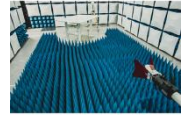




# Element Materials Technology

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



## MEASUREMENT REPORT PART 27

**Applicant Name:**

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

**Date of Testing:**

10/01/2023 - 03/07/2024

**Test Report Issue Date:**

4/4/2024

**Test Site/Location:**

Element Materials Technology, Morgan Hill, CA, USA

**Test Report Serial No.:**

1C2311270066-10.BCG

**FCC ID:**

**BCGA2899**

**Applicant Name:**

**Apple Inc.**

**Application Type:**

Certification

**Model:**

A2899, A2900

**EUT Type:**

Tablet Device

**FCC Classification:**

PCS Licensed Transmitter (PCB)

**FCC Rule Part:**

27

**Test Procedure(s):**

ANSI C63.26-2015, TIA-603-E-2016, KDB 971168 D01 v03r01

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 §2.947. 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

**Prepared by:** WKR0000006184

**Reviewed by:** WKR0000005805




<b>FCC ID:</b> BCGA2899	<b>PART 27 MEASUREMENT REPORT</b>		<b>Approved by:</b> Technical Manager
<b>Test Report S/N:</b> 1C2311270066-10.BCG	<b>Test Dates:</b> 10/01/2023 - 03/07/2024	<b>EUT Type:</b> Tablet Device	Page 1 of 571

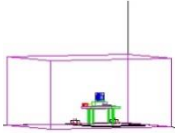
V2.2 09/07/2023

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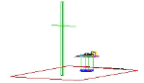
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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	EIRP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	
LTE Band 30	5 MHz	QPSK	2307.5 - 2312.5	4.5303	0.223	23.49	4M53G7W
		16QAM	2307.5 - 2312.5	4.5398	0.177	22.47	4M54D7W
		64QAM	2307.5 - 2312.5	4.5397	0.139	21.44	4M54D7W
		256QAM	2307.5 - 2312.5	4.5378	0.072	18.58	4M54D7W
	10MHz	QPSK	2310	9.0465	0.221	23.45	9M05G7W
		16QAM	2310	9.0369	0.177	22.48	9M04D7W
		64QAM	2310	9.0614	0.139	21.42	9M06D7W
		256QAM	2310	9.0602	0.072	18.58	9M06D7W
LTE Band 7	5 MHz	QPSK	2502.5 - 2567.5	4.5454	0.363	25.60	4M55G7W
		16QAM	2502.5 - 2567.5	4.5385	0.325	25.12	4M54D7W
		64QAM	2502.5 - 2567.5	4.5366	0.254	24.04	4M54D7W
		256QAM	2502.5 - 2567.5	4.5230	0.121	20.82	4M52D7W
	10 MHz	QPSK	2505 - 2565	9.0810	0.363	25.60	9M08G7W
		16QAM	2505 - 2565	9.0350	0.325	25.12	9M04D7W
		64QAM	2505 - 2565	9.0336	0.245	23.90	9M03D7W
		256QAM	2505 - 2565	9.0325	0.121	20.83	9M03D7W
	15 MHz	QPSK	2507.5 - 2562.5	13.5130	0.359	25.55	13M5G7W
		16QAM	2507.5 - 2562.5	13.5340	0.315	24.98	13M5D7W
		64QAM	2507.5 - 2562.5	13.5540	0.237	23.74	13M6D7W
		256QAM	2507.5 - 2562.5	13.5250	0.119	20.77	13M5D7W
	20 MHz	QPSK	2510 - 2560	18.0120	0.362	25.59	18M0G7W
		16QAM	2510 - 2560	18.0430	0.321	25.07	18M0D7W
		64QAM	2510 - 2560	18.0020	0.244	23.88	18M0D7W
		256QAM	2510 - 2560	18.0080	0.118	20.73	18M0D7W
LTE Band 41 (PC2)	5 MHz	QPSK	2498.5 - 2687.5	4.5323	1.148	30.60	4M53G7W
		16QAM	2498.5 - 2687.5	4.5324	0.906	29.57	4M53D7W
		64QAM	2498.5 - 2687.5	4.5333	0.818	29.13	4M53D7W
		256QAM	2498.5 - 2687.5	4.5276	0.561	27.49	4M53D7W
	10 MHz	QPSK	2501 - 2685	9.0362	1.148	30.60	9M04G7W
		16QAM	2501 - 2685	9.0624	0.899	29.54	9M06D7W
		64QAM	2501 - 2685	9.0321	0.820	29.14	9M03D7W
		256QAM	2501 - 2685	9.0340	0.558	27.47	9M03D7W
	15 MHz	QPSK	2503.5 - 2682.5	13.5490	1.148	30.60	13M5G7W
		16QAM	2503.5 - 2682.5	13.5410	0.904	29.56	13M5D7W
		64QAM	2503.5 - 2682.5	13.5520	0.817	29.12	13M6D7W
		256QAM	2503.5 - 2682.5	13.5710	0.557	27.46	13M6D7W
	20 MHz	QPSK	2506 - 2680	18.0320	1.148	30.60	18M0G7W
		16QAM	2506 - 2680	18.0590	0.897	29.53	18M1D7W
		64QAM	2506 - 2680	18.0450	0.826	29.17	18M0D7W
		256QAM	2506 - 2680	18.0090	0.555	27.44	18M0D7W
LTE Band 41(PC3)	5 MHz	QPSK	2498.5 - 2687.5	4.5323	0.646	28.10	4M53G7W
		16QAM	2498.5 - 2687.5	4.5324	0.505	27.03	4M53D7W
		64QAM	2498.5 - 2687.5	4.5333	0.408	26.11	4M53D7W
		256QAM	2498.5 - 2687.5	4.5276	0.243	23.85	4M53D7W
	10 MHz	QPSK	2501 - 2685	9.0362	0.646	28.10	9M04G7W
		16QAM	2501 - 2685	9.0624	0.525	27.20	9M06D7W
		64QAM	2501 - 2685	9.0321	0.414	26.17	9M03D7W
		256QAM	2501 - 2685	9.0340	0.235	23.71	9M03D7W
	15 MHz	QPSK	2503.5 - 2682.5	13.5490	0.610	27.85	13M5G7W
		16QAM	2503.5 - 2682.5	13.5410	0.499	26.98	13M5D7W
		64QAM	2503.5 - 2682.5	13.5520	0.386	25.87	13M6D7W
		256QAM	2503.5 - 2682.5	13.5710	0.230	23.62	13M6D7W
	20 MHz	QPSK	2506 - 2680	18.0320	0.612	27.87	18M0G7W
		16QAM	2506 - 2680	18.0590	0.506	27.04	18M1D7W
		64QAM	2506 - 2680	18.0450	0.394	25.96	18M0D7W
		256QAM	2506 - 2680	18.0090	0.235	23.71	18M0D7W
ULCA LTE Band 7	20 + 20 MHz	QPSK	2520 - 2550	37.5760	0.356	25.52	37M6G7W
		16QAM	2520 - 2550	37.5900	0.220	23.42	37M6D7W
		64QAM	2520 - 2550	37.5330	0.219	23.41	37M5D7W
		256QAM	2520 - 2550	37.5310	0.138	21.41	37M5D7W
ULCA LTE Band 41(PC2)	20 + 20 MHz	QPSK	2516 - 2670	37.5900	1.127	30.52	37M6G7W
		16QAM	2516 - 2670	37.5420	0.738	28.68	37M5D7W
		64QAM	2516 - 2670	37.5960	0.590	27.71	37M6D7W
		256QAM	2516 - 2670	37.5300	0.451	26.54	37M5D7W
ULCA LTE Band 41(PC3)	20 + 20 MHz	QPSK	2516 - 2670	37.5900	0.570	27.56	37M6G7W
		16QAM	2516 - 2670	37.5420	0.286	24.57	37M5D7W
		64QAM	2516 - 2670	37.5960	0.284	24.54	37M6D7W
		256QAM	2516 - 2670	37.5300	0.183	22.62	37M5D7W

## EUT Overview

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	OBW [MHz]	EIRP		Emission Designator
					Max. Power [W]	Max. Power [dBm]	
NR Band n30	5 MHz	$\pi/2$ BPSK	2307.5 - 2312.5	4.4658	0.223	23.48	4M47G7W
		QPSK	2307.5 - 2312.5	4.4913	0.224	23.50	4M49G7W
		16QAM	2307.5 - 2312.5	4.4913	0.182	22.59	4M49D7W
		64QAM	2307.5 - 2312.5	4.4971	0.142	21.53	4M50D7W
	256QAM	2307.5 - 2312.5	4.4909	0.086	19.37	4M49D7W	
	10MHz	$\pi/2$ BPSK	2310	8.9830	0.224	23.50	8M98G7W
		QPSK	2310	9.2935	0.221	23.45	9M29G7W
		16QAM	2310	9.2984	0.169	22.29	9M30D7W
		64QAM	2310	9.2982	0.141	21.50	9M30D7W
		256QAM	2310	9.2682	0.083	19.17	9M27D7W
NR Band n7		5 MHz	$\pi/2$ BPSK	2502.5 - 2567.5	4.4690	0.356	25.52
	QPSK		2502.5 - 2567.5	4.4661	0.356	25.52	4M47G7W
	16QAM		2502.5 - 2567.5	4.4728	0.298	24.74	4M47D7W
	64QAM		2502.5 - 2567.5	4.4711	0.231	23.63	4M47D7W
	256QAM		2502.5 - 2567.5	4.4599	0.144	21.58	4M46D7W
	10MHz	$\pi/2$ BPSK	2505 - 2565	8.9503	0.357	25.53	8M95G7W
		QPSK	2505 - 2565	9.3444	0.354	25.49	9M34G7W
		16QAM	2505 - 2565	9.2324	0.292	24.66	9M23D7W
		64QAM	2505 - 2565	9.3360	0.226	23.55	9M34D7W
		256QAM	2505 - 2565	9.3448	0.141	21.50	9M34D7W
	15 MHz	$\pi/2$ BPSK	2507.5 - 2562.5	13.4490	0.352	25.47	13M4G7W
		QPSK	2507.5 - 2562.5	14.1300	0.355	25.51	14M1G7W
		16QAM	2507.5 - 2562.5	14.1270	0.308	24.89	14M1D7W
		64QAM	2507.5 - 2562.5	14.1240	0.240	23.81	14M1D7W
		256QAM	2507.5 - 2562.5	14.1690	0.148	21.69	14M2D7W
	20MHz	$\pi/2$ BPSK	2510 - 2560	17.9010	0.343	25.36	17M9G7W
		QPSK	2510 - 2560	18.9290	0.356	25.51	18M9G7W
		16QAM	2510 - 2560	18.9260	0.284	24.53	18M9D7W
		64QAM	2510 - 2560	18.9670	0.231	23.64	19M0D7W
		256QAM	2510 - 2560	19.0500	0.143	21.54	19M1D7W
	25MHz	$\pi/2$ BPSK	2512.5 - 2557.5	22.8330	0.351	25.46	22M8G7W
		QPSK	2512.5 - 2557.5	23.7940	0.354	25.49	23M8G7W
		16QAM	2512.5 - 2557.5	23.7830	0.291	24.64	23M8D7W
		64QAM	2512.5 - 2557.5	23.7870	0.228	23.58	23M8D7W
		256QAM	2512.5 - 2557.5	23.8330	0.147	21.66	23M8D7W
	30MHz	$\pi/2$ BPSK	2515 - 2555	28.6460	0.363	25.60	28M6G7W
		QPSK	2515 - 2555	28.5660	0.357	25.53	28M6G7W
		16QAM	2515 - 2555	28.5800	0.301	24.79	28M6D7W
		64QAM	2515 - 2555	28.6460	0.225	23.53	28M6D7W
		256QAM	2515 - 2555	28.6830	0.141	21.50	28M7D7W
35MHz	$\pi/2$ BPSK	2517.5 - 2552.5	32.2700	0.351	25.46	32M3G7W	
	QPSK	2517.5 - 2552.5	33.6590	0.350	25.45	33M7G7W	
	16QAM	2517.5 - 2552.5	33.6620	0.292	24.65	33M7D7W	
	64QAM	2517.5 - 2552.5	33.6070	0.229	23.60	33M6D7W	
	256QAM	2517.5 - 2552.5	33.4880	0.142	21.51	33M5D7W	
40MHz	$\pi/2$ BPSK	2520 - 2550	38.6540	0.347	25.40	38M7G7W	
	QPSK	2520 - 2550	38.7050	0.354	25.49	38M7G7W	
	16QAM	2520 - 2550	38.6800	0.303	24.81	38M7D7W	
	64QAM	2520 - 2550	38.5810	0.225	23.51	38M6D7W	
	256QAM	2520 - 2550	38.6910	0.148	21.69	38M7D7W	

### EUT Overview

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# 1.0 INTRODUCTION

## 1.1 Scope

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


## 1.2 Element Materials Technology Test Location

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

## 1.3 Test Facility / Accreditations

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

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

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID:BCGA2899**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

**Test Device Serial No.:** V24Q9WMQW3, HJ1CX3PQ9Y, GLW6H6PV7R, DLXH0A0008D0000FH4

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, 802.11a/ax WIFI 6E, 802.15.4, Bluetooth (1x, EDR, LE1M, LE2M, HDR4, HDR8), NB UNII (1x, HDR4, HDR8), WPT

This device supports BT Beamforming

LTE Band 30 and FR1 Band n30 support NS21 and LTE Band 41 and FR1 Band n41 support NS04 for Antenna 4, Antenna 1b, Antenna 3b, and Antenna 2.

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


Antenna	Simultaneous Tx Config	Wifi 2GHz	Bluetooth	Thread	Wifi 5GHz	Wifi 6GHz	NB UNII	LTE/FR1 NR	LTE/FR1 NR
		802.11 b/g/n/ax	BDR, EDR, HDR4/8, LE1/2M	802.15.4	802.11 a/n/ac/ax	802.11 a/ax	BDR, HDR4/8	MB/HB	UHB
Antenna 3b	Config 1	X	X	X	✓	X	X	✓	X
Antenna 3b	Config 2	X	X	X	X	✓	X	✓	X
Antenna 3b	Config 3	X	X	X	X	X	✓	✓	X
Antenna 3a	Config 4	✓	X	X	X	X	X	X	✓
Antenna 3a	Config 5	X	✓	X	X	X	X	X	✓
Antenna 3a	Config 6	X	X	✓	X	X	X	X	✓
Antenna 1a	Config 7	✓	X	X	X	X	X	X	✓
Antenna 1a	Config 8	X	✓	X	X	X	X	X	✓
Antenna 1a	Config 9	X	X	✓	X	X	X	X	✓
Antenna 1b	Config 10	X	X	X	✓	X	X	✓	X
Antenna 1b	Config 11	X	X	X	X	✓	X	✓	X
Antenna 1b	Config 12	X	X	X	X	X	✓	✓	X

**Table 2-1. Simultaneous Transmission Configurations**

✓ = Support; ✗ = Not Support

#### Note:

- All the above simultaneous transmission configurations have been tested and the worst case configuration was found to be Config 8 and reported in RF Bluetooth and FCC Part 96 test reports.
- Specific 2.4GHz Wi-Fi antenna that can only transmit simultaneously with 2.4GHz Bluetooth antenna is listed in the SAR test report. For BT (2.4GHz) in connected mode and Wi-Fi (2.4GHz) - Wi-Fi max power will not exceed minimum of (13.5dBm, SAR max cap, Reg max cap) power. For BT (2.4GHz) in disconnected mode and Wi-Fi (2.4GHz) - BT will be using iPA only and Wi-Fi max power will not exceed minimum of (SAR max cap, Reg max cap) power. Bluetooth can simultaneously transmit with IEEE 802.11a/n/ac/ax 5/6 GHz on separate antenna.

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### 2.3 Antenna Description

Following antenna gains provided by manufacturer were used for testing.


Band	Antenna Gain [dBi]			
	Antenna 4	Antenna 1b	Antenna 3b	Antenna 2
LTE Band 30	-2.60	0.00	0.30	2.00
NR Band n30				
LTE Band 7	-0.10	-0.60	-1.30	2.50
NR Band n7				
LTE Band 41	1.10	-1.30	-2.00	2.40
NR Band n41				

Table 2-2. Highest Antenna Gain

### 2.4 Test Support Equipment

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

Table 2-3. Test Support Equipment

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## 2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.26 2015, TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

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.


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

## 2.6 Software and Firmware

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

## 2.7 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and 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 documents titled “American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services” (ANSI C63.26-2015 and TIA-603-E-2016) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

**Deviation from Measurement Procedure.....None**

### 3.2 Radiated Spurious 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. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$E_{[dB\mu V/m]} = \text{Measured amplitude level}_{[dBm]} + 107 + \text{Cable Loss}_{[dB]} + \text{Antenna Factor}_{[dB/m]}$$


And

$$\text{EIRP}_{[dBm]} = E_{[dB\mu V/m]} + 20\log D - 104.8; \text{ where } D \text{ is the measurement distance in meters.}$$

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014.

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 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.


Radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI C63.26-2015 and TIA-603-E-2016.

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## 4.0 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  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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

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## 5.0 TEST EQUIPMENT CALIBRATION DATA


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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	6/21/2023	Annual	6/21/2024	MY49430244
ESPEC	SU-241	Tabletop Temperature Chamber	11/17/2023	Annual	11/17/2024	92009574
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	3/30/2023	Annual	3/30/2024	00218555
Keysight Technology	N9040B	UXA Signal Analyzer	11/5/2023	Annual	11/5/2024	MY57213068
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/31/2023	Annual	8/31/2024	100052
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/11/2023	Annual	5/11/2024	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	6/6/2023	Annual	6/6/2024	101668
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	6/22/2023	Annual	6/22/2024	102356
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	11/30/2023	Annual	11/30/2024	161616
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	12/27/2023	Annual	12/27/2024	164715
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/2/2023	Annual	6/2/2024	100050
Rohde & Schwarz	HFH2-Z2	Loop Antenna	5/1/2023	Annual	5/1/2024	100519
Rohde & Schwarz	FSW43	Signal Analyzer (2Hz-43.5GHz)	7/13/2023	Annual	7/13/2024	101261
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	4/17/2023	Annual	4/17/2024	00304

**Table 5-1. Test Equipment**

**Notes:**

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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## 6.0 SAMPLE CALCULATIONS

### Emission Designator

#### $\pi/2$ BPSK / QPSK Modulation

**Emission Designator = 8M62G7W**

BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination of Any

#### QAM Modulation

**Emission Designator = 8M45D7W**

BW = 8.45 MHz

D = Amplitude/Angle Modulated


7 = Quantized/Digital Info

W = Combination of Any

### Spurious Radiated Emission

#### **Example: Spurious emission at 3700.40 MHz**

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was  $-81.0$  dBm. The gain of the substituted antenna is  $8.1$  dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of  $-81.0$  dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is  $2.0$  dB at  $3700.40$  MHz. So  $6.1$  dB is added to the signal generator reading of  $-30.9$  dBm yielding  $-24.80$  dBm. The fundamental EIRP was  $25.50$  dBm so this harmonic was  $25.50$  dBm  $- (-24.80) = 50.3$  dBc.

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Apple Inc.  
 FCC ID: BCGA2899  
 FCC Classification: PCS Licensed Transmitter (PCB)  
 Mode(s): LTE/NR/ULCA


Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Occupied Bandwidth	2.1049	N/A	N/A	Section 7.2
	Conducted Band Edge / Spurious Emissions (LTE Band 30)	2.1051, 27.53(a)	Undesirable emissions must meet the limits detailed in 27.53(a)	PASS	Sections 7.3, 7.4
	Conducted Band Edge / Spurious Emissions (LTE Band 7)	2.1051, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Sections 7.3, 7.4
	Conducted Band Edge / Spurious Emissions (LTE Band 41)			PASS	Sections 7.3, 7.4
	Conducted Band Edge / Spurious Emissions (NR Band n41)			PASS	Sections 7.3, 7.4
	Transmitter Conducted Output Power	2.1046	N/A	N/A	See RF Exposure Report
	Additional Maximum Power Reduction (A-MPR)	2.1046	N/A	N/A	Section 7.5
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 30)	27.50(a)(3)	< 0.25 Watts max. EIRP	PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 7)	27.50(h)(2)	< 2 Watts max. EIRP	PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 41)			PASS	Section 7.6
Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n41)	PASS			Section 7.6	
Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block over the temperature and voltage range as tested	PASS	Section 7.8	
RADIATED	Radiated Spurious Emissions (LTE Band 30)	2.1053, 27.53(a)	> 70 + 10log <sub>10</sub> (P[Watts])	PASS	Section 7.7
	Radiated Spurious Emissions (LTE Band 7)	2.1053, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section 7.7
	Radiated Spurious Emissions (LTE Band 41)			PASS	Section 7.7
	Radiated Spurious Emissions (NR Band n41)			PASS	Section 7.7

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

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**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 were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT 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, attenuators, and couplers.
4. All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized was Element EMC Software Tool v1.2.

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## 7.2 Occupied Bandwidth

§2.1049

### Test Overview

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. All ports were tested and only the worst case data were reported.

### Test Procedure Used

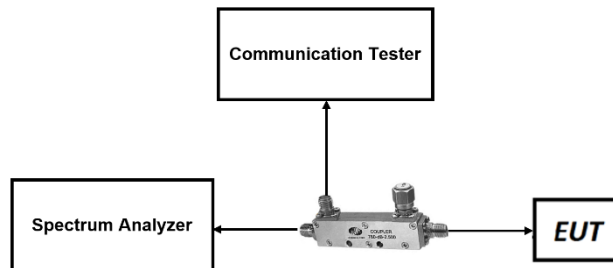
KDB 971168 D01 v03r01 – Section 4.2

### Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW  $\geq$  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, steps 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

### 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

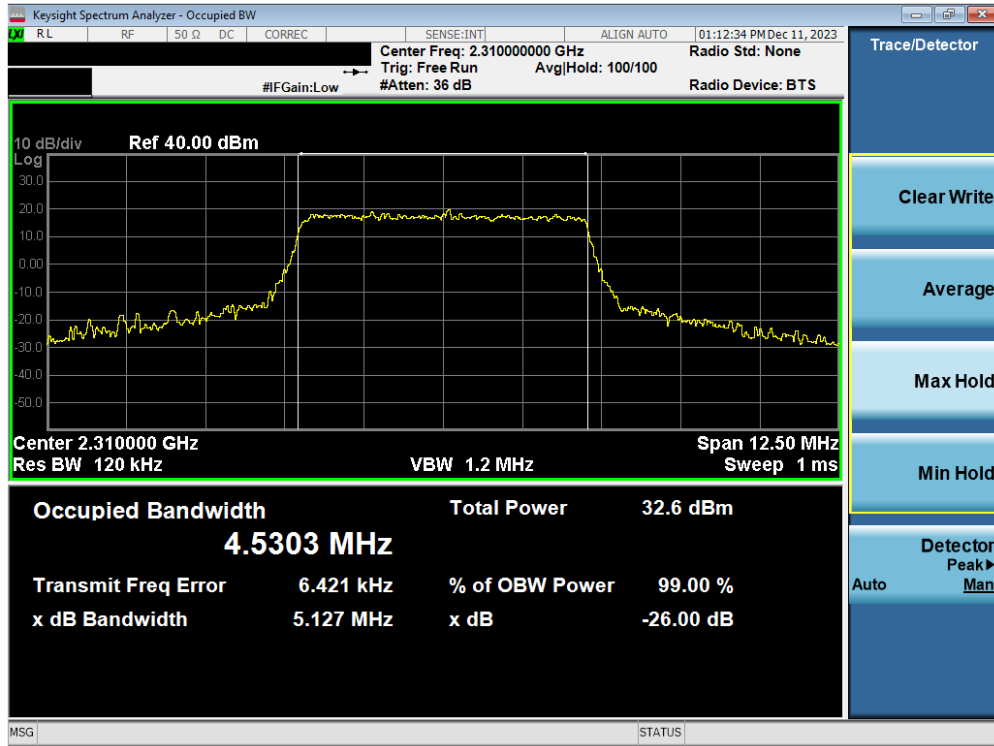
None.

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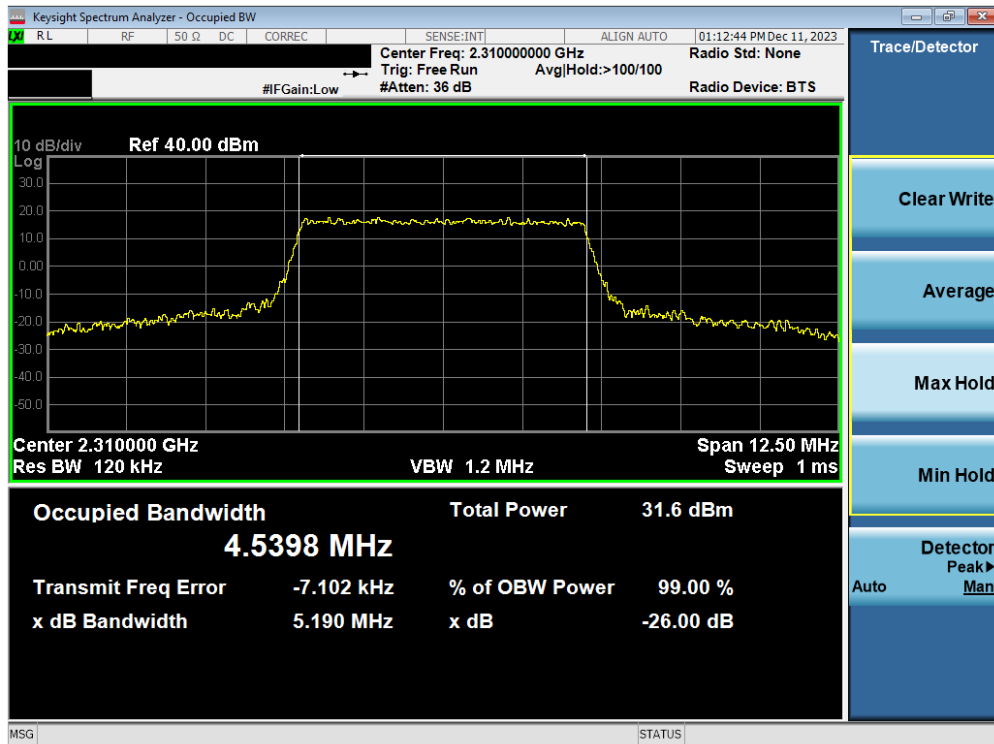
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## LTE Band 30



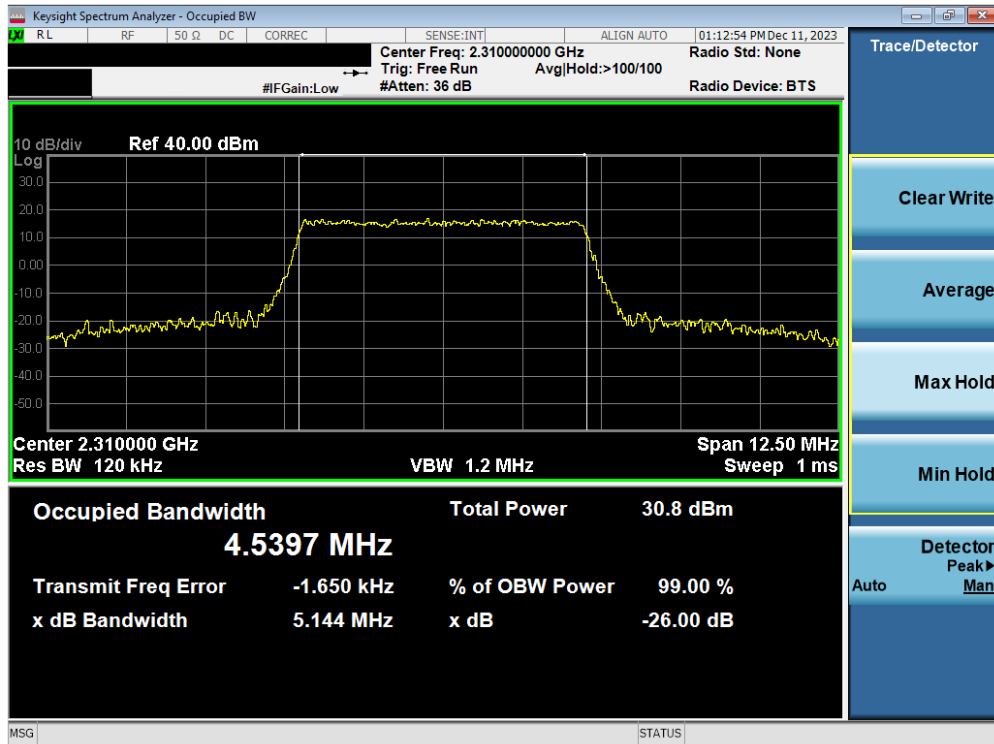
Plot 7-1. Occupied Bandwidth Plot (LTE Band 30 - 5MHz QPSK - Full RB)



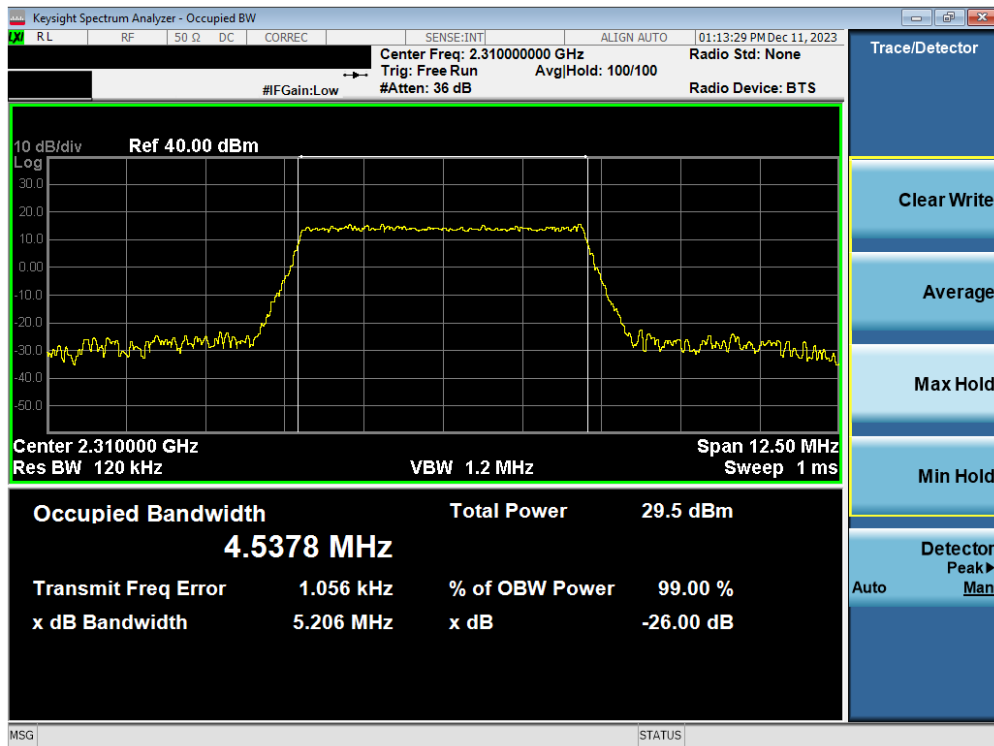
Plot 7-2. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 16-QAM - Full RB)

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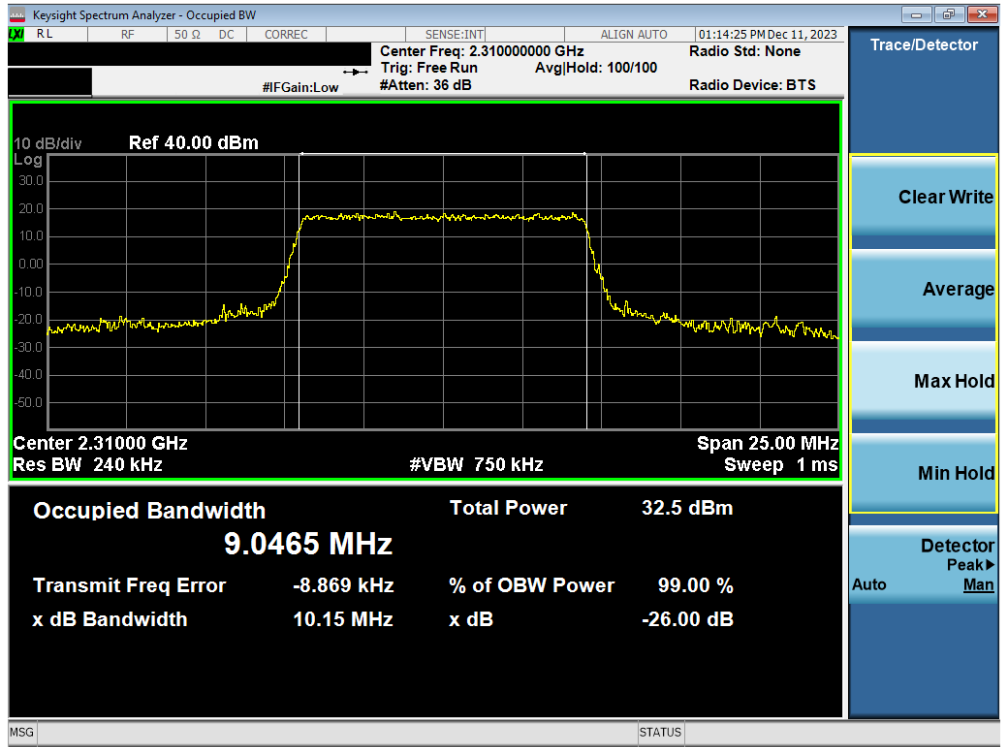


Plot 7-3. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 64-QAM - Full RB)

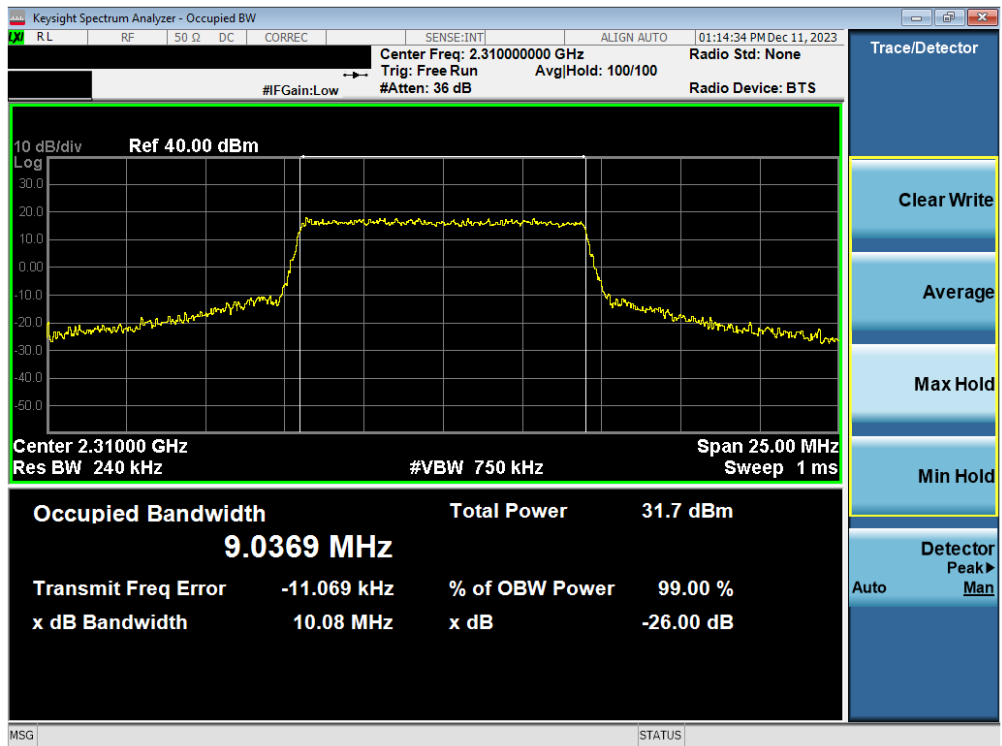


Plot 7-4. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 256-QAM - Full RB)

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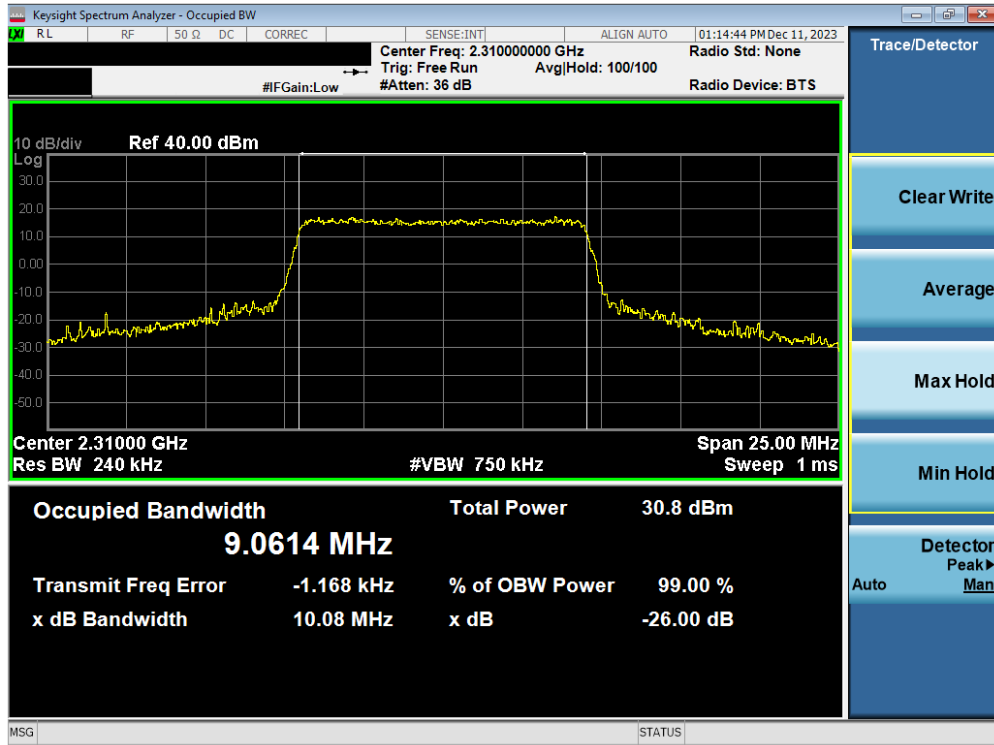


Plot 7-5. Occupied Bandwidth Plot (LTE Band 30 - 10MHz QPSK - Full RB)

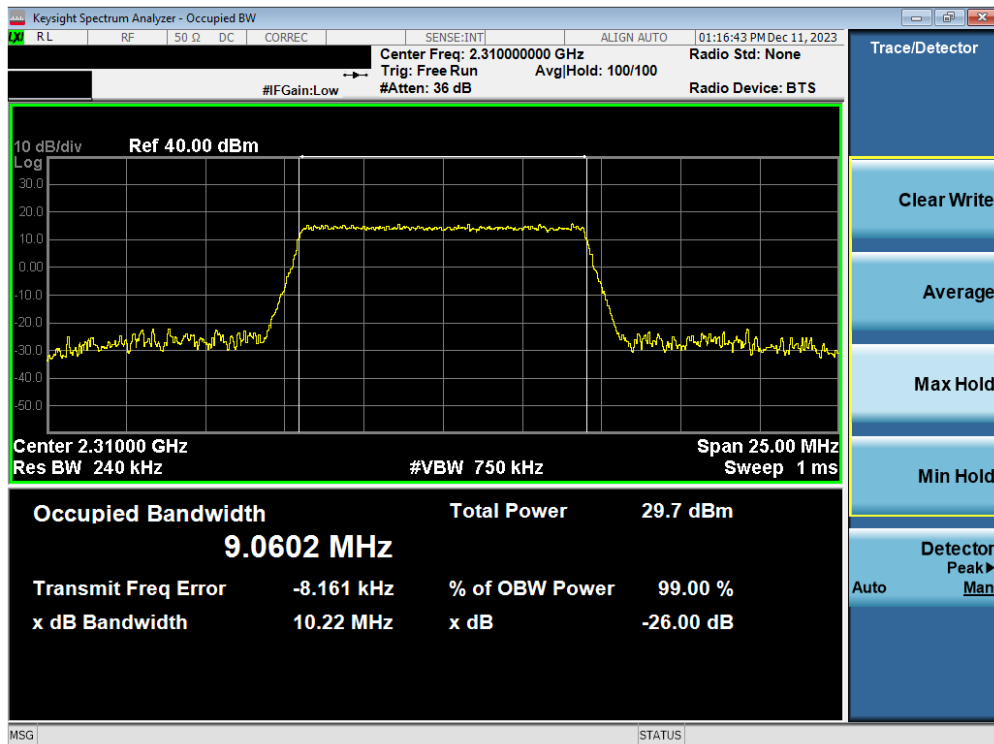


Plot 7-6. Occupied Bandwidth Plot (LTE Band 30 - 10MHz 16-QAM - Full RB)

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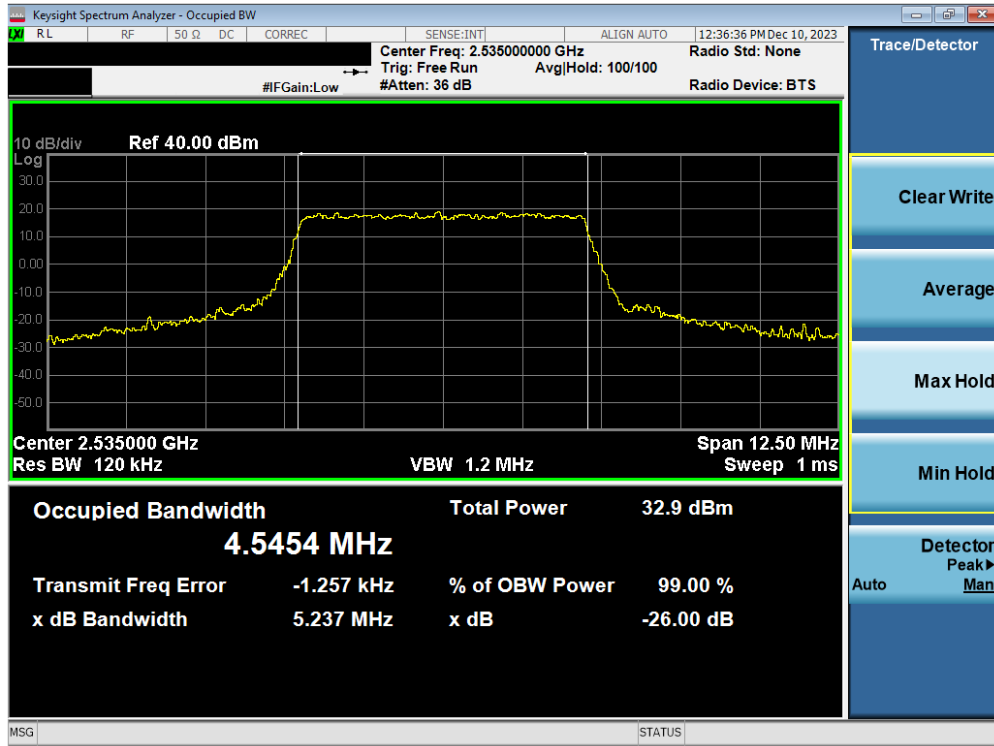
Plot 7-7. Occupied Bandwidth Plot (LTE Band 30 - 10MHz 64-QAM - Full RB)



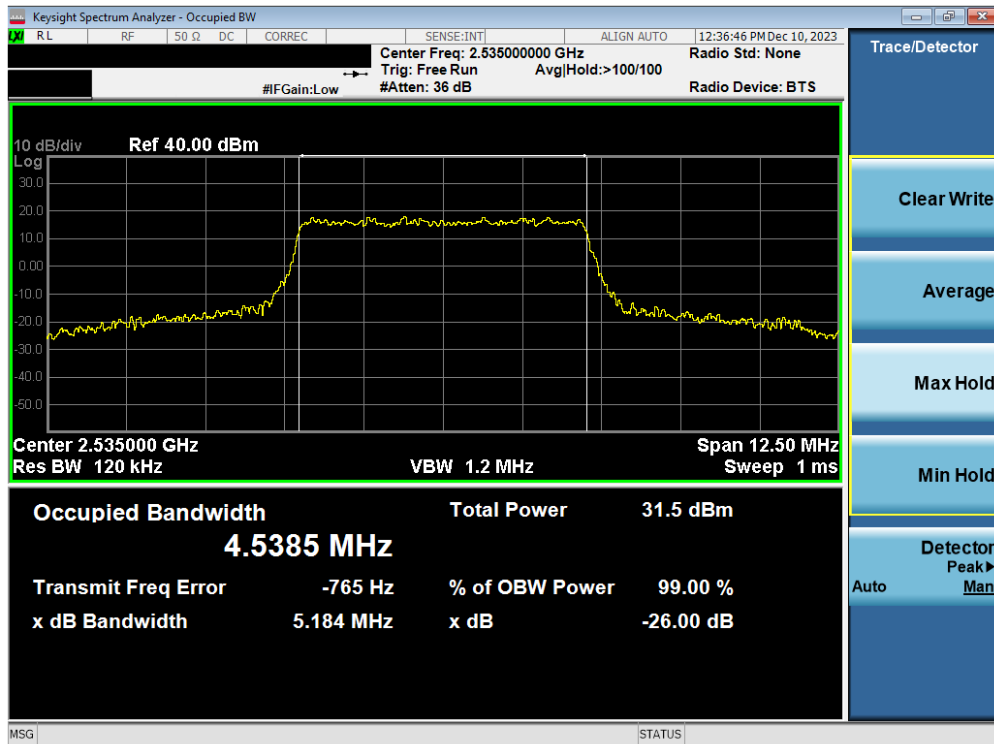
Plot 7-8. Occupied Bandwidth Plot (LTE Band 30 - 10MHz 256-QAM - Full RB)

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## LTE Band 7

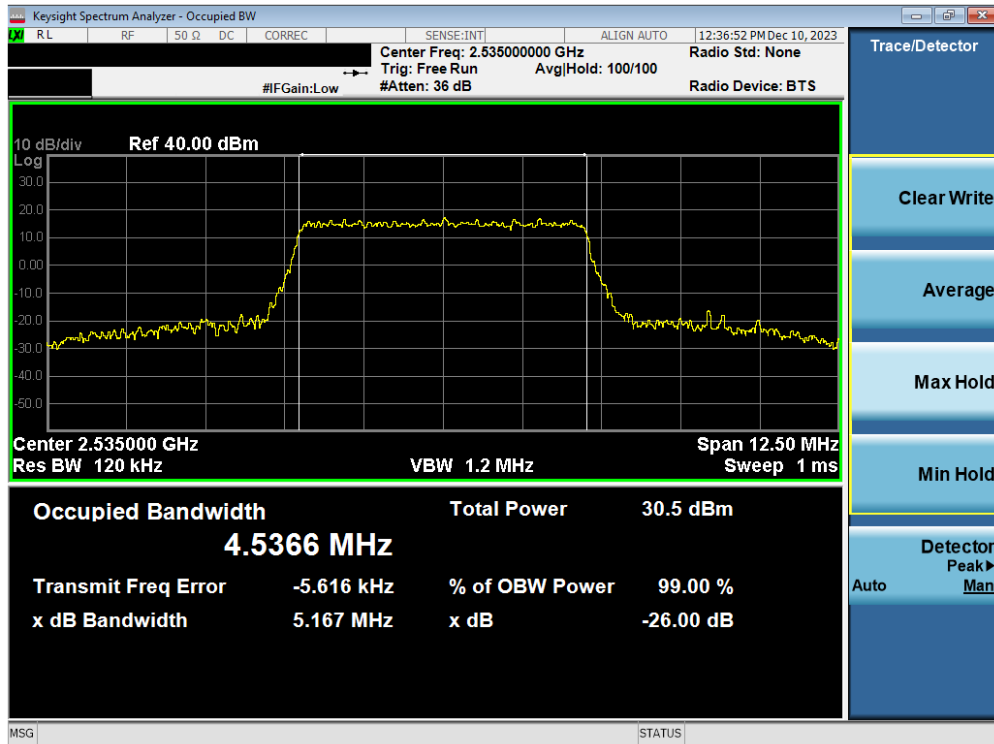


Plot 7-9. Occupied Bandwidth Plot (LTE Band 7 - 5MHz QPSK - Full RB)

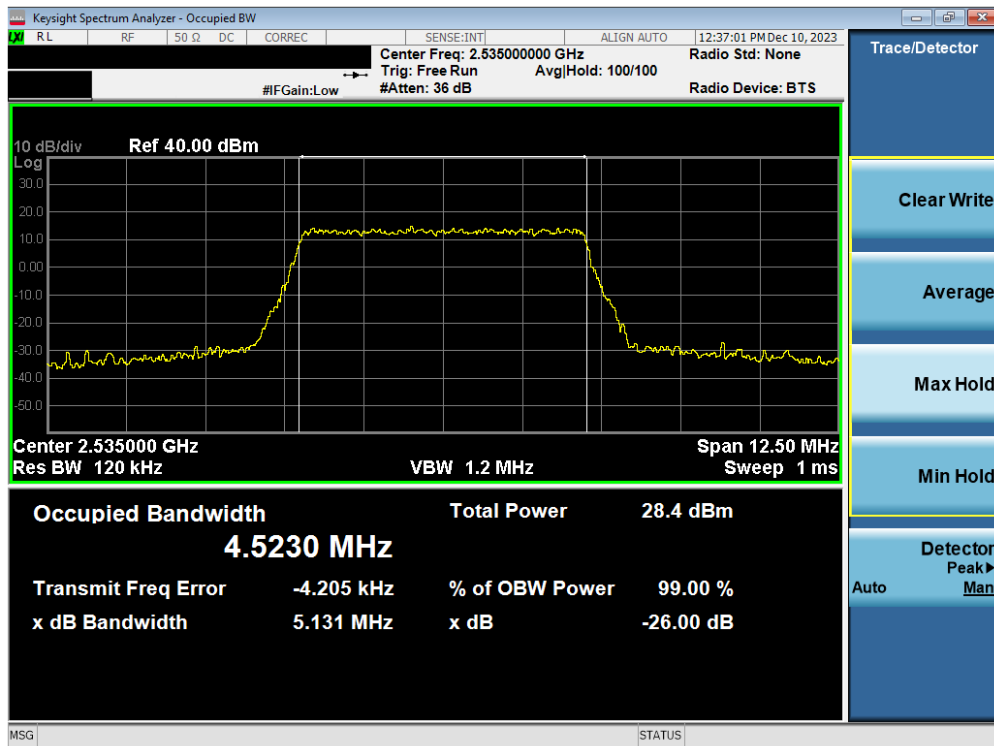


Plot 7-10. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 16-QAM - Full RB)

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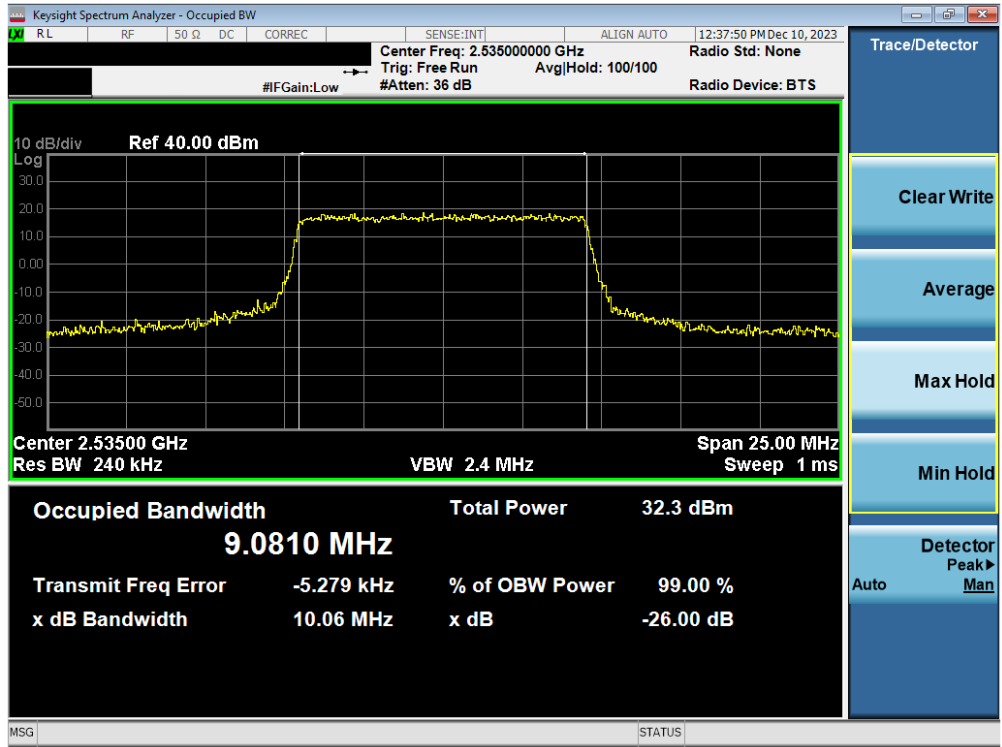


Plot 7-11. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 64-QAM - Full RB)

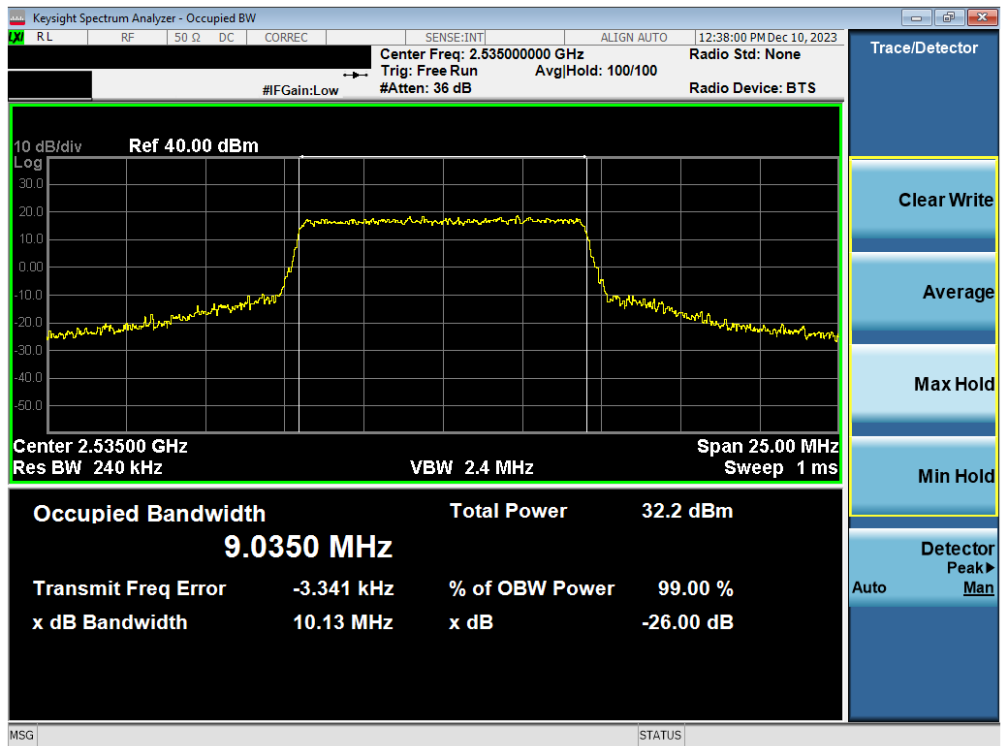


Plot 7-12. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 256-QAM - Full RB)

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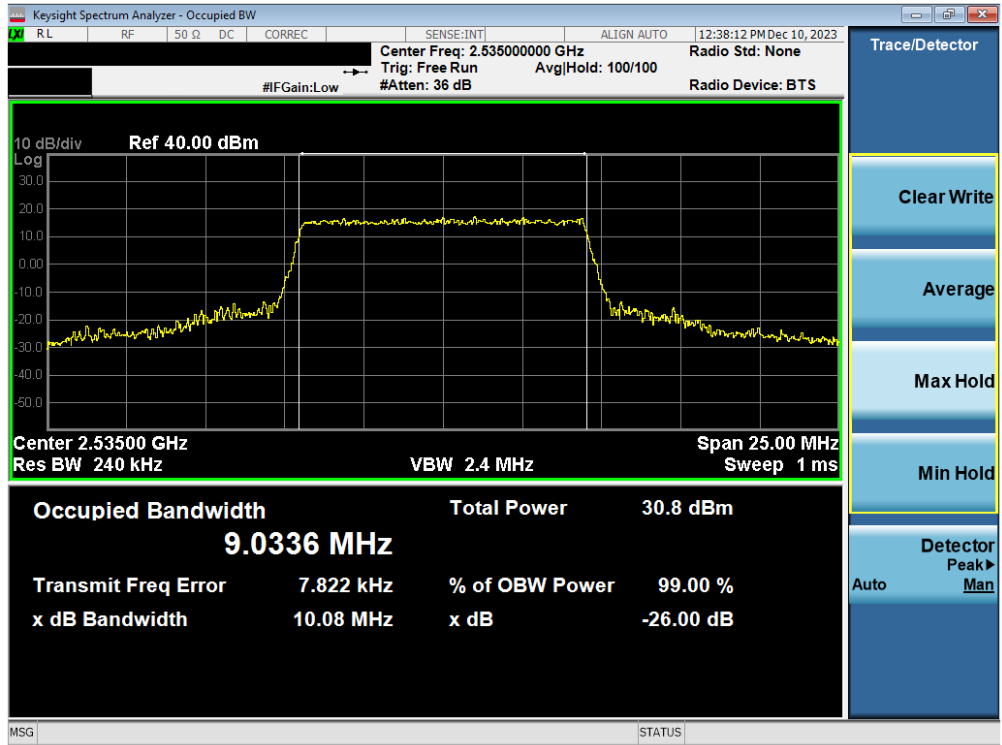


Plot 7-13. Occupied Bandwidth Plot (LTE Band 7 - 10MHz QPSK - Full RB)

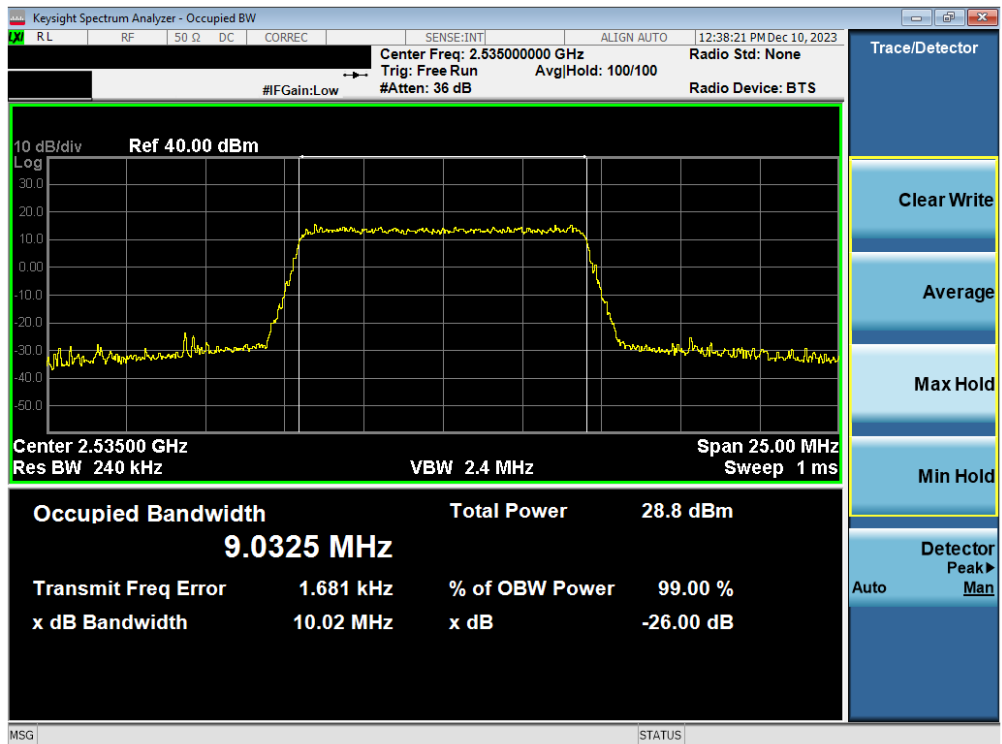


Plot 7-14. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 16-QAM - Full RB)

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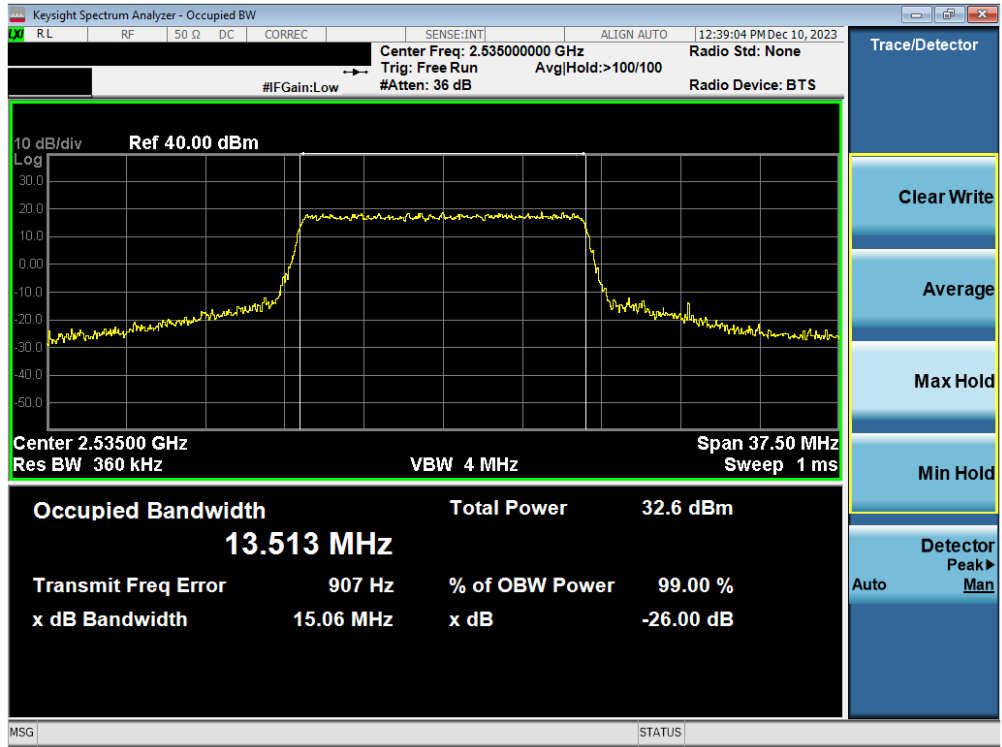
Plot 7-15. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 64-QAM - Full RB)



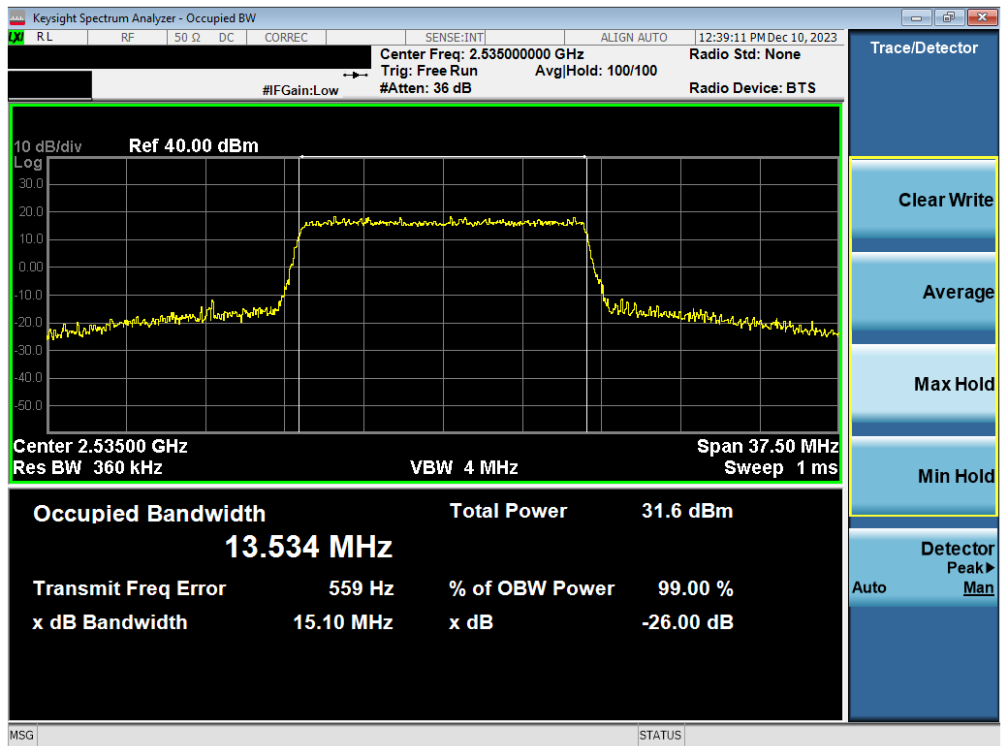
Plot 7-16. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 256-QAM - Full RB)

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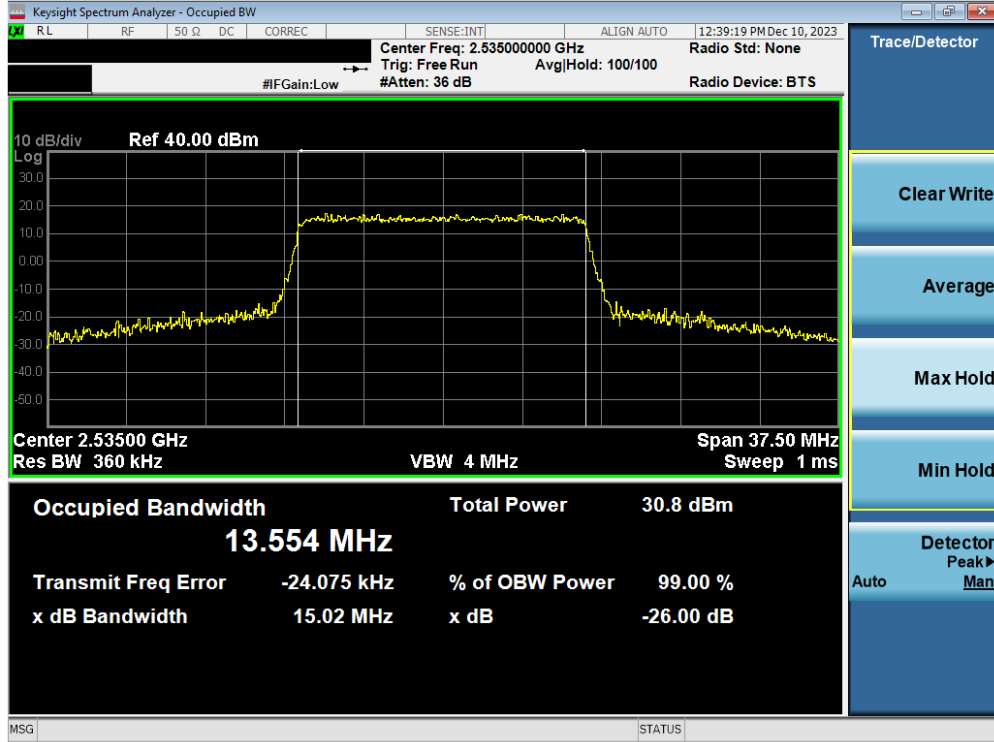


Plot 7-17. Occupied Bandwidth Plot (LTE Band 7 - 15MHz QPSK - Full RB)

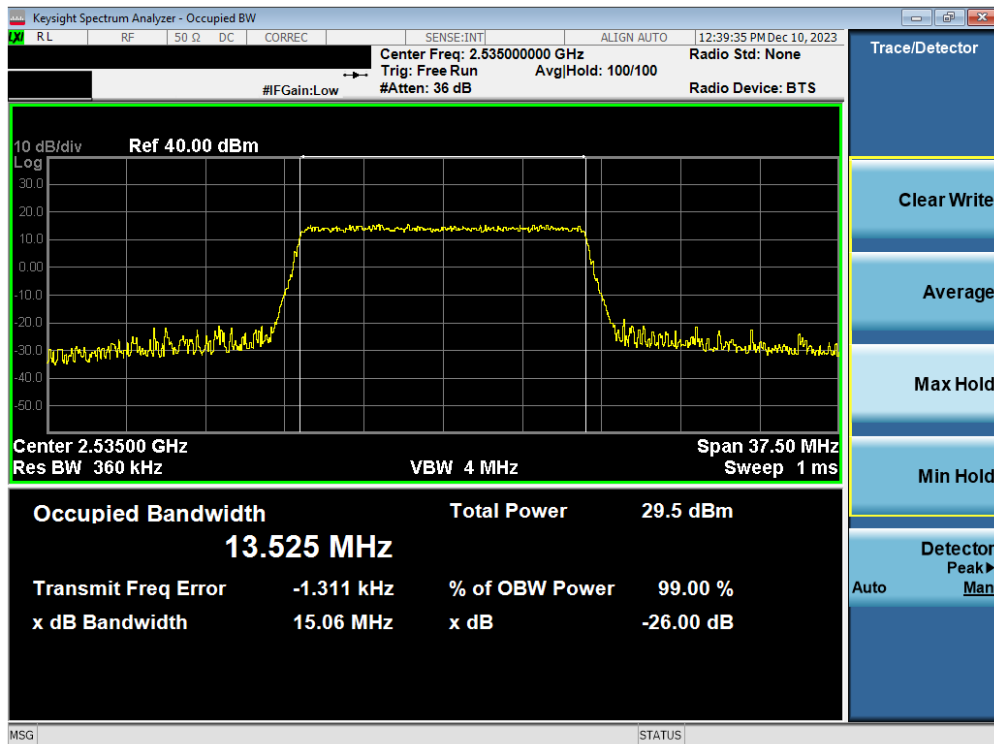


Plot 7-18. Occupied Bandwidth Plot (LTE Band 7 - 15MHz 16-QAM - Full RB)

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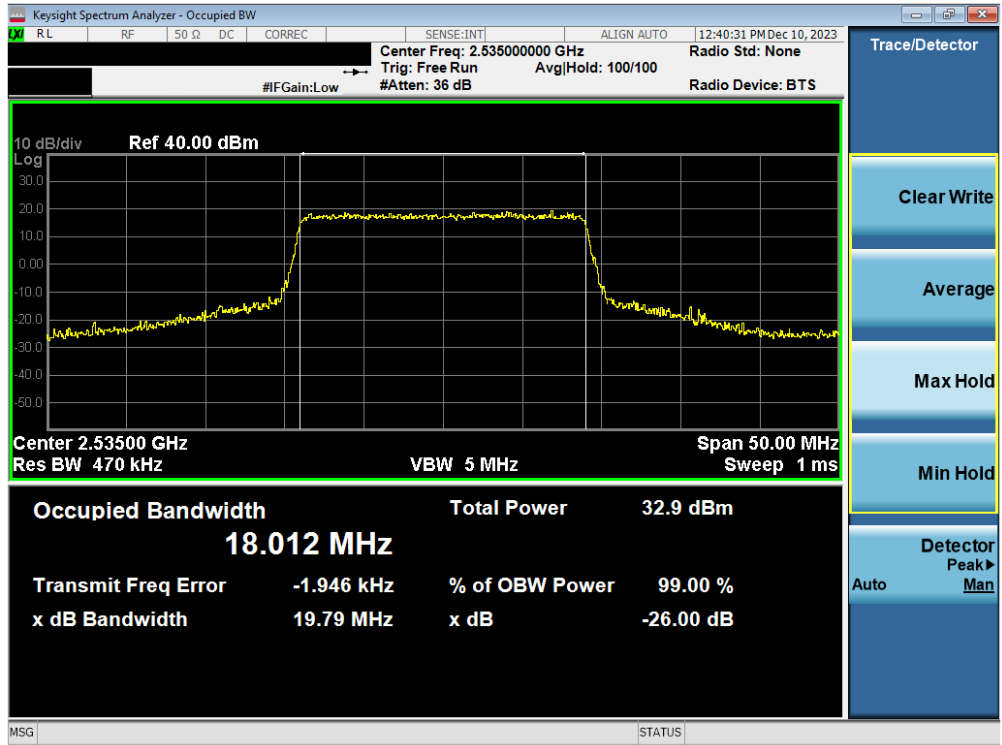


Plot 7-19. Occupied Bandwidth Plot (LTE Band 7 - 15MHz 64-QAM - Full RB)

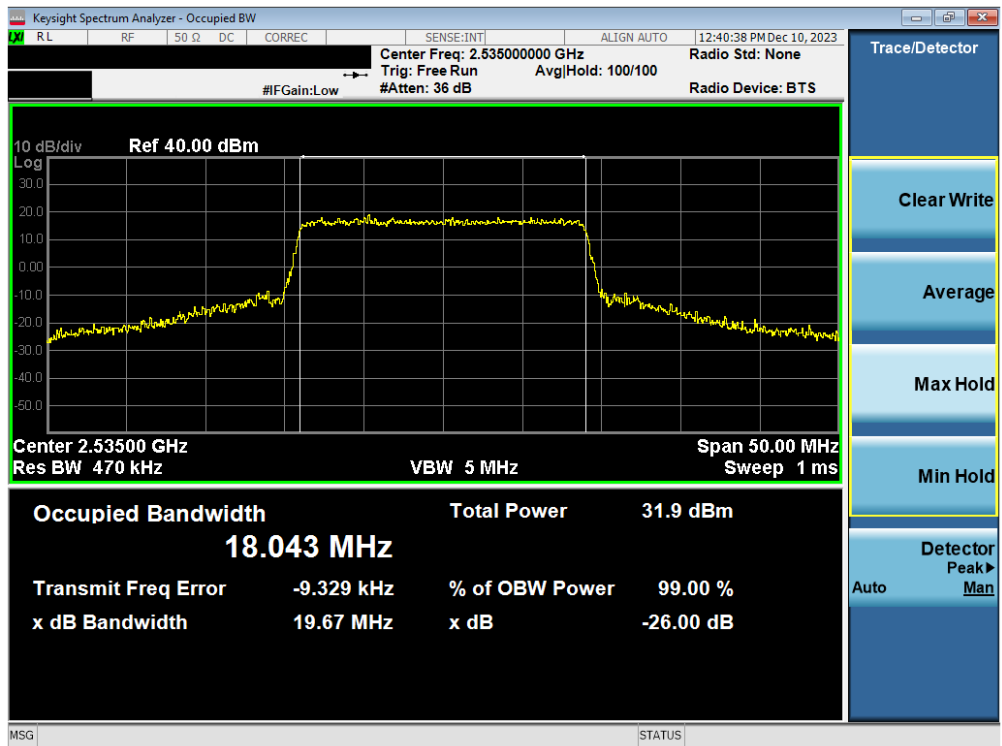


Plot 7-20. Occupied Bandwidth Plot (LTE Band 7 - 15MHz 256-QAM - Full RB)

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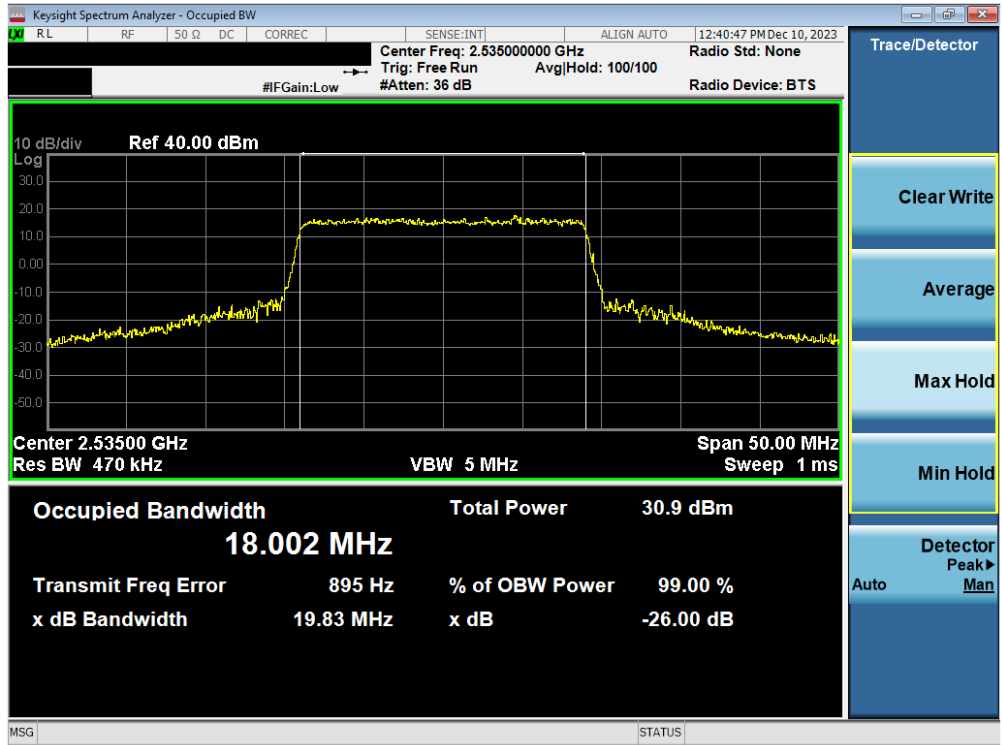


Plot 7-21. Occupied Bandwidth Plot (LTE Band 7 - 20MHz QPSK - Full RB)

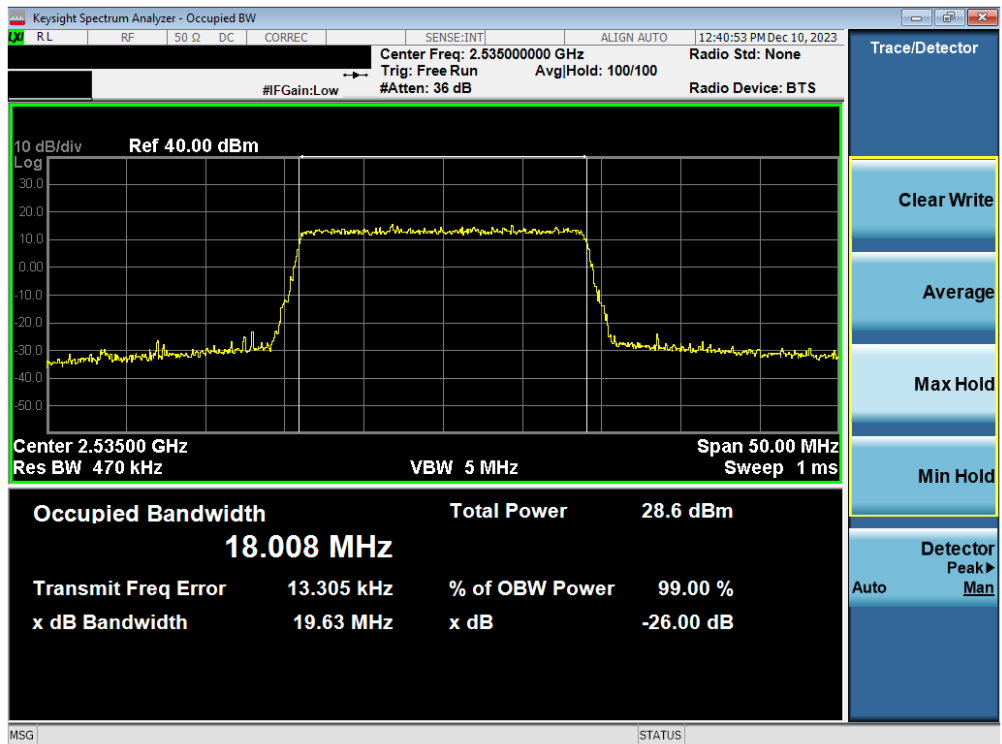


Plot 7-22. Occupied Bandwidth Plot (LTE Band 7 - 20MHz 16-QAM - Full RB)

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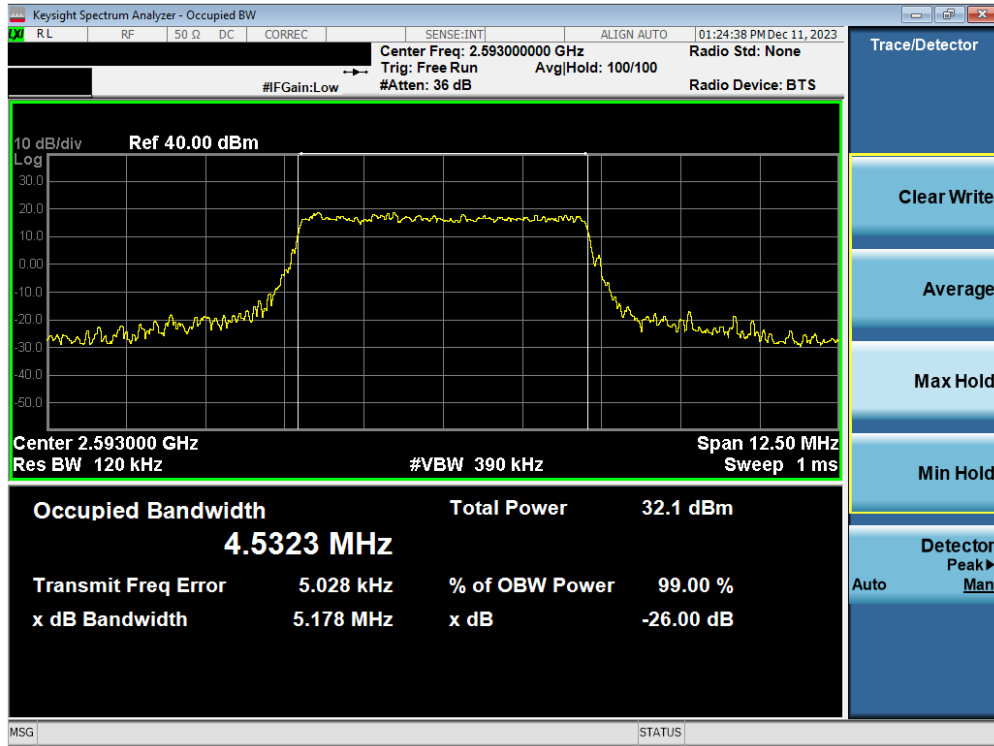
Plot 7-23. Occupied Bandwidth Plot (LTE Band 7 - 20MHz 64-QAM - Full RB)



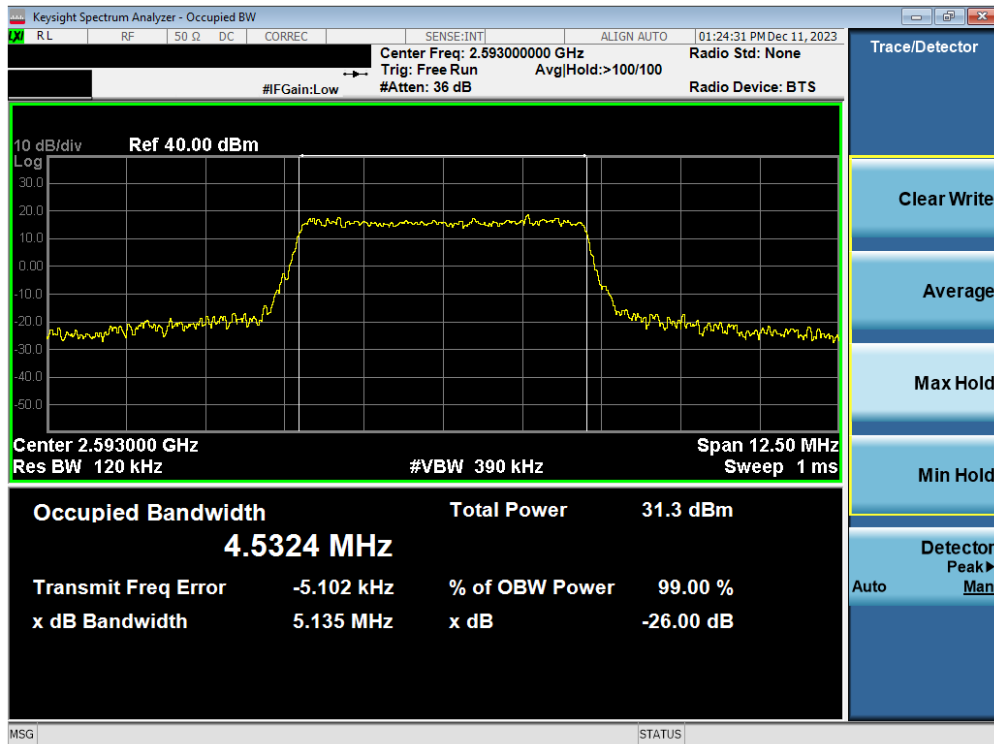
Plot 7-24. Occupied Bandwidth Plot (LTE Band 7 - 20MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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# LTE Band 41

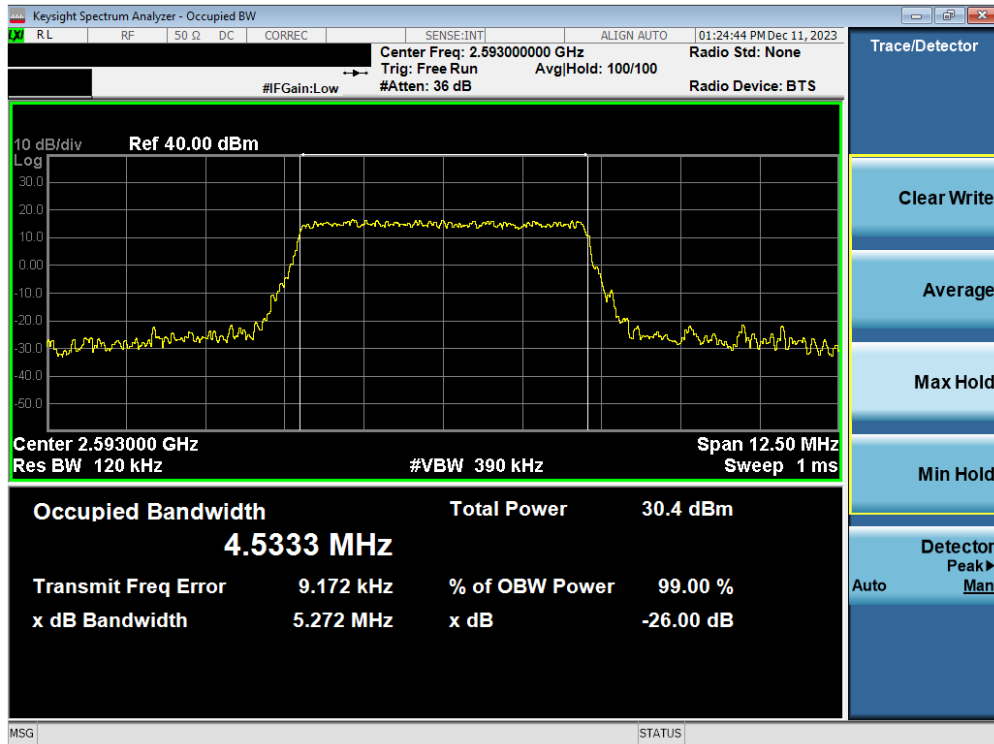


Plot 7-25. Occupied Bandwidth Plot (LTE Band 41 - 5MHz QPSK - Full RB)

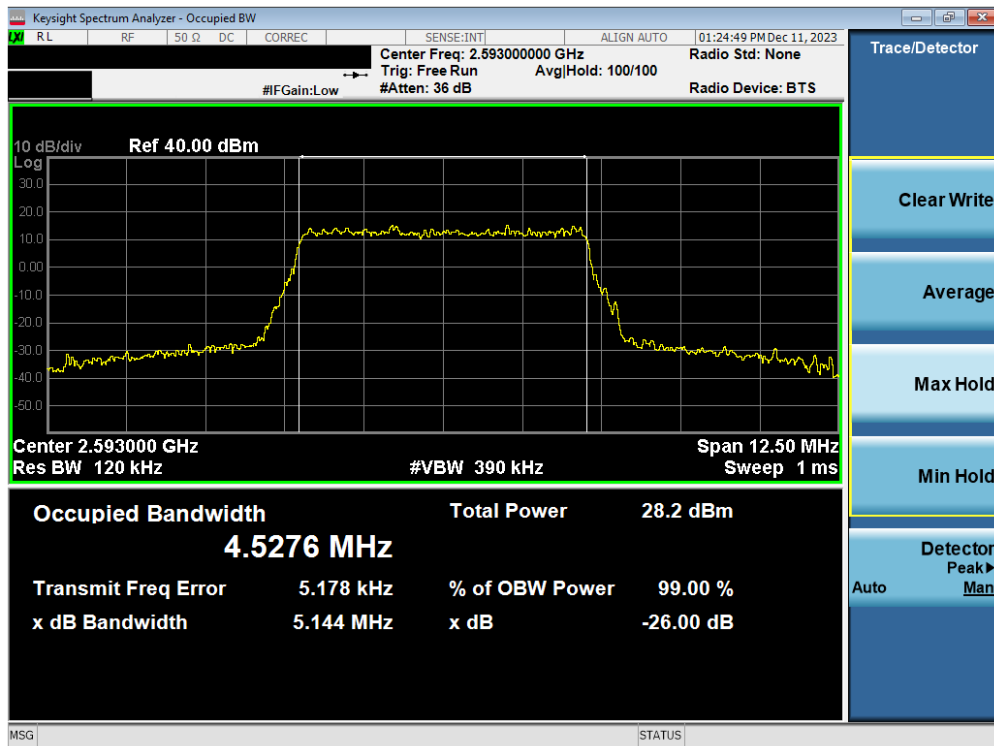


Plot 7-26. Occupied Bandwidth Plot (LTE Band 41 - 5MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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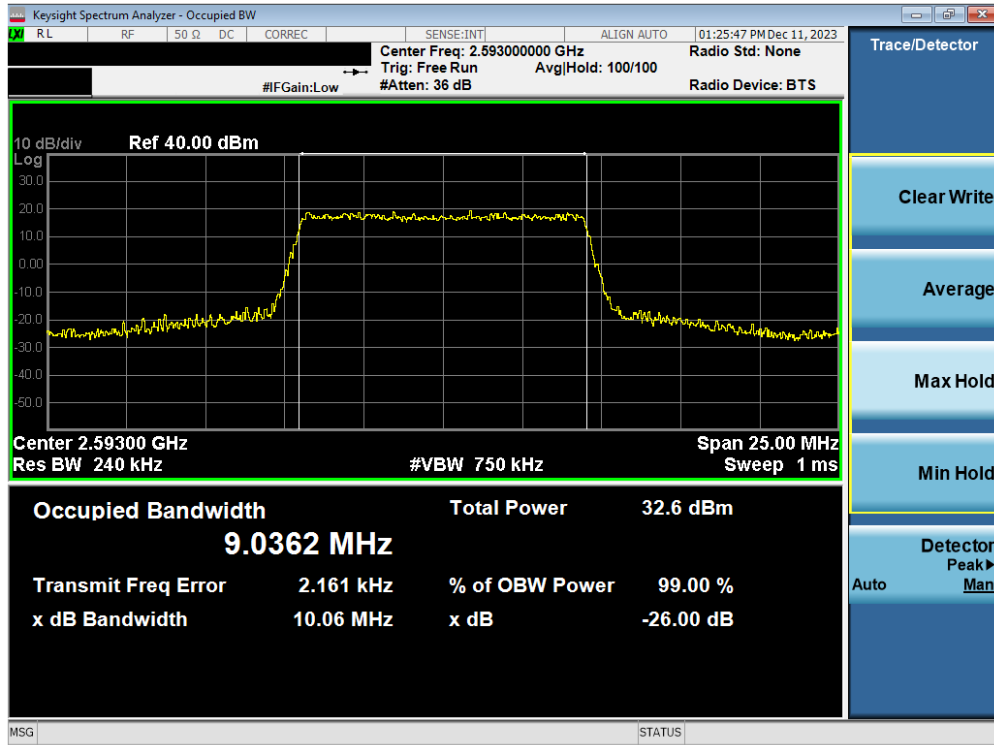


Plot 7-27. Occupied Bandwidth Plot (LTE Band 41 - 5MHz 64-QAM - Full RB)



Plot 7-28. Occupied Bandwidth Plot (LTE Band 41 - 5MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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Plot 7-29. Occupied Bandwidth Plot (LTE Band 41 - 10MHz QPSK - Full RB)

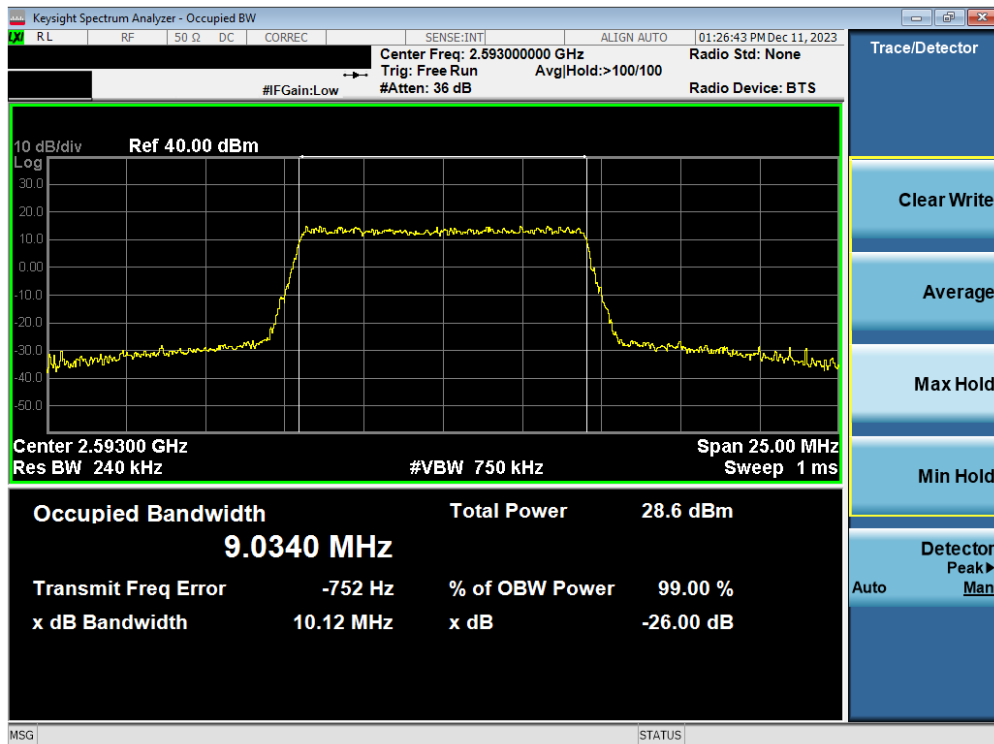


Plot 7-30. Occupied Bandwidth Plot (LTE Band 41 - 10MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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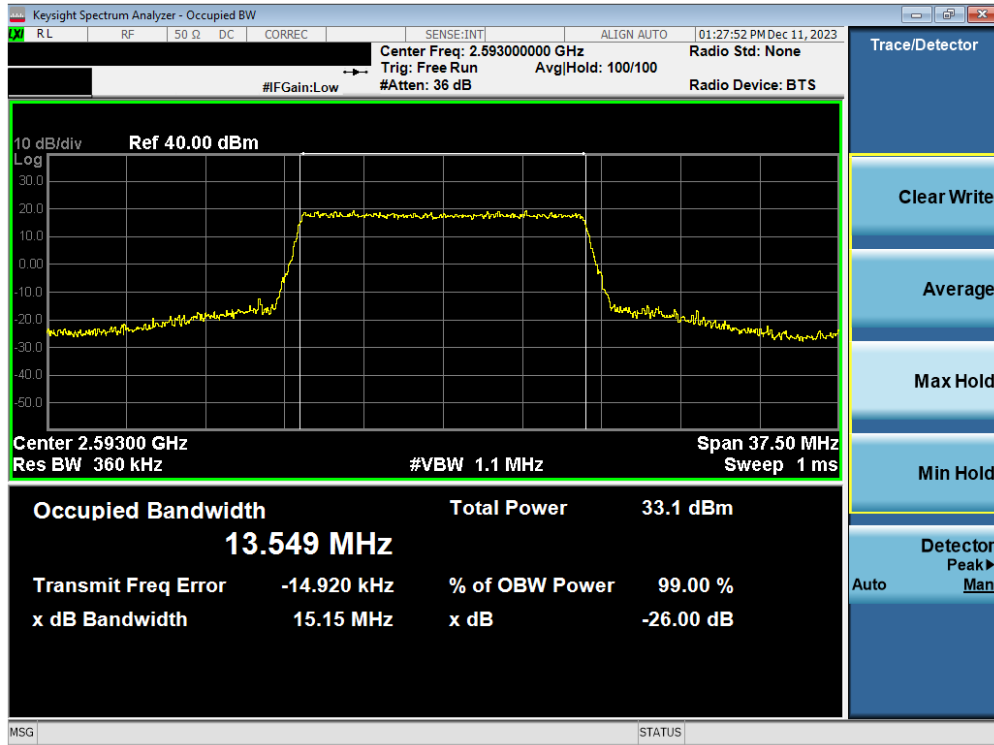
Plot 7-31. Occupied Bandwidth Plot (LTE Band 41 - 10MHz 64-QAM - Full RB)



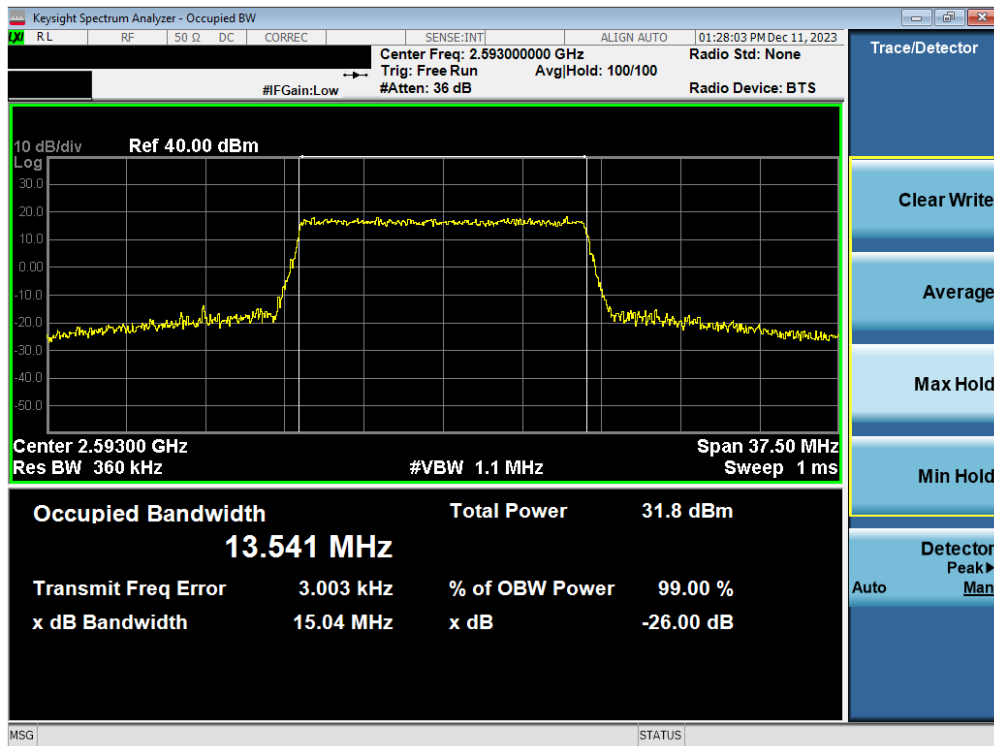
Plot 7-32. Occupied Bandwidth Plot (LTE Band 41 - 10MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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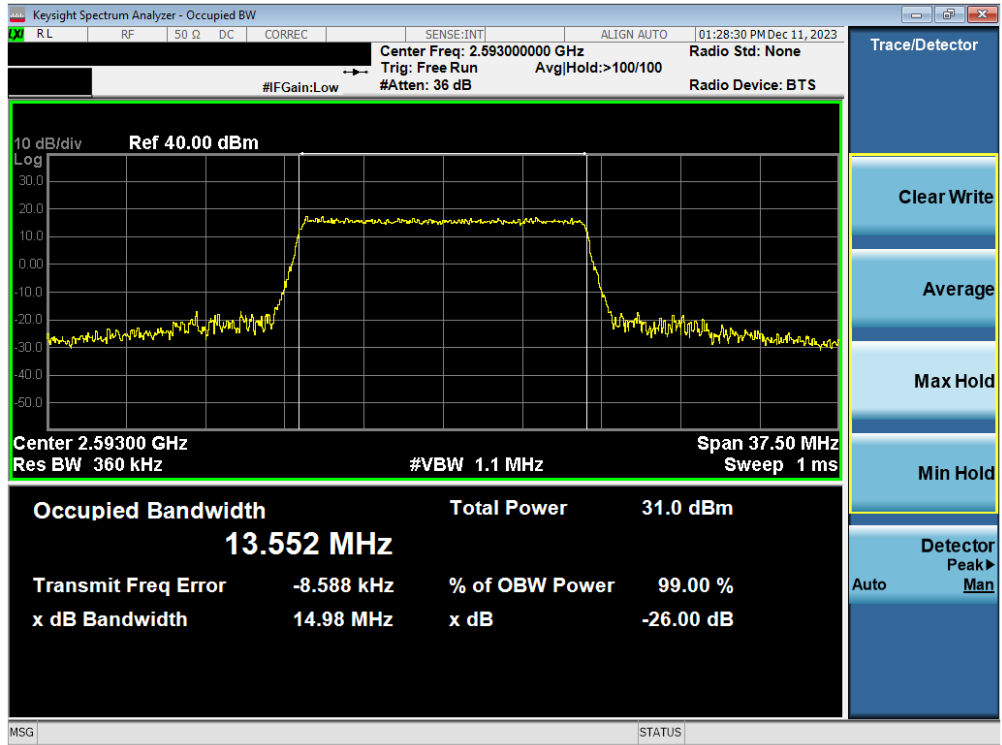


Plot 7-33. Occupied Bandwidth Plot (LTE Band 41 - 15MHz QPSK - Full RB)

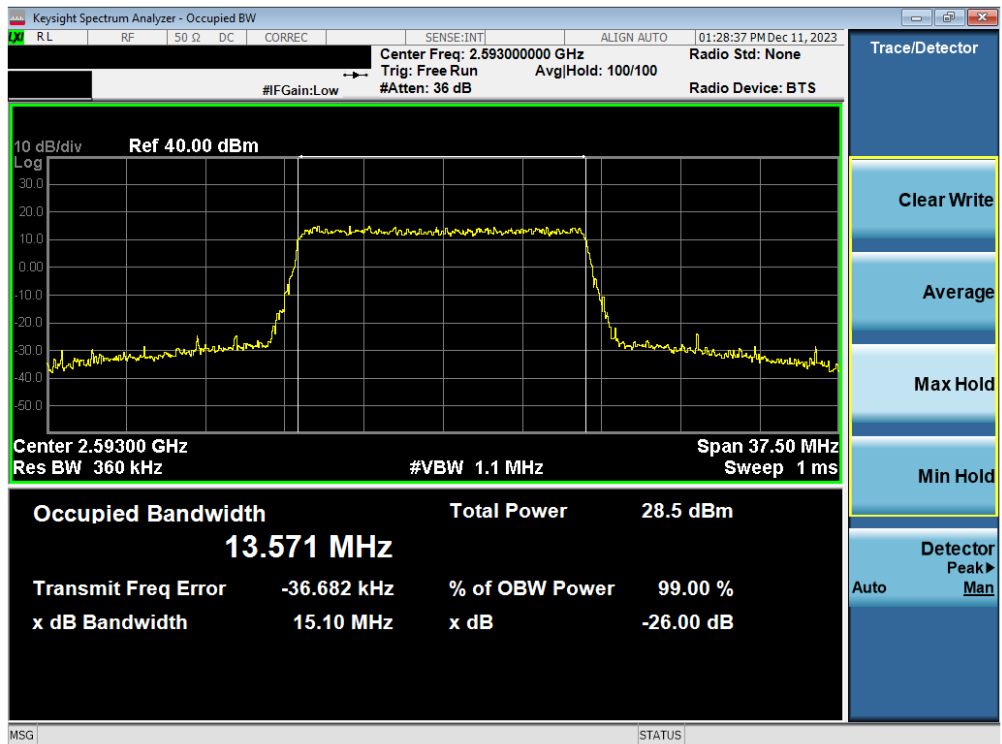


Plot 7-34. Occupied Bandwidth Plot (LTE Band 41 - 15MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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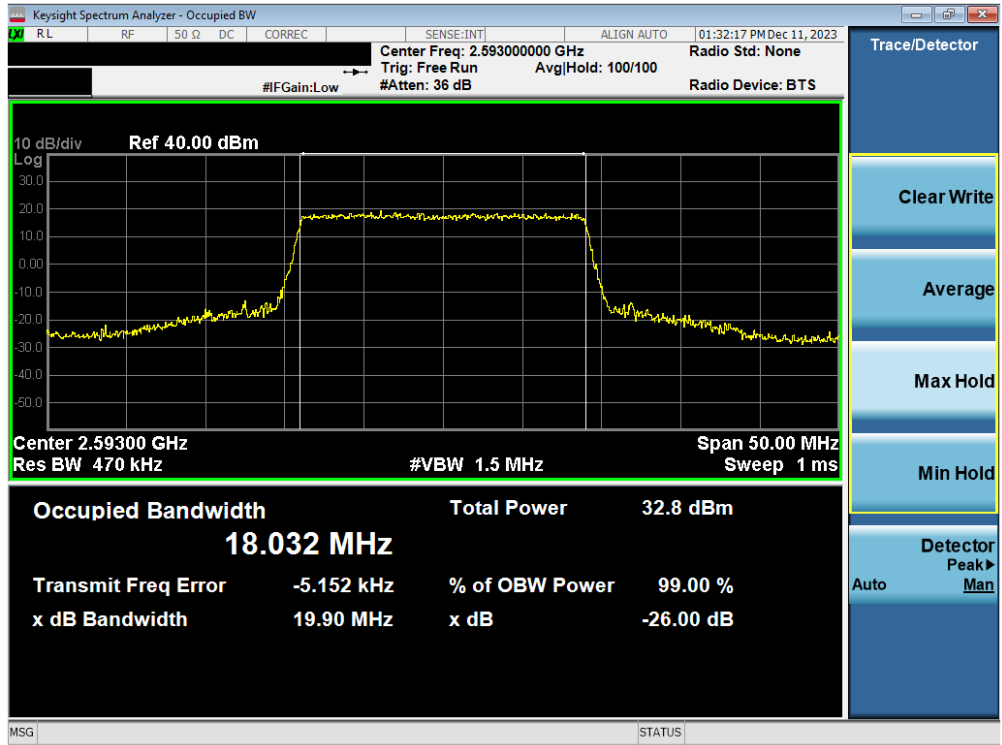


Plot 7-35. Occupied Bandwidth Plot (LTE Band 41 - 15MHz 64-QAM - Full RB)



Plot 7-36. Occupied Bandwidth Plot (LTE Band 41 - 15MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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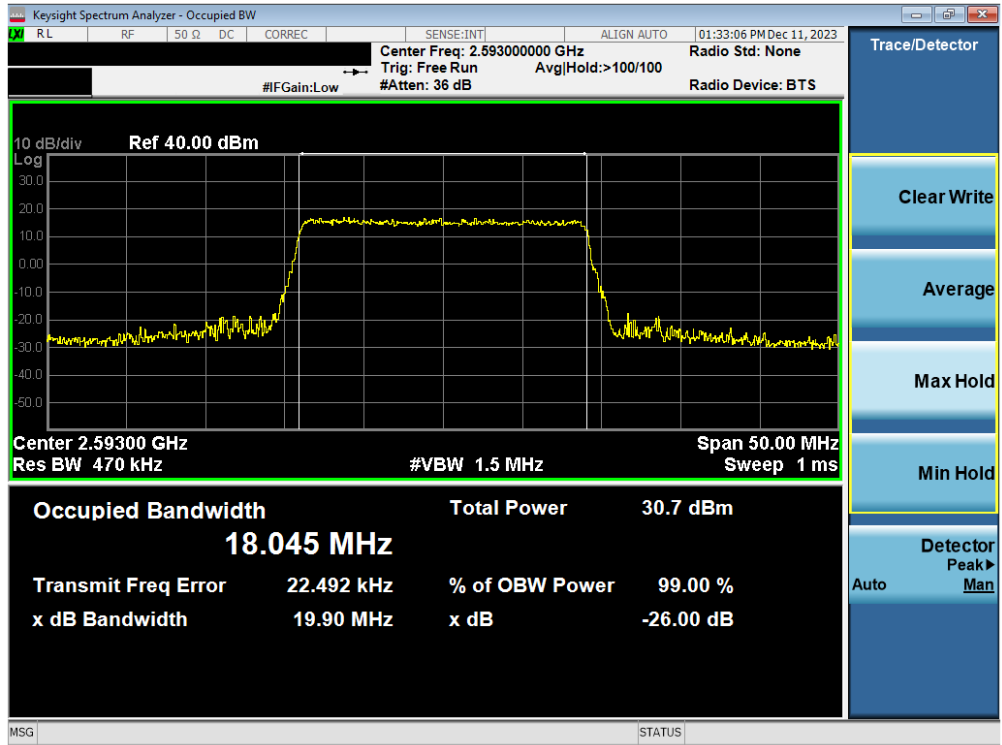


Plot 7-37. Occupied Bandwidth Plot (LTE Band 41 - 20MHz QPSK - Full RB)

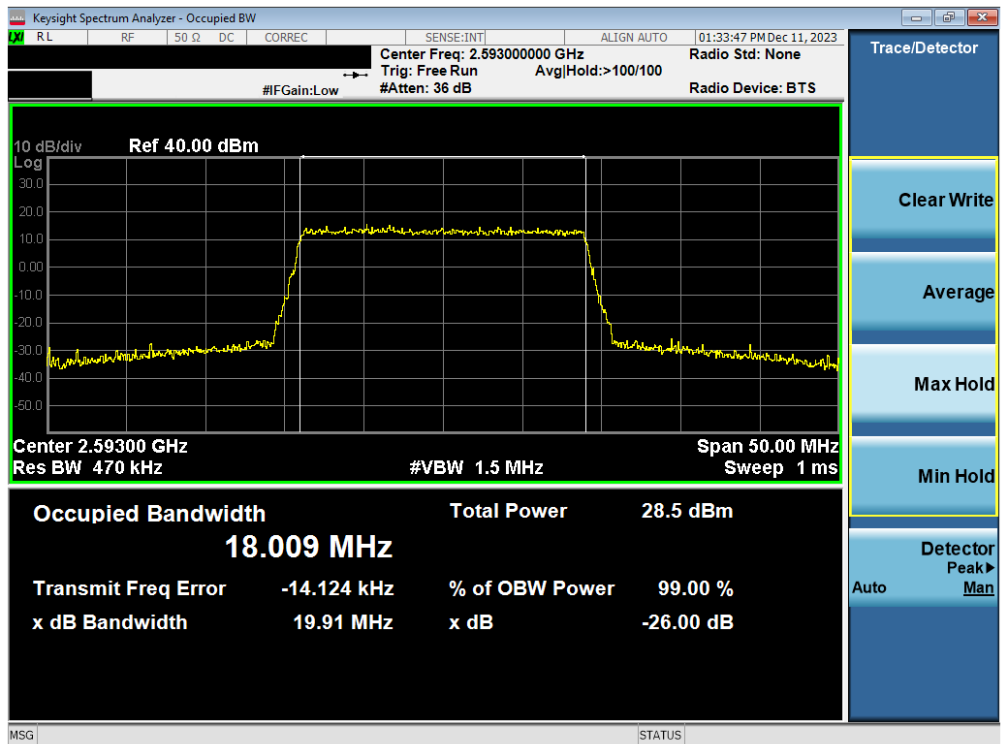


Plot 7-38. Occupied Bandwidth Plot (LTE Band 41 - 20MHz 16-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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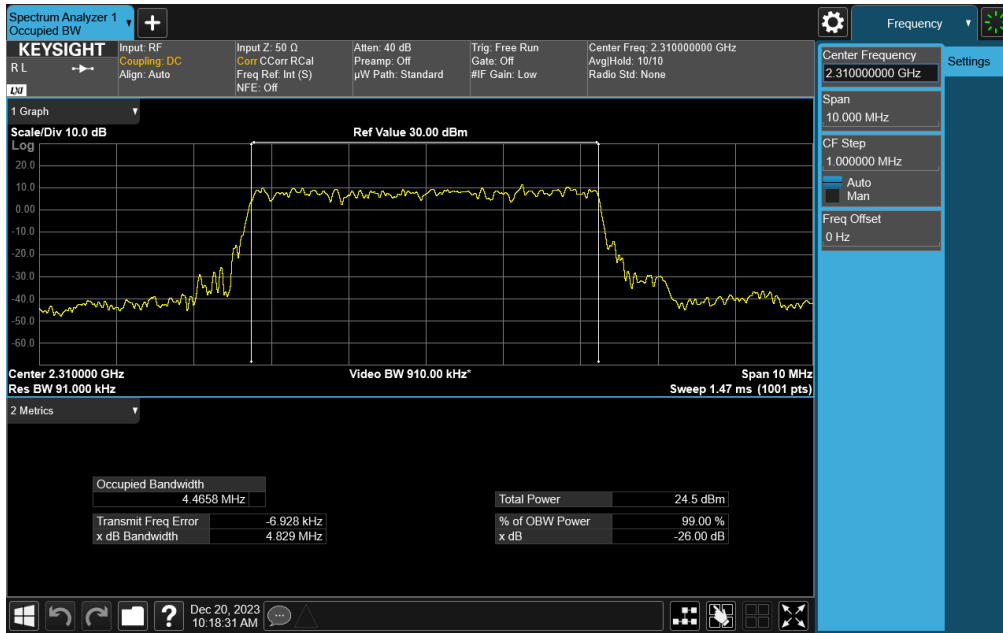
Plot 7-39. Occupied Bandwidth Plot (LTE Band 41 - 20MHz 64-QAM - Full RB)



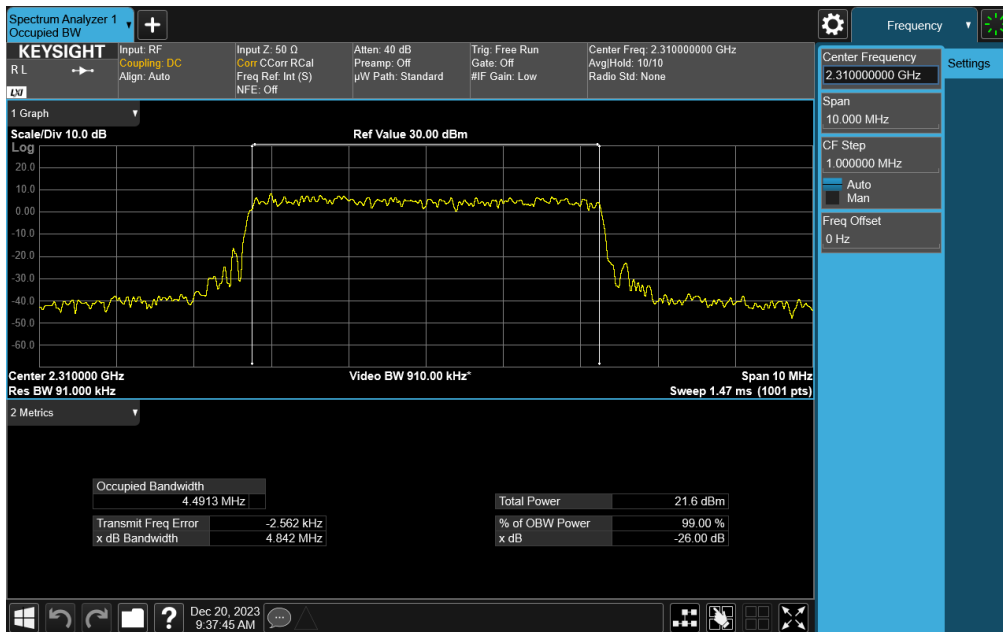
Plot 7-40. Occupied Bandwidth Plot (LTE Band 41 - 20MHz 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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# NR Band n30

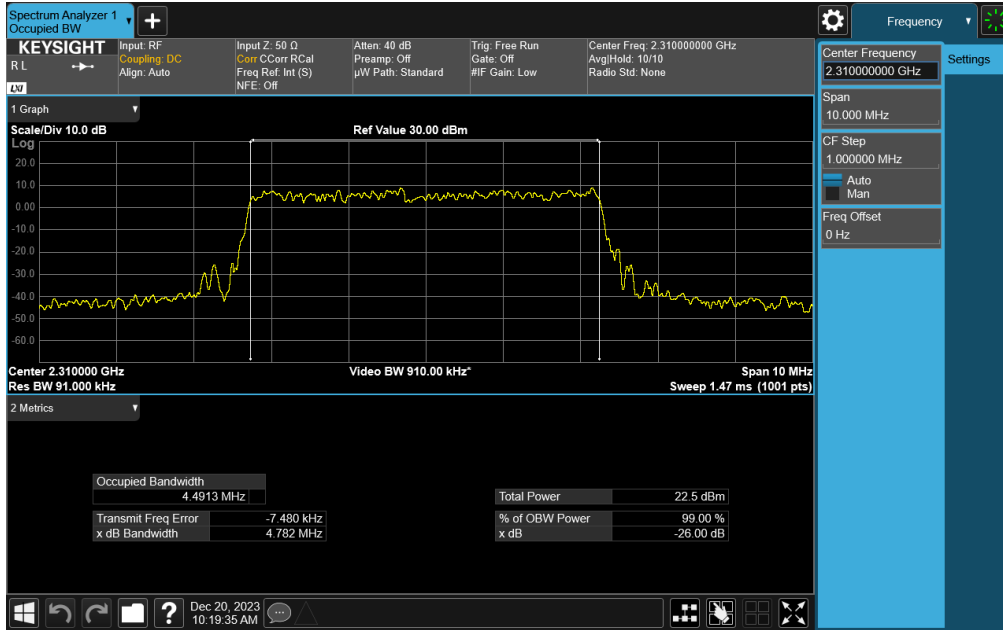


Plot 7-41. Occupied Bandwidth Plot (NR Band n30 - 5MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

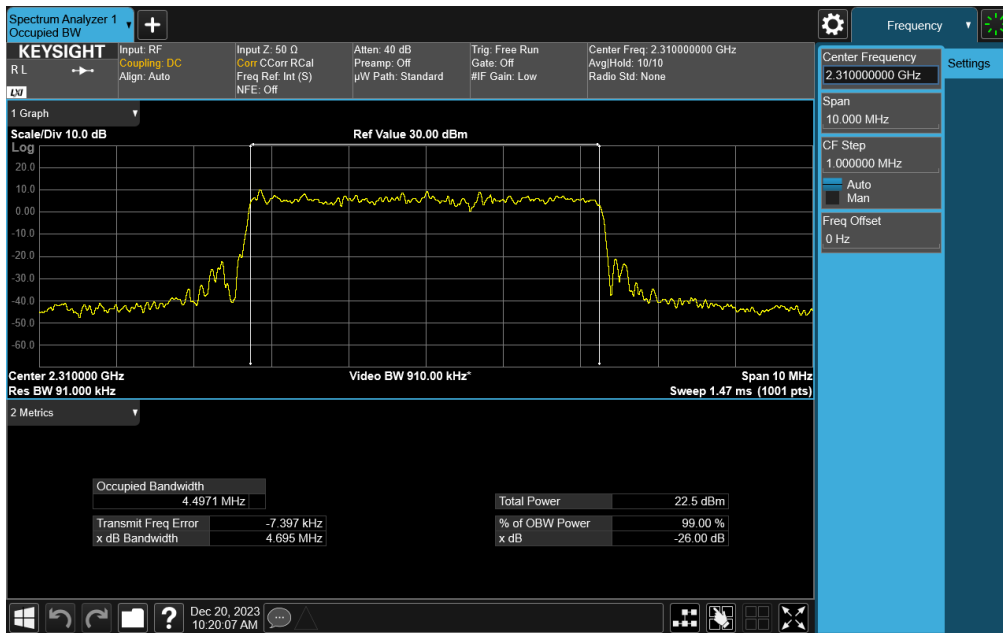


Plot 7-42. Occupied Bandwidth Plot (NR Band n30 - 5MHz CP-OFDM QPSK - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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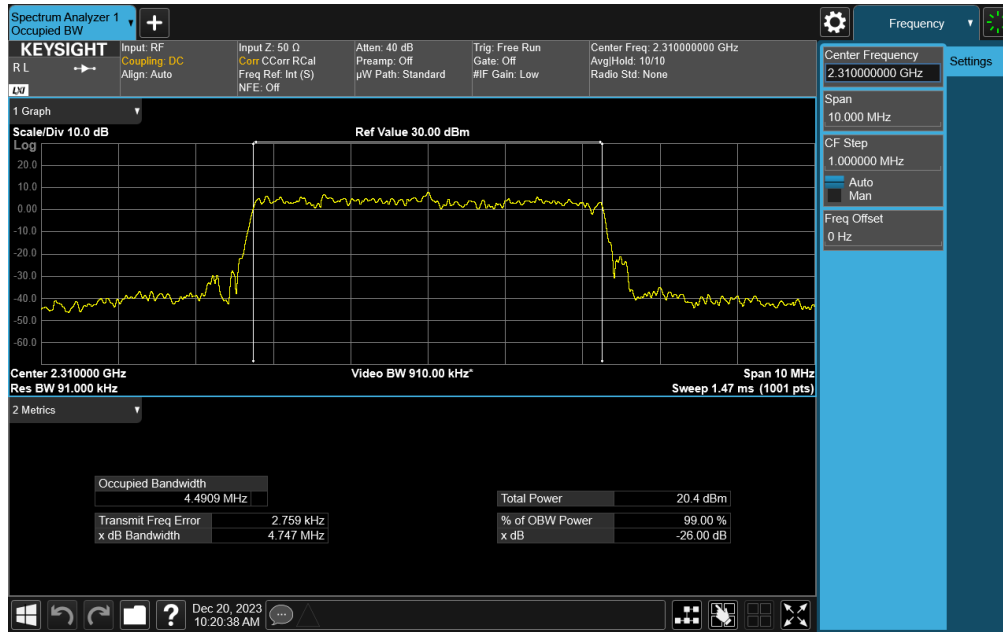


**Plot 7-43. Occupied Bandwidth Plot (NR Band n30 - 5MHz DFT-s-OFDM 16-QAM - Full RB)**



**Plot 7-44. Occupied Bandwidth Plot (NR Band n30 - 5MHz DFT-s-OFDM 64-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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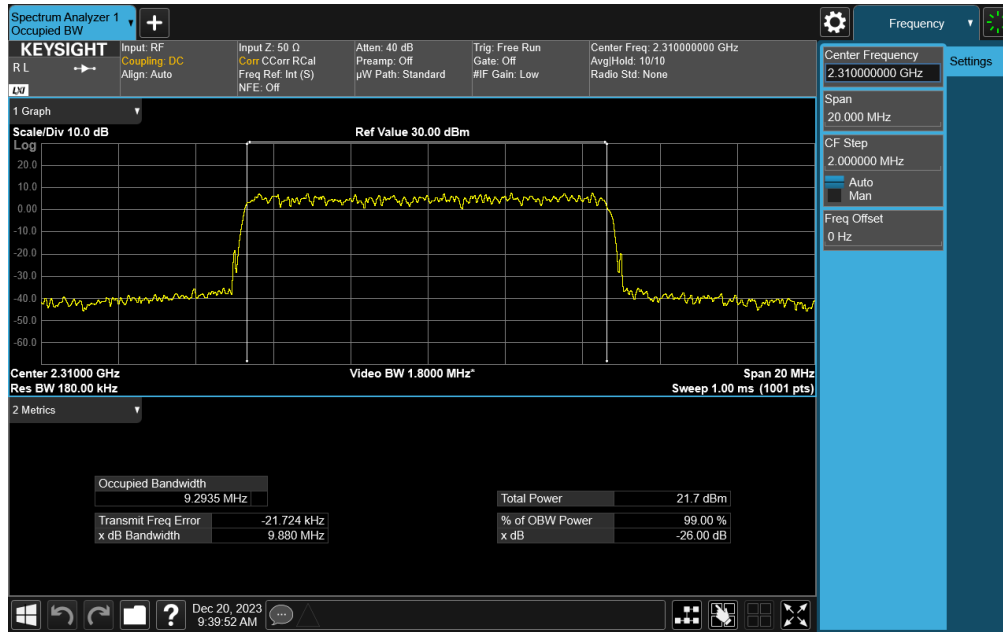


Plot 7-45. Occupied Bandwidth Plot (NR Band n30 - 5MHz CP-OFDM 256-QAM - Full RB)



Plot 7-46. Occupied Bandwidth Plot (NR Band n30 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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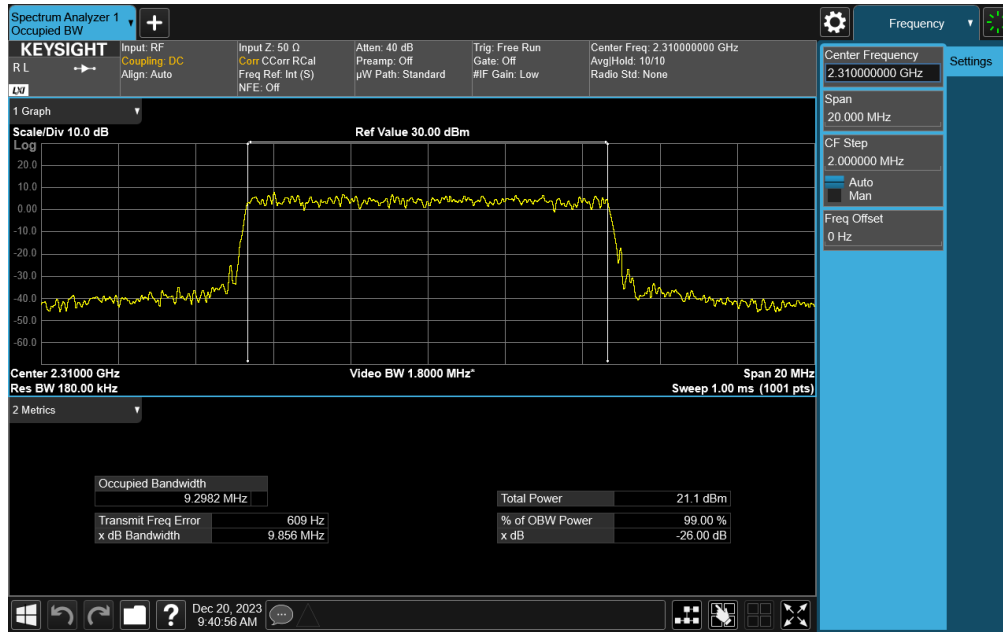
Plot 7-47. Occupied Bandwidth Plot (NR Band n30 - 10MHz CP-OFDM QPSK - Full RB)



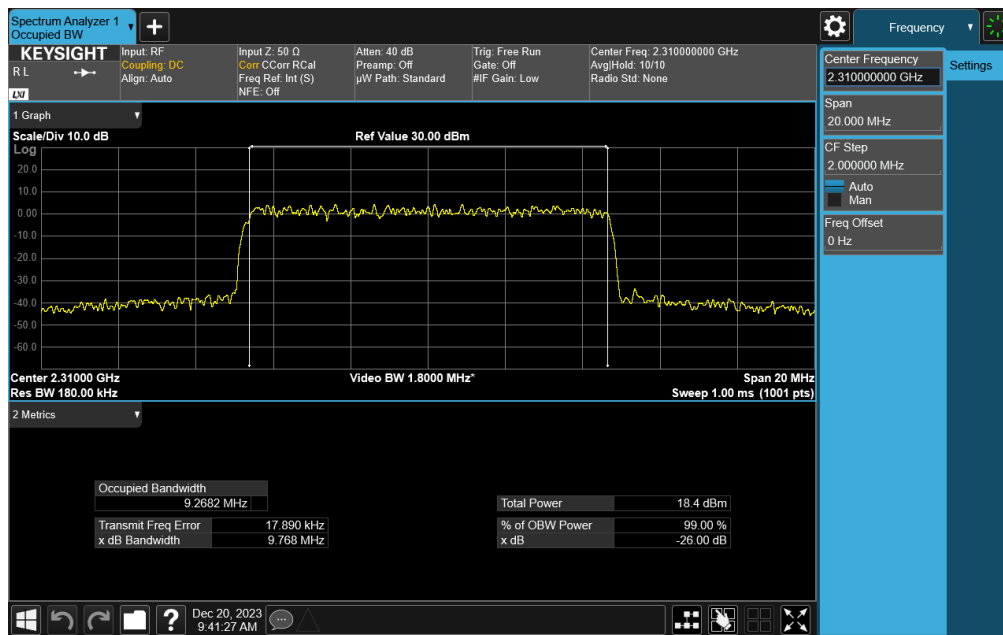
Plot 7-48. Occupied Bandwidth Plot (NR Band n30 - 10MHz CP-OFDM 16-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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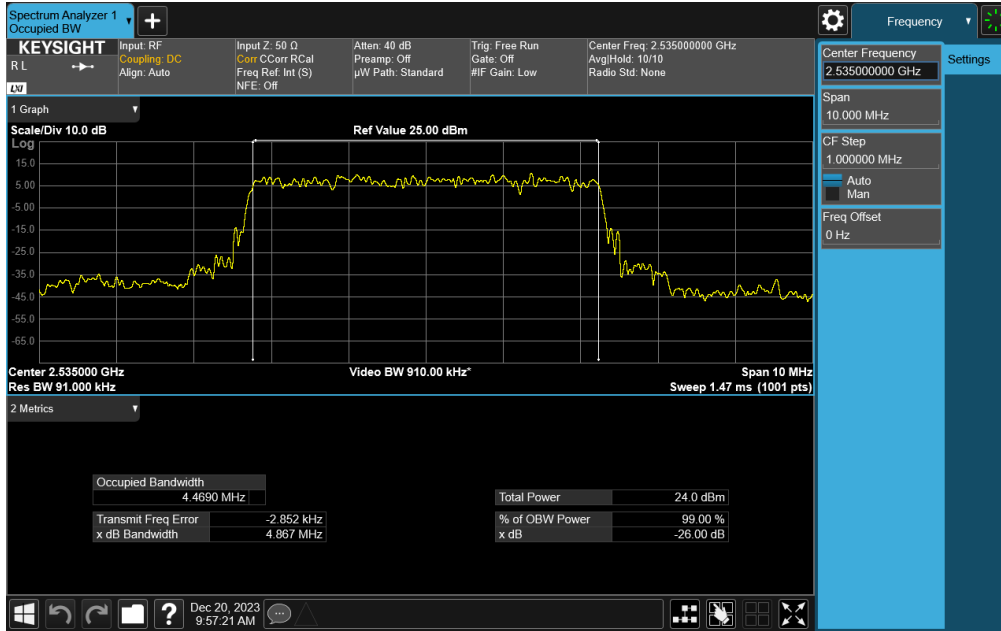
Plot 7-49. Occupied Bandwidth Plot (NR Band n30 - 10MHz CP-OFDM 64-QAM - Full RB)



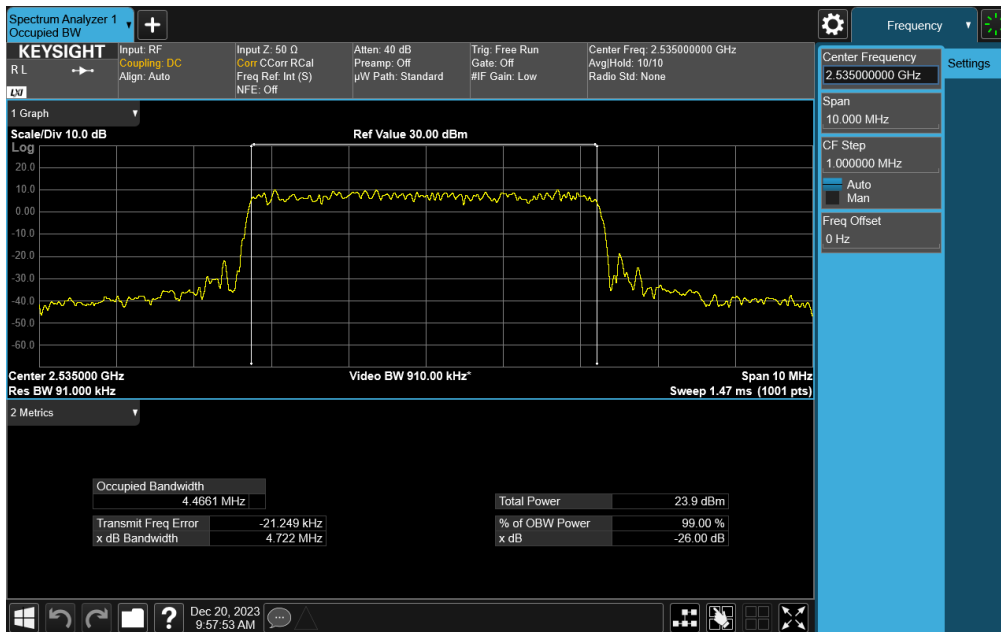
Plot 7-50. Occupied Bandwidth Plot (NR Band n30 - 10MHz CP-OFDM 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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# NR Band n7

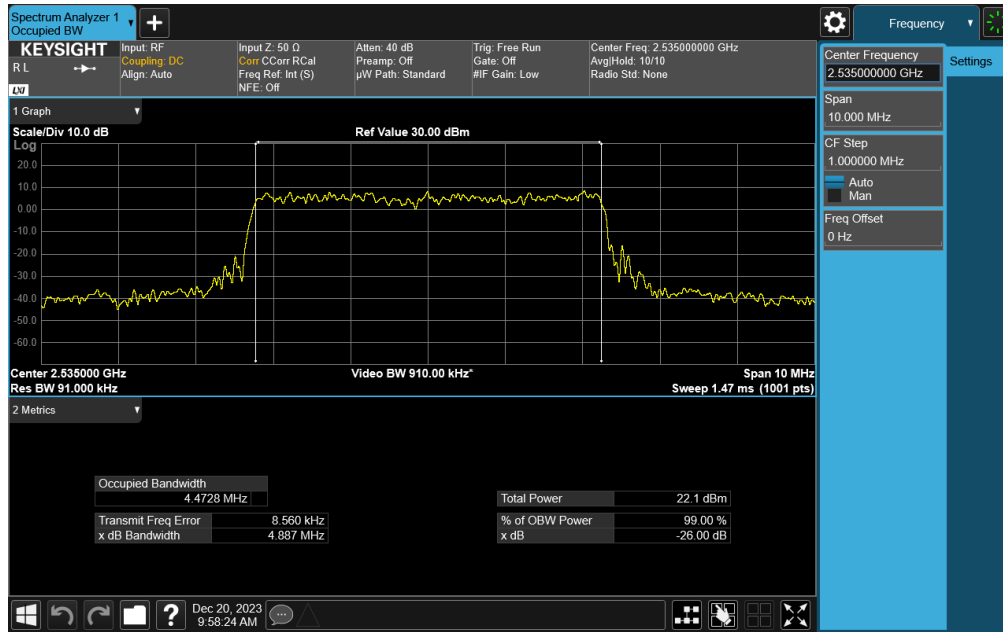


Plot 7-51. Occupied Bandwidth Plot (NR Band n7 - 5MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

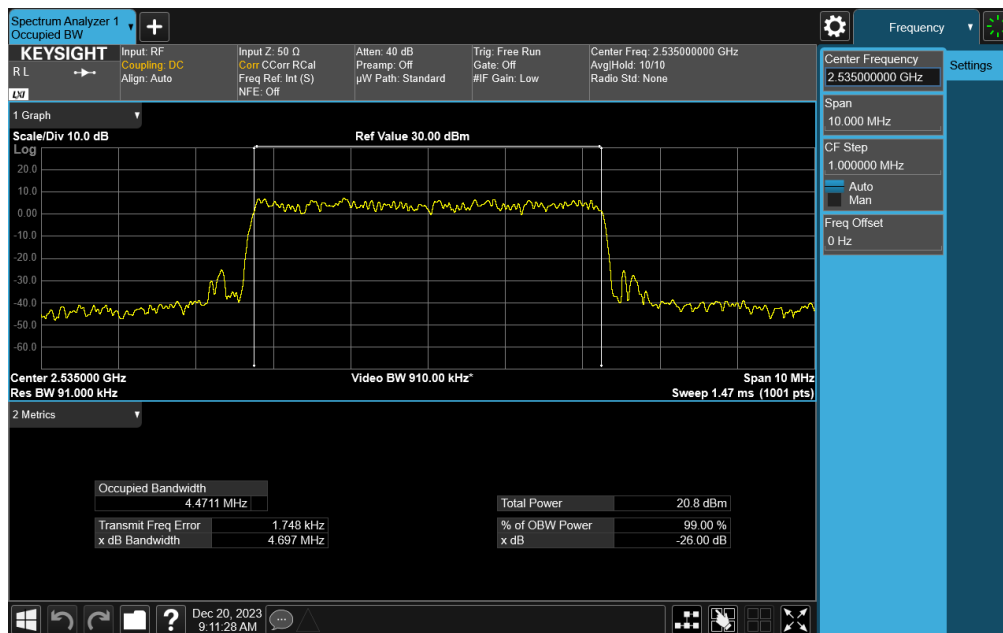


Plot 7-52. Occupied Bandwidth Plot (NR Band n7 - 5MHz DFT-s-OFDM QPSK - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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**Plot 7-53. Occupied Bandwidth Plot (NR Band n7 - 5MHz DFT-s-OFDM 16-QAM - Full RB)**

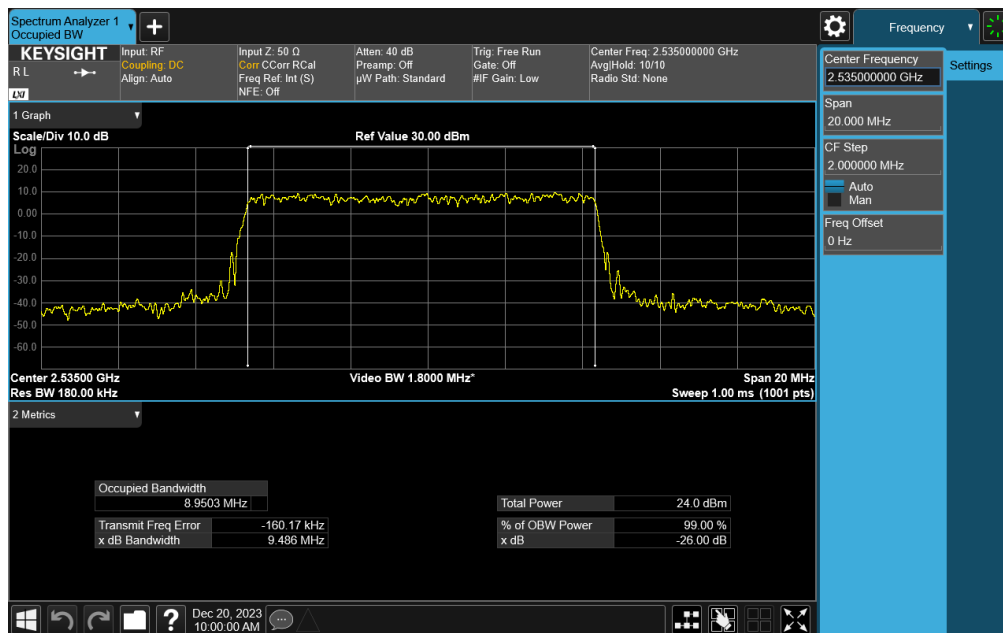


**Plot 7-54. Occupied Bandwidth Plot (NR Band n7 - 5MHz CP-OFDM 64-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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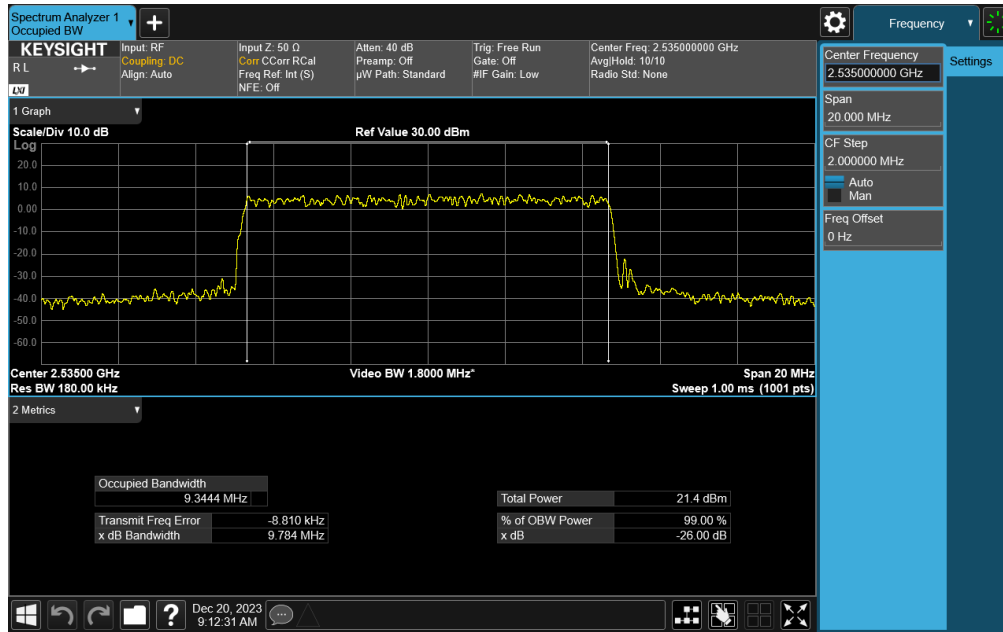


**Plot 7-55. Occupied Bandwidth Plot (NR Band n7 - 5MHz DFT-s-OFDM 256-QAM - Full RB)**

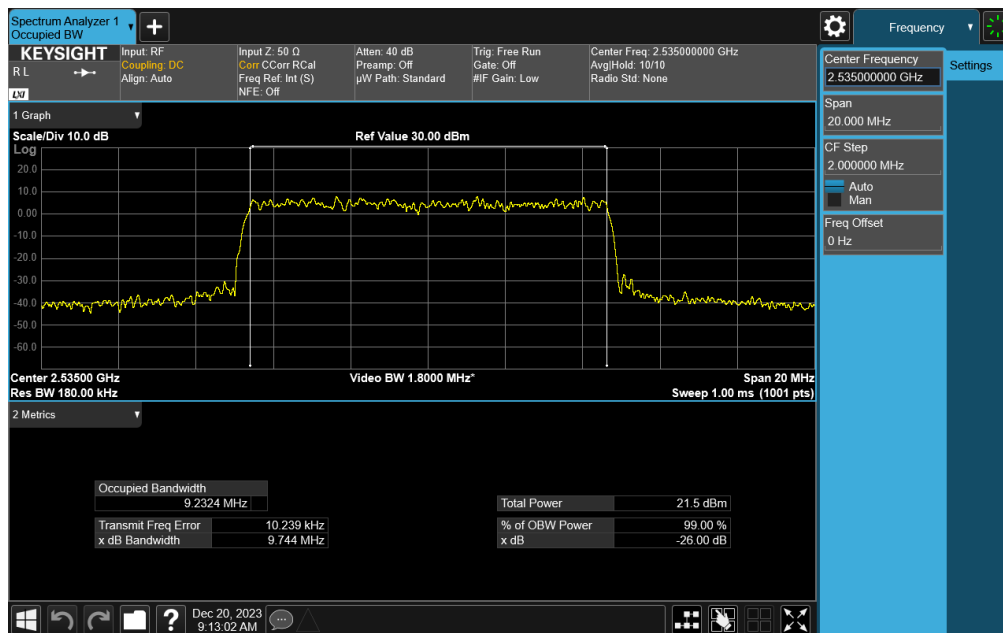


**Plot 7-56. Occupied Bandwidth Plot (NR Band n7 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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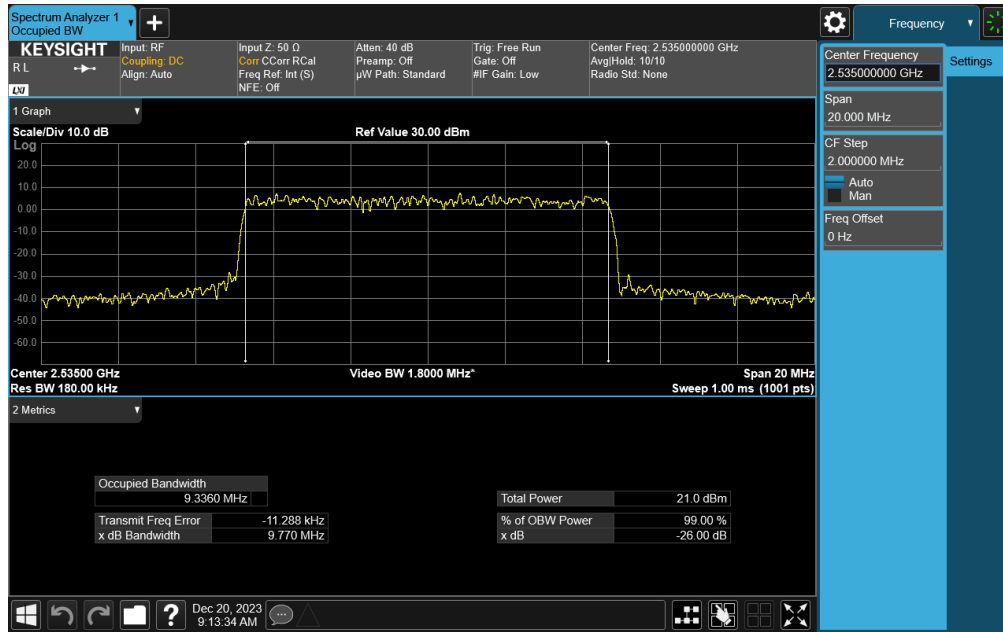


**Plot 7-57. Occupied Bandwidth Plot (NR Band n7 - 10MHz CP-OFDM QPSK - Full RB)**

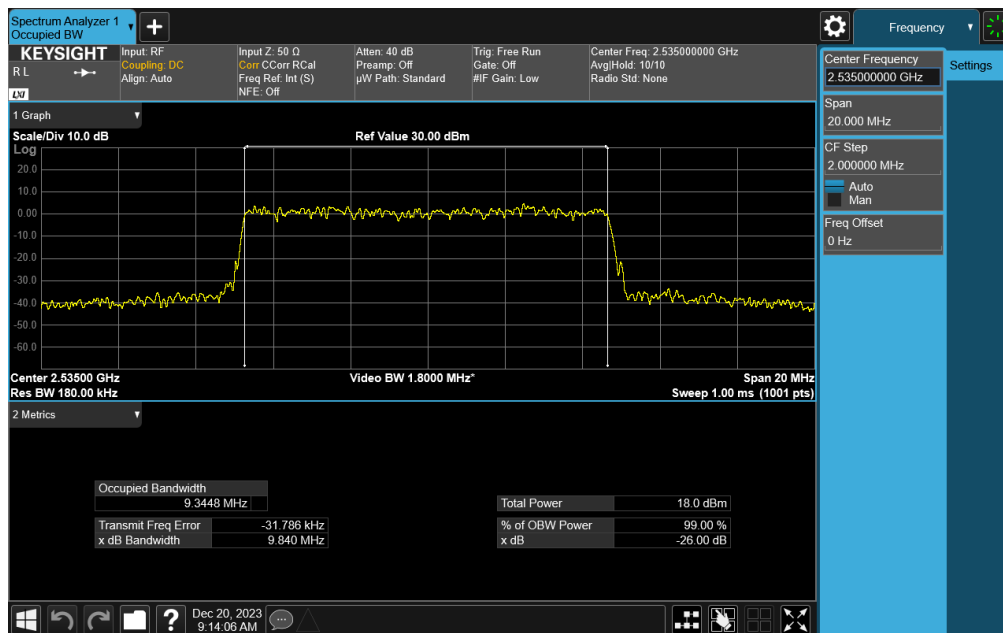


**Plot 7-58. Occupied Bandwidth Plot (NR Band n7 - 10MHz CP-OFDM 16-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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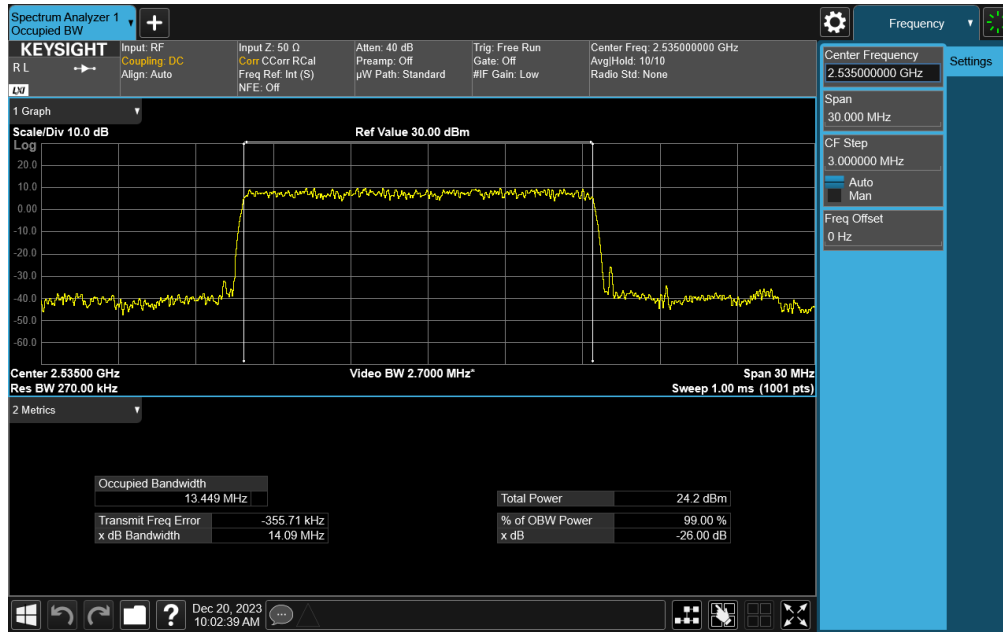


Plot 7-59. Occupied Bandwidth Plot (NR Band n7 - 10MHz CP-OFDM 64-QAM - Full RB)

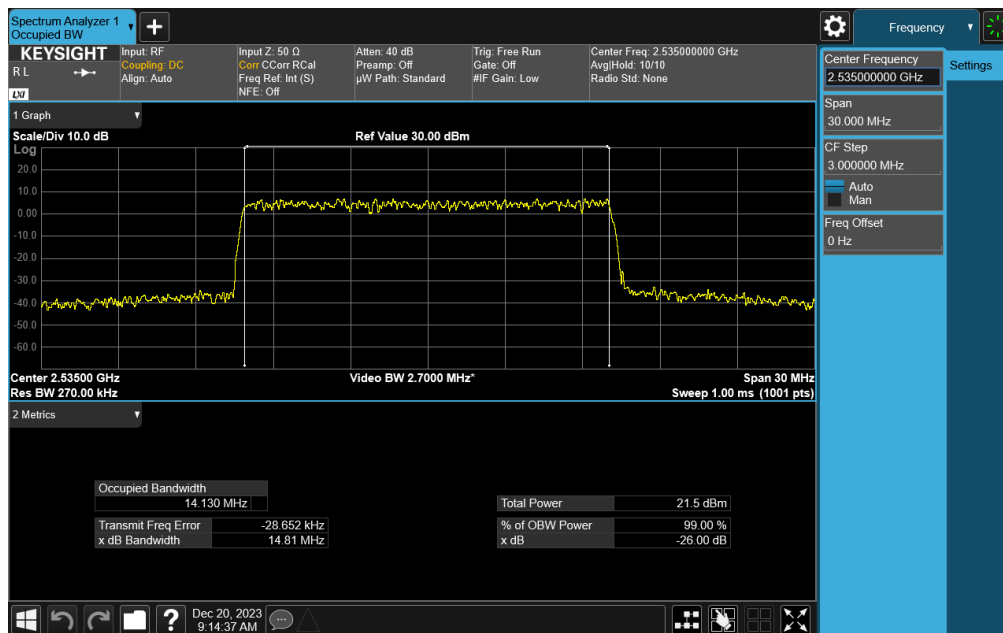


Plot 7-60. Occupied Bandwidth Plot (NR Band n7 - 10MHz CP-OFDM 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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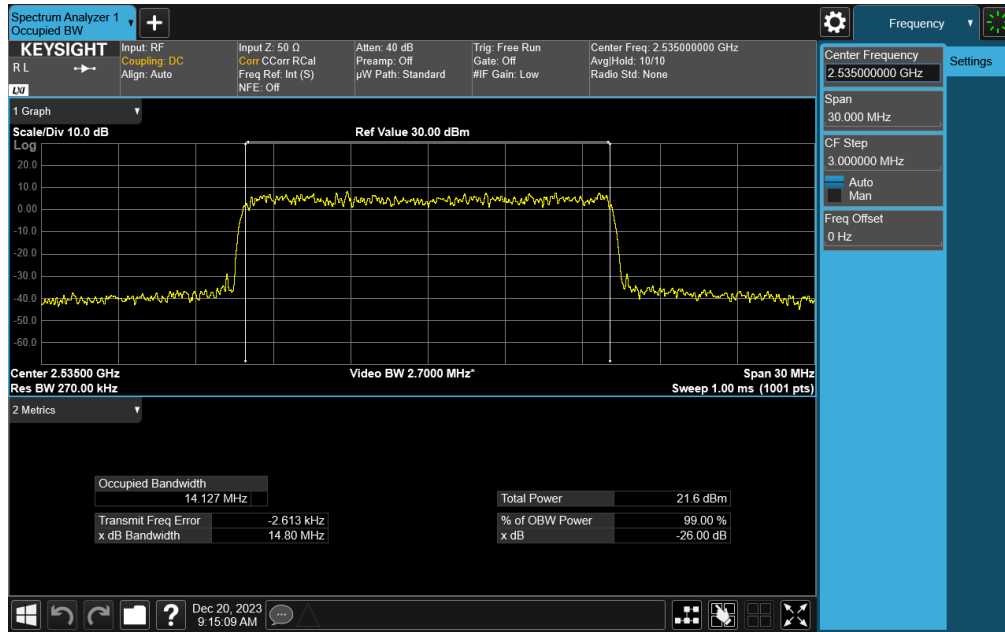


**Plot 7-61. Occupied Bandwidth Plot (NR Band n7 - 15MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

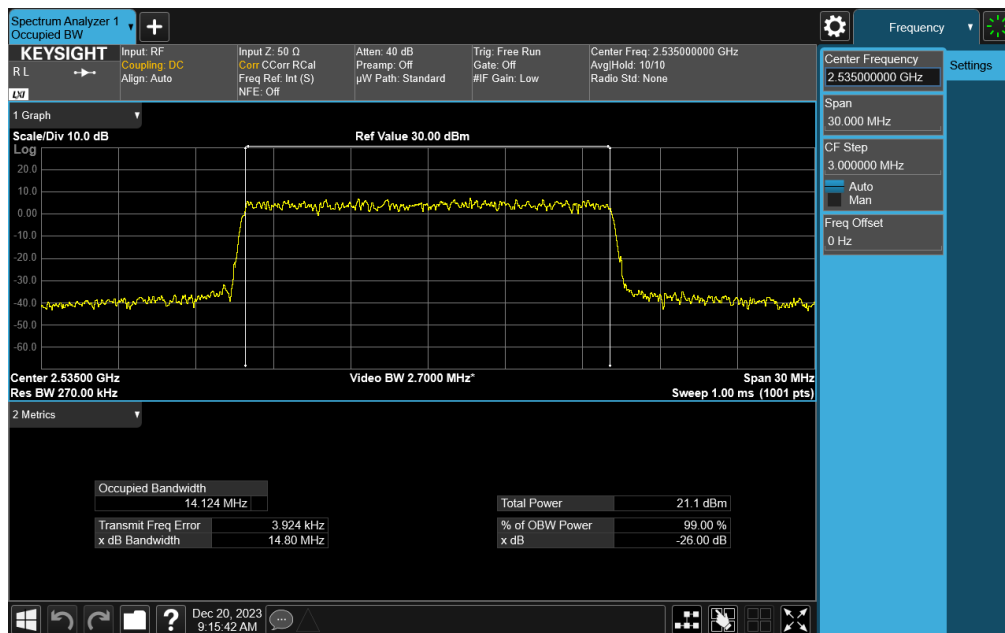


**Plot 7-62. Occupied Bandwidth Plot (NR Band n7 - 15MHz CP-OFDM QPSK - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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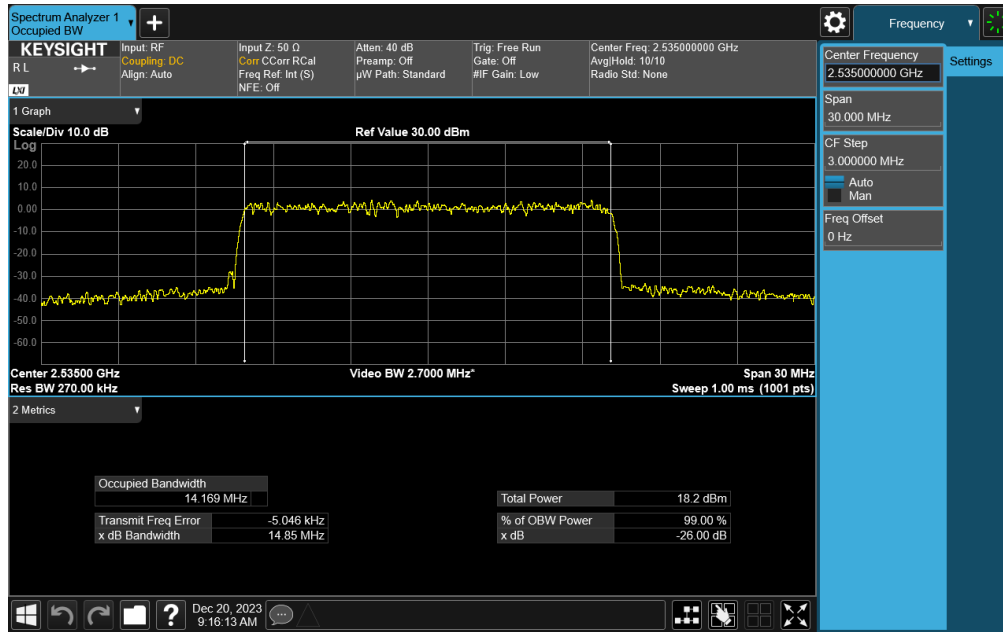
**Plot 7-63. Occupied Bandwidth Plot (NR Band n7 - 15MHz CP-OFDM 16-QAM - Full RB)**



**Plot 7-64. Occupied Bandwidth Plot (NR Band n7 - 15MHz CP-OFDM 64-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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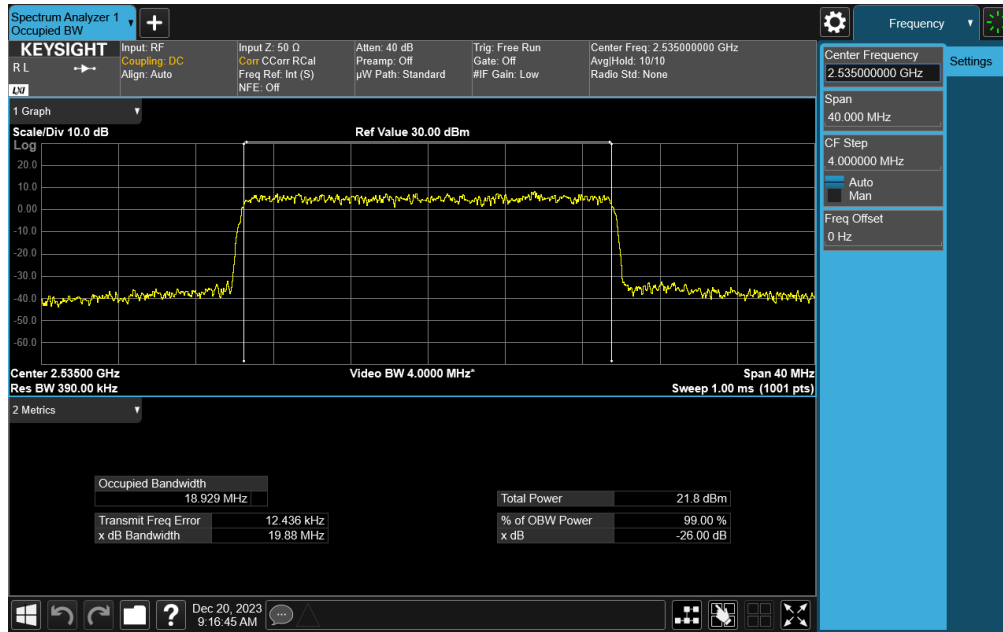


**Plot 7-65. Occupied Bandwidth Plot (NR Band n7 - 15MHz CP-OFDM 256-QAM - Full RB)**

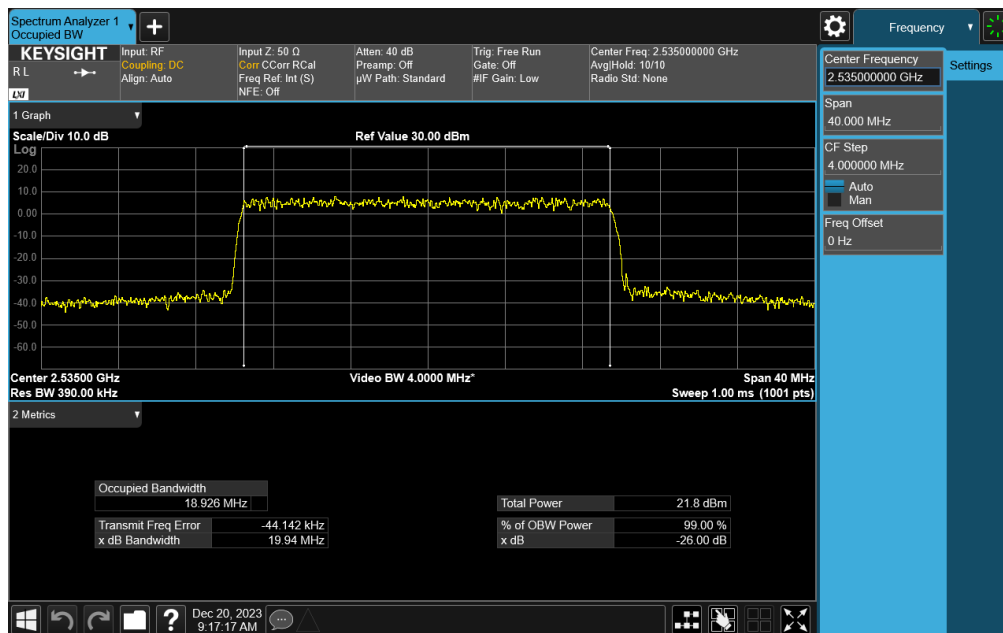


**Plot 7-66. Occupied Bandwidth Plot (NR Band n7 - 20MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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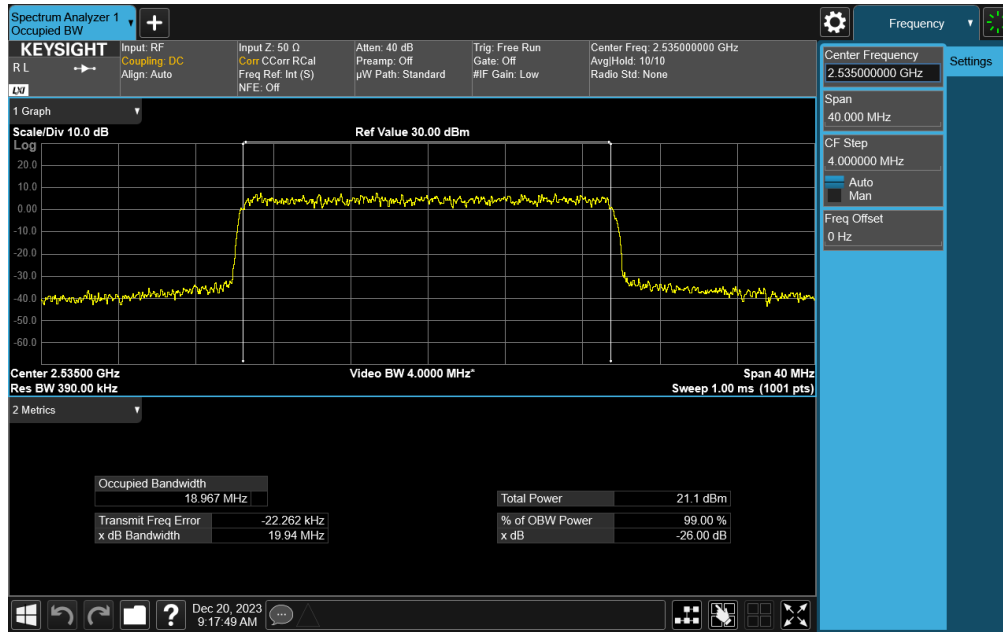


**Plot 7-67. Occupied Bandwidth Plot (NR Band n7 - 20MHz CP-OFDM QPSK - Full RB)**

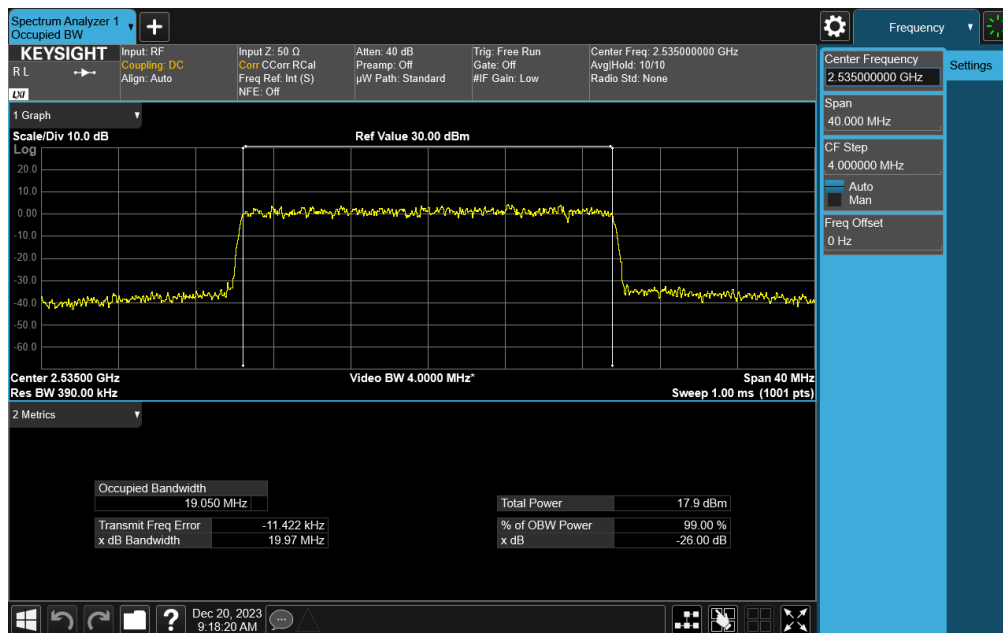


**Plot 7-68. Occupied Bandwidth Plot (NR Band n7 - 20MHz CP-OFDM 16-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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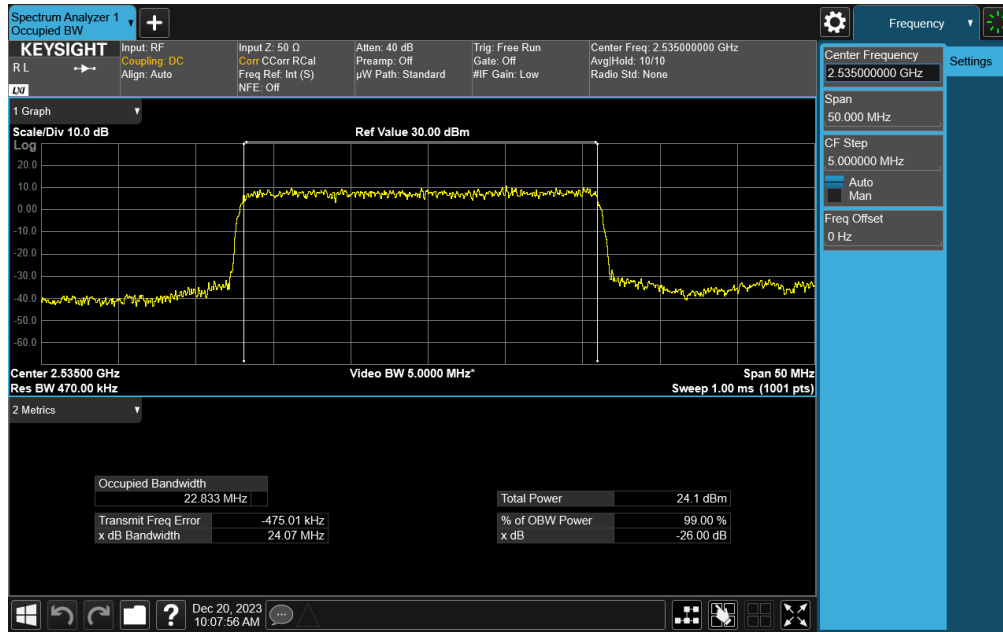


Plot 7-69. Occupied Bandwidth Plot (NR Band n7 - 20MHz CP-OFDM 64-QAM - Full RB)

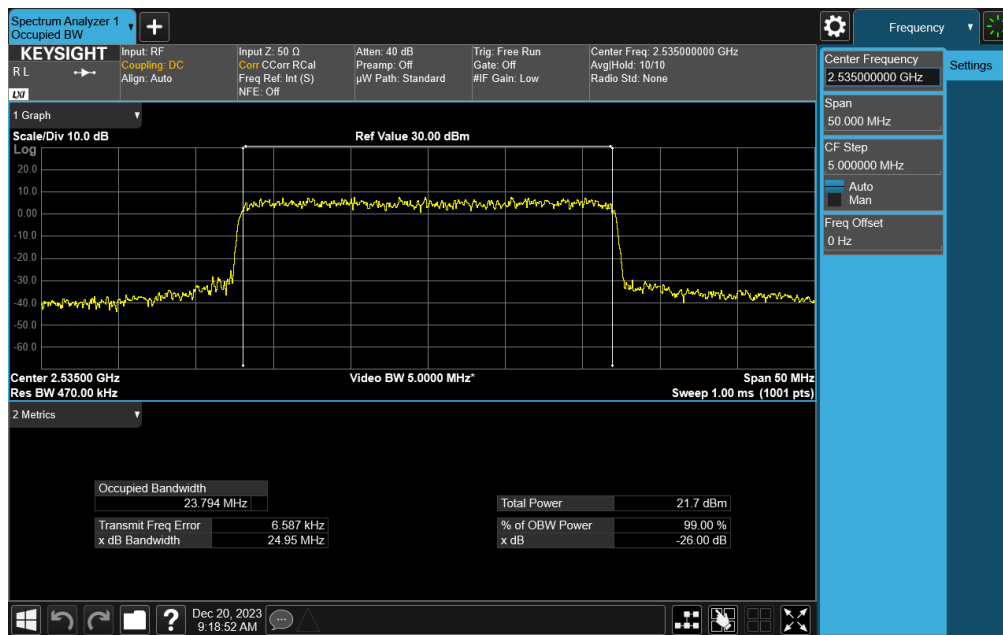


Plot 7-70. Occupied Bandwidth Plot (NR Band n7 - 20MHz CP-OFDM 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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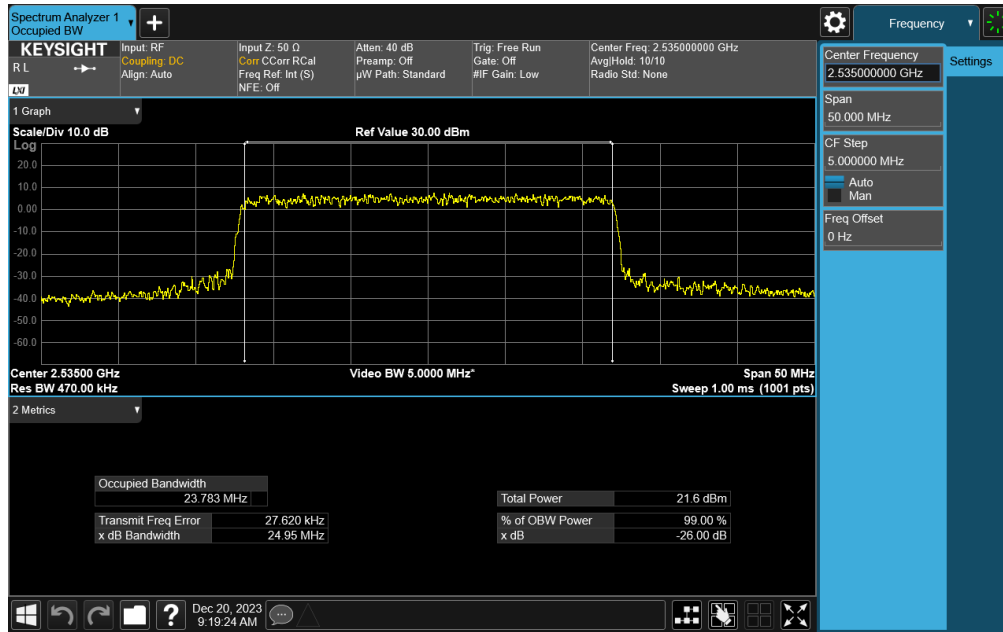


Plot 7-71. Occupied Bandwidth Plot (NR Band n7 - 25MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

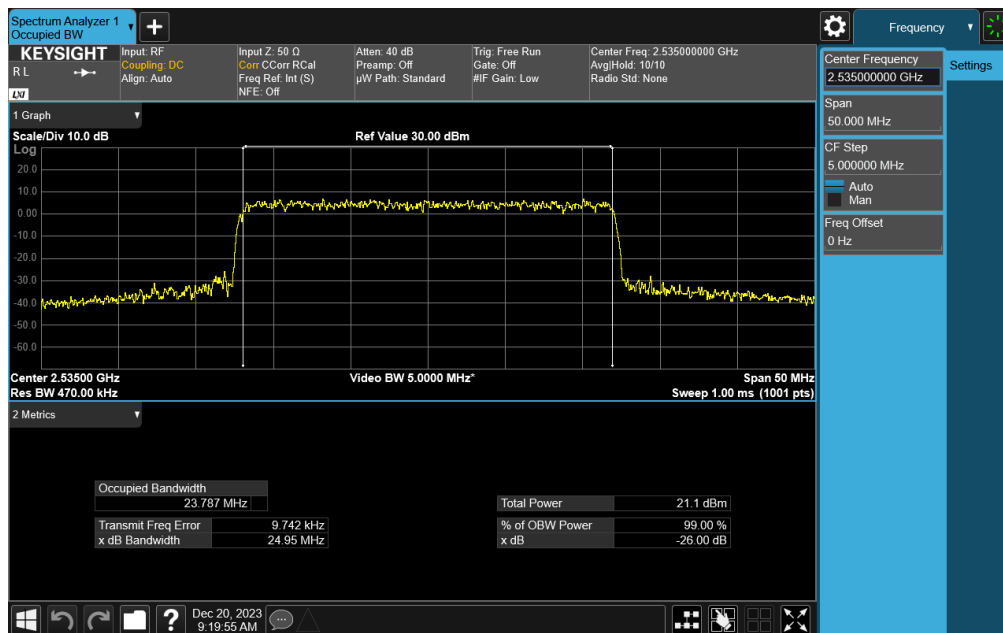


Plot 7-72. Occupied Bandwidth Plot (NR Band n7 - 25MHz CP-OFDM QPSK - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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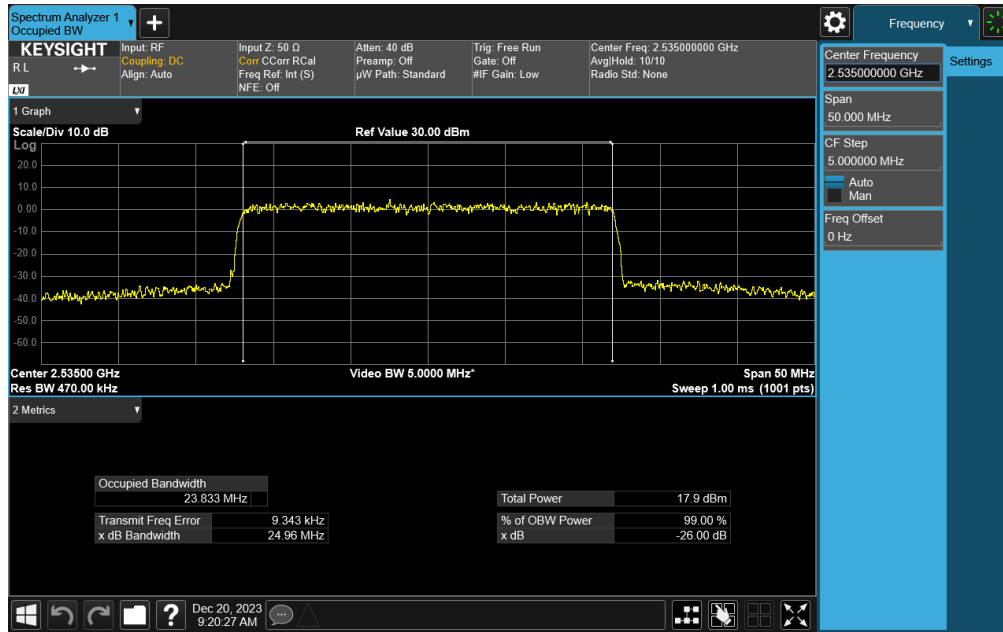


**Plot 7-73. Occupied Bandwidth Plot (NR Band n7 - 25MHz CP-OFDM 16-QAM - Full RB)**

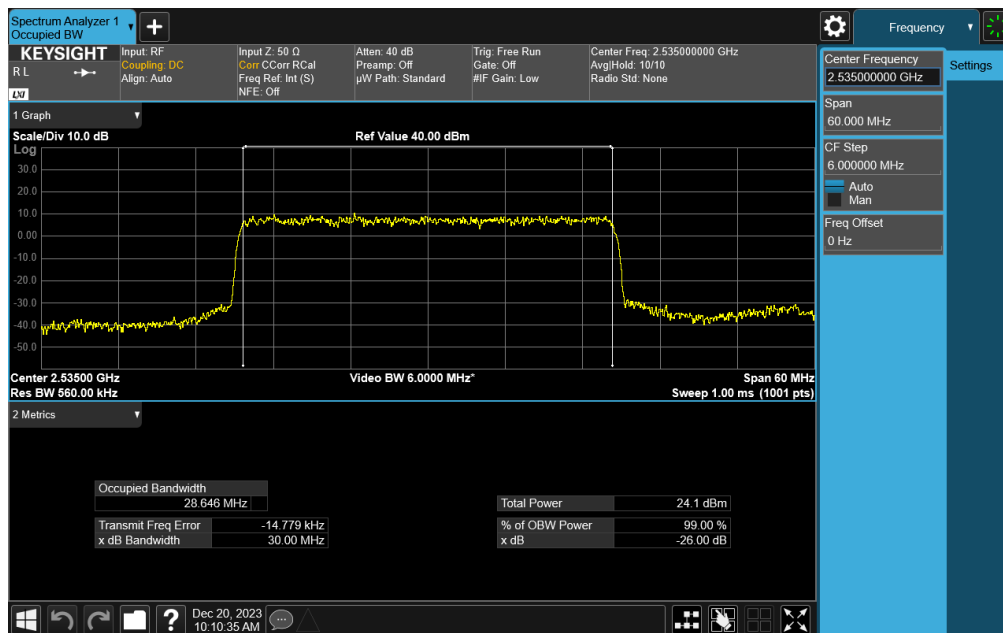


**Plot 7-74. Occupied Bandwidth Plot (NR Band n7 - 25MHz CP-OFDM 64-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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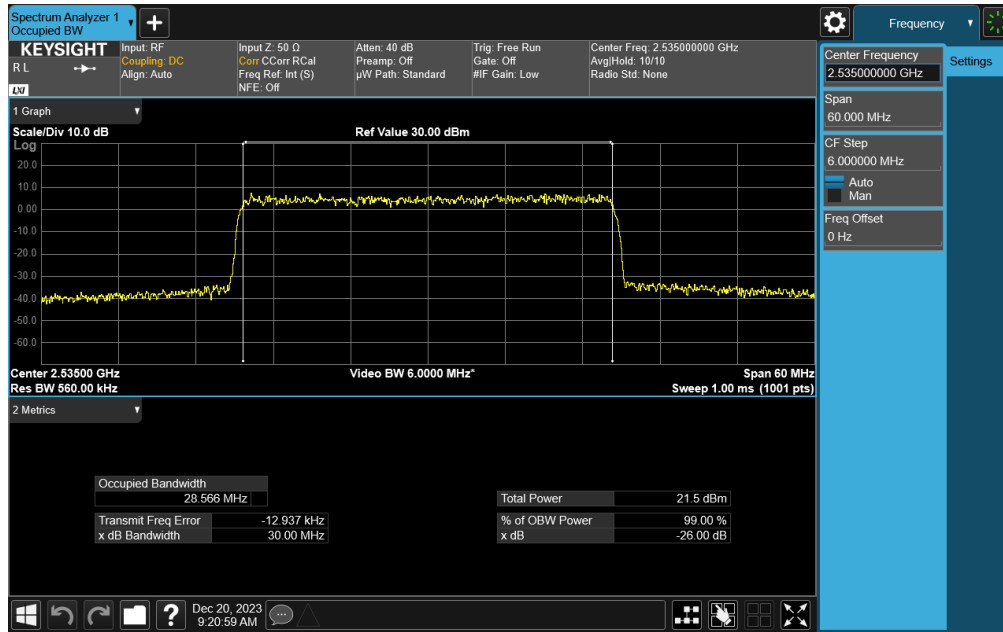


**Plot 7-75. Occupied Bandwidth Plot (NR Band n7 - 25MHz CP-OFDM 256-QAM - Full RB)**

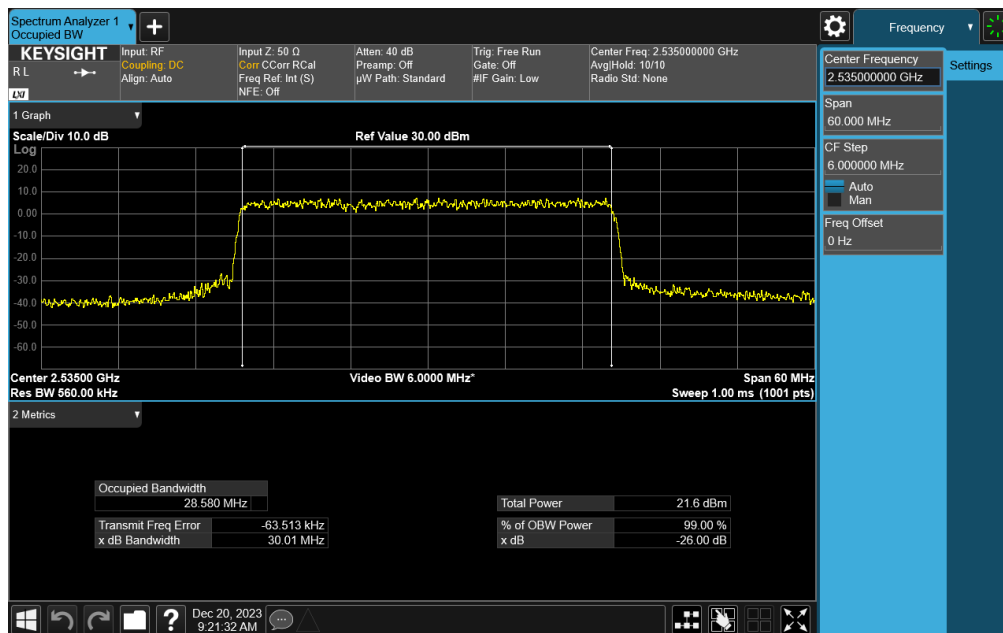


**Plot 7-76. Occupied Bandwidth Plot (NR Band n7 - 30MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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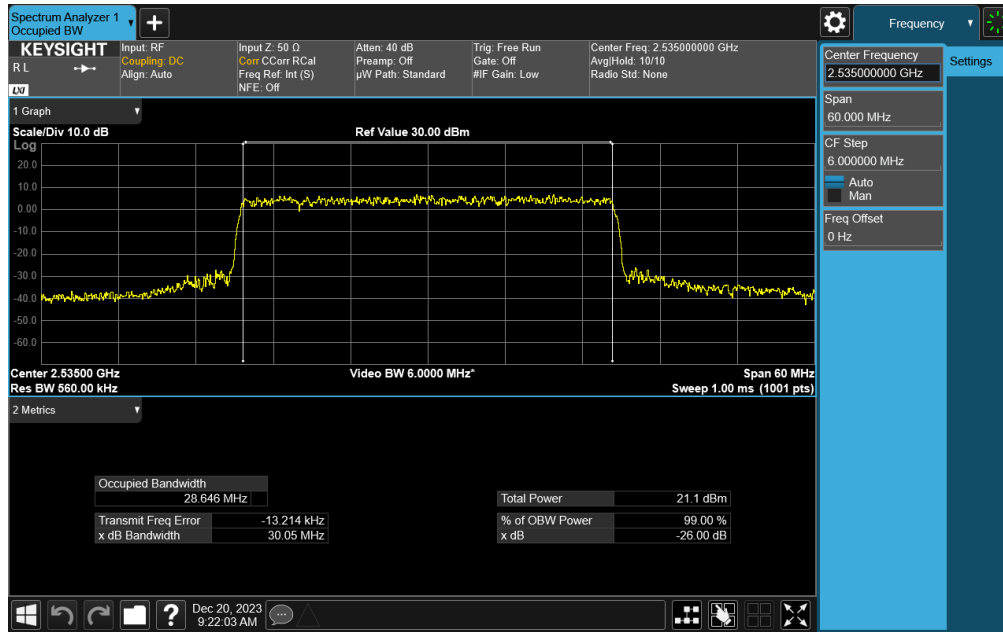


**Plot 7-77. Occupied Bandwidth Plot (NR Band n7 - 30MHz CP-OFDM QPSK - Full RB)**

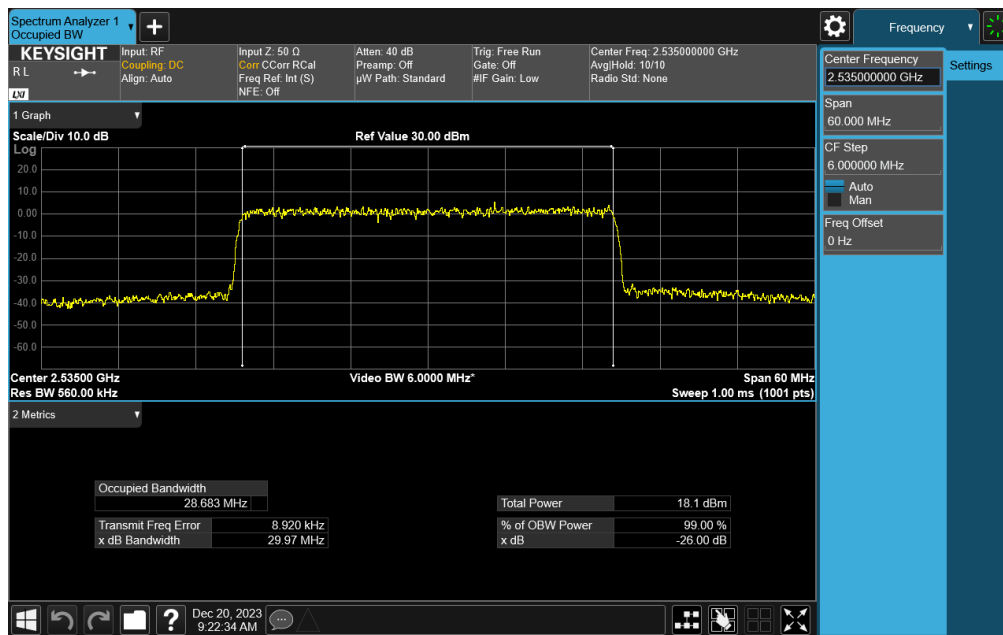


**Plot 7-78. Occupied Bandwidth Plot (NR Band n7 - 30MHz CP-OFDM 16-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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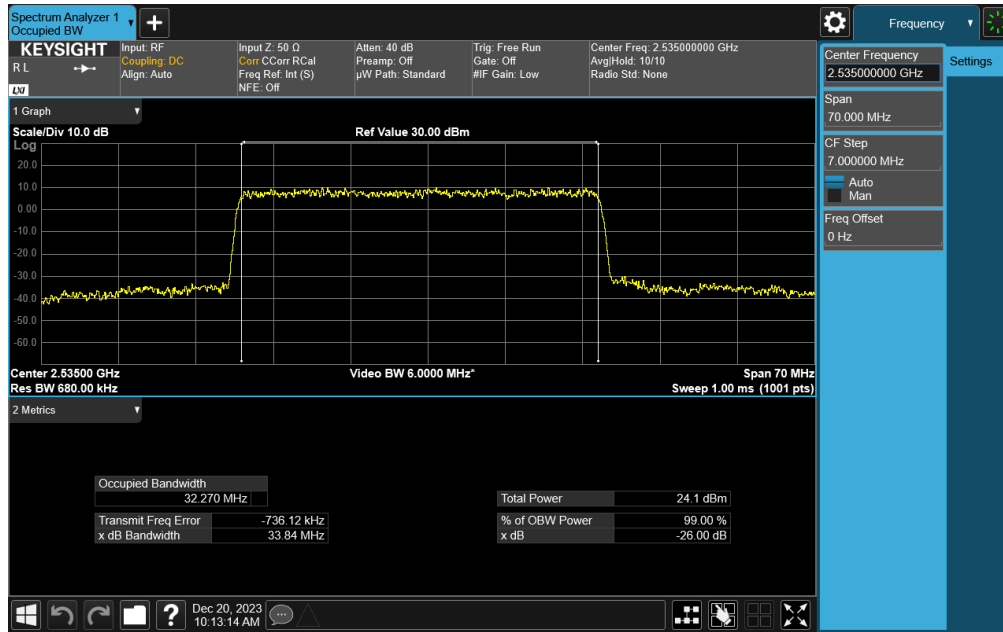
Plot 7-79. Occupied Bandwidth Plot (NR Band n7 - 30MHz CP-OFDM 64-QAM - Full RB)



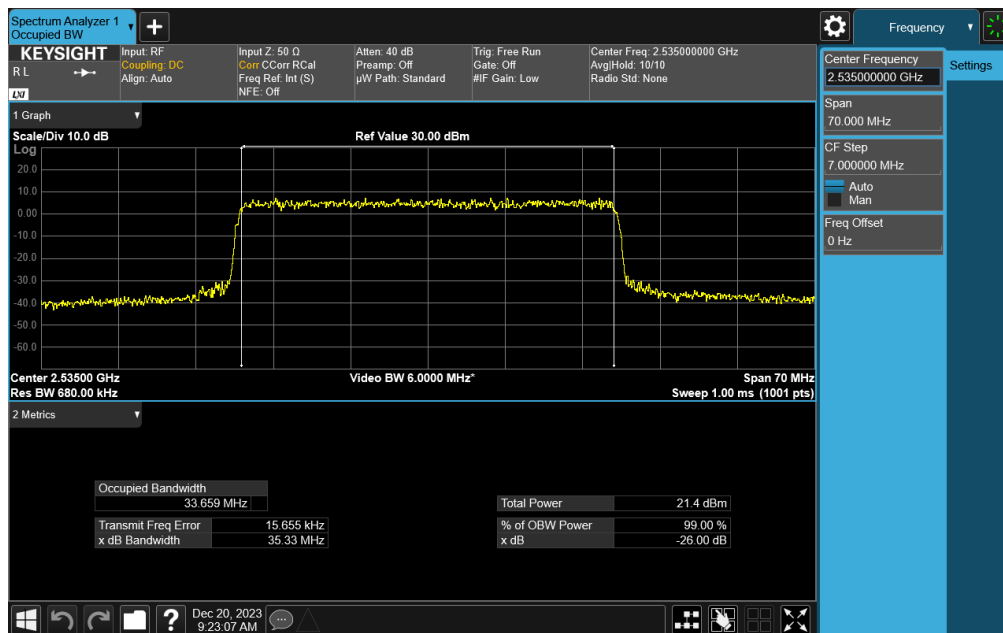
Plot 7-80. Occupied Bandwidth Plot (NR Band n7 - 30MHz CP-OFDM 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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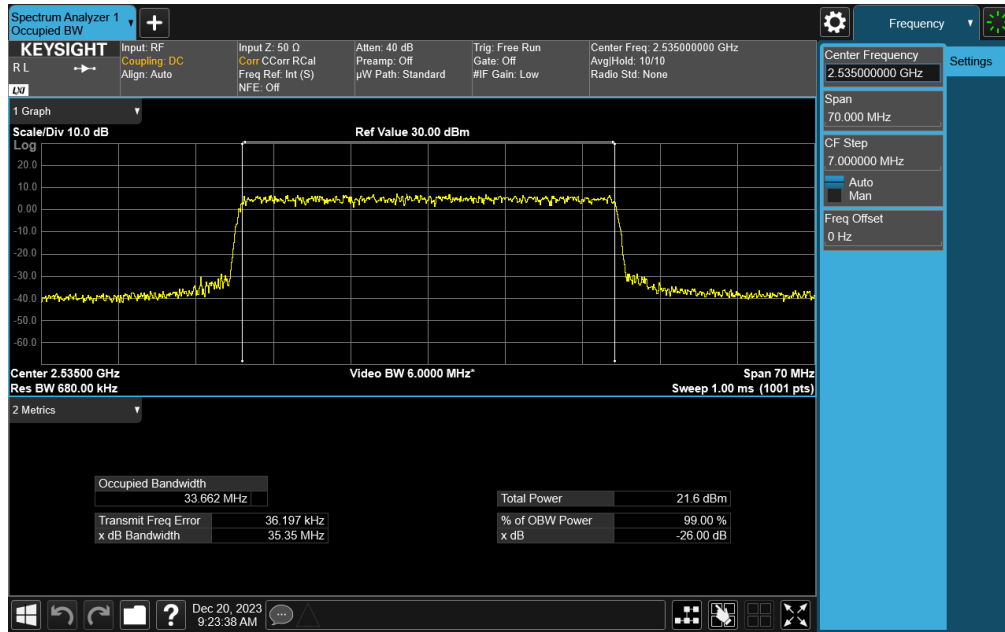


Plot 7-81. Occupied Bandwidth Plot (NR Band n7 - 35MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

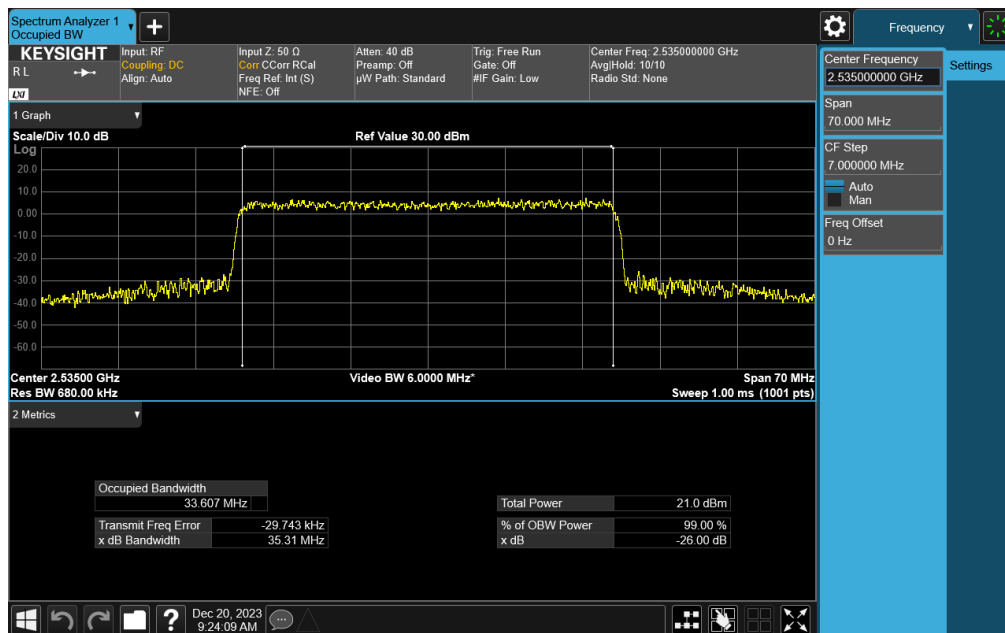


Plot 7-82. Occupied Bandwidth Plot (NR Band n7 - 35MHz CP-OFDM QPSK - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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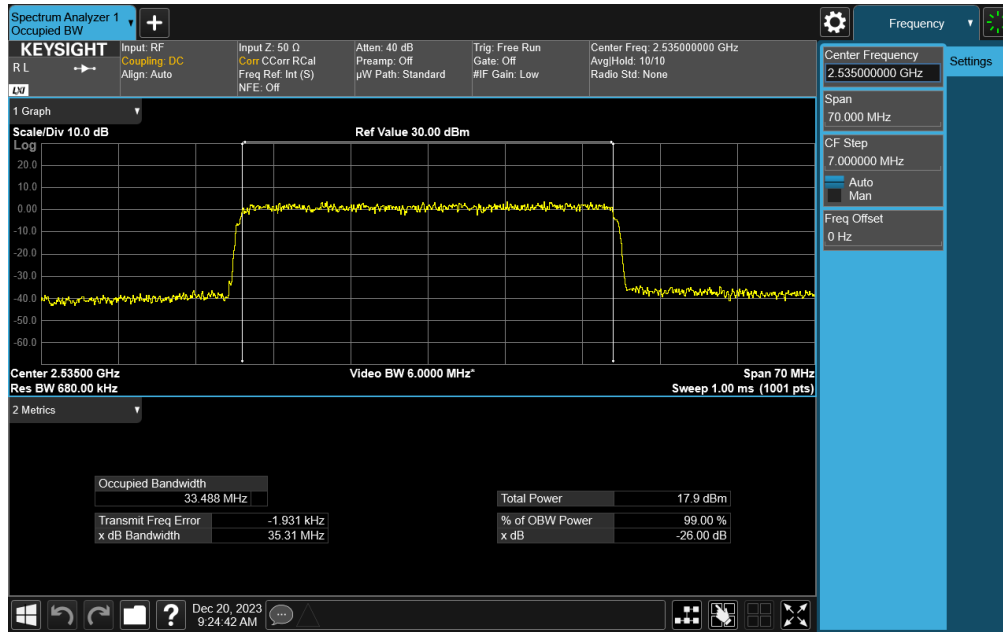


Plot 7-83. Occupied Bandwidth Plot (NR Band n7 - 35MHz CP-OFDM 16-QAM - Full RB)

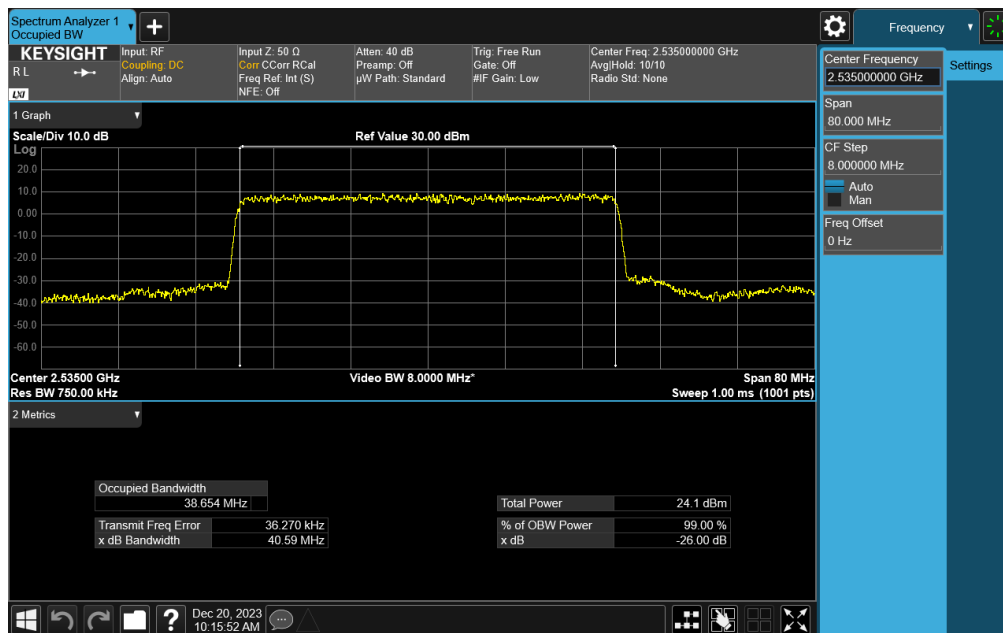


Plot 7-84. Occupied Bandwidth Plot (NR Band n7 - 35MHz CP-OFDM 64-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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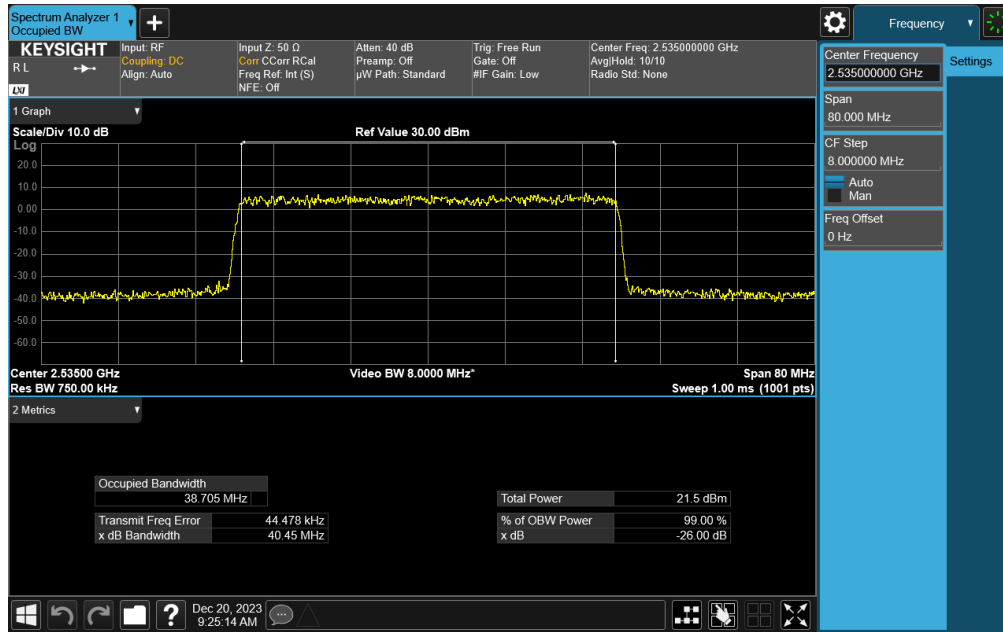


Plot 7-85. Occupied Bandwidth Plot (NR Band n7 - 35MHz CP-OFDM 256-QAM - Full RB)

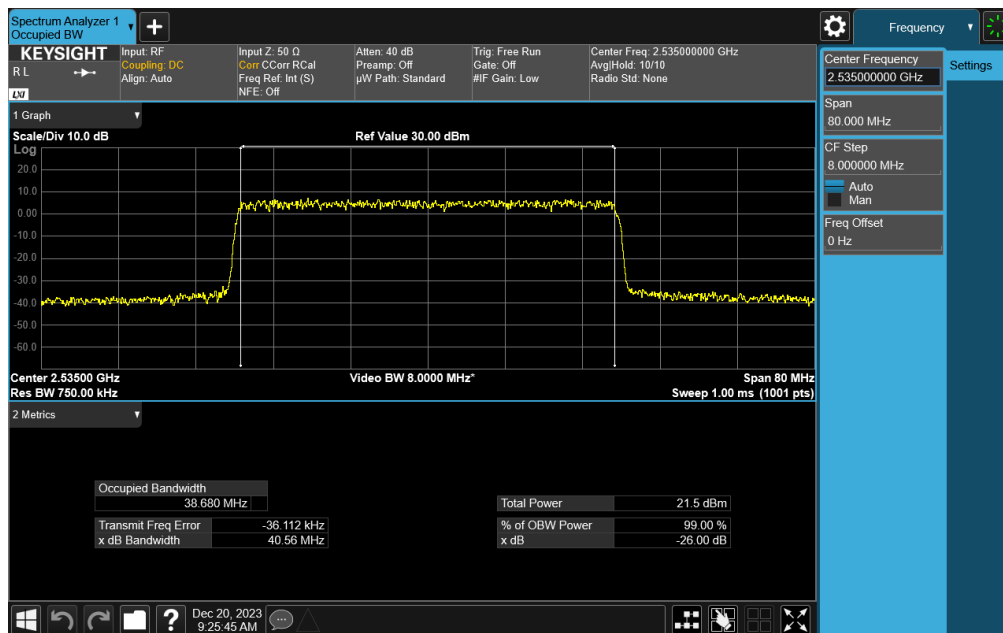


Plot 7-86. Occupied Bandwidth Plot (NR Band n7 - 40MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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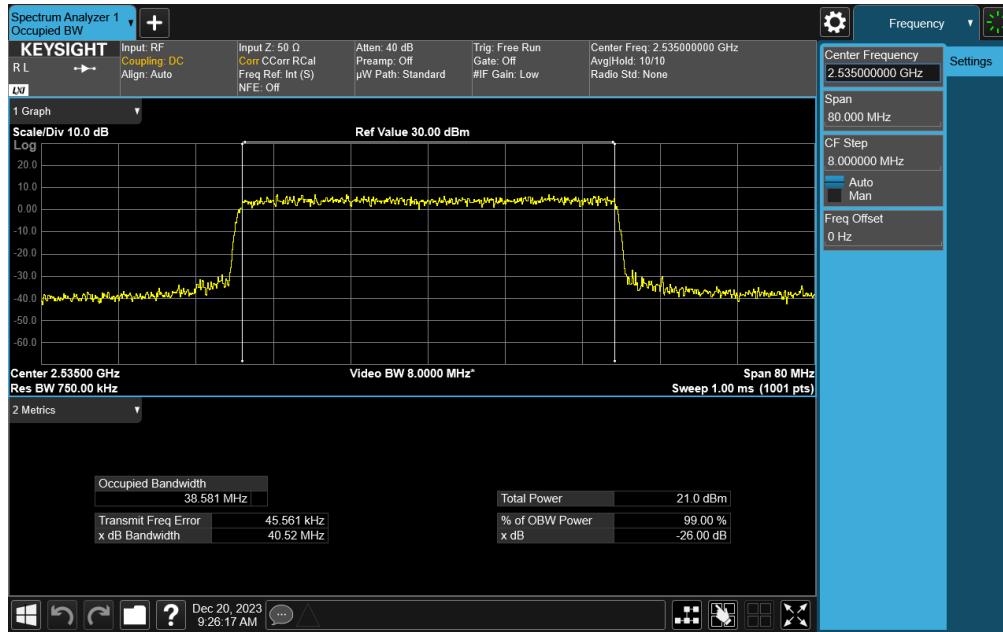


Plot 7-87. Occupied Bandwidth Plot (NR Band n7 - 40MHz CP-OFDM QPSK - Full RB)

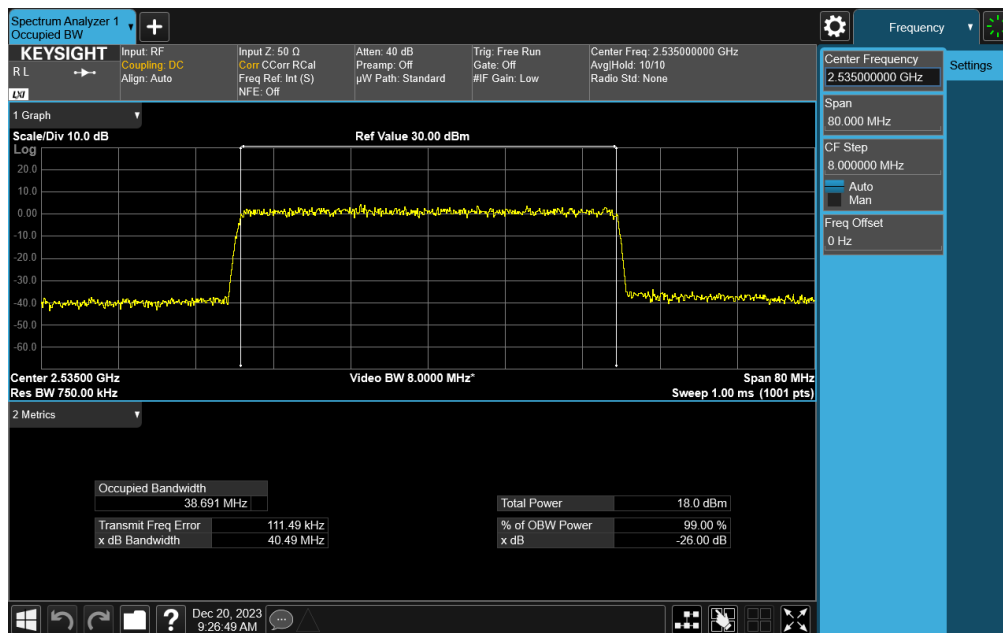


Plot 7-88. Occupied Bandwidth Plot (NR Band n7 - 40MHz CP-OFDM 16-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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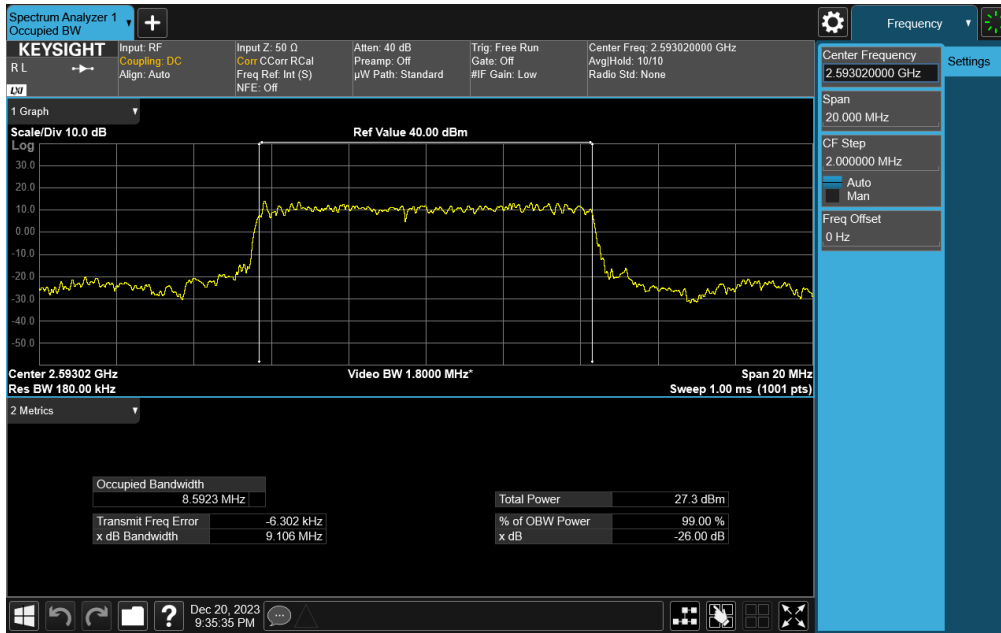
**Plot 7-89. Occupied Bandwidth Plot (NR Band n7 - 40MHz CP-OFDM 64-QAM - Full RB)**



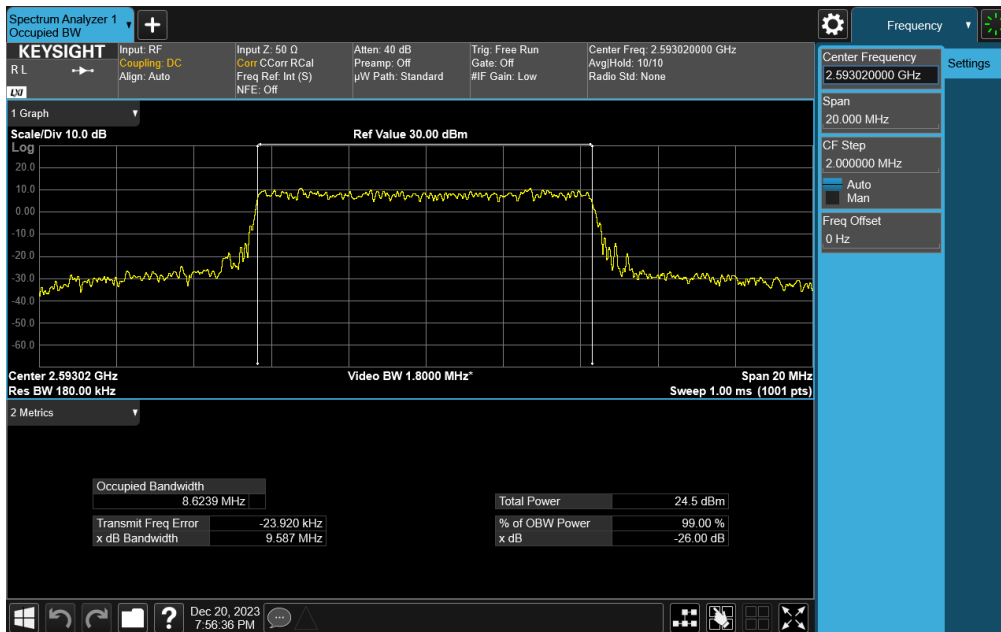
**Plot 7-90. Occupied Bandwidth Plot (NR Band n7 - 40MHz CP-OFDM 256-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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# NR Band n41

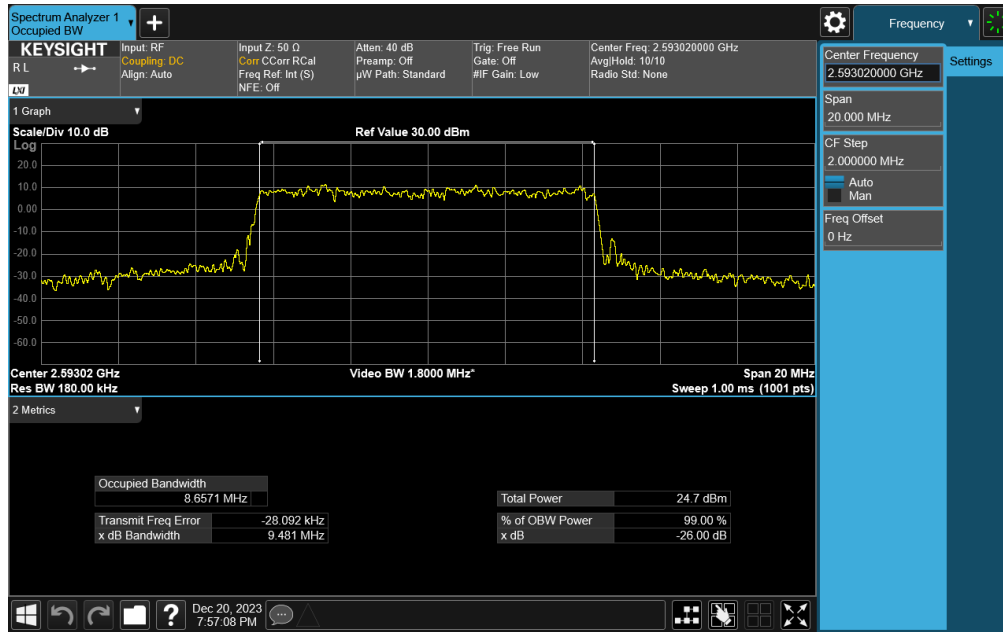


**Plot 7-91. Occupied Bandwidth Plot (NR Band n41 - 10MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

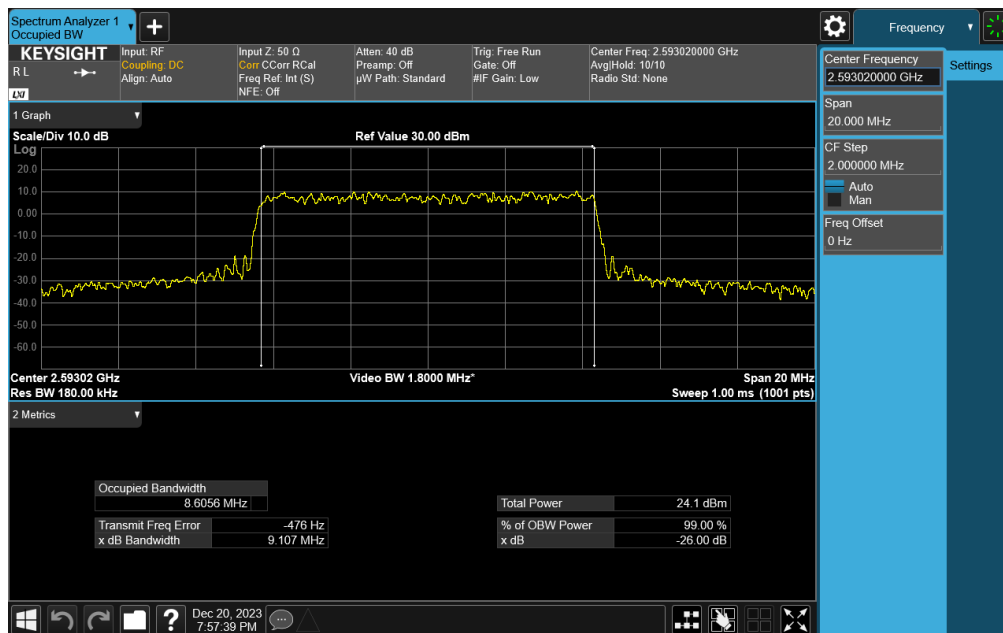


**Plot 7-92. Occupied Bandwidth Plot (NR Band n41 - 10MHz CP-OFDM QPSK - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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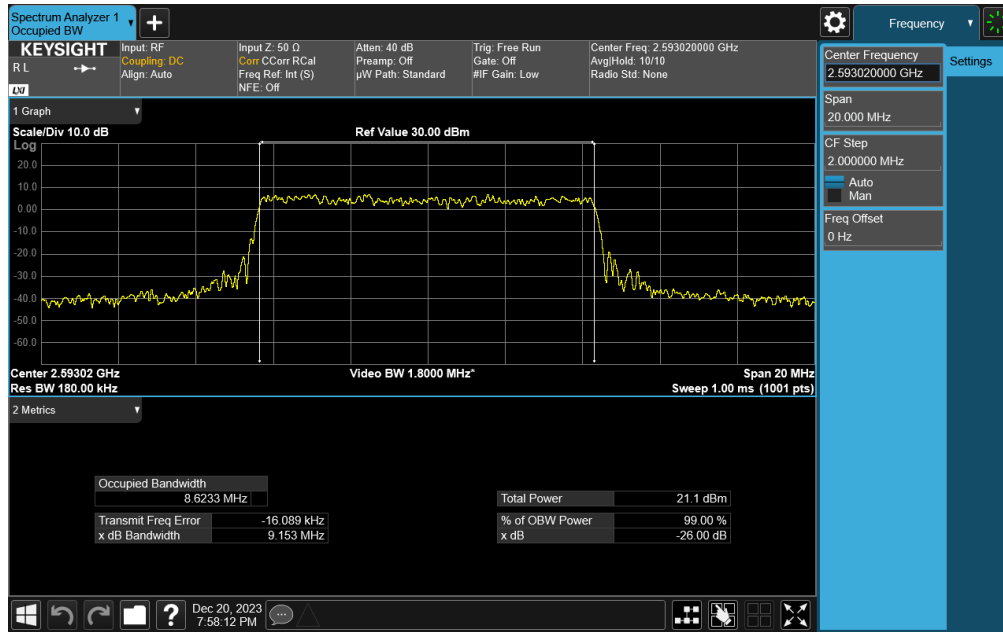


**Plot 7-93. Occupied Bandwidth Plot (NR Band n41 - 10MHz CP-OFDM 16-QAM - Full RB)**

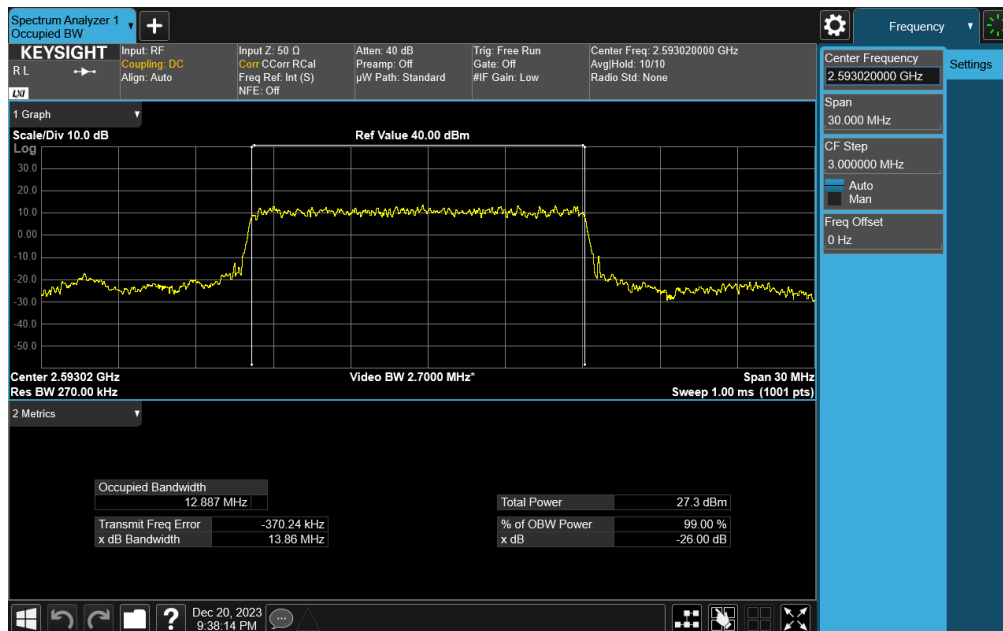


**Plot 7-94. Occupied Bandwidth Plot (NR Band n41 - 10MHz CP-OFDM 64-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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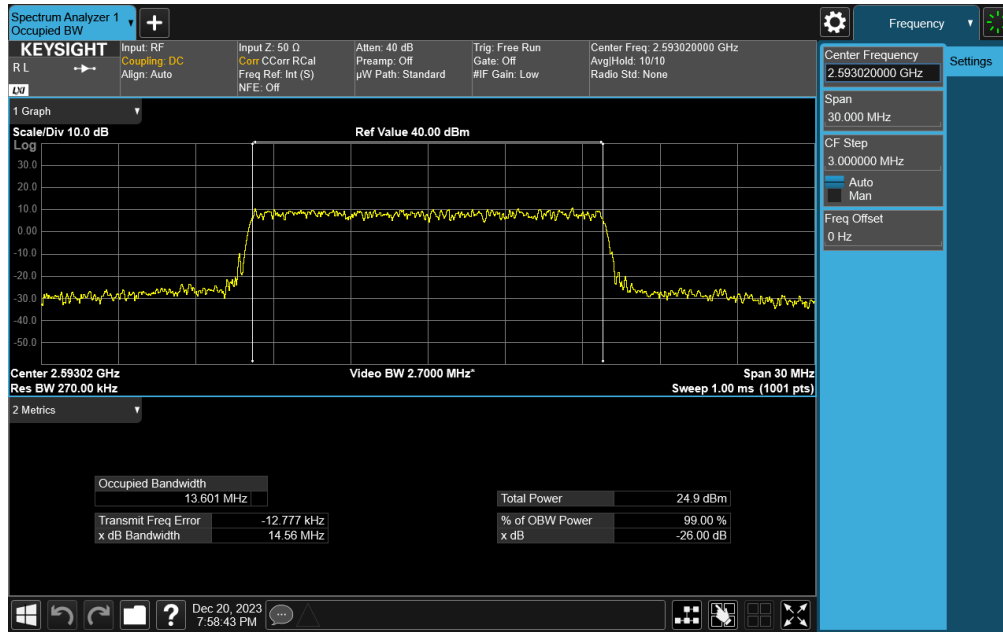
**Plot 7-95. Occupied Bandwidth Plot (NR Band n41 - 10MHz CP-OFDM 256-QAM - Full RB)**



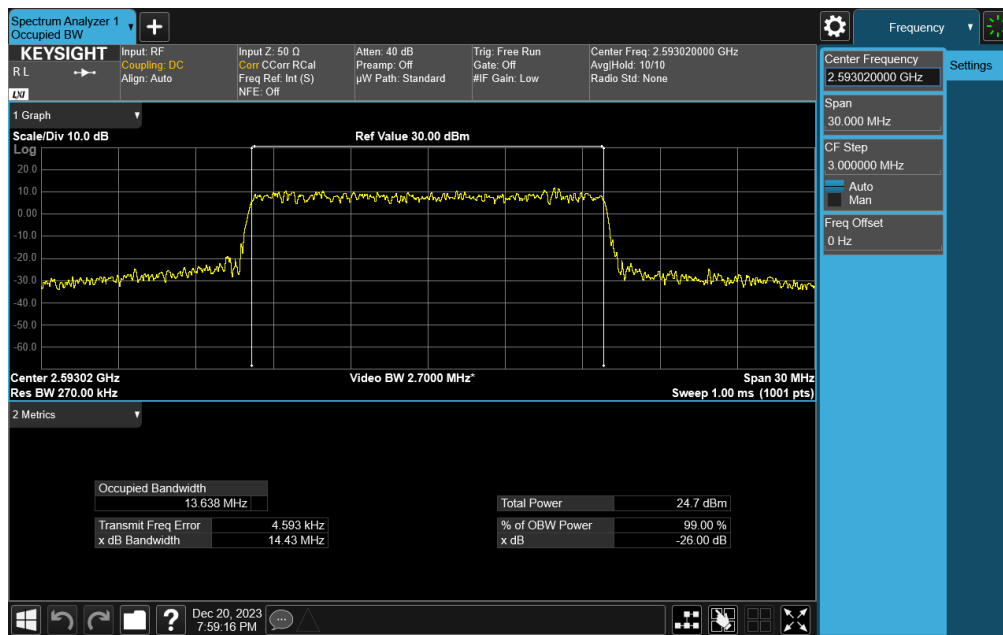
**Plot 7-96. Occupied Bandwidth Plot (NR Band n41 - 15MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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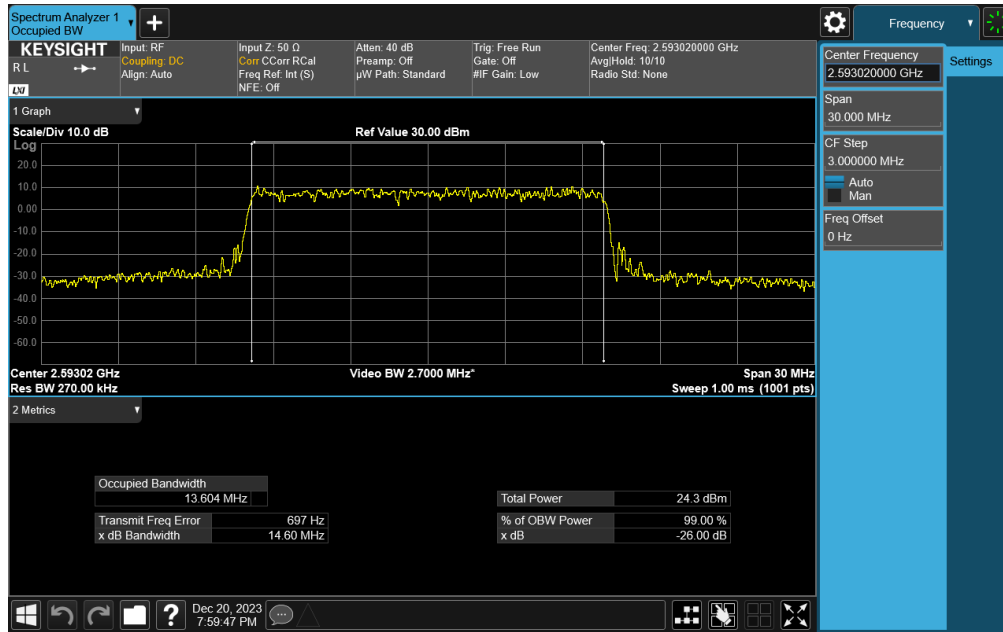


**Plot 7-97. Occupied Bandwidth Plot (NR Band n41 - 15MHz CP-OFDM QPSK - Full RB)**

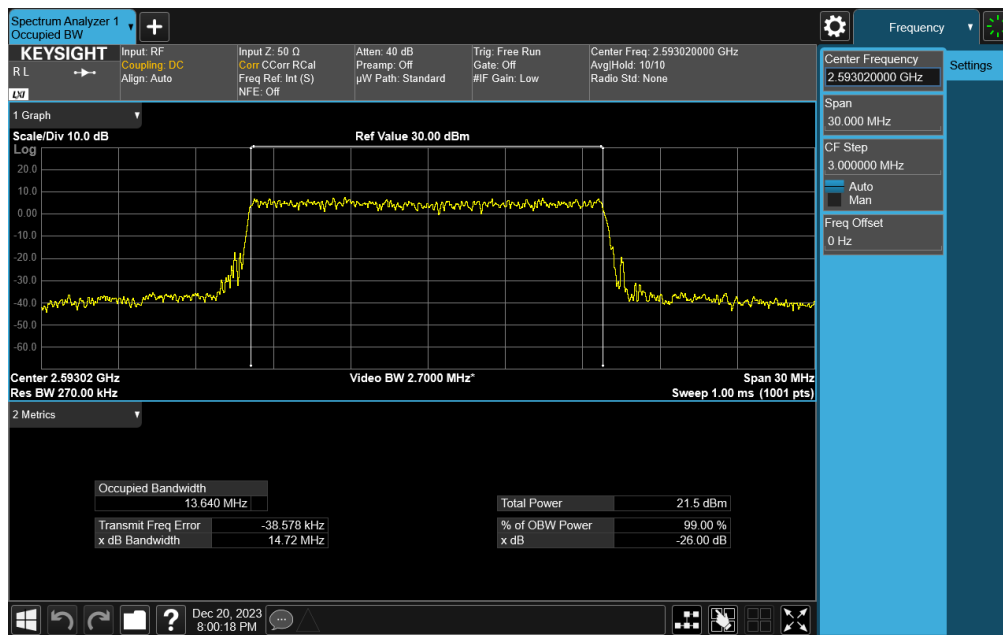


**Plot 7-98. Occupied Bandwidth Plot (NR Band n41 - 15MHz CP-OFDM 16-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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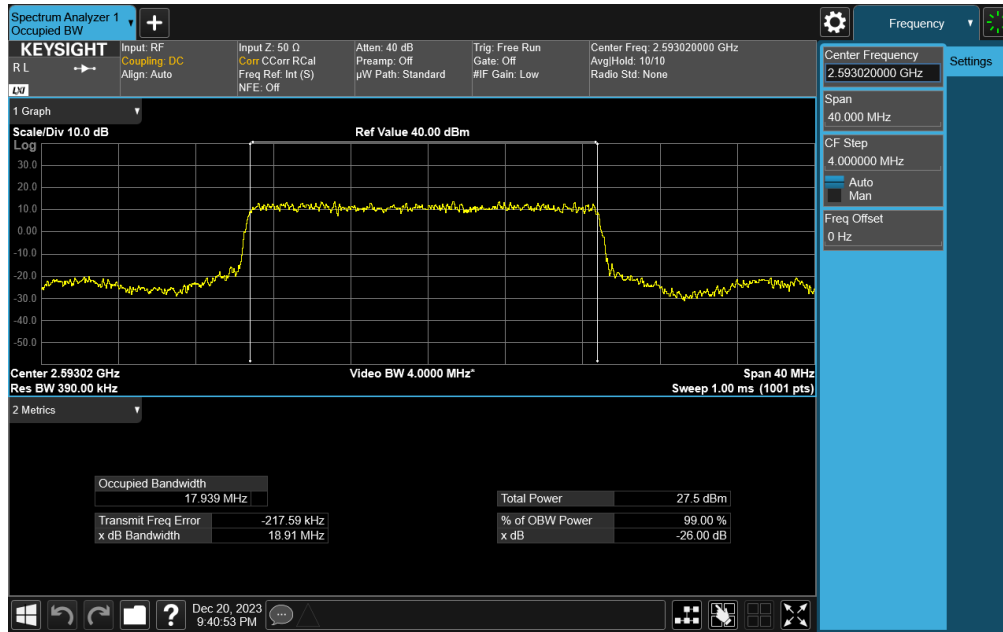


Plot 7-99. Occupied Bandwidth Plot (NR Band n41 - 15MHz CP-OFDM 64-QAM - Full RB)

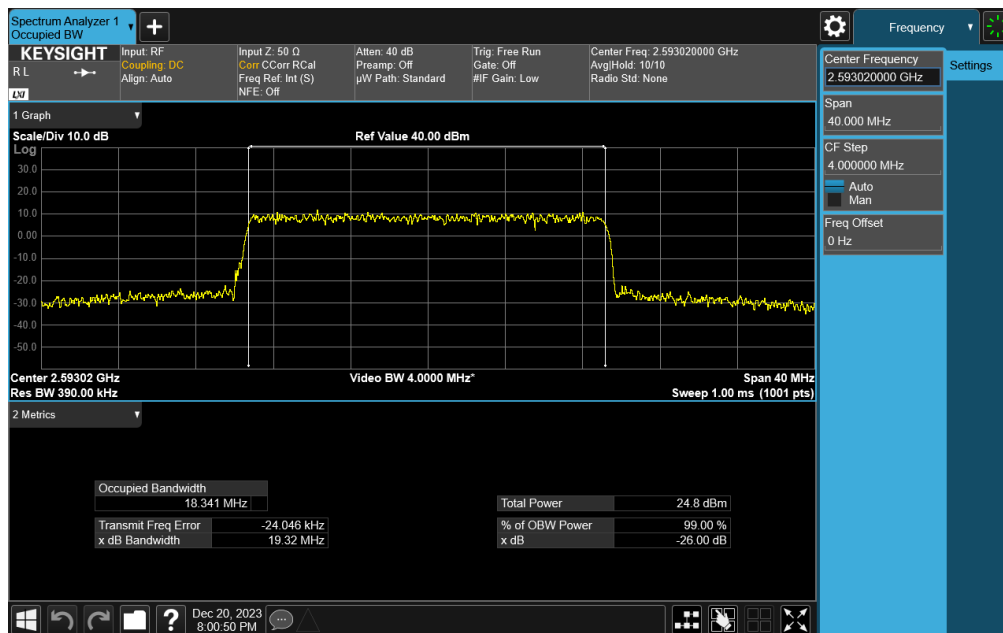


Plot 7-100. Occupied Bandwidth Plot (NR Band n41 - 15MHz CP-OFDM 256-QAM - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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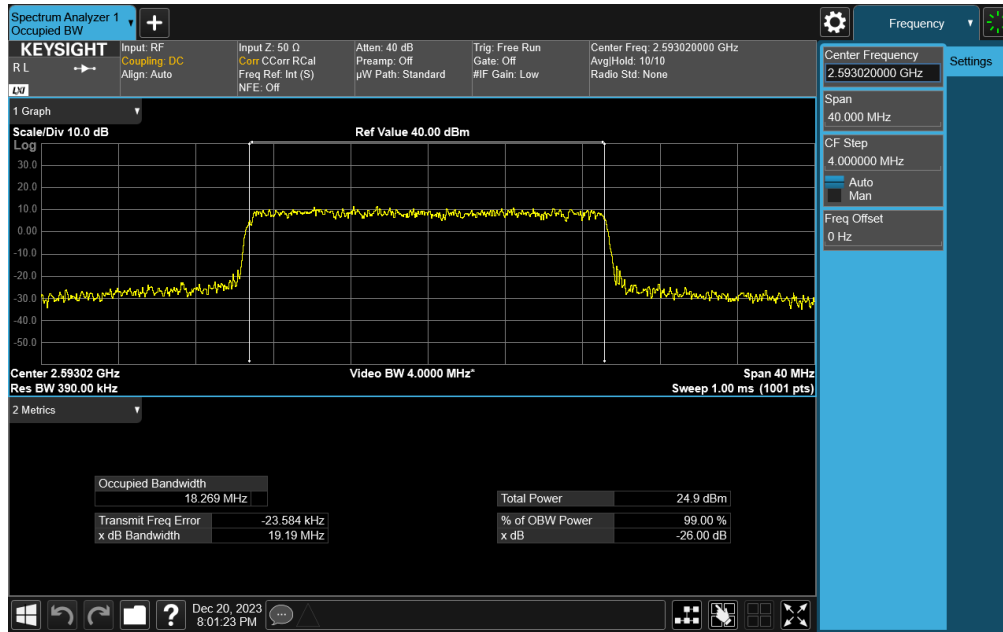


**Plot 7-101. Occupied Bandwidth Plot (NR Band n41 - 20MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)**

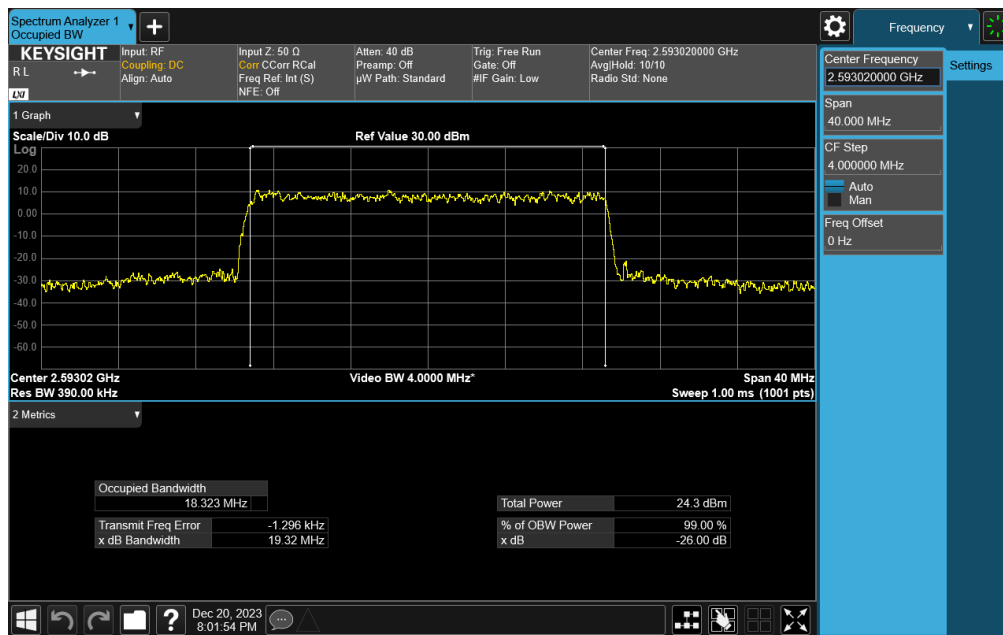


**Plot 7-102. Occupied Bandwidth Plot (NR Band n41 - 20MHz CP-OFDM QPSK - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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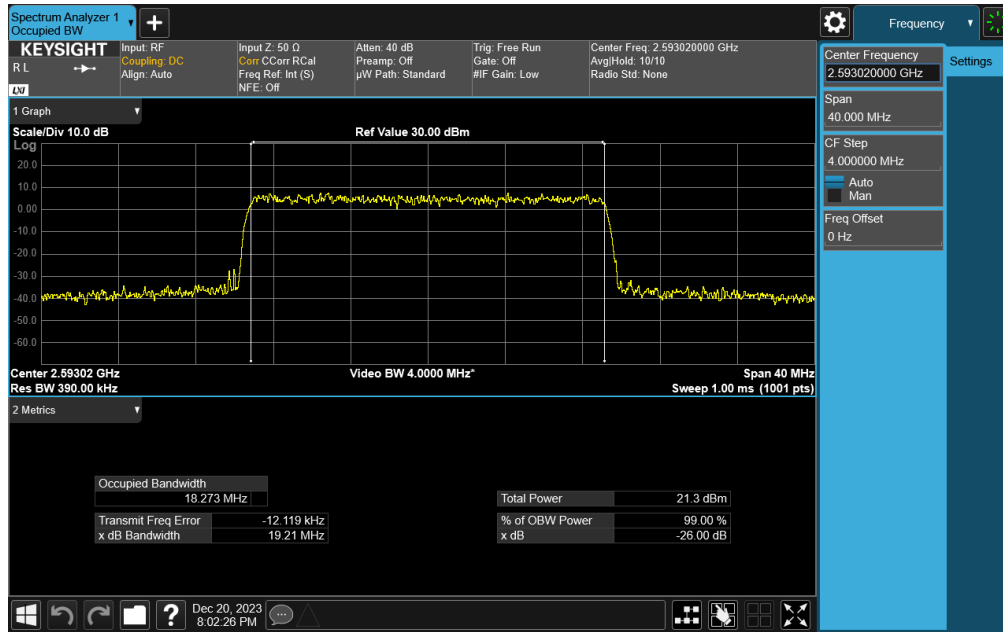


**Plot 7-103. Occupied Bandwidth Plot (NR Band n41 - 20MHz CP-OFDM 16-QAM - Full RB)**

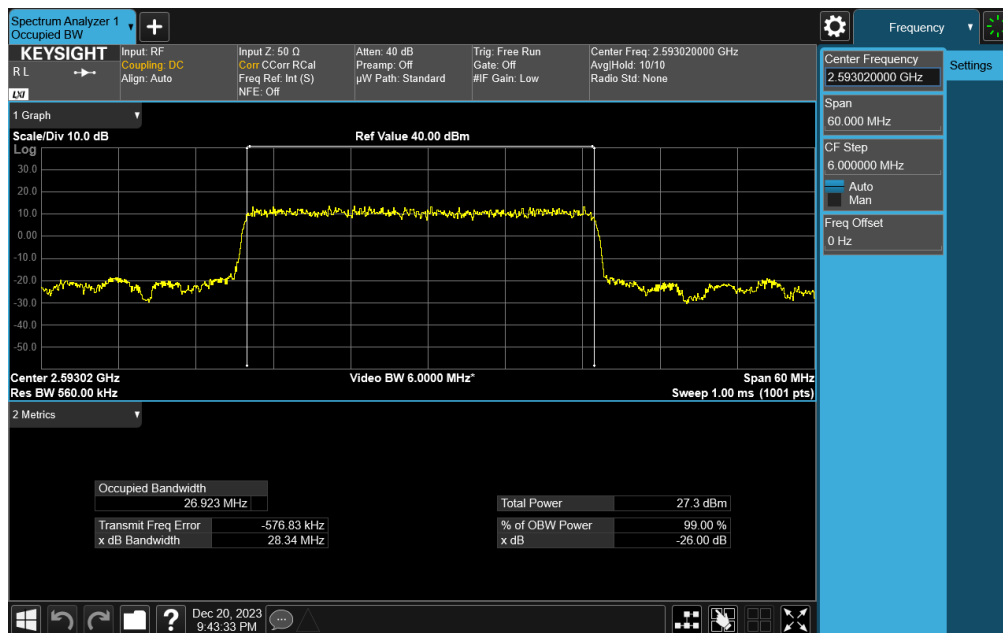


**Plot 7-104. Occupied Bandwidth Plot (NR Band n41 - 20MHz CP-OFDM 64-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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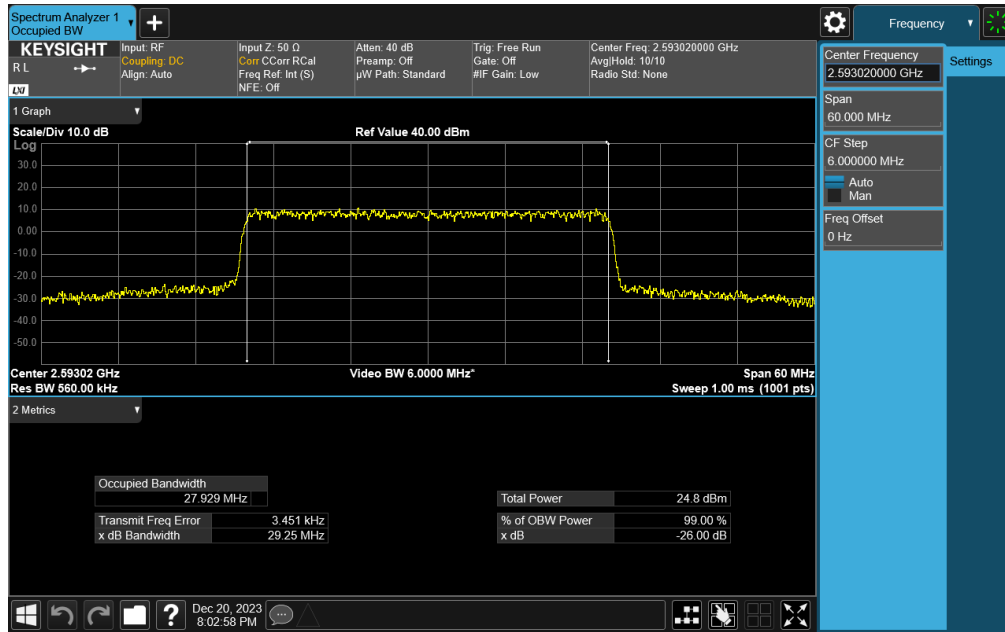


Plot 7-105. Occupied Bandwidth Plot (NR Band n41 - 20MHz CP-OFDM 256-QAM - Full RB)

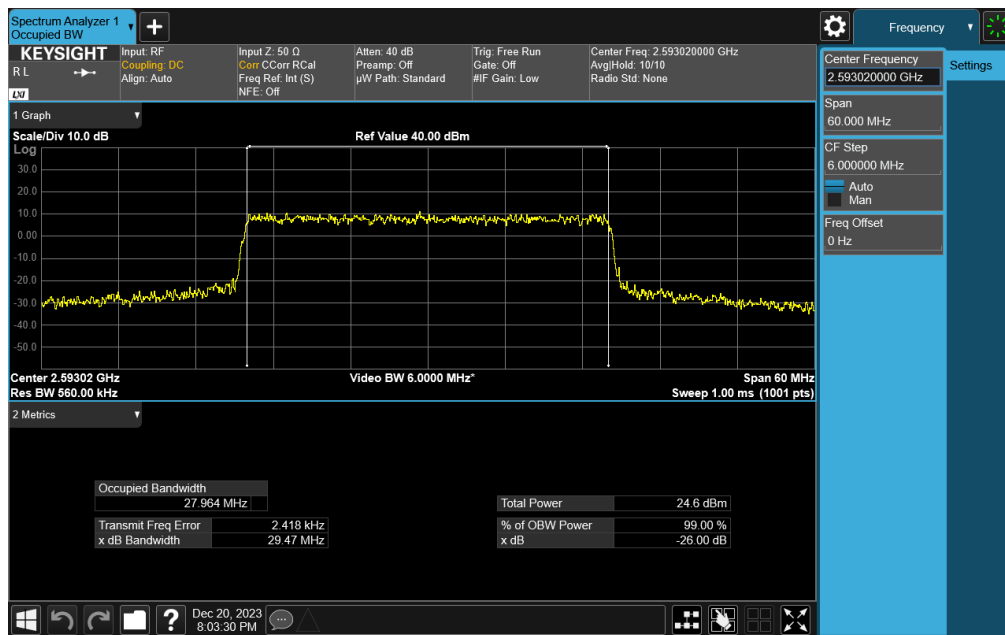


Plot 7-106. Occupied Bandwidth Plot (NR Band n41 - 30MHz DFT-s-OFDM  $\pi/2$  BPSK - Full RB)

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
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**Plot 7-107. Occupied Bandwidth Plot (NR Band n41 - 30MHz CP-OFDM QPSK - Full RB)**



**Plot 7-108. Occupied Bandwidth Plot (NR Band n41 - 30MHz CP-OFDM 16-QAM - Full RB)**

FCC ID: BCGA2899	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N: 1C2311270066-10.BCG	Test Dates: 10/01/2023 - 03/07/2024	EUT Type: Tablet Device
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