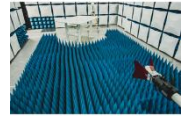




PCTEST
18855 Adams Court, Morgan Hill, CA 95037 USA
Tel. 410.290.6652 / Fax 410.290.6654
<http://www.pctest.com>



MEASUREMENT REPORT

FCC PART 15.407 / ISSED RSS-247 UNII 802.11ax OFDMA

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

Date of Testing:
12/10/2019 - 02/26/2020
Test Site/Location:
PCTEST, Morgan Hill, CA, USA
Test Report Serial No.:
1C1912170050-09.BCG

FCC ID:	BCGA2228
IC:	579C-A2228
APPLICANT:	Apple Inc.

Application Type:	Certification
Model/HVIN:	A2228
EUT Type:	Tablet Device
Frequency Range:	5180 – 5825MHz
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15 Subpart E (15.407)
ISED Specification:	RSS-247 Issue 2
Test Procedure(s):	ANSI C63.10-2013, KDB 789033 D02 v02r01, 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 789033 D02 v02r01. 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.


Randy Ortanez
President



FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 1 of 537

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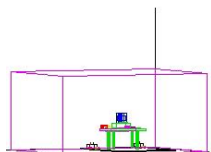
V 9.0 02/01/2019

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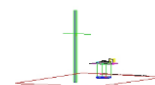
TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Scope.....	4
1.2	PCTEST Test Location.....	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT INFORMATION	5
2.1	Equipment Description	5
2.2	Device Capabilities.....	5
2.3	Antenna Description.....	6
2.4	Test Support Equipment.....	7
2.5	Test Configuration.....	7
2.6	Software and Firmware	7
2.7	EMI Suppression Device(s)/Modifications.....	7
3.0	DESCRIPTION OF TESTS	8
3.1	Evaluation Procedure	8
3.2	Radiated Emissions.....	8
3.3	Environmental Conditions.....	8
4.0	ANTENNA REQUIREMENTS	9
5.0	MEASUREMENT UNCERTAINTY	10
6.0	TEST EQUIPMENT CALIBRATION DATA.....	11
7.0	TEST RESULTS	12
7.1	Summary.....	12
7.2	26dB Bandwidth Measurement – 802.11ax OFDMA.....	13
7.3	6dB Bandwidth Measurement – 802.11ax OFDMA.....	98
7.4	UNII Output Power Measurement – 802.11ax OFDMA.....	125
7.5	Maximum Power Spectral Density – 802.11ax OFDMA.....	146
7.6	Radiated Spurious Emission Measurements – Above 1GHz	403
7.6.1	SISO Core 0 Radiated Spurious Emission Measurements	406
7.6.2	SISO Core 1 Radiated Spurious Emission Measurements	426
7.6.3	CDD Radiated Spurious Emission Measurements	446
7.6.4	SISO Core 0 Radiated Band Edge Measurements (20MHz BW)	467
7.6.5	SISO Core 0 Radiated Band Edge Measurements (40MHz BW)	475
7.6.6	SISO Core 0 Radiated Band Edge Measurements (80MHz BW)	483
7.6.7	SISO Core 1 Radiated Band Edge Measurements (20MHz BW)	489
7.6.8	SISO Core 1 Radiated Band Edge Measurements (40MHz BW)	497
7.6.9	SISO Core 1 Radiated Band Edge Measurements (80MHz BW)	505
7.6.10	CDD Radiated Band Edge Measurements (20MHz BW)	511
7.6.11	CDD Radiated Band Edge Measurements (40MHz BW)	519
7.6.12	CDD Radiated Band Edge Measurements (80MHz BW)	527
7.7	Radiated Spurious Emissions Measurements – Below 1GHz	533
8.0	CONCLUSION.....	537

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 2 of 537



MEASUREMENT REPORT



UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	SISO				CDD/SDM					
			Core 0		Core 1		Core 0		Core 1		Summed	
			Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
1	20	5180 - 5240	56.234	17.50	50.119	17.00	50.119	17.00	50.119	17.00	100.122	20.01
2A		5260 - 5320	44.668	16.50	44.668	16.50	44.668	16.50	44.668	16.50	89.337	19.51
2C		5500 - 5720	35.481	15.50	44.668	16.50	35.481	15.50	44.668	16.50	80.150	19.04
3		5745 - 5825	36.308	15.60	39.811	16.00	37.584	15.75	39.811	16.00	77.394	18.89
1	40	5190 - 5230	56.234	17.50	50.119	17.00	50.119	17.00	50.119	17.00	100.237	20.01
2A		5270 - 5310	44.668	16.50	44.259	16.46	44.668	16.50	44.259	16.46	88.927	19.49
2C		5510 - 5710	44.668	16.50	44.668	16.50	35.481	15.50	44.668	16.50	80.150	19.04
3		5755 - 5795	37.584	15.75	39.811	16.00	37.584	15.75	39.811	16.00	77.394	18.89
1	80	5210	21.135	13.25	21.135	13.25	15.849	12.00	15.849	12.00	31.698	15.01
2A		5290	14.125	11.50	14.125	11.50	9.931	9.97	10.000	10.00	19.931	13.00
2C		5530 - 5690	35.318	15.48	44.566	16.49	34.834	15.42	44.668	16.50	79.502	19.00
3		5775	37.584	15.75	39.811	16.00	25.119	14.00	25.119	14.00	50.238	17.01

FCC EUT Overview

UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	SISO				CDD/SDM					
			Core 0		Core 1		Core 0		Core 1		Summed	
			Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
1	20	5180 - 5240	39.811	16.00	39.719	15.99	12.589	11.00	12.589	11.00	25.179	14.01
2A		5260 - 5320	44.668	16.50	44.668	16.50	44.668	16.50	44.668	16.50	89.337	19.51
2C		5500 - 5720	35.481	15.50	44.668	16.50	35.481	15.50	44.668	16.50	80.150	19.04
3		5745 - 5825	36.308	15.60	39.811	16.00	37.584	15.75	39.811	16.00	77.394	18.89
1	40	5190 - 5230	56.234	17.50	50.119	17.00	22.387	13.50	22.080	13.44	44.467	16.48
2A		5270 - 5310	44.668	16.50	44.259	16.46	44.668	16.50	44.259	16.46	88.927	19.49
2C		5510 - 5710	44.668	16.50	44.668	16.50	35.481	15.50	44.668	16.50	80.150	19.04
3		5755 - 5795	37.584	15.75	39.811	16.00	37.584	15.75	39.811	16.00	77.394	18.89
1	80	5210	21.135	13.25	21.135	13.25	15.740	11.97	15.849	12.00	31.589	15.00
2A		5290	14.125	11.50	14.125	11.50	9.931	9.97	10.000	10.00	19.931	13.00
2C		5530 - 5690	35.318	15.48	44.566	16.49	34.834	15.42	44.668	16.50	79.502	19.00
3		5775	37.584	15.75	39.811	16.00	25.119	14.00	25.119	14.00	50.238	17.01

ISED EUT Overview

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 3 of 537

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 PCTEST Test Location

These measurement tests were conducted at the PCTEST 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 PCTEST located in Morgan Hill, CA 95037, U.S.A.

- PCTEST is an ISO 17025-2005 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.
- PCTEST 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).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISED.

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 4 of 537

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2228**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: DLXZR006P7FJ, DLXZR034P7FJ

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE, HDR4, HDR8)

This device supports BT Beamforming

Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
36	5180	52	5260	100	5500	149	5745
:	:	:	:	:	:	:	:
42	5210	56	5280	116	5580	157	5785
:	:	:	:	:	:	:	:
48	5240	64	5320	144	5720	165	5825

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

Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
38	5190	54	5270	102	5510	151	5755
:	:	:	:	:	:	:	:
46	5230	62	5310	110	5550	159	5795
				:	:		
				142	5710		

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

Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
42	5210	58	5290	106	5530	155	5775
				:	:		
				138	5690		

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

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	
			Page 5 of 537

Notes:

- 5GHz NII operation is possible in 20MHz, and 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of ANSI C63.10-2013 and KDB 789033 D02 v02r01. 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 [%]		
		CORE 0	CORE 1	CDD/SDM
5GHz	ax (HE20)	99.2	99.4	98.6
	ax (HE40)	98.4	98.5	98.2
	ax (HT80)	98.3	99.1	98.5

Table 2-4. Measured Duty Cycles

- 5GHz ANTUpper is correlating to Core 0 and 5GHz ANTLower is correlating to Core 1.
- The device employs CDD/SDM technology. Below are the possible configurations.

WiFi Configurations		SISO		CDD		SDM		STBC	
		CORE 0	CORE 1	CORE 0	CORE 1	CORE 0	CORE 1	CORE 0	CORE 1
5GHz	11ax (20MHz)	✓	✓	✓	✓	✗	✗	✗	✗
	11ax (40MHz)	✓	✓	✓	✓	✓	✓	✓	✓
	11ax (80MHz)	✓	✓	✓	✓	✓	✓	✓	✓

Table 2-5. Frequency / Channel Operations

✓ = Support ; ✗ = NOT Support

SISO = Single Input Single Output

CDD = Cyclic Delay Diversity – 2Tx Function

SDM = Spatial Diversity Multiplexing – CDD/SDM function

STBC = Space-Time Block Coding – 2Tx Function

2.3 Antenna Description

Following antennas were used for the testing.

Frequency [GHz]	Antenna Gain (dBi)	
	ANTUpper	ANTLower
5.150 – 5.250	2.1	-0.2
5.260 – 5.350	1.3	0.2
5.470 – 5.725	3.7	2.3
5.745 – 5.850	4.7	2.8

Table 2-6. Highest Antenna Gain

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 6 of 537

2.4 Test Support Equipment

1	Apple MacBook	Model: A1398	S/N: C2QKP008F6F3
	w/ AC/DC Adapter	Model: A1435	S/N: C04325505K1F288BG
2	Apple USB-C Cable	Model: Chimp	S/N: 304523
3	USB-C Cable	Model: A1997	S/N: N/A
	w / AC/DC Adapter	Model: A1720	S/N: C3D9274B06YLHDAE
4	Apple Pencil	Model: A2051	S/N: GQXYGSXCJKM9
5	DC Power Supply	Model: KPS3010D	S/N: N/A

Table 2-7. Test Support Equipment Used

2.5 Test Configuration

The EUT was tested per the guidance of KDB 789033 D02 v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing.

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 channel and the worst case configuration.

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.

Throughout the report, 5GHz ANTUpper is correlating to Core 0 and 5GHz ANTLower is correlating to Core 1.

For 802.11a/n/ac test results, see separate UNII report, 1C1912170050-08-R1.BCG.

2.6 Software and Firmware

The test was conducted with firmware version 17E228 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.

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 7 of 537

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

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

Deviation from measurement procedure.....None

3.2 Radiated Emissions

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

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

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

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

3.3 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).

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 8 of 537

4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

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

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

Conclusion:

The EUT complies with the requirement of §15.203.

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 9 of 537

5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. 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	1.29
Line Conducted Disturbance	2.48
Radiated Disturbance (<1GHz)	4.15
Radiated Disturbance (>1GHz)	4.70
Radiated Disturbance (>18GHz)	5.01

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 10 of 537

6.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	3/13/2019	Annual	3/13/2020	MY49430244
Anritsu	ML2496A	Power Meter	10/29/2019	Annual	10/29/2020	184005
Anritsu	MA2411B	Pulse Power Sensor	10/29/2019	Annual	10/29/2020	1726261
Anritsu	MA2411B	Pulse Power Sensor	10/29/2019	Annual	10/29/2020	1726262
ATM	180-442A-KF	20dB Nominal Gain Horn Antenna	10/29/2019	Annual	10/29/2020	T058701-02
COM-POWER	LIN-120A	LISN	3/13/2019	Annual	3/13/2020	241297
ETS-Lindgren	3142E-PA	Pre-Amplifier (30MHz - 6GHz)	9/19/2019	Annual	9/19/2020	213236
ETS-Lindgren	3142E	BiConiLog Antenna (30MHz - 6GHz)	8/14/2019	Annual	8/14/2020	224569
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	3/12/2019	Annual	3/12/2020	205956
Rohde & Schwarz	ESW26	EMI Test Receiver	5/21/2019	Annual	5/21/2020	101299
Rohde & Schwarz	ESW44	EMI Test Receiver	7/27/2019	Annual	7/27/2020	101668
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	9/19/2019	Annual	9/19/2020	100051
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Antenna (400MHz-18GHz)	11/14/2019	Annual	11/14/2020	101057
Rohde & Schwarz	HFH2-Z2	Loop Antenna	3/21/2019	Annual	3/21/2020	100519

Table 6-1. Annual Test Equipment Calibration Schedule

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.

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 11 of 537

7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
 FCC ID: BCGA2228
 FCC Classification: Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
N/A	RSS-Gen [6.7]	26dB Bandwidth	N/A	CONDUCTED	PASS	Section 7.2
15.407(e)	RSS-Gen [6.7]	6dB Bandwidth	>500kHz(5725-5850MHz)		PASS	Section 7.3
15.407 (a.1.iv), (a.2), (a.3)	RSS-247 [6.2]	Maximum Conducted Output Power	Maximum conducted powers must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])		PASS	Section 7.4
15.407 (a.1.iv), (a.2), (a.3)	RSS-247 [6.2]	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])		PASS	Section 7.5
15.407(h)	RSS-247 [6.3]	Dynamic Frequency Selection	See DFS Test Report	RADIATED	PASS	See DFS Test Report (1C191217005 0-07.BCG)
15.407(b.1), (2), (3), (4)	RSS-247 [6.2]	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 15.407(b) (RSS-247 [6.2])		PASS	Section 7.6
15.205, 15.407(b.1), (4), (5), (6)	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])		PASS	Section 7.6, 7.7
15.407	RSS-Gen [8.8]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 (RSS-Gen [8.8]) limits	LINE CONDUCTED	PASS	See UNII Test Report (1C191217005 0-08-R1.BCG)

Table 7-1. Summary of Test Results

Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "UNII Automation," Version 4.7.
- 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 PCTEST "Chamber Automation," Version 1.3.1.
- 6) Per RSS-247 Section 6.2.3, transmission on channels which overlap the 5600-5650 MHz is prohibited. This device operates under these frequencies only under the control of a certified master device and does not support active scanning on these channels. This device does not transmit any beacons or initiate any transmissions in UNII Bands 2A or 2C.
- 7) 802.11ax OFDMA testing was performed for all signal tone configurations as specified by the 802.11ax standard. Worst case results are determined and reported per the guidance provided at the October 2018 TCB Workshop.
- 8) Only one RU index could be selected at a time so no contiguous or non-contiguous RU's were considered for testing.

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 12 of 537

7.2 26dB Bandwidth Measurement – 802.11ax OFDMA

RSS-Gen [6.2]

Test Overview and Limit

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

The 26dB bandwidth is used to determine the conducted power limits.

Test Procedure Used

ANSI C63.10-2013 – Section 12.4

KDB 789033 D02 v02r01 – Section C

Test Settings

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

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

1. All antenna configs were investigated and only the worst case is reported.
2. All RU's were investigated and only worst case partially-loaded and fully-loaded RU's were reported.

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 13 of 537

SISO Core 0 26 dB Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	RU Size	Index	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
Band 1	5180	36	ax (20MHz)	RU26	0	MCS0	19.98
				RU26	4	MCS0	18.95
				RU26	8	MCS0	20.29
	5200	40	ax (20MHz)	RU26	0	MCS0	19.79
				RU26	4	MCS0	18.99
				RU26	8	MCS0	20.35
	5240	48	ax (20MHz)	RU26	0	MCS0	19.66
				RU26	4	MCS0	19.00
				RU26	8	MCS0	20.19
	5190	38	ax (40MHz)	RU26	0	MCS0	19.84
				RU26	8	MCS0	21.16
				RU26	17	MCS0	19.41
	5230	46	ax (40MHz)	RU26	0	MCS0	19.72
				RU26	8	MCS0	21.65
				RU26	17	MCS0	19.71
	5210	42	ax (80MHz)	RU26	0	MCS0	19.38
				RU26	18	MCS0	38.44
				RU26	36	MCS0	20.42
Band 2A	5260	52	ax (20MHz)	RU26	0	MCS0	19.62
				RU26	4	MCS0	18.99
				RU26	8	MCS0	20.32
	5280	56	ax (20MHz)	RU26	0	MCS0	19.92
				RU26	4	MCS0	18.65
				RU26	8	MCS0	20.34
	5320	64	ax (20MHz)	RU26	0	MCS0	19.94
				RU26	4	MCS0	19.00
				RU26	8	MCS0	20.24
	5270	54	ax (40MHz)	RU26	0	MCS0	20.13
				RU26	8	MCS0	22.11
				RU26	17	MCS0	19.52
	5310	62	ax (40MHz)	RU26	0	MCS0	20.20
				RU26	8	MCS0	22.15
				RU26	17	MCS0	19.34
	5290	58	ax (80MHz)	RU26	0	MCS0	19.53
				RU26	18	MCS0	38.74
				RU26	36	MCS0	20.28
Band 2C	5500	100	ax (20MHz)	RU26	0	MCS0	19.93
				RU26	4	MCS0	18.48
				RU26	8	MCS0	20.43
	5580	116	ax (20MHz)	RU26	0	MCS0	19.83
				RU26	4	MCS0	18.85
				RU26	8	MCS0	20.10
	5720	144	ax (20MHz)	RU26	0	MCS0	19.71
				RU26	4	MCS0	18.85
				RU26	8	MCS0	20.37
	5510	102	ax (40MHz)	RU26	0	MCS0	19.99
				RU26	8	MCS0	21.54
				RU26	17	MCS0	19.00
	5550	110	ax (40MHz)	RU26	0	MCS0	19.61
				RU26	8	MCS0	21.73
				RU26	17	MCS0	19.62
	5710	142	ax (40MHz)	RU26	0	MCS0	19.56
				RU26	8	MCS0	22.48
				RU26	17	MCS0	19.48
	5530	106	ax (80MHz)	RU26	0	MCS0	19.44
				RU26	18	MCS0	38.18
				RU26	36	MCS0	20.26
	5690	138	ax (80MHz)	RU26	0	MCS0	19.48
				RU26	18	MCS0	38.88
				RU26	36	MCS0	20.35

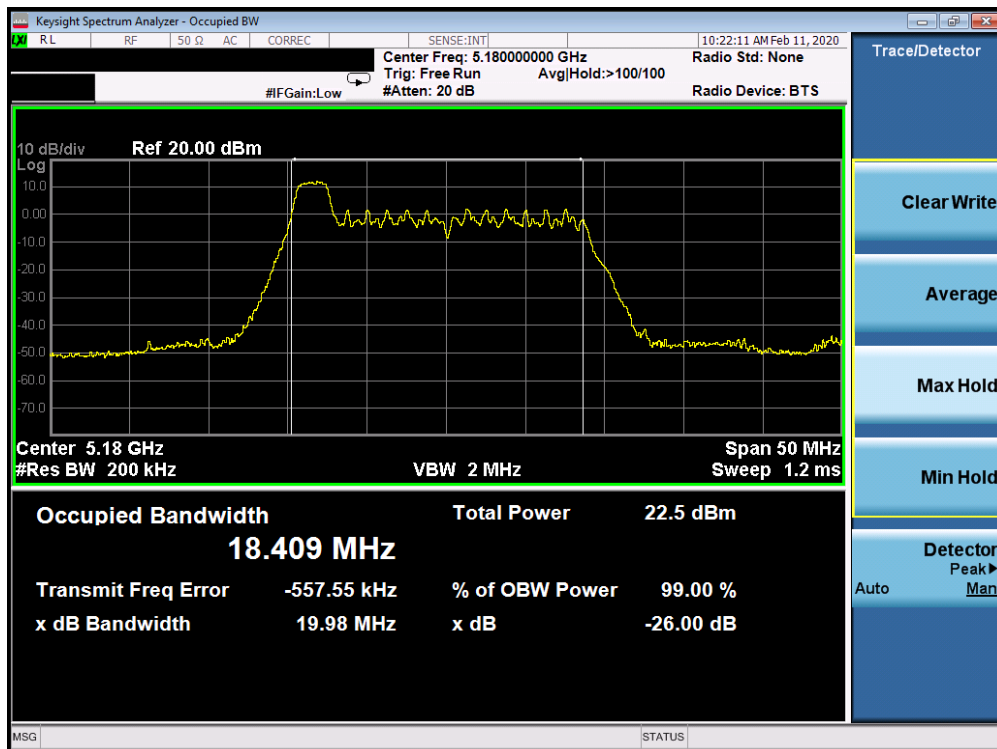
Table 7-2. Conducted Bandwidth Measurements SISO CORE 0 (RU26)

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 14 of 537

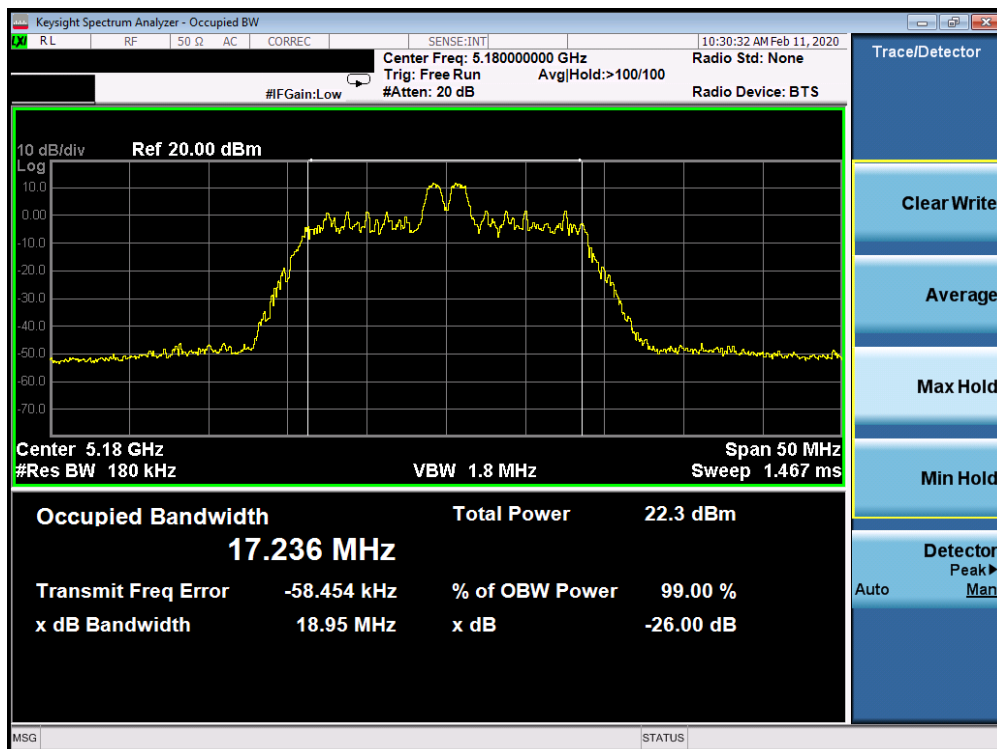
	Frequency [MHz]	Channel No.	802.11 Mode	RU Size	Index	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
Band 1	5180	36	ax (20MHz)	RU242	61	MCS0	20.94
	5200	40	ax (20MHz)	RU242	61	MCS0	20.88
	5240	48	ax (20MHz)	RU242	61	MCS0	20.91
	5190	38	ax (40MHz)	RU484	65	MCS0	39.86
	5230	46	ax (40MHz)	RU484	65	MCS0	40.28
	5210	42	ax (80MHz)	RU996	67	MCS0	80.89
Band 2A	5260	52	ax (20MHz)	RU242	61	MCS0	20.86
	5280	56	ax (20MHz)	RU242	61	MCS0	21.13
	5320	64	ax (20MHz)	RU242	61	MCS0	20.93
	5270	54	ax (40MHz)	RU484	65	MCS0	39.93
	5310	62	ax (40MHz)	RU484	65	MCS0	39.71
	5290	58	ax (80MHz)	RU996	67	MCS0	80.73
Band 2C	5500	100	ax (20MHz)	RU242	61	MCS0	21.03
	5580	116	ax (20MHz)	RU242	61	MCS0	20.98
	5720	144	ax (20MHz)	RU242	61	MCS0	21.02
	5510	102	ax (40MHz)	RU484	65	MCS0	39.84
	5550	110	ax (40MHz)	RU484	65	MCS0	40.07
	5710	142	ax (40MHz)	RU484	65	MCS0	40.08
	5530	106	ax (80MHz)	RU996	67	MCS0	80.94
	5690	138	ax (80MHz)	RU996	67	MCS0	80.82

Table 7-3. Conducted Bandwidth Measurements SISO CORE 0 (Full RU)

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 15 of 537

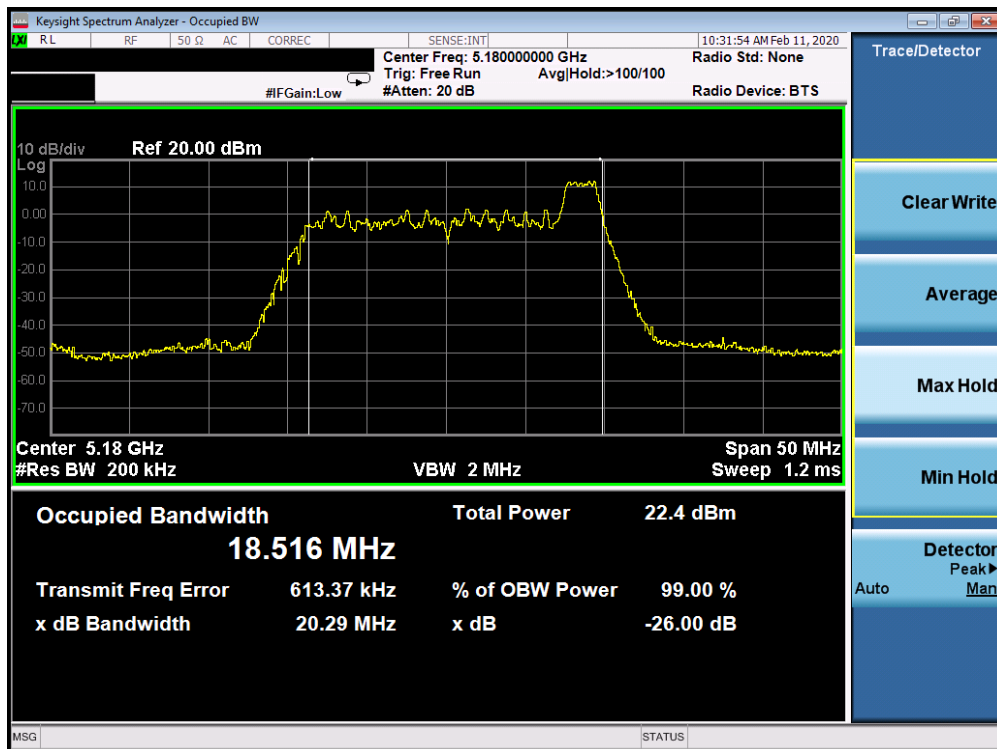


Plot 7-1. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 36)

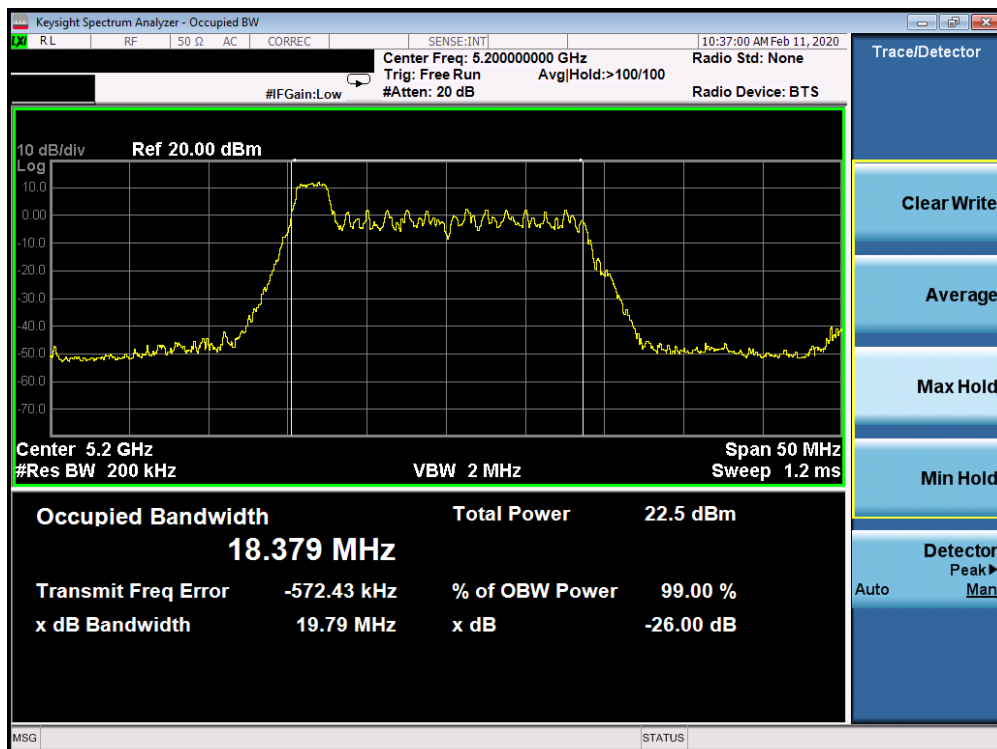


Plot 7-2. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 1) – Ch. 36)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 16 of 537

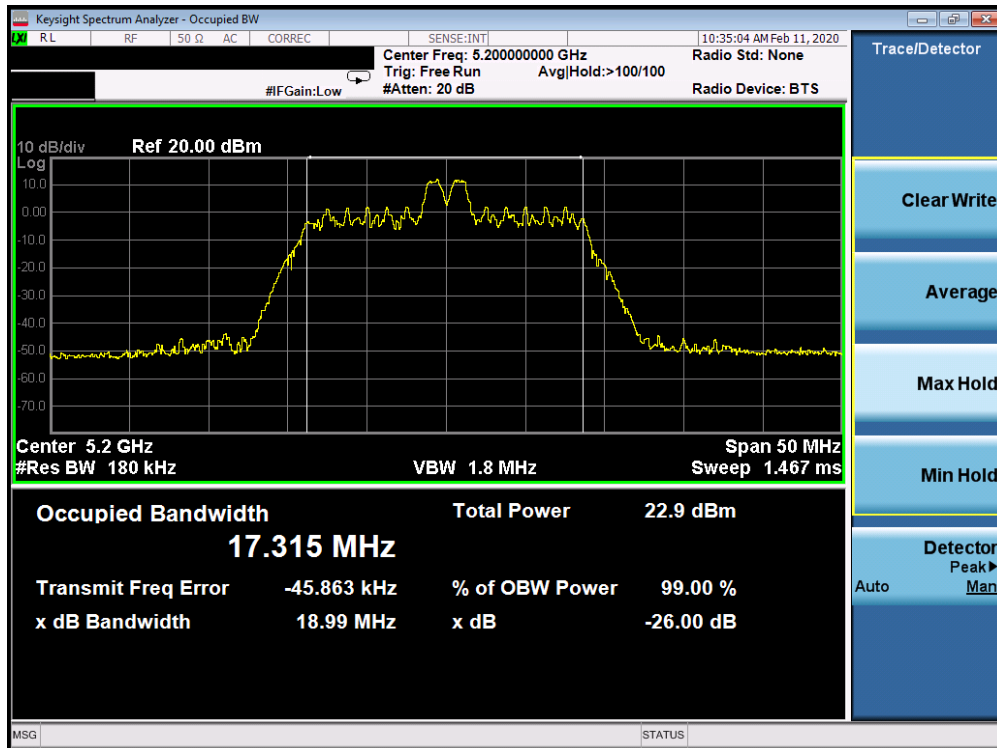


Plot 7-3. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 36)

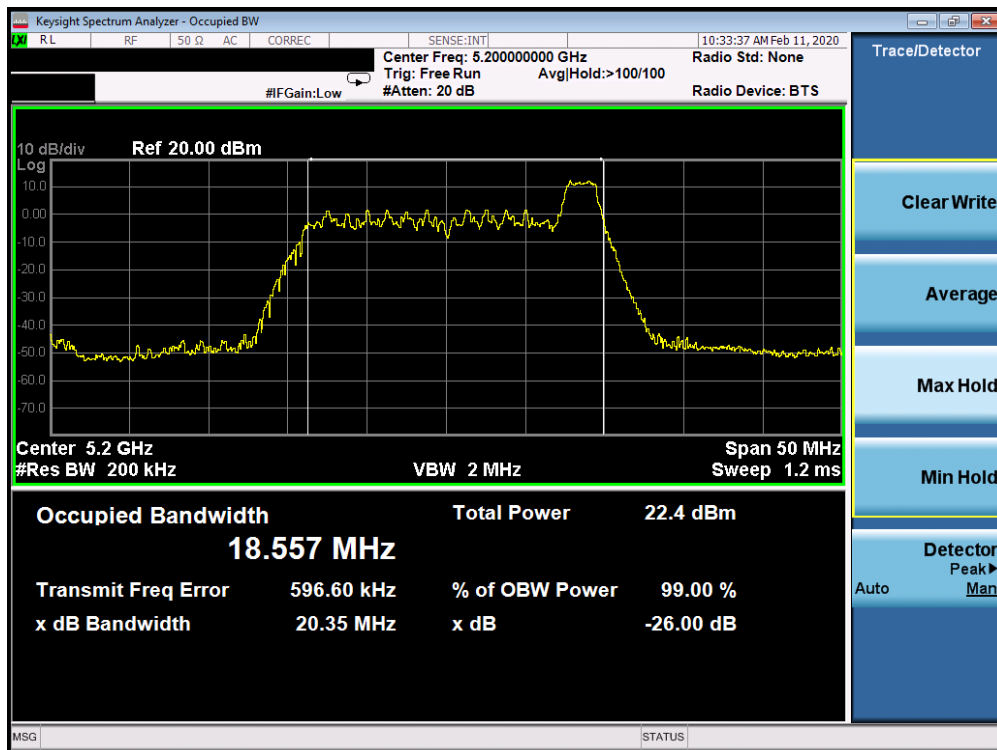


Plot 7-4. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 40)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 17 of 537

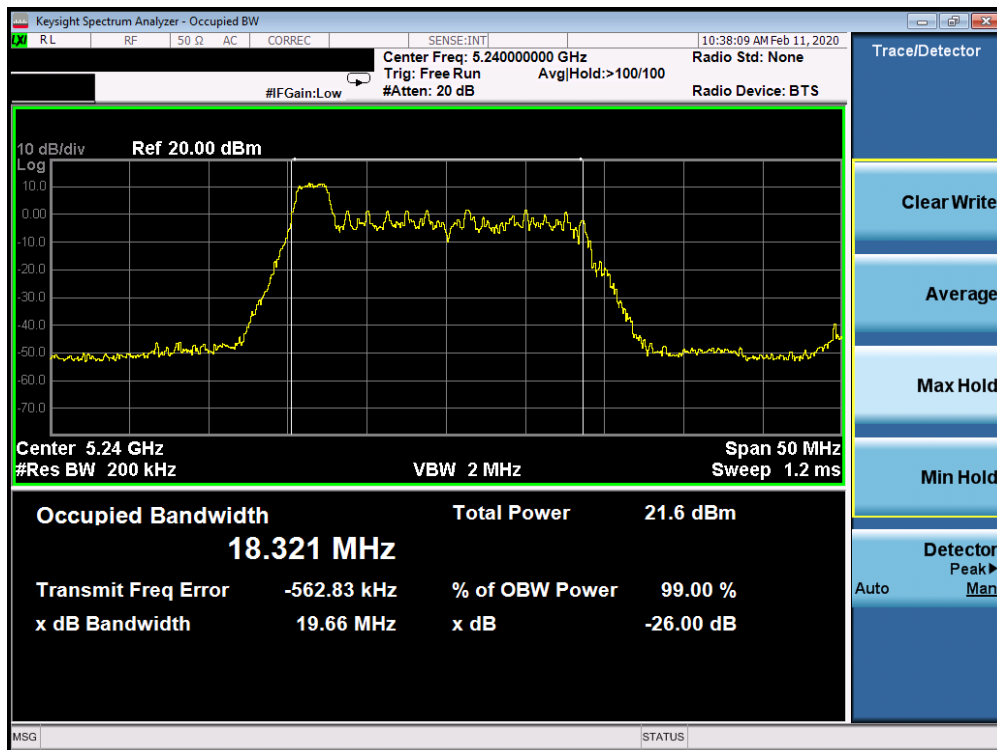


Plot 7-5. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 1) – Ch. 40)

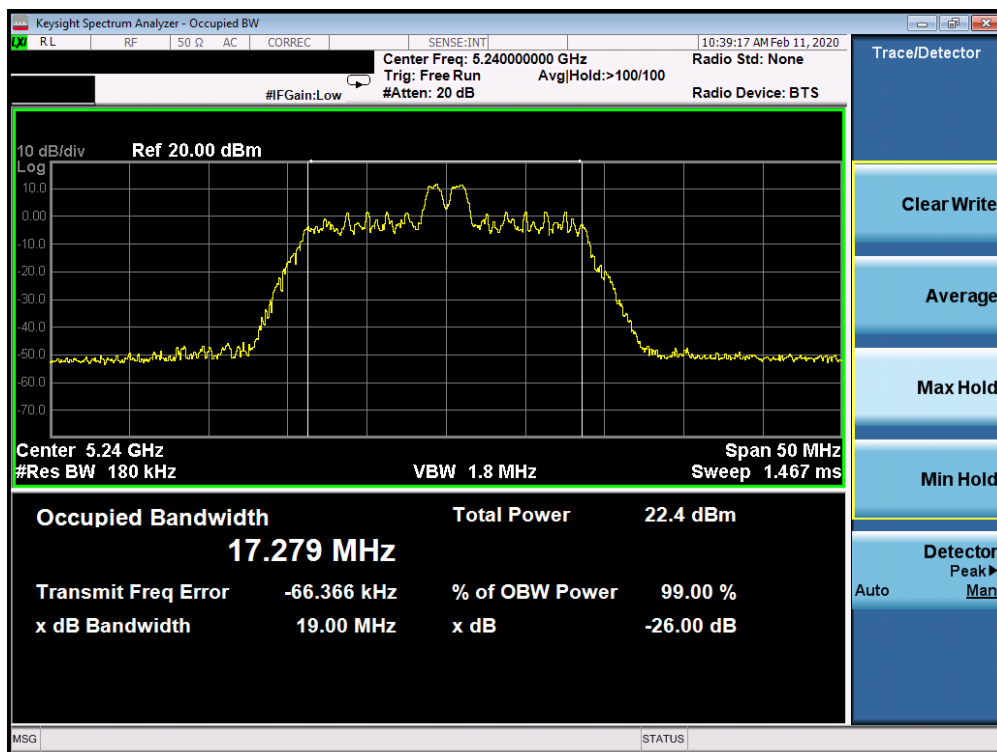


Plot 7-6. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8– RU26 (UNII Band 1) – Ch. 40)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 18 of 537

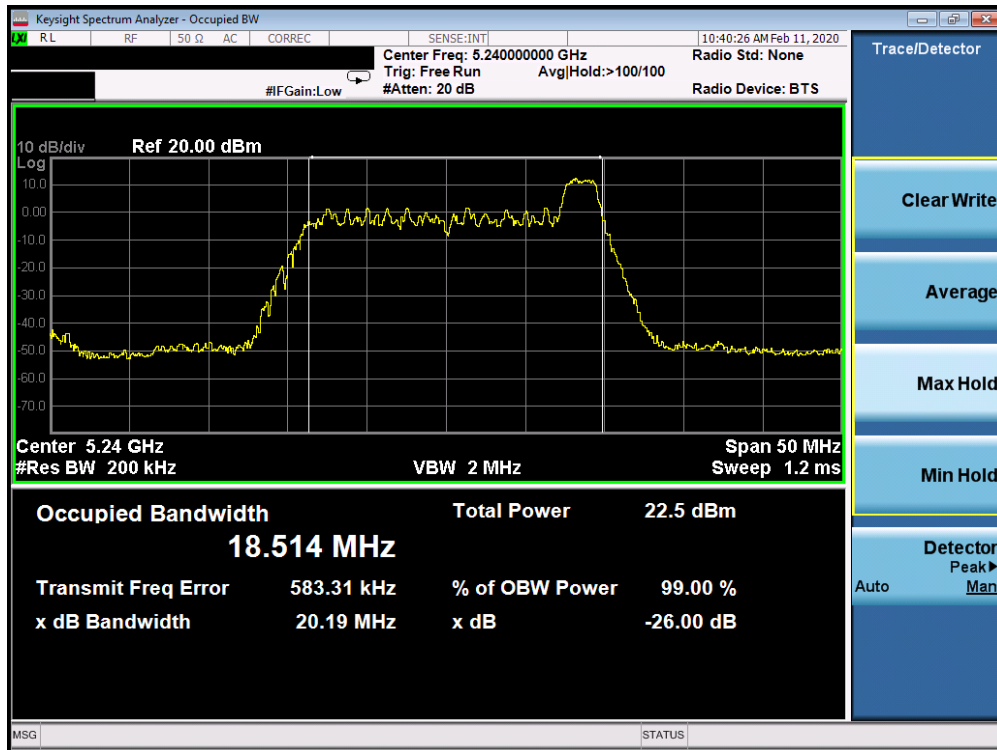


Plot 7-7. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 48)

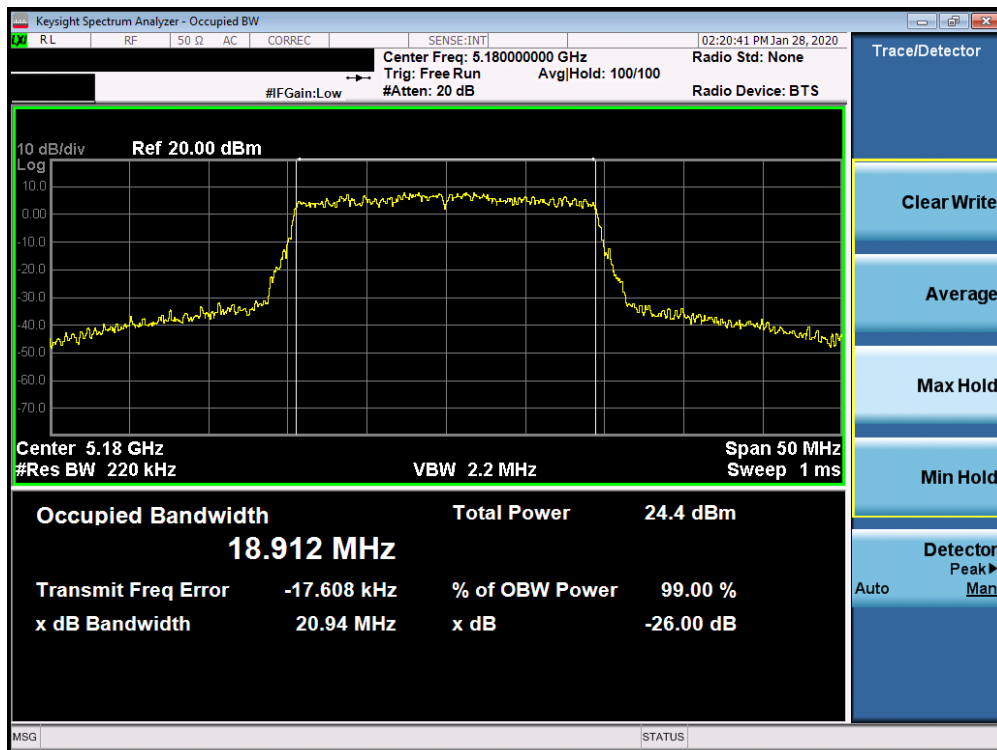


Plot 7-8. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 1) – Ch. 48)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 19 of 537

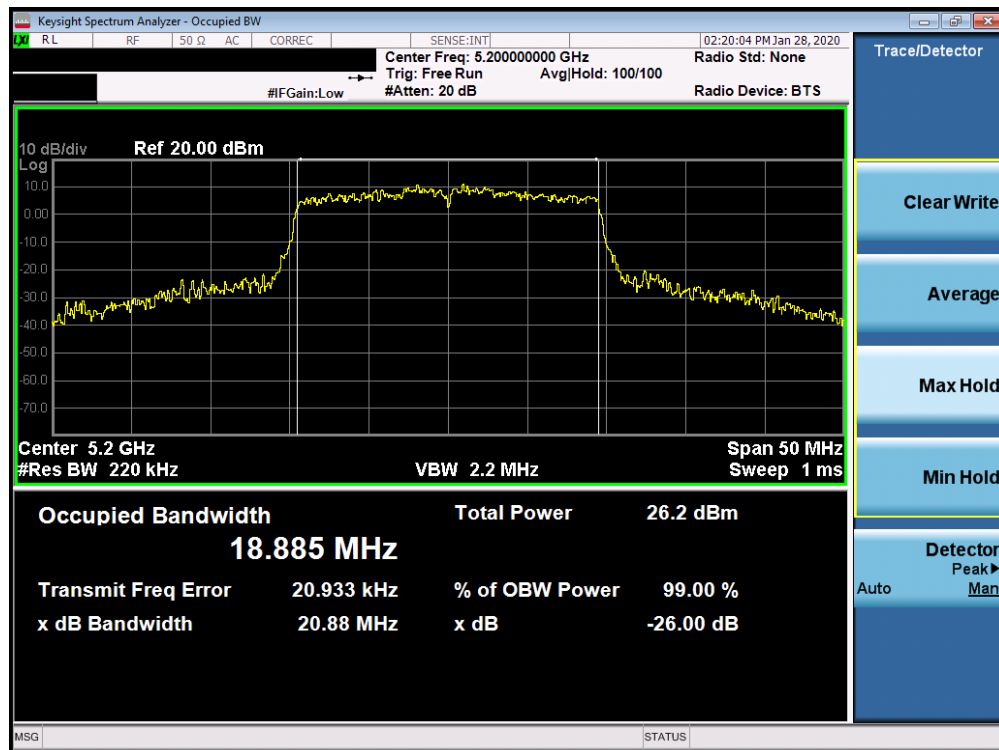


Plot 7-9. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 48)



Plot 7-10. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax– RU242 (UNII Band 1) – Ch. 36)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 20 of 537

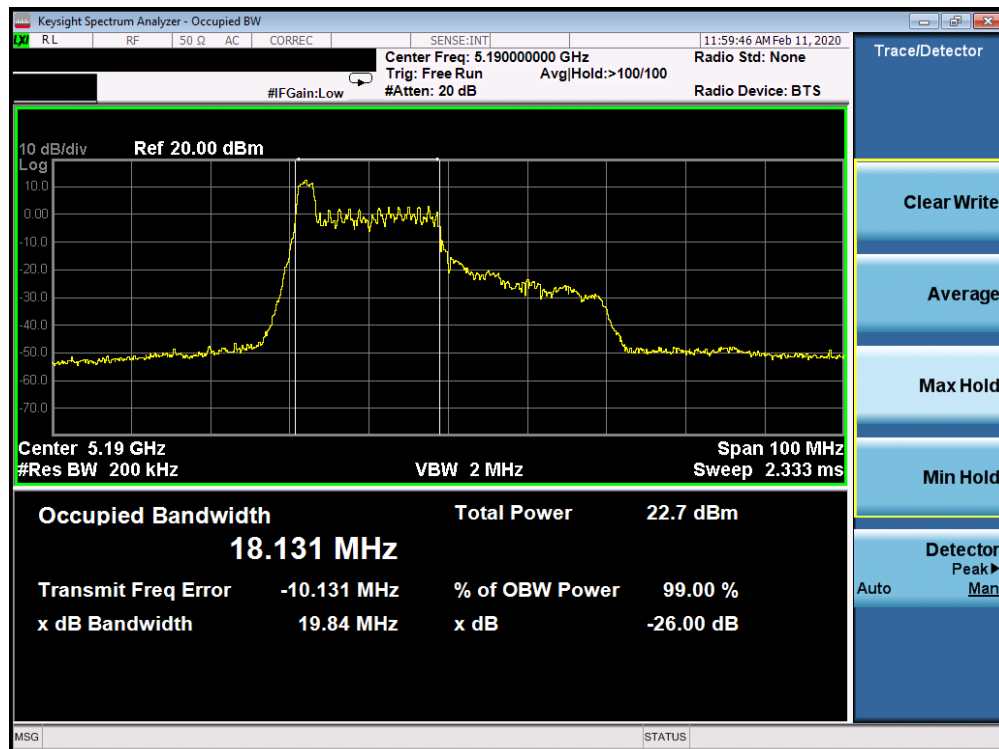


Plot 7-11. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax- RU242 (UNII Band 1) – Ch. 40)

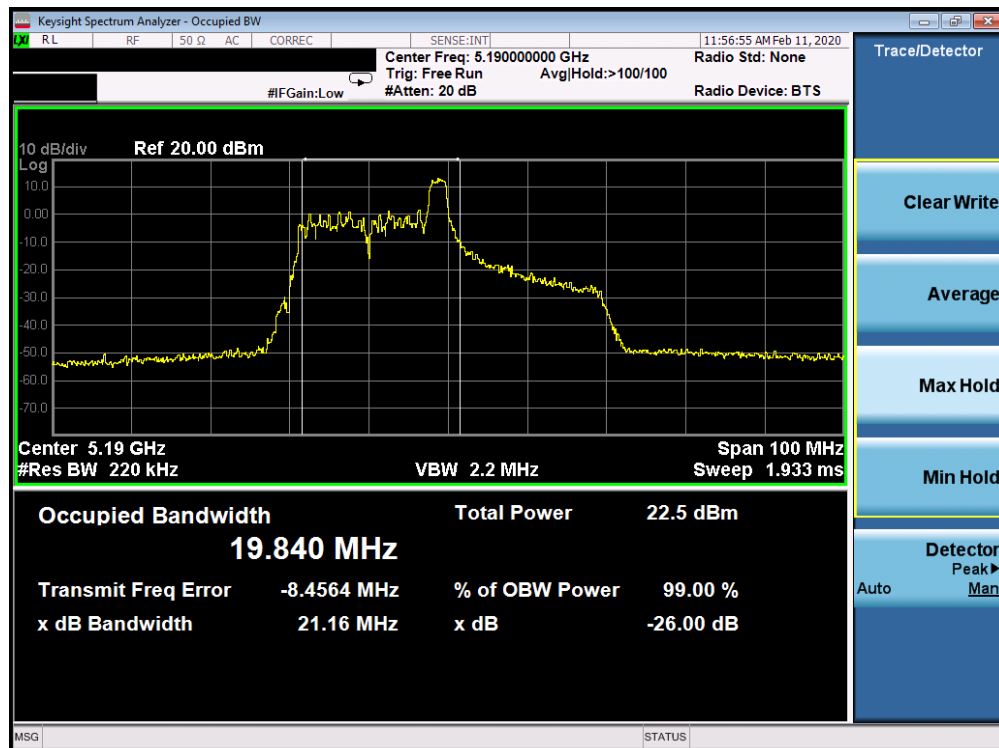


Plot 7-12. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax- RU242 (UNII Band 1) – Ch. 48)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 21 of 537

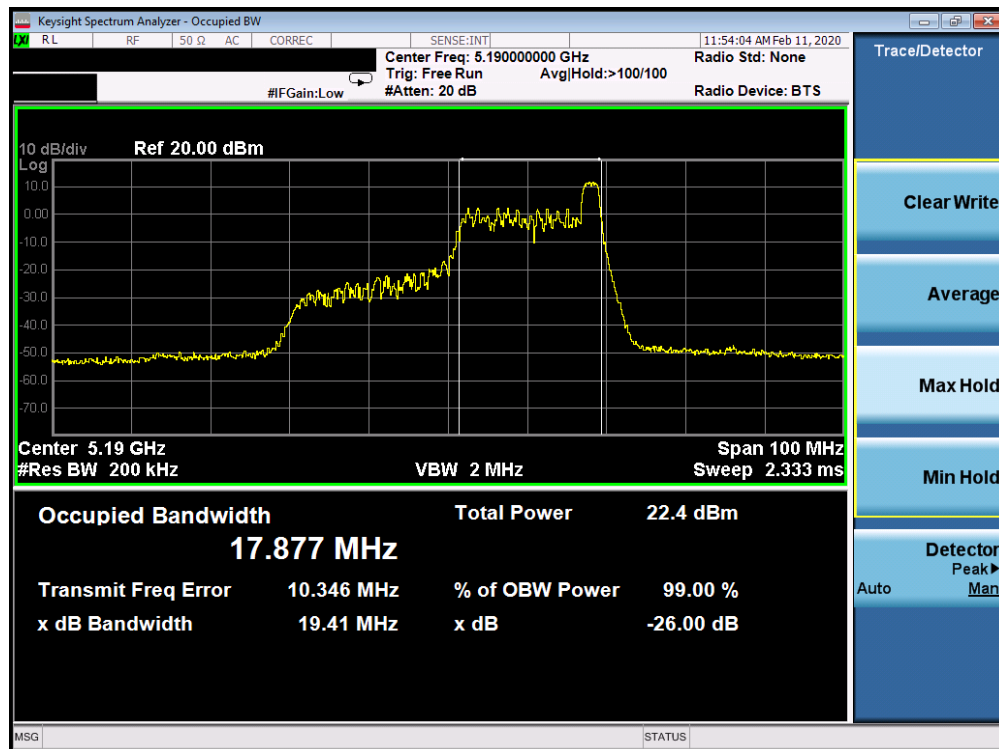


Plot 7-13. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 38)

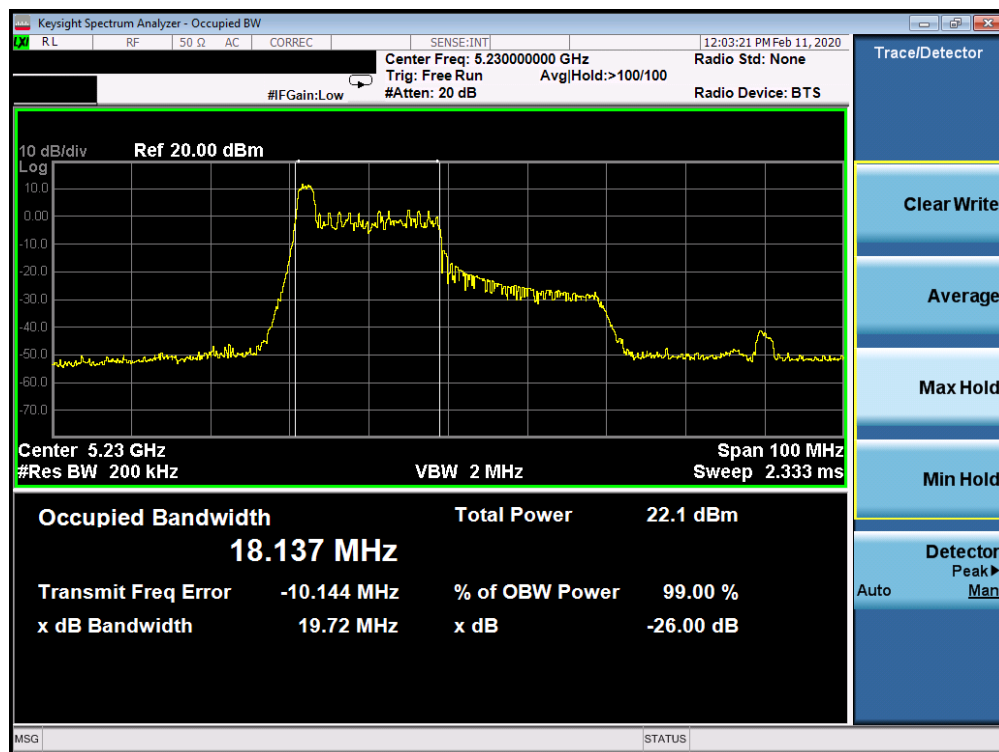


Plot 7-14. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 38)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 22 of 537

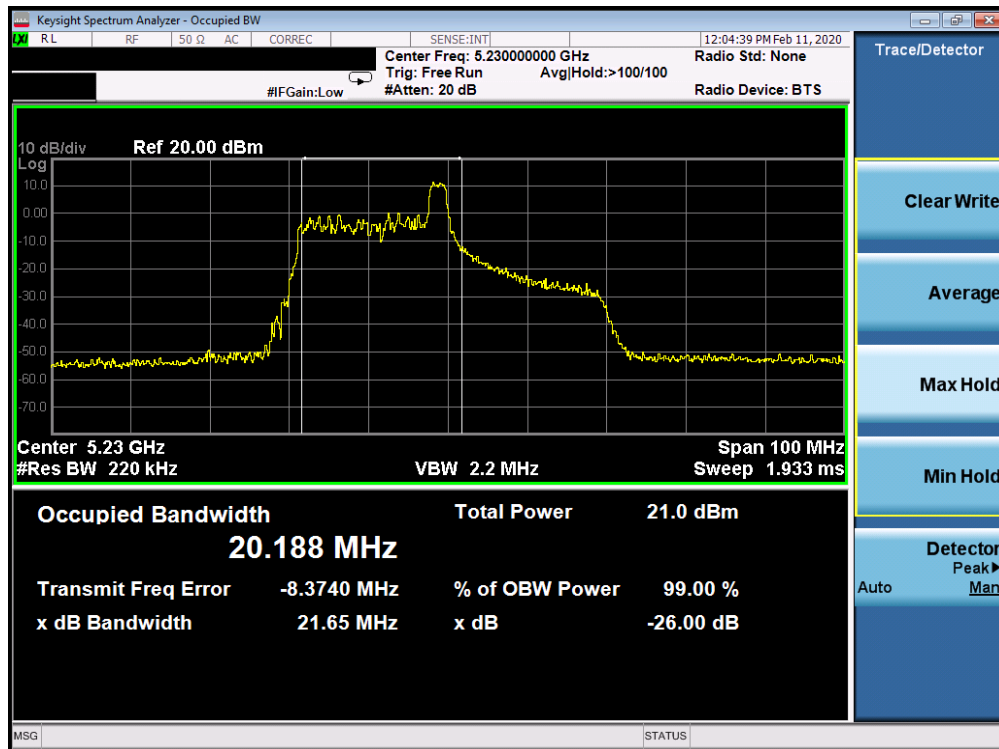


Plot 7-15. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 1) – Ch. 38)

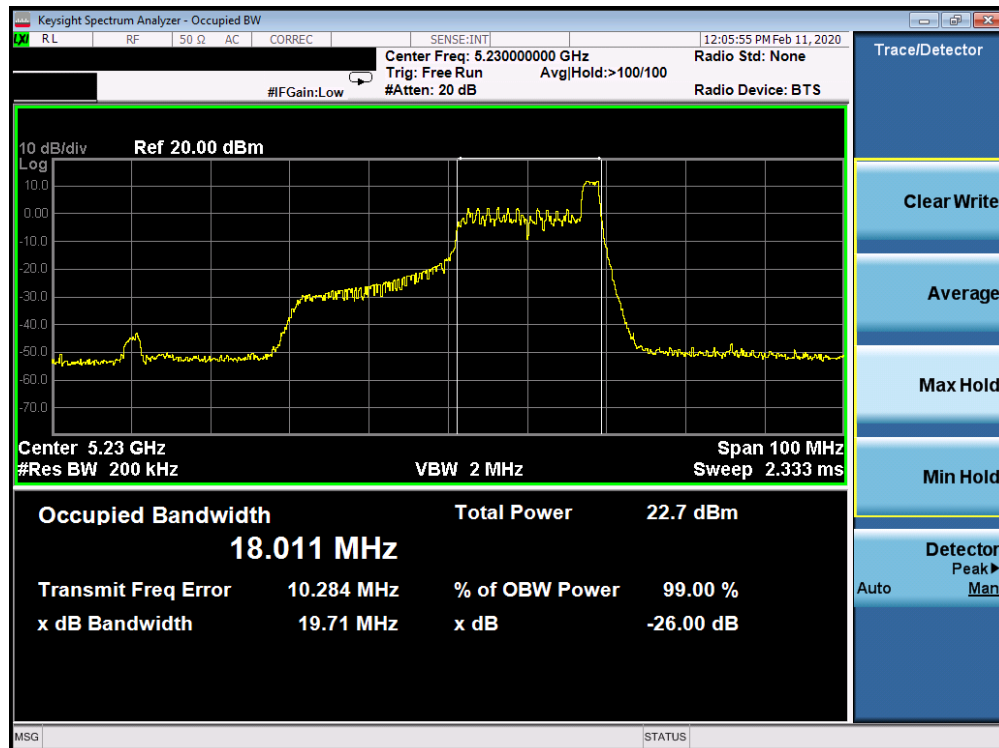


Plot 7-16. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 46)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 23 of 537

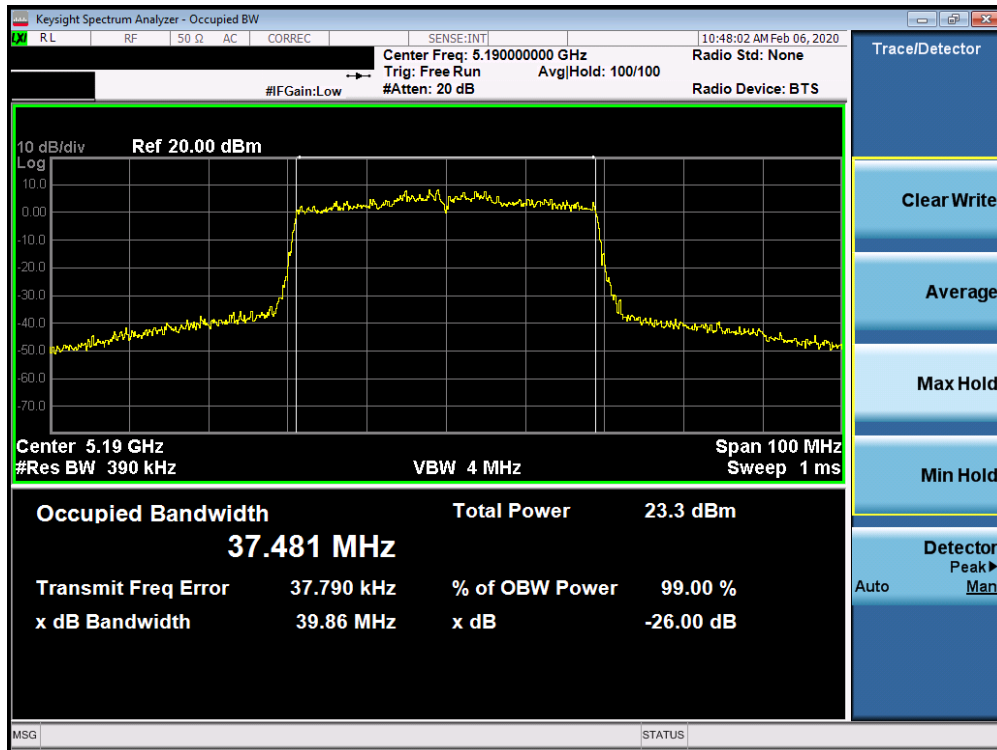


Plot 7-17. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 46)

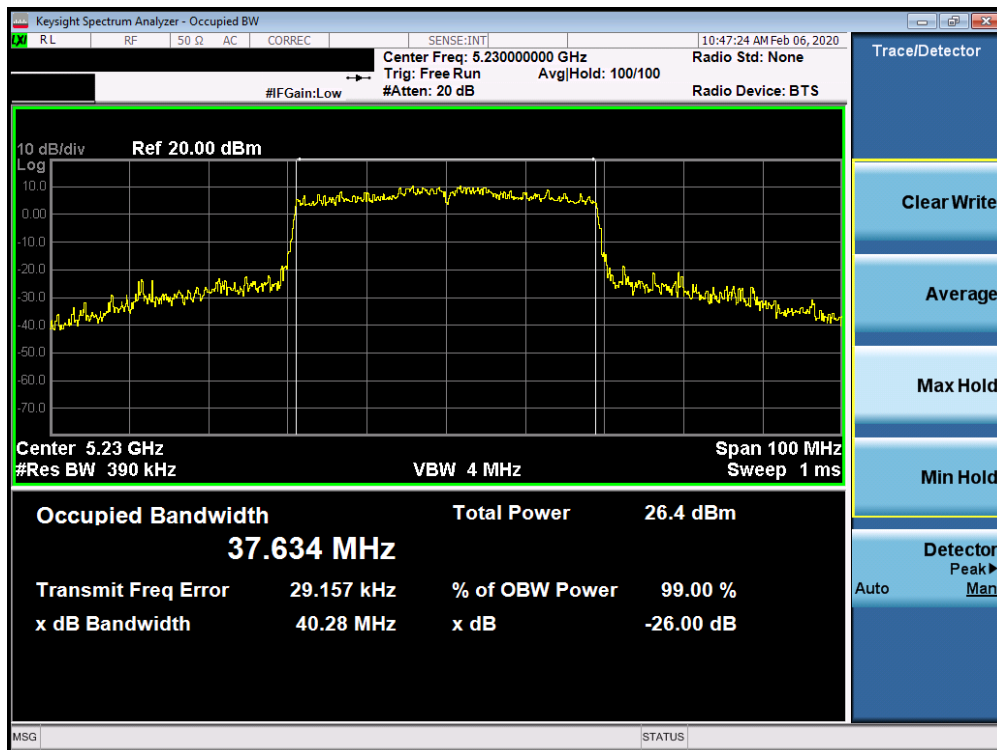


Plot 7-18. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 1) – Ch. 46)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 24 of 537

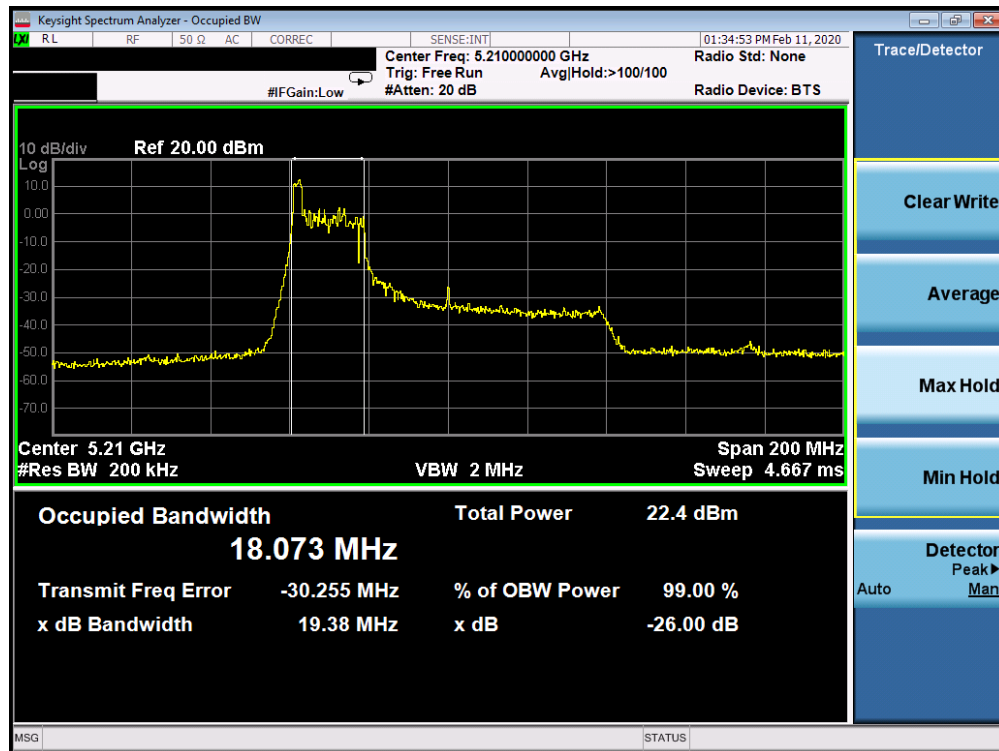


Plot 7-19. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax – RU484 (UNII Band 1) – Ch. 38)

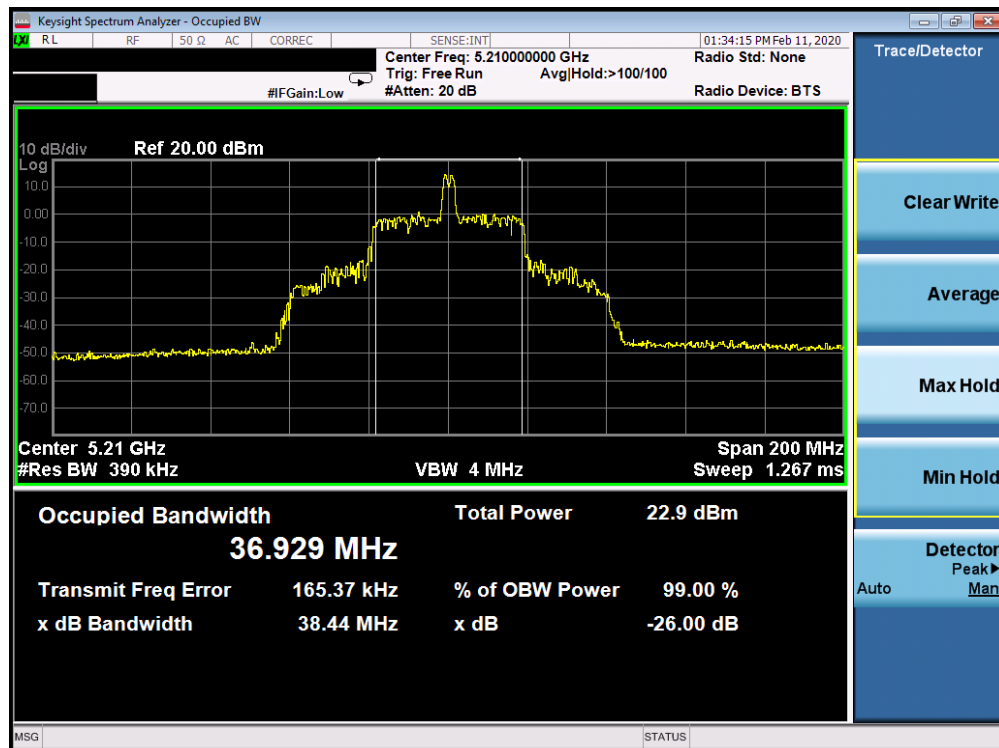


Plot 7-20. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax – RU484 (UNII Band 1) – Ch. 46)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 25 of 537

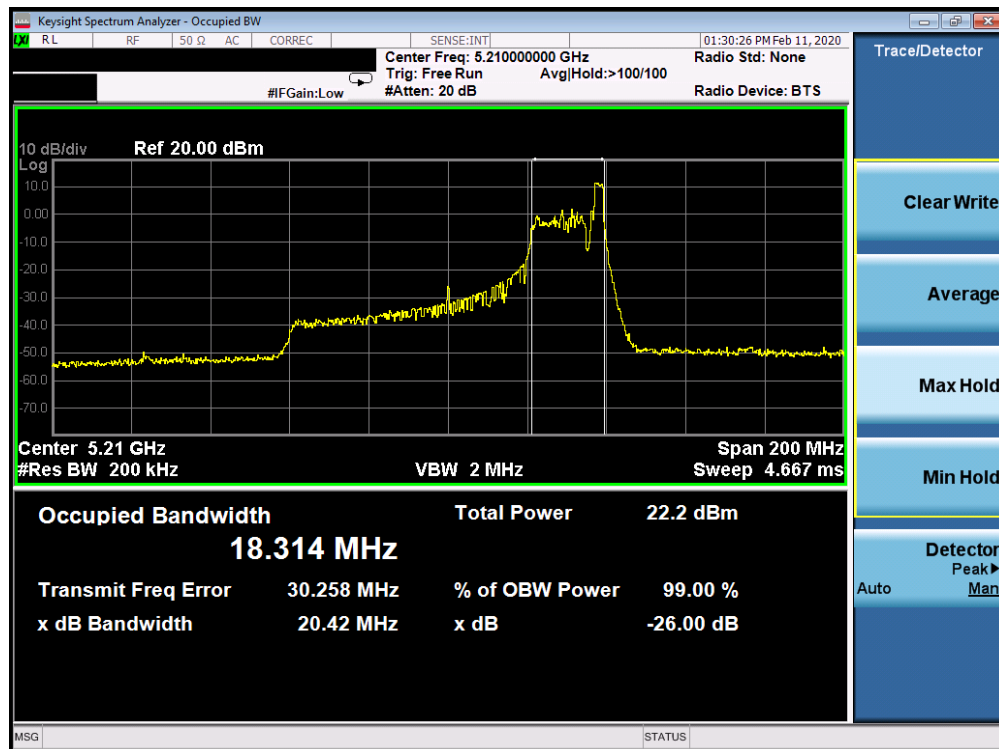


Plot 7-21. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 42)

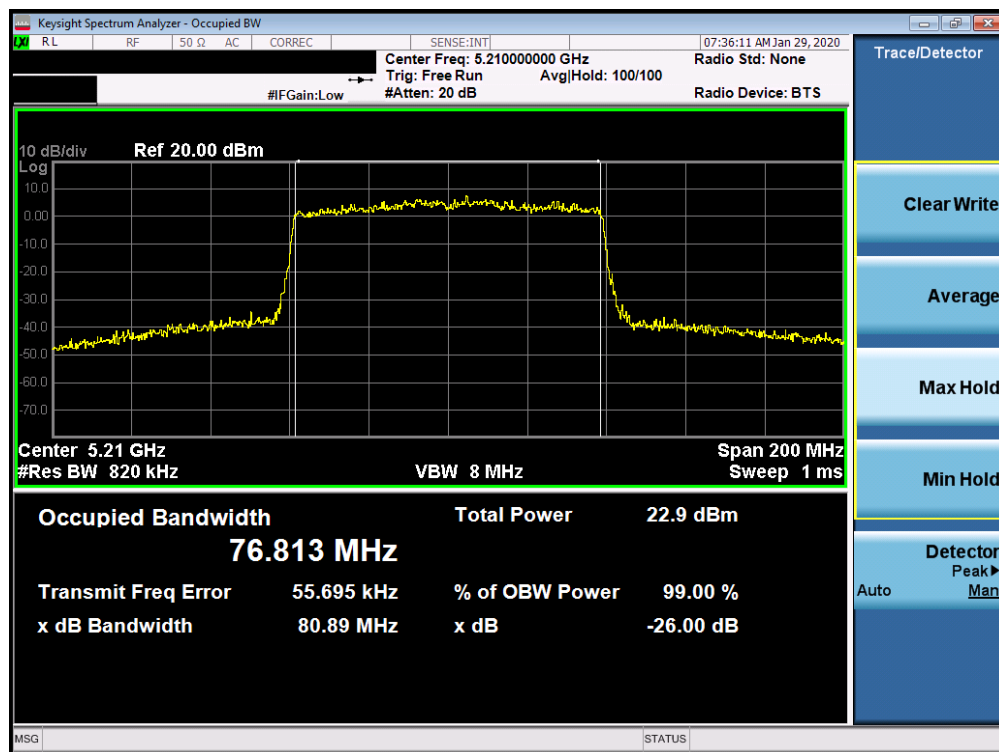


Plot 7-22. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 18 – RU26 (UNII Band 1) – Ch. 42)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 26 of 537

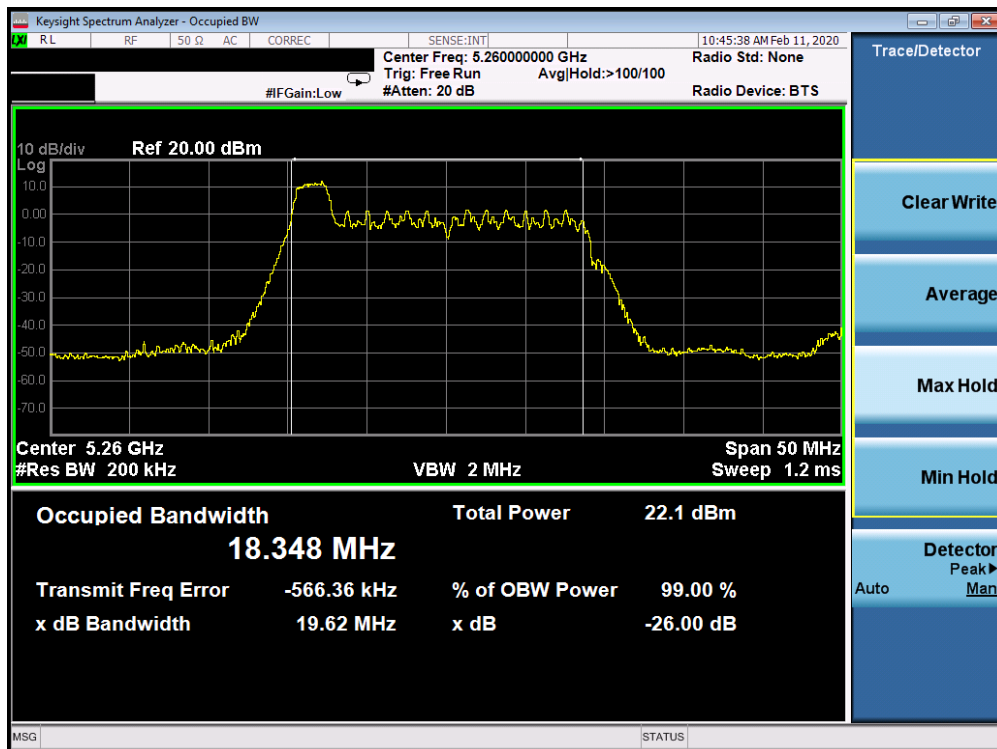


Plot 7-23. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 36 – RU26 (UNII Band 1) – Ch. 42)

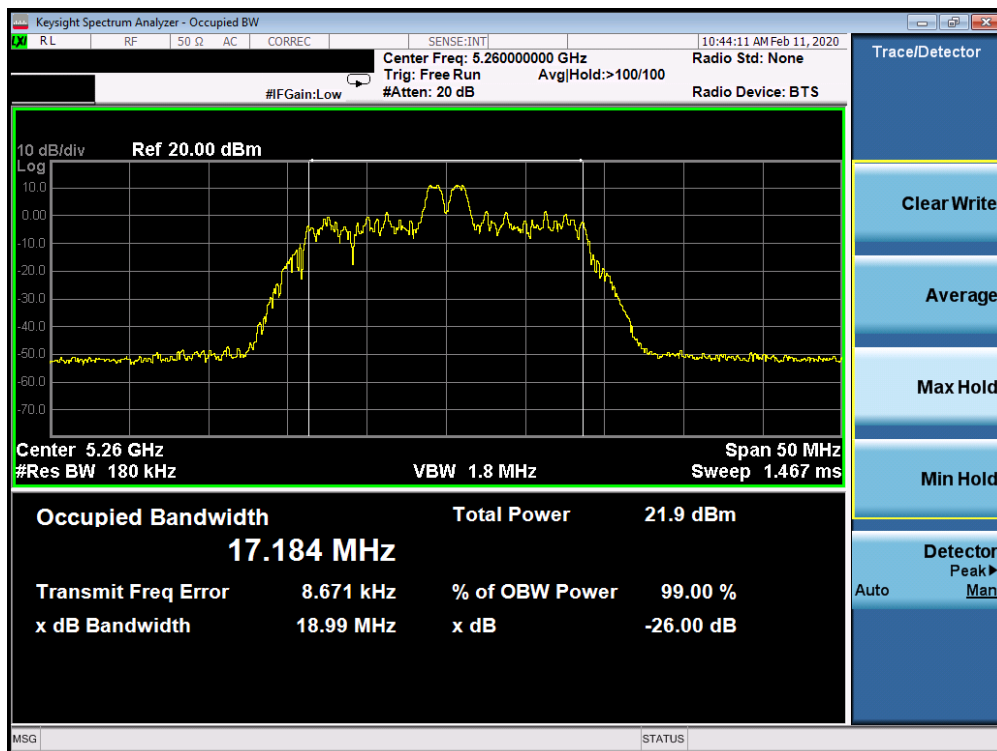


Plot 7-24. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax – RU996 (UNII Band 1) – Ch. 42)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 27 of 537

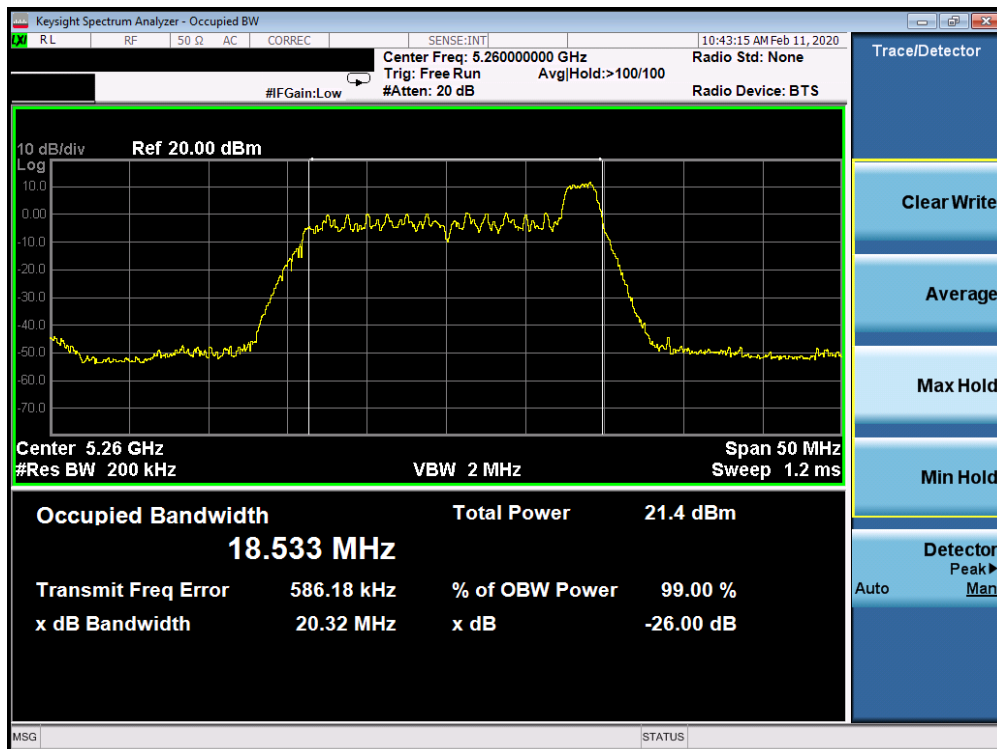


Plot 7-25. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 52)

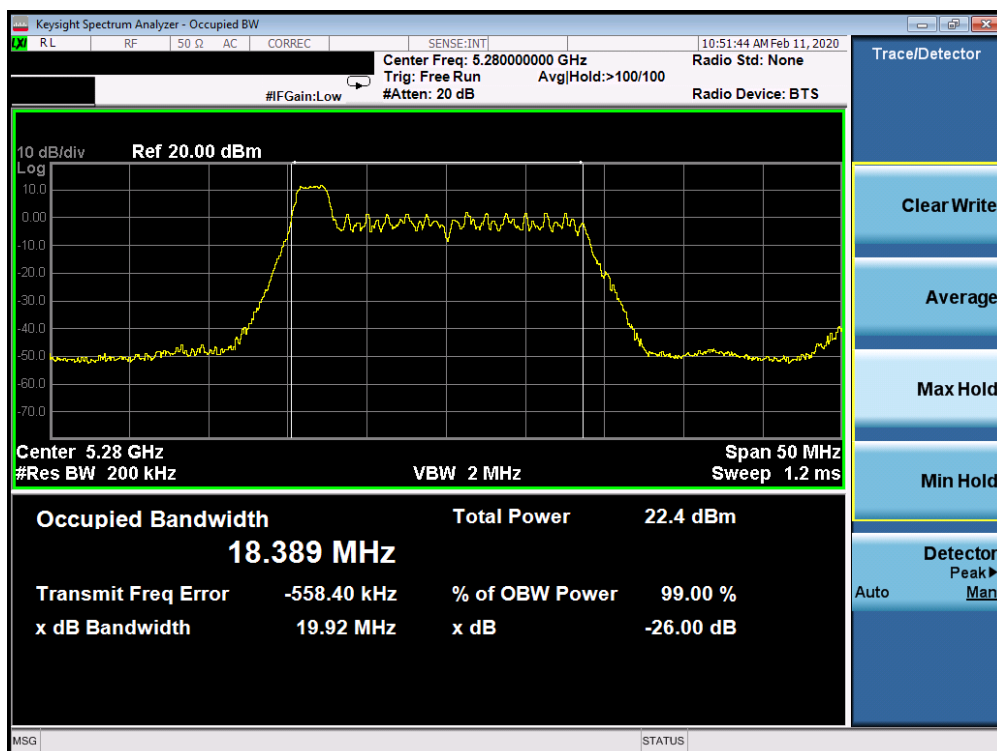


Plot 7-26. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2A) – Ch. 52)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 28 of 537

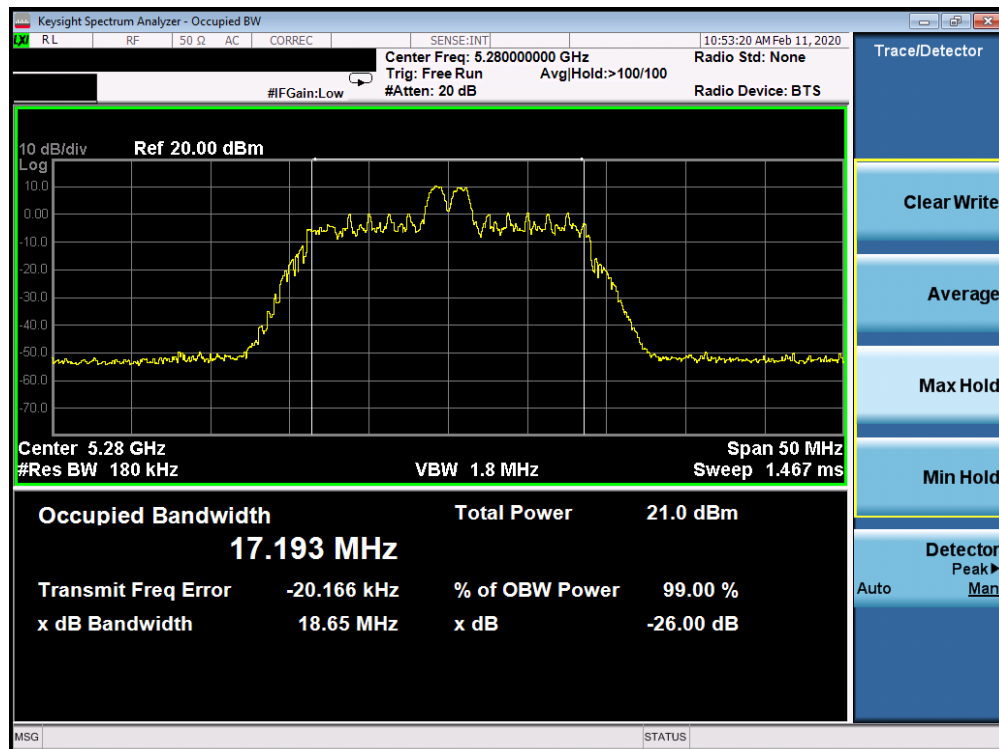


Plot 7-27. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 2A) – Ch. 52)

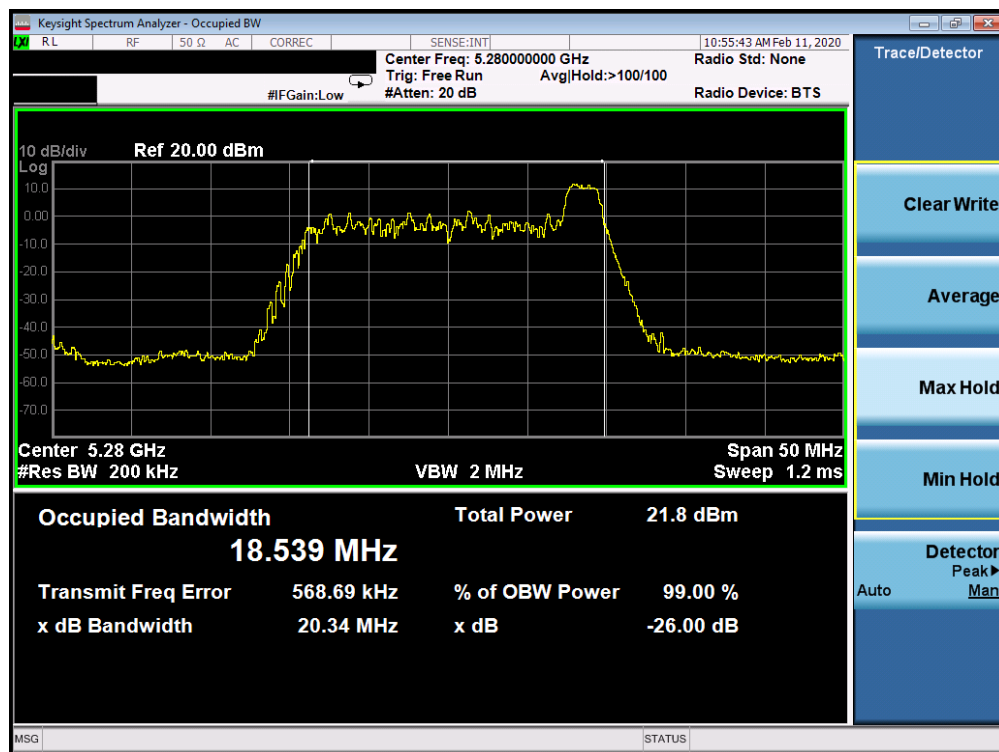


Plot 7-28. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 56)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 29 of 537

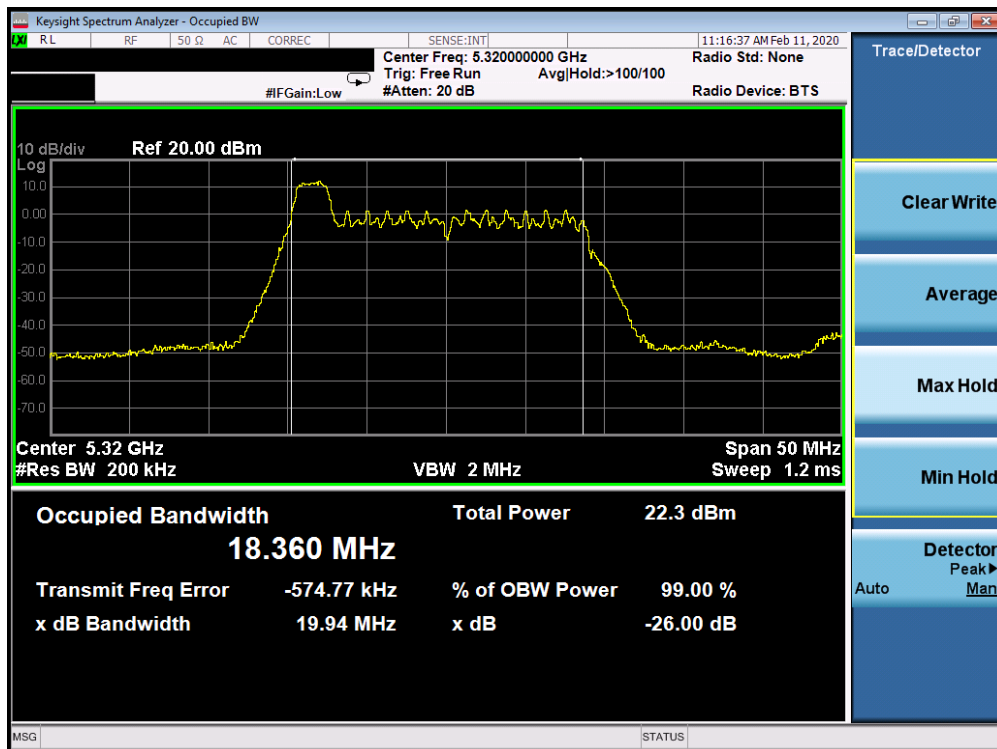


Plot 7-29. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2A) – Ch. 56)

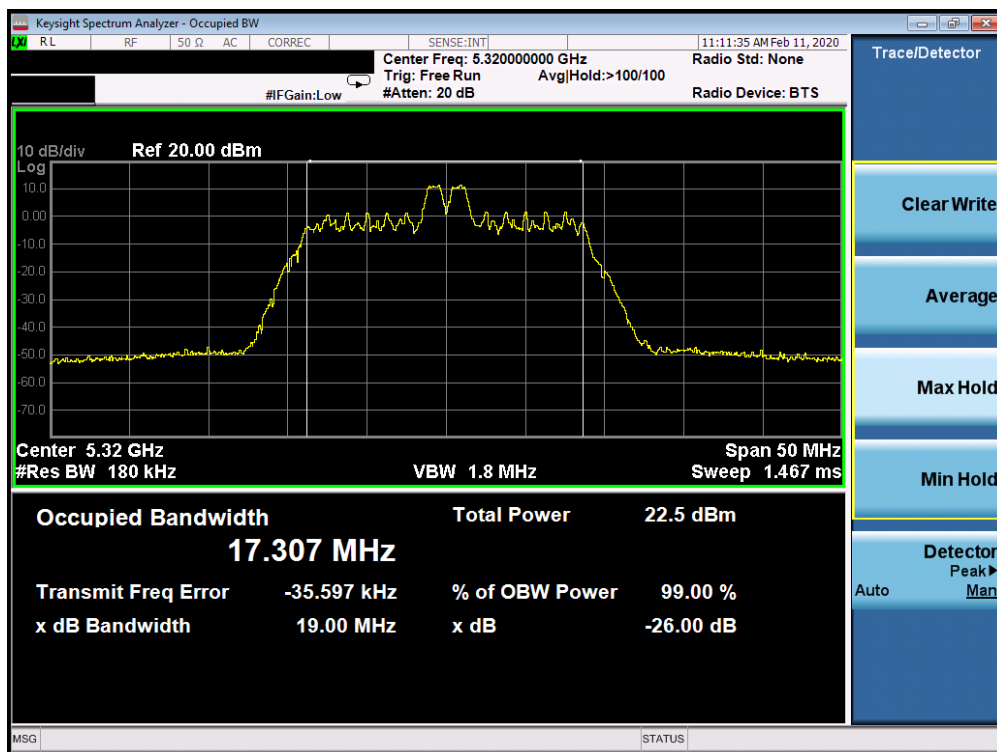


Plot 7-30. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8– RU26 (UNII Band 2A) – Ch. 56)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 30 of 537

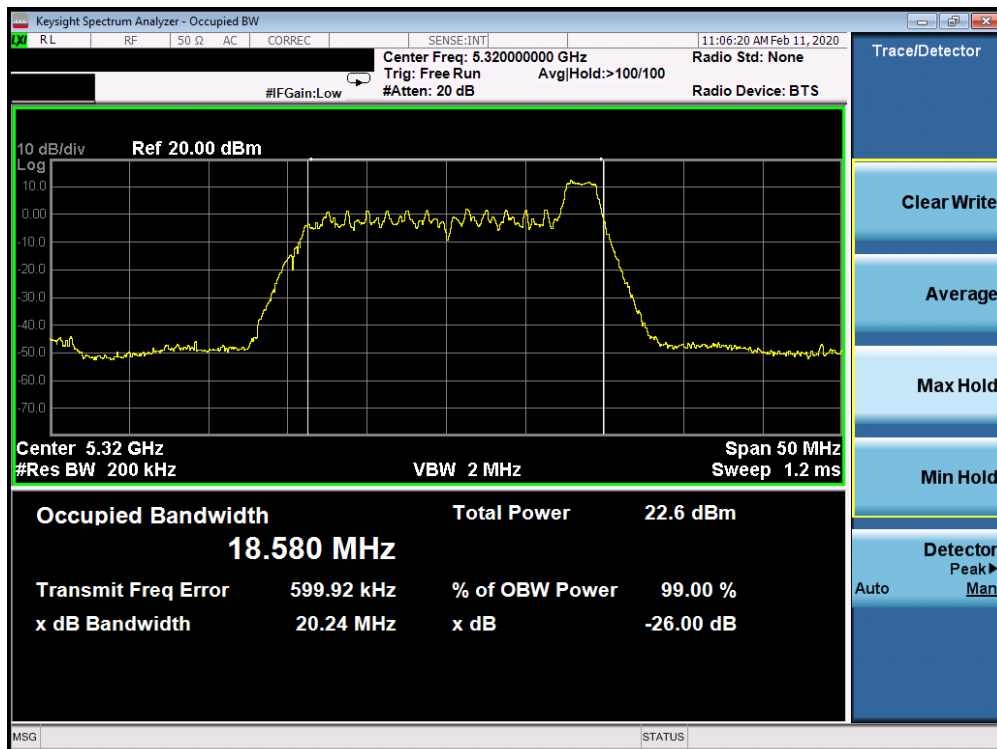


Plot 7-31. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 64)

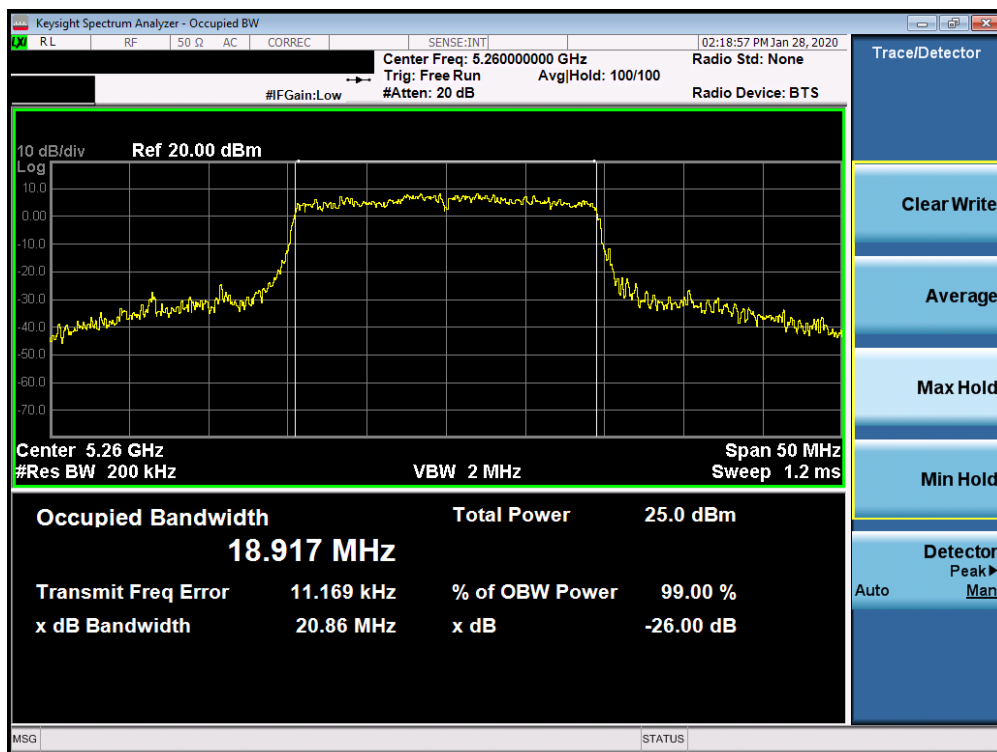


Plot 7-32. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2A) – Ch. 64)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 31 of 537

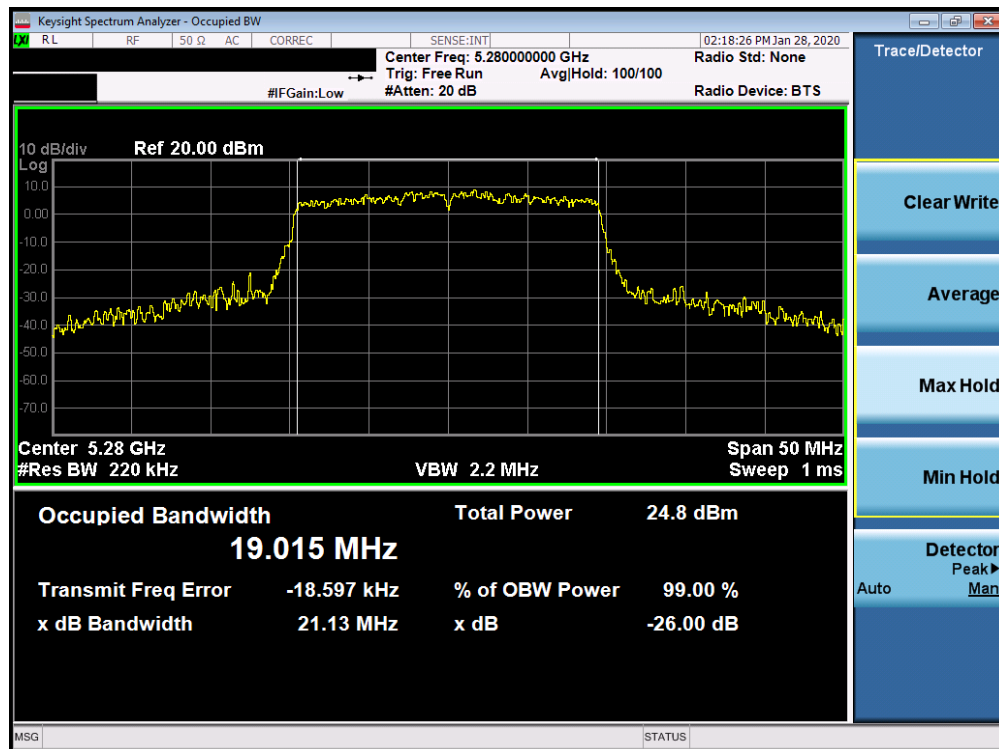


Plot 7-33. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 2A) – Ch. 64)

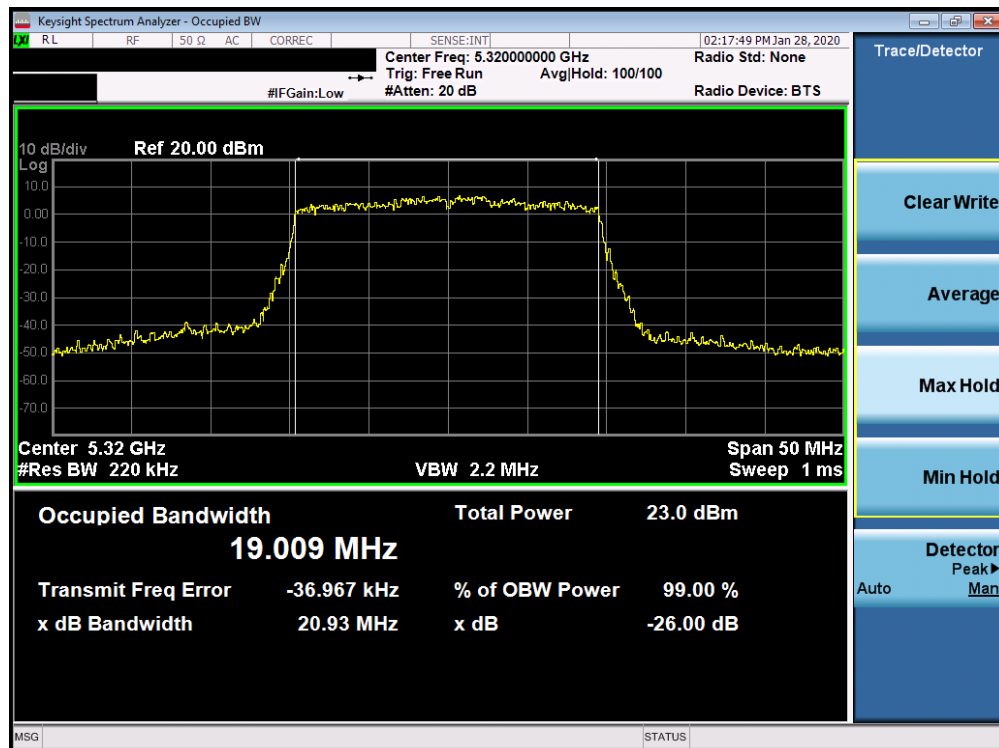


Plot 7-34. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax– RU242 (UNII Band 2A) – Ch. 52)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 32 of 537

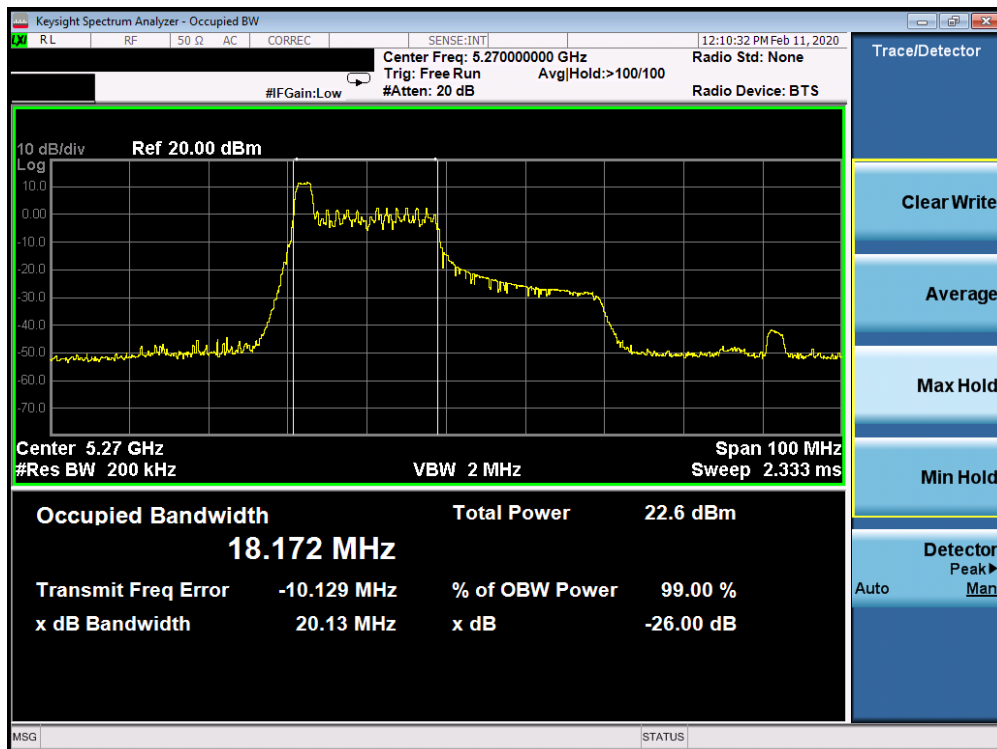


Plot 7-35. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax– RU242 (UNII Band 2A) – Ch. 56)

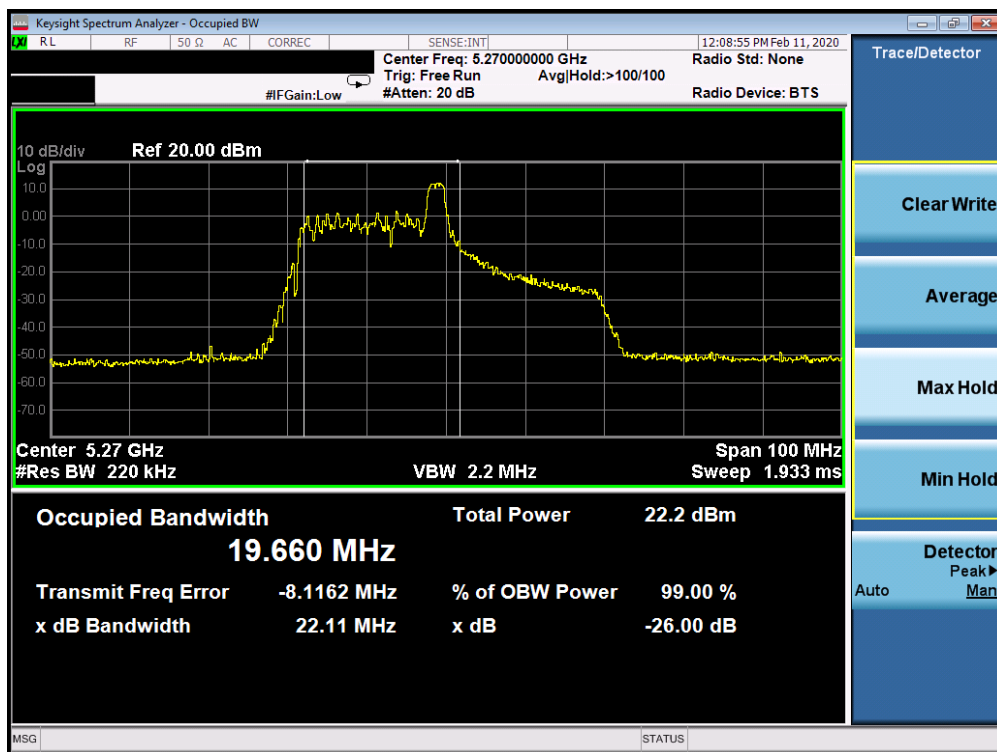


Plot 7-36. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax– RU242 (UNII Band 2A) – Ch. 64)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 33 of 537

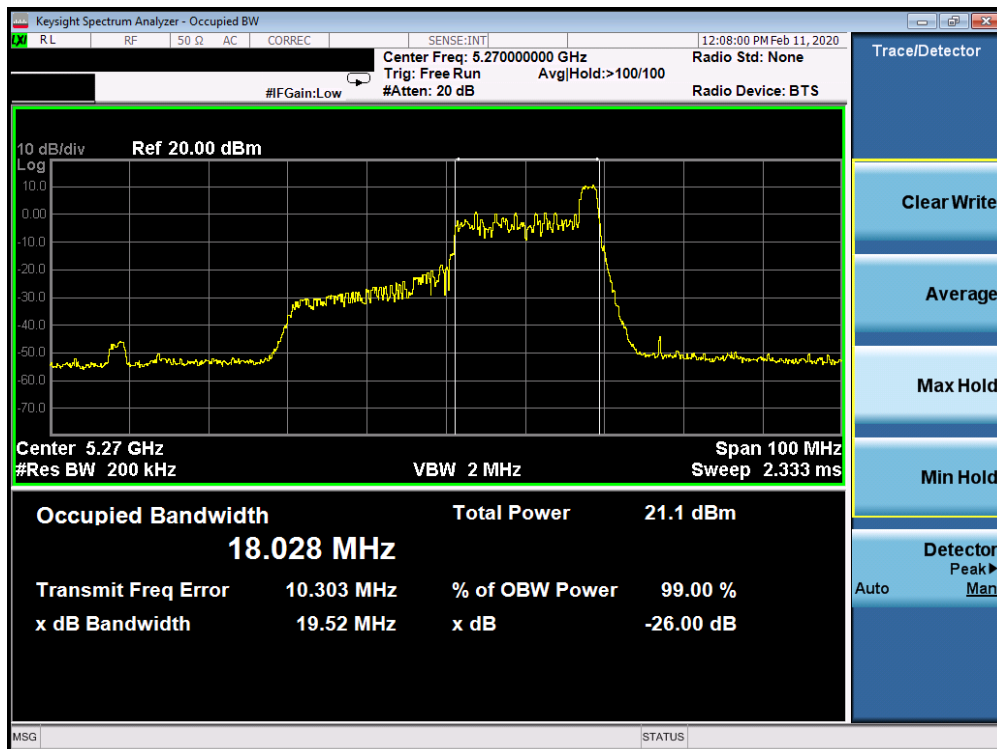


Plot 7-37. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 54)

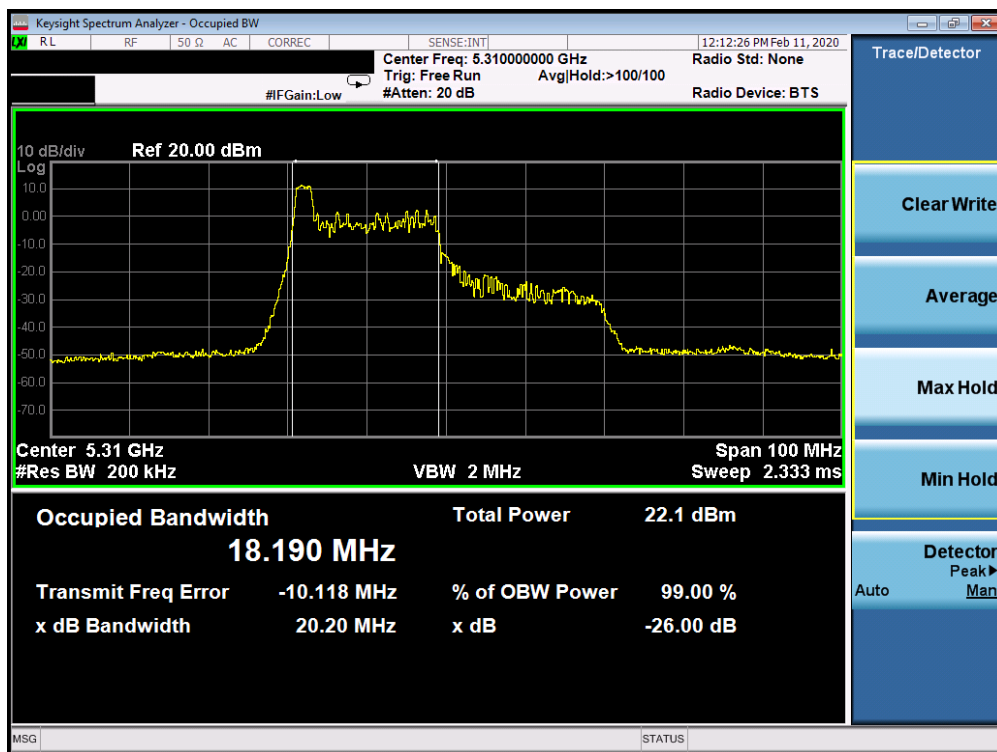


Plot 7-38. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 2A) – Ch. 54)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 34 of 537

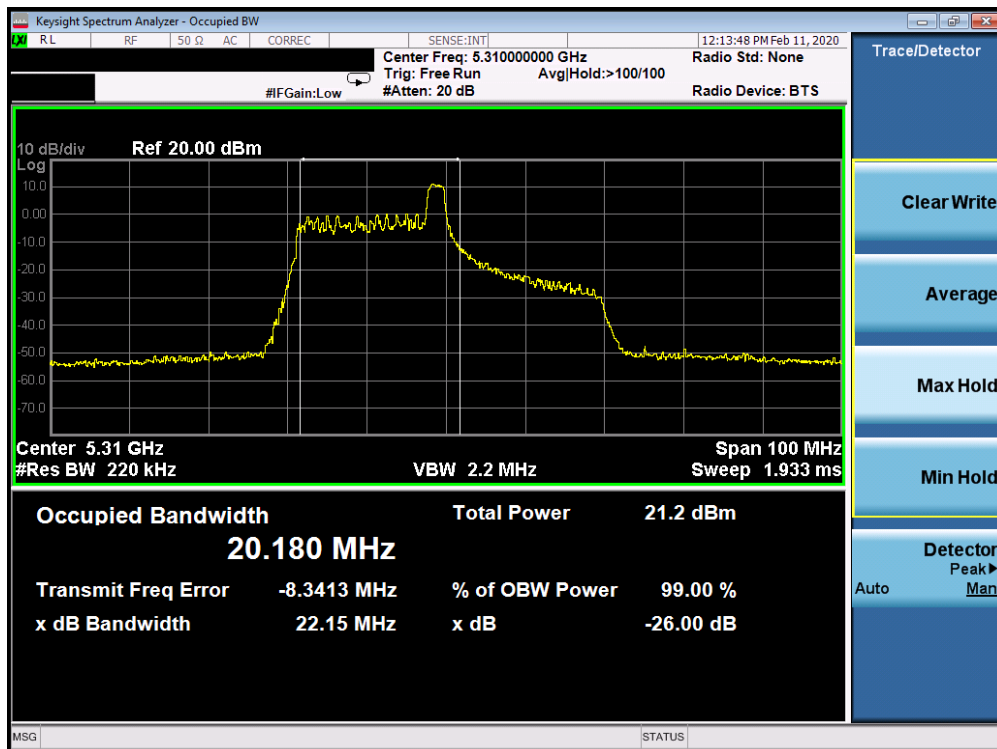


Plot 7-39. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 2A) – Ch. 54)

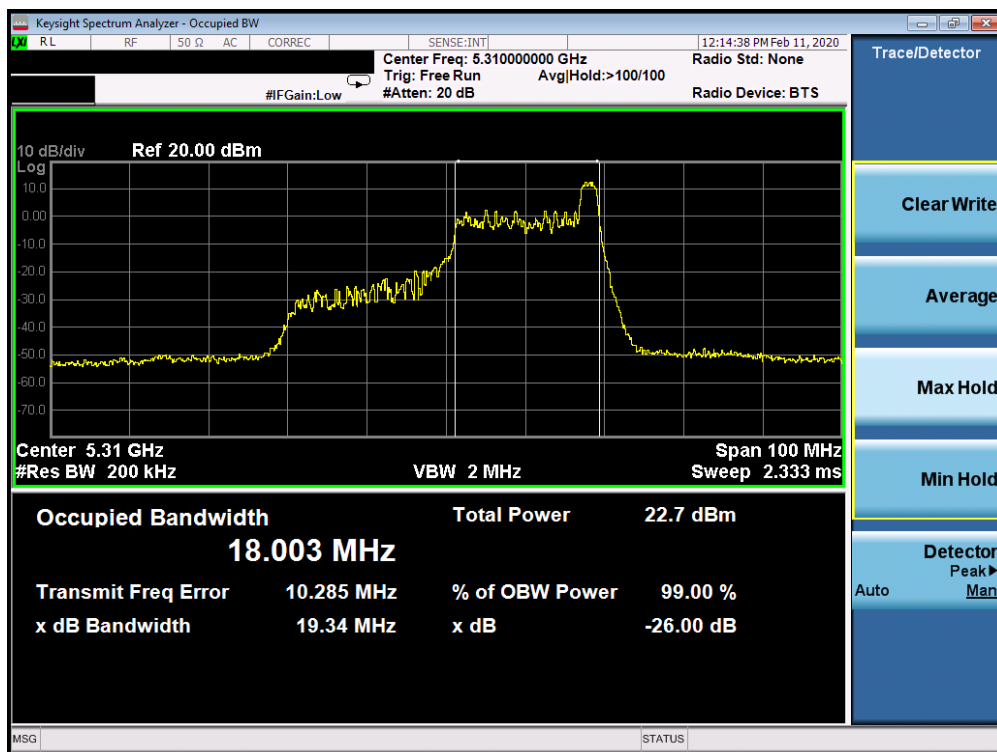


Plot 7-40. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 62)

FCC ID: BCGA2228	PCTEST		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device		Page 35 of 537

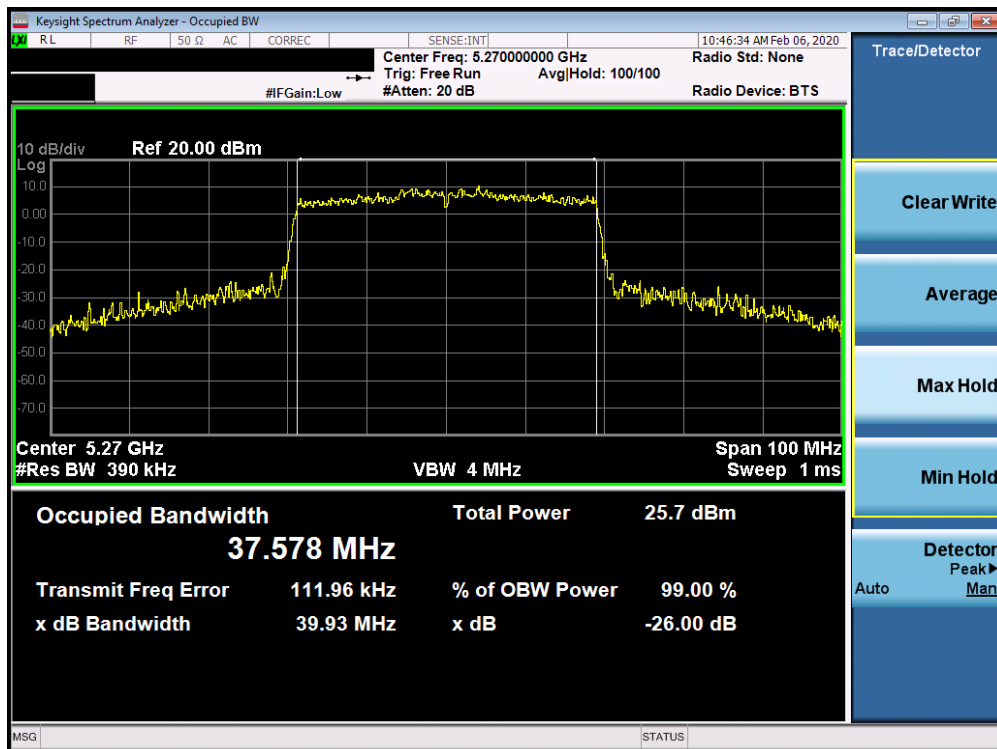


Plot 7-41. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 2A) – Ch. 62)

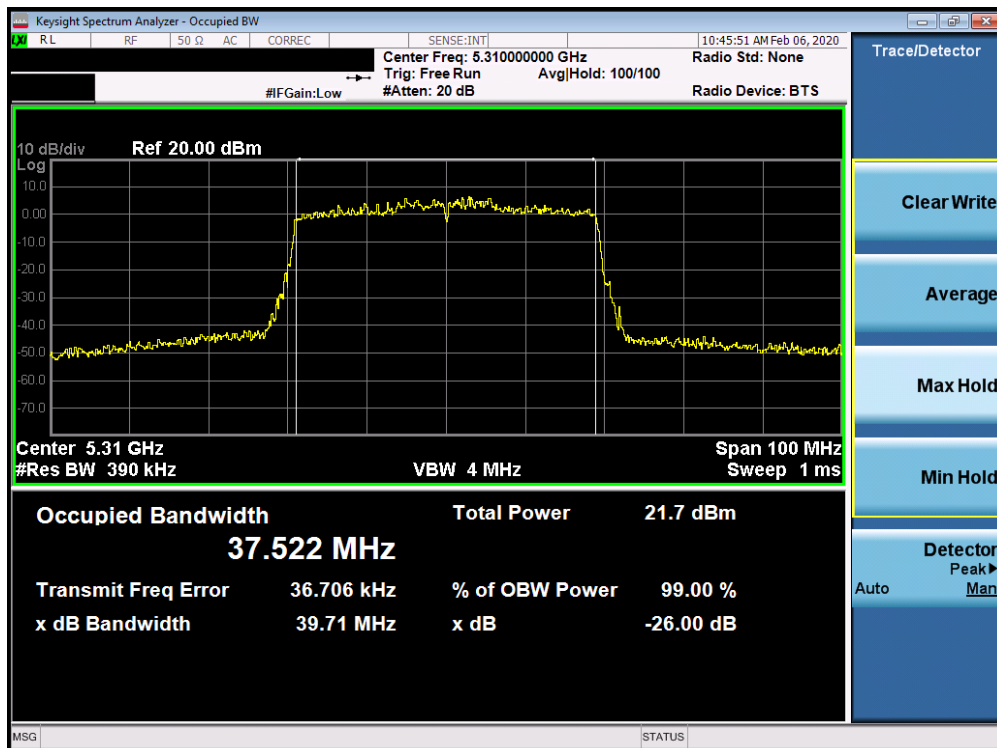


Plot 7-42. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 2A) – Ch. 62)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 36 of 537

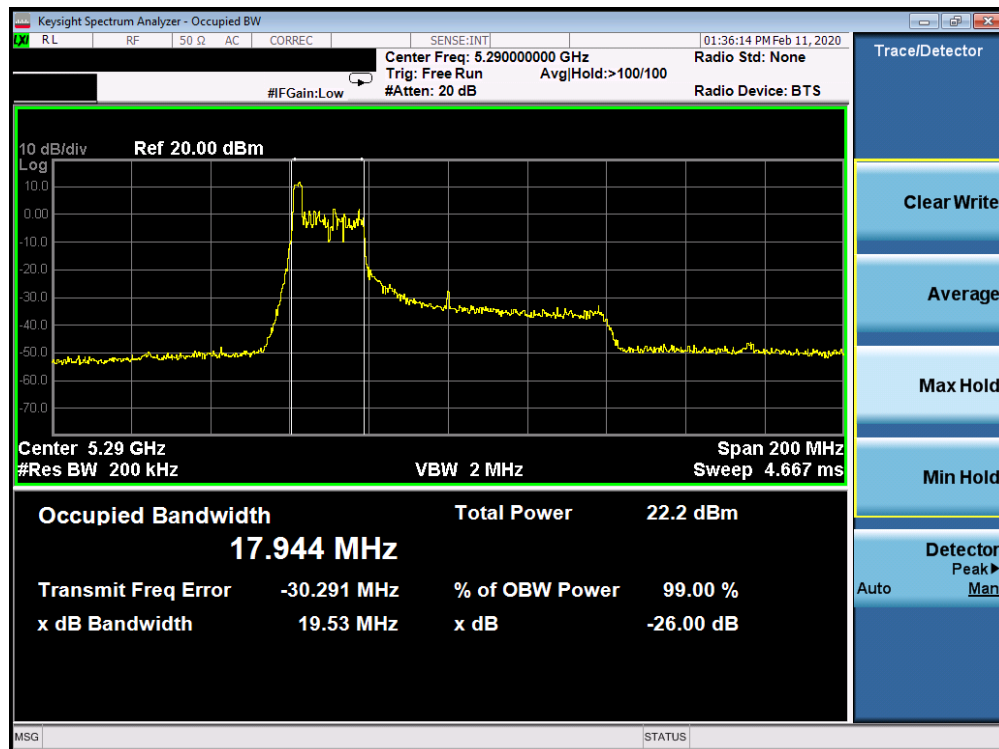


Plot 7-43. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax – RU484 (UNII Band 2A) – Ch. 54)

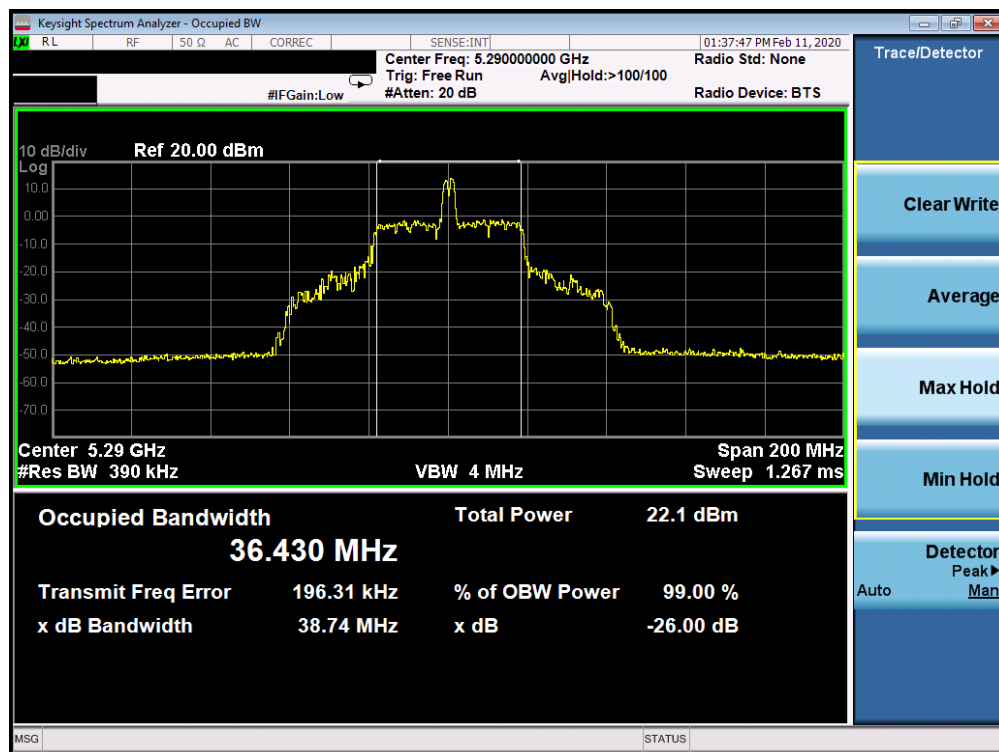


Plot 7-44. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax – RU484 (UNII Band 2A) – Ch. 62)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 37 of 537

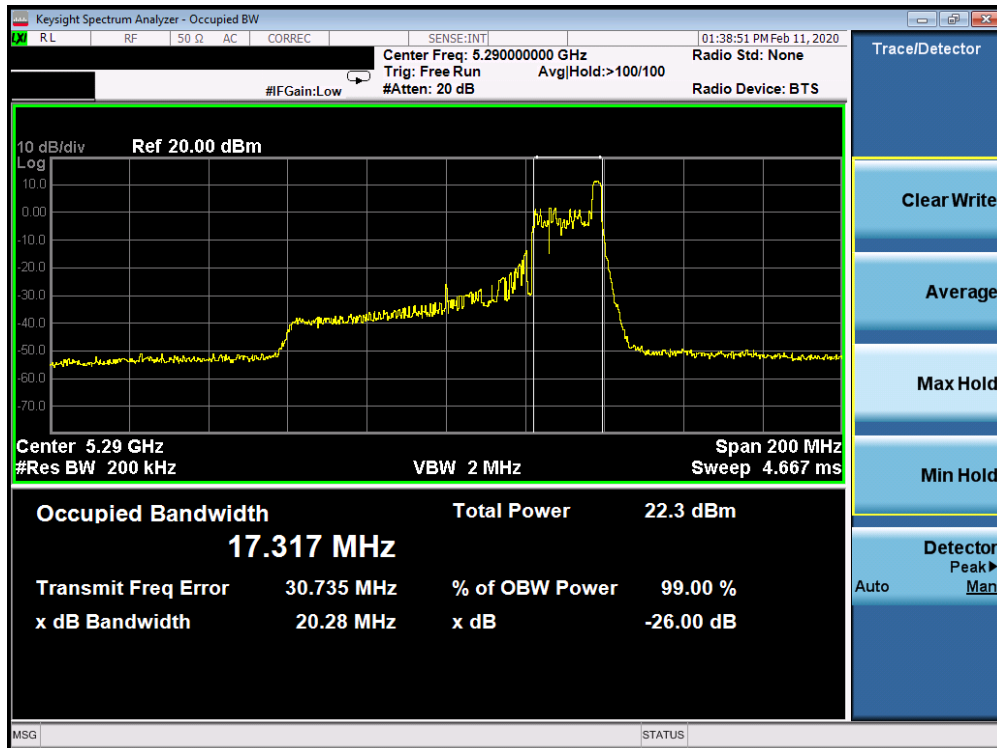


Plot 7-45. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 58)

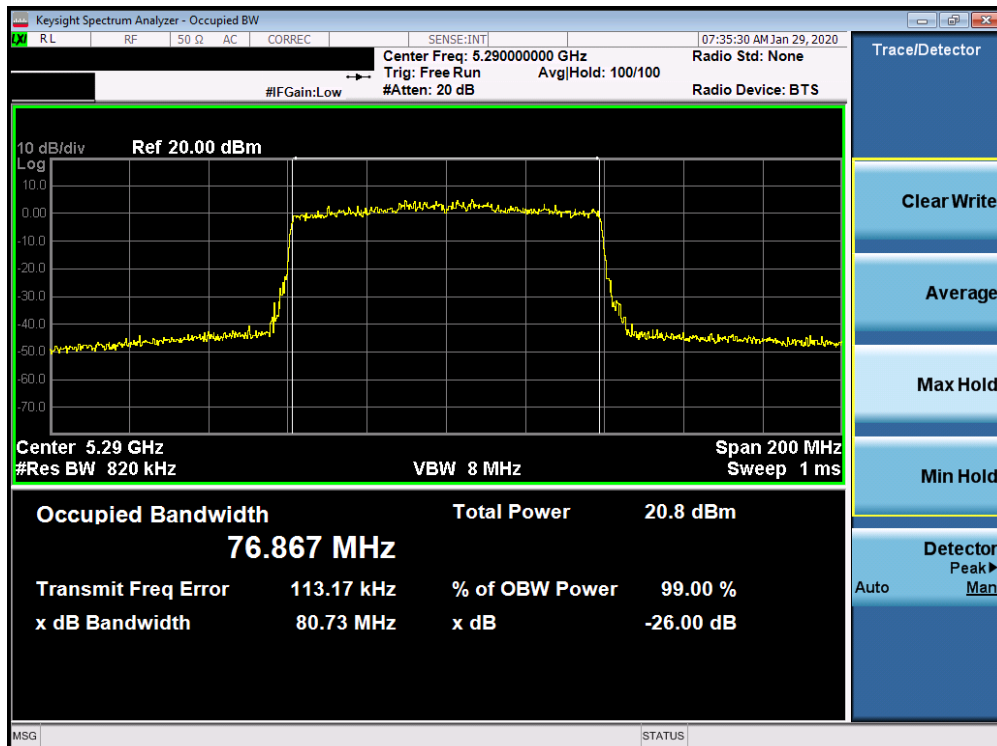


Plot 7-46. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 18 – RU26 (UNII Band 2A) – Ch. 58)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 38 of 537

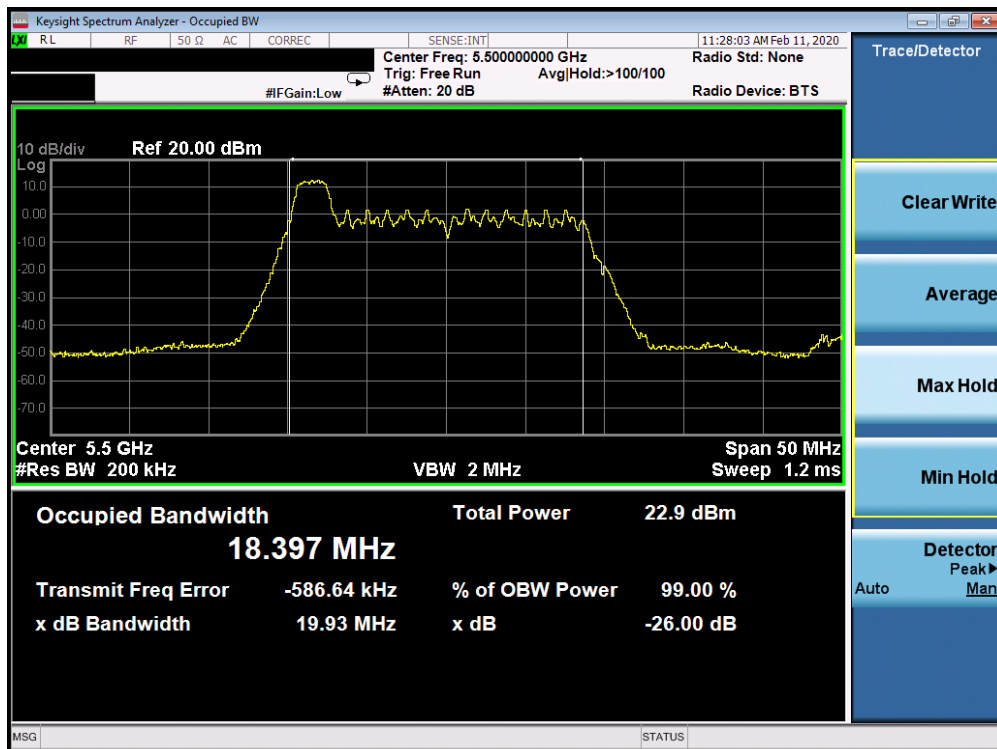


Plot 7-47. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 36 – RU26 (UNII Band 2A) – Ch. 58)

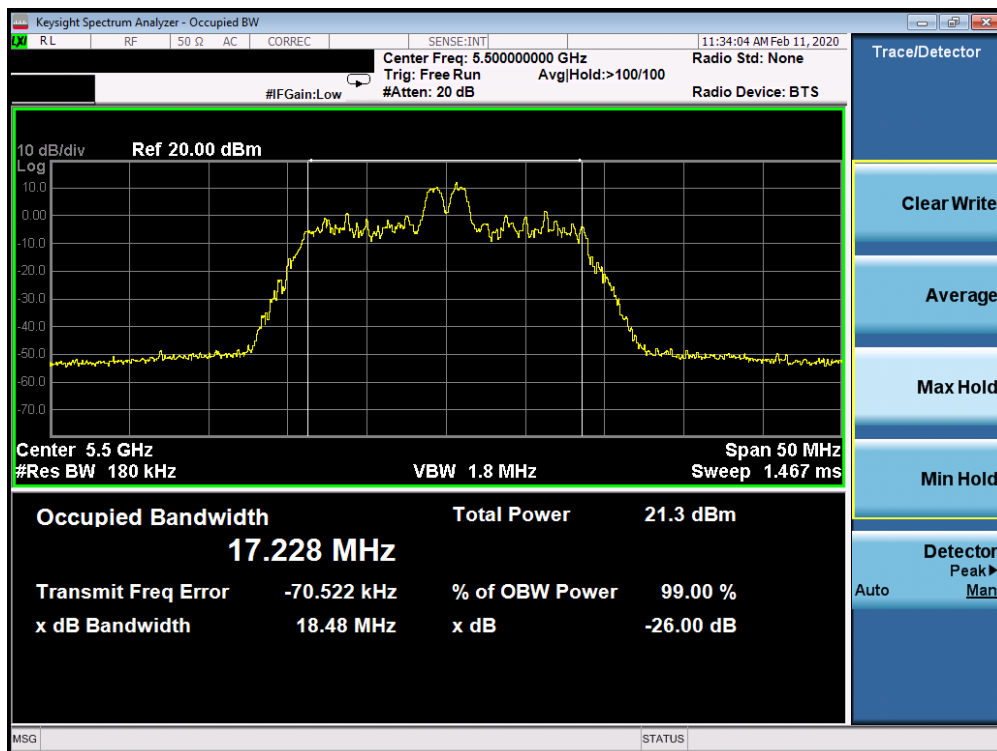


Plot 7-48. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax – RU996 (UNII Band 2A) – Ch. 58)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 39 of 537

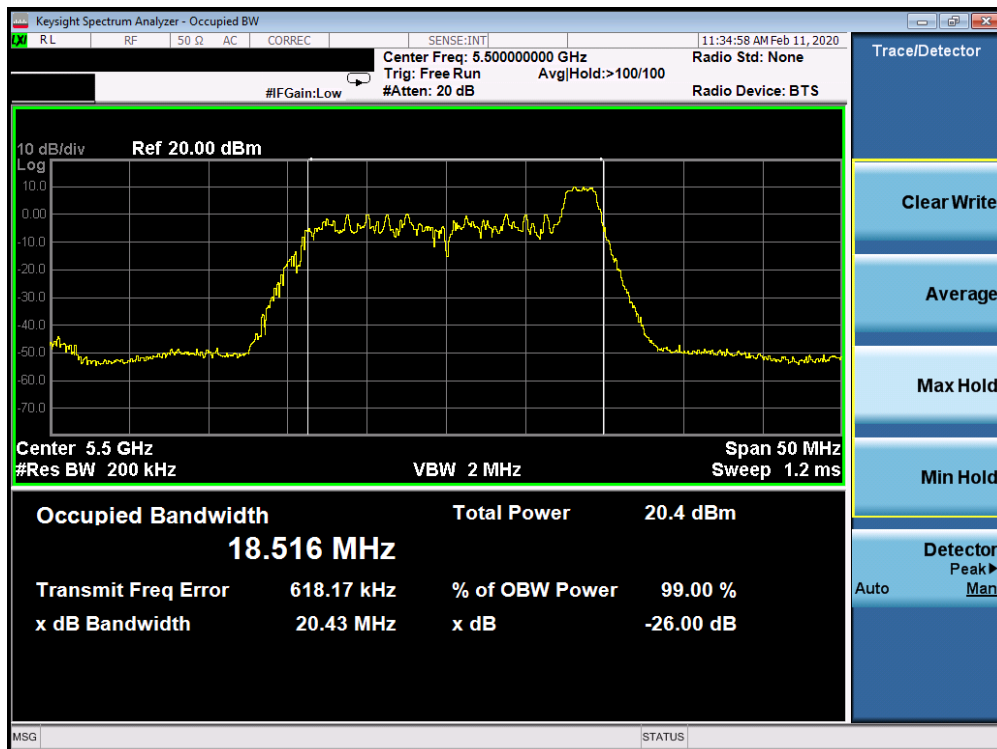


Plot 7-49. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 100)

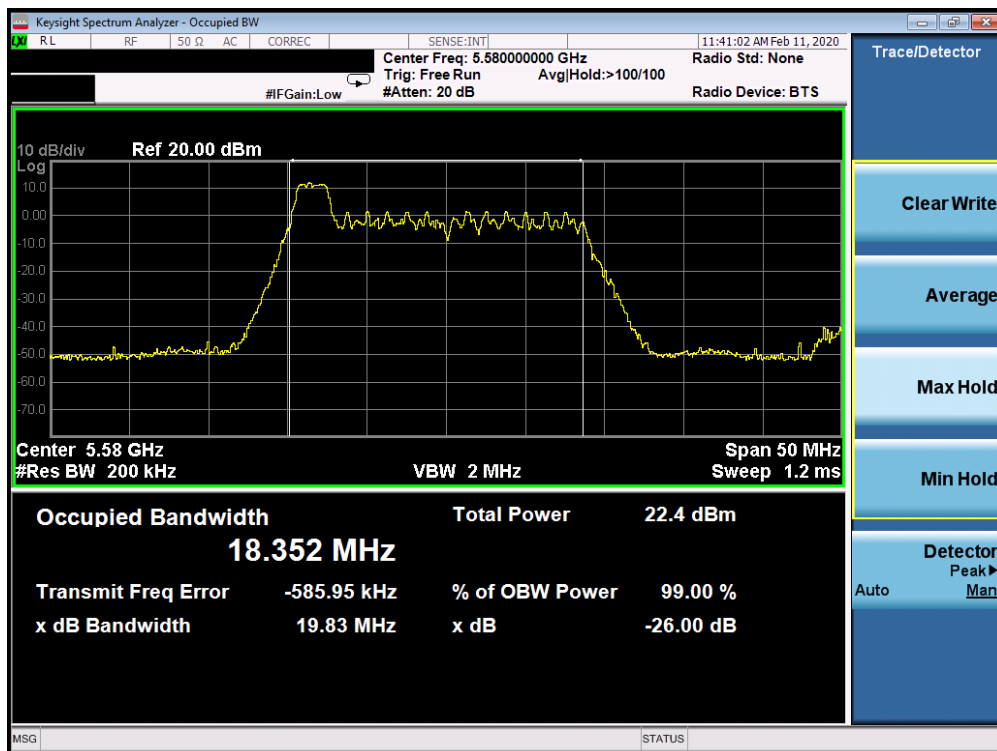


Plot 7-50. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2C) – Ch. 100)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 40 of 537

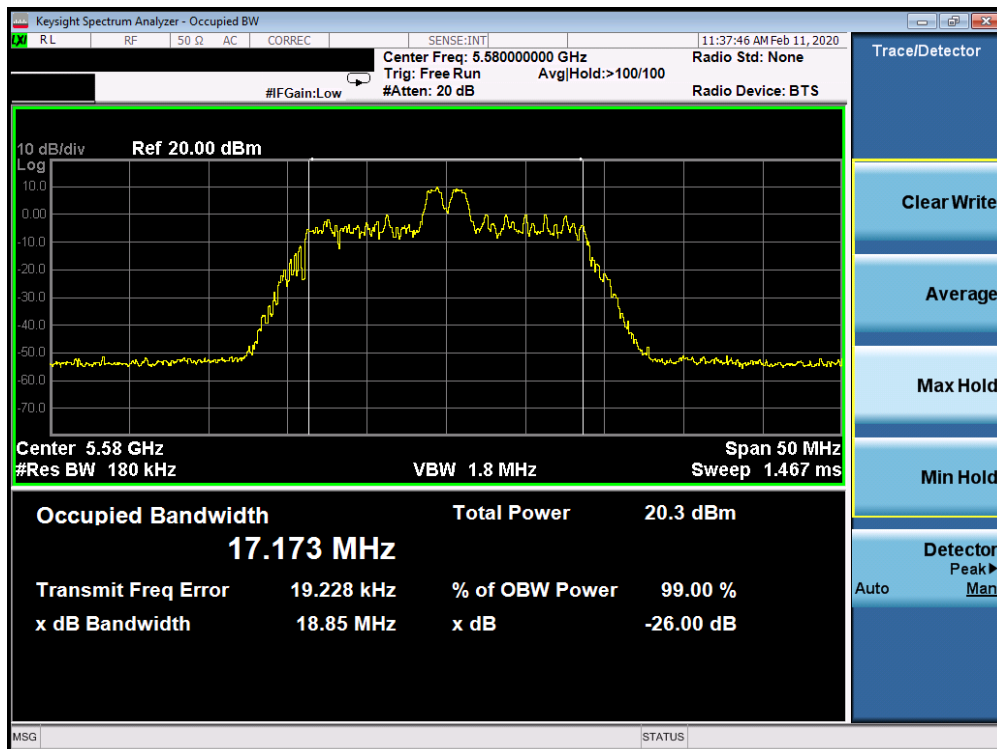


Plot 7-51. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 2C) – Ch. 100)

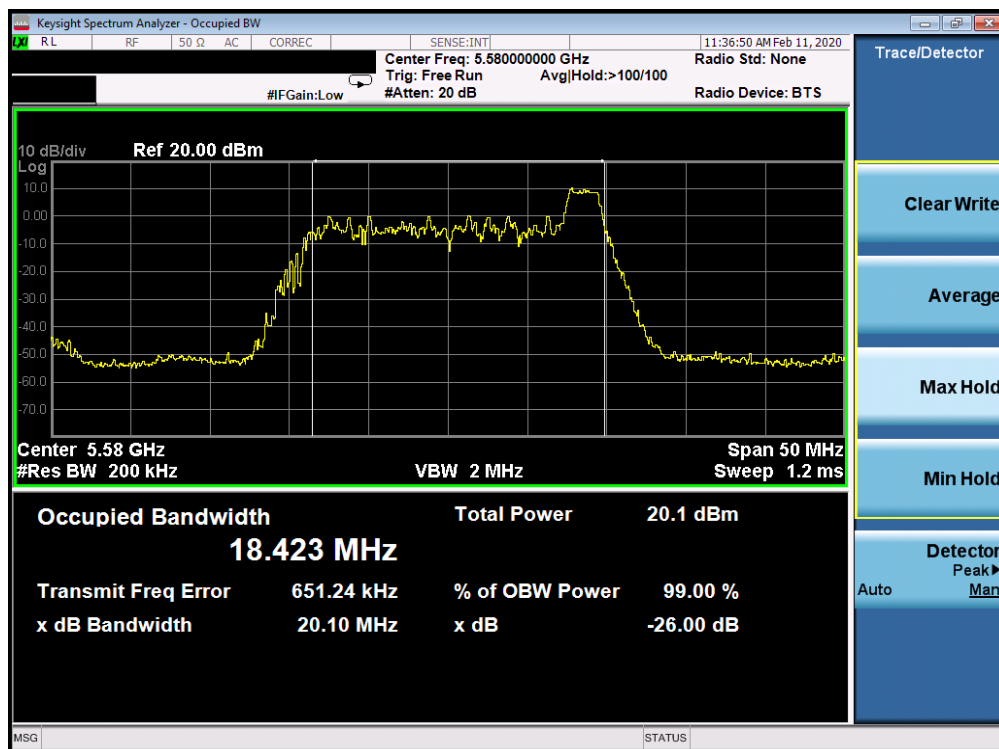


Plot 7-52. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 120)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 41 of 537

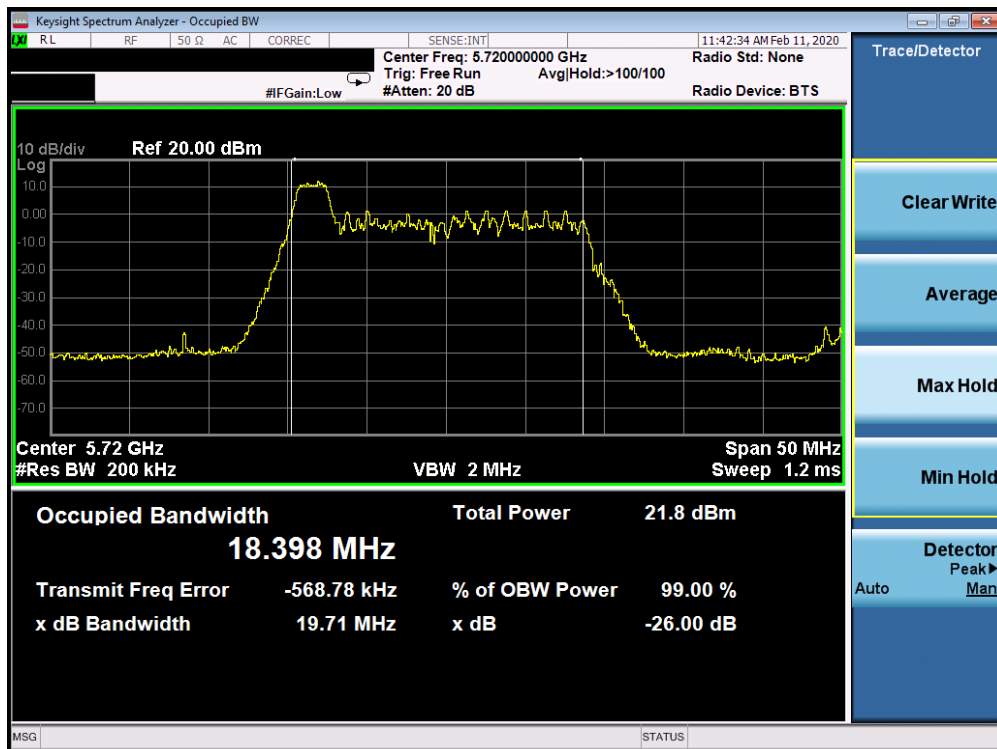


Plot 7-53. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2C) – Ch. 120)

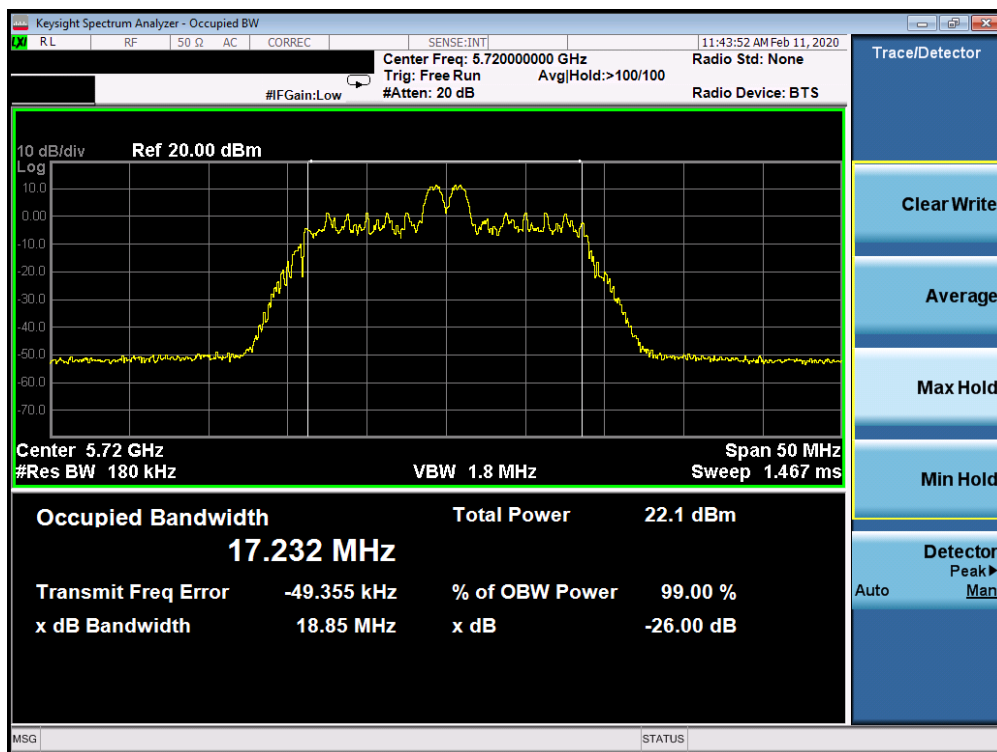


Plot 7-54. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8– RU26 (UNII Band 2C) – Ch. 120)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 42 of 537

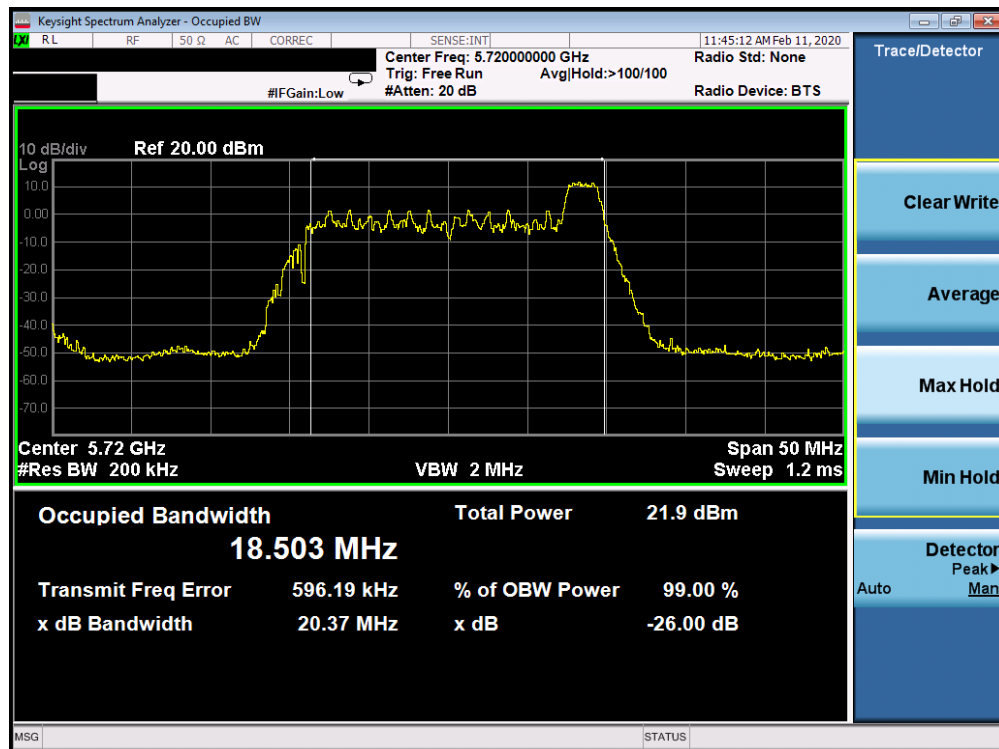


Plot 7-55. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 144)

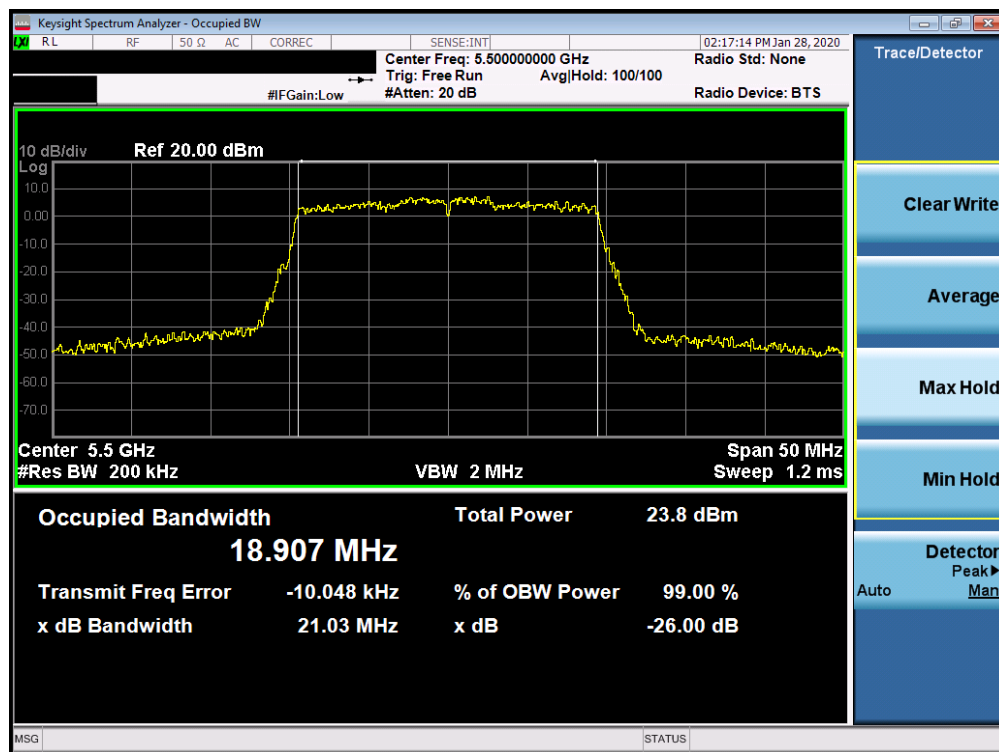


Plot 7-56. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2C) – Ch. 144)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 43 of 537

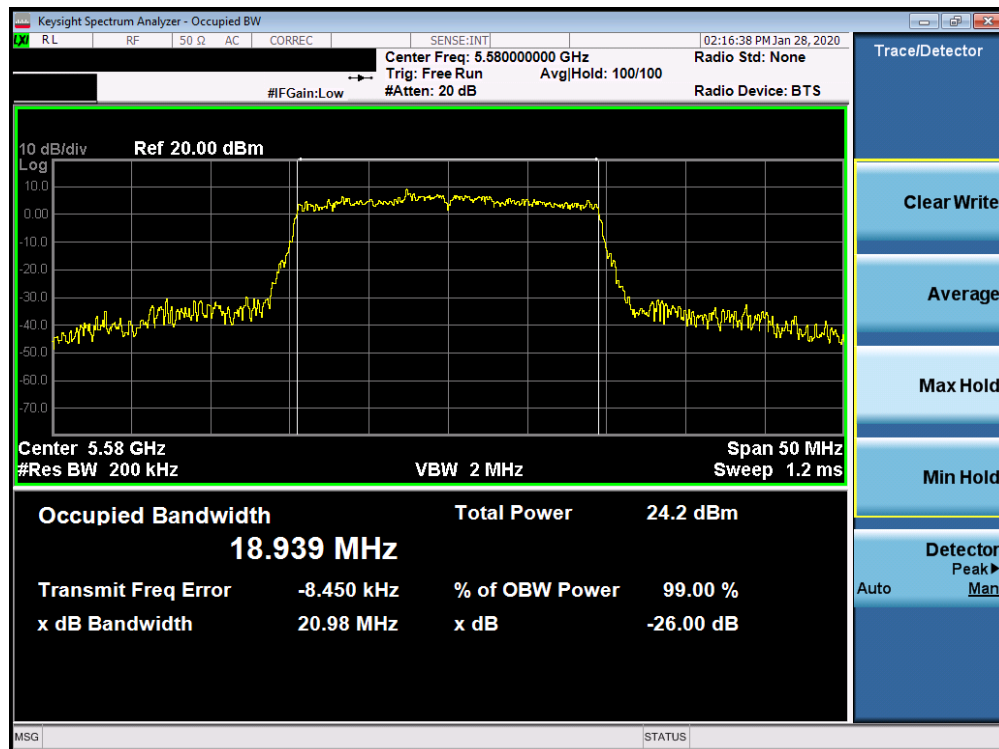


Plot 7-57. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 2C) – Ch. 144)

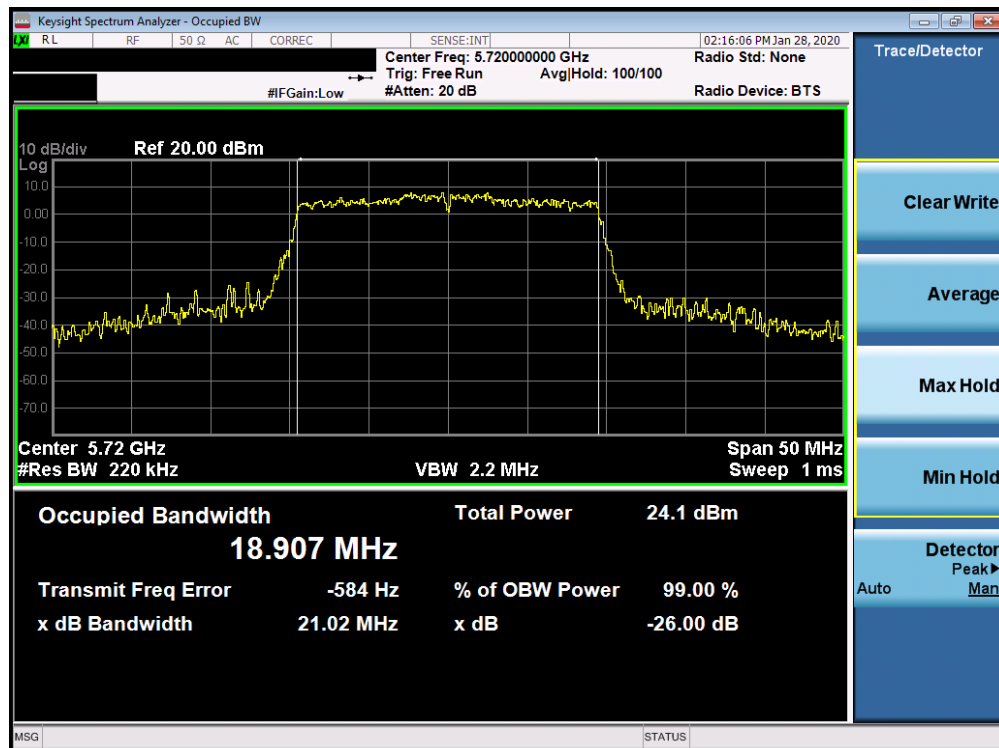


Plot 7-58. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax– RU242 (UNII Band 2C) – Ch. 100)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 44 of 537

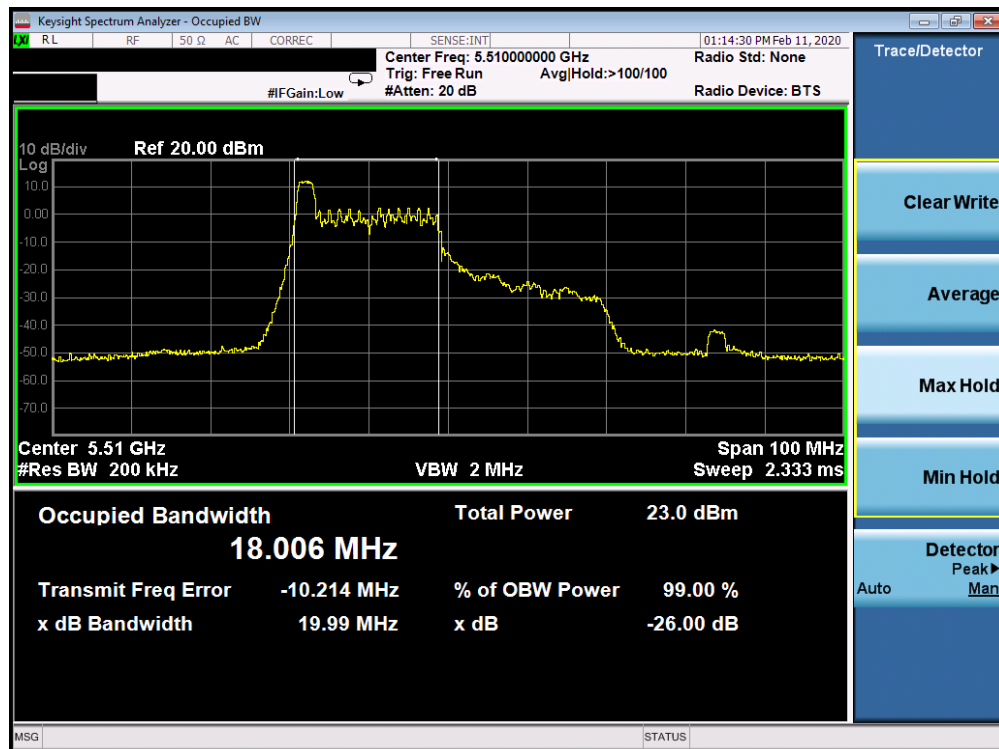


Plot 7-59. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax– RU242 (UNII Band 2C) – Ch. 120)

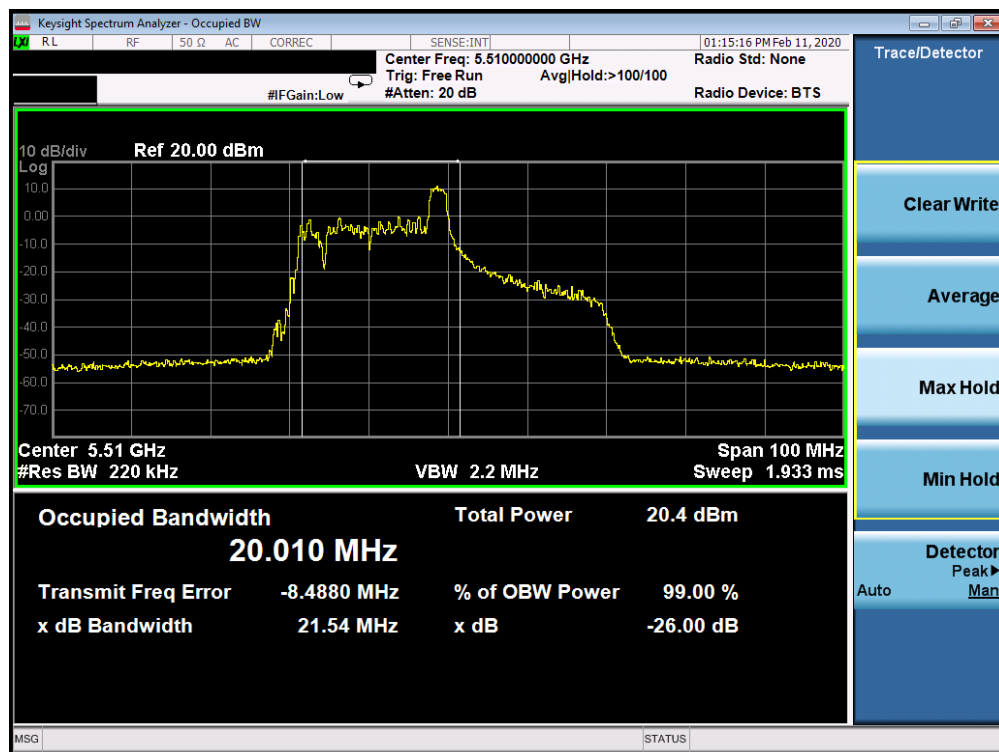


Plot 7-60. 26dB Bandwidth Plot SISO CORE 0 (20MHz BW 802.11ax– RU242 (UNII Band 2C) – Ch. 144)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 45 of 537

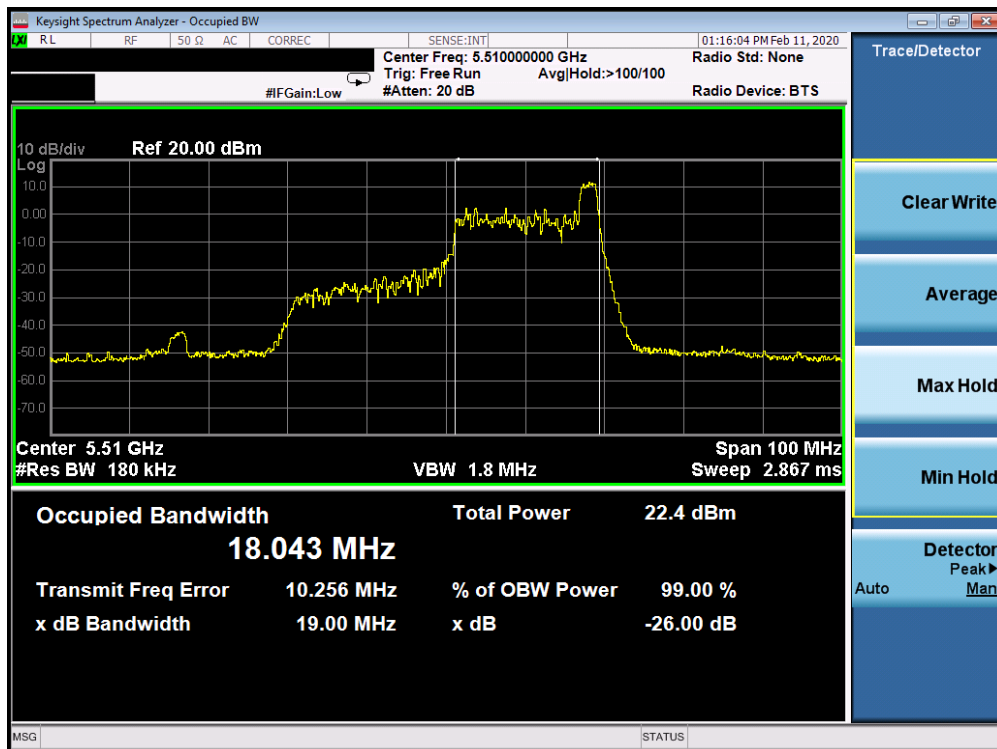


Plot 7-61. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 102)

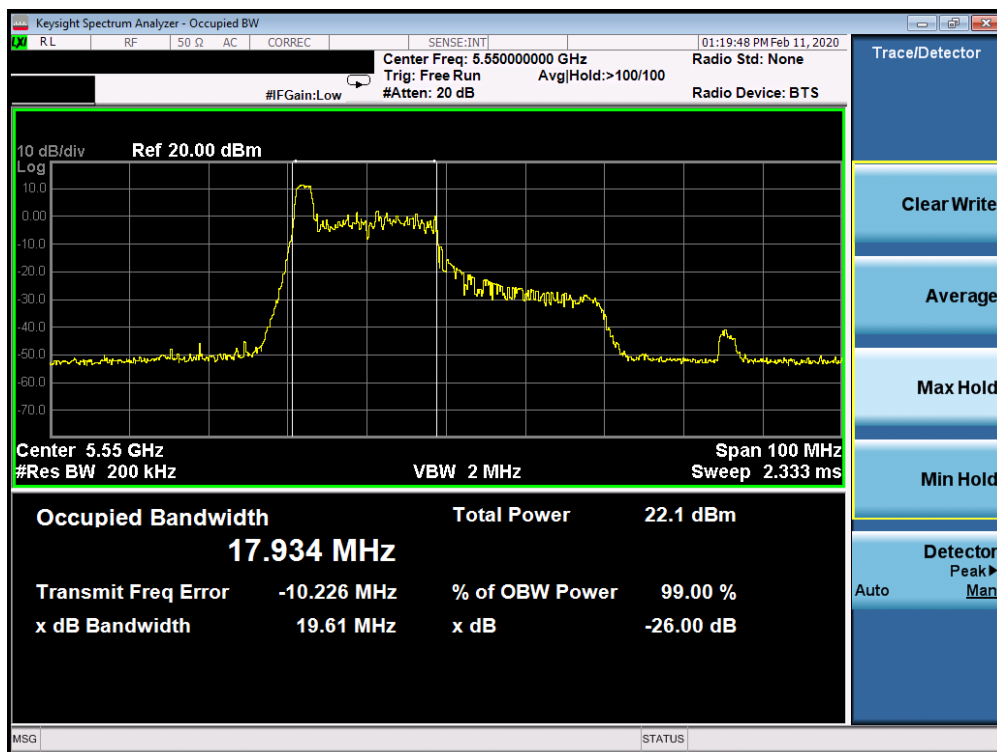


Plot 7-62. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 2C) – Ch. 102)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 46 of 537

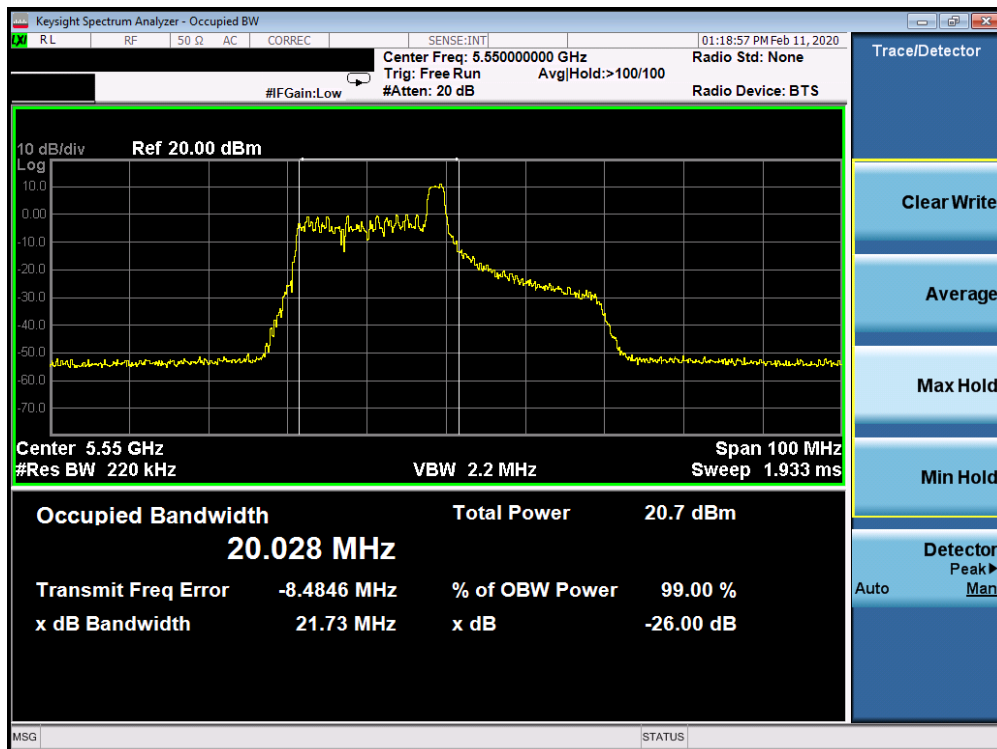


Plot 7-63. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 2C) – Ch. 102)

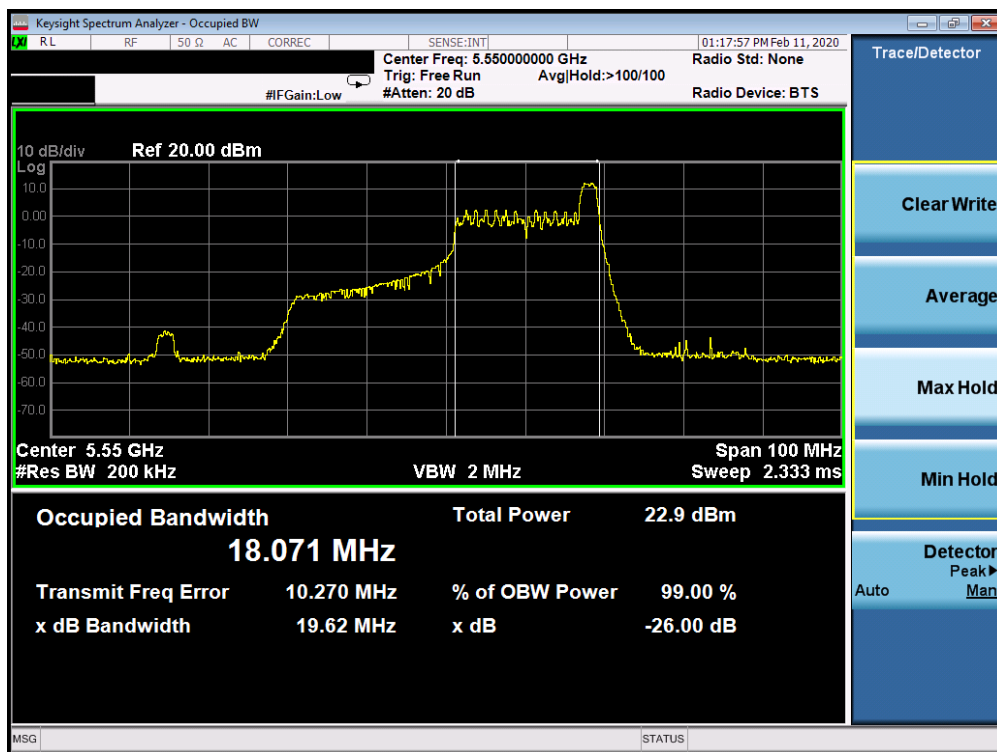


Plot 7-64. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 110)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 47 of 537

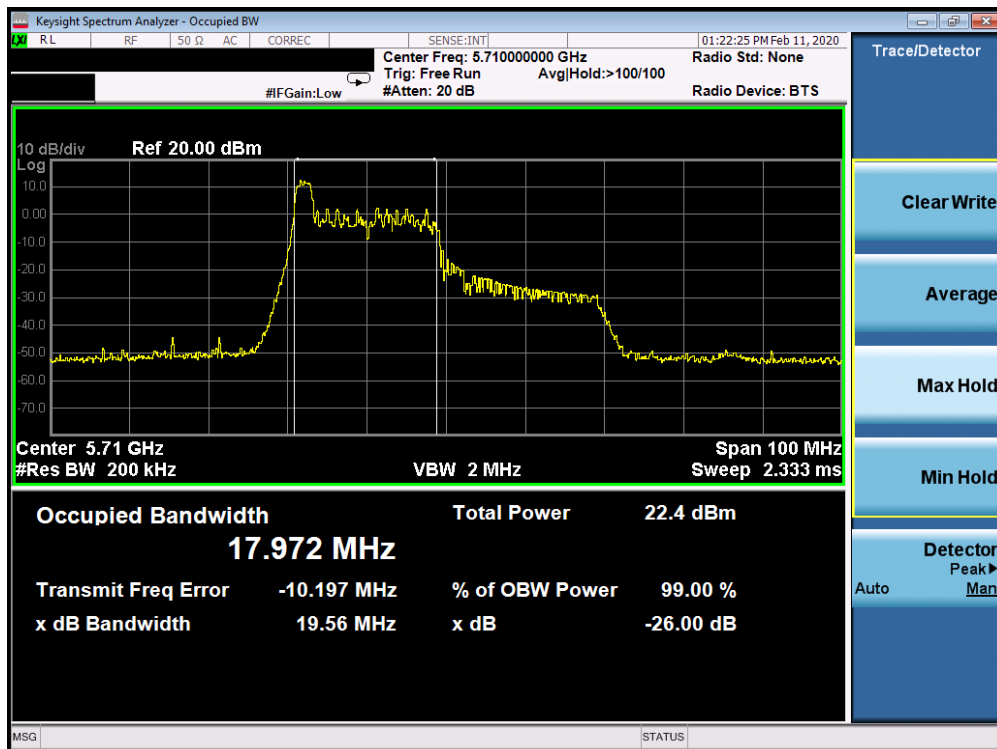


Plot 7-65. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 2C) – Ch. 110)

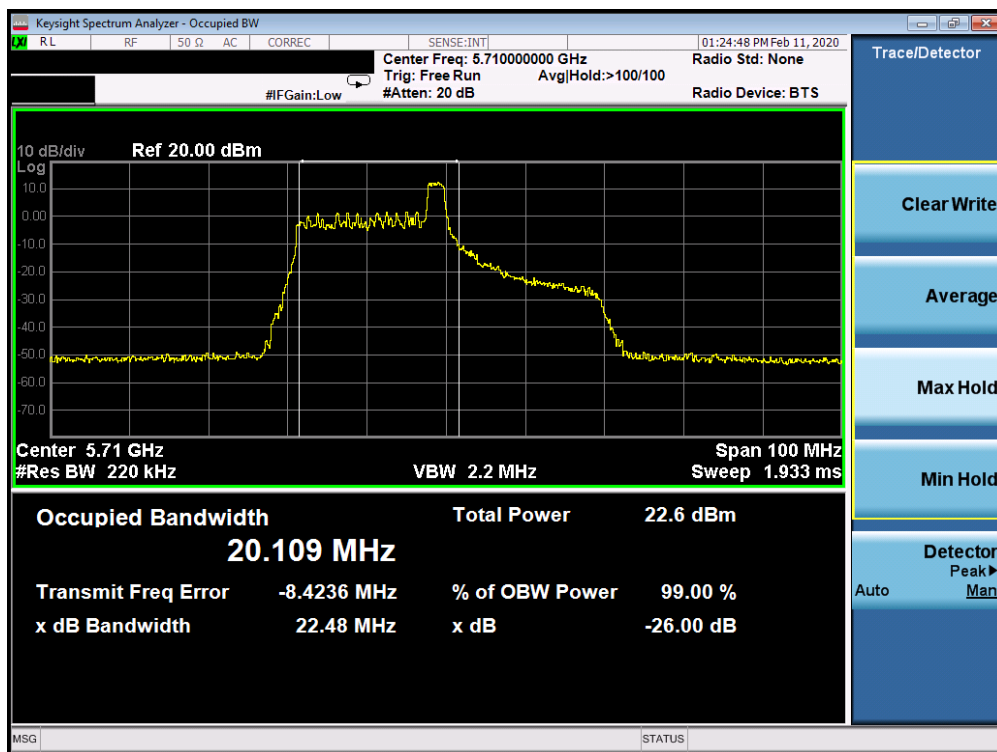


Plot 7-66. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 2C) – Ch. 110)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 48 of 537

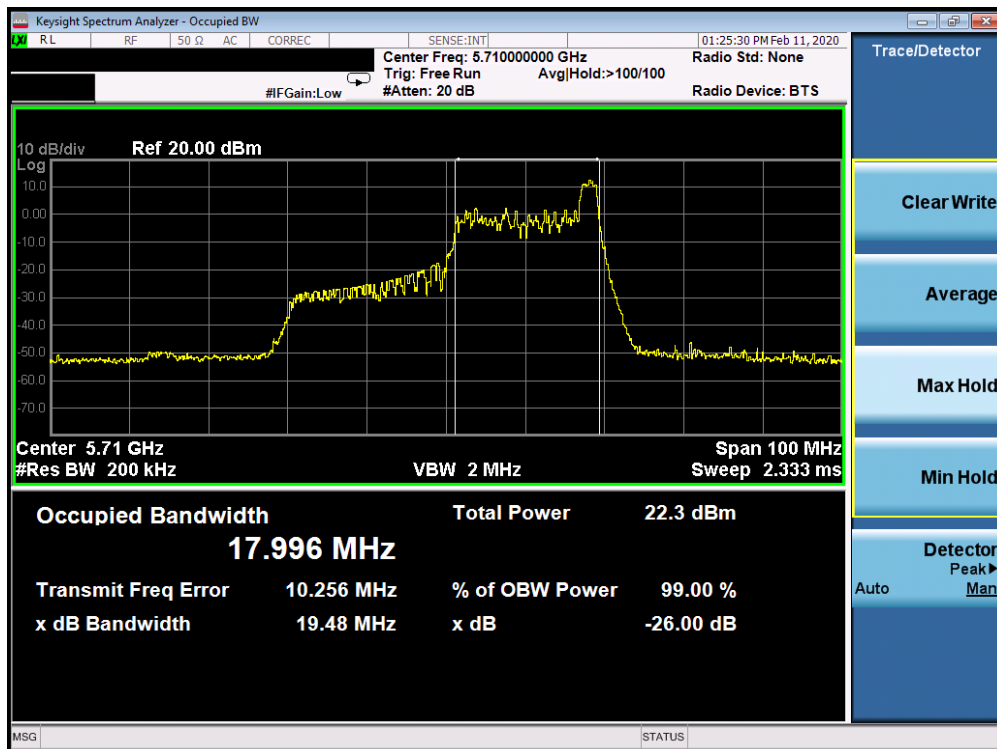


Plot 7-67. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 142)

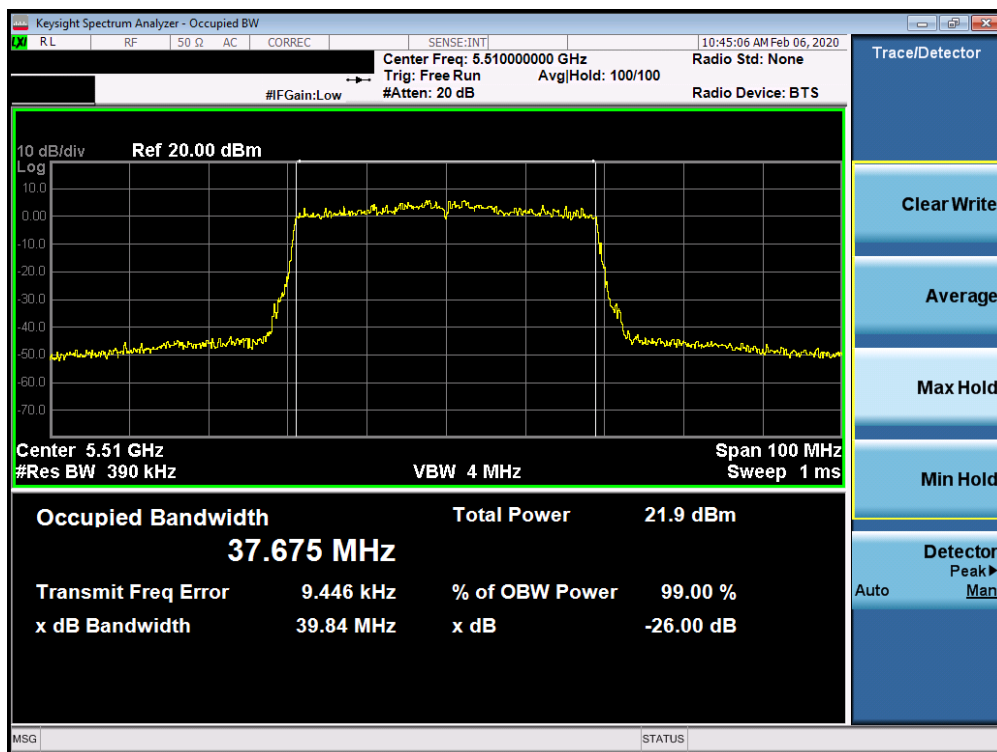


Plot 7-68. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 2C) – Ch. 142)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 49 of 537

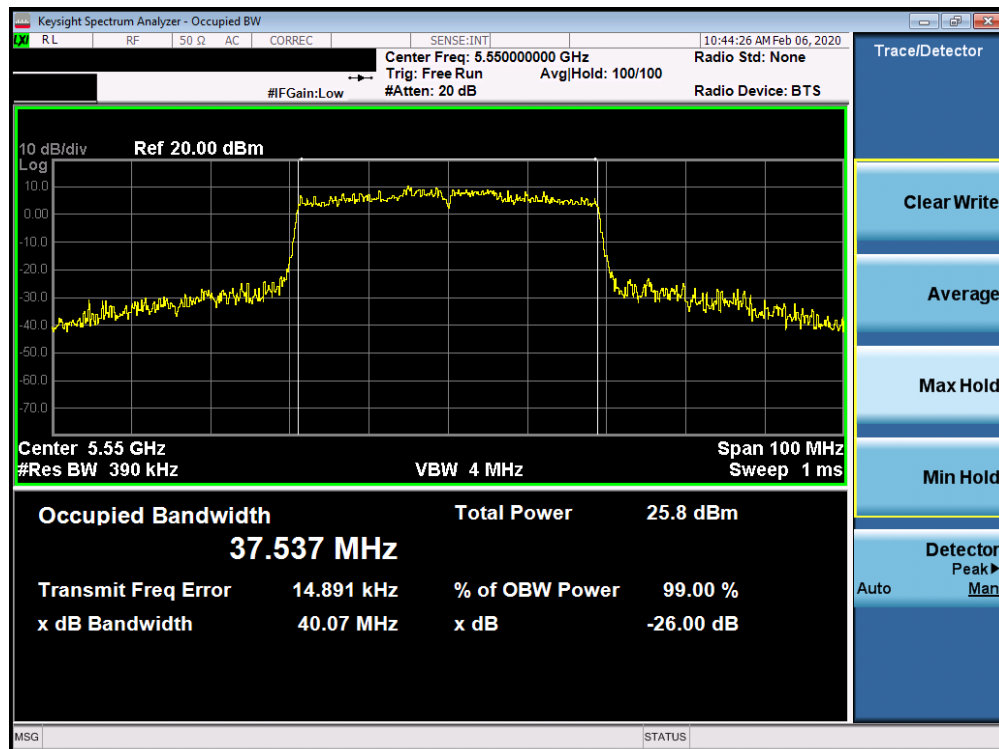


Plot 7-69. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 2C) – Ch. 142)

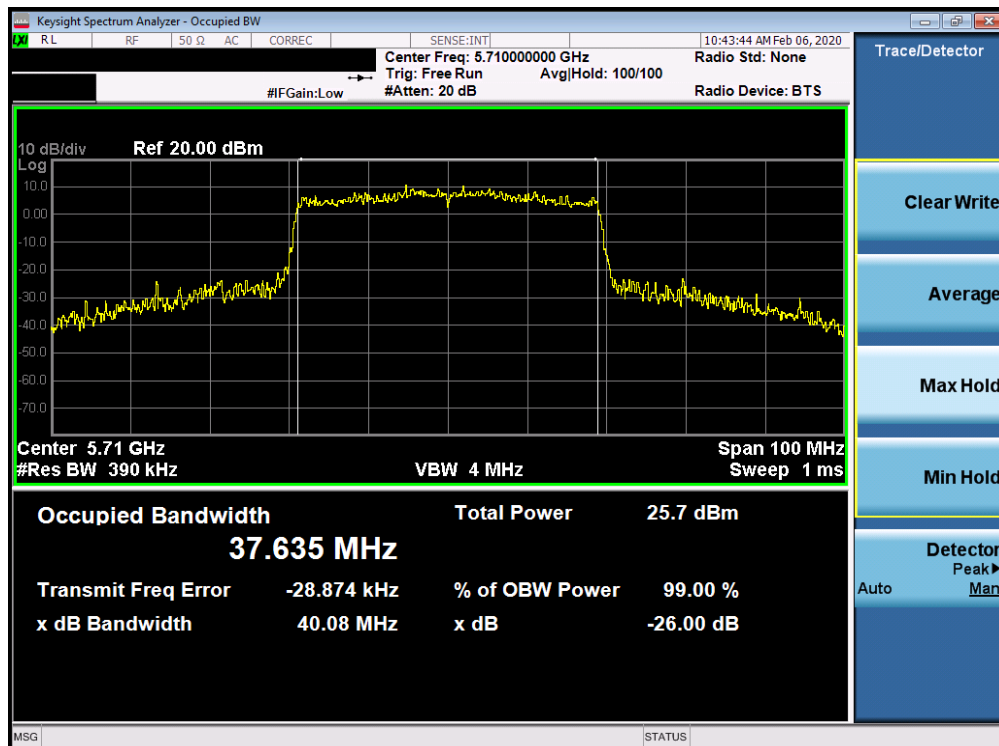


Plot 7-70. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax – RU484 (UNII Band 2C) – Ch. 102)

FCC ID: BCGA2228	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 50 of 537

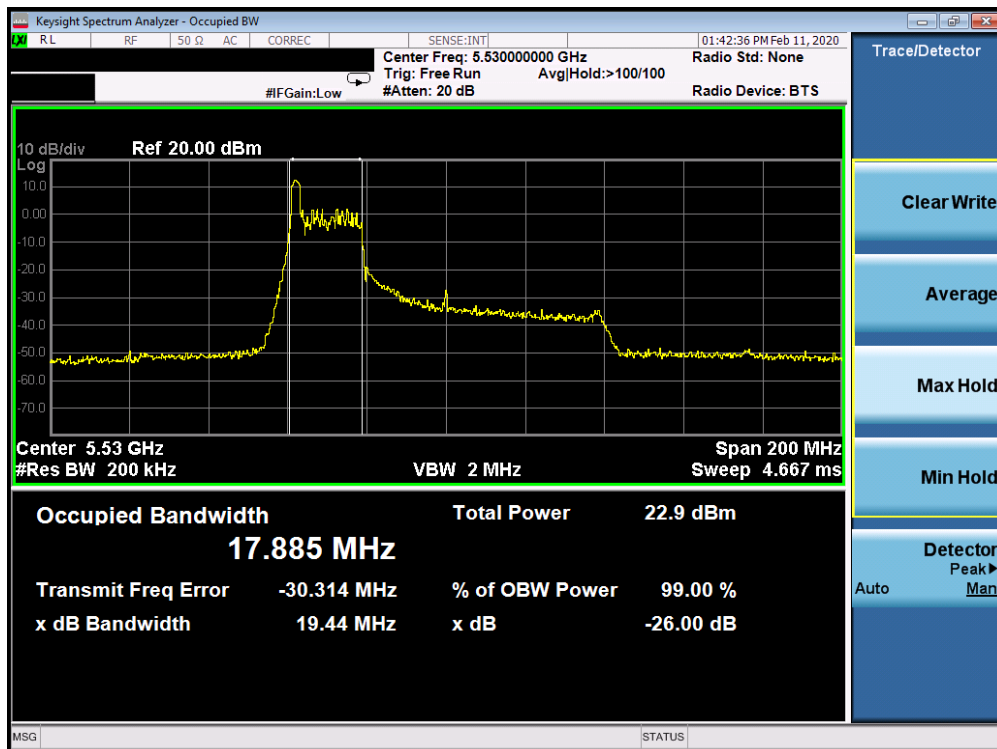


Plot 7-71. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax – RU484 (UNII Band 2C) – Ch. 110)

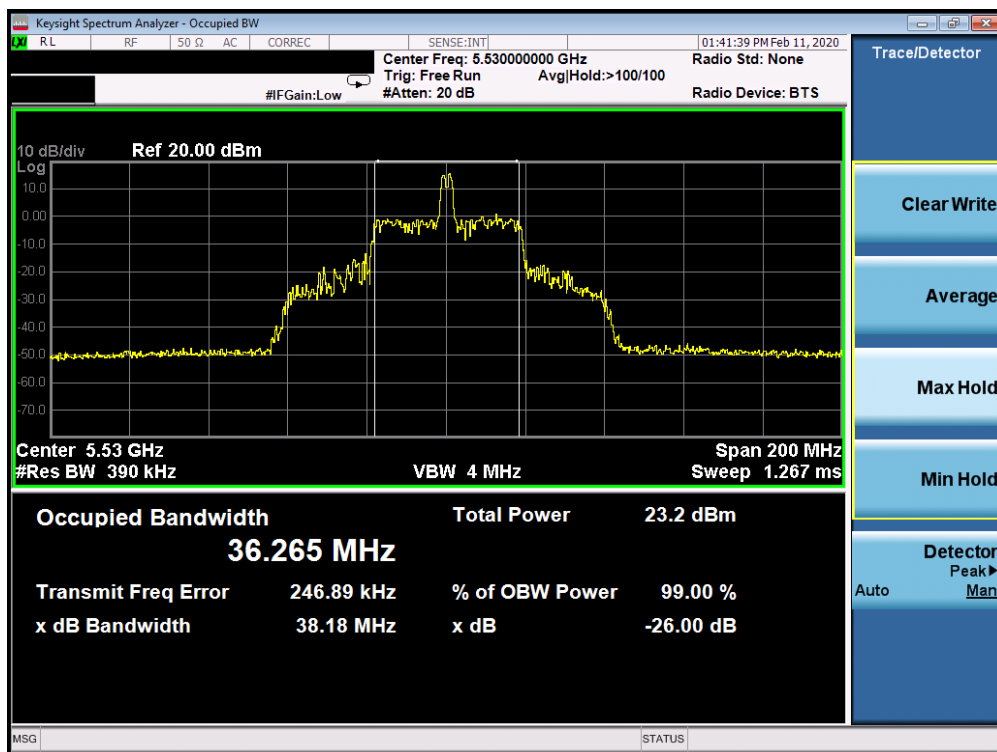


Plot 7-72. 26dB Bandwidth Plot SISO CORE 0 (40MHz BW 802.11ax – RU484 (UNII Band 2C) – Ch. 142)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 51 of 537

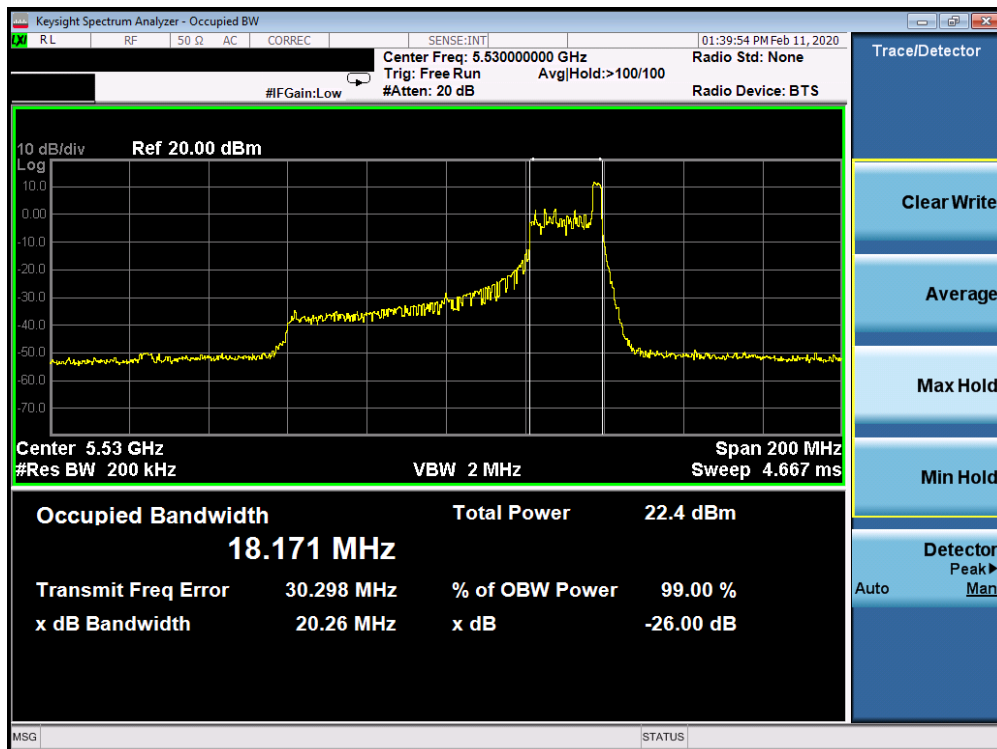


Plot 7-73. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 106)

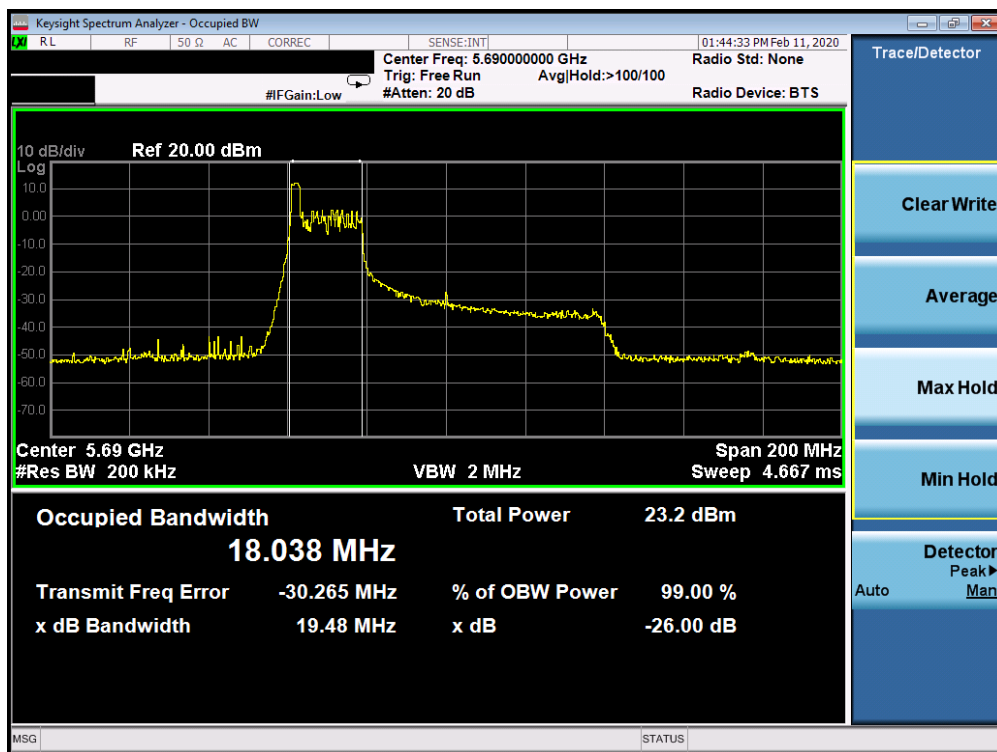


Plot 7-74. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 18 – RU26 (UNII Band 2C) – Ch. 106)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 52 of 537

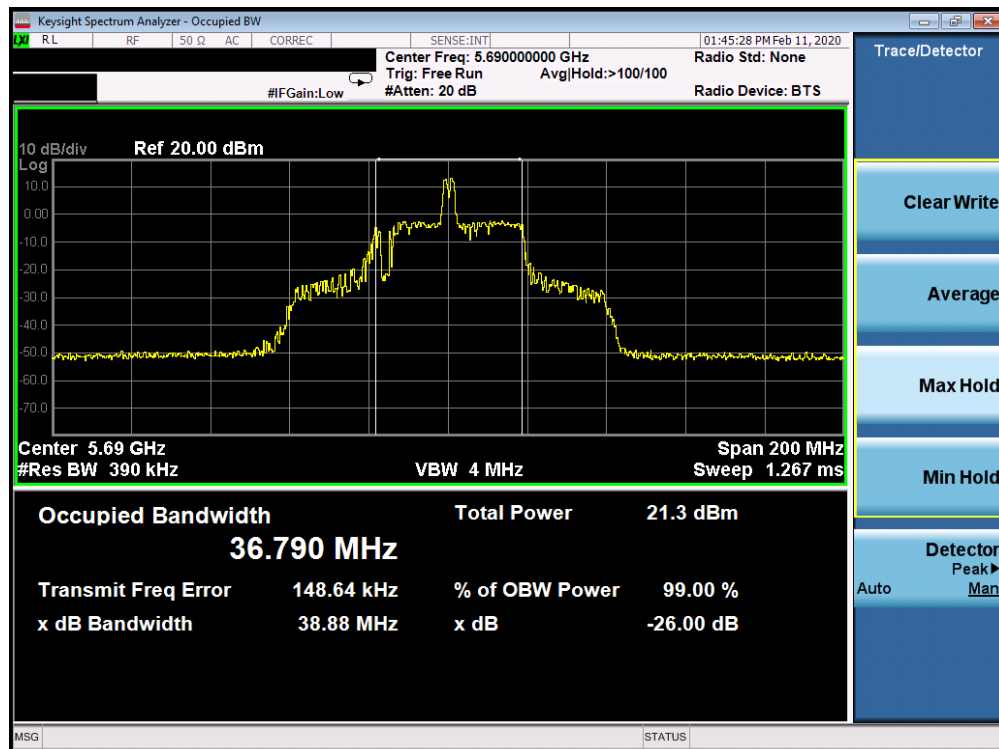


Plot 7-75. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 36 – RU26 (UNII Band 2C) – Ch. 106)

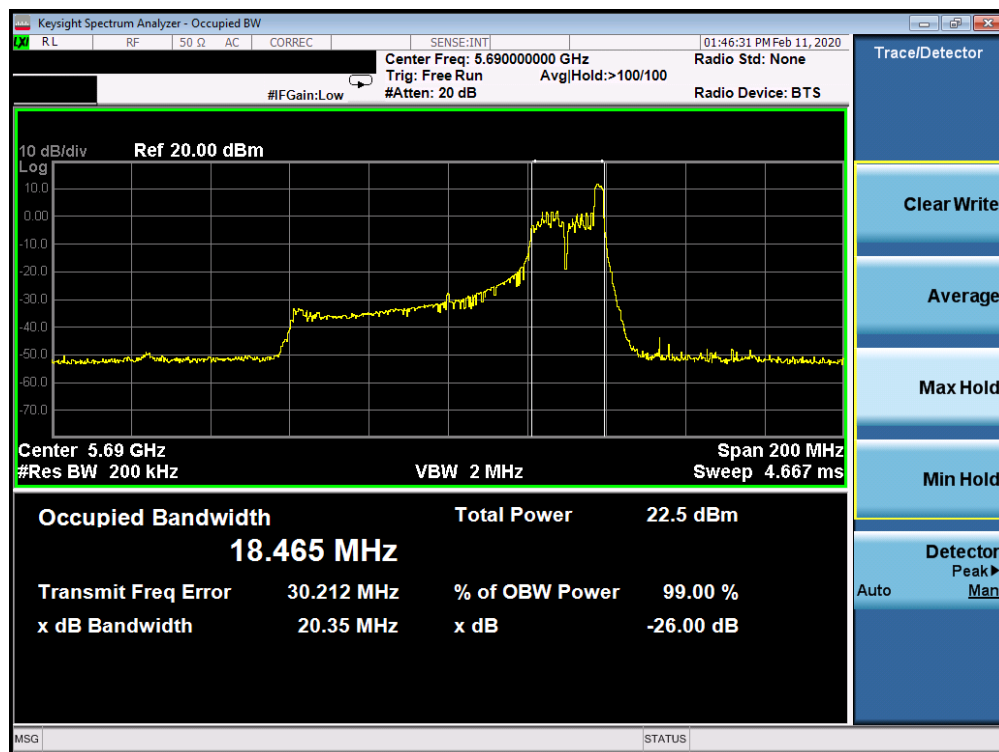


Plot 7-76. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 0 – RU26 (UNII Band 2C) – Ch. 138)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 53 of 537

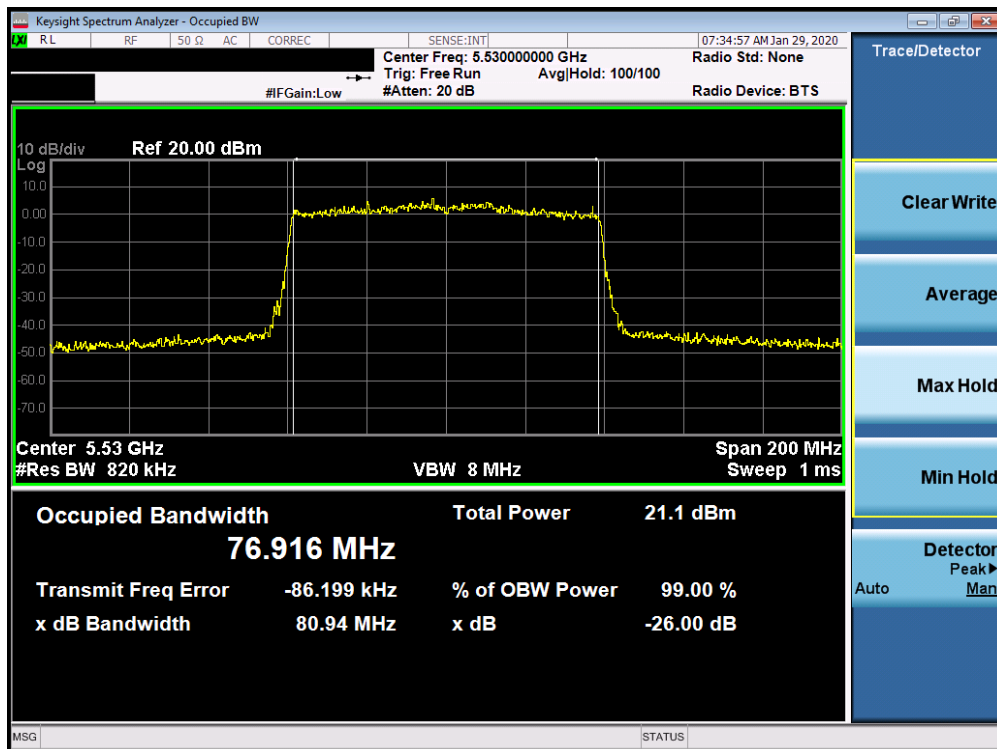


Plot 7-77. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 18 – RU26 (UNII Band 2C) – Ch. 138)

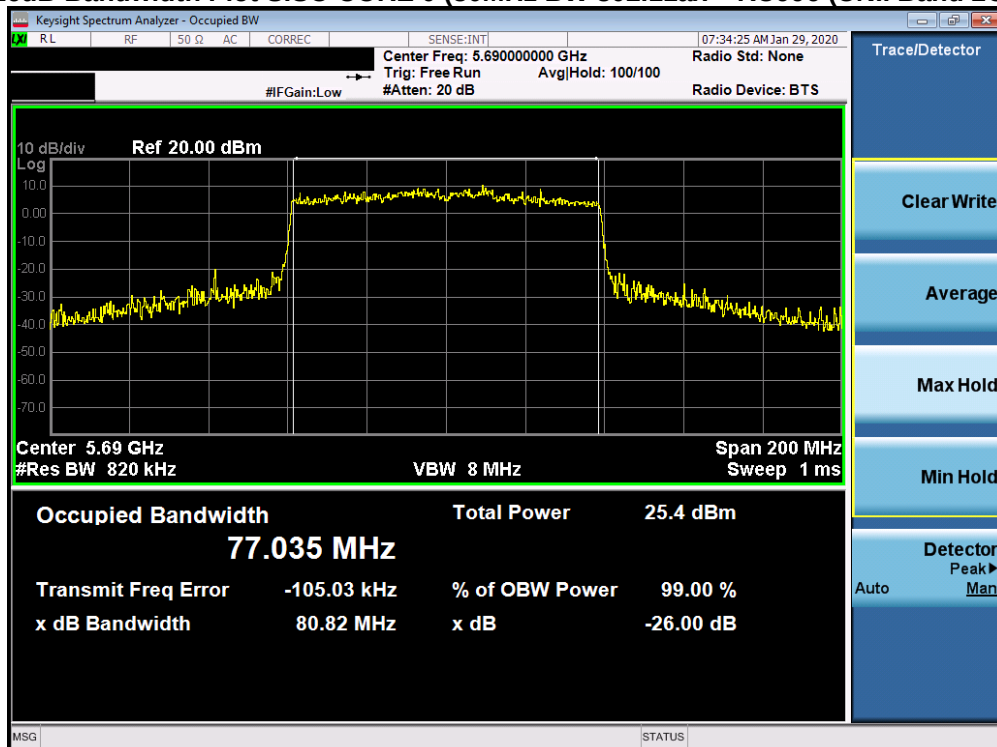


Plot 7-78. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax Index 36 – RU26 (UNII Band 2C) – Ch. 138)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 54 of 537



Plot 7-79. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax – RU996 (UNII Band 2C) – Ch. 106)



Plot 7-80. 26dB Bandwidth Plot SISO CORE 0 (80MHz BW 802.11ax – RU996 (UNII Band 2C) – Ch. 138)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 55 of 537

SISO Core 1 26dB Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	RU Size	Index	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
Band 1	5180	36	ax (20MHz)	RU26	0	MCS0	19.64
				RU26	4	MCS0	18.97
				RU26	8	MCS0	20.27
	5200	40	ax (20MHz)	RU26	0	MCS0	19.78
				RU26	4	MCS0	18.80
				RU26	8	MCS0	20.19
	5240	48	ax (20MHz)	RU26	0	MCS0	19.76
				RU26	4	MCS0	18.97
				RU26	8	MCS0	20.10
	5190	38	ax (40MHz)	RU26	0	MCS0	19.49
				RU26	8	MCS0	21.71
				RU26	17	MCS0	19.61
	5230	46	ax (40MHz)	RU26	0	MCS0	19.43
				RU26	8	MCS0	21.84
				RU26	17	MCS0	19.55
	5210	42	ax (80MHz)	RU26	0	MCS0	19.44
				RU26	18	MCS0	37.49
				RU26	36	MCS0	20.32
Band 2A	5260	52	ax (20MHz)	RU26	0	MCS0	19.74
				RU26	4	MCS0	18.74
				RU26	8	MCS0	20.52
	5280	56	ax (20MHz)	RU26	0	MCS0	19.53
				RU26	4	MCS0	18.65
				RU26	8	MCS0	19.76
	5320	64	ax (20MHz)	RU26	0	MCS0	19.36
				RU26	4	MCS0	18.91
				RU26	8	MCS0	20.38
	5270	54	ax (40MHz)	RU26	0	MCS0	19.35
				RU26	8	MCS0	21.48
				RU26	17	MCS0	19.46
	5310	62	ax (40MHz)	RU26	0	MCS0	20.00
				RU26	8	MCS0	21.95
				RU26	17	MCS0	20.04
	5290	58	ax (80MHz)	RU26	0	MCS0	19.52
				RU26	18	MCS0	38.71
				RU26	36	MCS0	19.75
Band 2C	5500	100	ax (20MHz)	RU26	0	MCS0	19.51
				RU26	4	MCS0	18.70
				RU26	8	MCS0	20.27
	5580	116	ax (20MHz)	RU26	0	MCS0	19.66
				RU26	4	MCS0	19.03
				RU26	8	MCS0	20.37
	5720	144	ax (20MHz)	RU26	0	MCS0	19.83
				RU26	4	MCS0	19.08
				RU26	8	MCS0	19.54
	5510	102	ax (40MHz)	RU26	0	MCS0	19.94
				RU26	8	MCS0	22.43
				RU26	17	MCS0	19.40
	5550	110	ax (40MHz)	RU26	0	MCS0	19.63
				RU26	8	MCS0	22.46
				RU26	17	MCS0	19.44
	5710	142	ax (40MHz)	RU26	0	MCS0	19.83
				RU26	8	MCS0	21.42
				RU26	17	MCS0	19.32
	5530	106	ax (80MHz)	RU26	0	MCS0	19.49
				RU26	18	MCS0	38.67
				RU26	36	MCS0	20.23
	5690	138	ax (80MHz)	RU26	0	MCS0	19.57
				RU26	18	MCS0	38.70
				RU26	36	MCS0	20.18

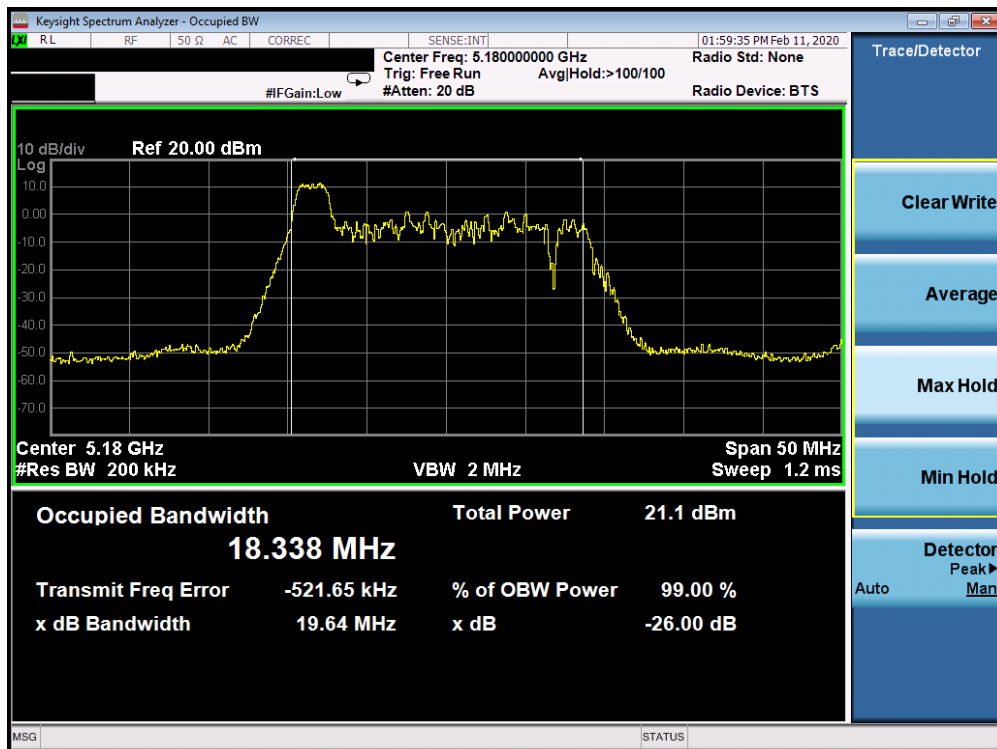
Table 7-4. Conducted Bandwidth Measurements SISO CORE 1 (RU26)

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 56 of 537

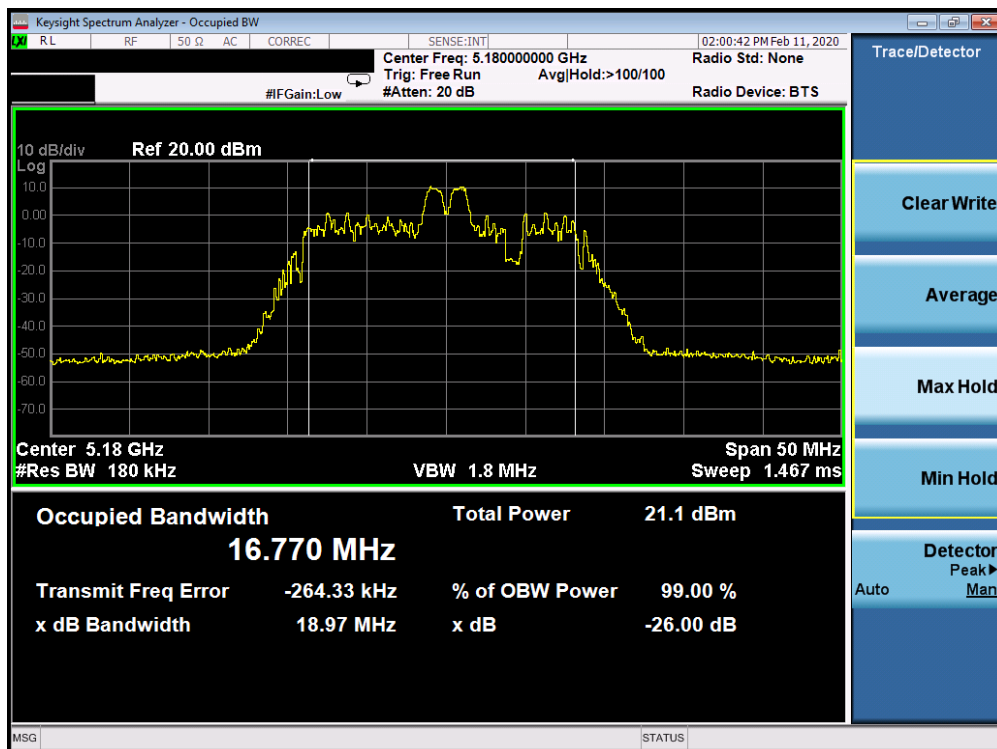
	Frequency [MHz]	Channel No.	802.11 Mode	RU Size	Index	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
Band 1	5180	36	ax (20MHz)	RU242	61	MCS0	20.95
	5200	40	ax (20MHz)	RU242	61	MCS0	20.81
	5240	48	ax (20MHz)	RU242	61	MCS0	20.76
	5190	38	ax (40MHz)	RU484	65	MCS0	39.78
	5230	46	ax (40MHz)	RU484	65	MCS0	40.13
	5210	42	ax (80MHz)	RU996	67	MCS0	80.59
Band 2A	5260	52	ax (20MHz)	RU242	61	MCS0	21.01
	5280	56	ax (20MHz)	RU242	61	MCS0	20.78
	5320	64	ax (20MHz)	RU242	61	MCS0	20.99
	5270	54	ax (40MHz)	RU484	65	MCS0	40.00
	5310	62	ax (40MHz)	RU484	65	MCS0	39.64
	5290	58	ax (80MHz)	RU996	67	MCS0	81.16
Band 2C	5500	100	ax (20MHz)	RU242	61	MCS0	20.81
	5580	116	ax (20MHz)	RU242	61	MCS0	20.95
	5720	144	ax (20MHz)	RU242	61	MCS0	20.87
	5510	102	ax (40MHz)	RU484	65	MCS0	40.01
	5550	110	ax (40MHz)	RU484	65	MCS0	40.29
	5710	142	ax (40MHz)	RU484	65	MCS0	39.94
	5530	106	ax (80MHz)	RU996	67	MCS0	81.13
	5690	138	ax (80MHz)	RU996	67	MCS0	81.47

Table 7-5. Conducted Bandwidth Measurements SISO CORE 1 (Full RU)

FCC ID: BCGA2228	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 57 of 537

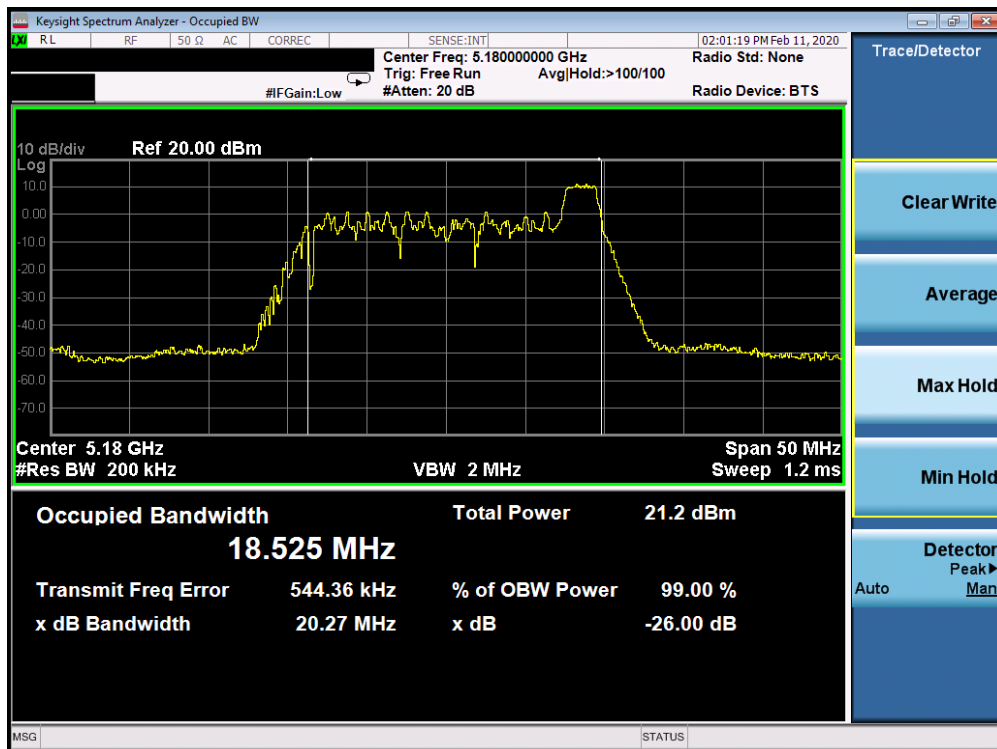


Plot 7-81. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 36)

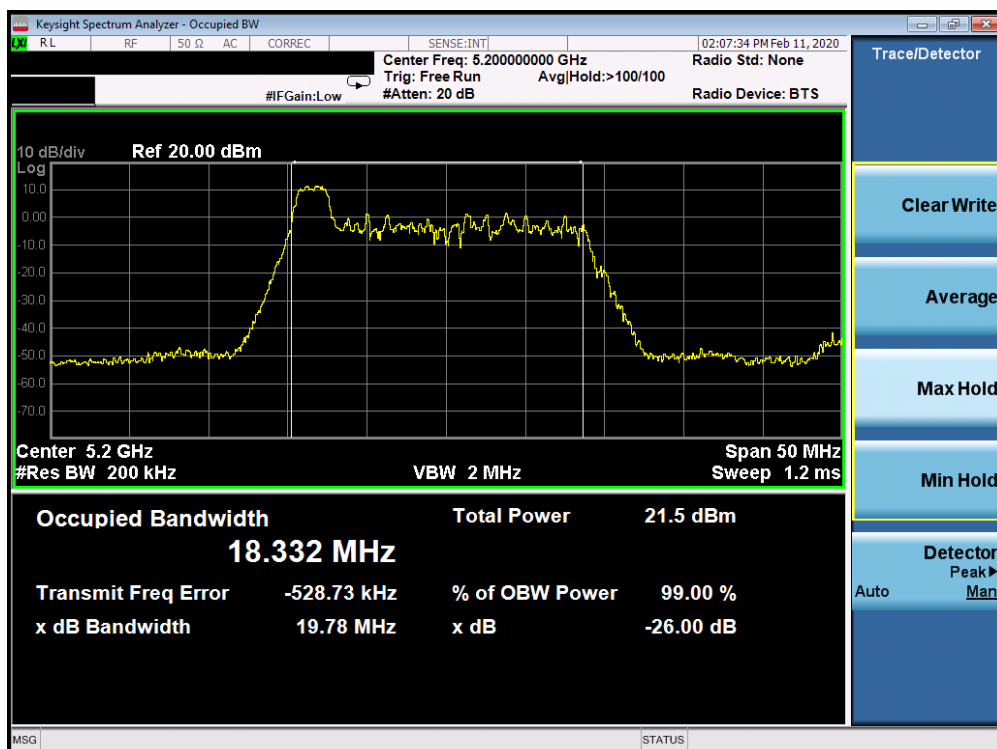


Plot 7-82. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 1) – Ch. 36)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 58 of 537

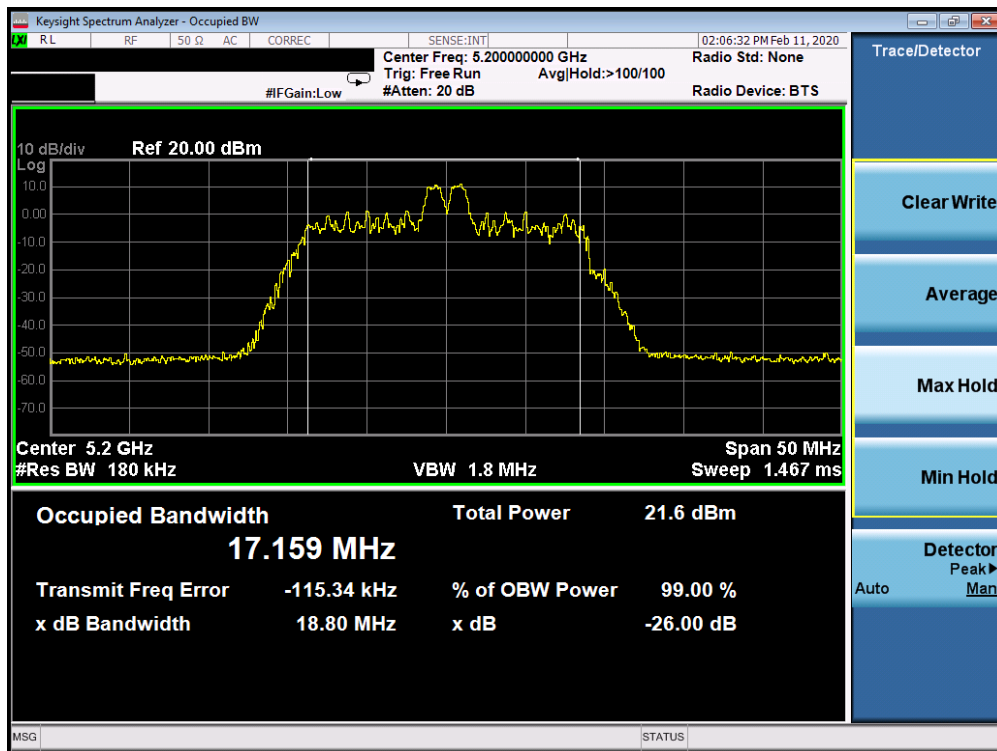


Plot 7-83. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 36)

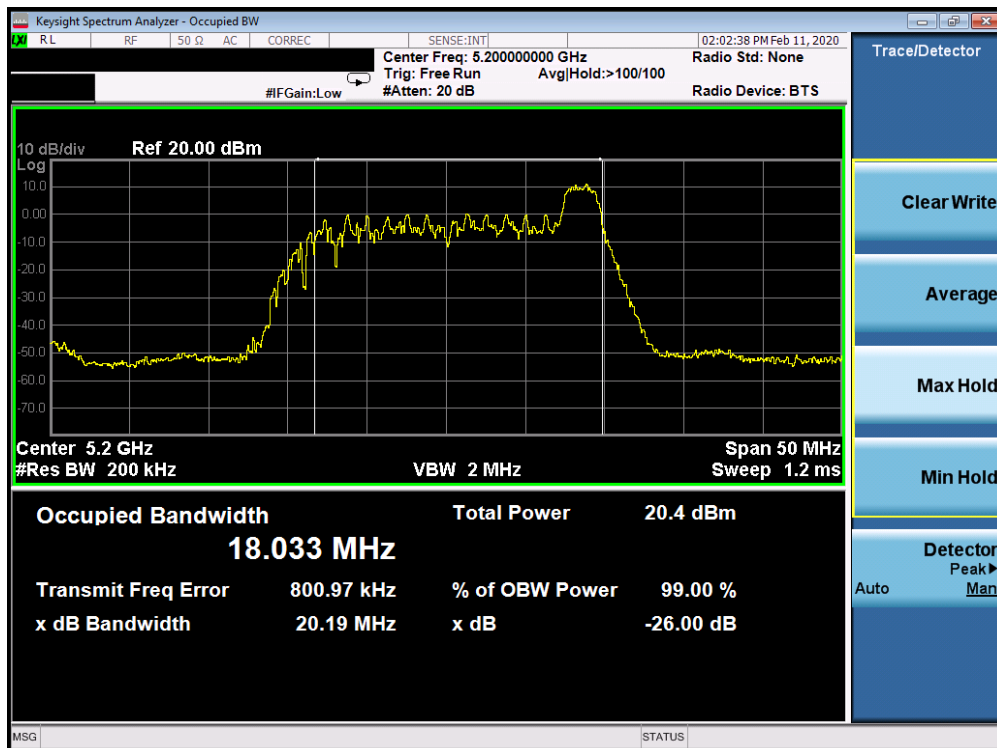


Plot 7-84. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 40)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 59 of 537

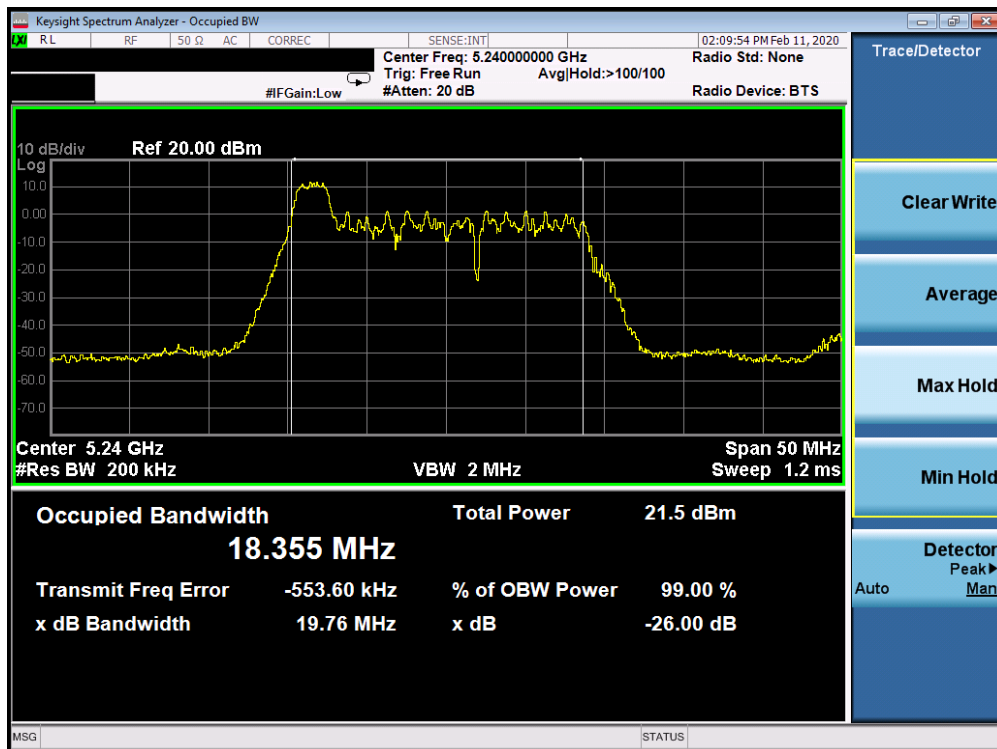


Plot 7-85. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 1) – Ch. 40)

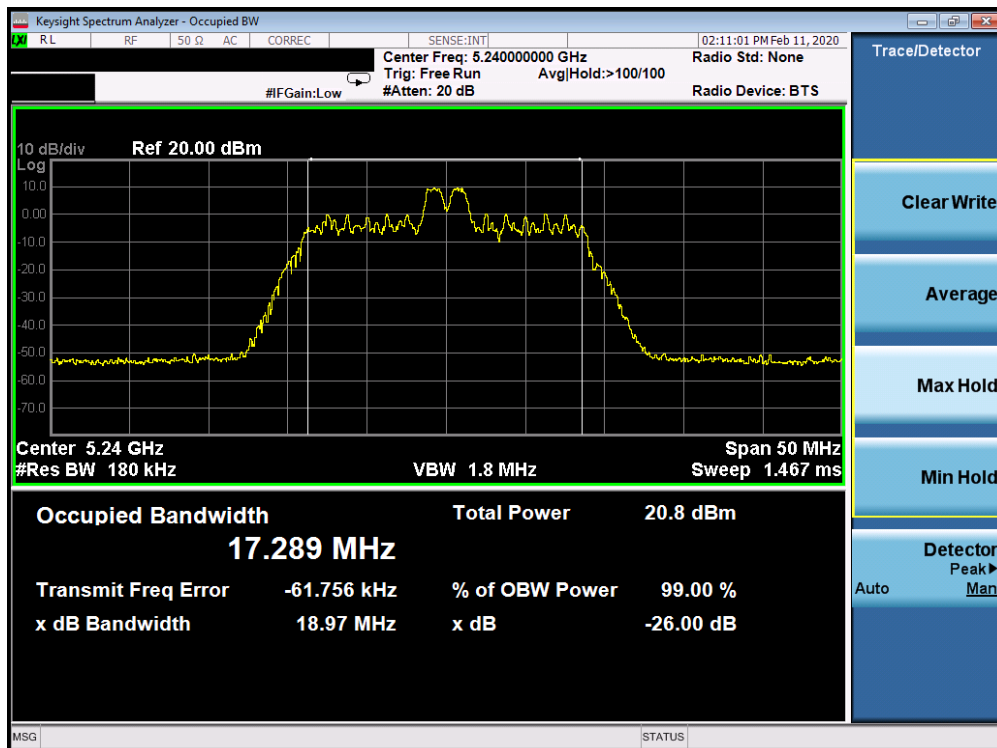


Plot 7-86. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 8– RU26 (UNII Band 1) – Ch. 40)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 60 of 537

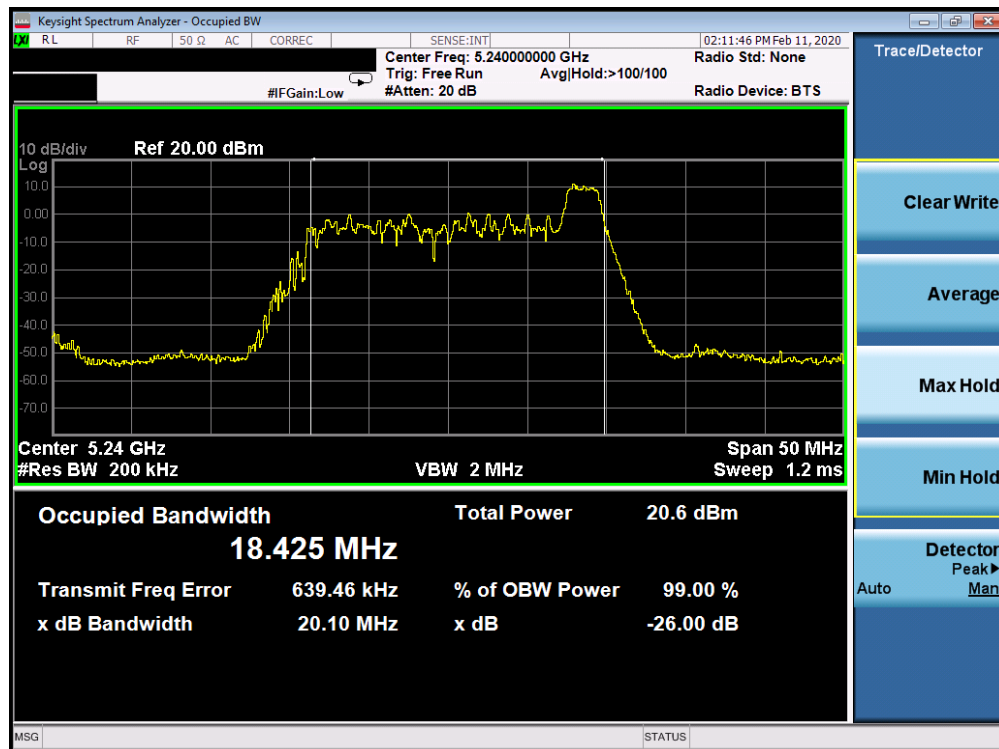


Plot 7-87. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 48)

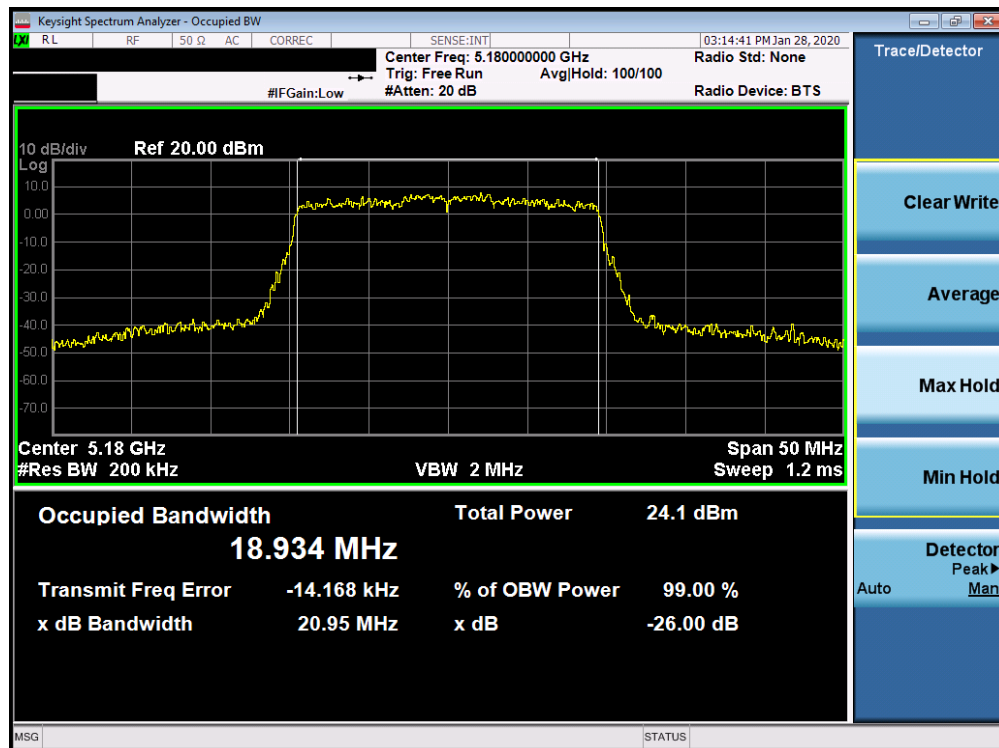


Plot 7-88. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 1) – Ch. 48)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 61 of 537

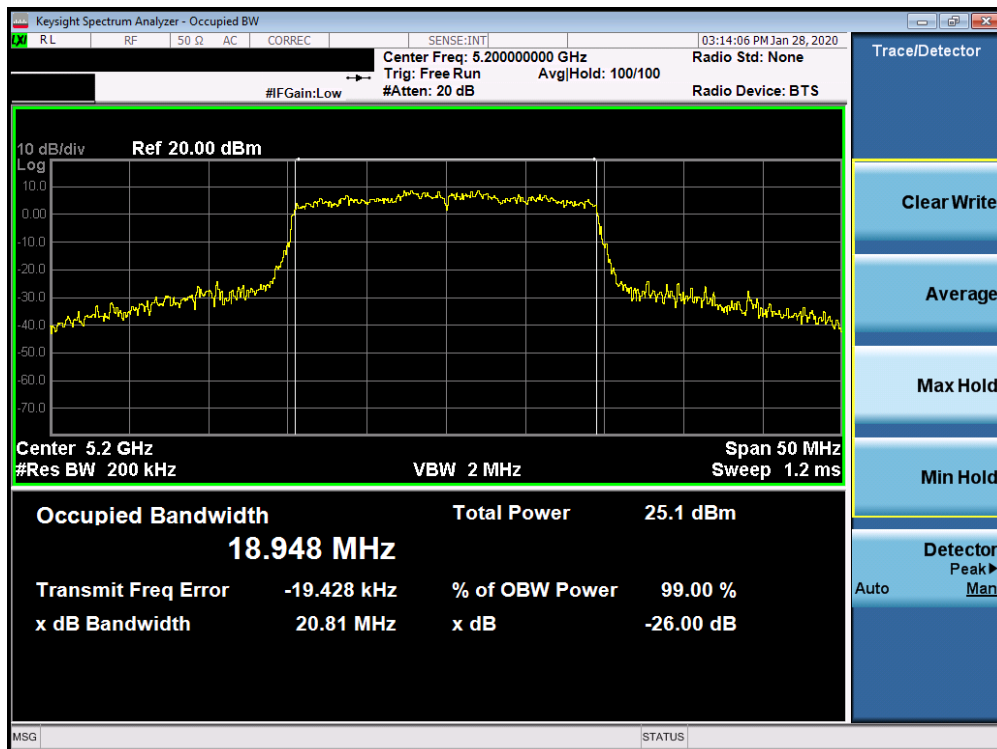


Plot 7-89. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 48)

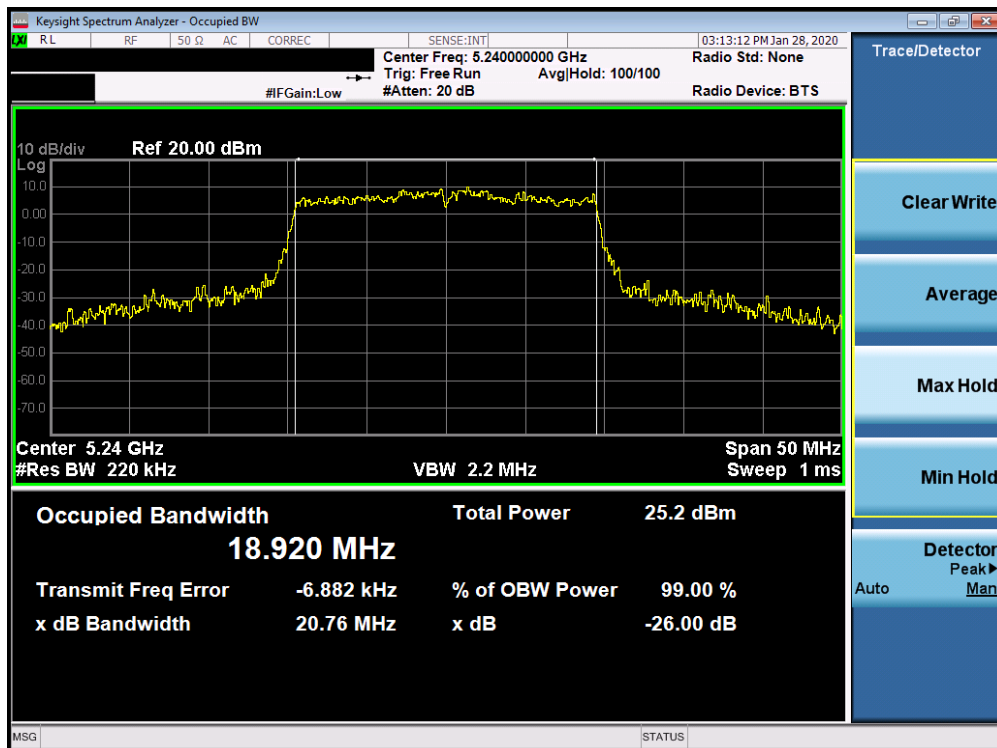


Plot 7-90. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax– RU242 (UNII Band 1) – Ch. 36)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 62 of 537

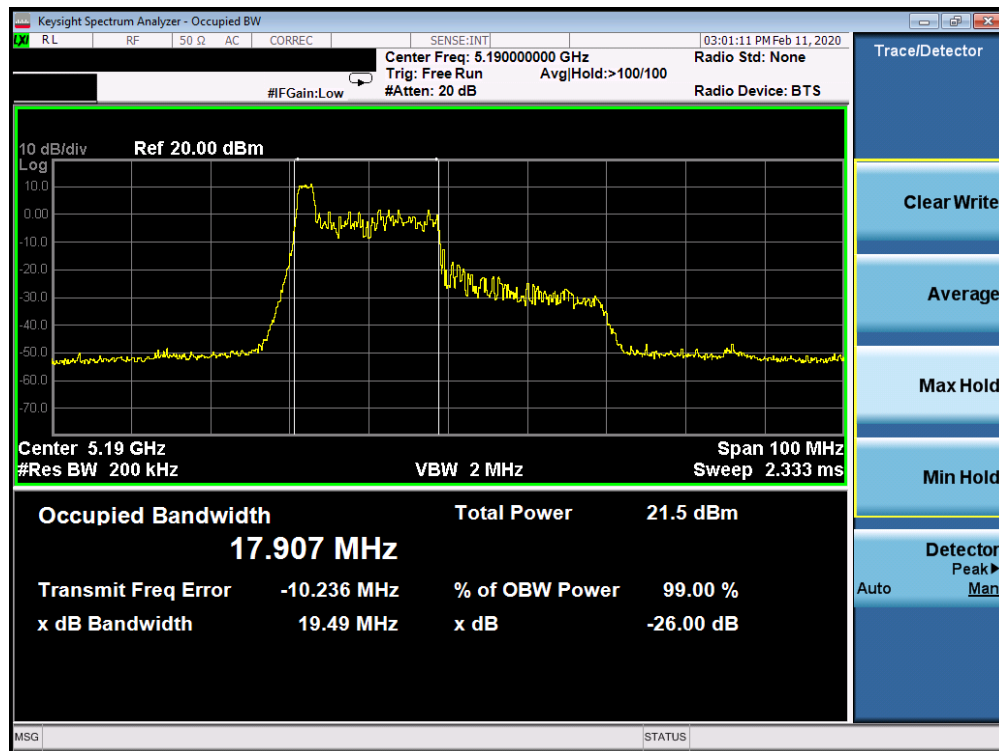


Plot 7-91. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax– RU242 (UNII Band 1) – Ch. 40)

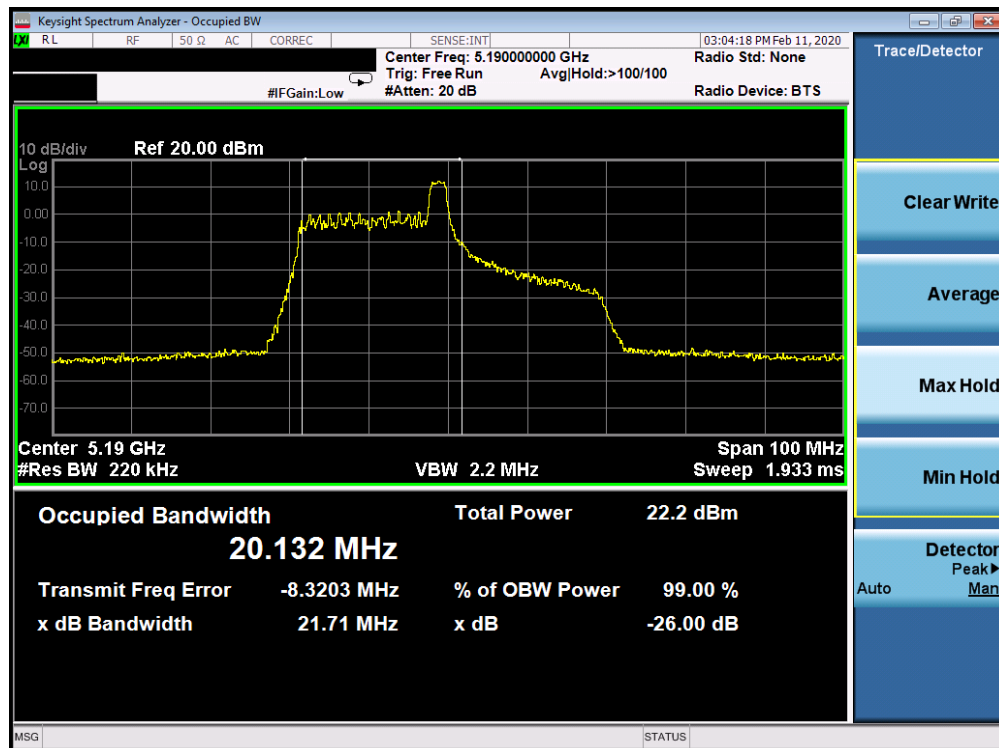


Plot 7-92. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax– RU242 (UNII Band 1) – Ch. 48)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 63 of 537

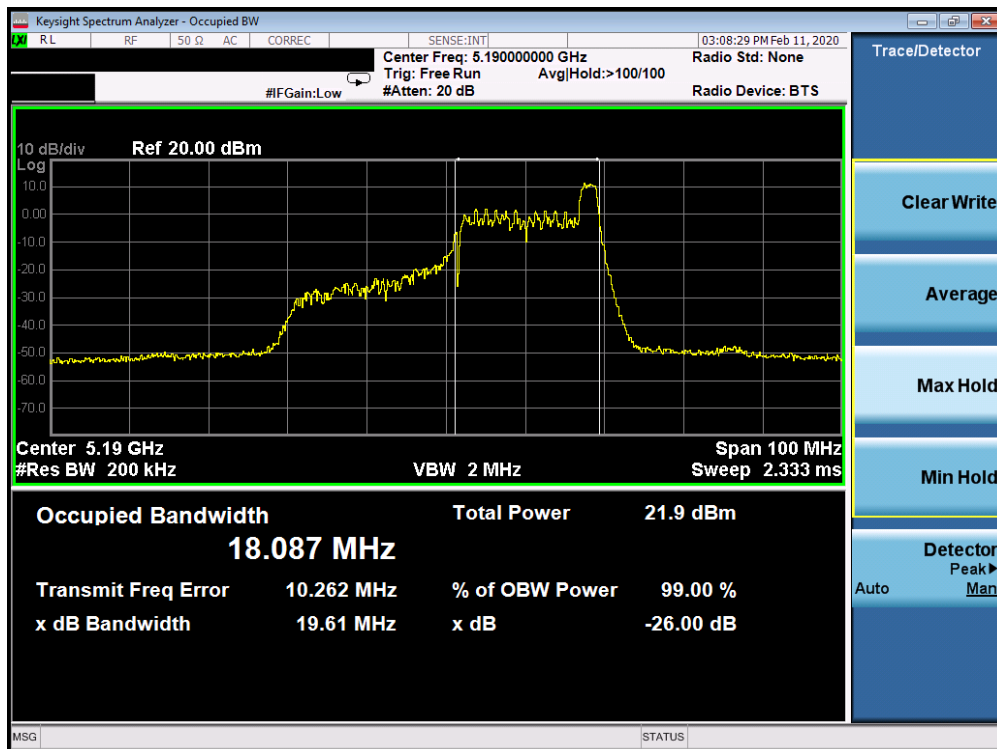


Plot 7-93. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 38)

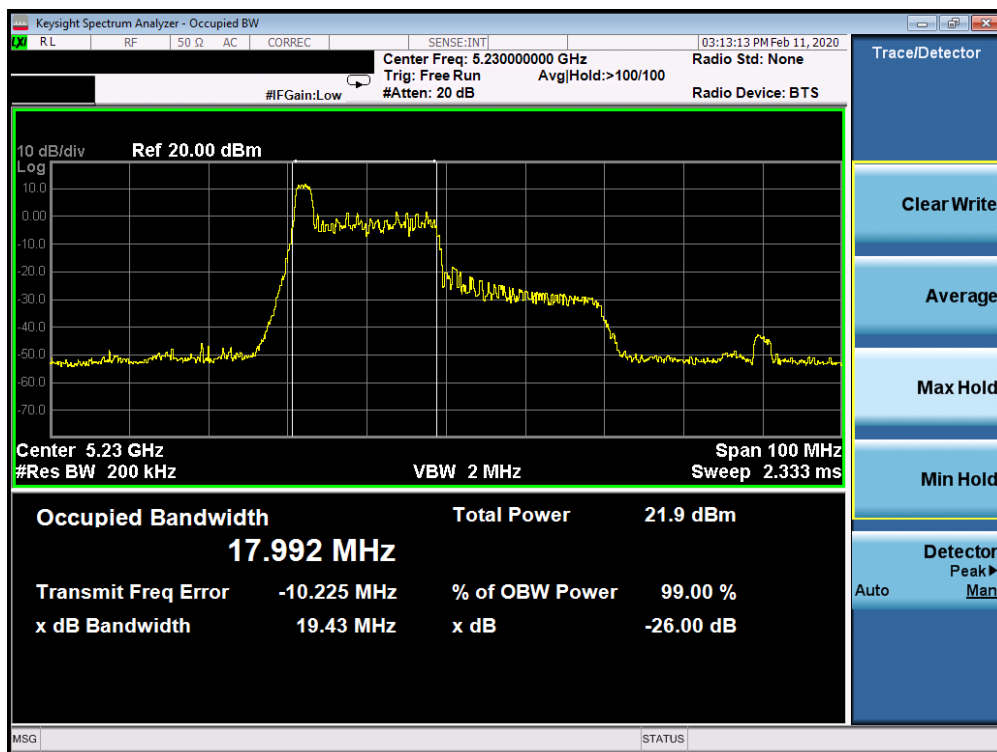


Plot 7-94. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 38)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 64 of 537

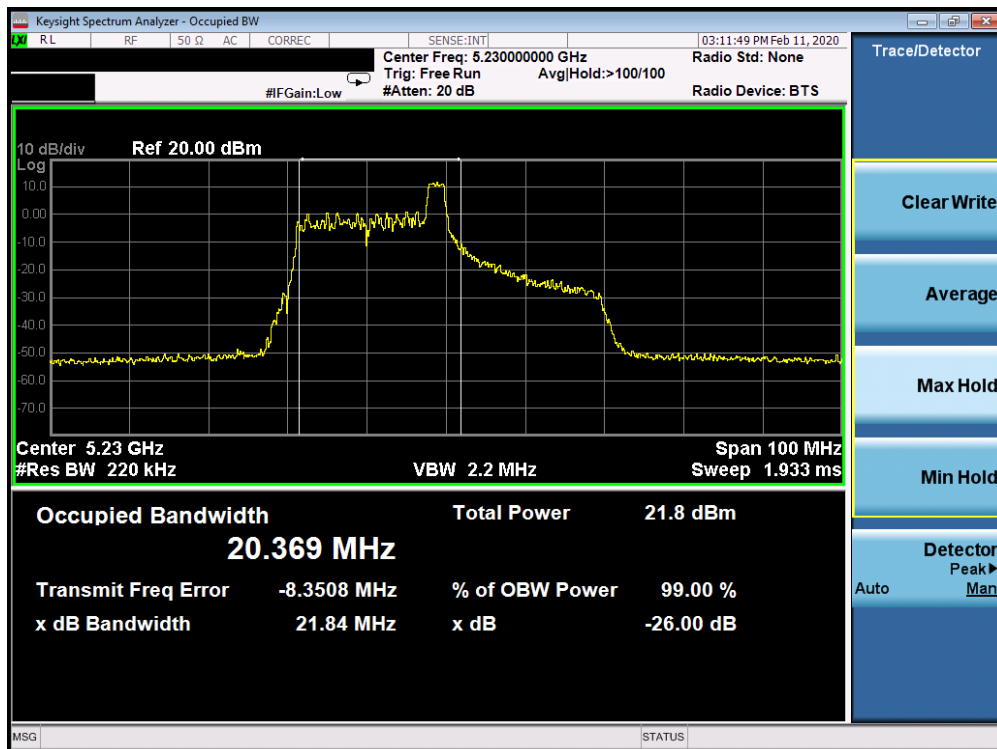


Plot 7-95. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 1) – Ch. 38)

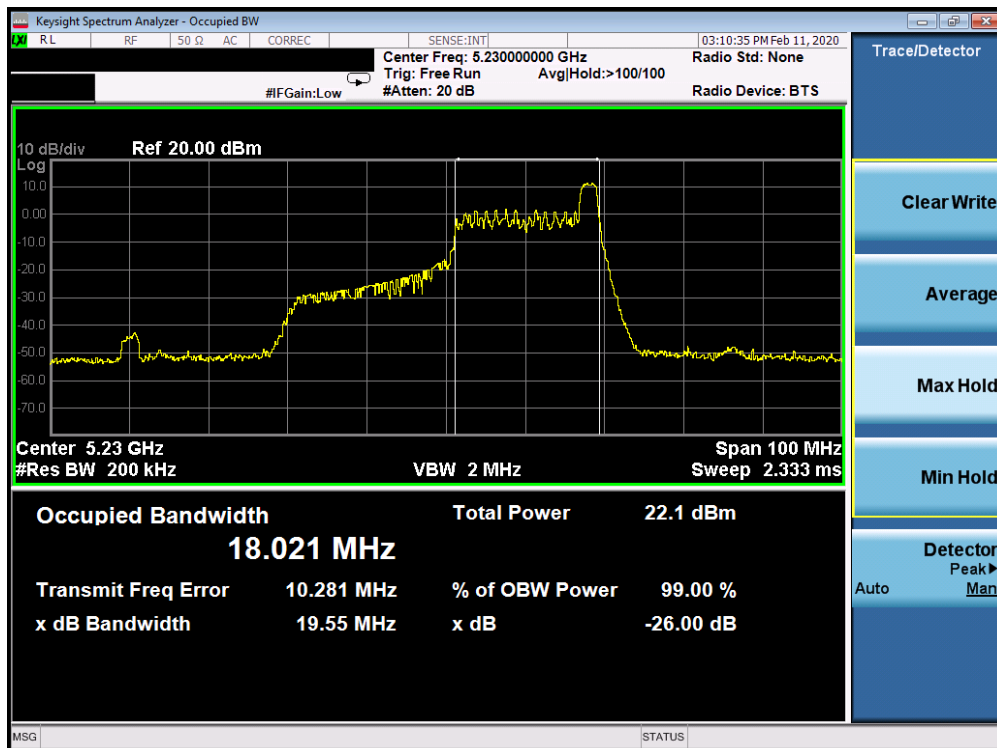


Plot 7-96. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 46)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 65 of 537

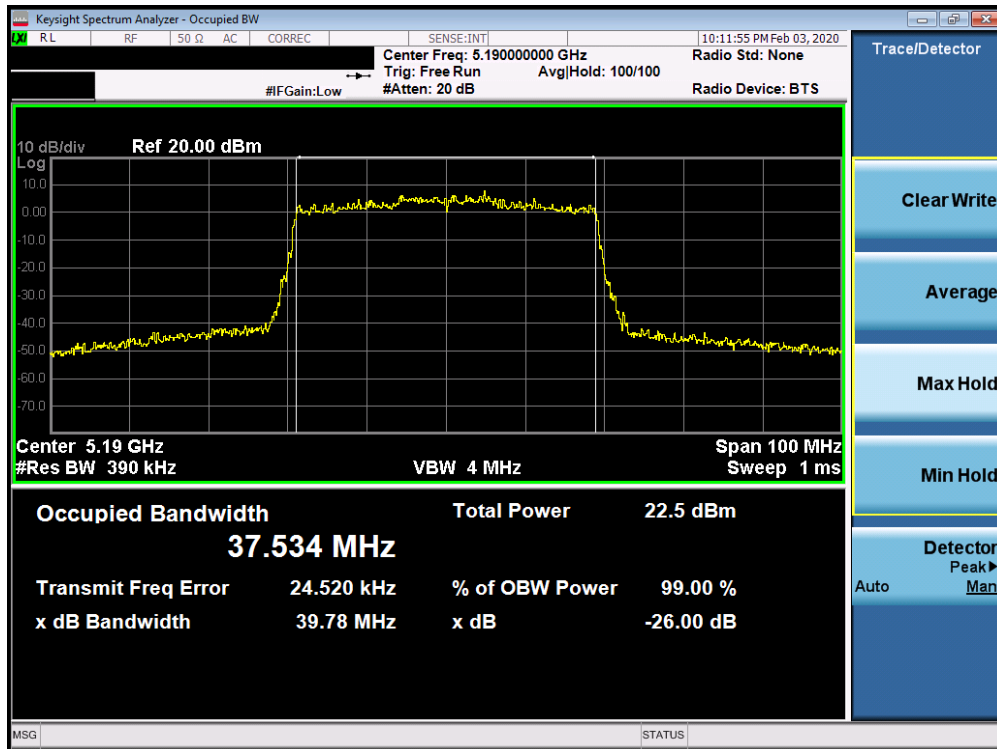


Plot 7-97. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax Index 8 – RU26 (UNII Band 1) – Ch. 46)

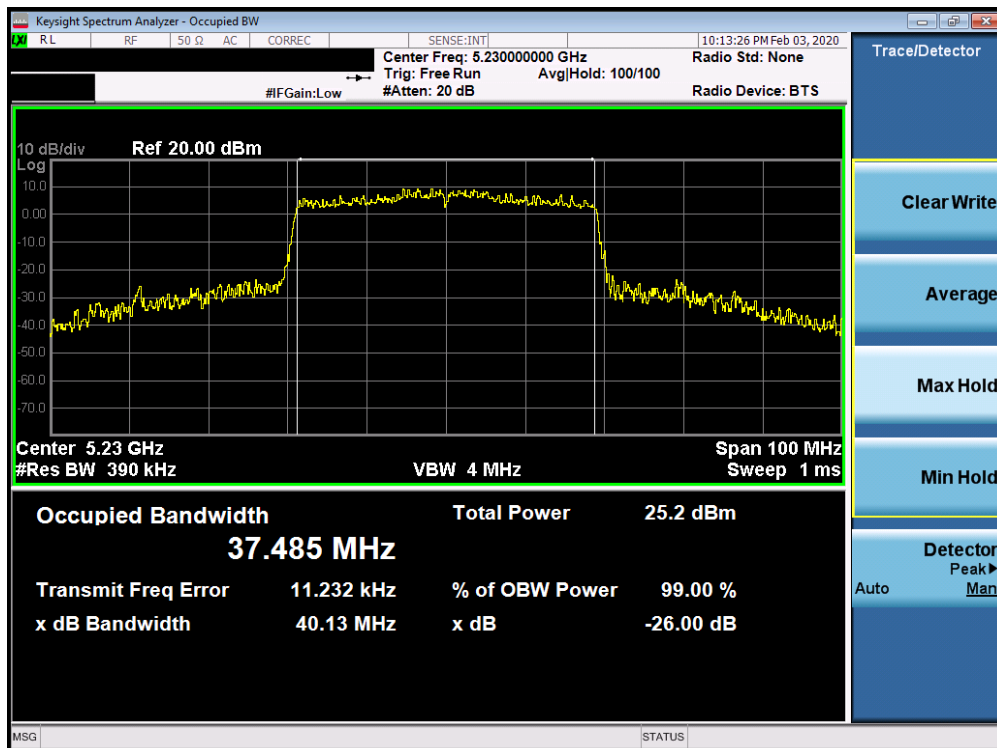


Plot 7-98. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax Index 17 – RU26 (UNII Band 1) – Ch. 46)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 66 of 537

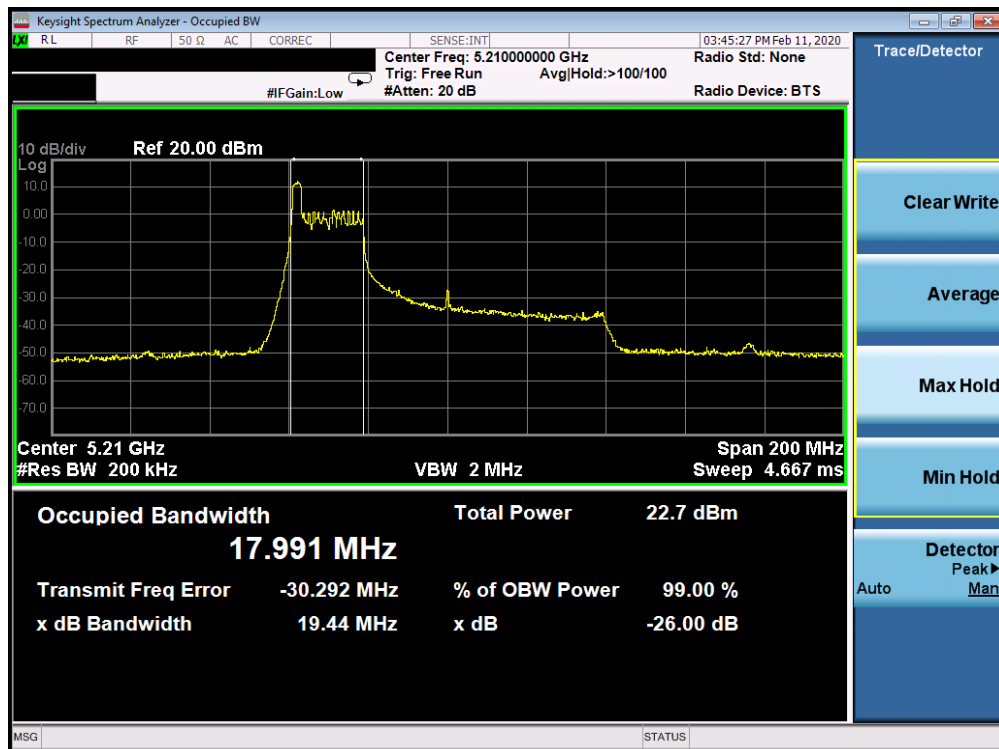


Plot 7-99. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax – RU484 (UNII Band 1) – Ch. 38)

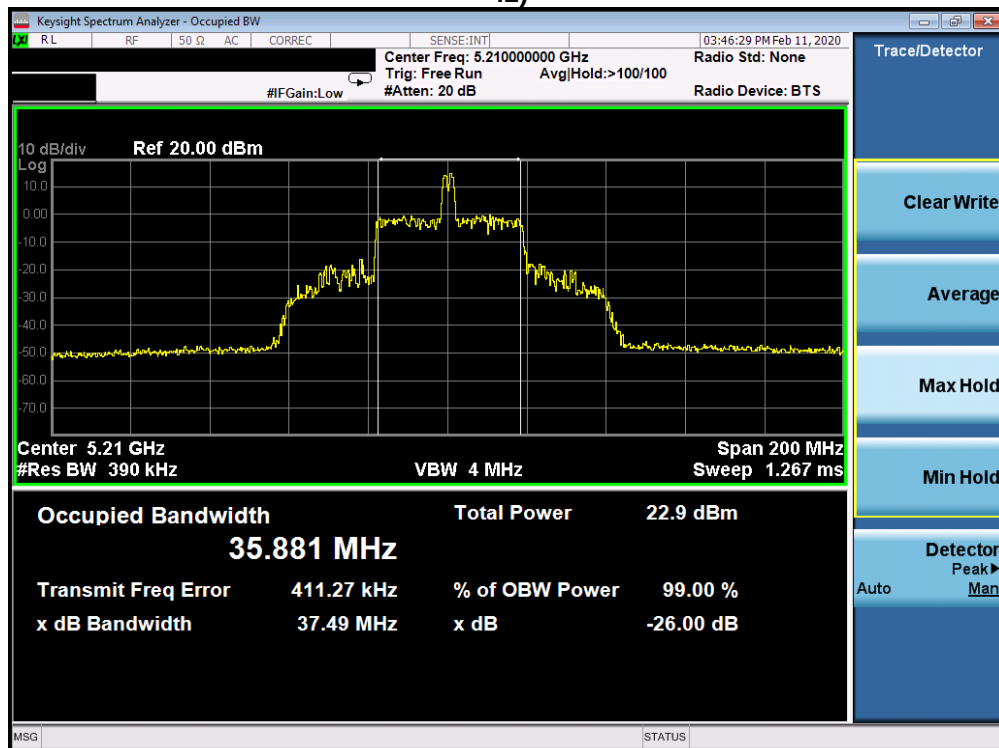


Plot 7-100. 26dB Bandwidth Plot SISO CORE 1 (40MHz BW 802.11ax – RU484 (UNII Band 1) – Ch. 46)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 67 of 537

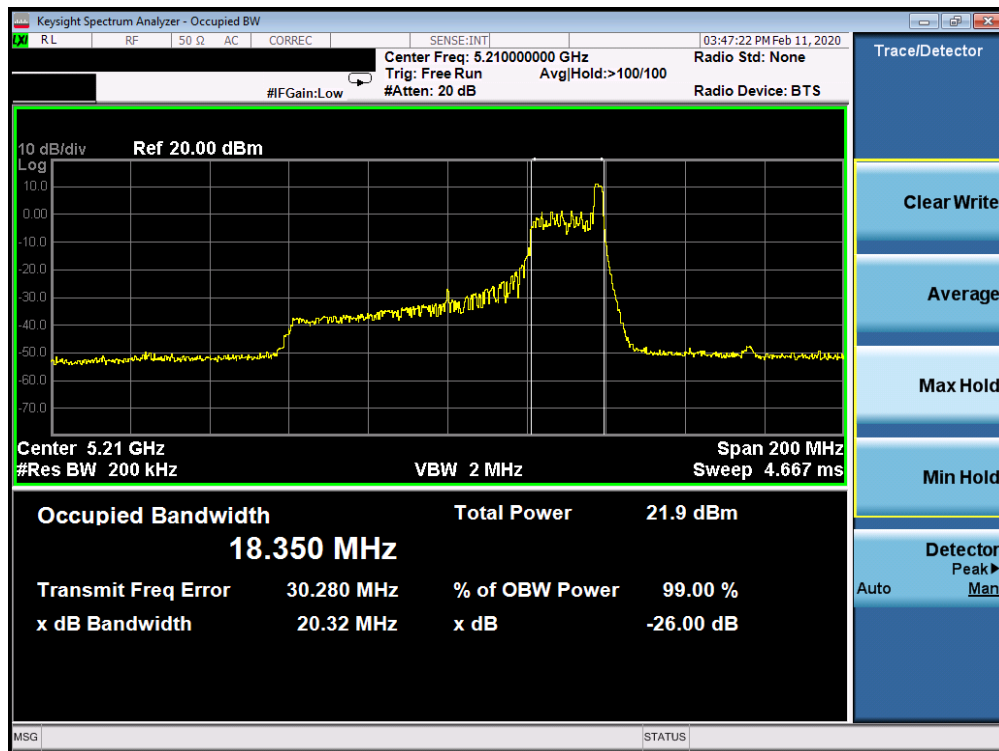


Plot 7-101. 26dB Bandwidth Plot SISO CORE 1 (80MHz BW 802.11ax Index 0 – RU26 (UNII Band 1) – Ch. 42)

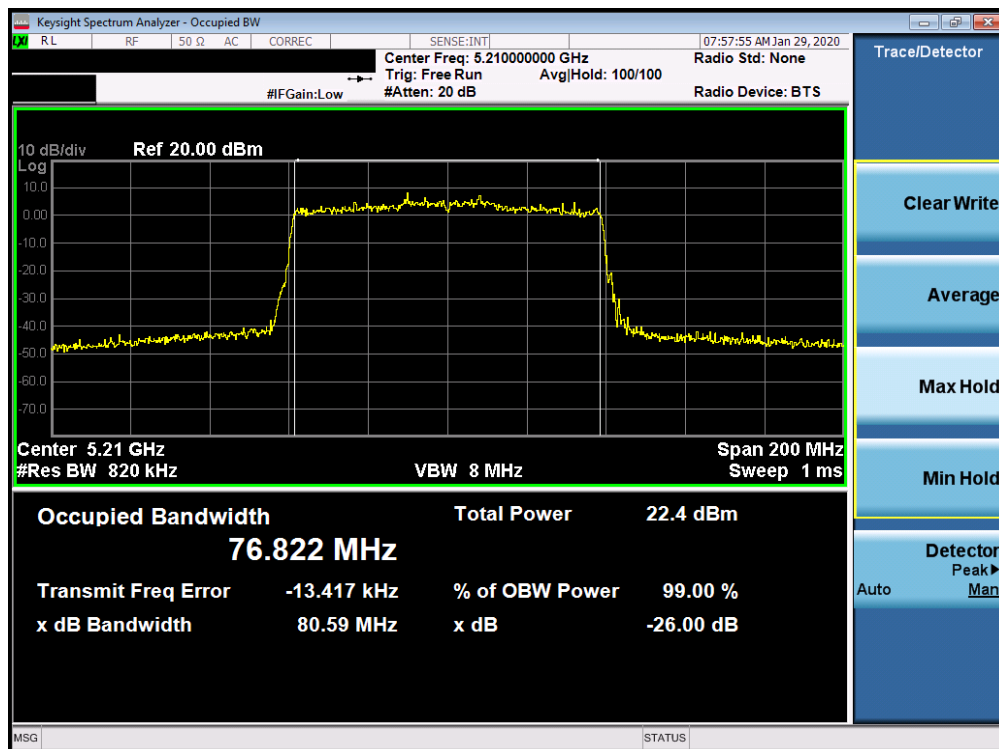


Plot 7-102. 26dB Bandwidth Plot SISO CORE 1 (80MHz BW 802.11ax Index 18 – RU26 (UNII Band 1) – Ch. 42)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 68 of 537

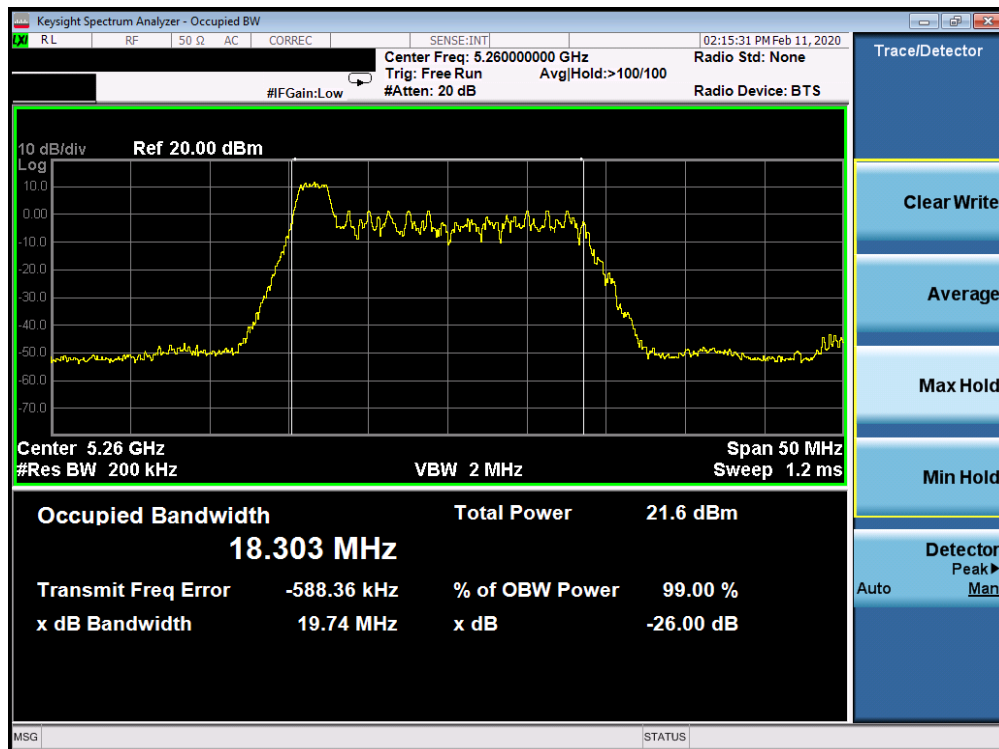


Plot 7-103. 26dB Bandwidth Plot SISO CORE 1 (80MHz BW 802.11ax Index 36 – RU26 (UNII Band 1) – Ch. 42)

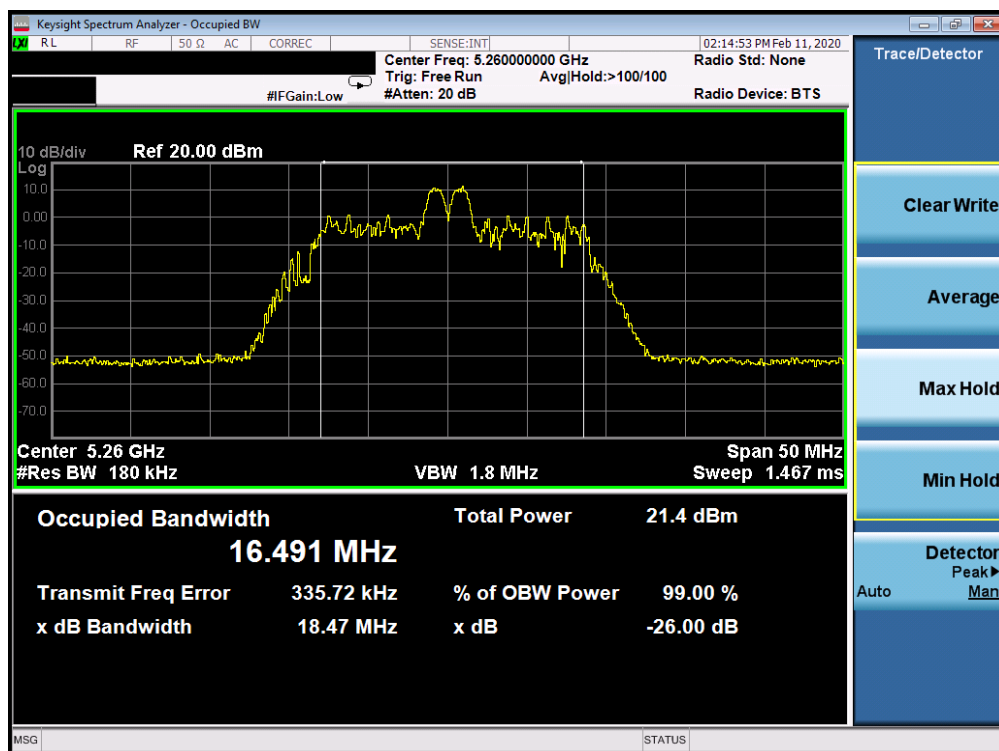


Plot 7-104. 26dB Bandwidth Plot SISO CORE 1 (80MHz BW 802.11ax – RU996 (UNII Band 1) – Ch. 42)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 69 of 537

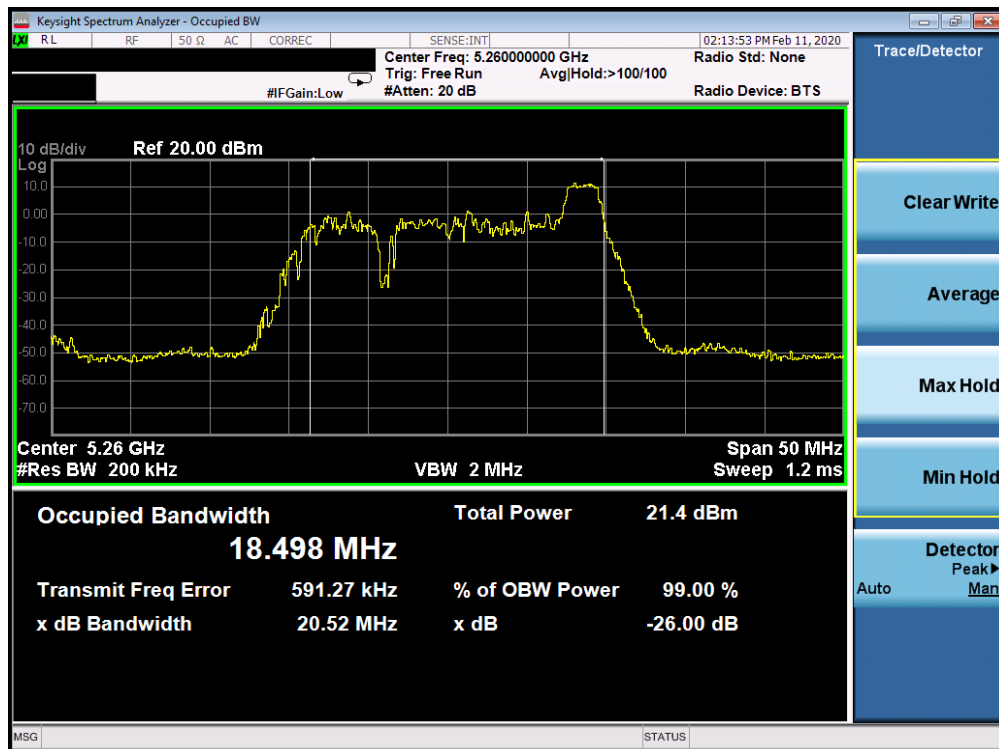


Plot 7-105. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 52)

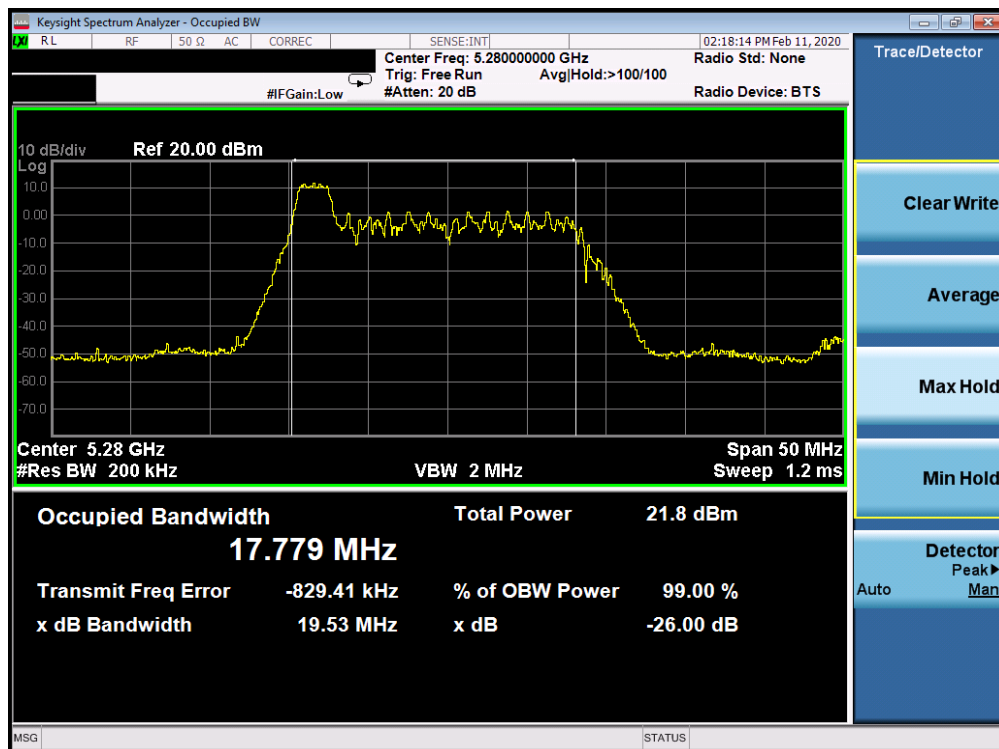


Plot 7-106. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2A) – Ch. 52)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 70 of 537

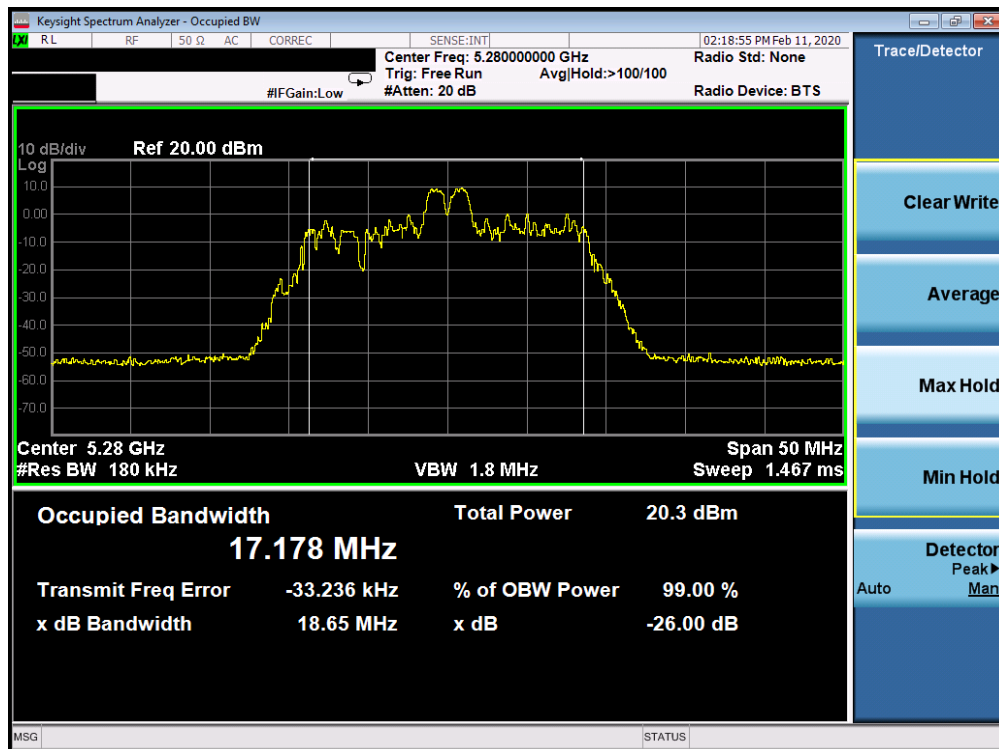


Plot 7-107. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 2A) – Ch. 52)

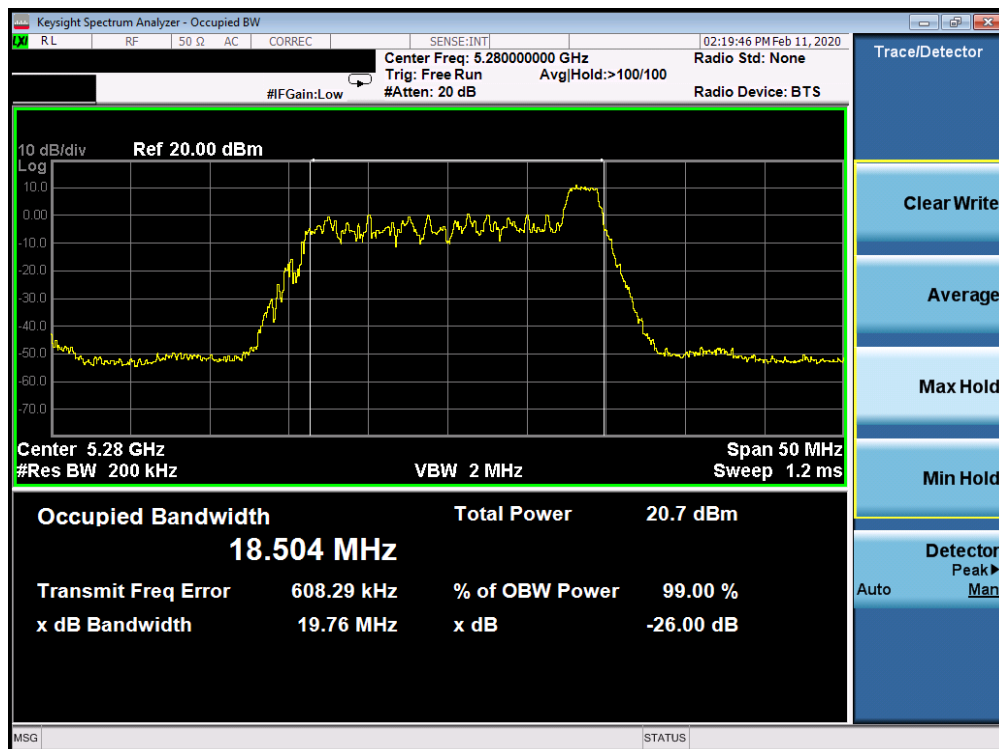


Plot 7-108. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 56)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 71 of 537

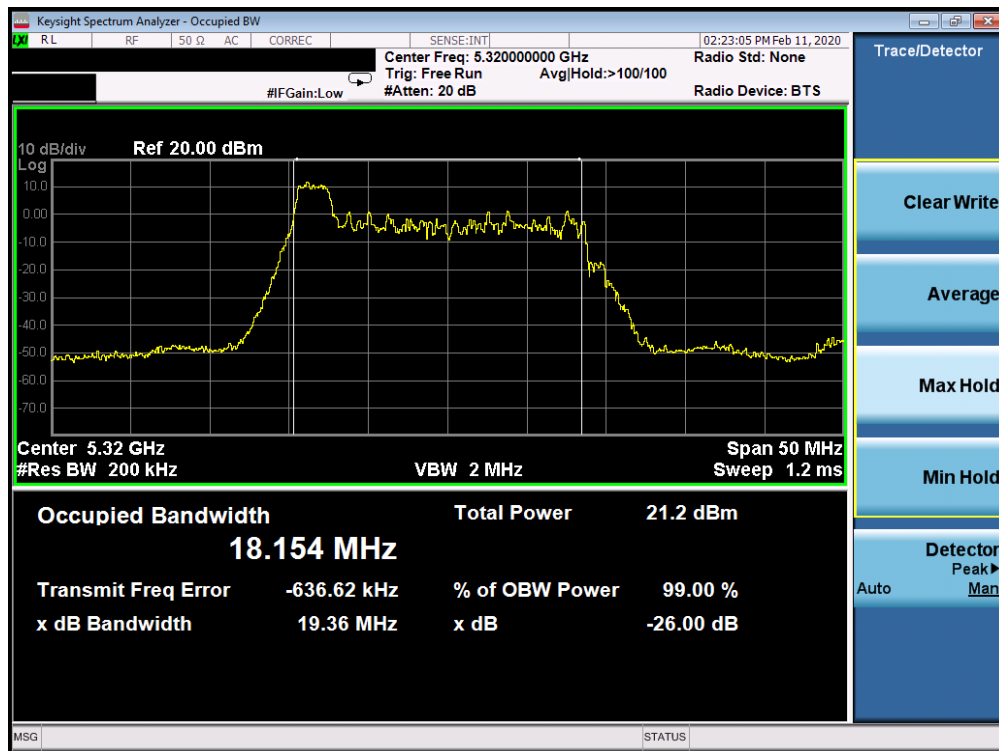


Plot 7-109. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2A) – Ch. 56)

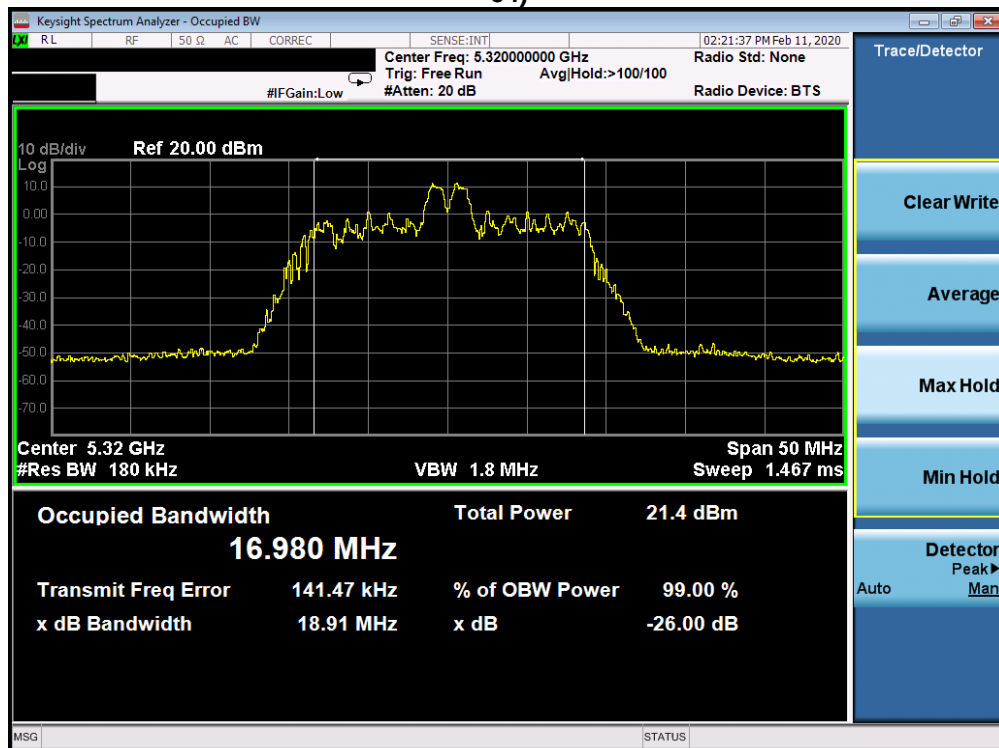


Plot 7-110. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 8– RU26 (UNII Band 2A) – Ch. 56)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 72 of 537

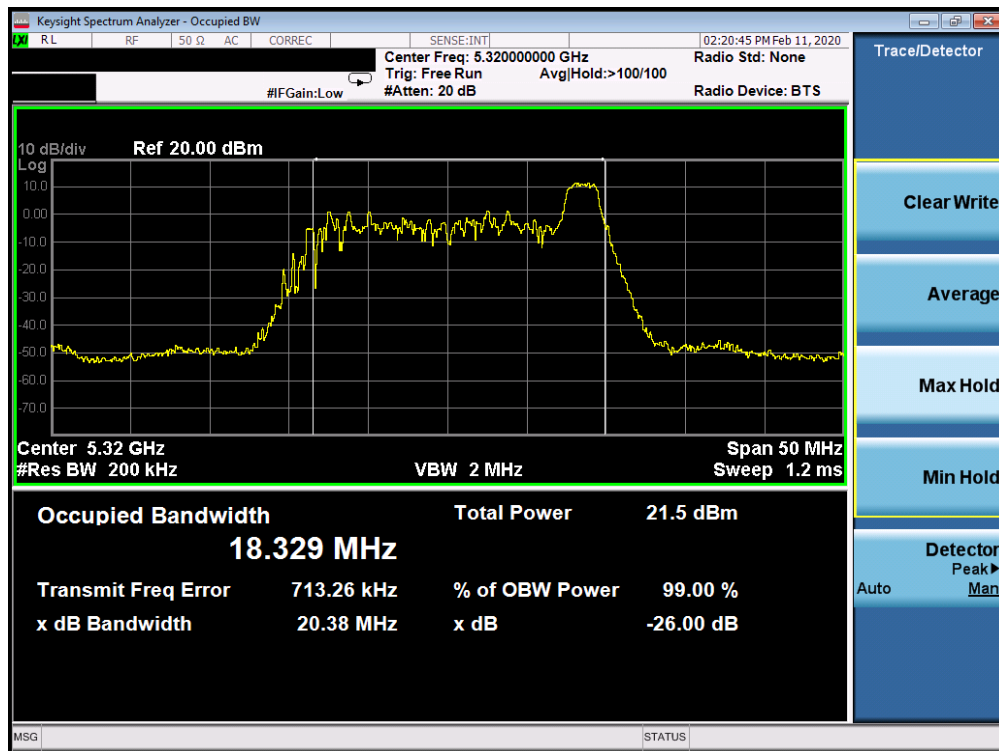


Plot 7-111. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 0 – RU26 (UNII Band 2A) – Ch. 64)

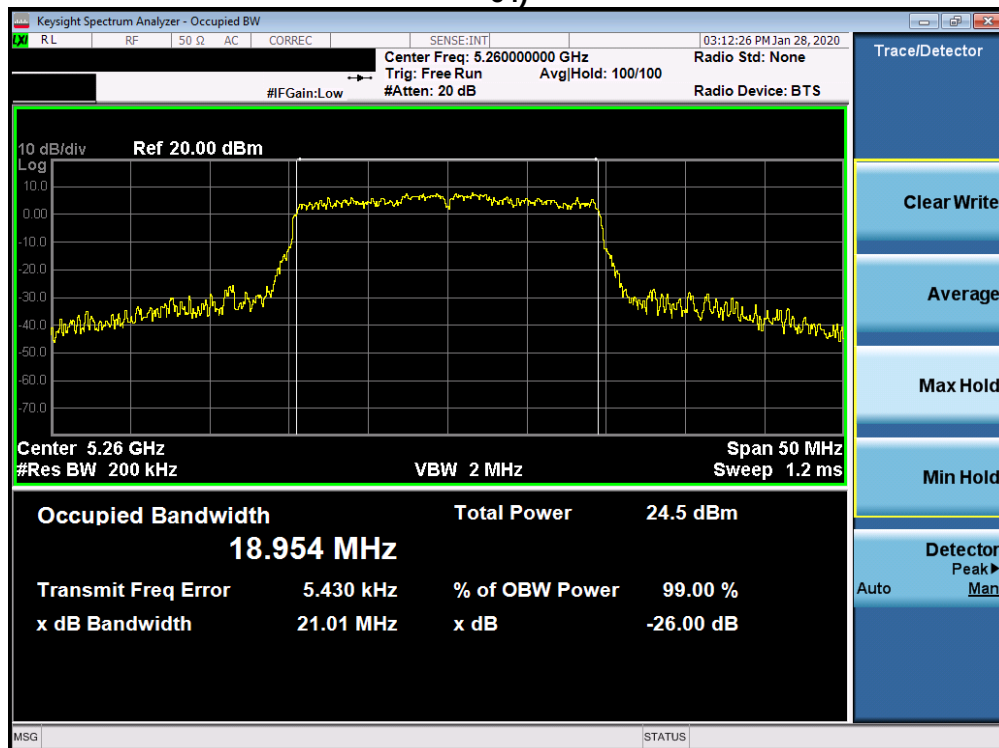


Plot 7-112. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 4 – RU26 (UNII Band 2A) – Ch. 64)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 73 of 537



Plot 7-113. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax Index 8 – RU26 (UNII Band 2A) – Ch. 64)



Plot 7-114. 26dB Bandwidth Plot SISO CORE 1 (20MHz BW 802.11ax– RU242 (UNII Band 2A) – Ch. 52)

FCC ID: BCGA2228		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1912170050-09.BCG	Test Dates: 12/10/2019 - 02/26/2020	EUT Type: Tablet Device	Page 74 of 537