



ELEMENT WASHINGTON DC LLC

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PART 27 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

1/6/2025 - 2/28/2025

Test Report Issue Date:

03/06/2025

Test Site/Location:

Element Lab., Columbia, MD, USA

Element Lab. Yongin-Si, Gyeonggi-do, South Korea

Test Report Serial No.:

1M2501020001-10.A3L

FCC ID:

A3LSMG766U

Applicant Name:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SM-G766U

Additional Model(s):

SM-G766U1

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: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 1 of 138

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	18
7.4	Spurious and Harmonic Emissions at Antenna Terminal	65
7.5	Band Edge Emissions at Antenna Terminal	87
7.6	Radiated Power (EIRP).....	104
7.7	Radiated Spurious Emissions Measurements	111
7.8	Frequency Stability / Temperature Variation	132
8.0	CONCLUSION.....	138

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 2 of 138

PART 27 MEASUREMENT REPORT

Antenna-2						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 30	10 MHz	QPSK	2310.0	0.160	22.04	9M06G7D
		16QAM	2310.0	0.126	21.00	9M05W7D
	5 MHz	QPSK	2307.5 - 2312.5	0.162	22.09	4M52G7D
		16QAM	2307.5 - 2312.5	0.130	21.13	4M54W7D
LTE Band 7	20 MHz	QPSK	2510.0 - 2560.0	0.178	22.50	18M0G7D
		16QAM	2510.0 - 2560.0	0.153	21.86	18M0W7D
	15 MHz	QPSK	2507.5 - 2562.5	0.181	22.57	13M5G7D
		16QAM	2507.5 - 2562.5	0.152	21.82	13M5W7D
	10 MHz	QPSK	2505.0 - 2565.0	0.185	22.66	9M07G7D
		16QAM	2505.0 - 2565.0	0.151	21.78	9M03W7D
	5 MHz	QPSK	2502.5 - 2567.5	0.185	22.67	4M54G7D
		16QAM	2502.5 - 2567.5	0.157	21.95	4M53W7D
LTE Band 41(PC3)/38	20 MHz	QPSK	2506.0 - 2680.0	0.203	23.08	18M1G7D
		16QAM	2506.0 - 2680.0	0.153	21.84	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.201	23.03	13M6G7D
		16QAM	2503.5 - 2682.5	0.191	22.81	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.204	23.11	9M05G7D
		16QAM	2501.0 - 2685.0	0.193	22.86	9M02W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.200	23.02	4M54G7D
		16QAM	2498.5 - 2687.5	0.190	22.78	4M51W7D
NR Band n30	10 MHz	TT/2 BPSK	2310.0	0.163	22.13	9M03G7D
		QPSK	2310.0	0.167	22.22	9M36G7D
		16QAM	2310.0	0.128	21.06	9M34W7D
	5 MHz	TT/2 BPSK	2307.5 - 2312.5	0.158	21.98	4M54G7D
		QPSK	2307.5 - 2312.5	0.169	22.28	4M52G7D
NR Band n41(PC2)	100 MHz	TT/2 BPSK	2546.0 - 2640.0	0.395	25.97	96M8G7D
		QPSK	2546.0 - 2640.0	0.382	25.82	98M1G7D
		16QAM	2546.0 - 2640.0	0.303	24.82	98M1W7D
	90 MHz	TT/2 BPSK	2541.0 - 2645.0	0.398	26.00	87M4G7D
		QPSK	2541.0 - 2645.0	0.395	25.97	87M8G7D
		16QAM	2541.0 - 2645.0	0.311	24.93	88M0W7D
	80 MHz	TT/2 BPSK	2536.0 - 2650.0	0.380	25.80	77M4G7D
		QPSK	2536.0 - 2650.0	0.390	25.91	77M8G7D
		16QAM	2536.0 - 2650.0	0.300	24.77	78M0W7D
	70 MHz	TT/2 BPSK	2531.0 - 2655.0	0.385	25.86	64M7G7D
		QPSK	2531.0 - 2655.0	0.396	25.98	67M6G7D
		16QAM	2531.0 - 2655.0	0.276	24.42	67M8W7D
	60 MHz	TT/2 BPSK	2526.0 - 2660.0	0.388	25.88	58M2G7D
		QPSK	2526.0 - 2660.0	0.407	26.10	58M2G7D
		16QAM	2526.0 - 2660.0	0.350	25.44	58M1W7D
	50 MHz	TT/2 BPSK	2521.0 - 2665.0	0.399	26.01	46M2G7D
		QPSK	2521.0 - 2665.0	0.415	26.18	47M8G7D
		16QAM	2521.0 - 2665.0	0.330	25.19	47M7W7D
		TT/2 BPSK	2516.0 - 2670.0	0.422	26.25	36M1G7D
	40 MHz	QPSK	2516.0 - 2670.0	0.410	26.13	38M0G7D
		16QAM	2516.0 - 2670.0	0.353	25.47	38M1W7D
		TT/2 BPSK	2511.0 - 2675.0	0.425	26.28	27M0G7D
	30 MHz	QPSK	2511.0 - 2675.0	0.438	26.41	27M9G7D
		16QAM	2511.0 - 2675.0	0.335	25.25	28M0W7D
		TT/2 BPSK	2506.0 - 2680.0	0.427	26.31	18M0G7D
	20 MHz	QPSK	2506.0 - 2680.0	0.395	25.97	18M4G7D
		16QAM	2506.0 - 2680.0	0.316	25.00	18M3W7D
		TT/2 BPSK	2550.0 - 2682.5	0.412	26.15	13M0G7D
	15 MHz	QPSK	2550.0 - 2682.5	0.389	25.90	13M7G7D
		16QAM	2550.0 - 2682.5	0.317	25.02	13M8W7D
		TT/2 BPSK	2545.0 - 2685.0	0.387	25.88	8M71G7D
	10 MHz	QPSK	2545.0 - 2685.0	0.375	25.74	8M77G7D
		16QAM	2545.0 - 2685.0	0.314	24.97	8M77W7D

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 3 of 138

Antenna-4						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 30	10 MHz	QPSK	2310.0	0.132	21.21	9M05G7D
		16QAM	2310.0	0.106	20.24	9M05W7D
	5 MHz	QPSK	2307.5 - 2312.5	0.137	21.37	4M55G7D
		16QAM	2307.5 - 2312.5	0.104	20.18	4M54W7D
LTE Band 7	20 MHz	QPSK	2510.0 - 2560.0	0.127	21.04	18M0G7D
		16QAM	2510.0 - 2560.0	0.102	20.08	18M0W7D
	15 MHz	QPSK	2507.5 - 2562.5	0.108	20.33	13M6G7D
		16QAM	2507.5 - 2562.5	0.086	19.34	13M5W7D
	10 MHz	QPSK	2505.0 - 2565.0	0.132	21.21	9M05G7D
		16QAM	2505.0 - 2565.0	0.100	20.02	9M06W7D
	5 MHz	QPSK	2502.5 - 2567.5	0.130	21.15	4M55G7D
		16QAM	2502.5 - 2567.5	0.108	20.32	4M55W7D
LTE Band 41(PC3)/38	20 MHz	QPSK	2506.0 - 2680.0	0.143	21.55	18M0G7D
		16QAM	2506.0 - 2680.0	0.114	20.58	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.152	21.82	13M6G7D
		16QAM	2503.5 - 2682.5	0.124	20.92	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.138	21.39	9M04G7D
		16QAM	2501.0 - 2685.0	0.115	20.62	9M05W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.144	21.58	4M54G7D
		16QAM	2498.5 - 2687.5	0.105	20.20	4M53W7D
NR Band n30	10 MHz	$\pi/2$ BPSK	2310.0	0.163	22.13	9M00G7D
		QPSK	2310.0	0.162	22.09	9M33G7D
		16QAM	2310.0	0.141	21.48	9M38W7D
	5 MHz	$\pi/2$ BPSK	2307.5 - 2312.5	0.165	22.17	4M54G7D
		QPSK	2307.5 - 2312.5	0.172	22.35	4M51G7D
		16QAM	2307.5 - 2312.5	0.138	21.41	4M54W7D

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 4 of 138

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

Measurements were conducted at the Element laboratory(ies) indicated in Section 1.3 below. All measurement facilities are compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

1.3 Test Facility / Accreditations

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

- 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 ISSED Standards (RSS).
- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISSED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISSED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreements (MRAs).

Measurements were performed at Element Materials Technology Suwon, Ltd. located in Yongin-si, Gyeonggi-do, 16954, South Korea. (“ES”)

- Element Materials Technology Suwon, Ltd. is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation(A2LA) with Certificate number 2041.04 for Specific Absorption Rate (SAR), and Electromagnetic Compatibility (EMC) & Telecommunications testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Materials Technology Suwon, Ltd. facility is accredited, designated, and recognized in accordance with the provision of Radio Wave Act and International Standard ISO/IEC 17025:2017 under the National Radio Research Agency.
 - Designation Number / CABID: KR0169
 - Test Firm Registration Number of FCC: 417945
 - Test Firm Registration Number of ISSED: 26168

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 5 of 138

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG766U**. 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.: 3704M, 1969M, 2117M, 4500M, 2086M, 4481M, 3466M, 4505M, 4495M

2.2 Device Capabilities

This device contains the following capabilities:

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

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 C766USQ0AXL3 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: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 6 of 138

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.

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 7 of 138

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

Table 4-1. Measurement Uncertainty Budget – MD

Contribution	Expanded Uncertainty ($\pm$ dB)
Conducted Bench Top Measurements	1.95
Radiated Disturbance (<1GHz)	4.10
Radiated Disturbance (>1GHz)	4.82
Radiated Disturbance (>18GHz)	4.96

Table 4-2. Measurement Uncertainty Budget – ES

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 8 of 138

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
-	LTx1	Licensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTx1
-	LTx2	Licensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTx2
-	LTx3	Licensed Transmitter Cable Set	4/2/2024	Annual	4/2/2025	LTx3
-	WL25-1	Conducted Cable Set (25GHz)	4/2/2024	Annual	4/2/2025	WL25-1
-	WL40-1	Conducted Cable Set (40GHz)	4/2/2024	Annual	4/2/2025	WL40-1
Agilent	N9020A	MXA Signal Analyzer	3/22/2024	Annual	3/22/2025	US46470561
Agilent	N9038A	MXE EMI Receiver	9/16/2024	Annual	9/16/2025	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	4/9/2024	Annual	4/9/2025	MY52350166
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201381794
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6200901190
Emco	3115	Horn Antenna (1-18GHz)	6/7/2024	Biennial	6/7/2026	150693
Espec	ESX-2CA	Environmental Chamber	7/5/2023	Annual	7/5/2025	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/29/2023	Biennial	3/29/2025	128337
Keysight Technologies	N9030A	PXA Signal Analyzer (3Hz-26.5GHz)	8/26/2024	Annual	8/26/2025	MY54490576
Keysight Technologies	N9020A	MXA Signal Analyzer	4/11/2024	Annual	4/11/2025	MY54500644
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			102060
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	10/16/2024	Annual	10/16/2025	100342
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	2/15/2024	Annual	2/15/2025	103200
Sunol	DRH-118	Horn Antenna (1-18GHz)	2/21/2024	Biennial	2/21/2026	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	2/13/2024	Biennial	2/13/2026	A042511
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	9/11/2024	Biennial	9/11/2026	A051107

Table 5-1. Test Equipment – MD

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	4/9/2024	Annual	4/9/2025	218555
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/14/2024	Annual	8/14/2025	101648
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/29/2024	Annual	5/29/2025	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	5/1/2024	Annual	5/1/2025	101867
Rohde & Schwarz	FSW67	Signal and Spectrum Analyzer (2Hz-67GHz)	7/5/2024	Annual	7/5/2025	101366
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	7/3/2024	Annual	7/3/2025	102356
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	12/10/2024	Annual	12/10/2025	161616
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	12/10/2024	Annual	12/10/2025	164715
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	4/9/2024	Annual	4/9/2025	304

Table 5-2. Test Equipment – ES

Notes:

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

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT			Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset		Page 9 of 138

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: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 10 of 138

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
FCC ID: A3LSMG766U
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
Mode(s): LTE/NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference	Test Location
CONDUCTED	Transmitter Conducted Output Power	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2	ES
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3	ES
	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	ES
	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	ES
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8	MD
RADIATED	Equivalent Isotropic Radiated Power (LTE Band 30; NR Band n30)	27.50(a)(3)	≤ 250mW / 5MHz max. EIRP	PASS	Section 7.6	MD
	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	MD
	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	MD
	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	MD

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: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 11 of 138

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.

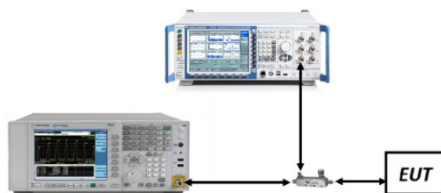


Figure 7-1. Test Instrument & Measurement Setup

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.
3. 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: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 12 of 138

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
10 MHz	QPSK	27710	2310.0	1 / 0	23.00
	16-QAM	27710	2310.0	1 / 0	22.25
5 MHz	QPSK	27685	2307.5	1 / 0	23.16
		27710	2310.0	1 / 0	22.88
		27735	2312.5	1 / 0	22.94
	16-QAM	27685	2307.5	1 / 0	22.19
		27710	2310.0	1 / 0	22.05
		27735	2312.5	1 / 0	21.91

Table 7-1. Conducted Power Data (LTE Band 30 – Ant 4)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	20850	2510.0	1 / 99	23.07
		21100	2535.0	1 / 99	23.41
		21350	2560.0	1 / 99	23.77
	16-QAM	20850	2510.0	1 / 99	22.24
		21100	2535.0	1 / 99	22.55
		21350	2560.0	1 / 99	23.03
15 MHz	QPSK	20825	2507.5	1 / 37	22.37
		21100	2535.0	1 / 0	23.13
		21375	2562.5	1 / 37	23.62
	16-QAM	20825	2507.5	1 / 37	21.51
		21100	2535.0	1 / 0	22.32
		21375	2562.5	1 / 37	22.81
10 MHz	QPSK	20800	2505.0	1 / 0	23.25
		21100	2535.0	1 / 49	23.46
		21400	2565.0	1 / 0	23.92
	16-QAM	20800	2505.0	1 / 0	22.19
		21100	2535.0	1 / 49	22.67
		21400	2565.0	1 / 0	22.96
5 MHz	QPSK	20775	2502.5	1 / 24	23.19
		21100	2535.0	1 / 24	23.45
		21425	2567.5	1 / 12	23.93
	16-QAM	20775	2502.5	1 / 24	22.49
		21100	2535.0	1 / 24	22.61
		21425	2567.5	1 / 12	22.97

Table 7-2. Conducted Power Data (LTE Band 7 – Ant 4)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 13 of 138

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	39750	2506.0	1 / 0	23.74
		40620	2593.0	1 / 99	23.69
		41490	2680.0	1 / 0	23.80
	16-QAM	39750	2506.0	1 / 0	22.84
		40620	2593.0	1 / 99	22.71
		41490	2680.0	1 / 0	21.87
15 MHz	QPSK	39725	2503.5	1 / 37	23.76
		40620	2593.0	1 / 74	23.61
		41515	2682.5	1 / 0	23.75
	16-QAM	39725	2503.5	1 / 37	22.85
		40620	2593.0	1 / 74	22.68
		41515	2682.5	1 / 0	22.84
10 MHz	QPSK	39700	2501.0	1 / 25	23.91
		40620	2593.0	1 / 25	23.70
		41540	2685.0	1 / 25	23.83
	16-QAM	39700	2501.0	1 / 25	22.94
		40620	2593.0	1 / 25	22.75
		41540	2685.0	1 / 25	22.89
5 MHz	QPSK	39675	2498.5	1 / 12	23.95
		40620	2593.0	1 / 12	23.72
		41565	2687.5	1 / 12	23.74
	16-QAM	39675	2498.5	1 / 12	22.95
		40620	2593.0	1 / 12	22.75
		41565	2687.5	1 / 12	22.81

Table 7-3. Conducted Power Data (LTE Band 41(PC3) – Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 14 of 138

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	39750	2506.0	1 / 99	23.46
		40620	2593.0	1 / 99	23.82
		41490	2680.0	1 / 99	23.98
	16-QAM	39750	2506.0	1 / 99	22.47
		40620	2593.0	1 / 99	23.03
		41490	2680.0	1 / 99	22.97
15 MHz	QPSK	39725	2503.5	1 / 74	23.73
		40620	2593.0	1 / 74	23.87
		41515	2682.5	1 / 74	23.97
	16-QAM	39725	2503.5	1 / 74	22.81
		40620	2593.0	1 / 74	23.36
		41515	2682.5	1 / 74	23.38
10 MHz	QPSK	39700	2501.0	1 / 25	23.30
		40620	2593.0	1 / 25	23.69
		41540	2685.0	1 / 25	23.60
	16-QAM	39700	2501.0	1 / 25	22.51
		40620	2593.0	1 / 25	22.14
		41540	2685.0	1 / 25	22.43
5 MHz	QPSK	39675	2498.5	1 / 24	23.49
		40620	2593.0	1 / 0	23.86
		41565	2687.5	1 / 24	23.82
	16-QAM	39675	2498.5	1 / 24	22.09
		40620	2593.0	1 / 0	22.49
		41565	2687.5	1 / 24	22.15

Table 7-4. Conducted Power Data (LTE Band 41(PC3) – Ant 4)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 15 of 138

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
10 MHz	$\pi/2$ BPSK	27710	2310.0	1 / 50	23.74
	QPSK	27710	2310.0	1 / 50	23.61
	16-QAM	27710	2310.0	1 / 50	22.75
5 MHz	$\pi/2$ BPSK	27685	2307.5	1 / 1	23.61
		27710	2310.0	1 / 12	23.77
		27735	2312.5	1 / 12	23.66
	QPSK	27685	2307.5	1 / 1	23.56
		27710	2310.0	1 / 12	23.79
		27735	2312.5	1 / 1	23.86
	16-QAM	27685	2307.5	1 / 1	22.68
		27710	2310.0	1 / 12	22.66
		27735	2312.5	1 / 1	22.65

Table 7-5. Conducted Power Data (NR Band n30 – Ant 4)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 16 of 138

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	509202	2546.01	1 / 136	26.96
		518598	2592.99	1 / 271	26.94
		528000	2640.00	1 / 136	26.99
	QPSK	509202	2546.01	1 / 136	26.63
		518598	2592.99	1 / 136	26.62
		528000	2640.00	1 / 136	26.67
	16-QAM	509202	2546.01	1 / 136	25.92
		518598	2592.99	1 / 271	25.56
		528000	2640.00	1 / 136	26.09
90 MHz	π/2 BPSK	508200	2541.00	1 / 122	26.85
		518598	2592.99	1 / 243	26.98
		528996	2644.98	1 / 122	26.73
	QPSK	508200	2541.00	1 / 122	26.78
		518598	2592.99	1 / 243	26.97
		528996	2644.98	1 / 122	26.44
	16-QAM	508200	2541.00	1 / 122	25.90
		518598	2592.99	1 / 243	25.95
		528996	2644.98	1 / 122	25.15
80 MHz	π/2 BPSK	507204	2536.02	1 / 108	26.82
		518598	2592.99	1 / 215	26.78
		529998	2649.99	1 / 108	26.98
	QPSK	507204	2536.02	1 / 108	26.72
		518598	2592.99	1 / 1	26.77
		529998	2649.99	1 / 108	26.82
	16-QAM	507204	2536.02	1 / 108	25.87
		518598	2592.99	1 / 215	25.63
		529998	2649.99	1 / 108	25.61
70 MHz	π/2 BPSK	506202	2531.01	1 / 187	26.75
		518598	2592.99	1 / 1	26.83
		531000	2655.00	1 / 94	26.86
	QPSK	506202	2531.01	1 / 94	26.79
		518598	2592.99	1 / 1	26.80
		531000	2655.00	1 / 94	26.85
	16-QAM	506202	2531.01	1 / 94	25.51
		518598	2592.99	1 / 94	25.43
		531000	2655.00	1 / 94	25.49
60 MHz	π/2 BPSK	505200	2526.00	1 / 160	26.93
		518598	2592.99	1 / 160	26.86
		531996	2659.98	1 / 81	26.81
	QPSK	505200	2526.00	1 / 160	26.91
		518598	2592.99	1 / 1	26.92
		531996	2659.98	1 / 1	26.77
	16-QAM	505200	2526.00	1 / 160	26.55
		518598	2592.99	1 / 1	25.72
		531996	2659.98	1 / 81	25.62
50 MHz	π/2 BPSK	504204	2521.02	1 / 131	26.98
		518598	2592.99	1 / 131	26.98
		532998	2664.99	1 / 1	26.99
	QPSK	504204	2521.02	1 / 131	26.99
		518598	2592.99	1 / 131	26.64
		532998	2664.99	1 / 1	27.00
	16-QAM	504204	2521.02	1 / 131	26.29
		518598	2592.99	1 / 131	25.83
		532998	2664.99	1 / 1	26.02
40 MHz	π/2 BPSK	503202	2516.01	1 / 104	27.30
		518598	2592.99	1 / 104	27.23
		534000	2670.00	1 / 1	27.34
	QPSK	503202	2516.01	1 / 104	26.95
		518598	2592.99	1 / 104	27.00
		534000	2670.00	1 / 1	27.03
	16-QAM	503202	2516.01	1 / 104	26.31
		518598	2592.99	1 / 104	26.49
		534000	2670.00	1 / 1	26.08
30 MHz	π/2 BPSK	502200	2511.00	1 / 76	27.33
		518598	2592.99	1 / 76	27.13
		534996	2674.98	1 / 1	27.35
	QPSK	502200	2511.00	1 / 76	27.22
		518598	2592.99	1 / 76	27.18
		534996	2674.98	1 / 1	27.02
	16-QAM	502200	2511.00	1 / 76	26.35
		518598	2592.99	1 / 76	26.01
		534996	2674.98	1 / 1	26.10
20 MHz	π/2 BPSK	501204	2506.02	1 / 49	27.19
		518598	2592.99	1 / 49	27.28
		535998	2679.99	1 / 1	27.36
	QPSK	501204	2506.02	1 / 49	26.59
		518598	2592.99	1 / 49	27.17
		535998	2679.99	1 / 1	27.05
	16-QAM	501204	2506.02	1 / 49	25.68
		518598	2592.99	1 / 49	26.02
		535998	2679.99	1 / 1	26.26

Table 7-6. Conducted Power Data (NR Band n41 – Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 17 of 138

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.

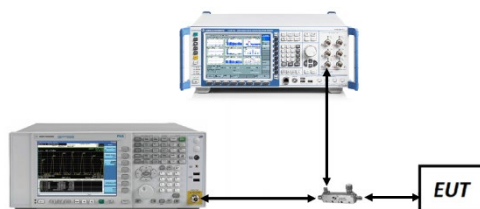


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 18 of 138

Mode	Bandwidth	Modulation	OBW [MHz]
LTE-B30	10MHz	QPSK	9.06
		16QAM	9.05
	5MHz	QPSK	4.52
		16QAM	4.54
LTE-B7	20MHz	QPSK	18.04
		16QAM	18.03
	15MHz	QPSK	13.54
		16QAM	13.55
	10MHz	QPSK	9.07
		16QAM	9.03
	5MHz	QPSK	4.54
		16QAM	4.53
LTE-B41/38PC3	20MHz	QPSK	18.08
		16QAM	18.04
	15MHz	QPSK	13.56
		16QAM	13.53
	10MHz	QPSK	9.05
		16QAM	9.02
	5MHz	QPSK	4.54
		16QAM	4.51

Table 7-2. Occupied Bandwidth Test Results – LTE – Ant 2

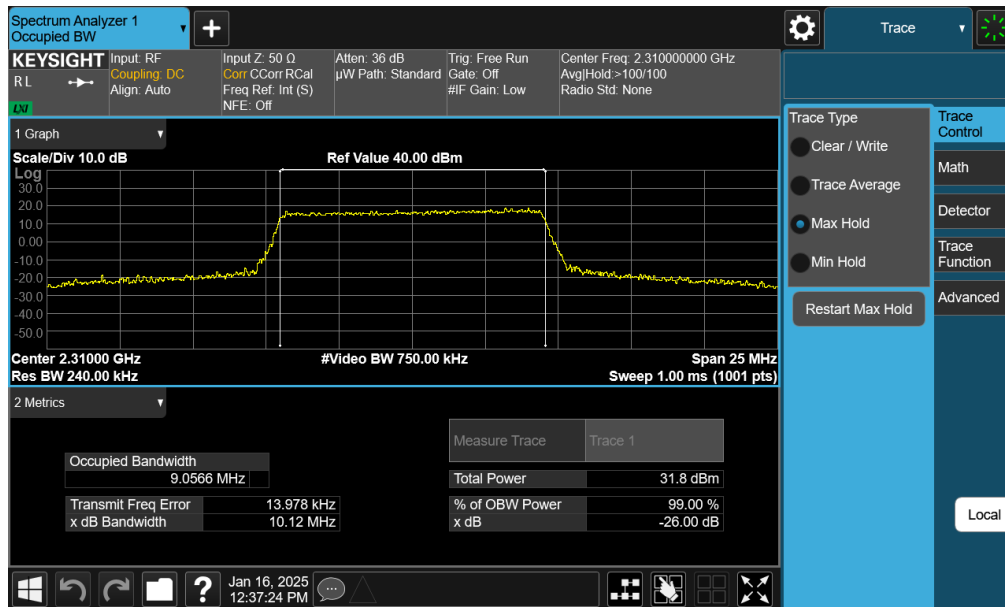
FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 19 of 138

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n30	10MHz	$\pi/2$ BPSK	9.03
		QPSK	9.36
		16QAM	9.34
	5MHz	$\pi/2$ BPSK	4.54
		QPSK	4.52
		16QAM	4.52
NR-n41PC2	100MHz	$\pi/2$ BPSK	96.79
		QPSK	98.12
		16QAM	98.10
	90MHz	$\pi/2$ BPSK	87.41
		QPSK	87.82
		16QAM	87.98
	80MHz	$\pi/2$ BPSK	77.43
		QPSK	77.77
		16QAM	77.97
	70MHz	$\pi/2$ BPSK	64.70
		QPSK	67.63
		16QAM	67.82
	60MHz	$\pi/2$ BPSK	58.19
		QPSK	58.20
		16QAM	58.15
	50MHz	$\pi/2$ BPSK	46.17
		QPSK	47.83
		16QAM	47.65
	40MHz	$\pi/2$ BPSK	36.09
		QPSK	37.99
		16QAM	38.07
	30MHz	$\pi/2$ BPSK	26.98
		QPSK	27.94
		16QAM	28.00
	20MHz	$\pi/2$ BPSK	18.03
		QPSK	18.37
		16QAM	18.30
	15MHz	$\pi/2$ BPSK	12.99
		QPSK	13.58
		16QAM	13.61
	10MHz	$\pi/2$ BPSK	8.60
		QPSK	8.58
		16QAM	8.56

Table 7-3. Occupied Bandwidth Test Results – NR – Ant 2

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 20 of 138

LTE Band 30 – Ant 2

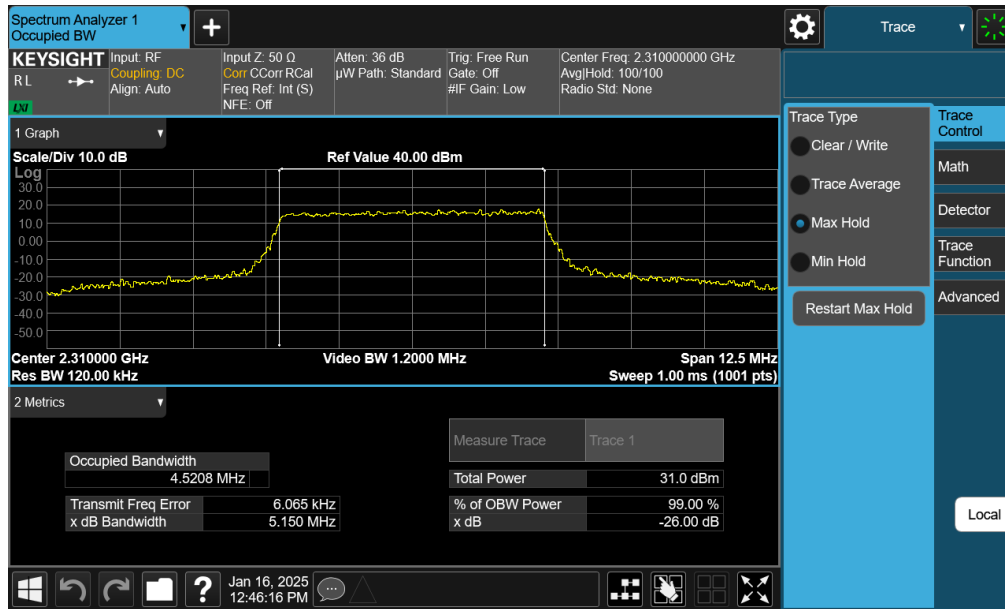


Plot 7-7. Occupied Bandwidth Plot (LTE Band 30 - 10MHz QPSK - Full RB - Ant 4 – Ant 2)

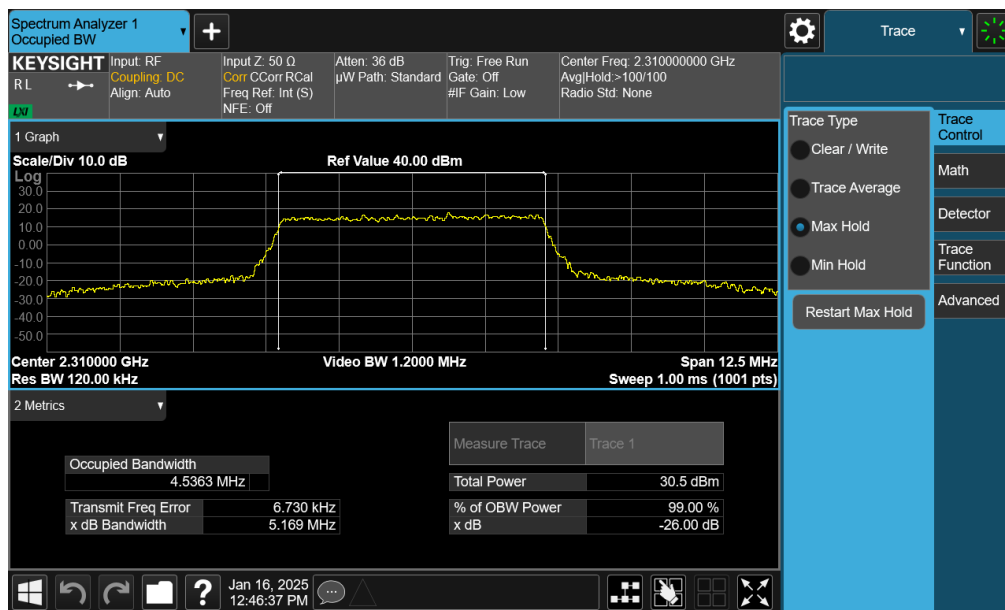


Plot 7-8. Occupied Bandwidth Plot (LTE Band 30 - 10MHz 16-QAM - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 21 of 138



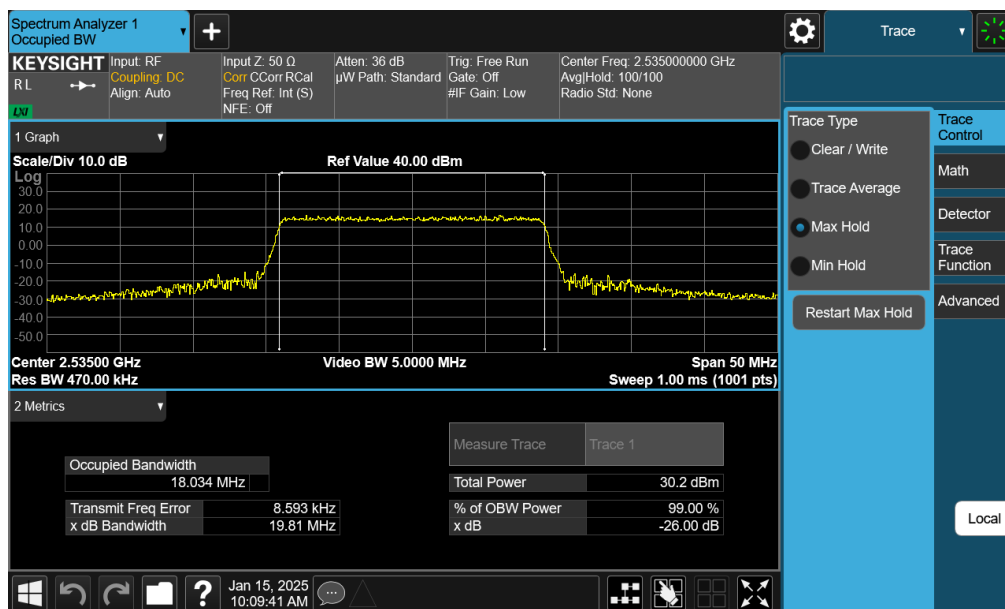
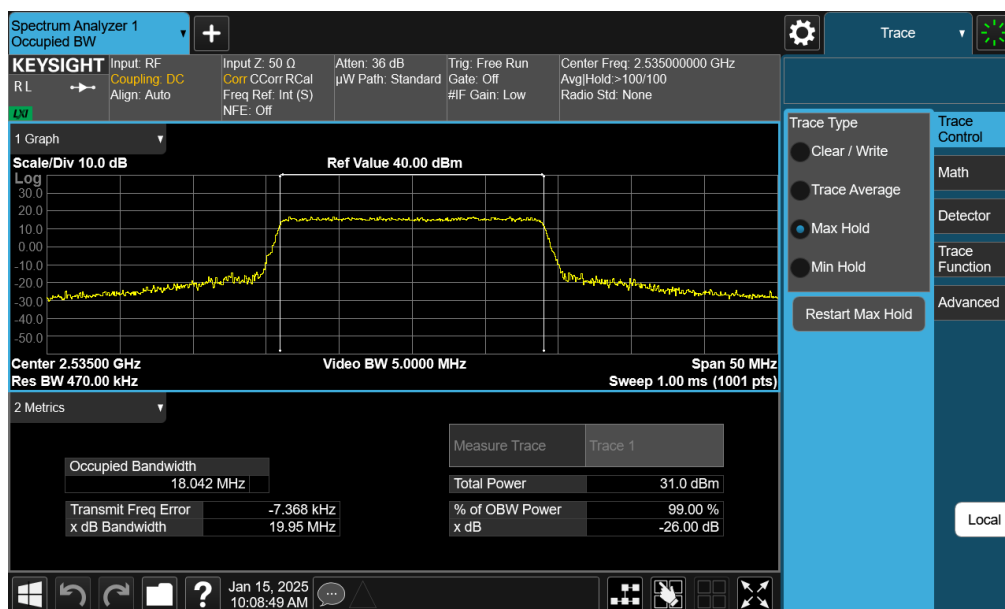
Plot 7-9. Occupied Bandwidth Plot (LTE Band 30 - 5MHz QPSK - Full RB - Ant 2)



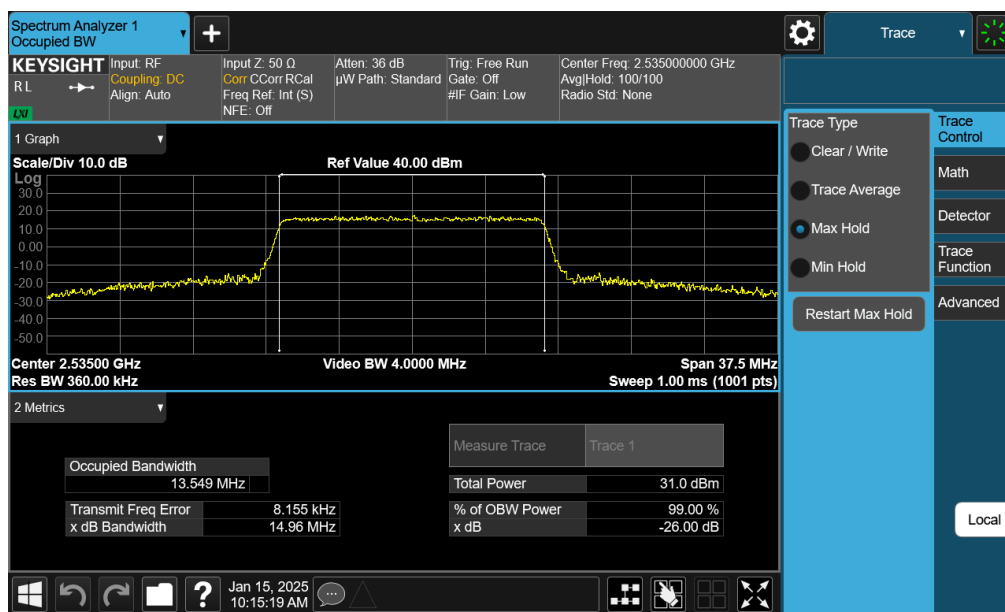
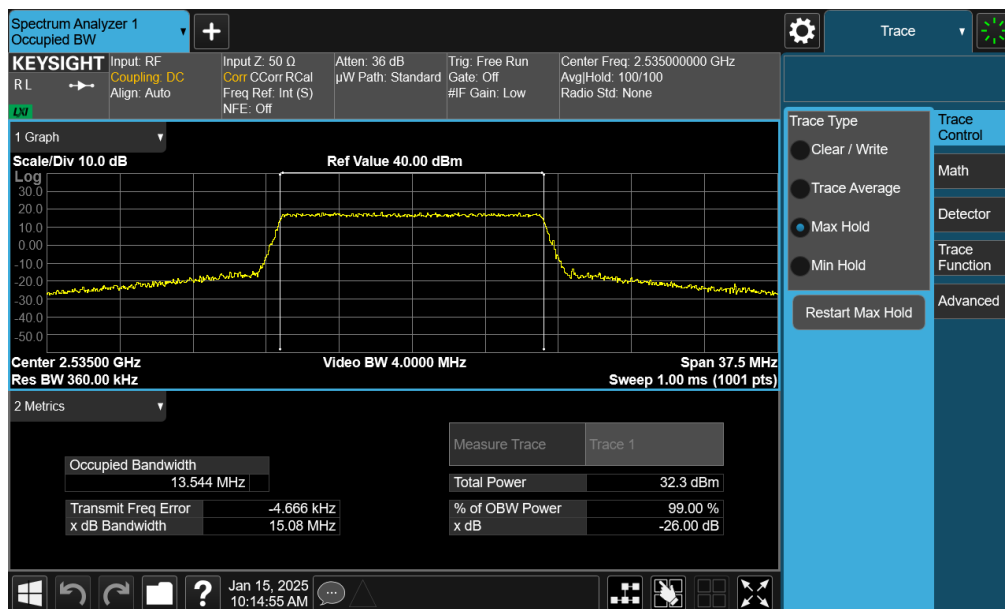
Plot 7-10. Occupied Bandwidth Plot (LTE Band 30 - 5MHz 16-QAM - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 22 of 138

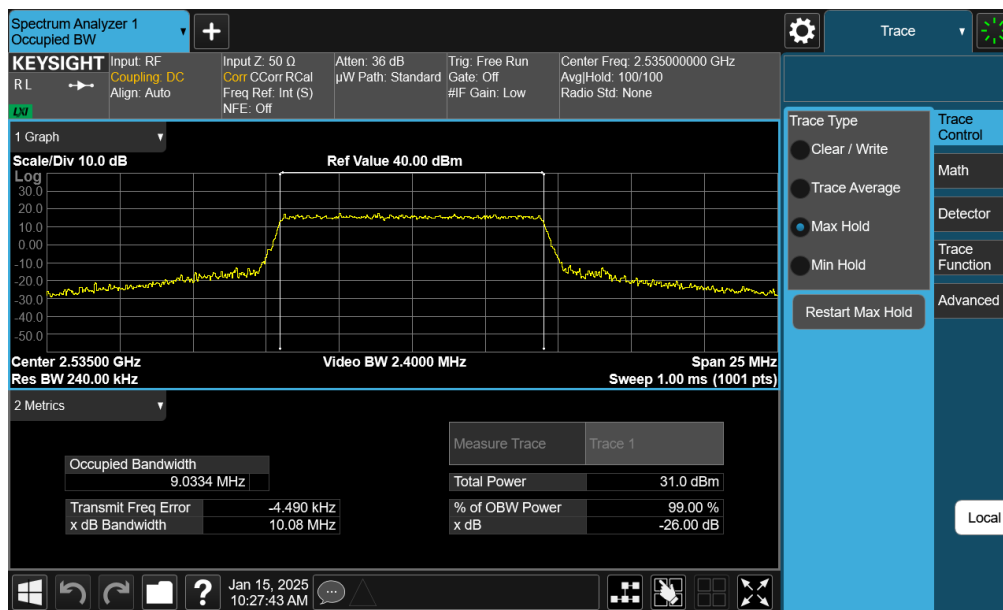
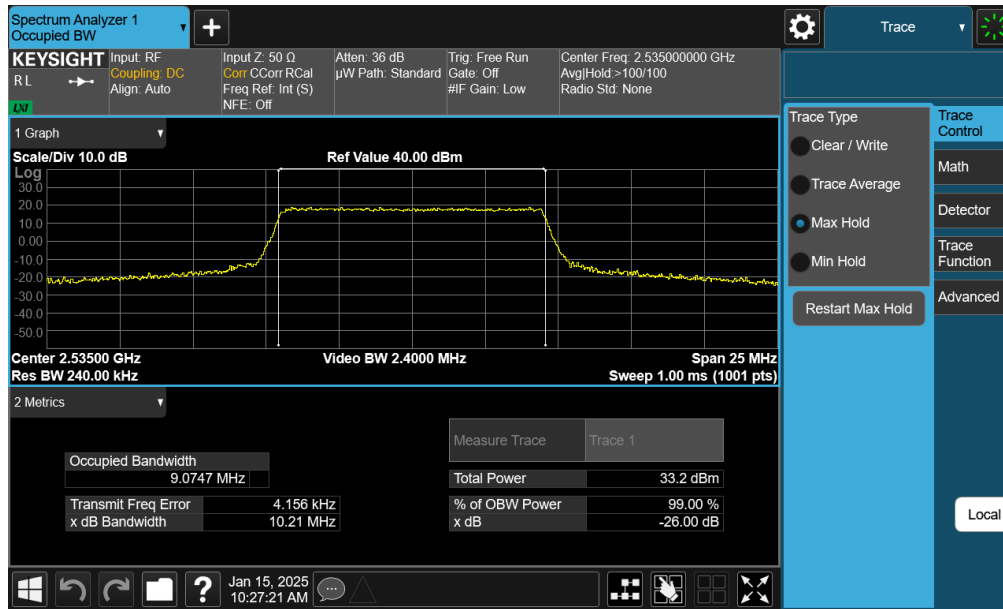
LTE Band 7 – Ant 2



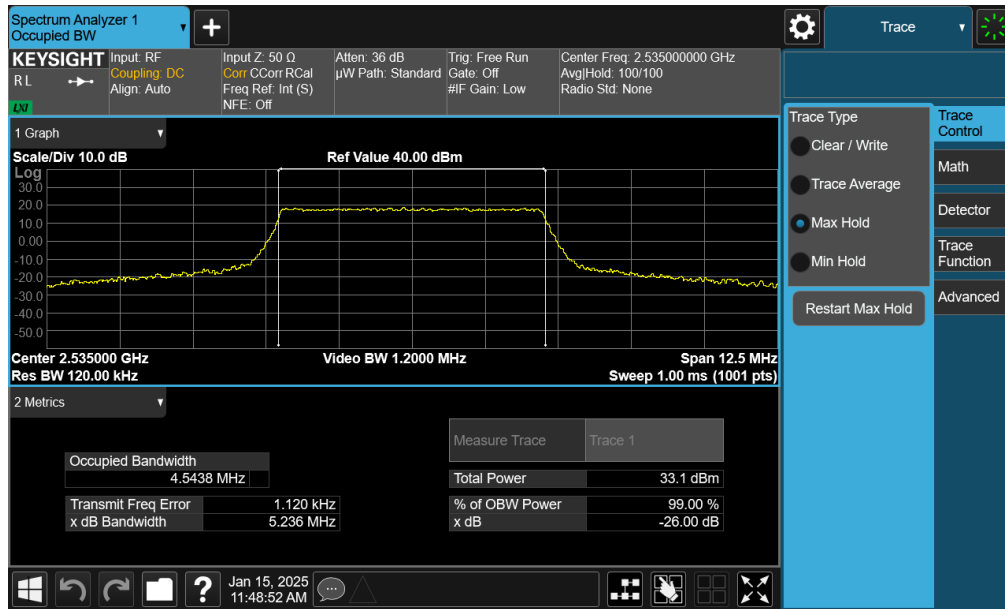
FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 23 of 138



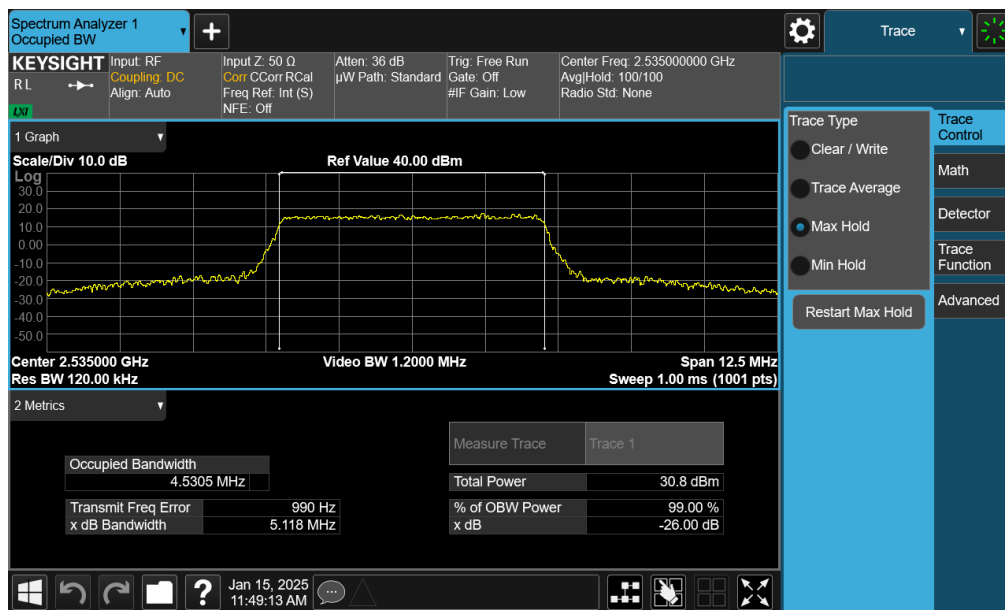
FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 24 of 138



FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 25 of 138



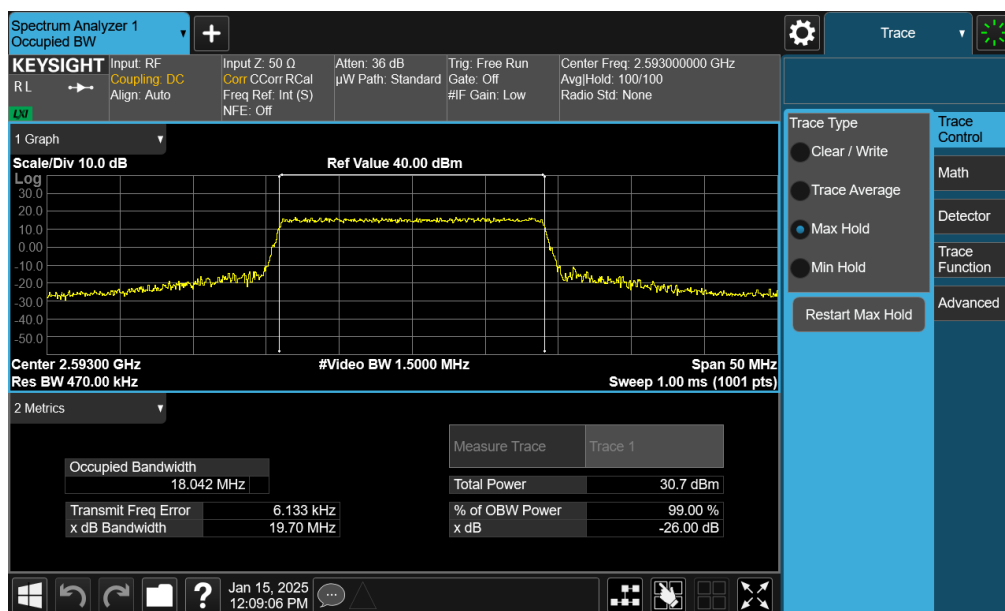
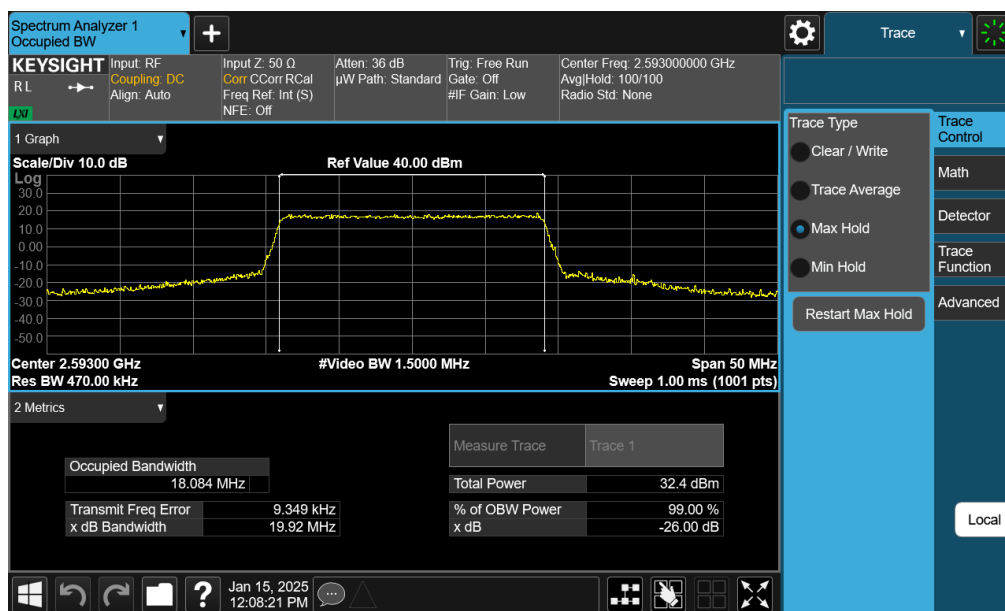
Plot 7-17. Occupied Bandwidth Plot (LTE Band 7 - 5MHz QPSK - Full RB - Ant 2)



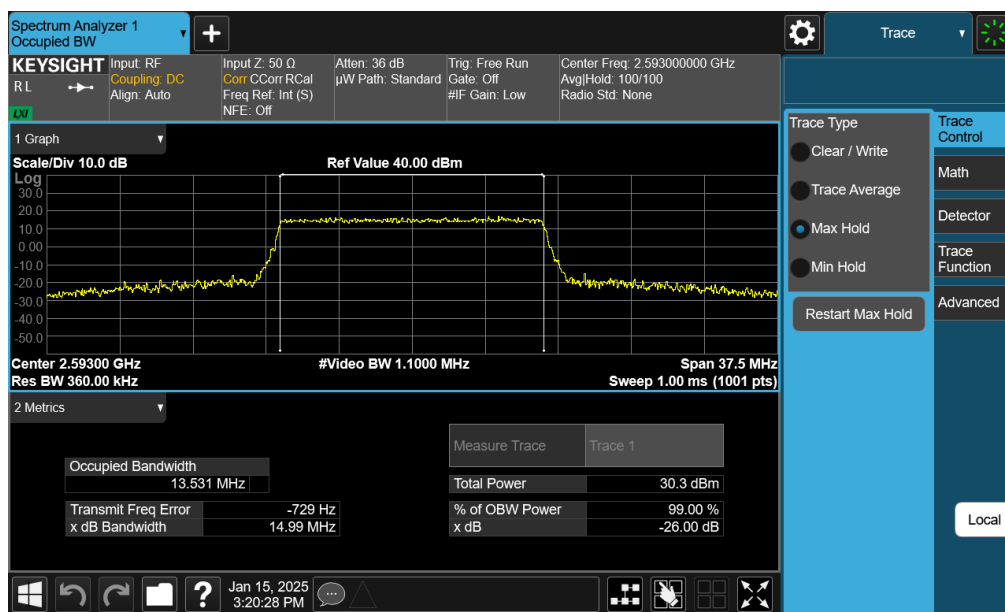
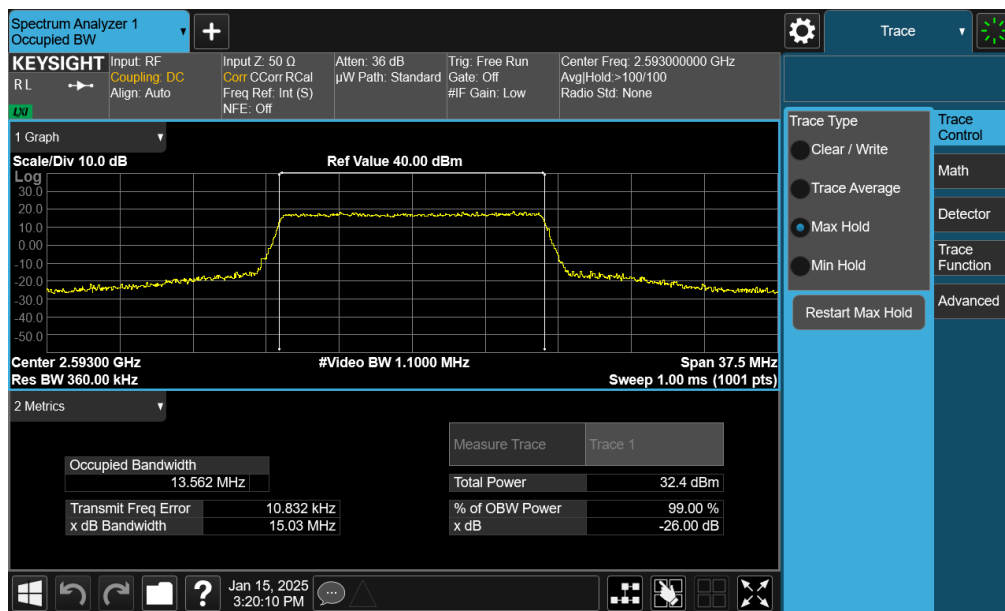
Plot 7-18. Occupied Bandwidth Plot (LTE Band 7 - 5MHz 16-QAM - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 26 of 138

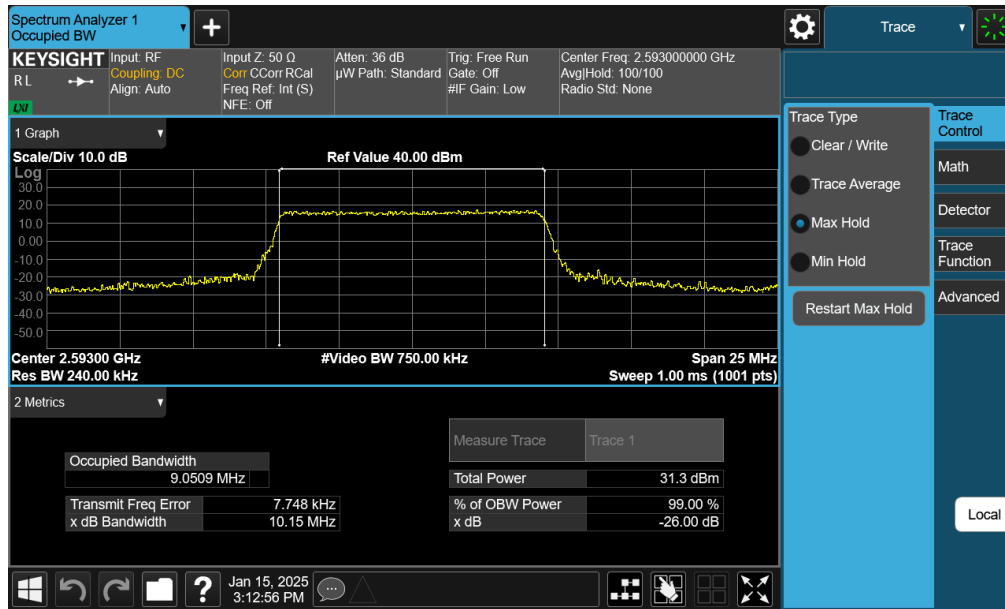
LTE Band 41(PC3)/38 – Ant 2



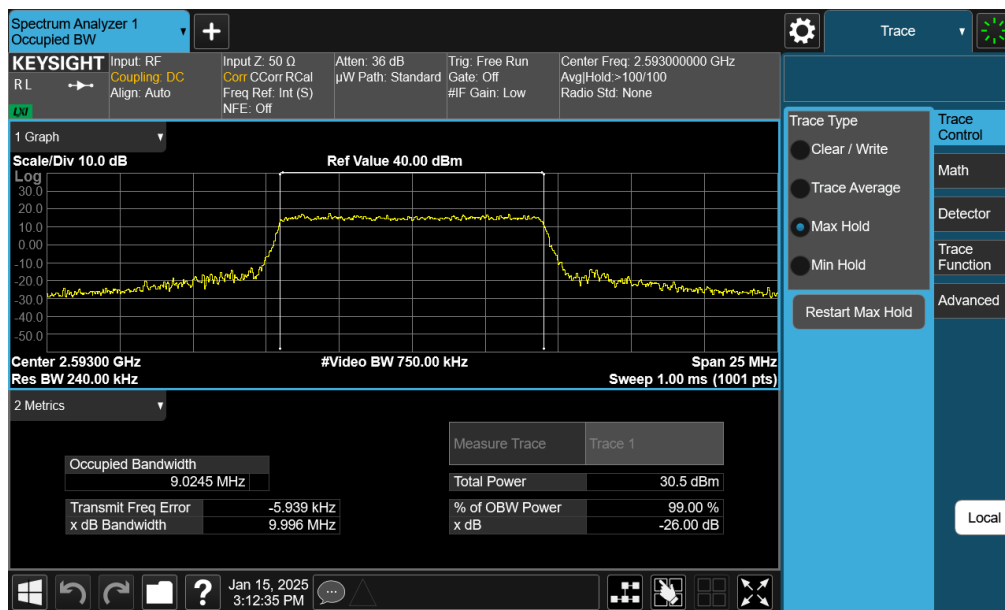
FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 27 of 138



FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 28 of 138

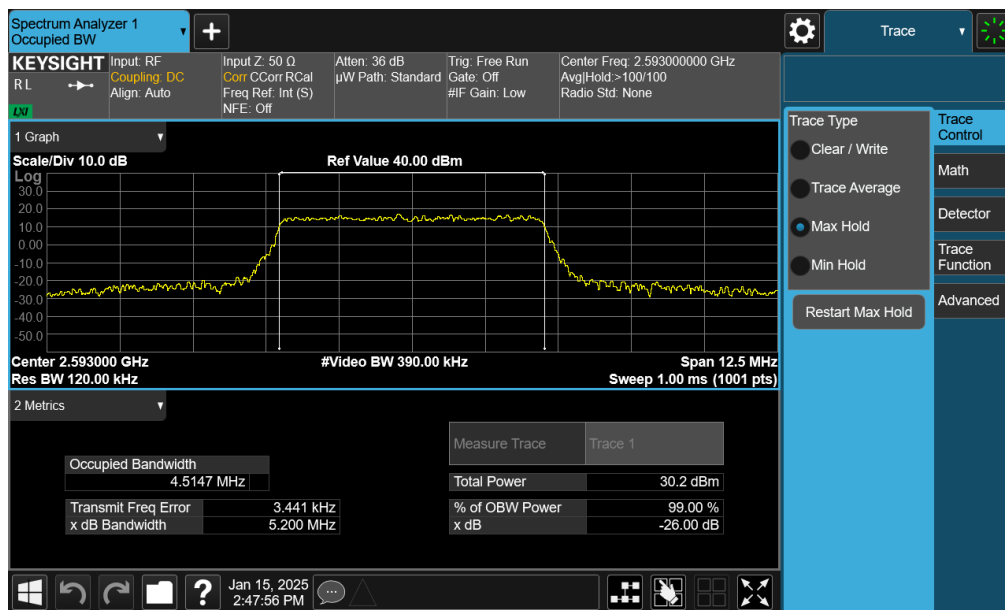
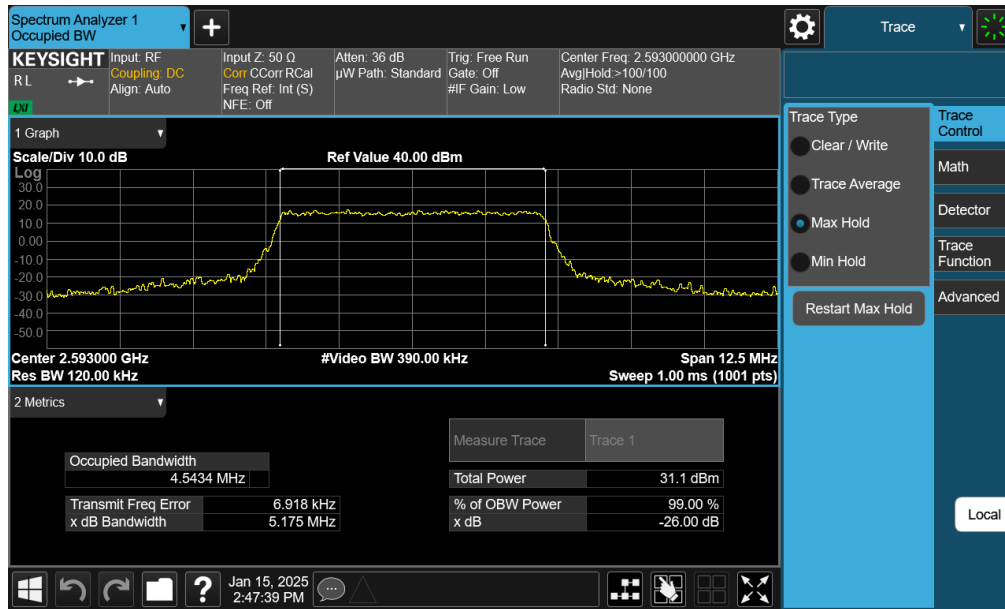


Plot 7-23. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 10MHz QPSK - Full RB - Ant 2)



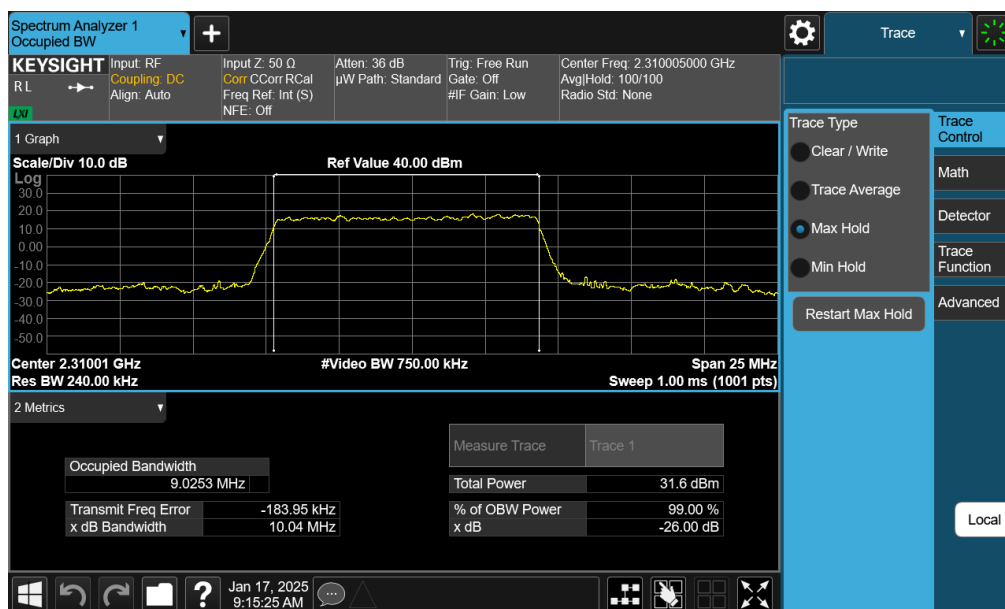
Plot 7-24. Occupied Bandwidth Plot (LTE Band 41(PC3)/38 - 10MHz 16-QAM - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 29 of 138

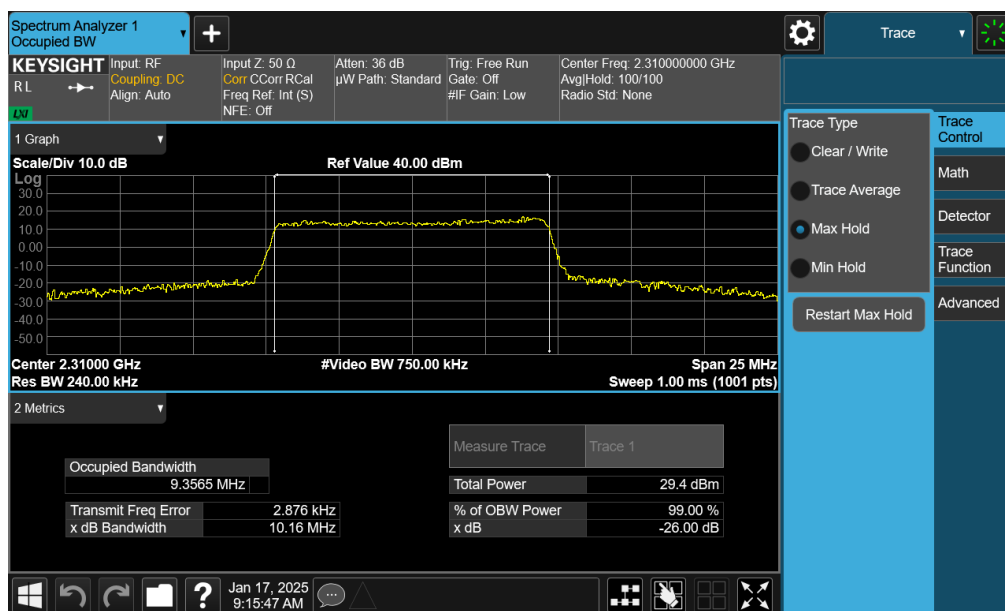


FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 30 of 138

NR Band n30 – Ant 2

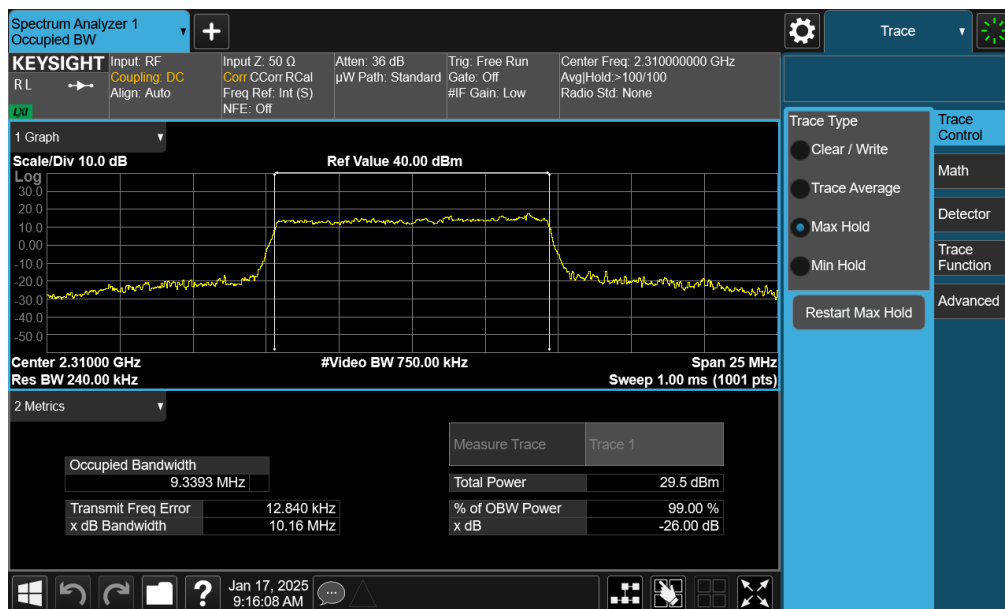


Plot 7-27. Occupied Bandwidth Plot (NR Band n30 - 10MHz $\pi/2$ BPSK - Full RB - Ant 2)

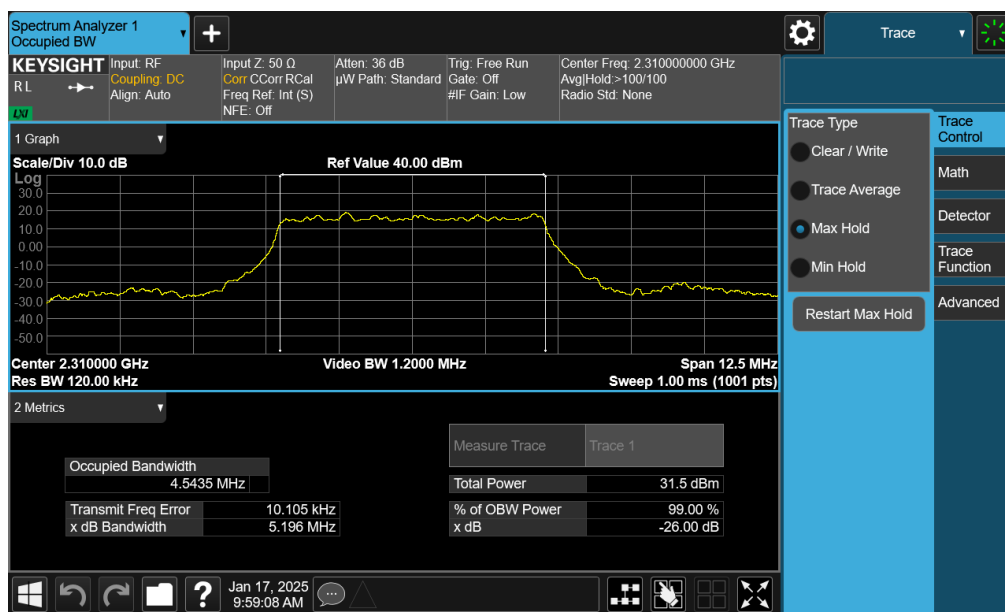


Plot 7-28. Occupied Bandwidth Plot (NR Band n30 - 10MHz QPSK - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 31 of 138

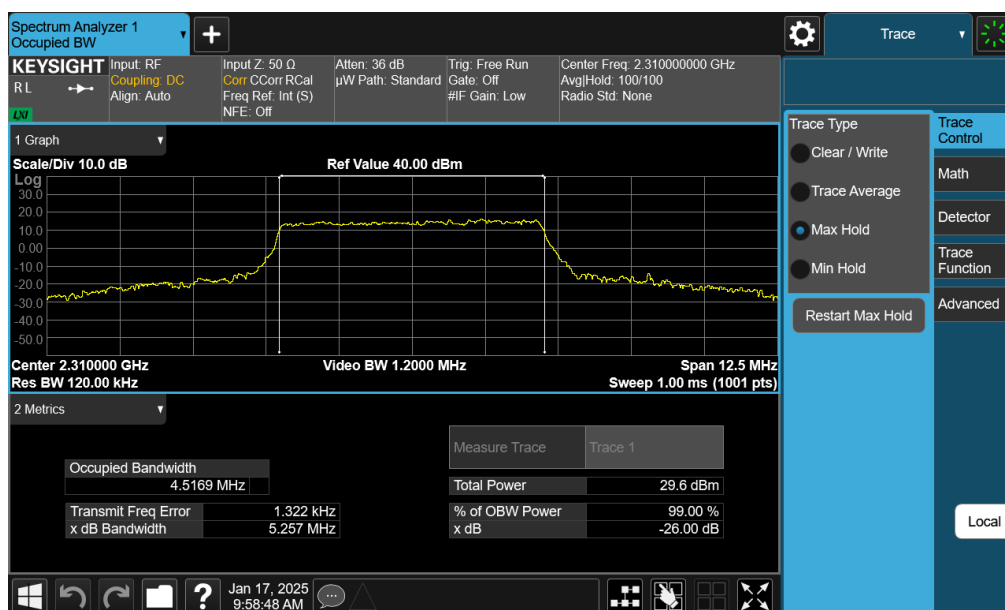
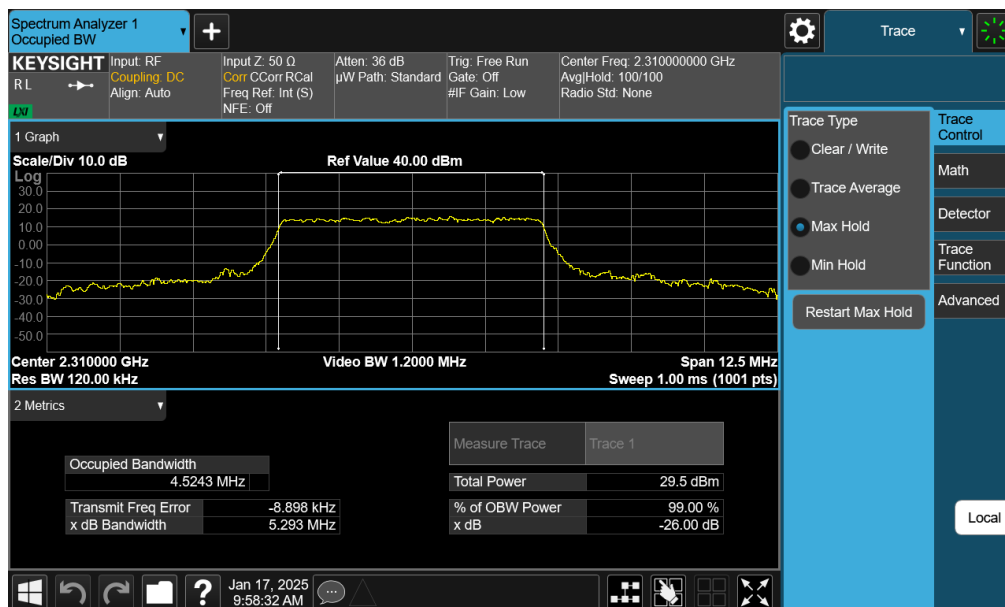


Plot 7-29. Occupied Bandwidth Plot (NR Band n30 - 10MHz 16-QAM - Full RB - Ant 2)



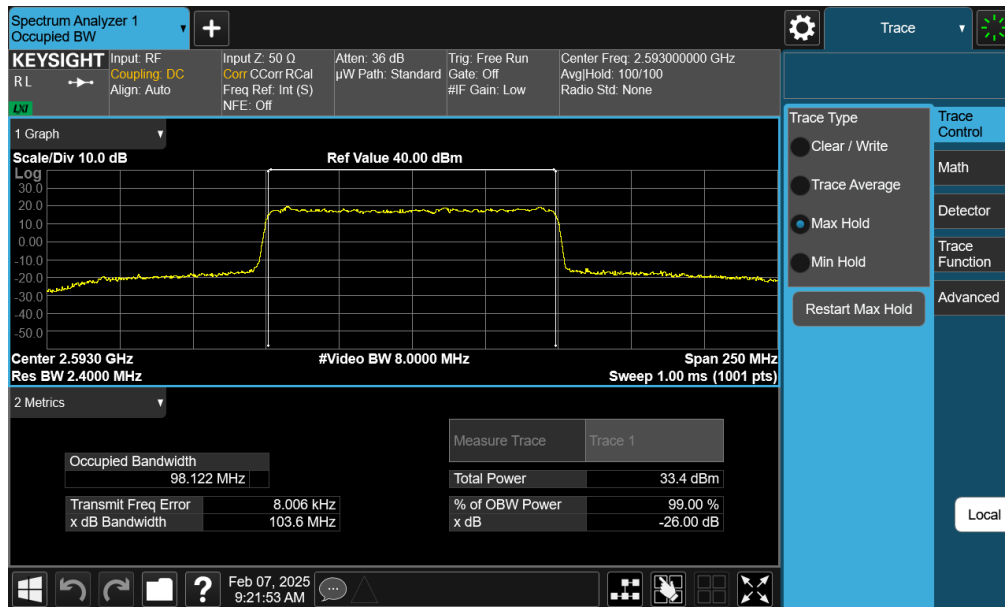
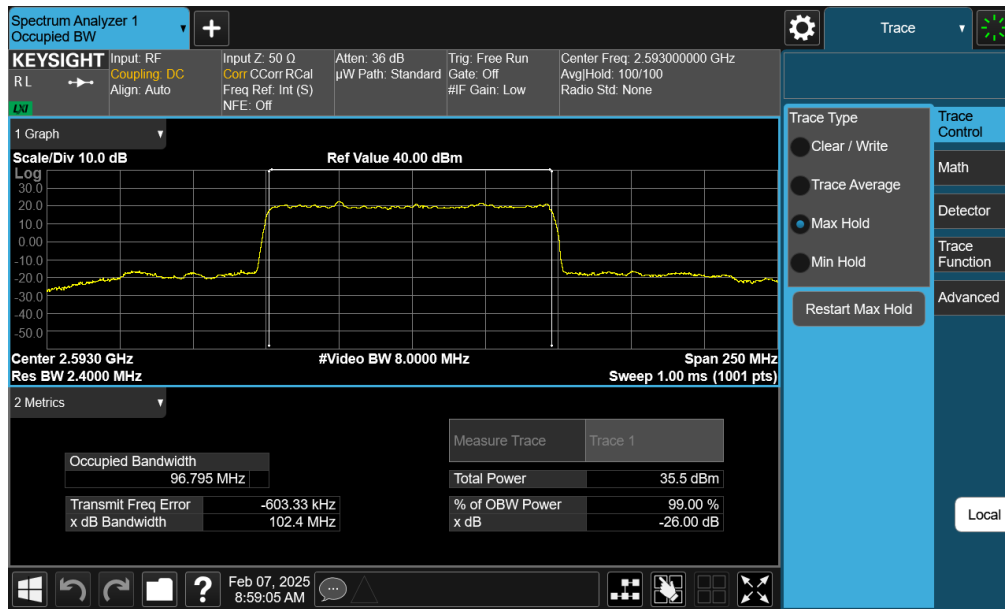
Plot 7-30. Occupied Bandwidth Plot (NR Band n30 - 5MHz $\pi/2$ BPSK - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 32 of 138

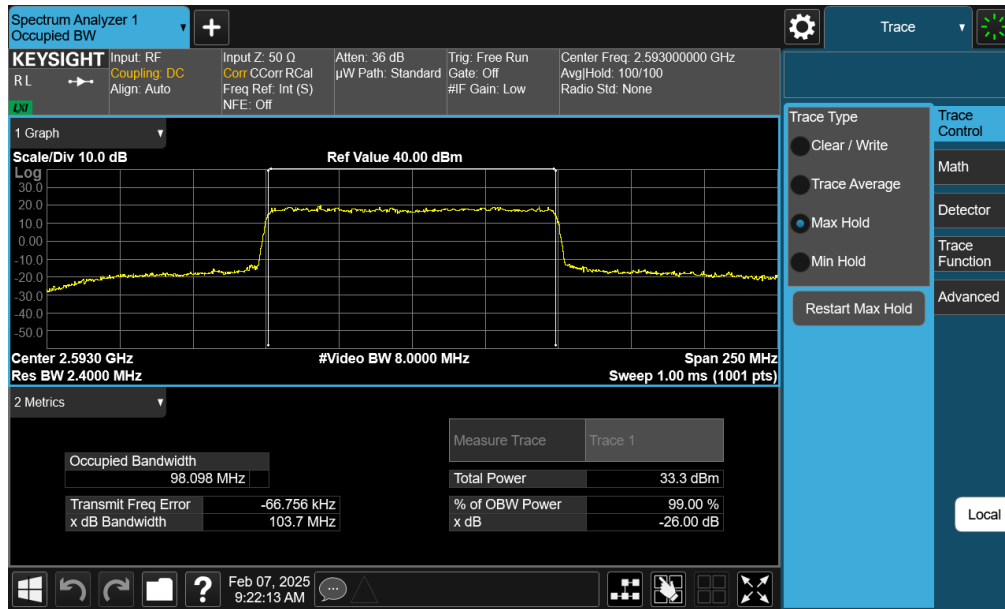


FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 33 of 138

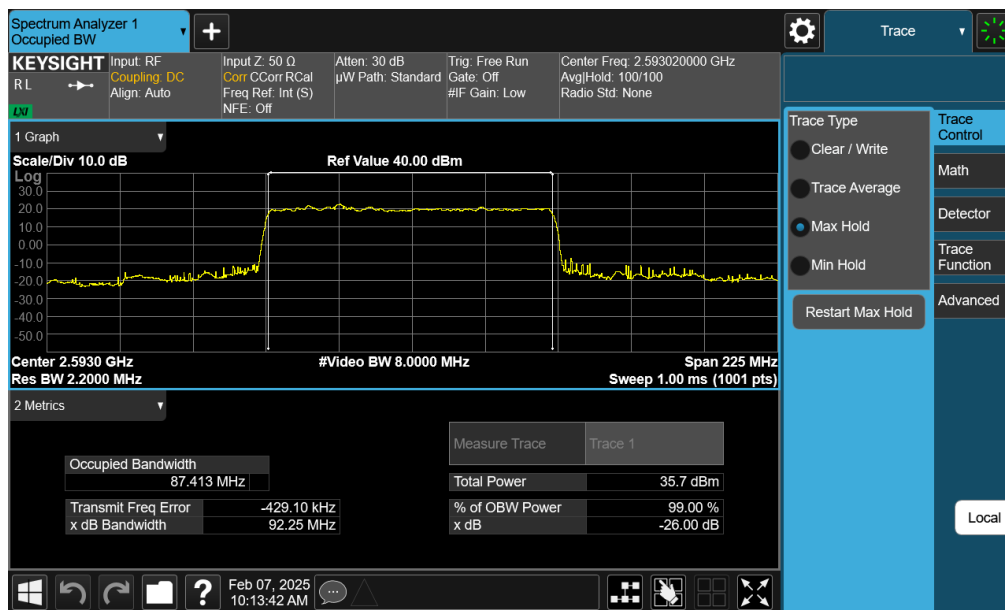
NR Band n41(PC2) – Ant 2



FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 34 of 138

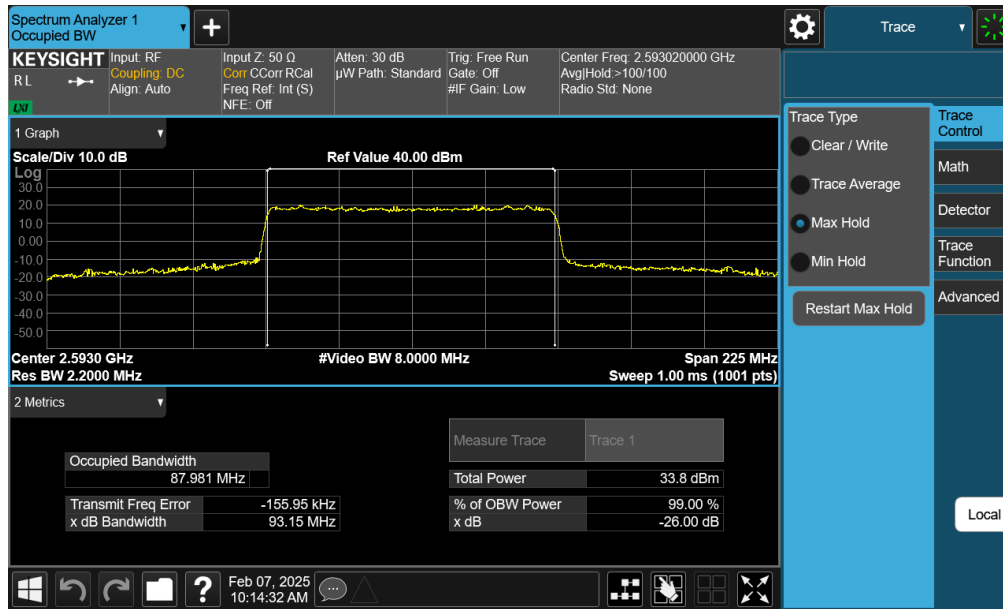


Plot 7-35. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB - Ant 2)

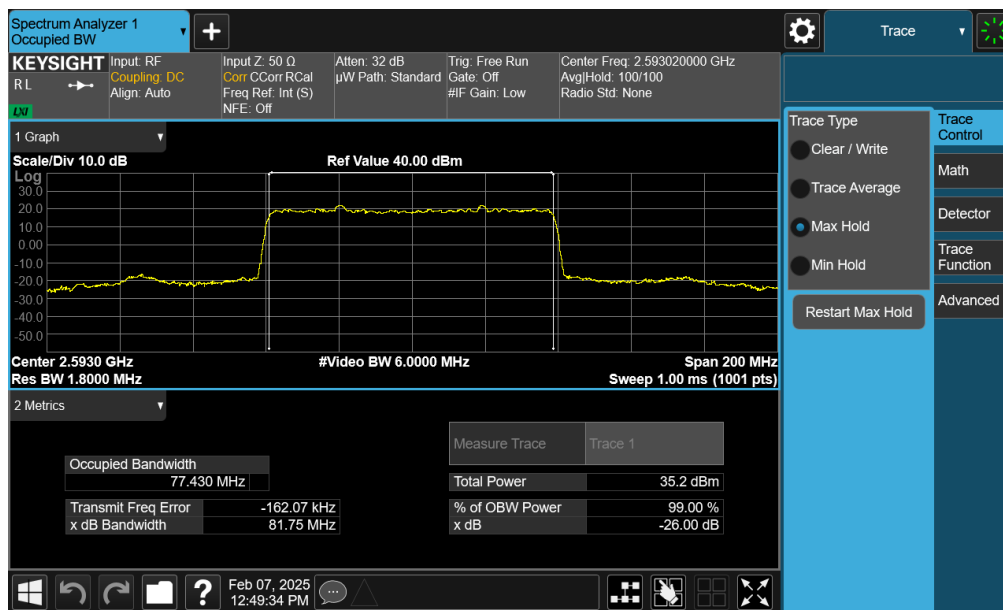


Plot 7-36. Occupied Bandwidth Plot (NR Band n41 - 90MHz $\pi/2$ BPSK - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 35 of 138

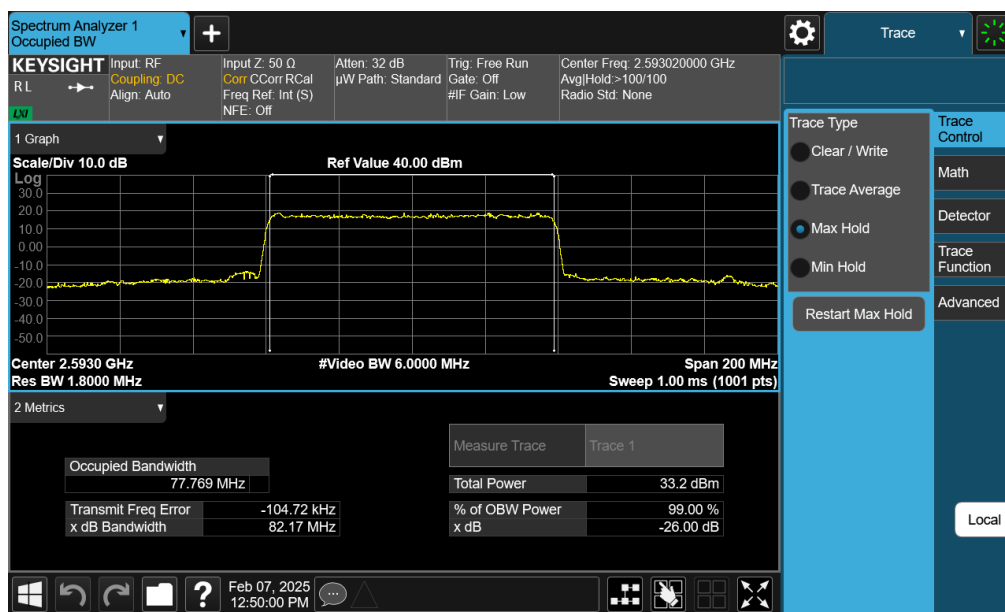
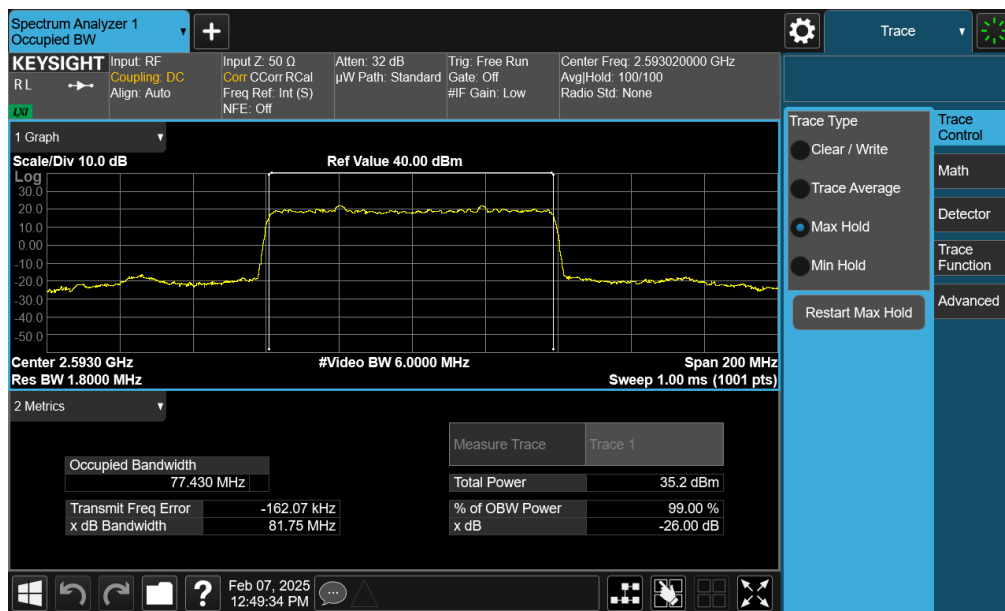


Plot 7-37. Occupied Bandwidth Plot (NR Band n41 - 90MHz QPSK - Full RB - Ant 2)

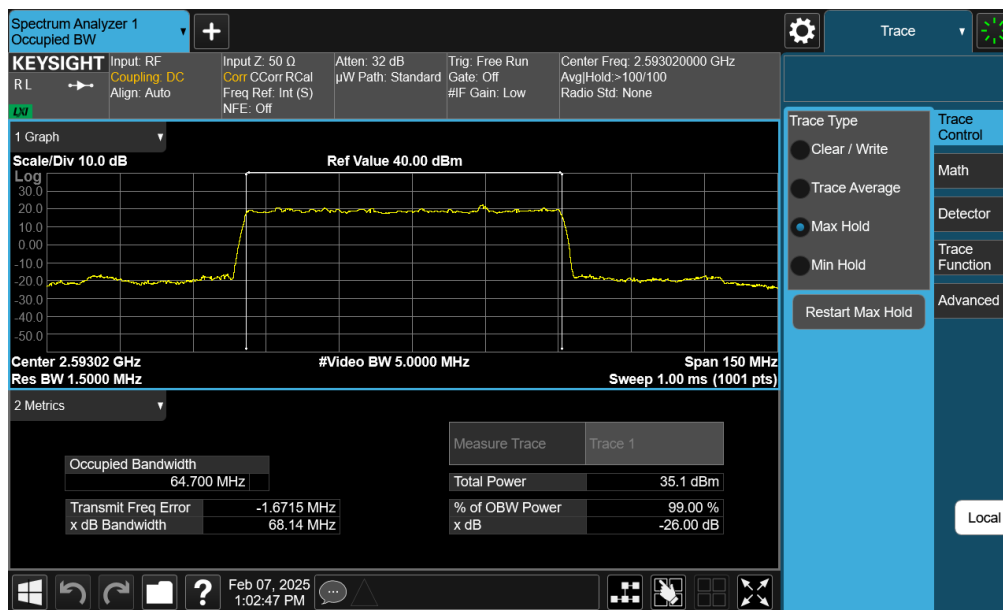
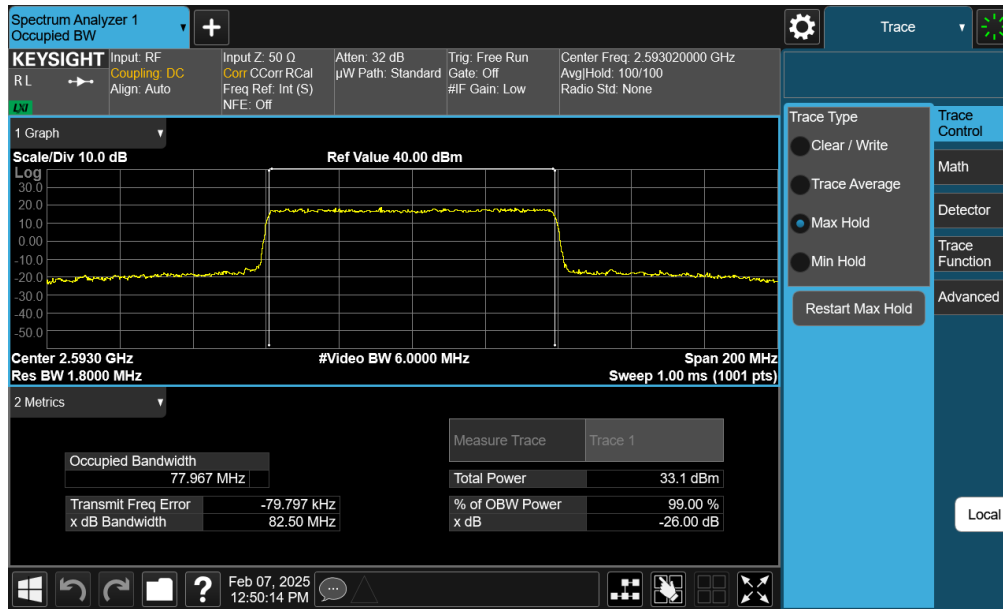


Plot 7-38. Occupied Bandwidth Plot (NR Band n41 - 90MHz 16-QAM - Full RB - Ant 2)

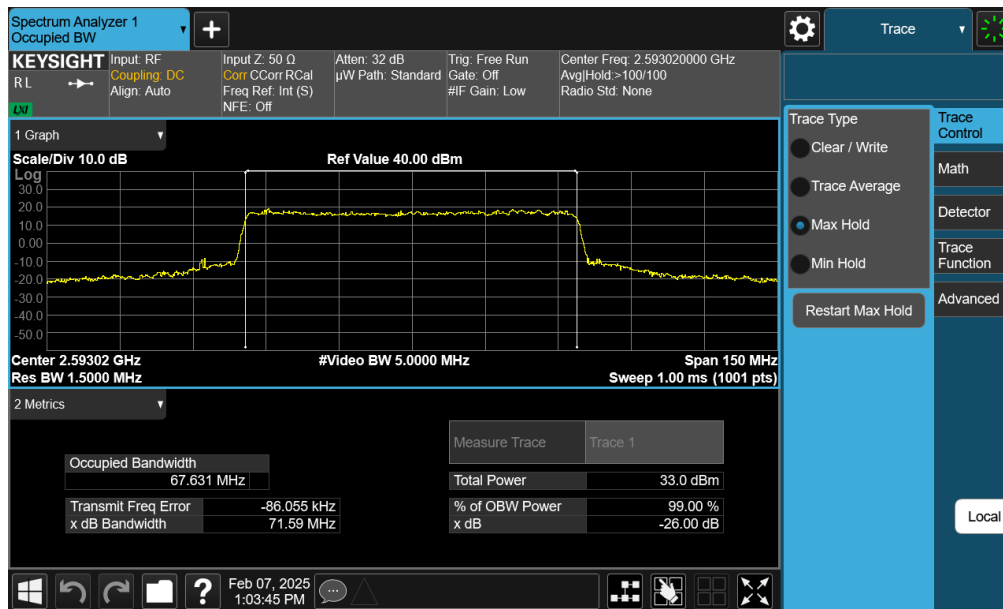
FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 36 of 138



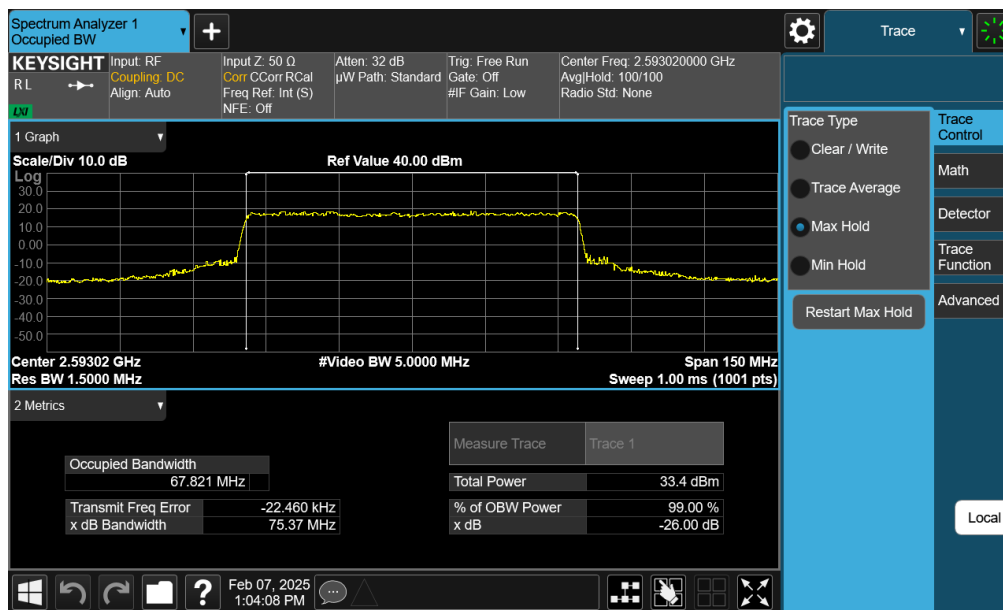
FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 37 of 138



FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 38 of 138

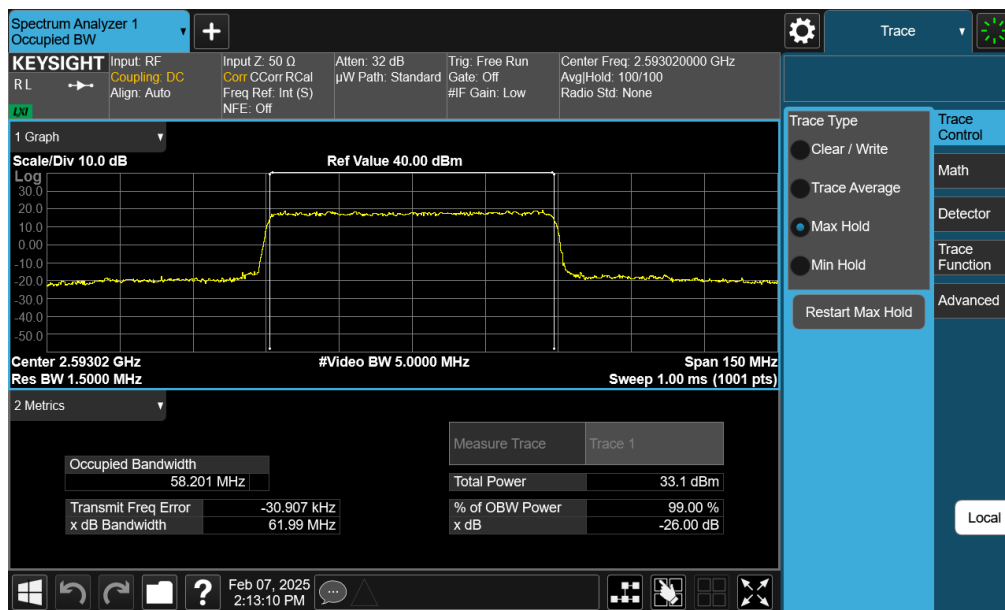
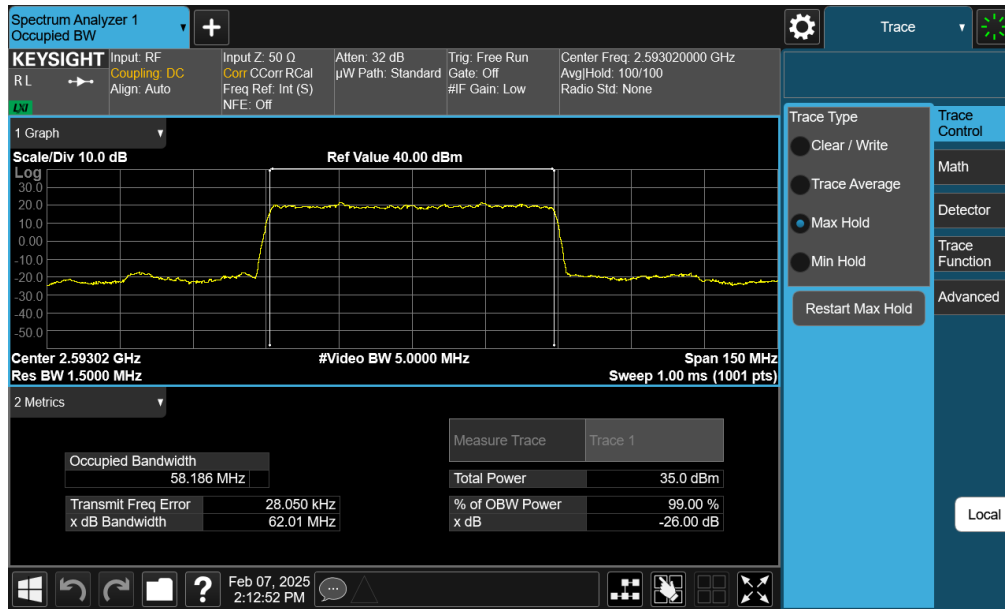


Plot 7-43. Occupied Bandwidth Plot (NR Band n41 - 70MHz QPSK - Full RB - Ant 2)

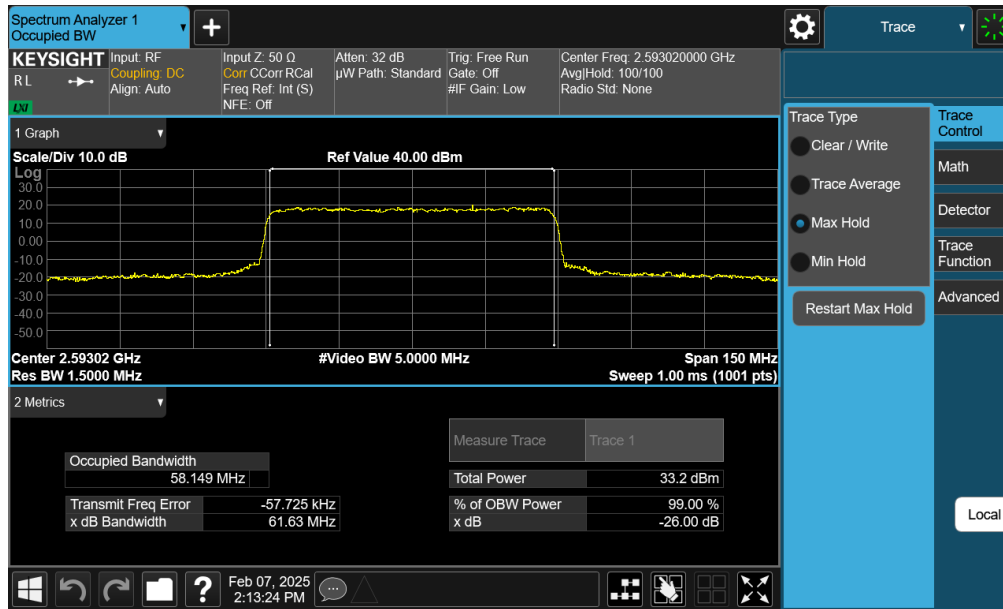


Plot 7-44. Occupied Bandwidth Plot (NR Band n41 - 70MHz 16-QAM - Full RB - Ant 2)

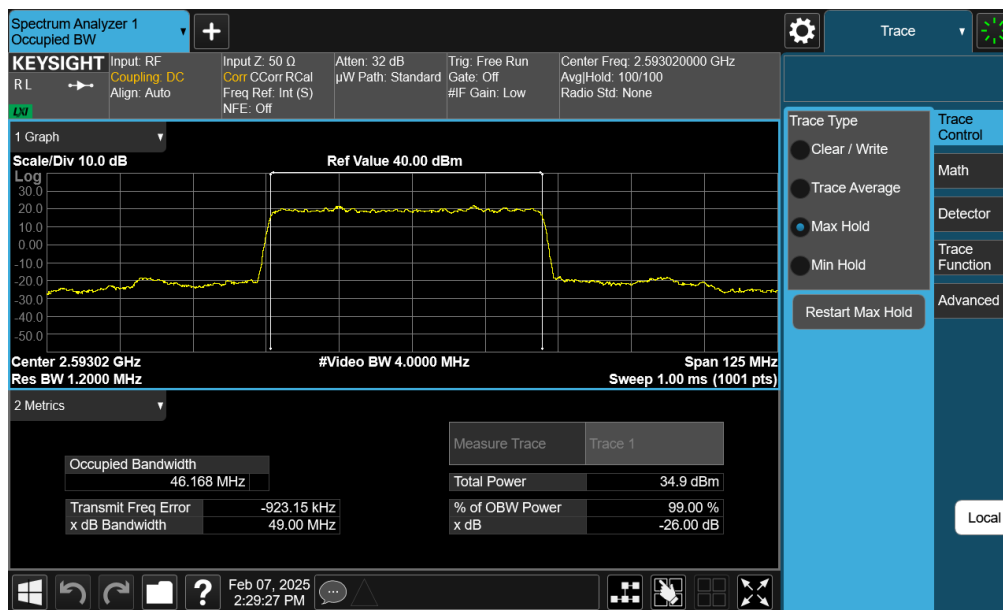
FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 39 of 138



FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 40 of 138

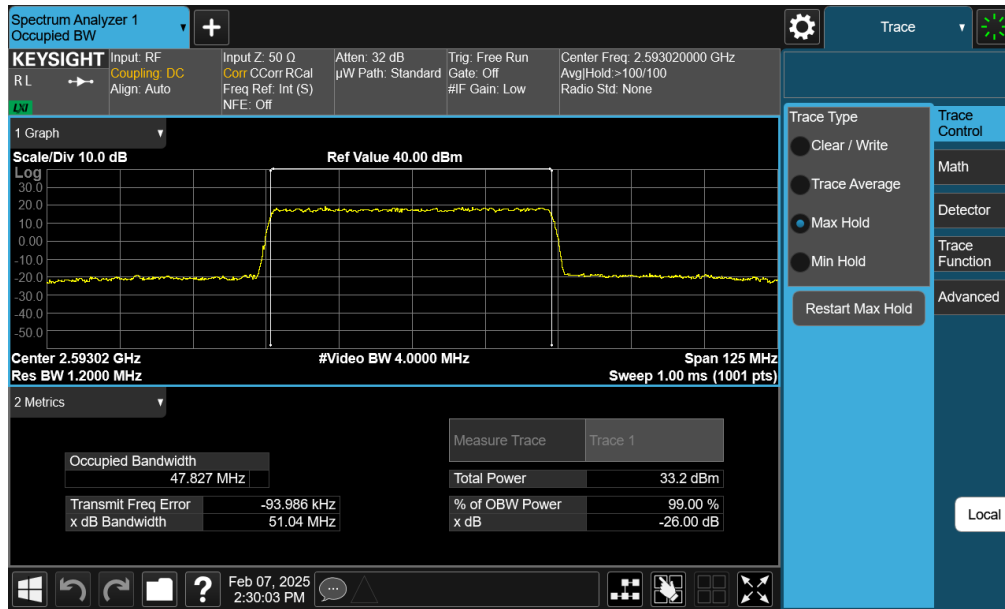


Plot 7-47. Occupied Bandwidth Plot (NR Band n41 - 60MHz 16-QAM - Full RB - Ant 2)

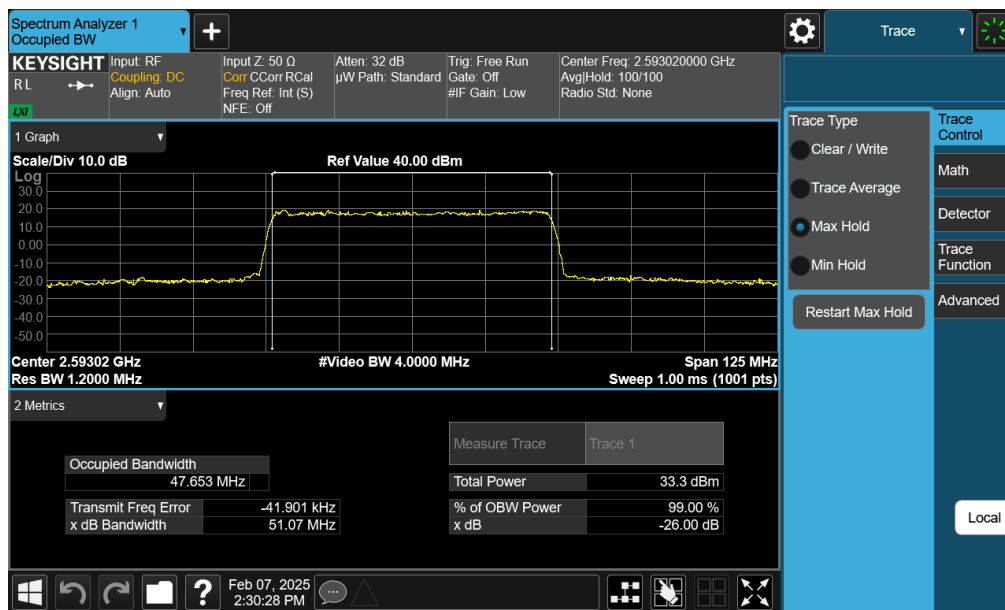


Plot 7-48. Occupied Bandwidth Plot (NR Band n41 - 50MHz $\pi/2$ BPSK - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 41 of 138

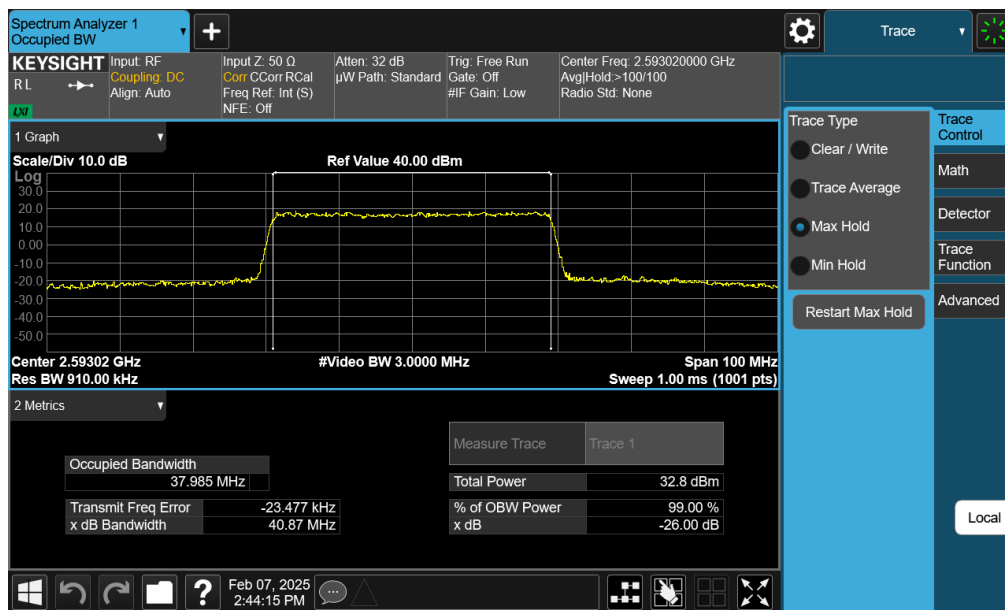
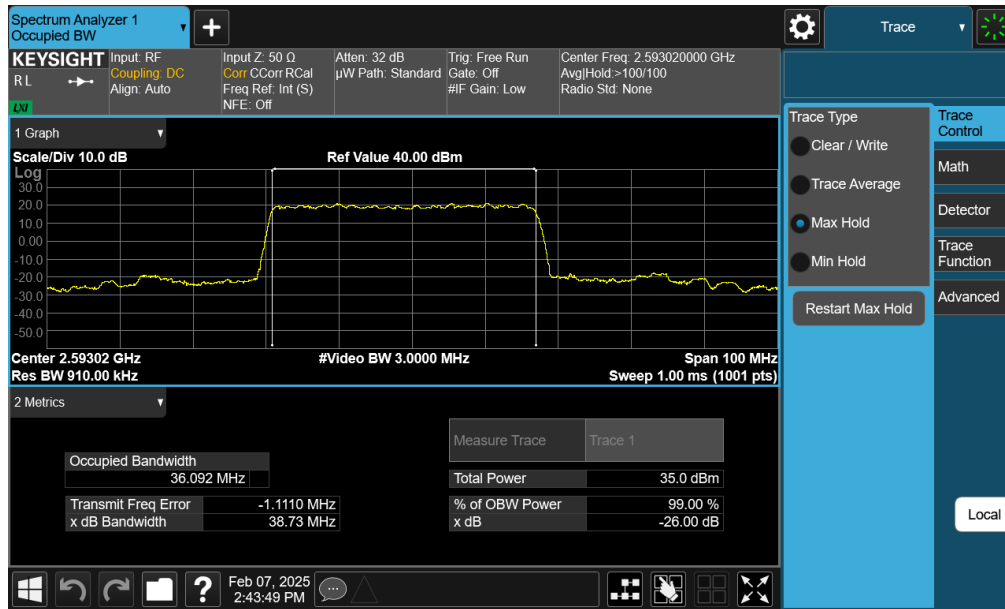


Plot 7-49. Occupied Bandwidth Plot (NR Band n41 - 50MHz QPSK - Full RB - Ant 2)



Plot 7-50. Occupied Bandwidth Plot (NR Band n41 - 50MHz 16-QAM - Full RB - Ant 2)

FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 42 of 138



FCC ID: A3LSMG766U	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-10.A3L	Test Dates: 1/6/2025 - 2/28/2025	EUT Type: Portable Handset	Page 43 of 138