



ELEMENT WASHINGTON DC LLC

7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
<http://www.element.com>

PART 27 MEASUREMENT REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
10/27/2023 - 12/22/2023
Test Report Issue Date:
12/28/2023
Test Site/Location:
Element lab., Columbia, MD, USA
Test Report Serial No.:
1M2311010111-06.A3L

FCC ID:	A3LSMA356U
Applicant Name:	Samsung Electronics Co., Ltd.

Application Type:	Certification
Model:	SM-A356U
Additional Model(s):	SM-A356U1, SM-S356V
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part:	27
Test Procedure(s):	ANSI C63.26-2015

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



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 1 of 130



TABLE OF CONTENTS

1.0	INTRODUCTION	5
1.1	Scope	5
1.2	Element Test Location.....	5
1.3	Test Facility / Accreditations.....	5
2.0	PRODUCT INFORMATION.....	6
2.1	Equipment Description	6
2.2	Device Capabilities.....	6
2.3	Test Configuration	6
2.4	Software and Firmware	6
2.5	EMI Suppression Device(s)/Modifications	6
3.0	DESCRIPTION OF TESTS	7
3.1	Evaluation Procedure	7
3.2	Radiated Power and Radiated Spurious Emissions	7
4.0	MEASUREMENT UNCERTAINTY	8
5.0	TEST EQUIPMENT CALIBRATION DATA	9
6.0	SAMPLE CALCULATIONS	10
7.0	TEST RESULTS.....	11
7.1	Summary.....	11
7.2	Conducted Output Power Data	12
7.3	Occupied Bandwidth	17
7.4	Spurious and Harmonic Emissions at Antenna Terminal	56
7.5	Band Edge Emissions at Antenna Terminal.....	77
7.6	Peak-Average Ratio	92
7.7	Radiated Power (EIRP).....	99
7.8	Radiated Spurious Emissions Measurements.....	105
7.9	Frequency Stability / Temperature Variation	128
8.0	CONCLUSION.....	130

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 2 of 130

PART 27 MEASUREMENT REPORT

Antenna-1							
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator	
				Max. Power [W]	Max. Power [dBm]		
NR Band n77/78 PC2 (3450 - 3550MHz)	100 MHz	π/2 BPSK	3500.0	0.366	25.63	97M1G7D	
		QPSK	3500.0	0.397	25.98	97M9G7D	
		16QAM	3500.0	0.303	24.81	97M7W7D	
	90 MHz	π/2 BPSK	3495.0 - 3505.0	0.381	25.80	87M3G7D	
		QPSK	3495.0 - 3505.0	0.413	26.16	87M8G7D	
		16QAM	3495.0 - 3505.0	0.333	25.22	88M0W7D	
	80 MHz	π/2 BPSK	3490.0 - 3510.0	0.377	25.76	77M6G7D	
		QPSK	3490.0 - 3510.0	0.412	26.14	77M8G7D	
		16QAM	3490.0 - 3510.0	0.327	25.14	77M8W7D	
	70 MHz	π/2 BPSK	3485.0 - 3515.0	0.378	25.77	64M8G7D	
		QPSK	3485.0 - 3515.0	0.412	26.14	67M9G7D	
		16QAM	3485.0 - 3515.0	0.328	25.16	67M8W7D	
	60 MHz	π/2 BPSK	3480.0 - 3520.0	0.379	25.78	58M3G7D	
		QPSK	3480.0 - 3520.0	0.410	26.12	58M2G7D	
		16QAM	3480.0 - 3520.0	0.325	25.11	58M1W7D	
	50 MHz	π/2 BPSK	3475.0 - 3525.0	0.378	25.77	45M9G7D	
		QPSK	3475.0 - 3525.0	0.410	26.12	47M7G7D	
		16QAM	3475.0 - 3525.0	0.325	25.12	47M8W7D	
	40 MHz	π/2 BPSK	3470.0 - 3530.0	0.375	25.74	36M0G7D	
		QPSK	3470.0 - 3530.0	0.412	26.14	38M1G7D	
		16QAM	3470.0 - 3530.0	0.328	25.16	38M1W7D	
	30 MHz	π/2 BPSK	3465.0 - 3535.0	0.381	25.81	27M1G7D	
		QPSK	3465.0 - 3535.0	0.419	26.22	28M1G7D	
		16QAM	3465.0 - 3535.0	0.325	25.12	28M0W7D	
	25 MHz	π/2 BPSK	3712.5 - 3967.0	0.373	25.72	23M0W7D	
		QPSK	3712.5 - 3967.0	0.418	26.21	23M3W7D	
		16QAM	3712.5 - 3967.0	0.324	25.10	23M4W7D	
	20 MHz	π/2 BPSK	3460.0 - 3540.0	0.388	25.88	18M1G7D	
		QPSK	3460.0 - 3540.0	0.416	26.19	18M3G7D	
		16QAM	3460.0 - 3540.0	0.333	25.22	18M4W7D	
	15 MHz	π/2 BPSK	3457.5 - 3542.5	0.387	25.87	13M0G7D	
		QPSK	3457.5 - 3542.5	0.418	26.21	13M7G7D	
		16QAM	3457.5 - 3542.5	0.332	25.21	13M7W7D	
	10 MHz	π/2 BPSK	3455.0 - 3545.0	0.382	25.82	8M73G7D	
		QPSK	3455.0 - 3545.0	0.416	26.19	8M68G7D	
		16QAM	3455.0 - 3545.0	0.325	25.11	8M69W7D	
	NR Band n77 PC2 (3700 - 3980MHz) NR Band n78 PC2 (3700 - 3800MHz)	100 MHz	π/2 BPSK	3750.0 - 3930.0	0.557	27.46	97M0G7D
			QPSK	3750.0 - 3930.0	0.566	27.53	97M9G7D
			16QAM	3750.0 - 3930.0	0.435	26.38	97M7W7D
		90 MHz	π/2 BPSK	3745.0 - 3935.0	0.546	27.37	87M4G7D
			QPSK	3745.0 - 3935.0	0.546	27.37	87M9G7D
			16QAM	3745.0 - 3935.0	0.408	26.10	87M9W7D
		80 MHz	π/2 BPSK	3740.0 - 3940.0	0.551	27.41	77M6G7D
			QPSK	3740.0 - 3940.0	0.554	27.43	77M9G7D
			16QAM	3740.0 - 3940.0	0.441	26.44	78M1W7D
		70 MHz	π/2 BPSK	3735.0 - 3945.0	0.550	27.40	64M7G7D
			QPSK	3735.0 - 3945.0	0.559	27.47	67M9G7D
			16QAM	3735.0 - 3945.0	0.408	26.10	67M8W7D
60 MHz		π/2 BPSK	3730.0 - 3950.0	0.537	27.30	58M3G7D	
		QPSK	3730.0 - 3950.0	0.540	27.32	58M2G7D	
		16QAM	3730.0 - 3950.0	0.417	26.20	58M2W7D	
50 MHz		π/2 BPSK	3725.0 - 3955.0	0.529	27.23	46M0G7D	
		QPSK	3725.0 - 3955.0	0.538	27.31	47M7G7D	
		16QAM	3725.0 - 3955.0	0.411	26.14	47M7W7D	
40 MHz		π/2 BPSK	3720.0 - 3960.0	0.519	27.15	36M0G7D	
		QPSK	3720.0 - 3960.0	0.524	27.19	38M2G7D	
		16QAM	3720.0 - 3960.0	0.387	25.88	38M2W7D	
30 MHz		π/2 BPSK	3715.0 - 3965.0	0.514	27.11	27M1G7D	
		QPSK	3715.0 - 3965.0	0.520	27.16	28M1G7D	
		16QAM	3715.0 - 3965.0	0.397	25.99	28M1W7D	
25 MHz		π/2 BPSK	3712.5 - 3967.0	0.502	27.01	23M1W7D	
		QPSK	3712.5 - 3967.0	0.505	27.03	23M3W7D	
		16QAM	3712.5 - 3967.0	0.393	25.94	23M3W7D	
20 MHz		π/2 BPSK	3710.0 - 3970.0	0.501	27.00	18M1G7D	
		QPSK	3710.0 - 3970.0	0.505	27.03	18M3G7D	
		16QAM	3710.0 - 3970.0	0.401	26.03	18M4W7D	
15 MHz		π/2 BPSK	3707.5 - 3972.5	0.498	26.97	13M0G7D	
		QPSK	3707.5 - 3972.5	0.507	27.05	13M7G7D	
		16QAM	3707.5 - 3972.5	0.373	25.72	13M8W7D	
10 MHz		π/2 BPSK	3705.0 - 3975.0	0.507	27.05	8M69G7D	
		QPSK	3705.0 - 3975.0	0.509	27.07	8M73G7D	
		16QAM	3705.0 - 3975.0	0.400	26.02	8M71W7D	

EUT Overview (Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 3 of 130

Antenna-2					
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP	
				Max. Power [W]	Max. Power [dBm]
NR Band n77/78 PC2 (3450 - 3550MHz)	100 MHz	$\pi/2$ BPSK	3500.0	0.010	9.92
		QPSK	3500.0	0.010	9.97
		16QAM	3500.0	0.009	9.39
NR Band n77 PC2 (3700 - 3980MHz) NR Band n78 PC2 (3700 - 3800MHz)	100 MHz	$\pi/2$ BPSK	3750.0 - 3930.0	0.031	14.95
		QPSK	3750.0 - 3930.0	0.031	14.92
		16QAM	3750.0 - 3930.0	0.028	14.43

EUT Overview (Ant 2)

Antenna-3					
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP	
				Max. Power [W]	Max. Power [dBm]
NR Band n77/78 PC2 (3450 - 3550MHz)	100 MHz	$\pi/2$ BPSK	3500.0	0.046	16.62
		QPSK	3500.0	0.046	16.59
		16QAM	3500.0	0.036	15.59
NR Band n77 PC2 (3700 - 3980MHz) NR Band n78 PC2 (3700 - 3800MHz)	100 MHz	$\pi/2$ BPSK	3750.0 - 3930.0	0.057	17.57
		QPSK	3750.0 - 3930.0	0.057	17.54
		16QAM	3750.0 - 3930.0	0.045	16.51

EUT Overview (Ant 3)

Antenna-4					
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP	
				Max. Power [W]	Max. Power [dBm]
NR Band n77/78 PC2 (3450 - 3550MHz)	100 MHz	$\pi/2$ BPSK	3500.0	0.021	13.18
		QPSK	3500.0	0.019	12.76
		16QAM	3500.0	0.016	12.05
NR Band n77 PC2 (3700 - 3980MHz) NR Band n78 PC2 (3700 - 3800MHz)	100 MHz	$\pi/2$ BPSK	3750.0 - 3930.0	0.013	11.02
		QPSK	3750.0 - 3930.0	0.012	10.67
		16QAM	3750.0 - 3930.0	0.009	9.74

EUT Overview (Ant 4)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 4 of 130

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.

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 5 of 130

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMA356U**. 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.: 3596M, 3383M, 3597M, 2807M, 3437M

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), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz), Bluetooth (1x, EDR, LE), NFC

Band	Ant 1	Ant 2	Ant 3	Ant 4
NR n77/78 C-Band	Ant G	Ant B	Ant K	Ant L
NR n77/78 DoD	Ant G	Ant B	Ant K	Ant L

Table 2-1. Antenna Naming Convention

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.

2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version A356USQU0AWJ2 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.

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 6 of 130

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 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 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:

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

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 $P_g [dBm] - \text{cable loss} [dB]$.

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:

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

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. 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.

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 7 of 130

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

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 8 of 130



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
-	AP2-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-001
-	ETS-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-001
-	ETS-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-002
-	MD 1M 18-40	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	MD 1M 18-40
-	WL40-1	Conducted Cable Set (40GHz)	1/12/2023	Annual	1/12/2024	WL40-1
-	WL25-1	Conducted Cable Set (25GHz)	1/12/2023	Annual	1/12/2024	WL25-1
Anritsu	MA24406A	Microwave Peak Power Sensor	9/7/2023	Annual	9/7/2024	11240
Emco	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	7/5/2022	Biennial	7/5/2024	9203-2178
Pastermack	MNLC-2	Line Conducted Emission Cable (NM)	1/11/2023	Annual	1/11/2024	MNLC-2
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	8/11/2022	Biennial	8/11/2024	114451
ETS Lindgren	3116C	1-18 GHz DRG Horn Antenna	2/27/2023	Biennial	2/27/2024	00218893
ETS Lindgren	3115	Double Ridged Guide Horn	4/12/2022	Biennial	4/12/2024	82333
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	4/13/2022	Biennial	4/13/2025	121034
Keysight Technologies	N9020A	MXA Signal Analyzer	3/15/2023	Annual	3/15/2024	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	3/15/2023	Annual	3/15/2024	MY52350166
Keysight Technologies	N9030A	PXA Signal Analyzer	1/31/2023	Annual	1/31/2024	MY55410501
Keysight Technologies	N9030B	PXA Signal Analyzer, Multi-touch	9/7/2023	Annual	9/7/2024	MY57141001
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	9/25/2023	Annual	9/25/2024	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/11/2023	Annual	9/11/2024	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	3/1/2023	Annual	3/1/2024	101716
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	1/13/2023	Annual	1/13/2024	103200
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	2/21/2023	Biennial	2/21/2025	A051107
Sunol	JB6	LB6 Antenna	3/2/2023	Biennial	3/2/2025	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.

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 9 of 130

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.

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 10 of 130

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMA356U
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): NR

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 (NR Band n77/78)	2.1051, 27.53(l), 27.53(n)	≤ -13 dBm / MHz	PASS	Sections 7.4, 7.5
	Peak-to-Average Ratio (NR Band n77/78)	27.50(j)(4), 27.50(k)(4)	≤ 13 dB	PASS	Section 7.6
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block.	PASS	Section 7.9
RADIATED	Effective Radiated Power / Equivalent Isotropic Radiated Power (NR Band n77/78)	27.50(j)(3), 27.50(k)(3)	≤ 1 Watt EIRP	PASS	Section 7.7
	Radiated Spurious Emissions (NR Band n77/78)	2.1053, 27.53(l), 27.53(n)	≤ -13 dBm / MHz	PASS	Section 7.8

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 v1.2.2.

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 11 of 130

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.

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.

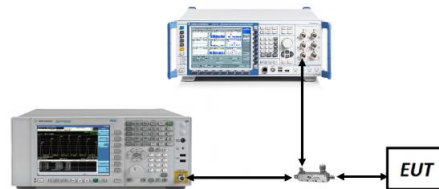


Figure 7-1. Test Instrument & Measurement Setup

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. Conducted power was found to reduce for the higher order QAM modulations when compared to 16QAM. Due to this trend, only the worst-case QAM (16QAM) powers are included in this section.

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 12 of 130



Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	65000	3750.00	1 / 271	26.19
		65600	3840.00	1 / 136	26.30
		66200	3930.00	1 / 1	26.31
	QPSK	65000	3750.00	1 / 271	26.19
		65600	3840.00	1 / 136	26.42
		66200	3930.00	1 / 1	26.34
	16-QAM	65000	3750.00	1 / 271	25.08
		65600	3840.00	1 / 136	25.37
		66200	3930.00	1 / 1	25.42
90 MHz	π/2 BPSK	649668	3745.02	1 / 243	26.09
		65600	3840.00	1 / 122	26.31
		662332	3934.98	1 / 1	26.22
	QPSK	649668	3745.02	1 / 243	26.10
		65600	3840.00	1 / 122	26.41
		662332	3934.98	1 / 1	26.18
	16-QAM	649668	3745.02	1 / 243	25.21
		65600	3840.00	1 / 122	25.31
		662332	3934.98	1 / 1	25.14
80 MHz	π/2 BPSK	649334	3740.01	1 / 215	26.10
		65600	3840.00	1 / 108	26.32
		662666	3939.99	1 / 1	26.26
	QPSK	649334	3740.01	1 / 215	26.12
		65600	3840.00	1 / 108	26.43
		662666	3939.99	1 / 1	26.24
	16-QAM	649334	3740.01	1 / 215	25.26
		65600	3840.00	1 / 108	25.36
		662666	3939.99	1 / 1	25.48
70 MHz	π/2 BPSK	649000	3735.00	1 / 94	26.08
		65600	3840.00	1 / 94	26.41
		663000	3945.00	1 / 1	26.25
	QPSK	649000	3735.00	1 / 94	26.11
		65600	3840.00	1 / 94	26.50
		663000	3945.00	1 / 1	26.28
	16-QAM	649000	3735.00	1 / 94	25.08
		65600	3840.00	1 / 94	25.47
		663000	3945.00	1 / 1	25.14
60 MHz	π/2 BPSK	648668	3730.02	1 / 81	26.12
		65600	3840.00	1 / 160	26.49
		663332	3949.98	1 / 1	26.15
	QPSK	648668	3730.02	1 / 81	26.22
		65600	3840.00	1 / 160	26.50
		663332	3949.98	1 / 1	26.13
	16-QAM	648668	3730.02	1 / 81	25.22
		65600	3840.00	1 / 160	25.51
		663332	3949.98	1 / 1	25.24
50 MHz	π/2 BPSK	648334	3725.01	1 / 131	26.03
		65600	3840.00	1 / 131	26.50
		663666	3954.99	1 / 1	26.08
	QPSK	648334	3725.01	1 / 131	26.53
		65600	3840.00	1 / 131	26.53
		663666	3954.99	1 / 1	26.12
	16-QAM	648334	3725.01	1 / 131	25.02
		65600	3840.00	1 / 131	25.59
		663666	3954.99	1 / 1	25.18
40 MHz	π/2 BPSK	648000	3720.00	1 / 104	26.13
		65600	3840.00	1 / 104	26.51
		664000	3960.00	1 / 1	26.00
	QPSK	648000	3720.00	1 / 104	26.14
		65600	3840.00	1 / 104	26.55
		664000	3960.00	1 / 1	26.00
	16-QAM	648000	3720.00	1 / 104	25.21
		65600	3840.00	1 / 104	25.59
		664000	3960.00	1 / 1	24.92
30 MHz	π/2 BPSK	647668	3715.02	1 / 39	26.05
		65600	3840.00	1 / 76	26.50
		664332	3964.98	1 / 1	25.96
	QPSK	647668	3715.02	1 / 39	26.06
		65600	3840.00	1 / 76	26.55
		664332	3964.98	1 / 1	25.97
	16-QAM	647668	3715.02	1 / 39	25.22
		65600	3840.00	1 / 76	25.58
		664332	3964.98	1 / 1	25.03
25 MHz	π/2 BPSK	647500	3712.50	1 / 32	26.09
		65600	3840.00	1 / 63	26.50
		664500	3967.50	1 / 1	25.86
	QPSK	647500	3712.50	1 / 32	26.09
		65600	3840.00	1 / 63	26.51
		664500	3967.50	1 / 1	25.84
	16-QAM	647500	3712.50	1 / 32	25.05
		65600	3840.00	1 / 63	25.50
		664500	3967.50	1 / 1	24.98
20 MHz	π/2 BPSK	647334	3710.01	1 / 25	26.03
		65600	3840.00	1 / 49	26.50
		664666	3969.99	1 / 1	25.85
	QPSK	647334	3710.01	1 / 25	26.05
		65600	3840.00	1 / 49	26.50
		664666	3969.99	1 / 1	25.84
	16-QAM	647334	3710.01	1 / 25	25.07
		65600	3840.00	1 / 49	25.38
		664666	3969.99	1 / 1	25.07
15 MHz	π/2 BPSK	647168	3707.52	1 / 19	26.07
		65600	3840.00	1 / 36	26.47
		664832	3972.48	1 / 1	25.82
	QPSK	647168	3707.52	1 / 19	26.05
		65600	3840.00	1 / 36	26.50
		664832	3972.48	1 / 1	25.86
	16-QAM	647168	3707.52	1 / 19	24.98
		65600	3840.00	1 / 36	25.54
		664832	3972.48	1 / 1	24.76
10 MHz	π/2 BPSK	647000	3705.00	1 / 12	26.04
		65600	3840.00	1 / 22	26.45
		665000	3975.00	1 / 1	25.90
	QPSK	647000	3705.00	1 / 12	26.07
		65600	3840.00	1 / 22	26.46
		665000	3975.00	1 / 1	25.88
	16-QAM	647000	3705.00	1 / 12	25.07
		65600	3840.00	1 / 22	25.54
		665000	3975.00	1 / 1	25.06

Table 7-2. Conducted Power Measurement (NR n77/78 PC2 C-Band) – Ant 1

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 13 of 130



Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	n/2 BPSK	633334	3500.01	1 / 1	25.97
	QPSK	633334	3500.01	1 / 1	25.95
	16-QAM	633334	3500.01	1 / 1	24.85
90 MHz	n/2 BPSK	633000	3495.00	1 / 1	26.14
		633334	3500.01	1 / 122	25.95
		633666	3504.99	1 / 122	26.08
	QPSK	633000	3495.00	1 / 1	26.13
		633334	3500.01	1 / 122	26.08
		633666	3504.99	1 / 122	26.05
	16-QAM	633000	3495.00	1 / 1	25.26
		633334	3500.01	1 / 122	25.00
		633666	3504.99	1 / 122	25.07
80 MHz	n/2 BPSK	632668	3490.02	1 / 108	26.10
		633334	3500.01	1 / 108	25.95
		634000	3510.00	1 / 1	25.94
	QPSK	632668	3490.02	1 / 108	26.11
		633334	3500.01	1 / 108	26.08
		634000	3510.00	1 / 1	25.97
	16-QAM	632668	3490.02	1 / 108	25.18
		633334	3500.01	1 / 108	25.01
		634000	3510.00	1 / 1	25.02
70 MHz	n/2 BPSK	632334	3485.01	1 / 1	26.11
		633334	3500.01	1 / 94	25.95
		634332	3514.98	1 / 94	25.97
	QPSK	632334	3485.01	1 / 1	26.11
		633334	3500.01	1 / 94	25.96
		634332	3514.98	1 / 94	26.11
	16-QAM	632334	3485.01	1 / 1	25.20
		633334	3500.01	1 / 94	25.13
		634332	3514.98	1 / 94	24.96
60 MHz	n/2 BPSK	632000	3480.00	1 / 1	26.08
		633334	3500.01	1 / 81	26.12
		634666	3519.99	1 / 81	25.99
	QPSK	632000	3480.00	1 / 1	26.09
		633334	3500.01	1 / 81	26.05
		634666	3519.99	1 / 81	25.95
	16-QAM	632000	3480.00	1 / 1	24.95
		633334	3500.01	1 / 81	25.15
		634666	3519.99	1 / 81	25.05
50 MHz	n/2 BPSK	631668	3475.02	1 / 1	26.11
		633334	3500.01	1 / 66	25.94
		635000	3525.00	1 / 66	26.00
	QPSK	631668	3475.02	1 / 1	26.09
		633334	3500.01	1 / 66	26.05
		635000	3525.00	1 / 66	26.01
	16-QAM	631668	3475.02	1 / 1	25.03
		633334	3500.01	1 / 66	25.16
		635000	3525.00	1 / 66	25.03
40 MHz	n/2 BPSK	631334	3470.01	1 / 53	26.08
		633334	3500.01	1 / 1	25.97
		635332	3529.98	1 / 53	26.06
	QPSK	631334	3470.01	1 / 53	26.11
		633334	3500.01	1 / 1	26.01
		635332	3529.98	1 / 53	26.01
	16-QAM	631334	3470.01	1 / 53	25.01
		633334	3500.01	1 / 1	25.04
		635332	3529.98	1 / 53	25.20
30 MHz	n/2 BPSK	631000	3465.00	1 / 1	26.15
		633334	3500.01	1 / 39	26.07
		635666	3534.99	1 / 39	26.13
	QPSK	631000	3465.00	1 / 1	26.19
		633334	3500.01	1 / 39	26.04
		635666	3534.99	1 / 39	26.10
	16-QAM	631000	3465.00	1 / 1	25.14
		633334	3500.01	1 / 39	25.00
		635666	3534.99	1 / 39	25.16
25 MHz	n/2 BPSK	630834	3462.51	1 / 32	26.15
		633334	3500.01	1 / 1	26.00
		635832	3537.48	1 / 32	26.06
	QPSK	630834	3462.51	1 / 32	26.18
		633334	3500.01	1 / 1	26.00
		635832	3537.48	1 / 32	26.07
	16-QAM	630834	3462.51	1 / 32	25.06
		633334	3500.01	1 / 1	25.06
		635832	3537.48	1 / 32	25.14
20 MHz	n/2 BPSK	630668	3460.02	1 / 1	26.22
		633334	3500.01	1 / 1	26.00
		636000	3540.00	1 / 25	26.08
	QPSK	630668	3460.02	1 / 1	26.16
		633334	3500.01	1 / 1	26.02
		636000	3540.00	1 / 25	26.03
	16-QAM	630668	3460.02	1 / 1	25.26
		633334	3500.01	1 / 1	24.91
		636000	3540.00	1 / 25	25.04
15 MHz	n/2 BPSK	630500	3457.50	1 / 19	26.21
		633334	3500.01	1 / 19	26.06
		636166	3542.49	1 / 19	26.06
	QPSK	630500	3457.50	1 / 19	26.18
		633334	3500.01	1 / 19	26.00
		636166	3542.49	1 / 19	26.09
	16-QAM	630500	3457.50	1 / 19	25.25
		633334	3500.01	1 / 19	24.95
		636166	3542.49	1 / 19	25.07
10 MHz	n/2 BPSK	630334	3455.01	1 / 1	26.16
		633334	3500.01	1 / 12	26.05
		636332	3544.98	1 / 1	26.03
	QPSK	630334	3455.01	1 / 1	26.16
		633334	3500.01	1 / 12	26.04
		636332	3544.98	1 / 1	26.07
	16-QAM	630334	3455.01	1 / 1	25.08
		633334	3500.01	1 / 12	25.12
		636332	3544.98	1 / 1	25.15

Table 7-3. Conducted Power Measurement (NR n77/78 PC2 DoD) – Ant 1

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 14 of 130

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	650000	3750.00	1 / 136	22.82
		656000	3840.00	1 / 136	22.35
		662000	3930.00	1 / 136	21.94
	QPSK	650000	3750.00	1 / 136	22.95
		656000	3840.00	1 / 136	22.57
		662000	3930.00	1 / 136	21.99
	16-QAM	650000	3750.00	1 / 136	22.37
		656000	3840.00	1 / 136	21.84
		662000	3930.00	1 / 136	21.19

Table 7-4. Conducted Power Measurement (NR n77/78 PC2 C-Band) – Ant 2

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	633334	3500.01	1 / 204	22.24
	QPSK	633334	3500.01	1 / 204	21.96
	16-QAM	633334	3500.01	1 / 204	21.38

Table 7-5. Conducted Power Measurement (NR n77/78 PC2 DoD) – Ant 2

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	650000	3750.00	1 / 271	24.36
		656000	3840.00	1 / 136	24.72
		662000	3930.00	1 / 136	24.68
	QPSK	650000	3750.00	1 / 271	24.57
		656000	3840.00	1 / 136	24.71
		662000	3930.00	1 / 136	24.40
	16-QAM	650000	3750.00	1 / 271	23.82
		656000	3840.00	1 / 136	24.40
		662000	3930.00	1 / 136	24.17

Table 7-6. Conducted Power Measurement (NR n77/78 PC2 C-Band) – Ant 3

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 15 of 130

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	$\pi/2$ BPSK	633334	3500.01	1 / 136	24.38
	QPSK	633334	3500.01	1 / 136	24.13
	16-QAM	633334	3500.01	1 / 136	23.79

Table 7-7. Conducted Power Measurement (NR n77/78 PC2 DoD) – Ant 3

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	$\pi/2$ BPSK	650000	3750.00	1 / 136	22.47
		656000	3840.00	1 / 136	21.08
		662000	3930.00	1 / 136	21.15
	QPSK	650000	3750.00	1 / 136	22.46
		656000	3840.00	1 / 136	21.23
		662000	3930.00	1 / 136	21.10
	16-QAM	650000	3750.00	1 / 136	21.42
		656000	3840.00	1 / 136	20.32
		662000	3930.00	1 / 136	20.07

Table 7-8. Conducted Power Measurement (NR n77/78 PC2 C-Band) – Ant 4

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	$\pi/2$ BPSK	633334	3500.01	1 / 271	21.58
	QPSK	633334	3500.01	1 / 271	21.54
	16-QAM	633334	3500.01	1 / 271	20.65

Table 7-9. Conducted Power Measurement (NR n77/78 PC2 DoD) – Ant 4

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 16 of 130

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 $\geq 3 \times$ 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.

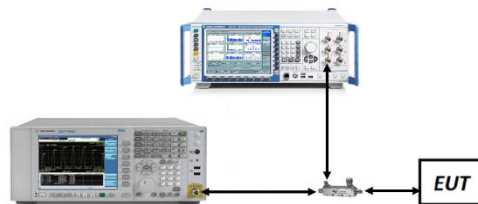


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

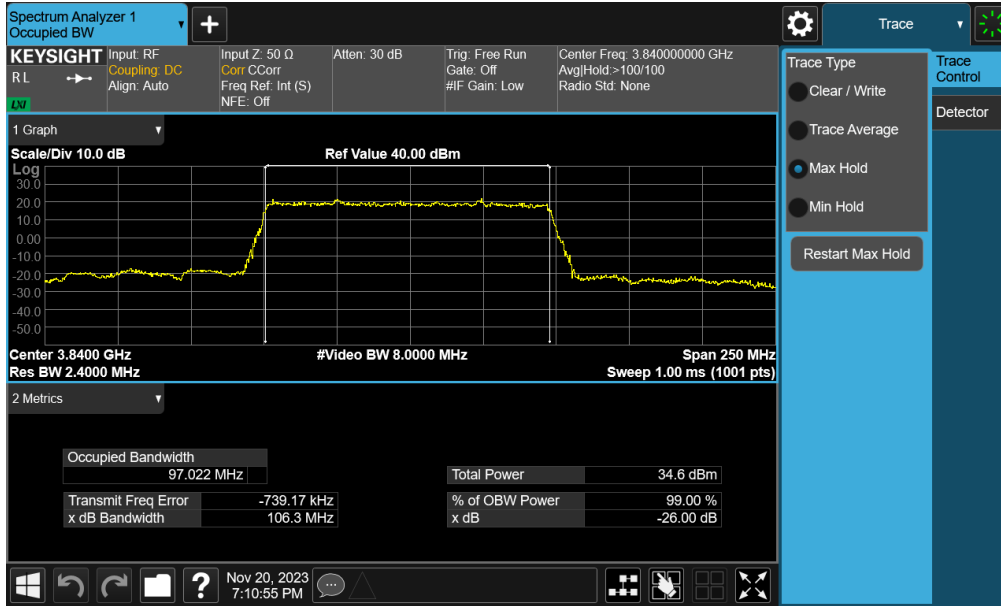
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 17 of 130

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n77/78 PC2 C-Band	100MHz	$\pi/2$ BPSK	97.02
		QPSK	97.93
		16QAM	97.72
	90MHz	$\pi/2$ BPSK	87.44
		QPSK	87.90
		16QAM	87.94
	80MHz	$\pi/2$ BPSK	77.60
		QPSK	77.86
		16QAM	78.09
	70MHz	$\pi/2$ BPSK	64.67
		QPSK	67.93
		16QAM	67.80
	60MHz	$\pi/2$ BPSK	58.29
		QPSK	58.25
		16QAM	58.19
	50MHz	$\pi/2$ BPSK	46.05
		QPSK	47.83
		16QAM	47.71
	40MHz	$\pi/2$ BPSK	36.03
		QPSK	38.17
		16QAM	38.16
	30MHz	$\pi/2$ BPSK	27.05
		QPSK	28.10
		16QAM	28.08
	25MHz	$\pi/2$ BPSK	23.06
		QPSK	23.33
		16QAM	23.35
20MHz	$\pi/2$ BPSK	18.07	
	QPSK	18.33	
	16QAM	18.39	
15MHz	$\pi/2$ BPSK	13.00	
	QPSK	13.68	
	16QAM	13.81	
10MHz	$\pi/2$ BPSK	8.69	
	QPSK	8.73	
	16QAM	8.71	

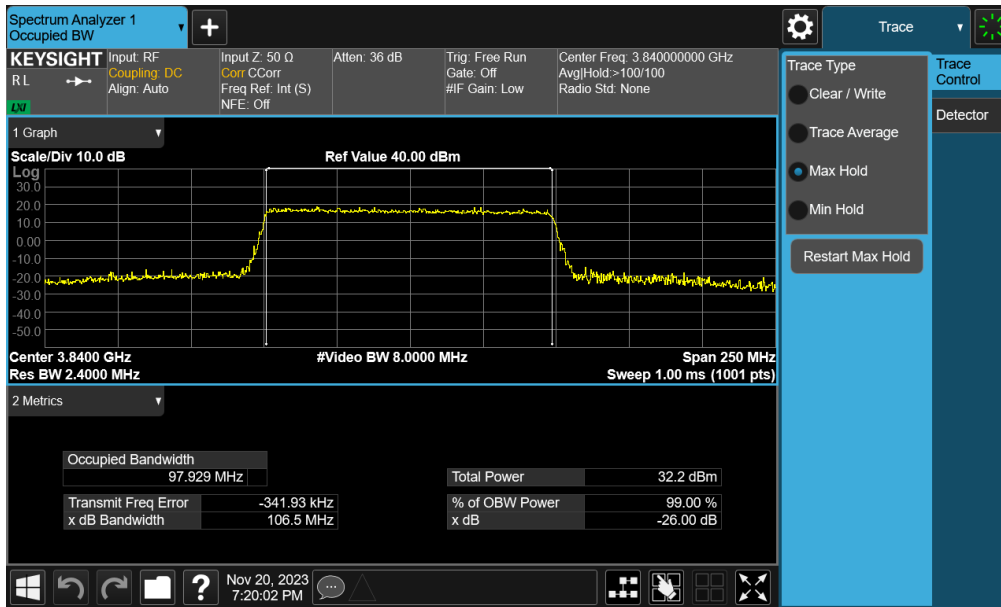
Table 7-10. Occupied Bandwidth Test Results – NR Band n77/78 PC2 C-Band – Ant 1

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 18 of 130

NR Band n77/78 PC2 C-Band – Ant 1

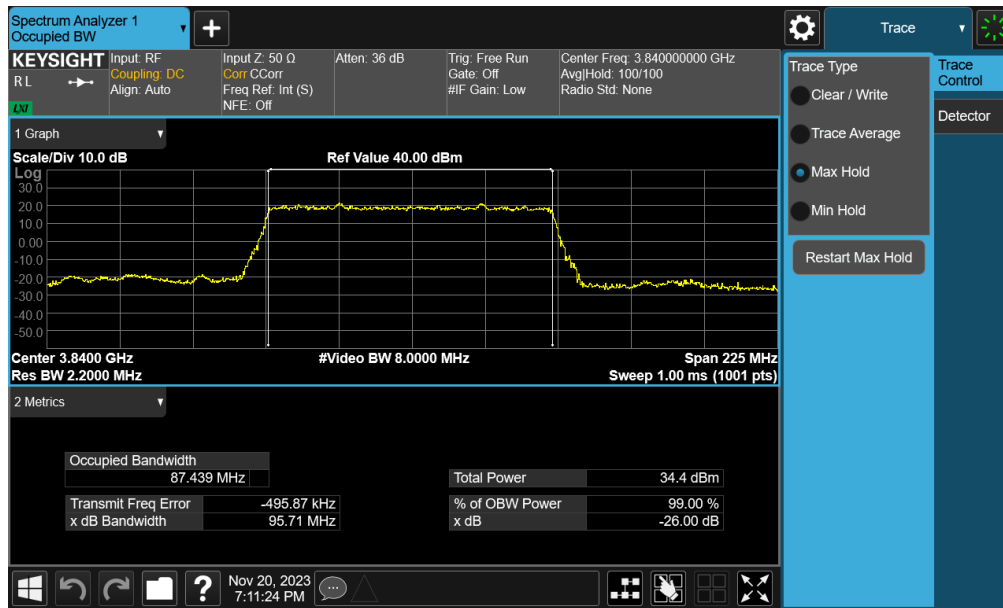
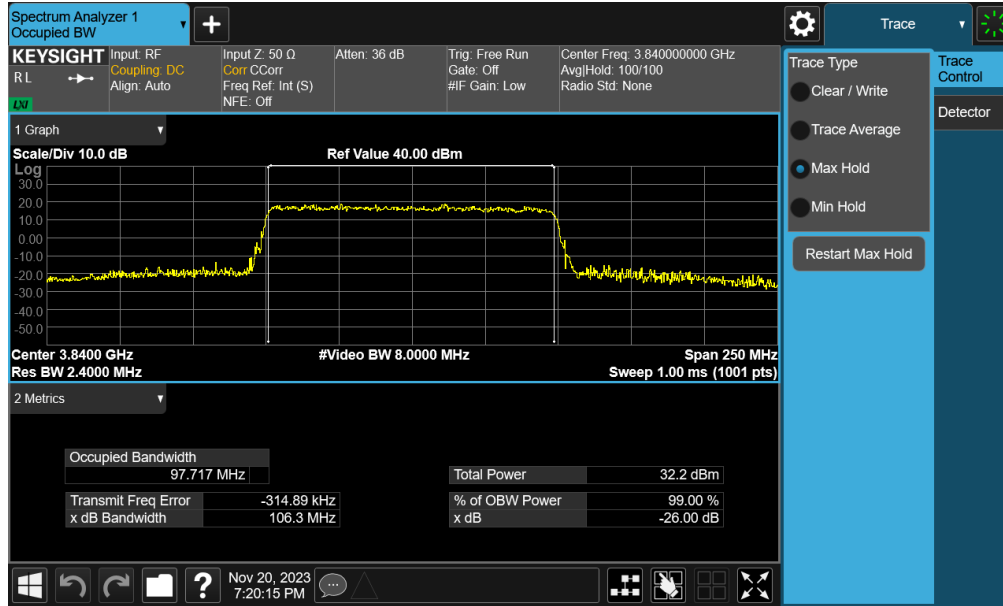


Plot 7-1. Occupied Bandwidth Plot (NR Band n77/78 - 100MHz $\pi/2$ BPSK - Full RB - Ant 1)



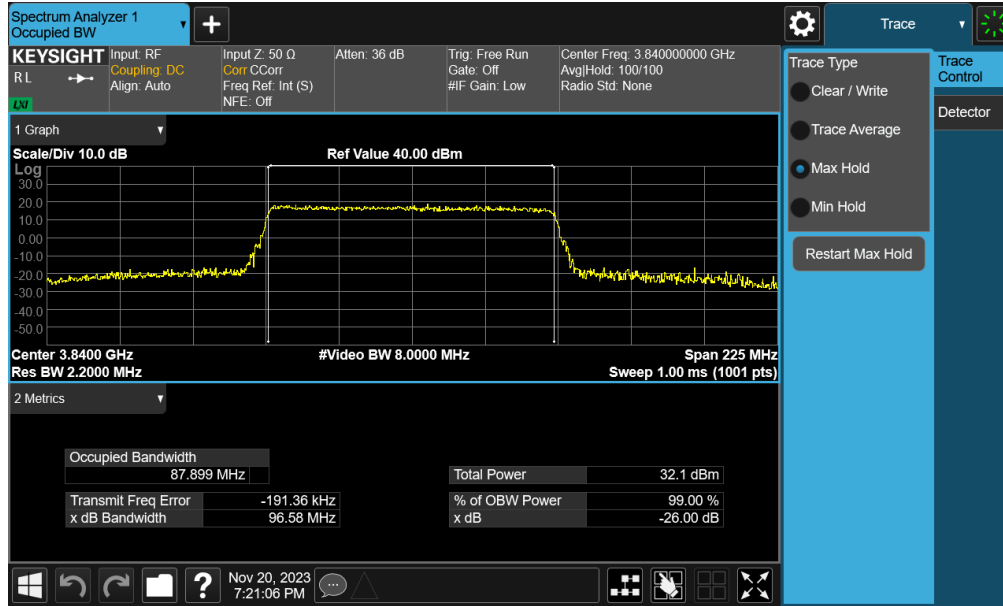
Plot 7-2. Occupied Bandwidth Plot (NR Band n77/78 - 100MHz QPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 19 of 130

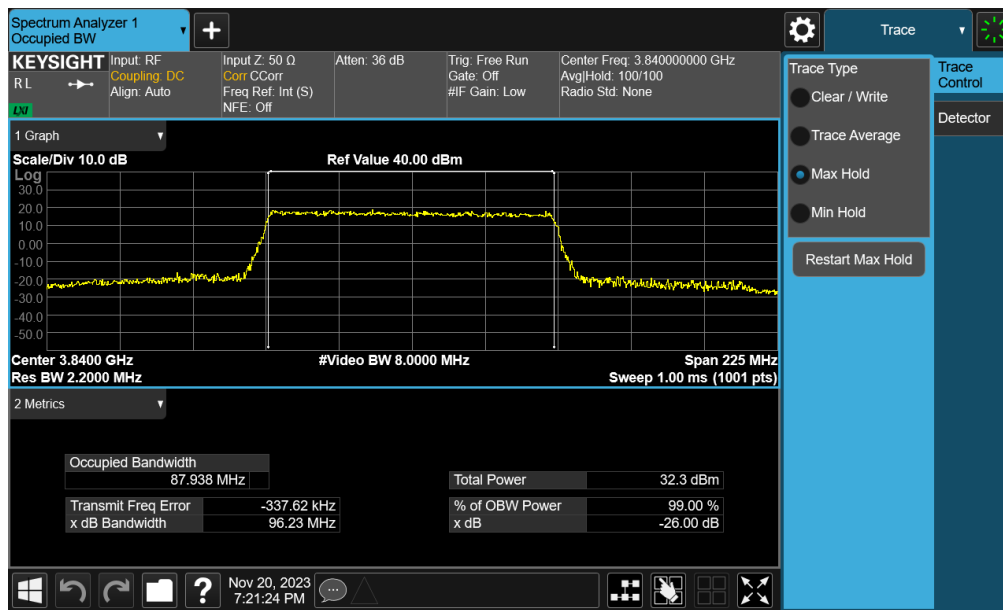


Plot 7-4. Occupied Bandwidth Plot (NR Band n7778 - 90MHz $\pi/2$ BPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 20 of 130

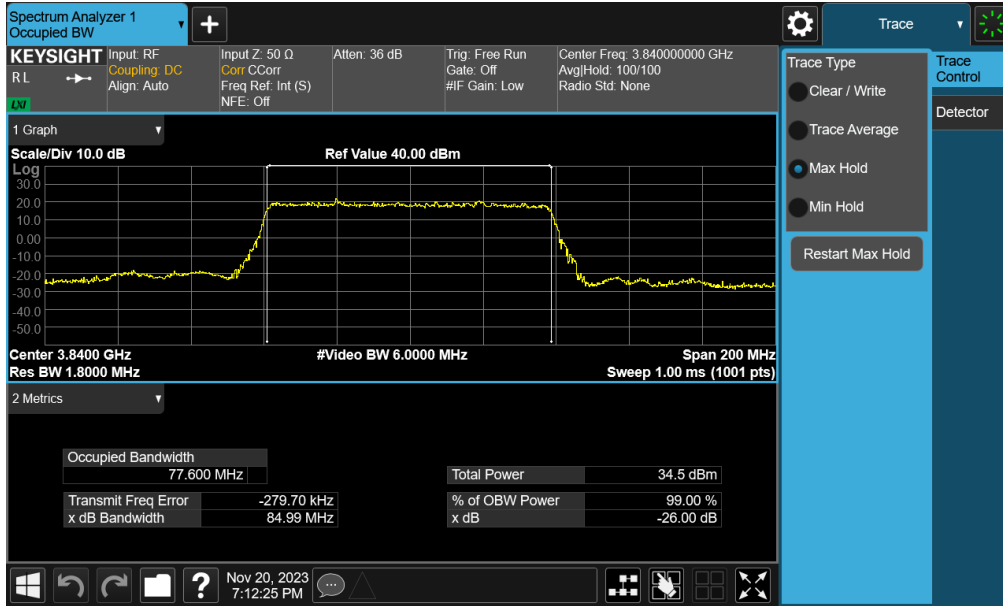


Plot 7-5. Occupied Bandwidth Plot (NR Band n7778 - 90MHz QPSK - Full RB - Ant 1)

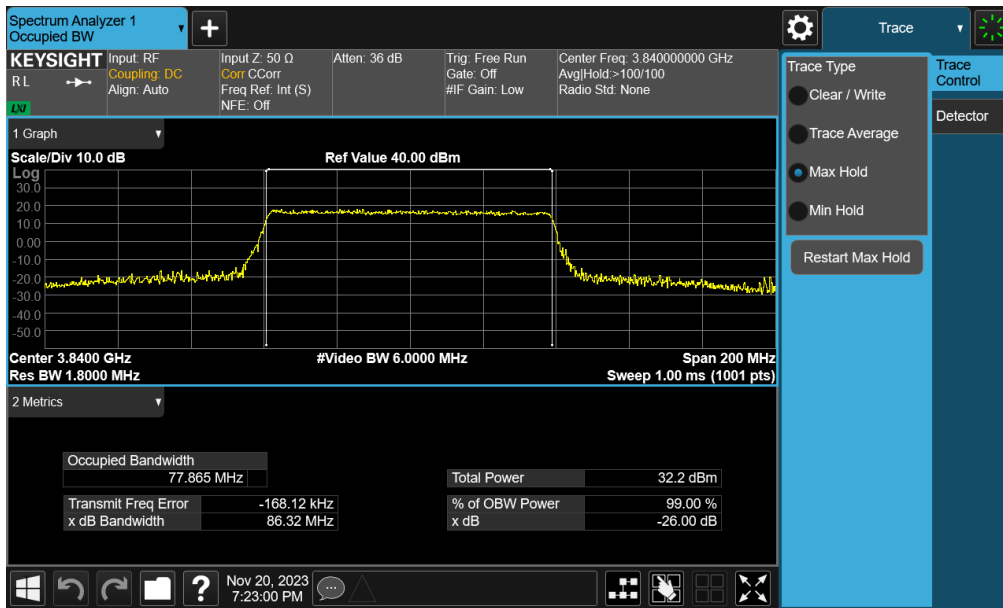


Plot 7-6. Occupied Bandwidth Plot (NR Band n7778 - 90MHz 16-QAM - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 21 of 130

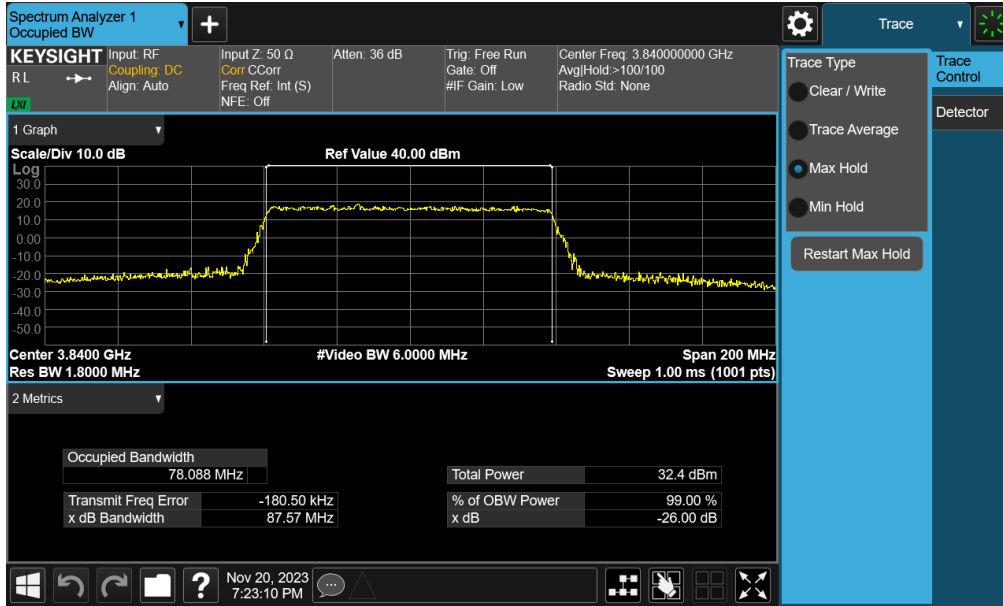


Plot 7-7. Occupied Bandwidth Plot (NR Band n77/78 - 80MHz $\pi/2$ BPSK - Full RB - Ant 1)

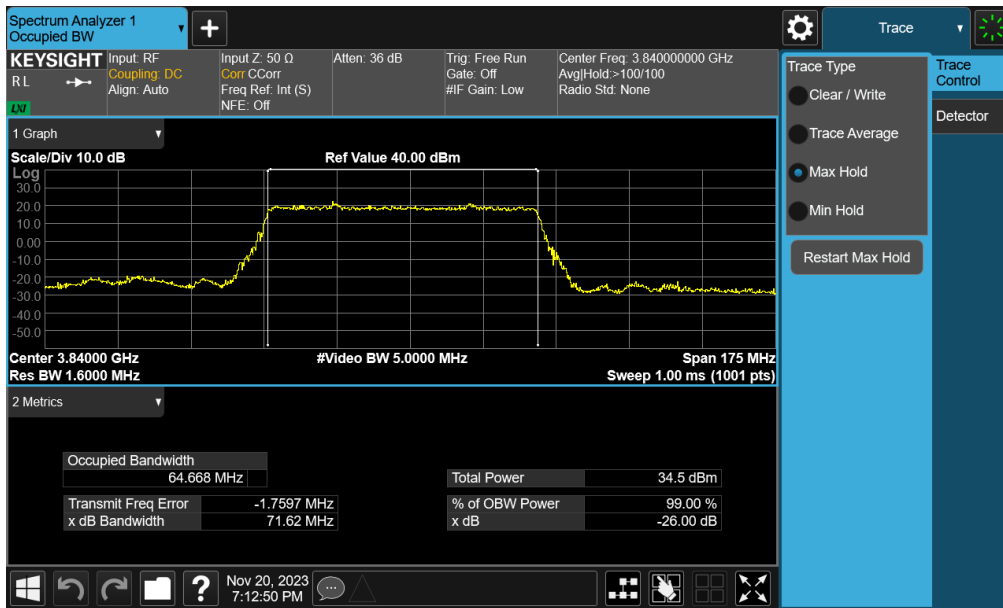


Plot 7-8. Occupied Bandwidth Plot (NR Band n77/78 - 80MHz QPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 22 of 130

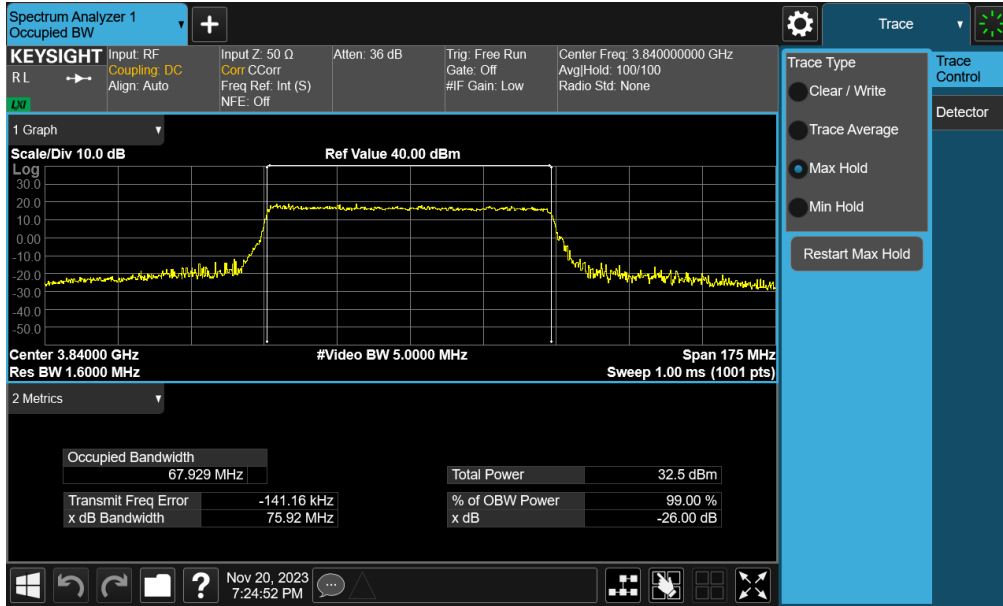


Plot 7-9. Occupied Bandwidth Plot (NR Band n77/78 - 80MHz 16-QAM - Full RB - Ant 1)

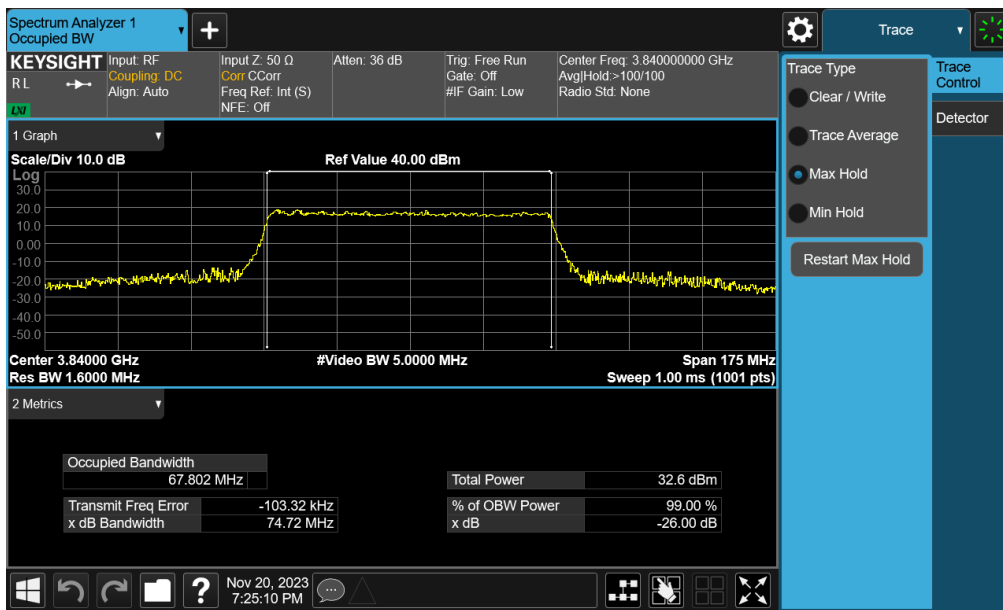


Plot 7-10. Occupied Bandwidth Plot (NR Band n77/78 - 70MHz $\pi/2$ BPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 23 of 130

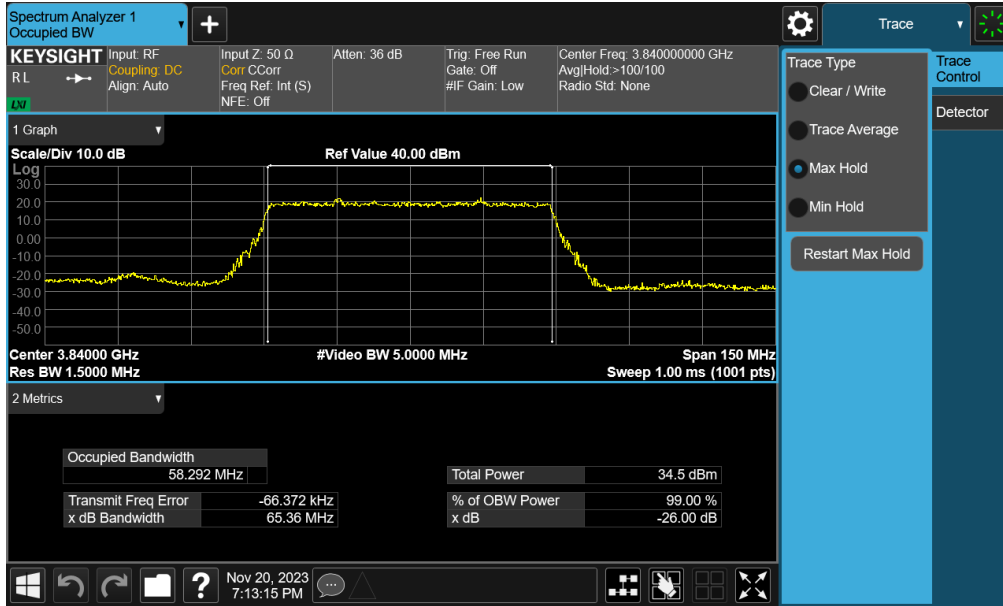


Plot 7-11. Occupied Bandwidth Plot (NR Band n77/78 - 70MHz QPSK - Full RB - Ant 1)

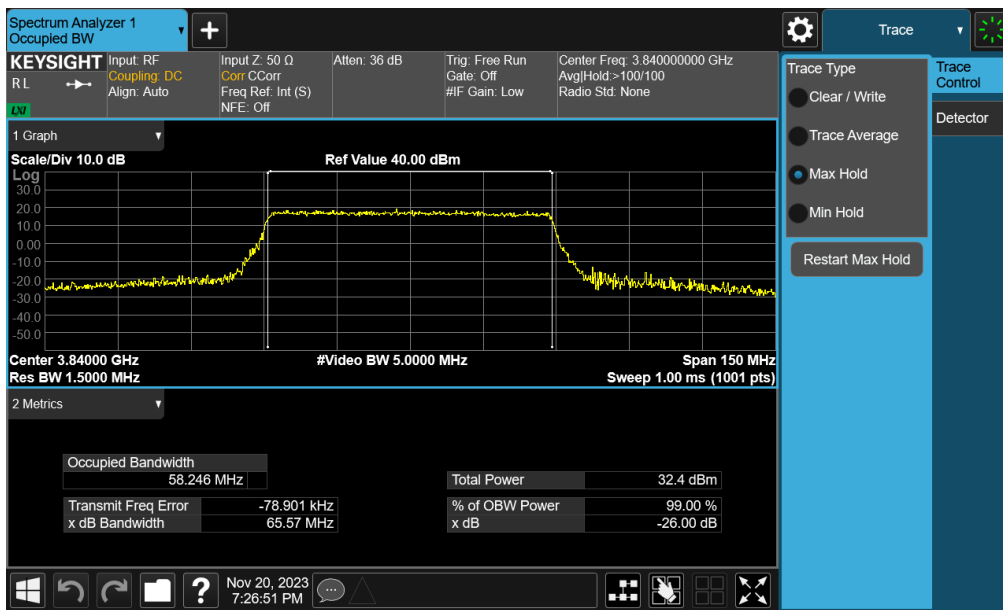


Plot 7-12. Occupied Bandwidth Plot (NR Band n77/78 - 70MHz 16-QAM - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 24 of 130

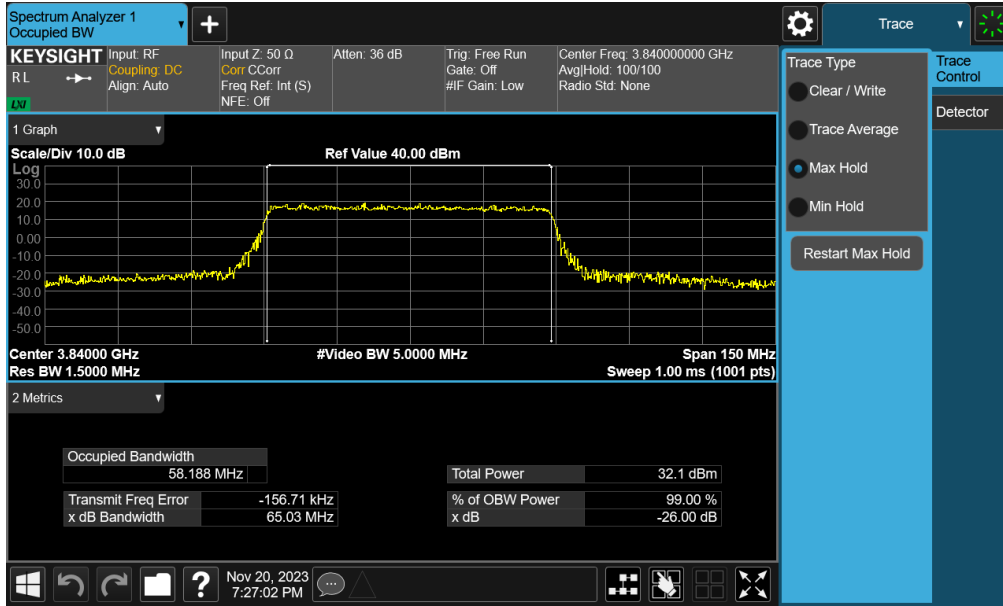


Plot 7-13. Occupied Bandwidth Plot (NR Band n77/78 - 60MHz $\pi/2$ BPSK - Full RB - Ant 1)

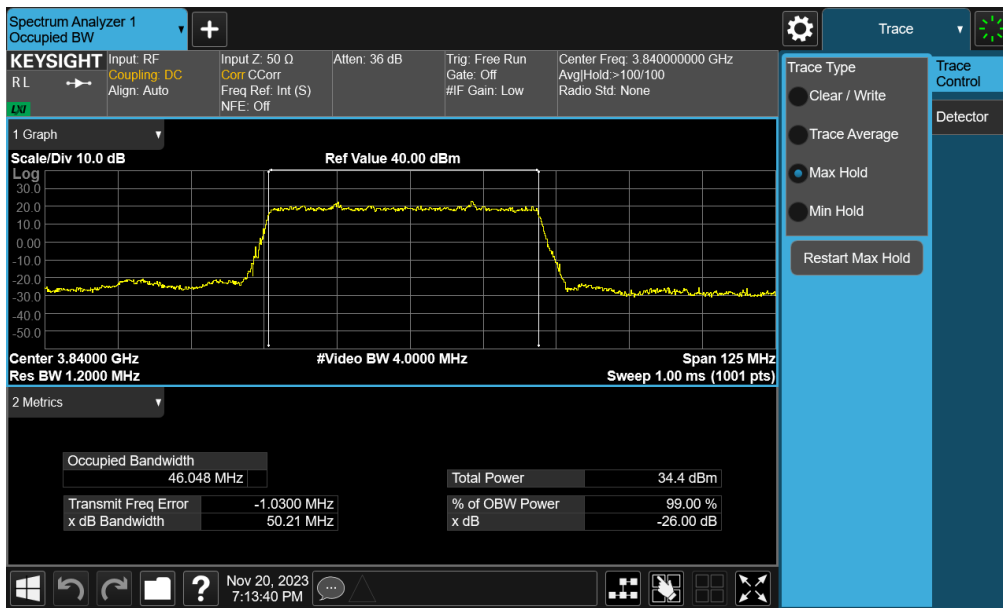


Plot 7-14. Occupied Bandwidth Plot (NR Band n77/78 - 60MHz QPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 25 of 130

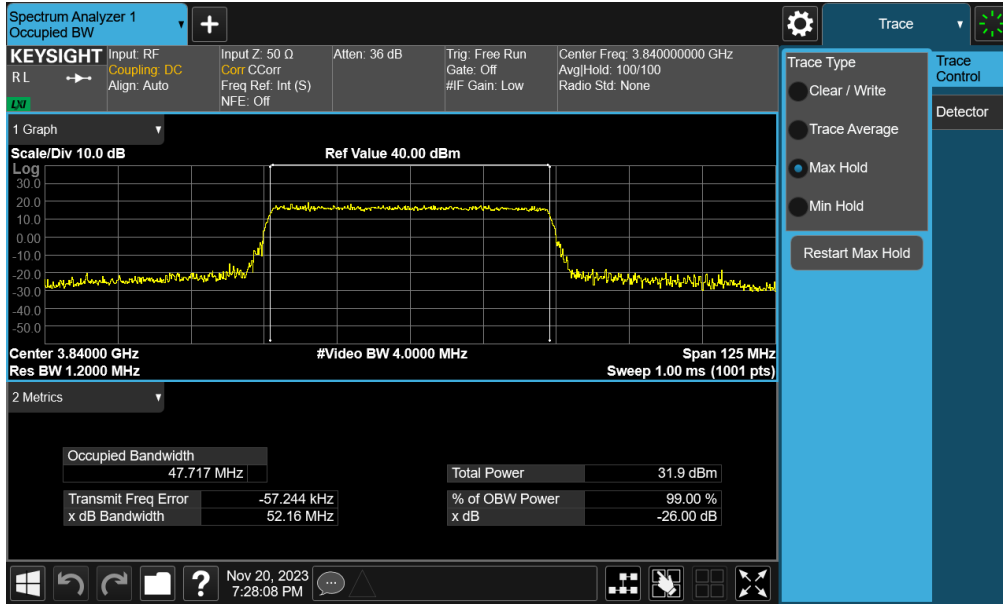


Plot 7-15. Occupied Bandwidth Plot (NR Band n77/78 - 60MHz 16-QAM - Full RB - Ant 1)

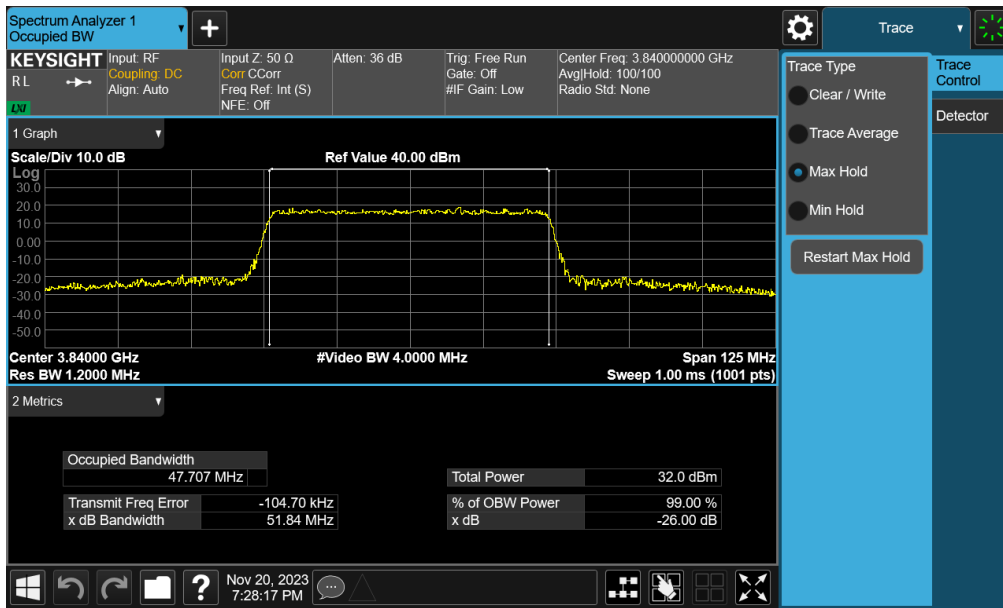


Plot 7-16. Occupied Bandwidth Plot (NR Band n77/78 - 50MHz $\pi/2$ BPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 26 of 130

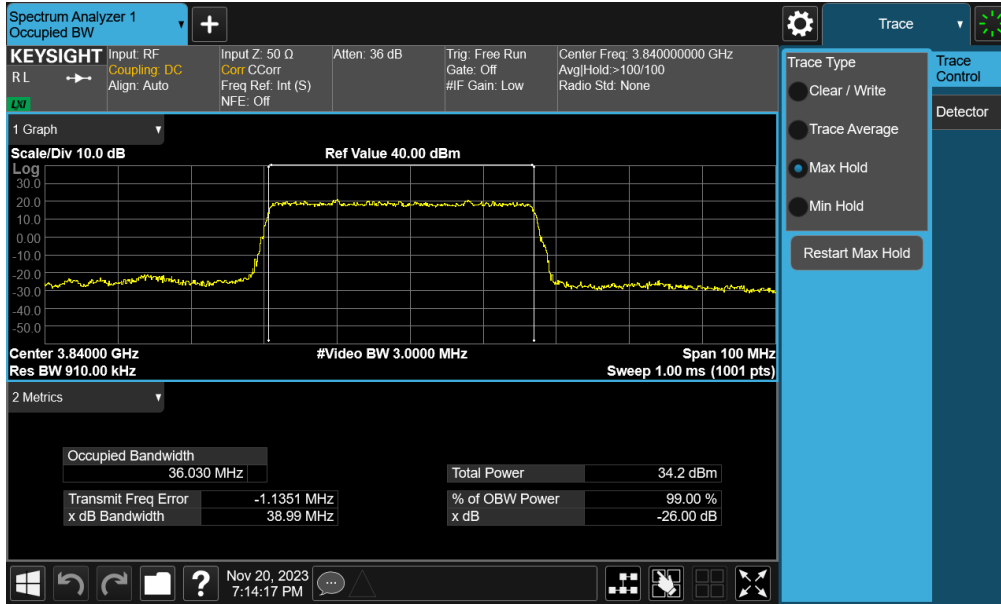


Plot 7-17. Occupied Bandwidth Plot (NR Band n77/78 - 50MHz QPSK - Full RB - Ant 1)

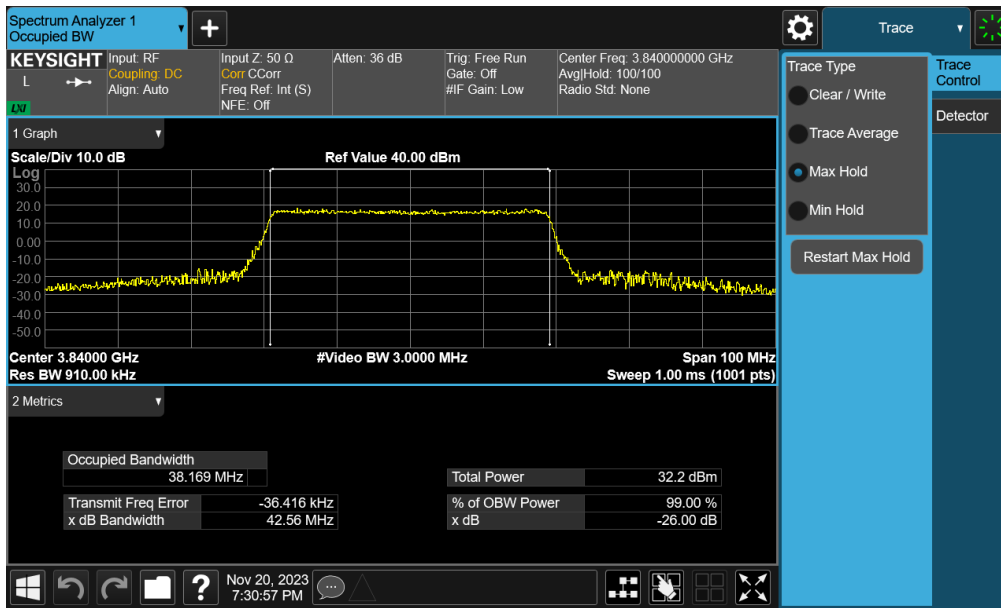


Plot 7-18. Occupied Bandwidth Plot (NR Band n77/78 - 50MHz 16-QAM - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 27 of 130

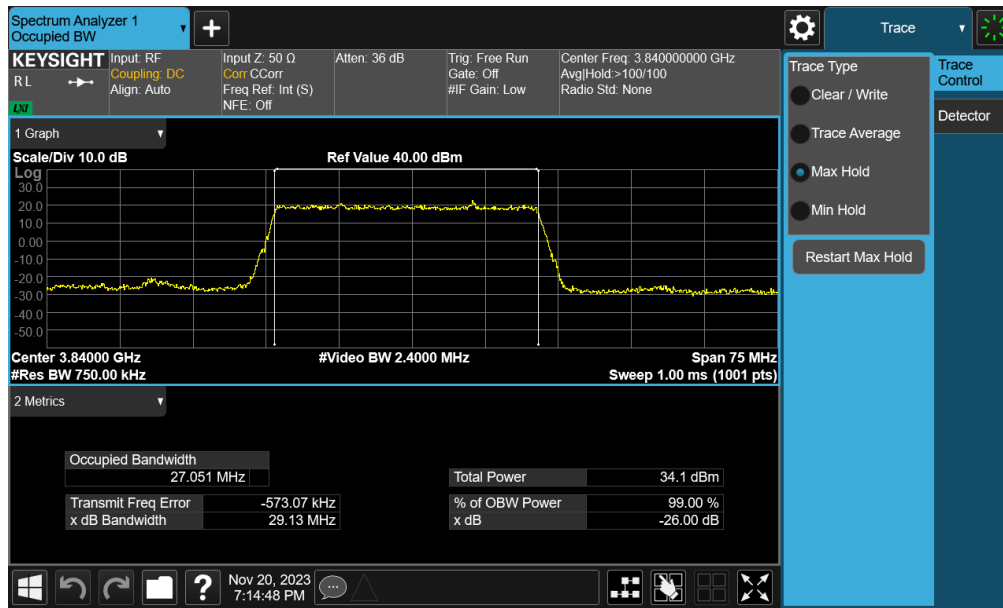
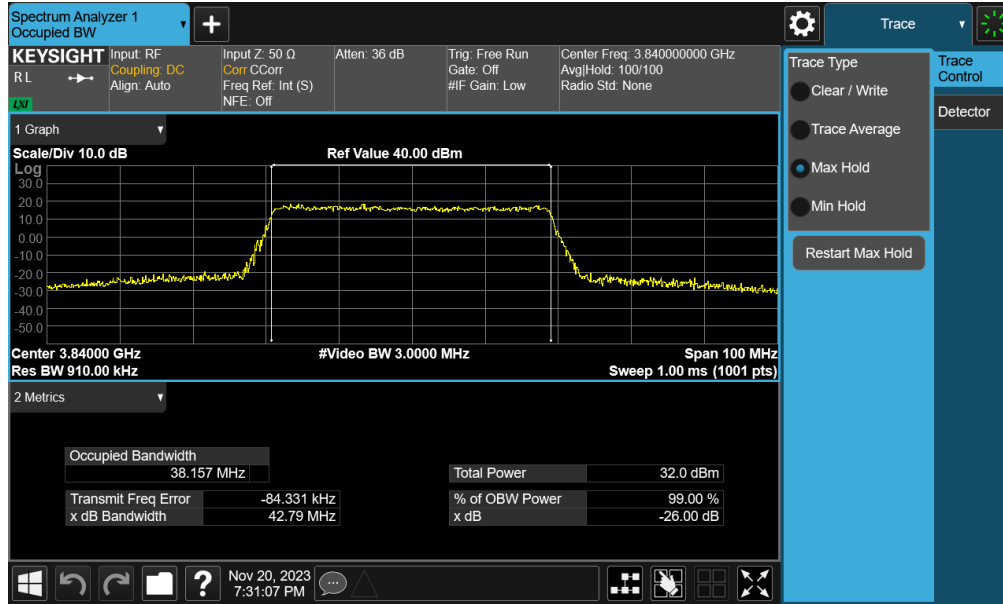


Plot 7-19. Occupied Bandwidth Plot (NR Band n77/78 - 40MHz $\pi/2$ BPSK - Full RB - Ant 1)

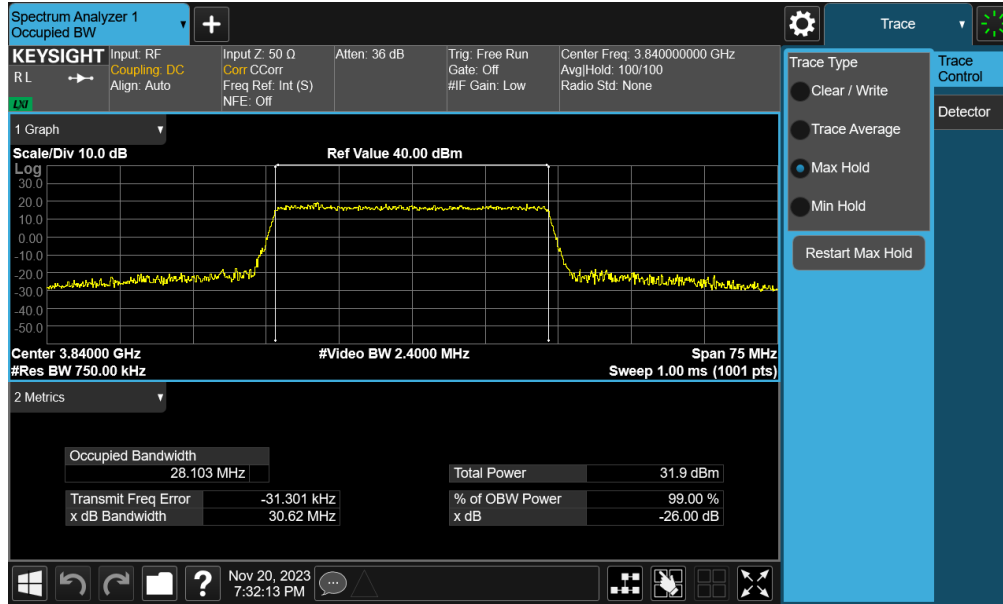


Plot 7-20. Occupied Bandwidth Plot (NR Band n77/78 - 40MHz QPSK - Full RB - Ant 1)

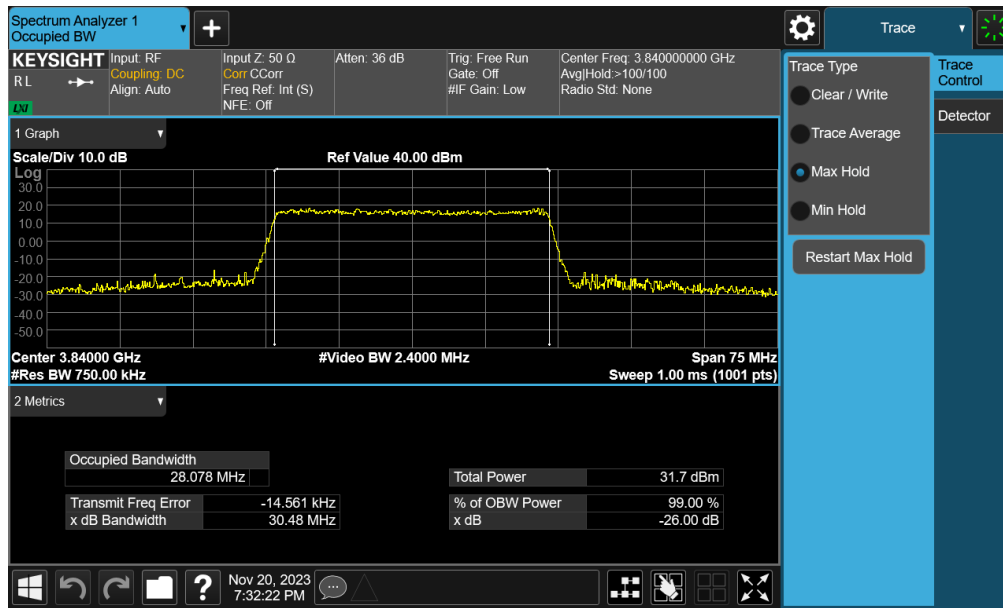
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 28 of 130



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 29 of 130

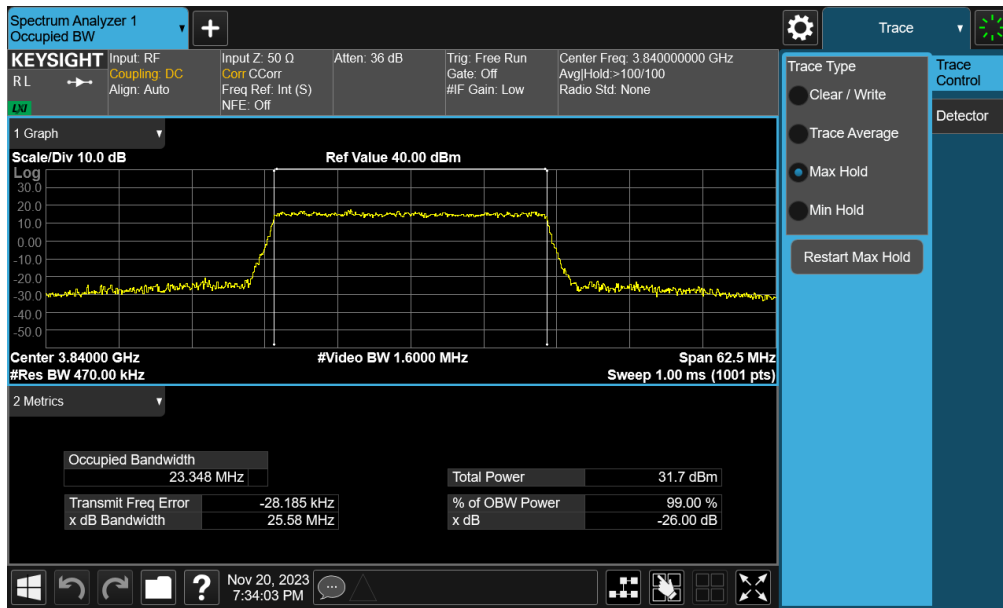
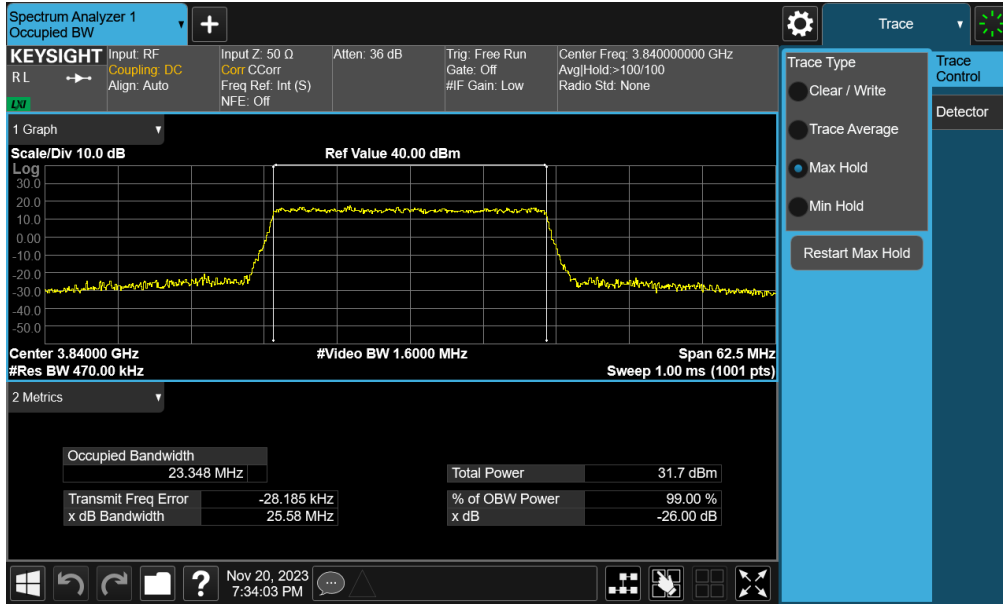


Plot 7-23. Occupied Bandwidth Plot (NR Band n77/78 - 30MHz QPSK - Full RB - Ant 1)

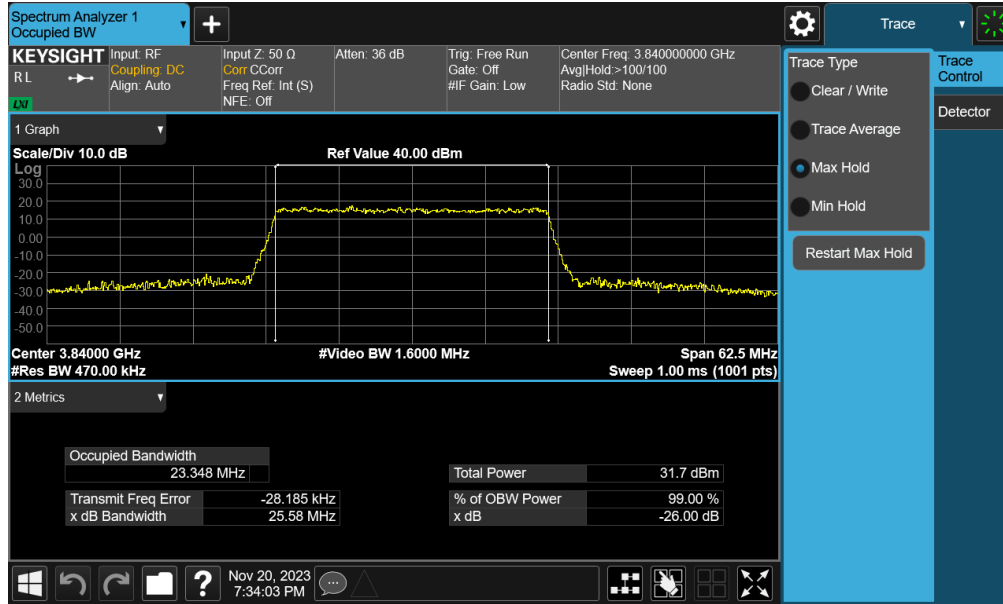


Plot 7-24. Occupied Bandwidth Plot (NR Band n77/78 - 30MHz 16-QAM - Full RB - Ant 1)

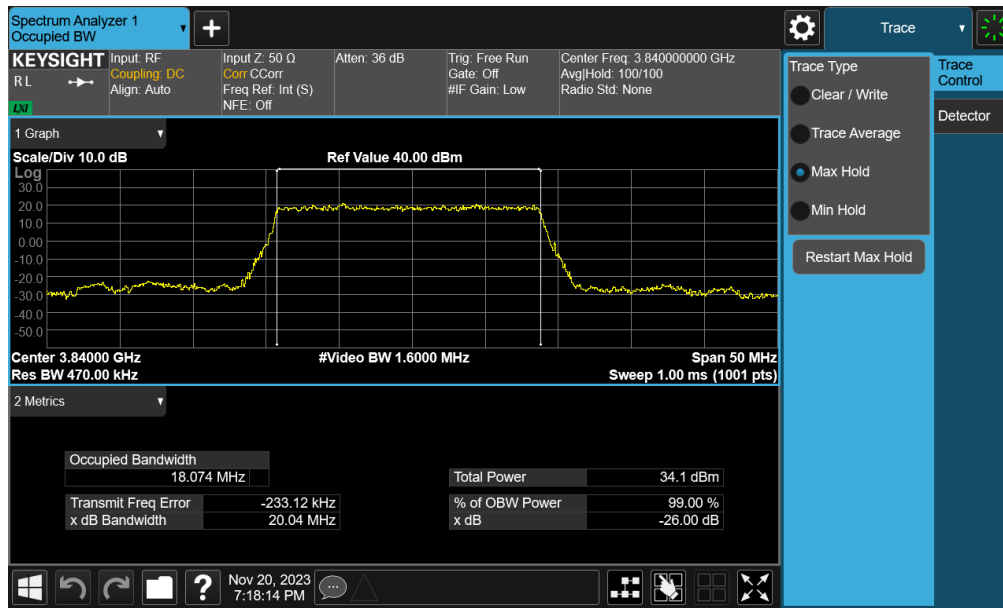
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 30 of 130



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 31 of 130

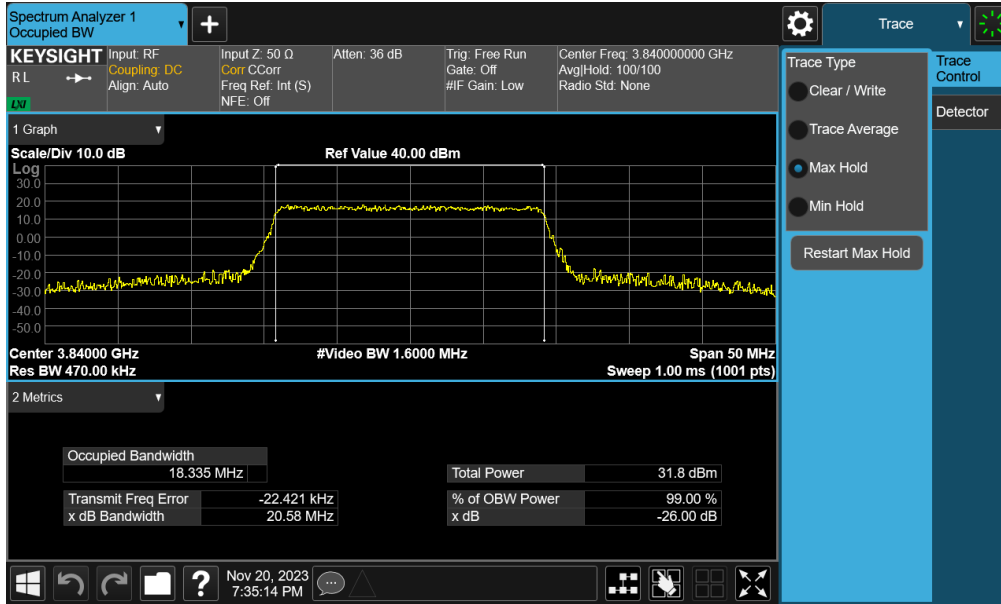


Plot 7-27. Occupied Bandwidth Plot (NR Band n77/78 - 25MHz 16-QAM - Full RB - Ant 1)

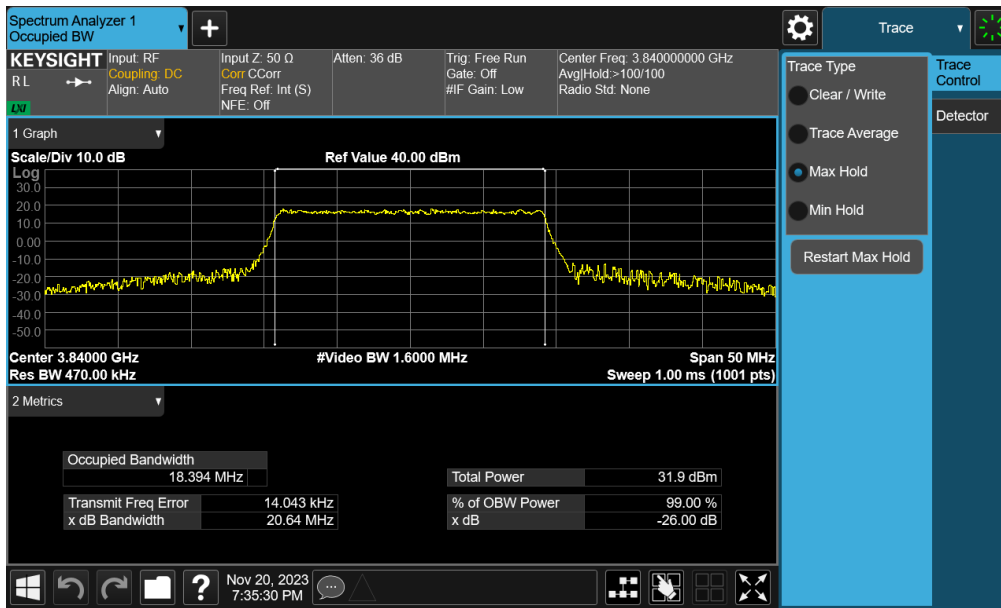


Plot 7-28. Occupied Bandwidth Plot (NR Band n77/78 - 20MHz π/2 BPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 32 of 130

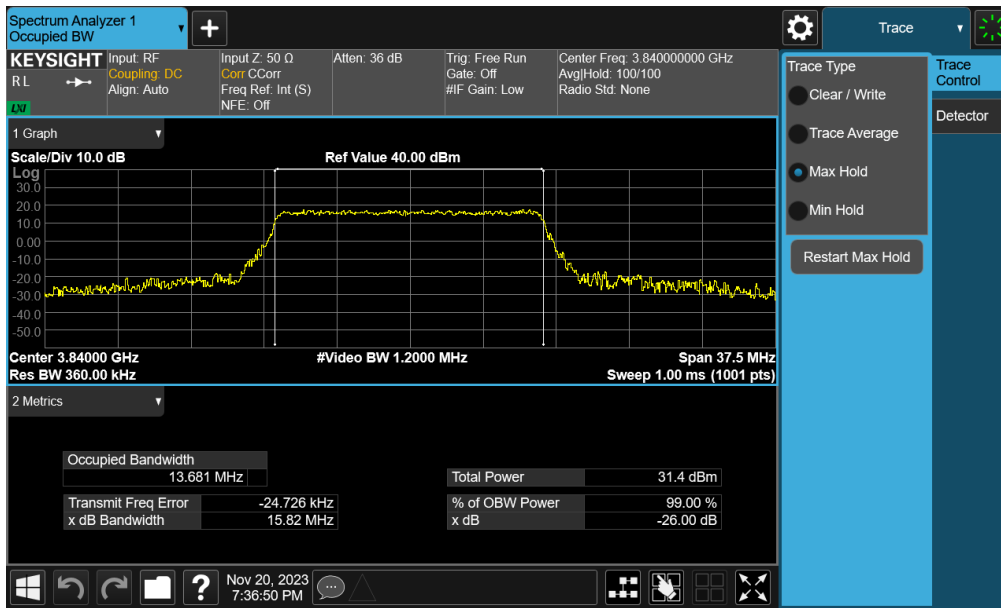
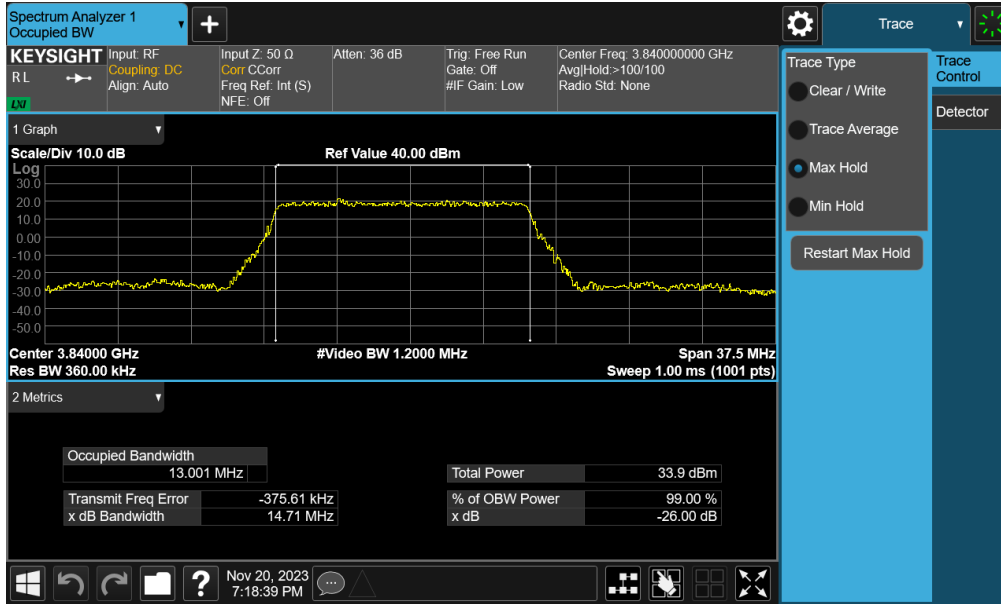


Plot 7-29. Occupied Bandwidth Plot (NR Band n77/78 - 20MHz QPSK - Full RB - Ant 1)

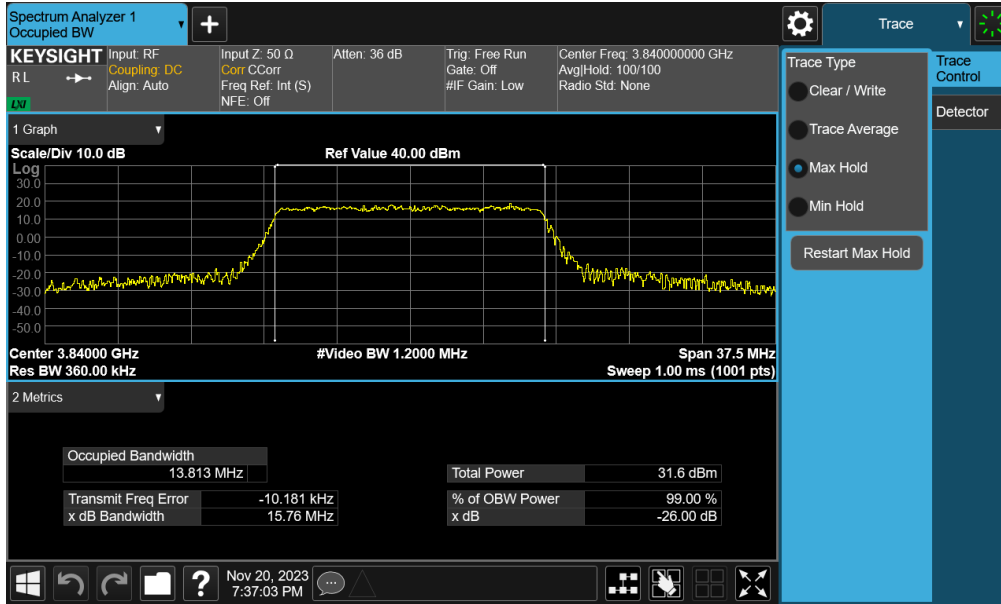


Plot 7-30. Occupied Bandwidth Plot (NR Band n77/78 - 20MHz 16-QAM - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 33 of 130



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 34 of 130

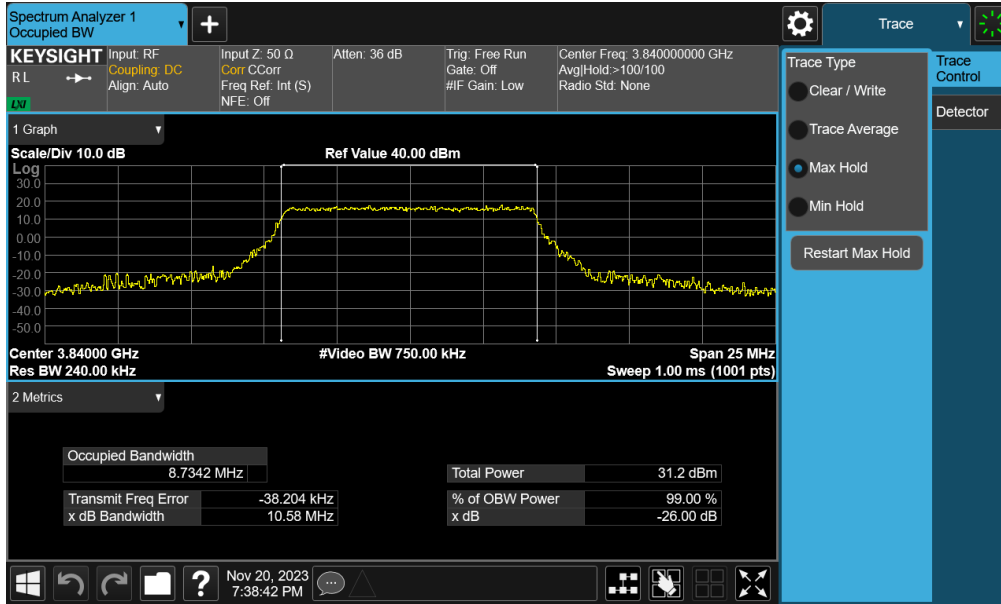


Plot 7-33. Occupied Bandwidth Plot (NR Band n77/78 - 15MHz 16-QAM - Full RB - Ant 1)

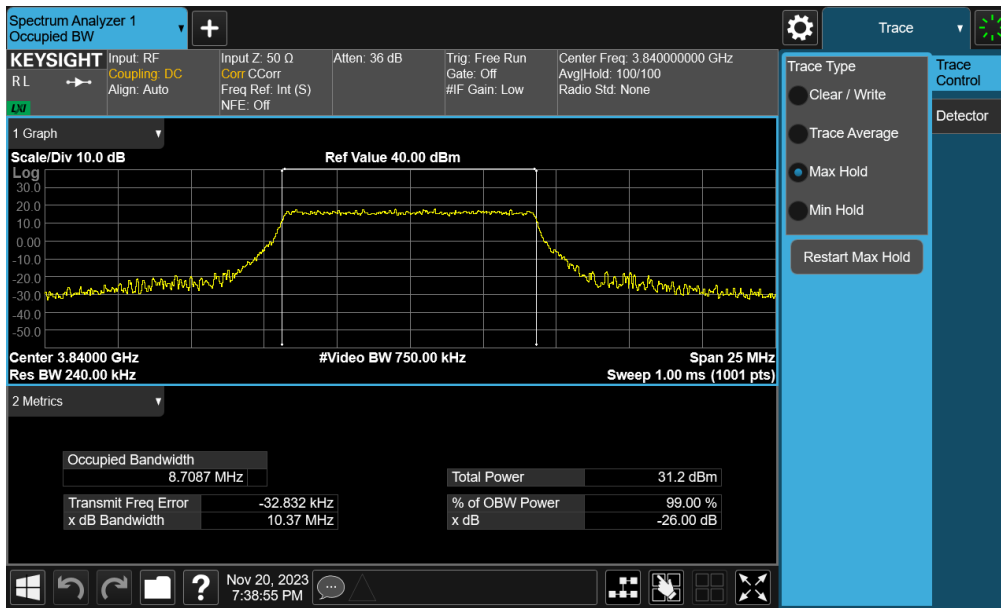


Plot 7-34. Occupied Bandwidth Plot (NR Band n77/78 - 10MHz π/2 BPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 35 of 130



Plot 7-35. Occupied Bandwidth Plot (NR Band n77/78 - 10MHz QPSK - Full RB - Ant 1)



Plot 7-36. Occupied Bandwidth Plot (NR Band n77/78 - 10MHz 16-QAM - Full RB - Ant 1)

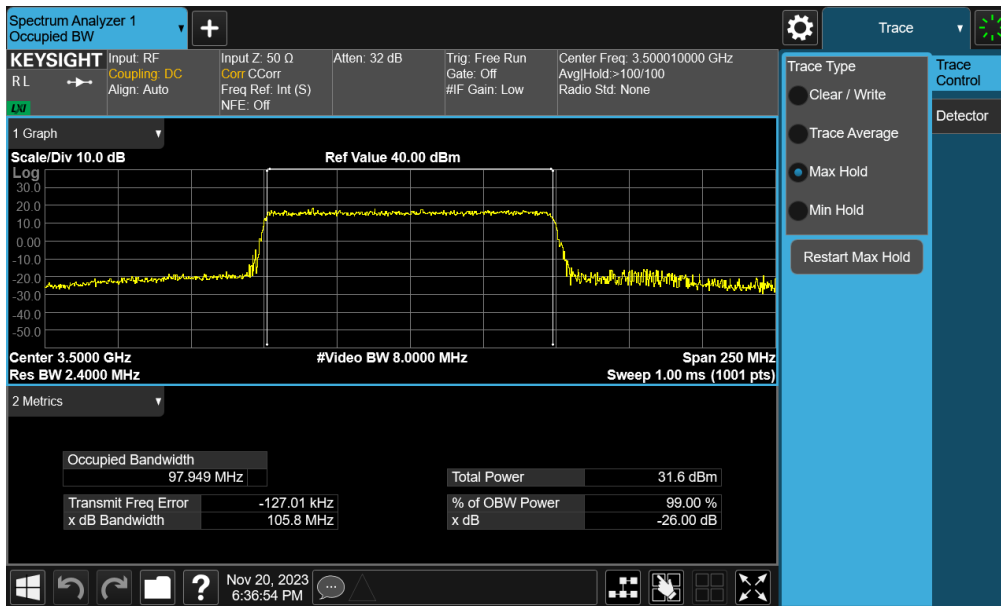
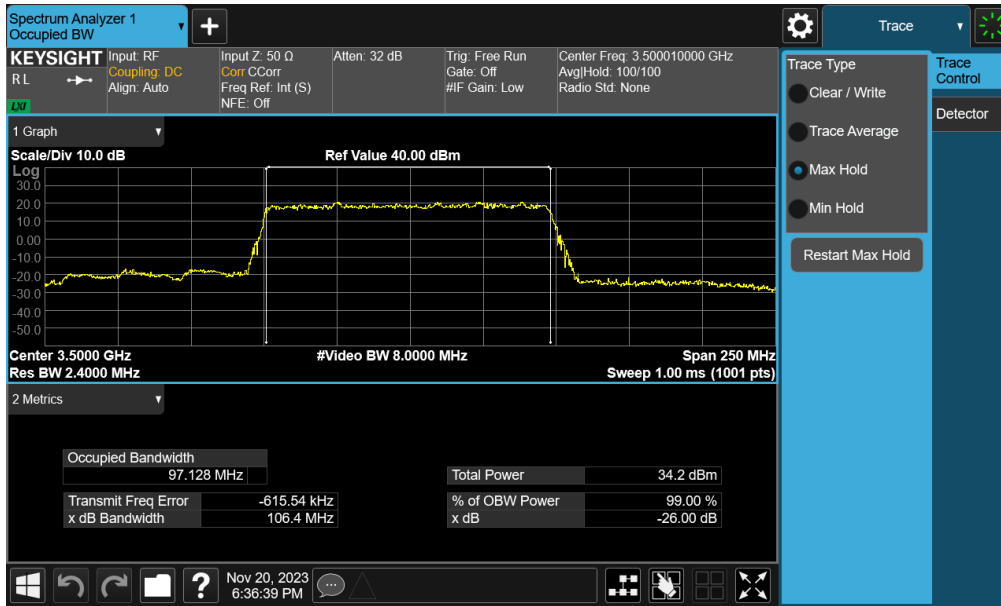
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 36 of 130

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n77/78 PC2 DoD	100MHz	$\pi/2$ BPSK	97.13
		QPSK	97.95
		16QAM	97.70
	90MHz	$\pi/2$ BPSK	87.32
		QPSK	87.76
		16QAM	88.01
	80MHz	$\pi/2$ BPSK	77.61
		QPSK	77.83
		16QAM	77.81
	70MHz	$\pi/2$ BPSK	64.81
		QPSK	67.86
		16QAM	67.76
	60MHz	$\pi/2$ BPSK	58.27
		QPSK	58.21
		16QAM	58.14
	50MHz	$\pi/2$ BPSK	45.94
		QPSK	47.73
		16QAM	47.76
	40MHz	$\pi/2$ BPSK	35.99
		QPSK	38.08
		16QAM	38.14
	30MHz	$\pi/2$ BPSK	27.09
		QPSK	28.08
		16QAM	28.05
	25MHz	$\pi/2$ BPSK	23.04
		QPSK	23.31
		16QAM	23.36
20MHz	$\pi/2$ BPSK	18.06	
	QPSK	18.34	
	16QAM	18.42	
15MHz	$\pi/2$ BPSK	13.04	
	QPSK	13.70	
	16QAM	13.70	
10MHz	$\pi/2$ BPSK	8.73	
	QPSK	8.68	
	16QAM	8.69	

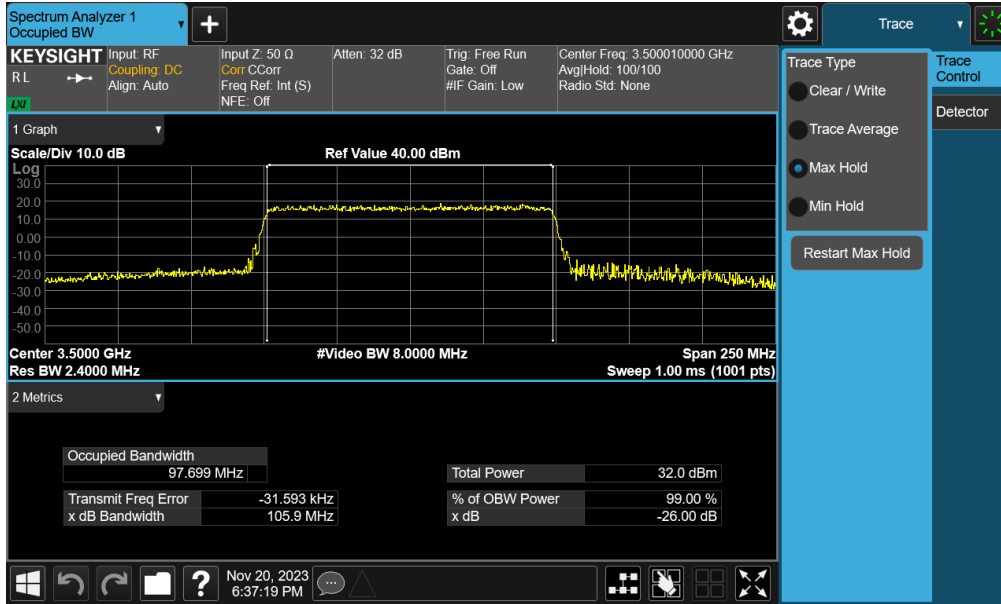
Table 7-11. Occupied Bandwidth Test Results – NR Band n77/78 DoD – Ant 1

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 37 of 130

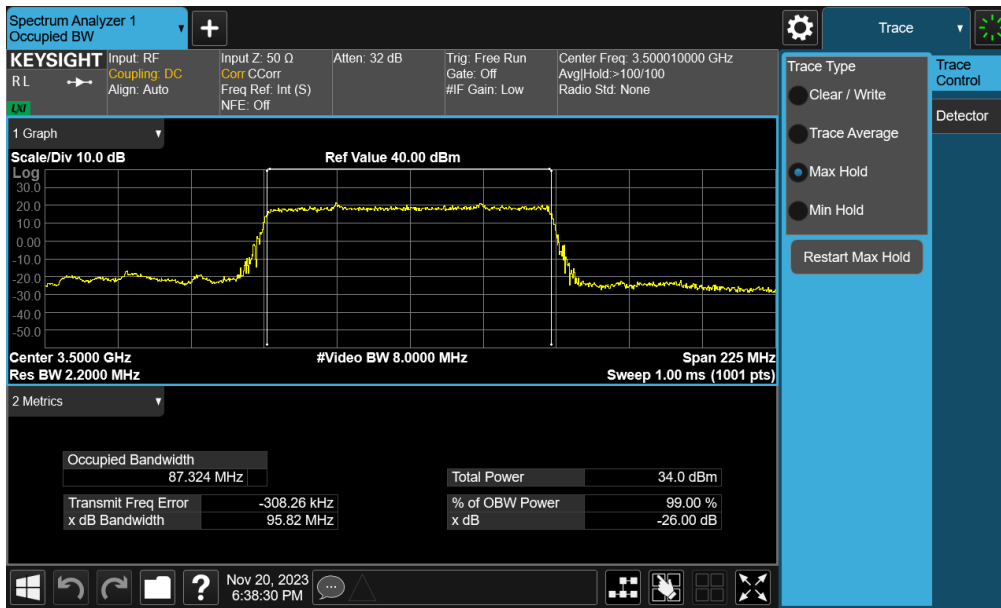
NR Band n77/78 PC2 DoD – Ant 1



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 38 of 130

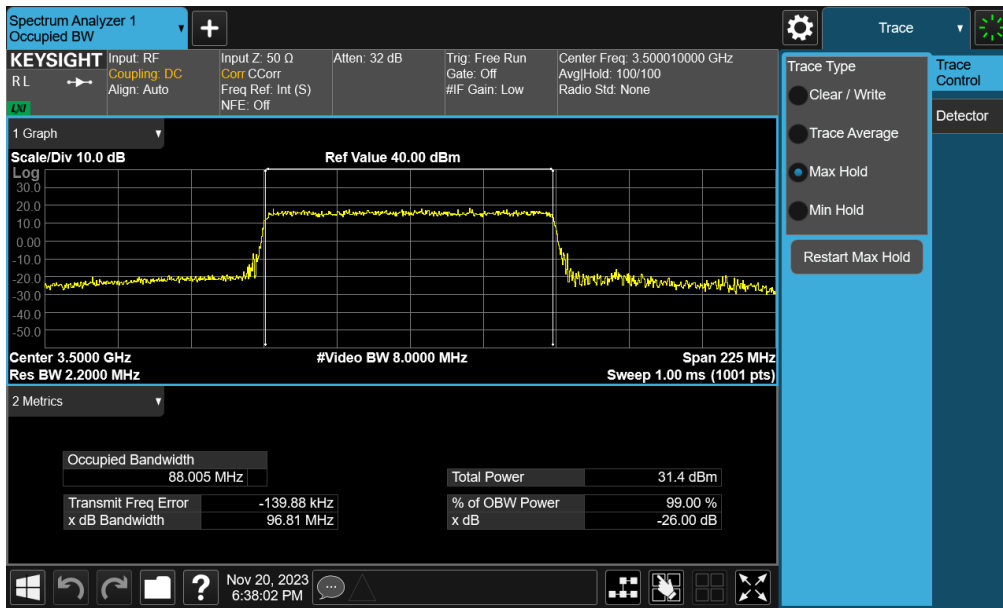
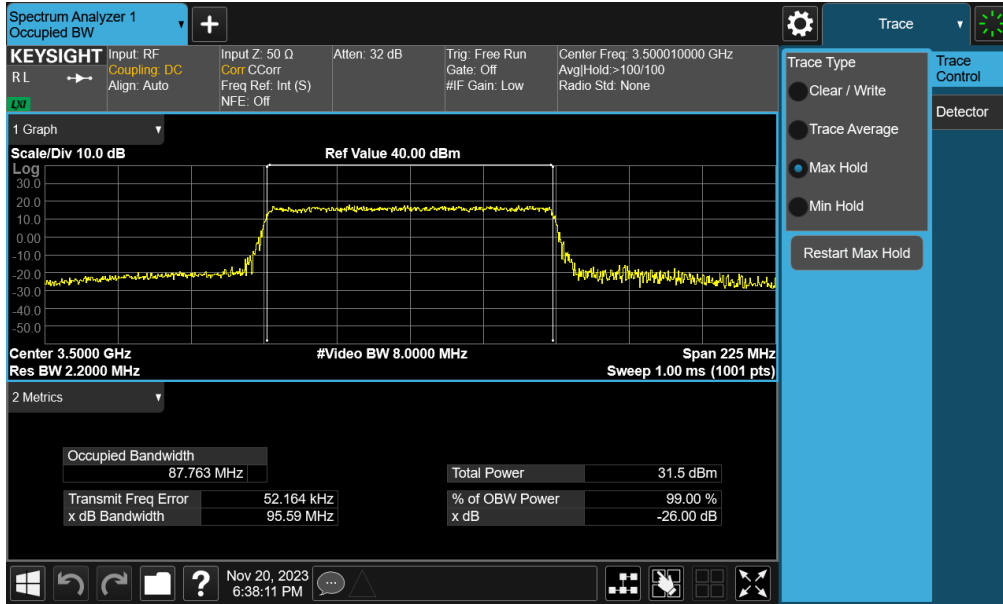


Plot 7-39. Occupied Bandwidth Plot (NR Band n77/78 DoD - 100MHz 16-QAM - Full RB - Ant 1)

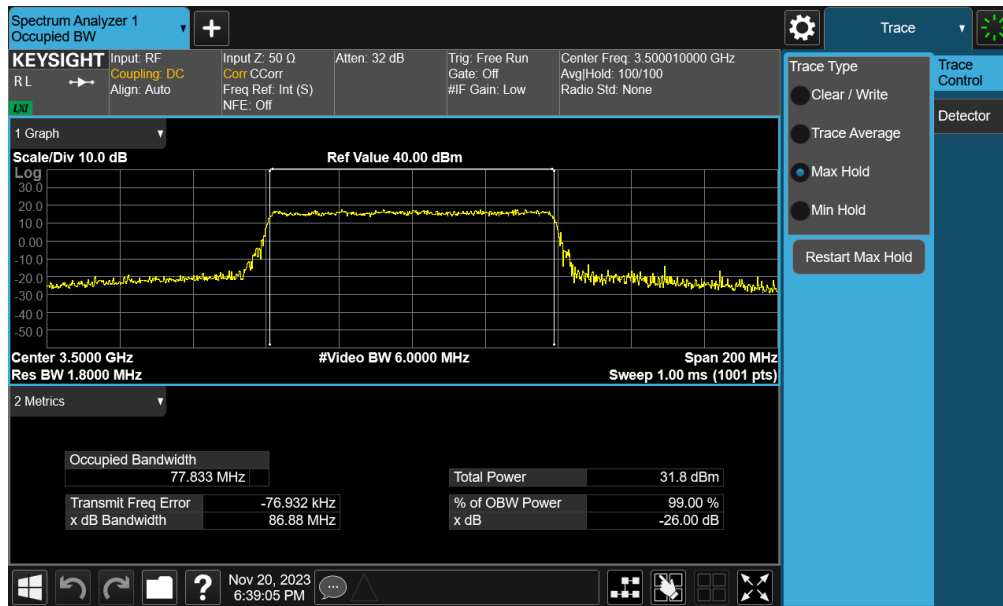
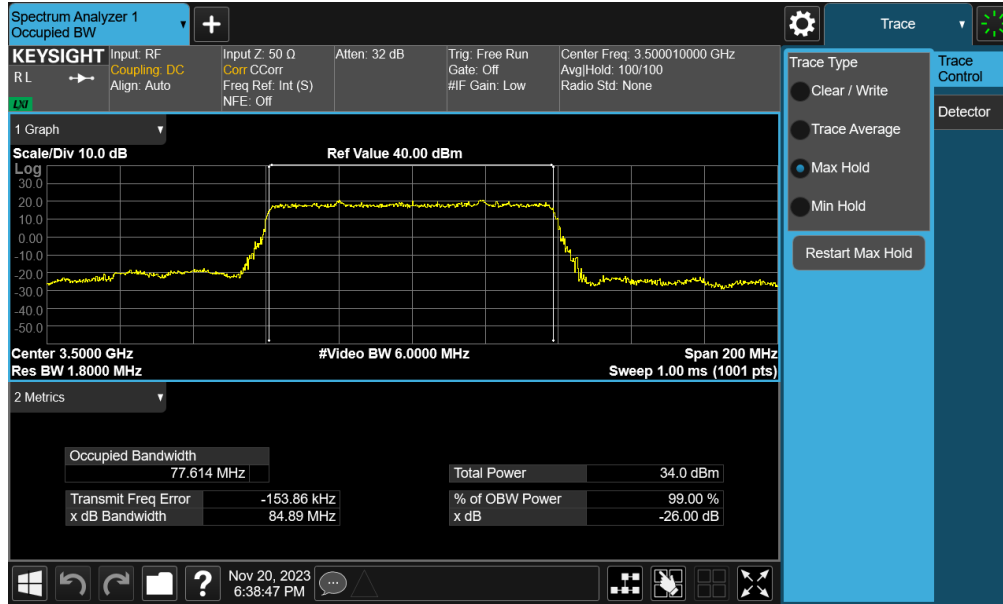


Plot 7-40. Occupied Bandwidth Plot (NR Band n77/78 DoD - 90MHz $\pi/2$ BPSK - Full RB - Ant 1)

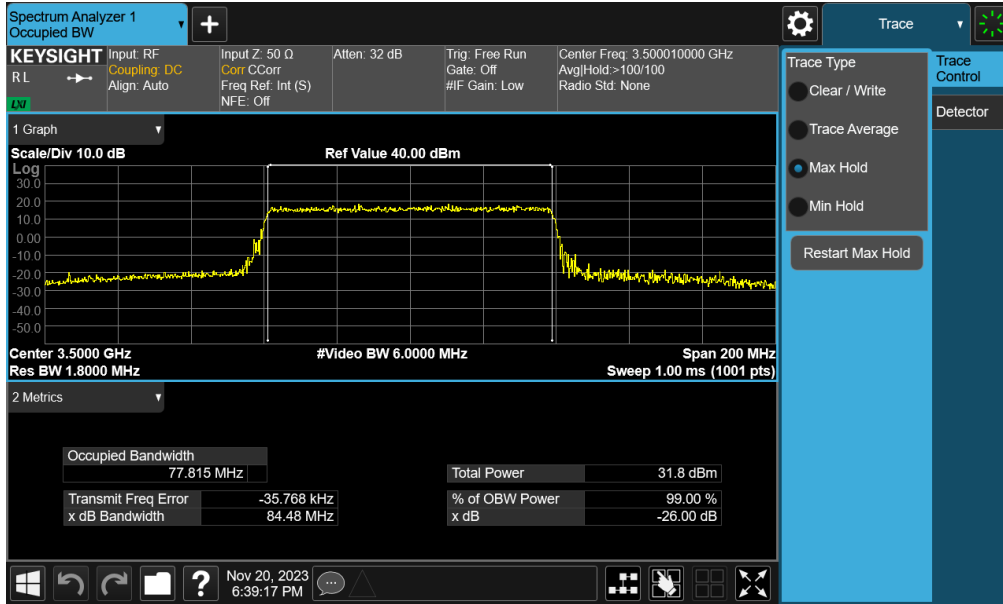
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 39 of 130



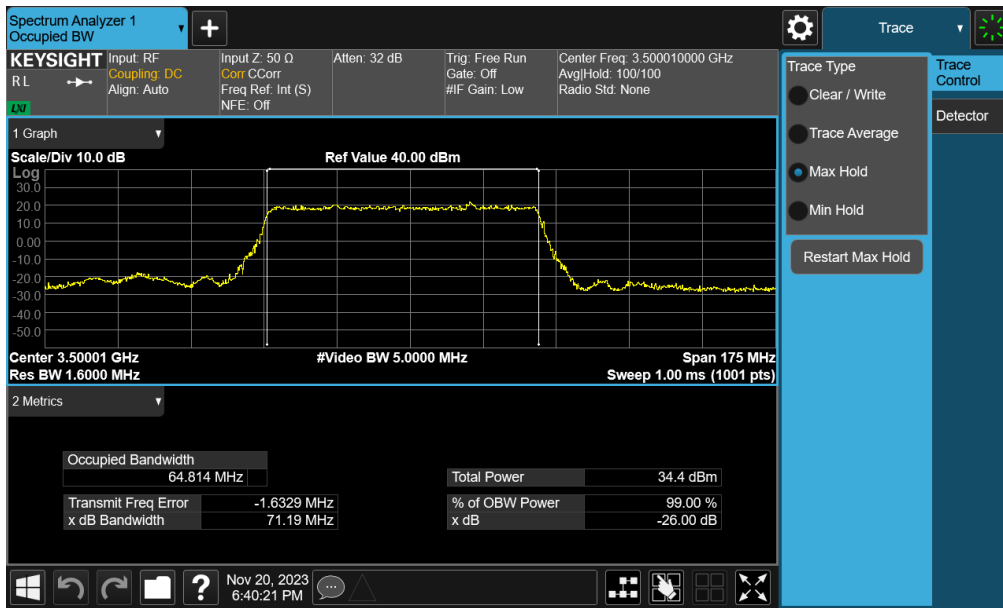
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 40 of 130



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 41 of 130

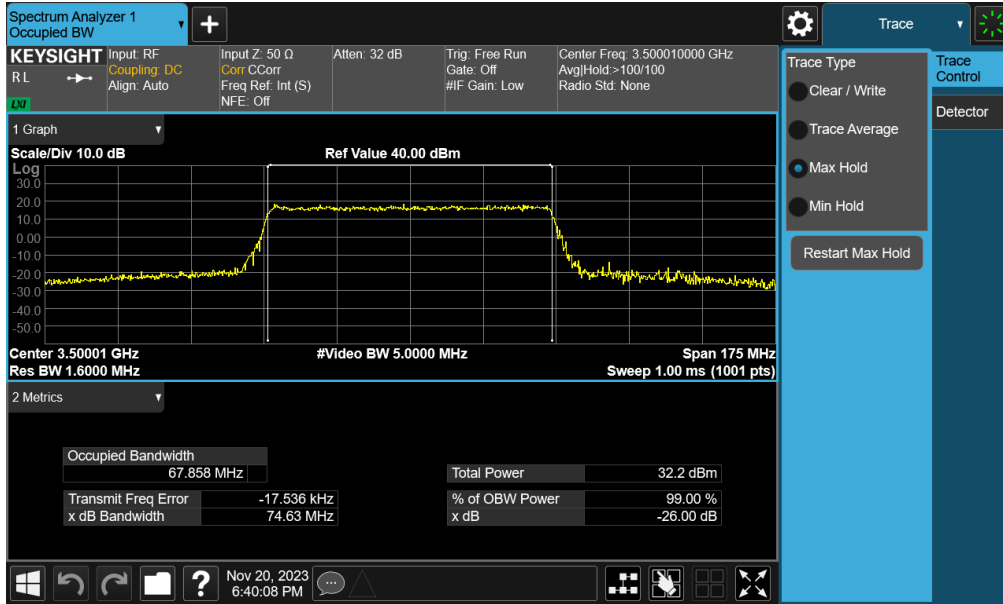


Plot 7-45. Occupied Bandwidth Plot (NR Band n77/78 DoD - 80MHz 16-QAM - Full RB - Ant 1)

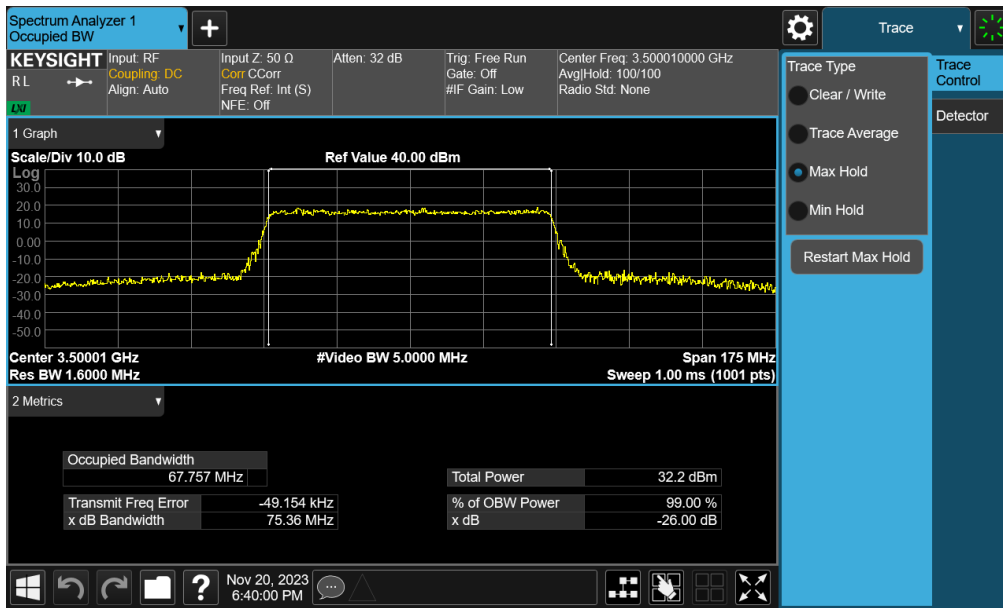


Plot 7-46. Occupied Bandwidth Plot (NR Band n77/78 DoD - 70MHz $\pi/2$ BPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 42 of 130

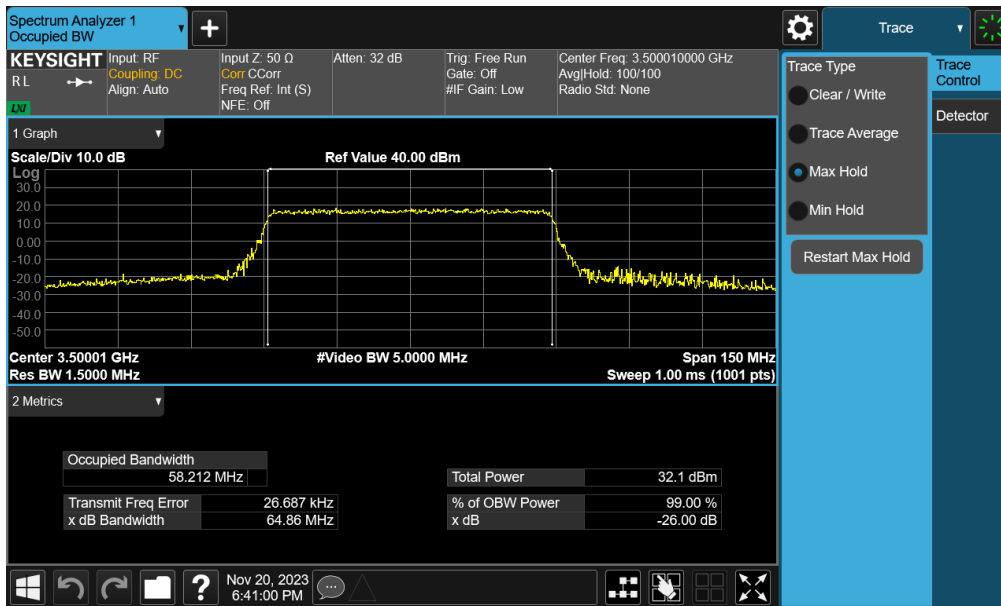
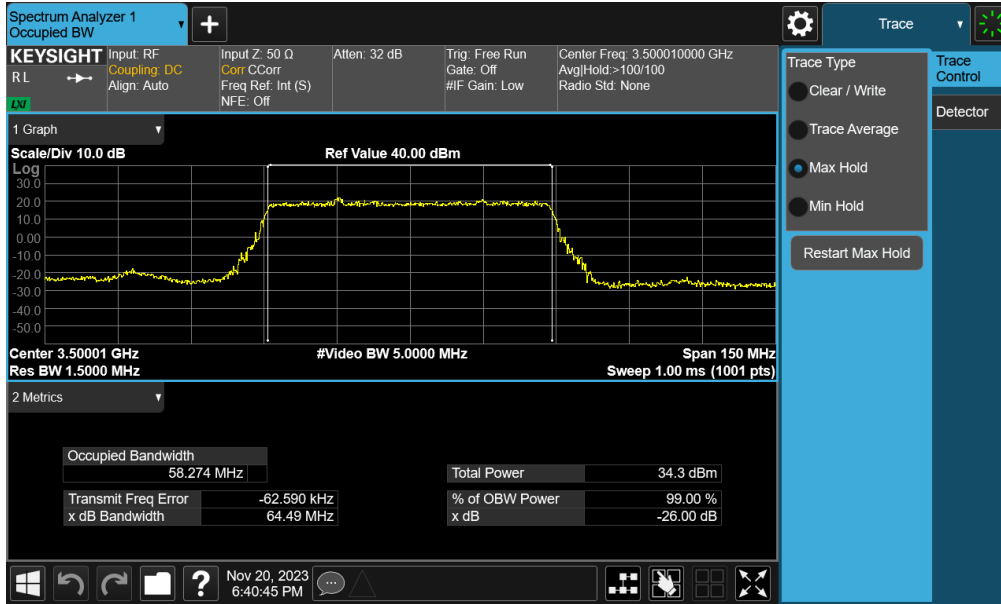


Plot 7-47. Occupied Bandwidth Plot (NR Band n77/78 DoD - 70MHz QPSK - Full RB - Ant 1)

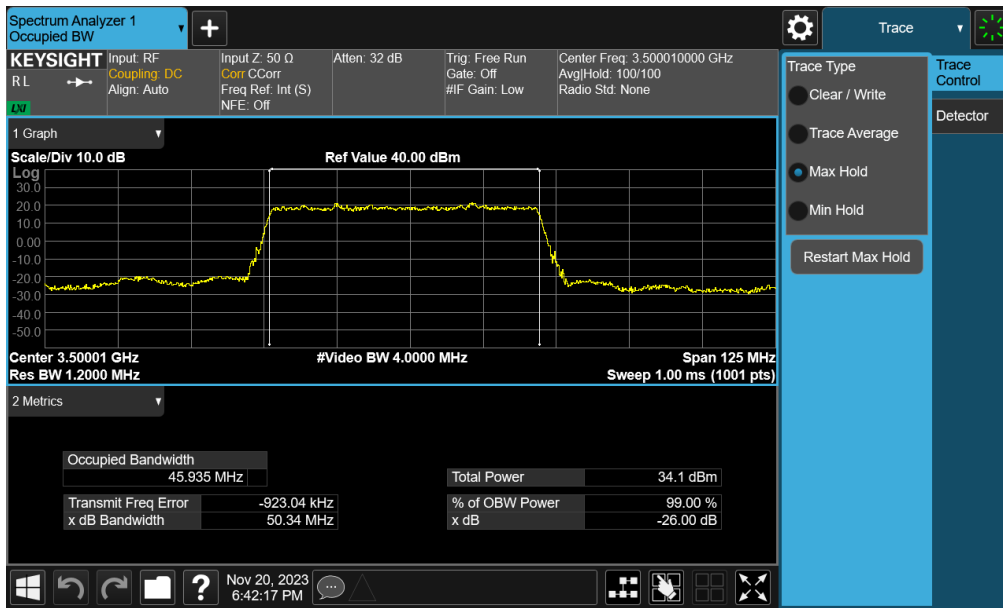
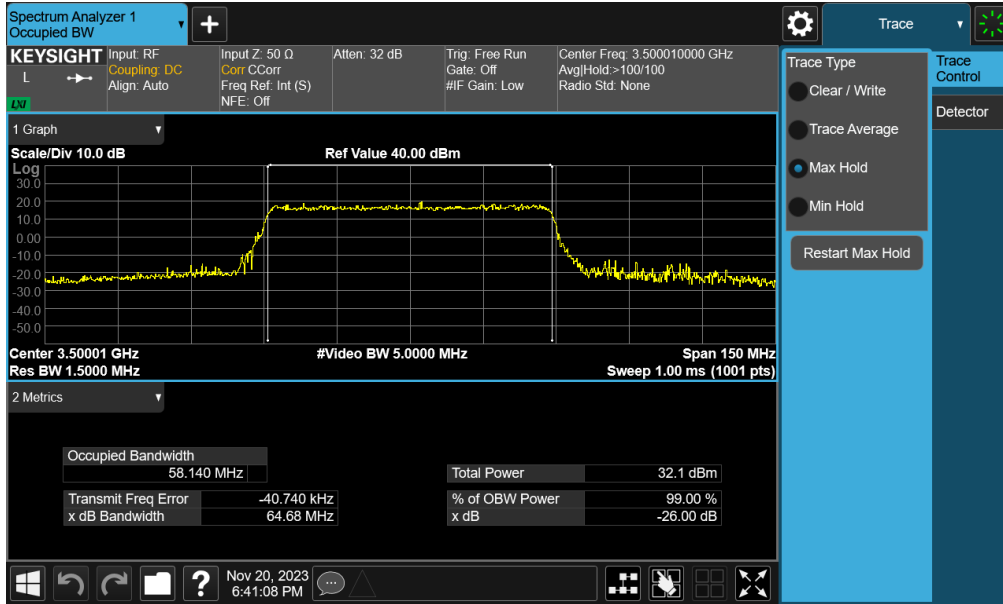


Plot 7-48. Occupied Bandwidth Plot (NR Band n77/78 DoD - 70MHz 16-QAM - Full RB - Ant 1)

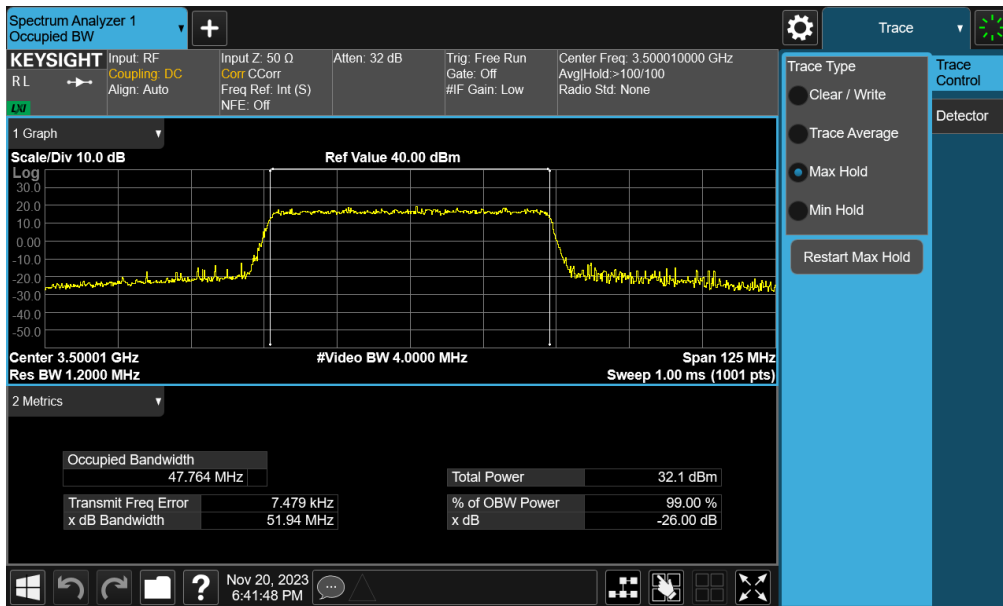
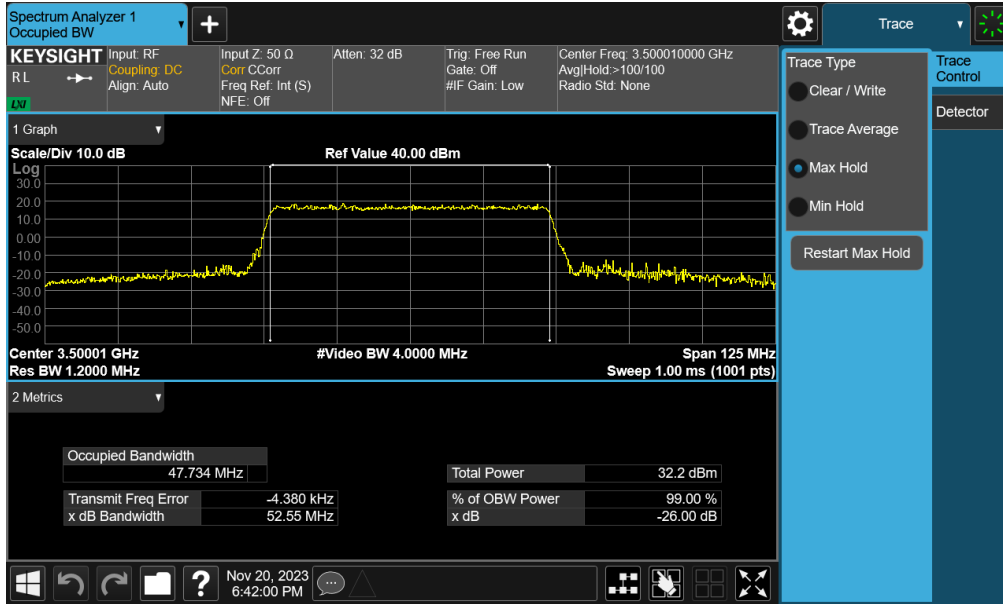
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 43 of 130



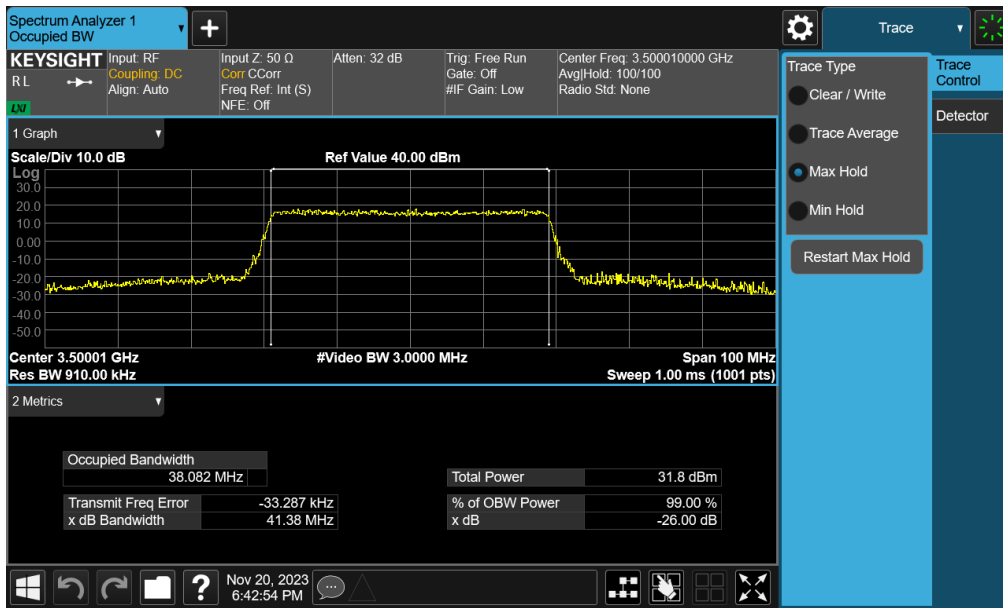
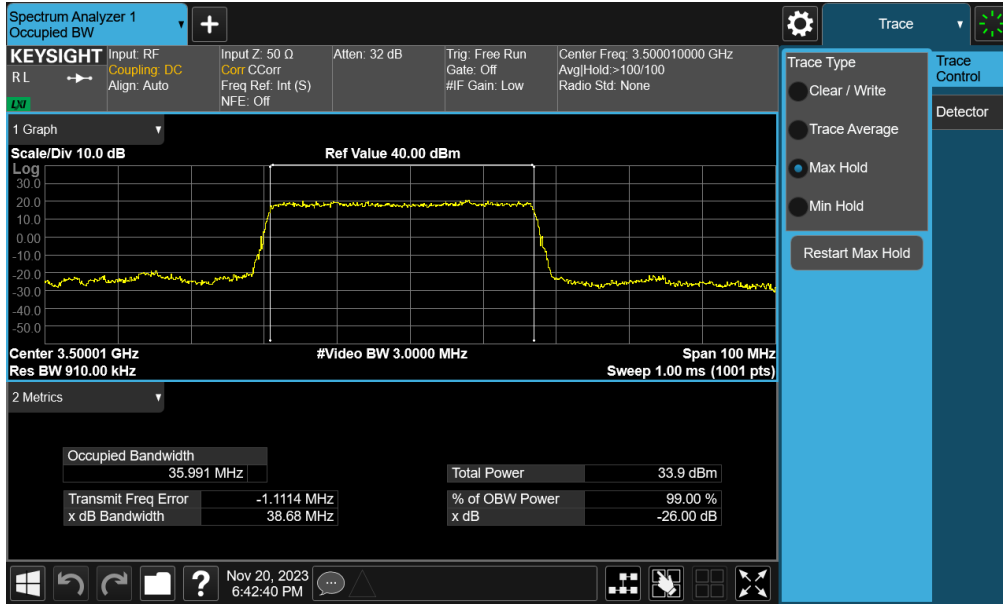
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 44 of 130



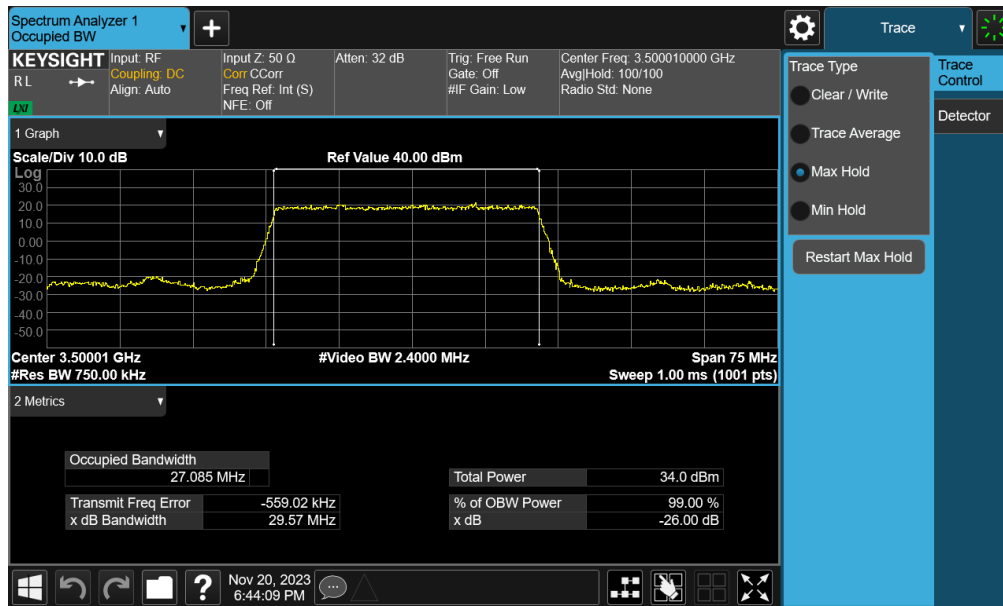
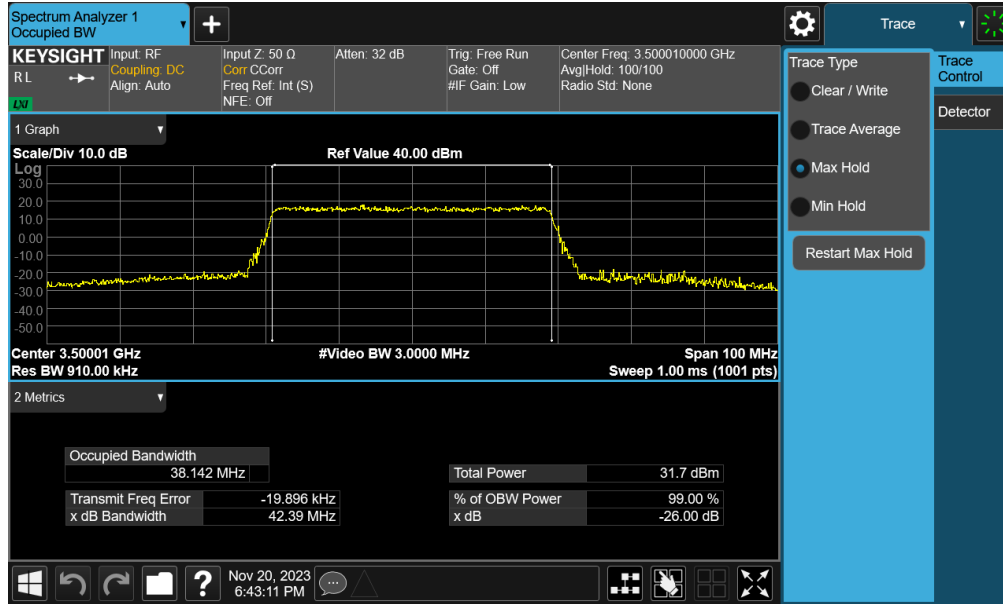
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 45 of 130



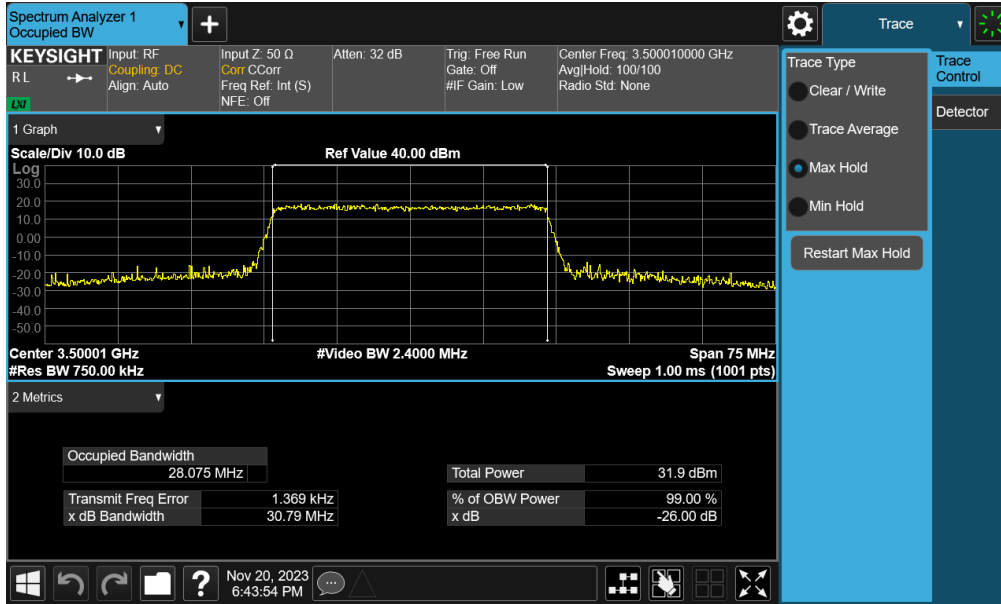
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 46 of 130



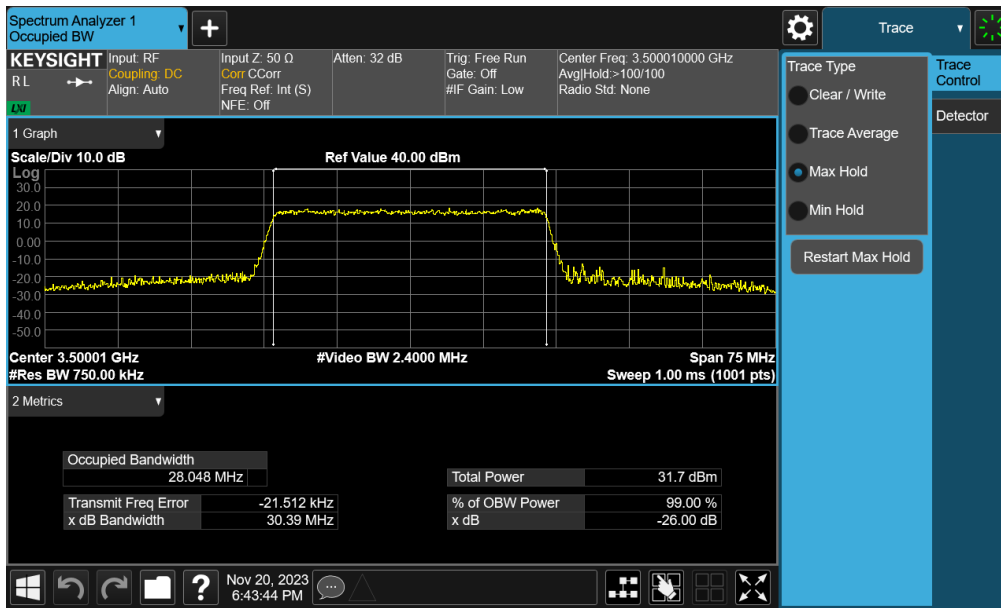
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 47 of 130



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 48 of 130

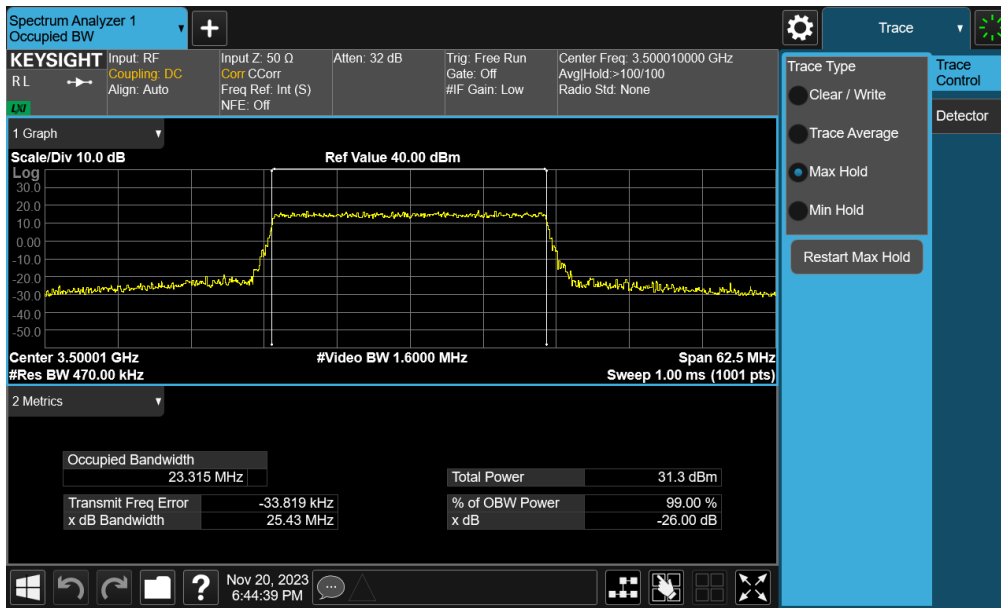
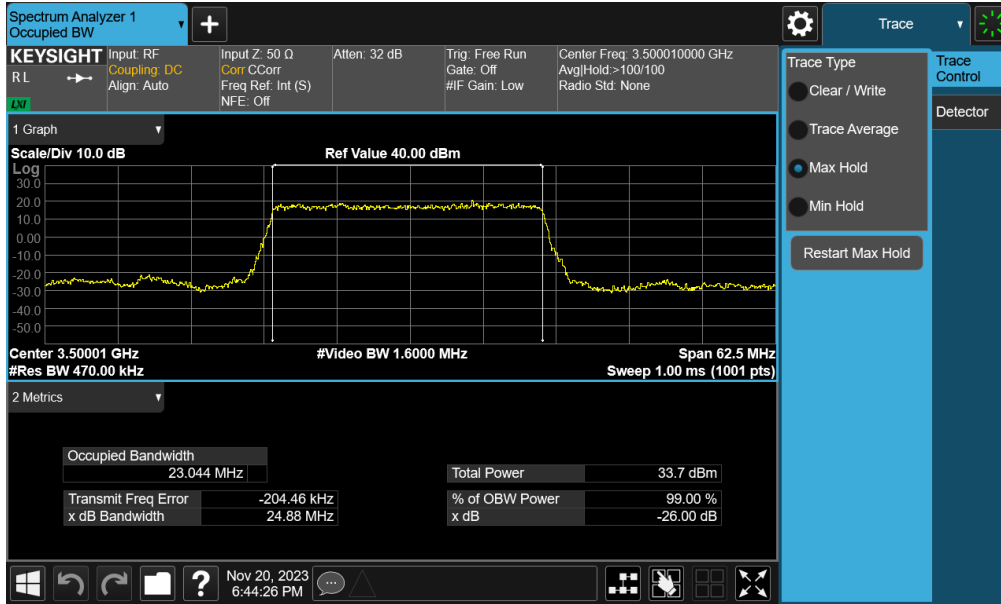


Plot 7-59. Occupied Bandwidth Plot (NR Band n77/78 DoD - 30MHz QPSK - Full RB - Ant 1)

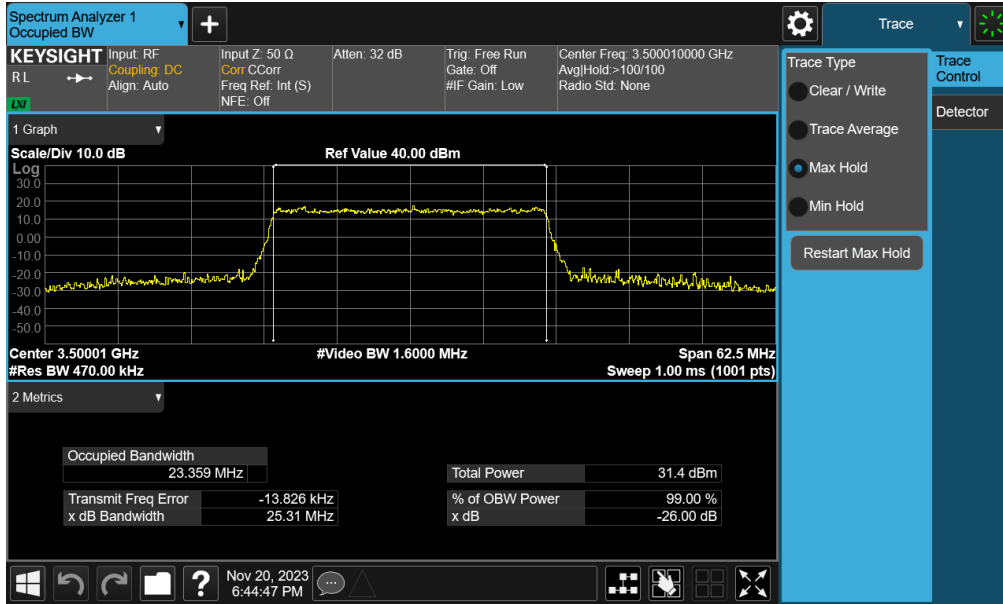


Plot 7-60. Occupied Bandwidth Plot (NR Band n77/78 DoD - 30MHz 16-QAM - Full RB - Ant 1)

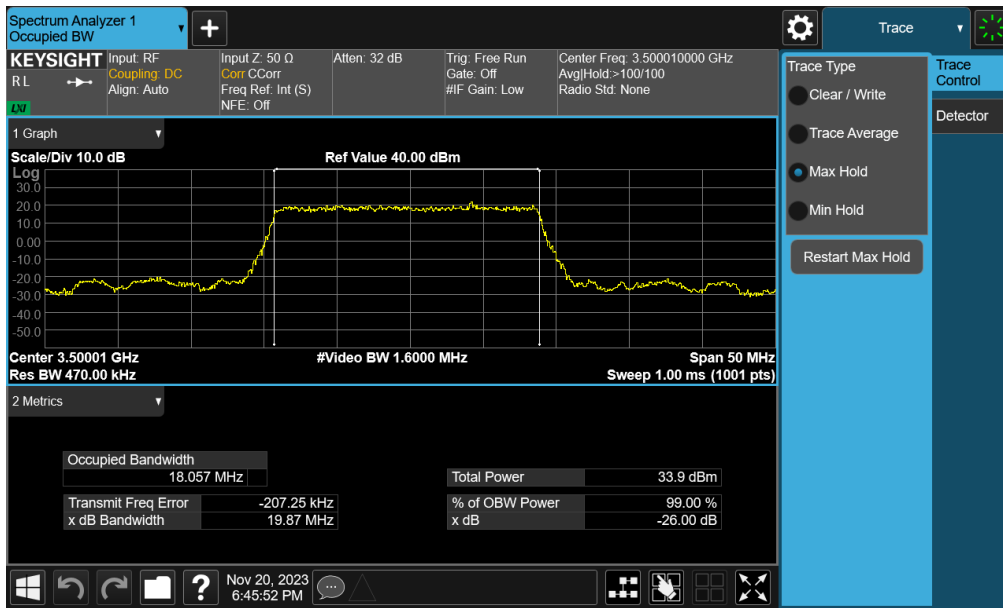
FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 49 of 130



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 50 of 130

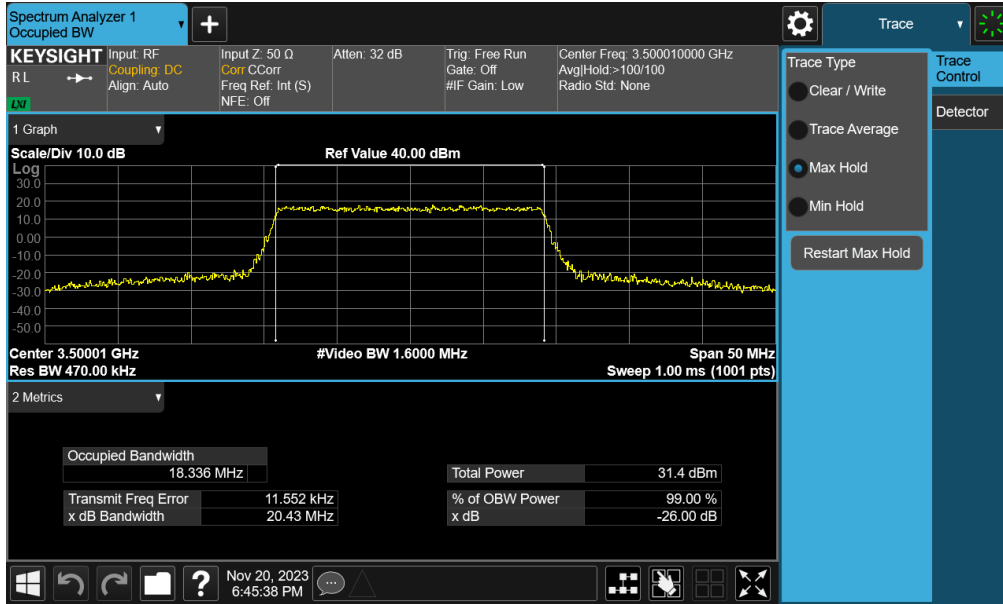


Plot 7-63. Occupied Bandwidth Plot (NR Band n77/78 DoD - 25MHz 16-QAM - Full RB - Ant 1)

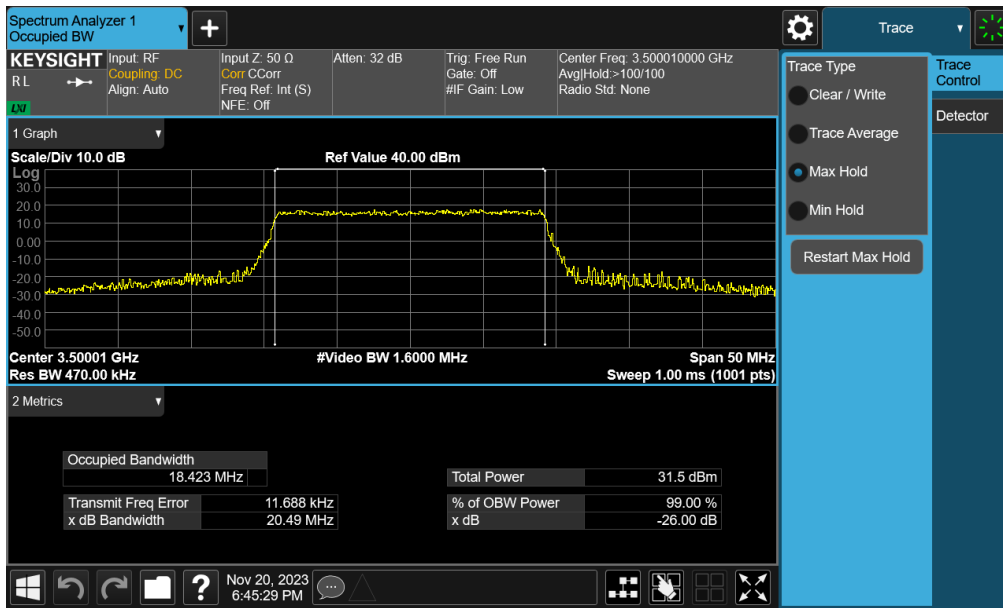


Plot 7-64. Occupied Bandwidth Plot (NR Band n77/78 DoD - 20MHz $\pi/2$ BPSK - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 51 of 130

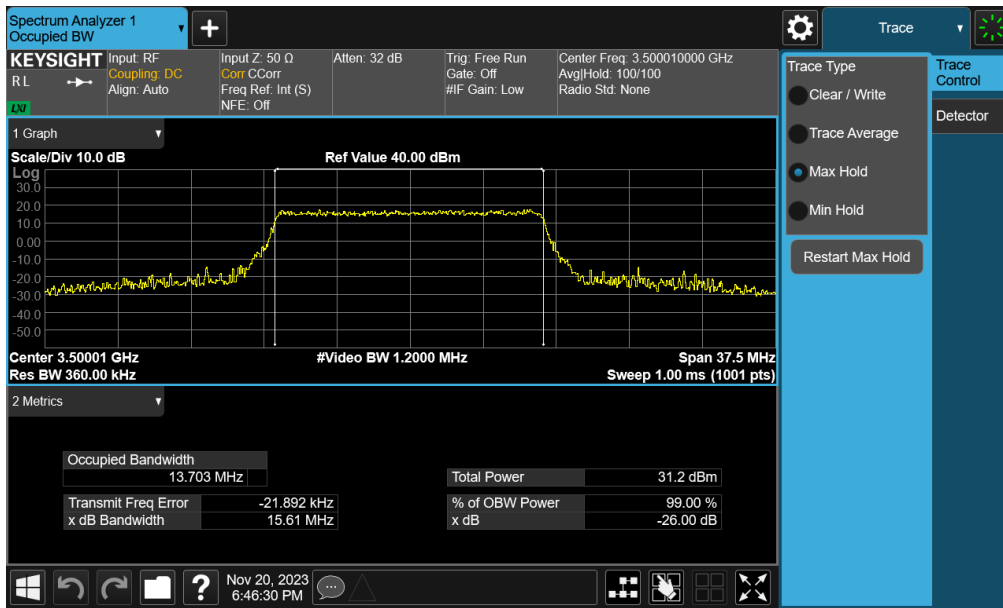
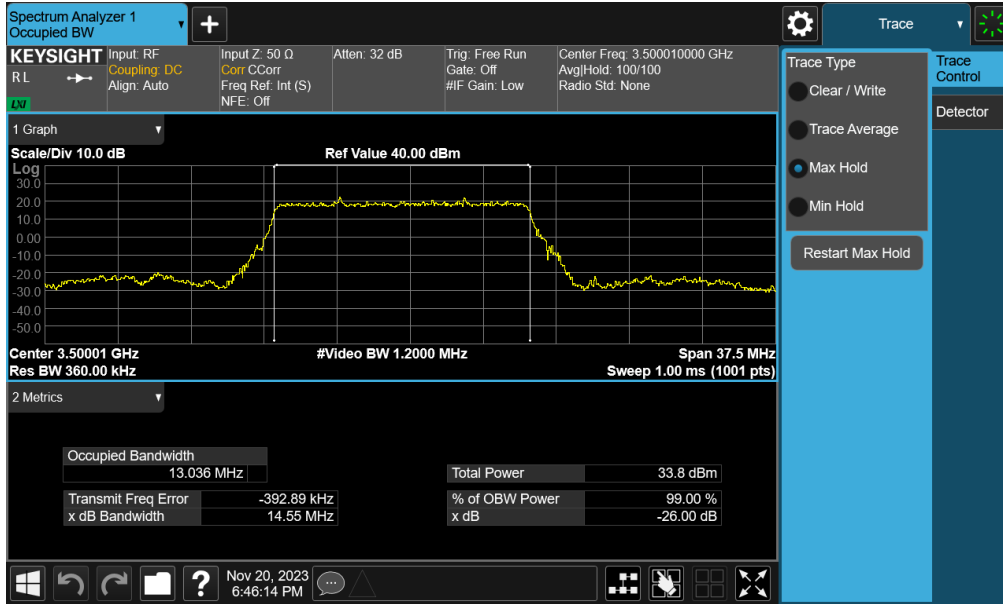


Plot 7-65. Occupied Bandwidth Plot (NR Band n77/78 DoD - 20MHz QPSK - Full RB - Ant 1)



Plot 7-66. Occupied Bandwidth Plot (NR Band n77/78 DoD - 20MHz 16-QAM - Full RB - Ant 1)

FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 52 of 130



FCC ID: A3LSMA356U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-06.A3L	Test Dates: 10/27/2023 - 12/22/2023	EUT Type: Portable Handset	Page 53 of 130