

PART 27 MEASUREMENT REPORT

Applicant Name:
 Samsung Electronics Co., Ltd.
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 Gyeonggi-do, 16677, Korea

Date of Testing:
 9/12/2022 – 11/16/2022
Test Report Issue Date:
 11/14/2022
Test Site/Location:
 Element lab., Columbia, MD, USA
Test Report Serial No.:
 1M2209010098-09-R2.A3L

FCC ID:	A3LSMS918U
Applicant Name:	Samsung Electronics Co., Ltd.

Application Type: Certification
Model: SM-S918U
Additional Model(s): SM-S918U1
EUT Type: Portable Handset
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part: 27
Test Procedure(s): ANSI C63.26-2015, KDB 648474 D03 v01r04

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.

Note: This revised Test Report (S/N: 1M2209010098-09-R2.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly

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



RJ Ortanez
Executive Vice President



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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 30 Ant A	10 MHz	QPSK	2310.0	0.165	22.19	9M05G7D
		16QAM	2310.0	0.145	21.63	9M01W7D
	5 MHz	QPSK	2307.5 - 2312.5	0.169	22.28	4M52G7D
		16QAM	2307.5 - 2312.5	0.147	21.66	4M53W7D
LTE Band 7 Ant B	20 MHz	QPSK	2510.0 - 2560.0	0.285	24.55	18M0G7D
		16QAM	2510.0 - 2560.0	0.266	24.24	18M0W7D
	15 MHz	QPSK	2507.5 - 2562.5	0.296	24.71	13M5G7D
		16QAM	2507.5 - 2562.5	0.263	24.21	13M5W7D
	10 MHz	QPSK	2505.0 - 2565.0	0.303	24.81	9M04G7D
		16QAM	2505.0 - 2565.0	0.295	24.70	9M05W7D
	5 MHz	QPSK	2502.5 - 2567.5	0.298	24.75	4M53G7D
		16QAM	2502.5 - 2567.5	0.274	24.38	4M54W7D
LTE Band 41(PC2) Ant B	20 MHz	QPSK	2506.0 - 2680.0	0.398	26.00	17M8G7D
		16QAM	2506.0 - 2680.0	0.275	24.40	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.435	26.39	13M5G7D
		16QAM	2503.5 - 2682.5	0.262	24.19	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.411	26.14	8M98G7D
		16QAM	2501.0 - 2685.0	0.288	24.60	8M98W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.422	26.25	4M51G7D
		16QAM	2498.5 - 2687.5	0.287	24.58	4M50W7D

EUT Overview (LTE)

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n30	10 MHz	$\pi/2$ BPSK	2310.0	0.147	21.68	9M01G7D
		QPSK	2310.0	0.144	21.58	9M38G7D
		16QAM	2310.0	0.130	21.16	9M37W7D
	5 MHz	$\pi/2$ BPSK	2307.5 - 2312.5	0.156	21.94	4M57G7D
		QPSK	2307.5 - 2312.5	0.158	21.98	4M52G7D
		16QAM	2307.5 - 2312.5	0.141	21.48	4M55W7D
NR Band n7	40MHz	$\pi/2$ BPSK	2520.0 - 2550.0	0.156	21.93	38M7G7D
		QPSK	2520.0 - 2550.0	0.153	21.85	38M7G7D
		16QAM	2520.0 - 2550.0	0.156	21.93	38M9W7D
	30MHz	$\pi/2$ BPSK	2515.0 - 2555.0	0.156	21.94	28M7G7D
		QPSK	2515.0 - 2555.0	0.151	21.79	28M7G7D
		16QAM	2515.0 - 2555.0	0.137	21.37	28M7W7D
	25MHz	$\pi/2$ BPSK	2512.5 - 2557.5	0.157	21.96	23M0G7D
		QPSK	2512.5 - 2557.5	0.151	21.80	23M9G7D
		16QAM	2512.5 - 2557.5	0.135	21.32	23M9W7D
	20MHz	$\pi/2$ BPSK	2510.0 - 2560.0	0.156	21.94	17M9G7D
		QPSK	2510.0 - 2560.0	0.159	22.01	19M0G7D
		16QAM	2510.0 - 2560.0	0.129	21.10	19M0W7D
	15 MHz	$\pi/2$ BPSK	2507.5 - 2562.5	0.160	22.03	13M6G7D
		QPSK	2507.5 - 2562.5	0.151	21.79	14M2G7D
		16QAM	2507.5 - 2562.5	0.135	21.30	14M2W7D
	10MHz	$\pi/2$ BPSK	2505.0 - 2565.0	0.153	21.86	9M02G7D
		QPSK	2505.0 - 2565.0	0.152	21.83	9M36G7D
		16QAM	2505.0 - 2565.0	0.131	21.19	9M35W7D
		$\pi/2$ BPSK	2502.5 - 2567.5	0.155	21.90	4M53G7D
		QPSK	2502.5 - 2567.5	0.145	21.61	4M52G7D
		16QAM	2502.5 - 2567.5	0.129	21.11	4M52W7D
		$\pi/2$ BPSK	2546.0 - 2640.0	0.254	24.04	97M0G7D
		QPSK	2546.0 - 2640.0	0.267	24.26	98M0G7D
		16QAM	2546.0 - 2640.0	0.207	23.17	98M0W7D
	90 MHz	$\pi/2$ BPSK	2541.0 - 2645.0	0.268	24.29	87M4G7D
		QPSK	2541.0 - 2645.0	0.253	24.04	87M9G7D
		16QAM	2541.0 - 2645.0	0.231	23.64	88M0W7D
	80 MHz	$\pi/2$ BPSK	2536.0 - 2650.0	0.239	23.79	77M4G7D
		QPSK	2536.0 - 2650.0	0.275	24.39	77M6G7D
		16QAM	2536.0 - 2650.0	0.245	23.89	77M8W7D
70 MHz	$\pi/2$ BPSK	2531.0 - 2655.0	0.239	23.78	64M5G7D	
	QPSK	2531.0 - 2655.0	0.265	24.23	67M8G7D	
	16QAM	2531.0 - 2655.0	0.181	22.58	67M6W7D	
60 MHz	$\pi/2$ BPSK	2526.0 - 2660.0	0.264	24.22	58M0G7D	
	QPSK	2526.0 - 2660.0	0.273	24.36	58M2G7D	
	16QAM	2526.0 - 2660.0	0.214	23.31	58M1W7D	
50 MHz	$\pi/2$ BPSK	2521.0 - 2665.0	0.255	24.06	46M0G7D	
	QPSK	2521.0 - 2665.0	0.288	24.60	47M8G7D	
	16QAM	2521.0 - 2665.0	0.208	23.18	47M7W7D	
40 MHz	$\pi/2$ BPSK	2516.0 - 2670.0	0.299	24.76	36M0G7D	
	QPSK	2516.0 - 2670.0	0.305	24.84	38M0G7D	
	16QAM	2516.0 - 2670.0	0.288	24.60	38M1W7D	
30 MHz	$\pi/2$ BPSK	2511.0 - 2675.0	0.321	25.06	26M8G7D	
	QPSK	2511.0 - 2675.0	0.300	24.77	28M0G7D	
	16QAM	2511.0 - 2675.0	0.240	23.80	28M1W7D	
20 MHz	$\pi/2$ BPSK	2506.0 - 2680.0	0.301	24.78	18M0G7D	
	QPSK	2506.0 - 2680.0	0.305	24.84	18M4G7D	
	16QAM	2506.0 - 2680.0	0.288	24.60	18M4W7D	
15 MHz	$\pi/2$ BPSK	2503.5 - 2682.5	0.314	24.97	12M9G7D	
	QPSK	2503.5 - 2682.5	0.306	24.86	13M7G7D	
	16QAM	2503.5 - 2682.5	0.245	23.89	12M9W7D	
10 MHz	$\pi/2$ BPSK	2501.0 - 2685.0	0.275	24.39	8M64G7D	
	QPSK	2501.0 - 2685.0	0.305	24.84	8M63G7D	
	16QAM	2501.0 - 2685.0	0.228	23.57	8M63W7D	

EUT Overview (NR Band)

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Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator	
				Max. Power [W]	Max. Power [dBm]		
NR Band n41 Switching Ant B	100 MHz	$\pi/2$ BPSK	2546.0 - 2640.0	0.429	26.33	96M8G7D	
		QPSK	2546.0 - 2640.0	0.415	26.18	98M1G7D	
		16QAM	2546.0 - 2640.0	0.271	24.34	98M2W7D	
	90 MHz	$\pi/2$ BPSK	2541.0 - 2645.0	0.394	25.96	87M3G7D	
		QPSK	2541.0 - 2645.0	0.396	25.98	88M0G7D	
		16QAM	2541.0 - 2645.0	0.288	24.59	88M0W7D	
	80 MHz	$\pi/2$ BPSK	2536.0 - 2650.0	0.440	26.43	77M5G7D	
		QPSK	2536.0 - 2650.0	0.431	26.34	77M8G7D	
		16QAM	2536.0 - 2650.0	0.425	26.28	77M8W7D	
	70 MHz	$\pi/2$ BPSK	2526.0 - 2660.0	0.455	26.58	64M5G7D	
		QPSK	2526.0 - 2660.0	0.382	25.83	67M7G7D	
		16QAM	2526.0 - 2660.0	0.359	25.55	67M8W7D	
	60 MHz	$\pi/2$ BPSK	2521.0 - 2665.0	0.463	26.66	58M2G7D	
		QPSK	2521.0 - 2665.0	0.411	26.14	58M2G7D	
		16QAM	2521.0 - 2665.0	0.373	25.72	58M2W7D	
	50 MHz	$\pi/2$ BPSK	2516.0 - 2670.0	0.467	26.70	46M0G7D	
		QPSK	2516.0 - 2670.0	0.429	26.32	47M9G7D	
		16QAM	2516.0 - 2670.0	0.411	26.13	47M8W7D	
	40 MHz	$\pi/2$ BPSK	2511.0 - 2675.0	0.491	26.91	36M0G7D	
		QPSK	2511.0 - 2675.0	0.442	26.45	38M0G7D	
		16QAM	2511.0 - 2675.0	0.414	26.17	38M0W7D	
	30 MHz	$\pi/2$ BPSK	2506.0 - 2680.0	0.476	26.78	27M0G7D	
		QPSK	2506.0 - 2680.0	0.448	26.51	28M0G7D	
		16QAM	2506.0 - 2680.0	0.424	26.27	28M0W7D	
	20 MHz	$\pi/2$ BPSK	2580.0 - 2610.0	0.453	26.56	18M0G7D	
		QPSK	2580.0 - 2610.0	0.386	25.87	18M3G7D	
		16QAM	2580.0 - 2610.0	0.388	25.88	18M3W7D	
	15 MHz	$\pi/2$ BPSK	2577.5 - 2612.5	0.486	26.86	27M0G7D	
		QPSK	2577.5 - 2612.5	0.411	26.14	28M0G7D	
		16QAM	2577.5 - 2612.5	0.381	25.81	28M0W7D	
	10 MHz	$\pi/2$ BPSK	2575.0 - 2615.0	0.490	26.91	13M0G7D	
		QPSK	2575.0 - 2615.0	0.456	26.59	13M7G7D	
		16QAM	2575.0 - 2615.0	0.406	26.08	13M7W7D	
	NR Band n41 Switching Ant F	100 MHz	$\pi/2$ BPSK	2546.0 - 2640.0	0.162	22.10	97M2G7D
			QPSK	2546.0 - 2640.0	0.131	21.16	98M0G7D
			16QAM	2546.0 - 2640.0	0.106	20.24	98M1W7D
NR Band n41 Switching Ant D	100 MHz	$\pi/2$ BPSK	2546.0 - 2640.0	0.016	12.09	96M7G7D	
		QPSK	2546.0 - 2640.0	0.017	12.38	97M8G7D	
		16QAM	2546.0 - 2640.0	0.014	11.54	97M7W7D	
NR Band n41 Switching Ant E	100 MHz	$\pi/2$ BPSK	2546.0 - 2640.0	0.047	16.71	97M0G7D	
		QPSK	2546.0 - 2640.0	0.046	16.61	97M1G7D	
		16QAM	2546.0 - 2640.0	0.030	14.82	96M9W7D	

EUT Overview (NR Band)

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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 Test Location

These measurement tests were conducted at the Element laboratory located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at Element lab located in Columbia, MD 21046, U.S.A.

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 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 Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreement.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS918U**. 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.: 0208M, 0203M, 1449M, 1489M, 1421M, 0161M, 1460M, 0209M, 0179M, 1478M, 0178M, 1443M, 1523M, 0206M, 1613M, 0206M, 0422M, 0367M, 1619M, 1667M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1 and FR2), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, UWB, Wireless Power Transfer

The device has 2 Tx antenna for n41 data (Ant F & B) and 2 Rx antennas (Ant E, D). With SRS operations, all 4 antennas can transmit the SRS signal to check for the channel quality of n41. The antennas cannot simultaneously transmit. Only the single TX/RX antenna is used for Data transmission. The device is also capable of path switching for all antennas during n41 operation and data is provided to cover all possible paths.

This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize antenna performance for certain bands and modes of operation. The tuner for this device was set to simulate a "free space" condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power is at its maximum level.

2.3 Test Configuration

The EUT was tested per the guidance of ANSI C63.26-2015. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version S918USQU0AVJH installed on the EUT.

2.5 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 “American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services” (ANSI C63.26-2015) were used in the measurement of the EUT.

Deviation from Measurement Procedure.....None

3.2 Radiated Power and 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 power measurements, substitution method is used per the guidance of ANSI C63.26-2015. For emissions below 1GHz, a half-wave dipole is substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]};$$

where P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

For radiated spurious emissions measurements, the field strength conversion method is used per the formulas in Section 5.2.7 of ANSI C63.26-2015. Field Strength (EIRP) is calculated using the following formulas:

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

And

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01 v01r01.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI C63.26-2015.

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. 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	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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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
-	AP2	EMC Cable and Switch System	8/11/2022	Annual	8/11/2023	AP2
-	AP1	EMC Cable and Switch System	8/15/2022	Annual	8/15/2023	AP1
-	ETS	EMC Cable and Switch System	8/11/2022	Annual	8/11/2023	ETS
-	LTx1	Licensed Transmitter Cable Set	7/29/2022	Annual	7/29/2023	LTx1
-	LTx2	Licensed Transmitter Cable Set	8/15/2022	Annual	8/15/2023	LTx2
-	LTx3	Licensed Transmitter Cable Set	8/15/2022	Annual	8/15/2023	LTx3
-	LTx4	Licensed Transmitter Cable Set	7/29/2022	Annual	7/29/2023	LTx4
-	LTx5	Licensed Transmitter Cable Set	7/29/2022	Annual	7/29/2023	LTx5
Agilent	E5515C	Wireless Communications Test Set	N/A			GB45360985
Agilent	E5515C	Wireless Communications Test Set	N/A			GB46310798
Anritsu	MT8820C	Radio Communication Analyzer	N/A			6201300731
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201381794
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6200901190
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201525694
Com-Power	AL-130R	Active Loop Antenna	1/19/2022	Biennial	1/19/2024	121085
Emco	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
Espec	ESX-2CA	Environmental Chamber	5/25/2022	Biennial	5/25/2024	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
ETS Lindgren	3164-10	Quad Ridge Horn 400MHz - 10000MHz	5/10/2021	Biennial	5/10/2023	00166283
ETS Lindgren	3816/2NM	LISN	8/11/2022	Biennial	8/11/2024	00114451
Keysight Technologies	N9020A	MXA Signal Analyzer	3/15/2022	Annual	3/15/2023	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/18/2022	Annual	8/18/2023	MY49430494
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	2/14/2022	Annual	2/14/2023	MY52350166
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			833855/0010
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			107826
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			109892
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836536/0005
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/29/2022	Annual	8/29/2023	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/25/2022	Annual	8/25/2023	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	3/28/2022	Annual	3/28/2023	101716
Rohde & Schwarz	FSW26	2Hz-26.5GHz Signal and Spectrum Analyzer	4/14/2022	Annual	4/14/2023	103187
Sunol	JB6	LB6 Antenna	11/13/2020	Biennial	11/13/2022	A082816

Table 5-1. Test Equipment

Notes:

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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6.0 SAMPLE CALCULATIONS

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

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: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMS918U
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE/NR/ULCA

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Transmitter Conducted Output Power*	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions (LTE Band 30; NR Band n30)	2.1051, 27.53(a)(4)	Undesirable emissions must meet the limits detailed in 27.53(a)(4)	PASS	Sections 7.4, 7.5
	Conducted Band Edge / Spurious Emissions (LTE Band 7, 38, 41; NR Band n7, n38, n41)	2.1051, 27.53(m)(4)	Undesirable emissions must meet the limits detailed in 27.53(m)(4)	PASS	Sections 7.4, 7.5
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Equivalent Isotropic Radiated Power (LTE Band 30; NR Band n30)	27.50(a)(3)	≤ 250mW / 5MHz max. EIRP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (LTE Band 7, 38, 41; NR Band n7, n38, n41)	27.50(h)(2)	≤ 2 Watts max. EIRP	PASS	Section 7.6
	Radiated Spurious Emissions (LTE Band 30; NR Band n30)	2.1053, 27.53(a)(4)	Undesirable emissions must meet the limits detailed in 27.53(a)(4)	PASS	Section 7.7
	Radiated Spurious Emissions (LTE Band 7, 38, 41; NR Band n7, n38, n41)	2.1053, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section 7.7

* The only transmitter output conducted powers included in this report are those where the Pmax value, per the tune-up document, is higher than any of the DSI power levels. For the remaining conducted power measurements, see the **RF Exposure Report**.

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots 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 is EMC Software Tool v1.1.

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7.2 Conducted Output Power Data

Test Overview

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

A-MPR is implemented in this device when operating at Power Class 2 in LTE Band 41 per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

Test Procedure Used

ANSI C63.26-2015 – Section 5.2

Test Settings

1. Span = 2 x OBW to 3 x OBW
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

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. Conducted power measurements were evaluated using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
2. All other conducted power measurements are contained in the RF exposure report for this filing.

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
10 MHz	QPSK	27710	2310.0	1 / 0	22.11
	16-QAM	27710	2310.0	1 / 49	21.37
5 MHz	QPSK	27685	2307.5	1 / 0	21.97
		27710	2310.0	1 / 24	22.14
		27735	2312.5	1 / 12	22.15
	16-QAM	27735	2312.5	1 / 12	21.41

Table 7-2. Conducted Power Data (LTE B30 – Ant F)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	20850	2510.0	1 / 50	23.49
		21100	2535.0	1 / 0	23.27
		21350	2560.0	1 / 99	23.19
	16-QAM	20850	2510.0	1 / 50	22.69
15 MHz	QPSK	20825	2507.5	1 / 37	23.41
		21100	2535.0	1 / 0	23.13
		21375	2562.5	1 / 37	23.24
	16-QAM	20825	2507.5	1 / 37	22.64
10 MHz	QPSK	20800	2505.0	1 / 25	23.68
		21100	2535.0	1 / 25	23.30
		21400	2565.0	1 / 25	23.18
	16-QAM	20800	2505.0	1 / 25	22.63
5 MHz	QPSK	20775	2502.5	1 / 24	23.62
		21100	2535.0	1 / 0	23.55
		21425	2567.5	1 / 12	23.41
	16-QAM	20775	2502.5	1 / 24	22.80

Table 7-3. Conducted Power Data (LTE B7 – Ant F)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	39750	2506.0	1 / 0	25.43
		40620	2593.0	1 / 0	25.34
		41490	2680.0	1 / 0	25.51
	16-QAM	39750	2506.0	1 / 50	24.60
15 MHz	QPSK	39725	2503.5	1 / 37	25.38
		40620	2593.0	1 / 74	25.27
		41515	2682.5	1 / 0	25.34
	16-QAM	39725	2503.5	1 / 0	24.54
10 MHz	QPSK	39700	2501.0	1 / 0	25.41
		40620	2593.0	1 / 25	25.29
		41540	2685.0	1 / 0	25.39
	16-QAM	39700	2501.0	1 / 0	24.68
5 MHz	QPSK	39675	2498.5	1 / 12	25.54
		40620	2593.0	1 / 12	25.33
		41565	2687.5	1 / 12	25.33
	16-QAM	39675	2498.5	1 / 12	24.70

Table 7-4. Conducted Power Data (LTE B41 (PC2) – Ant F)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
10 MHz	$\pi/2$ BPSK	27710	2310.0	1 / 38	21.77
	QPSK	27710	2310.0	1 / 38	21.58
	16-QAM	27710	2310.0	1 / 38	20.75
5 MHz	$\pi/2$ BPSK	27685	2307.5	1 / 12	21.82
		27710	2310.0	1 / 12	21.79
		27735	2312.5	1 / 12	21.68
	QPSK	27685	2307.5	1 / 12	21.57
		27710	2310.0	1 / 12	21.86
		27735	2312.5	1 / 12	21.55
	16-QAM	27685	2307.5	1 / 12	20.73

Table 7-5. Conducted Power Data (NR n30 – Ant F)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	504000	2520.0	1 / 108	23.00
		507000	2535.0	1 / 54	22.85
		510000	2550.0	1 / 161	22.91
	QPSK	504000	2520.0	1 / 108	22.71
		507000	2535.0	1 / 54	22.72
		510000	2550.0	1 / 161	22.64
16-QAM	504000	2520.0	1 / 108	21.93	
30 MHz	π/2 BPSK	503000	2515.0	1 / 119	22.93
		507000	2535.0	1 / 40	22.86
		511000	2555.0	1 / 119	22.83
	QPSK	503000	2515.0	1 / 119	22.72
		507000	2535.0	1 / 40	22.65
		511000	2555.0	1 / 119	22.71
16-QAM	503000	2515.0	1 / 119	21.91	
25 MHz	π/2 BPSK	502500	2512.5	1 / 33	22.75
		507000	2535.0	1 / 99	22.83
		511500	2557.5	1 / 66	22.66
	QPSK	502500	2512.5	1 / 33	22.62
		507000	2535.0	1 / 99	22.54
		511500	2557.5	1 / 66	22.47
16-QAM	502500	2512.5	1 / 33	21.69	
20 MHz	π/2 BPSK	502000	2510.0	1 / 26	22.67
		507000	2535.0	1 / 79	22.63
		512000	2560.0	1 / 53	22.48
	QPSK	502000	2510.0	1 / 26	22.51
		507000	2535.0	1 / 79	22.37
		512000	2560.0	1 / 53	22.43
16-QAM	502000	2510.0	1 / 26	21.53	
15 MHz	π/2 BPSK	501500	2507.5	1 / 20	22.83
		507000	2535.0	1 / 58	22.64
		512500	2562.5	1 / 58	22.66
	QPSK	501500	2507.5	1 / 20	22.75
		507000	2535.0	1 / 58	22.51
		512500	2562.5	1 / 58	22.57
16-QAM	501500	2507.5	1 / 20	21.75	
10 MHz	π/2 BPSK	501000	2505.0	1 / 26	22.85
		507000	2535.0	1 / 26	22.68
		513000	2565.0	1 / 38	22.52
	QPSK	501000	2505.0	1 / 26	22.69
		507000	2535.0	1 / 26	22.46
		513000	2565.0	1 / 38	22.54
16-QAM	501000	2505.0	1 / 26	21.85	
5 MHz	π/2 BPSK	500500	2502.5	1 / 18	22.78
		507000	2535.0	1 / 18	22.69
		513500	2567.5	1 / 18	22.61
	QPSK	500500	2502.5	1 / 18	22.62
		507000	2535.0	1 / 18	22.63
		513500	2567.5	1 / 18	22.51
16-QAM	500500	2502.5	1 / 18	21.74	

Table 7-6. Conducted Power Data (NR n7 – Ant F)

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Power State	Band	Bandwidth (PCC + SCC)	PCC				SCC					ULCA Tx. Power [dBm]		
			Modulation	UL Channel	UL Frequency	UL # RB	UL RB Offset	Modulation	UL Channel	UL Frequency	UL # RB		UL RB Offset	
Max	LTE B41 (PC2)	20MHz + 20MHz	QPSK	39750	2506.0	1	99	QPSK	39948	2525.8	1	0	25.27	
				40620	2593.0	1	99		40818	2612.8	1	0	25.35	
				41490	2680.0	1	0		41292	2660.2	1	99	25.4	
			QPSK	41490	2680	100	0	QPSK	41292	2660.2	100	0	23.76	
				16-QAM	41490	2680	100	0	16-QAM	41292	2660.2	100	0	22.78
				64-QAM	41490	2680	100	0	64-QAM	41292	2660.2	100	0	22.75
				256-QAM	41490	2680	100	0	256-QAM	41292	2660.2	100	0	20.8

Table 7-7. Conducted Power Data (ULCA LTE B41(PC2) – Ant B)

Power State	Band	Bandwidth (PCC + SCC)	PCC				SCC					ULCA Tx. Power [dBm]		
			Modulation	UL Channel	UL Frequency	UL # RB	UL RB Offset	Modulation	UL Channel	UL Frequency	UL # RB		UL RB Offset	
Max	LTE B41 (PC2)	20MHz + 20MHz	QPSK	39750	2506.0	1	99	QPSK	39948	2525.8	1	0	25.40	
				40620	2593.0	1	99		40818	2612.8	1	0	25.51	
				41490	2680.0	1	0		41292	2660.2	1	99	25.54	
			QPSK	41490	2680	100	0	QPSK	41292	2660.2	100	0	23.74	
				16-QAM	41490	2680	100	0	16-QAM	41292	2660.2	100	0	22.81
				64-QAM	41490	2680	100	0	64-QAM	41292	2660.2	100	0	22.75
				256-QAM	41490	2680	100	0	256-QAM	41292	2660.2	100	0	20.82

Table 7-8. Conducted Power Data (ULCA LTE B41(PC2) – Ant F)

NR (SCS 15kHz)						LTE						NR Conducted Power [dBm]	LTE Conducted Power [dBm]	EN-DC Total Tx. Power [dBm]
NR Band	NR Bandwidth [MHz]	NR Channel	NR Frequency [MHz]	Mod.	NR RB#/Offset	LTE Band	LTE Bandwidth [MHz]	LTE Channel	LTE Frequency [MHz]	Mod.	LTE RB#/Offset			
n30	10	Mid	2310	QPSK	50/0	B5	10	Mid	836.5	QPSK	50/0	19.14	21.32	23.38
				QPSK	50/0					QPSK	1/25	17.98	21.99	23.44
				QPSK	1/26					QPSK	50/0	18.89	21.42	23.35
				QPSK	1/26					QPSK	1/25	18.72	21.70	23.47
				16Q	1/26					16Q	1/25	19.01	21.56	23.48

Table 7-9. Conducted Power Data (EN-DC Combo n30 – B5)

NR (SCS 15kHz)						LTE						NR Conducted Power [dBm]	LTE Conducted Power [dBm]	EN-DC Total Tx. Power [dBm]
NR Band	NR Bandwidth [MHz]	NR Channel	NR Frequency [MHz]	Mod.	NR RB#/Offset	LTE Band	LTE Bandwidth [MHz]	LTE Channel	LTE Frequency [MHz]	Mod.	LTE RB#/Offset			
n30	10	Mid	2310	QPSK	50/0	B2	20	Mid	1880	QPSK	100/0	18.04	21.99	23.46
				QPSK	50/0					QPSK	1/50	16.62	22.45	23.46
				QPSK	1/26					QPSK	100/0	18.21	21.86	23.42
				QPSK	1/26					QPSK	1/50	17.53	22.34	23.58
				16Q	50/0					16Q	1/50	18.30	22.40	23.83

Table 7-10. Conducted Power Data (EN-DC Combo n30 – B2)

NR (SCS 30kHz)						LTE						NR Conducted Power [dBm]	LTE Conducted Power [dBm]	EN-DC Total Tx. Power [dBm]
NR Band	NR Bandwidth [MHz]	NR Channel	NR Frequency [MHz]	Mod.	NR RB#/Offset	LTE Band	LTE Bandwidth [MHz]	LTE Channel	LTE Frequency [MHz]	Mod.	LTE RB#/Offset			
n41	100	Mid	2593	QPSK	270/0	B25	20	Mid	1882.5	QPSK	100/0	18.14	21.85	23.39
				QPSK	270/0					QPSK	1/50	17.21	22.41	23.56
				QPSK	1/136					QPSK	100/0	18.32	21.80	23.41
				QPSK	1/136					QPSK	1/50	17.86	22.42	23.72
				16Q	1/136					16Q	1/50	17.43	22.36	23.57

Table 7-11. Conducted Power Data (EN-DC Combo n41 – B25)

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7.3 Occupied Bandwidth

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.

Test Procedure Used

ANSI C63.26-2015 – Section 5.4.4

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.

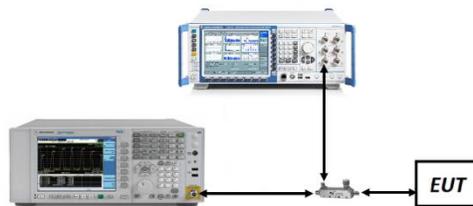


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

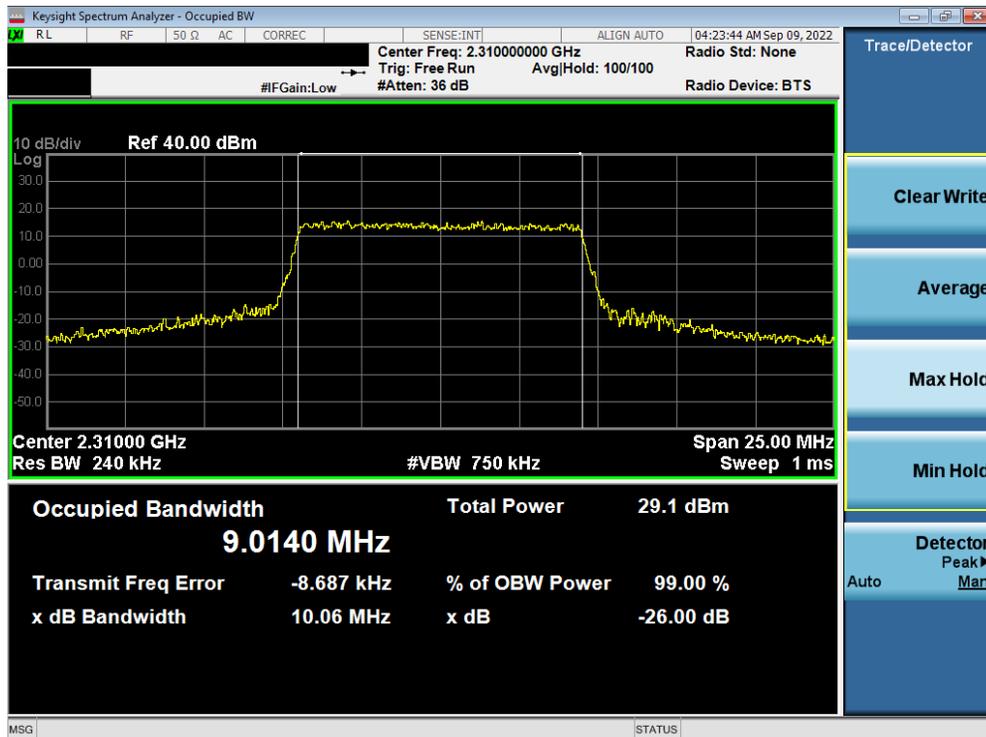
None.

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LTE Band 30 – Ant A

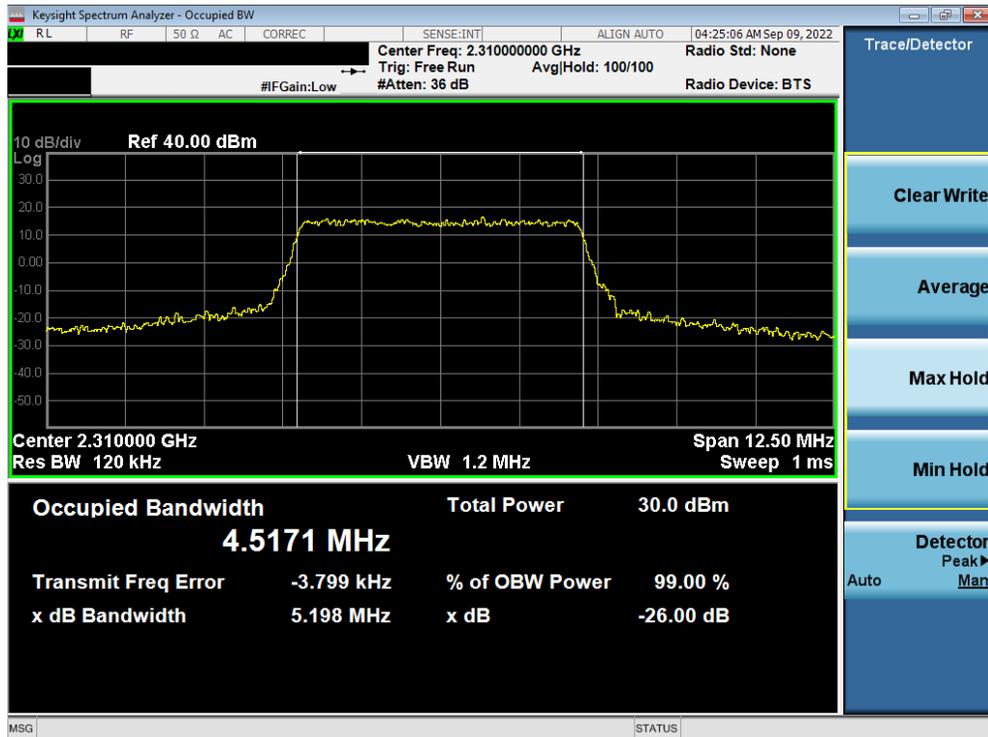


Plot 7-1. Occupied Bandwidth Plot (LTE Band 30 - 10MHz QPSK - Full RB - Ant A)

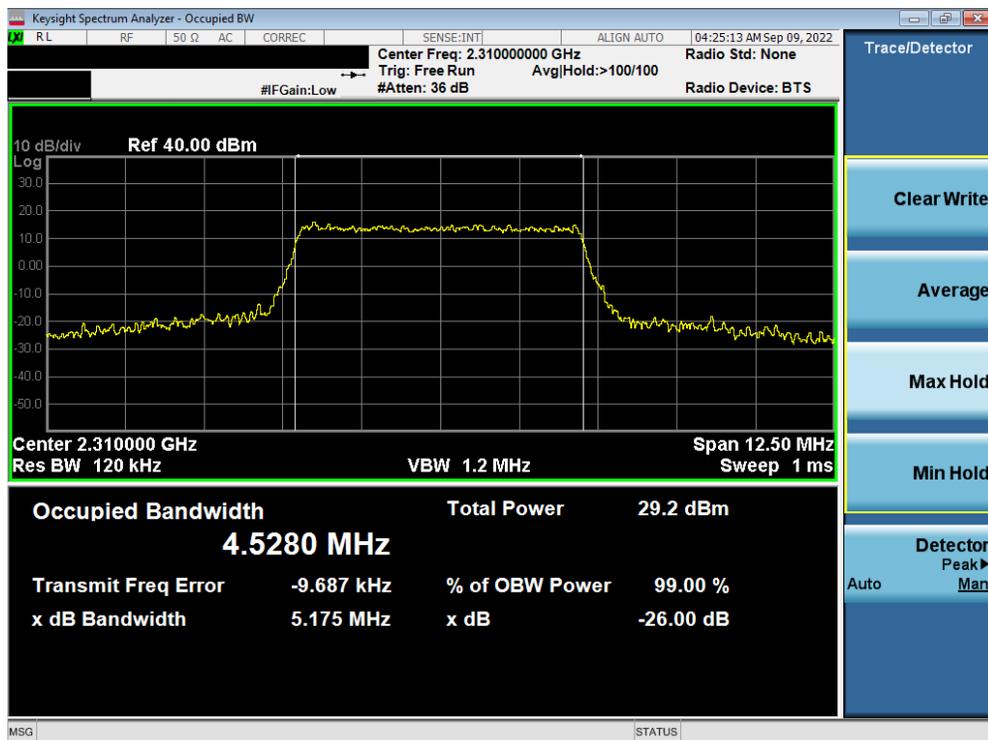


Plot 7-2. Occupied Bandwidth Plot (LTE Band 30 - 10MHz 16-QAM - Full RB - Ant A)

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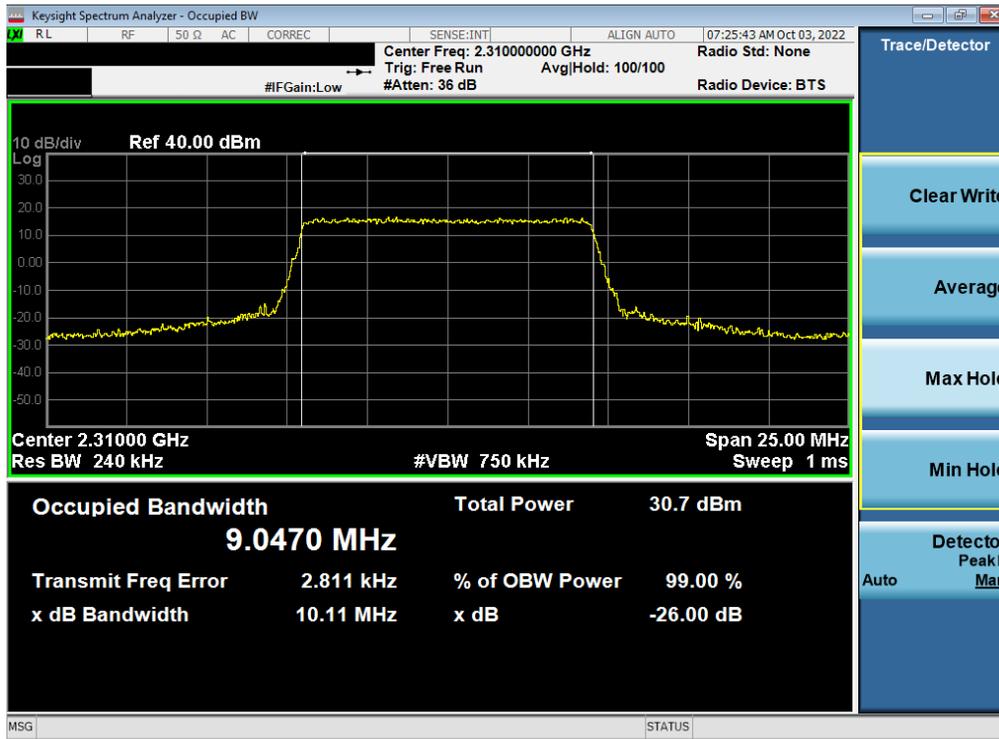
Plot 7-3. Occupied Bandwidth Plot (LTE Band 30 - 5MHz QPSK - Full RB – Ant A)



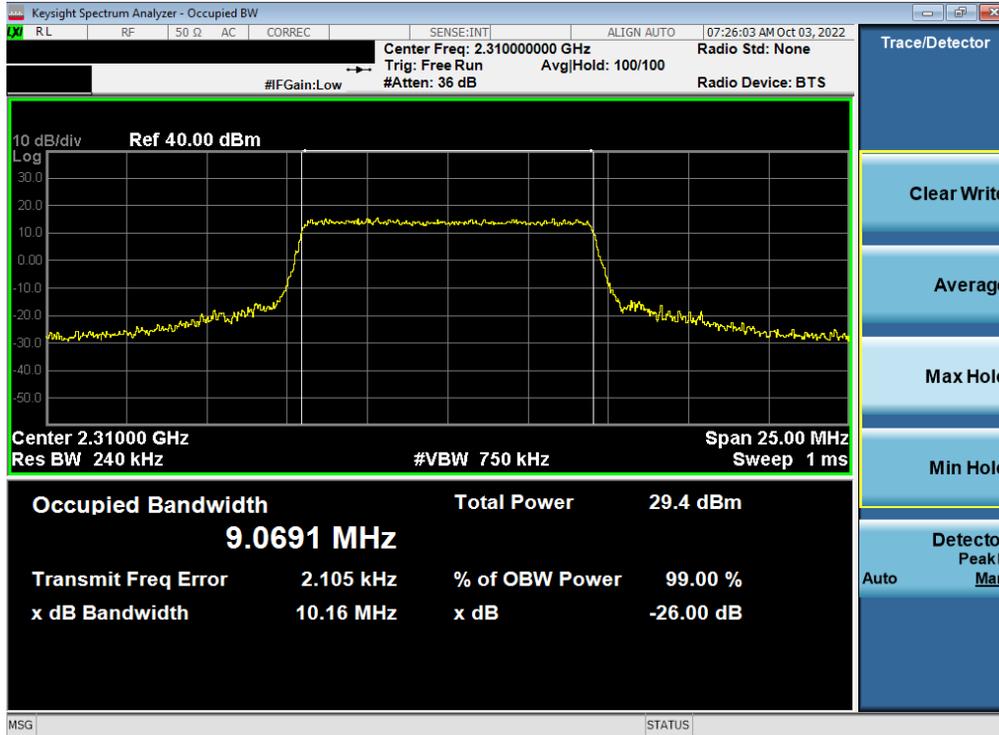
Plot 7-4. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 16-QAM - Full RB – Ant A)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 30 – Ant F

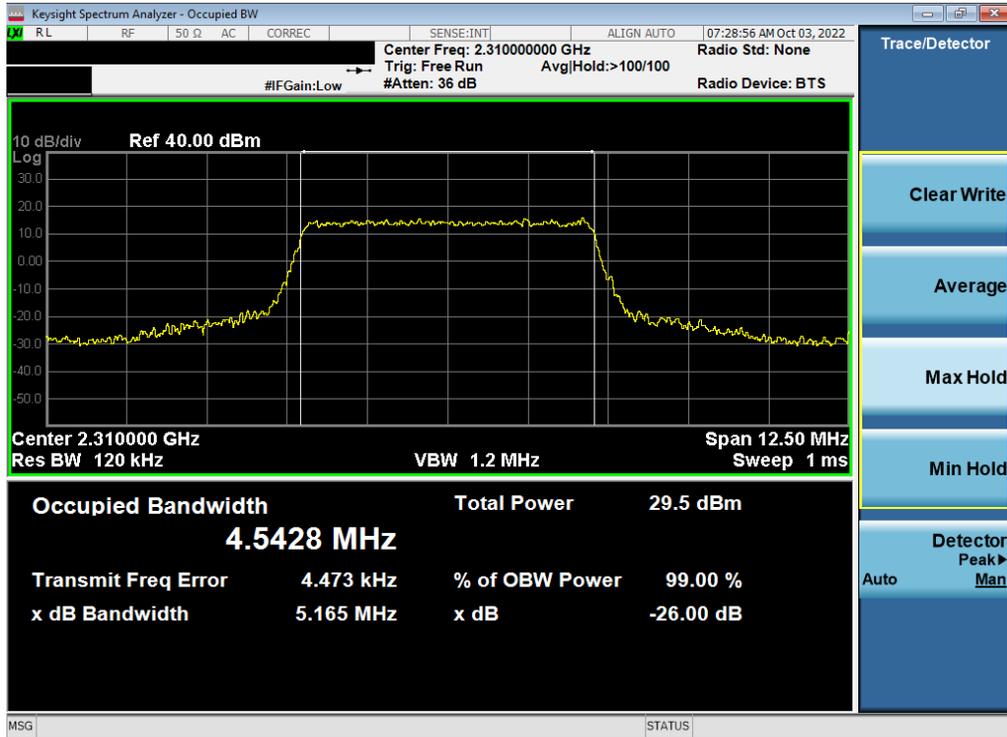


Plot 7-5. Occupied Bandwidth Plot (LTE Band 30 - 10MHz QPSK - Full RB - Ant F)



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

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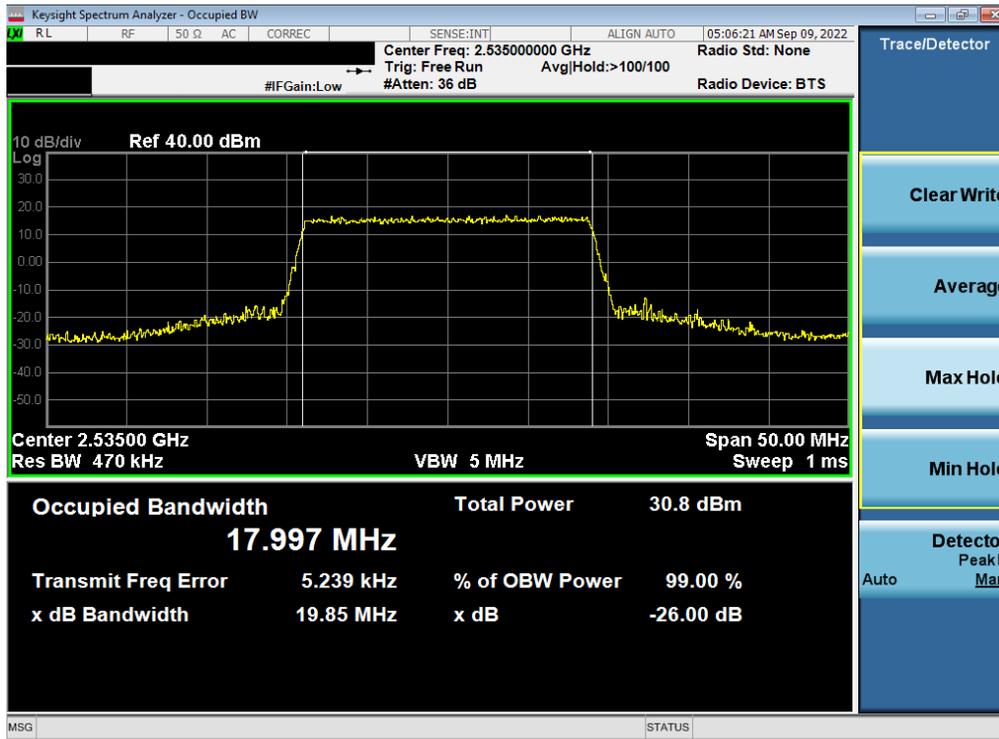
Plot 7-7. Occupied Bandwidth Plot (LTE Band 30 - 5MHz QPSK - Full RB - Ant F)



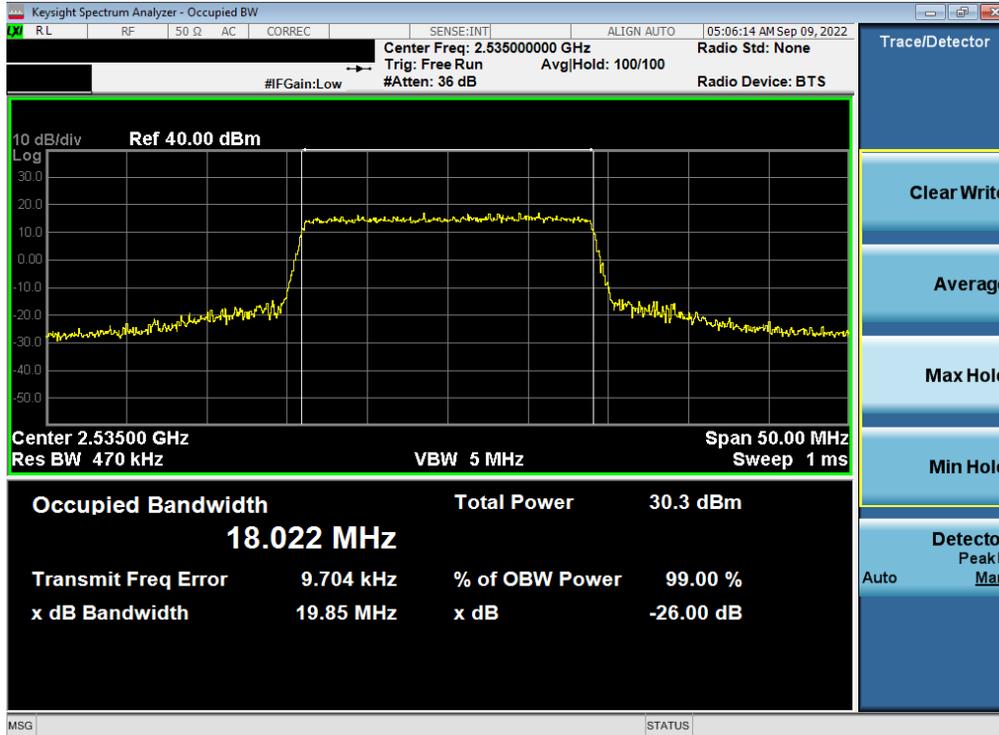
Plot 7-8. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 7 – Ant B

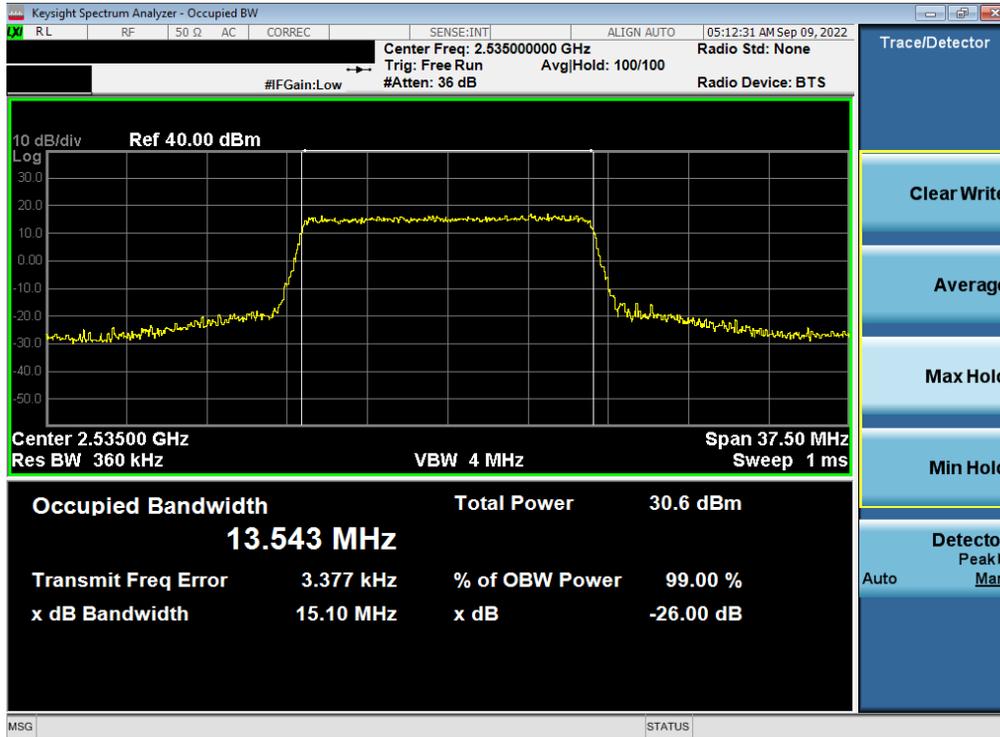


Plot 7-9. Occupied Bandwidth Plot (LTE Band 7 - 20MHz QPSK - Full RB - Ant B)

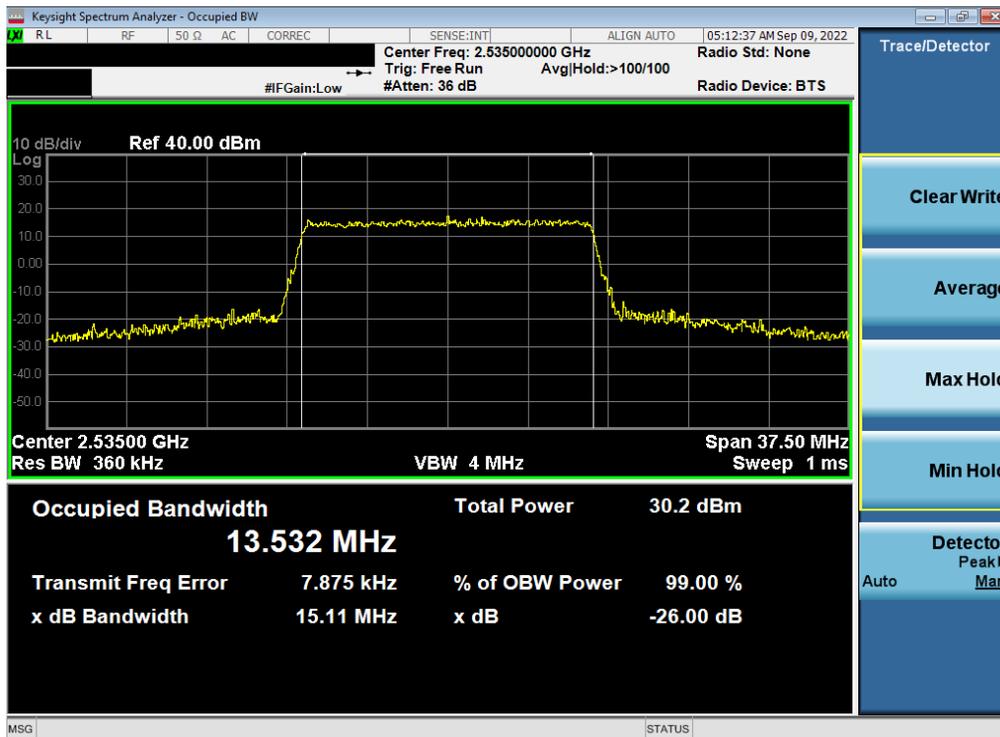


Plot 7-10. Occupied Bandwidth Plot (LTE Band 7 - 20MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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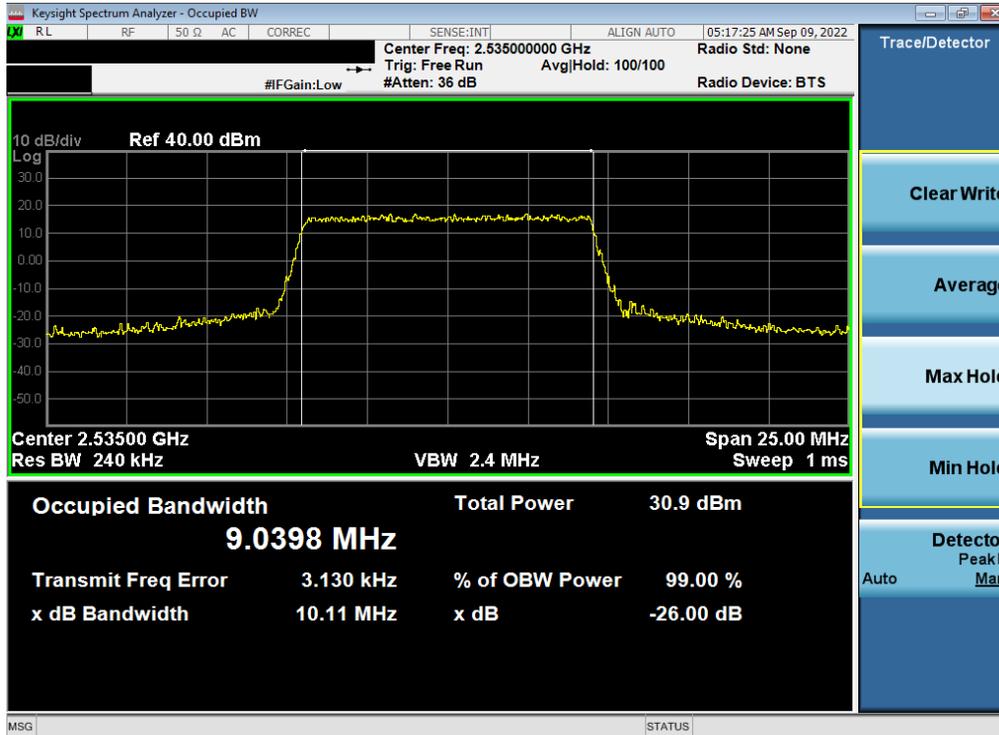


Plot 7-11. Occupied Bandwidth Plot (LTE Band 7 - 15MHz QPSK - Full RB - Ant B)

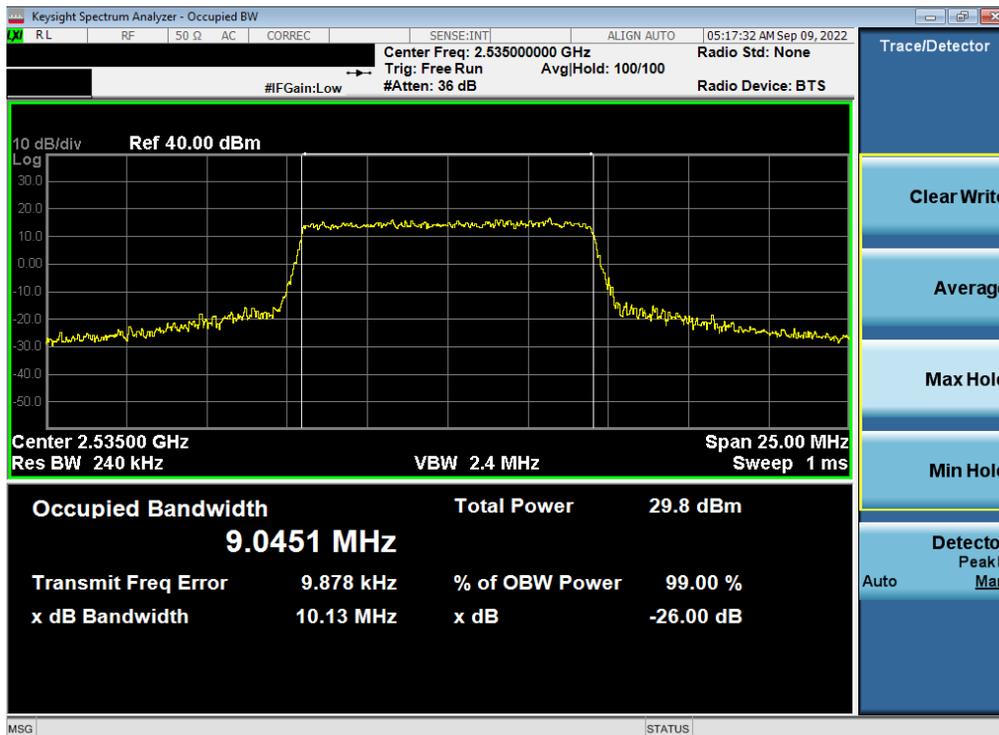


Plot 7-12. Occupied Bandwidth Plot (LTE Band 7 - 15MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-13. Occupied Bandwidth Plot (LTE Band 7 - 10MHz QPSK - Full RB - Ant B)

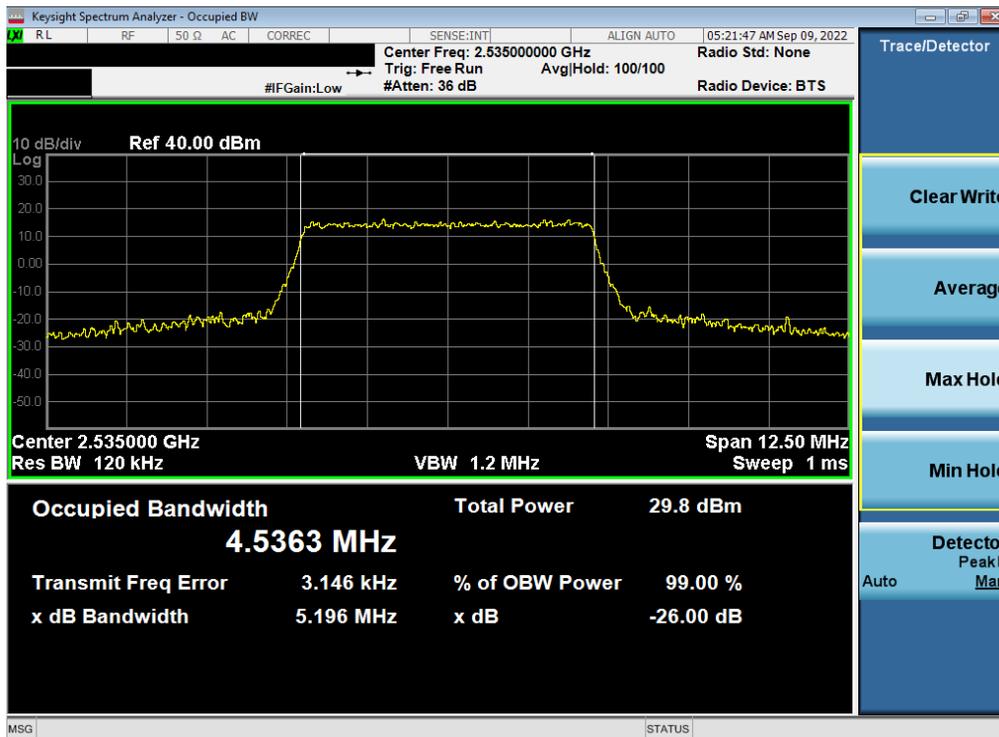


Plot 7-14. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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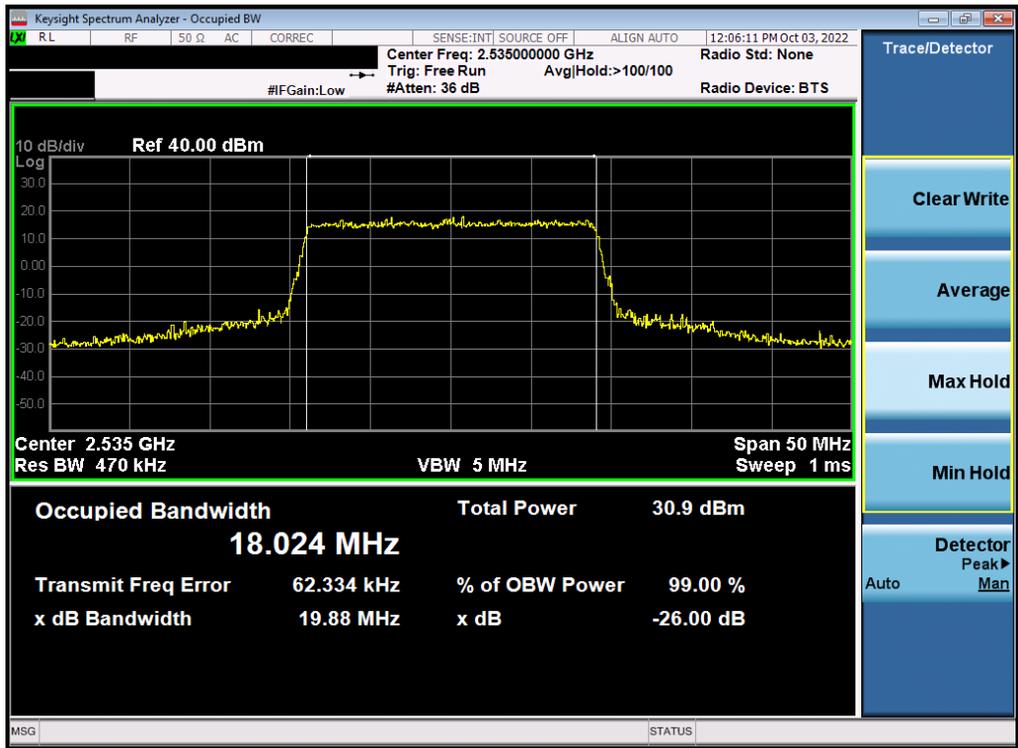
Plot 7-15. Occupied Bandwidth Plot (LTE Band 7 - 5MHz QPSK - Full RB - Ant B)



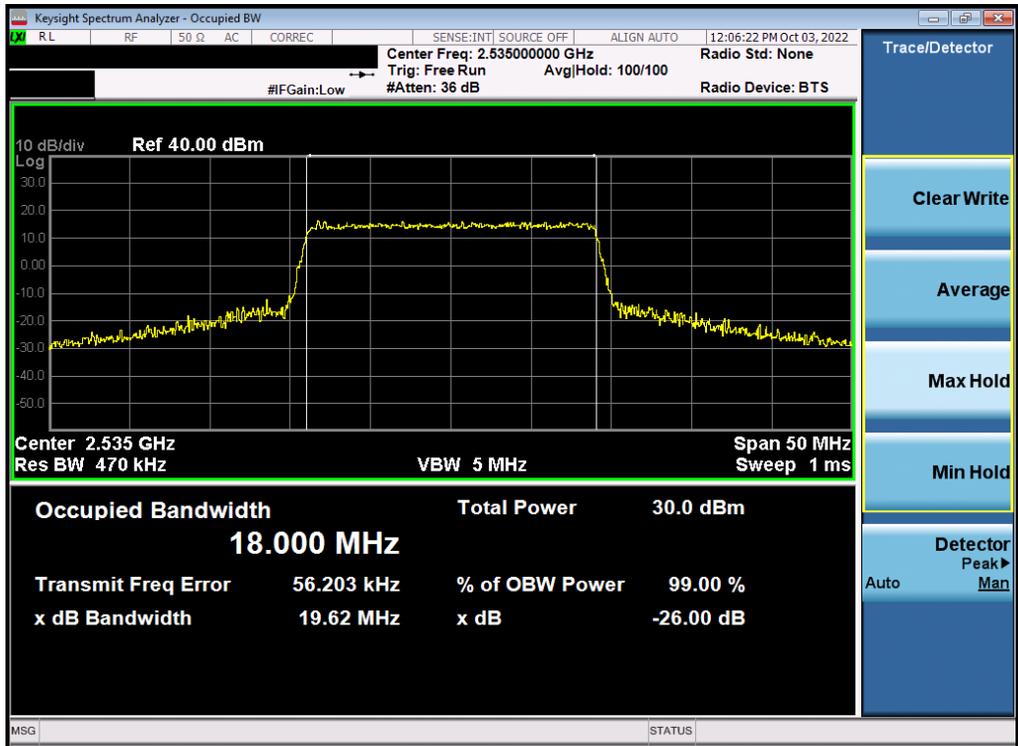
Plot 7-16. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 7 – Ant F

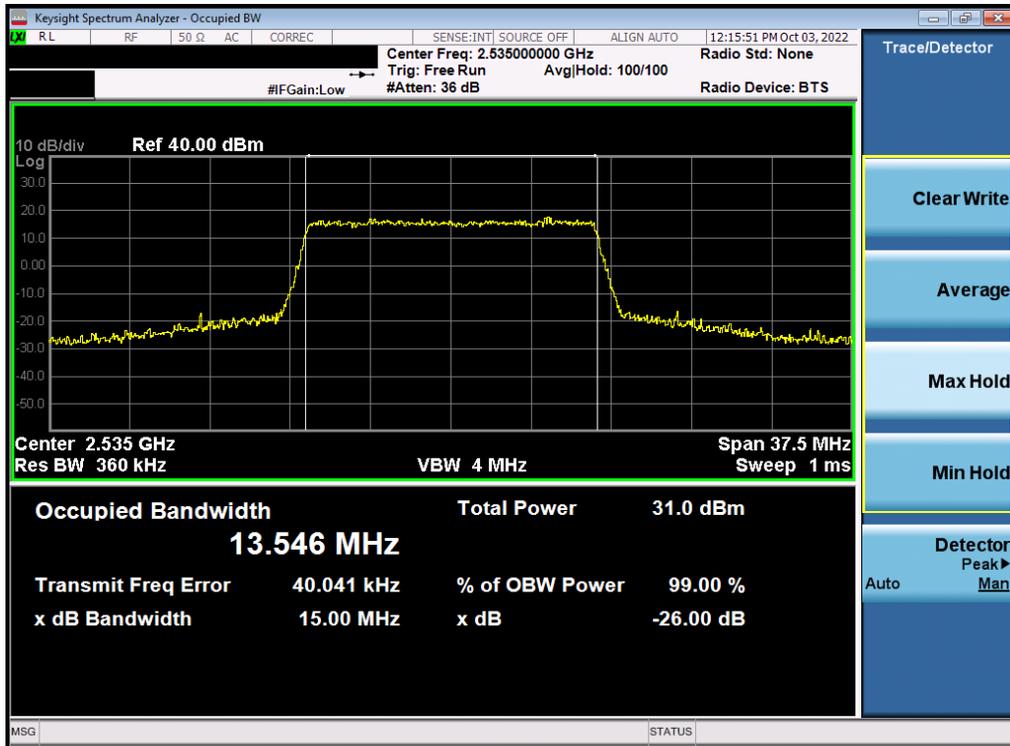


Plot 7-17. Occupied Bandwidth Plot (LTE Band 7 - 20MHz QPSK - Full RB - Ant F)

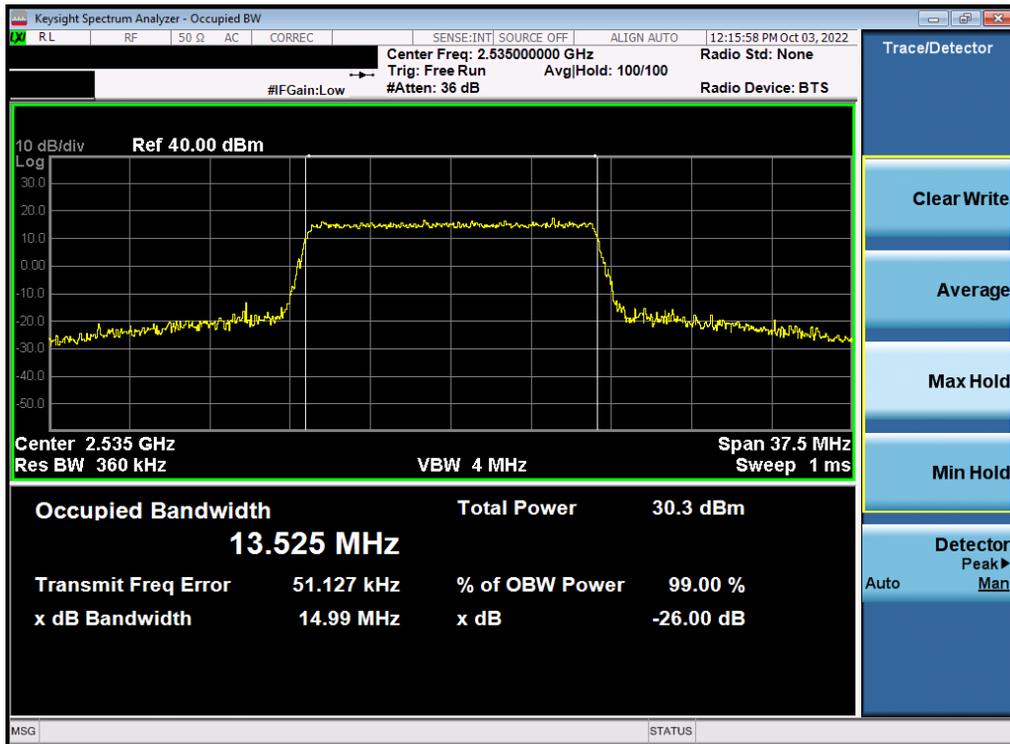


Plot 7-18. Occupied Bandwidth Plot (LTE Band 7 - 20MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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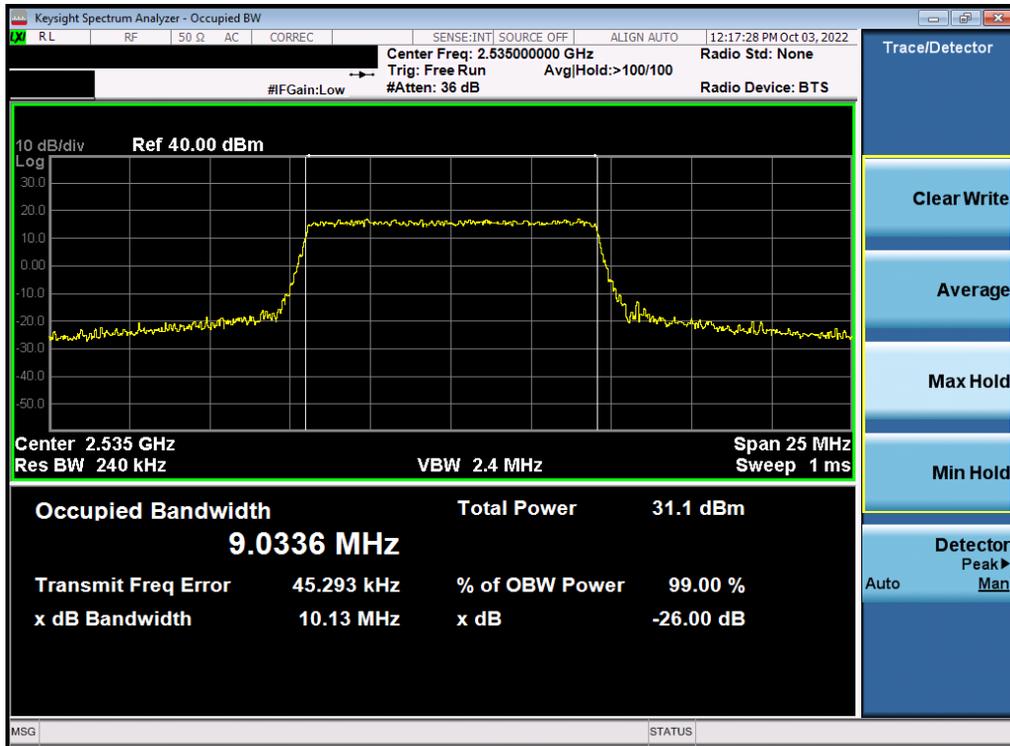


Plot 7-19. Occupied Bandwidth Plot (LTE Band 7 - 15MHz QPSK - Full RB - Ant F)

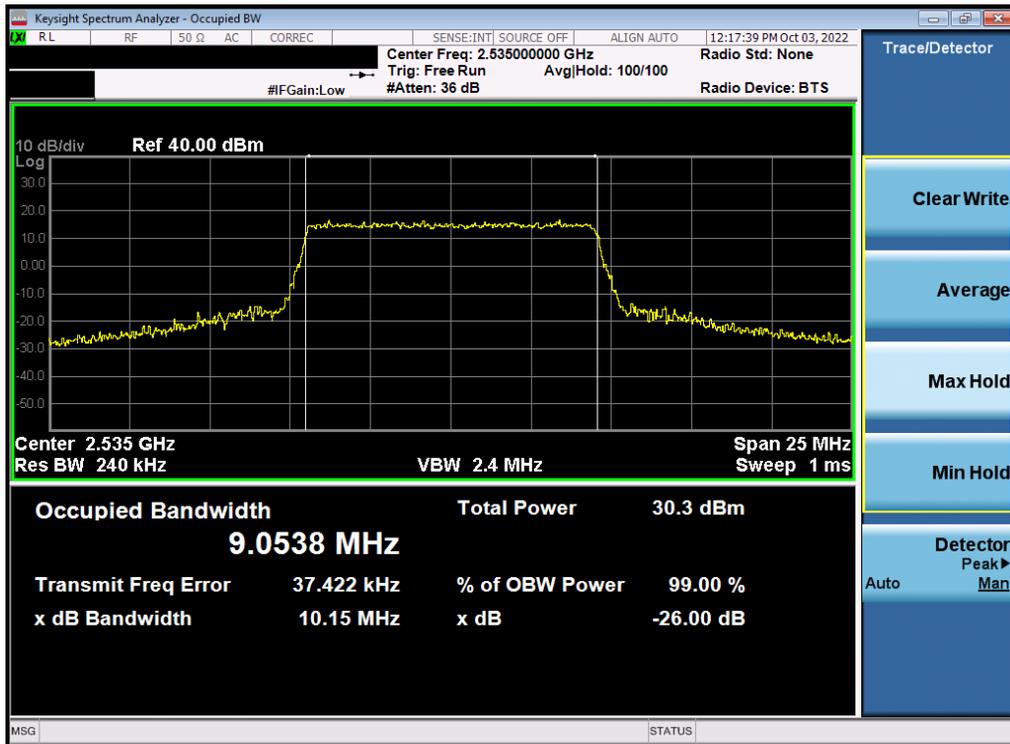


Plot 7-20. Occupied Bandwidth Plot (LTE Band 7 - 15MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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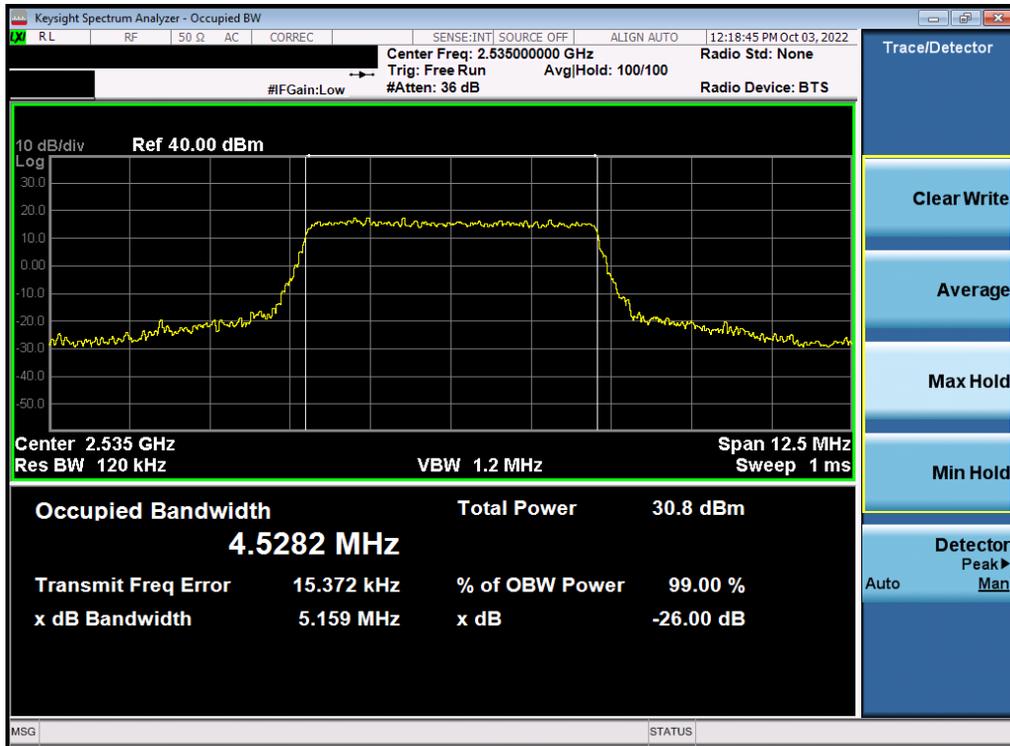


Plot 7-21. Occupied Bandwidth Plot (LTE Band 7 - 10MHz QPSK - Full RB - Ant F)

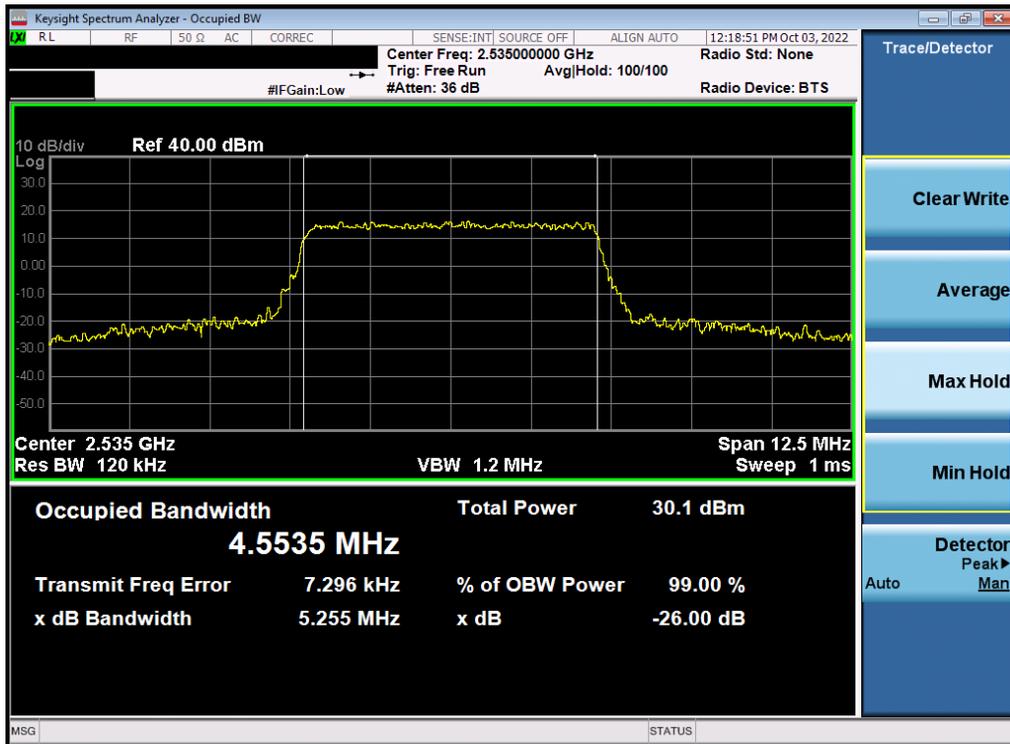


Plot 7-22. Occupied Bandwidth Plot (LTE Band 7 - 10MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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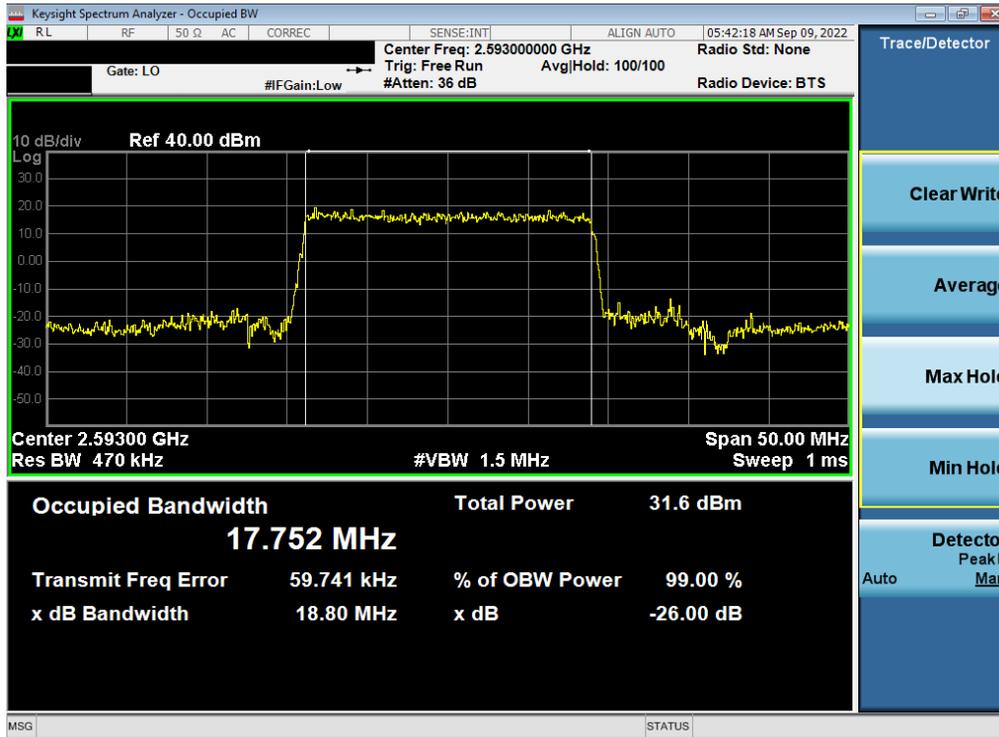
Plot 7-23. Occupied Bandwidth Plot (LTE Band 7 - 5MHz QPSK - Full RB - Ant F)



Plot 7-24. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 41(PC2) – Ant B

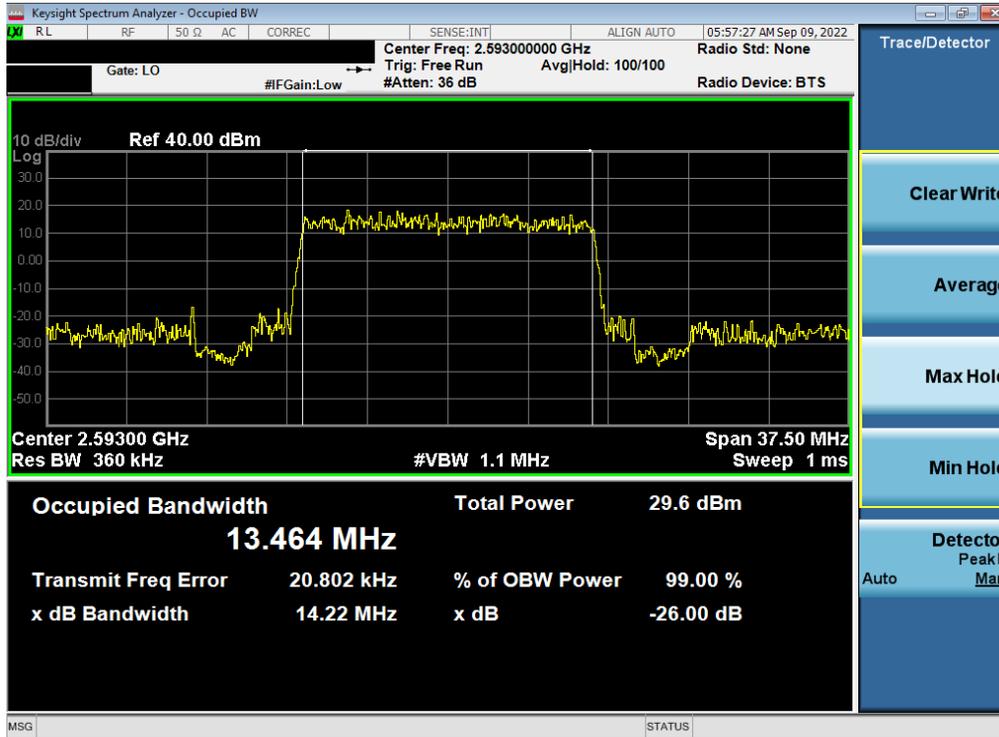


Plot 7-25. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz QPSK - Full RB - Ant B)

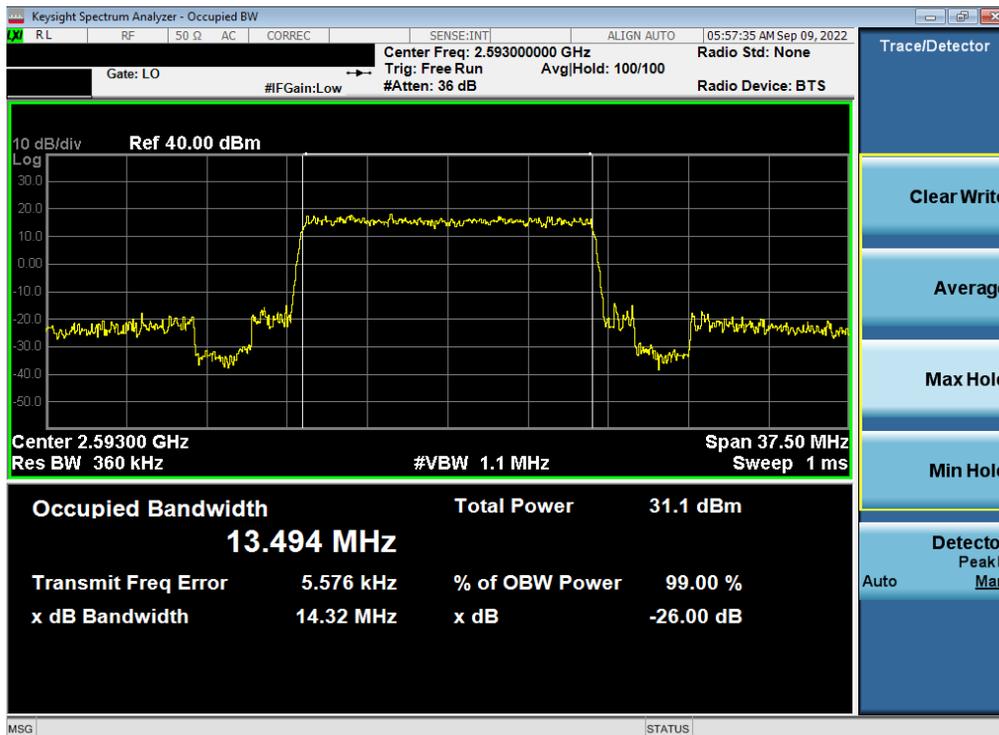


Plot 7-26. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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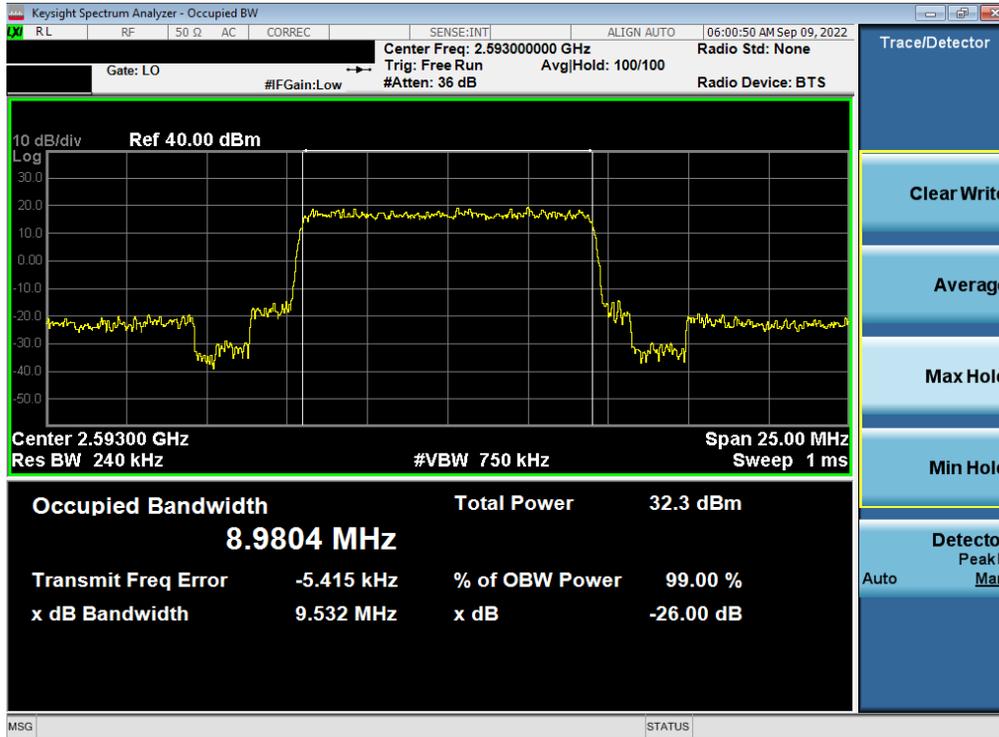


Plot 7-27. Occupied Bandwidth Plot (LTE Band 41(PC2) - 15MHz QPSK - Full RB - Ant B)

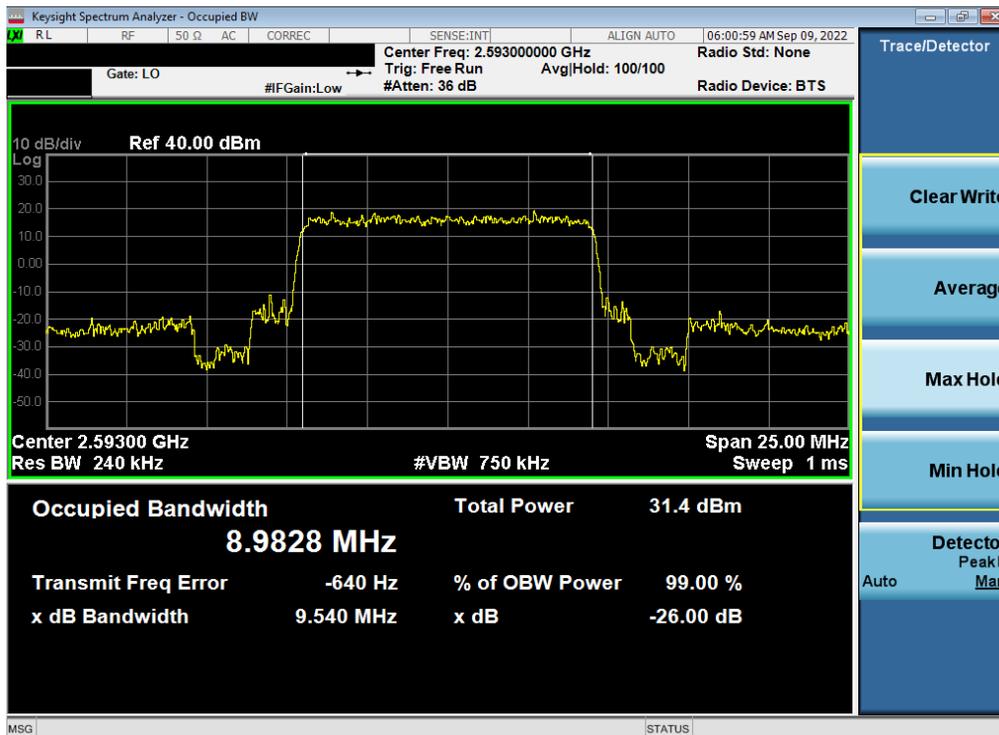


Plot 7-28. Occupied Bandwidth Plot (LTE Band 41(PC2) - 15MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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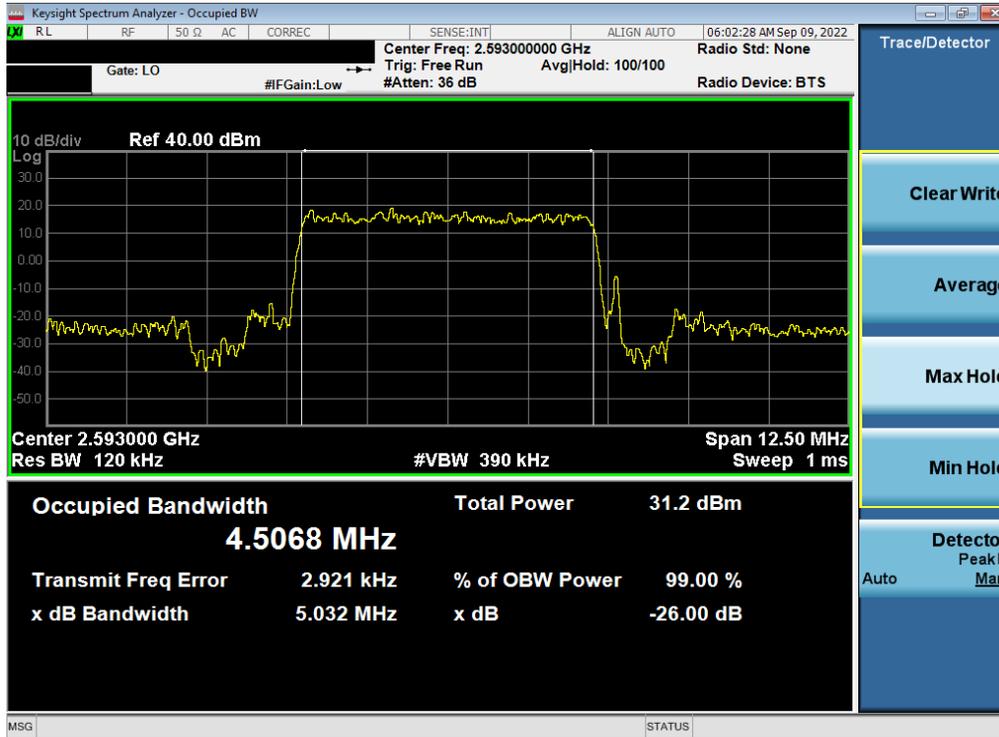


Plot 7-29. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz QPSK - Full RB - Ant B)



Plot 7-30. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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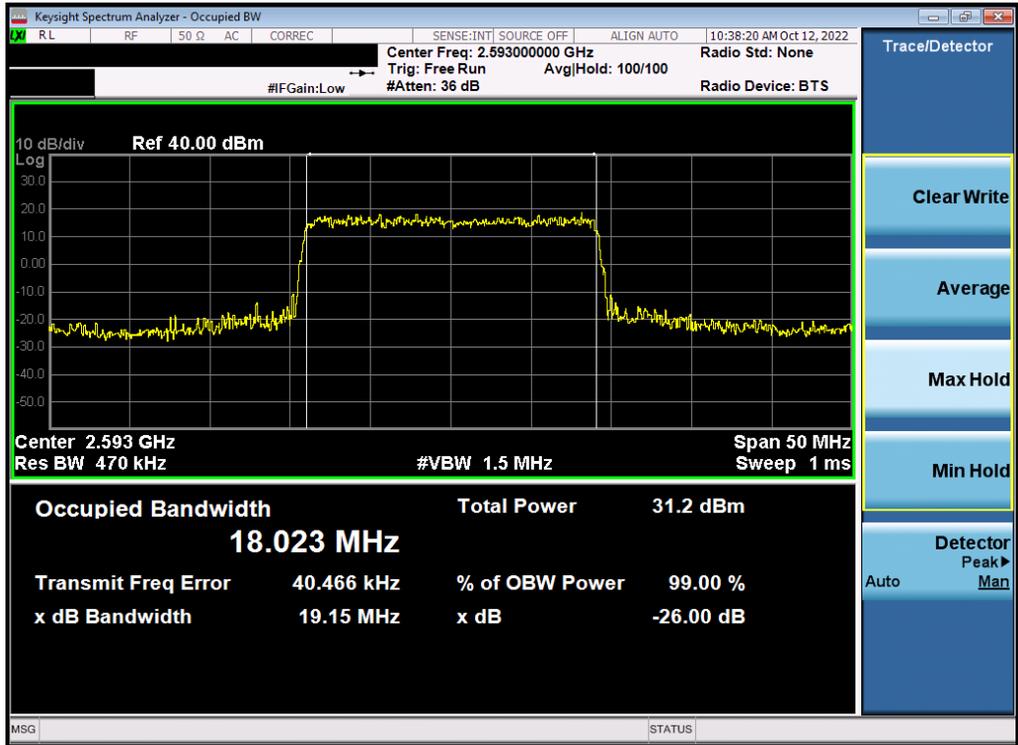
Plot 7-31. Occupied Bandwidth Plot (LTE Band 41(PCI) - 5MHz QPSK - Full RB - Ant B)



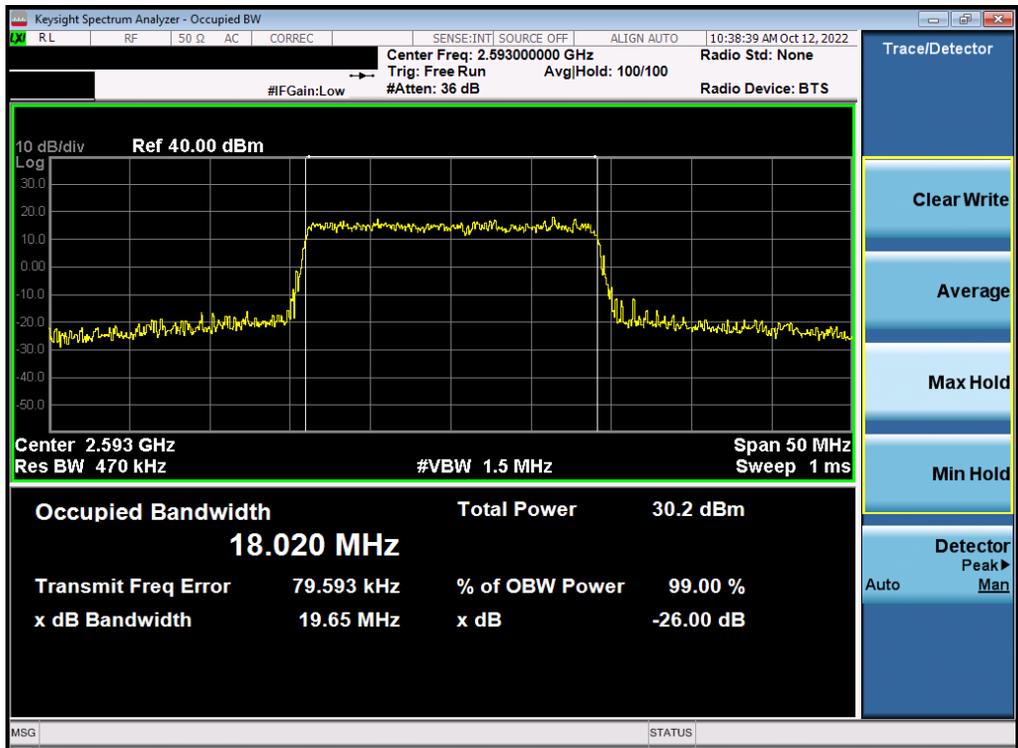
Plot 7-32. Occupied Bandwidth Plot (LTE Band 41(PCI) - 5MHz 16-QAM - Full RB - Ant B)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 41(PC2) – Ant F

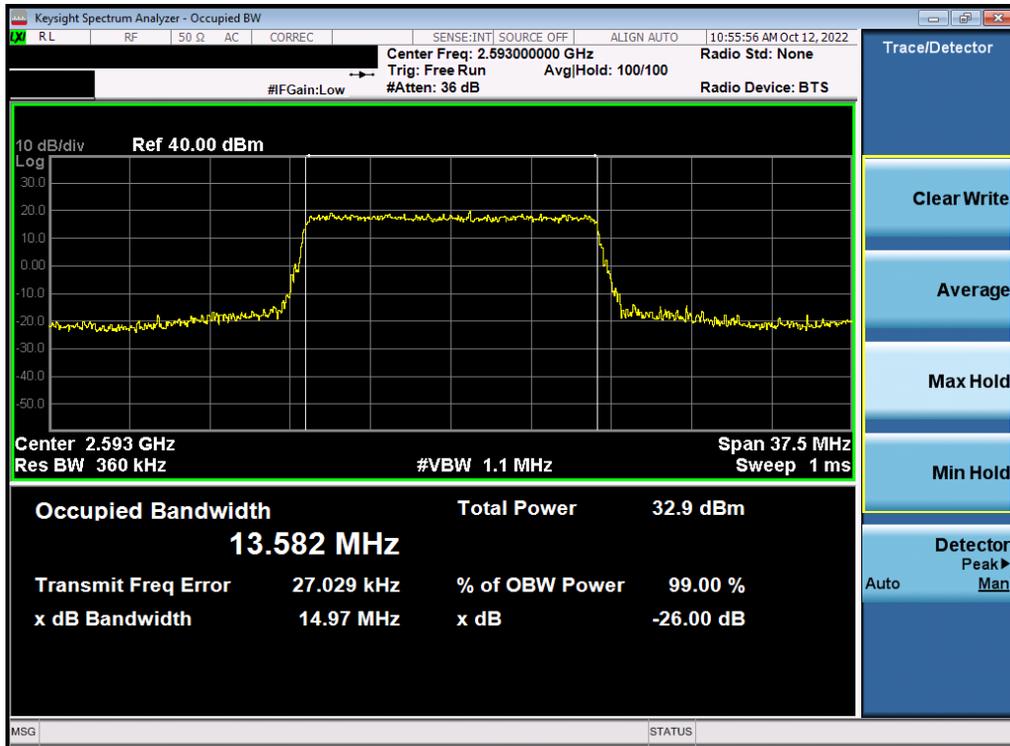


Plot 7-33. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz QPSK - Full RB - Ant F)

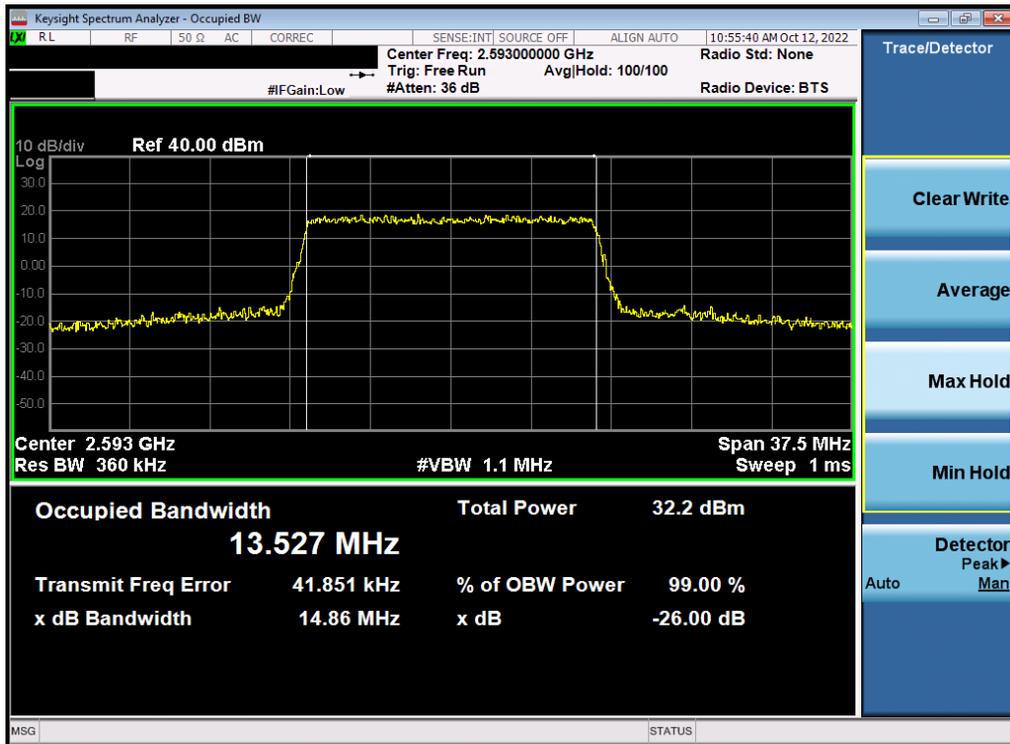


Plot 7-34. Occupied Bandwidth Plot (LTE Band 41(PC2) - 20MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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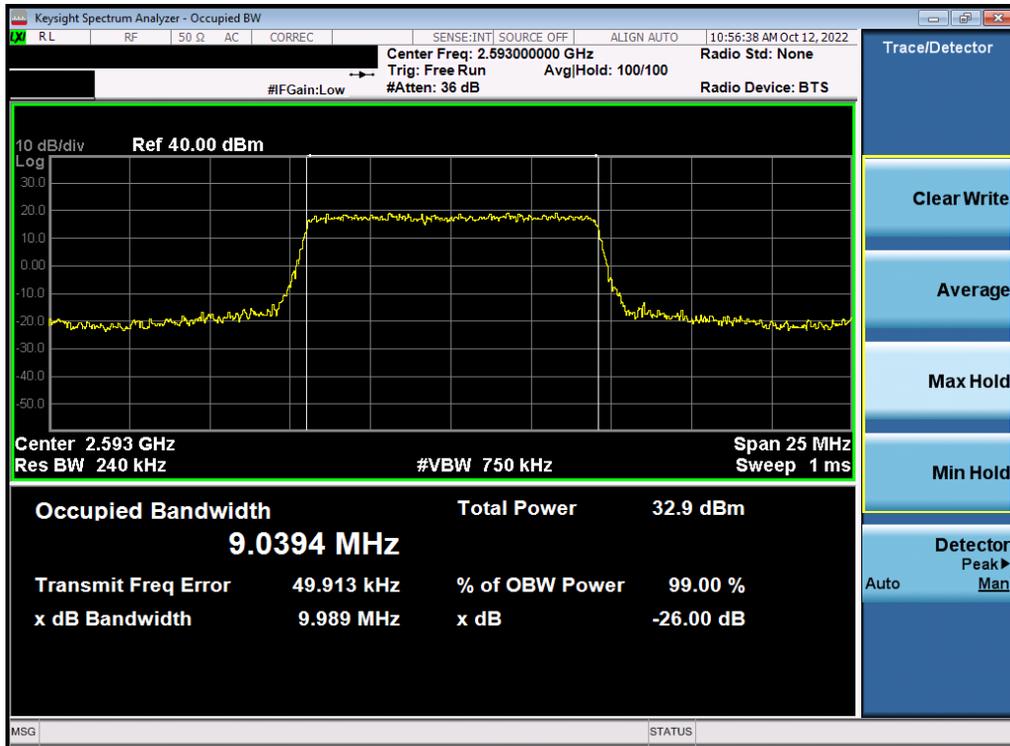


Plot 7-35. Occupied Bandwidth Plot (LTE Band 41(PC2) - 15MHz QPSK - Full RB - Ant F)

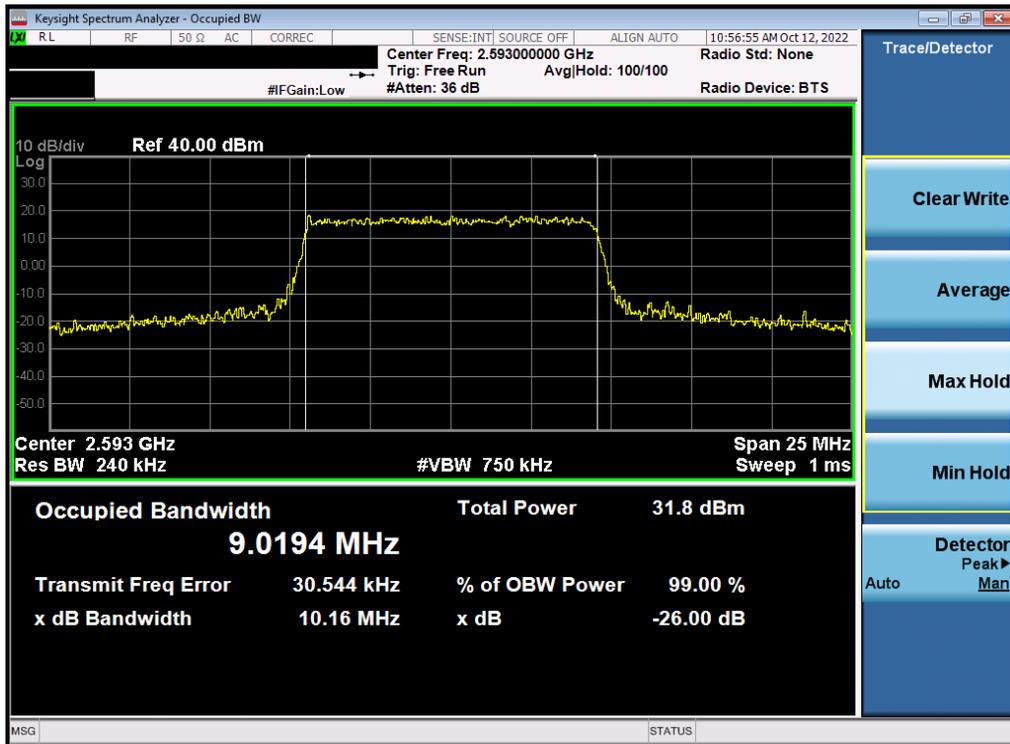


Plot 7-36. Occupied Bandwidth Plot (LTE Band 41(PC2) - 15MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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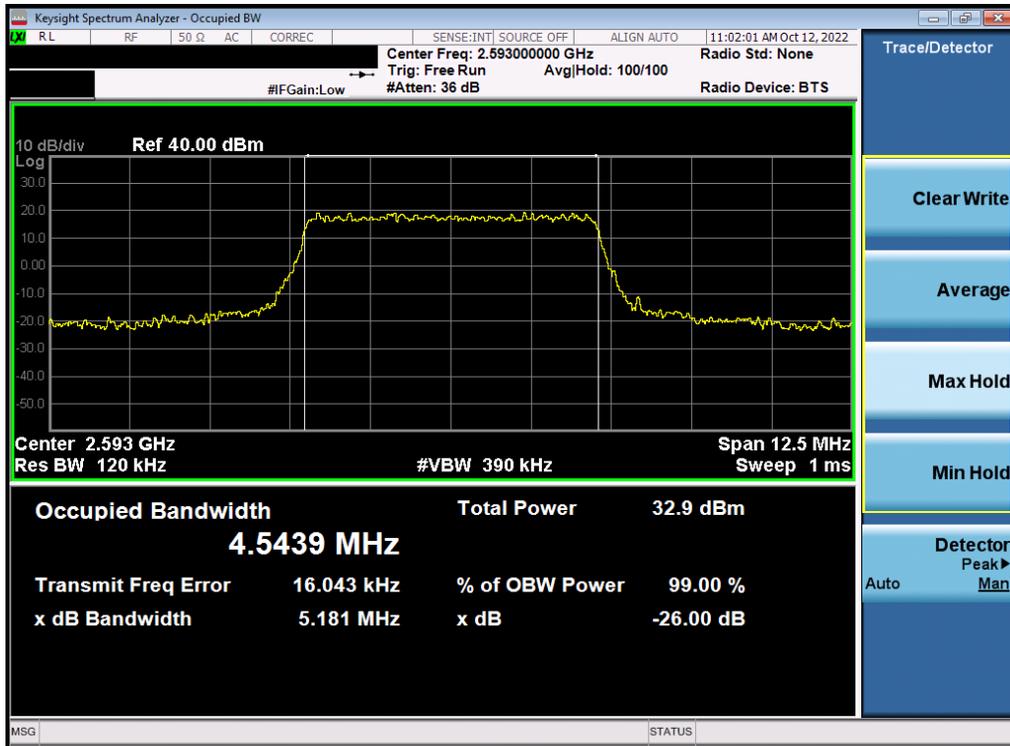


Plot 7-37. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz QPSK - Full RB - Ant F)

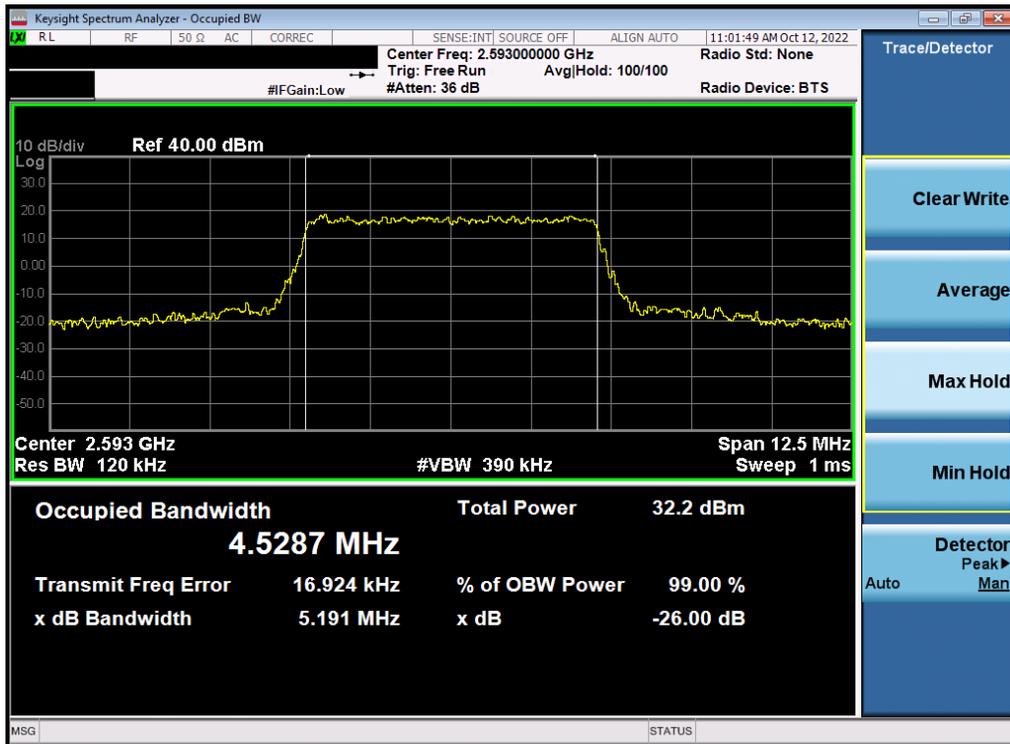


Plot 7-38. Occupied Bandwidth Plot (LTE Band 41(PC2) - 10MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-39. Occupied Bandwidth Plot (LTE Band 41(PC2) - 5MHz QPSK - Full RB - Ant F)



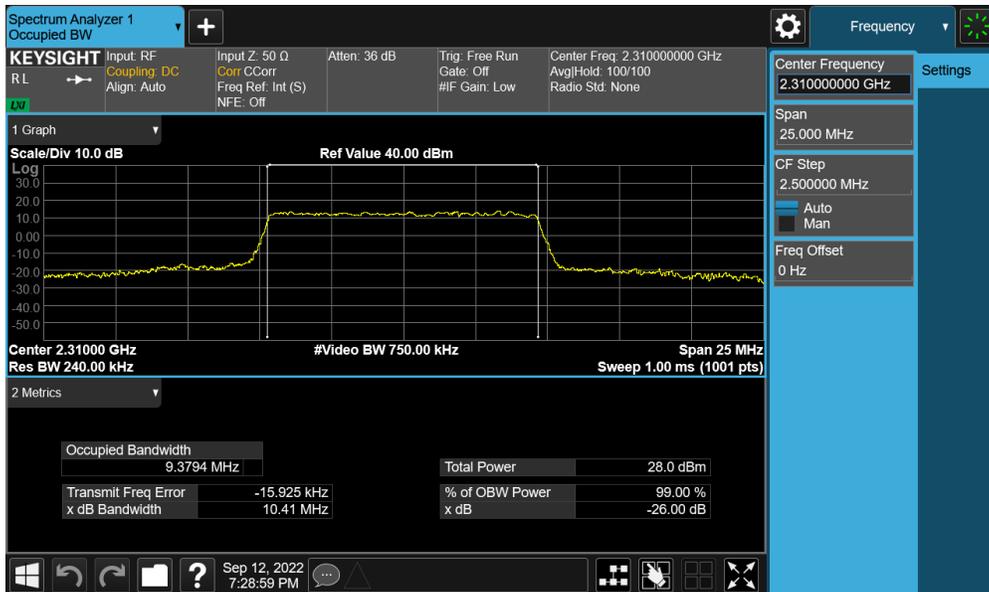
Plot 7-40. Occupied Bandwidth Plot (LTE Band 41(PC2) - 5MHz 16-QAM - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n30 – Ant A

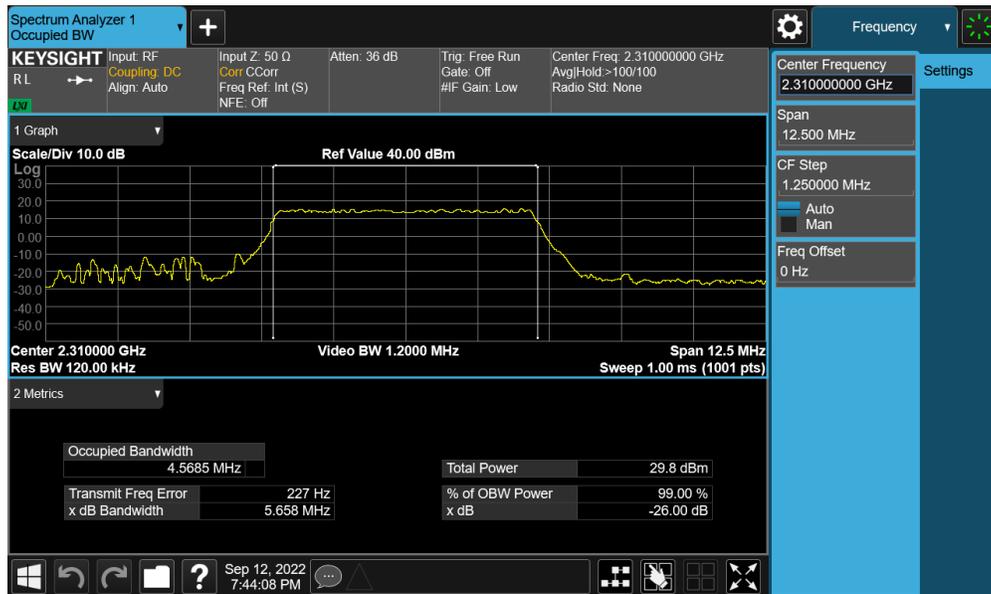
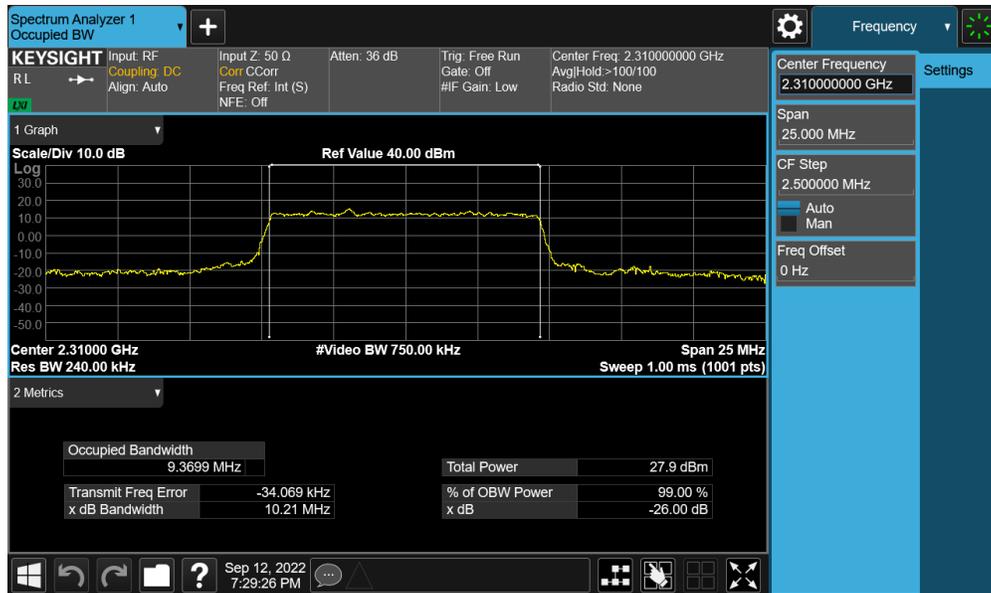


Plot 7-41. Occupied Bandwidth Plot (NR Band n30 - 10MHz $\pi/2$ BPSK - Full RB - Ant A)

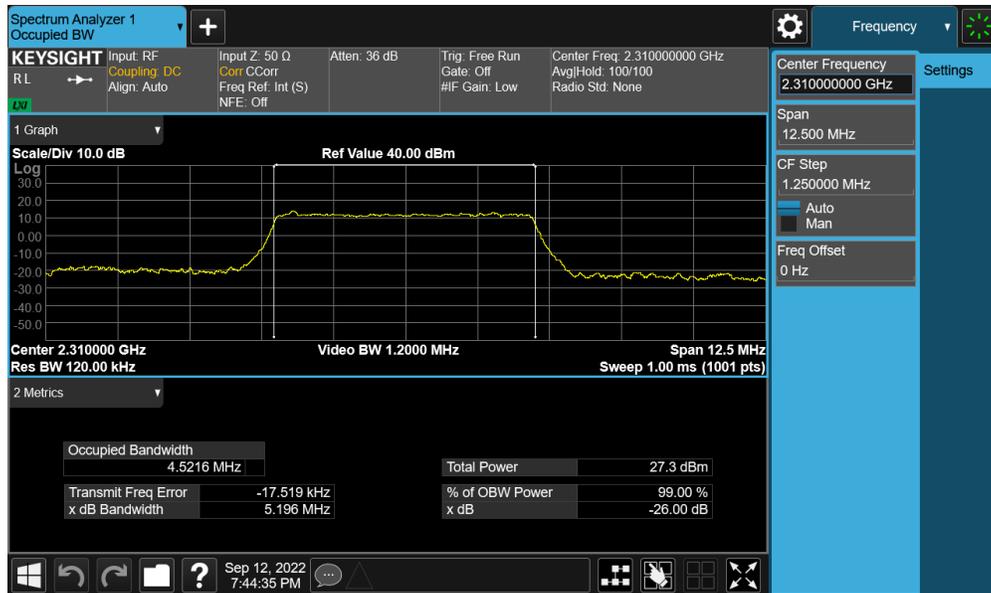


Plot 7-42. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant A)

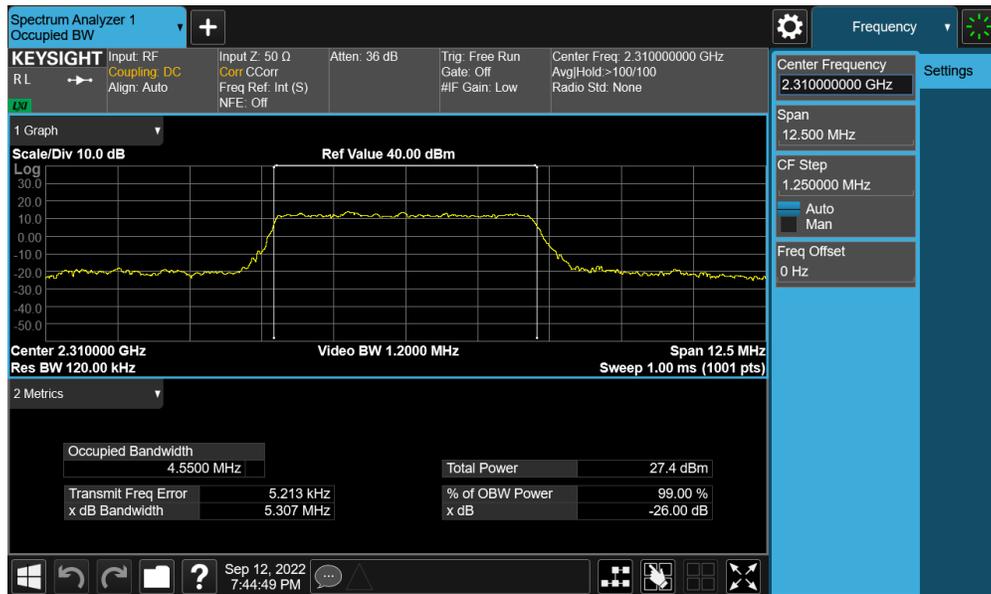
FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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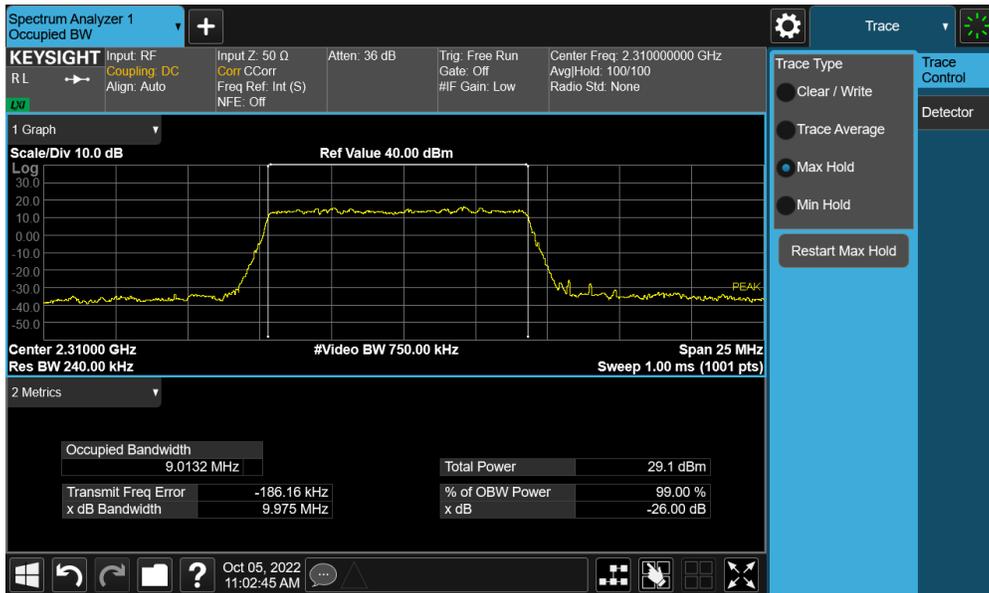
Plot 7-45. Occupied Bandwidth Plot (NR Band n30 - 5MHz QPSK - Full RB - Ant A)



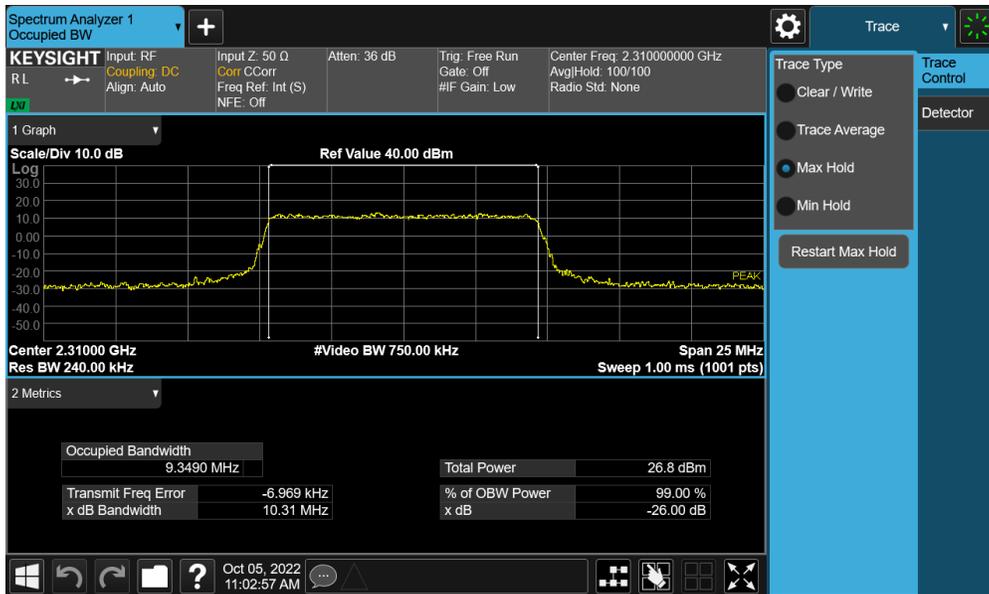
Plot 7-46. Occupied Bandwidth Plot (NR Band n30 - 5MHz 16-QAM - Full RB - Ant A)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n30 – Ant F

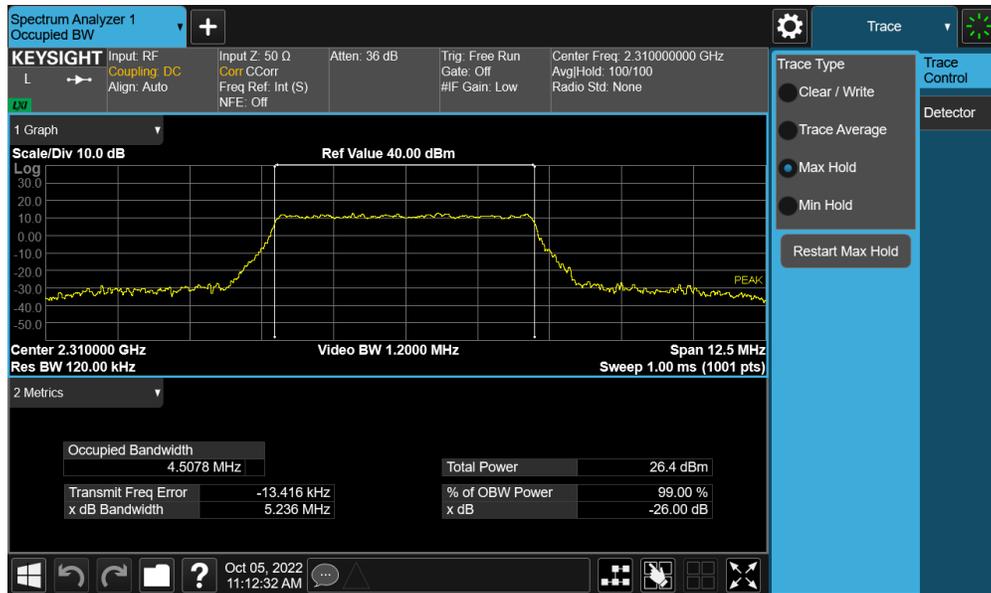


Plot 7-47. Occupied Bandwidth Plot (NR Band n30 - 10MHz $\pi/2$ BPSK - Full RB - Ant F)

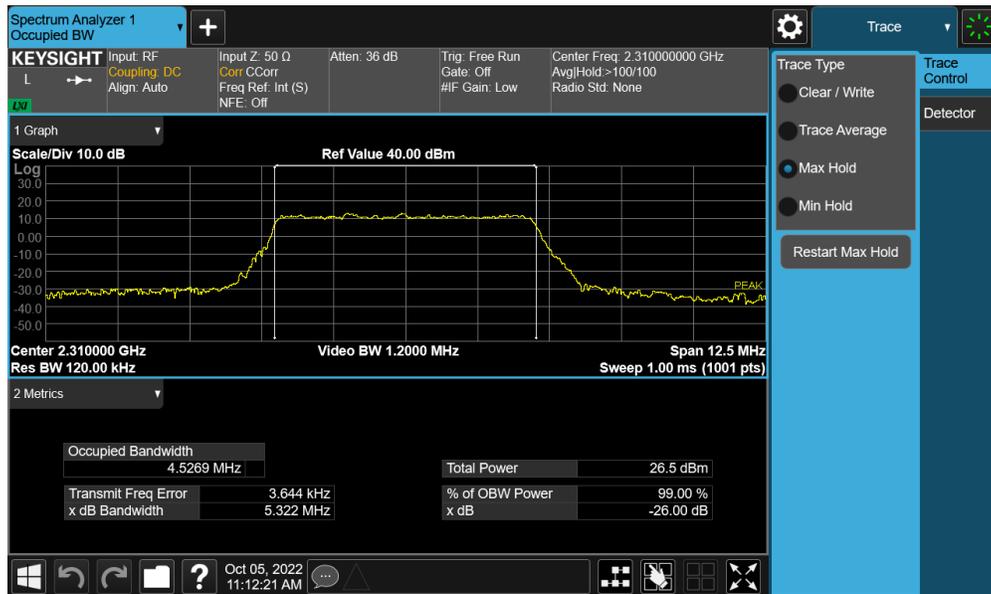


Plot 7-48. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant F)

FCC ID: A3LSMS918U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
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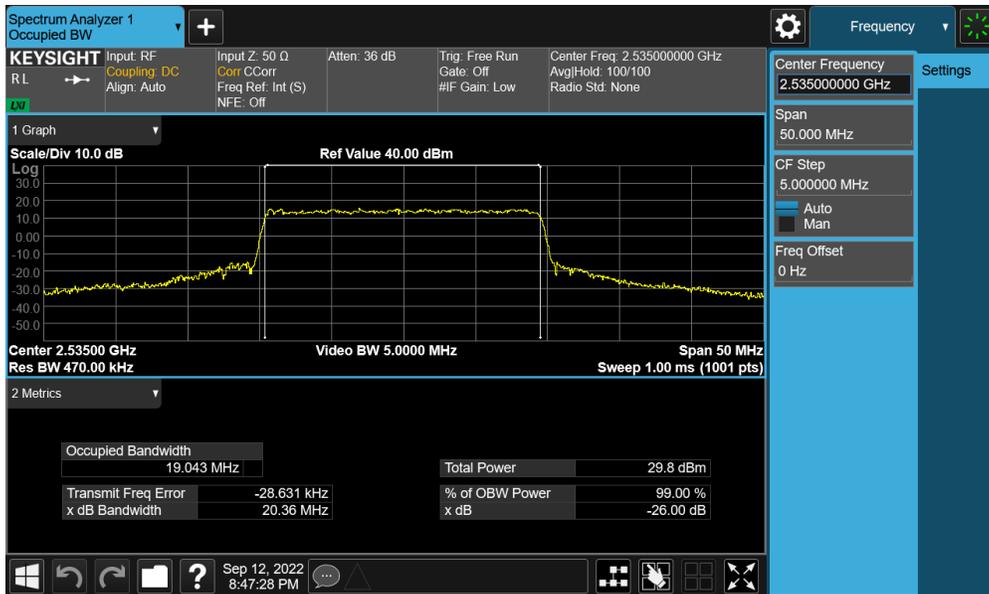
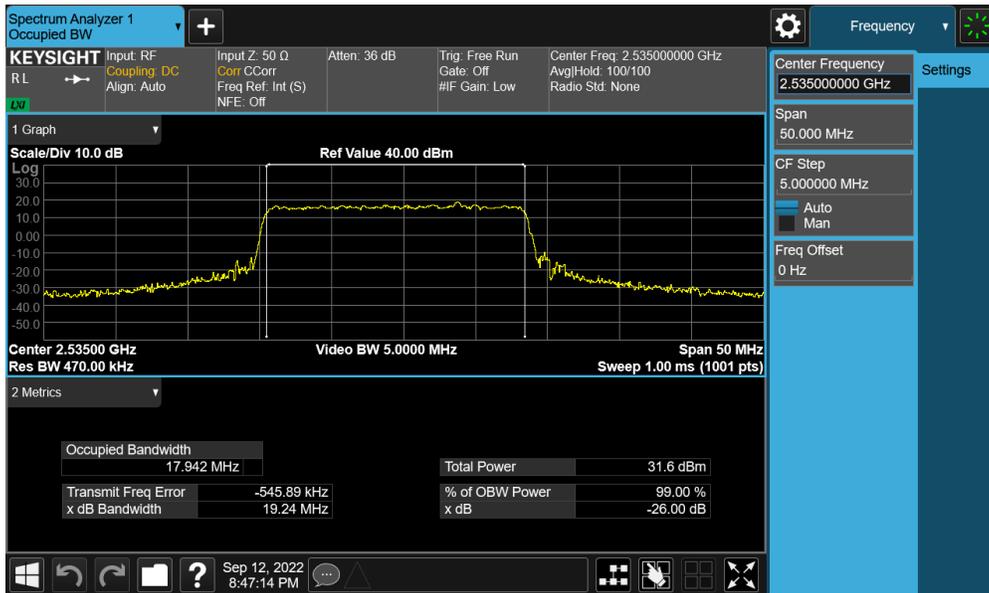
Plot 7-51. Occupied Bandwidth Plot (NR Band n30 - 5MHz QPSK - Full RB - Ant F)



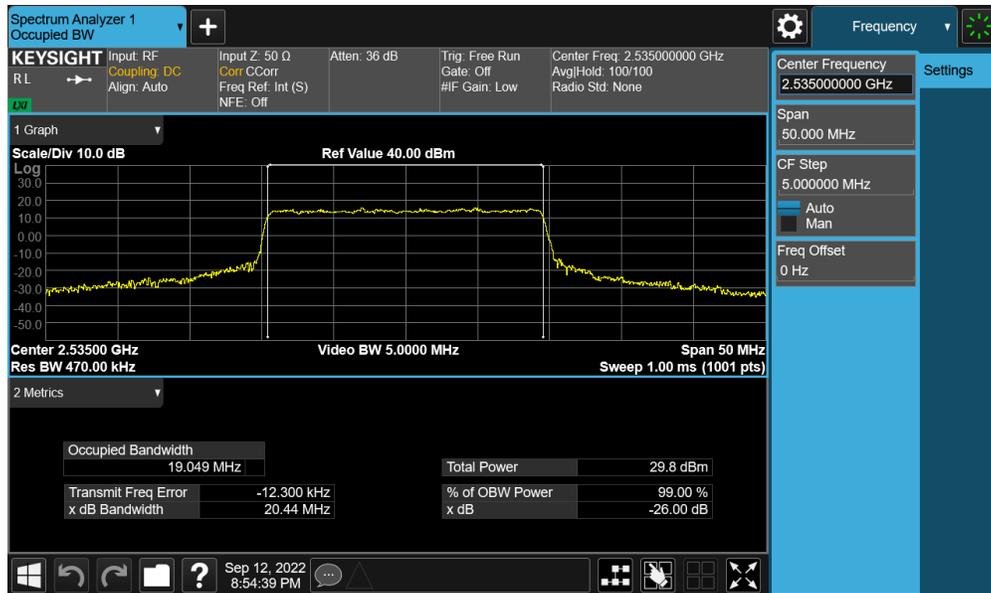
Plot 7-52. Occupied Bandwidth Plot (NR Band n30 - 5MHz 16-QAM - Full RB - Ant F)

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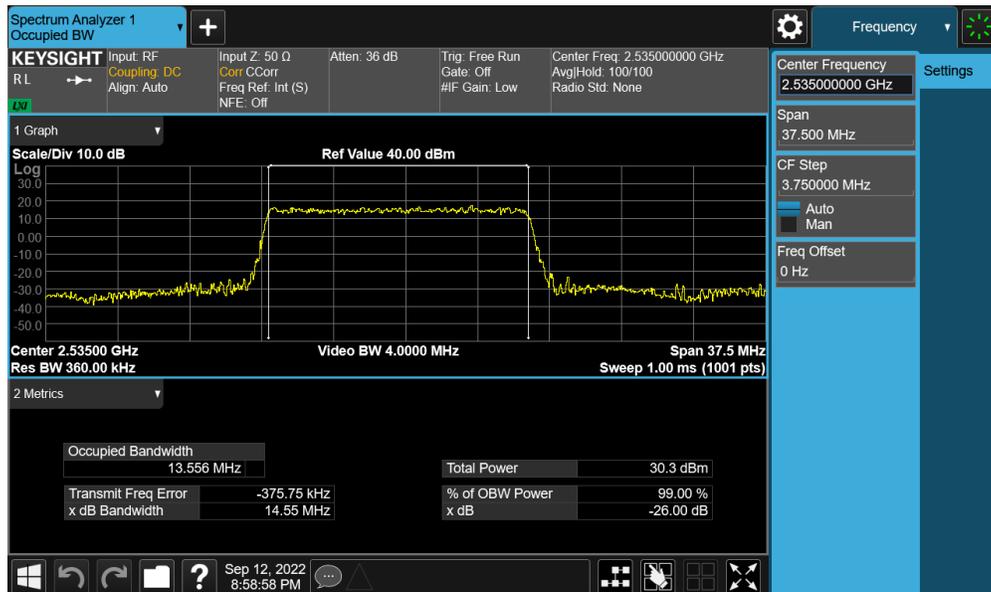
NR Band n7 – Ant B



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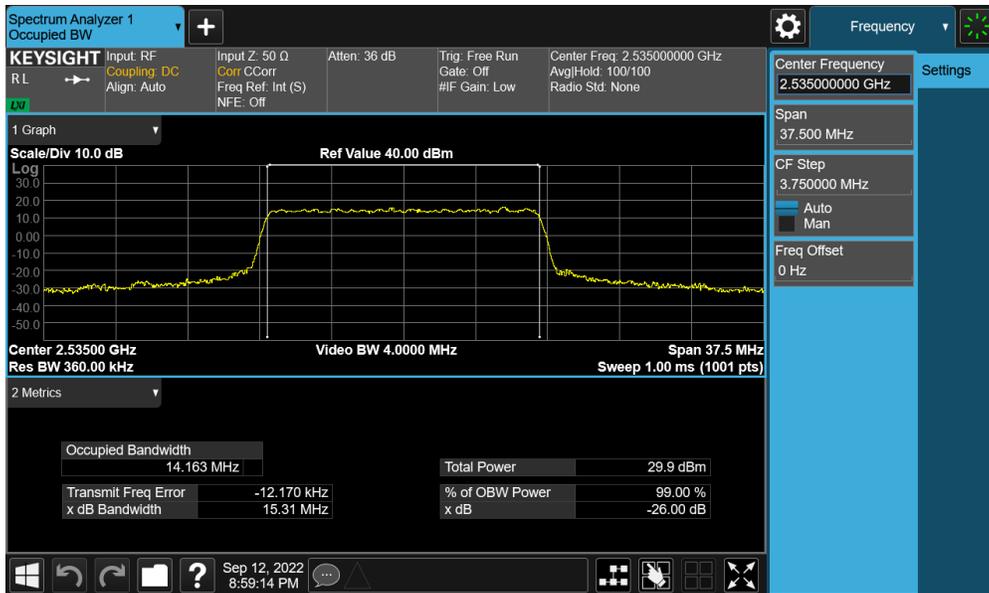


Plot 7-55. Occupied Bandwidth Plot (NR Band n7 - 20MHz 16-QAM - Full RB - Ant B)

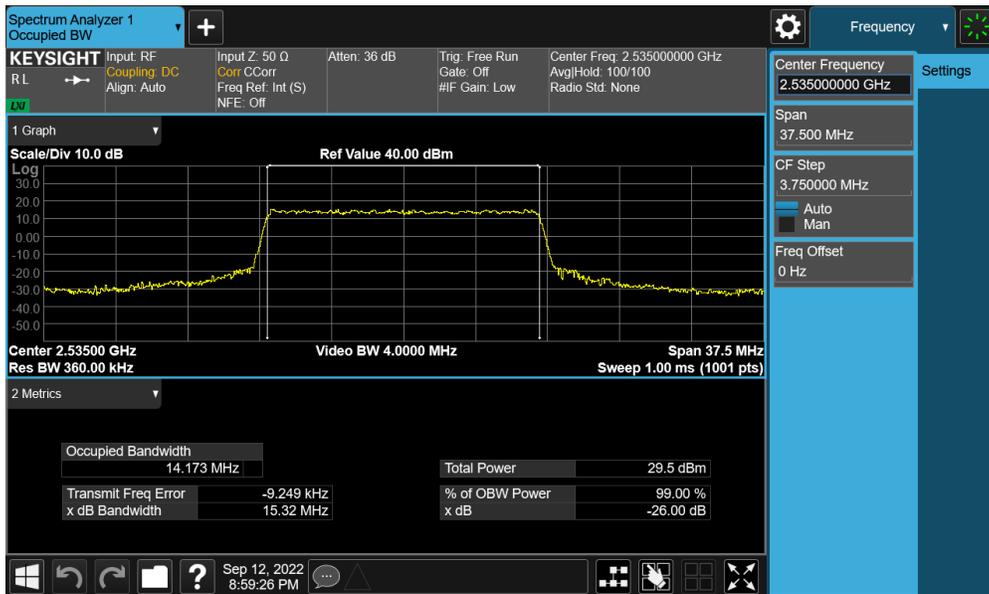


Plot 7-56. Occupied Bandwidth Plot (NR Band n7 - 15MHz $\pi/2$ BPSK - Full RB - Ant B)

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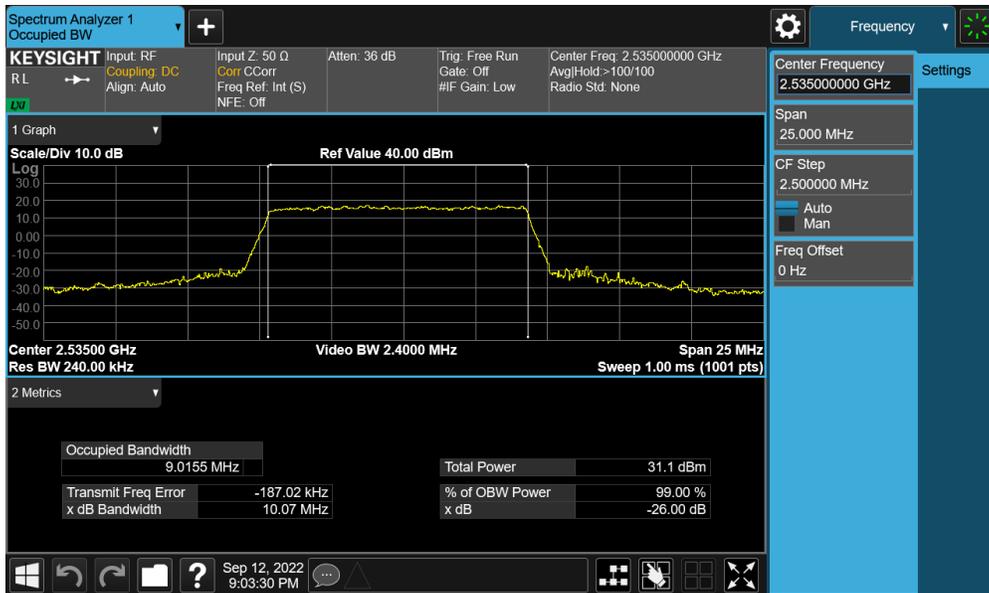


Plot 7-57. Occupied Bandwidth Plot (NR Band n7 - 15MHz QPSK - Full RB - Ant B)

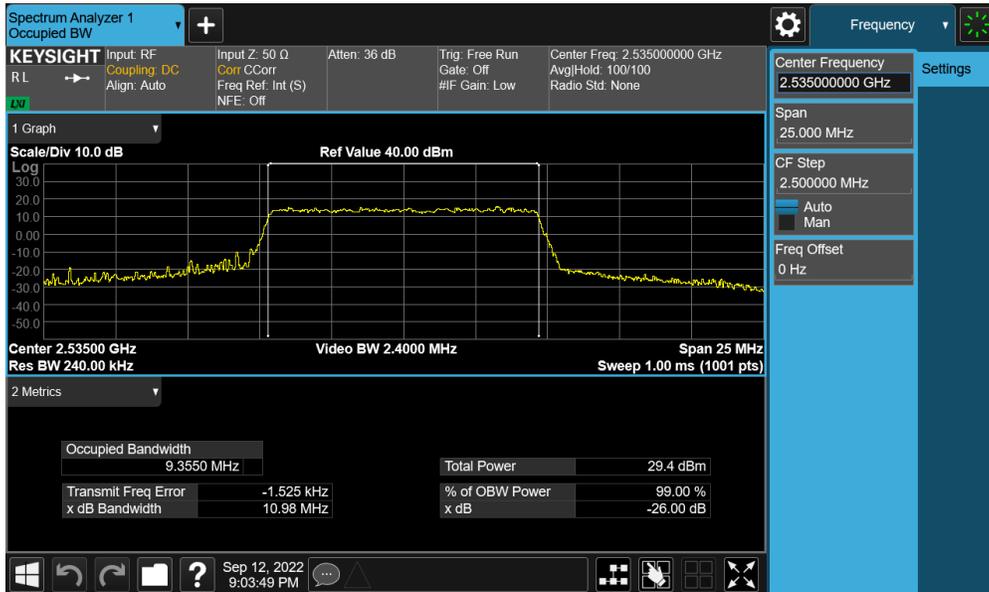


Plot 7-58. Occupied Bandwidth Plot (NR Band n7 - 15MHz 16-QAM - Full RB - Ant B)

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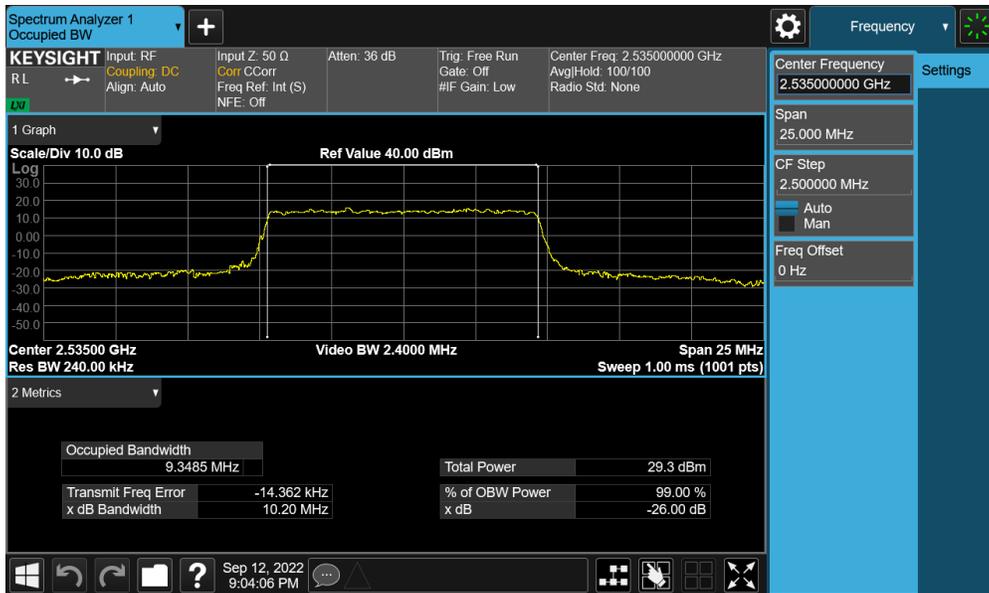


Plot 7-59. Occupied Bandwidth Plot (NR Band n7 - 10MHz $\pi/2$ BPSK - Full RB - Ant B)

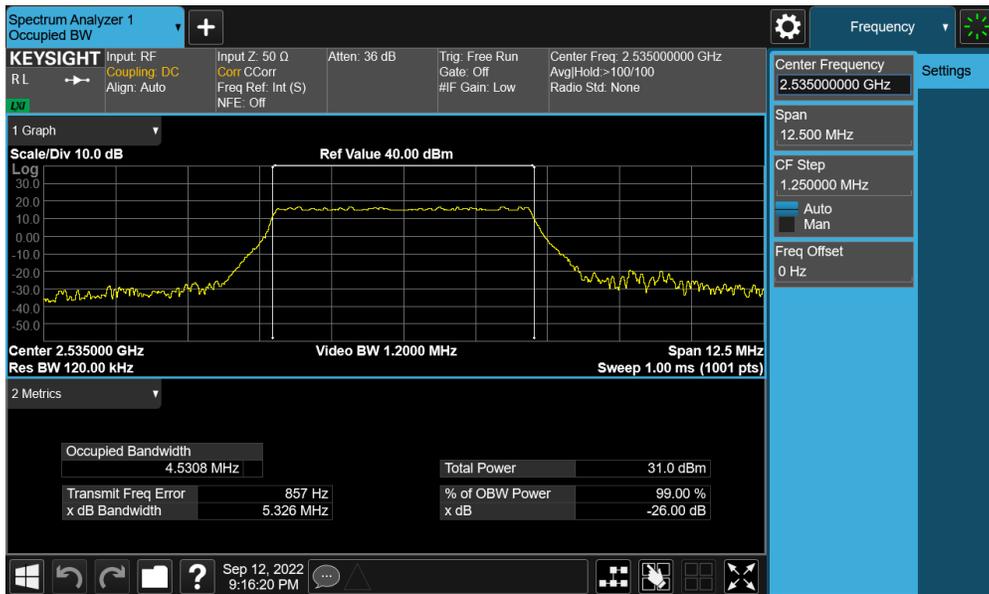


Plot 7-60. Occupied Bandwidth Plot (NR Band n7 - 10MHz QPSK - Full RB - Ant B)

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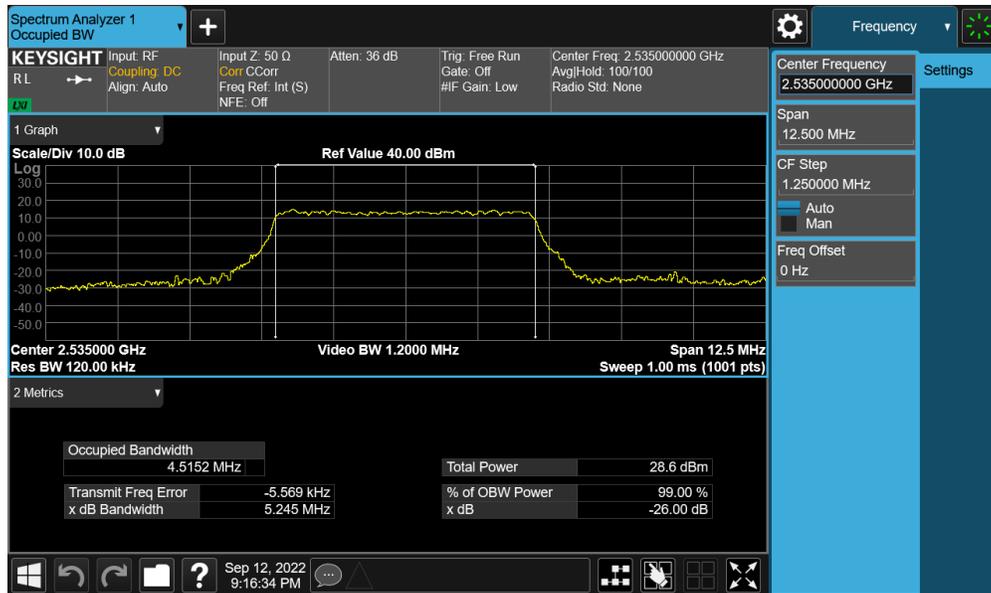


Plot 7-61. Occupied Bandwidth Plot (NR Band n7 - 10MHz 16-QAM - Full RB - Ant B)



Plot 7-62. Occupied Bandwidth Plot (NR Band n7 - 5MHz $\pi/2$ BPSK - Full RB - Ant B)

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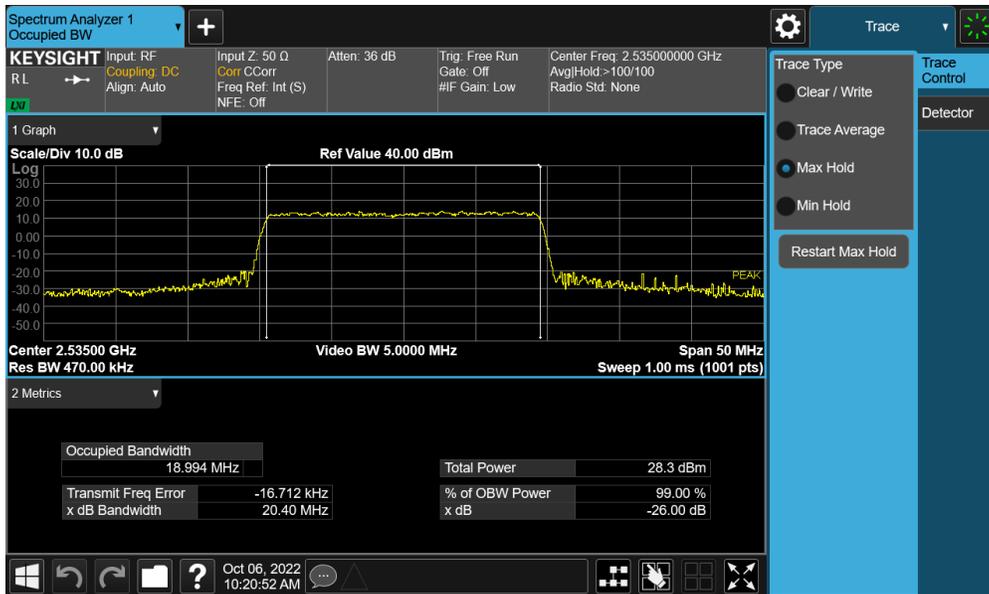
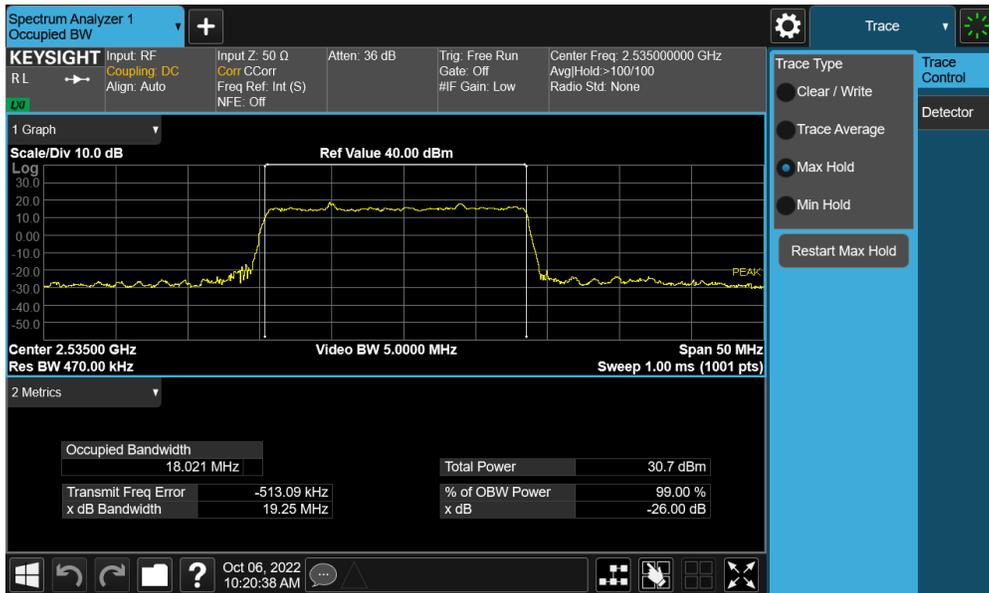
Plot 7-63. Occupied Bandwidth Plot (NR Band n7 - 5MHz QPSK - Full RB - Ant B)



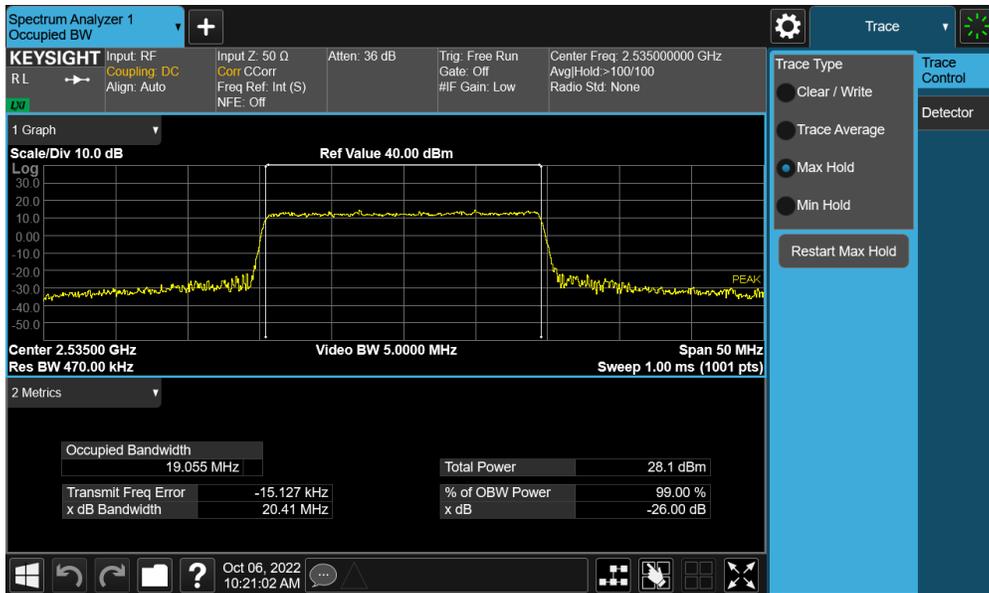
Plot 7-64. Occupied Bandwidth Plot (NR Band n7 - 5MHz 16-QAM - Full RB - Ant B)

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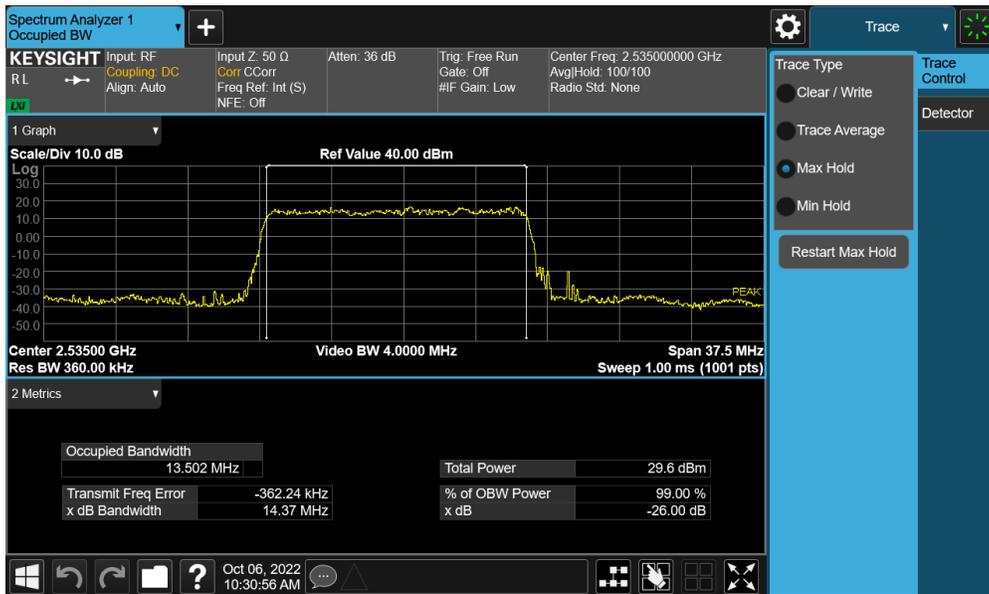
NR Band n7 – Ant F



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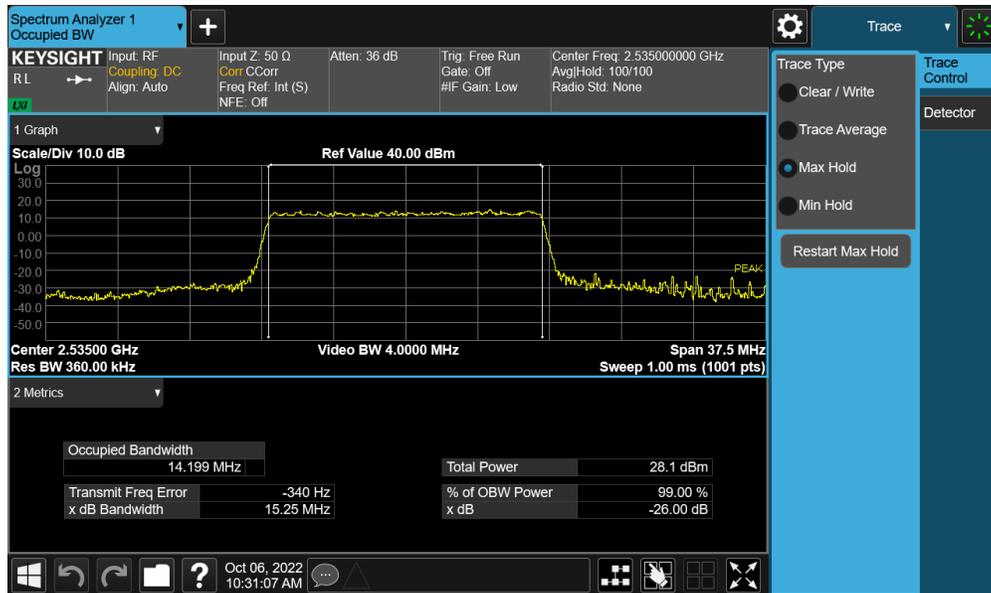


Plot 7-67. Occupied Bandwidth Plot (NR Band n7 - 20MHz 16-QAM - Full RB - Ant F)

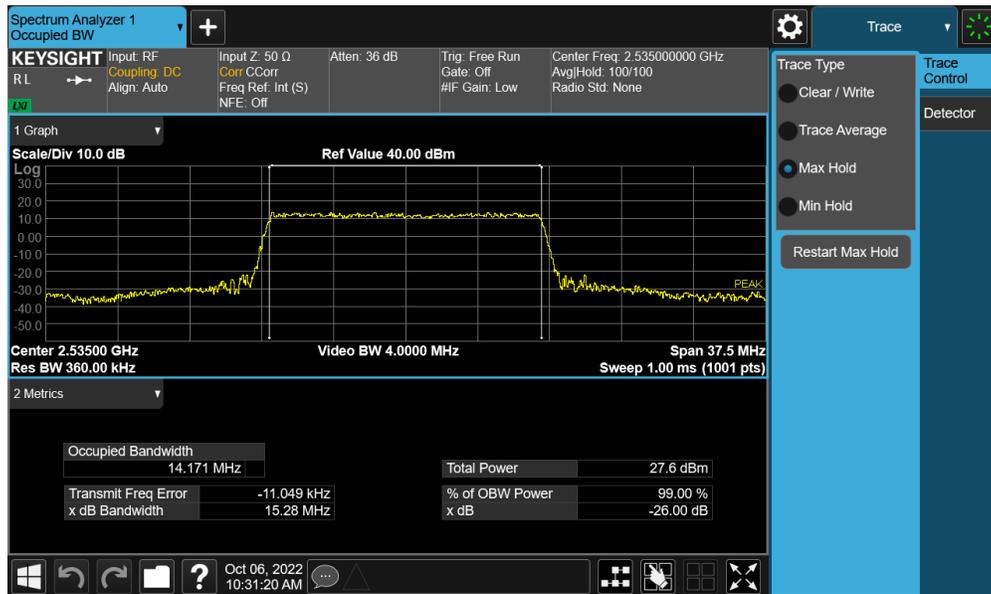


Plot 7-68. Occupied Bandwidth Plot (NR Band n7 - 15MHz $\pi/2$ BPSK - Full RB - Ant F)

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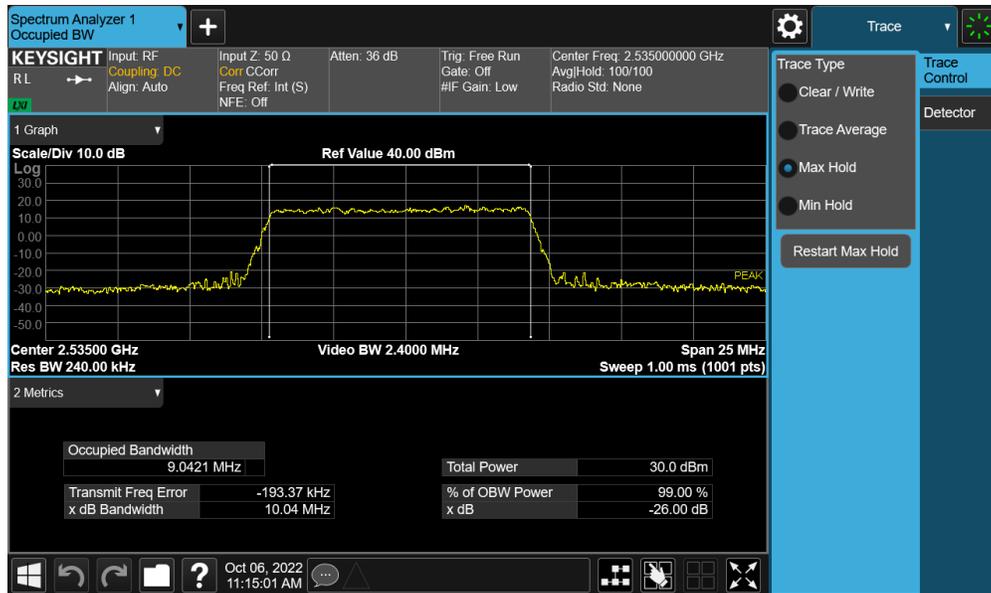


Plot 7-69. Occupied Bandwidth Plot (NR Band n7 - 15MHz QPSK - Full RB - Ant F)

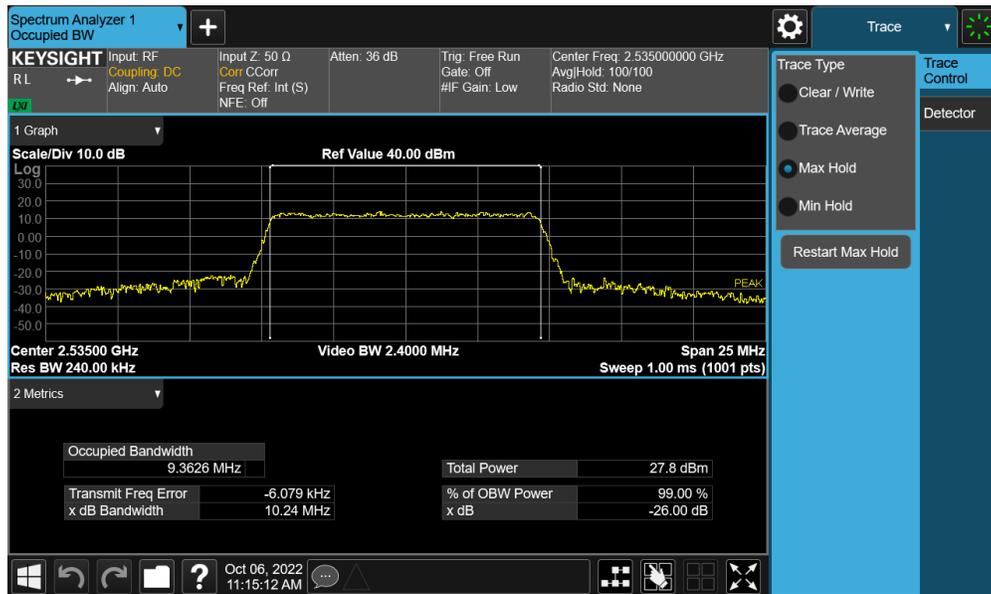


Plot 7-70. Occupied Bandwidth Plot (NR Band n7 - 15MHz 16-QAM - Full RB - Ant F)

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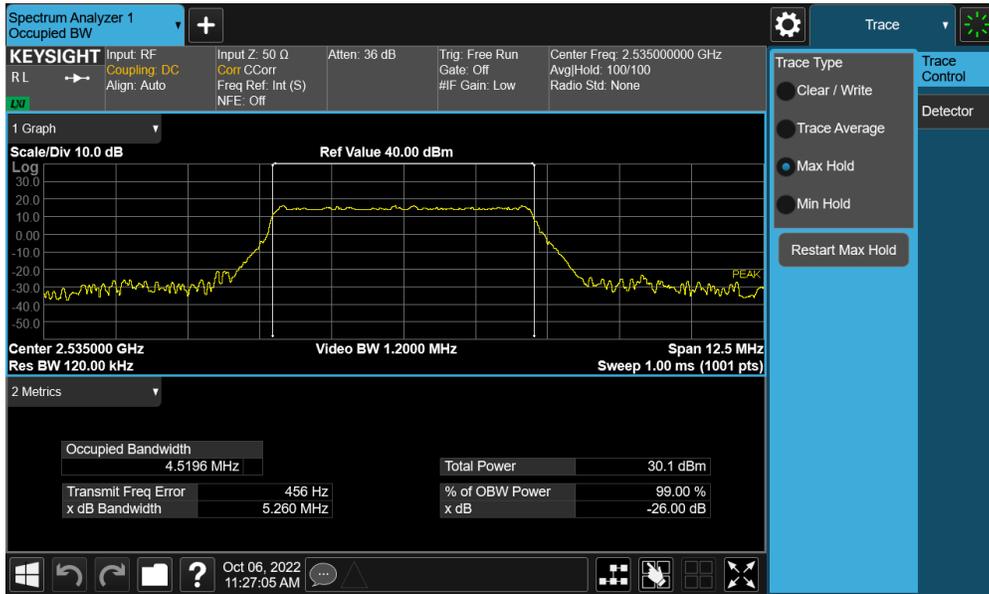
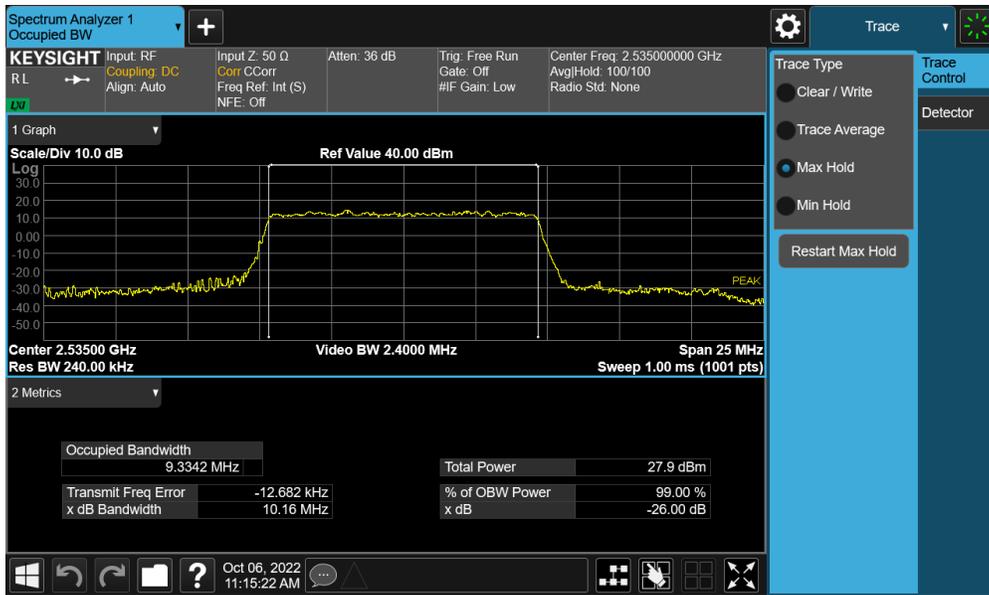


Plot 7-71. Occupied Bandwidth Plot (NR Band n7 - 10MHz $\pi/2$ BPSK - Full RB - Ant F)

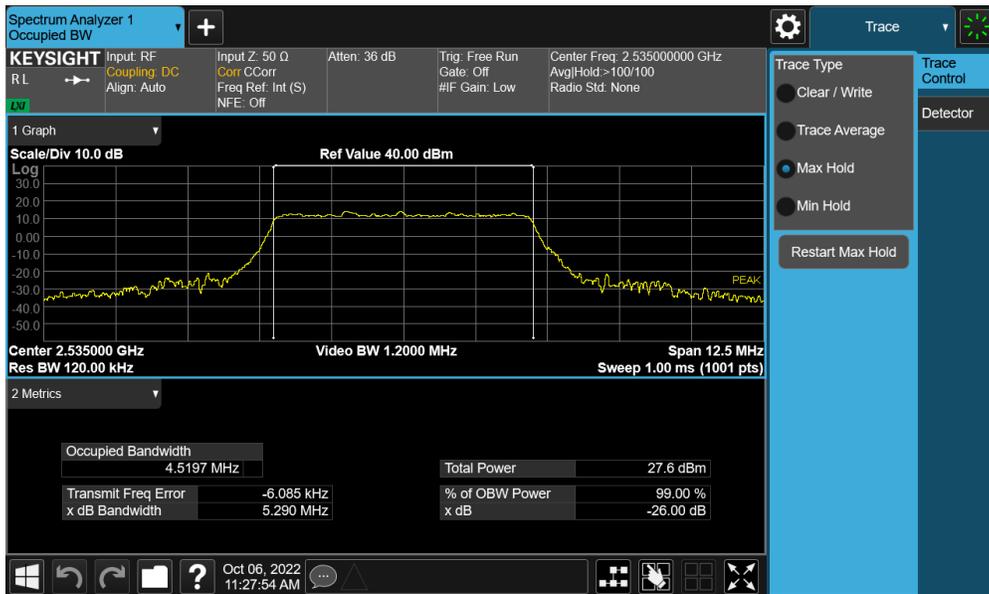
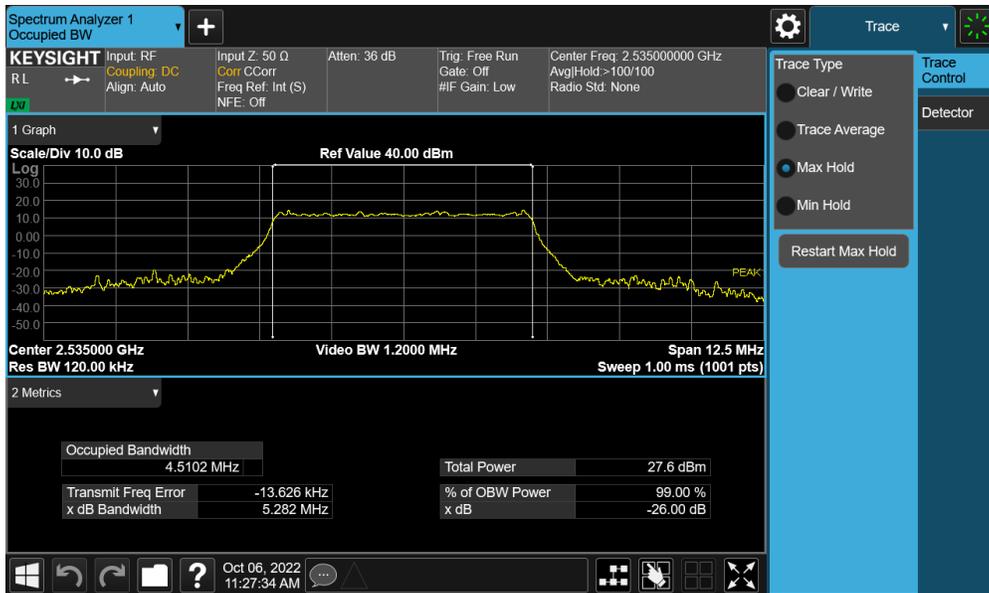


Plot 7-72. Occupied Bandwidth Plot (NR Band n7 - 10MHz QPSK - Full RB - Ant F)

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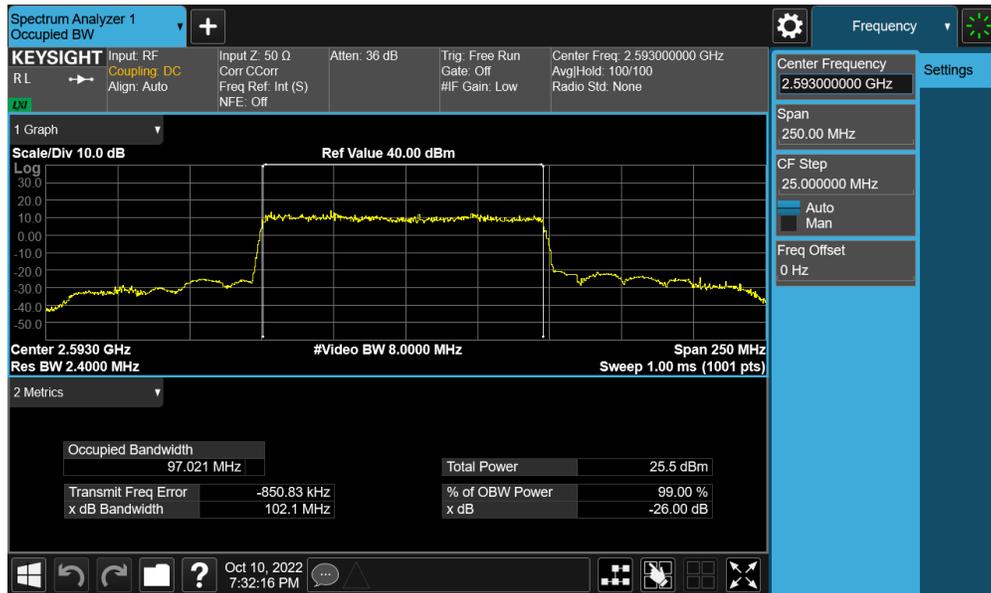


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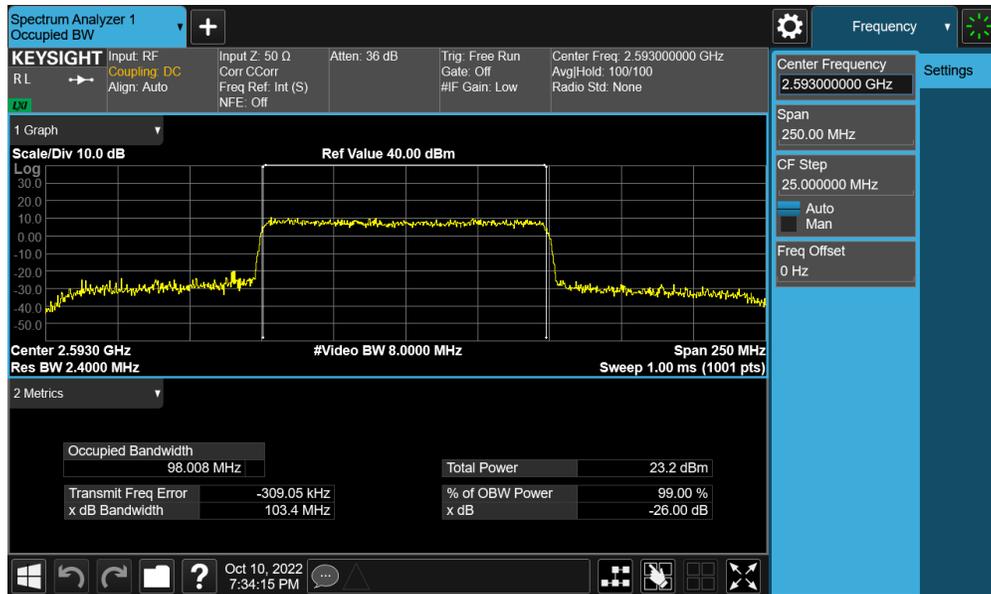


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NR Band n41 – Ant F

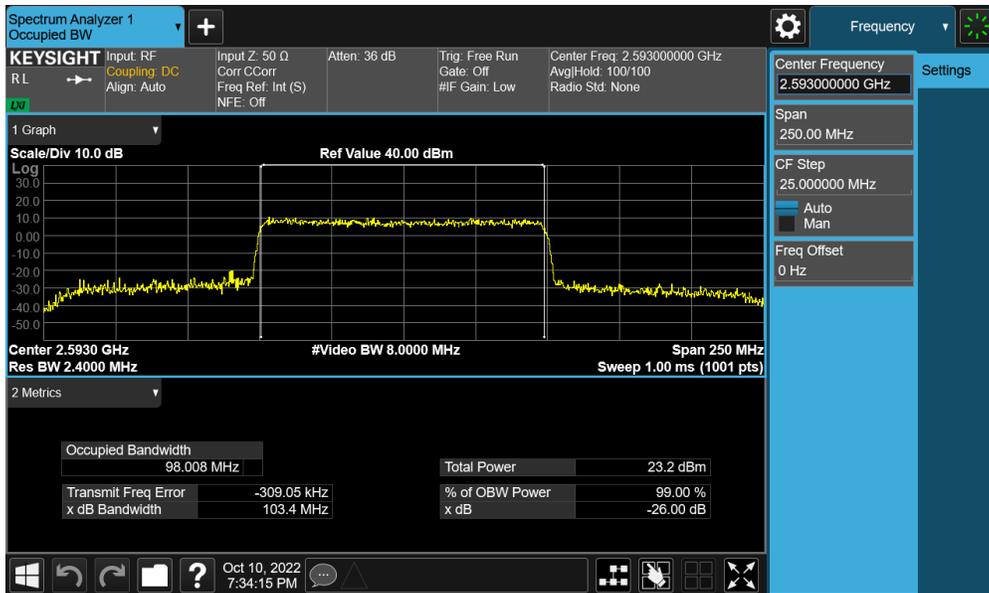


Plot 7-77. Occupied Bandwidth Plot (NR Band n41 - 100MHz $\pi/2$ BPSK - Full RB - Ant F)

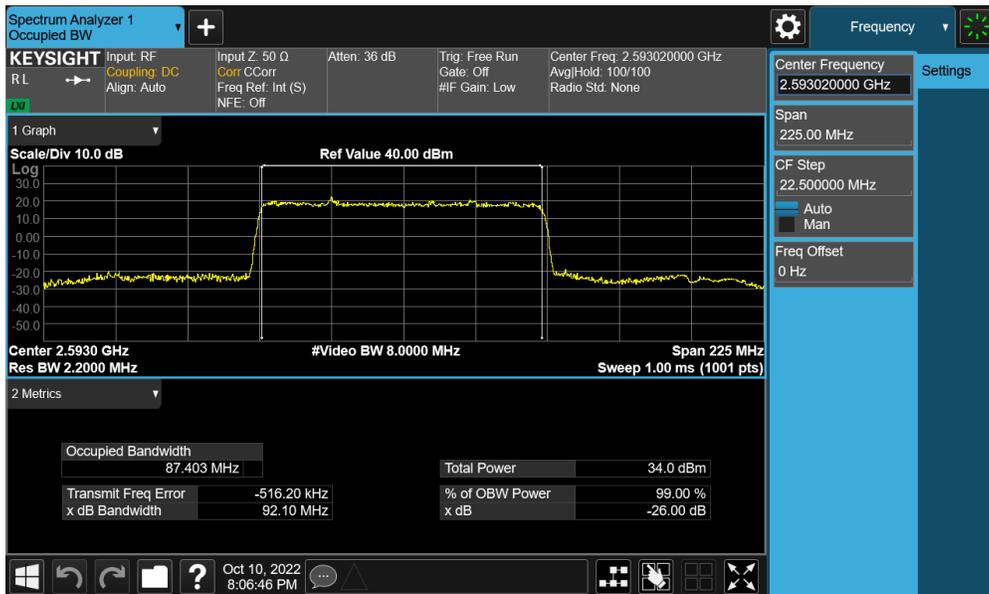


Plot 7-78. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB - Ant F)

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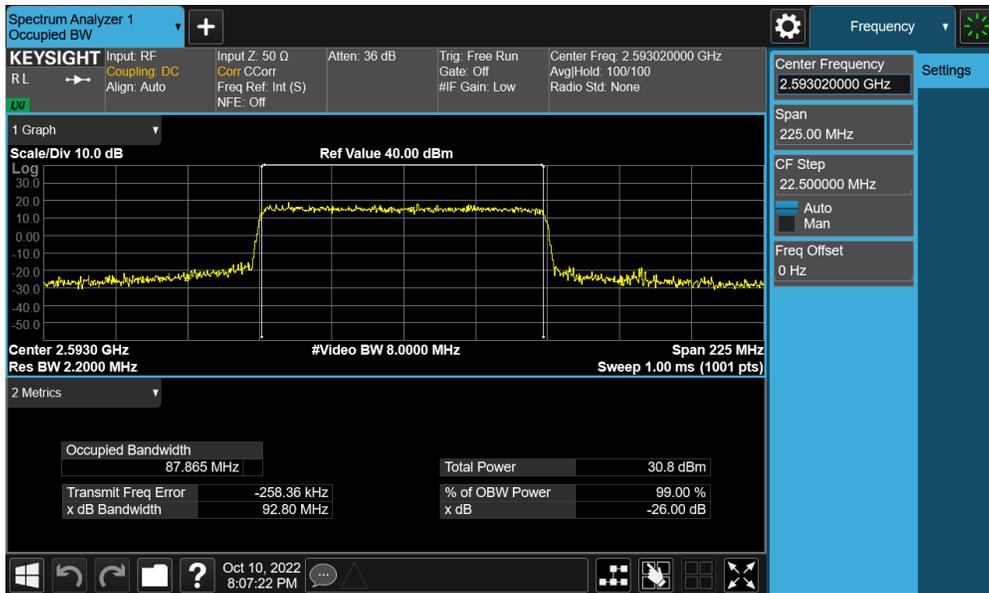


Plot 7-79. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant F)

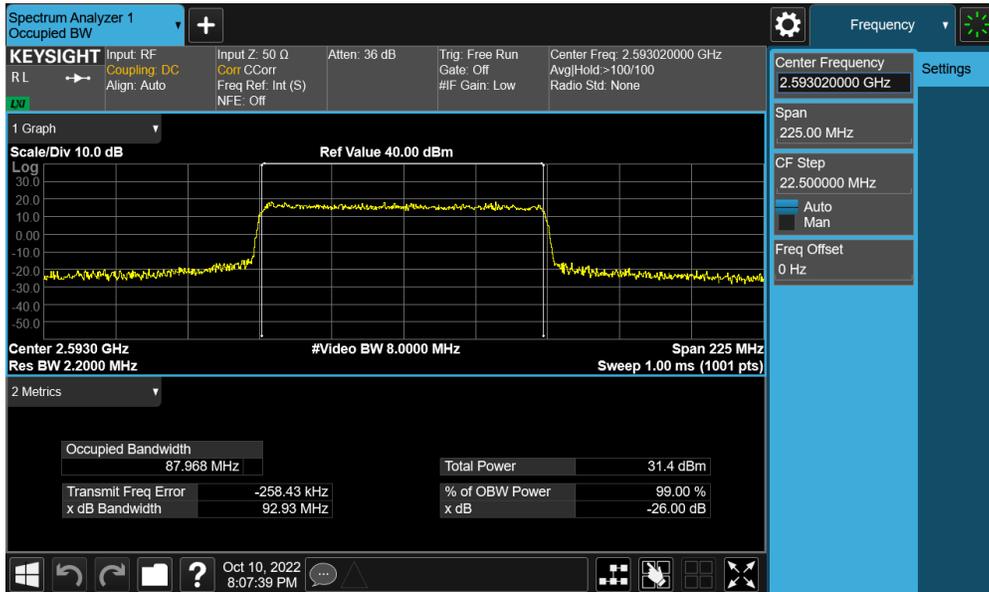


Plot 7-80. Occupied Bandwidth Plot (NR Band n41 - 90MHz $\pi/2$ BPSK - Full RB - Ant F)

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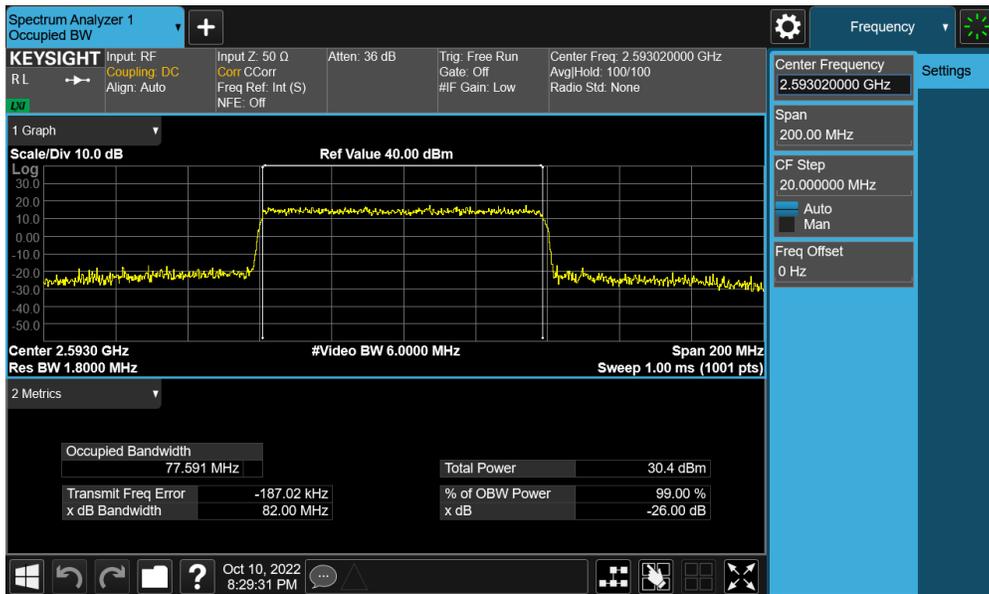
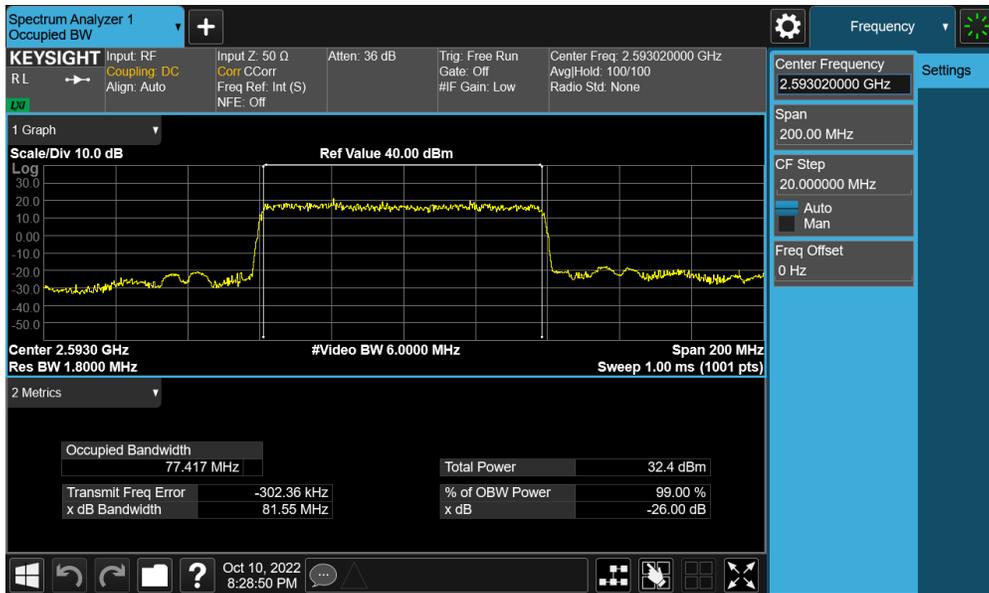


Plot 7-81. Occupied Bandwidth Plot (NR Band n41 - 90MHz QPSK - Full RB - Ant F)



Plot 7-82. Occupied Bandwidth Plot (NR Band n41 - 90MHz 16-QAM - Full RB - Ant F)

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