

Part 96 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

2/24/2025 - 4/28/2025

Test Report Issue Date:

5/1/2025

Test Site/Location:

Element Lab. Yongin-Si, Gyeonggi-do, South Korea
Element Lab., Columbia, MD, USA

Test Report Serial No.:

1M2502210015-14.A3L

FCC ID:

A3LSMF966U

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SM-F966U

Additional Models:

SM-F966U1

EUT Type:

Portable Handset

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s):

96

Test Procedure(s):

ANSI C63.26-2015, KDB 940660 D01 v03, WINNF-TS-0122
v1.0.2, KDB 648474 D03 v01r04

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

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.



Prepared by



Reviewed by

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FCC Part 96

Antenna-F						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
ULCA LTE Band 48	40 MHz	QPSK	3570.0 - 3680.0	0.123	20.89	37M7G7D
		16QAM	3570.0 - 3680.0	0.104	20.19	37M8W7D
	35 MHz	QPSK	3567.5 - 3682.5	0.114	20.55	32M9G7D
		16QAM	3567.5 - 3682.5	0.106	20.23	32M8W7D
	30 MHz	QPSK	3565.0 - 3685.0	0.121	20.81	27M8G7D
		16QAM	3565.0 - 3685.0	0.094	19.74	27M9W7D
	25 MHz	QPSK	3562.5 - 3687.5	0.108	20.34	23M0G7D
		16QAM	3562.5 - 3687.5	0.086	19.34	23M1W7D
LTE Band 48	20 MHz	QPSK	3560.0 - 3690.0	0.109	20.38	18M0G7D
		16QAM	3560.0 - 3690.0	0.077	18.84	18M0W7D
	15 MHz	QPSK	3557.5 - 3692.5	0.111	20.46	13M5G7D
		16QAM	3557.5 - 3692.5	0.064	18.10	13M5W7D
	10 MHz	QPSK	3555.0 - 3695.0	0.110	20.41	9M03G7D
		16QAM	3555.0 - 3695.0	0.075	18.72	9M02W7D
	5 MHz	QPSK	3552.5 - 3697.5	0.097	19.89	4M52G7D
		16QAM	3552.5 - 3697.5	0.072	18.57	4M51W7D
NR Band n48	40 MHz	π/2 BPSK	3570.0 - 3680.0	0.133	21.22	36M0G7D
		QPSK	3570.0 - 3680.0	0.130	21.15	38M1G7D
		16QAM	3570.0 - 3680.0	0.115	20.59	38M1W7D
	30 MHz	π/2 BPSK	3565.0 - 3685.0	0.140	21.47	27M0G7D
		QPSK	3565.0 - 3685.0	0.137	21.37	28M1G7D
		16QAM	3565.0 - 3685.0	0.127	21.05	28M0W7D
	20 MHz	π/2 BPSK	3560.0 - 3690.0	0.143	21.54	18M0G7D
		QPSK	3560.0 - 3690.0	0.141	21.49	18M4G7D
		16QAM	3560.0 - 3690.0	0.124	20.93	18M4W7D
	15 MHz	π/2 BPSK	3557.5 - 3692.5	0.139	21.43	13M0G7D
		QPSK	3557.5 - 3692.5	0.142	21.53	13M7G7D
		16QAM	3557.5 - 3692.5	0.119	20.74	13M7W7D
	10 MHz	π/2 BPSK	3555.0 - 3695.0	0.148	21.71	8M69G7D
		QPSK	3555.0 - 3695.0	0.145	21.61	8M68G7D
		16QAM	3555.0 - 3695.0	0.128	21.08	8M66W7D

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Antenna-C						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
ULCA LTE Band 48	40 MHz	QPSK	3570.0 - 3680.0	0.104	20.18	37M7G7D
		16QAM	3570.0 - 3680.0	0.083	19.20	37M7W7D
	35 MHz	QPSK	3567.5 - 3682.5	0.102	20.09	32M8G7D
		16QAM	3567.5 - 3682.5	0.077	18.85	32M8W7D
	30 MHz	QPSK	3565.0 - 3685.0	0.096	19.81	27M9G7D
		16QAM	3565.0 - 3685.0	0.084	19.23	27M9W7D
	25 MHz	QPSK	3562.5 - 3687.5	0.099	19.98	23M0G7D
		16QAM	3562.5 - 3687.5	0.069	18.41	23M0W7D
LTE Band 48	20 MHz	QPSK	3560.0 - 3690.0	0.138	21.40	18M0G7D
		16QAM	3560.0 - 3690.0	0.110	20.42	18M0W7D
	15 MHz	QPSK	3557.5 - 3692.5	0.146	21.64	13M5G7D
		16QAM	3557.5 - 3692.5	0.102	20.10	13M5W7D
	10 MHz	QPSK	3555.0 - 3695.0	0.134	21.28	8M99G7D
		16QAM	3555.0 - 3695.0	0.119	20.76	9M02W7D
	5 MHz	QPSK	3552.5 - 3697.5	0.149	21.74	4M51G7D
		16QAM	3552.5 - 3697.5	0.122	20.86	4M50W7D
NR Band n48	40 MHz	$\pi/2$ BPSK	3570.0 - 3680.0	0.030	14.74	0M50G7D
		QPSK	3570.0 - 3680.0	0.029	14.62	0M63G7D
		16QAM	3570.0 - 3680.0	0.025	14.04	0M59W7D

Antenna-G						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n48	40 MHz	$\pi/2$ BPSK	3570.0 - 3680.0	0.074	18.69	0M50G7D
		QPSK	3570.0 - 3680.0	0.072	18.55	0M58G7D
		16QAM	3570.0 - 3680.0	0.063	17.98	0M60W7D

Antenna-A						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n48	40 MHz	$\pi/2$ BPSK	3570.0 - 3680.0	0.016	12.06	0M50G7D
		QPSK	3570.0 - 3680.0	0.015	11.89	0M62G7D
		16QAM	3570.0 - 3680.0	0.014	11.36	0M61W7D

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Switching Antenna-C						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n48	40 MHz	$\pi/2$ BPSK	3570.0 - 3680.0	0.129	21.09	36M0G7D
		QPSK	3570.0 - 3680.0	0.133	21.22	38M0G7D
		16QAM	3570.0 - 3680.0	0.101	20.04	38M0W7D
	30 MHz	$\pi/2$ BPSK	3565.0 - 3685.0	0.134	21.28	27M0G7D
		QPSK	3565.0 - 3685.0	0.140	21.46	28M0G7D
		16QAM	3565.0 - 3685.0	0.098	19.91	28M1W7D
	20 MHz	$\pi/2$ BPSK	3560.0 - 3690.0	0.141	21.50	18M1G7D
		QPSK	3560.0 - 3690.0	0.136	21.32	18M3G7D
		16QAM	3560.0 - 3690.0	0.114	20.58	18M4W7D
	15 MHz	$\pi/2$ BPSK	3557.5 - 3692.5	0.138	21.41	13M0G7D
		QPSK	3557.5 - 3692.5	0.139	21.42	13M7G7D
		16QAM	3557.5 - 3692.5	0.113	20.54	13M7W7D
	10 MHz	$\pi/2$ BPSK	3555.0 - 3695.0	0.142	21.51	8M68G7D
		QPSK	3555.0 - 3695.0	0.139	21.43	8M66G7D
		16QAM	3555.0 - 3695.0	0.116	20.66	8M67W7D

Switching Antenna-F						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n48	40 MHz	$\pi/2$ BPSK	3570.0 - 3680.0	0.051	17.06	0M53G7D
		QPSK	3570.0 - 3680.0	0.051	17.04	0M60G7D
		16QAM	3570.0 - 3680.0	0.044	16.39	0M60W7D

Switching Antenna-A						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n48	40 MHz	$\pi/2$ BPSK	3570.0 - 3680.0	0.112	20.50	0M49G7D
		QPSK	3570.0 - 3680.0	0.110	20.42	0M62G7D
		16QAM	3570.0 - 3680.0	0.095	19.76	0M58W7D

Switching Antenna-G						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n48	40 MHz	$\pi/2$ BPSK	3570.0 - 3680.0	0.094	19.74	0M51G7D
		QPSK	3570.0 - 3680.0	0.094	19.72	0M63G7D
		16QAM	3570.0 - 3680.0	0.081	19.10	0M61W7D

EUT Overview

Note: EIRP levels shown in the table above are measured over the full channel bandwidth. These values will appear on the Grant of Authorization.

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1.0 INTRODUCTION

1.1 Scope

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

1.2 Element Test Location

These measurement tests were conducted at the Element Suwon Laboratory located at 13, Heungdeok 1-ro, Giheung-gu, Yongin-si, Gyeonggi-do, 16954, South Korea. 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 Materials Technology Suwon, Ltd. located in Yongin-si, Gyeonggi-do, 16954, South Korea. – “EK”

- 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 ISCED: 26168

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

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF966U**. The test data contained in this report pertains only to the emissions due to the EUT's LTE Band 48 operation in the CBRs band. Per FCC Part 96, this device is evaluated as a Citizens Band End User Devices (CBE).

Test Device Serial No.: 1929R, 0170M, 0151M, 2207R, 0567M, 0157R, 0164R, 0127M

2.2 Device Capabilities

This device contains the following capabilities:

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

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

2.3 Test Configuration

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

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-2400 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

This device supports Tx Device Hopping (ANT Switching) for the 5G NR Band n48 and can operate on two distinct paths. The paths are labeled as either Main or Switching paths. Testing was done on both paths and is included in this report.

This device can transmit in the 5G NR Band n48 band over four separate antennas labelled SRS-1, SRS-2, SRS-3, and SRS-4. SRS operation can occur on either the main or switching path. With SRS operations, any of these four antennas can transmit an SRS signal to check the channel quality for transmission in the n48 Band. However, these antennas cannot simultaneously transmit and only the SRS-1 antenna is capable of data transmission. The test data is marked to indicate the specific antenna transmitting in the n48 band. Transmission on SRS-2, SRS-3 and SRS-4 antennas are typically limited to very small pulses; testing on these modes are reported as 1 RB to approximate a worst-case real-world scenario.

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Antenna SRS-Label	Alternate Label
NR Band n48 – Default – SRS-1	Ant F
NR Band n48 – Default – SRS-2	Ant C
NR Band n48 – Default – SRS-3	Ant G
NR Band n48 – Default – SRS-4	Ant A
NR Band n48 – Switch – SRS-1	Ant C
NR Band n48 – Switch – SRS-2	Ant F
NR Band n48 – Switch – SRS-3	Ant A
NR Band n48 – Switch – SRS-4	Ant G

Table 2-1. Antenna Labelling Scheme Correlation

This device supports three folder configurations: one is with folder fully open, one is where the folder is half open (90 degrees), and one is with folder closed. All configurations are tested, and the worst case radiated emissions data is shown in this report.

2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version FAV0_F966UFAU0AYB3 installed on the EUT.

2.5 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

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

Deviation from Measurement Procedure.....None

3.2 Radiated Power and Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

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

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

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

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

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

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

And

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

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

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

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty ($\pm$ dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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 – EK

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5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP2	EMC Cable and Switch System	2/25/2025	Annual	2/25/2026	AP2
-	AP1	EMC Cable and Switch System	2/25/2025	Annual	2/25/2026	AP1
-	ETS	EMC Cable and Switch System	12/11/2024	Annual	12/11/2026	ETS
-	LTx4	Licensed Transmitter Cable Set	2/25/2025	Annual	2/25/2026	LTx4
-	LTx5	Licensed Transmitter Cable Set	2/25/2025	Annual	2/25/2026	LTx5
Espec	ESX-2CA	Environmental Chamber	11/20/2024	Biennial	11/20/2026	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	5/3/2023	Biennial	5/3/2025	00125518
Keysight Technologies	N9020A	MXA Signal Analyzer	4/11/2024	Annual	4/11/2025	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	4/9/2024	Annual	4/9/2025	MY52350166
Keysight Technologies	N9038A	MXE EMI Receiver	9/16/2024	Annual	9/16/2025	MY51210133
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	10/16/2024	Annual	10/16/2025	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	10/16/2024	Annual	10/16/2025	100348
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
Agilent	N9030A	PXA Signal Analyzer	7/8/2024	Annual	7/7/2025	MY49432391
Anritsu	S820E	Cable and Antenna Analyzer	7/9/2024	Annual	7/8/2025	1839097
Anritsu	MA24106A	USB Power Sensor	7/9/2024	Annual	7/8/2025	1244512
Anritsu	MT8000A	Radio Communicatino Test Station	9/5/2024	Annual	9/4/2025	6272337405
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2024	Annual	10/9/2026	10160045
Espec	SH-242	Environmental Chamber	7/9/2024	Annual	7/8/2025	93011064
Fairview Microwave	FM2CP1122-10	2.92mm Directional Coupler	7/9/2024	Annual	7/8/2025	1946
Keysight Technologies	N9030B	PXA Signal Analyzer	7/8/2024	Annual	7/7/2025	MY57143278
Mini-Circuits	BW-N10W5+	Attenuator	7/9/2024	Annual	7/8/2025	1507
Mini-Circuits	BW-N10W5+	Attenuator	7/9/2024	Annual	7/8/2025	1607
NARDA	180-442A-KF	Horn Antenna (small)	1/13/2025	Annual	1/12/2026	180-442A-KF
Rohde & Schwarz	SMF100A	Signal Generator	7/8/2024	Annual	7/7/2025	104154
Rohde & Schwarz	CMW500	Wideband Radio Communicatino Tester	1/6/2025	Annual	1/5/2026	171075
Rohde & Schwarz	FSW43	Signal and Spectrum Analyzer	1/6/2025	Annual	1/5/2026	101955
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	1/6/2025	Annual	1/5/2026	102131
Schwarzbeck	VULB9162	Broadband TRILOG Antenna	6/1/2023	Biennial	5/31/2025	9162-217
Sunol	DRH-118	Horn Antenna	1/13/2025	Annual	1/12/2026	A060215

Table 5-2. Test Equipment – EK

Notes:

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

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6.0 SAMPLE CALCULATIONS

Emission Designator

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 – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (7250 MHz)

The average 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 1564 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80) = 50.3 dBc.

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7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
FCC ID: A3LSMF966U
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
Mode(s): LTE/NR/ULCA

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference	Test Lab Location
CONDUCTED	Conducted Power	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2	EK
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3	EK
	Conducted Band Edge / Spurious Emissions (CBSD)	2.1051, 96.41(e)(i)	-13 dBm/MHz at frequencies within 0-10 MHz of above the upper SAS-assigned channel edge and within 0-10MHz below the lower SAS-assigned channel edge -25 dBm/MHz at frequencies greater than 10 MHz above and below channel edge -emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz	PASS	Sections 7.4, 7.5	MD
	Frequency Stability	2.1055	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8	MD
	End User Device Additional Requirements (CBSD Protocol)	96.47	End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation. An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.	PASS	Section 7.9	MD
RADIATED	Equivalent Isotropic Radiated Power (EIRP) (EUD)	96.41(b)	23 dBm/10MHz	PASS	Section 7.6	EK/MD
	Uplink Carrier Aggregation	96.47 €	> 43 + 10log(P[Watts]) at Band Edge and for all out-of-band emissions	PASS	Section 7.7	MD
	Radiated Spurious Emissions	2.1053, 96.41(e)	-40 dBm/MHz	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) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is EMC Software Tool v2.3.0.

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7.2 Conducted Output Power Data

Test Overview

The EUT is set up to transmit at maximum power for LTE. All power levels 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 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. RBW = 1% to 5% of the OBW
3. Number of measurement points in sweep $\geq 2 \times \text{span} / \text{RBW}$
4. Sweep = auto-couple (less than transmission burst duration)
5. Detector = RMS (power)
6. Trigger was set to enable power measurements only on full power bursts
7. Trace was allowed to stabilize
8. Spectrum analyzer's "Channel Power" function was used to compute the power by integrating the spectrum across the OBW of the signal

Test Setup

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

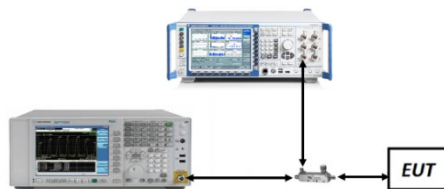


Figure 7-1. Test Instrument & Measurement Setup

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Test Notes

1. A-MPR was only applied for test purposes to the 2CC case since the 1CC case was compliant for all testing at max power.
2. A-MPR was verified to comply with the "CA_NS_10" specification in the 3GPP TS 36.101 standard by setting the MCC to a U.S. code and the MNC to a U.S. carrier supporting LTE B48 operation.
3. 256QAM operations does not employ A-MPR.
4. 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.
5. All other conducted power measurements are contained in the RF exposure report for this filing.
6. 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.

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	55340	3560.0	1 / 1	23.90
		55990	3625.0	1 / 1	23.42
		56640	3690.0	1 / 49	22.64
	16-QAM	55340	3560.0	1 / 1	22.85
		55990	3625.0	1 / 1	22.47
		56640	3690.0	1 / 49	21.69
15 MHz	QPSK	55315	3557.5	1 / 1	23.98
		55990	3625.0	1 / 1	23.07
		56665	3692.5	1 / 36	22.68
	16-QAM	55315	3557.5	1 / 1	22.10
		55990	3625.0	1 / 1	22.01
		56665	3692.5	1 / 36	20.08
10 MHz	QPSK	55290	3555.0	1 / 1	23.92
		55990	3625.0	1 / 22	23.24
		56690	3695.0	1 / 22	22.82
	16-QAM	55290	3555.0	1 / 1	22.73
		55990	3625.0	1 / 22	22.73
		56690	3695.0	1 / 22	22.10
5 MHz	QPSK	55265	3552.5	1 / 5	23.40
		55990	3625.0	1 / 5	23.66
		56715	3697.5	1 / 5	22.96
	16-QAM	55265	3552.5	1 / 5	22.05
		55990	3625.0	1 / 5	22.51
		56715	3697.5	1 / 5	22.14

Table 7-2. Conducted Power Output Data (LTE Band 48 – Ant F)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	23.89
		641666	3625.0	1 / 104	23.61
		645332	3680.0	1 / 53	24.27
	QPSK	638000	3570.0	1 / 53	23.88
		641666	3625.0	1 / 1	23.67
		645332	3680.0	1 / 53	24.06
	16-QAM	638000	3570.0	1 / 104	22.96
		641666	3625.0	1 / 1	22.68
		645332	3680.0	1 / 53	22.86
30 MHz	π/2 BPSK	637666	3565.0	1 / 76	23.75
		641666	3625.0	1 / 76	24.11
		645666	3685.0	1 / 76	24.14
	QPSK	637666	3565.0	1 / 1	23.78
		641666	3625.0	1 / 76	23.93
		645666	3685.0	1 / 76	24.08
	16-QAM	637666	3565.0	1 / 1	22.78
		641666	3625.0	1 / 76	23.20
		645666	3685.0	1 / 76	22.96
20 MHz	π/2 BPSK	637334	3560.0	1 / 1	24.20
		641666	3625.0	1 / 49	23.85
		646000	3690.0	1 / 49	24.06
	QPSK	637334	3560.0	1 / 1	24.22
		641666	3625.0	1 / 49	23.81
		646000	3690.0	1 / 49	24.07
	16-QAM	637334	3560.0	1 / 1	23.30
		641666	3625.0	1 / 49	22.93
		646000	3690.0	1 / 49	23.03
15 MHz	π/2 BPSK	637166	3557.5	1 / 1	24.09
		641666	3625.0	1 / 36	23.86
		646166	3692.5	1 / 1	24.13
	QPSK	637166	3557.5	1 / 1	24.26
		641666	3625.0	1 / 1	23.87
		646166	3692.5	1 / 1	24.15
	16-QAM	637166	3557.5	1 / 1	23.11
		641666	3625.0	1 / 1	22.83
		646166	3692.5	1 / 1	22.88
10 MHz	π/2 BPSK	637000	3555.0	1 / 1	24.38
		641666	3625.0	1 / 22	23.97
		646332	3695.0	1 / 1	24.23
	QPSK	637000	3555.0	1 / 1	24.34
		641666	3625.0	1 / 1	24.01
		646332	3695.0	1 / 12	24.17
	16-QAM	637000	3555.0	1 / 1	23.45
		641666	3625.0	1 / 1	22.66
		646332	3695.0	1 / 22	23.34

Table 7-5. Conducted Power Output Data (NR Band n48 – Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	17.45
		641666	3625.0	1 / 104	17.91
		645332	3680.0	1 / 1	17.61
	QPSK	638000	3570.0	1 / 104	17.43
		641666	3625.0	1 / 104	17.79
		645332	3680.0	1 / 1	17.48
	16-QAM	638000	3570.0	1 / 104	16.67
		641666	3625.0	1 / 104	16.64
		645332	3680.0	1 / 1	16.67

Table 7-6. Conducted Power Output Data (NR Band n48 – Ant C)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	22.60
		641666	3625.0	1 / 104	22.71
		645332	3680.0	1 / 104	22.55
	QPSK	638000	3570.0	1 / 104	22.60
		641666	3625.0	1 / 104	22.72
		645332	3680.0	1 / 1	22.47
	16-QAM	638000	3570.0	1 / 104	21.45
		641666	3625.0	1 / 104	21.81
		645332	3680.0	1 / 104	21.65

Table 7-7. Conducted Power Output Data (NR Band n48 – Ant G)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	16.26
		641666	3625.0	1 / 104	16.74
		645332	3680.0	1 / 1	16.63
	QPSK	638000	3570.0	1 / 104	16.34
		641666	3625.0	1 / 104	16.71
		645332	3680.0	1 / 1	16.66
	16-QAM	638000	3570.0	1 / 104	15.34
		641666	3625.0	1 / 104	15.80
		645332	3680.0	1 / 1	15.53

Table 7-8. Conducted Power Output Data (NR Band n48 – Ant A)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	55340	3560.0	1 / 1	23.28
		55990	3625.0	1 / 1	23.05
		56640	3690.0	1 / 1	23.21
	16-QAM	55340	3560.0	1 / 1	22.66
		55990	3625.0	1 / 1	21.40
		56640	3690.0	1 / 1	21.92
15 MHz	QPSK	55315	3557.5	1 / 1	23.58
		55990	3625.0	1 / 25	23.26
		56665	3692.5	1 / 25	23.45
	16-QAM	55315	3557.5	1 / 1	22.75
		55990	3625.0	1 / 25	21.69
		56665	3692.5	1 / 25	21.60
10 MHz	QPSK	55290	3555.0	1 / 1	23.73
		55990	3625.0	1 / 49	23.34
		56690	3695.0	1 / 49	23.09
	16-QAM	55290	3555.0	1 / 1	22.76
		55990	3625.0	1 / 49	22.34
		56690	3695.0	1 / 49	22.26
5 MHz	QPSK	55265	3552.5	1 / 1	23.41
		55990	3625.0	1 / 1	22.94
		56715	3697.5	1 / 1	23.55
	16-QAM	55265	3552.5	1 / 1	22.47
		55990	3625.0	1 / 1	21.07
		56715	3697.5	1 / 1	22.36

Table 7-9. Conducted Power Output Data (LTE Band 48 – Ant C)

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Bandwidth	Modulation	PCC			SCC			Conducted Power [dBm]
		Bandwidth [MHz]	Frequency [MHz]	RB / Offset	Bandwidth [MHz]	Frequency [MHz]	RB / Offset	
40 MHz	QPSK	20	3560.0	1 / 99	20	3579.8	1 / 0	23.06
		20	3625.0	1 / 99	20	3644.8	1 / 0	23.19
		20	3690.0	1 / 0	20	3670.2	1 / 99	23.64
	16-QAM	20	3560.0	1 / 99	20	3579.8	1 / 0	21.54
		20	3625.0	1 / 99	20	3644.8	1 / 0	22.44
		20	3690.0	1 / 0	20	3670.2	1 / 99	22.89
35 MHz	QPSK	20	3557.5	1 / 99	15	3577.1	1 / 0	22.87
		20	3625.0	1 / 99	15	3642.1	1 / 0	23.14
		20	3692.5	1 / 0	15	3672.9	1 / 74	23.55
	16-QAM	20	3557.5	1 / 99	15	3577.1	1 / 0	21.60
		20	3625.0	1 / 99	15	3642.1	1 / 0	22.63
		20	3692.5	1 / 0	15	3672.9	1 / 74	22.55
30 MHz	QPSK	20	3555.0	1 / 99	10	3574.4	1 / 0	22.77
		20	3625.0	1 / 99	10	3639.4	1 / 0	23.21
		20	3695.0	1 / 0	10	3678.3	1 / 49	23.27
	16-QAM	20	3555.0	1 / 99	10	3574.4	1 / 0	21.80
		20	3625.0	1 / 99	10	3639.4	1 / 0	22.15
		20	3695.0	1 / 0	10	3678.3	1 / 49	22.93
25 MHz	QPSK	20	3552.5	1 / 99	5	3571.7	1 / 0	23.88
		20	3625.0	1 / 99	5	3636.7	1 / 0	22.78
		20	3697.5	1 / 0	5	3678.3	1 / 24	23.44
	16-QAM	20	3552.5	1 / 99	5	3571.7	1 / 0	23.07
		20	3625.0	1 / 99	5	3636.7	1 / 0	21.65
		20	3697.5	1 / 0	5	3678.3	1 / 24	22.11

Table 7-10. Conducted Power Output Data (ULCA LB48 – Ant C)

Test Case	NS	MCC	MNC	Channel BW [MHz]	PCC			SCC			A-MPR [dB]	Modulation	MPR [dB]	Maximum Target Output Power [dBm]	A-MPR Measured Power [dBm]
					Channel Frequency [MHz]	RB Size	RB Offset	Channel Frequency [MHz]	RB Size	RB Offset					
1	NS_10	310	910	20 + 20	3560	100	0	3579.8	100	0	≤ 11	QPSK	0	23.00	11.04
2												16-QAM	1	22.00	10.89
3				20 + 20	3560	1	99	3579.8	1	0	≤ 11	QPSK	0	23.00	17.73
4												16-QAM	1	22.00	18.30
5				20 + 20	3605.1	100	0	3624.9	100	0	≤ 4.5	QPSK	0	23.00	18.80
6												16-QAM	1	22.00	19.09
7				20 + 20	3605.1	1	99	3624.9	1	0	≤ 4.5	QPSK	0	23.00	21.25
8												16-QAM	1	22.00	21.72
9				20 + 20	3670.1	100	0	3689.9	100	0	≤ 11	QPSK	0	23.00	11.10
10												16-QAM	1	22.00	11.23
11				20 + 20	3670.1	1	99	3689.9	1	0	≤ 11	QPSK	0	23.00	18.23
12												16-QAM	1	22.00	18.68

Table 7-11. A-MPR Conducted Power Output Data (ULCA LB48 – Ant C)

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	23.57
		641666	3625.0	1 / 1	23.74
		645332	3680.0	1 / 1	23.82
	QPSK	638000	3570.0	1 / 104	23.79
		641666	3625.0	1 / 1	23.75
		645332	3680.0	1 / 1	23.81
	16-QAM	638000	3570.0	1 / 104	22.89
		641666	3625.0	1 / 1	23.27
		645332	3680.0	1 / 1	23.00
30 MHz	π/2 BPSK	637666	3565.0	1 / 76	23.39
		641666	3625.0	1 / 76	23.92
		645666	3685.0	1 / 1	23.47
	QPSK	637666	3565.0	1 / 76	23.35
		641666	3625.0	1 / 76	23.99
		645666	3685.0	1 / 1	23.37
	16-QAM	637666	3565.0	1 / 76	22.59
		641666	3625.0	1 / 76	23.14
		645666	3685.0	1 / 1	22.65
20 MHz	π/2 BPSK	637334	3560.0	1 / 1	24.39
		641666	3625.0	1 / 49	23.77
		646000	3690.0	1 / 1	23.22
	QPSK	637334	3560.0	1 / 1	24.29
		641666	3625.0	1 / 49	23.85
		646000	3690.0	1 / 1	23.17
	16-QAM	637334	3560.0	1 / 1	23.73
		641666	3625.0	1 / 49	22.95
		646000	3690.0	1 / 1	22.58
15 MHz	π/2 BPSK	637166	3557.5	1 / 1	24.29
		641666	3625.0	1 / 36	24.05
		646166	3692.5	1 / 36	23.14
	QPSK	637166	3557.5	1 / 19	24.34
		641666	3625.0	1 / 36	23.95
		646166	3692.5	1 / 1	23.11
	16-QAM	637166	3557.5	1 / 19	23.69
		641666	3625.0	1 / 36	23.12
		646166	3692.5	1 / 36	22.21
10 MHz	π/2 BPSK	637000	3555.0	1 / 1	24.40
		641666	3625.0	1 / 22	23.99
		646332	3695.0	1 / 1	23.18
	QPSK	637000	3555.0	1 / 1	24.41
		641666	3625.0	1 / 1	23.96
		646332	3695.0	1 / 22	23.27
	16-QAM	637000	3555.0	1 / 1	23.81
		641666	3625.0	1 / 22	23.14
		646332	3695.0	1 / 22	22.50

Table 7-12. Conducted Power Output Data (NR Band n48 – Switching Ant C)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 22 of 201

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	20.25
		641666	3625.0	1 / 1	20.19
		645332	3680.0	1 / 104	20.58
	QPSK	638000	3570.0	1 / 104	20.20
		641666	3625.0	1 / 1	19.56
		645332	3680.0	1 / 104	20.63
	16-QAM	638000	3570.0	1 / 104	19.33
		641666	3625.0	1 / 1	18.60
		645332	3680.0	1 / 104	19.80

Table 7-13. Conducted Power Output Data (NR Band n48 – Switching Ant F)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	22.11
		641666	3625.0	1 / 104	22.28
		645332	3680.0	1 / 53	22.60
	QPSK	638000	3570.0	1 / 104	22.10
		641666	3625.0	1 / 104	22.32
		645332	3680.0	1 / 53	22.53
	16-QAM	638000	3570.0	1 / 104	21.25
		641666	3625.0	1 / 104	21.12
		645332	3680.0	1 / 53	21.43

Table 7-14. Conducted Power Output Data (NR Band n48 – Switching Ant A)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 104	19.48
		641666	3625.0	1 / 104	19.77
		645332	3680.0	1 / 53	19.51
	QPSK	638000	3570.0	1 / 104	19.57
		641666	3625.0	1 / 1	19.74
		645332	3680.0	1 / 53	19.33
	16-QAM	638000	3570.0	1 / 104	18.44
		641666	3625.0	1 / 104	18.70
		645332	3680.0	1 / 53	18.15

Table 7-15. Conducted Power Output Data (NR Band n48 – Switching Ant G)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT			Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset		Page 23 of 201

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.

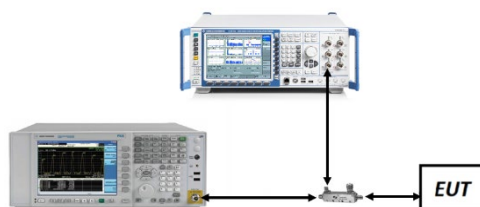


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None

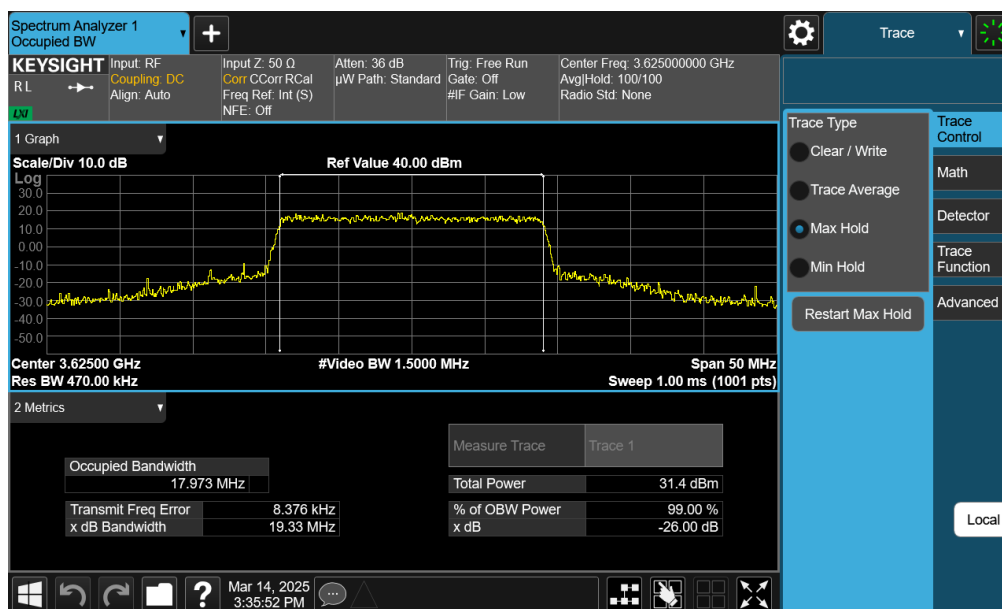
FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 24 of 201

Mode	Bandwidth	Modulation	OBW [MHz]
LTE-B48	20MHz	QPSK	17.97
		16QAM	18.04
	15MHz	QPSK	13.49
		16QAM	13.51
	10MHz	QPSK	9.03
		16QAM	9.02
	5MHz	QPSK	4.52
		16QAM	4.51
ULCA LTE-B48	20+20MHz	QPSK	37.67
		16QAM	37.80
	20+15MHz	QPSK	32.88
		16QAM	32.77
	20+10MHz	QPSK	27.81
		16QAM	27.91
	20+5MHz	QPSK	23.02
		16QAM	23.12
NR-n48	40MHz	BPSK	35.96
		QPSK	38.07
		16QAM	38.11
	30MHz	BPSK	27.01
		QPSK	28.07
		16QAM	28.01
	20MHz	BPSK	18.01
		QPSK	18.38
		16QAM	18.36
	15MHz	BPSK	12.99
		QPSK	13.69
		16QAM	13.71
	10MHz	BPSK	8.69
		QPSK	8.68
		16QAM	8.66

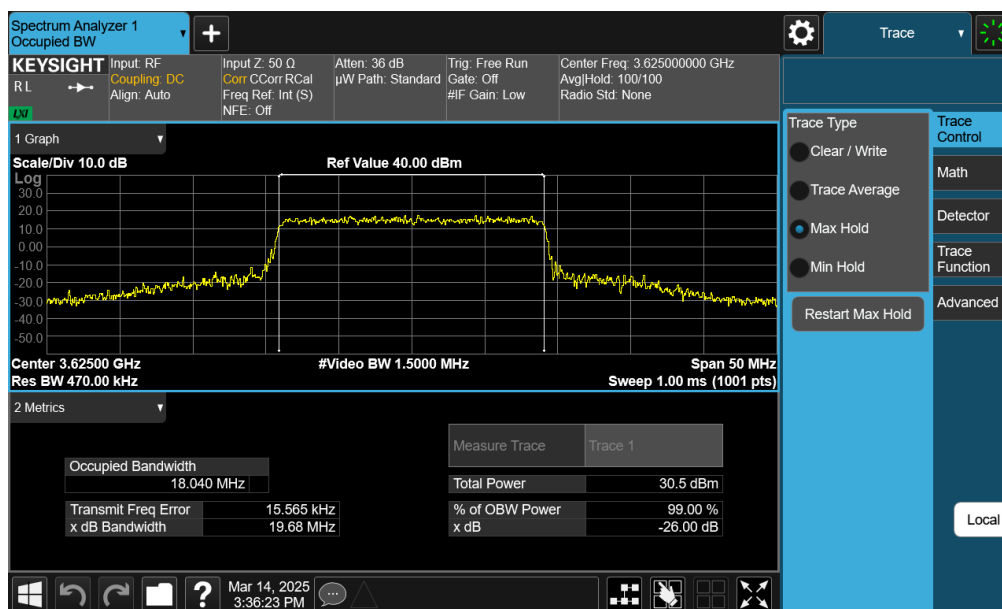
Table 7-16. Occupied Bandwidth Test Results – Ant F

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 25 of 201

LTE Band 48 – Ant F

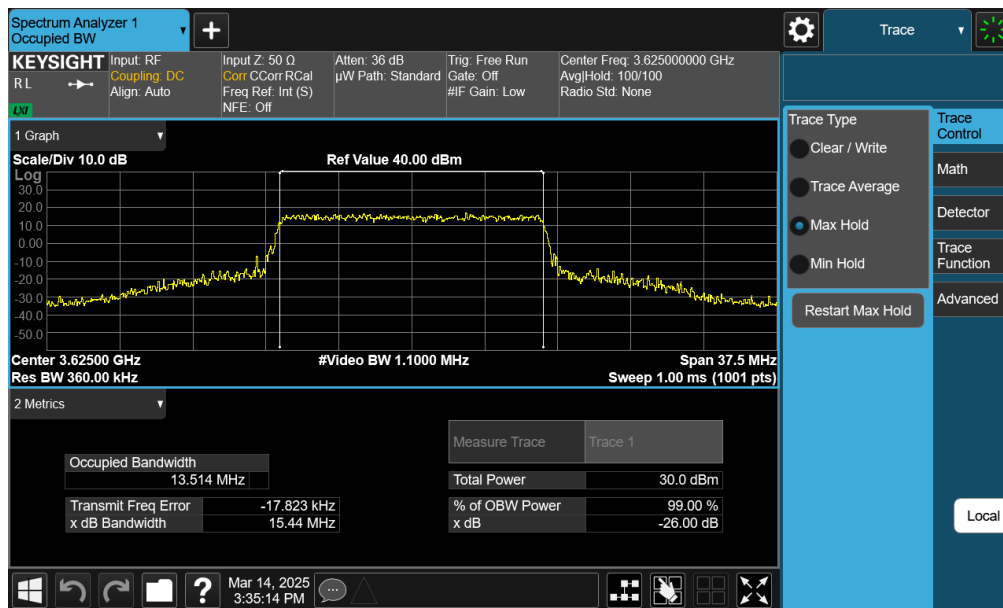
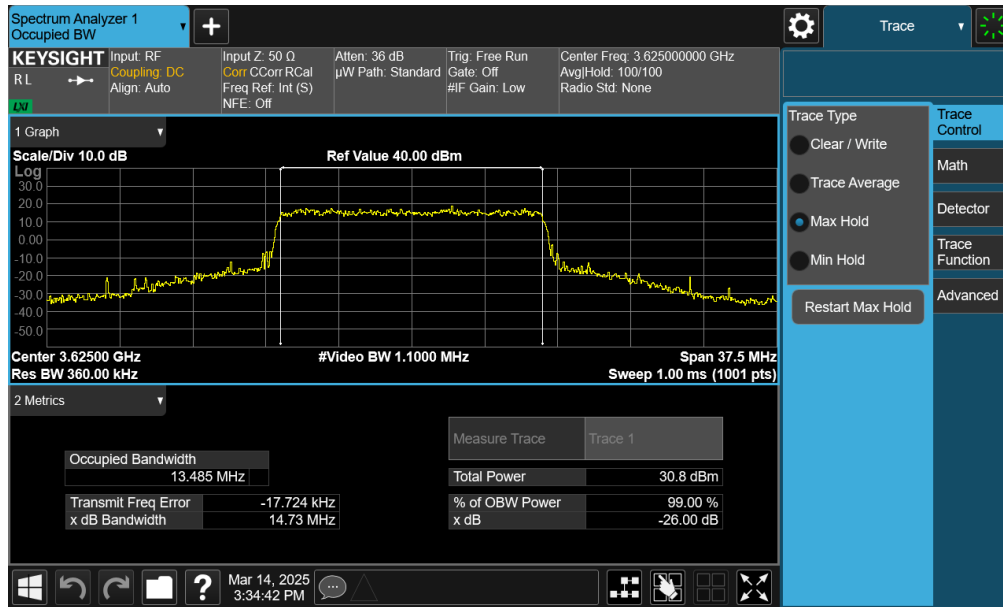


Plot 7-1. Occupied Bandwidth Plot (LTE Band 48 - 20MHz QPSK - Full RB Configuration - Ant F)

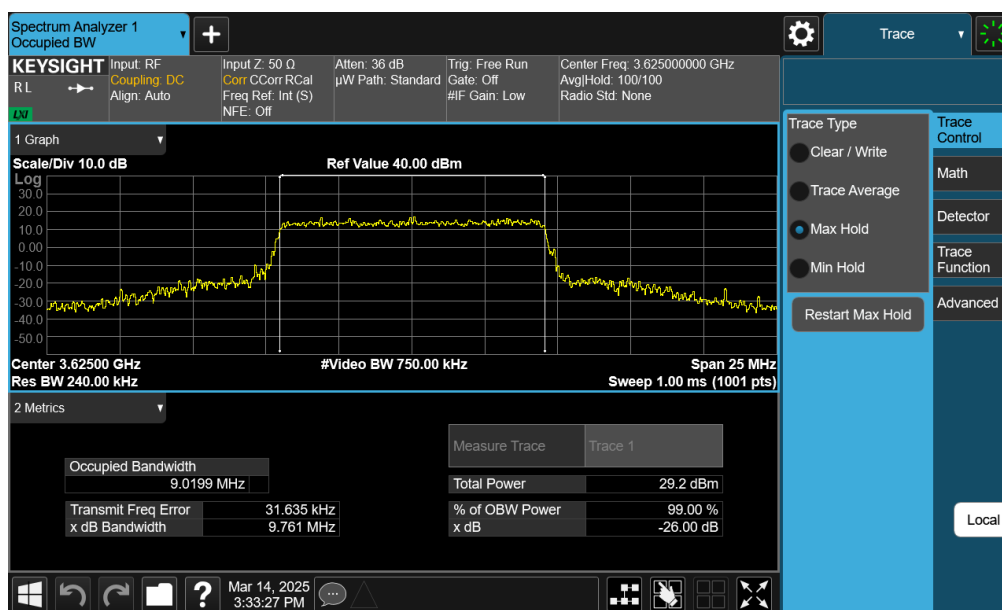
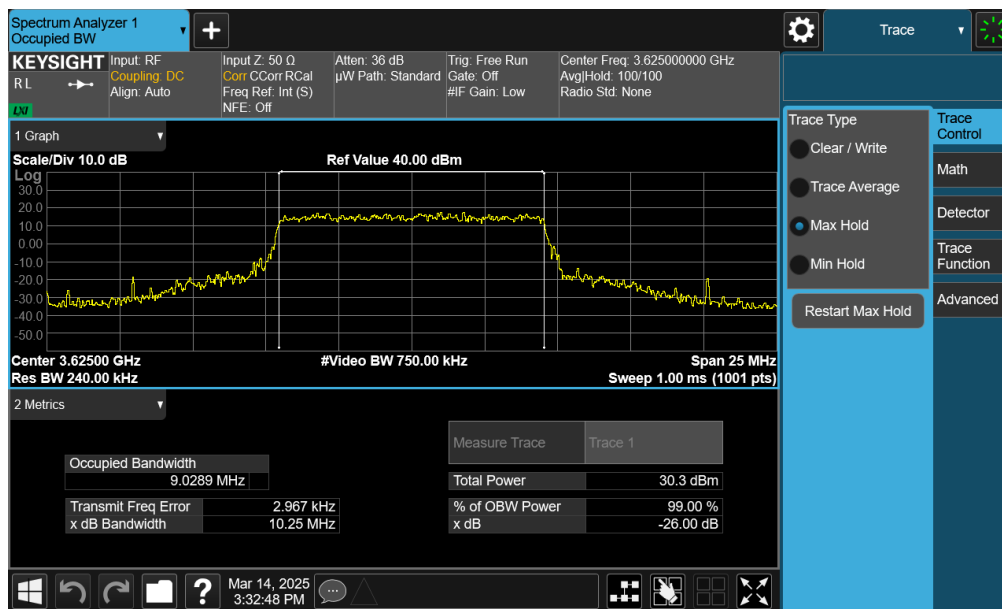


Plot 7-2. Occupied Bandwidth Plot (LTE Band 48 - 20MHz 16-QAM - Full RB Configuration - Ant F)

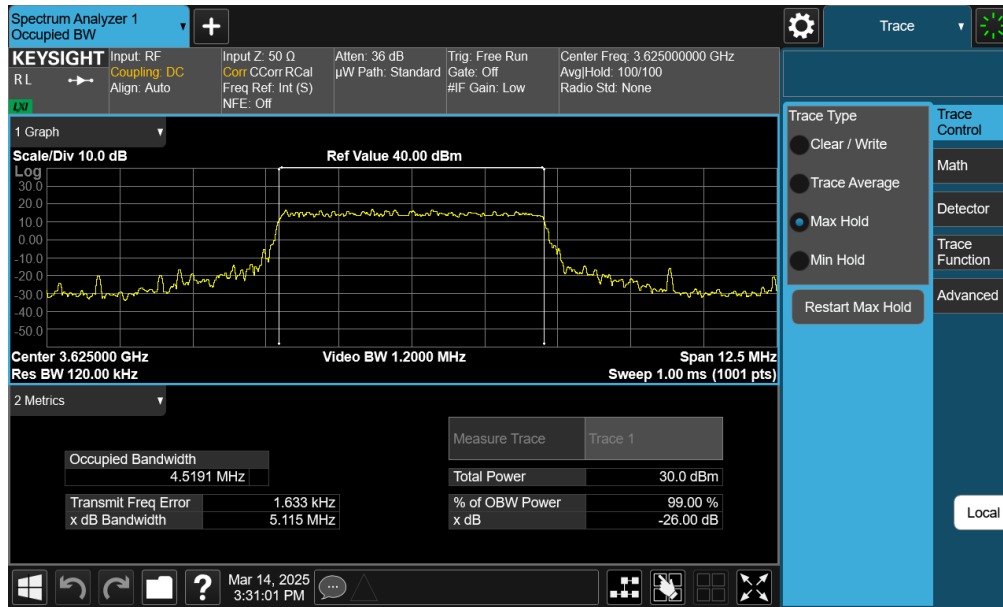
FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 26 of 201



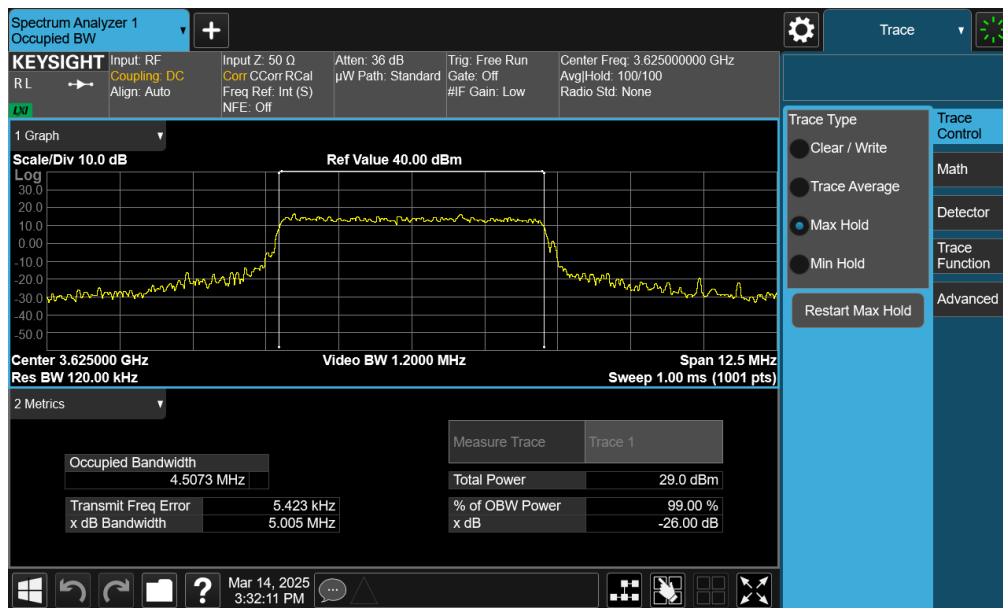
FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 27 of 201



FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 28 of 201



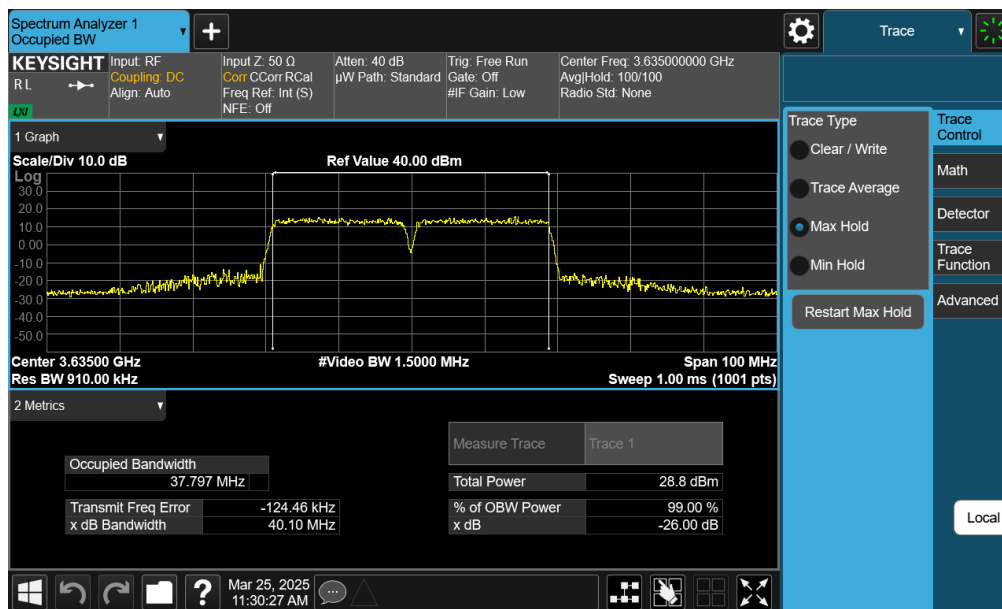
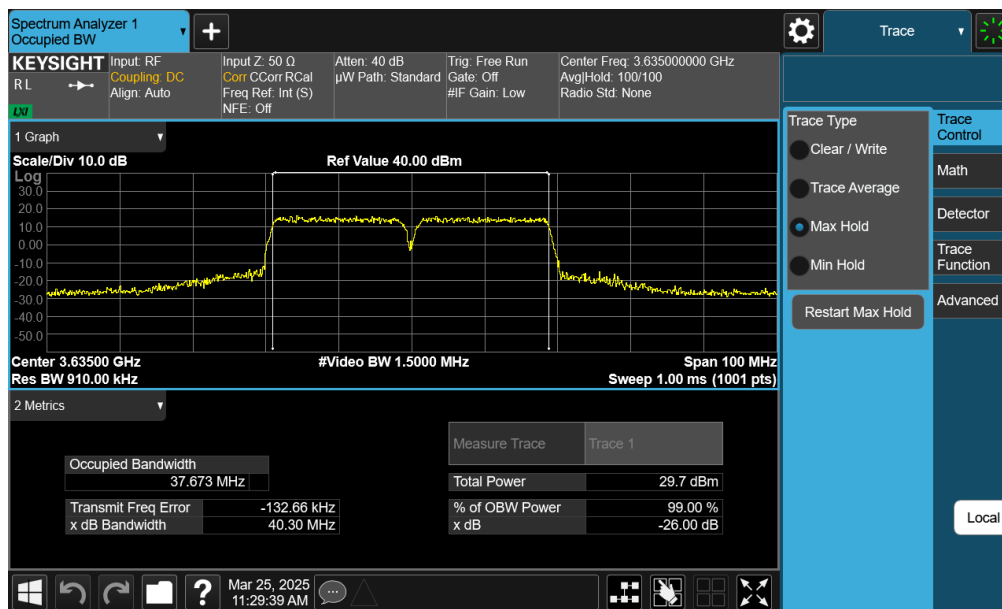
Plot 7-7. Occupied Bandwidth Plot (LTE Band 48 - 5MHz QPSK - Full RB Configuration - Ant F)



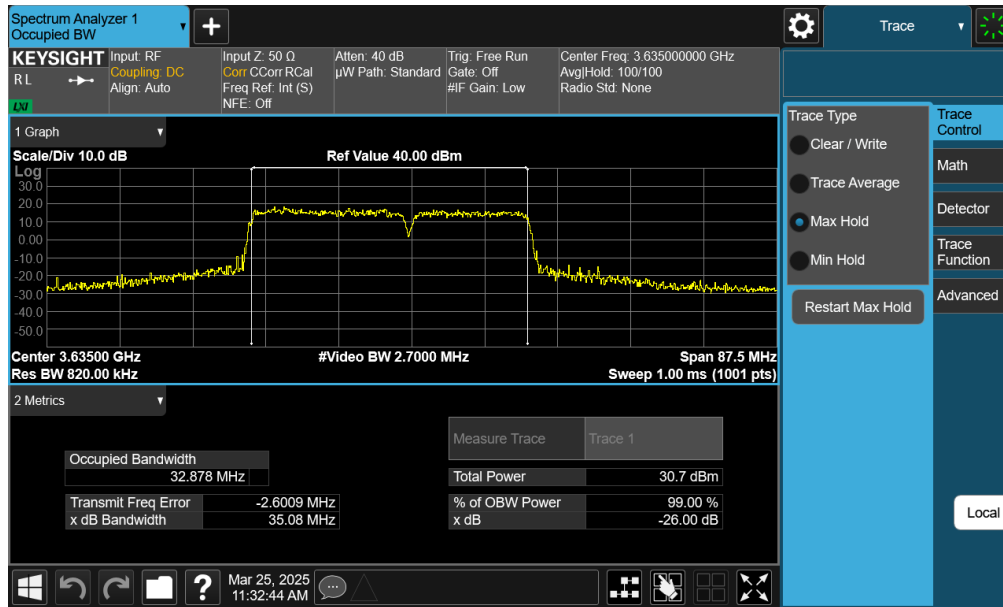
Plot 7-8. Occupied Bandwidth Plot (LTE Band 48 - 5MHz 16-QAM - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 29 of 201

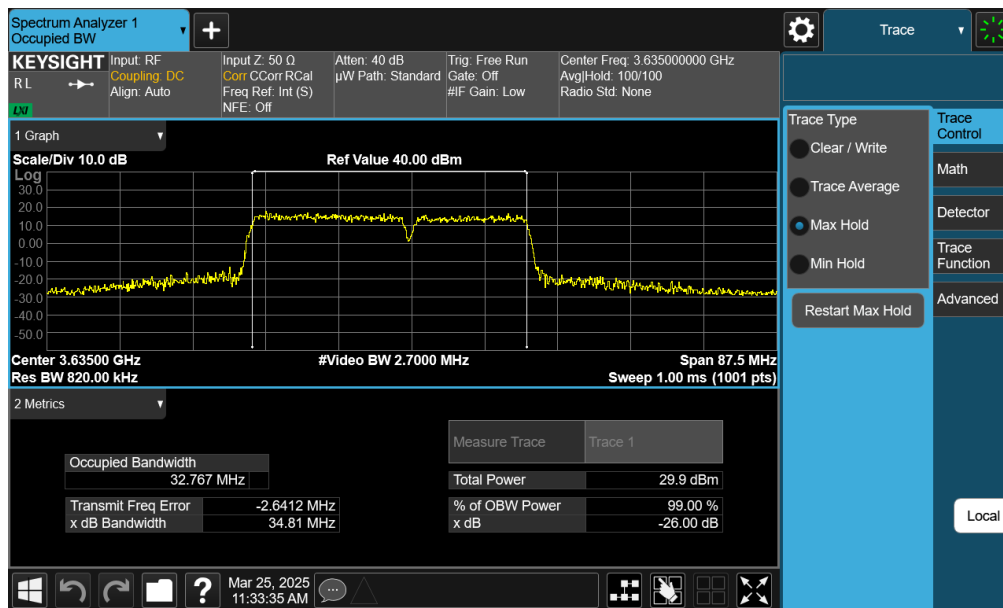
ULCA LTE Band 48 – Ant F



FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 30 of 201

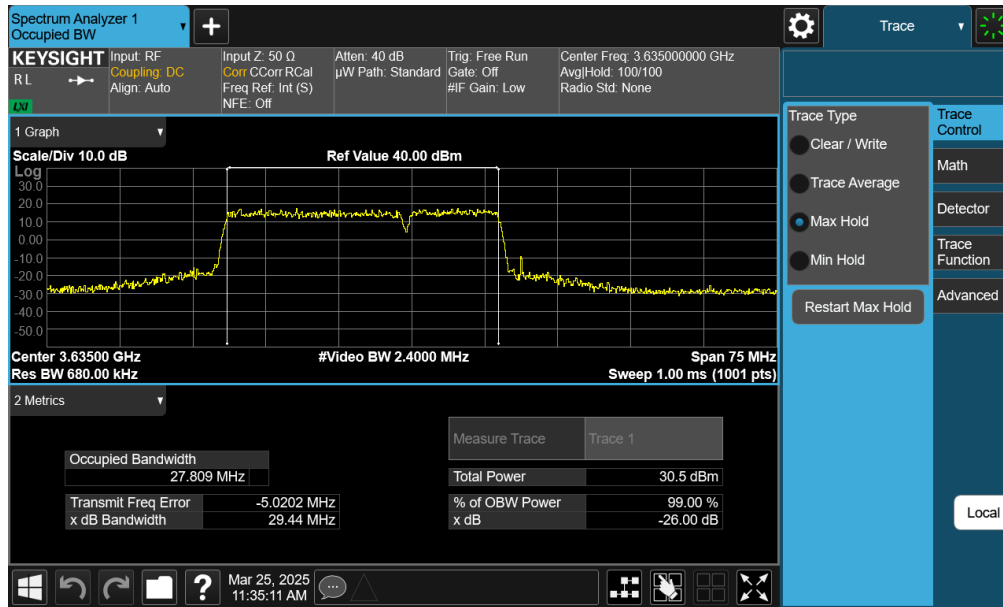


Plot 7-11. Occupied Bandwidth Plot (ULCA LB48 - 20+15MHz QPSK - Full RB Configuration - Ant F)

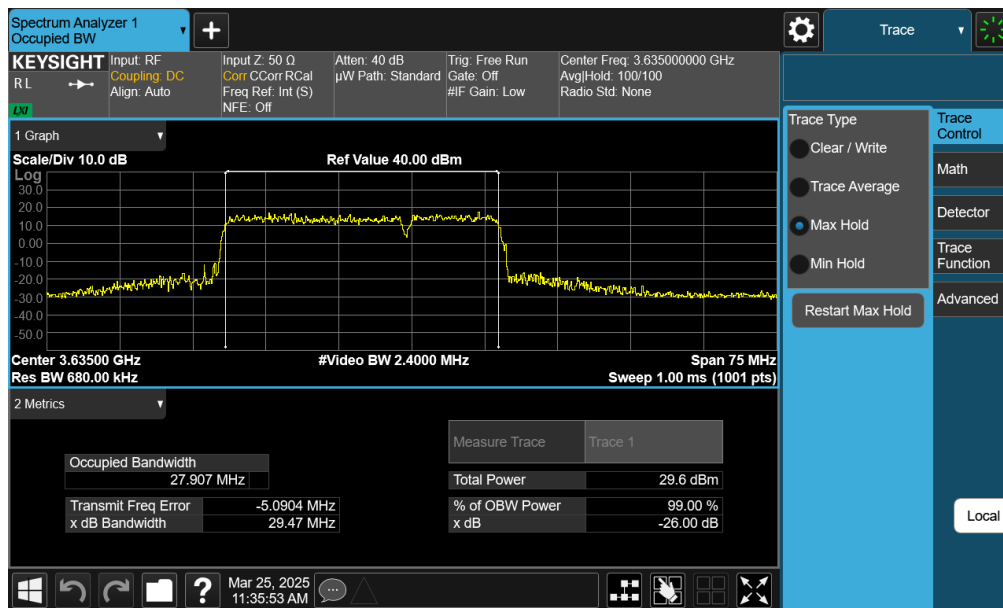


Plot 7-12. Occupied Bandwidth Plot (ULCA LB48 - 20+15MHz 16-QAM - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 31 of 201

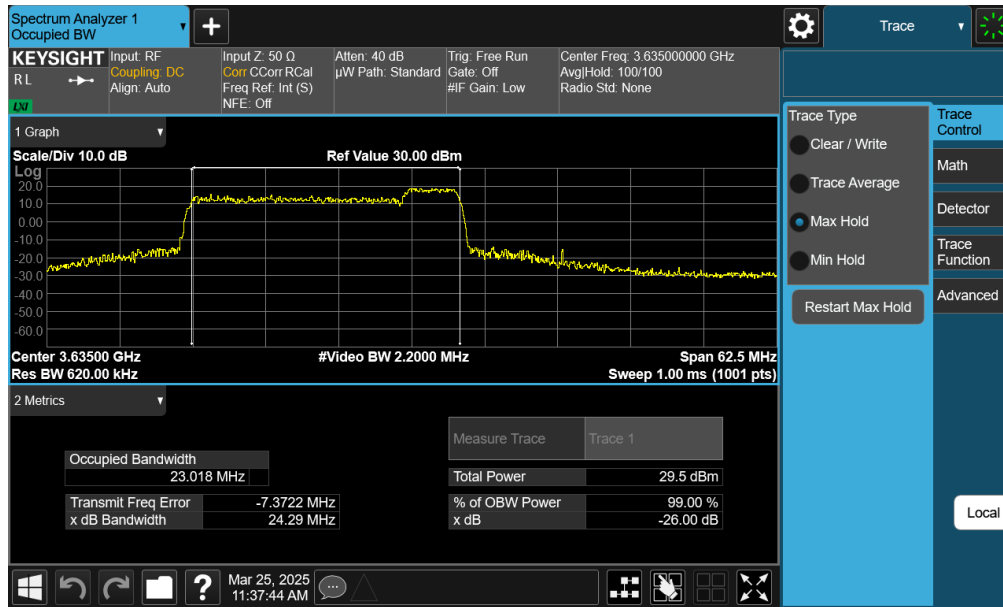


Plot 7-13. Occupied Bandwidth Plot (ULCA LB48 - 20+10MHz QPSK - Full RB Configuration - Ant F)

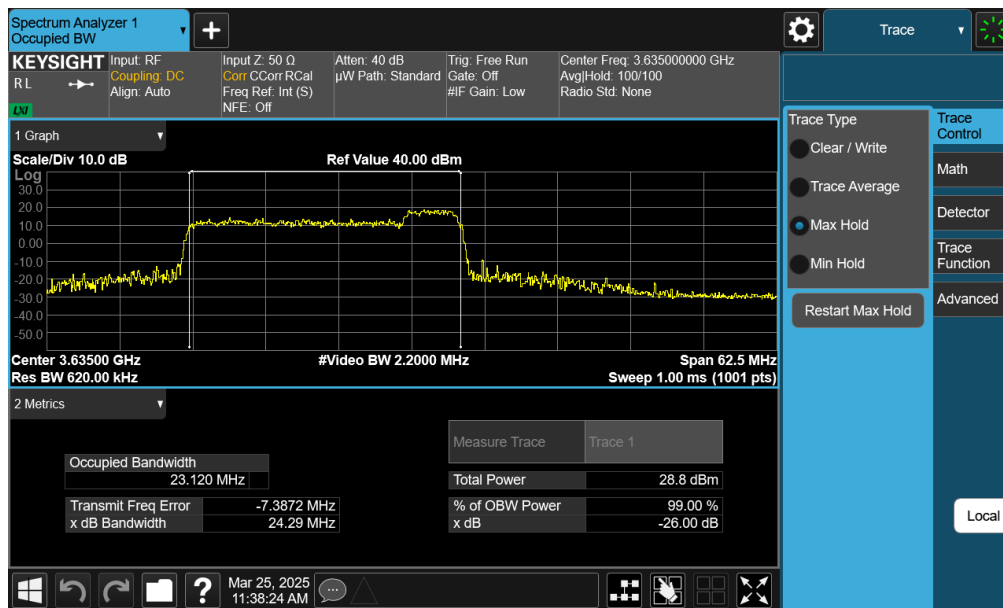


Plot 7-14. Occupied Bandwidth Plot (ULCA LB48 - 20+10MHz 16-QAM - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 32 of 201



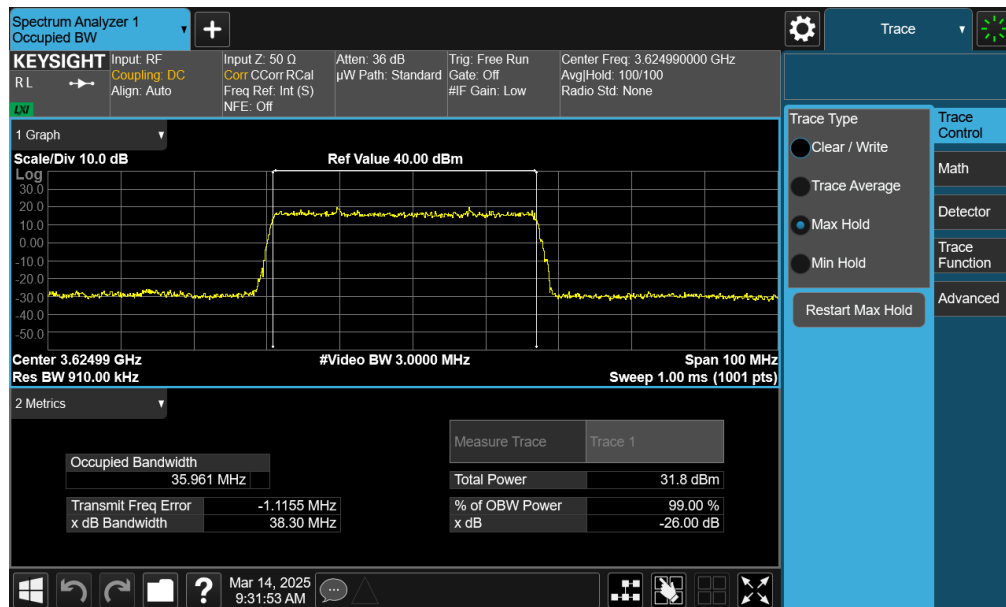
Plot 7-15. Occupied Bandwidth Plot (ULCA LB48 - 20+5MHz QPSK - Full RB Configuration - Ant F)



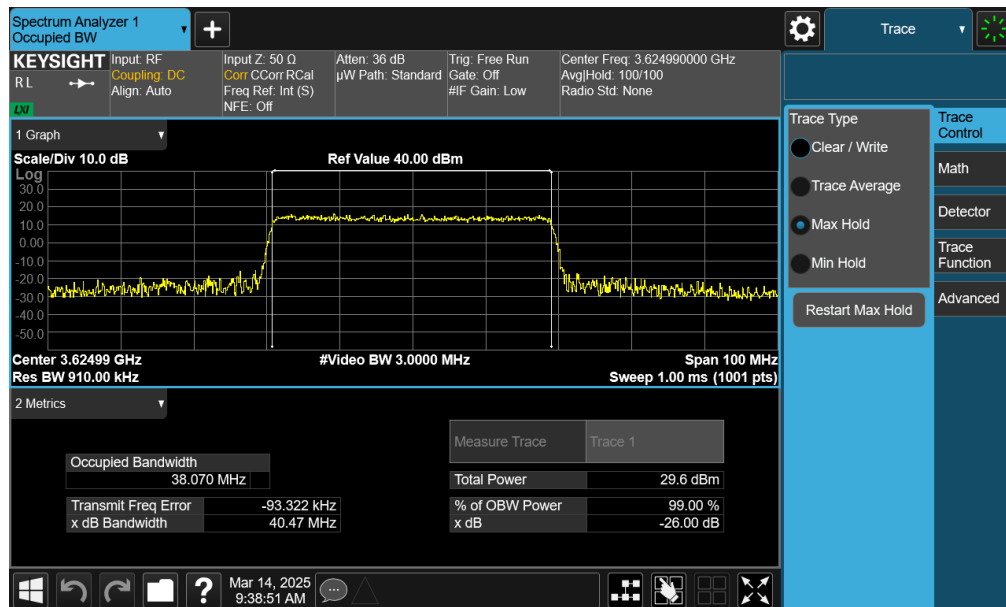
Plot 7-16. Occupied Bandwidth Plot (ULCA LB48 - 20+5MHz 16-QAM - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 33 of 201

NR Band n48 – Ant F

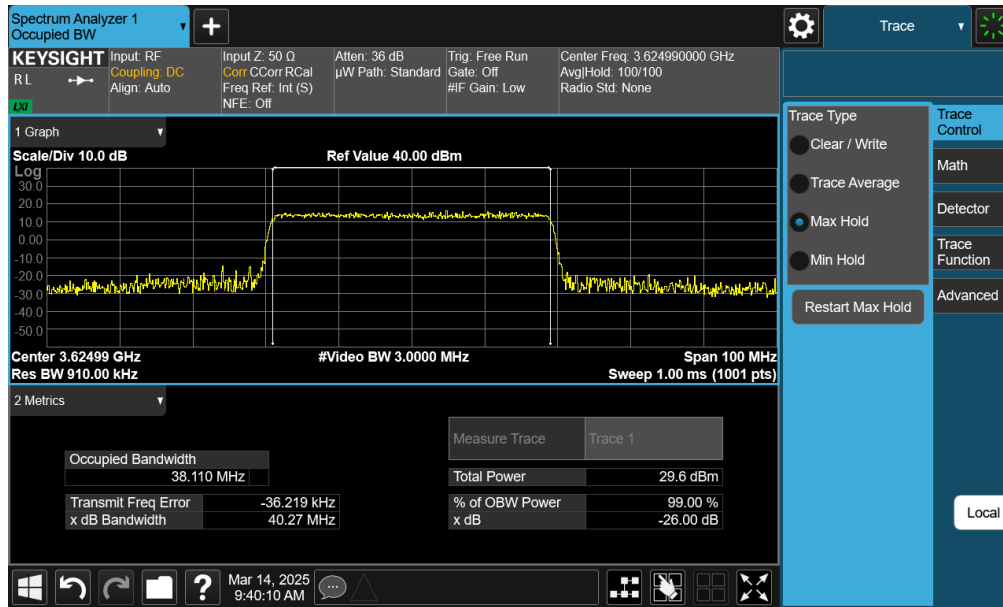


Plot 7-17. Occupied Bandwidth Plot (NR Band n48 - 40MHz $\pi/2$ BPSK - Full RB Configuration - Ant F)

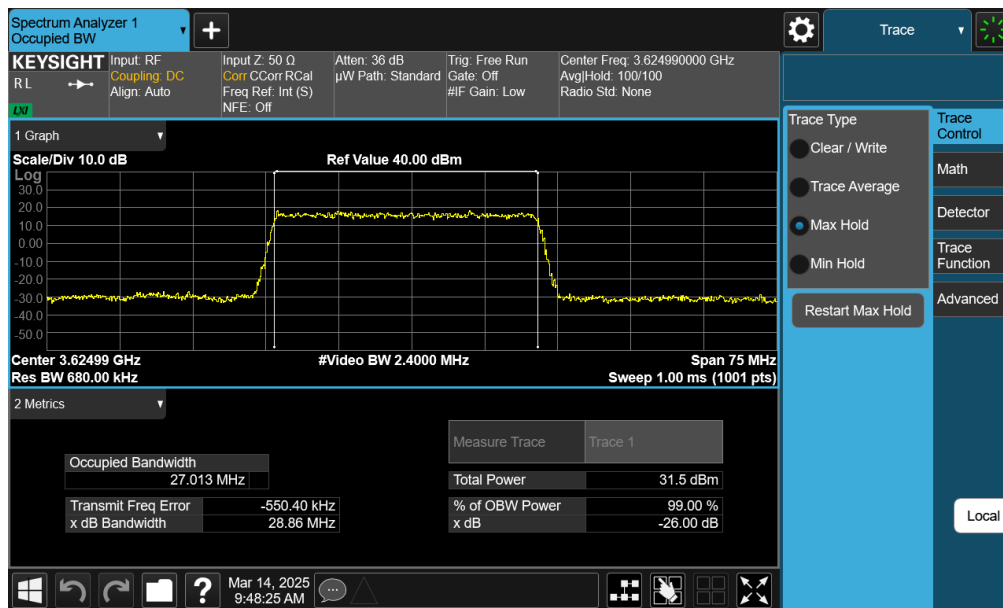


Plot 7-18. Occupied Bandwidth Plot (NR Band n48 - 40MHz QPSK - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 34 of 201

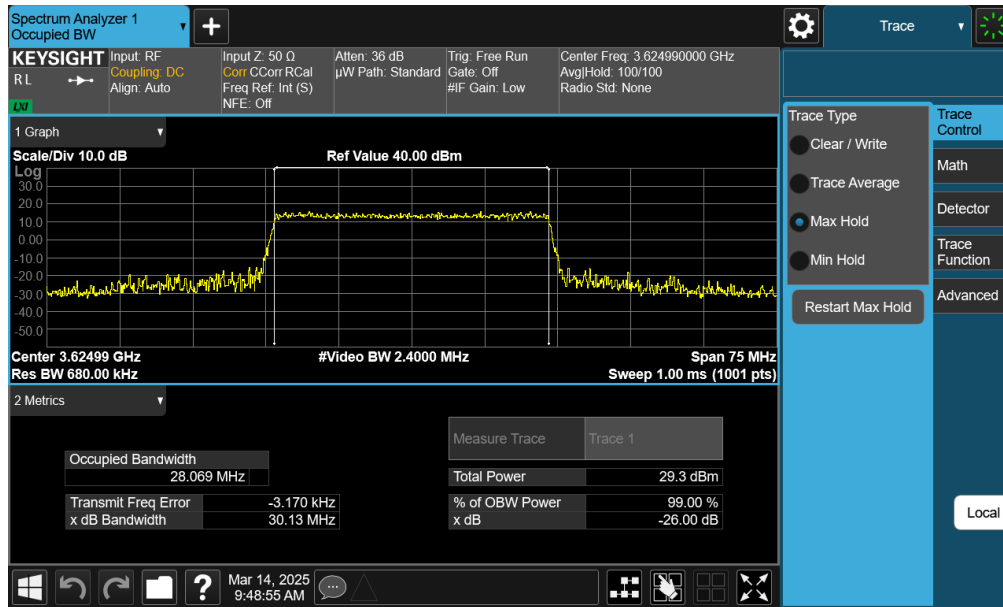


Plot 7-19. Occupied Bandwidth Plot (NR Band n48 - 40MHz 16-QAM - Full RB Configuration - Ant F)

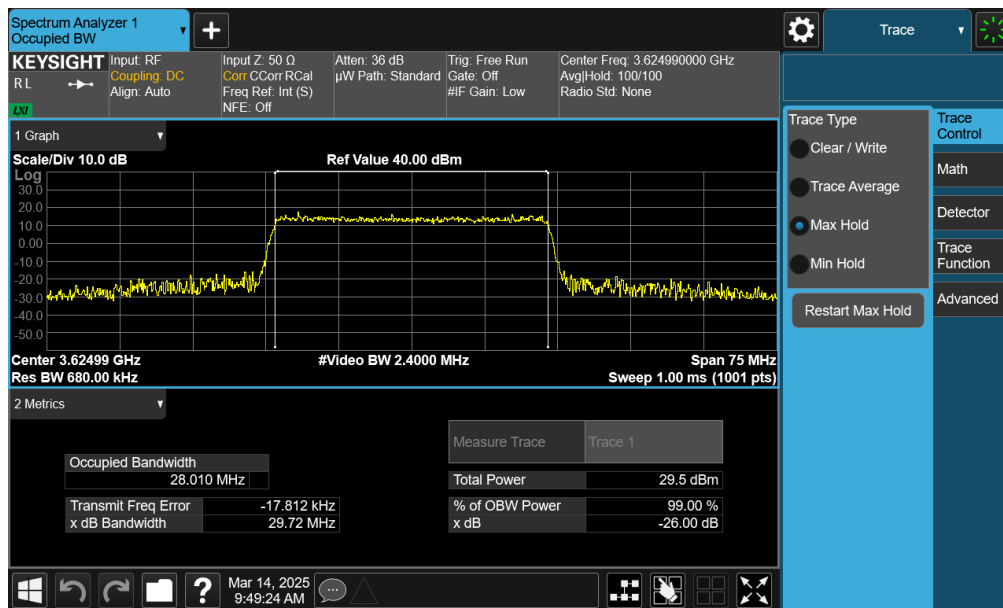


Plot 7-20. Occupied Bandwidth Plot (NR Band n48 - 30MHz $\pi/2$ BPSK - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 35 of 201

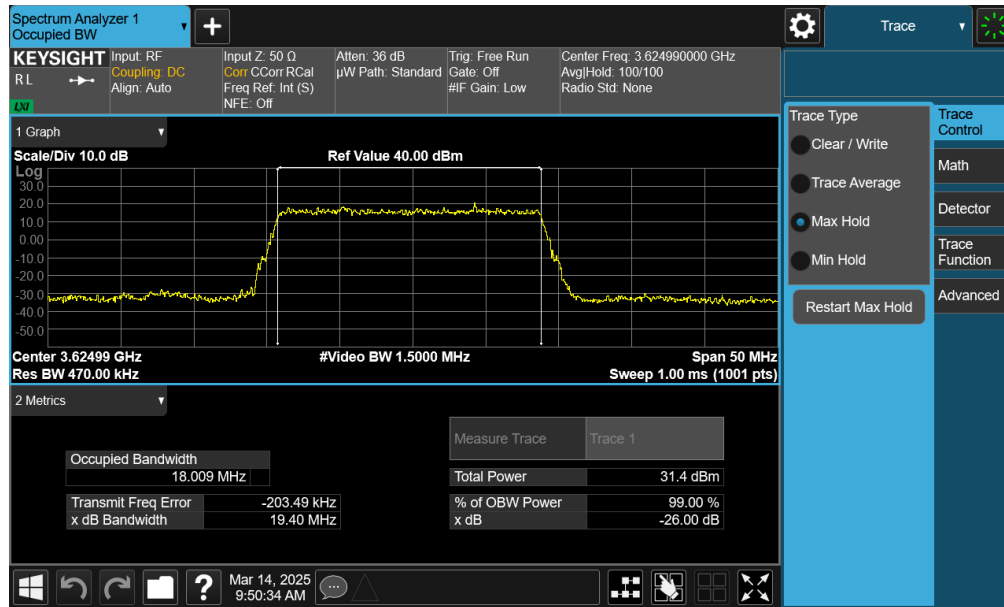


Plot 7-21. Occupied Bandwidth Plot (NR Band n48 - 30MHz QPSK - Full RB Configuration - Ant F)

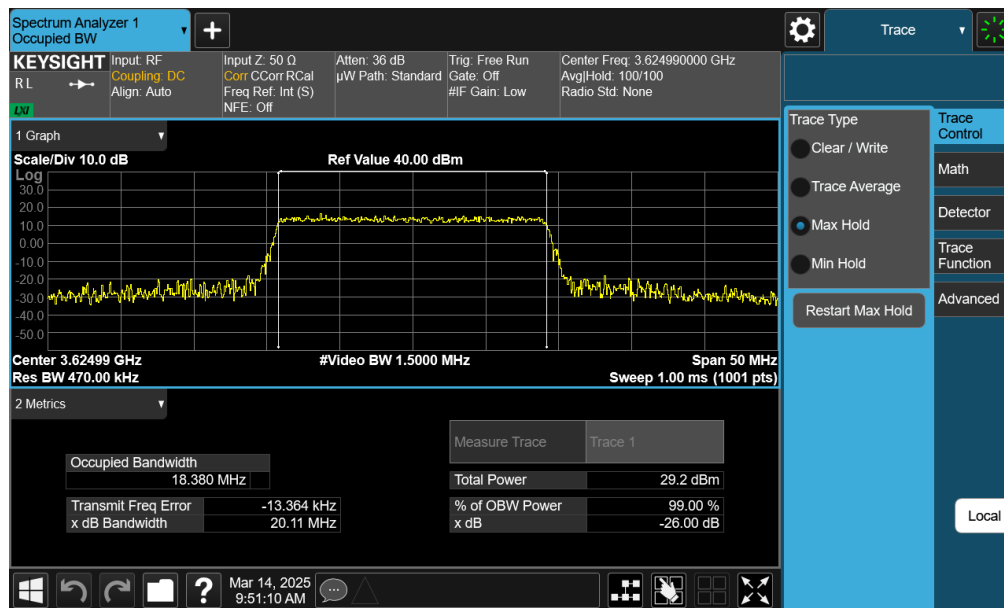


Plot 7-22. Occupied Bandwidth Plot (NR Band n48 - 30MHz 16-QAM - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 36 of 201

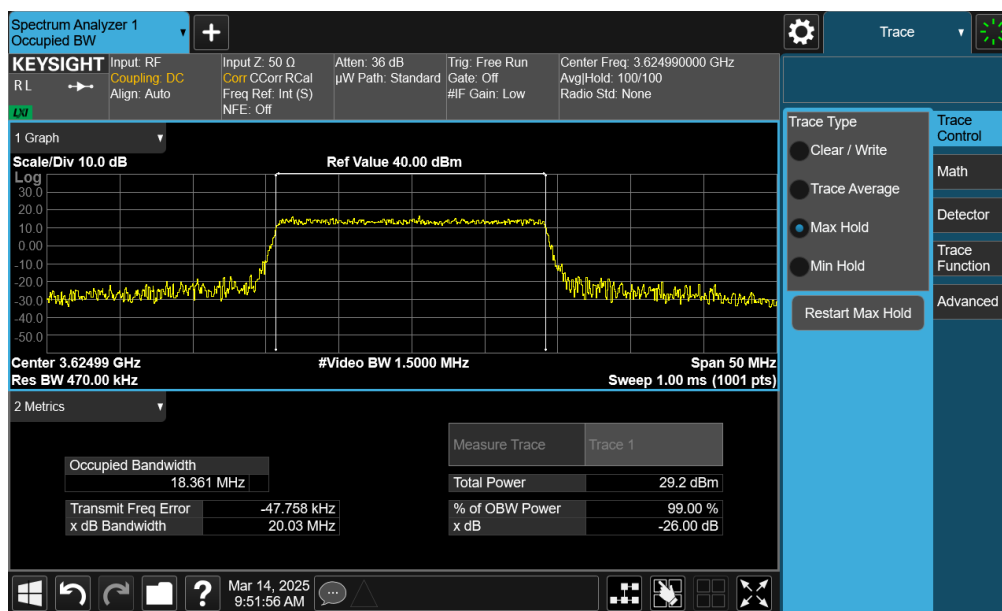


Plot 7-23. Occupied Bandwidth Plot (NR Band n48 - 20MHz $\pi/2$ BPSK - Full RB Configuration - Ant F)

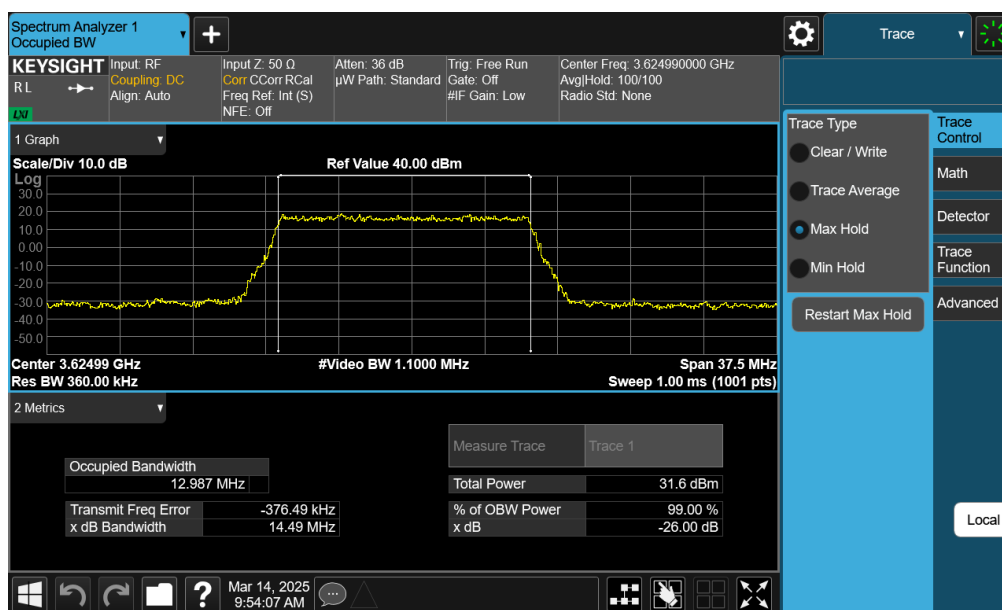


Plot 7-24. Occupied Bandwidth Plot (NR Band n48 - 20MHz QPSK - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 37 of 201

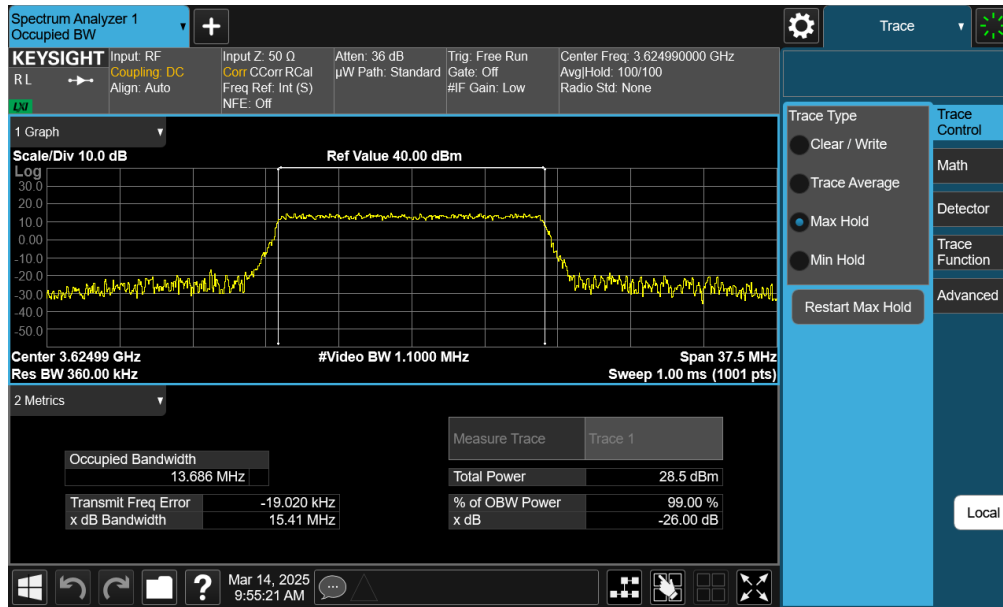


Plot 7-25. Occupied Bandwidth Plot (NR Band n48 - 20MHz 16-QAM - Full RB Configuration - Ant F)

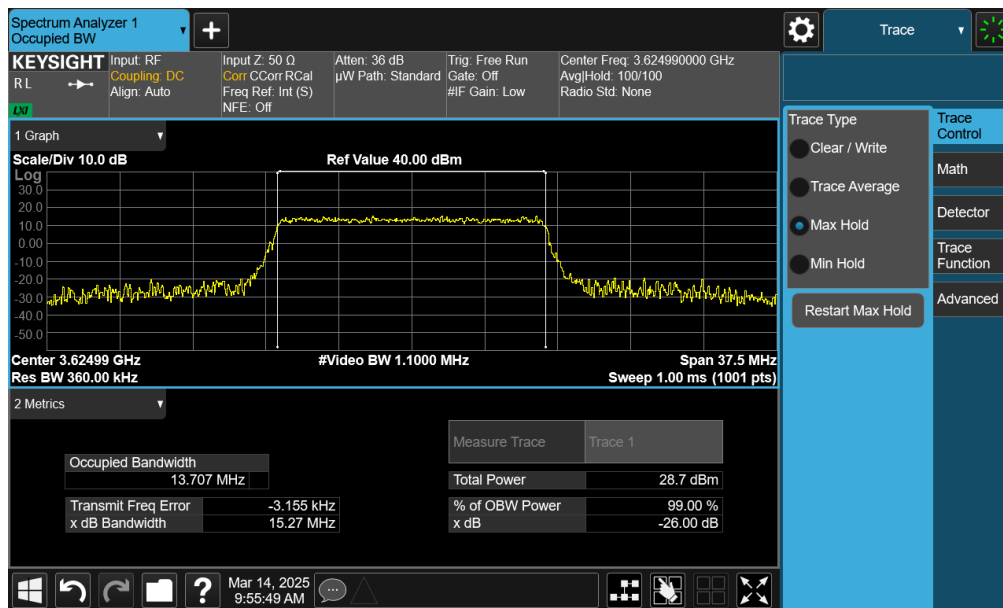


Plot 7-26. Occupied Bandwidth Plot (NR Band n48 - 15MHz $\pi/2$ BPSK - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 38 of 201

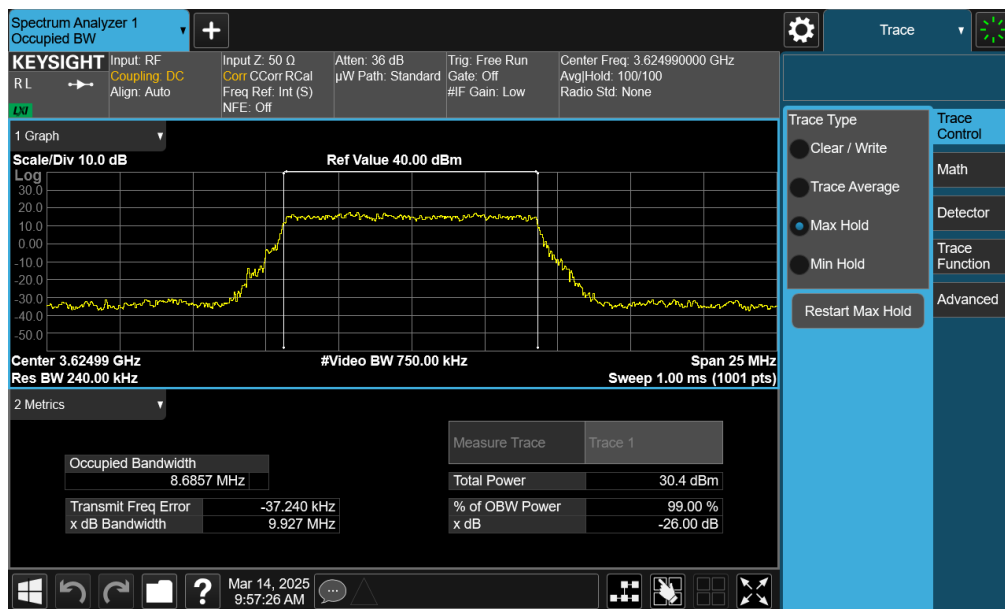


Plot 7-27. Occupied Bandwidth Plot (NR Band n48 - 15MHz QPSK - Full RB Configuration - Ant F)

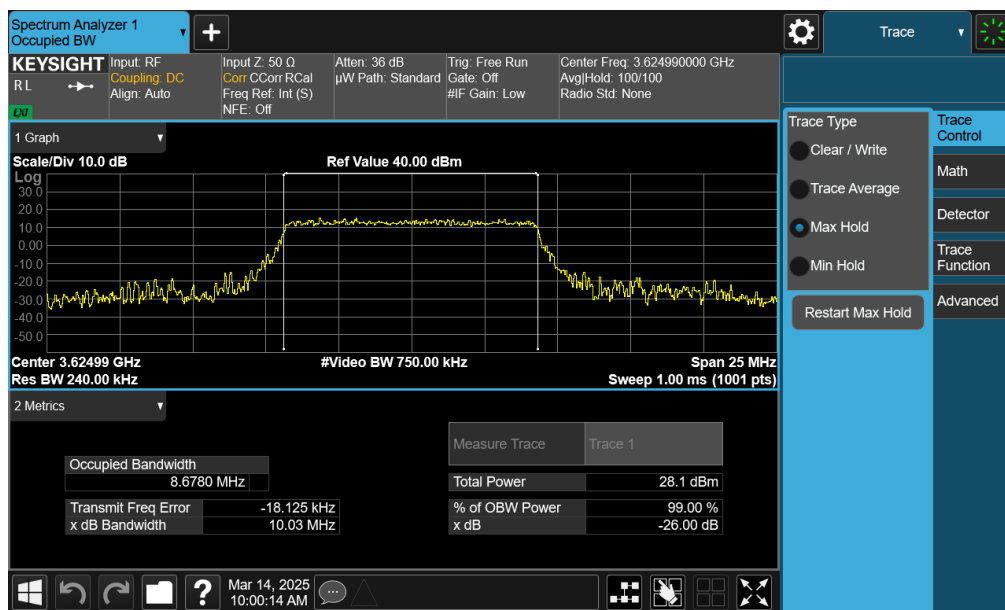


Plot 7-28. Occupied Bandwidth Plot (NR Band n48 - 15MHz 16-QAM - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 39 of 201

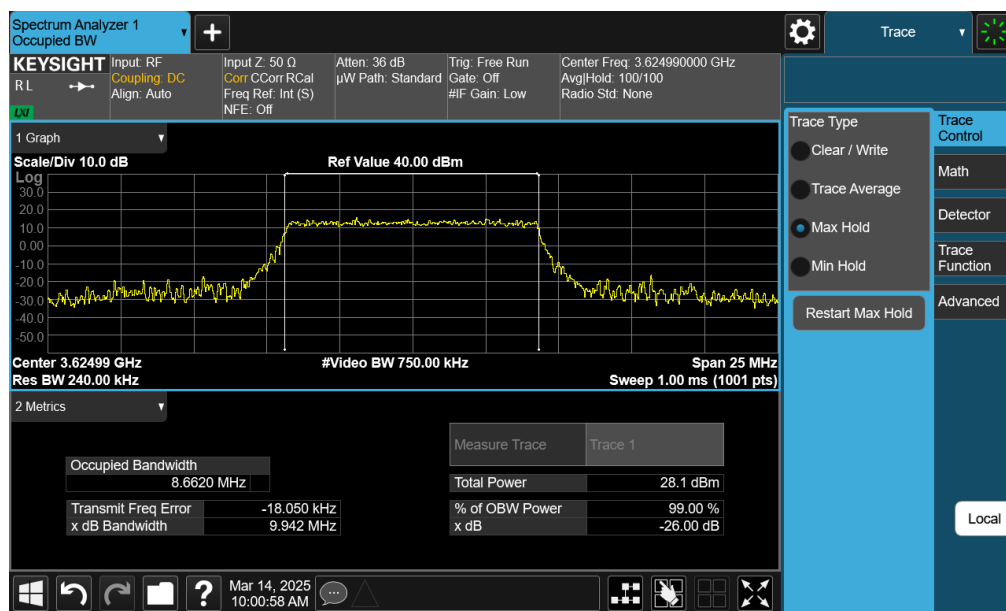


Plot 7-29. Occupied Bandwidth Plot (NR Band n48 - 10MHz $\pi/2$ BPSK - Full RB Configuration - Ant F)



Plot 7-30. Occupied Bandwidth Plot (NR Band n48 - 10MHz QPSK - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 40 of 201



Plot 7-31. Occupied Bandwidth Plot (NR Band n48 - 10MHz 16-QAM - Full RB Configuration - Ant F)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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Mode	Bandwidth	Modulation	OBW [MHz]
NR-n48	40MHz	BPSK	0.50
		QPSK	0.63
		16QAM	0.59

Table 7-17. Occupied Bandwidth Test Results – NR Band n48 – Ant C

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n48	40MHz	$\pi/2$ BPSK	0.50
		QPSK	0.58
		16QAM	0.60

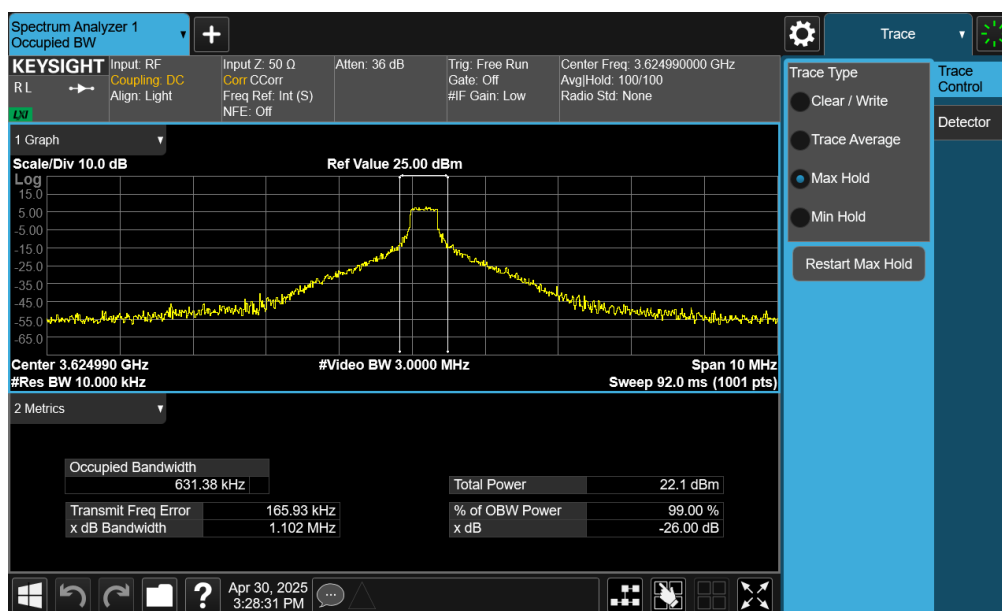
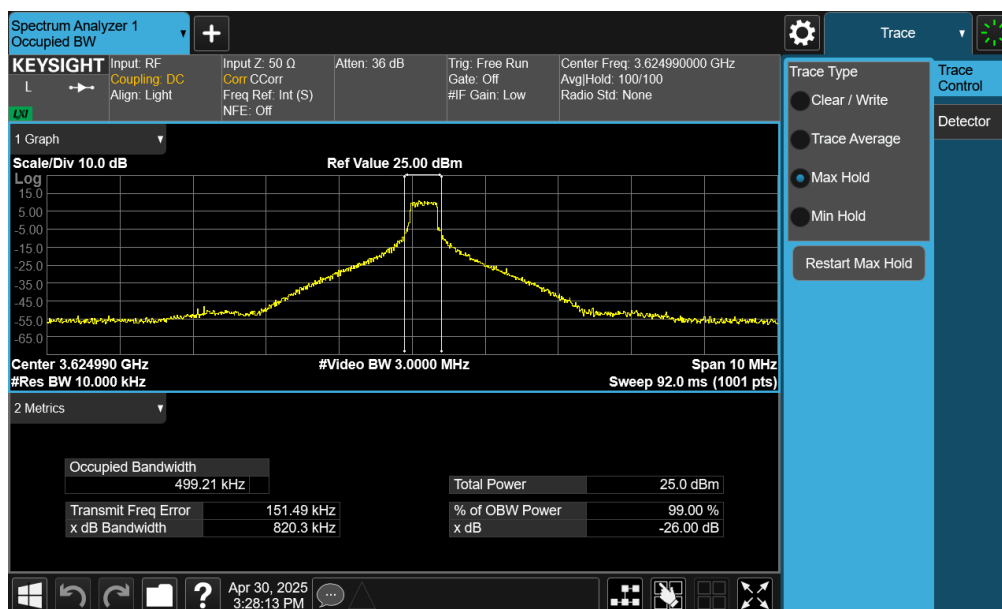
Table 7-18. Occupied Bandwidth Test Results – NR Band n48 – Ant G

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n48	40MHz	$\pi/2$ BPSK	0.50
		QPSK	0.62
		16QAM	0.61

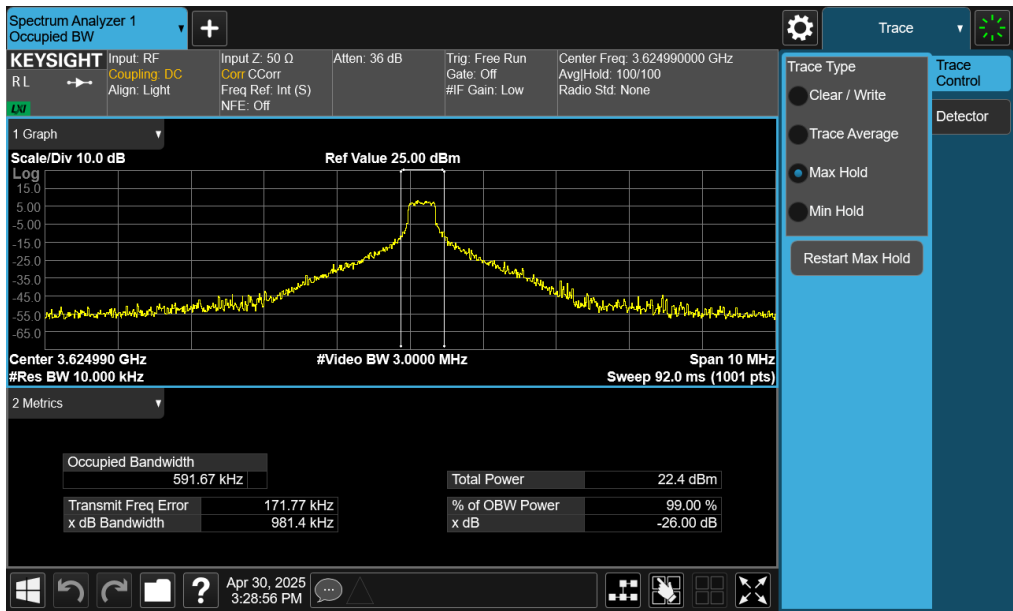
Table 7-19. Occupied Bandwidth Test Results – NR Band n48 – Ant A

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 42 of 201

NR Band n48 – Ant C



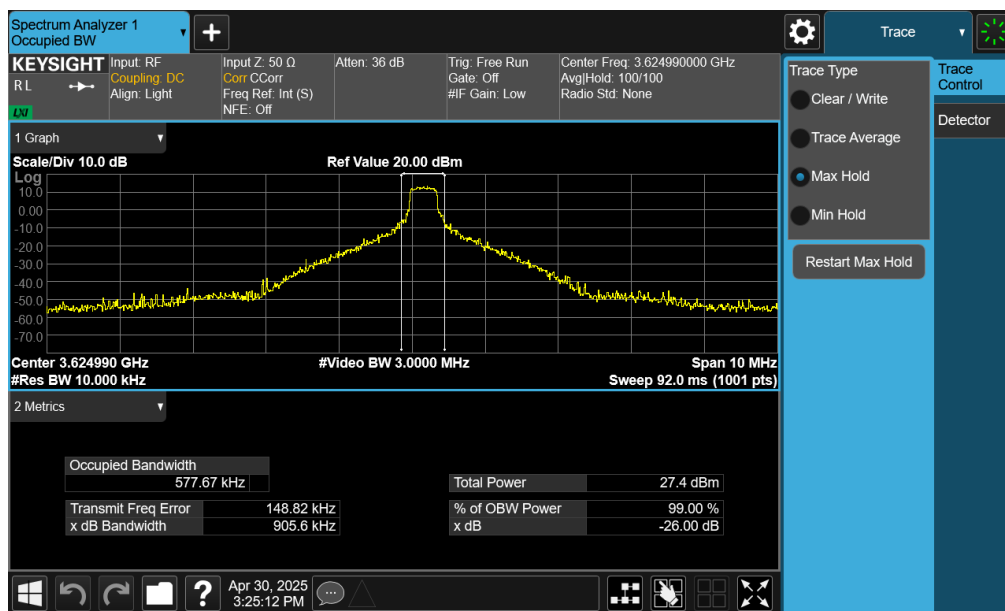
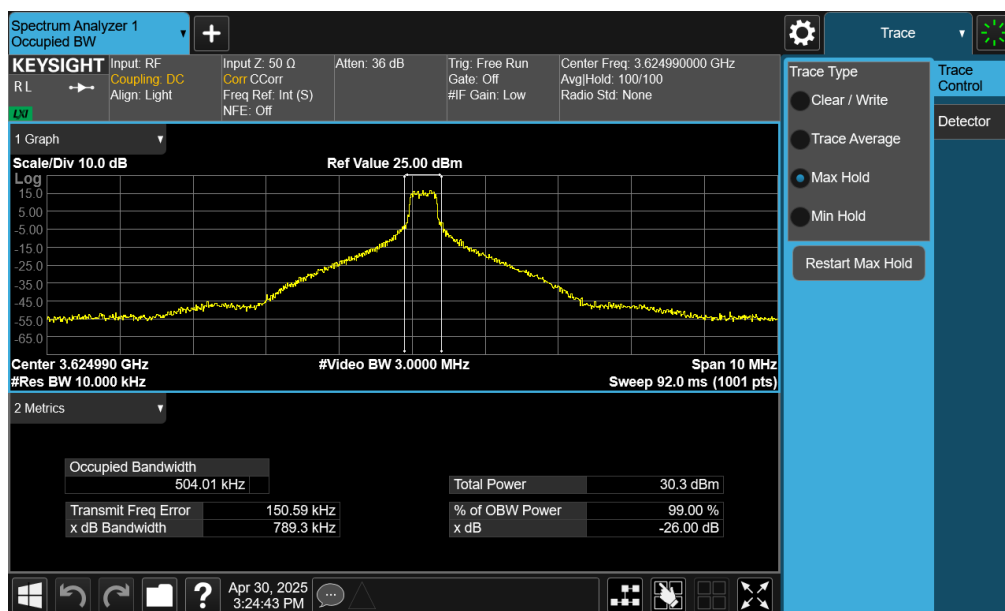
FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 43 of 201



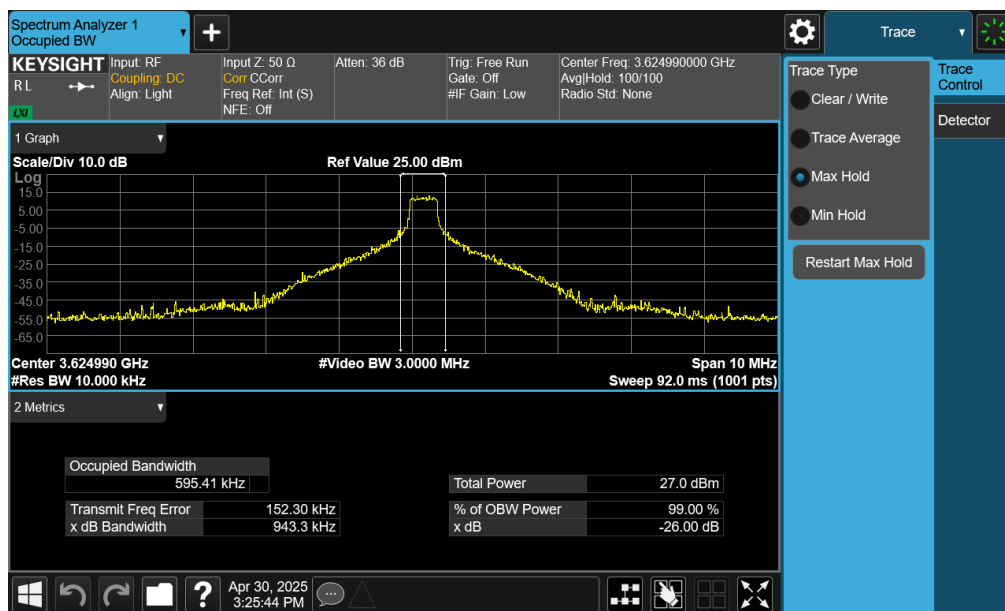
Plot 7-34. Occupied Bandwidth Plot (NR Band n48 - 40MHz 16-QAM - 1 RB Configuration - Ant C)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 44 of 201

NR Band n48 – Ant G



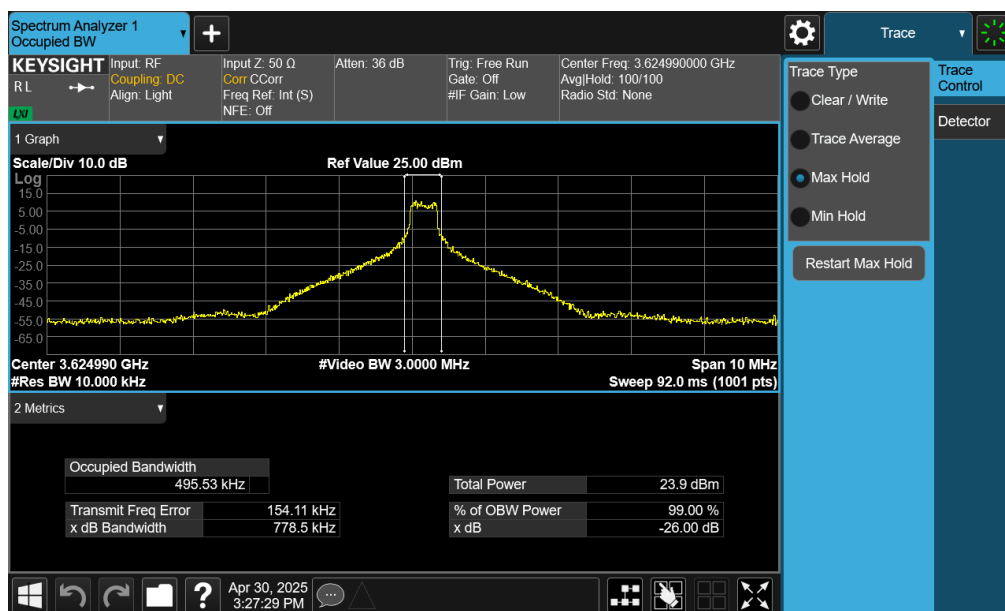
FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 45 of 201



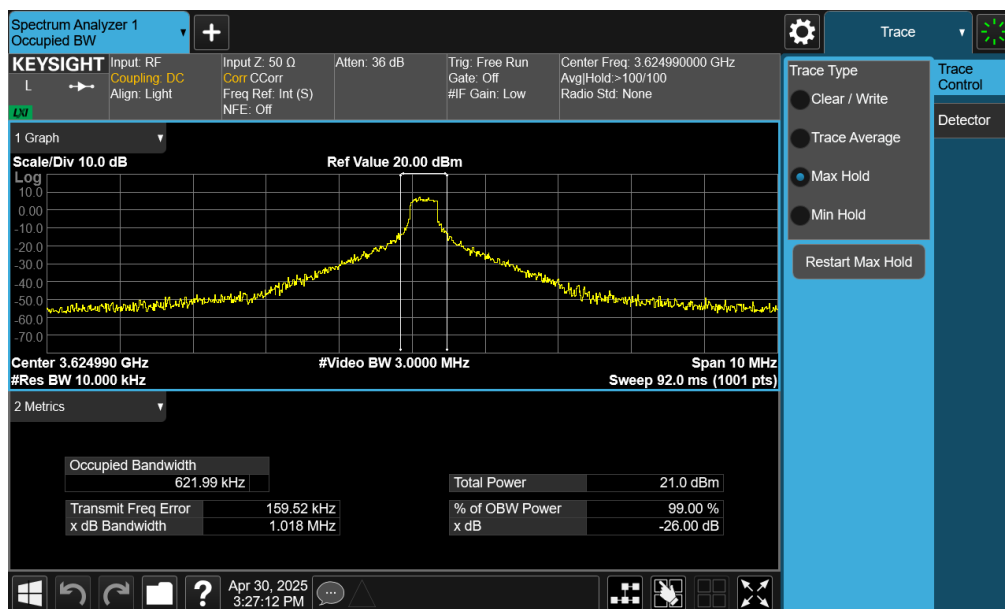
Plot 7-37. Occupied Bandwidth Plot (NR Band n48 - 40MHz 16-QAM - 1 RB Configuration - Ant G)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n48 – Ant A

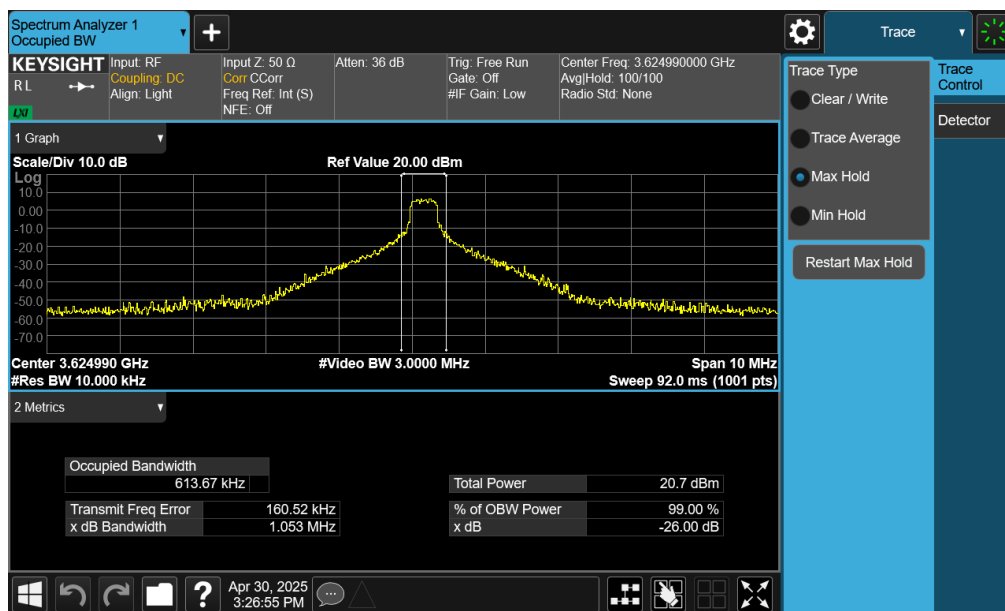


Plot 7-38. Occupied Bandwidth Plot (NR Band n48 - 40MHz $\pi/2$ BPSK - 1 RB Configuration - Ant A)



Plot 7-39. Occupied Bandwidth Plot (NR Band n48 - 40MHz QPSK - 1 RB Configuration - Ant A)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-40. Occupied Bandwidth Plot (NR Band n48 - 40MHz 16-QAM - 1 RB Configuration - Ant A)

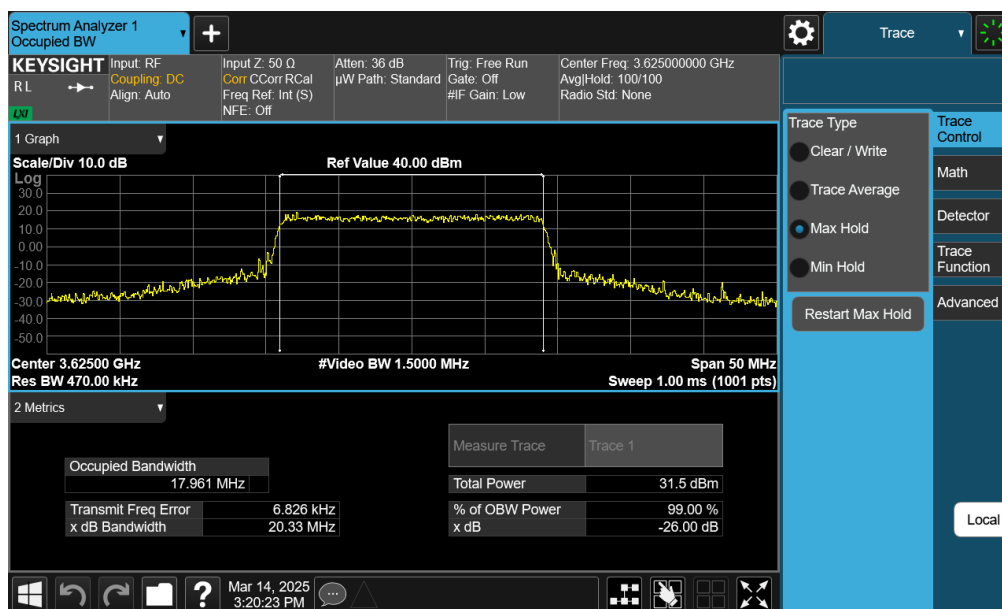
FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 48 of 201

Mode	Bandwidth	Modulation	OBW [MHz]
LTE-B48	20MHz	QPSK	17.96
		16QAM	17.96
	15MHz	QPSK	13.46
		16QAM	13.47
	10MHz	QPSK	8.99
		16QAM	9.02
	5MHz	QPSK	4.51
		16QAM	4.50
ULCA LTE-B48	20+20MHz	QPSK	37.71
		16QAM	37.70
	20+15MHz	QPSK	32.79
		16QAM	32.84
	20+10MHz	QPSK	27.85
		16QAM	27.86
	20+5MHz	QPSK	23.05
		16QAM	22.97

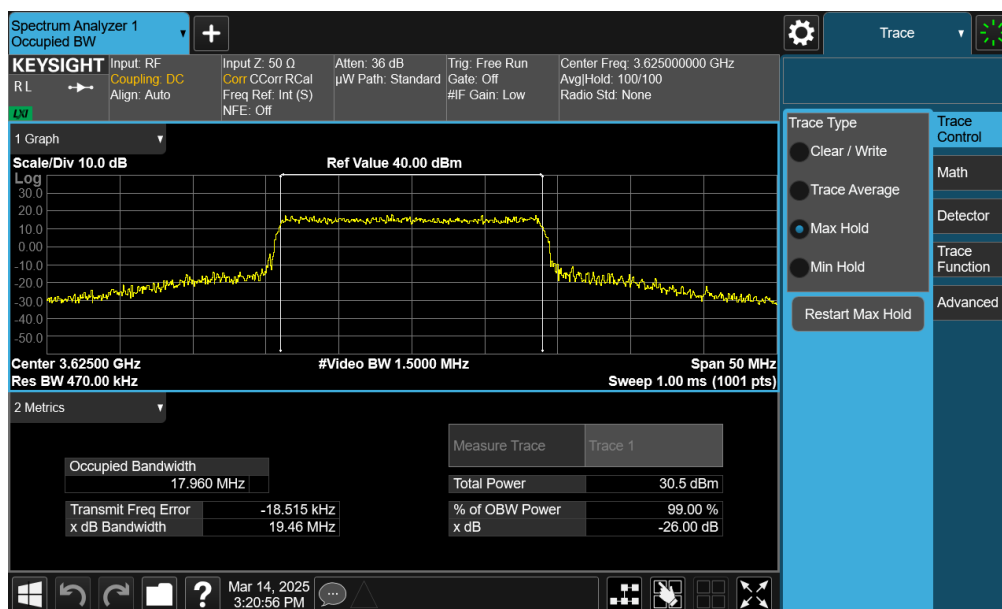
Table 7-20. Occupied Bandwidth Test Results – LTE Band 48 – ANT C

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 49 of 201

LTE Band 48 – ANT C

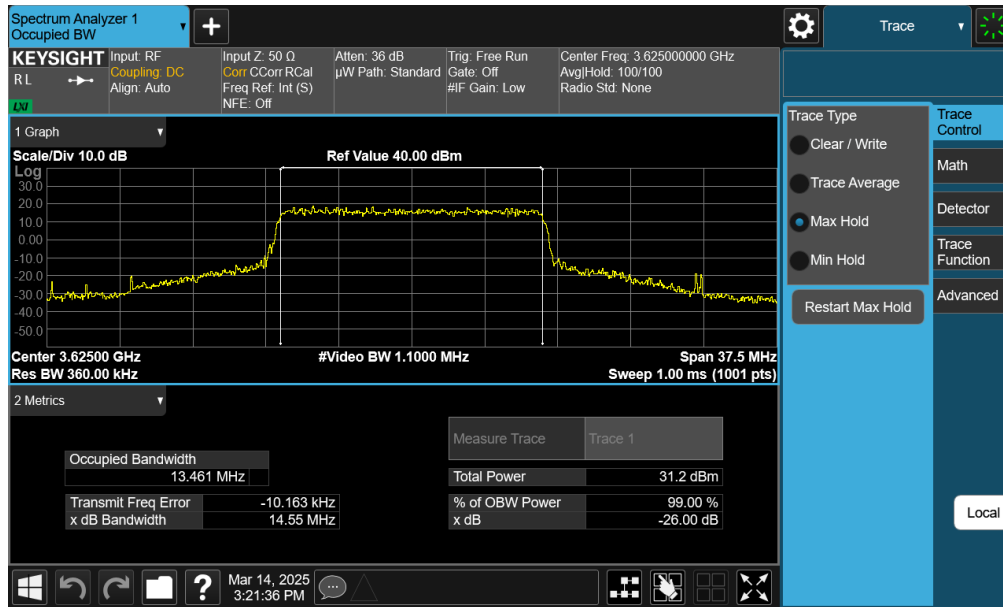


Plot 7-41. Occupied Bandwidth Plot (LTE Band 48 - 20MHz QPSK - Full RB Configuration - ANT C)

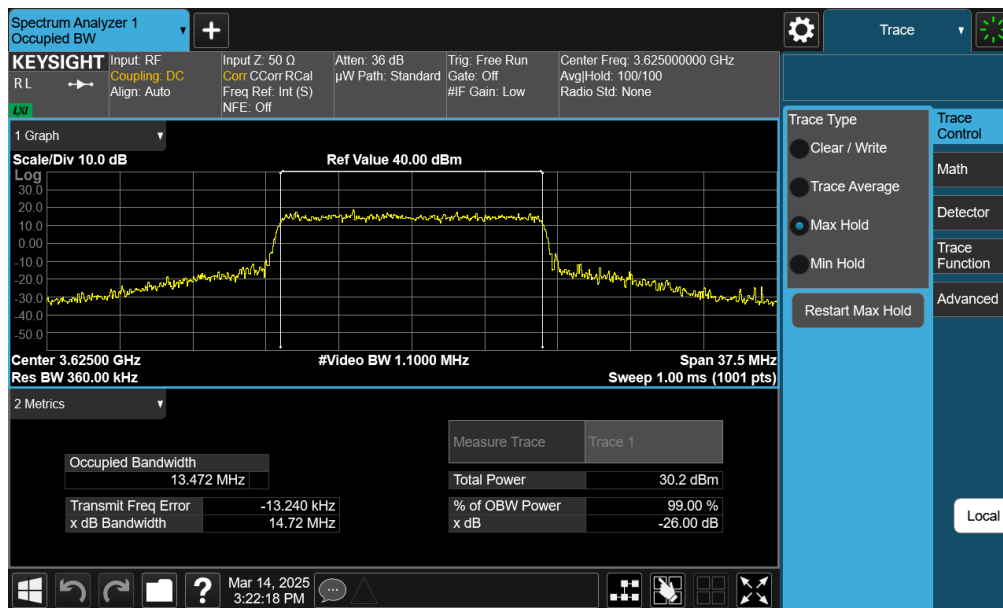


Plot 7-42. Occupied Bandwidth Plot (LTE Band 48 - 20MHz 16-QAM - Full RB Configuration - ANT C)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 50 of 201

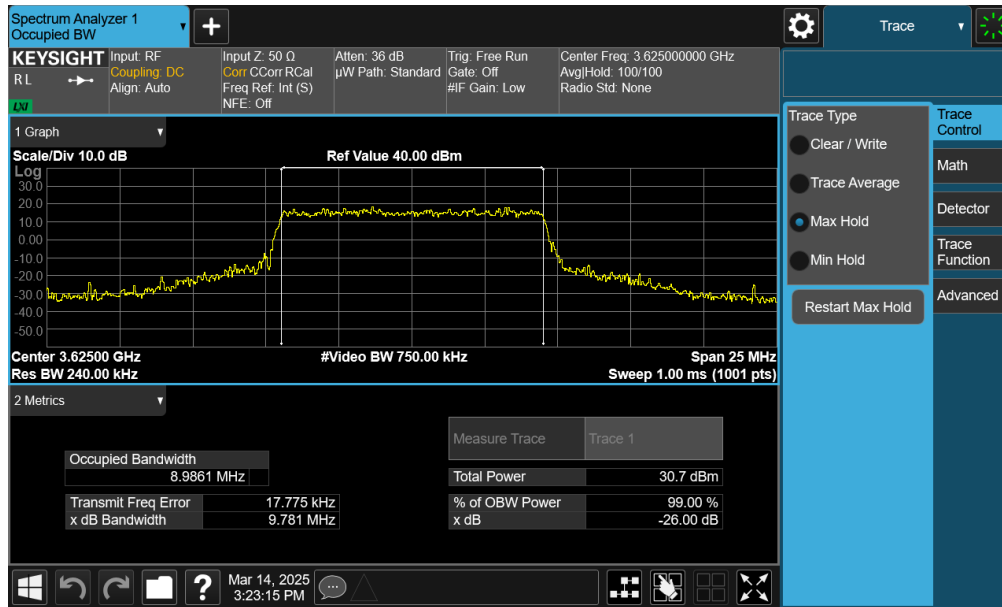


Plot 7-43. Occupied Bandwidth Plot (LTE Band 48 - 15MHz QPSK - Full RB Configuration - ANT C)

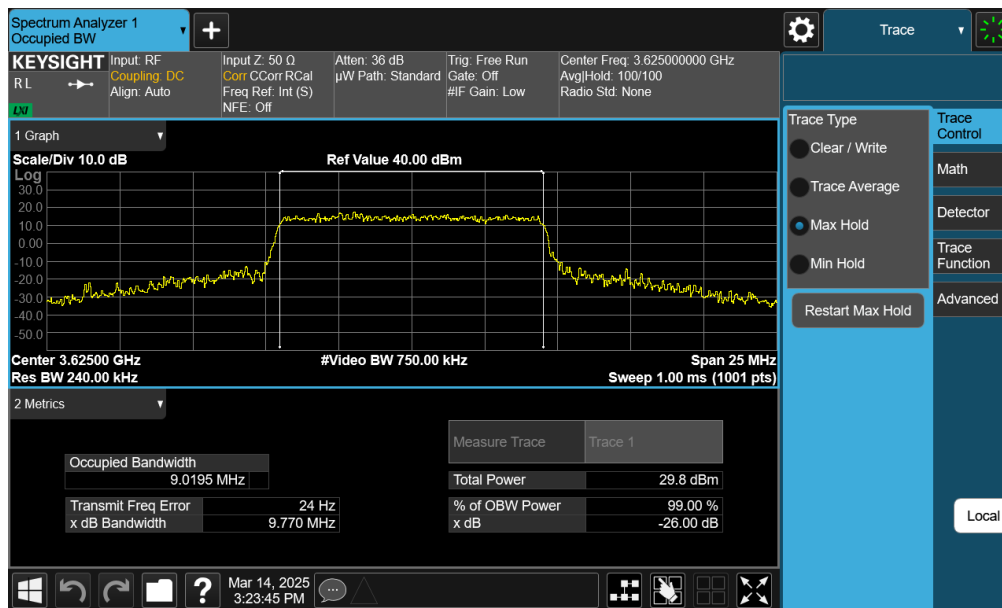


Plot 7-44. Occupied Bandwidth Plot (LTE Band 48 - 15MHz 16-QAM - Full RB Configuration - ANT C)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-45. Occupied Bandwidth Plot (LTE Band 48 - 10MHz QPSK - Full RB Configuration - ANT C)



Plot 7-46. Occupied Bandwidth Plot (LTE Band 48 - 10MHz 16-QAM - Full RB Configuration - ANT C)

FCC ID: A3LSMF966U	PART 96 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2502210015-14.A3L	Test Dates: 2/24/2025 - 4/28/2025	EUT Type: Portable Handset	Page 52 of 201