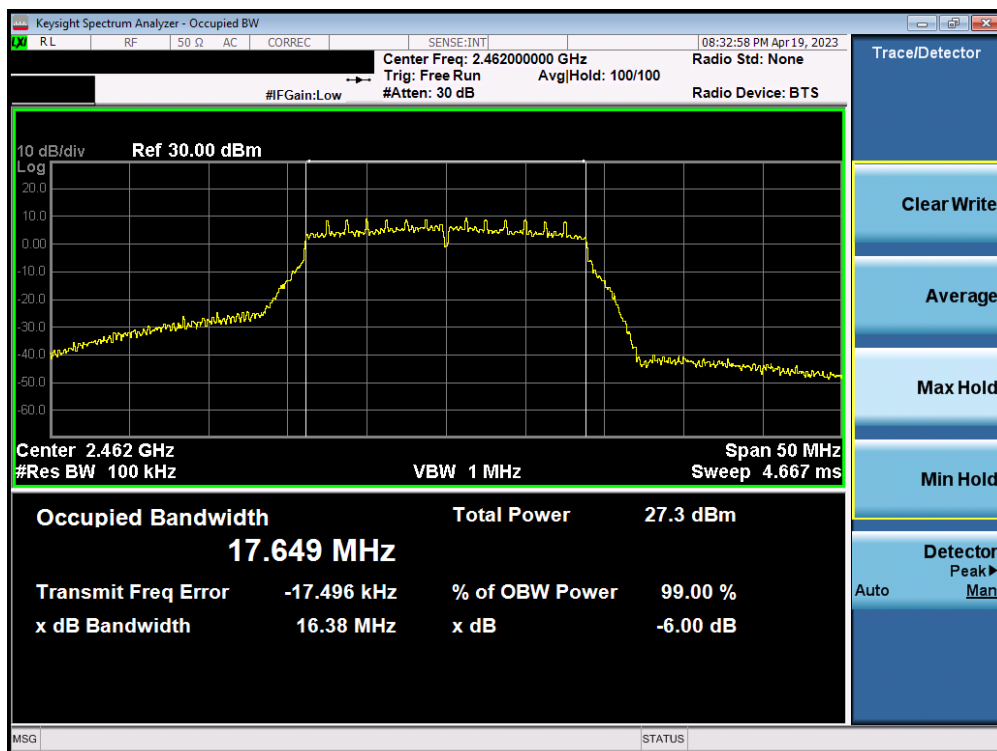


Plot 7-7. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 1) – MCS2

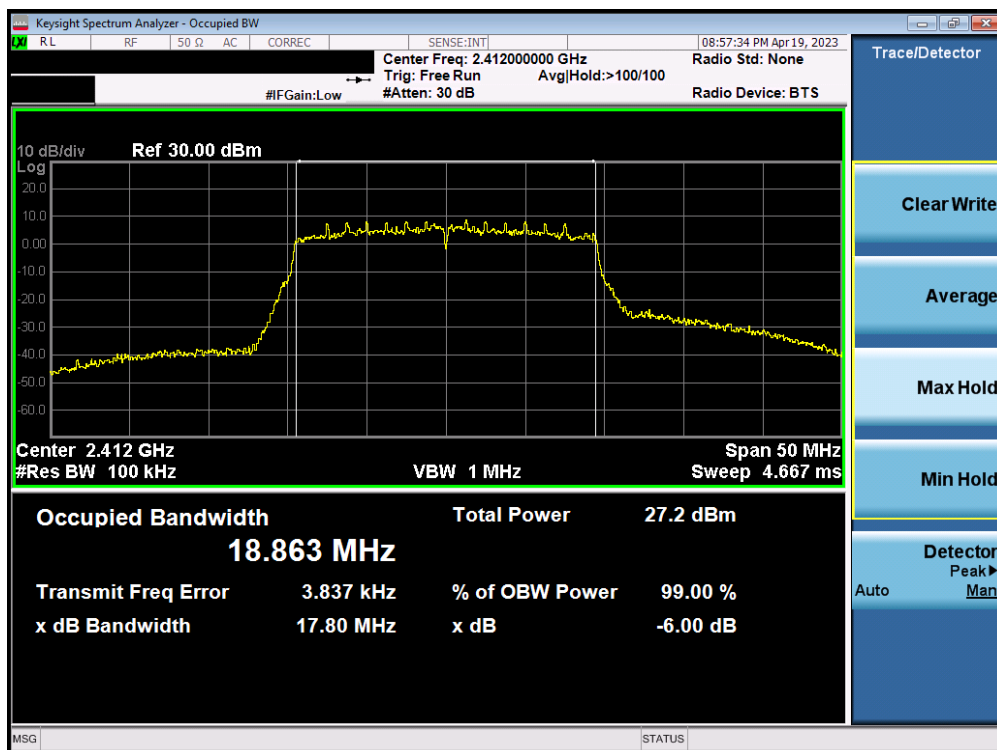


Plot 7-8. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 6) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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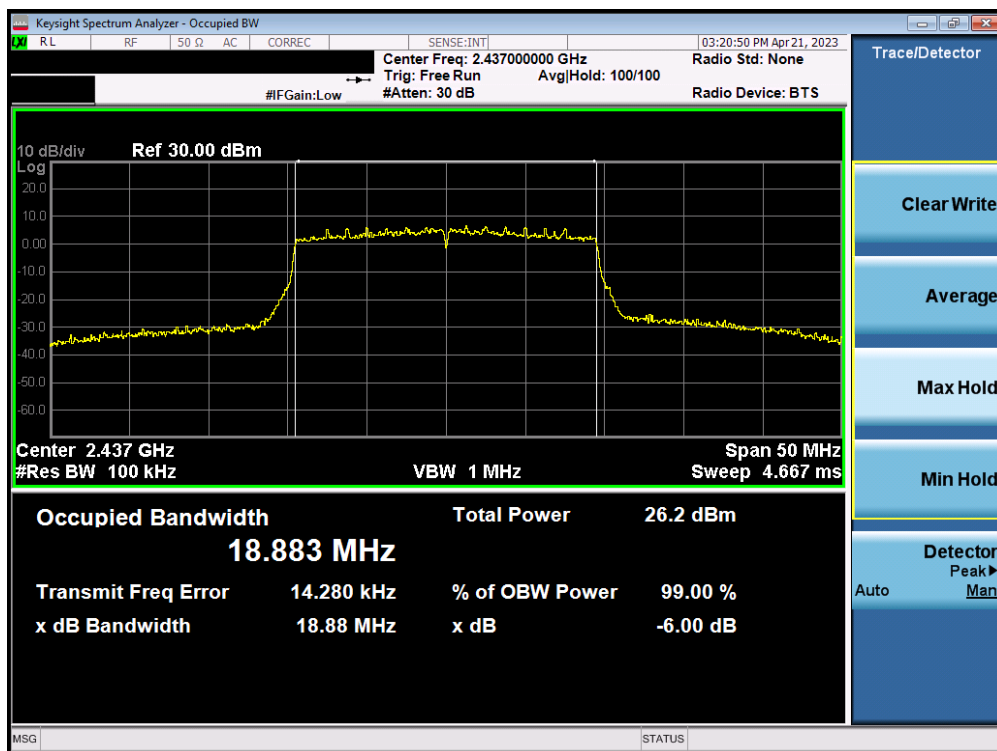


Plot 7-9. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 11) – MCS2

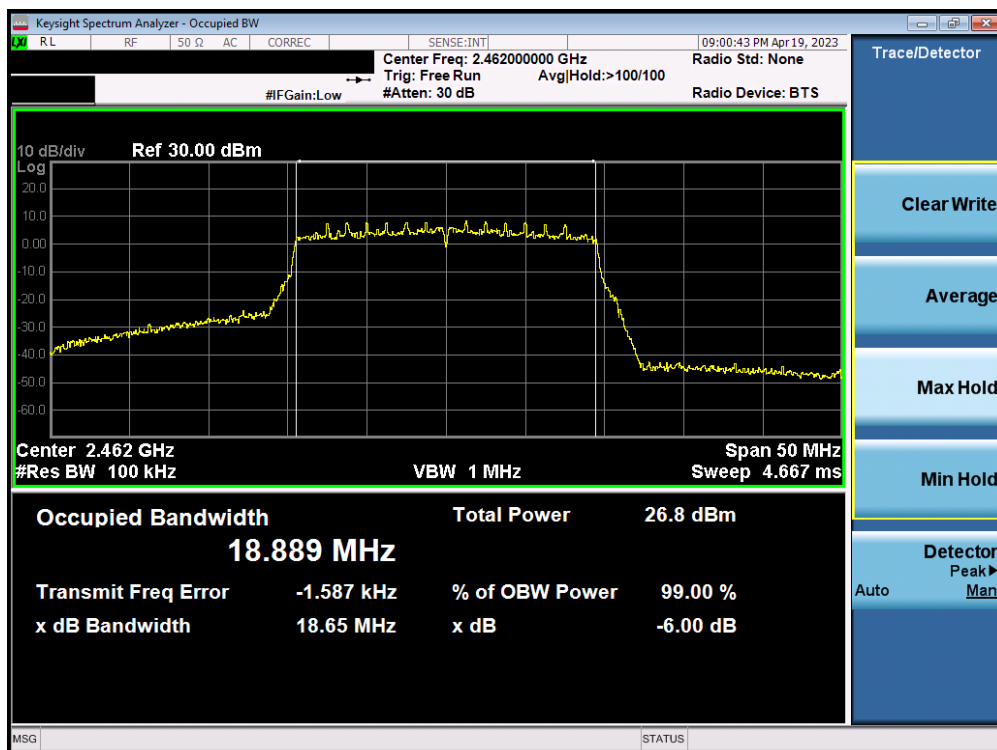


Plot 7-10. 6dB Bandwidth Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS2


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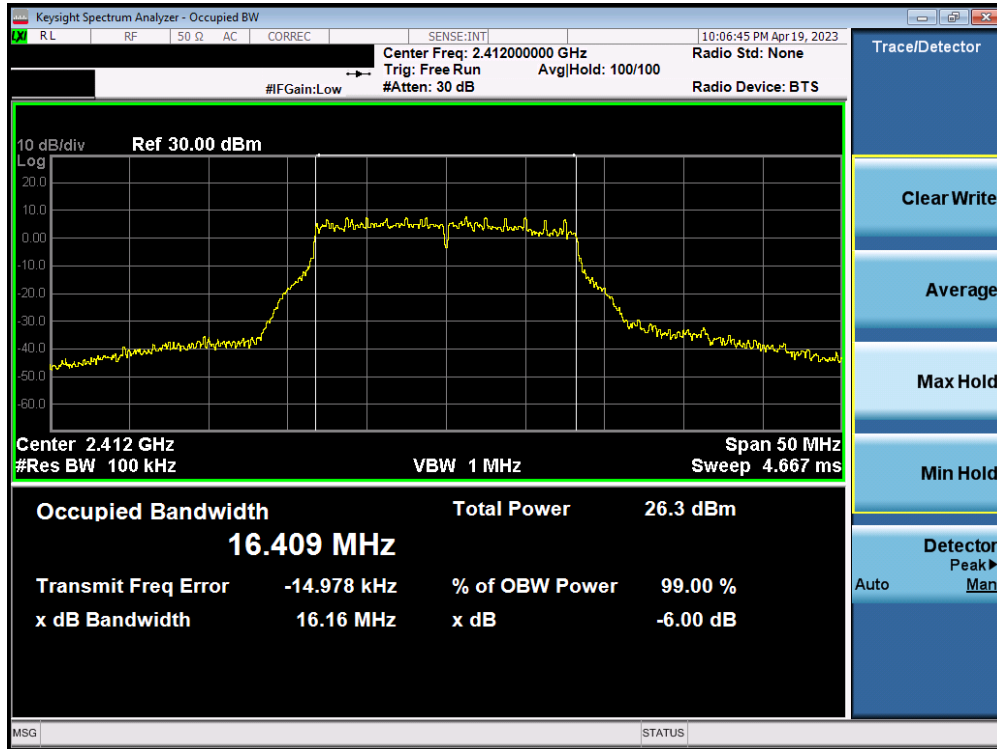
Plot 7-11. 6dB Bandwidth Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS2



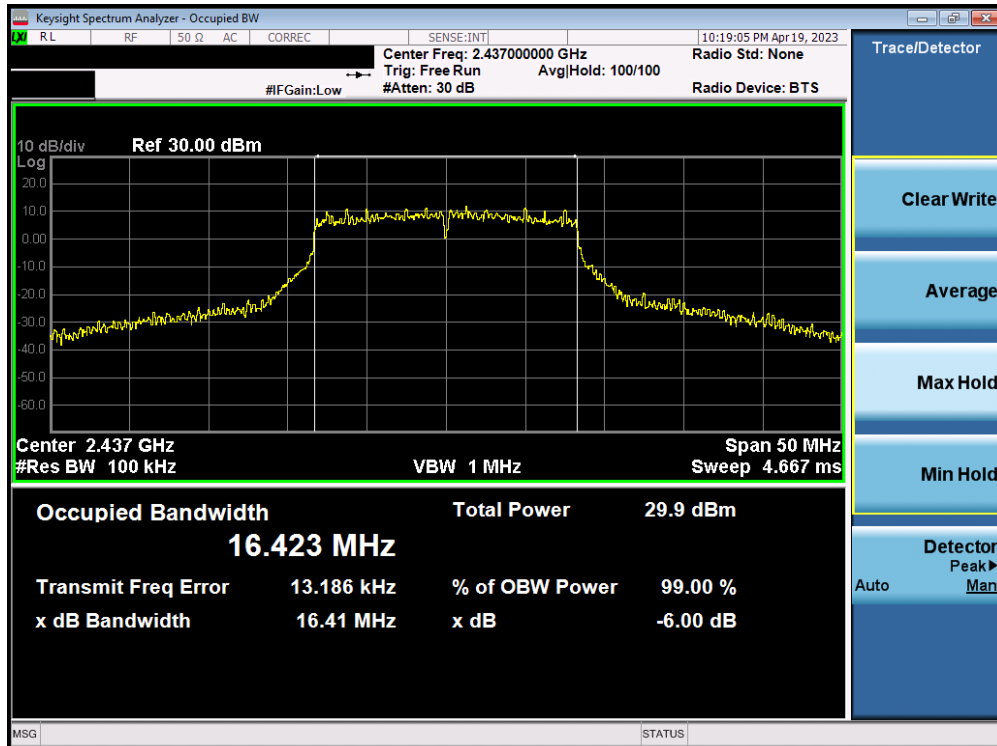
Plot 7-12. 6dB Bandwidth Plot ANT1 (802. 11ax (SU - 2.4GHz) – Ch. 11) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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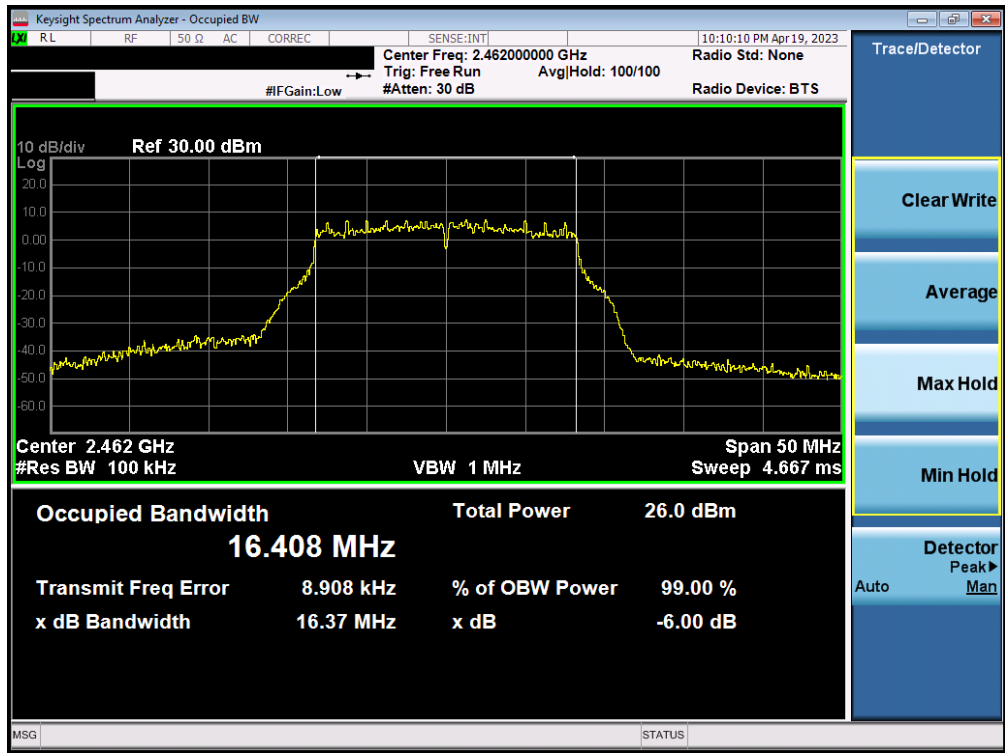


Plot 7-13. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 1) – 24Mbps

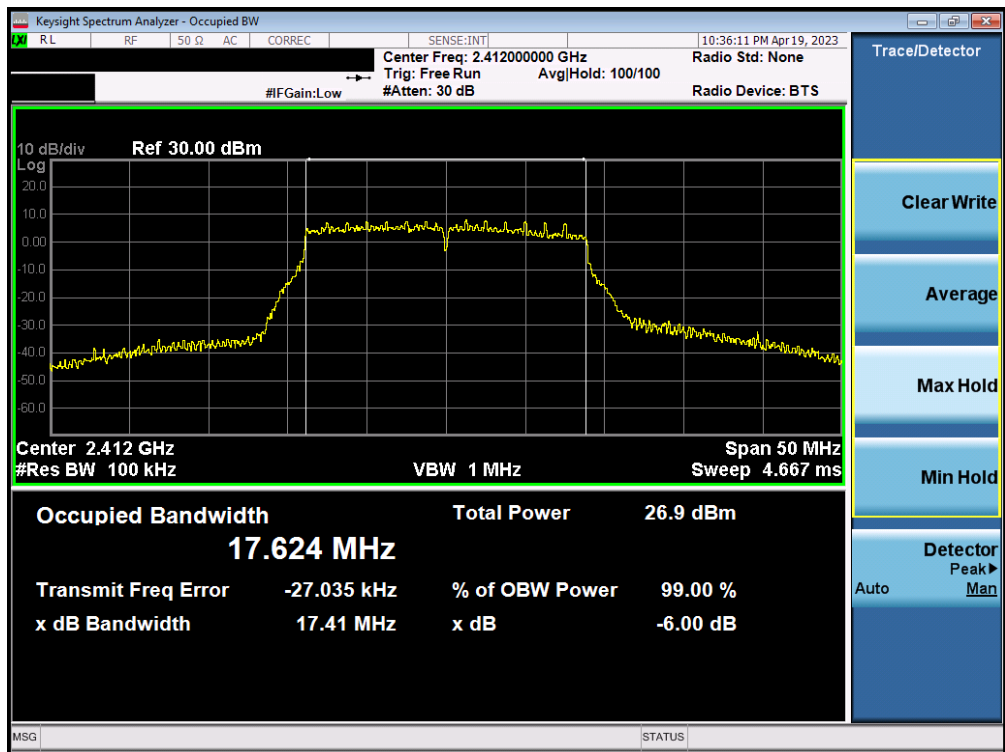


Plot 7-14. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 6) – 24Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 25 of 388

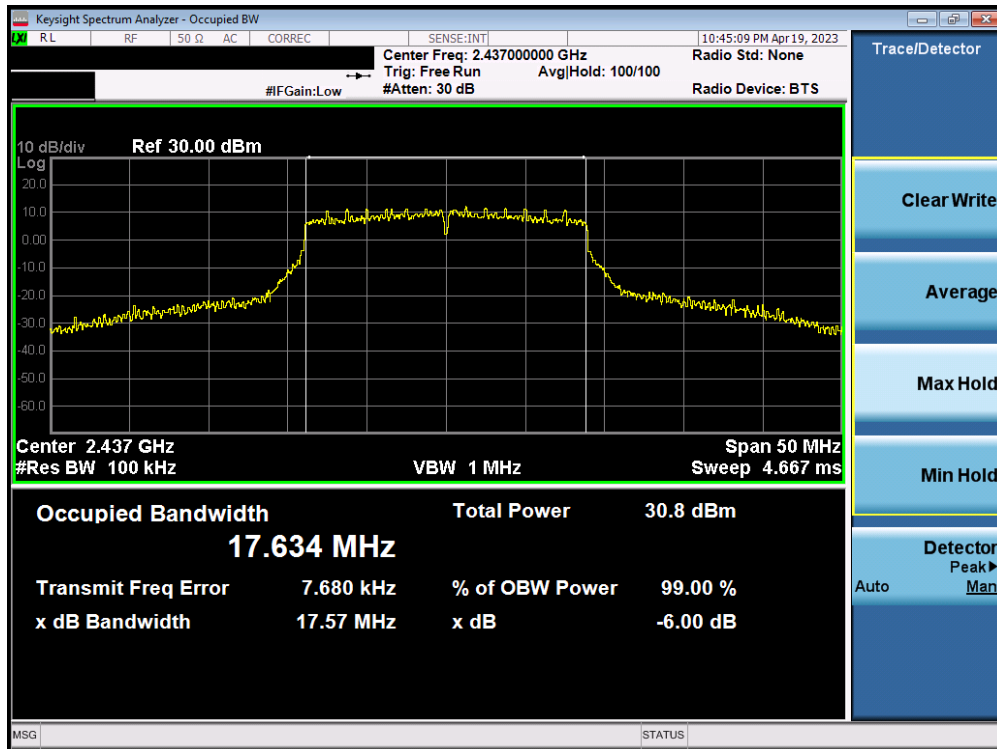


Plot 7-15. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 11) – 24Mbps

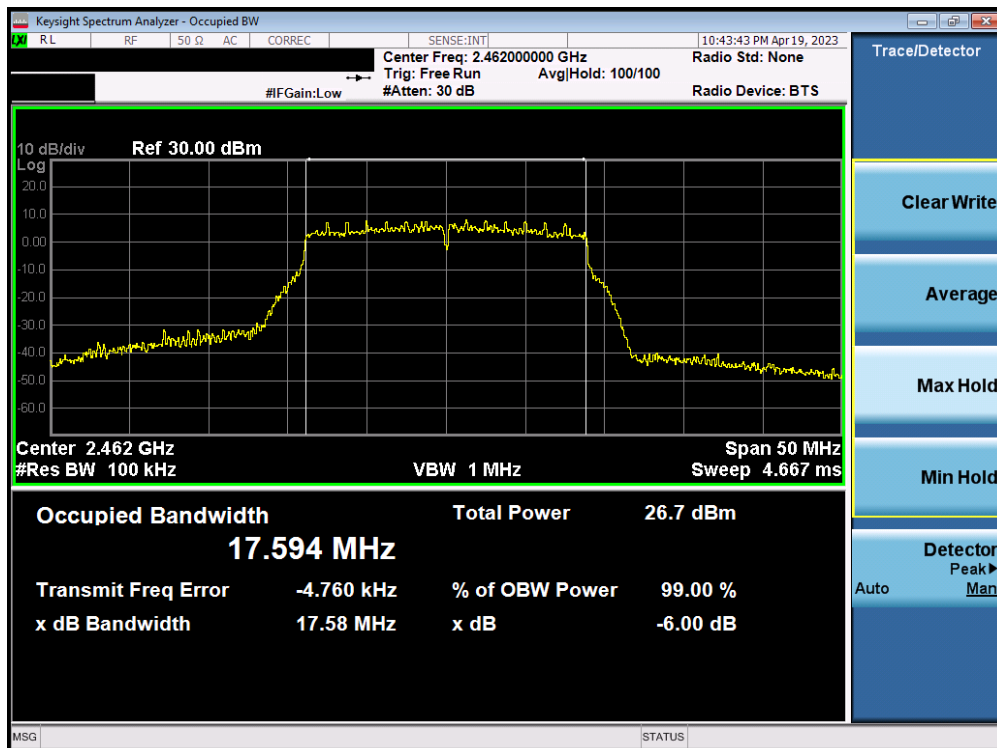


Plot 7-16. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 1) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 26 of 388

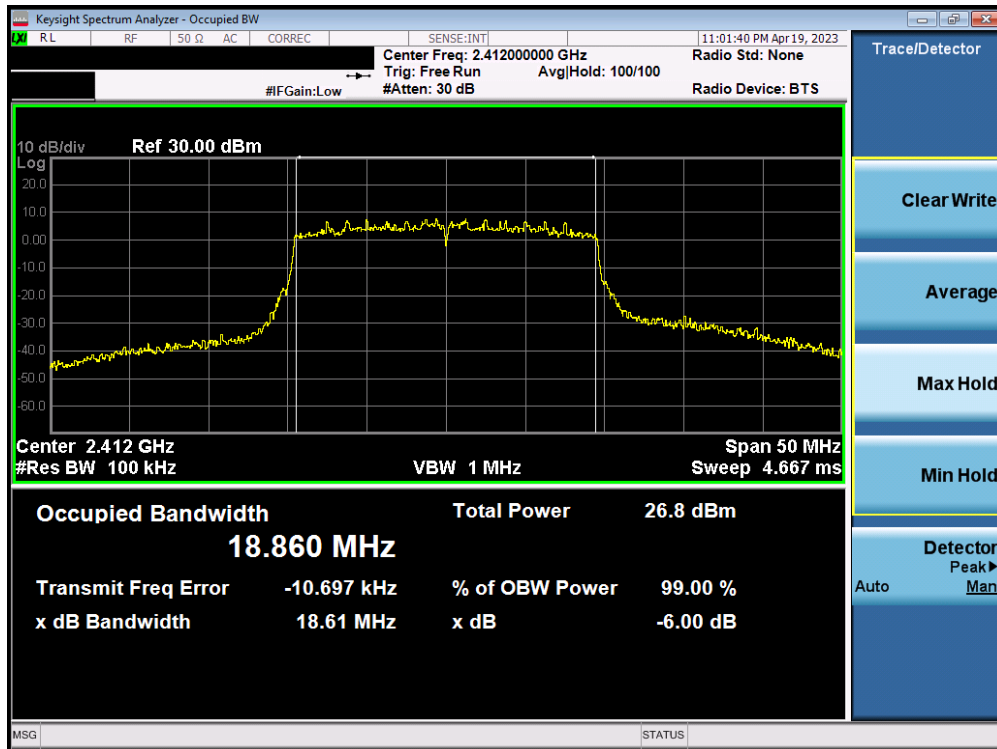


Plot 7-17. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 6) – MCS4

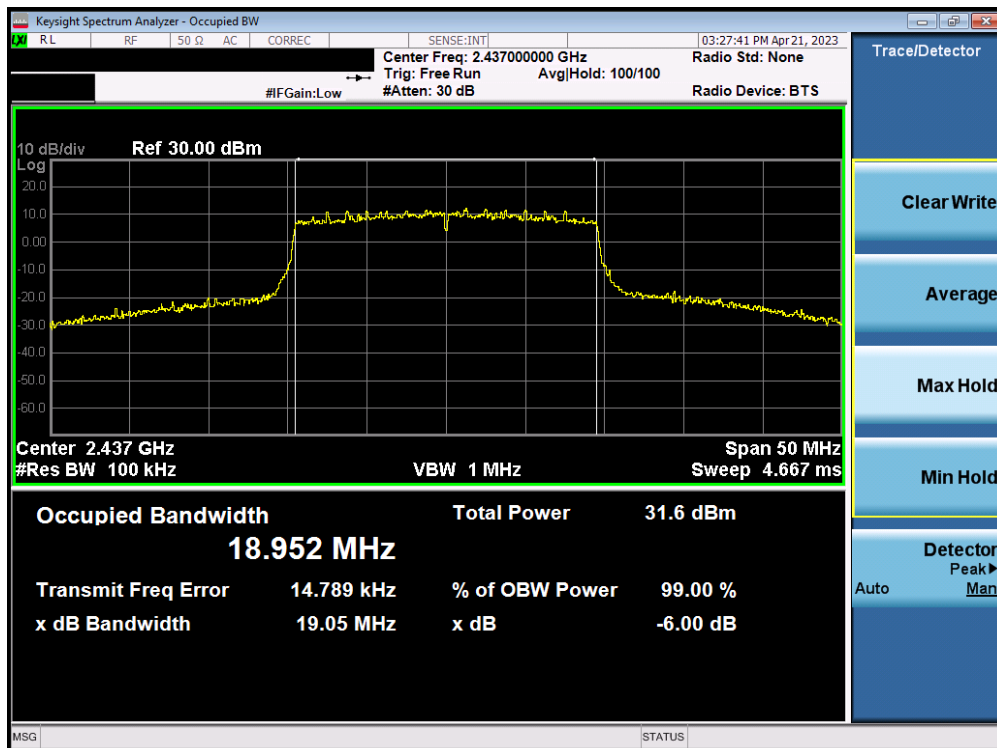


Plot 7-18. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 11) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 27 of 388

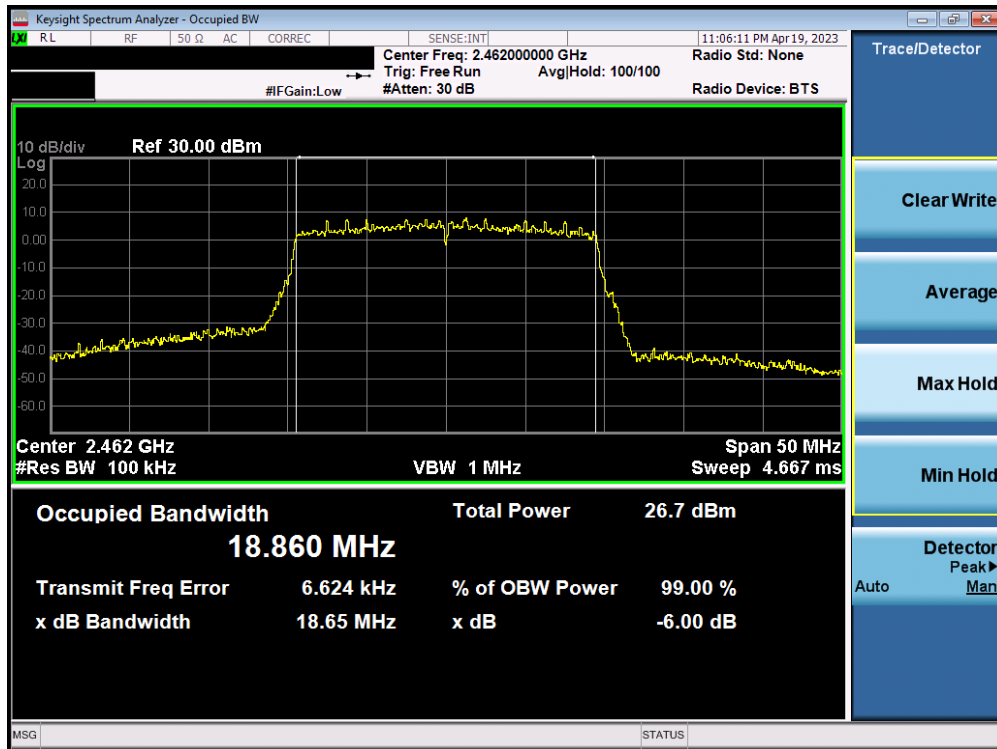


Plot 7-19. 6dB Bandwidth Plot ANT1 (802. 11ax (SU - 2.4GHz) – Ch. 1) – MCS4




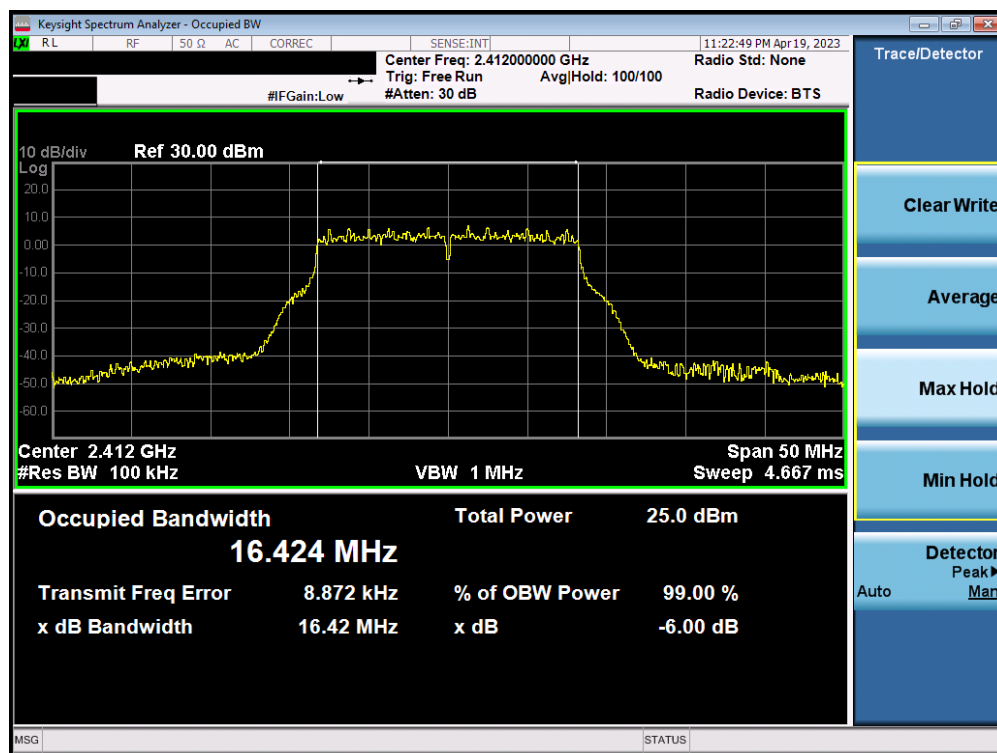
Plot 7-20. 6dB Bandwidth Plot ANT1 (802. 11ax (SU - 2.4GHz) – Ch. 6) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 28 of 388

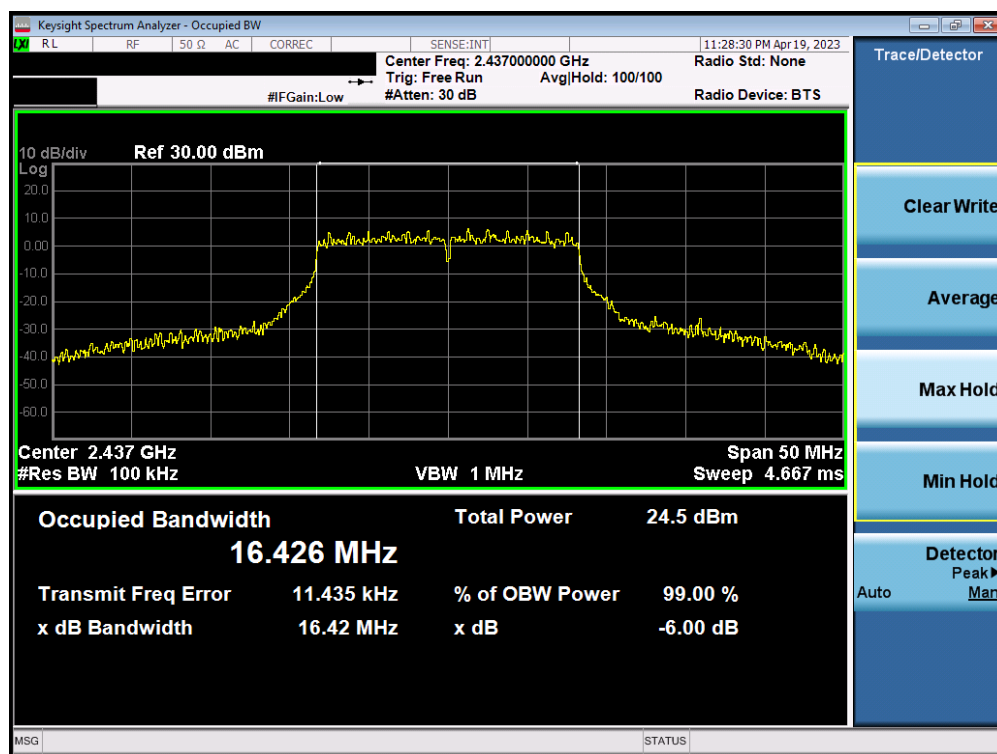


Plot 7-21. 6dB Bandwidth Plot ANT1 (802. 11ax (SU - 2.4GHz) – Ch. 11) – MCS4


FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1C2302130007-05.BCG	<b>Test Dates:</b> 2/10/2023 - 4/25/2023	<b>EUT Type:</b> Head Mounted Device	Page 29 of 388

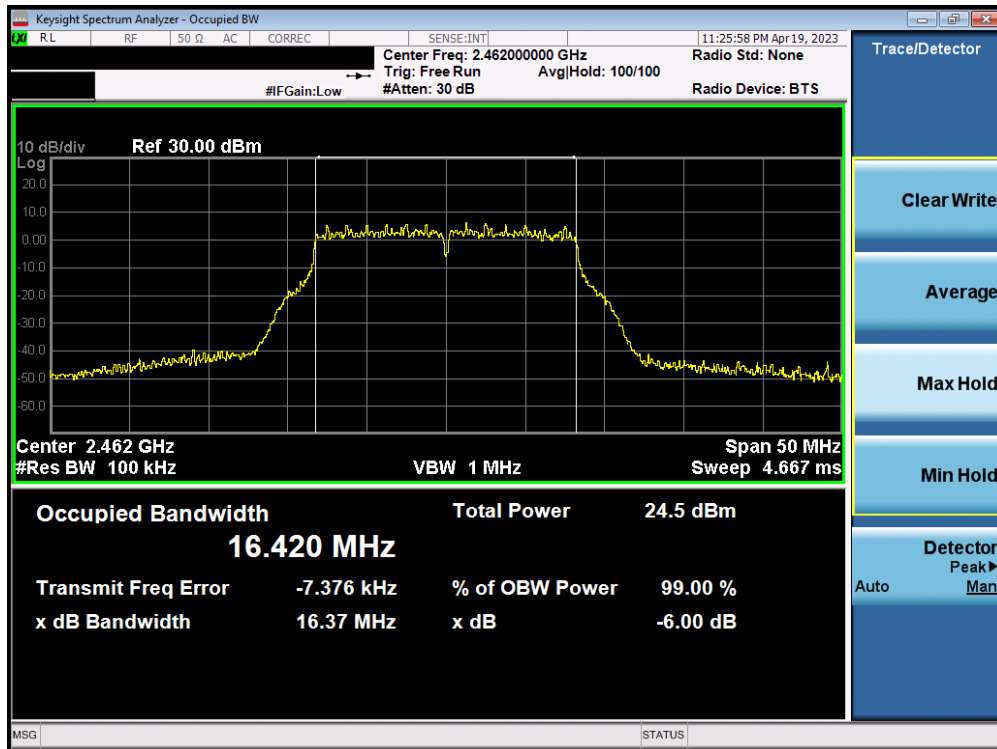


Plot 7-22. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 1) – 48Mbps

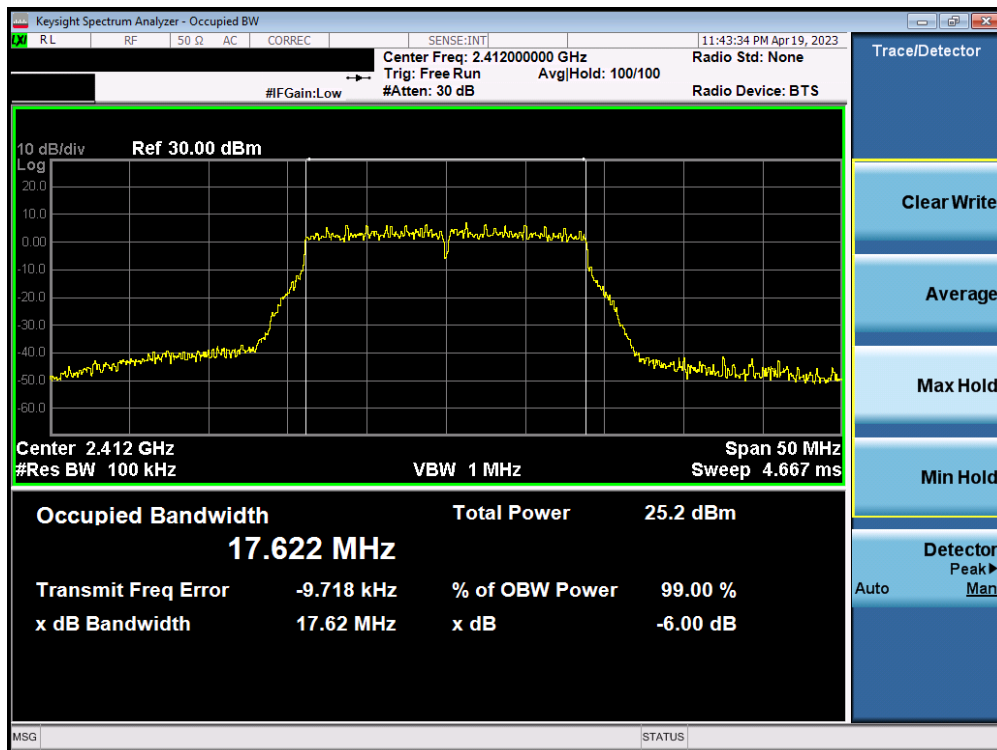


Plot 7-23. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 6) – 48Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 30 of 388

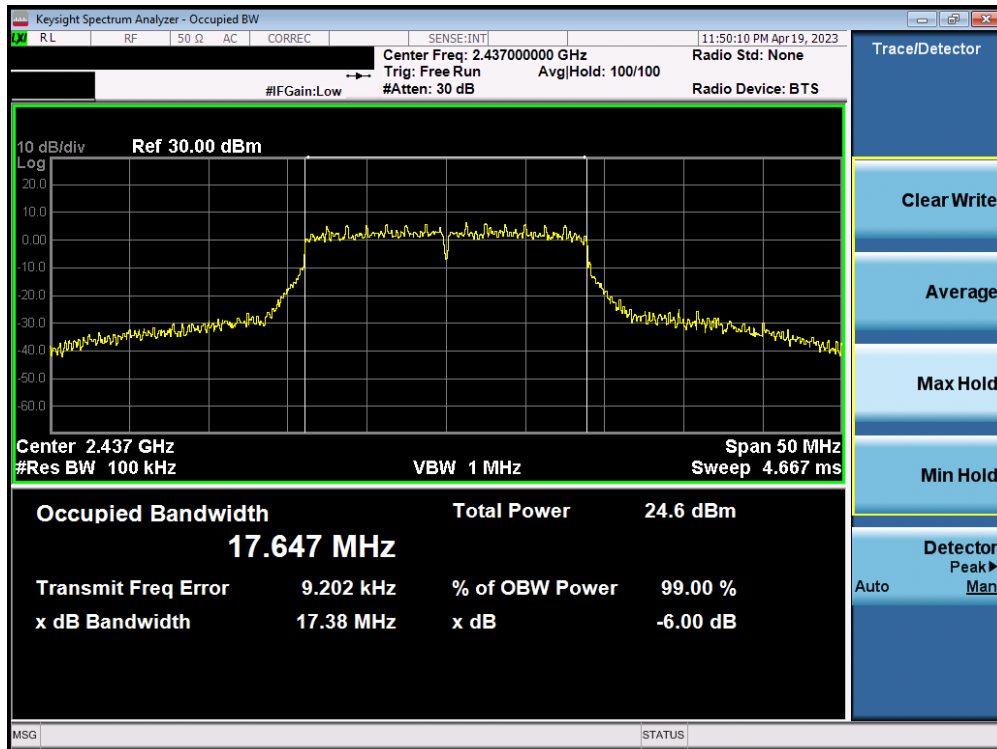


Plot 7-24. 6dB Bandwidth Plot ANT1 (802.11g – Ch. 11) – 48Mbps

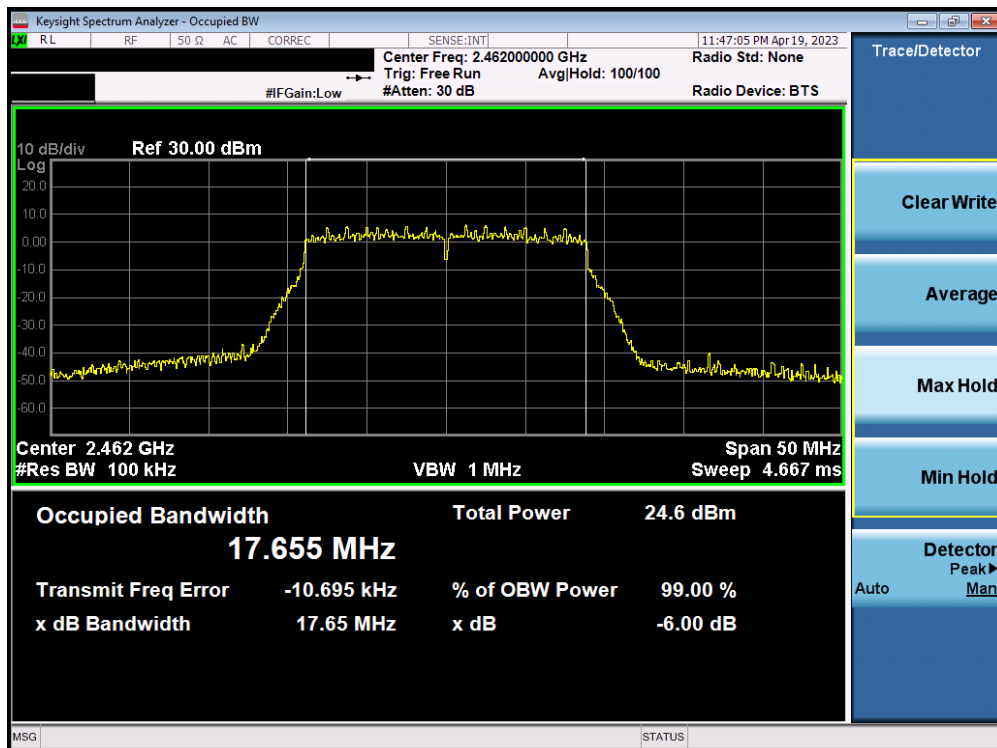


Plot 7-25. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 1) – MCS7


FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 31 of 388



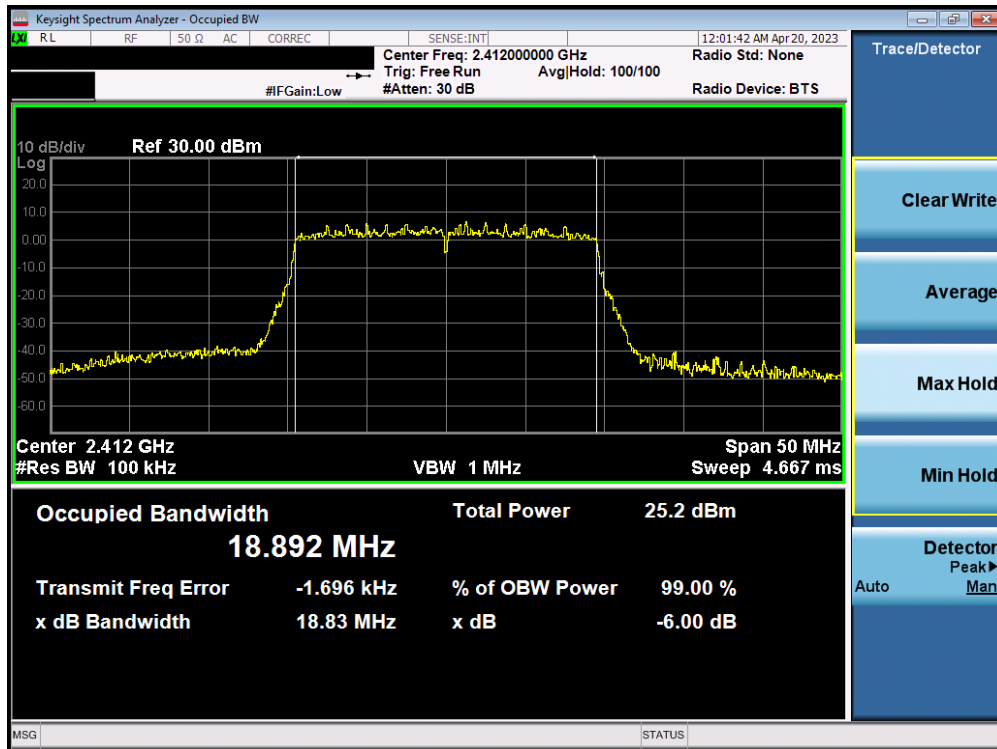
Plot 7-26. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 6) – MCS7



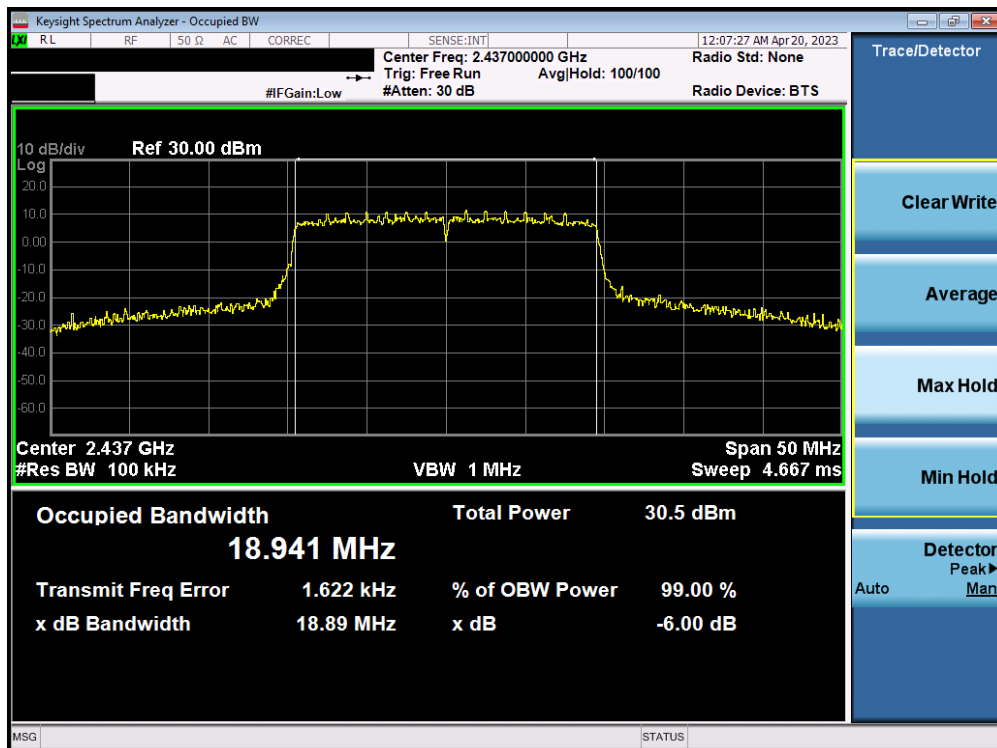
Plot 7-27. 6dB Bandwidth Plot ANT1 (802.11n (2.4GHz) – Ch. 11) – MCS7

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 32 of 388



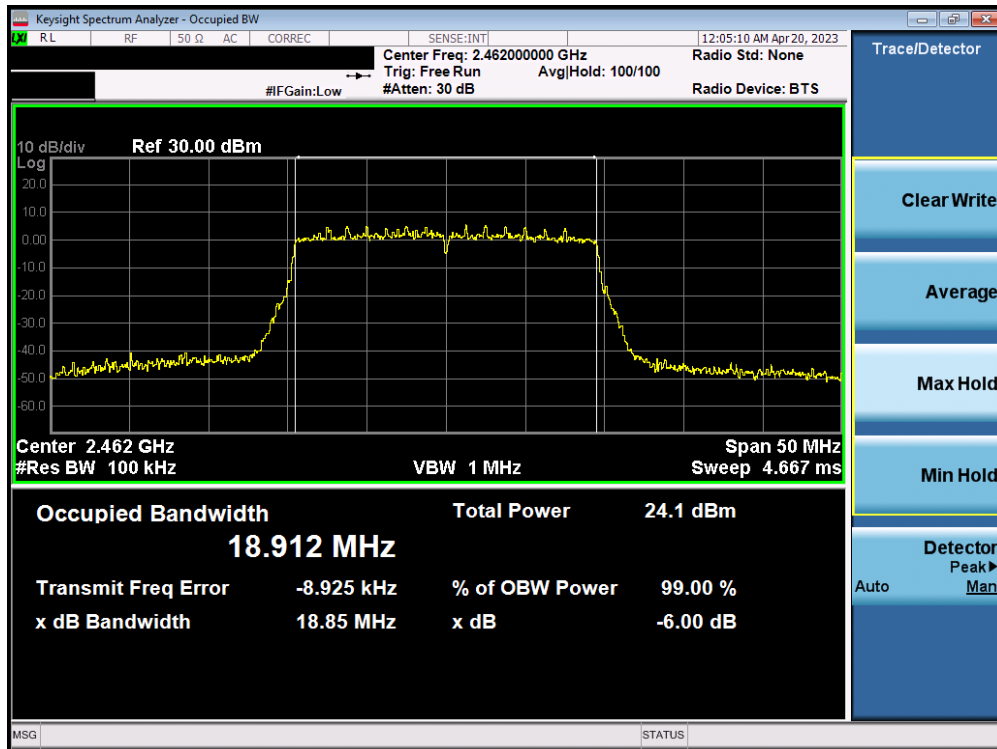


Plot 7-28. 6dB Bandwidth Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS9




Plot 7-29. 6dB Bandwidth Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS9

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 33 of 388



Plot 7-30. 6dB Bandwidth Plot ANT1 (802. 11ax (SU - 2.4GHz) – Ch. 11) – MCS9

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 34 of 388


## ANT2 6 dB BW and 99% OBW Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
2412	1	b	1	12.774	8.142	0.500	Pass
2437	6	b	1	12.827	8.584	0.500	Pass
2462	11	b	1	12.759	8.122	0.500	Pass
2412	1	g	12	16.449	15.800	0.500	Pass
2437	6	g	12	16.412	15.950	0.500	Pass
2462	11	g	12	16.438	15.780	0.500	Pass
2412	1	n	19.5/21.7 (MCS2)	17.664	16.150	0.500	Pass
2437	6	n	19.5/21.7 (MCS2)	17.635	17.360	0.500	Pass
2462	11	n	19.5/21.7 (MCS2)	17.659	17.000	0.500	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	18.861	18.760	0.500	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	18.885	18.900	0.500	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	18.871	18.710	0.500	Pass

**Table 7-5. Conducted Bandwidth Measurements ANT2 (Low Data Rate)**

Frequency [MHz]	Channel No.	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	16.413	16.150	0.500	Pass
2437	6	g	24	16.420	16.420	0.500	Pass
2462	11	g	24	16.393	16.380	0.500	Pass
2412	1	n	39/43.3 (MCS4)	17.628	17.380	0.500	Pass
2437	6	n	39/43.3 (MCS4)	17.649	17.680	0.500	Pass
2462	11	n	39/43.3 (MCS4)	17.607	17.650	0.500	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	18.860	18.690	0.500	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	18.896	18.880	0.500	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	18.873	18.760	0.500	Pass

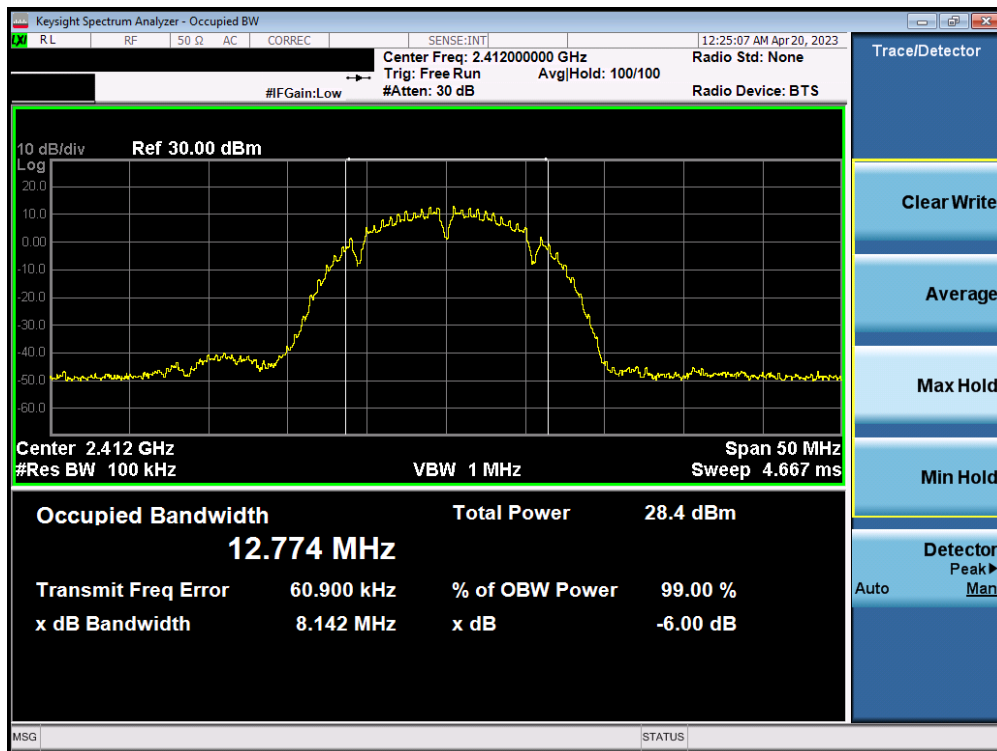
**Table 7-6. Conducted Bandwidth Measurements ANT2 (Mid Data Rate)**

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device		Page 35 of 388

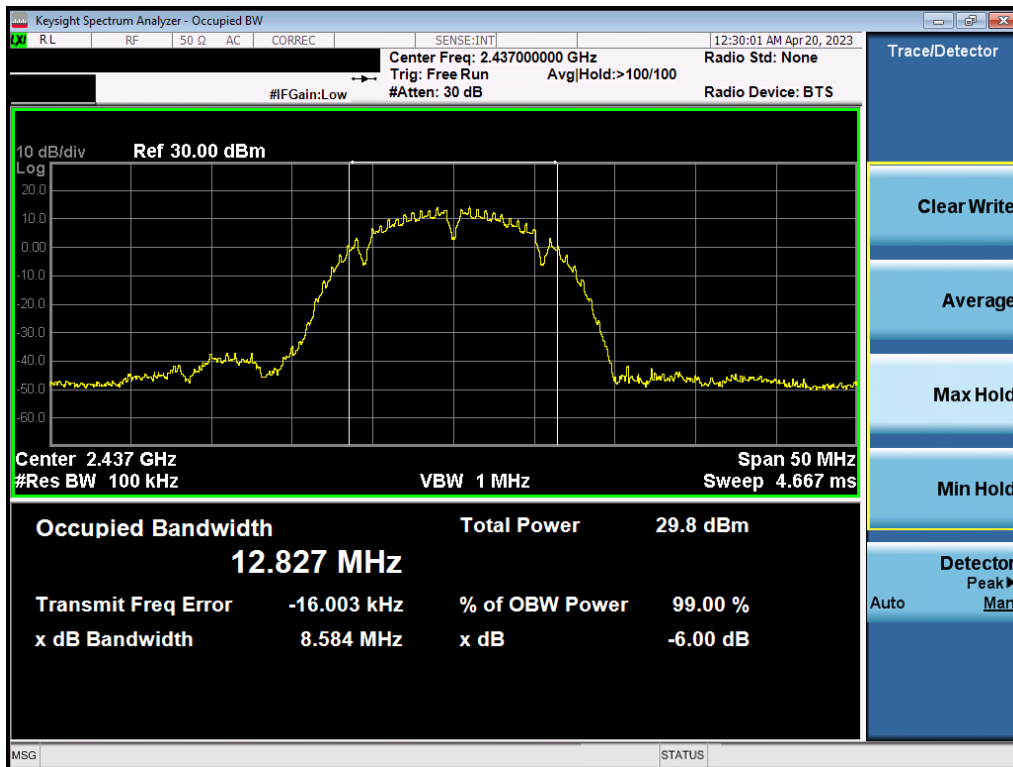
Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
2412	1	g	48	16.413	16.390	0.500	Pass
2437	6	g	48	16.441	16.440	0.500	Pass
2462	11	g	48	16.404	16.160	0.500	Pass
2412	1	n	65/72.2 (MCS7)	17.650	17.720	0.500	Pass
2437	6	n	65/72.2 (MCS7)	17.699	17.750	0.500	Pass
2462	11	n	65/72.2 (MCS7)	17.656	17.740	0.500	Pass
2412	1	ax (SU)	108/114.7 (MCS9)	18.894	18.780	0.500	Pass
2437	6	ax (SU)	108/114.7 (MCS9)	18.932	18.590	0.500	Pass
2462	11	ax (SU)	108/114.7 (MCS9)	18.903	18.530	0.500	Pass

**Table 7-7. Conducted Bandwidth Measurements ANT2 (High Data Rate)**


FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1C2302130007-05.BCG	<b>Test Dates:</b> 2/10/2023 - 4/25/2023	<b>EUT Type:</b> Head Mounted Device	Page 36 of 388

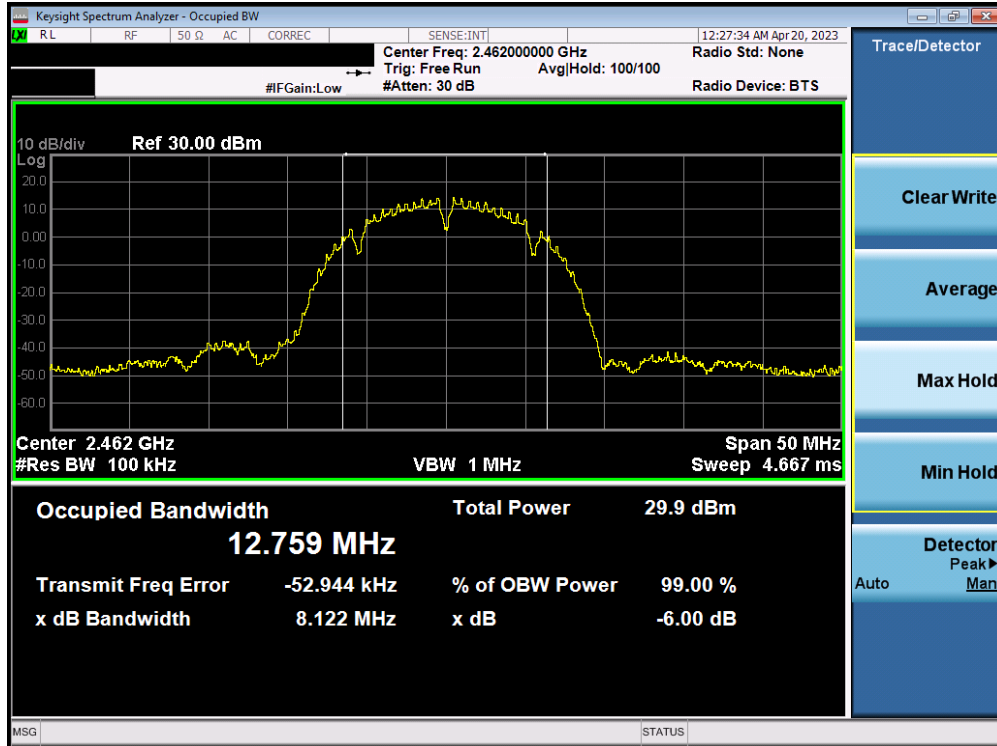


Plot 7-31. 6dB Bandwidth Plot ANT2 (802.11b – Ch. 1) – 1Mbps

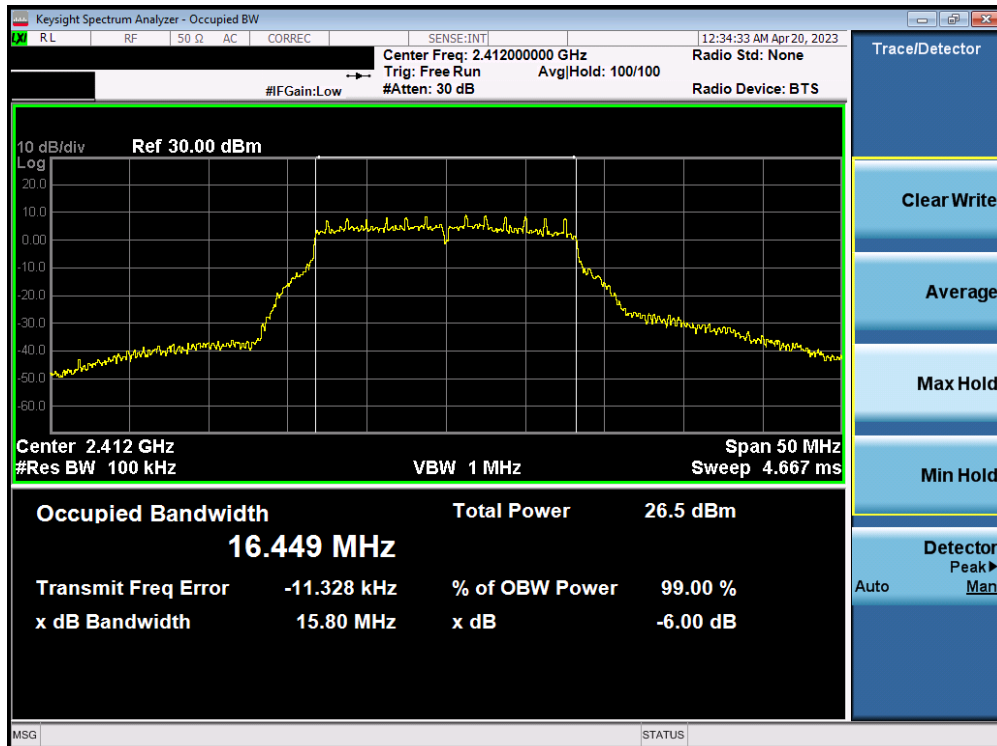


Plot 7-32. 6dB Bandwidth Plot ANT2 (802.11b – Ch. 6) – 1Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 37 of 388

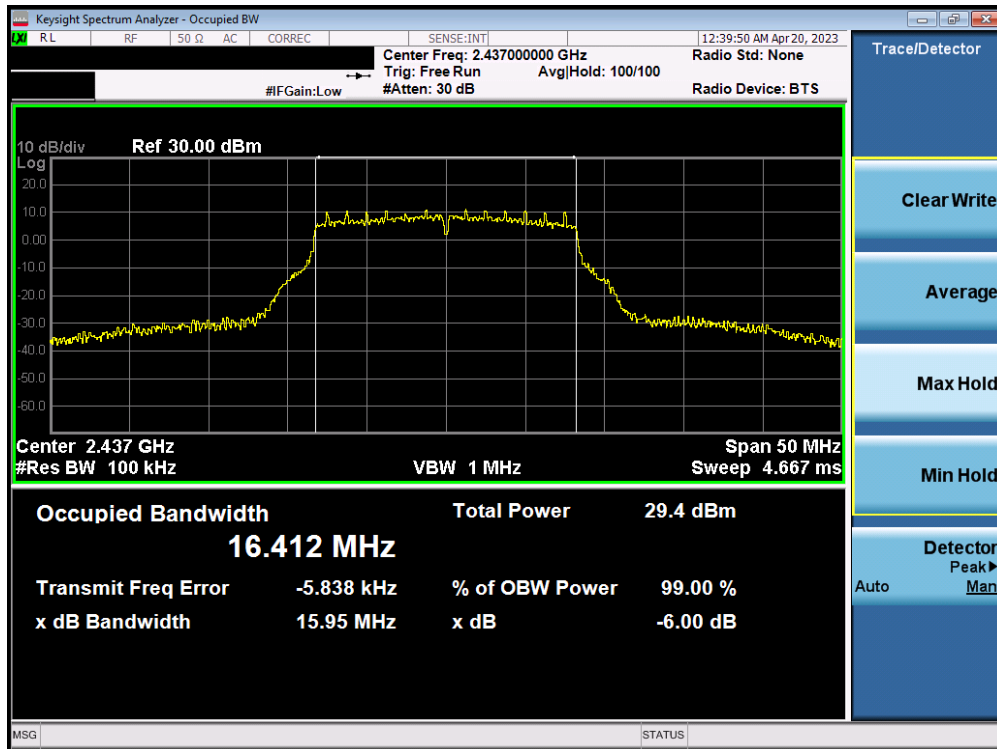


Plot 7-33. 6dB Bandwidth Plot ANT2 (802.11b – Ch. 11) – 1Mbps

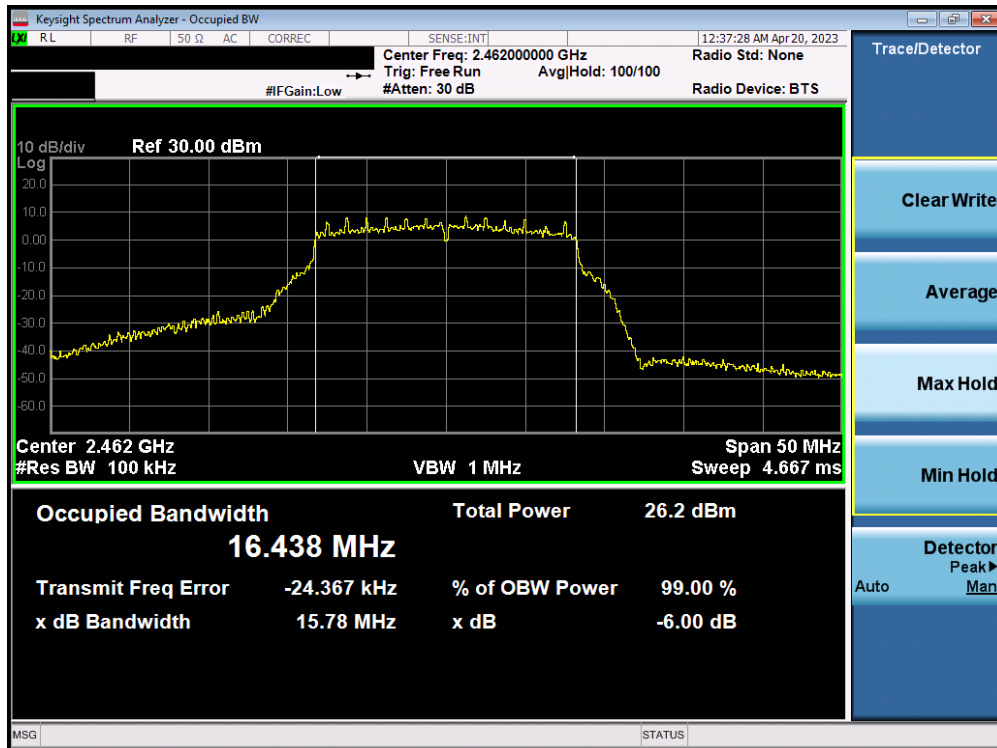


Plot 7-34. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 1) – 12Mbps


FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 38 of 388

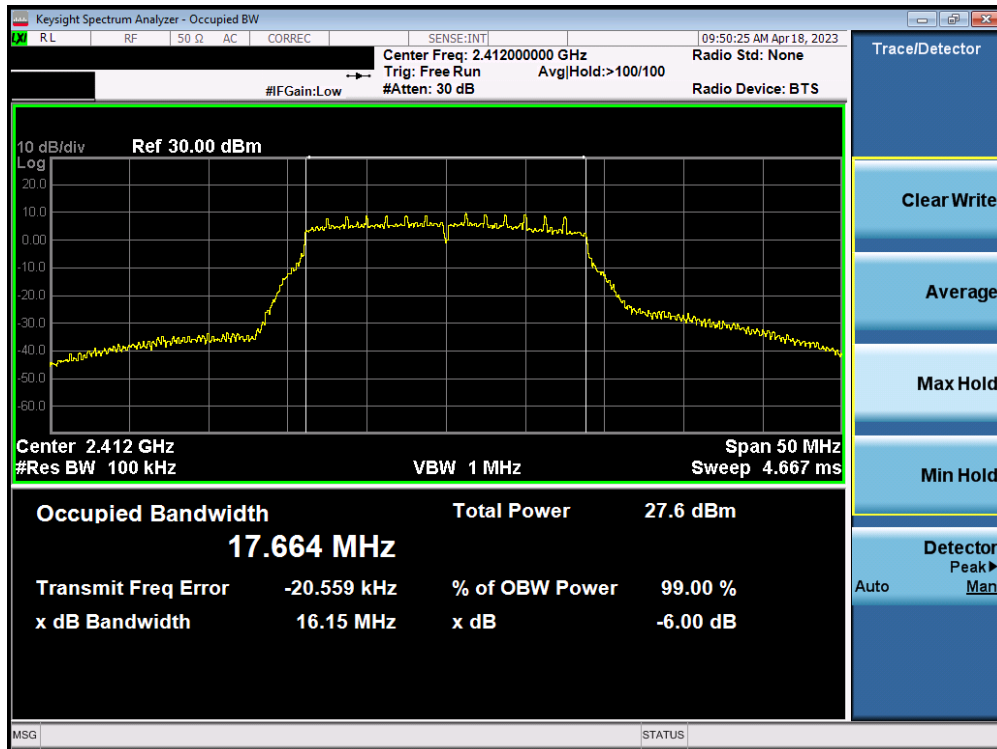


Plot 7-35. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 6) – 12Mbps

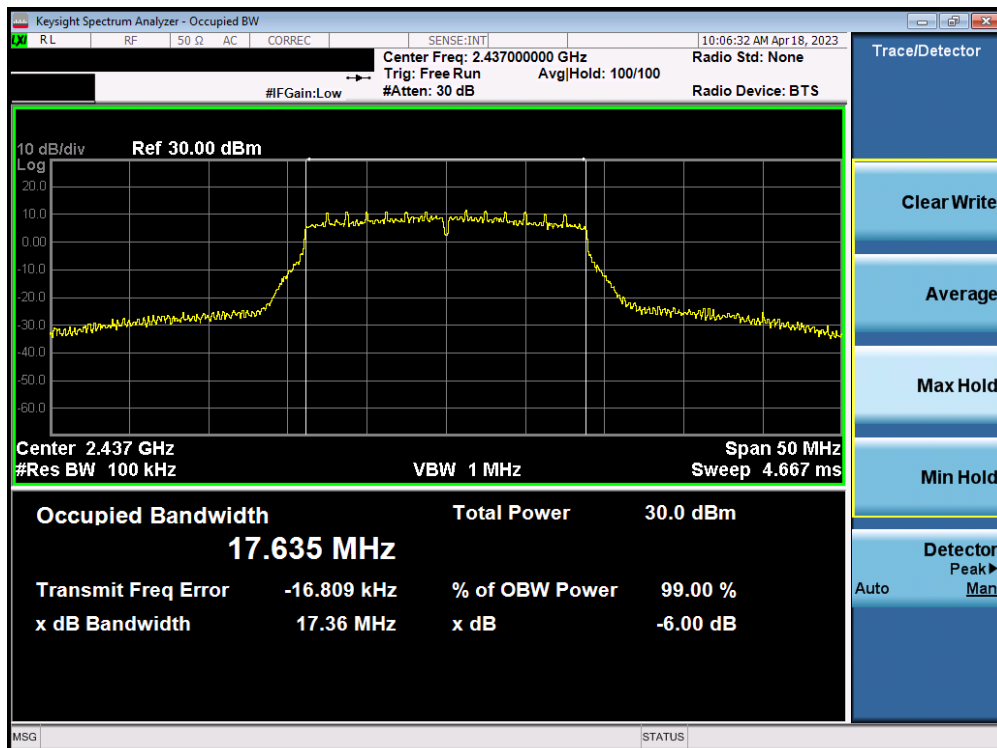


Plot 7-36. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 11) – 12Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 39 of 388



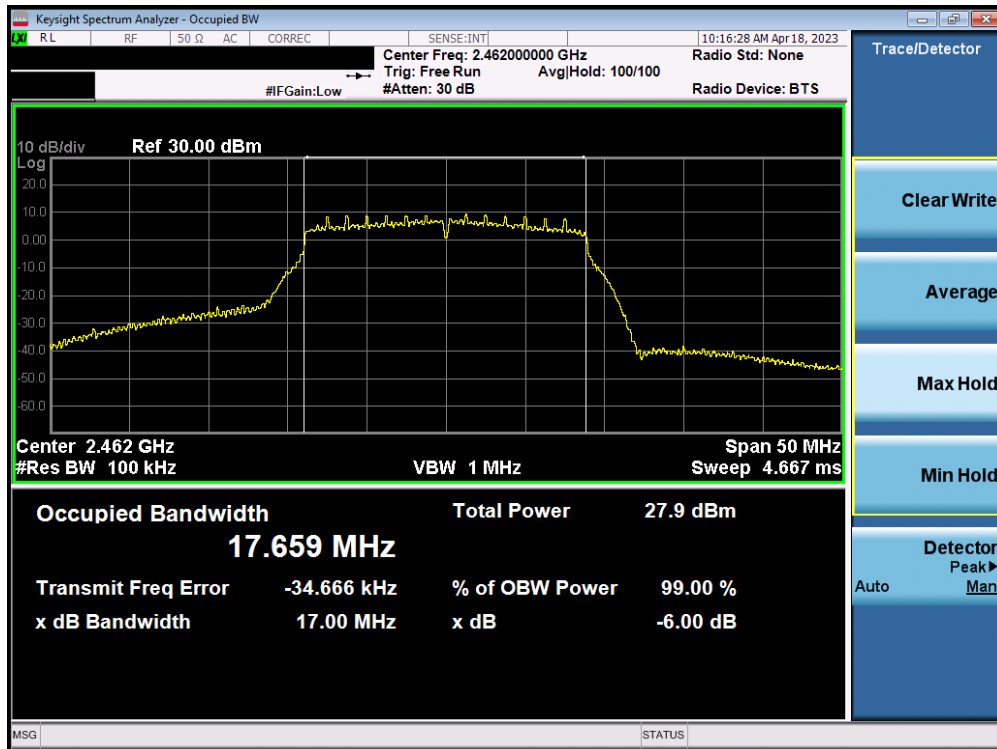
Plot 7-37. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 1) – MCS2



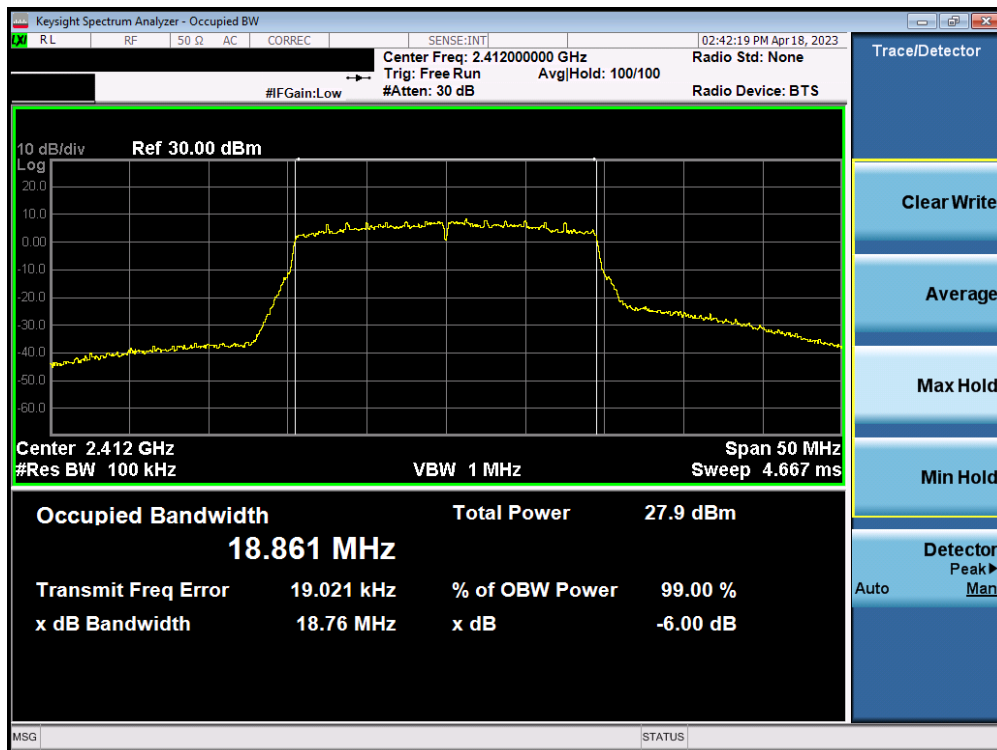
Plot 7-38. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 6) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 40 of 388



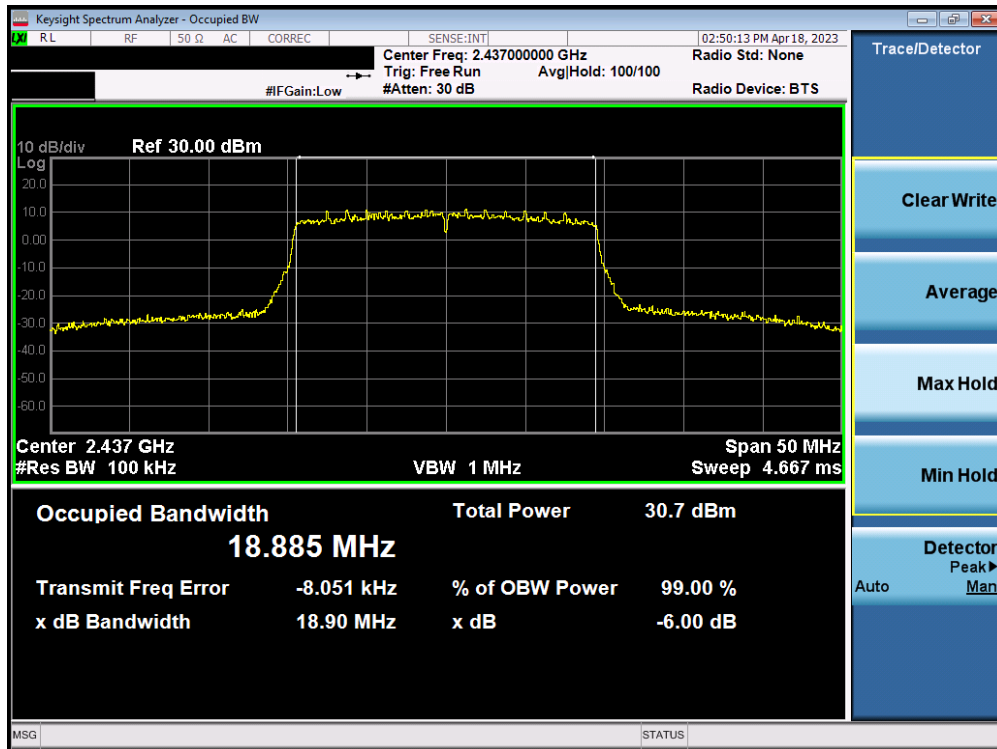


Plot 7-39. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 11) – MCS2

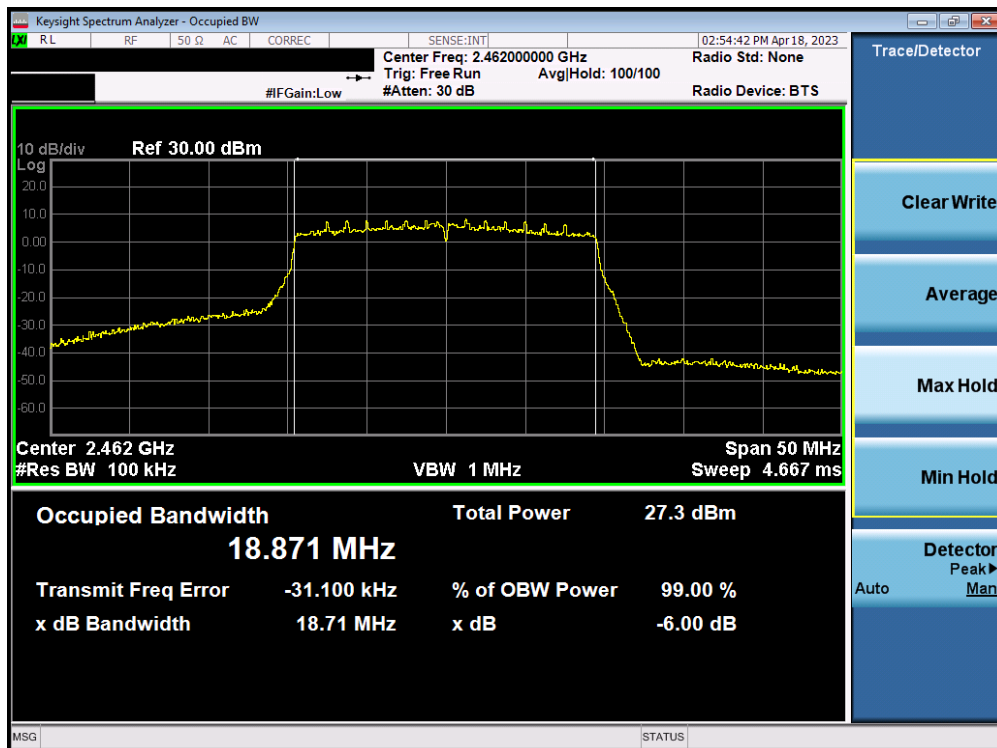


Plot 7-40. 6dB Bandwidth Plot ANT2 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 41 of 388

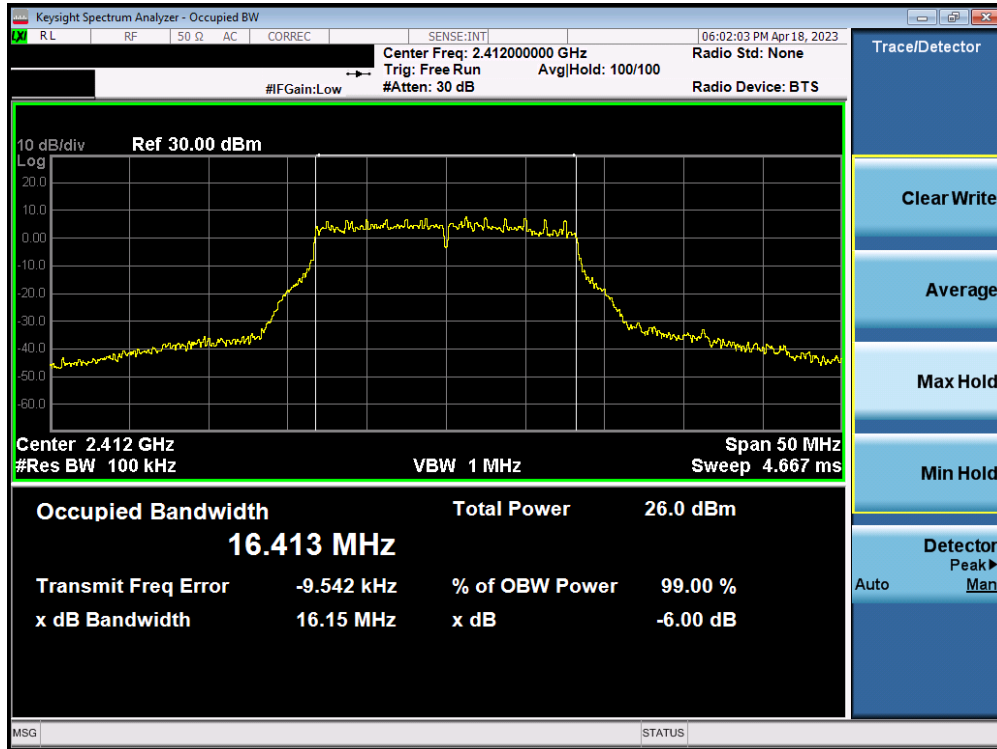


Plot 7-41. 6dB Bandwidth Plot ANT2 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS2

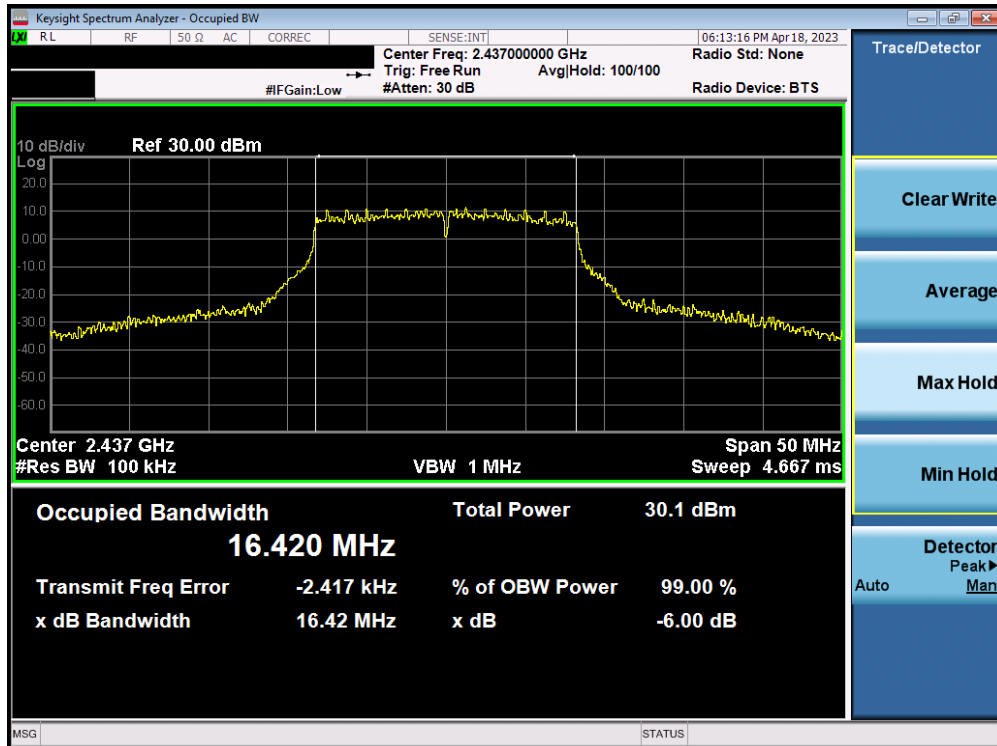


Plot 7-42. 6dB Bandwidth Plot ANT2 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 42 of 388

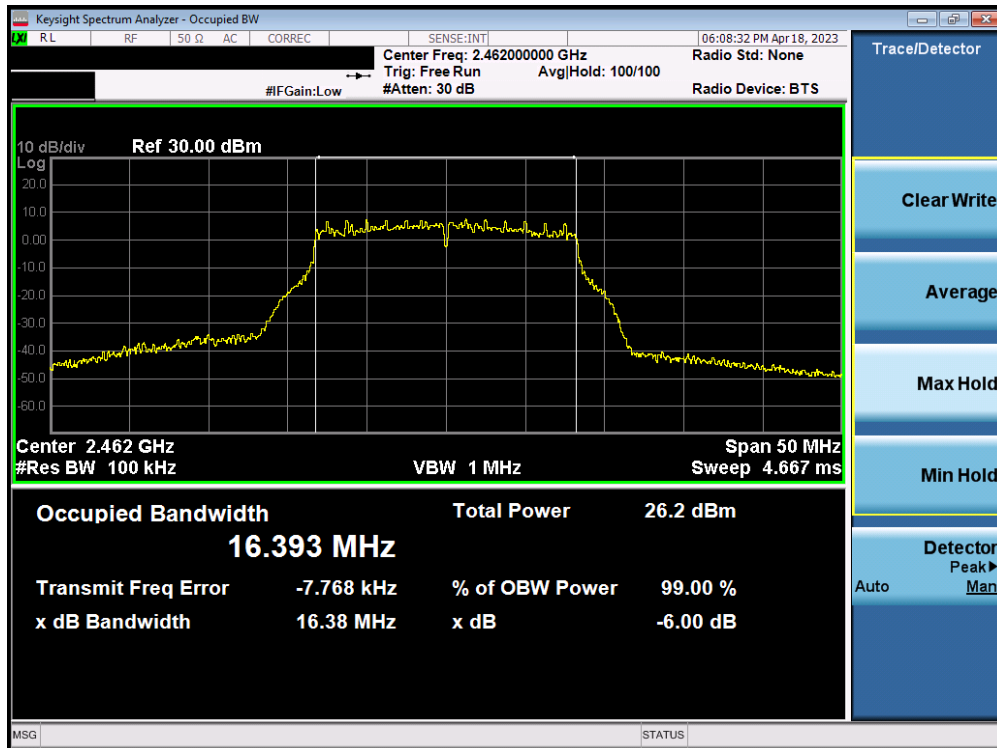


Plot 7-43. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 1) – 24Mbps

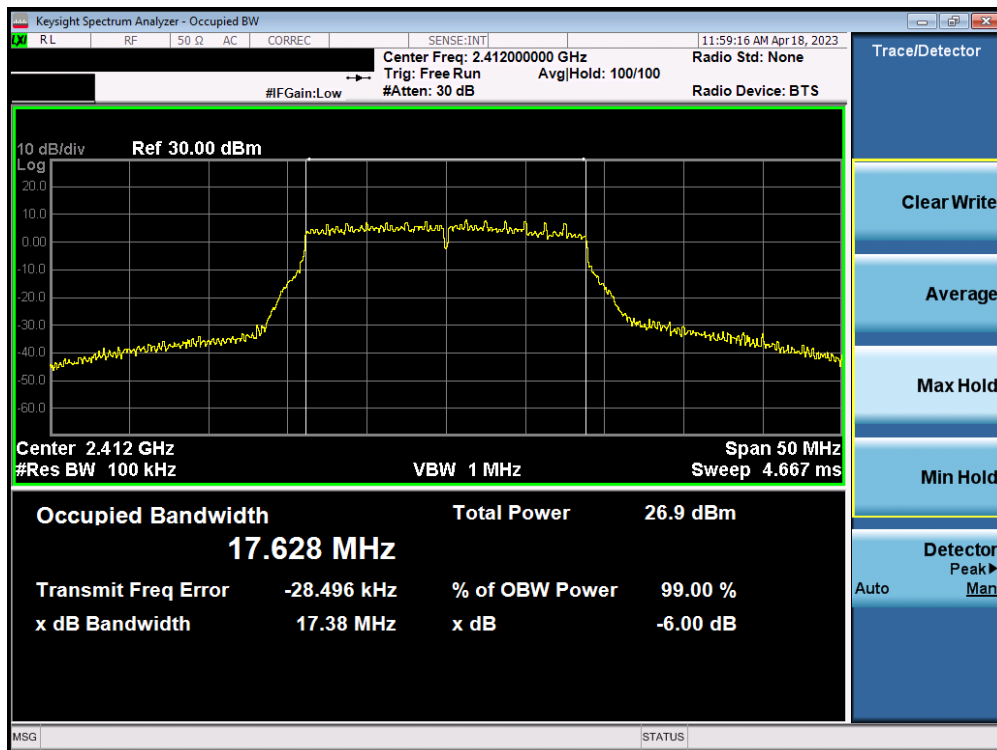


Plot 7-44. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 6) – 24Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 43 of 388

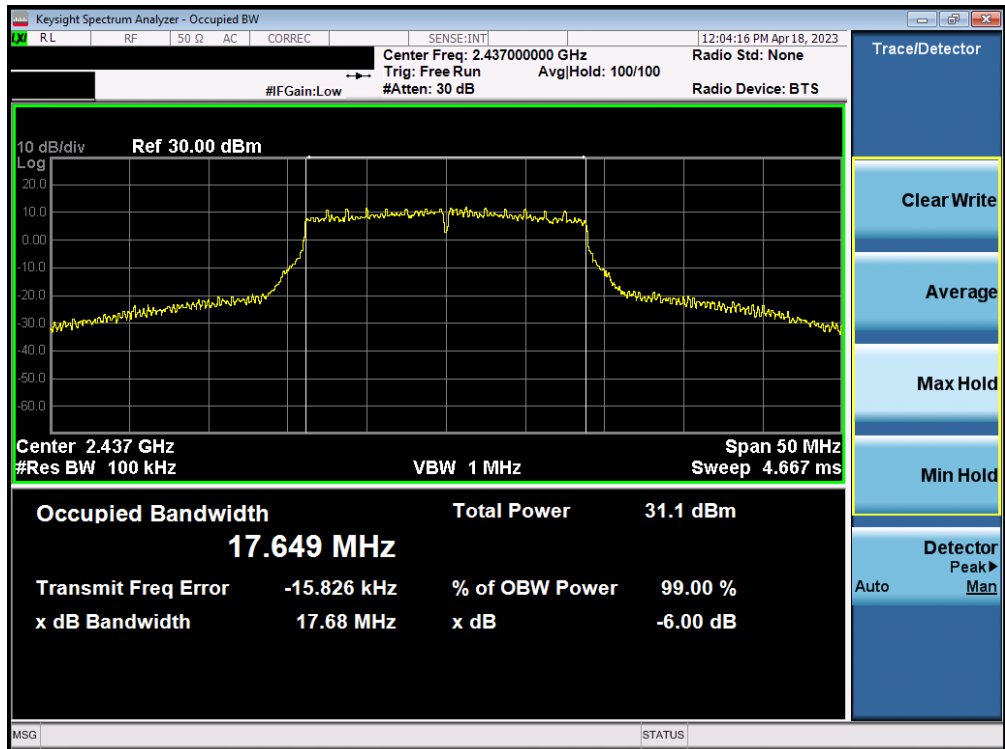


Plot 7-45. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 11) – 24Mbps

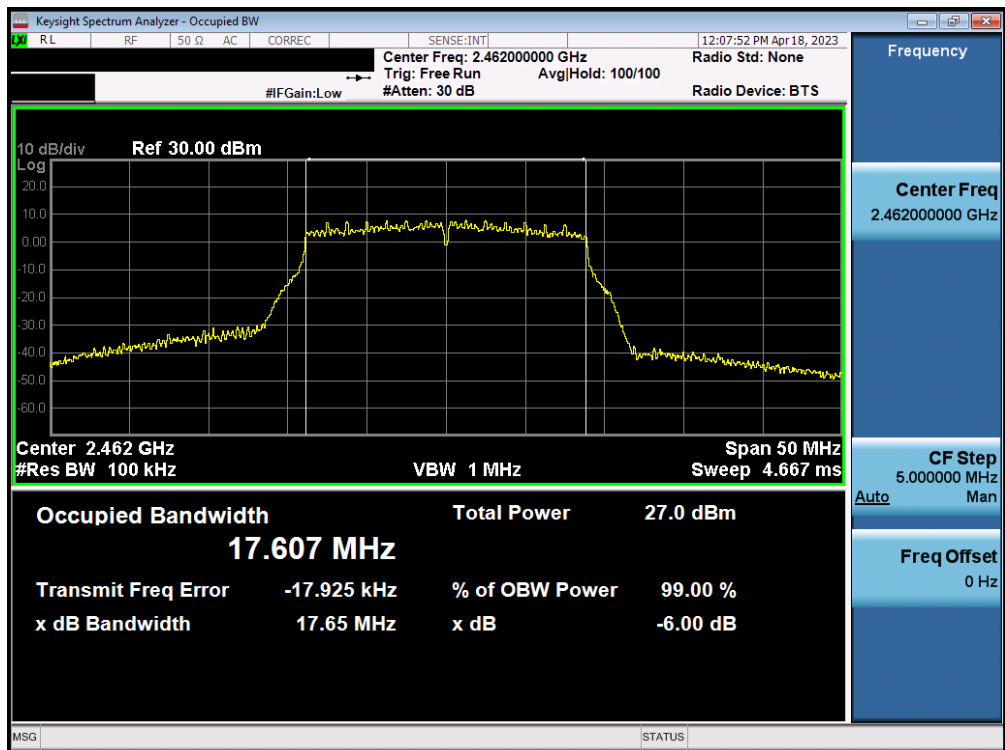


Plot 7-46. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 1) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 44 of 388

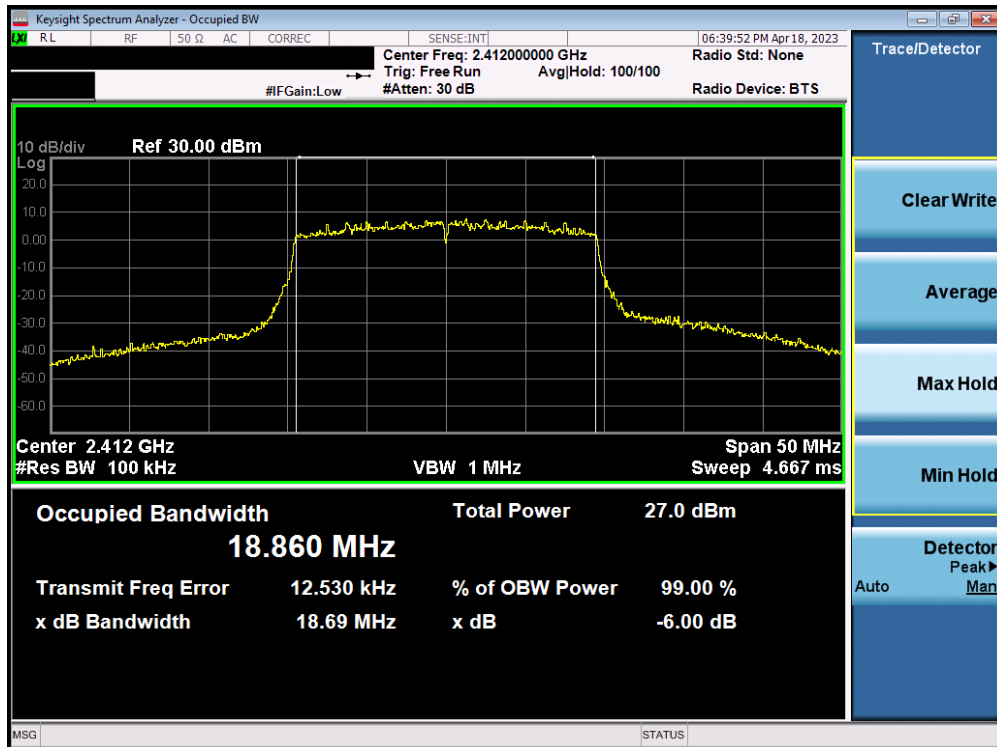


Plot 7-47. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 6) – MCS4

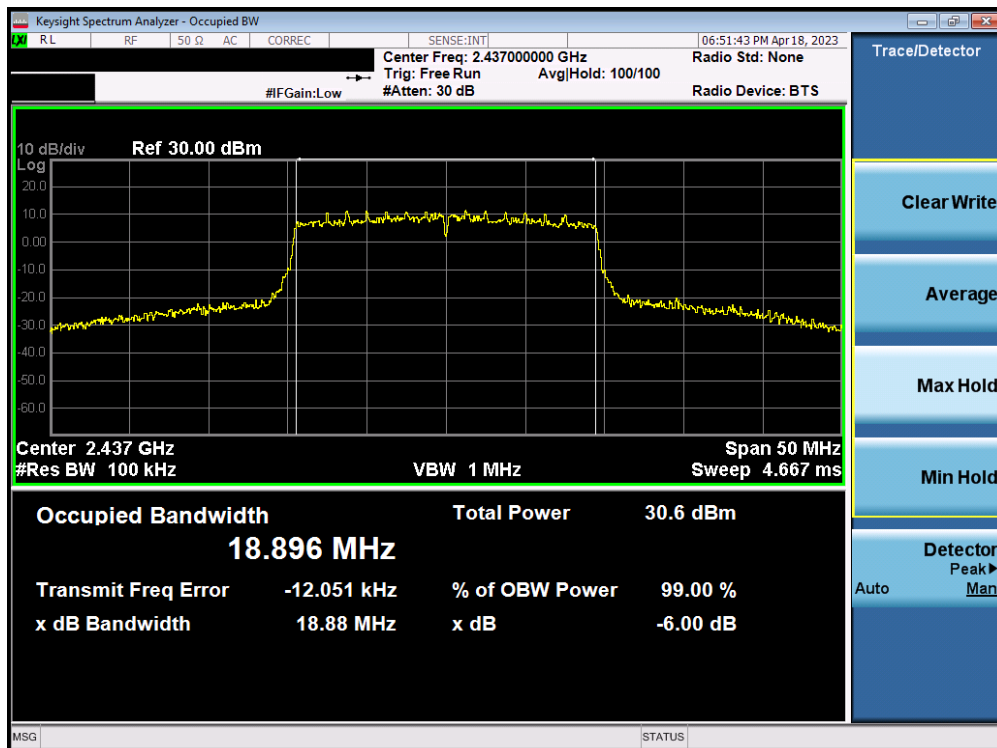


Plot 7-48. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 11) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 45 of 388

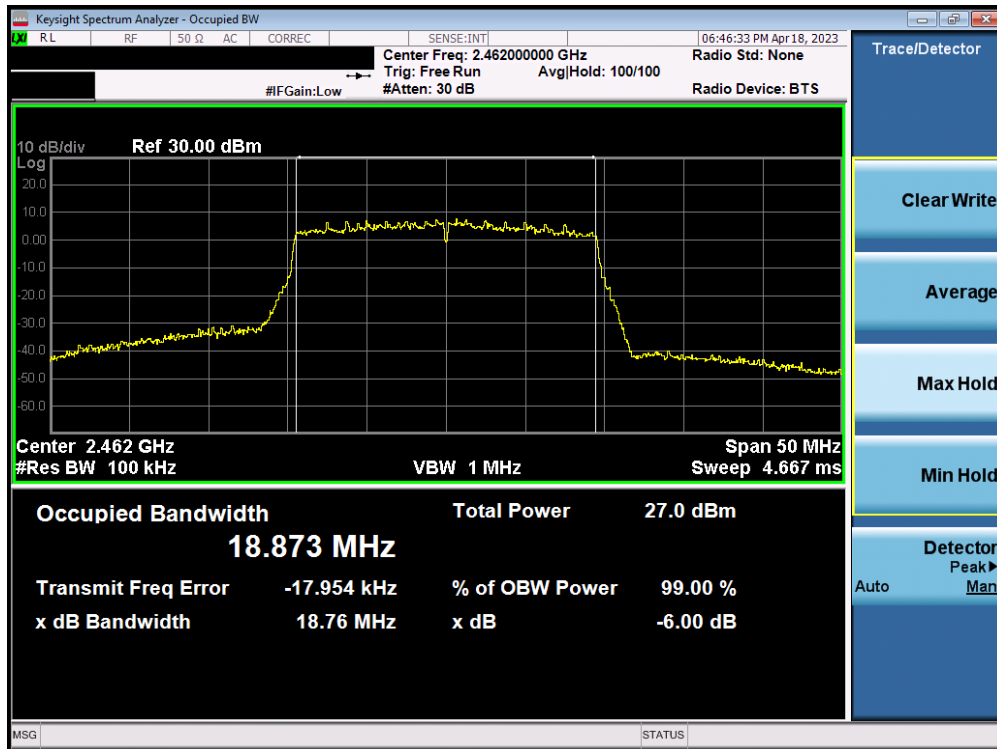


Plot 7-49. 6dB Bandwidth Plot ANT2 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS4




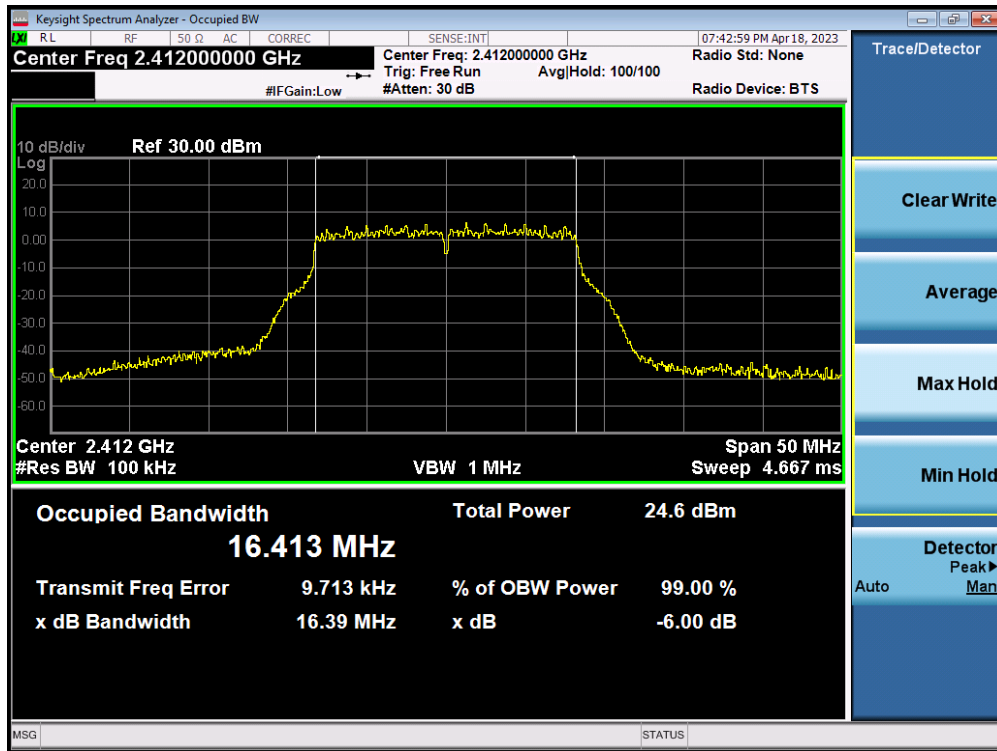
Plot 7-50. 6dB Bandwidth Plot ANT2 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 46 of 388

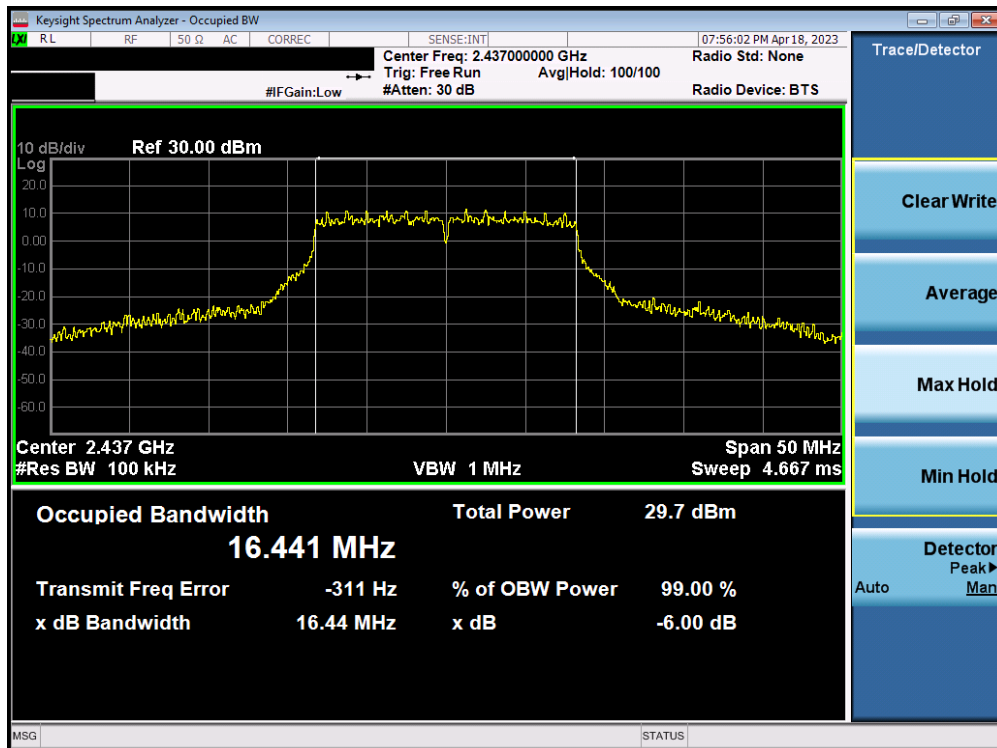


Plot 7-51. 6dB Bandwidth Plot ANT2 (802. 11ax (SU - 2.4GHz) – Ch. 11) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 47 of 388



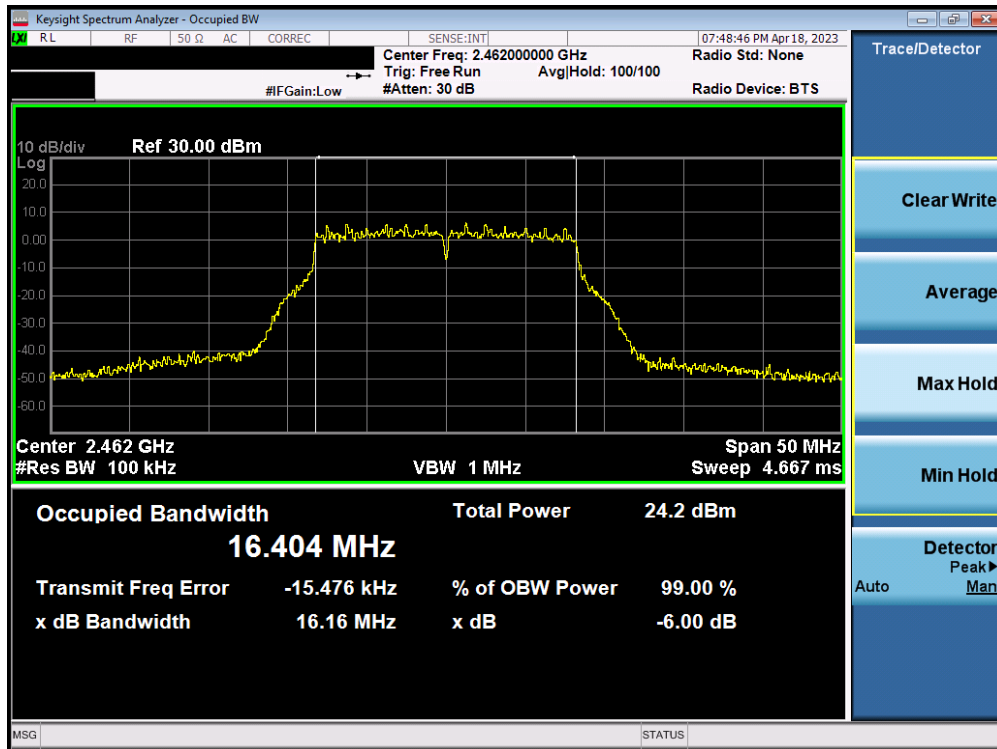
Plot 7-52. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 1) – 48Mbps



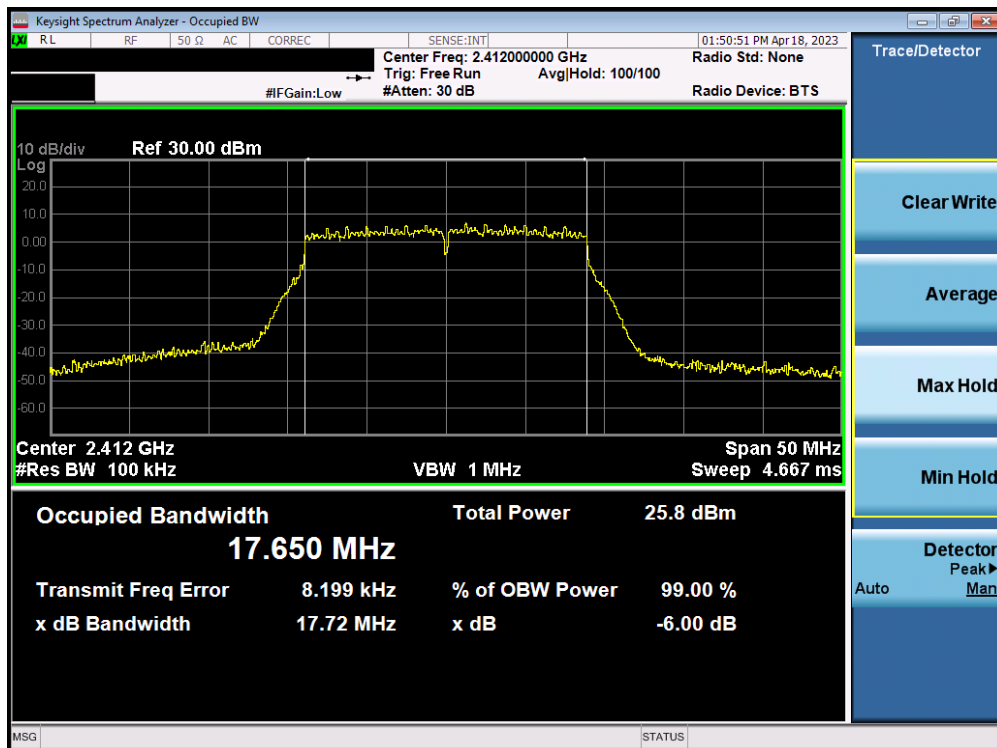
Plot 7-53. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 6) – 48Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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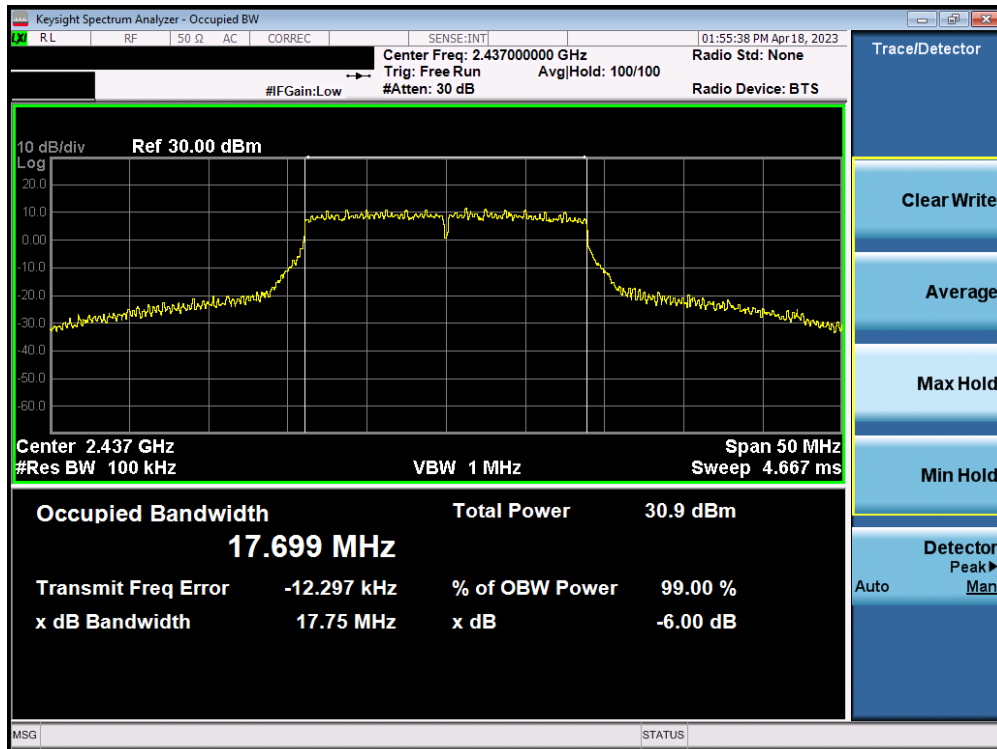


Plot 7-54. 6dB Bandwidth Plot ANT2 (802.11g – Ch. 11) – 48Mbps

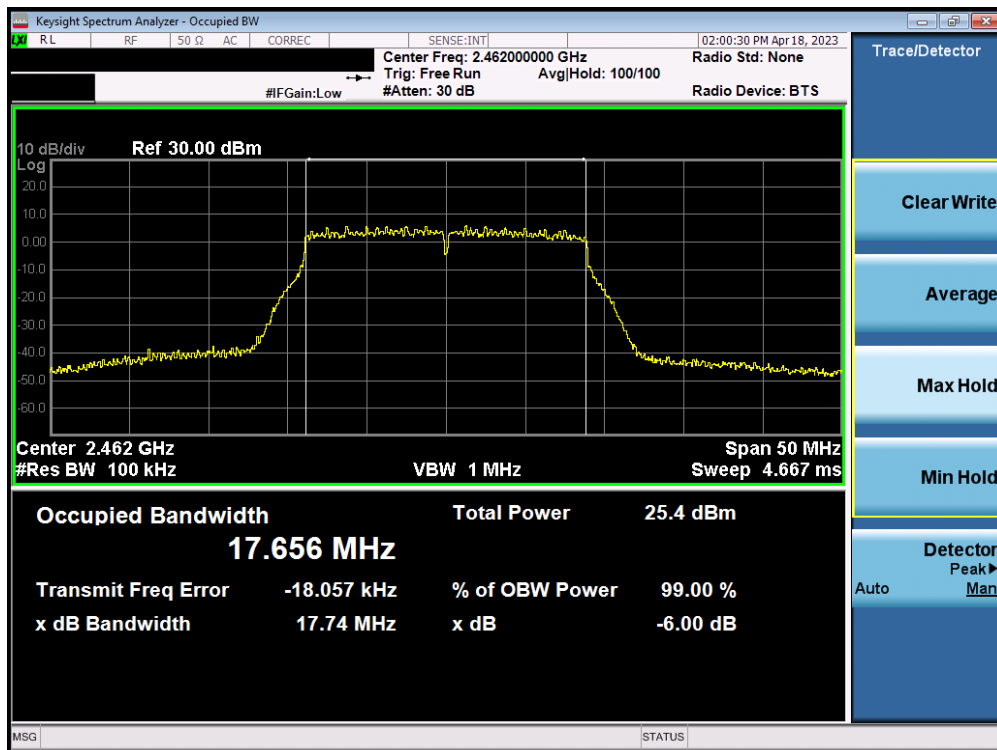


Plot 7-55. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 1) – MCS7

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 49 of 388

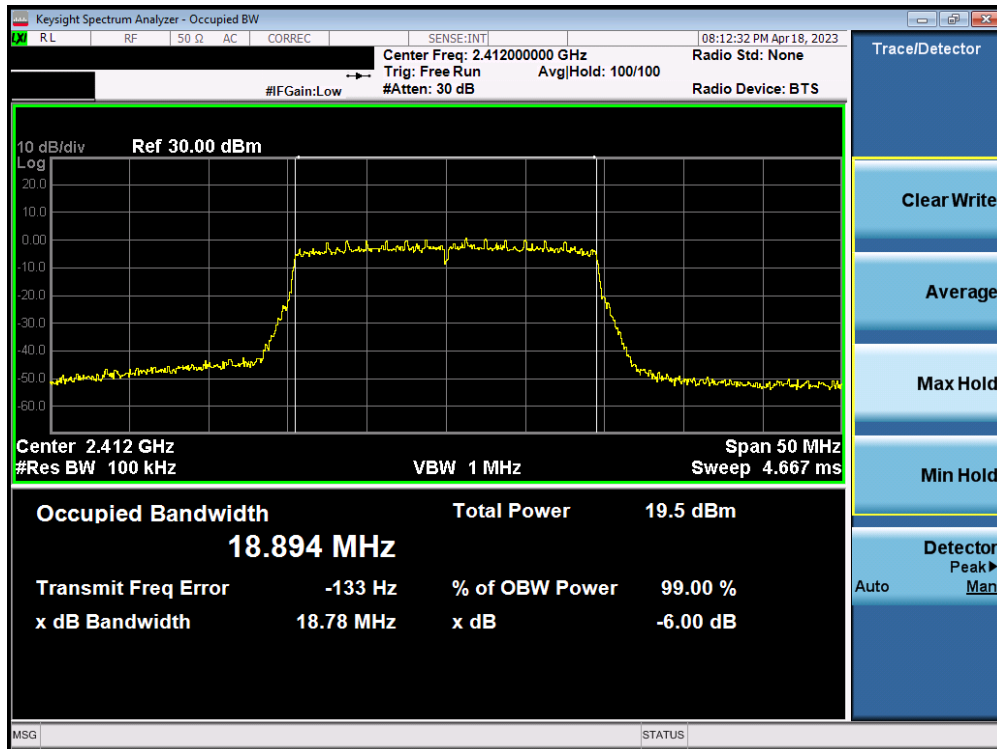


Plot 7-56. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 6) – MCS7

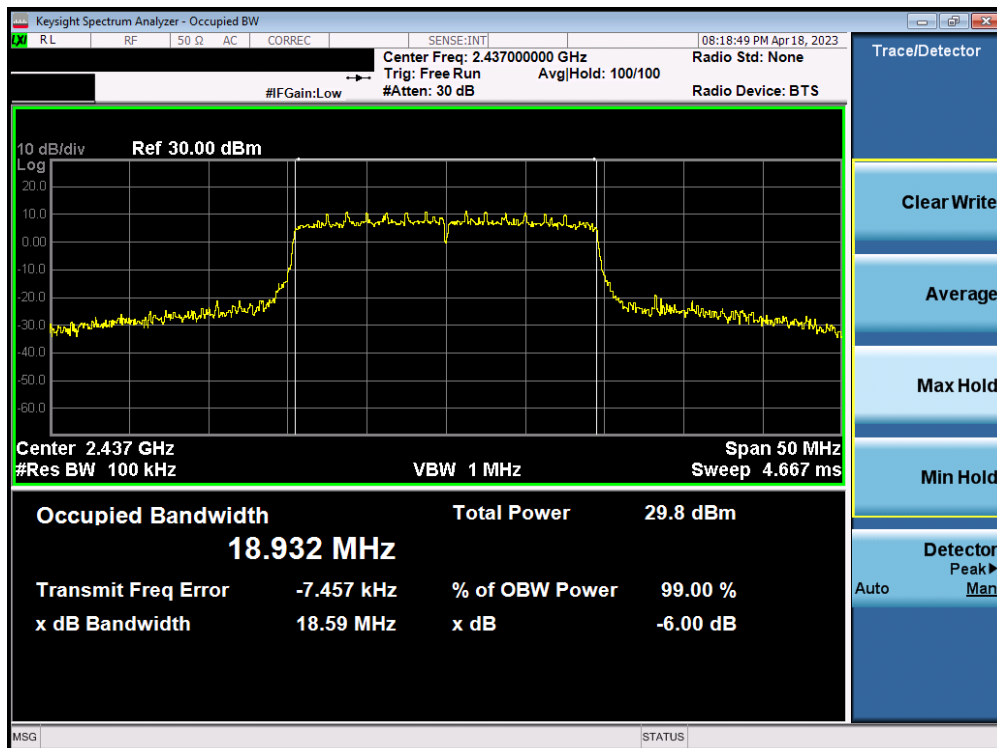


Plot 7-57. 6dB Bandwidth Plot ANT2 (802.11n (2.4GHz) – Ch. 11) – MCS7

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 50 of 388

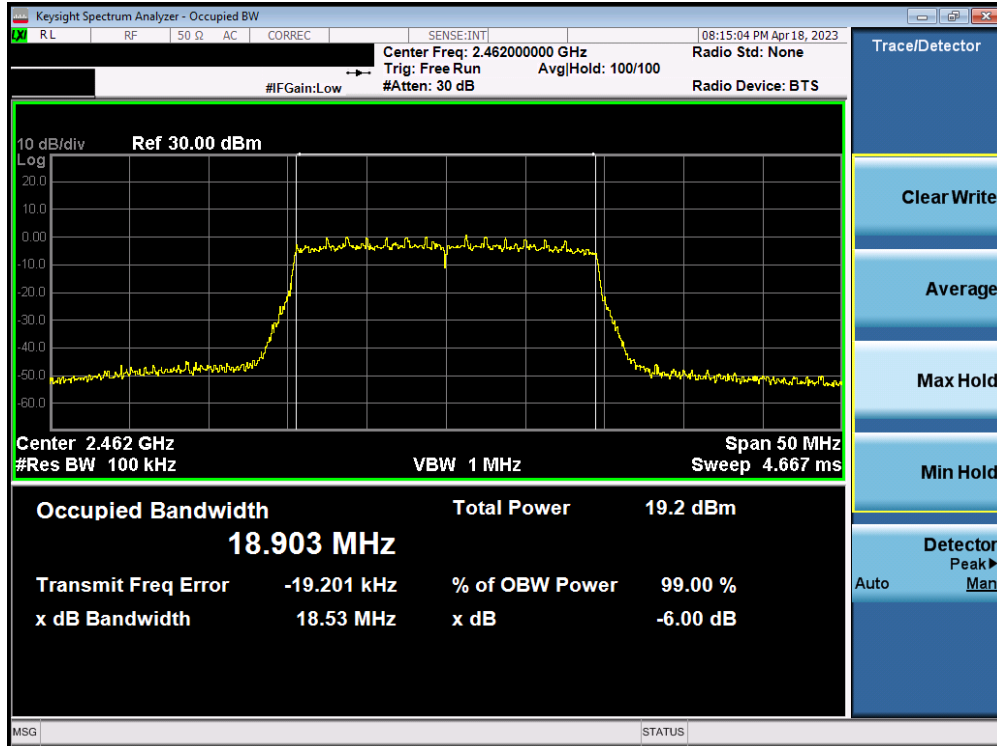


Plot 7-58. 6dB Bandwidth Plot ANT2 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS9



Plot 7-59. 6dB Bandwidth Plot ANT2 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS9

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 51 of 388



Plot 7-60. 6dB Bandwidth Plot ANT2 (802. 11ax (SU - 2.4GHz) – Ch. 11) – MCS9

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 52 of 388

### 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 C63.10-2013 – Subclause 11.9.1.3 PKPM1 Peak Power Method  
 KDB 558074 D01 v05r02 – Section 8.3.1.3 PKPM1 Peak-reading Power Meter Method  
 ANSI C63.10-2013 – 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 C63.10-2013 – Subclause 14.2 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 1Mbps.
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]

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	19.95	18.25	18.14	17.50	30.00	-10.05	1.60	21.55	36.02	-14.47
2417	2	AVG	21.30	19.18	19.22	19.17	30.00	-8.70	1.60	22.90	36.02	-13.12
2422	3	AVG	21.32	20.49	20.32	19.97	30.00	-8.68	1.60	22.92	36.02	-13.10
2427	4	AVG	21.35	21.30	21.47	21.30	30.00	-8.53	1.60	23.07	36.02	-12.95
2437	6	AVG	21.50	21.41	21.50	21.38	30.00	-8.50	1.60	23.10	36.02	-12.92
2442	7	AVG	21.37	21.44	21.33	21.42	30.00	-8.56	1.60	23.04	36.02	-12.98
2447	8	AVG	21.33	21.44	21.33	21.21	30.00	-8.56	1.60	23.04	36.02	-12.98
2452	9	AVG	21.49	20.10	20.21	19.86	30.00	-8.51	1.60	23.09	36.02	-12.93
2457	10	AVG	21.44	19.32	19.26	18.98	30.00	-8.56	1.60	23.04	36.02	-12.98
2462	11	AVG	21.38	18.04	18.19	17.52	30.00	-8.62	1.60	22.98	36.02	-13.04
2467	12	AVG	19.92	15.75	15.64	15.34	30.00	-10.08	1.60	21.52	36.02	-14.50
2472	13	AVG	18.14	11.97	11.87	-	30.00	-11.86	1.60	19.74	36.02	-16.28

**Table 7-8. Average Conducted Output Power Measurements ANT1 – 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]
			802.11b	802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	19.88	18.08	18.24	17.45	30.00	-10.12	-1.00	18.88	36.02	-17.14
2417	2	AVG	21.35	19.17	19.24	18.98	30.00	-8.65	-1.00	20.35	36.02	-15.67
2422	3	AVG	21.44	20.45	20.31	19.81	30.00	-8.56	-1.00	20.44	36.02	-15.58
2427	4	AVG	21.33	21.36	21.50	21.50	30.00	-8.50	-1.00	20.50	36.02	-15.52
2437	6	AVG	21.37	21.33	21.31	21.33	30.00	-8.63	-1.00	20.37	36.02	-15.65
2442	7	AVG	21.38	21.28	21.24	21.32	30.00	-8.62	-1.00	20.38	36.02	-15.64
2447	8	AVG	21.39	21.24	21.41	21.08	30.00	-8.59	-1.00	20.41	36.02	-15.61
2452	9	AVG	21.39	20.03	20.20	19.86	30.00	-8.61	-1.00	20.39	36.02	-15.63
2457	10	AVG	21.48	19.37	19.26	19.14	30.00	-8.52	-1.00	20.48	36.02	-15.54
2462	11	AVG	21.49	18.03	18.23	17.54	30.00	-8.51	-1.00	20.49	36.02	-15.53
2467	12	AVG	19.94	15.54	15.75	15.32	30.00	-10.06	-1.00	18.94	36.02	-17.08
2472	13	AVG	18.24	11.85	12.00	-	30.00	-11.76	-1.00	17.24	36.02	-18.78

**Table 7-9. Average Conducted Output Power Measurements ANT2 – 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]
			Ant1	Ant2	Summed						
2412	1	AVG	17.86	18.00	20.94	30.00	-9.06	3.41	24.35	36.02	-11.67
2417	2	AVG	18.86	18.95	21.92	30.00	-8.08	3.41	25.33	36.02	-10.69
2422	3	AVG	19.30	19.36	22.34	30.00	-7.66	3.41	25.75	36.02	-10.27
2427	4	AVG	21.26	21.36	24.32	30.00	-5.68	3.41	27.73	36.02	-8.29
2437	6	AVG	21.37	21.43	24.41	30.00	-5.59	3.41	27.82	36.02	-8.20
2442	7	AVG	21.27	21.34	24.32	30.00	-5.68	3.41	27.73	36.02	-8.29
2447	8	AVG	21.25	21.32	24.30	30.00	-5.70	3.41	27.71	36.02	-8.31
2452	9	AVG	19.97	20.08	23.04	30.00	-6.96	3.41	26.45	36.02	-9.57
2457	10	AVG	17.45	17.31	20.39	30.00	-9.61	3.41	23.80	36.02	-12.22
2462	11	AVG	17.44	17.37	20.42	30.00	-9.58	3.41	23.83	36.02	-12.19
2467	12	AVG	15.72	15.61	18.68	30.00	-11.32	3.41	22.09	36.02	-13.93
2472	13	AVG	11.87	11.76	14.83	30.00	-15.17	3.41	18.24	36.02	-17.78

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

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	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]
			Ant1	Ant2	Summed						
2412	1	AVG	17.91	18.00	20.97	30.00	-9.03	3.41	24.38	36.02	-11.64
2417	2	AVG	18.83	18.70	21.78	30.00	-8.22	3.41	25.19	36.02	-10.83
2422	3	AVG	19.41	19.48	22.46	30.00	-7.54	3.41	25.87	36.02	-10.15
2427	4	AVG	21.47	21.50	24.50	30.00	-5.50	3.41	27.91	36.02	-8.11
2437	6	AVG	21.40	21.20	24.31	30.00	-5.69	3.41	27.72	36.02	-8.30
2442	7	AVG	21.40	21.28	24.35	30.00	-5.65	3.41	27.76	36.02	-8.26
2447	8	AVG	21.40	21.22	24.32	30.00	-5.68	3.41	27.73	36.02	-8.29
2452	9	AVG	20.21	20.05	23.14	30.00	-6.86	3.41	26.55	36.02	-9.47
2457	10	AVG	17.50	17.40	20.46	30.00	-9.54	3.41	23.87	36.02	-12.15
2462	11	AVG	17.35	17.45	20.41	30.00	-9.59	3.41	23.82	36.02	-12.20
2467	12	AVG	15.57	15.50	18.55	30.00	-11.45	3.41	21.96	36.02	-14.06
2472	13	AVG	11.76	11.86	14.82	30.00	-15.18	3.41	18.23	36.02	-17.79


**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]
			Ant1	Ant2	Summed						
2412	1	AVG	16.95	16.98	19.98	30.00	-10.02	3.41	23.39	36.02	-12.63
2417	2	AVG	18.24	18.24	21.25	30.00	-8.75	3.41	24.66	36.02	-11.36
2422	3	AVG	19.01	19.13	22.08	30.00	-7.92	3.41	25.49	36.02	-10.53
2427	4	AVG	21.25	21.25	24.26	30.00	-5.74	3.41	27.67	36.02	-8.35
2437	6	AVG	21.47	21.30	24.40	30.00	-5.60	3.41	27.81	36.02	-8.21
2442	7	AVG	21.34	21.25	24.31	30.00	-5.69	3.41	27.72	36.02	-8.30
2447	8	AVG	21.09	21.01	24.06	30.00	-5.94	3.41	27.47	36.02	-8.55
2452	9	AVG	19.76	19.91	22.85	30.00	-7.15	3.41	26.26	36.02	-9.76
2457	10	AVG	19.25	19.25	22.26	30.00	-7.74	3.41	25.67	36.02	-10.35
2462	11	AVG	17.72	17.64	20.69	30.00	-9.31	3.41	24.10	36.02	-11.92
2467	12	AVG	15.46	15.22	18.35	30.00	-11.65	3.41	21.76	36.02	-14.26

**Table 7-12. Average Conducted Output Power Measurements CDD (802.11ax - SU) – 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	17.45	17.38	17.42	30.00	-10.01	1.60	21.59	36.02	-14.43
2417	2	AVG	18.58	18.75	18.55	30.00	-8.63	1.60	22.97	36.02	-13.05
2422	3	AVG	19.82	19.95	19.70	30.00	-8.79	1.60	22.81	36.02	-13.21
2427	4	AVG	21.49	21.50	21.15	30.00	-8.50	1.60	23.10	36.02	-12.92
2432	5	AVG	21.50	21.41	21.39	30.00	-8.50	1.60	23.10	36.02	-12.92
2437	6	AVG	21.50	21.44	21.42	30.00	-8.50	1.60	23.10	36.02	-12.92
2442	7	AVG	21.40	21.32	21.43	30.00	-8.57	1.60	23.03	36.02	-12.99
2447	8	AVG	21.23	21.16	20.58	30.00	-8.64	1.60	22.96	36.02	-13.06
2452	9	AVG	19.37	19.42	19.34	30.00	-8.55	1.60	23.05	36.02	-12.97
2457	10	AVG	18.85	18.78	18.36	30.00	-8.76	1.60	22.84	36.02	-13.18
2462	11	AVG	17.60	17.75	17.50	30.00	-8.86	1.60	22.74	36.02	-13.28
2467	12	AVG	15.33	15.50	15.21	30.00	-10.00	1.60	21.60	36.02	-14.42
2472	13	AVG	11.93	11.91	-	30.00	-11.80	1.60	19.80	36.02	-16.22

**Table 7-13. Average Conducted Output Power Measurements ANT1 – Mid Data Rate**

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Approved by:</b> Technical Manager
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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	17.32	17.25	17.25	30.00	-10.18	-1.00	18.82	36.02	-17.20
2417	2	AVG	18.56	18.57	18.74	30.00	-8.73	-1.00	20.27	36.02	-15.75
2422	3	AVG	20.00	19.88	19.73	30.00	-8.55	-1.00	20.45	36.02	-15.57
2427	4	AVG	21.41	21.33	21.17	30.00	-8.57	-1.00	20.43	36.02	-15.59
2432	5	AVG	21.30	21.30	21.25	30.00	-8.69	-1.00	20.31	36.02	-15.71
2437	6	AVG	21.43	21.32	21.41	30.00	-8.57	-1.00	20.43	36.02	-15.59
2442	7	AVG	21.36	21.44	21.27	30.00	-8.56	-1.00	20.44	36.02	-15.58
2447	8	AVG	21.11	21.13	20.62	30.00	-8.57	-1.00	20.43	36.02	-15.59
2452	9	AVG	19.44	19.50	19.30	30.00	-8.63	-1.00	20.37	36.02	-15.65
2457	10	AVG	18.93	18.91	18.31	30.00	-8.56	-1.00	20.44	36.02	-15.58
2462	11	AVG	17.74	17.59	17.35	30.00	-8.50	-1.00	20.50	36.02	-15.52
2467	12	AVG	15.38	15.50	15.47	30.00	-10.05	-1.00	18.95	36.02	-17.07
2472	13	AVG	11.94	11.94	-	30.00	-11.98	-1.00	17.02	36.02	-19.00

**Table 7-14. Average Conducted Output Power Measurements ANT2 – 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]
			Ant1	Ant2	Summed						
2412	1	AVG	16.83	16.73	19.79	30.00	-10.21	3.41	23.20	36.02	-12.82
2417	2	AVG	18.72	18.72	21.73	30.00	-8.27	3.41	25.14	36.02	-10.88
2422	3	AVG	19.13	19.21	22.18	30.00	-7.82	3.41	25.59	36.02	-10.43
2427	4	AVG	21.48	21.48	24.49	30.00	-5.51	3.41	27.90	36.02	-8.12
2432	5	AVG	21.42	21.39	24.42	30.00	-5.58	3.41	27.83	36.02	-8.19
2437	6	AVG	21.35	21.30	24.34	30.00	-5.66	3.41	27.75	36.02	-8.27
2442	7	AVG	21.41	21.47	24.45	30.00	-5.55	3.41	27.86	36.02	-8.16
2447	8	AVG	20.95	20.99	23.98	30.00	-6.02	3.41	27.39	36.02	-8.63
2452	9	AVG	19.47	19.49	22.49	30.00	-7.51	3.41	25.90	36.02	-10.12
2457	10	AVG	17.47	17.33	20.41	30.00	-9.59	3.41	23.82	36.02	-12.20
2462	11	AVG	17.31	17.38	20.36	30.00	-9.64	3.41	23.77	36.02	-12.25
2467	12	AVG	15.35	15.25	18.31	30.00	-11.69	3.41	21.72	36.02	-14.30
2472	13	AVG	11.70	11.57	14.65	30.00	-15.35	3.41	18.06	36.02	-17.96

**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]
			Ant1	Ant2	Summed						
2412	1	AVG	16.63	16.92	19.79	30.00	-10.21	3.41	23.20	36.02	-12.82
2417	2	AVG	18.74	18.74	21.75	30.00	-8.25	3.41	25.16	36.02	-10.86
2422	3	AVG	19.09	19.00	22.06	30.00	-7.94	3.41	25.47	36.02	-10.55
2427	4	AVG	21.15	21.31	24.24	30.00	-5.76	3.41	27.65	36.02	-8.37
2432	5	AVG	21.42	21.48	24.46	30.00	-5.54	3.41	27.87	36.02	-8.15
2437	6	AVG	21.48	21.35	24.43	30.00	-5.57	3.41	27.84	36.02	-8.18
2442	7	AVG	21.50	21.39	24.46	30.00	-5.54	3.41	27.87	36.02	-8.15
2447	8	AVG	21.00	20.89	23.96	30.00	-6.04	3.41	27.37	36.02	-8.65
2452	9	AVG	19.14	19.38	22.27	30.00	-7.73	3.41	25.68	36.02	-10.34
2457	10	AVG	17.25	17.31	20.29	30.00	-9.71	3.41	23.70	36.02	-12.32
2462	11	AVG	17.26	17.41	20.35	30.00	-9.65	3.41	23.76	36.02	-12.26
2467	12	AVG	15.32	15.39	18.37	30.00	-11.63	3.41	21.78	36.02	-14.24
2472	13	AVG	11.73	11.72	14.74	30.00	-15.26	3.41	18.15	36.02	-17.87

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

FCC ID: BCGA2117 IC: 579C-A2117	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 56 of 388

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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]
			Ant1	Ant2	Summed						
2412	1	AVG	16.31	16.50	19.42	30.00	-10.58	3.41	22.83	36.02	-13.19
2417	2	AVG	18.08	18.12	21.11	30.00	-8.89	3.41	24.52	36.02	-11.50
2422	3	AVG	18.72	18.68	21.71	30.00	-8.29	3.41	25.12	36.02	-10.90
2427	4	AVG	20.96	21.15	24.07	30.00	-5.93	3.41	27.48	36.02	-8.54
2432	5	AVG	21.49	21.32	24.42	30.00	-5.58	3.41	27.83	36.02	-8.19
2437	6	AVG	21.50	21.39	24.46	30.00	-5.54	3.41	27.87	36.02	-8.15
2442	7	AVG	21.35	21.33	24.35	30.00	-5.65	3.41	27.76	36.02	-8.26
2447	8	AVG	20.74	20.51	23.64	30.00	-6.36	3.41	27.05	36.02	-8.97
2452	9	AVG	19.37	19.40	22.40	30.00	-7.60	3.41	25.81	36.02	-10.21
2457	10	AVG	18.23	18.23	21.24	30.00	-8.76	3.41	24.65	36.02	-11.37
2462	11	AVG	17.09	17.31	20.21	30.00	-9.79	3.41	23.62	36.02	-12.40
2467	12	AVG	15.28	15.11	18.21	30.00	-11.79	3.41	21.62	36.02	-14.40

**Table 7-17. Average Conducted Output Power Measurements CDD (802.11ax - SU) – 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	16.47	16.22	16.25	30.00	-13.53	1.60	18.07	36.02	-17.95
2417	2	AVG	18.12	18.14	17.66	30.00	-11.86	1.60	19.74	36.02	-16.28
2422	3	AVG	19.18	19.24	18.84	30.00	-10.76	1.60	20.84	36.02	-15.18
2427	4	AVG	21.00	20.80	19.99	30.00	-9.00	1.60	22.60	36.02	-13.42
2432	5	AVG	21.46	21.35	21.29	30.00	-8.54	1.60	23.06	36.02	-12.96
2437	6	AVG	21.21	21.40	21.50	30.00	-8.50	1.60	23.10	36.02	-12.92
2442	7	AVG	21.30	21.46	21.12	30.00	-8.54	1.60	23.06	36.02	-12.96
2447	8	AVG	20.84	20.81	20.23	30.00	-9.16	1.60	22.44	36.02	-13.58
2452	9	AVG	18.96	18.84	18.83	30.00	-11.04	1.60	20.56	36.02	-15.46
2457	10	AVG	17.24	16.97	17.08	30.00	-12.76	1.60	18.84	36.02	-17.18
2462	11	AVG	16.18	16.20	15.96	30.00	-13.80	1.60	17.80	36.02	-18.22
2467	12	AVG	14.86	14.81	14.87	30.00	-15.13	1.60	16.47	36.02	-19.55
2472	13	AVG	11.91	11.98	-	30.00	-18.02	1.60	13.58	36.02	-22.44

**Table 7-18. Average Conducted Output Power Measurements ANT1 – 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]
			802.11g	802.11n	802.11ax (SU)						
2412	1	AVG	16.40	16.39	16.16	30.00	-13.60	-1.00	15.40	36.02	-20.62
2417	2	AVG	18.14	18.06	17.62	30.00	-11.86	-1.00	17.14	36.02	-18.88
2422	3	AVG	19.23	19.18	18.79	30.00	-10.77	-1.00	18.23	36.02	-17.79
2427	4	AVG	20.80	21.00	20.00	30.00	-9.00	-1.00	20.00	36.02	-16.02
2432	5	AVG	21.36	21.31	21.40	30.00	-8.60	-1.00	20.40	36.02	-15.62
2437	6	AVG	21.45	21.24	21.32	30.00	-8.55	-1.00	20.45	36.02	-15.57
2442	7	AVG	21.40	21.38	21.24	30.00	-8.60	-1.00	20.40	36.02	-15.62
2447	8	AVG	20.78	20.91	20.09	30.00	-9.09	-1.00	19.91	36.02	-16.11
2452	9	AVG	18.85	18.83	18.89	30.00	-11.11	-1.00	17.89	36.02	-18.13
2457	10	AVG	17.09	17.01	17.08	30.00	-12.91	-1.00	16.09	36.02	-19.93
2462	11	AVG	16.17	16.16	15.73	30.00	-13.83	-1.00	15.17	36.02	-20.85
2467	12	AVG	14.93	14.92	14.92	30.00	-15.07	-1.00	13.93	36.02	-22.09
2472	13	AVG	11.76	11.83	-	30.00	-18.17	-1.00	10.83	36.02	-25.19

**Table 7-19. Average Conducted Output Power Measurements ANT2 – High Data Rate**

FCC ID: BCGA2117 IC: 579C-A2117			MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 57 of 388	

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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]
			Ant1	Ant2	Summed						
2412	1	AVG	16.43	16.32	19.39	30.00	-10.61	3.41	22.80	36.02	-13.22
2417	2	AVG	17.91	17.90	20.92	30.00	-9.08	3.41	24.33	36.02	-11.69
2422	3	AVG	18.94	18.99	21.98	30.00	-8.02	3.41	25.39	36.02	-10.63
2427	4	AVG	19.99	20.00	23.01	30.00	-6.99	3.41	26.42	36.02	-9.60
2432	5	AVG	21.43	21.40	24.43	30.00	-5.57	3.41	27.84	36.02	-8.18
2437	6	AVG	21.33	21.29	24.32	30.00	-5.68	3.41	27.73	36.02	-8.29
2442	7	AVG	21.37	21.45	24.42	30.00	-5.58	3.41	27.83	36.02	-8.19
2447	8	AVG	20.50	20.40	23.46	30.00	-6.54	3.41	26.87	36.02	-9.15
2452	9	AVG	18.76	18.83	21.81	30.00	-8.19	3.41	25.22	36.02	-10.80
2457	10	AVG	17.23	17.11	20.18	30.00	-9.82	3.41	23.59	36.02	-12.43
2462	11	AVG	16.10	16.16	19.14	30.00	-10.86	3.41	22.55	36.02	-13.47
2467	12	AVG	14.79	14.84	17.83	30.00	-12.17	3.41	21.24	36.02	-14.78
2472	13	AVG	11.49	11.41	14.46	30.00	-15.54	3.41	17.87	36.02	-18.15

**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]
			Ant1	Ant2	Summed						
2412	1	AVG	16.37	16.39	19.39	30.00	-10.61	3.41	22.80	36.02	-13.22
2417	2	AVG	17.77	17.87	20.83	30.00	-9.17	3.41	24.24	36.02	-11.78
2422	3	AVG	18.88	18.79	21.85	30.00	-8.15	3.41	25.26	36.02	-10.76
2427	4	AVG	19.80	19.89	22.86	30.00	-7.14	3.41	26.27	36.02	-9.75
2432	5	AVG	21.43	21.45	24.45	30.00	-5.55	3.41	27.86	36.02	-8.16
2437	6	AVG	21.48	21.38	24.44	30.00	-5.56	3.41	27.85	36.02	-8.17
2442	7	AVG	21.50	21.47	24.50	30.00	-5.50	3.41	27.91	36.02	-8.11
2447	8	AVG	20.41	20.27	23.35	30.00	-6.65	3.41	26.76	36.02	-9.26
2452	9	AVG	18.92	18.89	21.92	30.00	-8.08	3.41	25.33	36.02	-10.69
2457	10	AVG	17.03	17.15	20.10	30.00	-9.90	3.41	23.51	36.02	-12.51
2462	11	AVG	16.03	16.23	19.14	30.00	-10.86	3.41	22.55	36.02	-13.47
2467	12	AVG	14.93	14.72	17.84	30.00	-12.16	3.41	21.25	36.02	-14.77
2472	13	AVG	11.43	11.20	14.33	30.00	-15.67	3.41	17.74	36.02	-18.28

**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]
			Ant1	Ant2	Summed						
2412	1	AVG	15.91	15.87	18.90	30.00	-11.10	3.41	22.31	36.02	-13.71
2417	2	AVG	17.56	17.73	20.66	30.00	-9.34	3.41	24.07	36.02	-11.95
2422	3	AVG	18.99	18.85	21.93	30.00	-8.07	3.41	25.34	36.02	-10.68
2427	4	AVG	19.96	19.85	22.92	30.00	-7.08	3.41	26.33	36.02	-9.69
2432	5	AVG	21.39	21.44	24.43	30.00	-5.57	3.41	27.84	36.02	-8.18
2437	6	AVG	21.48	21.40	24.45	30.00	-5.55	3.41	27.86	36.02	-8.16
2442	7	AVG	21.24	21.25	24.26	30.00	-5.74	3.41	27.67	36.02	-8.35
2447	8	AVG	20.11	20.06	23.10	30.00	-6.90	3.41	26.51	36.02	-9.51
2452	9	AVG	18.76	18.72	21.75	30.00	-8.25	3.41	25.16	36.02	-10.86
2457	10	AVG	17.15	17.18	20.18	30.00	-9.82	3.41	23.59	36.02	-12.43
2462	11	AVG	15.96	15.89	18.94	30.00	-11.06	3.41	22.35	36.02	-13.67
2467	12	AVG	14.97	14.53	17.77	30.00	-12.23	3.41	21.18	36.02	-14.84

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

FCC ID: BCGA2117 IC: 579C-A2117	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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### 7.3.2 Peak Output Power Measurement §15.247(b.3); RSS-247 [5.4]

#### 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]
			802.11b	802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	22.64	22.68	22.61	21.59	30.00	-7.32	1.60	24.28	36.02	-11.74
2417	2	PEAK	23.98	23.39	23.53	23.39	30.00	-6.02	1.60	25.58	36.02	-10.44
2422	3	PEAK	24.01	24.73	24.64	24.16	30.00	-5.27	1.60	26.33	36.02	-9.69
2427	4	PEAK	24.04	25.84	25.30	25.50	30.00	-4.16	1.60	27.44	36.02	-8.58
2432	5	PEAK	24.03	25.76	25.40	25.59	30.00	-4.24	1.60	27.36	36.02	-8.66
2437	6	PEAK	24.17	25.86	25.45	25.60	30.00	-4.14	1.60	27.46	36.02	-8.56
2442	7	PEAK	24.11	25.72	25.42	25.61	30.00	-4.28	1.60	27.32	36.02	-8.70
2447	8	PEAK	24.05	25.75	25.39	25.57	30.00	-4.25	1.60	27.35	36.02	-8.67
2452	9	PEAK	24.17	24.29	24.56	24.07	30.00	-5.44	1.60	26.16	36.02	-9.86
2457	10	PEAK	24.11	23.56	23.54	23.15	30.00	-5.89	1.60	25.71	36.02	-10.31
2462	11	PEAK	24.05	22.21	22.55	21.71	30.00	-5.95	1.60	25.65	36.02	-10.37
2467	12	PEAK	22.62	20.00	19.98	19.68	30.00	-7.38	1.60	24.22	36.02	-11.80
2472	13	PEAK	20.83	18.75	18.68	-	30.00	-9.17	1.60	22.43	36.02	-13.59

Table 7-23. Peak Conducted Output Power Measurements ANT1 – 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]
			802.11b	802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	22.60	22.42	22.71	21.49	30.00	-7.29	-1.00	21.71	36.02	-14.31
2417	2	PEAK	24.03	23.42	23.59	23.27	30.00	-5.97	-1.00	23.03	36.02	-12.99
2422	3	PEAK	24.12	24.66	24.62	24.10	30.00	-5.34	-1.00	23.66	36.02	-12.36
2427	4	PEAK	24.01	26.30	25.39	25.50	30.00	-3.70	-1.00	25.30	36.02	-10.72
2432	5	PEAK	24.12	26.34	25.45	25.53	30.00	-3.66	-1.00	25.34	36.02	-10.68
2437	6	PEAK	24.08	26.15	25.58	25.68	30.00	-3.85	-1.00	25.15	36.02	-10.87
2442	7	PEAK	24.06	26.02	25.68	25.69	30.00	-3.98	-1.00	25.02	36.02	-11.00
2447	8	PEAK	24.08	25.82	25.63	25.51	30.00	-4.18	-1.00	24.82	36.02	-11.20
2452	9	PEAK	24.13	24.29	24.61	24.12	30.00	-5.39	-1.00	23.61	36.02	-12.41
2457	10	PEAK	24.18	23.71	23.72	23.40	30.00	-5.82	-1.00	23.18	36.02	-12.84
2462	11	PEAK	24.19	22.24	22.66	21.78	30.00	-5.81	-1.00	23.19	36.02	-12.83
2467	12	PEAK	22.65	19.77	20.31	19.61	30.00	-7.35	-1.00	21.65	36.02	-14.37
2472	13	PEAK	20.93	18.62	18.85	-	30.00	-9.07	-1.00	19.93	36.02	-16.09

Table 7-24. Peak Conducted Output Power Measurements ANT2 – 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]
			Ant1	Ant2	Summed						
2412	1	PEAK	22.31	22.42	25.38	30.00	-4.62	3.41	28.79	36.02	-7.23
2417	2	PEAK	23.14	23.27	26.22	30.00	-3.78	3.41	29.63	36.02	-6.39
2422	3	PEAK	23.57	23.67	26.63	30.00	-3.37	3.41	30.04	36.02	-5.98
2427	4	PEAK	25.53	26.28	28.93	30.00	-1.07	3.41	32.34	36.02	-3.68
2432	5	PEAK	25.49	26.29	28.92	30.00	-1.08	3.41	32.33	36.02	-3.69
2437	6	PEAK	25.76	26.04	28.91	30.00	-1.09	3.41	32.32	36.02	-3.70
2442	7	PEAK	25.68	25.94	28.82	30.00	-1.18	3.41	32.23	36.02	-3.79
2447	8	PEAK	25.78	25.93	28.87	30.00	-1.13	3.41	32.28	36.02	-3.74
2452	9	PEAK	24.25	24.42	27.35	30.00	-2.65	3.41	30.76	36.02	-5.26
2457	10	PEAK	21.69	21.60	24.66	30.00	-5.34	3.41	28.07	36.02	-7.95
2462	11	PEAK	21.70	21.75	24.74	30.00	-5.26	3.41	28.15	36.02	-7.87
2467	12	PEAK	20.06	19.94	23.01	30.00	-6.99	3.41	26.42	36.02	-9.60
2472	13	PEAK	18.68	18.65	21.68	30.00	-8.32	3.41	25.09	36.02	-10.93

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

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 59 of 388



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]
			Ant1	Ant2	Summed						
2412	1	PEAK	22.40	22.50	25.46	30.00	-4.54	3.41	28.87	36.02	-7.15
2417	2	PEAK	23.29	23.10	26.21	30.00	-3.79	3.41	29.62	36.02	-6.40
2422	3	PEAK	23.77	23.90	26.85	30.00	-3.15	3.41	30.26	36.02	-5.76
2427	4	PEAK	25.37	25.33	28.36	30.00	-1.64	3.41	31.77	36.02	-4.25
2432	5	PEAK	25.41	25.39	28.41	30.00	-1.59	3.41	31.82	36.02	-4.20
2437	6	PEAK	25.55	25.49	28.53	30.00	-1.47	3.41	31.94	36.02	-4.08
2442	7	PEAK	25.62	25.67	28.66	30.00	-1.34	3.41	32.07	36.02	-3.95
2447	8	PEAK	25.65	25.72	28.70	30.00	-1.30	3.41	32.11	36.02	-3.91
2452	9	PEAK	24.74	24.78	27.77	30.00	-2.23	3.41	31.18	36.02	-4.84
2457	10	PEAK	17.50	21.89	23.24	30.00	-6.76	3.41	26.65	36.02	-9.37
2462	11	PEAK	21.78	21.94	24.87	30.00	-5.13	3.41	28.28	36.02	-7.74
2467	12	PEAK	20.04	19.91	22.99	30.00	-7.01	3.41	26.40	36.02	-9.62
2472	13	PEAK	18.77	18.85	21.82	30.00	-8.18	3.41	25.23	36.02	-10.79

**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]
			Ant1	Ant2	Summed						
2412	1	PEAK	21.04	21.02	24.04	30.00	-5.96	3.41	27.45	36.02	-8.57
2417	2	PEAK	22.40	22.44	25.43	30.00	-4.57	3.41	28.84	36.02	-7.18
2422	3	PEAK	23.15	23.35	26.26	30.00	-3.74	3.41	29.67	36.02	-6.35
2427	4	PEAK	25.48	25.51	28.51	30.00	-1.49	3.41	31.92	36.02	-4.10
2432	5	PEAK	25.53	25.58	28.57	30.00	-1.43	3.41	31.98	36.02	-4.04
2437	6	PEAK	25.62	25.59	28.62	30.00	-1.38	3.41	32.03	36.02	-3.99
2442	7	PEAK	25.65	25.68	28.68	30.00	-1.32	3.41	32.09	36.02	-3.93
2447	8	PEAK	25.54	25.57	28.57	30.00	-1.43	3.41	31.98	36.02	-4.04
2452	9	PEAK	23.94	24.14	27.05	30.00	-2.95	3.41	30.46	36.02	-5.56
2457	10	PEAK	23.44	23.54	26.50	30.00	-3.50	3.41	29.91	36.02	-6.11
2462	11	PEAK	21.91	21.92	24.93	30.00	-5.07	3.41	28.34	36.02	-7.68
2467	12	PEAK	19.69	19.47	22.59	30.00	-7.41	3.41	26.00	36.02	-10.02

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

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	Approved by: Technical Manager
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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	24.29	24.16	23.80	30.00	-5.71	1.60	25.89	36.02	-10.13
2417	2	PEAK	25.77	25.64	25.47	30.00	-4.23	1.60	27.37	36.02	-8.65
2422	3	PEAK	25.86	25.60	25.25	30.00	-4.14	1.60	27.46	36.02	-8.56
2427	4	PEAK	25.49	25.72	25.31	30.00	-4.28	1.60	27.32	36.02	-8.70
2432	5	PEAK	25.45	25.79	25.48	30.00	-4.21	1.60	27.39	36.02	-8.63
2437	6	PEAK	25.39	25.83	25.49	30.00	-4.17	1.60	27.43	36.02	-8.59
2442	7	PEAK	25.36	25.86	25.43	30.00	-4.14	1.60	27.46	36.02	-8.56
2447	8	PEAK	25.22	25.81	25.52	30.00	-4.19	1.60	27.41	36.02	-8.61
2452	9	PEAK	24.11	25.79	25.49	30.00	-4.21	1.60	27.39	36.02	-8.63
2457	10	PEAK	23.89	25.78	25.29	30.00	-4.22	1.60	27.38	36.02	-8.64
2462	11	PEAK	23.82	24.79	24.43	30.00	-5.21	1.60	26.39	36.02	-9.63
2467	12	PEAK	22.49	22.67	22.01	30.00	-7.27	1.60	24.33	36.02	-11.69
2472	13	PEAK	20.38	20.46	-	30.00	-9.15	1.60	22.45	36.02	-13.57

Table 7-28. Peak Conducted Output Power Measurements ANT1 – 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	24.13	24.12	23.57	30.00	-5.87	-1.00	23.13	36.02	-12.89
2417	2	PEAK	25.51	25.53	25.55	30.00	-4.45	-1.00	24.55	36.02	-11.47
2422	3	PEAK	25.84	25.10	25.57	30.00	-4.16	-1.00	24.84	36.02	-11.18
2427	4	PEAK	25.63	25.38	25.62	30.00	-4.37	-1.00	24.63	36.02	-11.39
2432	5	PEAK	25.59	25.45	25.68	30.00	-4.32	-1.00	24.68	36.02	-11.34
2437	6	PEAK	25.50	25.49	25.64	30.00	-4.36	-1.00	24.64	36.02	-11.38
2442	7	PEAK	25.61	25.46	25.54	30.00	-4.39	-1.00	24.61	36.02	-11.41
2447	8	PEAK	25.48	25.54	25.49	30.00	-4.46	-1.00	24.54	36.02	-11.48
2452	9	PEAK	25.56	25.42	25.46	30.00	-4.44	-1.00	24.56	36.02	-11.46
2457	10	PEAK	25.83	25.82	25.20	30.00	-4.17	-1.00	24.83	36.02	-11.19
2462	11	PEAK	24.85	24.75	24.40	30.00	-5.15	-1.00	23.85	36.02	-12.17
2467	12	PEAK	22.50	22.69	22.55	30.00	-7.31	-1.00	21.69	36.02	-14.33
2472	13	PEAK	20.36	20.55	-	30.00	-9.31	-1.00	19.69	36.02	-16.33

Table 7-29. Peak Conducted Output Power Measurements ANT2 – 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]
			Ant1	Ant2	Summed						
2412	1	PEAK	23.69	23.60	26.66	30.00	-3.34	3.41	30.07	36.02	-5.95
2417	2	PEAK	25.63	25.64	28.65	30.00	-1.35	3.41	32.06	36.02	-3.96
2422	3	PEAK	25.90	26.07	29.00	30.00	-1.00	3.41	32.41	36.02	-3.61
2427	4	PEAK	25.59	25.62	28.62	30.00	-1.38	3.41	32.03	36.02	-3.99
2432	5	PEAK	25.58	25.59	28.60	30.00	-1.40	3.41	32.01	36.02	-4.01
2437	6	PEAK	25.54	25.55	28.56	30.00	-1.44	3.41	31.97	36.02	-4.05
2442	7	PEAK	25.54	25.63	28.60	30.00	-1.40	3.41	32.01	36.02	-4.01
2447	8	PEAK	25.35	25.44	28.41	30.00	-1.59	3.41	31.82	36.02	-4.20
2452	9	PEAK	25.71	25.85	28.79	30.00	-1.21	3.41	32.20	36.02	-3.82
2457	10	PEAK	24.62	24.56	27.60	30.00	-2.40	3.41	31.01	36.02	-5.01
2462	11	PEAK	24.54	24.54	27.55	30.00	-2.45	3.41	30.96	36.02	-5.06
2467	12	PEAK	22.65	22.47	25.57	30.00	-4.43	3.41	28.98	36.02	-7.04
2472	13	PEAK	20.10	20.15	23.14	30.00	-6.86	3.41	26.55	36.02	-9.47

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

FCC ID: BCGA2117 IC: 579C-A2117	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 61 of 388

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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]
			Ant1	Ant2	Summed						
2412	1	PEAK	23.12	23.43	26.29	30.00	-3.71	3.41	29.70	36.02	-6.32
2417	2	PEAK	25.43	25.36	28.41	30.00	-1.59	3.41	31.82	36.02	-4.20
2422	3	PEAK	25.66	25.66	28.67	30.00	-1.33	3.41	32.08	36.02	-3.94
2427	4	PEAK	25.75	25.79	28.78	30.00	-1.22	3.41	32.19	36.02	-3.83
2432	5	PEAK	25.78	25.81	28.81	30.00	-1.19	3.41	32.22	36.02	-3.80
2437	6	PEAK	25.82	25.86	28.85	30.00	-1.15	3.41	32.26	36.02	-3.76
2442	7	PEAK	25.87	25.86	28.88	30.00	-1.12	3.41	32.29	36.02	-3.73
2447	8	PEAK	25.78	25.76	28.78	30.00	-1.22	3.41	32.19	36.02	-3.83
2452	9	PEAK	25.70	25.99	28.86	30.00	-1.14	3.41	32.27	36.02	-3.75
2457	10	PEAK	23.96	24.06	27.02	30.00	-2.98	3.41	30.43	36.02	-5.59
2462	11	PEAK	24.07	24.25	27.17	30.00	-2.83	3.41	30.58	36.02	-5.44
2467	12	PEAK	22.12	22.16	25.15	30.00	-4.85	3.41	28.56	36.02	-7.46
2472	13	PEAK	19.77	19.82	22.81	30.00	-7.19	3.41	26.22	36.02	-9.80

**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]
			Ant1	Ant2	Summed						
2412	1	PEAK	22.26	22.48	25.38	30.00	-4.62	3.41	28.79	36.02	-7.23
2417	2	PEAK	24.64	24.61	27.64	30.00	-2.36	3.41	31.05	36.02	-4.97
2422	3	PEAK	25.13	25.21	28.18	30.00	-1.82	3.41	31.59	36.02	-4.43
2427	4	PEAK	25.32	25.38	28.36	30.00	-1.64	3.41	31.77	36.02	-4.25
2432	5	PEAK	25.41	25.39	28.41	30.00	-1.59	3.41	31.82	36.02	-4.20
2437	6	PEAK	25.45	25.43	28.45	30.00	-1.55	3.41	31.86	36.02	-4.16
2442	7	PEAK	25.46	25.49	28.49	30.00	-1.51	3.41	31.90	36.02	-4.12
2447	8	PEAK	25.41	25.38	28.41	30.00	-1.59	3.41	31.82	36.02	-4.20
2452	9	PEAK	25.71	25.75	28.74	30.00	-1.26	3.41	32.15	36.02	-3.87
2457	10	PEAK	24.79	24.83	27.82	30.00	-2.18	3.41	31.23	36.02	-4.79
2462	11	PEAK	23.61	23.86	26.75	30.00	-3.25	3.41	30.16	36.02	-5.86
2467	12	PEAK	21.77	21.61	24.70	30.00	-5.30	3.41	28.11	36.02	-7.91

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

FCC ID: BCGA2117 IC: 579C-A2117	<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 62 of 388

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## 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]
			802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	25.56	25.08	25.19	30.00	-4.44	1.60	27.16	36.02	-8.86
2417	2	PEAK	26.74	25.31	25.28	30.00	-3.26	1.60	28.34	36.02	-7.68
2422	3	PEAK	25.89	25.42	25.32	30.00	-4.11	1.60	27.49	36.02	-8.53
2427	4	PEAK	25.92	25.45	25.39	30.00	-4.08	1.60	27.52	36.02	-8.50
2432	5	PEAK	25.73	25.54	25.42	30.00	-4.27	1.60	27.33	36.02	-8.69
2437	6	PEAK	25.76	25.61	25.49	30.00	-4.24	1.60	27.36	36.02	-8.66
2442	7	PEAK	25.66	25.79	25.55	30.00	-4.21	1.60	27.39	36.02	-8.63
2447	8	PEAK	25.69	25.65	25.50	30.00	-4.31	1.60	27.29	36.02	-8.73
2452	9	PEAK	25.24	25.61	25.46	30.00	-4.39	1.60	27.21	36.02	-8.81
2457	10	PEAK	26.24	25.48	25.48	30.00	-3.76	1.60	27.84	36.02	-8.18
2462	11	PEAK	25.49	25.29	24.96	30.00	-4.51	1.60	27.09	36.02	-8.93
2467	12	PEAK	24.24	23.88	23.96	30.00	-5.76	1.60	25.84	36.02	-10.18
2472	13	PEAK	20.13	21.02	-	30.00	-8.98	1.60	22.62	36.02	-13.40

**Table 7-33. Peak Conducted Output Power Measurements ANT1 – 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]
			802.11g	802.11n	802.11ax (SU)						
2412	1	PEAK	25.54	25.22	25.12	30.00	-4.46	-1.00	24.54	36.02	-11.48
2417	2	PEAK	26.84	25.31	25.38	30.00	-3.16	-1.00	25.84	36.02	-10.18
2422	3	PEAK	25.54	25.46	25.49	30.00	-4.46	-1.00	24.54	36.02	-11.48
2427	4	PEAK	25.76	25.52	25.62	30.00	-4.24	-1.00	24.76	36.02	-11.26
2432	5	PEAK	25.88	25.68	25.68	30.00	-4.12	-1.00	24.88	36.02	-11.14
2437	6	PEAK	25.91	25.69	25.73	30.00	-4.09	-1.00	24.91	36.02	-11.11
2442	7	PEAK	25.96	25.62	25.70	30.00	-4.04	-1.00	24.96	36.02	-11.06
2447	8	PEAK	25.73	25.54	25.62	30.00	-4.27	-1.00	24.73	36.02	-11.29
2452	9	PEAK	25.39	25.50	25.55	30.00	-4.45	-1.00	24.55	36.02	-11.47
2457	10	PEAK	26.14	25.49	25.42	30.00	-3.86	-1.00	25.14	36.02	-10.88
2462	11	PEAK	25.34	25.24	24.79	30.00	-4.66	-1.00	24.34	36.02	-11.68
2467	12	PEAK	24.32	23.98	24.10	30.00	-5.68	-1.00	23.32	36.02	-12.70
2472	13	PEAK	20.01	20.89	-	30.00	-9.11	-1.00	19.89	36.02	-16.13

**Table 7-34. Peak Conducted Output Power Measurements ANT2 – 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]
			Ant1	Ant2	Summed						
2412	1	PEAK	25.81	25.91	28.87	30.00	-1.13	3.41	32.28	36.02	-3.74
2417	2	PEAK	26.74	26.86	29.81	30.00	-0.19	3.41	33.22	36.02	-2.80
2422	3	PEAK	25.18	25.34	28.27	30.00	-1.73	3.41	31.68	36.02	-4.34
2427	4	PEAK	25.61	25.71	28.67	30.00	-1.33	3.41	32.08	36.02	-3.94
2432	5	PEAK	25.76	25.82	28.80	30.00	-1.20	3.41	32.21	36.02	-3.81
2437	6	PEAK	25.78	25.83	28.82	30.00	-1.18	3.41	32.23	36.02	-3.79
2442	7	PEAK	25.70	25.93	28.83	30.00	-1.17	3.41	32.24	36.02	-3.78
2447	8	PEAK	25.77	25.84	28.82	30.00	-1.18	3.41	32.23	36.02	-3.79
2452	9	PEAK	25.08	25.29	28.20	30.00	-1.80	3.41	31.61	36.02	-4.41
2457	10	PEAK	26.33	26.47	29.41	30.00	-0.59	3.41	32.82	36.02	-3.20
2462	11	PEAK	25.55	25.83	28.70	30.00	-1.30	3.41	32.11	36.02	-3.91
2467	12	PEAK	24.27	24.69	27.50	30.00	-2.50	3.41	30.91	36.02	-5.11
2472	13	PEAK	20.31	20.27	23.30	30.00	-6.70	3.41	26.71	36.02	-9.31

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

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	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]
			Ant1	Ant2	Summed						
2412	1	PEAK	25.34	25.28	28.32	30.00	-1.68	3.41	31.73	36.02	-4.29
2417	2	PEAK	25.42	25.48	28.46	30.00	-1.54	3.41	31.87	36.02	-4.15
2422	3	PEAK	25.48	25.49	28.50	30.00	-1.50	3.41	31.91	36.02	-4.11
2427	4	PEAK	25.53	25.58	28.57	30.00	-1.43	3.41	31.98	36.02	-4.04
2432	5	PEAK	25.59	25.60	28.61	30.00	-1.39	3.41	32.02	36.02	-4.00
2437	6	PEAK	25.62	25.59	28.62	30.00	-1.38	3.41	32.03	36.02	-3.99
2442	7	PEAK	25.60	25.58	28.60	30.00	-1.4	3.41	32.01	36.02	-4.01
2447	8	PEAK	25.54	25.51	28.54	30.00	-1.46	3.41	31.95	36.02	-4.07
2452	9	PEAK	25.49	25.51	28.51	30.00	-1.49	3.41	31.92	36.02	-4.10
2457	10	PEAK	25.48	25.53	28.52	30.00	-1.48	3.41	31.93	36.02	-4.09
2462	11	PEAK	25.24	25.29	28.28	30.00	-1.72	3.41	31.69	36.02	-4.33
2467	12	PEAK	24.08	23.94	27.02	30.00	-2.98	3.41	30.43	36.02	-5.59
2472	13	PEAK	20.44	20.22	23.34	30.00	-6.66	3.41	26.75	36.02	-9.27

**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]
			Ant1	Ant2	Summed						
2412	1	PEAK	24.92	24.88	27.91	30.00	-2.09	3.41	31.32	36.02	-4.70
2417	2	PEAK	25.32	25.35	28.35	30.00	-1.65	3.41	31.76	36.02	-4.26
2422	3	PEAK	25.41	25.39	28.41	30.00	-1.59	3.41	31.82	36.02	-4.20
2427	4	PEAK	25.48	25.47	28.49	30.00	-1.51	3.41	31.90	36.02	-4.12
2432	5	PEAK	25.51	25.49	28.51	30.00	-1.49	3.41	31.92	36.02	-4.10
2437	6	PEAK	25.63	25.68	28.67	30.00	-1.33	3.41	32.08	36.02	-3.94
2442	7	PEAK	25.59	25.54	28.58	30.00	-1.42	3.41	31.99	36.02	-4.03
2447	8	PEAK	25.52	25.56	28.55	30.00	-1.45	3.41	31.96	36.02	-4.06
2452	9	PEAK	25.61	25.59	28.61	30.00	-1.39	3.41	32.02	36.02	-4.00
2457	10	PEAK	25.31	25.29	28.31	30.00	-1.69	3.41	31.72	36.02	-4.30
2462	11	PEAK	25.06	24.98	28.03	30.00	-1.97	3.41	31.44	36.02	-4.58
2467	12	PEAK	24.05	23.62	26.85	30.00	-3.15	3.41	30.26	36.02	-5.76

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

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**Note:**

Per ANSI C63.10-2013 and KDB 662911 D01 v02r01 Section E)1), the conducted powers at ANT1 and ANT2 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 C63.10-2013 Subclause 14.4.3, 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.

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

**Sample CDD Calculation:**

At 2412MHz the average conducted output power was measured to be 17.91 dBm for ANT1 and 18.00 dBm for ANT2.

$$\text{ANT1} + \text{ANT2} = \text{CDD}$$


$$(17.91 \text{ dBm} + 18.00 \text{ dBm}) = (61.802 \text{ mW} + 63.096 \text{ mW}) = 125.026 \text{ mW} = 20.97 \text{ dBm}$$

**Sample e.i.r.p. Calculation:**

At 2412MHz, the average conducted output power was calculated to be 20.97 dBm with directional gain of 3.41 dBi.

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

$$20.97 \text{ dBm} + 3.41 \text{ dBi} = 24.38 \text{ dBm}$$

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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 C63.10-2013 – Subclause 11.10.2 Method PKPSD  
 KDB 558074 D01 v05r02 – Section 8.4 DTS Maximum Power Spectral Density level in the fundamental emission  
 ANSI C63.10-2013 – Subclause 14.3.2.2 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 rate 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 group is reported.

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## ANT1 Power Spectral Density Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Spectral Density [dBm / 3kHz]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	b	1	-0.52	8.00	-8.52	Pass
2437	6	b	1	3.28	8.00	-4.72	Pass
2462	11	b	1	0.85	8.00	-7.15	Pass
2412	1	g	12	-4.10	8.00	-12.10	Pass
2437	6	g	12	-1.94	8.00	-9.94	Pass
2462	11	g	12	-5.25	8.00	-13.25	Pass
2412	1	n	19.5/21.7 (MCS2)	-4.48	8.00	-12.48	Pass
2437	6	n	19.5/21.7 (MCS2)	-0.98	8.00	-8.98	Pass
2462	11	n	19.5/21.7 (MCS2)	-3.96	8.00	-11.96	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	-6.16	8.00	-14.16	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	-1.71	8.00	-9.71	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	-6.52	8.00	-14.52	Pass

**Table 7-38. Conducted Power Density Measurements ANT1 (Low Data Rate)**

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Technical Manager
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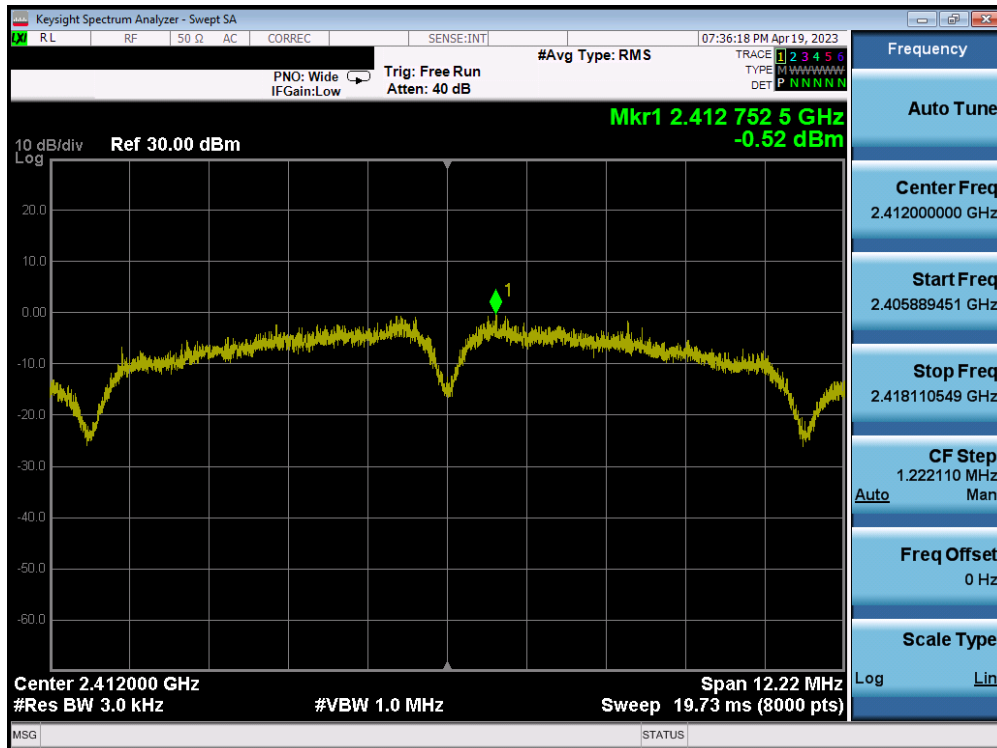
Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Spectral Density [dBm / 3kHz]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	g	24	-5.73	8.00	-13.73	Pass
2437	6	g	24	-1.45	8.00	-9.45	Pass
2462	11	g	24	-6.07	8.00	-14.07	Pass
2412	1	n	39/43.3 (MCS4)	-4.45	8.00	-12.45	Pass
2437	6	n	39/43.3 (MCS4)	-0.89	8.00	-8.89	Pass
2462	11	n	39/43.3 (MCS4)	-5.14	8.00	-13.14	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	-5.88	8.00	-13.88	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	-1.67	8.00	-9.67	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	-5.78	8.00	-13.78	Pass

**Table 7-39. Conducted Power Density Measurements ANT1 (Mid Data Rate)**

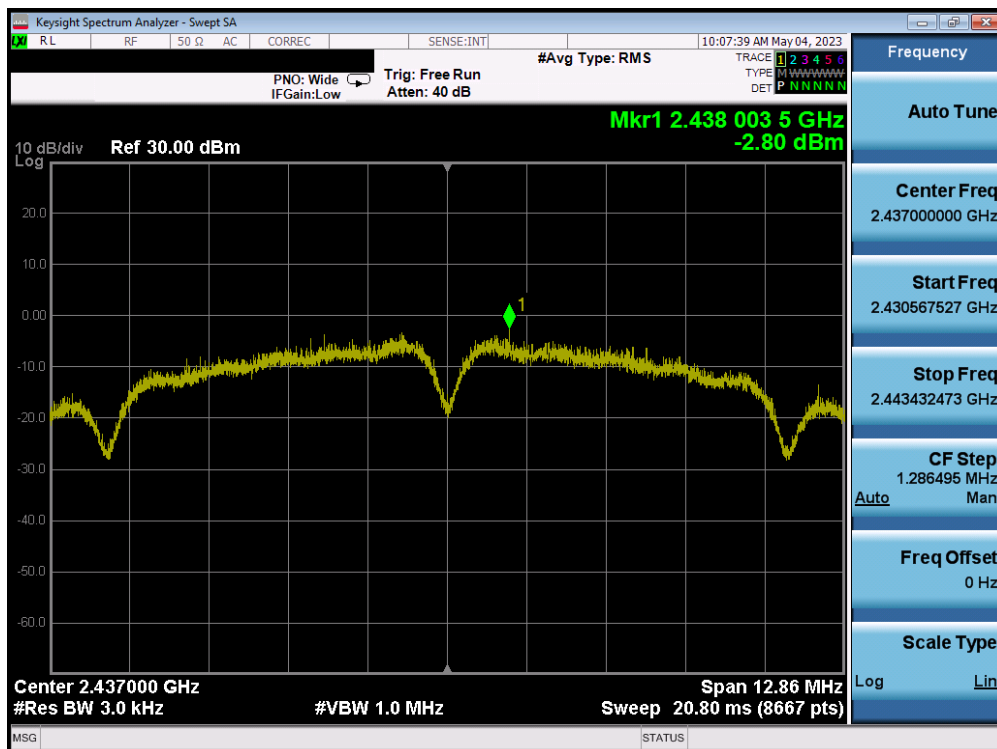
Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Spectral Density [dBm / 3kHz]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	g	48	-7.48	8.00	-15.48	Pass
2437	6	g	48	-2.85	8.00	-10.85	Pass
2462	11	g	48	-7.88	8.00	-15.88	Pass
2412	1	n	65/72.2 (MCS7)	-6.45	8.00	-14.45	Pass
2437	6	n	65/72.2 (MCS7)	-1.64	8.00	-9.64	Pass
2462	11	n	65/72.2 (MCS7)	-7.13	8.00	-15.13	Pass
2412	1	ax (SU)	108/114.7 (MCS9)	-7.12	8.00	-15.12	Pass
2437	6	ax (SU)	108/114.7 (MCS9)	-1.65	8.00	-9.65	Pass
2462	11	ax (SU)	108/114.7 (MCS9)	-7.60	8.00	-15.60	Pass

**Table 7-40. Conducted Power Density Measurements ANT1 (High Data Rate)**

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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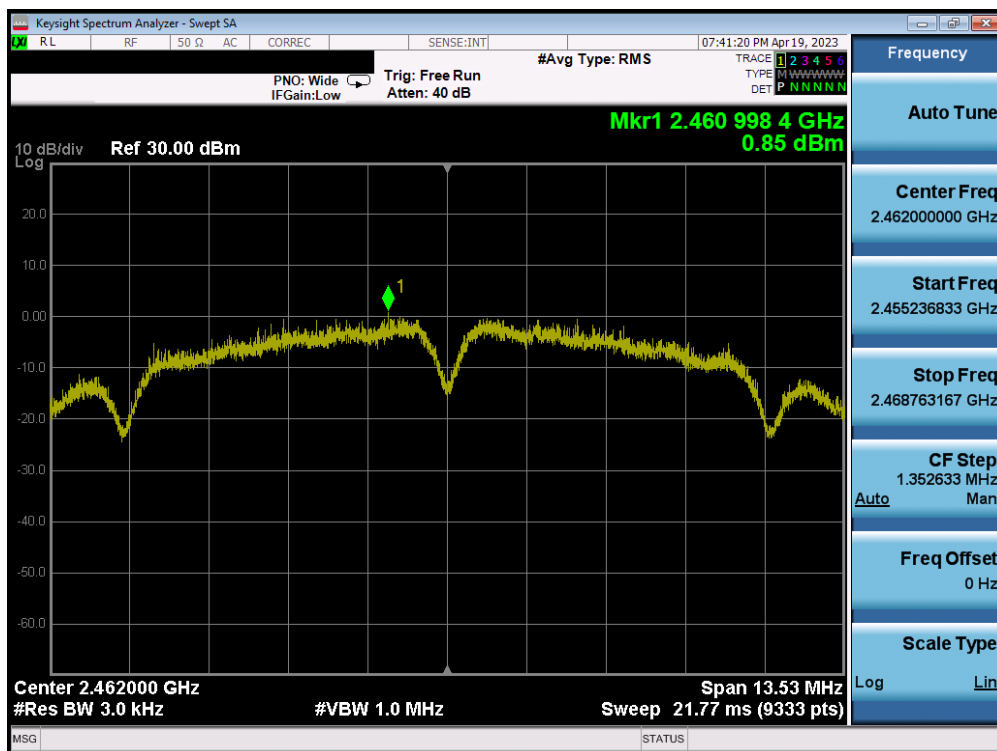


Plot 7-61. Power Spectral Density Plot ANT1 (802.11b – Ch. 1) – 1Mbps

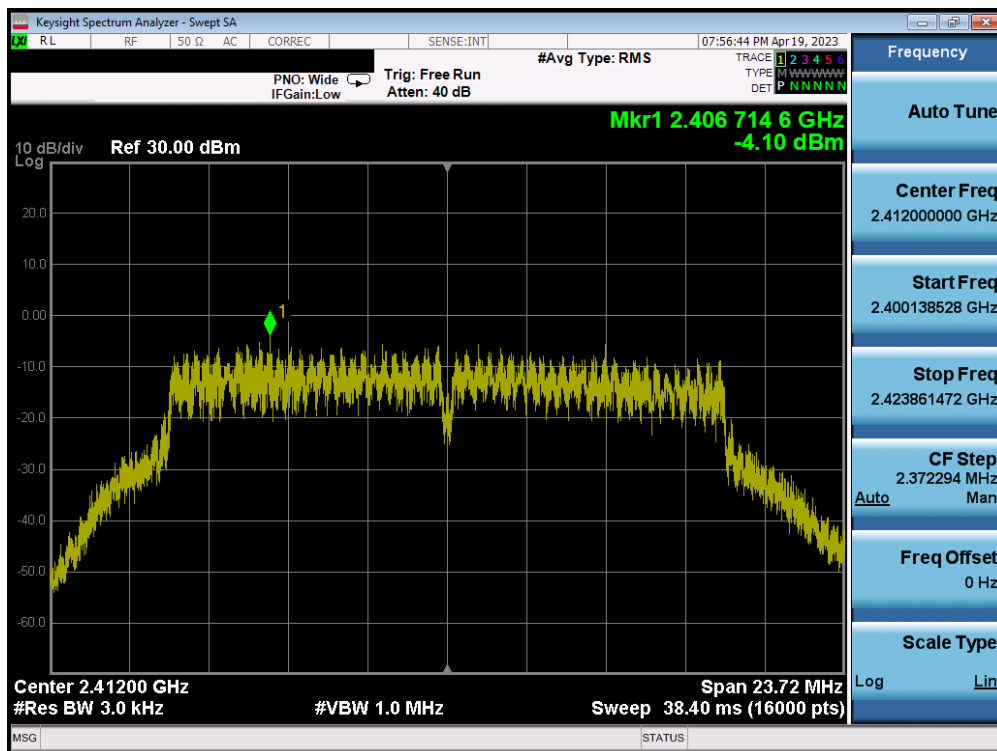


Plot 7-62. Power Spectral Density Plot ANT1 (802.11b – Ch. 6) – 1Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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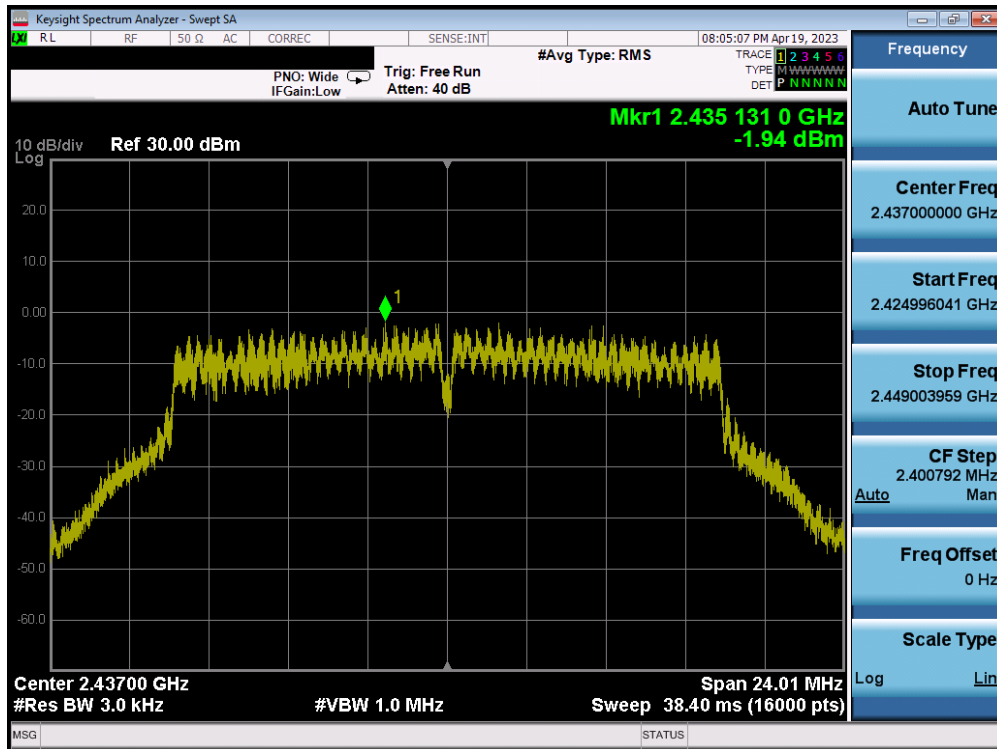


Plot 7-63. Power Spectral Density Plot ANT1 (802.11b – Ch. 11) – 1Mbps

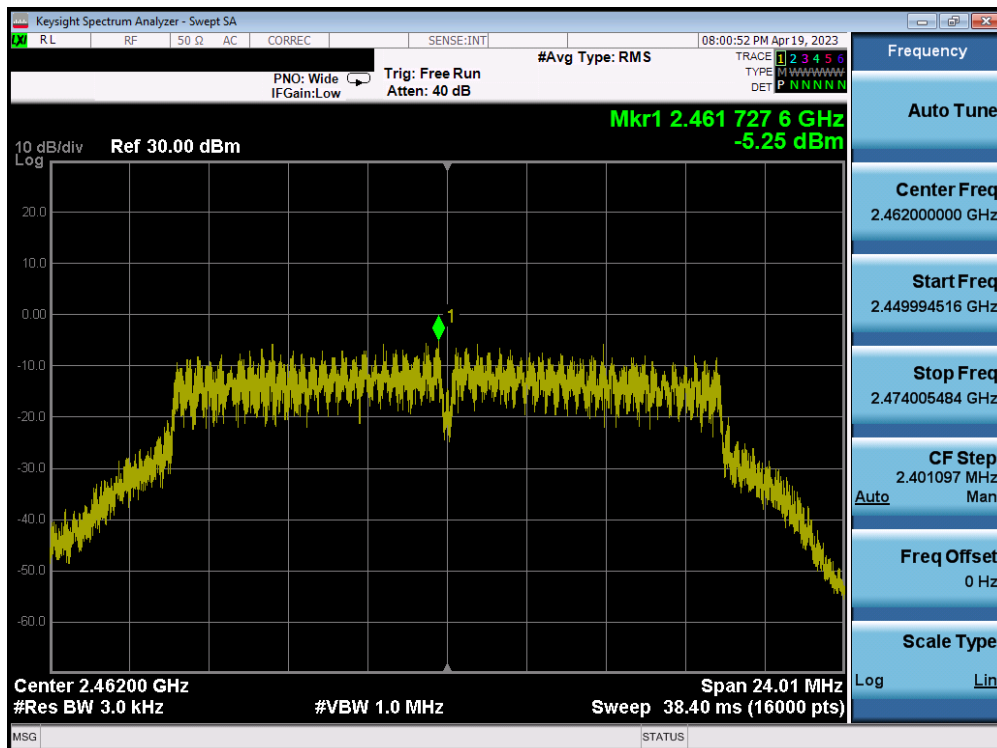


Plot 7-64. Power Spectral Density Plot ANT1 (802.11g – Ch. 1) – 12Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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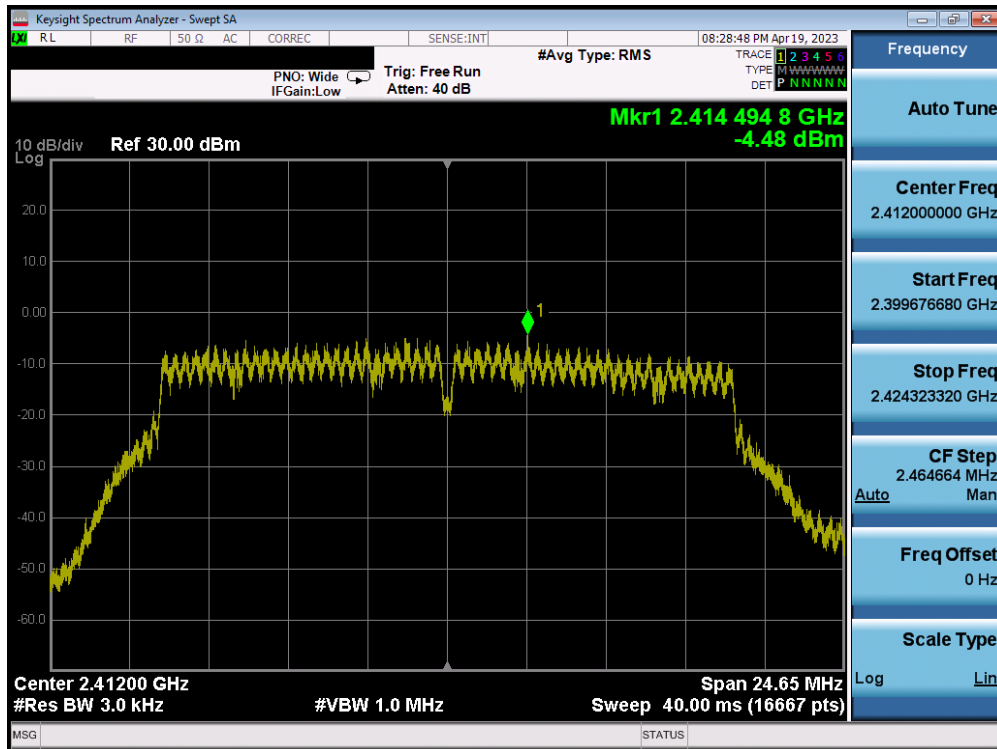


Plot 7-65. Power Spectral Density Plot ANT1 (802.11g – Ch. 6) – 12Mbps

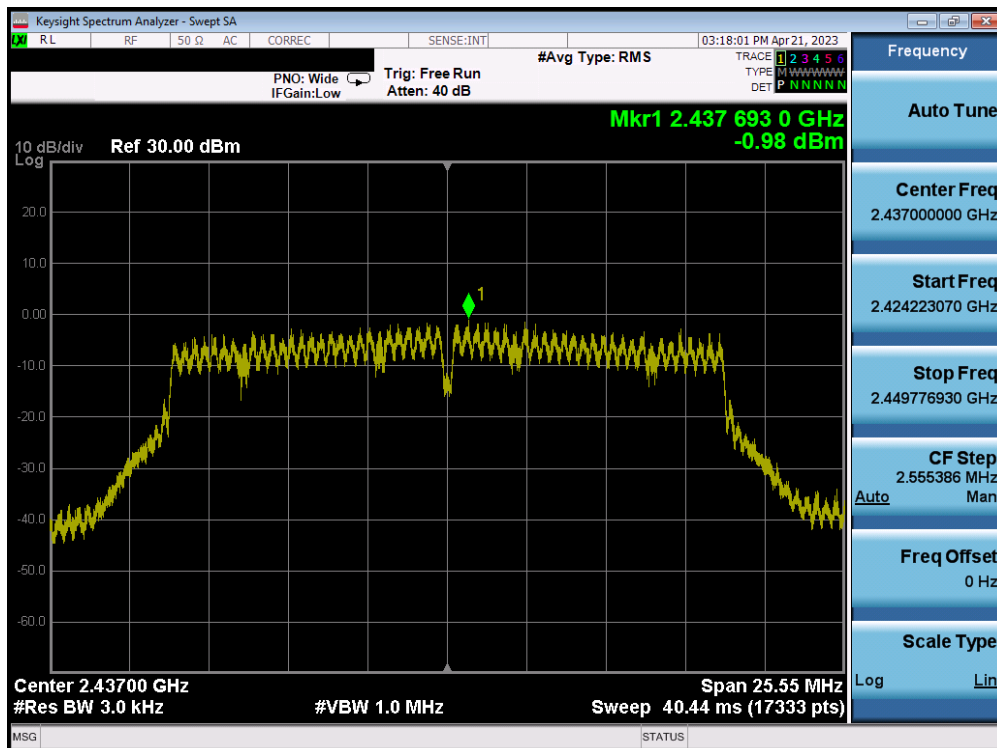


Plot 7-66. Power Spectral Density Plot ANT1 (802.11g – Ch. 11) – 12Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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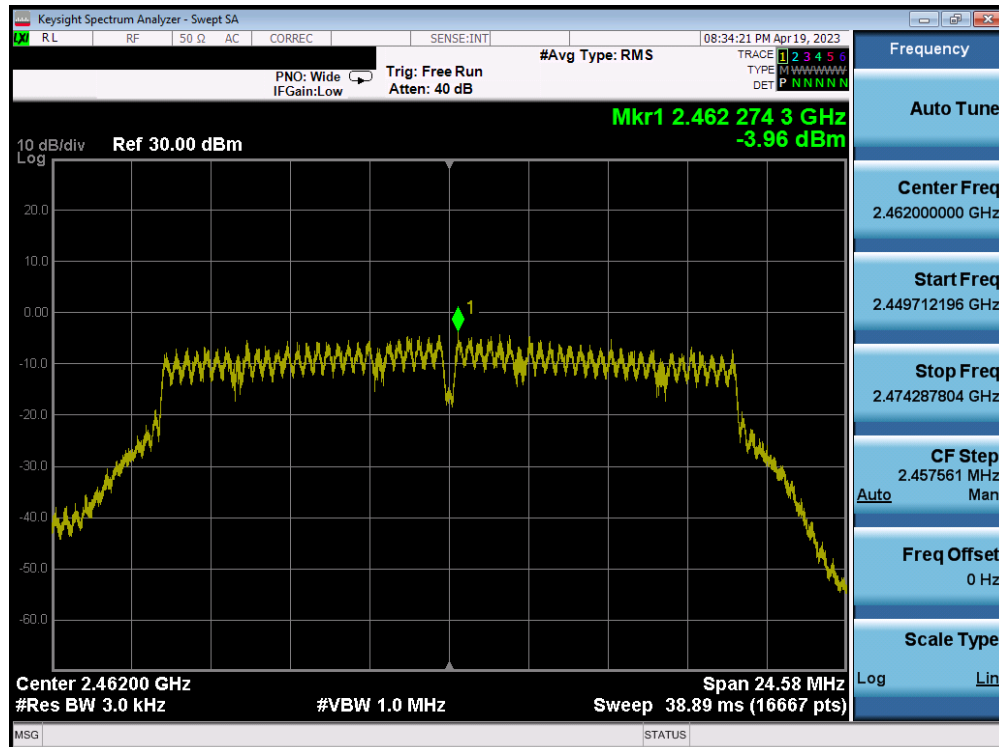
Plot 7-67. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 1) – MCS2



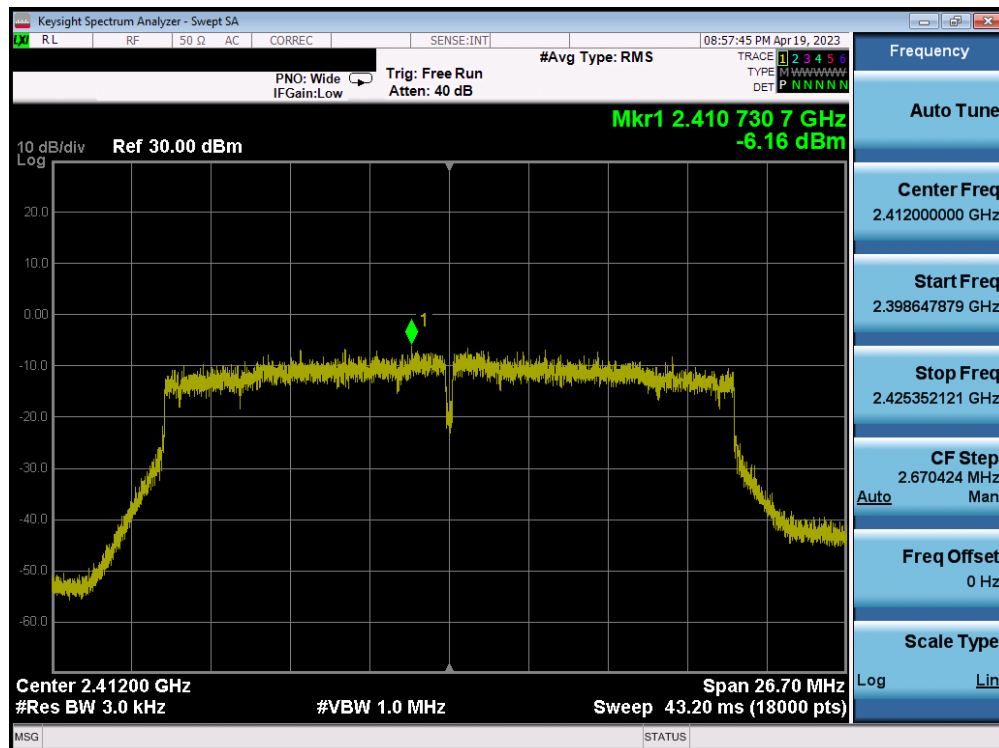
Plot 7-68. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 6) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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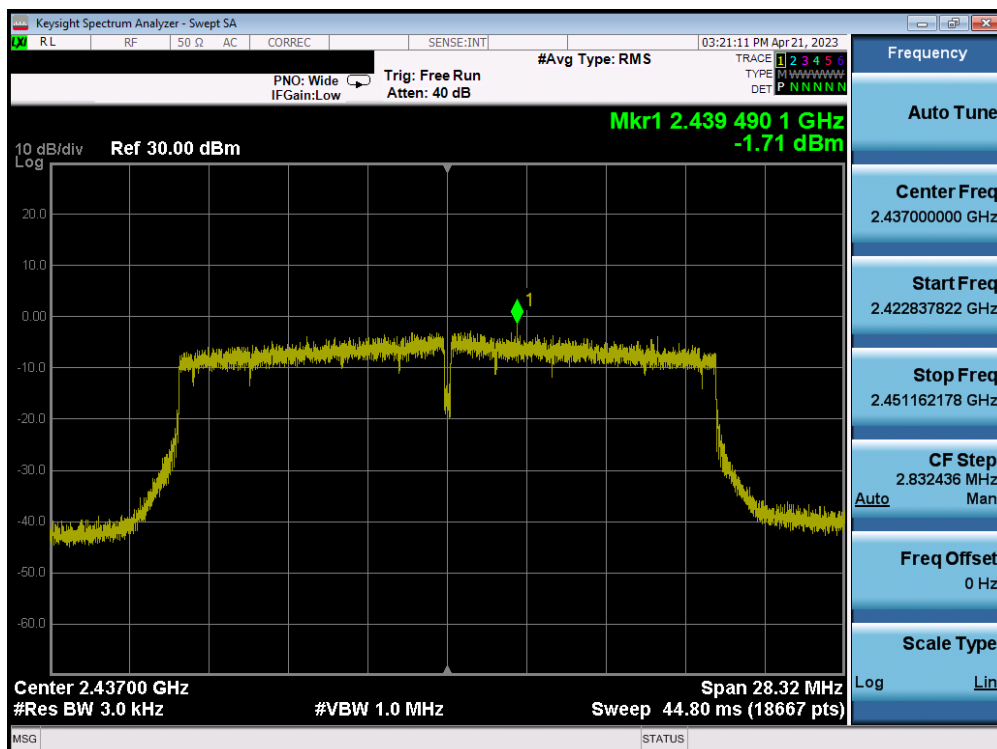


Plot 7-69. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 11) – MCS2

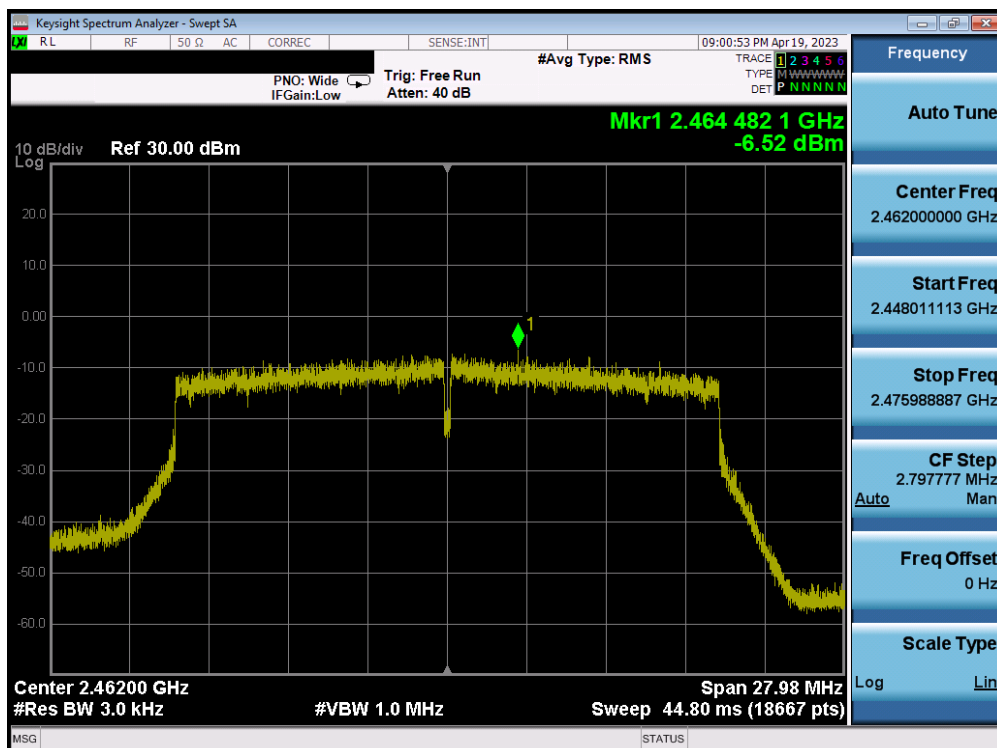


Plot 7-70. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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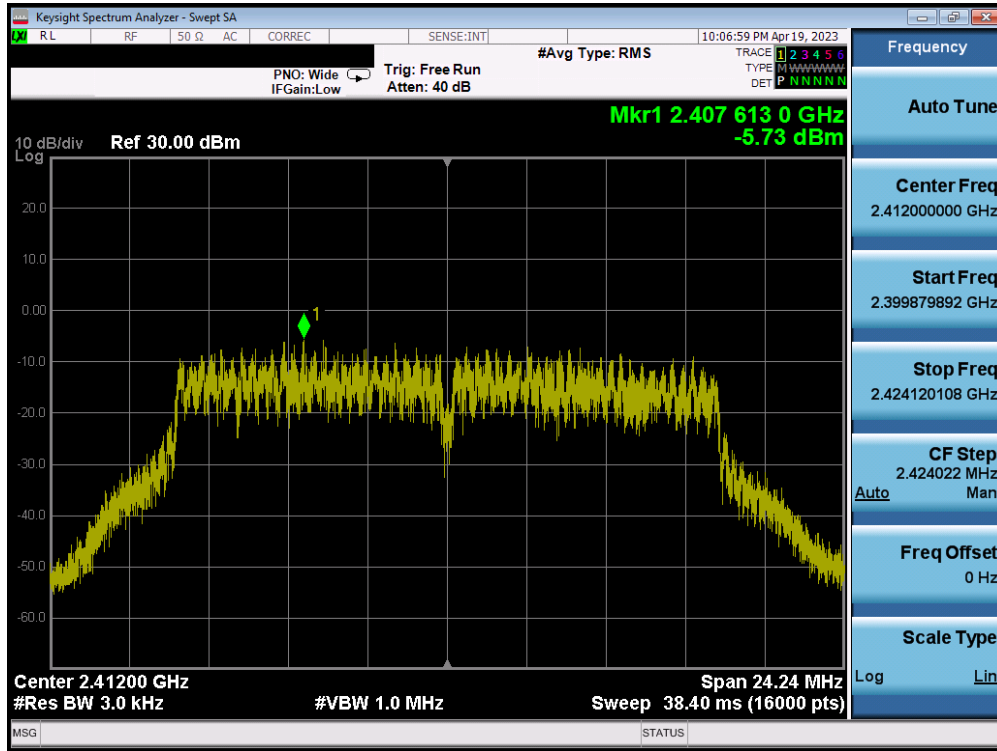


Plot 7-71. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS2

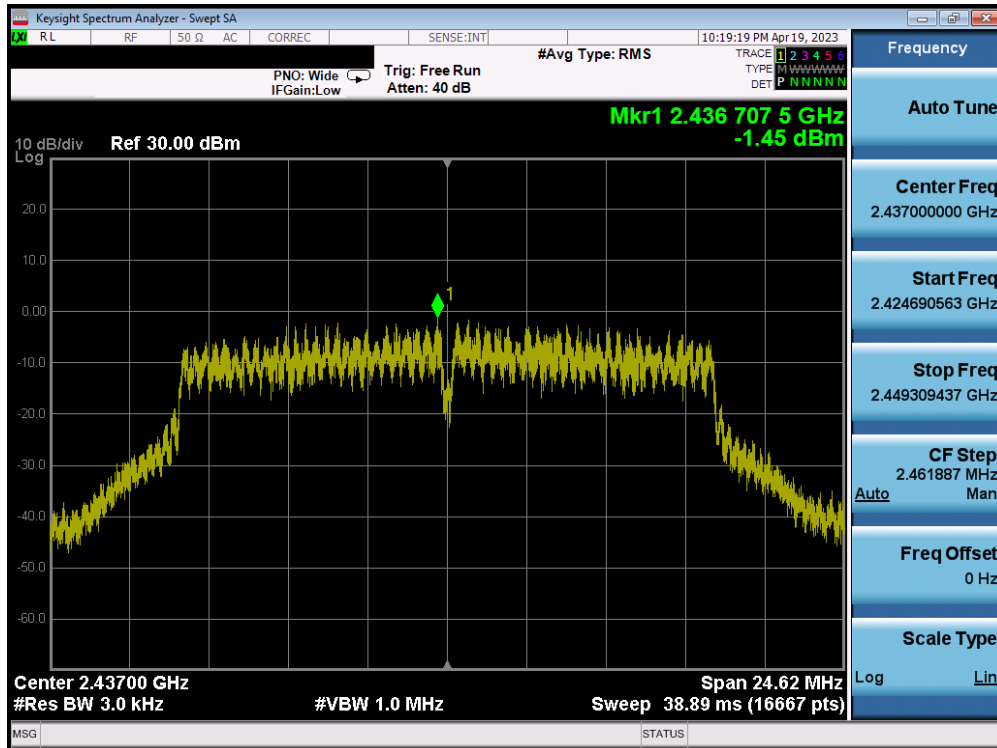


Plot 7-72. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS2

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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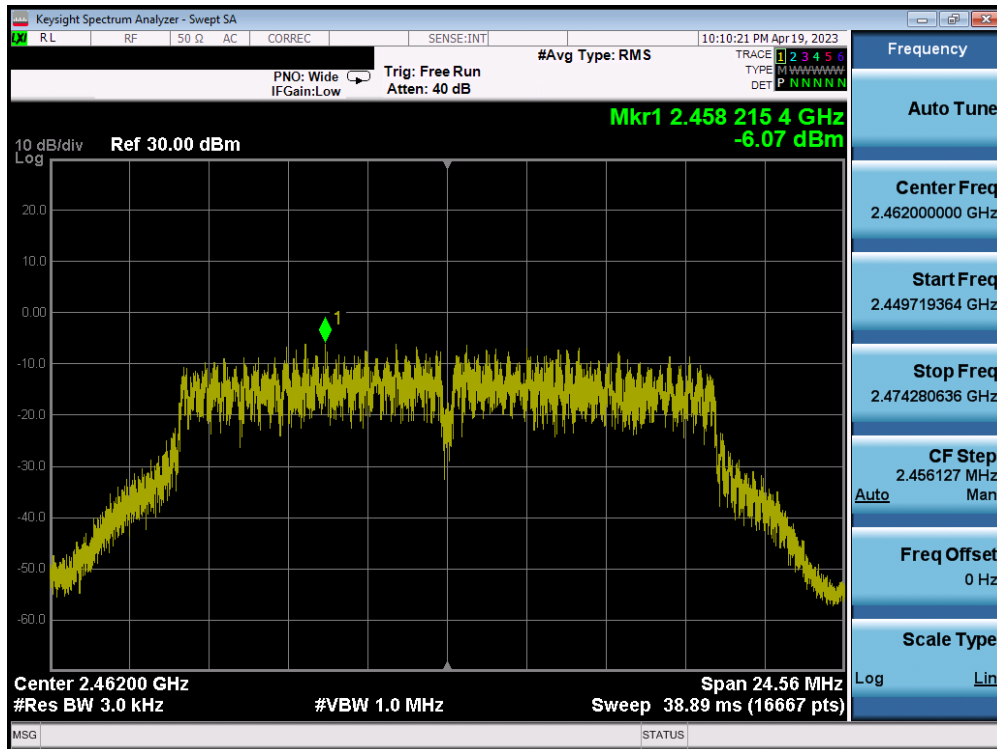


Plot 7-73. Power Spectral Density Plot ANT1 (802.11g – Ch. 1) – 24Mbps

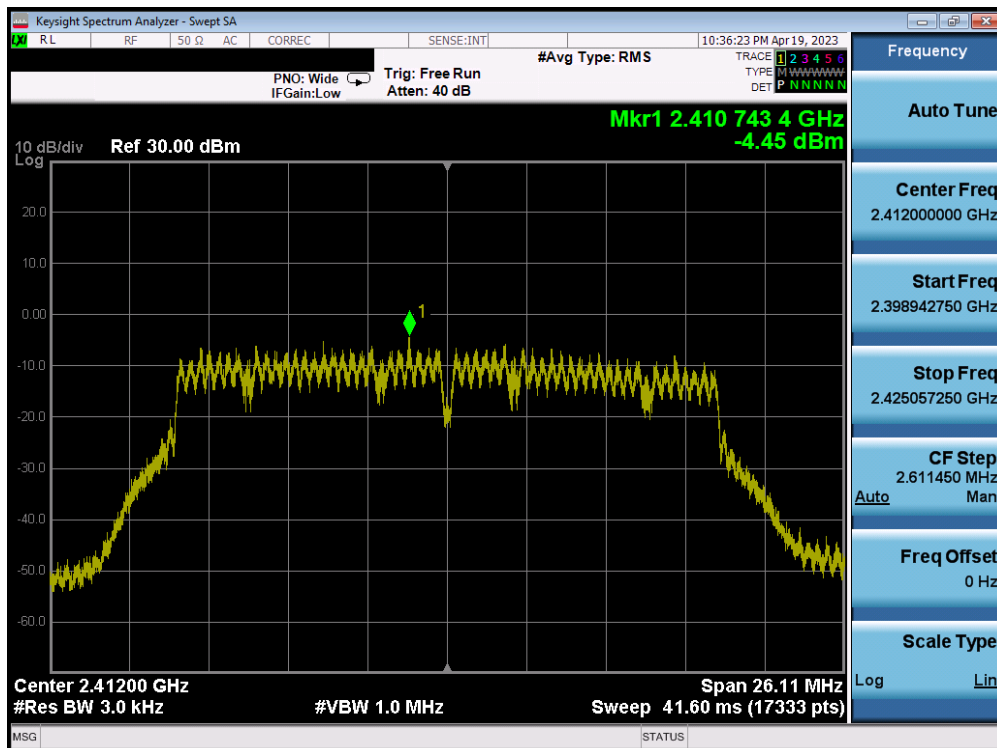


Plot 7-74. Power Spectral Density Plot ANT1 (802.11g – Ch. 6) – 24Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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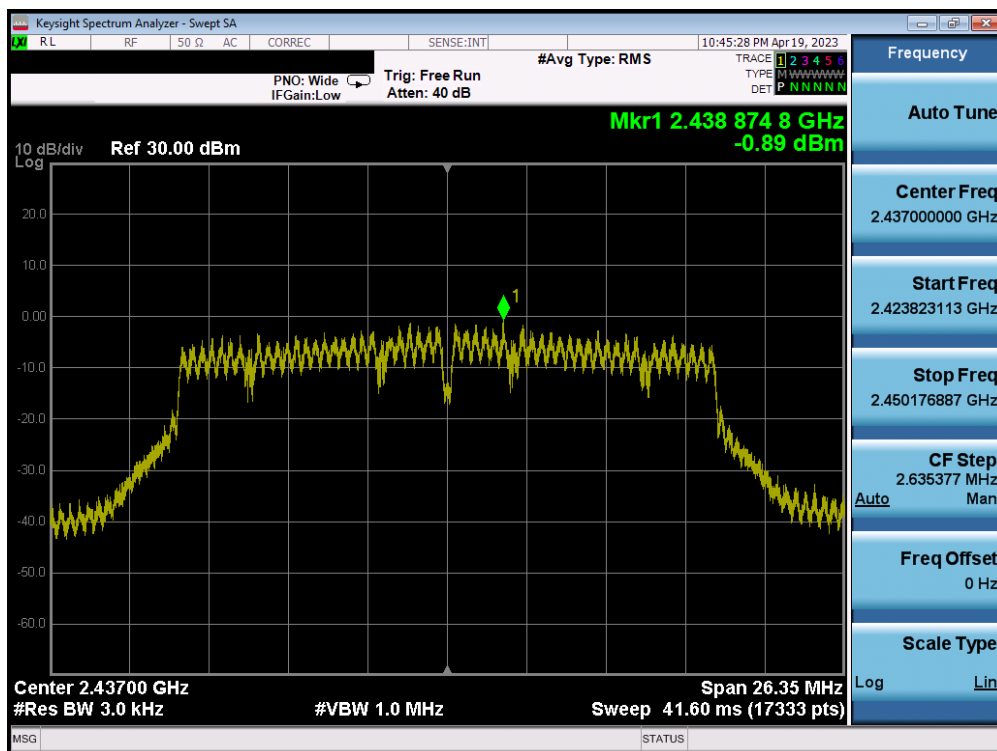


Plot 7-75. Power Spectral Density Plot ANT1 (802.11g – Ch. 11) – 24Mbps

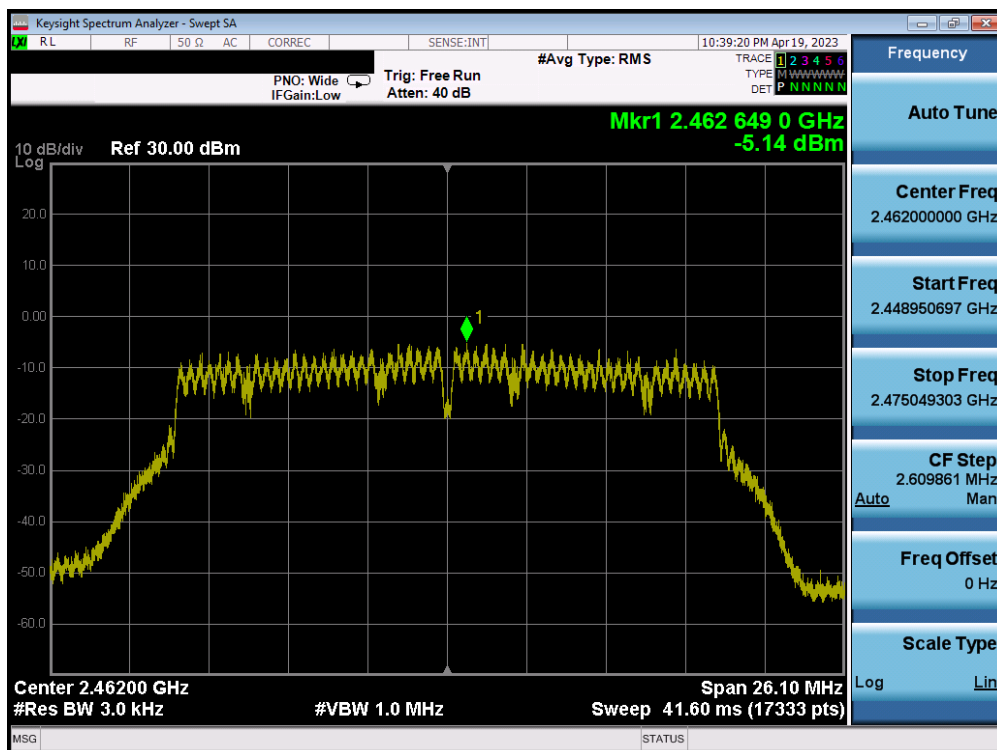


Plot 7-76. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 1) – MCS4


FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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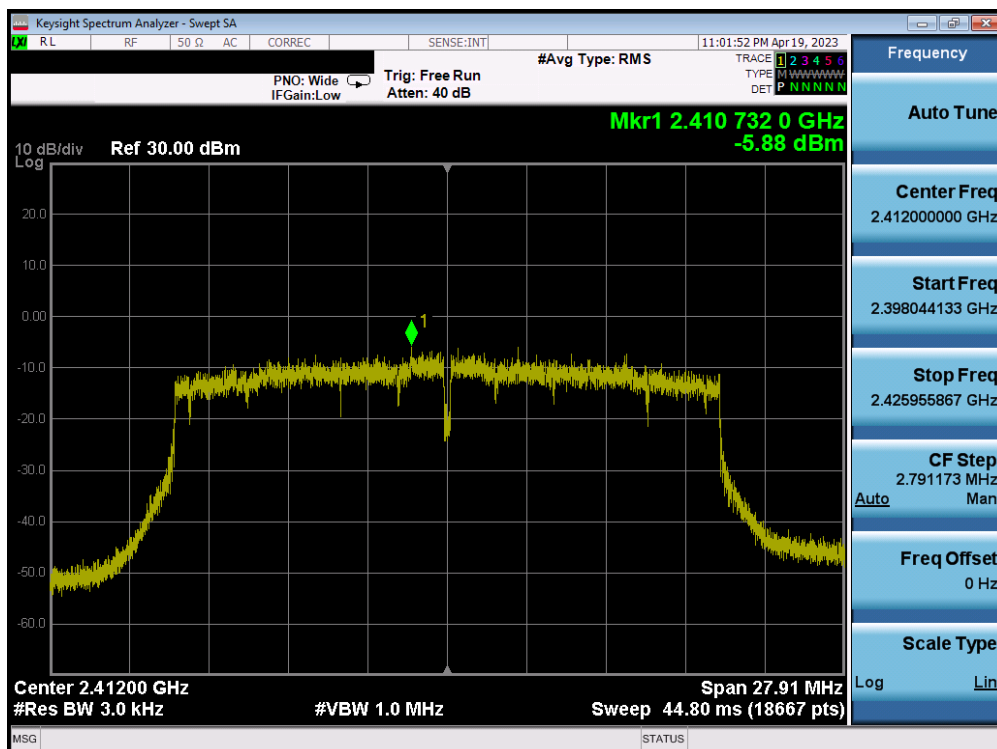


Plot 7-77. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 6) – MCS4

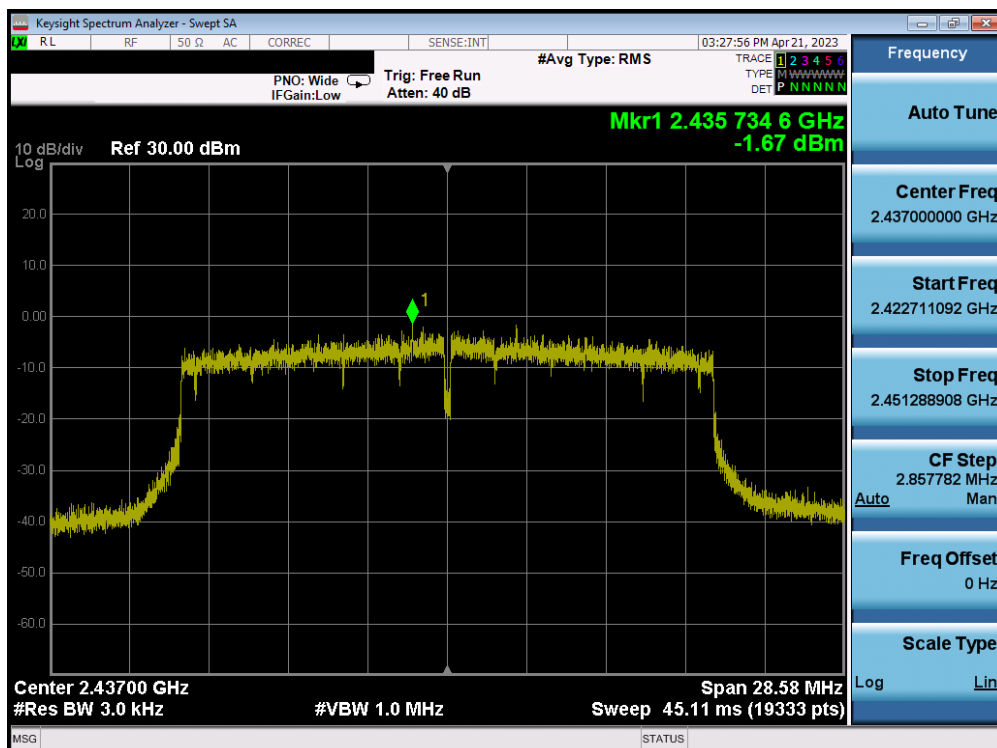


Plot 7-78. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 11) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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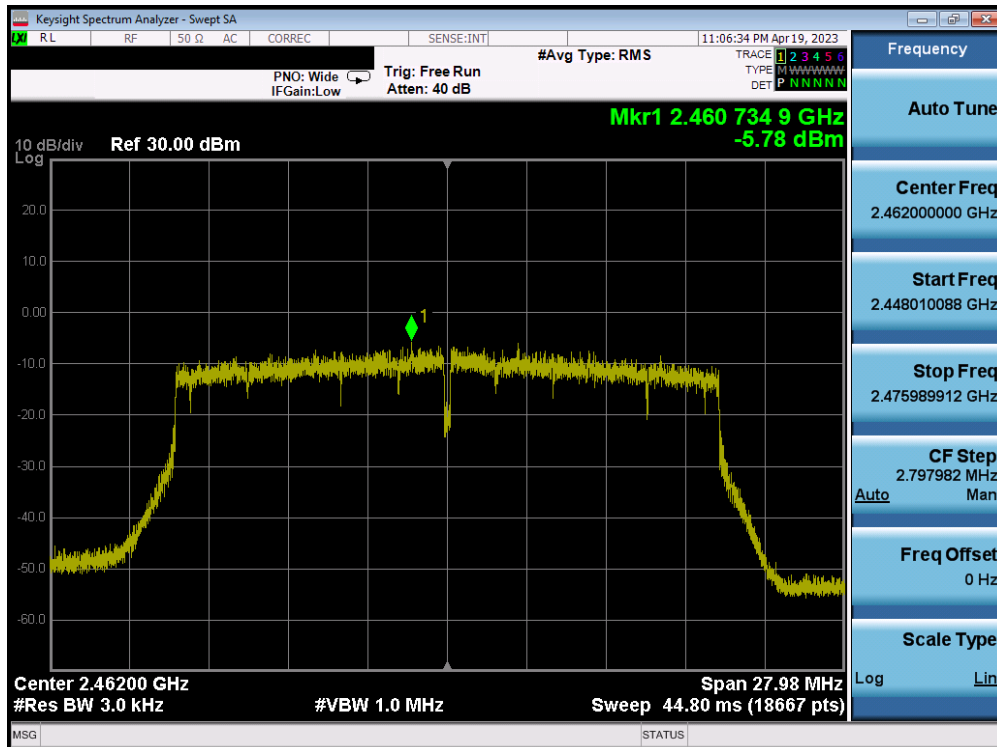


Plot 7-79. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS4



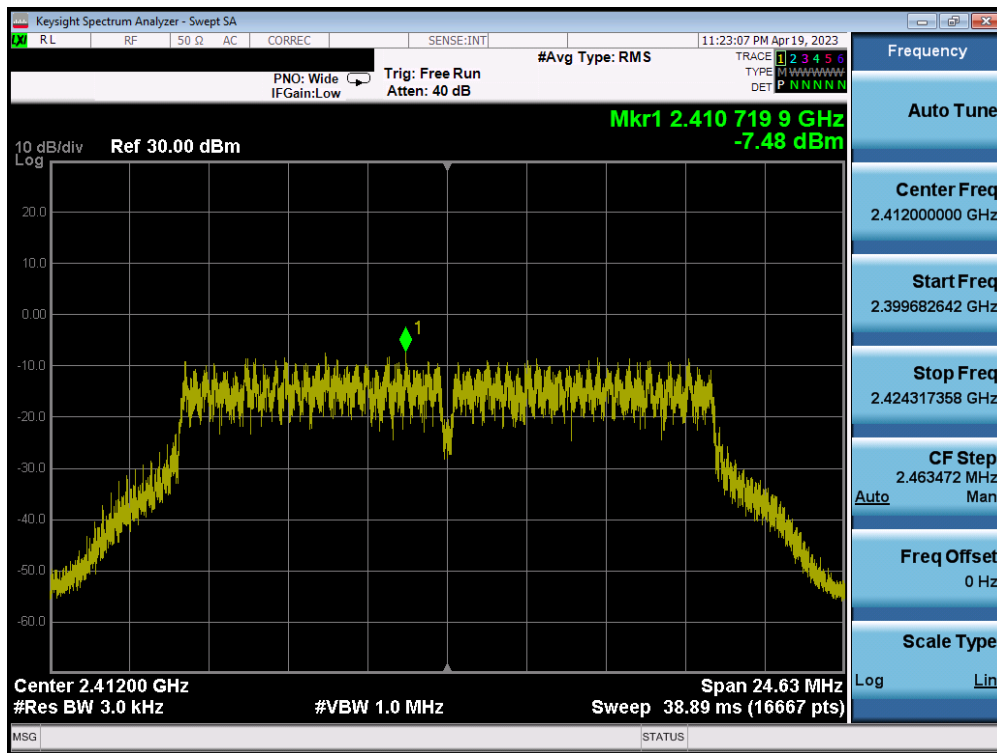
Plot 7-80. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS4

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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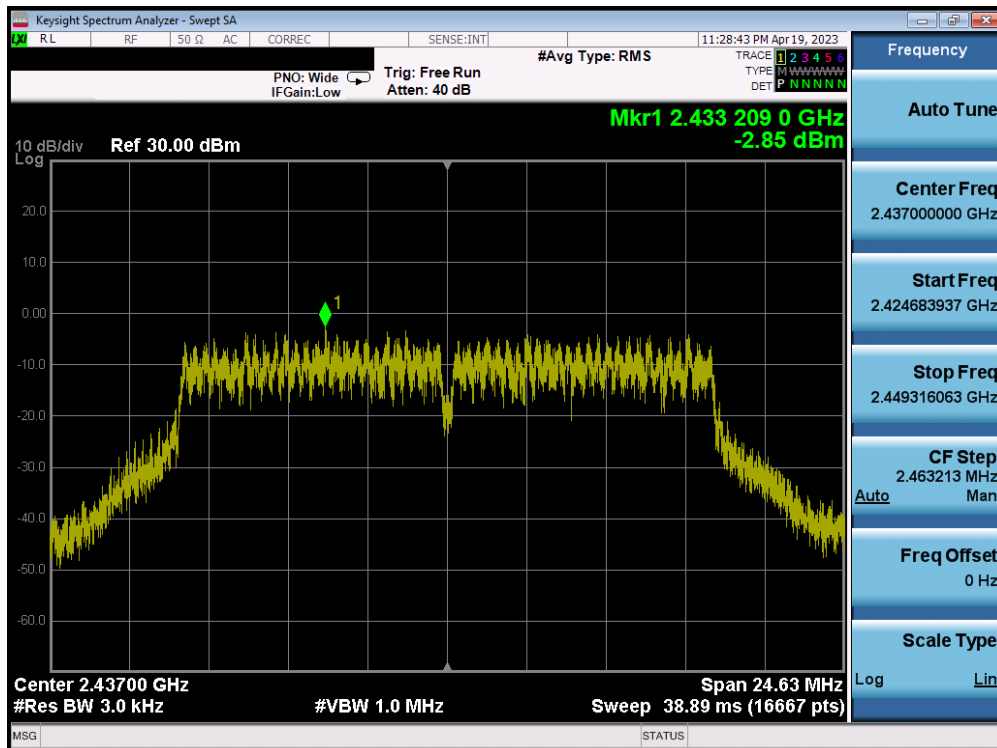


Plot 7-81. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS4


FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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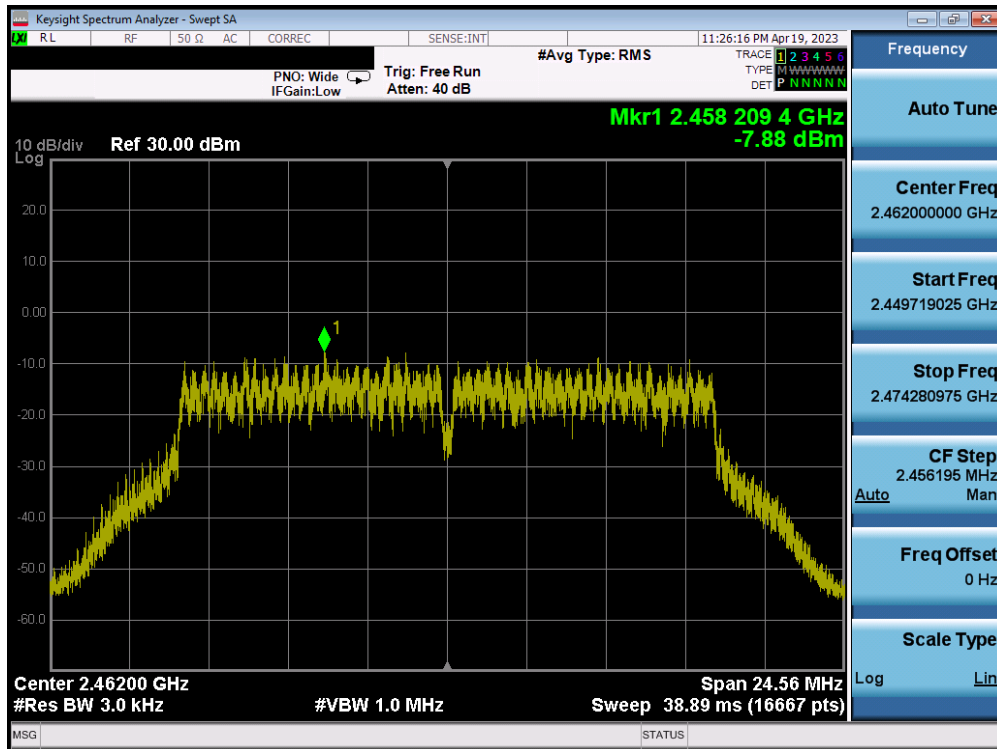
Plot 7-82. Power Spectral Density Plot ANT1 (802.11g – Ch. 1) – 48Mbps



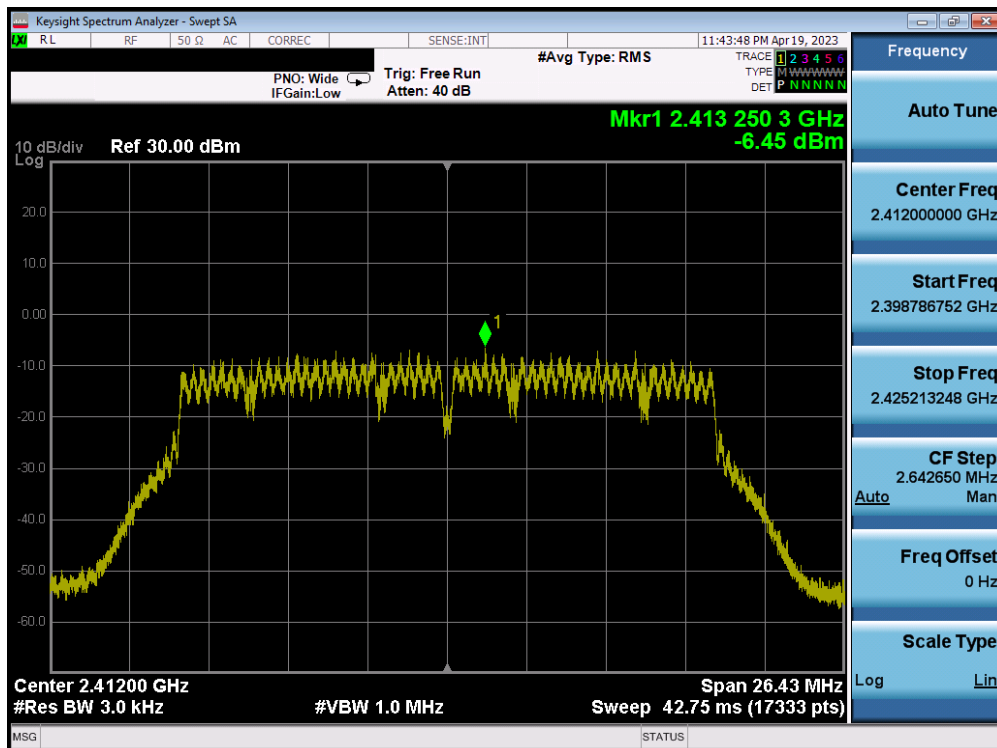
Plot 7-83. Power Spectral Density Plot ANT1 (802.11g – Ch. 6) – 48Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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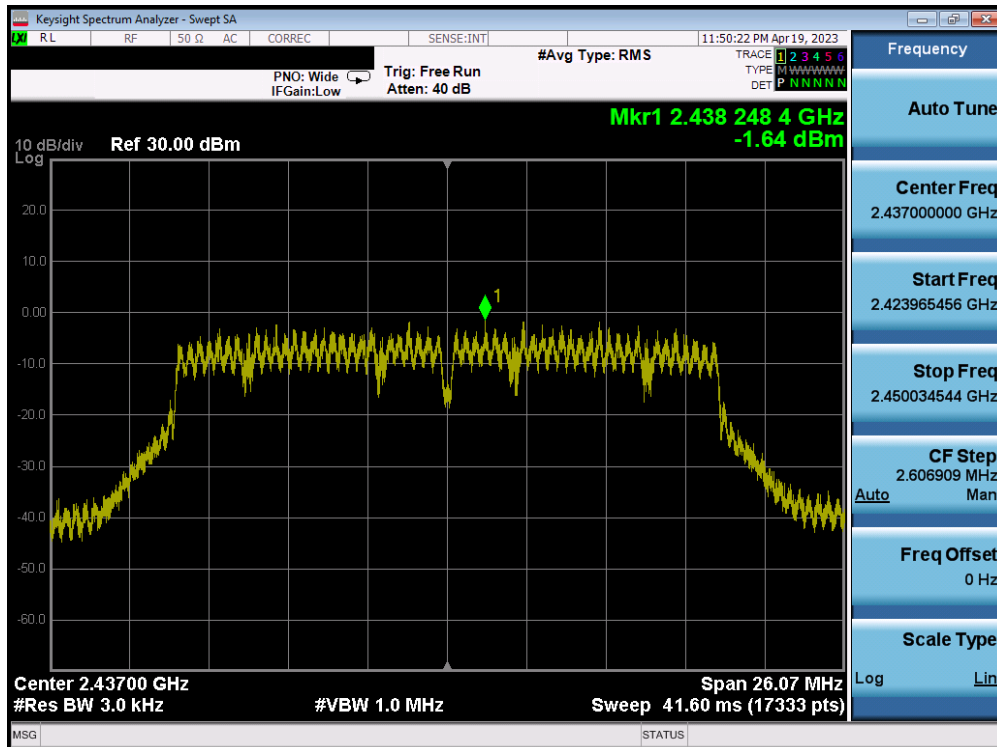


Plot 7-84. Power Spectral Density Plot ANT1 (802.11g – Ch. 11) – 48Mbps

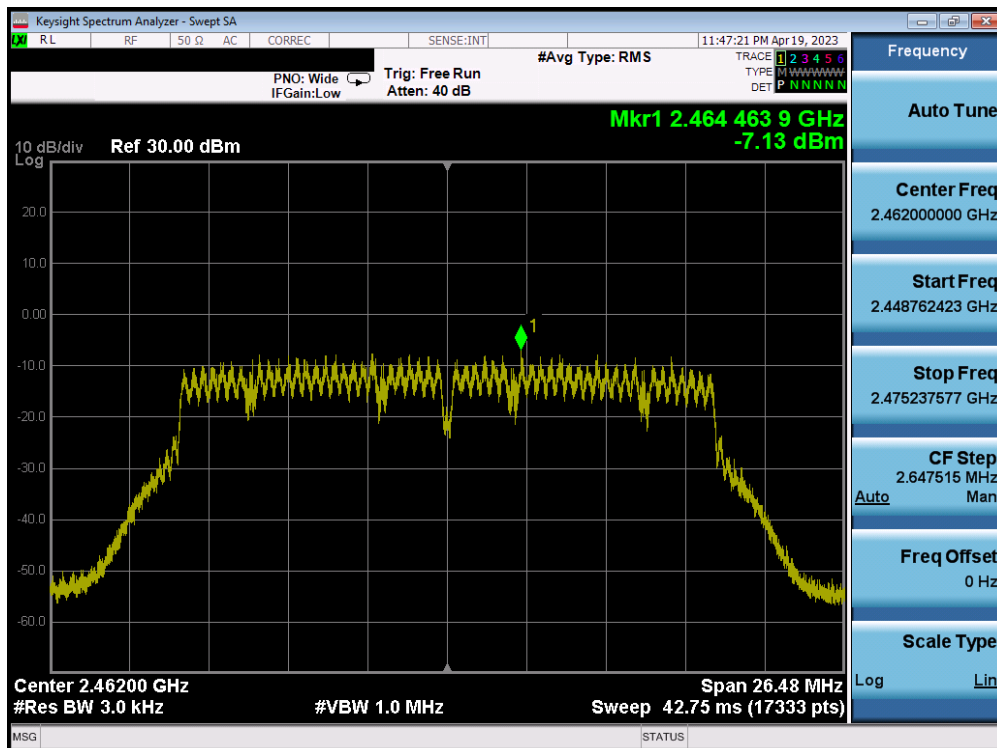


Plot 7-85. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 1) – MCS7

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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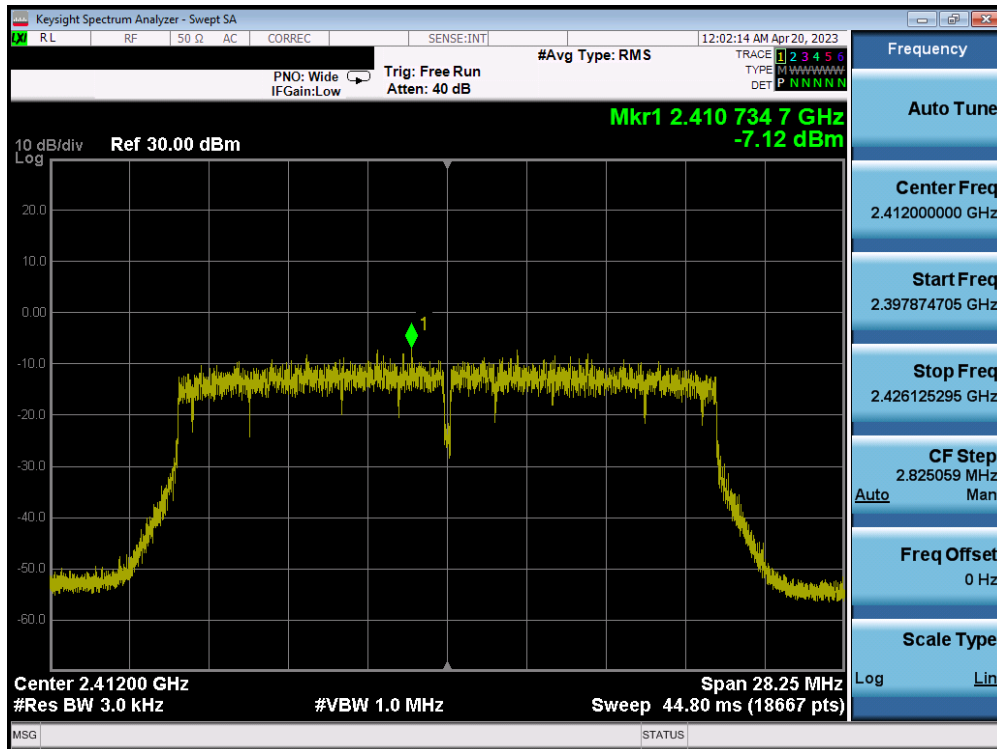


Plot 7-86. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 6) – MCS7

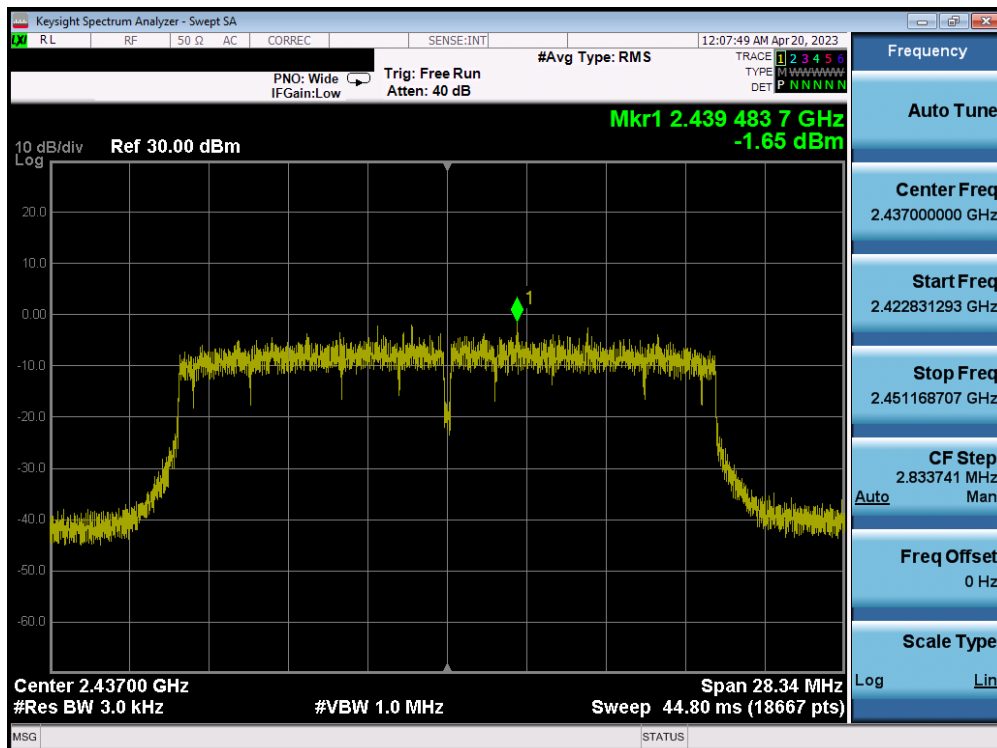


Plot 7-87. Power Spectral Density Plot ANT1 (802.11n (2.4GHz) – Ch. 11) – MCS7

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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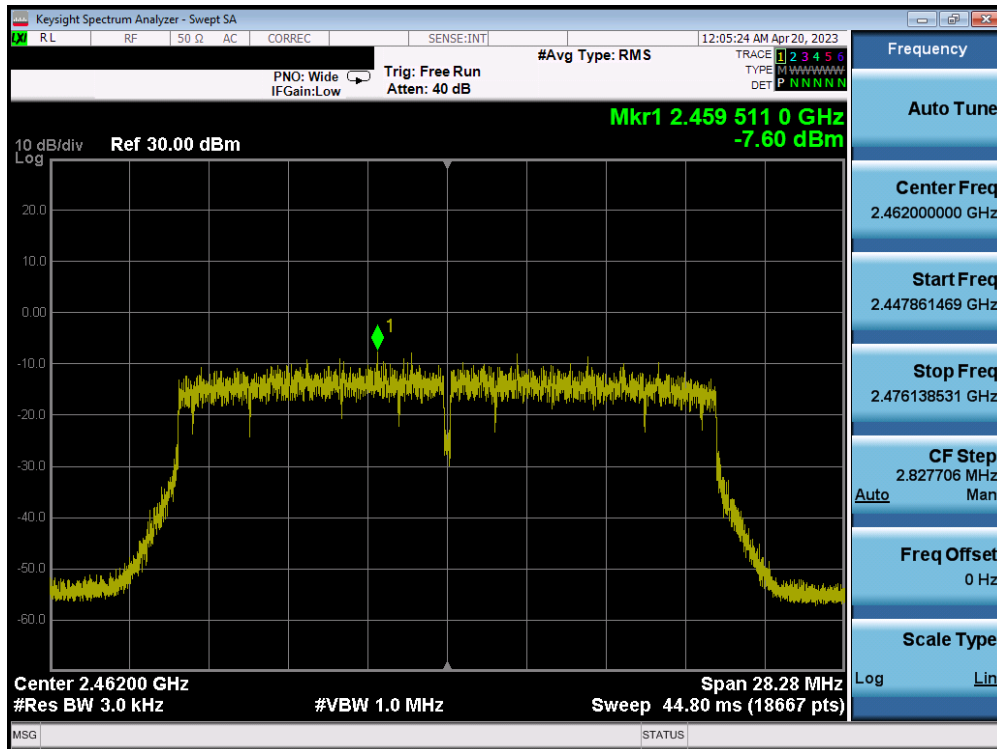


Plot 7-88. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 1) – MCS9



Plot 7-89. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 6) – MCS9

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-90. Power Spectral Density Plot ANT1 (802.11ax (SU - 2.4GHz) – Ch. 11) – MCS9

<b>FCC ID:</b> BCGA2117 <b>IC:</b> 579C-A2117	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1C2302130007-05.BCG		<b>Test Dates:</b> 2/10/2023 - 4/25/2023

## ANT2 Power Spectral Density Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Spectral Density [dBm / 3kHz]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	b	1	-0.80	8.00	-8.80	Pass
2437	6	b	1	2.17	8.00	-5.83	Pass
2462	11	b	1	2.11	8.00	-5.89	Pass
2412	1	g	12	-4.93	8.00	-12.93	Pass
2437	6	g	12	-1.86	8.00	-9.86	Pass
2462	11	g	12	-5.56	8.00	-13.56	Pass
2412	1	n	19.5/21.7 (MCS2)	-4.48	8.00	-12.48	Pass
2437	6	n	19.5/21.7 (MCS2)	-1.14	8.00	-9.14	Pass
2462	11	n	19.5/21.7 (MCS2)	-4.82	8.00	-12.82	Pass
2412	1	ax (SU)	24/25.8 (MCS2)	-6.84	8.00	-14.84	Pass
2437	6	ax (SU)	24/25.8 (MCS2)	-3.14	8.00	-11.14	Pass
2462	11	ax (SU)	24/25.8 (MCS2)	-6.70	8.00	-14.70	Pass

**Table 7-41. Conducted Power Density Measurements ANT2 (Low Data Rate)**

FCC ID: BCGA2117 IC: 579C-A2117		<b>MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1C2302130007-05.BCG	<b>Test Dates:</b> 2/10/2023 - 4/25/2023	<b>EUT Type:</b> Head Mounted Device	Page 85 of 388

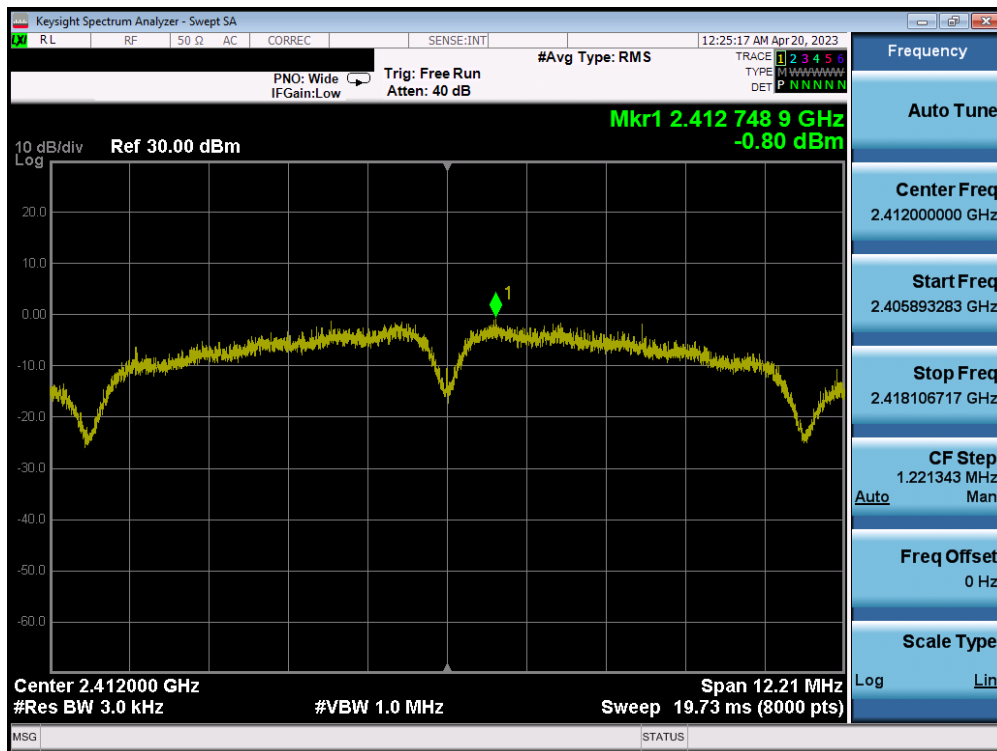
Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Spectral Density [dBm / 3kHz]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	g	24	-6.35	8.00	-14.35	Pass
2437	6	g	24	-1.66	8.00	-9.66	Pass
2462	11	g	24	-6.12	8.00	-14.12	Pass
2412	1	n	39/43.3 (MCS4)	-5.42	8.00	-13.42	Pass
2437	6	n	39/43.3 (MCS4)	-1.06	8.00	-9.06	Pass
2462	11	n	39/43.3 (MCS4)	-4.86	8.00	-12.86	Pass
2412	1	ax (SU)	49/51.6 (MCS4)	-5.73	8.00	-13.73	Pass
2437	6	ax (SU)	49/51.6 (MCS4)	-1.51	8.00	-9.51	Pass
2462	11	ax (SU)	49/51.6 (MCS4)	-6.21	8.00	-14.21	Pass

**Table 7-42. Conducted Power Density Measurements ANT2 (Mid Data Rate)**

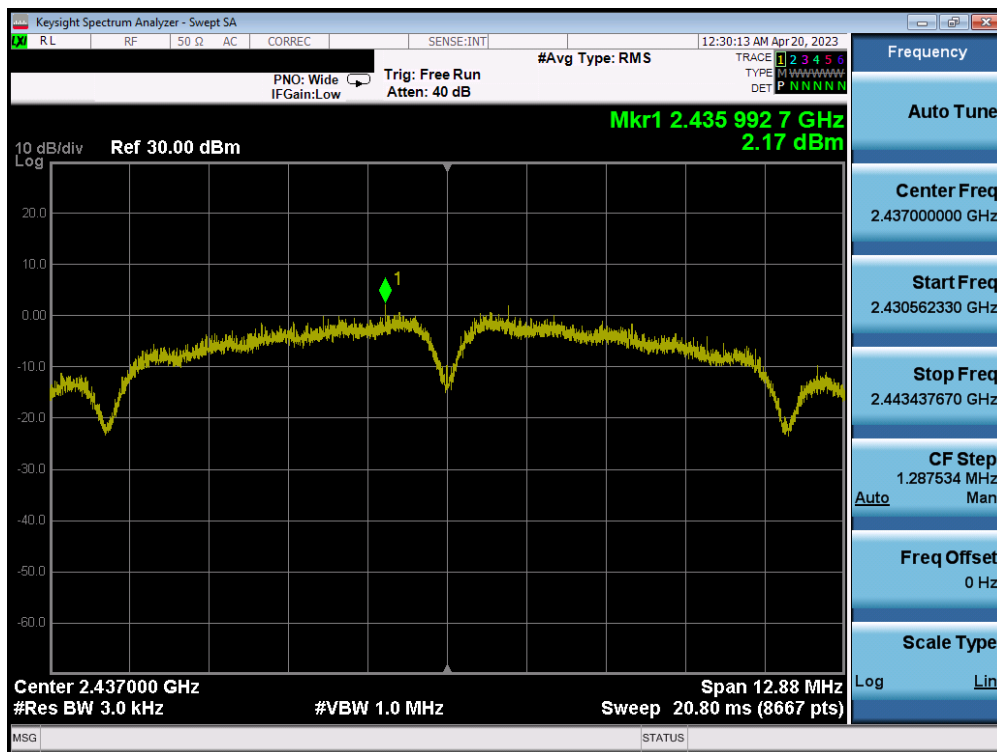
Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Spectral Density [dBm / 3kHz]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	g	48	-7.91	8.00	-15.91	Pass
2437	6	g	48	-2.66	8.00	-10.66	Pass
2462	11	g	48	-7.80	8.00	-15.80	Pass
2412	1	n	65/72.2 (MCS7)	-6.55	8.00	-14.55	Pass
2437	6	n	65/72.2 (MCS7)	-1.82	8.00	-9.82	Pass
2462	11	n	65/72.2 (MCS7)	-6.61	8.00	-14.61	Pass
2412	1	ax (SU)	108/114.7 (MCS9)	-7.48	8.00	-15.48	Pass
2437	6	ax (SU)	108/114.7 (MCS9)	-1.58	8.00	-9.58	Pass
2462	11	ax (SU)	108/114.7 (MCS9)	-7.90	8.00	-15.90	Pass

**Table 7-43. Conducted Power Density Measurements ANT2 (High Data Rate)**

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-91. Power Spectral Density Plot ANT2 (802.11b – Ch. 1) – 1Mbps



Plot 7-92. Power Spectral Density Plot ANT2 (802.11b – Ch. 6) – 1Mbps

FCC ID: BCGA2117 IC: 579C-A2117		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: 1C2302130007-05.BCG	Test Dates: 2/10/2023 - 4/25/2023	EUT Type: Head Mounted Device	Page 87 of 388